

Catalog | June 2016

Electronic relays and controls The whole assortment for monitoring and controlling devices

Electronic relays and controls News



Liquid level monitoring relays in new housing

ABB's liquid level monitoring relays are used for regulation and control of liquid levels and ratios of mixtures of conductive fluids. The assortment includes single function and multifunctional devices which can be used for overflow, dry-running protection of pumps, filling and draining applications as well as max. and min. level alarm. A range of accessories like different electrodes complete the offer.

The new housing provides two different connection terminals: The proven double-chamber cage connection terminals and the Easy Connect Technology with Push-in terminals.



The slim line of interface relays and optocouplers

The pluggable interface relays and optocouplers of the CR-S Range are used for electrical isolation, amplification and signal matching between the electronic controlling, e.g. PLC, iPC or field bus systems and the sensor / actuator level. The CR-S Range combines the flexibility of a modular system and the ability of switching high currents on a small footprint thus can be used in applications where space saving is essential.



Universal Motor Controller UMC100.3 now available with additional analog temperature module A111

The intelligent ABB Motor Controllers for motor protection, motor control, fieldbus and Ethernet communication and fault diagnosis. Due to the benefits it provides, the UMC is used worldwide in many segments and in Projects with several thousand motor controllers. Beside the proven UMC100 the new UMC100.3 offers even more capabilities like 24 V DC or 110-220 V AC/DC supply voltage and fieldbus communication interfaces. Different modules like the newest analog and temperature module Al111 extend the functional scope.



Short form catalog

The smaller brother of this binder. It includes all necessary information to select a product.

Electronic relays and controls Further marketing tools and technical data



Selection app

Finding the right product within a large product range could be a difficult task. Electronic relays and controls selection tool will help you quickly and easily select your products in few easy steps.

Android version



iOS version





Rail brochure

Selected products of the electronic timers and measuring and monitoring relays comply to the latest rail standards NF F 16-101/102, EN 45545, EN 50155 and more standards which are relevant for railway applications.



Electronic relays and	controls
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Approvals and marks for the world market Overview

ABB low-voltage switching devices are developed and produced in accordance with the applicable regulations as stated in the international IEC publications, the European EN specifications and the national VDE standards.

In most countries, low-voltage switching devices are produced according to such regulations under the responsibility of the manufacturers. This is why the devices are not subject to further approval. However, for those devices which are intended for use in household or for public use our customers can request test reports of our internal laboratory for presentation to the various qualified local organizations. In other countries, approvals are prescribed by law. For devices installed in ships, an approval issued by independent shipping companies, such as the GL, are demanded by the maritime insurance companies.

Marks of conformity and examples of approvals (device-dependent)

International

CB scheme

CB

The CB (Certification Body) Scheme is a system designed to facilitate international trade by establishing mutual acceptance of test reports among participating safety certification organizations (the National Certification Bodies) in more than 30 countries. The CB Scheme was established by the International

Electrotechnical Committee for Conformity Testing to Standards for Electrical Equipment (IECEE).

Europe

Conformité Européen (CE)



All devices which comply with the European low voltage directive and which are intended for sale within the European Union must have the CE sign applied. All products in this catalog are CE marked.

The CE sign must not be confused with a certificate of quality issued by the EU. It is solely used to confirm that the respective product complies with the applicable European directives *). The CE sign is part of an administrative procedure to guarantee free movement of goods within the European Community.

Directives:

Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC Machinery Directive 98/37/EEC

Verband der Elektrotechnik Elektronik Informationstechnik (VDE)



Applicable for technical instruments covered by the German Gerätesicherheitsgesetz (GSG) as well as for single parts and electrical wiring devices.

Berufsgenossenschaft der Feinmechanik und Elektrotechnik (BGFE)



The BG-PRÜFZERT sign is a voluntary safety mark, awarded by the BGFE following successful safety testing.

Explosion protection (EX)



Explosion protection acc. to Directive 94/9/EG (ATEX 100a)

Swiss insurance institution (SUVA)



Department accident prevention suvaPRO

Germanischer Lloyd (GL)



Shipping approval

Lloyds Register



Shipping approval

Russia

In Russia, low-voltage switching devices are subject to certification and have to be provided with a sign.

Eurasian Conformity



EAC certification is mandatory for many products. This certification is based on a safety test (IEC standards with Russiaspecific deviations) and an EMC test.

Russian Maritime Register of Shipping RMRS



Shipping approval

Australia, New Zealand

RCM Mark



The RCM Mark certifies compliance with the Australian EMC requirements. The Mark is also recognized in New Zealand.

China

CCC (China Compulsory Certification)



In China the CCC certification mark is a compulsory certification mark in the field of safety and quality for products sold on the Chinese market.

North America

Canadian and US standards are more or less equivalent but considerably differ from the IEC and VDE regulations.

USA

Underwriters Laboratories (UL) Listing



Released for installation in systems and for sale as individual component in the USA.

Recognition



Released for installation in systems, if the respective system has been completely mounted and wired by qualified personnel.

Canada

Canadian Standards Association (CSA)



USA and Canada

The combined UL signs for the USA and Canada are recognized by the authorities of both countries. Devices with this certificate meet the requirements of both countries.

Listina



Recognition

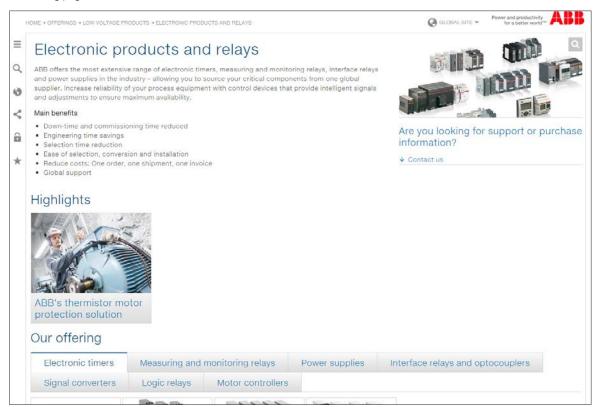


Find Electronic relays and controls product information and documentation on our web page

The following steps will guide you to the documentation and product search section of the Electronic relays and controls portfolio on www.ABB.com.

Enter http://new.abb.com/low-voltage/products/electronicrelays in your internet browser.

You will be redirected to the following page:



Latest information about the Electronic relays and controls product range could be found in the Highlights section.

In the lower area of the web page you can find the Our offering section.

The assortment of the Electronic relays and controls range is listed here as shown in the screenshot below:



Select the register of the relevant product group to see all the products related to the product group.

Choose a product range from which you want to see the documentation or from which you want to choose a specific product.

In this example the CT-S range from the register Electronic timers has been selected as shown on the screenshot.

Find Electronic relays and controls product information and documentation on our web page

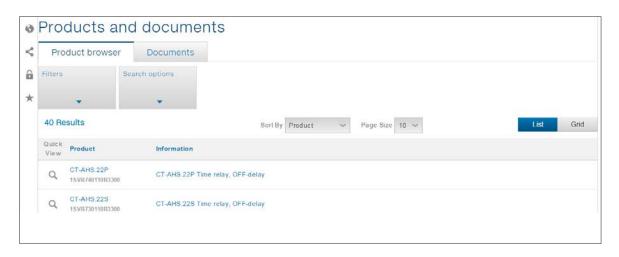
You will be redirected to the following page:



Latest information about the Electronic relays and controls product range could be found in the **Highlights** sections.

In the lower area of the web page you can find the **Products and documents** section.

The functions to choose a product or a document are listed here as in the screenshot below:



To search for a product continue on page 9.

To search for documentation continue on page 10.

Find Electronic relays and controls product information and documentation on our web page How to find the right product

Click on Filters to see the different search attributes for the selected product range.

The filter section will be expanded as shown below.



The different product filters are shown.

Click on the filter attribute to continue the product search process.

In this example Output has been chosen.



In the right part mark the corresponding check box to narrow down the search. You can also select several check boxes.

Click on Apply to submit your filter.

The search results are now listed according to your selection.

Proceed this approach with different filters until the right product is listed.

Click on the product in the Result section to get the dedicated product information listed in your browser.

Find Electronic relays and controls product information and documentation on our web page How to find the right documentation

Click on **Documents** to see the different types of documentation for the product.

The document section will be expanded as shown below.



On the left side select the type of document related to the product. In the example **Popular documents** has been selected. In the right area click on the document related to the product.

The document is opened or downloaded, depending on the individual browser settings.

Electronic relays and controls catalog 2016 Notes

Electronic timers Product group picture



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Electronic timers Type selection



CT-D range in modular DIN rail housing

- Time ranges: 7 (0.05 s 100 h)
- CT-SDD, CT-SAD: (0.05 s 10 min)
- Wide and multi ranges of control supply voltage
- 1 or 2 c/o contacts
- CT-SDD, CT-SAD: 2 n/o contacts
- Control inputs: voltage-related triggering, polarized, capable of switching a parallel load



CT-E the econimic range

- Multifunction devices: 8 (0.05 s - 100 h) Single-function devices: 0.05-1 s, 0.1-10 s, 0.3-30 s, 3-300 s. 0.3-300 min
- Wide, single and dual ranges of control supply voltage
- 1 c/ o contact CT-SDE: 1 n/o contact and 1 n/c contact CT-MKE, CT-EKE, CT-AKE: 1 thyristor
- voltage-related triggering, polarized CT-MFE, CT-AHE, CT-AWE: with auxiliary voltage



CT-S the high-performance range

- 10 (0.05 s 300 h) CT-ARS, CT-SDS: 7 (0.05 s- 10 min)
- Wide, single and multi ranges of control supply voltage
- 1 or 2 c/o contacts CT-MVS.21, CT-MFS, CT-MBS: 2nd c/o contact selectable as inst. contact CT-SDS: 2 n/o contacts
- voltage-related triggering, non-polarized, capable of switching a parallel CT-MFS, CT-MBS, CT-AHS: volt-free triggering

	multifunctional	single-functional	multifunctional	single-functional	multifunctional	single-functional
Timing function	CT-D		CT-E		CT-S	
⊠ ON-delay	CT-MFD	CT-ERD	CT-MFE, CT-MKE	CT-ERE, CT-EKE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	CT-ERS
OFF-delay	CT-MFD	CT-AHD	CT-MFE	CT-AHE, CT-ARE, CT-AKE	CT-MVS, CT-MFS, CT-MBS	CT-APS, CT-AHS, CT-ARS
ON- and OFF-delay					CT-MVS, CT-MXS, CT-MFS, CT-MBS	
1∏⊠ Impulse-ON	CT-MFD	CT-VWD	CT-MFE, CT-MKE	CT-VWE	CT-MVS, CT-MFS, CT-MBS, CT-WBS	
1Л ■■ Impulse-OFF	CT-MFD			CT-AWE	CT-MVS, CT-MFS, CT-MBS	
1Л≌ Impulse-ON and OFF					CT-MXS	
☐ Flasher starting with ON	CT-MFD	CT-EBD	CT-MFE, CT-MKE		CT-MFS, CT-MBS, CT-WBS	
☐ Flasher staring with OFF	CT-MFD		CT-MFE, CT-MKE	CT-EBE	CT-MFS, CT-MBS, CT-WBS	
∏≅ Flasher starting with ON or OFF					CT-MVS	
☑ Pulse generator starting with ON or OFF		CT-TGD			CT-MXS	
Pulse former	CT-MFD		CT-MFE		CT-MVS, CT-MFS, CT-MBS	
△ Star-delta change-over		CT-SDD, CT-SAD				CT-SDS
▲1几 Star-delta change-over with impulse				CT-SDE	CT-MVS.2x, CT-MFS, CT-MBS	
△⊠ Star-delta change-over twice ON-delayed				CT-YDE		
□ + □ II □ □ further functions (depending on device)					CT-MVS, CT-MXS, CT-MFS, CT-MBS, CT-WBS	

A detailed explanation of the different timing functions can be found at "Timing functions" on page 47.

Electronic timers Approvals and marks

		CT-D	CT-E	CT-S
c UL US	UL508, CAN/CA C22.2 No. 14	All	All	All
CB scinos	CB Scheme	All except: CT-MFD.21, CT-ERD.22, CT-AHD.22, CT-TGD.22, CT-SDD.22, CT-SAD.22	All except: CT-MKE, CT-EKE, CT-AKE	All
EAC	EAC	All	All	All
((()	CCC	All	All except: CT-MKE, CT-EKE, CT-AKE	All
⊕	RMRS	All except: CT-SDD.22, CT-SAD.22	All	All
(6)	Germanischer Lloyd	-	All	All available Pending for: CT-ARS.11
C€	Communauté Européenne	All	All	All
<u>&</u>	RCM	All available Pending for: CT-MFD.21, CT-ERD.22, CT-AHD.22, CT-TGD.22, CT-SDD-22. CT-SAD.22	All	All

CT-D range Product group picture



CT-D range Table of contents

CT-D Range

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CT-D range Benefits and advantages

Characteristics

- Diversity:
 - 2 multifunction timers
 - 10 single-function timers
- Control supply voltages:
 - Wide range: 12-240 V AC/DC
 - Multi range: 24-48 V DC, 24-240 V AC
- 7 time ranges from 0.05 s to 100 h or 4 time ranges from 0.05 s to 10 min
- Width of only 17.5 mm
- Light-grey housing in RAL 7035
- Devices with:
 - 1 c/o contact (250 V / 6 A) or 2 c/o contacts (250 V / 5 A) Control input: voltage-related triggering, polarized, capable of switching parallel loads
- Approvals / Marks (partly pending, details see "Approvals and marks" on page 14)
 - c∰us, CB1), ⋘, ER[, �� / C€, ₺

3 2 4 2 multifunctional single-functional

Benefits

Direct reading scales ①

Direct setting of the time delay without any additional calculation provides accurate time delay adjustment.

LEDs for status indication ②

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

Switching currents

The CT-D range timers allow an output load of up to 6 A on devices with 1 c/o contact and up to 5 A on devices with 2 c/o contacts.

Connection terminals ③

Wide terminal spacing allows connection of wires: 2 x 1.5 mm² (2 x 16 AWG) with wire end ferrules or 2 x 2.5 mm² (2 x 14 AWG) without ferrules.

Width 17.5 mm ④

With their width of 17.5 mm only, the CT-D range timers are ideally suited for installation in distribution panels.

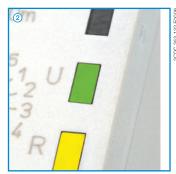
Operating controls

1 LEDs for status indication

U - green LED: Г T control supply voltage applied ☐☐☐ timing R, R1, R2 - yellow LED: \(\subseteq \) ¬ output relay energized

- 2 Time range adjustment
- 3 Fine adjustment of the time delay
- 4 Preselection of the timing function









¹⁾ Only for devices with 1 c/o (SPDT) contact

CT-D range Ordering details



CT-MFD.12



CT-ERD.22

Description

The CT-D range in MDRC design with a width of only 17.5 mm fits into all domestic installation and distribution panels.

The CT-D range represents a link between industry and the installation types. For maximum flexibility in operation, 10 single-function as well as 2 multifunction devices with 7 timing functions are available. The devices offer 4 or 7 time ranges from 0.05 seconds up to 100 hours. Their wide input range allows the use in applications worldwide.

Ordering details

Timing function	Rated control supply	Time ranges	Con- trol input	Output	Туре	Order code	Price	Weight (1 pce)
	voltage						1 pce	kg (lb)
Multi ¹⁾	24-240 V AC 24-48 V DC	7 (0.05 s - 100 h)	•	1 c/o	CT-MFD.12	1SVR500020R0000		0.060 (0.132)
Multi ¹⁾	12-240 V AC/DC	7 (0.05 s - 100 h)	•	2 c/o	CT-MFD.21	1SVR500020R1100		0.065 (0.143)
ON dalay			-	1 c/o	CT-ERD.12	1SVR500100R0000		0.060 (0.132)
ON-delay		7 (0.05 s - 100 h)	-	2 c/o	CT-ERD.22	1SVR500100R0100		0.065 (0.143)
OFF-delay				1 c/o	CT-AHD.12	1SVR500110R0000		0.060 (0.132)
OFF-Uelay				2 c/o	CT-AHD.22	1SVR500110R0100		0.065 (0.143)
Impulse- ON			-		CT-VWD.12	1SVR500130R0000		0.060
Flasher starting with ON	24-48 V DC		-	1 c/o	CT-EBD.12	1SVR500150R0000		(0.132)
Pulse	• •	2×7 (0.05	•		CT-TGD.12 ²⁾	1SVR500160R0000		0.060 (0.132)
generator		s - 100 h)		2 c/o	CT-TGD.22 ²⁾	1SVR500160R0100		0.065 (0.143)
Star-delta		4 (0.05 s -		0 - /-	CT-SDD.223)	1SVR500211R0100		0.065
change- over		10 min) -	-	2 c/o	CT-SAD.224)	1SVR500210R0100		(0.143)

¹⁾ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Flasher starting with ON, Flasher starting with OFF, Pulse former

Synonyms

used expression	alternative expression(s)	used expression	alternative expression(s)
1 c/o contact	SPDT	voltage-related	wet / non-floating
2 c/o contacts	DPDT	volt-free	dry / floating



Further documentation CT-D electronic timers on www.abb.com

²⁾ ON and OFF times adjustable independently: 2 x 7 time ranges 0.05 s - 100 h

³⁾ Transition time 50 ms fixed

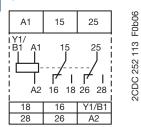
⁴⁾ Transition time adjustable

[■] Control input with voltage-related triggering

no triggering

CT-D range Connection diagrams

CT-MFD.21



A1-A2

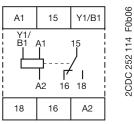
25-26/28

Supply: 12-240 V AC/DC

2. c/o contact

A1-Y1/B1 Control input 15-16/18 1. c/o contact

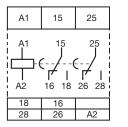
CT-MFD.12



A1-A2

Supply: 24-48 V DC or 24-240 V AC Control input A1-Y1/B1 15-16/18 1. c/o contact

⊠ CT-ERD.22



F0b06

2CDC 252 115

F0b05

2CDC 252 179

F0b06

160

252

2CDC

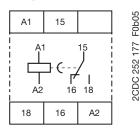
Supply: 24-48 V DC or A1-A2

25-26/28

24-240 V AC 15-16/18 1. c/o contact

2. c/o contact

⊠ CT-ERD.12

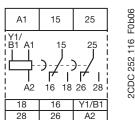


A1-A2

Supply: 24-48 V DC or 24-240 V AC

15-16/18 1. c/o contact

CT-AHD.22

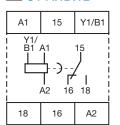


A1-A2

Supply: 24-48 V DC or 24-240 V AC

A1-Y1/B1 15-16/18 25-26/28 Control input 1. c/o contact 2. c/o contact

CT-AHD.12



A1-A2

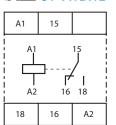
Supply: 24-48 V DC or 24-240 V AC

252 117 F0b06

2CDC

A1-Y1/B1 15-16/18 Control input 1. c/o contact

1 □ CT-VWD.12

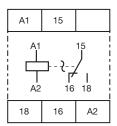


A1-A2

Supply: 24-48 V DC or 24-240 V AC

15-16/18 1. c/o contact

□ CT-EBD.12



A1-A2

Supply: 24-48 V DC or 24-240 V AC

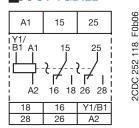
F0b05

252 180

2CDC 2

15-16/18 1, c/o contact

≅⊓ CT-TGD.22

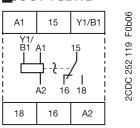


A1-A2

Supply: 24-48 V DC or 24-240 V AC

A1-Y1/B1 15-16/18 25-26/28 Control input 1. c/o contact 2. c/o contact

⊠⊓ CT-TGD.12

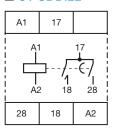


A1-A2

Supply: 24-48 V DC or 24-240 V AC

A1-Y1/B1 15-16/18 Control input 1. c/o contact

△ CT-SDD.22



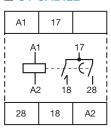
A1-A2

17-18

Supply: 24-48 V DC or 24-240 V AC 1. n/o contact (star contactor)

17-28 2. n/o contact (delta contactor)

△ CT-SAD.22



A1-A2

Supply: 24-48 V DC or 24-240 V AC

2CDC 252 160

17-18

1. n/o contact (star contactor)

17-28 2. n/o contact (delta contactor)

CT-D range Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

		CT-D with 1 c/o contact	CT-D with 2 c/o contacts	CT-MFD.21
Input circuit - Supply circuit				
Rated control supply voltage U _s		24-240 V AC / 24-48	V DC	12-240 V AC/DC
Rated control supply voltage U _s tolerance		-15+10 %		
Rated frequency		DC or 50/60 Hz		
Frequency range AC		47-63 Hz		······
Typical current / power consumption Power failure buffering time		see data sheet		
Release voltage		min. 20 ms	um rated control supply	voltage U
Input circuit - Control circuit				s
	1-Y1/B1	start timing external		
Kind of triggering Resistance to reverse polarity		voltage-related trigg	ering	
Parallel load / polarized		yes yes / yes		······
Maximum cable length to the control inputs		50 m - 100 pF/m		
Minimum control pulse length		20 ms		
Control voltage potential			oply voltage	
Control voltage potential Current consumption of the control input		see data sheet		
Timing circuit Time ranges 7 time ranges 0.05 s	100 h	1100510 2105	10 s 3.) 5-100 s 4.)	0.5-10 min
-		5.) 5-100 min 6.) 0.	5-10 h 7.) 5-100 h	
4 time ranges 0.05 s - 10 min (CT-SDD, 0	CT-SAD)	1.) 0.05-1 s 2.) 0.5-	10 s 3.) 5-100 s 4.)	0.5-10 min
Recovery time		< 50 ms		
Accuracy within the rated control supply voltage tolerance Accuracy within the temperature range		Δt < 0.005 % / V Δt < 0.06 % / °C		
Depost accuracy (constant parameters)		A+ O = 0/		
Repeat accuracy (constant parameters) Setting accuracy of time delay Star-delta transition time CT-SDD /	61812-1	± 10% of full-scale v	alue	
Setting accuracy of time delay IEC/EN Star-delta transition time CT-SDD /	CT-SAD			
		adjustable: 20 ms, 30 ms, 40 ms, 50 ms, 60 ms, 80 ms or 100 ms		
Star-delta transition time tolerance CT-SDD / Indication of operational states	CI-SAD	<u> ±3 ms</u>		
	en I FD	☐ : control sup	nly voltage applied	
		□□□□: timing	ory vortage applied	
Relay energized (1 c/o contact / R: yel	ellow LED			
2 c/o contacts or inst. contact)				
Operating elements and controls Adjustment of the time range		front food rotory owit	ch, direct reading scale	20
Fine adjustment of the time value		front-face potentiom		35
Preselection of the timing function at multifunction devices			ch, direct reading scale	9S
	CT-SAD	front-face potentiom		
Output circuit				
		Relay, 1 c/o contact	- Dolov 0 a/a aast	to
15-16/18; 2 17-1	5-26/28 8; 17-28	-	Relay, 2 c/o contac	ts (CT-SDD, CT-SAD)
Contact material	o, 11-20	AgNi alloy, Cd free	: 1101dy, 2 11/0 00111d0	10 (01 000, 01-0AD)
Rated operational voltage U _e		250 V		
Minimum switching voltage / minimum switching current		12 V / 100 mA		
Maximum switching voltage / maximum switching current		250 V AC / 6 A	250 V AC / 5 A	
Rated operational current I _e AC-12 (resistive) : (IEC/EN 60947-5-1) AC-15 (inductive) :			5 A 3 A	n/o: 3 A n/c: 0.75 A
DC-12 (resistive)		•	5 A	: 11/0. 3 A 11/0. U./3 A
DC-13 (inductive	at 24 V	2 A	2 A	1 A
AC rating (UL 508) utilization category (Control Circuit Ratin				n/o: B 300 n/c: C 300
max. rated operational				n/o: 5 A
Maximum continuous thermal current Maximum continuous thermal current		O A	·····	n/o: 5 A n/c: 2.5 A
max. making/breaking apparent power		3600 VA / 360 VA	·····	n/o: 3600/360 VA
max. making/breaking apparent power		-		n/c: 1800/180 VA
Mechanical lifetime		30 x 10 ⁶ switching cy		
Electrical lifetime Max, fuse rating to achieve short-circuit protection n/c	000+00+	0.1 x 10 ⁶ switching c	ycles	
		6 A fast-acting 10 A fast-acting	·····	6 A fast-acting
11/0	Jonitaul	I TO A TUST-ACTING		O A last-acting

CT-D range Technical data

		CT-D with 1 c/o	CT-D with 2 c/o	CT-MFD.21
Consul data		contact	contacts	
General data				
Mean time between failures (MTBF)	•••••	on request		
Duty time		100%		
Dimensions (W x H x D)		17.5 x 70 x 58 mm	17.5 x 80 x 58 mm	
	•	4	(0.69 x 3.15 x 2.28 ir	n)
Weight		see ordering details	· <u></u> ;-····	······ ·
Mounting			5), snap-mounting with	out any tool
Mounting position	•	any		
Minimum distance to other units	horizontal / vertical			
Degree of protection	housing / terminals	IP50 / IP20		
Electrical connection				
Wire size	fine-strand with(out) wire end ferrule			
		1 x 0.5-2.5 mm ² (1 x 2	20-14 AWG)	
	rigid	2 x 0.5-1.5 mm ² (2 x 2	20-16 AWG)	
	ŭ	1 x 0.5-4 mm ² (1 x 20)-12 AWG)	
Stripping length	•	7 mm (0.28 in)	•••••	•
Tightening torque		0.5-0.8 Nm (4.43-7.08	3 lb.in)	
Environmental data				
Ambient temperature range	operation / storage	-20 +60 °C / -40	. +85 °C	
Climatic class	IEC/EN 60068-2-30	3K3		······
Relative humidity range		25-85%	····	·····
Shock (half-sine)	IEC/EN 60068-2-27		·····	······
Isolation data	120/214 00000 2 21	1 100 111/0 , 11 1110		
Rated impulse withstand voltage U _{imp}	IEC/EN 60664-1	type test: 4 kV; 1.2/50) lie	
between all isolated circuits	1EO/EN 00004-1	type test. 4 kV, 1.2/30	υ μο	
Pollution category	IEC/EN 60664-1	1	····•	····· ·
Overvoltage category	IEC/EN 60664-1		····	······
Rated insulation voltage U	input circuit / output circuit		····•	······
nated insulation voltage o	output circuit 1 / output circuit 2		300 V	300 V
Basic insulation (IEC/EN 61140)	input circuit / output circuit /		: 300 V	: 300 V
Protective separation	input circuit / output circuit		····	······
(IEC/EN 61140, EN 50178)	input circuit / output circuit	250 V		
Power-frequency withstand voltage test	between all isolated circuits	routing toot: 2.5 kV: 5	∩ U-z- 1 o	····· ·
(test voltage)	between an isolated circuits	type test: 2.5 kV; 50 l		
Standards		1 13 PO 1001. Z.O NV, 00 I	12, 00 0	
		IEO/EN 04040 4		
Product standard		IEC/EN 61812-1		
Low Voltage Directive		2006/95/EC		
EMC Directive		2004/108/EC		
RoHS Directive		2011/65/EC		
Electromagnetic compatibility		I .==		
Interference immunity to		IEC/EN 61000-6-1, IE	C/EN 61000-6-2	
electrostatic discharge		Level 3 (6 kV / 8 kV)		
radiated, radio-frequency, electromag		Level 3 (10 V / m)		
electrical fast transient / burst		Level 3 (2 kV / 5 kHz)		
surge	IEC/EN 61000-4-5	Level 4 (2 kV L-L)		
conducted disturbances, induced by radio-freq	uency fields IEC/EN 61000-4-6			
Interference emission	•	IEC/EN 61000-6-3, IE	EC/EN 61000-6-4	
high-frequency radiated	IEC/CISPR 22, EN 55022			
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B		

Product certifications and declarations see "Approvals and marks" on page 14.

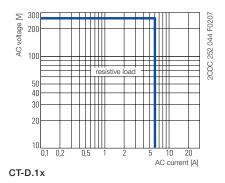
CT-D range

Technical diagrams, Wiring notes, Dimensional drawings

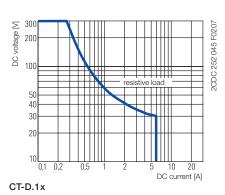
Technical diagrams

Load limit curves

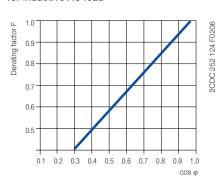
AC load (resistive)

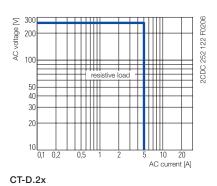


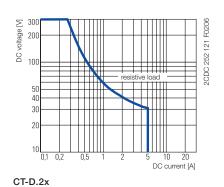
DC load (resistive)



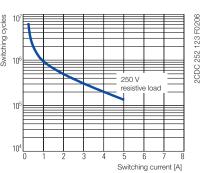
Derating factor F for inductive AC load





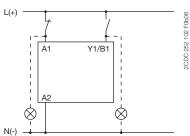


Contact lifetime

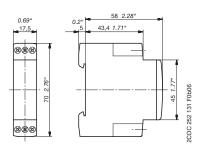


Wiring notes for devices with control input

A parallel load to the control input is possible

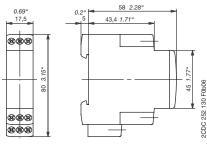


Dimensional drawings



CT-D devices with 1 c/o contact or 2 n/o contacts

dimensions in mm



CT-D devices with 2 c/o contacts

CT-E range Product group picture



CT-E range Table of contents

CT-E Range

CT-E range	24
Benefits and advantages	25
Ordering details	26
Connection diagrams	28
Connection diagrams, Technical diagrams	29
Technical data	30
Wiring notes, Dimensional drawings	32

CT-E range Benefits and advantages

Characteristics

- Diversity:
 - 2 multifunction timers
- 56 single-function timers
- Control supply voltages:
 - Dual range: 24 V AC/DC
 - Single range: 110-130 V AC, 220-240 V AC
 - Wide range: 24-240 V AC/DC (CT-MFE)
- Time ranges
 - 5 single ranges: 0.05-1 s, 0.1-10 s, 0.3-30 s, 3-300 s, 0.3-30 min
 - 8 time ranges: 0.05 s 100 h (CT-MFE)
- Devices with 1 c/o (SPDT) contact (250 V / 4 A) or solid-state output for high switching frequencies (thyristor
- Approvals / Marks (details see "Approvals and marks" on page 14)
 - c⊕us, 60, [H[, CB, (C, & / €, &

Benefits

Direct reading scales

Direct setting of the time delay without any additional calculation provides accurate time delay adjustment.

LEDs for status indication ②

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

Connection screws in M3 (Pozidrive 1) ③

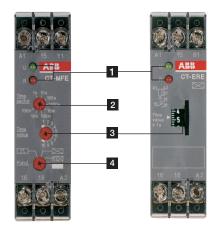
Easy and fast tightening and release of the connection screws with pozidrive, pan- or crosshead screwdriver.

Solid-state output 4

Devices with solid-state output are the perfect solution for high operation cycles.

Synonyms

used expression	alternative expression(s)	used expression	alternative expression(s)
1 c/o contact	SPDT	voltage-related	wet / non-floating
2 c/o contacts	DPDT	volt-free	dry / floating

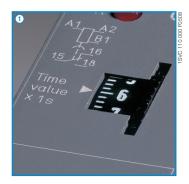


Operating controls

1 LEDs for status indication

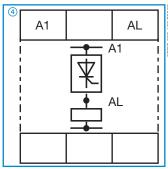
1 control supply voltage applied R2: red LED: Γ l output relay energized

- 2 Time range adjustment (only multifunctional devices)
- 3 Fine adjustment of the time delay
- 4 Preselection of the timing function (only multifunctional devices)









CT-E range Ordering details



CT-MFE



CT-AHE

Description

The CT-E range with its excellent price/performance ratio offers an ideal solution for serial applications. 56 single-function devices with 5 different time ranges as well as 2 multifunction timers with 6 functions and 8 time ranges offer the highest possible flexibility for almost every application. For high operating cycles, contact-free CT-E timers with solid-state output are available.

Ordering details

Timing function	Rated con- trol supply	Time ranges	Con- trol	Output	Type	Order code	Price	Weight (1 pce)
	voltage		Input				1 pce	kg (lb)
Multi 1)	24-240 V AC/DC	8 (0.05 s - 100 h)		1 c/o	CT-MFE	1SVR550029R8100		0.08 (0.18)
•••••	24 V AC/DC, 220-240 V AC	0.1-10 s	-			1SVR550107R1100		
ON-delay		0.3-30 s		1 c/o	CT-ERE	1SVR550107R4100		0.08 (0.18)
		3-300 s				1SVR550107R2100		
		0.3-30 min				1SVR550107R5100		
		0.1-10 s	-			1SVR550100R1100		
	110 100 \/ A0	0.3-30 s				1SVR550100R4100		
	110-130 V AC	3-300 s				1SVR550100R2100		
		0.3-30 min				1SVR550100R5100		
		0.1-10 s		1 c/o	CT-AHE	1SVR550118R1100		0.08 (0.18)
	24 V AC/DC	0.3-30 s				1SVR550118R4100		
		3-300 s				1SVR550118R2100		
	110-130 V AC	0.1-10 s				1SVR550110R1100		
OFF-delay		0.3-30 s				1SVR550110R4100		
		3-300 s				1SVR550110R2100		
	220-240 V AC	0.1-10 s				1SVR550111R1100		
		0.3-30 s				1SVR550111R4100		
		3-300 s				1SVR550111R2100		
OFF-delay ²⁾	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-ARE	1SVR550127R1100		0.08 (0.18)
		0.3-30 s				1SVR550127R4100		
	110-130 V AC	0.1-10 s				1SVR550120R1100		
		0.3-30 s				1SVR550120R4100		
	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-VWE	1SVR550137R1100		0.08 (0.18)
Impulse-ON		0.3-30 s				1SVR550137R4100		
		3-300 s				1SVR550137R2100		
	110-130 V AC	0.1-10 s				1SVR550130R1100		
		0.3-30 s				1SVR550130R4100		
		3-300 s				1SVR550130R2100		
Impulse- OFF ²⁾	24 V AC/DC		-	1 c/o	CT-AWE	1SVR550158R3100		0.08 (0.18)
	110-130 V AC	0.05-1 s				1SVR550150R3100		
	220-240 V AC					1SVR550151R3100		



Further documentation CT-E electronic timers on www.abb.com

¹⁾ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Flasher starting with ON, Flasher starting with OFF, Pulse former

²⁾ without auxiliary voltage, True Off-delay timer

[■] Control input with voltage-related triggering - no triggering

CT-E range Ordering details



CT-MFE



CT-AHE

Description

The CT-E range with its excellent price/performance ratio offers an ideal solution for serial applications. 56 single-function devices with 5 different time ranges as well as 2 multifunction timers with 6 functions and 8 time ranges offer the highest possible flexibility for almost every application. For high operating cycles, contact-free CT-E timers with solid-state output are available.

Ordering details

Timing function	Rated con- trol supply	Time ranges	Con- trol	Output	Type	Order code	Price	Weight (1 pce)
	voltage		Input				1 pce	kg (lb)
Multi 1)	24-240 V AC/DC	8 (0.05 s - 100 h)		1 c/o	CT-MFE	1SVR550029R8100		0.08 (0.18)
		0.1-10 s		1 c/o	CT-ERE	1SVR550107R1100		0.08 (0.18)
ON-delay	24 V AC/DC, 220-240 V AC	0.3-30 s				1SVR550107R4100		
		3-300 s				1SVR550107R2100		
		0.3-30 min				1SVR550107R5100		
		0.1-10 s				1SVR550100R1100		
	110-130 V AC	0.3-30 s				1SVR550100R4100		
	110-130 V AC	3-300 s	-			1SVR550100R2100		
		0.3-30 min				1SVR550100R5100		
	24 V AC/DC	0.1-10 s		1 c/o	СТ-АНЕ	1SVR550118R1100		0.08 (0.18)
		0.3-30 s				1SVR550118R4100		
		3-300 s				1SVR550118R2100		
		0.1-10 s				1SVR550110R1100		
OFF-delay	110-130 V AC	0.3-30 s				1SVR550110R4100		
		3-300 s				1SVR550110R2100		
	220-240 V AC	0.1-10 s				1SVR550111R1100		
		0.3-30 s				1SVR550111R4100		
		3-300 s				1SVR550111R2100		
OFF-delay ²⁾	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-ARE	1SVR550127R1100		0.08 (0.18)
		0.3-30 s				1SVR550127R4100		
	110-130 V AC	0.1-10 s				1SVR550120R1100		
		0.3-30 s				1SVR550120R4100		
Impulse-ON	24 V AC/DC, 220-240 V AC	0.1-10 s	-	1 c/o	CT-VWE	1SVR550137R1100		0.08 (0.18)
		0.3-30 s				1SVR550137R4100		
		3-300 s				1SVR550137R2100		
	110-130 V AC	0.1-10 s				1SVR550130R1100		
		0.3-30 s				1SVR550130R4100		
		3-300 s				1SVR550130R2100		
Impulse- OFF ²⁾	24 V AC/DC			1 c/o	CT-AWE	1SVR550158R3100		0.08 (0.18)
	110-130 V AC	0.05-1 s	-			1SVR550150R3100		
	220-240 V AC					1SVR550151R3100		





Further documentation CT-E electronic timers on www.abb.com

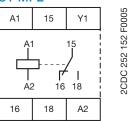
¹⁾ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Flasher starting with ON, Flasher starting with OFF, Pulse former

²⁾ without auxiliary voltage, True Off-delay timer

[■] Control input with voltage-related triggering - no triggering

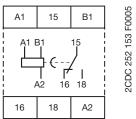
CT-E range Connection diagrams

CT-MFE



A1-A2 :vlaauS 24-240 V AC/DC Control input 15-16/18 c/o contact

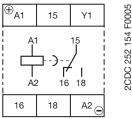
⊠ CT-ERE



Supply: 220-240 V AC A1-A2 or 110-130 V AC A1-B1 Supply: 24 V AC/DC

15-16/18 c/o contact

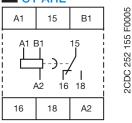
CT-AHE 1)



Supply: 24 V AC/DC or 110-240 V AC or A1-A2 220-240 V AC

A1-Y1 Control input 15-16/18 c/o contact

CT-ARE

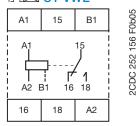


Supply: 220-240 V AC or A1-A2 110-130 V AC

A1-B1 Supply: 24 V AC/DC

15-16/18 c/o contact

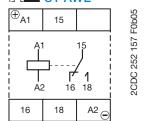
1Л⊠ CT-VWE



A1-A2 Supply: 220-240 V AC or 110-130 V AC

Supply: 24 V AC/DC 15-16/18 c/o contact

1√ CT-AWE

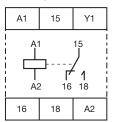


Device without aux. voltage

A1(+)-A2(-) Supply: 24 V AC/DC or 110-240 V AC or 220-240 V AC

15-16/18 c/o contact

1JT CT-AWE 1)



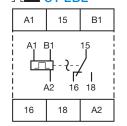
Device with aux. voltage

Supply: 24 V AC/DC or 110-240 V AC or A1-A2 220-240 V AC

2CDC 252 158 F0b05

A1-Y1 Control input 15-16/18 c/o contact

л**ш** СТ-ЕВЕ

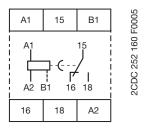


A1-A2 Supply: 220-240 V AC

2CDC 252 159 F0005

or 110-130 V AC A1-B1 Supply: 24 V AC/DC 15-16/18 c/o contact

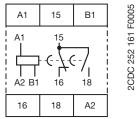
△ CT-YDE



Supply: 220-240 V AC A1-A2 or 110-130 V AC

A1-B1 Supply: 24 V AC/DC 15-16/18 c/o contact

∆1/L CT-SDE

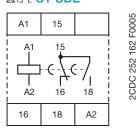


Device: 1SVR 550 217 R4100

Supply: 220-240 V AC A1-A2 A1-B1 Supply: 24 V AC/DC 15-16 n/c contact n/o contact

15-18 with common contact

∆1/\ CT-SDE

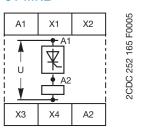


Devices: 1SVR 550 210 R4100, 1SVR 550 212 R4100

A1-A2 Supply: 110-130 V AC or 380-415 V AC

15-16 n/c contact 15-18 n/o contact with common contact

CT-MKE



Supply: 24-240 V AC/DC A1-A2

A1-A2 Thyristor

X1-X4 Timing function adjustment X2-X4 Timing function adjustment X3-X4 Time range adjustment

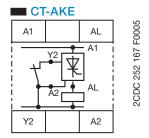
(Details see function diagrams)

^{1) &}quot;Wiring notes, Dimensional drawings" on page 32

CT-E range Connection diagrams, Technical diagrams

⊠ CT-EKE 2CDC 252 166 F0005

Supply: 24-240 A1-AL V AC/DC A1-AL Thyristor

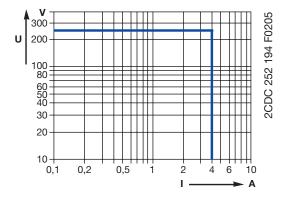


A1-AL A1-AL Y2-A2 Supply: 24-240 V AC Thyristor Control input

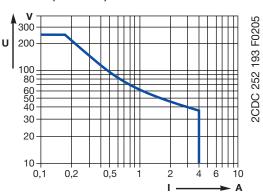
Technical diagrams

Load limit curves

AC load (resistive)

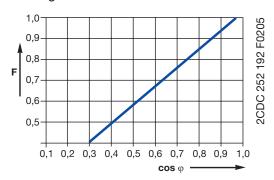


DC load (resistive)

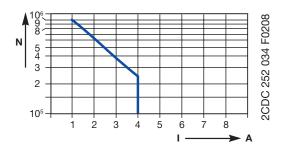


220 V 50 Hz AC1 360 cycles/h

Derating factor F for inductive AC load



Contact lifetime



CT-E range Technical data

Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

		CT-E (relays)	CT-E (solid-state)
Input circuit - Supply circuit			
Rated control supply voltage U		24-240 V AC/DC	
y = s	A1-A2, A1-AL	24-240 V AC	
ted control supply voltage U _s toleranded frequency Dical current / power consumption Dical current / power current Dical current / power current Dical current / power current Dical curr		110-130 V AC	-
	A1-A2	220-240 V AC	-
	A1-A2	380-415 V AC	=
	A1-B1	24 V AC/DC	-
Rated control supply voltage U _s tolerance	0	-15+10 %	•
Rated frequency	AC/DC versions	DC or 50/60 Hz	•
	AC versions	50/60 Hz	•
Typical current / power consumption	24-240 V AC/DC, 24-240 V AC		•
71- 12 22 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2	110-130 V AC, 220-240 V AC	approx. 2.0 VA	-
		approx. 3.0 VA	-
rrent consumption while timing out circuit - Control circuit d of triggering Control input, Control function Parallel load / polarized Minimum control pulse length Control voltage potential ning circuit ne ranges 1 of 5		approx. 1.0 VA/W	<u>. </u>
Minimum energizing time	CT-ARE, CT-AWE w/o aux. voltage		-
Current consumption while timing			≤ 2 mA (24-60 V AC/DC)
			≤ 8 mA (60-240 V AC/DC)
			(CT-AKE only AC)
Input circuit - Control circuit		1	* * * * * * * * * * * * * * * * * * * *
•		voltage-related triggering	_
Control input. Control function	A1-Y1	start timing external	-
Parallel load / polarized		no / yes 1)	-
		20 ms	_
		see rated control supply voltage	-
<u> </u>		, 111 .atoa oo o. oappiy voitago	:
	5 time ranges per single-function device	0.05-1 e / 0.1-10 e / 0.3-30 e / 3-30	10 s / 0.3-30 min
0 +		1.) 0.05-1 s	: _
0.1		3.) 5-100 s 4.) 50-1000 s	
		5.) 0.5-10 min 6.) 5-100 min	
		7.) 0.5-10 h 8.) 5-100 h	
	2 time ranges 0.1-300 s (CT-MKE)		1.) 0.1-10 s
	2 mile ranges 0.1-000 s (01-MRE)		2.) 3-300 s
Recovery time		<50 ms	CT-EKE: <50 ms
11000 vor y timo		CT-ARE: <200 ms	CT-MKE: <100 ms
		CT-AWE, CT-SDE: <400 ms	CT-AKE: <300 ms
		CT-YDE: <500 ms	2
Accuracy within the rated control supply	voltage tolerance	Δt < 0.5 % / V	i
	voltago tolorarioo	Δt < 0.3 % / V Δt < 0.1 % / °C	•
Control input, Control function A Parallel load / polarized Minimum control pulse length Control voltage potential ing circuit e ranges 1 of 5 time ranges per single-function de 8 time ranges 0.05 s - 100 h (CT-h 2 time ranges 0.1-300 s (CT-h covery time curacy within the rated control supply voltage tolerance curacy within the temperature range curacy within the temperature range curacy within the temperature range curacy constant parameters) control voltage potential curacy within the rated control supply voltage tolerance curacy within the temperature range curacy delta transition time CT-YDE / CT-i put circuit		CT-MFE: Δt <0.06 % / °C	-
Repeat accuracy (constant parameters)		$\Delta t < 1 \%$	<u>i</u>
	CT-YDE / CT-SDE		: _
	31 1BE / 01-0BE	100 mo / 00 mo	:
•	15_16/10	Relay, 1 c/o contact	<u> </u>
Airia or output	CT-SDE: 15-16, 15-18	1 n/c, 1 n/o contact with common	<u>:</u>
	01-3DL. 13-10, 13-16	contact	
	A1-A2. A1-AL	-	Thyristor
Contact material	AT-AZ, AT-AL	- AgCdO	-
Rated operational voltage II	IEC/EN 60947-1	250 V	i
	10/11/00947-1		
	10.407	250 V AC, 250 V DC	
Hated operational current I	AC-12 (resistive) at 230 V	4 A	-
(IEU/EN 60947-5-1)	AC-15 (inductive) at 230 V		-
	DC-12 (resistive) at 24 V	4 A	-
put circuit - Control circuit Ind of triggering Control input, Control function Parallel load / polarized Minimum control pulse length Control voltage potential ming circuit me ranges 1 o	DC-13 (inductive) at 24 V	2 A	-

¹⁾ CT-MFE: yes / no

CT-E range Technical data

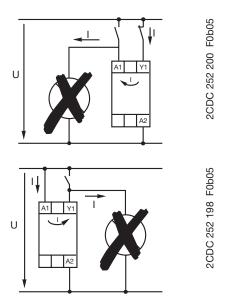
		CT-E (relays)	CT-E (solid-state)
AC rating (UL 508) Utilization category	ory (Control Circuit Rating Code)		-
	max. rated operational voltage		-
	tinuous thermal current at B300		-
	eaking apparent power at B300		-
Mechanical lifetime	at AC-12, 230 V, 4 A	30 x 10 ⁶ switching cycles	-
Electrical lifetime	at AC-12, 230 V, 4 A	0.1 x 10 ⁶ switching cycles	-
iviax. Tuse rating to achieve short-circuit	TI/C COTILACT	TO A last-acting, OT-AIL. 3 A	-
protection (IEC/EN 60947-5-1)	n/o contact	10 A fast-acting, CT-ARE: 5 A	-
Minimum load current		-	CT-MKE: 20 mA CT-EKE, CT-AKE: 10 mA
Maximum load current		-	CT-MKE: 0.8 A at T = 20 °C CT-EKE, CT-AKE: 0.7 A
Load current reduction / Derating		-	10 mA/°C
Maximum surge current		-	CT-MKE: \leq 20 A for t \leq 20 ms CT-EKE, CT-AKE: \leq 15 A
Voltage drop in connected state		-	≤3 V
Cable length between solid-state timer	at 24 V AC	-	220 m / 22 nF
and connected load at 50 Hz and a	at 42 V AC	-	100 m / 10 nF
cable capacity of 100 pF/m:	at 60 V AC	-	65 m / 6.5 nF
*****	at 110 V AC	-	50 m / 5 nF
	at 240 V AC	-	22 m / 2.2 nF
General data			
Duty time	······	100%	
Dimensions (W x H x D)		22.5 x 78 x 78.5 mm (0.886 x 3.07	7 x 3.09 in)
Weight		approx. 80 g (0.176 lb)	
Mounting		DIN rail (IEC/EN 60715)	
Mounting position		any	
Minimum distance to other units	horizontal / vertical		······································
Degree of protection	housing / terminals	IP50 / IP20	
Electrical connection		1	
		2 x 0.75-1.5 mm ² (2 x 18-16 AWG)	
TINE	e-strand without wire end ferrule		
01	rigia	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)	
Stripping length		10 mm (0.39 in) 0.6-0.8 Nm (5.31-7.08 lb.in)	
Tightening torque		0.0-0.6 MIII (5.31-7.06 ID.III)	
Environmental data		1	
Ambient temperature ranges	operation / storage	-20+60 °C / -40+85 °C	
Damp heat		24 h cycle, 55 °C, 93 % rel., 96 h	
Operational reliability	IEC/EN 60068-2-6		
Mechanical resistance	IEC/EN 60068-2-6	10 g	
solation data			
Rated impulse withstand voltage U _{imp} between all isolated circuits	IEC/EN 60664-1	type test: 4 kV; 1.2/50 μs	-
Pollution category	IEC/EN 60664-1		
Overvoltage category	IEC/EN 60664-1		
Power-frequency withstand voltage (test		routine test: 2.5 kV; 50 Hz; 1 s	-
voltage) between all isolated circuits		type test: 2.5 kV; 50 Hz; 60 s	
Basic insulation (IEC/EN 61140)	input circuit / output circuit	300 V	-
Rated insulation voltage U _i	input circuit / output circuit	300 V (supply up to 240 V)	-
		500 V (supply up to 440 V)	-
Test voltage between all isolated circuits	routine test	2.5 kV, 50 Hz, 1 s	-
Standards			
Product standard		IEC 61812-1, EN 61812-1 + A11, D	IN VDE 0435 Teil 2021
Low Voltage Directive		2006/95/EC	
EMC Directive		2004/108/EC	
Electromagnetic compatibility			
nterference immunity to		IEC/EN 61000-6-2	
electrostatic discharge	IEC/ENI 61000 4.0	Level 3 (6 kV / 8 kV)	
radiated, radio-frequency	IEC/EN 61000-4-2		
electromagnetic field	IEO/EN 01000-4-3	Level 9 (10 Will)	
	IFO/FN 61000 4 4	Level 3 (2 kV / 5 kHz)	
electrical fast transient / burst			
surge		Level 4 (2 kV L-L)	
conducted disturbances, induced by ra	dio- IEC/EN 61000-4-6	Level 3 (IU V)	
frequency fields		 IEC/EN 61000-6-4	
Interference emission		IEU/ EIN 0 1000-0-4	

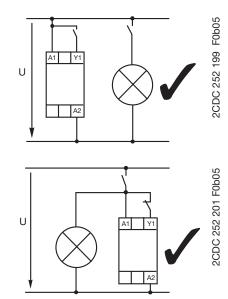
Product certifications and declarations see "Approvals and marks" on page 14.

CT-E range Wiring notes, Dimensional drawings

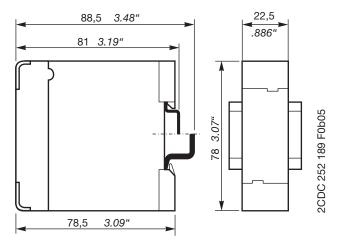
Wiring notes

for single-function devices with control contact (CT-AHE, CT-AWE with auxiliary voltage)





Dimensional drawing Dimensions in mm



CT-S range Product group picture



CT-S range Table of contents

CT-S Range

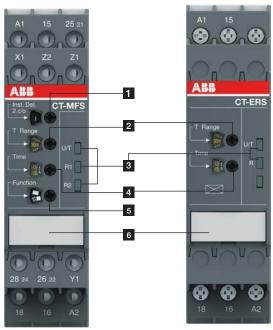
CT-S range	34
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CT-S range Benefits and advantages

Characteristics

- Diversity:
 - 8 multifunction timers
 - 11 single-function timers
- Control supply voltages:
 - Multi range: 24-48 V DC, 24-240 V AC
 - Wide range: 24-240 V AC/DC - Single range: 380-440 V AC
- Innovative connection technology
 - Double-chamber cage connection terminals
 - Easy Connect Technology
- Devices with:
 - 1 or 2 c/o (SPDT) contacts
 - 2nd c/o contact can be selected as instantaneous contact 1)
 - Remote potentiometer connection 1)
 - Control input with volt-free or voltage-related triggering e.g. to start timing, pause timing
 - Extended operating temperature range down to -40 $^{\circ}\text{C}^{\ \ ^{1)}}$
- Sealable transparent cover for protection against unauthorized changes of time values
- Integrated marker label
- Approvals / Marks (partly pending, details see "Approvals and marks" on page 14)
 - 1) selected devices

Operating controls



- 1 2nd contact as an instantaneous contact
- 2 Preselection of the time range
- 3 Indication of operational states

☐ control supply voltage applied / ☐☐☐ timing Coutput relay energized

- 4 Fine adjustment of time delay
- 5 Preselection of timing function
- 6 Marker label

CT-S range Benefits and advantages

Easy Connect Technology

Tool-free wiring and excellent vibration resistance. Push-in terminals provide connection of wires up to 2 x 0.5 - 1.5 mm² (2 x 20 -16 AWG), rigid or fine-strand with or without wire end ferrules. The extended type designators for products with push-in terminals are indicated by a P following the extended type designator e.g. CT-xxS.xxP.

Double-chamber cage connection terminals ②

Double-chamber cage connection terminals provide connection of wires up to 2 x 0.5-2.5 mm² (2 x 20-14 AWG) rigid or fine-strand, with or without wire end ferrules. Potential distribution does not require additional terminals. The extended type designators for products with double-chamber cage connection terminals are indicated by a **S** following the extended type designator e.g. CT-xxS.xxS.

Time range preselection and fine adjustment 3

Direct assignment of the preselected time range to the fine adjustment potentiometer scale by multicolor scales.

Higher utility class

The Easy Connect Technology provides excellent vibration resistance with gas tight push-in terminals - the right solution for harsh environment. Selected products of the electronic timers and measuring and monitoring relays comply to the latest rail standards NF F 16-101/102, EN 45545, EN 50155 and more standards which are relevant for railway applications. Find more inforamtion in the rail brochure 2CDC110084B0201.

LEDs for status indication

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

Integrated marker label

Integrated marker labels allow the product to be marked quickly and simply. No additional marker labels are required.

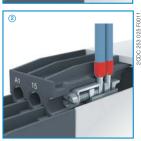
Sealable transparent cover

Protection against unauthorized changes of time and threshold values. Available as an accessory.

Snap-On housing

Tool-free DIN rail installation and deinstallation of the electronic timer.

















CT-S range Ordering details - multifunctional



CT-MVS.21P



CT-MBS.22P

Description

The high-performance CT-S range in ABB's new S-range housing offers two different types of connection terminals and is ideally suited for universal use. Two different connection technologies are available:

- Double-chamber cage connection terminals
- Easy Connect Technology

Accessories:

The CT-S range offers the possibility of using accessories such as a remote potentiometer to adjust the time delay or a sealable, transparent cover to protect against unauthorized changes. of time and threshold values.

Ordering details

Timing function	Rated control supply	Time ranges	Control input	Output	Туре	Order code	Price	Weight (1 pce)							
	voltage						1 pce	kg (lb)							
	04 040 \/ 40/00				CT-MVS.21S 1) 2) 3)	1SVR730020R0200		0.148 (0.326)							
	24- 240 V AC/DC				CT-MVS.21P	1SVR740020R0200		0.136 (0.30)							
N 4 (4.1 6.)	24-48 V DC.	10 (0.05 s -	_	0 - /-	CT-MVS.22S	1SVR730020R3300		0.142 (0.313)							
Multi 5)	24-240 V AČ	300 h)		2 c/o	CT-MVS.22P	1SVR740020R3300		0.131 (0.289)							
	380-440 V AC				CT-MVS.23S	1SVR730021R2300		0.144 (0.317)							
	380-440 V AC		CT-MVS.23P	1SVR740021R2300		0.133 (0.293)									
N 4 . IL: 6\	24-48 V DC,	10 (0.05 s -		al _/_	CT-MVS.12S	1SVR730020R3100		0.107 (0.236)							
Multi 6)	24-240 V AC	300 h)		1 c/o	CT-MVS.12P	1SVR740020R3100		0.102 (0.225)							
A 11: 7\	24-48 V DC.	2×10 (0.05 s -	_		CT- MXS.22S 4)	1SVR730030R3300		0.142 (0.313)							
Multi ⁷⁾	24-240 V AC	300 h)	-	-					-		2 c/o	CT-MXS.22P 4)	1SVR740030R3300		0.131 (0.289)
•••••		10 (0.05 s -			CT-MFS.21S	1SVR730010R0200		0.145 (0.32)							
	24- 240 V AC/DC	300 h)		2 c/o	CT-MFS.21P	1SVR740010R0200		0.133 (0.293)							
Multi ⁸⁾	24-48 V DC,	10 (0.05 s -			CT-MBS.22S ^{2) 3)}	1SVR730010R3200		0.14 (0.309)							
24-240 V AC	300 h)		2 c/o	CT-MBS.22P ^{2) 3)}	1SVR740010R3200		0.129 (0.284)								
	24-48 V DC,	10 (0.05 s -			CT-WBS.22S	1SVR730040R3300		0.123 (0.271)							
Multi ⁹⁾ 24-240 V AC			-	2 c/o	CT-WBS.22P	1SVR740040R3300		0.115 (0.254)							

- Control input with voltage-related triggering
- ☐ Control input with volt-free triggering
- \square / \square two control input with volt-free triggering
- no triggering
- S: screw connection
- P: push-in / easy connect
- 1) Extended temperature range -40 °C
- Permote potentiometer connection
 2nd c/o contact selectable as instantaneous contact
- 4) 2 remote potentiometer connections
- ⁵⁾ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Symmetrical ON- and OFF-delay, Flasher starting with ON or OFF, Star-delta change-over with impulse, Pulse former, Accumulative ON-delay, ON/ OFF-function
- ⁶ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Symmetrical ON- and OFF-delay, Flasher starting with ON or OFF, Pulse former, Accumulative ON-delay, ON/OFF-function
- ⁷⁾ Functions: Select function via DIP switches behind the marker label on the front of the unit, asymmetrical ON- and OFF-delay, Impulse-ON/OFF, Pulse generator starting with ON or OFF, Single pulse generator, ON/OFF-function
- ⁸ Functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Symmetrical ON- and OFF-delay, Flasher starting with ON, Flasher starting with OFF, Star-delta change-over with impulse, Pulse former, ON/OFF-function
- ⁹⁾ Functions: Flasher starting with ON, Flasher starting with OFF, Impulse-ON, ON-delay, fixed impulse with adjustable time delay, Adjustable impulse with fixed time delay, ON/OFF-function



Further documentation CT-S electronic timers on www.abb.com

CT-S range Ordering details - singlefunctional



CT-ERS.21P



CT-AHS.22P



CT-SDS.23P

Timing function	Rated con- trol supply voltage	Time ranges	Con- trol input	Output	Туре	Order code	Price	Weight (1 pce)		
							1 pce	kg (lb)		
	0.4.0.4.0.4.0.4.0.4.0.0				CT-ERS.21S ¹⁾	1SVR730100R0300		0.13 (0.287)		
	24-240 V AC/DC				CT-ERS.21P1)	1SVR740100R0300		0.121 (0.267)		
	24-48 V DC.	10 (0.05 s -	-	2 c/o	CT-ERS.22S	1SVR730100R3300		0.121 (0.267)		
ON-delay	24-240 V AC	300 h)			CT-ERS.22P	1SVR740100R3300		0.113 (0.249)		
	24-48 V DC,	<u>.</u>		. <u>.</u>	CT-ERS.12S	1SVR730100R3100		0.106 (0.234)		
	24-240 V AC		-	1 c/o	CT-ERS.12P	1SVR740100R3100		0.101 (0.222)		
		<u>.</u>			CT-APS.21S ¹⁾	1SVR730180R0300		0.146 (0.322)		
	24-240 V AC/DC	10 (0.05 s - 300 h)					CT-APS.21P ¹⁾	1SVR740180R0300		0.125 (0.276)
OFF-delay	24-48 V DC, 24-240 V AC			2 c/o	CT-APS.22S	1SVR730180R3300		0.138 (0.304)		
					CT-APS.22P	1SVR740180R3300		0.127 (0.28)		
			•	1 c/o	CT-APS.12S	1SVR730180R3100		0.109 (0.24)		
					CT-APS.12P	1SVR740180R3100		0.103 (0.227)		
	24-48 V DC,	10 (0.05 -		2 c/o	CT-AHS.22S	1SVR730110R3300		0.136 (0.30)		
	24-240 V AC	10 (0.05 s - 300 h)			CT-AHS.22P	1SVR740110R3300		0.125 (0.276)		
					CT-ARS.11S	1SVR730120R3100		0.106 (0.234)		
	24-240	7 (0.05 s -	-	1 c/o	CT-ARS.11P	1SVR740120R3100		0.10 (0.22)		
OFF-delay ⁵⁾	V AC/DC	10.05 s -			CT-ARS.21S	1SVR730120R3300		0.124 (0.273)		
			-	2 c/o	CT-ARS.21P	1SVR740120R3300		0.115 (0.254)		
	04 49 V DC				CT-SDS.22S	1SVR730210R3300		0.114		
04	24-48 V DC, 24-240 V AC	7 /0 05 a		:	CT-SDS.22P	1SVR740210R3300		(0.251)		
Star-delta change-over ⁶⁾		7 (0.05 s - 10 min)	-	2 n/o	CT-SDS.23S	1SVR730211R2300		(0.238)		
	380-440 V AC				CT-SDS.23P	1SVR740211R2300		(0.26) 0.112 (0.247)		

- $^{\mbox{\tiny 1)}}$ Extended temperature range -40 $^{\circ}\mbox{C}$
- ²⁾ Remote potentiometer connection
- $^{\mbox{\tiny 3)}}$ 2nd c/o contact selectable as instantaneous contact
- ⁴⁾ 2 remote potentiometer connections
- ⁵⁾ Without auxiliary voltage
- 6) 50 ms transition time

- Control input with voltage-related triggering
- ☐ Control input with volt-free triggering
- \square / \square two control input with volt-free triggering
- no triggering
- S: screw connection
- P: push-in / easy connect



Further documentation CT-S electronic timers on www.abb.com

CT-S range Ordering details - Accessories



Remote potentiometer

50 k Ω ±20 % - 0.2 $\Omega,$ degree of protection IP66

Material	Diameter	Туре	Order code	Price	Pack unit	Weight 1 piece
	in mm			1 piece	pieces	g/oz
Plastic, black	22.5	MT-150B	1SFA611410R1506		1	0.040
Plastic, chrome	22.5	MT-250B	1SFA611410R2506		1	0.040
Metal, chrome	22.5	MT-350B	1SFA611410R3506		1	0.048



Data sheet remote potentiometer

30 mm adapters

30 mm adapter for attaching the potentiometer 22 mm in 30 mm mounting hole

Material	Type		unit	Weight 1 piece g / oz
Plastic, black	KA1-8029	1SFA616920R8029	1	
Metal, chrome	KA1-8030	1SFA616920R8030	1	



Marker label 29.6 x 44.5 mm

Marker label

Caption	Туре		Price 1 piece	unit	Weight 1 piece g / oz
Symbol (see illustration)	SK 615 562-87	GJD6155620R0087		1	0.002
Scale 0 - 10	SK 615 562-88	GJD6155620R0088		1	0.002
Scale 0 - 30	MA16-1060	1SFA611940R1060		1	0.002



Marker label with scale 0-10 48.5 x 44.5 mm

Accessories for CT-S in new housing (1SVR7...)

Description	Type	Order code	Price 1 piece	Pack unit pieces	Weight 1 piece g / oz
Adapter for screw mounting	ADP.01	1SVR430029R0100		1	0.018 (0.040)
Sealable transparent cover	COV.11	1SVR730005R0100		1	0.004 (0.009)
Marker label for devices w/o DIP switches	MAR.01	1SVR366017R0100		10	0.001 (0.002)
Marker label for devices with DIP switches	MAR.12	1SVR730006R0000		10	0.001 (0.002)



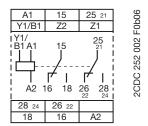
Sealable transparent cover for CT-S in new housing

Accessories for CT-S in old housing (1SVR4...)

	5 (,			
Description	Туре	Order code	Price 1 piece	Pack unit pieces	Weight 1 piece g / oz
Adapter for screw mounting	ADP.01	1SVR430029R0100		1	0.018 (0.040)
Sealable transparent cover	COV.01	1SVR430005R0100		1	0.004 (0.009)
Marker label for devices w/o DIP switches	MAR.01	1SVR366017R0100		10	0.001 (0.002)
Marker label for devices with DIP switches	MAR.02	1SVR430043R0000		10	0.001 (0.002)

CT-S range Connection diagrams

CT-MVS.21



Supply: 24-240 V AC/DC A1-A2 A1-Y1/B1 Control input 15-16/18 1. c/o contact

25-26/28 2. c/o contact

21-22/24 2. c/o contact as instantaneous contact

Z1-Z2 Remote potentiometer connection

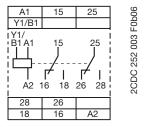
CT-MVS.22

A1 Y1/B1	15	25	9090-
Y1/ B1 A1 	15 	25 26 28	2CDC 252 003 F0b06
28	26		
18	16	A2	

A1-A2 Supply: 224-48 V DC or 24-240 V AC A1-Y1/B1 Control input

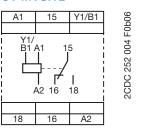
15-16/18 1. c/o contact 25-26/28 2. c/o contact

CT-MVS.23



Supply: 380-440V AC A1-A2 A1-Y1/B1 Control input 15-16/18 1. c/o contact 25-26/28 2. c/o contact

CT-MVS.12



Supply: 24-48 V DC or 24-240 V AC A1-A2 A1-Y1/B1 Control input 15-16/18 1, c/o contact

CT-MXS.22

A1	15	25	8
Z3	Z2	Z1	9
Y1/ B1 A1 	15 	25 	2CDC 252 005 F0b06
28	26	Y1/B1	
18	16	A2	1

Supply: 24-48 V DC or 24-240 V AC A1-A2

A1-Y1/B1 Control input

15-16/18 1. c/o contact

Remote Z1-Z2 potentiometer

Z3-Z2 Remote

25-26/28 2. c/o contact

connection

potentiometer connection

CT-MFS.21

A1	15	25 21	
X1	Z2	Z1	
A1 — - — - A2 1	15 6 18	25 21 26 28 22 24	
28 24	26 22	Y1	
18	16	A2	

A1-A2 Supply: 24-240 V AC/DC

2CDC 252 006 F0b06

15-16/18 1. c/o contact 25-26/28 2. c/o contact

21-22/24 2. c/o contact as instantaneous contact

Y1-Z2 Control input

X1-Z2 Control input

Z1-Z2 Remote potentiometer connection

CT-MBS.22

A1	15	25 21
	Z2	Z1
A1 	15 6 18	25 21 21 21 21 21 22 28 22 24
28 24	26 22	Y1
18	16	A2

2CDC 252 007 F0b06

Supply: 24-48 V DC A1-A2 or 24-240 V AC

15-16/18 1. c/o contact 25-26/28 2. c/o contact

21-22/24 2. c/o contact as

instantaneous contact Y1-Z2 Control input

Z1-Z2 Remote potentiometer connection

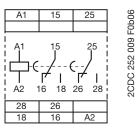
CT-WBS.22

A1	15	25	900
			ļ ģ
A1 — - — - A2 1	15 7 1 6 18	25 1 26 28	2CDC 252 008 F0b06
28	26		
18	16	A2	

Supply: 24-48 V DC or 24-240 V AC A1-A2

15-16/18 1. c/o contact 25-26/28 2. c/o contact

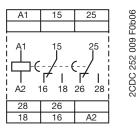
⊠ CT-ERS.21



Supply: 24-240 V AC/DC A1-A2

15-16/18 1. c/o contact 25-26/28 2. c/o contact

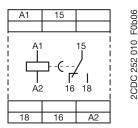
⊠ CT-ERS.22



Supply: 24-48 V DC A1-A2 or 24-240 V AC

15-16/18 1. c/o contact 25-26/28 2. c/o contact

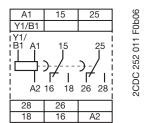
⊠ CT-ERS.12



Supply: 24-48 V DC A1-A2 or 24-240 V AC 15-16/18 1. c/o contact

CT-S range Connection diagrams

■ CT-APS.21



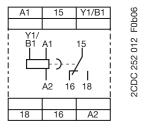
A1-A2 Supply: 24-240 V AC/DC A1-Y1/B1 Control input 15-16/18 1. c/o contact 25-26/28 2. c/o contact

CT-APS.22

A1	15	25	909
Y1/B1 Y1/ B1 A1 I I A A2	15)/ 16 18	25 -) -/ 	2CDC 252 011 F0b06
28	26		
18	16	A2	

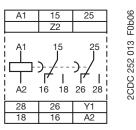
Supply: 24-48 V DC or 24-240 V AC A1-A2 A1-Y1/B1 Control input 15-16/18 1. c/o contact 25-26/28 2. c/o contact

CT-APS.12



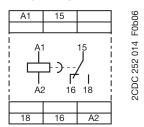
Supply: 24-48 V DC or 24-240 V AC A1-A2 A1-Y1/B1 Control input 15-16/18 1. c/o contact

CT-AHS.22



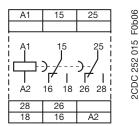
Supply: 24-48 V DC or 24-240 V AC A1-A2 Y1-Z2 Control input 15-16/18 1. c/o contact 25-26/28 2. c/o contact

CT-ARS.11



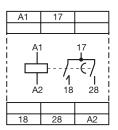
Supply: 24-240 V AC/DC A1-A2 15-16/18 1. c/o contact

CT-ARS.21



Supply: 24-240 V AC/DC A1-A2 15-16/18 1. c/o contact 25-26/28 2. c/o contact

△ CT-SDS.22

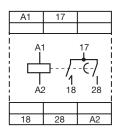


A1-A2 Supply: 24-48 V DC or 24-240 V AC

2CDC 252 016 F0b06

17-18 1. n/o contact 17-28 2. n/o contact

△ CT-SDS.23



A1-A2 Supply: 380-440 V AC 17-18 1. n/o contact 17-28 2. n/o contact

2CDC 252 016 F0b06

CT-S range Technical data

Data at T = 25 °C and rated values unless otherwise indicated

	CT-S
Input circuit - Supply circuit	1
	24-240 V AC/DC
CT-xxx.x2	24-48 V DC, 24-240 V AC
CT-xxx.x3	380-440 V AC
	110-240 V AC
CT-xxx.x5	220-240 V AC
	24 V AC/DC 100-127 V AC or 110 V DC
	200-240V AC/DC
Rated control supply voltage U _s tolerance	-15+10 %
Rated frequency	DC or 50/60 Hz
Frequency range AC	47-63 Hz
Typical current / power consumption	depending on device, see data sheet
Power failure buffering time 24 V DC	min. 15 ms
230/400 V AC	
Minimum energizing time	100 ms (CT-ARS)
Formatting time 1)	5 min (CT-ARS)
Input circuit - Control circuit	
Kind of triggering CT-MVS, CT-MXS, CT-APS	voltage-related triggering
Control input, Control function A1-Y1/B1	start timing external
Parallel load / polarized	yes / no
Maximum cable length to the control input	50 m - 100 pF/m
Minimum control pulse length	20 ms
Control voltage potential	see rated control supply voltage
	1.2 mA
230 V AC	8 mA
400 V AC	6 mA
Kind of triggering CT-MFS, CT-MBS, CT-AHS	
0	
X1-Z2	11
Maximum switching current in the control circuit	1 mA
Maximum cable length to the control input Minimum control pulse length	50 m - 100 pF/m 20 ms
No-load voltage at the control inputs	10-40 V DC
Remote potentiometer	
	50 kΩ (CT-MFS, CT-MBS, CT-MVS.21, CT-MXS)
	50 kΩ (CT-MXS)
Maximum cable length to remote potentiometer	2 x 25 m, shielded with 100 pF/m
Shield connection	Z2
Timing circuit	
Time ranges 0.05 s - 300 h	1.) 0.05-1 s 2.) 0.15-3 s 3.) 0.5-10 s 4.) 1.5-30 s 5.) 5-100 s
	6.) 15-300 s 7.) 1.5-30 min 8.) 15-300 min 9.) 1.5-30 h 10.) 15-300 l
	1,005,4 - 0,045,0 - 0,05,40
7 time ranges 0.05 s - 10 min (CT-SDS	1.) 0.05-1 s 2.) 0.15-3 s 3.) 0.5-10 s 4.) 1.5-30 s 5.) 5-100 s 6.) 15-300 s 7.) 0.5-10 min
CI-Ano,	7-7, 1.0-00 8 - 0.7 0-100 8 - 0.7 10-000 8 - 1.7 0.0-10 111111
Recovery time 24-240 V AC/DC	< 50 ms
24-48 V DC, 24-240 V AC	< 80 ms
380-440 V AC	
Accuracy within the rated control supply voltage tolerance	\(\Delta t < 0.004 \% / V \)
Accuracy within the temperature range	Δt < 0.03 % / °C
	1 0 0 0 0
Repeat accuracy (constant parameters)	< ±0.2 %
Repeat accuracy (constant parameters)	<pre> < ±0.2 % fixed 50 ms (CT-SDS, CT-MBS, CT-MFS, CT-MVS.2x)</pre>

CT-S range Technical data

Indication of operation			
Control supply voltage		☐☐: control supply voltage app	blied / TLTL: timing
Control supply voltage	U: green LED	: control supply voltage app	olied
Relay state	R, R1, R2: yellow LED	☐ : output relay energized	
Output circuit			
Kind of output	15-16/18	relay, 1 c/o contact	
	15-16/18; 25-26/28	relay, 2 c/o contacts	
	15-16/18; 25(21)-26(22)/28(24)	relay, 2 c/o contacts, 2nd c/o conta	act selectable as inst. contact
	17-18; 17-28	relay, 2 n/o contacts (CT-SDS)	
Contact material		Cd-free, on request	
Rated operational volta		250 V	
	tage / minimum switching current	12 V / 10 mA	
	ltage / maximum switching current	see load limit curves	
Rated operational curr		4 A	
(IEC/EN 60947-5-1)	AC-15 (inductive) at 230 V	3 A	•••••••••••••••••••••••••••••••••••••••
	DC-12 (resistive) at 24 V	4 A	
	DC-13 (inductive) at 24 V	2 A (CT-ARS; 1.5 A)	•••••••••••••••••••••••••••••••••••••••
AC rating (UL 508)	Utilization category (Control Circuit Rating Code)		
	max. rated operational voltage	300 V AC	
	Maximum continuous thermal current at B300	5 A	
	max. making/breaking apparent power at B300	3600 VA / 360 VA	
Mechanical lifetime		30 x 106 switching cycles	
Electrical lifetime		0.1 x 10 ⁶ switching cycles	
	ieve short-circuit protection n/c contact	6 A fast-acting	
(IEC/EN 60947-5-1)	n/o contact	10 A fast-acting	
General data 2)			
MTBF		on request	
Duty time		100%	
Dimensions (W x H x D	product dimensions	22.5 x 85.6 x 103.7 mm (0.89 x 3.3	
	packaging dimensions	97 x 109 x 30 mm (3.82 x 4.29 x 1.	*
Weight		depending on device, see ordering	
Mounting		DIN rail (IEC/EN 60715), snap-on m	ounting without any tool
Mounting position		any	
Minimum distance to o	ther units vertical / horizontal	not necessary / not necessary	•
Material of housing		UL 94 V-0	•
Degree of protection	housing / terminals	IP50 / IP20	•
Electrical connection 2			
		Screw connection technology	Easy Connect Technology
			(Push-in)
Wire size		1 x 0.5-2.5 mm ² (1 x 20-14 AWG) 2 x 0.5-1.5 mm ² (2 x 20-16 AWG)	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)
	rigid	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	<u>i</u>
Tightening torque	······································	0.6-0.8 Nm (5.31-7.08 lb.in)	-

²⁾ Data for all references 1SVR 730 xxx xxx and 1SVR 740 xxx xxx. For devices with 1SVR 430 xxx xxx please refer to the data sheet.

CT-S range Technical data

Environmental data			
Ambient temperature ranges	operation / storage	-25+60 °C / -40+85 °C, -40+60 °C / -40+85 °C (CT-M\ CT-APS.21)	vS.21, CT-MFS.21, CT-ERS.21,
Damp heat (cyclic) (IEC/EN 60068-2-30) Vibration, sinusoidal (IEC/EN 60068-2-6)		6 x 24 h cycle, 55 °C, 95 % RH 40 m/s², 10-58/60-150 Hz 60 m/s², 10-58/60-150 Hz, 20 cyc	iles
Vibration, seismic (IEC/EN 60068-3-3) Shock, half-sine (IEC/EN 60068-2-27)	functioning functioning		on
Isolation data		CT-S with 1 c/o	CT-S with 2 c/o
Rated insulation voltage U _i O Rated impulse withstand voltage U _{imp} between	input circuit / output circuit utput circuit 1 / output circuit 2	500 V not available	300 V
(IEC/EN 00004-1)			
Power-frequency withstand voltage (test volt circuits	age) between all isolated	routine test: 2.0 kV; 50 Hz; 1 s type test: 2.0 kV; 50 Hz; 60 s	
Basic insulation (IEC/EN 61140) Protective separation (IEC/EN 61140; EN 50178)	input circuit / output circuit input circuit / output circuit	250 V	
Pollution degree Overvoltage category	IEC/EN 60664-1 IEC/EN 60664-1	3	
Standards			
Product standard Low Voltage Directive EMC Directive RoHS Directive		IEC 61812-1, EN 61812-1 + A11, DI 2006/95/EC 2004/108/EC 2011/65/EC	IN VDE 0435 part 2021
Electromagnetic compatibility			
Interference immunity to electrostatic discharge radiated, radio-frequency electromagnetic field		IEC/EN 61000-6-1, IEC/EN 61000 Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz) 3 V/m (2 G	
electrical fast transient / burst surge conducted disturbances, induced by		Level 3, 2 kV / 5 kHz Level 4, 2 kV A1-A2	
radio-frequency fields harmonics and interharmonics Interference emission	IEC/EN 61000-4-13		0-6-4
high-frequency radiated high-frequency conducted	IEC/CISPR 22, EN 55022 IEC/CISPR 22, EN 55022	Class B	

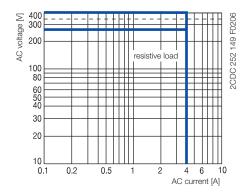
Product certifications and declarations see "Approvals and marks" on page 14.

CT-S range Technical diagrams

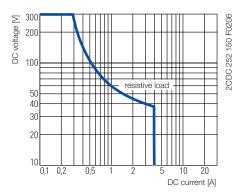
Technical diagrams

Load limit curves

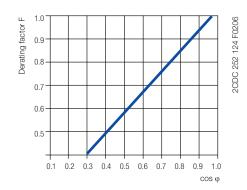
AC load (resistive)



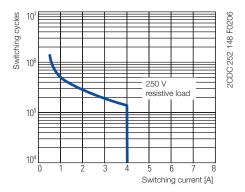
DC load (resistive)



Derating factor F for inductive AC load



Contact lifetime

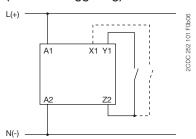


CT-S range

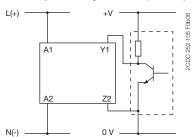
Wiring notes, Dimensional drawings

Wiring notes

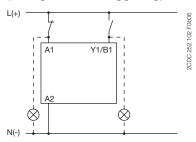
Control inputs (volt-free triggering)

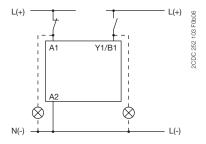


Triggering of the control inputs (volt-free) with a proximity switch (3 wire)



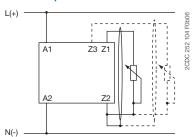
Control inputs (voltage-related triggering)



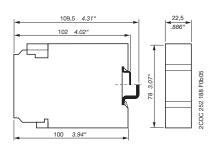


The control input Y1/B1 is triggered with electric potential against A2. It is possible to use the control supply voltage from terminal A1 or any other voltage within the rated control supply voltage range.

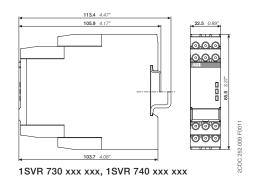
Remote potentiometer



Dimensional drawing Dimensions in mm

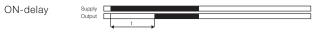


1SVR 430 xxx xxx



For a detailed overview of product specific timing functions please refer to the corresponding data sheet.

On delay functions



This function requires continuous control supply voltage for timing. Timing begins when control supply voltage is applied. When the selected time delay is complete, the output relay energizes. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

ON-delay accumulative



This function requires continuous control supply voltage for timing. Timing begins when control supply voltage is applied. When the selected time delay is complete, the output relay energizes. Timing can be paused by closing control input. The elapsed time t1 is stored and continues from this time value when the control input is re-opened.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

OFF delay functions

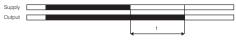
OFF-delay with auxiliary voltage



This function requires continuous control supply voltage for timing. If control input is closed, the output relay energizes immediately. If control input is opened, the time delay starts. When the selected time delay is complete, the output relay de-energizes.

If control input recloses before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when control input A1-Y1/B1 re-opens. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

OFF-delay without auxiliary voltage



The OFF-delay function without auxiliary voltage does not require continuous control supply voltage for timing.

Applying control supply voltage, energizes the output relay. If control supply voltage is interrupted, the OFF-delay starts. When timing is complete, the output relay de-energizes. If control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay remains energized. Control supply voltage must be applied for the minimum energizing time (200 ms), for proper operation.

OFF-delay with auxiliary voltage (Delay on break)



This function requires continuous control supply voltage for timing. If control input is closed, the output relay energizes immediately. If control input is opened, the time delay starts. When the selected time delay is complete, the output relay

If control input closes before the time delay is complete, the time delay is reset and the output relay does not change state. Timing starts again when control input reopens.

Pause timing / Accumulative OFF-delay: Timing can be paused by closing control input X1-Z2. The elapsed time t1 is stored and continues from this time value when X1-Z2 is re-opened.

This can be repeated as often as required.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-ON functions 1□⊠

Impulse-ON (interval)



This function requires continuous control supply voltage for timing. The output relay energizes immediately when control supply voltage is applied and de-energizes after the set pulse time is complete. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impulse-OFF functions 1□

Impulse-OFF Impulse-OFF without auxiliary voltage

This function requires continuous control supply voltage for timing. The output relay energizes immediately when the control input is de-energized and the output de-energizes after the set pulse time is complete. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

This function does not require continuous control supply voltage for timing. If control supply voltage is interrupted, the output relay energizes and the OFF time starts. When timing is complete, the output relay de-energizes. If control supply voltage is re-applied before the time delay is complete, the time delay is reset and the output relay de-energizes. Control supply voltage must be applied for the minimum energizing time (200 ms), for proper operation.

Impulse-OFF with auxiliary voltage (Trailing edge interval)

This function requires continuous control supply voltage for timing. If control supply voltage is applied, opening control input energizes the output relay immediately and starts timing. When the selected pulse time is complete, the output relay de-energizes.

Closing control input, before the time delay is complete, de-energizes the output relay and resets the time delay. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Impuls-ON and Impulse-OFF functions 1□

Impulse-ON and impulse-OFF



This function requires continuous control supply voltage for timing. If control supply voltage is applied, closing control input energizes the output relay immediately and starts the pulse time t1. When t1 is complete, the output relay de-energize. Re-opening control input energizes the output relay immediately and starts the pulse time t2. When t2 is complete, the output relay de-energizes. t1 and t2 are independently adjustable. If control input changes state before the pulse time is complete, the output relay de-energizes and the pulse time is reset. If control input changes state again, the interrupted pulse time restarts. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Flasher starting with ON Flasher with reset starting with ON

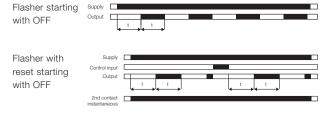
Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an ON time first.

If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an ON time first.

The time delay can be reset by closing control input. Opening control input starts the timer pulsing again with symmetrical ON & OFF times. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Flasher starting with OFF functions □



Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an OFF time first. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Applying control supply voltage starts timing with symmetrical ON & OFF times. The cycle starts with an OFF time first. The time delay can be reset by closing control input. Opening control input starts the timer pulsing again with symmetrical ON & OFF times. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

Flasher starting with ON or OFF functions □ □

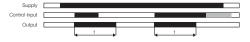
Flasher starting with ON or OFF



Applying control supply voltage starts timing with symmetrical ON / OFF times. If the control input is open during supply voltage is connected the cycle starts with an ON time first. If the control input is closed during supply voltage is connected the cycle starts with an OFF time first.

Pulse former III

Pulse former (single shot)



This function requires continuous control supply voltage for timing. Closing control input energizes the output relay immediately and starts timing. Operating the control input during the time delay has no effect. When the selected ON time is complete, the output relay de-energizes. After the ON time is complete, it can be restarted by closing control input. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

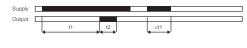
Single-pulse generator, starting with



This function requires continuous control supply voltage for timing. Applying control supply voltage, or, if control supply voltage is already applied, opening control input energizes the output relay after the OFF time t1 is complete. When the following ON time t2 is complete, the output relay de-energizes. The ON & OFF times are independently adjustable. Closing control input with control supply voltage applied, de-energizes the output relay and resets the time delay. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

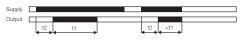
Impulse with delay ⊠1Л

Fixed impulse with adjustable time delay



This function requires continuous control supply voltage for timing. The time delay t1 starts when control supply voltage is applied. When t1 is complete, the output relay energizes for the fixed impulse time t2 of 500 ms. If control supply voltage is interrupted, the time delay is reset. The output relay does not change state.

Adjustable impulse with fixed time delay



This function requires continuous control supply voltage for timing. Applying control supply voltage starts the fixed time delay t2 of 500 ms. When t2 is complete, the output relay energizes and the selected pulse time t1 starts. When t1 is complete, the output relay de-energizes. If control supply voltage is interrupted, the pulse time is reset. The output relay does not change state.

ON- and OFF-delay ⊠

ON- and OFFdelay



This function requires continuous control supply voltage for timing. Closing the control input the ON delay starts. After the ON delay time is elapsed the output energizes. Opening the control input let the OFF delays time start. When the OFF delay time is elapsed the output de-energizes again. Operating the control input during timing will reset the respective timing function.

Symmetrical ON- and OFFdelav



This function requires continuous control supply voltage for timing. Closing control input starts the ON-delay time t1. When timing is complete, the output relay energizes. Opening control input starts the OFF-delay time t2. When the OFF-delay t2 is complete, the output relay de-energizes. If control input opens before the ON-delay t1 is complete, the time delay is reset and the output relay remains de-energized. If control input closes before the OFF-delay time t2 is complete, the time delay is reset and the output relay remains energized.

Asymmetrical ON- and OFF delav



This function requires continuous control supply voltage for timing. Closing control input starts the ON-delay t1. When timing is complete, the output relay energizes. Opening control input starts the OFF-delay t2. When the OFF-delay is complete, the output relay de-energizes. The ON-delay and OFF-delay are independently adjustable.

If control input opens before the ON-delay is complete (<t1), the time delay is reset and the output relay remains de-energized. If control input closes before the OFF-delay is complete (<t2), the time delay is reset and the output relay remains energized. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset

Further functions





This function is used for test purposes during commissioning and troubleshooting.

If the selected max. value of the time range is smaller than 300 h (front-face potentiometer "Time sector" ≠ 300 h), applying control supply voltage energizes the output relay immediately. Interrupting control

supply voltage, de-energizes the output relay. If the selected max. value of the time range is 300 h (front-face potentiometer "Time sector" = 300 h) and control supply voltage is applied the output relay does not energize.

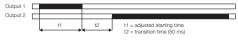
Pulse \cong Γ generator, starting with the ON or OFF time (Recycling unequal



This function requires continuous control supply voltage for timing. Applying control supply voltage, with open control input, starts timing with an ON time first. Applying control supply voltage, with closed control input, starts timing with an OFF time first. If control supply voltage is interrupted, the output relay de-energizes and the time delay is reset.

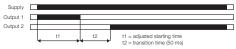
Star-delta Δ change-over

times, ON or OFF first)



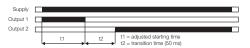
Applying control supply voltage energizes the star contactor and begins the set starting time. When the starting time is complete the star contactor de-energizes. Now, the fix transition time starts. When the transition time is complete, the delta contactor energizes.

Star-delta Δ change-over (Star-delta starting)



This function requires continuous control supply voltage for timing. Applying control supply voltage, energizes the star contactor and begins the set starting time t1. When the starting time is complete, the first output contact de-energizes the star contactor. When the transition time t2 is complete, the second output contact energizes the delta contactor. The delta contactor remains energized as long as control supply voltage is applied.

∆1Л Star-delta change-over with impulse function



This function requires continuous control supply voltage for timing . Applying control supply voltage energizes the star contactor connected to output 1 and begins the set starting time t1. When the starting time is complete, the first output de energizes the star

Now, the fixed transition time t2 of 50 ms starts. When the transition time is complete, the second ouput energizes the delta contactor. The delta contactor remains energized as long as control supply voltage is applied.

Measuring and monitoring relays Product group picture



Measuring and monitoring relays Table of contents

Measuring and monitoring relays

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Measuring and monitoring relays Benefits and advantages

CM-N range: Multifunctional



- 45 mm wide housing
- Output contacts: 2 c/o (SPDT) contacts
- Continuous voltage range (24-240 V AC/DC) or single-supply
- Setting and operation via front-face operating controls
- Adjustment of threshold values and switching hysteresis via direct reading scale
- Adjustable time delays
- Integrated and snap-fitted front-face marker
- Sealable transparent cover (accessory)

CM-S range: Universal and multifunctional



- Only 22.5 mm wide housing
- Output contacts: 1 or 2 c/o (SPDT) con-
- One supply voltage range or supplied by measuring circuit
- Setting and operation via front-face operating controls
- Adjustment of threshold values and switching hysteresis via direct reading
- Integrated and snap-fitted front-face marker
- Snap-on housing: The relays can be placed on a DIN rail tool-free - just snap it on or remove it tool-free
- Sealable transparent cover (accessory)

CM-E range: Economy



- Only 22.5 mm wide housing
- Output contacts: 1 c/o contact or 1 n/o contact
- One supply voltage range
- One monitoring function
- Cost-efficient solution for **OEM** applications
- Preset monitoring ranges

ABB's measuring and monitoring relays in a new housing

Benefits at a glance

Easy Connect Technology

New options:

Additionally to the existing well established screw connections a new innovative connection technology can be offered: Easy Connect Technology with push-in terminals.

Tool-free wiring:

The push-in terminals can be wired with rigid or fine stranded wires with wire end ferrules totally tool-free. The connection direction is exactly the same as the screw version.

Higher utility class:

The Easy Connect Technology provides excellent vibration resistance with gas tight push-in terminals – the right solution for harsh environment.

Extended features

Flammability:

The plastic housing material used meets the requirements for the highest flammability class. (UL94 V-0 rated)

Look and feel:

The new housing fits perfectly with ABB's control products offer.

Measuring and monitoring relays Benefits and advantages

Higher utility class ①

The Easy Connect Technology provides excellent vibration resistance with gas tight push-in terminals - the right solution for harsh environment. Selected products of the electronic timers and measuring and monitoring relays comply to the latest rail standards NF F 16-101/102, EN 45545, EN 50155 and more standards which are relevant for railway applications. Find more inforamtion in the rail brochure 2CDC110084B0201.

Safety 2

The "real distance" is hidden.

The clearance and the creepage distances of our products exceed international standards and substantially increase the safety of our products.

Easy Connect Technology

Tool-free wiring and excellent vibration resistance. Push-in terminals provide connection of wires up to 2 x 0.5 - 1.5 mm² (2 x 20 -16 AWG), rigid or fine-strand with or without wire end ferrules. The extended type designators for products with push-in terminals are indicated by a P following the extended type designator e.g. CM-xxS.xxP.

Double-chamber cage connection terminals ④

Double-chamber cage connection terminals provide connection of wires up to 2 x 0.5-2.5 mm² (2 x 20-14 AWG) rigid or fine-strand, with or without wire end ferrules. Potential distribution does not require additional terminals. The extended type designators for products with double-chamber cage connection terminals are indicated by a S following the extended type designator e.g. CM-xxS.xxS.

LED's for status indication

All actual operational states are displayed by front-face LEDs, thus simplifying commissioning and troubleshooting.

Integrated marker label

Integrated marker labels allow the product to be marked quickly and simply. No additional marker labels are required.

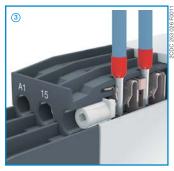
Sealable transparent cover

Protection against unauthorized changes of time and threshold values. Available as an accessory.

Snap-On housing

Tool-free DIN rail installation and deinstallation of the monitoring relay.















Measuring and monitoring relays Assortment overview

Single-phase current and voltage monitoring



Current monitoring

- Monitoring of motor current consumption
- Monitoring of lighting installations and heating circuits
- Monitoring of transportation equipment overload
- Monitoring of locking devices, electromechanical brake gear and locked rotors

See "Ordering details - Current monitoring relays" on page 64.

Voltage monitoring

- Speed monitoring of DC motors
- Monitoring of battery voltages and other supply networks

See "Ordering details - Voltage monitoring relays" on page

Three-phase monitoring



- Voltage monitoring of mobile three-phase equipment
- Protection of personnel and installations against phase
- Monitoring of the supply voltage of machines and installa-
- Protection of equipment against damage caused by unstable supply voltage
- Switching to emergency or auxiliary supply
- Protection of motors against damage caused by unbalanced phase voltages and phase loss

See "Ordering details - Singlefunctional" on page 82 or "Ordering details - Multifunctional" on page 84.

Grid feeding monitoring relays



The CM-UFx range monitors all voltage and frequency parameters in a grid and ensures the safe feeding of decentral produced eletrical energy into the grid.

- Monitoring of the voltage with up to 2 thresholds for over- and undervoltage
- Monitoring of the frequency with up to 2 thresholds for over- and underfrequency
- ROCOF (rate of change of frequency) and vector shift detection
- In compliance with several local standards

See "Ordering and selection" on page 104.

Motor load monitoring



CM-LWN monitoring relays load states of single- and three-phase asynchronous motors.

- Detection of V-belt breaking
- Motor protection against overload
- Monitoring of filters for clogging
- Protection of pumps against dry running
- Detection of high pressure in conduit systems
- Monitoring for dulling blades in sawing and cutting machines

See "Ordering details" on page 126.

Measuring and monitoring relays Assortment overview

Insulation monitoring



- Monitoring of electrically isolated supply mains for insulation resistance failure
- Detection of initial faults
- Protection against earth faults

See "Ordering details" on page 116.

Temperature monitoring



Acquisition, messaging and regulation of temperatures of solid, liquid and gaseous media in processes and machines

- Motor and system protection
- Control panel temperature monitoring
- Frost monitoring
- Temperature limits for process variables, e.g. in the packing or electroplating industry
- Control of systems and machines like heating, air-conditioning and ventilation systems, solar collectors, heat pumps or hot water supply systems
- Monitoring of servomotors with KTY sensors
- Bearing and gear oil monitoring
- Coolant monitoring

See "Ordering details" on page 154.

Thermistor motor protection



CM-MSE and CM-MSS provide full protection of motors with integrated PTC resistor sensors.

- Protection of motors against thermal overload, e. g. caused by insufficient cooling, heavy load starting conditions, undersized motors, etc.

See "Ordering details" on page 140.

Liquid level monitoring and control



- Protection of pumps against dry running
- Protection against container overflow
- Control of liquid levels
- Detection of leaks
- Control of mixing ratios

See "Ordering details" on page 166.

Measuring and monitoring relays Approvals and marks

	sting nding		rrent and voltage monitoring, ngle-phase							Three-phase monitoring													
Appro	ovals	CM-SRS.1xS/P	CM-SRS.2xS	CM.SRS.MS/P	CM-SFS.2S/P	CM-ESS.1xS/P	CM-ESS.2xS	CM-ESS.MS/P	CM- EFS.2S/P		CM-PBE	CM-PVE	CM-PFE	CM-PFS.S/P	CM-PSS.x1S/P	CM-PVS.x1S/P	CM-PVS.81S/P	CM-PAS.x1S/P	CM-MPS.x1S/P	CM-MPS.x3S/P	CM-MPN.52S/P	CM-MPN.62S/P	CM-MPN.72S/P
cUL) US	UL 508, CAN/CSA C22.2 No.14		-	-	•		-	•	-		•					•					•		
(i)	GL	-	-	-	-	-	-		-							•						•	•
ERE	EAC		•	-	-		-		-		•					•					•	•	-
CB	CB scheme	•	•	-	-		•		•		•		•			•	-				•	•	-
(1)	CCC		•	-	-		-	-	•			•	•			•	•				•	•	•
⊛	RMRS	-	•	•	-	-	•	-	-		•	•	•			•	•	•				•	•
=	Rail applications 1)	-	•	•		•	•							•		•			•	•			
Mark																							=
C€	CE	-		•				-	-		•	•	-	-	-	-	•	-	-	-	-	-	
ℰ	RCM	-	•	-			-		-		-					-		-			•	•	

■ exis		Insulation monitoring relays for ungrounded supply mains							or loa itorin	 ture	Tempera- ture monitoring			Grid feeding monitoring relays				
Appro	vals	CM-IWS.2S/P	CM-IWS.1S/P	CM-IWN.1S/P	CM-IWN.4,5,6.S/P	CM-IVN.S/P		CM-LWN		CM-TCS.xxS/P	C512	C513		CM-UFD.M22	CM-UFD.M31	CM-UFD.M33	CM-UFD.M34	
	UL 508, CAN/CSA C22.2 No.14						1	•		•		•				•		
(EL)	GL	-		-														
EAC	EAC			-	-		ĺ	•									\neg	
CB	CB scheme						ĺ										\neg	
(II)	CCC						İ										\neg	
⊛	RMRS			-	-	<u> </u>											\neg	
•	Rail applications 1)	<u>-</u>	 -	-	-			<u> </u>									\neg	
	CEI 0-21 G59/3 LV + G83/2, G59/3 HV	Ė		_		Ē								•		_	\equiv	
0	VDE-AR-N 4105 "Erzeugungsanlagen am Niederspannungsnetz"														•	•		
0	BDEW "Erzeugungsanlagen am Mittelspannungsnetz"														•			
	DRRG standard of DEWA																•	
Marks		_				1								_			\dashv	
CE	CE							_				-		•	•	•	•	
<u></u>	RCM		-					-										

¹⁾ Applicable in rail application following the latest standards for rail applications: NF F 16-101/102 (I2/F2 classified), EN 45545 (Hazard Level 3), DIN 5510, EN 50155, IEC 60571. Further information is available in our rail segment brochure 2CDC110084B0201.

Measuring and monitoring relays Approvals and marks

■ exis		The	rmist	or m	otor	pro	tect	ion			uid le	
Appro	ovals	CM-MSE	CM-MSS.x1S/P	CM-MSS.12S/P	CM-MSS.13S/P	CM-MSS.22S/P	CM-MSS.23S/P	CM-MSS.32S/P	CM-MSS.33S/P	CM-ENE MIN	CM-ENE MAX	CM-ENS.xxS/P
cUL US	UL 508, CAN/CSA C22.2 No.14			•		•	•		•	-		-
(i)	GL			•		•	•	•	•			
ERC	EAC			•		•	•	•	•			•
€x>	II (2) G D, PTB 02 ATEX 3080		•						•			
CB	CB scheme			•		•	•	•	•	-		
(11)	CCC			•		•	•	•	•	-		-
⊛	RMRS									-		
⟨Ex⟩	ATEX								•			
<u>1.8</u>	DNV											
Marks												
C€	CE	•	•	•		•		•	•			•
ℰ	RCM			•	-	•	•	•	•	-		-

Current and voltage monitoring relays, single-phase Product group picture



Current and voltage monitoring relays, single-phase Table of contents

Current and voltage monitoring relays, single-phase

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Connection diagrams, DIP switches	70
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Current and voltage monitoring relays, single-phase Benefits and advantages





Characteristics current and voltage monitoring relays

- Monitoring of DC and AC currents: 3 mA to 15 A 1)
- Monitoring of DC and AC voltages from 3-600 V
- TRMS measuring principle
- One device includes 3 measuring ranges
- One device includes 4 measuring ranges: 3-30 V; 6-60 V; 30-300 V; 60-600 V
- Over- and undercurrent monitoring¹⁾
- Over- and undervoltage monitoring¹⁾
- ON or OFF-delay configurable¹⁾
- Open- or closed-circuit principle configurable¹⁾
- Threshold values for >U and/or <U adjustable¹⁾
- Latching function configurable¹⁾
- Thresholds for >I and/or <I adjustable¹⁾
- Fixed hysteresis of 5 %1)
- Start-up delay T_v adjustable 0; 0.1-30 $s^{1)}$
- Tripping delay T_v adjustable 0; 0.1-30 s¹⁾
- 1 x 2 c/o contacts (common signal) or 2 x 1 c/o contact (separate signals for >I and <I) configurable 1)
- 1 x 2 c/o contacts (common signal) or 2 x 1 c/o contact (separate signals for >U and <U) configurable¹⁾
- 22.5 mm width
- 3 LEDs for the indication of operational states
- Approvals / Marks



Current monitoring, single-phase

The ABB current monitoring relays CM-SRS.xx reliably monitor the occurence of currents that exceed or fall below the selected threshold value. The functions overcurrent or undercurrent monitoring can be preselected. Single- and multifunction devices for the monitoring of direct or alternating currents from 3 mA to 15 A are available.

Current window monitoring (I_{min}, I_n

The window monitoring relay CM-SFS.2x is available if the application requires the simultaneous monitoring of over- and undercurrents.

Voltage monitoring, single-phase

The ABB voltage monitoring relays CM-SRS.xx are used to monitor direct and alternating voltages within a range of 3-600 V. Over- or undervoltage detection can be preselected.

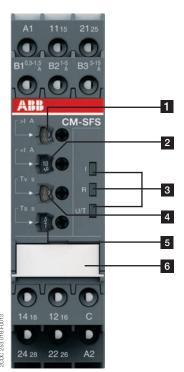
Voltage window monitoring (U_{min}, U_{max})

For the simultaneous detection of over- and undervoltages, the window monitoring relay CM-EFS.2 can be used.

²⁾ Applicable in rail application following the latest standards for rail applications: NF F 16-101/102 (I2/F2 classified), EN 45545 (Hazard Level 3), DIN 5510, EN 50155, IEC 60571. Further information is available in our rail segment brochure 2CDC110084B0201.

Current and voltage monitoring relays, single-phase Operating controls

Current monitoring relays



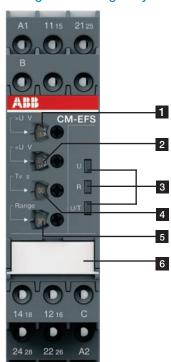
- 1 Adjustment of the threshold value >I for overcurrent
- 2 Adjustment of the threshold value <I for undercurrent
- 3 Indication of operational states

U/T: green LED - control supply voltage/timing R: yellow LED - relay status I: red LED - over- / undercurrent

- 4 Adjustment of the tripping delay T,
- 5 Adjustment of the start-up delay T_s
- 6 DIP switches (see DIP switch functions on page 2/20)

 - OFF-delay
 - Closed-circuit principle
 - Open-circuit principle
 - Latching function activated
 - M Latching function not activated
 - 2x1 c/o (SPDT) contact
 - 1x2 c/o (SPDT) contacts

Voltage monitoring relays



- 1 Adjustment of the threshold value >U for overvoltage
- 2 Adjustment of the threshold value <U for undervoltage
- 3 Indication of operational states

U/T: green LED - control supply voltage/timing R: yellow LED - relay status

U: red LED - over- / undervoltage

- 4 Adjustment of the tripping delay T_v
- 5 Adjustment of the measuring range
- 6 DIP switches (see DIP switch functions on page 2/20)

 - OFF-delay
 - Closed-circuit principle
 - Open-circuit principle
 - Latching function activated
 - Latching function not activated
 - 2x1 c/o (SPDT) contact
 - 1x2 c/o (SPDT) contacts

Current and voltage monitoring relays, single-phase Selection table - Current monitoring relays

Order number	1SVR730840R0200	1SVR740840R0200	1SVR730841R0200	1SVR740841R0200	1SVR730841R1200	1SVR740841R1200	1SVR730840R0300	1SVR730841R0300	1SVR730841R1300	1SVR730840R0400	1SVR740840R0400	1SVR730841R0400	1SVR740841R0400	1SVR730841R1400	1SVR740841R1400	1SVR730840R0500	1SVR730841R0500	1SVR730841R1500	1SVR730840R0600	1SVR740840R0600	1SVR730840R0700	1SVR730760R0400	1SVR740760R0400	1SVR730760R0500
Type	CM-SRS.11S	CM-SRS.11P	CM-SRS.11S	CM-SRS.11P	CM-SRS.11S	CM-SRS.11P		CM-SRS.12S		CM-SRS.21S	CM-SRS.21P	CM-SRS.21S	CM-SRS.21P	CM-SRS.21S	CM-SRS.21P		CM-SRS.22S		CM-SRS.M1S	CM-SRS.M1P	CM-SRS.M2S	CM-SFS.21S	CM-SFS.21P	CM-SFS.22S
Rated control supply voltage U _s																								
24 - 240 V AC/DC		•					•			•	•					•			•	•	•		•	•
110 - 130 V AC				•				•															<u>.</u>	
220 - 240 V AC															•									
Measuring ranges AC/DC		,	,	,		,	,	,	,				,		,	,	,				,		,	
3 - 30 mA		•		•	•	•				•	•	•	•	•	•				•	•		•	•	
10 - 100 mA		•			•					•	•			•					•					
0.1 - 1 A		•																						
0.3 - 1.5 A								•																
1 - 5 A								•	•							•		•			•			•
3 - 15 A								■													•			
Monitoring function																								
Over- or undercurrent		•						•															<u>.</u>	
Window current monitoring																						•		•
Latching																			sel	sel	sel	sel	sel	sel
Open circuit or closed circuit principle																			sel	sel	sel	sel	sel	sel
Timing functions for tripping delay																								
ON delay, 0.1 - 30 s										adj														
ON or OFF delay, 0.1 - 30 s																						sel	sel	sel
Output																								
c/o contact	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Connection type																								
Push-in terminals																								
Double-chamber cage connection terminals			•				•	•	•							•					•	•		•

adj: adjustable sel: selectable

Current and voltage monitoring relays, single-phase Ordering details - Current monitoring relays



CM-SRS.22S



CM-SFS.22P

Description

The CM range current monitoring relays protect single-phase mains (DC or AC) from over- and undercurrent from 3 mA to 15 A.

Description	Туре	Order code	Price	Weight (1 pce)
			1 pce	kg (lb)
		1SVR730840R0200		0.145 (0.320)
	CM-SRS.11S	1SVR730841R0200		0.161 (0.355)
		1SVR730841R1200		0.161 (0.355)
		1SVR740840R0200		0.137 (0.302)
	CM-SRS.11P	1SVR740841R0200		0.153 (0.337)
		1SVR740841R1200		0.153 (0.337)
		1SVR730840R0300		0.137 (0.302)
	CM-SRS.12S	1SVR730841R0300		0.168 (0.370)
		1SVR730841R1300		0.168 (0.370)
		1SVR730840R0400		0.152 (0.335)
	CM-SRS.21S	1SVR730841R0400		0.179 (0.395)
See "Selection table - Current monitoring relays" on page		1SVR730841R1400		0.179 (0.395)
63.		1SVR740840R0400		0.141 (0.311)
	CM-SRS.21P	1SVR740841R0400		0.168 (0.370)
		1SVR740841R1400		0.168 (0.370)
		1SVR730840R0500		0.144 (0.399)
	CM-SRS.22S	1SVR730841R0500		0.181 (0.399)
		1SVR730841R1500		0.181 (0.399)
	CM-SRS.M1S	1SVR730840R0600		0.153 (0.337)
	CM-SRS.M1P	1SVR740840R0600		0.142 (0.313)
	CM-SRS.M2S	1SVR730840R0700		0.155 (0.342)
	CM-SFS.21S	1SVR730760R0400		0.150 (0.331)
	CM-SFS.21P	1SVR740760R0400		0.139 (0.306)

S: screw connection

1SVR730760R0500

CM-SFS.22S



Further documentation single-phase monitoring relays on www.abb.com

0.158 (0.348)

Current and voltage monitoring relays, single-phase Selection table - Voltage monitoring relays

	1SVR730830R0300	1SVR740830R0300	1SVR730831R0300	1SVR740831R0300	1SVR730831R1300	1SVR740831R1300	1SVR730830R0400	1SVR740830R0400	1SVR730831R0400	1SVR740831R0400	1SVR730831R1400	1SVR740831R1400	1SVR730830R0500	1SVR740830R0500	1SVR730750R0400	1SVR740750R0400
	CM-ESS.1S	CM-ESS.1P	CM-ESS.1S	CM-ESS.1P	CM-ESS.1S	CM-ESS.1P	CM-ESS.2S	CM-ESS.2P	CM-ESS.2S	CM-ESS.2P	CM-ESS.2S	CM-ESS.2P	CM-ESS.MS	CM-ESS.MP	CM-EFS.2S	CM-EFS.2P
Rated control supply voltage U _s																
24 - 240 V AC/DC		•	ļ	į	į	<u>.</u>	•	•	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	•	•	•	•
110 - 130 V AC				•	ļ		ļ	<u> </u>	•	•	ļ		ļ	<u> </u>	<u>.</u>	
220 - 240 V AC						•										
Measuring ranges AC/DC																
3 - 30 V			•	•		•	•	•	•				•	•	•	•
6 - 60 V		•		•		•	•	•	•			•	•	•	•	•
30 - 300 V			•	•		•	•	•	•	•			•	•	•	•
60 - 600 V			•	•			•	•	•				•	•	•	
Monitoring function																
Over- or undervoltage						•	•	•	•			•	•			
Windows voltage monitoring															•	
Latching						<u>.</u>							sel	sel	sel	sel
Open circuit or closed circuit principle													sel	sel	sel	sel
Timing functions for tripping delay																
ON delay, 0.1 - 30 s							adj									
ON or OFF delay, 0.1 - 30 s															sel	sel
Output																
c/o contact	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
Connection type		•														
Push-in terminals						•		•								
Double-chamber cage connection terminals	•		•				•		•				•		•	

adj: adjustable sel: selectable

Current and voltage monitoring relays, single-phase Ordering details - Voltage monitoring relays



CM-ESS.MP



CM-EFS.2

Description

The CM range voltage monitoring relays provide reliable monitoring of voltages as well as detection of phase loss in single-phase mains.

Ordering details

Description	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	CM-ESS.1S	1SVR730830R0300		0.135 (0.298)
		1SVR730831R0300		0.164 (0.362)
		1SVR730831R1300		0.164 (0.362)
	CM-ESS.1P	1SVR740830R0300		0.126 (0.278)
		1SVR740831R0300		0.155 (0.342)
		1SVR740831R1300		0.155 (0.342)
	CM-ESS.2S	1SVR730830R0400		0.153 (0.337)
See "Selection table - Voltage monitoring relays" on page 65.		1SVR730831R0400		0.181 (0.399)
		1SVR730831R1400		0.181 (0.399)
	CM-ESS.2P	1SVR740830R0400		0.142 (0.313)
		1SVR740831R0400		0.170 (0.375)
		1SVR740831R1400		0.170 (0.375)
	CM-ESS.MS	1SVR730830R0500		0.154 (0.340)
	CM-ESS.MP	1SVR740830R0500		0.143 (0.320)
	CM-EFS.2S	1SVR730750R0400		0.157 (0.346)
	CM-EFS.2P	1SVR740750R0400		0.146 (0.322)

S: screw connection

P: push-in connection

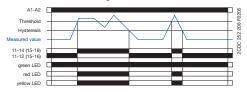


Further documentation single-phase monitoring relays on www.abb.com

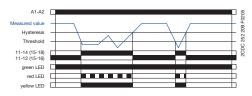
Current and voltage monitoring relays, single-phase Function diagrams

Function diagrams - CM-SRS.1

Overcurrent monitoring =

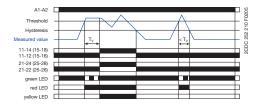


Undercurrent monitoring **►**

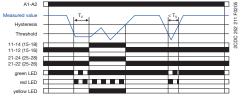


Function diagrams - CM-SRS.2

Overcurrent monitoring



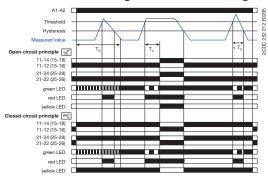
Undercurrent monitoring **→**

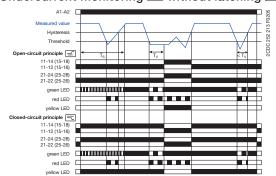


If the measured value exceeds resp. drops below the adjusted threshold value, the output relay(s) energize(s): on the CM-SRS.1 immediately, on the CM-SRS.2 after the set tripping delay T_v. If the measured value exceeds resp. drops below the threshold value plus resp. minus the adjusted hysteresis, the output relay(s) de-energize(s). The hysteresis is adjustable within a range of 3-30 % of the threshold value.

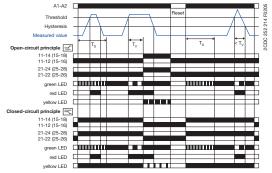
Function diagrams - CM-SRS.M

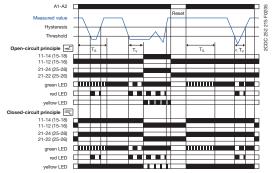






Overcurrent monitoring 🖅 with latching 🗖





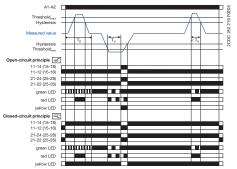
If the measured value exceeds resp. drops below the adjusted threshold value before the set start-up delay T_s is complete, the output relays do not change their actual state. If the measured value exceeds resp. drops below the adjusted threshold value when T_S is complete, the tripping delay T_V starts. If T_V is complete and the measured value is still exceeding resp. below the threshold value plus resp. minus the set hysteresis, the output relays energize 🖃 / de-energize 🖃.

If the measured value exceeds resp. drops below the threshold value minus resp. plus the set hysteresis and the latching function is not activated 🖂, the output relays de-energize 🖃 / energize 🚍. With activated latching function 🗖 the output relays remain energized and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized and energize only, when the supply voltage is switched off and then again switched on = Reset.

Current and voltage monitoring relays, single-phase Function diagrams

Function diagrams - CM-SFS.2

Current window monitoring 1x2 c/o contact ON-delayed ⊠ without latching □



Further function diagrams see data sheet.

ON-delayed ⊠ current window monitoring with parallel switching c/o contacts :

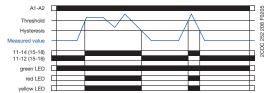
If the measured value exceeds resp. drops below the adjusted threshold value before the set start-up delay $\rm T_{\rm S}$ is complete, the output relays do not change their actual state.

If the measured value exceeds resp. drops below the adjusted threshold value when $T_{_{\rm S}}$ is complete, the tripping delay $T_{_{\rm V}}$ starts, when \boxtimes is configured. If $T_{_{\rm V}}$ is complete and the measured value is still exceeding resp. below the threshold value minus resp. plus the fixed hysteresis (5%), the output relays energize \boxtimes /de-energize \boxtimes .

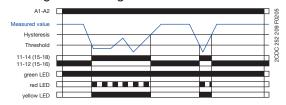
If the measured value exceeds resp. drops below the threshold value plus resp. minus the hysteresis and the latching function is not activated , the output relays de-energize / energize . With activated latching function / the output relays remain energized / and de-energize only, when the supply voltage is interrupted / the output relays remain deenergized and energize only, when the supply voltage is switched off and then again switched on = Reset.

Function diagrams - CM-ESS.1

Overvoltage monitoring ፷



Undervoltage monitoring 玉



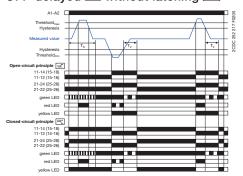
Current window monitoring 1x2 c/o contact

□□□

OFF-delayed

without latching

□□



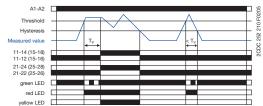
OFF-delayed ■ current window monitoring with parallel switching c/o contacts :

If the measured value exceeds resp. drops below the adjusted threshold value when the set start-up delay T_s is complete, the output relays energize 🖃 / de-energize 🖭, when 🖿 is configured, and remain in this position during the set tripping delay T_v. If the measured value exceeds resp. drops below the threshold value plus resp. minus the fixed hysteresis (5%) and the latching function is not activated M, the tripping delay T, starts. After completion of T_v, the output relays de-energize / energize , provided that the latching function is not activated . With activated latching function . the output relays remain energized and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized and energize only, when the supply voltage is switched off and then again switched on = Reset. When is adjusted on the device, the functionality is equivalent to the one described above. There is only to consider that in this case, instead of both output relays, only one output relay each will be switched.

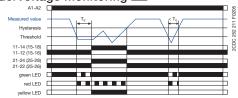
">|" =
$$11_{15}$$
- 12_{16} / 14_{18} ; "<|" = 21_{25} - 22_{26} / 24_{28}

Function diagrams - CM-ESS.2

Overvoltage monitoring 🗺



Undervoltage monitoring 🛬

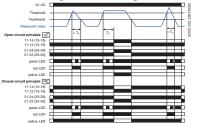


Depending on the configuration, the voltage monitoring relays CM-ESS.1 and CM-ESS.2 can be used for over- \square or undervoltage monitoring \bowtie in single-phase AC and/or DC systems. The voltage to be monitored (measured value) is applied to terminals B-C. The devices work according the open-circuit principle. If the measured value exceeds resp. drops below the adjusted threshold value, the output relay(s) energize(s): on the CM-ESS.1 immediately, on the CM-ESS.2 after the set tripping delay T_v . If the measured value exceeds resp. drops below the threshold value plus resp. minus the adjusted hysteresis, the output relay(s) de-energize(s). The hysteresis is adjustable within a range of 3-30 % of the threshold value.

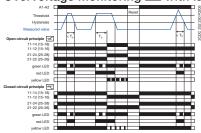
Current and voltage monitoring relays, single-phase Function diagrams

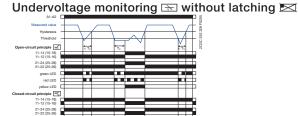
Function diagrams - CM-ESS.M

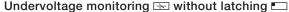
Overvoltage monitoring 🔀 without latching 🔀

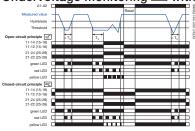


Overvoltage monitoring 🗺 with latching 🗀





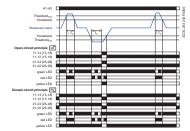




If the measured value exceeds resp. drops below the adjusted threshold value, the tripping delay T_v starts. If T_v is complete and the measured value is still exceeding resp. below the threshold value plus resp. minus the set hysteresis, the output relays energize 🖃 / de-energize 🖭.

If the measured value exceeds resp. drops below the threshold value plus resp. minus the set hysteresis and the latching function is not activated 🔀, the output relays de-energize 🖃 / energize 🖃. With activated latching function 🗀 the output relays remain energized 🖃 and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized 🖃 and energize only, when the supply voltage is switched off and then again switched on = Reset. The hysteresis is adjustable within a range of 3-30 % of the threshold value. Further function diagrams see data sheet.

Voltage window monitoring 1x2 c/o contact was ON-delayed ≥ without latching ≥

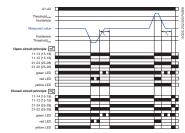


ON-delayed 🖂 voltage window monitoring with parallel switching c/o contacts 🔤: If the measured value exceeds resp. drops below the adjusted threshold value, the tripping de-

lay T_v starts, when \(\square\) is configured. If T_v is complete and the measured value is still exceeding resp. below the threshold value minus resp. plus the fixed hysteresis (5%), the output relays energize 🖃 /de-energize 🖃.

If the measured value exceeds resp. drops below the threshold value plus resp. minus the hysteresis and the latching function is not activated ⋈, the output relays de-energize ☑ / energize 🖃. With activated latching function 💌 the output relays remain energized 🖃 and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized 🖃 and energize only, when the supply voltage is switched off and then again switched on = Reset.

Voltage window monitoring 1x2 c/o contact ∞ OFF-delayed without latching M



OFF-delayed ■ voltage window monitoring with parallel switching c/o contacts : If the measured value exceeds resp. drops below the adjusted threshold value, the output

relays energize 🖃 / de-energize 🖃, when 🖿 is configured, and remain in this position during

the set tripping delay T_v.

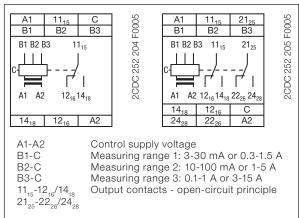
If the measured value exceeds resp. drops below the threshold value plus resp. minus the fixed hysteresis (5%) and the latching function is not activated \bowtie , the tripping delay T_v starts. After completion of T_v, the output relays de-energize 🖃 / energize 🖃, provided that the latching function is not activated M. With activated latching function M the output relays remain energized and de-energize only, when the supply voltage is interrupted / the output relays remain de-energized 🖃 and energize only, when the supply voltage is switched off and then again switched on = Reset.

When so is adjusted on the device, the functionality is equivalent to the one described above. There is only to consider that in this case, instead of both output relays, only one output relay each will be switched.

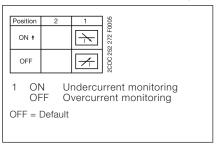
">U" =
$$11_{15}$$
- 12_{16} / 14_{18} ; "21_{25}- 22_{26} / 24_{28}

Current and voltage monitoring relays, single-phase Connection diagrams, DIP switches

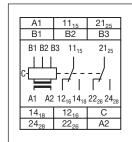
Connection diagram CM-SRS.1, CM-SRS.2



DIP switch functions CM-SRS.1, CM-SRS.2

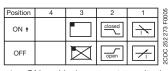


Connection diagram CM-SRS.M



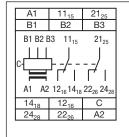
F0005 B1-C 205 B2-C В3-С 11₁₅-12₁₆/14₁₈ 21₂₅-22₂₆/24₂₈ Control supply voltage Measuring range 1: 3-30 mA or 0.3-1.5 A Measuring range 2: 10-100 mA or 1-5 A Measuring range 3: 0.1-1 A or 3-15 A Output contacts - open- or closed circuit principle

DIP switch functions CM-SRS.M



- Undercurrent monitoring OFF Overcurrent monitoring ON Closed-circuit principle
- 2 OFF Open-circuit principle 3 ON Latching function activated
- OFF Latching function not activated OFF = Default

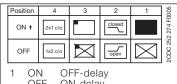
Connection diagram CM-SFS.2



A1-A2 205 F0005 B1-C B2-C В3-С 11₁₅-12₁₆/14₁₈ 21 25 - 22 26 / 24 28

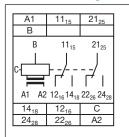
Control supply voltage Measuring range 1: 3-30 mA or 0.3-1.5 A Measuring range 2: 10-100 mA or 1-5 A Measuring range 3: 0.1-1 A or 3-15 A Output contacts - open- or closed circuit principle

DIP switch function CM-SFS.2



- OFF ON-delay
- 2 ON Closed-circuit principle OFF Open-circuit principle
- ON Latching function activated Latching function not activated OFF
- ON 2x1 c/o contact OFF 1x2 c/o contacts

Connection diagram CM-ESS.M



F0005 A1-A2 В-С 207

11₁₅-12₁₆/14₁₈ 21₂₅-22₂₆/24₂₈

Control supply voltage Measuring ranges AC/DC: 3-30 V; 6-60 V 30-300 V; 60-600 V Output contacts - open- or closed circuit principle

DIP switch functions CM-ESS.M

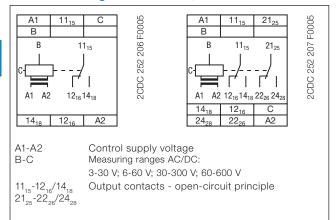
ı	Position	4	3	2	1	F0005
	ON †			closed	\	252 276 F0
	OFF			open	✓ √	2CDC 25

- Undervoltage monitoring OFF Overvoltage monitoring
- Closed-circuit principle 2 ON OFF Open-circuit principle
- ON Latching function activated Latching function not activated

OFF = Default

Current and voltage monitoring relays, single-phase Connection diagrams, DIP switches

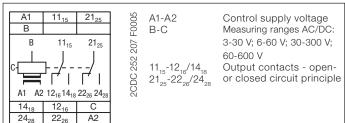
Connection diagram CM-ESS.1, CM-ESS.2



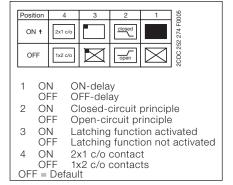
DIP switch functions CM-ESS.1, CM-ESS.2

Position	2	1	000		
ON †		\rightarrow	2 275 F0005		
OFF		/ v	2CDC 252		
1 ON Undervoltage monitoring OFF Overvoltage monitoring					
OFF = Default					

Connection diagram CM-EFS.2



DIP switch functions CM-EFS.2



Current monitoring relays, single-phase Technical data - Current monitoring relays

B3-C
Over- and under- current monitoring
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.05 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O o
Over- and under-current monitoring
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.05 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O o
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.005 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.05 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O o
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.005 Ω O.001 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.05 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O o
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.005 Ω O.001 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.05 Ω O.01 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable O o
Over- and under- current monitoring CM-SxS.x2 B1-C B2-C B3-C O.3-1.5 A 1-5 A 3-1.5 A 2 O.005 Ω O.001 Ω O.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 5 % fixed O or 0.1-30 s adjustable
CM-SxS.x2 B1-C B2-C B3-C 0.3-1.5 A 1-5 A 3-15 A ² 0.05 Ω 0.01 Ω 0.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed
CM-SxS.x2 B1-C B2-C B3-C 0.3-1.5 A 1-5 A 3-15 A ⁻² 0.05 Ω 0.01 Ω 0.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed
B1-C B2-C B3-C 0.3-1.5 A 1-5 A 3-15 A 2 0.05 Ω 0.01 Ω 0.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 0 or 0.1-30 s adjustable
0.3-1.5 A 1-5 A 3-15 A 2 0.05 Ω 0.01 Ω 0.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed
0.05 Ω 0.01 Ω 0.0025 Ω 15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed 0 or 0.1-30 s adjustable
15 A 50 A 100 A 2 A 7 A 17 A ange 5 % fixed
2 A 7 A 17 A ange 5 % fixed
ange 5 % fixed 0 or 0.1-30 s adjustable
5 % fixed 0 or 0.1-30 s adjustable
0 or 0.1-30 s adjustable
le
n ction
function
5)-22(26)/24(28) - Relays
1x2 c/o contacts
or 2x1 c/o contact
configurable open- or closed-circuit principle configurable 1)
open- or closed-circuit principle cornigurable
6 A fast-acting

¹⁾ Open-circuit principle: output relay energizes if the measured value exceeds 🗲 / falls below 🖎 the adjusted threshold value Closed-circuit principle: output relay de-energizes if measured value exceeds 🗲 / falls below 🖎 the adjusted threshold value 2) In case of measured currents > 10 A, lateral spacing has to be min. 10 mm

Current monitoring relays, single-phase Technical data - Current monitoring relays

Туре	CM-SRS.1	CM-SRS.2	CM-SRS.M	CM-SFS.2				
General data								
MTBF	on request							
Duty time	100%	/0.00	00.1.1					
	22.5 x 85.6 x 103.7 ı	*	08 in)					
packaging differsions								
	t depending on device							
gross weight	t depending on device	e, see ordering detai	ls					
Mounting	DIN rail (IEC/EN 607	15), snap-on mounti	ng without any tool					
Mounting position	any							
Minimum distance to other units	10 mm (0.39 in) at m	easured current > 1	0 A ²⁾					
Material of housing	UL 94 V-0							
Degree of protection housing / terminals	3 IP50 / IP20							
Electrical connection								
Wire size	Screw connec	tion technology	Easy Connect Tec	,				
fine-strand with(out) wire end ferrule	2 x 0.5-1.5 mm ² (2 x	20-16 AWG)	2 x 0.5-1.5 mm² (2 x 2					
-	1 x 0.5-4 mm ² (1 x 2 2 x 0.5-2.5 mm ² (2 x	0-12 AWG) 20-14 AWG)	2 x 0.5-1.5 mm ² (2 x 2	20-16 AWG)				
Stripping length	8 mm (0.32 in)							
Tightening torque	0.6-0.8 Nm (5.31-7.0	8 lb.in)	-					
Environmental data	-		•					
Ambient temperature range operation / storage	e	-85 °C						
Damp heat (IEC 60068-2-30)	55 °C, 6 cycles	•••••	•					
Vibration (sinusoidal) (IEC/EN 60255-21-1)	Class 2							
Shock (IEC/EN 60255-21-2)	Class 2	··•···································	·····•					
Isolation data								
Rated insulation voltage supply /	/ 600 V							
(VDE 0110, IEC 60947-1, measuring circuit / output	t							
IEC/EN 60255-5) supply / output 1/2								
Rated impulse withstand supply /measuring								
voltage U _{imp} (IEC/EN 60947-1, circuit / output IEC/EN 60255-5) supply / output 1/2	1 1 1 1 2 /50 110							
120/211 00200 0)	3		·····•					
Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5)								
Overvoltage category (VDE 0110, IEC 664, IEC/EN 60255-5)	III							
Standards								
Product standard	IEC/EN 60255-1, IEC	//EN 60255-27, EN 5	0178					
Low Voltage Directive	2006/95/EC							
EMC Directive	2004/108/EC							
Electromagnetic compatibility								
Interference immunity to	IEC/EN 61000-6-2							
electrostatic discharge IEC/EN 61000-4-2	Level 3		·····•					
radiated, radio-frequency, IEC/EN 61000-4-3 electromagnetic field								
electrical fast transient / burst IEC/EN 61000-4-4	Level 3							
surge IEC/EN 61000-4-5	5 Level 3							
conducted disturbances, induced by IEC/EN 61000-4-6 radio-frequency fields								
Interference emission	IEC/EN 61000-6-3							
high-frequency radiated IEC/CISPR 22; EN 55022	Class B	•••••						
11.g. 11.04do110) 1.daia10d 12.07 0101 11.22, 211.00022								

Voltage monitoring relays, single-phase Technical data - Voltage monitoring relays

Туре	CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2
Input circuit - Supply circuit		A	1-A2	
3 5	110-130 V AC			
	220-240 V AC	••••		
	24-240 V AC/DC	***************************************	····	.
Rated control supply voltage U _s tolerance	-15+10 %			
Rated frequency AC versions	50/60 Hz	•••••	•	
	50/60 Hz or DC			
Current / power consumption	see data sheet	•••••	······	.
Power failure buffering time	20 ms	•	.	.
Transient overvoltage protection	Varistors			
Input circuit - Measuring circuit			B-C	
Monitoring function	over- or undervoltage configurable	e monitoring		over- and undervoltage monitoring configurable
Mossuring method	True RMS measuring	nrinoinlo		Comigurable
Measuring method Measuring	True Rivis measuring		/I-ExS	
inputs Terminal connection	B-C	B-C	B-C	B-C
Measuring range AC/DC	3-30 V	6-60 V	30-300 V	60-600 V
Input resistance	600 kΩ	600 kΩ	600 kΩ	600 kΩ
Pulse overload capacity t < 1 s	800 V	800 V	800 V	800 V
Continous capacity	660 V	660 V	660 V	660 V
Threshold value(s)	adjustable within the			
Setting accuracy of threshold value	10 %			
Hysteresis related to the threshold value	3-30 % adjustable			5 % fixed
Measuring signal frequency range	DC / 15 Hz - 2 kHz	•••••	······	
Rated measuring signal frequency range	DC / 50-60 Hz	• · · · · · · · · · · · · · · · · · · ·	·····	
Maximum response time	AC: 80 ms / DC: 120	ms		
Accuracy within the control supply voltage tolerance	$\Delta U \le 0.5 \%$ $\Delta U \le 0.06 \% / °C$	•		
Accuracy within the temperature range Transient overvoltage protection	Varistors	***************************************		
<u> </u>	Valisiois			
Timing circuit	T	0 0 1 00 111	-1-1-	
Delay time T _v	none	0 or 0.1-30 s adjust	abie	
Repeat accuracy (constant parameters)	±0.07 % of full scale	·	····	.
Accuracy within the control supply voltage tolerance	-	$\Delta t \leq 0.5 \%$		
Accuracy within the temperature range	-	$\Delta t \leq 0.06 \% / ^{\circ}C$		
Indication of operational states	I			
	l: control supplication of the	av T. active		
Measured value U: red LED	□□□□: undervoltag	e		
Relay status R: yellow LED	I relay energi IIIII: relay energi IIIIII: relay de-ene	zed, no latching func zed, active latching for active latchin	unction	
Output circuits				
Kind of output	1 c/o contact	2 c/o contacts		1x2 c/o contacts
·				2x1 c/o contact configurable
Operating principle	open-circuit principle) ¹⁾	open- or closed-cire configurable ¹⁾	cuit principle
Contact material	AgNi	•		
Rated operational voltage U _e IEC/EN 60947-1	250 V	•••••		
Minimum switching voltage / minimum switching current	24 V / 10 mA	•	.	···•
Maximum switching voltage / maximum switching current	250 V AC / 4 A AC	•		
Rated operational current AC-12 (resistive) at 230 V	4 A	•		
(IEC/EN 60947-5-1) AC-15 (inductive) at 230 V	3 A	•		
DC-12 (resistive) at 24 V DC-13 (inductive) at 24 V	4 A 2 A	•		
AC rating Utilization category (Control Circuit Rating Code)		•		
(UL 508) max. rated operational voltage	300 V AC	•••••		
max. continuous thermal current at B 300	5 A	•		
max. making/breaking apparent power (Make/Break) at B 300	3600/360 VA			
Mechanical lifetime	30x106 switching cyc			
	0.1x10 ⁶ switching cyc			
	6 A fast-acting	10 A fast-acting		6 A fast-acting
circuit protection n/o contact	10 A fast-acting			

Voltage monitoring relays, single-phase Technical data - Voltage monitoring relays

### Comparison of the comparis	Туре	CM-ESS.1	CM-ESS.2	CM-ESS.M	CM-EFS.2
Duty time	General data				
Dimensions (W x H x D)	MTBF	on request			
Dimensions (W x H x D)	Duty time	100%		•••••	••••••
Medight Medi	Dimensions (W x H x D) product dimension	ns 22.5 x 85.6 x 103.7	mm (0.89 x 3.37 x 4.0	08 in)	•
Mounting gross weight gross weight gross weight depending on device, see ordering details gross see ordering details gross weight depending on device, see ordering details gross weight depending on device, see ordering details gross see ordering details gross	packaging dimension	ns 97 x 109 x 30 mm (3	3.82 x 4.29 x 1.18 in)	***************************************	•
dounting position dounting position would provide the provided of the provided provided by the provided provided by the provided provided by the provided by t	A/=!!-+	ht depending on device	e, see ordering detail	S	••••••
Mounting Mounting position without any tool any working position without any tool any working position without any tool any any alterial of housing begree of protection housing / terminals begree / 20.84 of 20.84 of 20.84 of 20.85 of	gross weig	ht depending on device	e, see ordering detail	S	•
Information	Mounting				•
Information	Mounting position				•
Use of the protection Description Desc	Minimum distance to other units vertical / horizont	al not necessary / not	necessary		•••••••••
Ambient temperature ranges operation -20+60 °C -40+85 °C	Material of housing	UL 94 V-0		••••	••••••
Ambient temperature ranges	Degree of protection housing / termina	ls IP50 / IP20	••••	• • • • • • • • • • • • • • • • • • • •	••••••
Storage 40. +86 °C 55 °C 6 cycle 55 °C 55 °C 6 cycle 55 °C 6 cycle 55 °C 5					
Storage	Ambient temperature ranges operation	n -20 +60 °C			
Damp heat, cyclic (EC/EN 60088-2-30)			····•		.*
Class 2 Class 2 Class 2 Class 2)amp heat_cyclic (IEC/EN 60068-2-30)				•••••
Class 2 Clas			······································	····•	•••••
Screw connection Screw connection technology Easy Connect Technology (Push fine-strand with(out) wire end ferrule 1 x 0.5-2.5 mm² (1 x 20-14 AWG) 2 x 0.5-1.5 mm² (2 x 20-16 AWG) 2 x 0.5-1.5 mm² (2 x 20-16 AWG) 2 x 0.5-2.5 mm² (2 x	ii.i.i.i.i/i.i.i.i.i.i.i.i.i			•••••	.*
Screw connection technology 1 x 0.5 - 2.5 mm² (1 x 20 - 14 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG) 2 x 0.5 - 1.5 mm² (2 x 20 - 16 kWG)		01000 2			
fine-strand with(out) wire end ferrule x 0.5-2.5 mm² (1 x 20-16 AWG) 2 x 0.5-1.5 mm² (2 x 20-16 AWG)	Vira siza	Screw conne	ction technology	Fasy Connect To	chnology (Push-in
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I x 0.5-4 mm² (1 x 20-12 AWG)	inte strana with(out) who one forta			2 x 0.0 1.0 11111 (2 x	20 10 / ((Va)
2 x 0.5-2.5 mm² (2 x 20-14 AWG)	ria			2 x 0.5-1.5 mm ² (2 x	20-16 AWG)
Stripping length 8 mm (0.32 in)	9				
Comparison	Stripping length		···•··································	••••	••••••
Rated insulation voltage VDE 0110, IEC 60947-1, IEC/EN SUSPENDIA (1/2)			08 lb.in)	=	••••••
VDE 0110, IEC 60947-1, IEC/EN 00255-5) Supply / output 1/2 Supply / o	solation data	,	,		
VDE 0110, IEC 60947-1, IEC/EN Circuit / output Supply / output 1/2 250 V	Rated insulation voltage supply / measurin	ng 600 V			
Supply / output 1/2 250 V					
Rated impulse withstand voltage U supply / measuring circuit / output supply / output 1/2 4 kV 1.2/50 µs Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5) 3 Divervoltage category (VDE 0110, IEC 664, IEC/EN 60255-5) 13 Divervoltage category (VDE 0110, IEC 664, IEC/EN 60255-5) 3 Divervoltage category (VDE 0110, IEC 664, IEC/EN 60255-5) III Standards Product standard IEC/EN 60255-1, IEC/EN 60255-27, EN 50178 Ow Voltage Directive 2006/95/EC Electromagnetic compatibility Interference immunity to IEC/EN 61000-4-2 Level 3 adiated, radio-frequency, IEC/EN 61000-4-3 IEC/EN 61000-4-5 Level 3 Electromagnetic field Electrical fast transient / burst IEC/EN 61000-4-5 Level 3 Electromagnetic disturbances, induced by adio-frequency, fields IEC/EN 61000-4-6 IEC/EN 61000-6-3	200EE E\	/2 250 V	····•	***************************************	•••••
IEC/EN 60947-1, IEC/EN 60255-5) Supply / output 1/2 4 kV 1.2/50 µs Pollution degree (VDE 0110, IEC 664, IEC/EN 60255-5) 3 Divervoltage category (VDE 0110, IEC 664, IEC/EN 60255-5) III Standards Product standard IEC/EN 60255-1, IEC/EN 60255-27, EN 50178 Ow Voltage Directive 2006/95/EC IMC Directive 2004/108/EC IEC/EN 61000-6-2 IEC/EN 61000-6-2 IEC/EN 61000-6-2 IEC/EN 61000-4-3 IEC/EN 61000-4-3 IEC/EN 61000-4-5 IEC/EN 61000-4-5 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61000-4-6 IEC/EN 61000-4-6 IEC/EN 61000-4-6 IEC/EN 61000-4-7 IEC/EN 61000-4-8 IEC/EN 61000-4-9 IEC/EN 61000-6-3 I	Rated impulse withstand voltage U. supply / measuring	ng 6 kV 1.2/50 µs		••••	••••••
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EMC Directive 2004/108/EC Electromagnetic compatibility Interference immunity to IEC/EN 61000-6-2 Electrostatic discharge IEC/EN 61000-4-2 Level 3 Edectromagnetic field Electrical fast transient / burst IEC/EN 61000-4-4 Level 3 Electrical fast transient / burst IEC/EN 61000-4-5 Level 3 Electromagnetic field Electrical fast transient / burst IEC/EN 61000-4-5 Level 3 Electromagnetic field Electrical fast transient / burst IEC/EN 61000-4-5 Level 3 Electromagnetic field IEC/EN 61000-4-5 Level 3 Electromagnetic field IEC/EN 61000-4-6 Level 3			C/EN 60255-27, EN 5	0178	
Electromagnetic compatibility Interference immunity to IEC/EN 61000-6-2 Electrostatic discharge IEC/EN 61000-4-2 Level 3 Ediated, radio-frequency, IEC/EN 61000-4-3 Level 3 Electromagnetic field Electrical fast transient / burst IEC/EN 61000-4-4 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-5 Level 3 Electroal fast transient / burst IEC/EN 61000-4-6 Level 3 Electroal fast transient / burst IEC/EN 61000-4-6 Level 3 Electroal fast transient / burst IEC/EN 61000-4-6 Level 3					
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adiated, radio-frequency, IEC/EN 61000-4-3 Level 3 electrical fast transient / burst IEC/EN 61000-4-4 Level 3 surge IEC/EN 61000-4-5 Level 3 conducted disturbances, induced by adio-frequency fields nterference emission IEC/EN 61000-6-3					
radiated, radio-frequency, alectromagnetic field electrical fast transient / burst IEC/EN 61000-4-4 Level 3 surge IEC/EN 61000-4-5 Level 3 conducted disturbances, induced by radio-frequency fields nterference emission IEC/EN 61000-6-3		-2 Level 3			
electrical fast transient / burst IEC/EN 61000-4-4 Level 3 surge IEC/EN 61000-4-5 Level 3 conducted disturbances, induced by adio-frequency fields nterference emission IEC/EN 61000-6-3	adiated, radio-frequency, IEC/EN 61000-4-	-3 Level 3			
urge IEC/EN 61000-4-5 Level 3 conducted disturbances, induced by IEC/EN 61000-4-6 Level 3 adio-frequency fields nterference emission IEC/EN 61000-6-3	electromagnetic field				
iurge IEC/EN 61000-4-5 Level 3 conducted disturbances, induced by IEC/EN 61000-4-6 Level 3 adio-frequency fields nterference emission IEC/EN 61000-6-3	Noctrical fact transiont / hurst IEC/EN 61000 4	4 1 0/01 3	···•	····•	
conducted disturbances, induced by IEC/EN 61000-4-6 Level 3 adio-frequency fields nterference emission IEC/EN 61000-6-3			···•	*	
adio-frequency fields nterference emission IEC/EN 61000-6-3			···•		
nterference emission IEC/EN 61000-6-3		LOVOIO			
		IFC/FN 61000-6-3	···•		••••••
					•••••
nigh-frequency conducted IEC/CISPR 22; EN 55022 Class B					

¹⁾ Open-circuit principle: output relay energizes if the measured value exceeds 🔀 / falls below 🛬 the adjusted threshold value Closed-circuit principle: output relay de-energizes if measured value exceeds 🛃 / falls below 🛬 the adjusted threshold value

Current and voltage monitoring relays, single-phase Notes

Three-phase monitoring relays Product group picture



Three-phase monitoring relays Table of contents

Three-phase monitoring relays

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Three-phase monitoring relays Benefits and advantages, Applications

Characteristics of the CM range three-phase monitors

- Adjustable phase unbalance threshold value ¹⁾
- Adjustable ON-delay/OFF-delay time ¹⁾
- Dual frequency measuring 50/60 Hz
- Powered by the measuring circuit
- 1 n/o contact, 1 or 2 c/o contacts
- LEDs for the indication of operational states
- Multifunctional and single-functional devices
- Phase failure detection
- Phase sequence monitoring 1)
- Over- and undervoltage monitoring (fixed or adjustable)¹⁾
- Wide-range operating voltage guarantees world-wide operation



1) depending on device type

Phase unbalance monitoring

If the supply by the three-phase system is unbalanced due to uneven distribution of the load, the motor will convert a part of the energy into reactive power. This energy gets lost unexploited; also the motor is exposed to higher thermal stress. Other thermal protection devices fail to dete ct continuing unbalances which can lead to damage or destruction of the motor. The CM range three-phase monitors with phase unbalance monitoring can reliably detect this critical situation.

Phase sequence

Changing the phase sequence during operation or a wrong phase sequence prior to startup causes a change of the rotational direction of the connected device. Generators, pumps or fans rotate in the wrong direction and the installation is no longer working properly. Especially for moveable equipment, such as construction machinery, phase sequence detection prior to the startup process is highly reasonable.

Phase loss

In case of phase loss, undefined stats of the installation are likely to occur. E.g. the startup process of motors is disturbed. All three-phase monitors of the ABB CM range detect a phase loss as soon as the voltage of one phase drops below 60% of its nominal value.

Voltage monitoring

All electric devices can be damaged when operated continuously in a network with out-of-range voltages. For example, safe starting is not ensured in case of undervoltage. Also, the switching state of a contactor is not clearly defined when operated in a "forbidden" voltage range. This can lead to undefined states of the installtion and cause damage or destruction of valuable parts.

Extended functionality

ABB's new generation of three-phase monitoring relays feature additional functions making the application field for the devices considerably larger.

Selectable phase sequence monitoring

The phase sequence monitoring can be switched off by means of a rotary switch or a DIP switch. This enables monitoring of three-phase mains where phase sequence is not relevant for the application, for example in case of motors with forward and reverse rotation, heating applications, etc.

Automatic phase sequence correction

The automatic phase sequence correction is activated by means of a DIP switch. With activated phase sequence correction, it is ensured that for any non-fixed or portable equipment, e.g. construction machinery, the correct phase sequence is always applied to the input terminals of the load. For details regarding the wiring, please see function description / diagrams.

Structure of the type designation

CM-_ _ x.yz

x: width of enclosure

y: Control supply voltage / measuring range

1	110, 115, 120, 127 V supply systems (phase-neutral)
2	220, 230, 240 V supply systems (phase-neutral)
3	200, 208, 220, 230, 240, 257, 260 V supply systems (phase-phase)
4	440, 460 V supply systems (phase-phase)
5	480, 500 V supply systems (phase-phase)
6	575, 600 V supply systems (phase-phase)
7	660, 690 V supply systems (phase-phase)
8	200, 400 V supply systems (phase-phase)

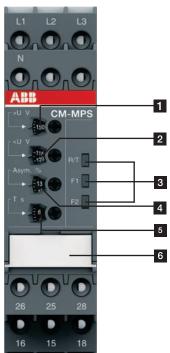
z: Rated frequency / output circuit

1	50/60 Hz - 1x2 c/o
2	50/60 Hz - 1x2 or 2x1 c/o
3	50/60/400 Hz - 1x2 oder 2x1 c/o

²⁾ Applicable in rail application following the latest standards for rail applications: NF F 16-101/102 (I2/F2 classified), EN 45545 (Hazard Level 3), DIN 5510, EN 50155, IEC 60571. Further information is available in our rail segment brochure 2CDC110084B0201.

Three-phase monitoring relays Operating controls

S-Range Housing



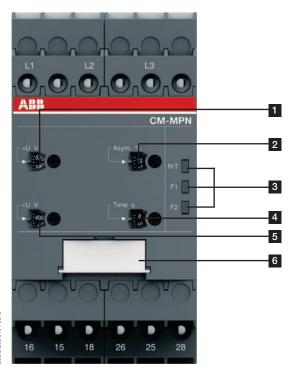
- 1 Adjustment of the hysteresis >U for overvoltage
- 2 Adjustment of the threshold value <U for undervoltage
- 3 Indication of operational states

R/T: red LED - Relay status / timing F1: yellow LED - Fault message F2: yellow LED - Fault message

- 4 Adjustment of the threshold value Asym. for phase unbalance
- 5 Adjustment of the tripping delay T
- 6 DIP switches (see DIP switch functions on page 2/40)

 - OFF-delay
 - Phase sequence monitoring deactivated
 - Phase sequence monitoring activated
 - Phase sequence correction activated
 - Phase sequence correction deactivated
 - 2x1 c/o (SPDT) contact
 - 1x2 c/o (SPDT) contacts

N-Range Housing



- 1 Adjustment of the hysteresis >U for overvoltage
- 2 Adjustment of the threshold value Asym. for phase unbalance
- 3 Indication of operational states

R/T: red LED - Relay status / timing

F1: yellow LED - Fault message

F2: yellow LED - Fault message

- 4 Adjustment of the tripping delay T
- 5 Adjustment of the hysteresis <U for undervoltage
- 6 DIP switches (see DIP switch functions on page 2/40)

 - OFF-delay
 - Dhase sequence monitoring deactivated
 - Phase sequence monitoring activated
 - Phase sequence correction activated
 - Phase sequence correction deactivated
 - 2x1 c/o (SPDT) contact
 - 1x2 c/o (SPDT) contacts

Three-phase monitoring relays Selection table - Singlefunctional

Order number	1SVR550881R9400	1SVR550882R9500	1SVR550870R9400	1SVR550871R9500	1SVR550824R9100	1SVR730824R9300	1SVR740824R9300	S 1SVR730784R2300	P 1SVR740784R2300	S 1SVR730784R3300	P 1SVR740784R3300	S 1SVR730794R1300	P 1SVR730794R1300	S 1SVR730794R3300	- 1SVR740794R3300	S 1SVR730794R2300	P 1SVR740794R2300	S 1SVR730774R1300	P 1SVR740774R1300	S 1SVR730774R3300	- 1SVR740774R3300
Rated control supply voltage U _s	CM-PBE	CM-PBE	CM-PVE	CM-PVE	CM-PFE	CM-PFS.S	CM-PFS.P	CM-PSS.31S	CM-PSS.31P	CM-PSS.41S	CM-PSS.41P	CM-PVS.31S	CM-PVS.31P	CM-PVS.41S	CM-PVS.41P	CM-PVS.81S	CM-PVS.81P	CM-PAS.31S	CM-PAS.31P	CM-PAS.41S	CM-PAS.41P
Phase to phase																					
160-300 V AC 200-400 V AC 200-500 V AC 208-440 V AC						•	•							-	-	•	•				
300-500 V AC 320-460 V AC 380 V AC			•	•				•	•						•					•	•
380-440 V AC		•	ļ	<u>.</u>	<u>.</u>		ļ	ļ	ļ	ļ			ļ	ļ	<u>.</u>	<u> </u>		ļ	ļ	<u>.</u>	<u> </u>
400 V AC			<u> </u>				<u> </u>	<u> </u>	<u> </u>	•			<u> </u>								<u>: </u>
Phase to Neutral	1	7	: _	:	:	:	į.	:	:	:	:	:	:	:	:	:	:	:	:	:	:
185-265 V AC 220-240 V AC	<u>.</u>	<u> </u>		<u>.</u>	<u>:</u>		<u>.</u>	<u> </u>	<u> </u>	<u>.</u>	<u>.</u>		<u>:</u>	<u>.</u>	<u>.</u>	<u> </u>	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>
Rated frequency		-																			
50/60 Hz				_	_		-	_						_		_					
Suitable for monitoring	-	-	-	-		-	-	:=	:=	-	-		-	-		=	: =		=		-
Single-phase mains							[-	-	-			:	:				[-
Three-phase mains		•	•	•	•		•	•	•		•	•	•	•	•	•	•	•	•	•	•
Monitoring function		•			-	•	•				•					•	•		•		
Phase failure			•	•	•			•	•			•	•	•	•	•		•		•	•
Phase sequence								sel		•											
Automatic phase sequence correction			<u>.</u>					<u>.</u>	<u>.</u>	<u>.</u>						<u>.</u>			<u>.</u>		<u>.</u>
Overvoltage				•				•	•	•	•	•	•	•	•	•	•	<u>.</u>			<u>.</u>
Undervoltage				•	<u>.</u>	<u>.</u>	<u>.</u>	•			•	•	•	•	•		•	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>
Unbalance			ļ	<u> </u>	<u> </u>	<u> </u>	ļ	ļ	ļ	ļ	<u> </u>		ļ	ļ	<u> </u>	<u> </u>	<u> </u>	•			
Neutral 1)	I	<i>c</i> :	•									<i>c</i> :									
Thresholds	İΪΧ	fix	TIX	İΙΧ	İΙΧ	İΙΧ	İΙΧ	İΙΧ	TIX	İΙΧ	İΙΧ	İΙΧ	İΙΧ	adj							
ON delay On and OFF delay	fix	fix	fix	fix		fix	fix	adj	sel	sel	sel	sel									
Connection type			_					,													
Push-in terminals Double-chamber cage connection terminals		<u>.</u>	<u> </u>	<u>.</u>	<u>.</u>		<u>.</u>				•	•	•		•	•	•		•		•

¹⁾ The external conductor voltage towards the neutral conductor is measured.

adj: adjustable sel: selectable fix: fixed

Three-phase monitoring relays Ordering details - Singlefunctional



CM-PBE



CM-PSS.41P



CM-PAS.31P

Description

The three-phase monitoring relays are designed for use in three-phase mains for monitoring the phase parameters like phase sequence, phase failure, over- and undervoltage as well as phase unbalance.

Ordering details

Characteristics	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	CM-PBE	1SVR550881R9400		0.08 (0.17)
	CM-PBE	1SVR550882R9500		0.08 (0.17)
Con "Colontian table. Cincleti metional" on page 01	CM-PVE	1SVR550870R9400		0.08 (0.17)
See "Selection table - Singlefunctional" on page 81.	CM-PVE	1SVR550871R9500		0.08 (0.17)
	CM-PFE	1SVR550824R9100		0.08 (0.17)
	CM-PFE.2	1SVR550826R9100		0.067 (0.147)

Ordering details

Characteristics	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	CM-PFS.S	1SVR730824R9300		0.127 (0.280)
	CM-PFS.P	1SVR740824R9300		0.119 (0.262)
	CM-PSS.31S	1SVR730784R2300		0.132 (0.291)
	CM-PSS.31P	1SVR740784R2300		0.123 (0.271)
	CM-PSS.41S	1SVR730784R3300		0.132 (0.291)
	CM-PSS.41P	1SVR740784R3300		0.123 (0.271)
	CM-PVS.31S	1SVR730794R1300		0.141 (0.311)
0 #0-1	CM-PVS.31P	1SVR740794R1300		0.132 (0.291)
See "Selection table - Singlefunctional" on page 81.	CM-PVS.41S	1SVR730794R3300		0.139 (0.306)
	CM-PVS.41P	1SVR740794R3300		0.131 (0.289)
	CM-PVS.81S	1SVR730794R2300		0.136 (0.300)
	CM-PVS.81P	1SVR740794R2300		0.128 (0.282)
	CM-PAS.31S	1SVR730774R1300		0.133 (0.293)
	CM-PAS.31P	1SVR740774R1300		0.124 (0.273)
	CM-PAS.41S	1SVR730774R3300		0.132 (0.291)
	CM-PAS.41P	1SVR740774R3300		0.123 (0.271)

S: screw connection

P: push-in connection



Further documentation three-phase monitoring relays on www.abb.com

Three-phase monitoring relays Selection table - Multifunctional

	Order number	1SVR730885R1300	1SVR740885R1300	1SVR730885R3300	1SVR740885R3300	1SVR730884R1300	1SVR740884R1300	1SVR730884R3300	1SVR740884R3300	1SVR730885R4300	1SVR740885R4300	1SVR730884R4300	1SVR740884R4300	1SVR750487R8300	1SVR760487R8300	1SVR750488R8300	1SVR760488R8300	1SVR750489R8300	1SVR760489R8300
Rated control supply voltage U _s	Type	CM-MPS.11S	CM-MPS.11P	CM-MPS.21S	CM-MPS.21P	CM-MPS.31S	CM-MPS.31P	CM-MPS.41S	CM-MPS.41P	CM-MPS.23S	CM-MPS.23P	CM-MPS.43S	CM-MPS.43P	CM-MPN.52S	CM-MPN.52P	CM-MPN.62S	CM-MPN.62P	CM-MPN.72S	CM-MPN.72P
Phase to Phase								•											
160-300 V AC						•													
300-500 V AC		1		[•				•	•			1			
350-580 V AC		1												•	•	Ī			
450-720 V AC		1														•	•		
530-820 V AC		1																•	•
Phase to Neutral			•				•					•					•		
90-170 V AC																			
180-280 V AC				•	•														
Rated frequency				•	•	•	•	•	•	•		•	•	•	•	•	•	•	
50/60 Hz			•	•	•	•				-						•	•	•	•
50/60/400 Hz		1					.												
Suitable for monitoring				•	•	•			•	•						•		•	
Single-phase mains				•	•														
Three-phase mains				•	•	•		•									•	•	•
Monitoring function			•				•	•	•					•	•				
Phase failure			•	•	•	•		•		•	•	•				•	•	•	•
Phase sequence		sel	sel	sel	sel	sel	sel	sel	sel	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Automatic phase sequence correction	1	1								adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Overvoltage				•	•							•					•		
Undervoltage		•		•	•	•						•			•	•	•	•	•
Unbalance		•		•	•	•		•				•			•	•	•	•	•
Neutral 1)		= 2)	■ ²⁾	■ ²⁾	■ ²⁾		<u> </u>			■ ²⁾	= 2)								
Thresholds		adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Timing functions for tripping delay																			
On and OFF delay		adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj	adj
Connection type			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
Push-in terminals					•												•		•
Double-chamber cage connection ter	minals			•		•					1	•					:	•	

¹⁾ The external conductor voltage towards the neutral conductor is measured. 2) Interrupted neutral monitoring

adj: adjustable sel: selectable

0.142 (0.313)

0.133 (0.293)

0.140 (0.309)

0.132 (0.291)

0.149 (0.328)

0.138 (0.304)

0.148 (0.327)

0.137 (0.302)

0.230 (0.507)

0.226 (0.498)

0.229 (0.505)

0.225 (0.496)

0.224 (0.494)

0.220 (0.485)

Three-phase monitoring relays Ordering details - Multifunctional

Ordering details



CM-MPS.23P



CM-MPN.52P

Characteristics	Туре	Order code	Weight (1 pce) kg (lb)
	CM-MPS.11S	1SVR730885R1300	0.148 (0.326)
	CM-MPS.11P	1SVR740885R1300	0.137 (0.302)
	CM-MPS.21S	1SVR730885R3300	0.146 (0.322)
	CM-MPS.21P	1SVR740885R3300	0.135 (0.298)

CM-MPS.31S

CM-MPS.31P

CM-MPS.41S

CM-MPS.41P

CM-MPS.23S

CM-MPS.23P

CM-MPS.43S

CM-MPS.43P

CM-MPN.52S

CM-MPN.52P

CM-MPN.62S

CM-MPN.62P

CM-MPN.72S

1SVR730884R1300

1SVR740884R1300

1SVR730884R3300

1SVR740884R3300

1SVR730885R4300

1SVR740885R4300

1SVR730884R4300

1SVR740884R4300

1SVR750487R8300

1SVR760487R8300

1SVR750488R8300

1SVR760488R8300

1SVR750489R8300

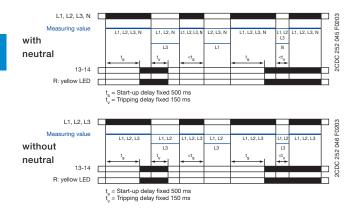
See "Selection table - Multifunctional" on page 83.

CM-MPN.72P 1SVR760489R8300 S: screw connection P: push-in connection



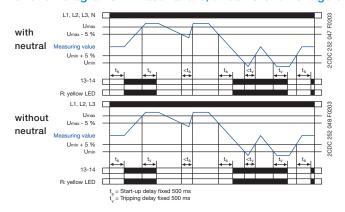
Further documentation three-phase monitoring relays on www.abb.com

Function diagrams - Phase failure detection CM-PBE



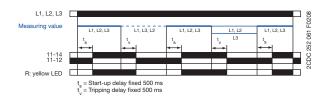
If all phases (and the neutral) are present, the output relay energizes after the start-up delay to is complete. If a phase failure occurs, the tripping delay t starts. When timing is complete, the output relay de-energizes. As soon as the voltage returns to the tolerance range, timing of ts starts. When timing is complete, the output relay re-energizes automatically. The yellow LED glows when the output relay is energized.

Function diagrams - Phase failure, under- / overvoltage detection CM-PVE



If all phases (and the neutral) are present with correct voltage, the output relay energizes after the start-up delay t is complete. If the voltage exceeds or falls below the fixed threshold value or if a phase failure occurs, the tripping delay t starts. When timing is complete, the output relay de-energizes. As soon as the voltage returns to the tolerance range, timing of ts starts. When timing is complete, the output relay re-energizes automatically. The yellow LED glows when the output relay is energized.

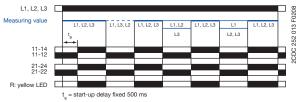
Function diagram - Phase failure detection, phase sequence monitoring CM-PFE



If all phases are present with the correct phase sequence, the output relay energizes after the start-up delay t_s is complete. If a phase failure or a phase sequence error occurs, the tripping delay t_v starts. When timing is complete, the output relay de-energizes. The yellow LED glows when the output relay is energized.

In case of motors which continue running with only two phases, the CM-PFE detects phase failure if the reverse fed voltage is less than 60 % of the originally applied voltage.

Function diagram - Phase failure detection, phase sequence monitoring CM-PFS



If all phases are present with the correct phase sequence, the output relay energizes after the start-up delay to is complete. If a phase failure or a phase sequence error occurs, the output relay de-energizes instantaneous. The yellow LED glows when the output relay is energized.

In case of motors which continue running with only two phases, the CM-PFS detects phase failure if the reverse fed voltage is less than 60 % of the originally applied voltage.

ATTENTION

ral CM-PFS units are placed side by side and the control supply voltage is higher than 415 V, spacing of at least 10 mm has to be kept on the individual units.

CM-PSS.xx, CM-PVS.xx, CM.PAS.xx, CM-MPS.xx, CM-MPN.xx Phase sequence monitoring and phase failure detection

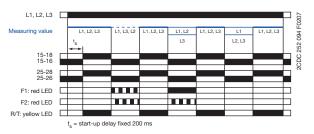
Applying control supply voltage begins the fixed start-up delay t_s. When t_s is complete and all phases are present with correct voltage, the output relays energize and the yellow LED R/T glows.

Phase sequence monitoring

If phase sequence monitoring is activated, the output relays de-energize as soon as a phase sequence error occurs. The fault is displayed by alternated flashing of the LEDs F1 and F2. The output relays re-energize automatically as soon as the phase sequence is correct again.

Phase failure detection

The output relays de-energize instantaneous if a phase failure occurs. The fault is indicated by lightning of LED F1 and flashing of LED F2. The output relays re-energize automatically as soon as the voltage returns to the tolerance range.



CM-MPS.11, CM-MPS.21, CM-MPS.23 Interrupted neutral monitoring

The interruption of the neutral in the main to be monitored is detected by means of phase unbalance evaluation. Determined by the system, in case of unloaded neutral, i.e. symmetrical load between all three phases, it may happen that an interruption of the neutral will not be detected. If the star point is displaced by asymmetrical load in the three-phase main, an interrupted neutral will be detected.

Displacement of the star point



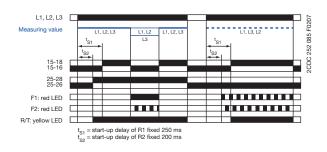
CM-MPS.x3, CM-MPN.x2

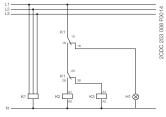
Automatic phase sequence correction

This function can be selected only if phase sequence monitoring is activated and operating mode 2x1 c/o (SPDT) contact is selected.

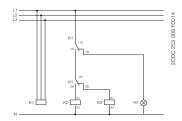
Applying control supply voltage begins the fixed start-up delay $t_{\rm S1}.$ When $t_{\rm S1}$ is complete and all phases are present with correct voltage, output relay R1 energizes. Output relay R2 energizes when the fixed start-up delay t_{sp} is complete and all phases are present with correct phase sequence. Output relay R2 remains de-energized if the phase sequence is incorrect. If the voltage to be monitored exceeds or falls below the set threshold values for phase unbalance, over- or undervoltage or if a phase failure occurs, output relay R1 de-energizes and the LEDs F1 and F2 indicate the fault.

Output relay R2 is responsive only to a false phase sequence. In conjunction with a reversing contactor combination, this enables an automatic correction of the rotation direction. See circuit diagrams on the right.

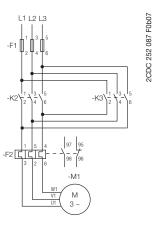




Control circuit diagram (K1 = CM-MPS.23)



Control circuit diagram (K1 = CM-MPS.43 or CM-MPN.xx)



Power circuit diagram

CM-PSS.xx1, CM-PVS.xx2, CM-MPS.xx2, CM-MPN.xx2 Over- and undervoltage monitoring was

Applying control supply voltage begins the fixed start-up delay t_s. When t_s is complete and all phases are present with correct voltage and with correct phase sequence, the output relays energize and the yellow LED R/T glows.

Type of tripping delay = ON-delay

If the voltage to be monitored exceeds or falls below the fixed1) or set2) threshold value, the output relays de-energize after the set tripping delay t, is complete. The LED R/T flashes during timing and turns off as soon as the output relays deenergize.

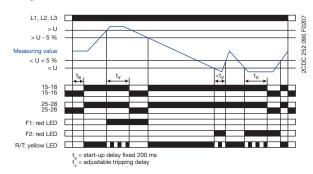
The output relays re-energize automatically as soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 5 % and the LED R/T glows.

Type of tripping delay = OFF-delay

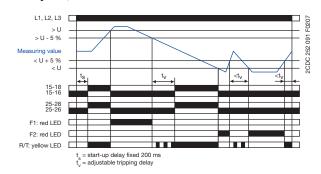
If the voltage to be monitored exceeds or falls below the fixed1) or set2) threshold value, the output relays de-energize instantaneously and the LED R/T turns off.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 5 %, the output relays re-energize automatically after the set tripping delay to is complete. The LED R/T flashes during timing and turns steady when timing is complete.

ON-delay ⊠, 1x2 c/o contacts ™



OFF-delay ■, 1x2 c/o contacts



CM-MPS.x3, CM-MPN.x2

Over- and undervoltage monitoring

Applying control supply voltage begins the fixed start-up delay t_s. When t_s is complete and all phases are present with correct voltage and with correct phase sequence, the output relays energize. The yellow LED R/T glows as long as at least one output relay is energized.

Type of tripping delay = ON-delay

If the voltage to be monitored exceeds or falls below the set threshold value, output relay R1 (overvoltage) or output relay R2 (undervoltage) de-energizes after the set tripping delay to is complete. The LED R/T flashes during timing.

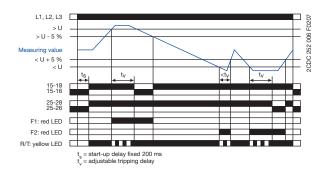
The corresponding output relay re-energizes automatically as soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 5 %.

Type of tripping delay = OFF-delay

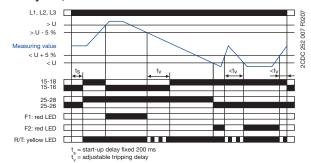
If the voltage to be monitored exceeds or falls below the set threshold value, output relay R1 (overvoltage) or output relay R2 (undervoltage) de-energizes instantaneously.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 5 %, the corresponding output relay re-energizes automatically after the set tripping delay t, is complete. The LED R/T flashes during timing.

ON-delay ≥ ,2x1 c/o contact ≤



OFF-delay ■, 2x1 c/o contact



CM-PAS.xx, CM-MPS.xx, CM-MPN.xx Phase unbalance monitoring

Applying control supply voltage begins the fixed start-up delay t_s. When t_s is complete and all phases are present with correct voltage and with correct phase sequence, the output relays energize and the yellow LED R/T glows.

Type of tripping delay = ON-delay

If the voltage to be monitored exceeds or falls below the set phase unbalance threshold value, the output relays deenergize after the set tripping delay t_v is complete. The LED R/T flashes during timing and turns off as soon as the output relays de-energize.

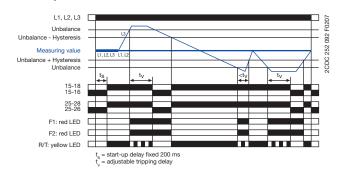
The output relays re-energize automatically as soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 20 % and the LED R/T glows.

Type of tripping delay = OFF-delay

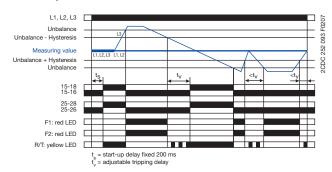
If the voltage to be monitored exceeds or falls below the set phase unbalance threshold value, the output relays de-energize instantaneously and the LED R/T turns off.

As soon as the voltage returns to the tolerance range, taking into account a fixed hysteresis of 20 %, the output relays re-energize automatically after the set tripping delay t, is complete. The LED R/T flashes during timing and turns steady when timing is complete.

ON-delay ⊠



OFF-delay



CM-PSS.xx, CM-PSV.xx, CM-PAS.xx, CM-MPS.xx, CM-MPN.xx **LED functions**

Function	R/T:	F1:	F2:
	yellow LED	red LED	red LED
Control supply voltage applied, output relay energized	<u></u>	-	-
Tripping delay t _v active		-	-
Phase failure	-		
Phase sequence	-	☐☐☐ alternation	ernating
Overvoltage	-		-
Undervoltage	-	-	
Phase unbalance	-		
Interruption of the neutral	-		
Adjustment error 1)			

1) Possible misadjustments of the front-face operating controls: Overlapping of the threshold values: An overlapping of the threshold values is given, if the threshold value for overvoltage is set to a smaller value than the threshold value for undervoltage.

DIP switch 3 = OFF and DIP switch 4 = ON: Automatic phase sequence correction is activated and selected operating mode is 1x2 c/o contacts DIP switch 2 and 4 = ON: Phase sequence detection is deactivated and the automatic phase sequence correction is actived

CM-PSS.xx, CM-PSV.xx, CM-PAS.xx, CM-MPS.xx, CM-MPN.xx Type of tripping delay

The type of tripping delay \(\square\) can be adjusted via a rotary (CM-PxS.xx) or a DIP switch (CM-MPx.xx).

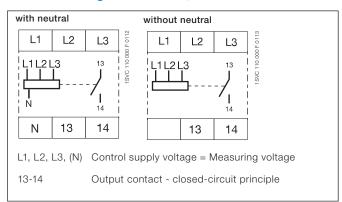
Switch position ON-delay ⊠:

In case of a fault, the de-energizing of the output relays and the respective fault message are suppressed for the adjusted tripping delay t_v.

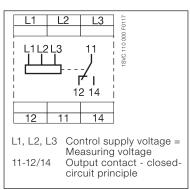
Switch position OFF-delay ::

In case of a fault, the output relays de-energize instantaneously and a fault message is displayed and stored for the length of the adjusted tripping delay t_v. Thereby, also momentary undervoltage conditions are recognized.

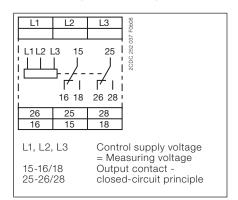
Connection diagrams CM-PBE, CM-PVE



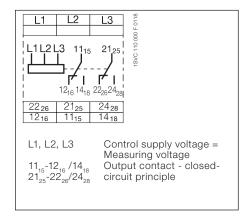
Connection diagram CM-PFE



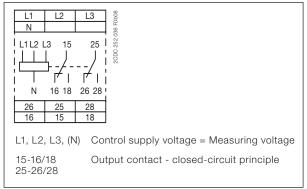
Connection diagram CM-PVS.x1, CM-PSS.x1, CM-PAS.x1



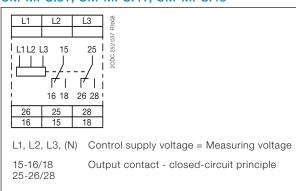
Connection diagram CM-PFS



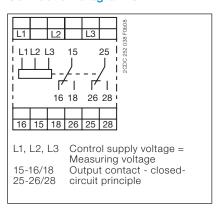
Connection diagram CM-MPS.11, CM-MPS.21, CM-MPS.23



Connection diagram CM-MPS.31, CM-MPS.41, CM-MPS.43



Connection diagram CM-MPN.x2



Three-phase monitoring relays DIP switches, Rotary switches

Rotary switch "Function" CM-PVS



with phase sequence monitoring



OFF-delay with phase sequence monitoring



ON-delay without phase sequence monitoring



OFF-delay without phase sequence monitoring

Rotary switch "Function" CM-PSS



ON-delay with phase sequence monitoring



with phase sequence monitoring



ON-delay without phase sequence monitoring



OFF-delay without phase sequence monitoring

DIP switch functions CM-MPS.x3 and CM-MPN.x2



1 Timing function

ON ON-delayed OFF OFF-delayed

3 Operating principle of output

ON 2x1 c/o contact OFF 1x2 c/o contact

2 Phase sequence monitoring

ON deactivated OFF activated

4 Phase sequence correction

ON activated OFF deactivated

Output relay R1 is responsive to overvoltage, output relay R2 is responsive to undervoltage. In case of other faults, both output relays react synchronously.

DIP switch functions CM-MPS.x1



1 Timing function ON ON-delayed OFF OFF-delayed

2 Phase sequence monitoring ON deactivated OFF activated

Туре			CM-PBE 1)	CM-PBE	CM-PVE 1)	CM-PVE	CM-PFE	CM-PFS
Supply circu	it = measuring circu	it	L1-L2-L3-N	L1-L2-L3	L1-L2-L3-N	L1-L2-L3	L1-	L2-L3
Rated contro	ol supply voltage U _s =	= measuring voltage	3x380- 440 V AC, 220-240 V AC	3x380- 440 V AC	3x320- 460 V AC, 185-265 V AC	3x320- 460 V AC	3x208- 440 V AC	3x200- 500 V AC
Power consu	umption	·····					approx. 15 \	/A
Rated contro	ol supply voltage U _s t	olerance	-15+15 %	. <u>i</u>	-15+10 %		-10+10 %	-15+10 %
Rated freque		······································	50/60 Hz	•••••	50/60 Hz (-10	D+10 %)		50/60 Hz
Duty time			100 %	•••••	i			
Measuring ci	ircuit	-	L1-L2-L3-N	L1-L2-L3	L1-L2-L3-N	L1-L2-L3	L1-L2-L3	
Monitoring fu	unctions	phase failure	•	•	•	•	•	•
	****	phase sequence	-	-	-	-	•	•
	••••	over- / undervoltage	-	-	•	•	-	-
	•••	neutral	•	-	•	-	-	-
Measuring ra	anges		3x380-440 V AC, 220- 240 V AC	3x380- 440 V AC	3x320- 460 V AC, 185-265 V AC	3x320- 460 V AC	3x208- 440 V AC	3x200- 500 V AC
Thresholds		U_{min}		•	fixed 185 V / 320 V	fixed 320 V	0.6 x U _N	
		U _{max}			fixed 265 V / 460 V	fixed 460 V		
Hysteresis re	elated to the threshol	d value	fixed 5 %	- 0.0E v.II.)	fixed 5 %	•	-	•
Measuring vo	oltage frequency		50/60 Hz (-10	$\theta = 0.65 \times U_{N}$			50/60 Hz	····
Response tir			40 ms		80 ms		500 ms	*
	.	supply voltage tolerance	-	· 	<u>i</u>		$\Delta U \leq 0.5 \%$	
Accuracy wit	thin the temperature	range	-		$\Delta U \leq 0.06 \%$	5/°C	<u>i</u>	
Timing circu	it				-:			
Start-up dela			fixed 500 ms	(±20 %)			fixed 500 m	S
Tripping t _v			fixed 150 ms (±20 %)		at over-/ und fixed 500 ms		fixed 500 ms	-
	f operational states							
Relay status		R: yellow LED						*
Fault messaç	ge	F: red LED	Only CM-PFS	S: J L Pha	ase failure / 「	l Phase se	equence error	:
Output circu	uits			10	3-14		11-12/14	11 ₁₅ -12 ₁₆ / 14 ₁₈ ; 21 ₂₅ -22 ₂₆ / 24 ₂₈
Kind of outpo	ut		1 n/o contac	t			1 c/o contact	2 c/o contacts
Operating pr	inciple		closed-circui	t principle 2)	······································			
Contact mate	erial	•	AgCdO	•••••				AgNi allow,
Rated operat	tional voltage U	IEC/EN 60947-1	250 V	•••••	··•·······	•••••		Cd free 250 V AC
	- 6	imum switching current	200 v					1-00.7.0
	vitching voltage		250 V AC, 25	0 V DC	······································	•••••		
Rated operat	tional current I	AC-12 (resistive) 230 V	4 A	-	······································	•••••	··•···································	···•
(IEC/EN 609	47-5-1)	AC-15 (inductive) 230 V	3 A					
		DC-12 (resistive) 24 V	4 A	· 				···•
	****	DC-13 (inductive) 24 V	2 A	· 	······································			
Mechanical I	lifetime		30 x 10 ⁶ swit	ching cycles		•••••		
Electrical life	time (AC-12, 230 V, 4	4 A)	0.1 x 10 ⁶ swi	tching cycles				
Max. fuse ra short-circuit	ting to achieve protection	n/c contact	10 A fast-act					6 A fast- acting
	11488	n/o contact	10 A fast-act	•	24 21.14	/6==		-! 0.75\
AC rating (UL 508)		y (Control Circuit Rating Code)		'FS: B300, pilo	ot duty general	purpose (250	v, 4 A, cos pl	าเ U./5)
, 3 = 300)	***************************************	max. rated operational voltage		· 	··•···································	·•····································	··•········	
	•	uous thermal current at B 300	5 A					
	max. making/brea	king apparent power at B 300	3600/360 VA					

¹⁾ Device with neutral monitoring: The external conductor voltage towards the neutral conductor is measured.

²⁾ Closed-circuit principle: Output relay is de-energized if the measured value exceeds/drops below the adjusted threshold.

Туре		CM-PBE 1)	CM-PBE	CM-PVE 1)	CM-PVE	CM-PFE	CM-PFS	
General data								
Dimensions (W x H x D)		22.5 x 78 x 7	8.5 mm (0.89	x 3.07 x 3.09 in)			
Weight		see data she	•	nm (0.89 x 3.07	x 3.94 in)	··•······	···•	
Mounting	•••••	DIN rail (IEC/		•••••••••••••••••••••••••••••••••••••••		··•····	···•	
Mounting position	•••••	any						
Degree of protection	housing / terminals	IP50 / IP20						
Electrical connection								
Wire size fine-str	and with wire end ferrule	2 x 0.75-1.5 r	nm² (2 x 18-16	(AWG			Same as	
fine-strand	without wire end ferrule	2 x 1-1.5 mm	² (2 x 18-16 AV	VG)		·····	···· CM-PSS.31, see page 2/44	
	rigid	2 x 0.75-1.5 r	nm² (2 x 18-16	AWG)		··•········	000 pago 2, 11	
	O .		,	,				
Chrispina Ionath		10 mm (0.39	:\	· 		.		
Stripping length		10 111111 (0.39	111)				Same as CM-PSS.31,	
							see page 2/44	
Tightening torque		0.6-0.8 Nm						
Environmental data								
Ambient temperature range	operation / storage	-20+60 °C /				··•·····	··· · ·····	
Environmental testing (IEC 68-2-30) Operational reliability (IEC 68-2-6)		6 g	ne, 55 °C, 93 °	70 TEL., 96 N		··•···································		
Mechanical resistance (IEC 68-2-6)		10 g	•			······································	-	
Climatic category	IEC/EN 60721-3-3	-	••••••			······································	3K3	
Damp heat, cyclic	IEC/EN 60068-2-30	CM-PFS: 6 x	24 h cycle, 55	°C, 95 % RH			Ole 0	
Vibration, sinusoidal Shock	IEC/EN 60255-21-1 IEC/EN 60255-21-2		<u></u>			··•····	Class 2 Class 2	
Isolation data	1LO/LN 00233-21-2						Olass Z	
Rated insulation voltage U	between supply,	400 V				-		
(IEC/EN 60947-1, IEC/EN 60664-1)	measuring and output							
	circuits		•				.	
	supply circuit / output circuit					600 V		
	output circuit 1 /	-	•	•••••••••••		300 V	···•	
	output circuit 2							
Rated impulse withstand voltage U _{imp}		4 kV / 1.2 - 5	0 µs				-	
between all isolated circuits (VDE 0110, IEC 664)	supply circuit / output circuit						6 kV	
(122 0110, 120 00 1)	output circuit 1 /	-	•	· ······		··•·······	4 kV	
	output circuit 2							
Basic insulation for rated control	supply circuit / output						600 V AC	
supply voltage (IEC/EN 60664-1) Protective seperation	circuit supply circuit / output		•			··•···································	n/a	
(IEC/EN 61140, EN 50178)	circuit						11/a	
Test voltage (routine test)		2.5 kV, 50 Hz	, 1 min.			····	-	
	supply circuit /	=					2.5 kV, 50	
	output circuit output circuit 1 /		•			··•····	Hz, 1 min. 2.5 kV, 50	
	output circuit 2						Hz, 1 min.	
Pollution degree (IEC/EN 60664-1)		3	• • • • • • • • • • • • • • • • • • • •			······································	.	
Overvoltage category (IEC/EN 60664-1	1)	III						
Standards Draduct standard		LIEO 055 0 5	N 00055 0 0	A DEC. JEO/EN	00055 4 150	VEN 00055 05	7 EN E0470	
Product standard Low Voltage Directive	•	2006/95/EC	N 0U∠35-6, Cl	M-PFS: IEC/EN	υυ255-1, IEC	// EIN 00255-21	, ⊏IN OU1/8	
EMC Directive		2000/93/LO 2004/108/EC	;			···•··································	····	
RoHS Directive		CM-PFS: 201						
Electromagnetic compatibility								
Interference immunity to	IEO/EN 04000 4.0		***************************************	N 61000-6-1, E	N 61000-6-2		<u>.</u>	
electrostatic discharge radiated, radio-frequency,	IEC/EN 61000-4-2 IEC/EN 61000-4-3			8 V/m (2 CH→) /	1 V/m (2.7 ∩	Hz)	···•	
electromagnetic field	120/21101000-4-3		,,,,,, (1 GI1Z) / C	, v/111 (2 CI 12) /	. v/111 (2./ GI	14)		
electrical fast transient / burst	IEC/EN 61000-4-4					.	···•	
surge	IEC/EN 61000-4-5							
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 - 10 \	/					
voltage dips, short interruptions	IEC/EN 61000-4-11	-	<u>.</u>			.	Class 3	
and voltage variations								
harmonics and interharmonics	IEC/EN 61000-4-13			101005			Class 3	
Interference emission high-frequency radiated	IEC/CISPR 22, EN 55022		4, CM-PFS: El	N 61000-6-3, E	N 61000-6-4	-	Class B	
high-frequency conducted	IEC/CISPR 22, EN 55022	. •	•	•••••••••••••••••••••••••••••••••••••••		··•········	Class B	
J		1	-					

 $^{^{\}scriptsize 1)}$ Device with neutral monitoring: The external conductor voltage towards the neutral conductor is measured.

Туре		CM-PSS.31	CM-PSS.41	CM-PVS.31	CM-PVS.41	CM-PVS.81	CM-PAS.31	CM-PAS.41
Input circuit = Measuri					L1, L2, L3			
Rated control supply vo	oltage U _s = measuring voltage	3x380 V AC	3x400 V AC	3x160- 300 V AC	3x300- 500 V AC	3x200- 400 V AC	3x160- 300 V AC	3x300- 500 V AC
Rated control supply vo	oltage U _s tolerance	-15+10 %						
Rated frequency	<u>.</u>	50/60 Hz	. *					. *
Frequency range		45-65 Hz						
Typical current / power	consumption	25 mA / 18 VA (380 V AC)	25 mA / 18 VA (400 V AC)	25 mA / 10 VA (230 V AC)	25 mA / 18 VA (400 V AC)	19 mA / 10 VA (300 V AC)	25 mA / 10 VA (230 V AC)	25 mA /18 VA (400 V AC)
Measuring circuit		,			L1, L2, L3			,
Monitoring functions	Phase failure			·				
	Phase sequence	can be switc	i hed off		. <u>i</u>	<u>i</u>	•	
<u></u>	Automatic phase sequence	-	-	-	-	-	-	-
****	correction Over- / undervoltage		<u> </u>	<u> </u>	<u> </u>	+		
****	Phase unbalance	-	-	=	•	=		-
***		-	-	-	-	-	•	•
Measuring range	Neutral Overvoltage	3x418 V AC	3x440 V AC	3x220- 300 V AC	3x420- 500 V AC	3x300- 400 V AC	-	-
	Undervoltage	3x342 V AC	3x360 V AC	3x160- 230 V AC	3x300- 380 V AC	3x210- 300 V AC	-	-
	Phase unbalance	-	-	-	-	-	2-25 % of av of phase vol	
Thresholds	Overvoltage	fixed			ithin measurii		-	-
	Undervoltage	fixed		adjustable w	ithin measurii	ng range	-	_
	Phase unbalance (switch-off value)	-	-	-	-	-	adjust. withi range	n meas.
Hysteresis related to the threshold value	Over- / undervoltage	fixed 5 %	•	•:	•	· .	- -	
Rated frequency of the	Phase unbalance	50/60 Hz			<u></u>		fixed 20 %	. *
Frequency range of the	measuring signal	45-65 Hz	•••••	•••••				
Maximum measuring cy	ycle time	100 ms			•••••		•••••	•••••
	control supply voltage tolerance	$\Delta U \le 0.5 \%$ $\Delta U \le 0.06 \%$	6 / °C					
Measuring method		True RMS						
Timing circuit								
Start-up delay t _s		fixed 200 ms	3					
Tripping delay t _v		ON- or OFF- 0; 0.1-30 s a					ON- delay 0; 0.1-30 s a	ıdjustable
Repeat accuracy (cons		_				< ± 0.2 %	-	
	control supply voltage tolerance	$\Delta t \leq 0.5 \%$						
Accuracy within the ten	nperature range	$\Delta t \leq 0.06 \%$	/ °C	1 volla L FF) 0 rod FD:-			.*
Indication of operational states		1 yellow LED, 2 red LED's Details see function Details see operating mode and Details see function Details see function Details see function Details see function Details see function Details see function Details see function						
Output circuits		aescription/	-ulayrailis		-16/18, 25-26 /		: aescription /	-ulaylalliS
Kind of output		relay, 2 x 1 c	:/o.contact	13	10/10, 20-20/	20		
Operating principle	······	closed-circu						••••••
Contact material	······	AgNi alloy, C						.*
Rated operational volta		250 V		•	•	•	•	•••••
Minimum switching pov	ver	24 V / 10 mA						
Maximum switching vol	ltage	see "Load lir	nit curves" on	page 173				

¹⁾ Closed-circuit principle: Output relay(s) de-energize(s) if measured value exceeds or falls below the adjusted threshold value

Type	CM-PSS.31	CM-PSS.41	CM-PVS.31	CM-PVS.41	CM-PVS.81	CM-PAS.31	CM-PAS.41
Rated operational current I _e AC-12 (resistive) 230 V		-			•		•
(IEC/EN 60947-5-1) AC-15 (inductive) 230 V	3 A						•
DC-12 (resistive) 24 V		•••••	•••••	•••••			***************************************
DG-13 (inductive) 24 V		•••••	•	•••••		•••••	•
AC rating (UL 508) Utilization category (Control Circuit Rating Code)							
max. rated operational voltage			•				•
max. continuous thermal current at B 300							
max. making/breaking		4	•	•••••	•••••	• • • • • • • • • • • • • • • • • • • •	•
apparent power at B 300							
Mechanical lifetime	30 x 10 ⁶ swit						•
Electrical lifetime (AC-12, 230 V, 4 A)		tching cycles	•				*
Max. fuse rating to achieve n/c contact short-circuit protection n/o contact	10 A fast-actir	1g	•	· · · · · · · · · · · · · · · · · · ·		• • • • • • • • • • • • • • • • • • • •	.
General data	10 A 1831-801	ing					
MTBF	on request						
Duty time	100%	•	• • • • • • • • • • • • • • • • • • • •	•••••		•••••	•····
Dimensions product dimensions	22.5 x 85.6 x	(103.7 mm (0.	89 x 3.37 x 4	.08 in)	.*	•••••	***************************************
(W x H x D) packaging dimensions	97 x 109 x 30	0 mm (3.82 x 4	4.29 x 1.18 in)			•	
Weight	depending o	n device, see	ordering deta	ils			*
Mounting position	DIN rail (IEC/	n device, see /EN 60715), sn	ap-on mount	ing without ar	ıy tool		•
Mounting position Minimum distance to other horizontal	any 10 mm (0.39	in) in case of	continuous m	easuring volta	ages		•
units		> 400 V	> 220 V	> 400 V		> 220 V	> 400 V
Material of housing	UL 94 V-0	•••••	• • • • • • • • • • • • • • • • • • • •				• • • • • • • • • • • • • • • • • • • •
Degree of protection housing / terminals	IP50 / IP20						
Electrical connection							
Wire size	Scre	w connection	technology		Easy Connect	Technology (F	Push-in)
fine-strand with(out) wire end	1 v 0 5-2 5 m	nm² (1 × 20-14	V/V/G/	2 v 0	.5-1.5 mm² (2 x	20.16 (\)/(2)	•
	2 x 0.5-1.5 m			2 X U.	.5-1.5 IIIII- (2 X	. 20-10 AWG)	
	1 x 0.5-4 mm	n² (1 x 20-12 A	WG)	2 x 0.	5-1.5 mm² (2 x	20-16 AWG)	***************************************
ŭ .	2 x 0.5-2.5 m	nm ² (2 x 20-14	AWG)		`		
Stripping length	8 mm (0.32 ii						•
Tightening torque	0.6-0.8 Nm (5.31-7.08 lb.in)				
Environmental data							
Ambient temperature ranges operation / storage Damp heat (IEC 60068-2-30)		/ -40+85 °C					<u>.</u>
Climatic category	55 °C, 6 cycl 3K3	es	•	•••••			•
Vibration (sinusoidal) (IEC/EN 60255-21-1)	Class 2	•					
Shock (IEC/EN 60255-21-2)	Class 2		•				***************************************
Isolation data							
Rated insulation input circuit / output circuit	600 V		• • • • • • • • • • • • • • • • • • • •				
voltage U, output circuit 1 / output circuit 2	300 V	•••••	• • • • • • • • • • • • • • • • • • • •				
Rated impulse withstand voltage input circuit U _{imp} (VDE 0110, IEC/EN 60664) output circuit	6 kV; 1.2/50	μs	• · · · · · · · · · · · · · · · · · · ·			• • • • • • • • • • • • • • • • • • • •	
output circuit	4 KV; 1.2/50		•	•••••			•
Test voltage between all isolated circuits (routine test) Basic insulation input circuit / output circuit	2.5 kV, 50 Hz	<u>4, 1 S</u>	•	•••••		•••••	•
Protective separation (VDE 0106 input circuit /		• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	•••••		• • • • • • • • • • • • • • • • • • • •	•····
part 101 and 101/A, IEC/EN 1140) output circuit							
Pollution degree (VDE 0110, IEC/EN 60664)	3	•••••	•			•••••	•
Overvoltage category (VDE 0110, IEC 60664)	III						
Standards	TIEO/EN COSE	- 0 EN 50.3	2				
Product standard Low Voltage Directive	1EC/EN 6025 2006/95/EC	55-6, EN 50178	5	•••••		•	•
EMC directive	2006/95/EC	5	<u> </u>	· 			•
RoHS directive	2011/65/EC	<u></u>					•
Electromagnetic compatibility							
Interference immunity to		-1, EN 61000-6	3-2				
electrostatic discharge IEC/EN 61000-4-2			•			• • • • • • • • • • • • • • • • • • • •	
radiated, radio-frequency, IEC/EN 61000-4-3	Level 3 (10 V	/m)					
electromagnetic field electrical fast transient / IEC/EN 61000-4-4	Level 3 (2 kV	/ / 2 kH-1	•	•••••		•	•
burst burst	Level 3 (2 KV	/ ∠ NП∠)					
surge IEC/EN 61000-4-5	Level 4 (2 kV		•	· • · · · · · · · · · · · · · · · · · ·		•••••	•
conducted disturbances, IEC/EN 61000-4-6			•	•••••		•••••	•
induced by radio-	,						
frequency fields	 	0 EN 03000		· · · · · · · · · · · · · · · · · · ·			•
Interference emission		-3, EN 61000-	0-4		. *		*
high-frequency radiated IEC/CISDD 22 EN EEC22	1 (:1acc R						
high-frequency radiated IEC/CISPR 22, EN 55022 high-frequency conducted IEC/CISPR 22, EN 55022		•••••	•	······································		•••••	•

Туре		CM-MPS.11	CM-MPS.21	CM-MPS.31	CM-MPS.41		
Input circuit = Measuring		L1, L2	, L3, N	L1,	L2, L3		
	age U _s = measuring voltage	3x90-170 V AC	3x180-280 V AC	3x160-300 V AC	3x300-500 V AC		
Rated control supply volt	age U _s tolerance	-15+10 %	······································	<u>i</u>	<u>i</u>		
Rated frequency		50/60 Hz	•••••	······································			
Frequency range		45-65 Hz					
Typical current / power co	onsumption	25 mA / 10 VA (115 V AC)	25 mA / 18 VA (230 V AC)	25 mA / 10 VA (230 V AC)	25 mA / 18 VA (400 V AC)		
Measuring circuit		·	, L3, N	L1,	L2, L3		
Monitoring functions	Phase failure	•	•	•	•		
	Phase sequence Automatic phase sequence correction Over- / undervoltage Phase unbalance	-	- -	-	-		
	Interrupted neutral			_	_		
Measuring range Thresholds	Overvoltage Undervoltage Phase unbalance	3x120-170 V AC 3x90-130 V AC 2-25 % of average of adjustable within m	3x240-280 V AC 3x180-220 V AC of phase voltages	3x220-300 V AC 3x160-230 V AC	3x420-500 V AC 3x300-380 V AC		
	Undervoltage Phase unbalance (switch-off value)	adjustable within m adjustable within m	easuring range				
Hysteresis related to the threshold value Rated frequency of the m Frequency range of the m Maximum measuring cyc Accuracy within the rated	neasuring signal						
Accuracy within the temp Measuring method	erature range	ΔU ≤ 0.06 % / °C True RMS					
Timing circuit Start-up delay t _c		fixed 200 ms					
		L); 0.1-30 s adjustable				
Tripping delay t _v Accuracy within the rated Accuracy within the temp Indication of operational services.	control supply voltage tolerance erature range	$\Delta t \le 0.5 \%$ $\Delta t \le 0.06 \% / ^{\circ}C$	n description / -diagr				
Output circuits	states	15-16/18, 25-26/28		Tamo			
Kind of output		relay, 1 x 2 c/o con					
Operating principle	••••••	closed-circuit princ	iple 1)				
Contact material		AgNi alloy, Cd free	•		·····		
Rated operational voltage		250 V					
Minimum switching powe Maximum switching volta Rated operational current	ge t I AC-12 (resistive) 230 V	24 V / 10 mA see "Load limit curv 4 A	ves" on page 173				
(IEC/EN 60947-5-1)	AC-15 (inductive) 230 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V	4 A					
AC rating (UL 508)	Utilization category (Control Circuit Rating Code) max. rated operational voltage max. continuous thermal current at B 300 max. making/breaking apparent power at B 300	300 V AC 5 A					
Mechanical lifetime Electrical lifetime (AC-12, Max. fuse rating to achiev	230 V, 4 A)	30 x 10 ⁶ switching of 0.1 x 10 ⁶ switching 6 A fast-acting	cycles cycles				
protection		10 A fast-acting					

¹⁾ Closed-circuit principle: Output relay(s) de-energize(s) if measured value exceeds or falls below the adjusted threshold value

Туре		CM-MPS.11	CM-MPS.21	CM-MPS.31	CM-MPS.41
General data		1	:	*	-
MTBF		on request			
Duty time		100%	•		
· ·	nduct dimensions	22.5 x 85.6 x 103.7	mm (0.89 x 3.37 x 4	. 08 in)	
nook	aging dimensions	97 x 109 x 30 mm (2 00 v 4 00 v 1 10 in	\\	
	aging dimensions				ahnalagy (Duah in)
Weight	net weight	depending on device	ion technology	ile Easy Connect Te	chnology (Push-in)
		depending on device			
Marratina	gross weight	DIN wait (IEC/EN CO	715), snap-on mount	1115 .:	
Mounting Mounting position			15), Shap-on mount	ing without any tool	
		any	***************************************		
Minimum distance to other units	horizontal	10 mm (0.39 in) in c	ase of continuous m > 240 V	neasuring voltages > 220 V	: 100 \/
Material of housing		UL 94 V-0	> 240 V	> 22U V	> 400 V
9	ousing / terminals		•		
Electrical connection	Justing / terminals	11 30 / 11 20			
Wire size		Screw connect	ion technology	Fasy Connect Te	chnology (Push-in)
	t) wire end ferrule	1 x 0.5-2.5 mm ² (1 x	(20-14 AWG)	2 x 0.5-1.5 mm ² (2	x 20-16 AWG)
		2 x 0.5-1.5 mm ² (2 x	(20-16 AWG)		
	rigid	1 x 0.5-4 mm ² (1 x 2		2 x 0.5-1.5 mm ² (2	x 20-16 AWG)
Stripping length		2 x 0.5-2.5 mm ² (2 x mm (0.32 in)	(2U-14 AVVG)		
Tightening torque		0.6-0.8 Nm (5.31-7.0		:	
Environmental data		0.0 0.0 1 (0.0 1 1	00 101111	·	
	peration / storage	-25+60 °C / -40	+85 °C		
Damp heat (IEC 60068-2-30)		55 °C, 6 cycles	•	•	•••••
Climatic category		3K3	•		
Vibration (sinusoidal) (IEC/EN 60255-21-1)		Class 2	•		
Shock (IEC/EN 60255-21-2)		Class 2			
Isolation data Rated insulation voltage input circi	it / acitacit aluacit	000 1/			
	uit / output circuit		•		
Output circuit 1	/ output circuit 2	L	•		
Rated impulse withstand voltage U _{imp} (VDE 0110, IEC/EN 60664)		6 kV; 1.2/50 μs	***************************************		
(VDE 0110, 1EO/EN 00004)	output circuit	4 kV; 1.2/50 μs			
Test voltage between all isolated circuits (routine	test)	2.5 kV, 50 Hz, 1 s			
Basic insulation input circ	uit / output circuit	600 V	•	•	•
Protective separation (VDE 0106 part inp	ut circuit / output	yes	•	<u> </u>	
101 and 101/A, IEC/EN 61140)	circuit		•		
Pollution degree (VDE 0110, IEC/EN 60664)		3	•		
Overvoltage category (VDE 0110, IEC 60664)		III			
Standards Product standard		IEC/EN GOOGE 4 EN	1 50170		
Product standard		IEC/EN 60255-1, EN	V 1001/8		
Low Voltage Directive		2006/95/EC	•		
EMC directive		2004/108/EC			
RoHS directive		2011/65/EC			
Electromagnetic compatibility					
Interference immunity to		EN 61000-6-1, EN 6	31000-6-2		
electrostatic discharge	EC/EN 61000-4-2	Level 3 (6 kV / 8 kV)			
	EC/EN 61000-4-3	Level 3 (10 V/m)			
electromagnetic field electrical fast transient / burst	EC/EN 61000-4-4	Level 3 (2 kV / 2 kH			
	EC/EN 61000-4-4 EC/EN 61000-4-5		<u></u>	Level 4 (2 kV L-L)	
	EC/EN 61000-4-6		•		
induced by radio-frequency fields					
	C/EN 61000-4-13				
Interference emission	1000 00 EN 55000	EN 61000-6-3, EN 6	61000-6-4		
	ISPR 22, EN 55022	Class B			
high-frequency conducted IEC/C	ISPR 22, EN 55022	UIASS D			

Туре		CM-MPS.23	CM-MPS.43	CM-MPN.52	CM-MPN.62	CM-MPN.72
Input circuit = Measuring		L1, L2, L3, N		L1, L	_2, L3	•
Rated control supply voltage		3x180-280 V AC	3x300-500 V AC	3x350-580 V AC	3x450-720 V AC	3x530-820 V AC
Rated control supply voltage	ge U _s tolerance	-15+10 %		•		
Rated frequency	<u>.</u>	50/60/400 Hz		50/60 Hz		
Frequency range		45-440 Hz		45-65 Hz		
Typical current / power co	nsumption	5 mA / 4 VA (230 V AC)	5 mA / 4 VA (400 V AC)	(480 V AC)	(600 V AC)	29 mA / 59 VA (690 V AC)
Measuring circuit		L1, L2, L3, N		L1, L	_2, L3	
Monitoring functions	Phase failure Phase sequence Automatic phase sequence correction	•		•		
	Phase sequence	can be switche	ed off			
	Automatic phase sequence correction Over- / undervoltage		: _	<u>: _</u>	: _	· : _
	Phase unbalance	_	-		-	-
	Interrupted neutral		-	-	■	-
Measuring range	Overvoltage		3x420-500	3x480-580	3x600-720	3x690-820
	9	V AC	V AC	V AC	V AC	V AC
	Undervoltage		3x300-380	3x350-460	3x450-570	3x530-660
······		V AC	V AC	V AC	V AC	V AC
	Phase unbalance	2-25 % of aver	age of phase vol	tages		
Thresholds	Overvoltage Undervoltage		in measuring rar	nge		
	Undervoltage Phase unbalance (switch-off value)	adjustable with	nin measuring rar nin measuring rar	ige	•••••	
Hysteresis related to	Over- / undervoltage	fixed 5 %	iii iiieasaiiig iai	196	•••••	
the threshold value	Phase unbalance	fixed 20 %	•••••		•••••	
Rated frequency of the me	asuring signal	50/60/400 Hz	••••	50/60 Hz	•••••	•••
Frequency range of the me	easuring signal	45-440 Hz		45-65 Hz		
Maximum measuring cycle		100 ms				
Accuracy within the rated of	control supply voltage tolerance	$\Delta U \leq 0.5 \%$	00			
Measuring method	rature range	ΔU ≤ 0.06 % /	-0	•••••	•••••	
Timing circuit		Tide Hivio				
Start-up delay t _s and t _{s2}		fixed 200 ms				
0 02						
Start-up delay t _{s1}		fixed 250 ms		***************************************		
Tripping delay t _v		ON- or OFF-de	elay 0; 0.1-30 s a	djustable		
Accuracy within the rated	control supply voltage tolerance	$\Delta t \le 0.5 \%$				
Accuracy within the tempe	rature range	$\Delta t \le 0.06 \% / 1$	°C			
Indication of operational st	ates	Details see fun	ction description			
Output circuits				5-16/18, 25-26/2	28	
Kind of output			1 x 2 c/o contact			
Operating principle Contact material		closed-circuit AgNi alloy, Cd	orinciple 1)			
Rated operational voltage	U ₋ IEC/EN 60947-1	250 V	II E E			
Minimum switching newer	O _e 1LO/LIN 00947-1	24 V / 10 mA	•••••		•••••	
Maximum switching voltag	Α	see "Load limit	curves" on page	173		
Rated operational current	L AC-12 (resistive) 230 V	4 A	carvos on page	2.11.0	•••••	
(IEC/EN 60947-5-1)	AC-15 (inductive) 230 V	3 A				
•	DC-12 (resistive) 24 V	4 A		***************************************		
	DC-13 (inductive) 24 V	2 A				
AC rating (UL 508)	Utilization category	R 300				
·······	(Control Circuit Rating Code) max. rated operational voltage	300 V AC				
n	nax. continuous thermal current at B 300	5 A				
!!! ma	x. making/breaking apparent power at B 300	3600/360 VA		•••••	•••••	
Mechanical lifetime		30 x 106 switch	ning cycles	••••••	•••••	•••
Electrical lifetime (AC-12, 2	230 V, 4 A)	101 v 106 ewital	ning cycles			
Max. fuse rating to achieve			iiig cycles	10 A fast-actin	9	
circuit protection	n/o contact	10 A fast-acting	9			

¹⁾ Closed-circuit principle: Output relay(s) de-energize(s) if measured value exceeds or falls below the adjusted threshold value

Туре	CM-MPS.23	CM-MPS.43	CM-MPN.52	CM-MPN.62	CM-MPN.72
General data	1	·	-		
MTBF	on request				
Duty time	100%	•••••••••••••••••••••••••••••••••••••••	•		•
Dimensions (W x H x D) product dimensions		0.89 x 3			
packaging dimensions	97 x 109 x 30 n	nm (3.82 x 4.29 x	1.18 in)		
Weight	depending on o	device, see orderi	ng details		• • • • • • • • • • • • • • • • • • • •
Mounting		l 60715), snap-on	mounting wit	hout any tool	•••••
Mounting position	any	······			
Minimum distance to other units vertical / horizontal	not necessary	not necessary			
Material of housing	UL 94 V-0	***************************************			•••••
Degree of protection housing / terminals	IP50 / IP20				
Electrical connection					
Wire size	Screw connec	ction technology	Easy C	Connect Technol	ogy (Push-in)
fine-strand with(out) wire end ferrule		² (1 x 20-14 AWG)		mm ² (2 x 20-16	AWG)
	2 x 0.5-1.5 mm	² (2 x 20-16 AWG)		2 (0 00 10	A1A/O1
rigid	1 x 0.5-4 mm ² (1 X 20-12 AWG)	2 x 0.5-1.5	mm² (2 x 20-16	AVVG)
Chinaina lanath		² (2 x 20-14 AWG)	<u>i</u>		
Stripping length Tightoping torque	8 mm (0.32 in) 0.6-0.8 Nm (5.3	01 7 00 lb in\			•••••
Tightening torque	U.b-U.8 NIII (5.3	31-7.08 ID.III)	i	-	
Environmental data	1 05 00 00 /				
Ambient temperature ranges operation / storage					
Damp heat (IEC 60068-2-30)	55 °C, 6 cycles	<u>.</u>	.		
Climatic category Vibration (sinusoidal) (IEC/EN 60255-21-1)	3K3 Class 2				
Shock (IEC/EN 60255-21-2)	Class 2	•			•
	Glass 2				
Isolation data	10001/		10001/		
Rated insulation voltage U _i input circuit / output			1000 V		
circuit output circuit 1 / 2		<u>i</u>			•••••
	6 kV; 1.2/50 μs	•••••••••••••••••••••••••••••••••••••••	8 kV; 1.2/50 μ		•••••
(VDE 0110, IEC/EN 60664) untput circuit	4 kV; 1.2/50 µs		O KV, 1.2/30 L	15	•••••
Test voltage (routine isolated output circuits	. L				•
test) between input circuit and isolated output circuits	2.5 KV, 50 Hz,	1.5	4 kV, 50 Hz, 1	1 0	•••••
Basic insulation input circuit and isolated output circuits	600 V	1.0	1000 V	1 5	•
Protective separation (VDE 0106 part input circuit / input circuit /	- 000 V	······	1000 V		•••••
101 and 101/A, IEC/EN 61140) output circuit					
Pollution degree (VDE 0110, IEC/EN 60664)	3	•••••••••••			•••••
Overvoltage category (VDE 0110, IEC 60664)	III	•••••••••••••••••••••••••••••••••••••••	······································		•••••
Standards					
Product standard	IEC/EN 60255-	1 FN 50178			
Low Voltage Directive	2006/95/EC	1, 21, 00110			•••••
EMC directive	2004/108/EC	•••••••••••••			•••••
RoHS directive	2011/65/EC	•••••••••••••••••••••••••••••••••••••••			•••••
Electromagnetic compatibility					
Interference immunity to	EN 61000-6-1,	EN 61000-6-2			
electrostatic discharge IEC/EN 61000-4-2					
radiated, radio-frequency, IEC/EN 61000-4-3					•••••
electromagnetic field	,	•			
electrical fast transient / burst IEC/EN 61000-4-4					
surge IEC/EN 61000-4-5	Level 4 (2 kV	Level 4 (2 kV L-L)		
	L-N)				
conducted disturbances, induced by IEC/EN 61000-4-6	Level 3 (10 V)				
radio-frequency fields		•			
harmonics and interharmonics IEC/EN 61000-4-13		•			
Interference emission	EN 61000-6-3,	EN 61000-6-4			
high-frequency radiated IEC/CISPR 22, EN 55022		• • • • • • • • • • • • • • • • • • • •			• • • • • • • • • • • • • • • • • • • •
high-frequency conducted IEC/CISPR 22, EN 55022	Ulass B				

Grid feeding monitoring relays -Voltage and frequency monitoring functions Product group picture



Grid feeding monitoring relays -Voltage and frequency monitoring functions Table of contents

Grid feeding monitoring relays - Voltage and frequency monitoring functions

Grid feeding monitoring relays -

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Grid feeding monitoring relays -Voltage and frequency monitoring functions Benefits and advantages, operating controls

Characteristics for all CM-UFD devices

- Monitoring of voltage and frequency in single- and threephase mains 2-wire, 3-wire or 4-wire
- Over- and undervoltage, 10 minutes average value as well as over- and underfrequency monitoring
- Two-level threshold settings for over-/undervoltage and frequency
- Multiline, backlit LCD display
- All threshold values adjustable as absolute values
- True RMS measuring principle
- High measurement accuracy
- 3 control inputs for remote trip, feedback signal, and external signal
- Interrupted neutral detection
- Error memory for up to 99 entries (incl. cause of error, measured value, relative timestamp)
- Test function
- Password setting protection
- 3 c/o (SPDT) contacts
- LEDs for the indication of operational states

Characteristics CM-UFD.M22

- ROCOF (rate of change of frequency) monitoring configurable
- Third party certificate confirming accordance with CEI 0-21
- Pre-setting according to CEI 0-21

Characteristics CM-UFD.M31

- ROCOF (rate of change of frequency) monitoring and vector shift detection configurable
- Third party certificate confirming accordance with VDE-AR-N 4105 and BDEW
- Pre-settings according to VDE-AR-N 4105 and BDEW

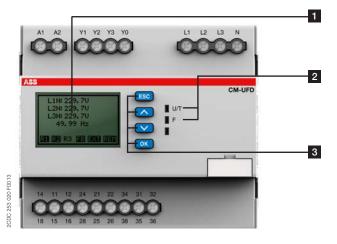
Characteristics CM-UFD.M33

- ROCOF (rate of change of frequency) monitoring and vector shift detection configurable
- Factory certificate confirming accordance with Engineering Recommendation G59 Issue 3 - September 2013; Engineering Recommendation G83 Issue 2 - December 2012
- Pre-setting according to G59/3 LV + G83/2 HV
- UL 508, CAN/CSA C22.2 No.14

Characteristics CM-UFD.M34

- ROCOF (rate of change of frequency) monitoring and vector shift detection, configurable
- Pre-setting according to DRRG standard of DEWA

CM-UFD.Mxx



R1 R2 R3 - relay status; in this case R3 is de-energized FB - status feedback loop Y0-Y1; in this case FB is closed EXT - status input external signal: in this case input is closed REM - status remote trip input; in this case input is closed

2 Indication of operational states

U/T: green LED - supply voltage applied / flashing = timing active F: red LED - failure

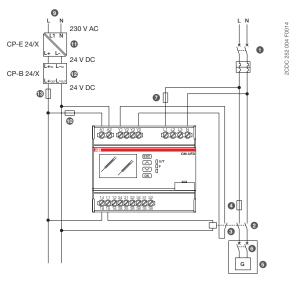
3 Keypad

ESC: escape / return to previous menu

∧ · up / value increase V: down / value decrease OK: enter / confirm selection

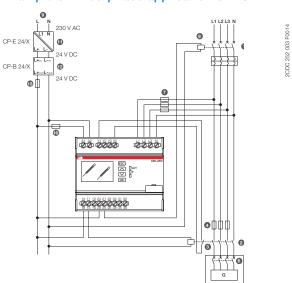
Grid feeding monitoring relays -Voltage and frequency monitoring functions **Applications**

Example of single-phase application CM-UFD.M22



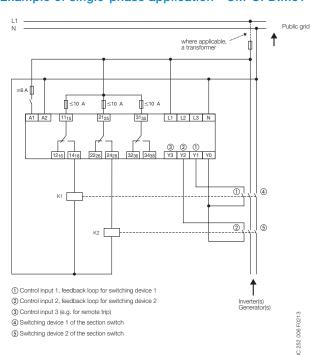
- 1. Main circuit breaker DG or DGL
- 2. DDI: Automatic circuit breaker or contactor equipped with low voltage coil and motor for automatic closure
- 3. Auxiliary contact of DDI, necessary for realizing the feedback function (compulsory for CM-UFD.M22)
- 4. DDI short-circuit protection
- 5. Generator and/or inverter
- 6. Generator (DDG)
- 7. Protection fuse for the measuring circuit of the CM-UFD.M22 (optional)
- 8. Shunt trip coil for feedback function (P>20 kW). This coil can control DG/DGL or

Example of three-phase application CM-UFD.M22

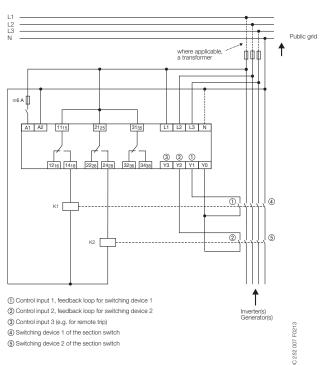


- 9. Control supply voltage for CM-UFD.M22 (SPI) and tripping device (DDI)*
- 10. Device protection fuse for the CM-UFD.M22
- 11. Primary switch mode power supply unit CP-E (230 V AC / 24 V DC) for the buffer module CP-B*
- 12. Ultra-capacitor based buffer module CP-B (24 V DC in/out)
- 13. Wire protection fuse for the output of the buffer module CP-B * in accordance to CEI 0-21 regulation, in case of loss of control supply voltage it's asked to guarantee, at least for 5 seconds, the functionality of the CM-UFD.M22, the operability of the DDI and when present the command coil for operating the redundancy device. This function has to be realized by external buffer or UPS devices.

Example of single-phase application - CM-UFD.M31

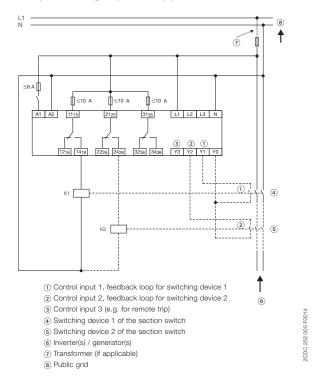


Example of three-phase application - CM-UFD.M31

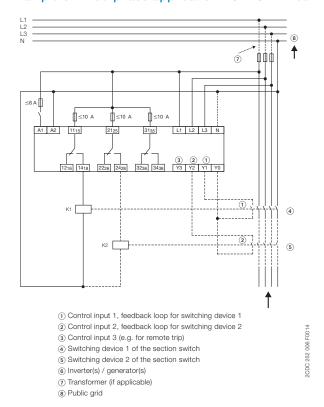


Grid feeding monitoring relays -Voltage and frequency monitoring functions Applications, connection diagram

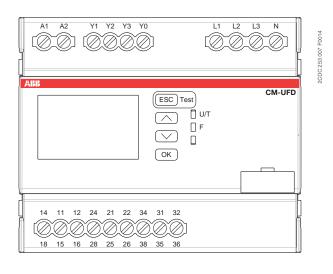
Example of single-phase application - CM-UFD.M33



Example of three-phase application - CM-UFD.M33



Electrical connection - CM-UFD.Mxx



A1-A2 L1, L2, L3, N Y1-Y0 Y2-Y0 Y3-Y0

 11_{15} -12_{16} $/14_{18}$ 21,5-22,6/24,28

31₃₅-32₃₆/34₃₈

Control supply voltage U Measuring inputs Control input 1: Feedback from switching device 1 Control input 2: Feedback from switching device 2 Control input 3: Remote trip, suppress Y1, suppress Y2, suppress Y1/Y2 or suppress vector shift detection Output relay 1: Relay for tripping switching device 1 of the section switch, closed-circuit principle
Output relay 2: Relay for tripping switching device 2 of the section switch, closed-circuit principle Output relay 3: Closing command for circuit breaker motor, configuration possibilities: closed-circuit principle, open-circuit principle, disabled or

synchronous with R1/R2

Grid feeding monitoring relays -Voltage and frequency monitoring functions Ordering and selection



CM-UFD.Mxy

Description

The grid feeding monitoring relays CM-UFD.Mxy are designed to monitor the voltage and the frequency of the public low voltage or medium voltage grid. Whenever the measured values are not within the range of the adjusted threshold values, the CM-UFD.Mxy causes tripping of the section switch (consisting of 1 or 2 switching devices according to the applicable standard). This tripping disconnects the power generation such as photovoltaic systems, wind turbines, block-type thermal power stations from the grid.

Further documentation grid feeding monitoring relays on www.abb.com

Rated control supply voltage = measuring voltage	Standard	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-240 V AC/DC	CEI 0-21: 2014-09 + CEI 0-21, V1: 2014-1	CM-UFD.M22	1SVR560730R3400		0.225 (0.496)
24-240 V AC/DC	VDE-AR-N 4105 and BDEW	CM-UFD.M31	1SVR560730R3401		0.225 (0.496)
24-240 V AC/DC	G59/3; G83/2	CM-UFD.M33	1SVR560730R3402		0.304 (0.670)
24-240 V AC/DC	DRRG standard of DEWA	CM-UFD.M34	1SVR560730R3403		0.306 (0.675)

	Order number	1SVR560730R3400	1SVR560730R3401	1SVR560730R3402	1SVR560730R3403
	Type	CM-UFD.M22	CM-UFD.M31	CM-UFD.M33	CM-UFD.M34
Rated control supply voltage U _s			•	•	
24-240 V AC/DC			•	•	•
Standard					
VDE AR-N 4105, BDEW	***************************************		•		
G59/3; G83/2	• · · · · · · · · · · · · · · · · · · ·		<u>.</u>	•	:
CEI 0-21	• • • • • • • • • • • • • • • • • • • •	-	<u>.</u>	<u>.</u>	
DRRG standard of DEWA					•
Rated frequency					
DC or 50 Hz	• • • • • • • • • • • • • • • • • • • •			<u>.</u>	<u>.</u>
DC or 50/60 Hz				•	•
Suitable for monitoring			:	:	
Single-phase mains				•	•
Three-phase mains		•	•	•	•
Monitoring function			,		
Over-/undervoltage	***************************************		•	•	•
Over-/underfrequency	• · · · · · · · · · · · · · · · · · · ·			•	•
ROCOF (rate of change of frequency)	• • • • • • • • • • • • • • • • • • • •			•	•
10 minutes average value		-	•	•	•
Vector shift			•	•	•
Thresholds		adj	adj	adj	adj

Grid feeding monitoring relays -Voltage and frequency monitoring functions Technical data - CM-UFD.Mxx

Technical data

Data at Ta = 25 °C and rated values, unless otherwise indicated

Туре		CM-UFD.M22	CM-UFD.M31	CM-UFD.M33	
Input circuit - Supply circuit					
Rated control supply voltage U _s		24-240 V AC/DC			
Rated control supply voltage U _s	tolerance	-15+10 %			
Rated frequency		DC or 50 Hz		DC or 50/60 Hz	
Frequency range AC		40-60 Hz		40-70 Hz	
Typical current / power consump		64 mA / 1.5 W			
External fusing (necessary)	230 V AC		oreaker 6 A with B charac	cteristic or 6 A Class CC	
External rusing (necessary)		6 A gG (gL) or cirucit breaker 6 A with B characteristic or 6 A Class CC (acc. to UL-requirements)			
Power failure buffering time		200 ms, according to	LVFRT (Low Voltage Faul	t Ride Through)	
Measuring circuit					
Monitoring functions	overvoltage 10-min average (>UAV)	adjustable, 1.00-1.30 * U _s in 0.01*U _s steps	threshold adjustable, in 0.005 * U _n steps	1.000-1.300 * U _n	
	overvoltage (>U1)		threshold adjustable, in 0.005 * U _n steps	1.000-1.300 * U _n	
	overvoltage (>U2)	- -	threshold adjustable, in 0.005 * U_ steps	1.000-1.300 * U _n	
	undervoltage (<u1)< td=""><td>0.05-1.00 * U_s in 0.01*U_s steps</td><td>threshold adjustable, (in 0.005 * U_n steps</td><td>0.100-1.000 * U_n</td></u1)<>	0.05-1.00 * U _s in 0.01*U _s steps	threshold adjustable, (in 0.005 * U _n steps	0.100-1.000 * U _n	
	undervoltage (<u2)< td=""><td>adjustable, 0.05-1.00 * U_s in 0.01*U_s steps</td><td>threshold adjustable, (in 0.005 * U_n steps</td><td>).100-1.000 * U_n</td></u2)<>	adjustable, 0.05-1.00 * U _s in 0.01*U _s steps	threshold adjustable, (in 0.005 * U _n steps).100-1.000 * U _n	
	overfrequency (>F1)	adjustable, 50.0-54.0 Hz in 0.1 Hz steps	threshold adjustable, s in 0.01 Hz steps	50.00-65.00 Hz	
	underfrequency (<f2)< td=""><td>adjustable, 46.0-50.0 Hz in 0.1 Hz steps</td><td>threshold adjustable, a in 0.01 Hz steps</td><td>50.00-65.00 Hz</td></f2)<>	adjustable, 46.0-50.0 Hz in 0.1 Hz steps	threshold adjustable, a in 0.01 Hz steps	50.00-65.00 Hz	
	overfrequency (>F1)	adjustable, 50.0-54.0 Hz in 0.1 Hz steps	threshold adjustable, 4 in 0.01 Hz steps	15.00-60.00 Hz	
	underfrequency (<f2)< td=""><td>adjustable, 46.0-50.0 Hz in 0.1 Hz steps</td><td>threshold adjustable, 4 in 0.01 Hz steps</td><td>45.00-60.00 Hz</td></f2)<>	adjustable, 46.0-50.0 Hz in 0.1 Hz steps	threshold adjustable, 4 in 0.01 Hz steps	45.00-60.00 Hz	
	ROCOF	adjustable, 0.1-1.0 Hz/s, in 0.1 Hz/s steps	threshold adjustable, (in 0.005 Hz steps	0.100-5.000 Hz	
	vector shift		threshold adjustable, 2	2.0-40.0 ° in 0.1 ° steps	
	interrupted neutral conductor	enabled if a measuring principle with interrupted neutral conductor is selected			
Measuring ranges	voltage (4-wire system L1, L2, L3-N) (3-wire system L1,L2,L3)			0-317 V AC 0-550 V AC	
·······	(3-wire system L1,L2,L3) (2-wire system L-N)			0-550 V AC 0-317 V AC	
	frequency	40-60 Hz		40-70 Hz	
Rated frequency of the measuring	ng signal	50 Hz			
Accuracy of measurements	voltage	≤ 2 %	≤ 0.5 % ± 0.5 V		
		± 20 mHz	± 20 mHz		
Accuracy within the temperature		$≤ 5 \% \pm 20 \text{ ms}$ $≤ 0.1 \% \pm 20 \text{ ms}$ $\Delta U ≤ 0.02 \%$ [°] C			
Accuracy within the temperature Hysteresis related to the	overvoltage 10-min average		adjustable, 0.1-10.0 %	in 0.1 % steps	
threshold value	overvoltage			adjustable, 0.5-10.0 % in 0.1 % steps	
		5		adjustable, 0.5-10.0 % in 0.1 % steps adjustable, 0.5-10.0 % in 0.1 % steps	
	undervoltage			·	
	overfrequency	0.997-0.999 * f _n	adjustable, 0.05-4.00		
	underfrequency	1.001-1.003 * f _n	adjustable, 0.05-4.00	· · · · · · · · · · · · · · · · · · ·	
Reaction time acc. CEI 0-21 cha	apter A.4.3	for: Overvoltage 2, Un Overfrequency 2, Und	able, 0.05-600.00 s in 0.0 Idervoltage 1, Undervolta Ierfrequency 1, Underfred	ge 2, Overfrequency 1,	
Measuring cycle	ROCOF	640 ms at 50 Hz	adjustable, 4-50 perio	ds	

Grid feeding monitoring relays -Voltage and frequency monitoring functions Technical data - CM-UFD.Mxx

		CM-UFD.M22	CM-UFD.M31 CM-UFD.M33		
Control circuits					
lumber		3			
ype of triggering		volt-free triggering, sign	nal source Y0		
unction of the control inputs	Y1-Y0 Control input 1	DDI feedback, trip and i feedback from switching device 1			
		release monitoring	g		
		times adjustable			
	Y2-Y0 Control input 2		feedback from switching device 2		
	Y3-Y0 Control input 3		remote trip; suppression of Y1, Y2, Y1/Y2 or		
	10-10 Control input o	Hemote trip	vector shift detect.		
lectrical isolation	from aupply voltage	1,000	vector striit detect.		
Electrical isolation from supply voltage from the measuring circuit from the relay outputs Max. switching current in the control circuit No-load voltage at the control inputs (V0-V1, V2, V3) Minimum control pulse length Max. cable length at the control inputs (unshielded)					
		s yes			
		l 6 mA	•		
		22-26 V DC 20 ms			
					10 m
			or inputs (unshieraea)	<u> 10 m</u>	
iming functions					
tart-up delay, R1 (prior to firs	t grid connection or re-connection after	adjuotabio,	-		
nterruption)		1.00-600.00 s			
		in 0.05 s steps			
estart delay, R1		adjustable,	-		
- -		0.05-600.00 s			
		in 0.05 s steps			
tart-up delay, R2 (prior to firs	t grid connection or re-connection after	1 s, fixed	-		
terruption)	<u> </u>	,			
N-delay, R3		adjustable,	-		
		0.00-10.00 s			
		in 0.05 s steps			
N-time, R3		adjustable,	_		
TT time, Tto		0.05-10.00 s			
		in 0.05 s steps			
rip window, feedback loop Y1		adjustable,	_		
ip willdow, iccaback loop i i		0.05-0.50 s			
		in 0.05 s steps			
elease window, feedback loc	un V1	adjustable,	<u> </u>		
lelease willdow, leedback loc	рп	0.50-600.00 s			
		in 0.05 s steps			
ripping delays		adjustable,	•		
,		0.05-600.00 s	-		
OCOF error time		in 0.05 s steps	-		
witch on dolay (prior to first	grid connection or reconnection after	111 0.00 3 31603	adjustable 0.05 600.00 a in 0.01 a stans		
	and connection or reconnection after	-	adjustable, 0.05-600.00 s in 0.01 s steps		
iterruption)	overvoltage 10-min average (>U _{AV})				
ripping delay			. 0 -		
ripping delay		-	<3s		
ripping delay 	overvoltage (>U1. >U2)	-	adjustable, 0.00-600.00 s in 0.01 s steps;		
ripping delay 	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<="" td=""><td> - - </td><td></td></u1,>	- - 			
ripping delay	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<br="">overfrequency (>F1, >F2)</u1,>		adjustable, 0.00-600.00 s in 0.01 s steps;		
ipping delay 	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<="" td=""><td>-</td><td>adjustable, 0.00-600.00 s in 0.01 s steps;</td></u1,>	-	adjustable, 0.00-600.00 s in 0.01 s steps;		
ipping delay	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<br="">overfrequency (>F1, >F2) underfrequency (<f1, <f2)<br="">ROCOF</f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms		
ipping delay	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<br="">overfrequency (>F1, >F2) underfrequency (<f1, <f2)<="" td=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps;</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps;		
ipping delay	overvoltage (>U1, >U2) undervoltage (<u1, <u2)<br="">overfrequency (>F1, >F2) underfrequency (<f1, <f2)<br="">ROCOF</f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms		
	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, <f2)="" rocof="" shift<="" td="" vector=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps		
rror time	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, <f2)="" conductor="" interrupted="" neutral="" rocof="" shift="" shift<="" td="" vector=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms		
rror time	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, 1-y0,="" <f2)="" conductor="" interrupted="" neutral="" rocof="" shift="" td="" vector="" y2-y0)<=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps		
rror time	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, 1-y0,="" <f2)="" conductor="" interrupted="" neutral="" rocof="" shift="" td="" vector="" y2-y0)<=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps		
ror time ip window (feedback loops Yelease window (feedback lo	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, '1-y0,="" <f2)="" conductor="" interrupted="" neutral="" ps="" rocof="" shift="" td="" vector="" y1-y0,="" y2-y0)="" y2-y0)<=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps		
ror time ip window (feedback loops Y elease window (feedback loo me error within the temperat	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, 1-y0,="" <f2)="" conductor="" interrupted="" neutral="" range<="" rocof="" shift="" td="" ups="" ure="" vector="" y1-y0,="" y2-y0)=""><td></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps</td></f1,></u1,>		adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
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rror time ip window (feedback loops Yelease window (feedback loome error within the temperates interface - Indication of Control supply voltage applied	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, '1-y0,="" <f2)="" conductor="" i="" interrupted="" neutral="" operational="" range="" rocof="" roof="" shift="" states="" t<="" td="" timing="" u="" ups="" ure="" vector="" y1-y0,="" y2-y0)=""><td><pre>< 150 ms LED green on / flashing</pre></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps</td></f1,></u1,>	<pre>< 150 ms LED green on / flashing</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
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ror time ip window (feedback loops Yelease window (feedback loome error within the temperates interface - Indication of control supply voltage applied ault message or details see the message or	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, '1-y0,="" <f2)="" conductor="" i="" interrupted="" neutral="" operational="" range="" roof="" shift="" states="" t<="" td="" timing="" u="" ure="" vector="" y2-y0)=""><td><pre>< 150 ms LED green on / flashing</pre></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps</td></f1,></u1,>	<pre>< 150 ms LED green on / flashing</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time ip window (feedback loops Yelease window (feedback loome error within the temperat ser interface - Indication of control supply voltage applied ault message or details see the message oser interface - Display	overvoltage (>U1, >U2) undervoltage (<u1, (="" <u2)="" overfrequency="">F1, >F2) underfrequency (<f1, '1-y0,="" <f2)="" conductor="" i="" interrupted="" neutral="" operational="" range="" roof="" shift="" states="" t<="" td="" timing="" u="" ure="" vector="" y2-y0)=""><td><pre>< 150 ms LED green on / flashing LED red on</pre></td><td>adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps</td></f1,></u1,>	<pre>< 150 ms LED green on / flashing LED red on</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time rip window (feedback loops Y lelease window (feedback loome error within the temperate ser interface - Indication of control supply voltage applied ault message or details see the message of ser interface - Display lack light	overvoltage (>U1, >U2)	<pre>< 150 ms LED green on / flashing LED red on press any button</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time rip window (feedback loops Yelease window (feedback loome error within the temperat ser interface - Indication of control supply voltage applied ault message or details see the message of details see the message oser interface - Display ack light	overvoltage (>U1, >U2)	<pre>< 150 ms LED green on / flashing LED red on press any button switch-off delay adjusta</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time ip window (feedback loops Yelease window (feedback loome error within the temperat ser interface - Indication of control supply voltage applied ault message or details see the message or ser interface - Display ack light perating temperature range of	overvoltage (>U1, >U2)	<pre>< 150 ms LED green on / flashing LED red on press any button switch-off delay adjusta -20+60 °C</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time ip window (feedback loops Yelease window (feedback loome error within the temperat ser interface - Indication of control supply voltage applied ault message or details see the message or ser interface - Display ack light perating temperature range of	overvoltage (>U1, >U2)	<pre>< 150 ms LED green on / flashing LED red on press any button switch-off delay adjusta</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time rip window (feedback loops Yelease window (feedback locime error within the temperat is ser interface - Indication of control supply voltage applied ault message or details see the message of ser interface - Display	overvoltage (>U1, >U2)	<pre>< 150 ms LED green on / flashing LED red on press any button switch-off delay adjusta -20+60 °C</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		
rror time rip window (feedback loops Yelease window (feedback loome error within the temperat ser interface - Indication of control supply voltage applied ault message or details see the message or details see	overvoltage (>U1, >U2)	<pre>< 150 ms</pre>	adjustable, 0.00-600.00 s in 0.01 s steps; +50 ms / -0 ms < 50 ms adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.5-600.00s in 0.01 s steps adjustable, 0.05-0.50 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps adjustable, 0.50-600.00 s in 0.01 s steps		

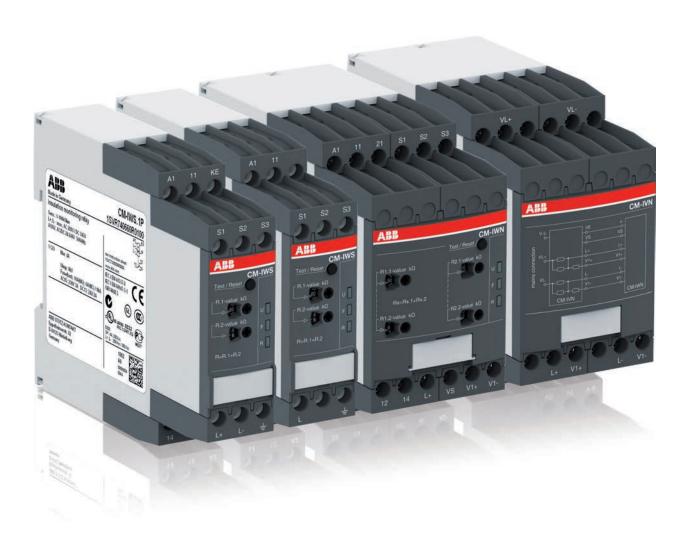
Grid feeding monitoring relays -Voltage and frequency monitoring functions Technical data - CM-UFD.Mxx

Туре	CM-UFD.M22 CM-UFD.M31 CM-UF	FD.M33
Output circuits		
21-22/24 (25-26 31-32/34 (35-36	 18) 1st c/o (SPDT) contact, tripping relay for switching device 1 28) 2nd c/o (SPDT) contact, tripping relay for switching device 2 38) 3rd c/o (SPDT) contact, closing command for breaker motor 	2 (DG)
	/14 closed-circuit principle /24 open- or closed-circuit closed-circuit principle /34 principle configurable open-circuit, closed-circuit, disable synchronous with R1/R2 configurable	d or
Contact material Rated operational voltage U _e IEC/EN 609	AgNi alloy, Cd-free	
Minimum switching voltage / minimum switching current Maximum switching voltage / maximum switching current	24 V / 10 mA see load limit curves	
Rated operational current I AC-12 (resisitive) at 23 (IEC/EN 60947-5-1) AC-15 (inductive) at 23	0 V 4 A	
DC-12 (resistive) at a DC-13 (inductive) at a	4 V 4 A 4 V 2 A	
Mechanical lifetime	30 x 10 ⁶ switching cycles	
Electrical lifetime at AC12, 230 V AC, Maximum fuse rating to achieve short-circuit protection n/c con	4 A 50 x 10° switching cycles act 10 A fast-acting 10 A fast-acting or circuit breaker 1 characteristic	0 A with E
	act 10 A fast-acting 10 A fast-acting or circuit breaker 1 characteristic	0 A with E
	ms 30 A	
	ms 17 A	
	7-1 5 A	
General data MTBF	on request	
	on request	
Repeat accuracy (constant parameters) Duty time	< ±0.5 % 100 %	
Dimensions (W x H x D) product dimens		
packaging dimens		
Weight net we	ght 0.360 kg (0.794 lb)	
Material of housing	PA666FR	
Mounting	DIN rail (IEC/EN 60715) TH 35-7.5 and TH 35-15, snap-on m without any tool	ounting
Mounting position	any	
Minimum distance to other units horizontal / ver	cal not necessary	
Degree of protection housing / termi	als IP20	
Electrical connection		
	ılle 1 x 0.25-4 mm² (1 x 24-12 AWG), 2 x 0.25-0.75 mm² (2 x 24-	
	ule 1 x 0.2-4 mm² (1 x 24-12 AWG), 2 x 0.2-1.5 mm² (2 x 24-16 A gid 1 x 0.2-6 mm² (1 x 24-10 AWG), 2 x 0.2-1.5 mm² (2 x 24-16 A	
Stripping length	8 mm (0.31 in)	
Tightening torque	0.5-0.6 Nm (4.4 -5.3 lb.in)	
Environmental data		
Ambient temperature ranges opera	ion -20+60 °C	
stor	ige -20+80 °C	
Climatic class (EN 50178)	3K5 (w/o condensation, w/o icing)	
Damp heat, cyclic (IEC/EN 60068-2-30)	6 x 24 h cycle, 55 °C, 95 % RH	
Darrip ricat, cyclic (IEO/EN 00000 Z 00)		
Vibration, sinusoidal (IEC/EN 60255-21-1)	Class 2	

Grid feeding monitoring relays -Voltage and frequency monitoring functions Technical data - CM-UFD.Mxx

Туре		CM-UFD.M22	CM-UFD.M31	CM-UFD.M33		
Isolation data			·	•		
Rated insulation voltage U _i	supply/measuring/output circuits	600 V				
(IEC/EN 60947-1, IEC/EN 60664-1)	output 1/output 2/output 3	300 V				
Rated impulse withstand voltage Uimp	supply/measuring/output circuits	6 kV; 1.2/50 μs				
(IEC/EN 60947-1, IEC/EN 60664-1)	output 1/output 2/output 3	4 kV; 1.2/50 μs				
Basic insulation acc. rated control	supply/measuring/output circuits	600 V				
supply voltage (IEC/EN 60664-1)	output 1/output 2/output 3	300 V				
Protective separation acc. rated	supply/measuring/output circuits	250 V				
voltage (IEC/EN 61140)	output 1/output 2/output 3					
Test voltage, routine test	supply/measuring/output circuits					
(IEC/EN 60255-5)	output 1/output 2/output 3					
Test voltage, type test (CEI 0-21)	supply/measuring /output circuits	1 '	-			
	output 1/output 2/output 3	L	-			
Pollution degree (IEC/EN 60664-1)	oatpat waapat Zwaapat o	3	<u>i</u>			
Overvoltage category (IEC/EN 60664-1)						
Overvoltage category according to CEI 0-	21	''' IV	:_			
	<u> </u>	I V				
Standard Product standard		IEC/EN 60255-1		-		
Electrical safety		ILO/LIN 00233-1	.	UL 508, CAN/CSA		
Electrical Salety		_		C22.2 No.14		
Application standards		CEI 0-21: 2012-06 + CEI 0-21; V1: 2012-12 + A70 Terna	VDE-AR-N 4105: 2011-08; BDEW, June 2008 "Technische Richtlinie – Erzeugungsanlagen am Mittelspannungsnetz" including supplementary provisions of January 2013	Engineering Recommendation G59 Issu 3 - September 2013; Engineering Recommendation G83 Issu 2 - December 2012		
Low Voltage Directive		2006/95/EC		·· ·		
EMC Directive	······································	2004/108/EC				
RoHS Directive		2011/65/EC				
Electromagnetic compatibility						
Interference immunity to		IEC/EN 61000-6-1, IEC	C/EN 61000-6-2			
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 kV / 8 kV)				
radiated, radio-frequency, electron	nagnetic IEC/EN 61000-4-3	Level 3, 10 V/m		·· ···		
electrical fast transient/burst	IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz				
surge	IEC/EN 61000-4-5	Level 3, installation class 3, supply and measuring input 1 kV L-L, 2 kV L-earth				
conducted disturbances, induced frequency fields	•	Level 3, 10 V				
voltage dips, short interruptions ar voltage variations		Class 3				
harmonics and interharmonics	IEC/EN 61000-4-13					
Interference emission		IEC/EN 61000-6-3, IE	C/EN 61000-6-4			
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B				
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B				

Insulation monitoring relays for unearthed supply systems Product group picture



Insulation monitoring relays for unearthed supply systems Table of contents

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Insulation monitoring relays for unearthed supply systems Benefits and advantages





CM-IWS.1

Insulation monitoring relays for unearthed pure AC systems:

Characteristics CM-IWS.1

- For monitoring the insulation resistance of unearthed IT systems up to $U_n = 250 \text{ V}$ AC and 300 V DC
- According to IEC/EN 61557-8
- Rated control supply voltage 24-240 V AC/DC
- Prognostic measuring principle with superimposed square wave signal
- One measuring range 1-100 $k\Omega$
- 1 c/o (SPDT) contact, closed-circuit principle
- Precise adjustment by front-face operating controls in 1 k Ω
- Interrupted wire detection
- Fault storage / latching configurable by control input
- Screw connection technology or Easy Connect Technology avail-
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 22.5 or 45 mm width
- 3 LEDs for status indication

Characteristics CM-IWN.1

- For monitoring the insulation resistance of unearthed IT systems up to U_s= 400 V AC and 600 V DC
- According to IEC/EN 61557-8
- Rated control supply voltage 24-240 V AC/DC
- Prognostic measuring principle with superimposed square wave signal
- Two measuring ranges 1-100 $k\Omega$ and 2-200 $k\Omega$
- Precise adjustment of the measuring value in 1 or 2 k Ω steps
- One (1 x 2 c/o) or two (2 x 1 c/o) threshold values R₂₀1/R1 (warning) and R_{an}2/R2 (prewarning) configurable¹)
- Precise adjustment of the threshold values in 1 k Ω steps (R1) and 2 kΩ steps (R2)
- Interrupted wire detection configurable
- Non-volatile fault storage configurable
- Open- or closed-circuit principle configurable
- Screw connection technology or Easy Connect Technology
- Housing material for highest fire protection classification
- Tool-free mounting on DIN rail as well as demounting
- 45 mm (1.77 in) width
- 3 LEDs for status indication $^{\mbox{\tiny 1)}}\mbox{\,R2}$ only active with 2 x 1 c/o configuration



CM-IWN

Insulation monitoring relays for unearthed AC, DC or mixed AC/DC systems:

Characteristics CM-IWS.2

- For monitoring the insulation resistance of unearthed IT systems up to U_a = 400 V AC
- According to IEC/EN 61557-8
- Rated control supply voltage 24-240 V AC/DC
- Measuring principle with superimposed DC voltage
- One measuring range 1-100 $k\Omega$
- Fault storage / latching configurable by control input
- Precise adjustment by front-face operating controls in 1 $\ensuremath{\text{k}}\Omega$
- Screw connection technology or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 1 c/o (SPDT) contact, closed-circuit principle
- 22.5 mm (0.89 in) width
- 3 LEDs for the indication of operational states

Characteristics CM-IWN.4,5,6

Follows in parts the standard of IEC/EN 61557-8 (see data sheet for details):

- For monitoring the insulation resistance of unearthed IT systems up to U = 400 V AC and 600 V DC
- Specifically for applications with high system leakage capacitances
- Rated control supply voltage 24-240 V AC/DC
- Prognostic measuring principle with superimposed square wave signal
- Two measuring ranges 1-100 $k\Omega$ and 2-200 $k\Omega$
- Precise adjustmemt of the measuring value in 1 or 2 k Ω steps
- One (1 x 2 c/o) or two (2 x 1 c/o) threshold values R_m1/R1 (warning) and R_{an}2/R2 (prewarning) configurable¹)
- Precise adjustment of the threshold values in 1 k Ω steps (R1) and 2 kΩ steps (R2)
- Interrupted wire detection configurable
- Non-volatile fault storage configurable
- Open- or closed-circuit principle configurable
- Screw connection technology or Easy Connect Technology available
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting on DIN rail as well as demounting
- 45 mm (1.77 in) width
- 3 LEDs for status indication ¹⁾R2 only active with 2 x 1 c/o configuration

Insulation monitoring relays for unearthed supply systems Benefits and advantages, Applications

Application / monitoring function CM-IWx

The CM-IWx serve to monitor insulation resistance in unearthed IT AC systems, IT AC sytems with galvanically connected DC circuits, or unearthed IT DC systems. The insulation resistance between system lines and system earth is measured. If this falls below the adjustable threshold values, the output relay(s) energize or de-energize. The CM-IWS.x can monitor control circuits (single-phase) and main circuits (3-phase). Supply systems with voltages U = 0-400 V AC (45-65 Hz), U₂=0-250 V AC (15-400 Hz) or 0-300 V DC can be directly connected. For systems with voltages above 400 V AC the insulation monitoring relay with or without the coupling unit CM-IVN can be used.

Application / monitoring function CM-IWN.x

The CM-IWN.x serves to monitor insulation resistance in unearthed IT AC systems, IT AC systems with galvanically connected DC circuits, or unearthed IT DC systems. The insulation resistance between system lines and system earth is measured. If this falls below the adjustable threshold values, the output relays switch into the fault state. The device can monitor control circuits (single-phase) and main circuits (3-phase). Supply systems with voltages U_n = 0-400 V AC (15-400 Hz) or 0-600 V DC can be directly connected to the measuring inputs and their insulation resistance being monitored. For systems with voltages above 400 V AC and 600 V DC the coupling unit CM-IVN can be used for the expansion of the CM-IWN.x voltage range.

Expansion of assortment for the requirements of decentral eletrical energy sources

ABB's insulation monitoring relays from the CM-IWN range provide higher system leakage capacitances. This expanded product range covers the requirements of decentral eletrical

The range of system leakage capacitances is 20 - 2000 µF.

Application / monitoring function CM-IVN

The coupling unit CM-IVN is designed to extend the nominal voltage range of the insulation monitoring relay CM-IWN.1 up to 690 V AC and 1000 V DC. The coupling unit can be connected to the system to be monitored by means of the terminals VL+ and VL-. The terminal Vw has to be connected to the earth potential. The terminals L+, V1+, L-, V1-, VS and VE have to be connected to the CM-IWN.1 as shown in the connection diagrams below. Supply systems with voltages U = 0-690 V AC (15-400 Hz) or 0-1000 V DC can be connected.

Measuring principle CM-IWS.2

A superimposed DC measuring signal is used for measurement. From the superimposed DC measuring voltage and its resultant current the value of the insulation resistance of the system to be monitored is calculated.

Measuring principle CM-IWN.x, CM-IWS.1

A pulsating measuring signal is fed into the system to be monitored and the insulation resistance is calculated. This pulsating measuring signal alters its form depending on the insulation resistance and system leakage capacitance. From this altered form the change in the insulation resistance is forecast. When the forecast insulation resistance corresponds to the insulation resistance calculated in the next measurement cycle and is smaller than the set threshold value, the output relay de-energizes. This measuring princiiple is also suitable for the detection of symmetrical insulation faults.

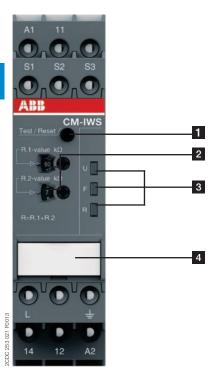








Insulation monitoring relays for unearthed supply systems Operating controls



1 Test and reset button

2 Configuration and setting

Front-face rotary switches for threshold value adjustment:

R.1 for R1 tens figures:

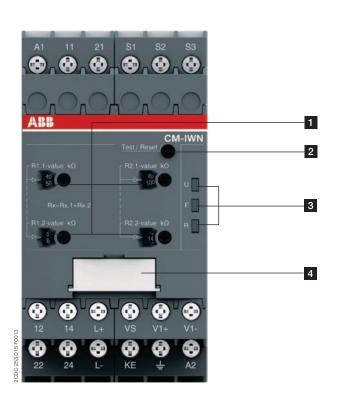
0, 10, 20, 30, 40, 50, 60, 70, 80, 90 k Ω in ten k Ω steps R.2 for R1 units figures:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10 $k\Omega$ in one $k\Omega$ steps

3 Indication of operational states

U: green LED - control supply voltage F: red LED - fault message R: yellow LED - relay status

4 Marker label for devices without DIP switches



1 Front-face rotary switches to adjust the threshold value:

R1.1 for R1 tens figure:

0, 10, 20, 30, 40, 50, 60, 70, 80, 90 $k\Omega$ in ten $k\Omega$ steps

R1.2 for R1 units figure:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10 $k\Omega$ in one $k\Omega$ steps

R2.1 for R2 tens figure:

0, 20, 40, 60, 80, 100, 120, 140, 160, 180 $k\Omega$ in twenty $k\Omega$ steps

R2.2 for R2 units figure:

2, 4, 6, 8, 10, 12, 14, 16, 18, 20 kΩ in two kΩ steps

2 Test and reset button

3 Indication of operational states

U: green LED - control supply voltage F1: red LED - fault message F2: yellow LED - relay status

4 DIP switches (see DIP switch functions)

Insulation monitoring relays for unearthed supply systems Insulation monitoring in IT systems

In electricity supply systems, an earthing system defines the electrial potential of the conductors relative to that of the earth's conductive surface. The choice of earthing system has implications for the safety and electromagnetic compatibility of the power supply. Note that regulations for earthing (grounding) systems vary considerably among different countries.

The international standard IEC 60364 distinguishes three families of earthing arrangements, using the two-letter codes TN, TT and IT.

The first letter indicates the connection between earth and the power-supply equipment (generator or transformer):

T: direct connection of a point with earth (Latin: terra)

I: no point is connected with earth (insulation), except perhaps via a high impendance

The second letter indicates the connection between earth and the electrical device being supplied:

T: direct connection of a point with earth

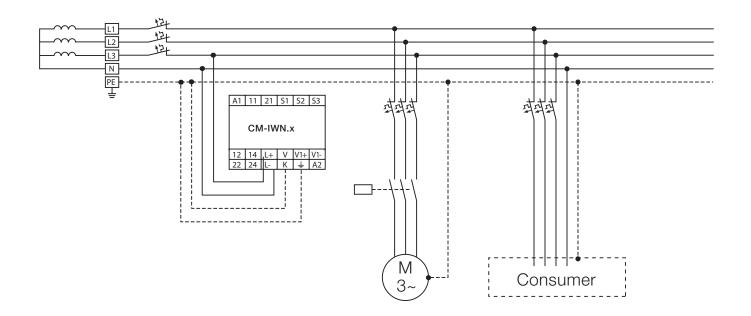
N: direct connection to neutral at the origin of installation, which is connected to the earth

IT supply systems

The IT system is supplied either by an isolation transformer or a voltage source, such as battery or a generator. In this system no active conductor is directly connected to earth potential. The advantage of this is that only a small fault current can flow in case of an insulation fault. This current is essentially caused by the leakage capacitance of the system. The fuse of the system or MCB does not respond, thus maintaining the voltage supply and therefore operation even in case of a phase-to-earth fault.

The high reliability of an IT system is guaranteed thanks to continous insulation monitoring.

The insulation monitoring device recognizes insulation faults as they develop, and immediately reports that the value has fallen below the minimum. This prevents operational interruptions caused by a second more severe insulation fault.



Insulation monitoring relays for unearthed supply systems Selection table

a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a service a serv	1SVR730670R0200	1SVR740670R0200	1SVR730660R0100	1SVR740660R0100	1SVR750660R0200	1SVR760660R0200	1SVR750660R0300	1SVR760660R0300	1SVR750660R0400	1SVR760660R0400	1SVR750660R0500	1SVR760660R0500
	SO SWI-MO	CM-IWS.2P	CM-IWS.1S	CM-IWS.1P	CM-IWN.1S	CM-IWN.1P	CM-IWN.4S	CM-IWN.4P	CM-IWN.5S	CM-IWN.5P	CM-IWN.6S	CM-IWN.6P
Rated control supply voltage U _s		•	•					•				
24 - 240 VAC/DC	-	•	•			-		•	•		-	•
Measuring voltages				•	•		•	•	•	•		•
250 V AC (L-PE)			•	•								
400 V AC (L-PE)	•	•	†	.	•	•	•	•	•	•	•	•
			<u> </u>	<u>.</u>	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾
690 V AC (L-PE)			<u> </u>	<u>.</u>	<u>.</u>	<u> </u>	ļ	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	
300 V DC (L-PE)			ļ. "		<u>.</u>	.						
600 V DC (L-PE)			<u> </u>	<u>.</u>	•	-	•	•	•	•	•	-
1000 V DC (L-PE)					■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾	■ ¹⁾
Measuring range		-	-			-	-				-	
1 - 100 kΩ		•	•	•	•	•	•	•	•	•	•	•
2 - 200 kΩ			Ī	Ī	•	•	•	•	•	•	•	•
System leakage capacitance, max.												
10 μF		•	•	•								
20 μF			<u> </u>	<u>.</u>	•	•		ļ		<u>.</u>		
500 μF			<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	•	•	<u>.</u>	<u>.</u>	<u>.</u>	
1000 μF			<u> </u>	<u>.</u>	<u> </u>	<u>.</u>	<u>.</u>	<u> </u>	•	•	<u>.</u>	
2000 μF											•	•
Output		,	,			,	,	,			,	
1 c/o		•	•	•	<u>.</u>	<u>.</u>	ļ	ļ	ļ	<u>.</u>	<u>.</u>	
1 x 2 c/o or 2 x 1 c/o					•	•	•	•	•	•	•	•
Operating principle		-	:	:	:	:	:	:	:	:	:	
Open-circuit principle		•			<u>.</u>	<u> </u>		ļ <u>.</u>		<u>.</u>	<u> </u>	
Open- or closed-circuit principle adjusta	bie	<u> </u>	1		-	-	-	-	-	-	-	-
Test		-	-		_	_	_				_	_
Front-face button or control input Reset		-	-	-	-	-	-	-	_	-	-	-
Front-face button or control input												
Fault storage / latching configurable		-	-	-	-	-	-	-	-	-	-	-
Non volatile storage configurable			-									•
Interrupted wire detection			<u>†</u>	<u>.</u>								•
Threshold values configurable	1	1	1	1	2	2	2	2	2	2	2	2
Connection type		÷	•	•	•	•	•	•	•	•	•	•
Push-in terminals		•		•		•		•				•
Double-chamber cage connection termin	nals =			<u> </u>	•		•		•		•	
		•	<u>, </u>		•	•	•		•	•	•	1
	version			M-IV	'NI C	. 101	/D7	5066	SOD	2400)	1

Insulation monitoring relays for unearthed supply systems Ordering details



CM-IWS.1



CM-IWS.2



CM-IWN.1



Further documentation insulation monitoring relays on www.abb.com

Description

The CM-IWx serves to monitor insulation resistance in accordance with IEC 61557-8 in unearthed IT AC systems, IT AC systems with galvanically connected DC circuits, or IT DC

The devices are able to monitor control circuits (single-phase) and main circuits (3-phase).

Ordering details

Rated control supply voltage = measuring voltage	Nominal voltage U _n of the distribution system to be monitored	capaci- tance,	Adjust- ment range of the specified response value R _{an} (threshold)	Type	Order code	Price	Weight (1 pce) kg (lb)
	0-250 V AC /			CM-IWS.1S	1SVR730660R0100		0.148 (0.326
	0-300 V DC	40F	1 100 1:0	CM-IWS.1P	1SVR740660R0100		0.137 (0.302)
	0-400 V AC	- 10 μF	1-100 kΩ	CM-IWS.2S	1SVR730670R0200		0.141 (0.311)
				CM-IWS.2P	1SVR740670R0200		0.130 (0.287)
		20 μF	1-100 kΩ	CM-IWN.1S	1SVR750660R0200		0.241 (0.531)
24-240 V AC/DC				CM-IWN.1P	1SVR760660R0200		0.217 (0.478)
24-240 V AG/DG		500 μF		CM-IWN.4S	1SVR750660R0300		0.241 (0.531)
	0-400 V AC /			CM-IWN.4P	1SVR760660R0300		0.217 (0.478)
	0-600 V DC	4000	2-200 kΩ	CM-IWN.5S	1SVR750660R0400		0.241 (0.531)
		1000 μF		CM-IWN.5P	1SVR760660R0400		0.217 (0.478)
		0000		CM-IWN.6S	1SVR750660R0500		0.241 (0.531)
		2000 μF	•	CM-IWN.6P	1SVR760660R0500		0.217 (0.478)

Ordering details - Coupling unit

Rated control supply voltage = measuring voltage	Nominal voltage Un of the distribution system to be monitored	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
Passive device, no control supply	0-690 V AC /	CM-IVN.S	1SVR750669R9400		0.179 (0.395)
voltage needed		CM-IVN.P	1SVR760669R9400		0.165 (0.364)

S: screw connection

P: push-in connection

Insulation monitoring relays for unearthed supply systems Operating state indication, Connection diagrams, DIP switches

LEDs, status information and fault messages CM-IWN.x

Operational state	LED U (green)	LED F (red)	LED R (yellow)
Start-up		OFF	OFF
No fault		OFF	1)
Prewarning			ПП
Insulation fault (below threshold value)			1)
KE/+ wire interruption		лл_	1)
L+/L- wire interruption during system start-up / test function		л_л_	1)
System leakage capacitance too high / invalid measurement result		л_л_	1)
Internal system fault	1)	ML	1)
Setting fault 2)			
Test function	MML	OFF	1)
No fault after fault storage 3)		4)	MML

LEDs, status information and fault messages CM-IWS.x

Operational state	LED U (green)	LED F (red)	LED R (yellow)
Start-up	ПП	OFF	OFF
No fault		OFF	Г
Insulation fault (below threshold value)			OFF
Invalid measuring result		几几	OFF
KE/\(\frac{1}{2}\) wire interruption (only CM-IWS.\(^1)\)			OFF
CM-IWS.1: System leakage capacitance too high / invalid measurement result	ллл	пппп	OFF
CM-IWS.2: Invalid measurement result		л_л_	OFF
Internal system fault	OFF	MML	OFF
Test function		OFF	OFF
No fault after fault storage 3)		4)	ллл

Connection diagram CM-IWS.2

A1	11		8
S1	S2	S3	NO EC
L R < A1	± 	11 7 12 14	9CDC 959 109 E0009
L		Ţ	ı
14	12	A2	ı

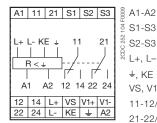
AI-AZ	Control supply voltage
S1-S3	Remote test
S2-S3	Remote reset
L	Measuring circuit/input, system connection
±	Measuring circuit/input, earth connections
11-12/14	Output relay, closed-circuit principle

nnection diagram CM-IWS.1

Connection diagra					
A1	11	KE			
S1	S2	S3			
L+ L- R < A1	11 / 12 14				
L+	L-	÷			
14	12	A2			

A1-A2 Control supply voltage Remote test Measuring circuit/input, system connection ±, KE Measuring circuit/input, earth connections Output relay, closed-circuit principle

Connection diagram CM-IWN.1, 4, 5, 6



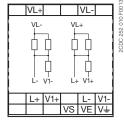
6000	A1-A2 S1-S3	Control supply voltage
104 F	S1-S3	Remote test
O 252	S2-S3 L+, L-	Remote reset
202	L+, L-	Measuring circuit/input, system connection
	- , KE	Measuring circuit/input, earth connections
	VS, V1+, V1	Connections for the coupling unit (if used)
	11-12/14	Output relay 1, open- or closed-circuit principle
	21-22/24	Output relay 2, open- or closed-circuit principle

Connection diagram CM-IVN

L+ V1+

V1-

VL+



Connection to CM-IWN.x - ± Connection to CM-IWN.x - VS Connection to CM-IWN.x - L+ Connection to CM-IWN.x - V1+ Connection to CM-IWN.x - L-Connection to CM-IWN.x - V1-Measuring circuit / Measuring input Connection to the system Measuring circuit / Measuring input Connection to earth

DIP switches of CM-IWN.1, 4, 5, 6

Position	4	3	2	1	
ON †	2x1 c/o			closed	00,000
OFF	1x2 c/o	M		open	0000

	ON	OFF (default)
DIP switch 1 Operating principle of the output relays	Closed-circuit principle If closed-circuit principle is selected, the output relays de- energize in case a fault is occuring. In non-fault state the relays are energized.	Open-circuit principle If open-circuit principle is selected, the output relays energize in case a fault is occuring. In non-fault state the relays are de-energized.
DIP switch 2 Non-volatile fault storage	Fault storage activated (latching)	Fault storage de-activated (non latching) If the fault storage function is de-activated, the output relays switch back to their original position as soon as the insulation fault no longer exists.
DIP switch 3 Interrupted wire detection	Interrupted wire detection activated ■ With this configuration, the CM-IWN.1 monitoring relays the wires connected to + and KE for interruptions.	Interrupted wire detection de-activated M With this configuration the interrupted wire detection is deactivated.
DIP switch 4 2 x 1 c/o, 1 x 2 c/o	2 x 1 c/o (SPDT) contact 2 If operating principle 2 x 1 c/o contact is selected, the output relay R1 (11-12/14) reacts to threshold value R1 (final switch-off) and the output relay R2 (21-22/24) reacts to threshold value R2 (prewarning)	1 x 2 c/o (SPDT) contacts Imm If operating principle 1 x 2 c/o contacts is selected, both output relays R1 (11-12/14) and R2 (21-22/24) react synchronously to threshold value R1. Settings of the threshold value R2 have no effect on the operation.

¹⁾ Depending on the configuration.

²⁾ Possible faulty setting: The threshold value for final switch-off is set at a higher value than the threshold value for prewarning

³ The device has triggered after an insulation fault. The fault has been stored and the insulation resistance has returned to a higher value than the threshold value plus hysteresis.

⁴⁾ Depending on the fault

Insulation monitoring relays for unearthed supply systems Technical data - CM-IWx

Data at T_a = 25 °C and rated values, unless otherwise indicated

		CM-IWS.2	CM-IWS.1	CM-IWN.1, 4, 5, 6
Input circuit - Supply circuit			A1 - A2	
Rated control supply voltage U _s		24-240 V AC/DC		
Rated control supply voltage tolerance		-15+10 %	•	
Typical current / power consumption	24 V DC	30 mA / 0.7 VA	35 mA / 0.9 VA	55 mA / 1.3 VA
	***************************************	12 mA / 1.4 VA	17 mA / 2.0 VA	20 mA / 2.3 VA
Rated frequency f	230 V AC	12 mA / 2.8 VA DC or 15-400 Hz	14 mA / 3.2 VA	15 mA / 3.5 VA
Frequency range AC	· 		***************************************	.
Frequency range AC Power failure buffering time	min	13.5-440 Hz 20 ms		
Input circuit - Measuring circuit	min.		I. I. I. I.	I. I. I. KE
Monitoring function		L, ± insulation resistance n	L+, L-, +, KE	L+, L-, - , KE
Measuring runction Measuring principle		superimposed DC	prognostic measuring	n nrincinla with
wicadaming principle		voltage	superimposed square	
Nominal voltage U _n of the distribution system to be monitored	······································	0-400 V AC	0-250 V AC /	0-400 V AC /
ч п			0-300 V DC	0-600 V DC
Voltage range of the distribution system to be monitored		0-460 V AC	0-287.5 V AC /	0-460 V AC /
		(tolerance +15 %)	0-345 V DC	0-690 V DC
Dated from an of afthe distribution systems to be provided		50-60 Hz	(tolerance +15 %)	(tolerance +15 %)
Rated frequency f _N of the distribution system to be monitored		[DC or 15-400 Hz	DC or 15-400 Hz
System leakage capacitance C _e	max.	10 μF		CM-IWN.1: 20 µF
				CM-IWN.4: 500 μF CM-IWN.5 1000 μF
				CM-IWN.6: 2000 µF
Tolerance of the rated frequency f _N		45-65 Hz	13.5-440 Hz	13.5-440 Hz
		none	290 V DC	460 V DC
Extraneous DC voltage U _{fg} (when connected to an AC system) Number of possible response / threshold values	max.	none	290 V DC	
Number of possible response / threshold values		1		2
Adjustment range of the specified response value R _{an} (threshold)	minmax. minmax. R1	1-100 Ω	***************************************	– 1-100 kΩ
(in esticia)	minmax. R2			2-200 kΩ (activated
	min. max. mz			de-activated by DIP
				switch)
Adjustment resolution	•••••••••••	1 kΩ	•••••••••••••••••••••••••••••••••••••••	······································
	R1	1 kΩ		1 kΩ
	R2	=		2 kΩ
Tolerance of the adjusted threshold value /	at 1-10 kΩ R _F	L		=
Relative percentage uncertainty A at -5+45 °C, $U_n = 0.115$ %, $U_s = 85.110$ %, f_N , f_s , $C_e = 1\mu F$	at 10-100 k Ω R _F	±6 %		-
at 3 18 3, 3 _n 3 118 73, 3 _s 33 118 73, 1 _N , 1 _s , 3 _e 1 _e 1 _p .	at 1-15 k Ω R _F	=	***************************************	±1 kΩ*
	at 15-200 kΩ R _e	_	•••••••••••••••••••••••	±8 %
Hysteresis related to the threshold value		L	•••••	i
Internal impedance Z	at 50 Hz		100 kΩ	155 kΩ
Internal DC resistance R		185 kΩ	115 kΩ	185 kΩ
Measuring voltage U	·····	15 V	22 V	24 V
wieasuring voitage o _m		[22 V	24 V
Tolerance of measuring voltage U _m		+10 %		
Measuring current I _m	max.	0.1 mA	0.3 mA	0.15 mA
Response time t	••••••		<u></u>	···•
an	and $C_e = 1 \mu F$	max. 10 s	••••••	
			mov 15 o	
DC system or AC system with connec	ied rectillers	_	max. 15 s	···•
Repeat accuracy (constant parameters) Accuracy of R _a (measured value) within the rated control supply voltag		< 0.1 % of full scale		
- a	····			···•
Accuracy of R _a (measured value) within the	at 1-10 k Ω R _F	5Ω/K		
operation temperature range	at 10-100 k Ω R $_{\scriptscriptstyle F}$	0.05 % / K		-
	at 10-200 kΩ R _F	-	***************************************	0.05 % / K
Transient overvoltage protection (+ - terminal)		Z-diode	avalanche diode	
			<u> </u>	
Input circuit - Control circuits			S1 - S2 - S3	
Control inputs - volt free		remote test		
Mariles as a situation of mark to the second state of the second s	S2-S3			
Maximum switching current in the control circuit		1 mA	ft - 20 5 pE/ft1	
Maximum cable length to the control inputs Minimum control pulse length	·····	50 m - 100 pF/m [164 150 ms	ιι - ου.υ pr/IIJ	···•
No-load voltage at the control input		150 ms ≤ 24 V ± 5 %	≤ 24 V DC	
Indication of operational states		1 = - 1 + /0	: = 2.1 + 20	
•		LED U (green)		
Control supply voltage Fault message		LED F (red)	••••••••••••••••••••••••••••••••	•

^{*}in combination with CM-IVN $\pm 1.5~\text{k}\Omega$

Insulation monitoring relays for unearthed supply systems Technical data - CM-IWx

		CM-IWS.2	CM-IWS.1	CM-IWN.1, 4, 5, 6
Output circuits				
Kind of output		relay, 1 c/o (SPDT) co	ontact	2 x 1 or 1 x 2 c/o (SPDT) contacts configurable
Operating principle		closed-circuit princip	le ¹⁾	open- or closed circuit principle ¹⁾ configurable
Contact material	······································	AgNi alloy, Cd free	······································	· · · · · · · · · · · · · · · · · · ·
Rated voltage (VDE 0110, IEC 60947-1)		250 V AC / 300 V DC	······································	
Min. switching voltage / Min. switching current		24 V / 10 mA	•	
Max. switching voltage / Max. switching current		see data sheet		
Rated operational current I _e (IEC/EN 60947-	AC-12 (resistive) at 230 V		······································	····•
5-1)	AC-15 (inductive) at 230 V	3 A		
	DC-12 (resistive) at 24 V DC-13 (inductive) at 24 V			
AC rating (UL 508)	Utilization category		eral purpose (250 V, 4	Δ cos d 0.75)
AO Tating (OE 300)	(Control Circuit Rating Code)	D 500, pilot daty gen	erai purpose (200 v, 4	Α, 003 ψ 0.7 0)
	max. rated operational voltage	250 V AC	······································	
•	max. continuous thermal		······································	····•
	current at B 300			
	max. making/breaking	3600/360 VA		
Mechanical lifetime	apparent power at B 300	30 x 10 ⁶ switching cy		
Electrical lifetime (AC-12, 230 V, 4 A)	······	0.1 x 10° switching cy		
Max. fuse rating to achieve short-circuit protecti	on n/c contact	6 A fast-acting	0163	····•
maxi race rating to demote entert entert protecti	n/o contact			····•
Conventional thermal current I _{th} (IEC/EN 60947-1)	4 A		•
General data				
Duty time		100 %		.
Dimensions (W x H x D)			······································	
	product dimension	22.5 x 85.6 x 103.7 m (0.89 x 3.37 x 4.08 in)		45 x 85.6 x 103.7 mr (0.89 x 3.37 x 4.08 ir
	packaging dimenesion			97 x 109 x 30 mm
	1-11-13-3-1-11	(**	,	(3.82 x 4.29 x 1.18 in
Weight	net weight		CM-IWS.1P:	CM-IWN.xP:
		0.130 kg (0.287 lb)	0.137 kg (0.302 lb)	0.217 kg (0.478 lb)
		CM-IWS.2S: 0.141 kg (0.311 lb)	CM-IWS.1S: 0.148 kg (0.326 lb)	CM-IWN.xS: 0.241 kg (0.531 lb)
	gross weight		CM-IWS.1P:	CM-IWN.xP:
	gross weight	0.155 kg (0.342 lb)	0.162 kg (0.357 lb)	0.246 kg (0.542 lb)
		CM-IWS.2S:	CM-IWS.1S:	CM-IWN.xS:
		0.166 kg (0.366 lb)	0.173 kg (0.381 lb)	0.270 kg (0.595 lb)
Mounting		DIN rail (IEC/EN 6071	5), snap-on mounting v	without any tool
Mounting position		any	······································	<u>*</u>
Minimum distance to other units	vertical	not necessary		: 10 (0 00 !-)
	horizontal	10 mm (0.39 in) at U _n > 240 V	not necessary	10 mm (0.39 in) at U ₂ > 400 V
			<u>. i</u>	ar O _n > 400 V
Material of housing	housing / terminal	UL 94 V-0	······································	
Degree of protection	riousing / terminal	1F30 / 1F20		
Electrical connection		Screw connection te	chnology Fasy Co	nnect Technology
			(Push-in	
Wire size	fine-strand with(out) wire end			.5 mm² (2 x 20-16 AWG
		2 x 0.5-1.5 mm ² (2 x 2		
	rigid			.5 mm² (2 x 20-16 AWG
Stripping length	······	2 x 0.5-2.5 mm ² (2 x 2 8 mm (0.32 in)	20-14 AVVG)	····•
Stripping length Tightening torque		0.6-0.8 Nm (5.31-7.08	3 lh in)	
Environmental data		10.0 0.0 1411 (0.01-7.00	, 10.111 <i>)</i>	
	operation / storage / transport	-25 ±60 °C/_40 + °E	5 °C/-40 ±85 °C	
Ambient temperature ranges Climatic category		3K5 (no condensation		
Damp heat, cyclic		6 x 24 h cycle, 55 °C,		···· •
Vibration, sinusoidal	IEC/EN 60255-21-1			
Shock, half-sine	IEC/EN 60255-21-2		• • • • • • • • • • • • • • • • • • • •	••••

¹⁾ Closed-circuit principle: Output relay(s) de-energize(s) if a fault is occuring Open-circuit principle: Output relay(s) energize(s) if a fault is occuring

Insulation monitoring relays for unearthed supply systems Technical data - CM-IWx

		CM-IWS.2	CM-IWS.1	CM-IWN.1, 4, 5, 6
Isolation data			•	•
Rated impulse withstand voltage U _{imp} between	supply / measuring circuit	6 kV		
all isolated circuits	supply / output circuit		······································	. •
(IEC/EN 60947-1, IEC/EN 60664-1, VDE 0110-1)	measuring / output circuit		<u> </u>	
	output 1 / output circuit 2		•	4 kV
Pollution degree (IEC/EN 60664-1, VDE 0110-1)	output 17 output circuit 2	3	······································	; 7 KV
Overvoltage category (IEC/EN 60664-1, VDE 0110) 1)		······································	•
Rated insulation voltage U				COO V
(IEC/EN 60947-1, IEC/EN 60664-1, VDE 0110-1)	supply / measuring circuit	1400 V	300 V	600 V
(IEC/EIN 00947-1, IEC/EIN 00004-1, VDE 0110-1)	supply / output circuit	1300 V		
	supply / measuring circuit	400 V	300 V	600 V
	output 1 / output circuit 2	-	i -	300 V
Basis isolation for rated control supply voltage	supply / measuring circuit	400 V AC / 300 V DC	250 V AC / 300 V DC	400 V AC / 600 V D
(IEC/EN 60664-1, VDE 0110-1)	supply / output circuit			
	measuring / output circuit	400 V AC / 300 V DC	250 V AC / 300 V DC	400 V AC / 600 V D0
	output 1 / output 2	250 V AC / 300 V DC		
Protective separation (IEC/EN 61140)	supply / output circuit	250 V AC / 250 V DC	•••••	•
	supply / measuring circuit	250 V AC / 250 V DC	••••••	•••••
•••	measuring / output circuit		•	
Test voltage between all isolated circuits,	supply / output circuit			. •
	supply / measuring circuit		•	•••••
	measuring / output circuit			2.53 kV, 50 Hz, 1 s
Standards	measuring / output circuit	2.2 KV, 50 HZ, 1 5		2.00 KV, 00 HZ, 1 5
Standards		CM-IWS, CM-IWN.1		CM-IWN.4/5/6
		OWI-WO, OWI-WWW.		OW-14414.4/5/0
Product standard		 IEC/EN 61557-1, IEC/E	EN 61557-8,	IEC/EN 60255-1,
Product standard		 IEC/EN 61557-1, IEC/E IEC/EN 60255-1, EN 5		IEC/EN 60255-1, EN 50178
		IEC/EN 60255-1, EN 5		
Other standards		IEC/EN 60255-1, EN 5 EN 50178		
Other standards Low Voltage Directive		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC		
Other standards Low Voltage Directive EMC Directive		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC		
Other standards Low Voltage Directive EMC Directive RoHS Directive		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC		
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC	0178	EN 50178
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC		EN 50178
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV	0178 0178 0/EN 61000-6-2, IEC/E	EN 50178 N 61326-2-4
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge		IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV	0178 0178 0/EN 61000-6-2, IEC/E	EN 50178 N 61326-2-4
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz	0178 0178 0/EN 61000-6-2, IEC/E	EN 50178 N 61326-2-4
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst	IEC/EN 61000-4-3 IEC/EN 61000-4-4	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, 2 kV / 5 kHz	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3 IEC/EN 61000-4-4	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GH: Level 3, 2 kV / 5 kHz Level 3, installation cla	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by	IEC/EN 61000-4-3 IEC/EN 61000-4-4	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GH: Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GH: Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61000-4-11	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GH: Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V Class 3	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive ROHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and voltage variations harmonics and interharmonics	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V Class 3 Class 3	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/ ass 3, supply circuit and	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive RoHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and voltage variations harmonics and interharmonics	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61000-4-11 IEC/EN 61000-4-13	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V Class 3 Class 3 IEC/EN 61000-6-3, IEC	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/ ass 3, supply circuit and	EN 50178 N 61326-2-4 m (2.7 GHz)
Other standards Low Voltage Directive EMC Directive ROHS Directive Electromagnetic compability Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and voltage variations harmonics and interharmonics	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61000-4-11	IEC/EN 60255-1, EN 5 EN 50178 2006/95/EC 2004/108/EC 2011/65/EC IEC/EN 61000-6-1, IEC Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz Level 3, 2 kV / 5 kHz Level 3, installation cla 1 kV L-L, 2 kV L-earth Level 3, 10 V Class 3 Class 3 IEC/EN 61000-6-3, IEC Class B	0178 C/EN 61000-6-2, IEC/E 2) / 3 V/m (2 GHz) / 1 V/ ass 3, supply circuit and	EN 50178 N 61326-2-4 m (2.7 GHz)

Insulation monitoring relays for unearthed supply systems Technical data CM-IVN

Input circuit - Measuring circuit	VL+, VL-, V÷
Function	expansion of the nominal voltage range of the insulation monitoring relay CM-IWN to 690 V AC or 1000 V DC, max. length of connection cable 40 cm
Measuring principle	see CM-IWN
Nominal voltage U _n of the distribution system to be monitored	0-690 V AC / 0-1000 V DC
Voltage range of the distribution system to be monitored	0-793.5 V AC / 0-1150 V DC (tolerance +15 %)
Rated frequency f_N of the distribution system to be monitored	DC or 15-400 Hz
Tolerance of the rated frequency f _N	13.5-440 Hz
System leakage capacitance C _e max.	identical to that of the insulation monitoring relay used
Extraneous DC voltage $U_{\rm fg}$ (when max. connected to an AC system)	793.5 V DC
Tolerance of the adjusted threshold value / $\frac{1}{2}$ at 1-15 k Ω R _F	±1.5 kΩ
Relative percentage uncertainty A at	±8 %
-5+ 45 O, O _n = 0-115 /0, O _s = 05-110 /0, I _N , I _s , O _e = 1 μ1	L
Internal impedance Z at 50 Hz	L .
Internal DC resistance R _i Measuring voltage U	200 kΩ 24 V
Tolerance of measuring voltage U _m	+10 %
Measuring current I_	0.15 mA
General data	10101111
MTBF	on request
Duty time	100 %
Dimensions (W x H x D)	45 x 78 x 100 mm (1.78 x 3.07 x 3.94 in)
	0.200 kg (0.441 lb) 0.169 kg (0.373 lb)
Mounting	DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position	any
Minimum distance to other units vertical	not necessary 10 mm (0.39 in) at U _a > 600 V
Degree of protection	10 mm (0.39 m) at 0
Electrical connection	11 30 / 11 20
	2 x 0.75-2.5 mm² (2 x 18-14 AWG)
end férrule	,
Stripping length	2 x 0.5-4 mm² (2 x 20-12 AWG) 7 mm (0.28 in)
Tightening torque	0.6-0.8 Nm (5.31-7.08 lb.in)
Max. length of connection cable to CM-IWN	40 cm
Environmental data	
Ambient temperature ranges operation / storage / transport	-25+60 °C / -40+85 °C / -40+85 °C 3K5 (no condensation, no ice formation)
Climatic category IEC/EN 60721-3-3 Damp heat, cyclic IEC/EN 60068-2-30	6 x 24 h cycle, 55 °C, 95 % RH
Vibration, sinusoidal IEC/EN 60255-21-1	
Shock, half-sine IEC/EN 60255-21-2 Isolation data	Class 2
Rated impulse withstand voltage U _{imp} between all input circuit / PE	8 kV
isolated circuits	O KV
(IEC/EN 60947-1, IEC/EN 60664-1,VDE 0110-1)	
Pollution degree (IEC/EN 60664-1, VDE 0110-1) Overvoltage category (IEC/EN 60664-1, VDE 0110-1)	3 III
Rated insulation voltage U, input circuit / PE	* : 2 · 2 · 2 · 2 · 3 · 3 · 3 · 3 · 3 · 3 ·
(IEC/EN 60947-1, IEC/EN 60664-1,VDE 0110-1)	
	3.3 kV, 50 Hz, 1 s
(IEC/EN 60255-5, IEC/EN 61010-1)	
Standards Product standard	IEC/EN 61557-1, IEC/EN 61557-8, IEC/EN 60255-1, EN 50178
Other standards	EN 50178
Low Voltage Directive	2006/95/EC
EMC Directive RoHS Directive	2004/108/EC
Electromagnetic compability	2011/65/EC
Interference immunity to	IEC/EN 61000-6-1, IEC/EN 61000-6-2, IEC/EN 61326-2-4
electrostatic discharge IEC/EN 61000-4-2	Level 3, 6 kV / 8 kV
radiated, radio-frequency, IEC/EN 61000-4-3	Level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz) / 1 V/m (2.7 GHz)
electromagnetic field electrical fast transient/burst IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz
surge IEC/EN 61000-4-5	Level 3, installation class 3, supply circuit
conducted disturbances, induced by IEC/EN 61000-4-6	and measuring circuit 1 kV L-L, 2 kV L-earth
radio-frequency fields	LEVELO, IO V
voltage dips, short interruptions and IEC/EN 61000-4-11	Level 3
voltage variations harmonics and interharmonics IEC/EN 61000-4-13	Level 3
Interference emission	IEC/EN 61000-6-3, IEC/EN 61000-6-4
high-frequency radiated IEC/CISPR 22, EN 50022	Class B
high-frequency conducted IEC/CISPR 22, EN 50022	Class B

Insulation monitoring relays for unearthed supply systems Notes

Motor load monitoring relays Product picture



Motor load monitoring relays Table of contents

Motor load monitoring relays

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Motor load monitoring relays Fields of application

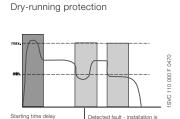
The motor load monitor relay monitors the load states of single-phase and three-phase asynchronous motors. The evaluation of the phase angle between current and voltage allows a very precise monitoring of the load states. Compared with other conventional measuring principles

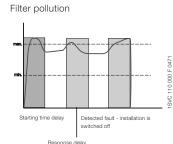
Main applications

- Pump monitoring
 - Dry-running protection (underload)
 - Closed valves (overload)
 - Pipe break (overload)
- Heating, air-conditioning, ventilation
 - Monitoring of filter pollution
 - V-belt breakage (underload)
 - Closed shutters/valves (overload)
 - Air ventilating volume
- Agitating machines
 - High consistency within the tank (overload)
 - Pollution of the tank (overload)
- Transport/Conveyance
 - Congested conveyor belts (overload)
 - Jamming of belts (overload)
 - Material accumulation in spiral conveyors (overload)
 - Lifting platforms
- Machine installation
 - Wear of tools, e.g. worn saw blades in circular saws, etc. (overload)
 - Tool breakage (underload)
 - V-belt drives (breakage underload)

(e.g. pressure transducers, current measurement), cos φ monitoring is a more precise and economical alternative. The motor is used as a sensor for its own load status.

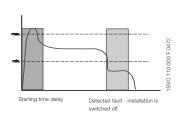
Pump control

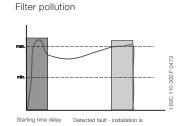




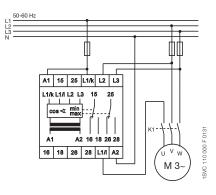
Ventilator monitoring

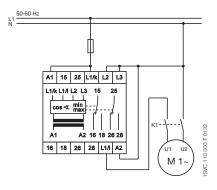
V-belt monitoring

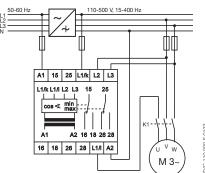


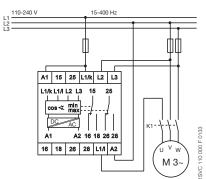


Wiring examples (for motor currents ≤ 20 A)

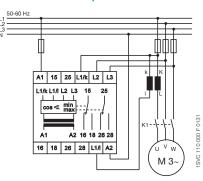


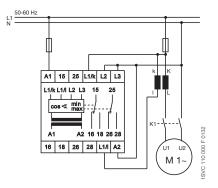






Wiring examples (for motor currents ≥ 20 A)





Motor load monitoring relays Ordering details



CM-LWN



Further documentation motor load monitoring relays on www.abb.com

Description

The CM-LWN monitors the motor load of single-phase and three-phase asynchronous motors. The evaluation of the phase angle between current and voltage (cos φ monitoring) allows a very precise monitoring of the motor load status.

Ordering details

Rated control supply voltage	Current range	Туре	Order code	Price	Weight (1 pce)
				1 pce	kg (lb)
24-240 V AC/DC			1SVR450335R0000		0.30 (0.66)
110-130 V AC			1SVR450330R0000		0.30 (0.66)
220-240 V AC	0.5-5 A		1SVR450331R0000		0.30 (0.66)
380-440 V AC			1SVR450332R0000		0.30 (0.66)
480-500 V AC		CNA LVA/NI	1SVR450334R0000		0.30 (0.66)
24-240 V AC/DC	2-20 A	CIVI-LVVIN	1SVR450335R0100		0.30 (0.66)
110-130 V AC			1SVR450330R0100		0.30 (0.66)
220-240 V AC			1SVR450331R0100		0.30 (0.66)
380-440 V AC			1SVR450332R0100		0.30 (0 .66)
480-500 V AC			1SVR450334R0100		0.30 (0.66)

Current transformers "Ordering details - CM-CT current transformers" on page 177"

Characteristics

- Pump monitoring
- Under- and overload monitoring $\cos \varphi$ in one unit
- Adjustable starting delay 0.3-30 s
- Direct measurement of currents up to 20 A
- Adjustable response time delay 0.2-2 s
- Single-phase or three-phase monitoring
- 2 x 1 c/o contact, closed-circuit principle
- 3 LEDs for status indication



- 1 Starting delay "Time S"
- 2 Response delay "Time R"
- 3 Threshold for load limit cos ϕ_{max}
- 4 Threshold for load limit $\cos \phi_{min}$
- 5 Reset button
- 6 Indication of operational states

U: green LED - control supply voltage $\mbox{cos}\; \phi_{\mbox{\scriptsize max}} \colon \mbox{red LED} - \mbox{cos}\; \phi_{\mbox{\scriptsize max}} \; \mbox{exceeded}$ $\mbox{cos}\;\phi_{\mbox{\scriptsize min}}\!\!:$ red LED – below $\mbox{cos}\;\phi_{\mbox{\scriptsize min}}$

7 Marker label

Motor load monitoring relays Technical information

The CM-LWN module monitors the load status of inductive loads.

The primary application is the monitoring of single- or three-phase asynchronous motors (squirrel cage) under varying load conditions. The measuring principle is based on the evaluation of the phase shift (φ) between the voltage and the current in one

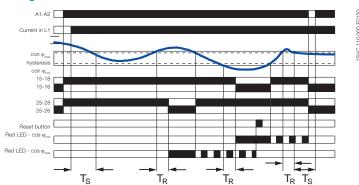
The phase difference is nearly inversely proportional to the load. Therefore, cos φ, measured relatively from 0 to 1, measures the relationship of effective power to apparent power. A value towards 0 indicates low load and a value towards 1 indicates

Threshold values can be set individually for $\cos \phi_{max}$ and $\cos \phi_{min}$ If the set threshold value is reached, a LED lights up and the relay is de-energized.

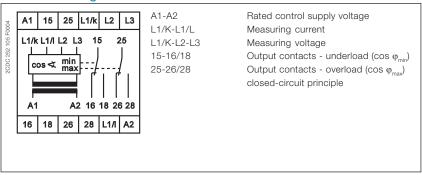
If cos φ returns to the acceptable limits (taking into account the hysteresis), the relay is reset to its original state and the LED flashes permanently to indicate the occurrence of the trip event. This message can be deleted using the reset button or by switching off the supply.

A time delay (Time S) of 0.3 to 30 s can be set for the starting phase of the motor. It is also possible to set a response delay time (Time R) of 0.2 to 2 s to suppress unwanted tripping due to unavoidable short load changes during normal operation. To guarantee correct operation of the response delay (Time R), the adjusted value for $\cos \phi_{max}$ has to be higher than the value for $\cos \varphi_{min}$ plus the hysteresis. Consequently, the overload and underload indication must not be active at the same time. Due to the internal electrical isolation of the supply circuit and the measuring circuit, it is also possible to use the device in systems with different supply voltages.

Function diagram - CM-LWN



Connection diagram CM-LWN



Motor load monitoring relays Technical data

Туре	CM-LWN
Input circuit - Supply circuit	A1-A2
Rated control supply voltage U_s - power A1-A2 consumption A1-A2	24-240 V AC/DC approx. 8.4 VA/W 110-130 V AC approx. 3.6 VA
A1-A2	220-240 V AC approx. 3.6 VA
A1-A2	380-440 V AC approx. 3.6 VA
A1-A2	480-500 V AC approx. 3.6 VA
Rated control supply voltage U _s tolerance	-15 %+10 %
Rated frequency AC versions	50-60 Hz
AC/DC versions	15-400 Hz or DC
Duty time	100 %
Measuring circuit Monitoring function	L1/L-L1/K-L2-L3 Motor load monitoring by cos φ
Voltage range L1/K-L2-L3	110-500 V AC single-phase or three-phase
Current range L1/L-L1/K Permissible overload of current input	0.5-5 A version 2-20 A version 25 A for 3 s 100 A for 3 s
Thresholds	$\cos\phi_{\text{min}}$ and $\cos\phi_{\text{max}}$ adjustable from 0 to 1
Hysteresis (related to phase angle φ in °)	4°
Frequency of measuring voltage	15-400 Hz
Response time	300 ms
Timing circuits	indication of over- and undervoltage fault
Start-up time (Time S)	0.3-30 s, adjustable
Response delay (Time R) Accuracy within the rated control supply voltage tolerance	0.2-2 s, adjustable
Accuracy within the rated control supply voltage tolerance	$\Delta t \leq 0.5\%$
Accuracy within the temperature range	$\Delta t \le 0.06 \% / ^{\circ}C$
Indication of operational states Control supply voltage	U: green LED
below cos ϕ_{min}	cos φ _{min} : red LED
	cos φ _{max} : red LED
cos φ _{max} exceeded	·
Output circuits	15-16/18, 25-26/28
Kind of output Operational principle	2 x 1 c/o contact closed-circuit principle ¹⁾
Contact material	AgCdO
Rated voltage (VDE 0110, IEC 664-1, IEC 947-1)	250 V
Max. switching voltage	400 V AC, 300 V DC
Rated operational current I _e (IEC/EN 60947-1) AC-12 (resistive) 230 V	[4 A
AC-15 (inductive) 230 V DC-12 (resistive) 24 V	4. A
DC-12 (resistive) 24 V	0.4
max. rated operational voltage	300 V AC
max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime Electrical lifetime at AC-12, 230 V, 4 A	30 x 10 ⁶ switching cycles
Max. fuse rating to achieve short-circuit Act Ac-12, 250 v, 4 A	10 A fast-acting / 10 A fast-acting
protection	1077 last dolling / 1077 last dolling
General data	
Dimensions (W x H x D)	45 mm x 78 mm x 100 mm (1.77 inch x 3.07 inch x 3.94 inch)
Mounting position	any
Degree of protection housing / terminals	
Ambient temperature range operation / storage Mounting	-25+65 °C / -40+85 °C DIN rail (IEC/EN 60715)
Electrical connection	DINTAIL (IEO/EN 007 13)
Wire size fine-strand with wire end ferrule	2 x 2.5 mm ² (2 x 14 AWG)
Standards	<u> </u>
Product standard	IEC 255-6, EN 60255-6
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC
Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4
	Level 3 (6 kV / 8 kV)
radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3	
electrical fast transient / burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5	Level 3 (2 kV / 5 kHz)
conducted disturbances, induced by radio-frequency fieldsIEC/EN 61000-4-6	
Operational reliability (IEC 68-2-6)	5 g
	10 ~
Mechanical resistance (IEC 68-2-6)	10 g
Mechanical resistance (IEC 68-2-6)	24 h cycle time, 55 °C, 93 % rel., 96 h
Mechanical resistance (IEC 68-2-6) Environmental testing (IEC 68-2-30) Isolation data	10 9 24 h cycle time, 55 °C, 93 % rel., 96 h
Mechanical resistance (IEC 68-2-6) Environmental testing (IEC 68-2-30) Isolation data Rating (HD 625.1 S1, VDE 0110, IEC 664-1, IEC 60255-5)	24 h cycle time, 55 °C, 93 % rel., 96 h
Mechanical resistance (IEC 68-2-6) Environmental testing (IEC 68-2-30) Isolation data Rating (HD 625.1 S1, VDE 0110, IEC 664-1, IEC 60255-5) Rated insulation voltage between supply-, measuring- and output circuit	24 h cycle time, 55 °C, 93 % rel., 96 h 250 V, 400 V, 500 V depending on the version
Mechanical resistance (IEC 68-2-6) Environmental testing (IEC 68-2-30) Isolation data Rating (HD 625.1 S1, VDE 0110, IEC 664-1, IEC 60255-5) Rated insulation voltage between supply-, measuring- and output circuit Rated impulse withstand voltage between all isolated circuits	24 h cycle time, 55 °C, 93 % rel., 96 h 250 V, 400 V, 500 V depending on the version 4 kV / 1.2 - 50 µs
Mechanical resistance (IEC 68-2-6) Environmental testing (IEC 68-2-30) Isolation data Rating (HD 625.1 S1, VDE 0110, IEC 664-1, IEC 60255-5) Rated insulation voltage between supply-, measuring- and output circuit	24 h cycle time, 55 °C, 93 % rel., 96 h 250 V, 400 V, 500 V depending on the version

¹⁾ Open-circuit principle: Output relay is energized if the measured value exceeds/drops below the adjusted threshold. Closed-circuit principle: Output relay is de-energized if the measured value exceeds/drops below the adjusted threshold.

Motor control and protection Product group picture



Motor control and protection Table of contents

Motor control and protection

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Technical data	132

Motor control and protection Benefits and advantages

UMC100.3 is a flexible, modular and expandable motor management system for constant-speed low-voltage range motors. It's most important tasks include motor protection, prevention of plant standstills and the reduction of down time. This is made possible by early information relating to possible motor problems which avoids unplanned plant standstills. Even if a motor trips, quick diagnosis of the cause of the fault serves to reduce downtime.

UMC100.3 combines in a very compact unit:

Motor protection

- Overload, underload
- Overvoltage, undervoltage
- Blocked rotor, low / high current
- Phase failure, imbalance, phase sequence
- Earth leakage
- Thermistor protection
- Limitation of starts per time
- One single version with integrated measuring system covers the rated motor current from 0.24 to 63 A

Motor control

- Integrated and easy to parametrize motor starter functions like direct, reverse, star-delta,...
- Additionally free programmable logic for application specific control functions
- Expansion modules DX111, DX122 for more I/Os
- Expansion modules VI150, VI155 for 3-phase voltage measuring
- Analog and temperature module Al111

Motor diagnostics

- Quick and comprehensive access to all relevant data via fieldbus and/or operator panel
- Current, thermal load
- Phase voltages
- Power factor
- Energy

Further information

UMC Catalog 2CDC 190 022 C0206 UMC Brochure 2CDC 135 011 B0203

Communication

- Communication-independent basic device
- Freely selectable fieldbus protocol with FieldBusPlug
- Profibus DP
- DeviceNet
- Modbus RTU
- Ethernet Modbus TCP
- Profinet

Typical application segments

- Oil & gas
- Cement
- Paper
- Mining
- Steel
- Chemical industry

Motor control and protection Technical data



Basic device UMC100.3

Main power		
Voltage	max 1000 V AC	
Frequency	4565 Hz	
Rated motor current	0.2463 A, without accessories Higher currents with external transformer	
Tripping classes	5E, 10E, 20E, 30E, 40E in accordance with EN/IEC 60947-4-1	
Short-circuit protection	Separate fuse on network side	
Control unit		
Supply voltage	24 V DC, 110-240 V AC/DC	
Inputs	6 digital inputs 24 V DC 1 PTC input	
Outputs	3 digital relay outputs 1 digital transistor output	

Expansion modules

The UMC100.3 can be expanded with maximum 4 expanstion modules: One digital expansion module DX111 or DX122, one module VI150 or VI155 and 2 analog modules Al111.

Communication takes place via a simple two-wire line. The maximum distance allowed between the UMC100.3 and the expansion module is 3 m.



Digital expansion modules DX111 / DX122
Expands the UMC100.3 to include additional digital inputs and outputs and an analog output

Supply voltage	24 V DC
Inputs	DX111: 8 digital inputs 24 V DC DX122 8 digital inputs 110/230 V AC
Outputs	4 digital relay outputs 1 analog output, 0/420 mA, / 010 V configurable

Voltage modules VI150/VI155

Voltage modules for determining phase voltages, power factor (cos j), active power, apparent power, energy, harmonic content (THD)



VI155 for use in grounded and ungrounded networks



Supply voltage	24 V DC
Voltage inputs	L1, L2, L3
Rated voltage range	150 690 V AC
Outputs	1 digital relay output

Analog module Al111 Expand the UMC100.3 with analog and temperature inputs

Supply voltage	24 V DC
Inputs	0-10 V, 0/4-20 mA PT100, PT1000, 2- or 3-wire connection KTY83, KTY84, NTC

Motor control and protection Technical data



Ethernet communication interfaces

Mounted in the MCC cable chamber; connection of 1 to 4 motor controllers UMC100.3 via simple cables

MTQ22	for Modbus TCP
PNQ22	for Profinet IO



Fieldbus communication interfaces
Can be mounted direct on the UMC100.3 or separate in the cable chamber of the MCC.
Connection for standard fieldbus cables with 9-pole Sub-D (Profibus DP) or terminal blocks

PDP32	for Profibus DP
DNP31	for DeviceNet
MRP31	for Modbus RTU



CEM11 earth leakage sensors
Summation current transformer for connecting to a digital input Mounting with bracket on DIN busbar or wall

11100010		
CEM11-FBP.20	80 – 1.700 mA	20 mm Ø
CEM11-FBP.35	100 – 3.400 mA	35 mm Ø
CEM11-FBP.60	120 – 6.800 mA	60 mm Ø
CEM11-FBP.120	300 – 13.600 mA	120 mm Ø



Current transformer CT4L / CT5L

Only required for rated motor currents >63 A

Linear transformer, 3-phase with terminal block, designed for connecting leads Cu 2.5 mm²



UMC100-PAN control panel
Installation on the device or on the switching cabinet door

Graphics-enabled and backlit display, 3 LEDs for status indication

Freely configurable error messages

USB port for PC connection

Multilingual: German, English, French, Italian, Polish, Portuguese, Spanish, Russian

Motor control and protection Notes

Thermistor motor protection relays Product group picture



Thermistor motor protection relays Table of contents

Thermistor motor protection relays

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Selection table CM-MSx range	139
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Ordering details - PTC temperature sensors C011	141
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Technical data - CM-MSE	145
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Thermistor motor protection relays Benefits and advantages, Applications

The thermistor motor protection relays of the CM-MSx range protect motors with PTC sensors against high temperature. These sensors are incorporated in the motor windings thus measuring the motor heat directly.

Direct temperature measuring

Generally, motor damages caused by overload or overheating situations can be prevented in different ways. Compared to the indirect temperature measuring which monitors the motor current, the temperature inside the motor can be measured by direct temperature measuring.

This enables direct control and evaluation of the following operating conditions like:

- Heavy duty starting
- Increased switching frequency
- Single phase operation
- Phase unbalance
- High ambient temperature
- Insufficient cooling
- Breaking operation

Therefore the consequences from overheating like abrasion as well as electrical failures can be prevented.

The direct measuring principle is carried out by a combination of the thermistor motor protection relay and 3 PTC sensors which are installed directly in the motor by the manufacturer. Those 3 PTC sensors are placed directly at the thermal hotspots, the motor windings.

Monitoring the motor

The thermistor motor protection relay measures the resistance of the PTC sensors which reflects the internal motor temperature permanently.

If the temperature in the motor windings rises excessively and reaches the nominal response temperature (NRT), the thermistor motor protection relay detects this situation and the output relay switches off.

By doing so the motor contactor gets triggered and switches off the motor.

CM-MSS functionality video



Characteristics CM-MSS¹⁾

- Different types of contacts available
 - 1 x 2 c/o (SPDT) contacts
 - 2 x 1 c/o (SPDT) contact
 - 1 n/o and 1 n/c contact
- 1 or 2 measuring circuits
- Different types of reset functions
 - Automatic
 - Manual
 - Remote
- Rated control supply voltages
 - 24 V AC/DC
 - 24-240 V AC/DC
 - 110-130 V AC, 220-240 V AC
- Approvals / Marks
 - «(h)» (1) / C€ &

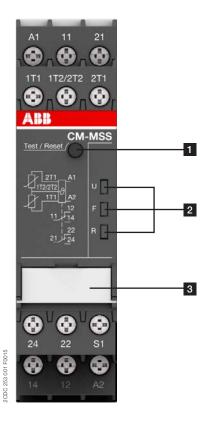
Features 1)

- Additional functions:
 - Dynamic interrupted wire detection
 - Short-circuit monitoring of the sensor circuit
 - Non-volatile fault storage
 - Single or sum evaluation
- Easy configuration via DIP switches
- LEDs to distinguish between different failure causes
- Screw connection technology or Easy Connect Technology available
- Test/Reset button available
 - ¹⁾ Depending on device the characteristics vary, for detailled overview see "Selection table CM-MSx range" on page 139.

Characteristics CM-MSE

- Auto reset
- Connection of several sensors (max. 6 sensors connected in series)
- Monitoring of bimetals
- 1 n/o contact
- Excellenct cost / performance ratio

Thermistor motor protection relays Operating controls



1 Test / Reset button

Reset - only possible if measured value < switch-on resistance

2 Indication of operational states with LEDs

U: green LED - Status indication of control supply voltage Γ

Control supply voltage applied

F: red LED - Fault message

R: yellow LED - Status indication of the output relay

3 Marker label / DIP switches (depending on device) e.g.

- Single evaluation 2 x 1 c/o (SPDT) contact
- Accumulative evaluation 1 x 2 c/o (SPDT) contacts
- M Short-circuit detection de-activated
- Short-circuit detection activated
- Non-volatile fault storage activated
- Mon-volatile fault storage de-activated
- Remote Reset
- Remote Test/Reset

LEDs, status information and fault messages CM-MSS

Operational state	U: green LED	F: red LED	R: yellow LED
Absence of control supply voltage	OFF	OFF	OFF
Internal fault 2)	OFF	ПП	
Internal fault 2)		MML	MML
Control supply voltage not within the tolerance range			OFF
Short circuit			OFF
Interrupted wire		חחחת	OFF
Measuring circuit 2: Overtemperature		ПП	OFF
Measuring circuit 1: Overtemperature			OFF
Fault rectified but not confirmed		¹⁾	MML
Test function		OFF	OFF
Change of configuration not confirmed		OFF	nnn.
No fault		OFF	

¹⁾ Depending on the fault with the highest priority

²⁾ Restart the device. If after restart the same fault is indicated, replace the device.

Thermistor motor protection relays Selection table CM-MSx range

	Order code 1SVR550805R9300	1SVR550800R9300	1SVR550801R9300	1SVR740720R1400	1SVR730720R1400	1SVR740700R0100	1SVR730700R0100	1SVR740700R2100	1SVR730700R2100	1SVR740722R1400	1SVR730722R1400	1SVR740700R0200	1SVR730700R0200	1SVR740700R2200	1SVR730700R2200	1SVR740712R1400	1SVR730712R1400	1SVR740712R0200	1SVR730712R0200	1SVR740712R2200	1SVR730712R2200	1SVR740712R1200	1SVR730712R1200	1SVR740712R1300	1SVR730712R1300
	Type CM-MSE	CM-MSE	CM-MSE	CM-MSS.11P	CM-MSS.11S	CM-MSS.12P	CM-MSS.12S	CM-MSS.13P	CM-MSS.13S	CM-MSS.21P	CM-MSS.21S	CM-MSS.22P	CM-MSS.22S	CM-MSS.23P	CM-MSS.23S	CM-MSS.31P	CM-MSS.31S	CM-MSS.32P	CM-MSS.32S	CM-MSS.33P	CM-MSS.33S	CM-MSS.41P	CM-MSS.41S	CM-MSS.51P	CM-MSS.51S
ATEX approval		-	-			-		:					:											·	
Number of sensor circuits	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Single or accumulative evaluation		ii.	÷	÷	+	<u> </u>	 	† ·	<u> </u>	<u> </u>	<u> </u>	<u> </u>	† ·	<u> </u>	<u> </u>	<u> </u>	† · · · ·	<u> </u>	i i	<u> </u>	<u> </u>	<u> </u>	† ·	•	-
Number of LEDs			-	3	3	2	2	2	2	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	3
1 c/o (SPDT) contact				<u>.</u>		•	•	•	•	<u>.</u>			<u>.</u>	<u>.</u>				<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>		<u> </u>		<u>.</u>
2 c/o (SPDT) contacts								<u>.</u>				•	•	•	•			•	•	•	•	•	•	<u>.</u>	
1 n/o		•	•				<u>.</u>			<u>.</u>		<u>.</u>		<u>.</u>	<u>.</u>					<u> </u>	<u> </u>		<u>.</u>		
1 n/c and 1 n/o					•					•	•						•								
2 x 1 c/o or 1 x 2 c/o contacts, configurable																								•	•
Manual		-	-		-	-	-	:	-		-	-	-	-			-			-		-			
Remote						ļ		ļ	<u>.</u>	<u>.</u>		-	-	=		_	-	-	-	-		-		-	-
Auto			-	-	-	_	-	-	-	_	_	- 1)	1)	- 1)	= 1)	— 1)	- 1)	- 1)	1)	1)	- 1)	— 1)	1)	= 2)	2)
Test button	······			-		-		-	-	-	-		-				-								
Test button			-	-	-	<u> </u>	-	<u> </u>		-	<u> </u>	-	<u> </u>	-	-	-	-	-	-	-	-	-	-	-	-
Short-circuit detection							-	-	-	•	•	-	-	-	-	•	•	•	•	•	•			-	
Short-circuit detection, configurable								-	-				Ī	-	-			-		-			•	•	•
Dynamic interrupted wire detection				•				1		•			1						•					•	•
Non-volatile fault storage		1		•	•			<u>†</u>		•	•		<u>†</u>			•	•	†····	<u>†</u>	<u>†</u>	<u>†</u>		<u>†</u>		<u>†</u>
Non-volatile fault storage, configurable					1			<u> </u>	<u> </u>				<u> </u>					<u> </u>	<u> </u>		<u> </u>	•	•	•	•
							:								:								:		
24 V AC							į	<u> </u>	<u>.</u>	<u>.</u>		į	<u> </u>	<u>.</u>	<u>.</u>			<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>		ļ		<u>.</u>
110-130 V AC		•		. .		ļ	ļ	<u> </u>	<u>.</u>	<u>.</u>	ļ	ļ	<u> </u>	<u> </u>	<u>.</u>	ļ	. .	ļ	<u> </u>	<u>.</u>	ļ	ļ	ļ	ļ	<u>.</u>
220-240 V AC						ļ	ļ	<u> </u>	<u> </u>	<u> </u>	ļ	ļ	<u> </u>	<u> </u>	<u>.</u>	ļ	ļ	ļ	<u> </u>	<u> </u>	ļ	ļ	ļ	<u>.</u>	<u> </u>
24-240 V AC/DC						<u>.</u>	ļ	<u> </u>	<u>.</u>		•	ļ	<u> </u>	<u> </u>	<u>.</u>	•	•	ļ	<u> </u>	<u>.</u>	<u> </u>	•	•		
24 V AC/DC						•	•	<u> </u>	ļ	ļ		•	•	<u>.</u>	ļ			•	•	ļ	ļ	ļ	ļ	<u>.</u>	<u>.</u>
110-130 V AC, 220-240 V AC				<u>!</u>				•	•										<u> </u>	•	•				
Push-in terminals		-	-			•					-	•	:				:		-		-	•			:
Pusn-in terminals																									

 $^{^{1)}}$ For automatic reset, connect terminals S1 to T2. $^{2)}$ For automatic reset, connect Terminals S1 to 1T2/2T2.

Thermistor motor protection relays Ordering details



CM-MSS.12S



CM-MSS.41S



CM-MSS.51S

Description

The thermistor motor protection relay CM-MSS monitors the winding temperature and thus protects the motor from overheating, overload and insufficient cooling in accordance to the product standard IEC 60947-8.

Ordering details CM-MSx

Characteristics	Туре	Order code	Price	Weight (1 pce)
			1 pce	kg (lb)
	CM-MSE	1SVR550805R9300		0.11 (0.24)
	CM-MSE	1SVR550800R9300		0.11 (0.24)
	CM-MSE	1SVR550801R9300		0.11 (0.24)
	CM-MSS.11P	1SVR740720R1400		0.119 (0.26
	CM-MSS.11S	1SVR730720R1400		0.127 (0.28
	CM-MSS.12P	1SVR740700R0100		0.105 (0.23
	CM-MSS.12S	1SVR730700R0100		0.113 (0.24
	CM-MSS.13P	1SVR740700R2100		0.147 (0.32
	CM-MSS.13S	1SVR730700R2100		0.155 (0.34
	CM-MSS.21P	1SVR740722R1400		0.118 (0.26
	CM-MSS.21S	1SVR730722R1400		0.126 (0.27
	CM-MSS.22P	1SVR740700R0200		0.121 (0.26
See "Selection table CM-MSx range" on page 139.	CM-MSS.22S	1SVR730700R0200		0.132 (0.29
0 1 0	CM-MSS.23P	1SVR740700R2200		0.163 (0.35
	CM-MSS.23S	1SVR730700R2200		0.174 (0.38
	CM-MSS.31P	1SVR740712R1400		0.120 (0.26
	CM-MSS.31S	1SVR730712R1400		0.128 (0.28
	CM-MSS.32P	1SVR740712R0200		0.120 (0.26
	CM-MSS.32S	1SVR730712R0200		0.130 (0.28
	CM-MSS.33P	1SVR740712R2200		0.162 (0.35
	CM-MSS.33S	1SVR730712R2200		0.172 (0.37
	CM-MSS.41P	1SVR740712R1200		0.130 (0.28
	CM-MSS.41S	1SVR730712R1200		0.141 (0.31
	CM-MSS.51P	1SVR740712R1300		0.135 (0.29
	CM-MSS.51S	1SVR730712R1300		0.145 (0.32

S: screw connection

P: push-in connection

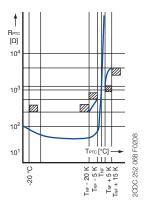


Further documentation thermistor motor protection monitoring relays on www.abb.com

Thermistor motor protection relays Ordering details - PTC temperature sensors C011



Temperature sensor characteristics



- 1) Temperature sensor C011, standard version acc. to DIN 44081
- ²⁾ Triple temperature sensor C011-3

Description

The PTC temperature sensors (temperature-dependent with positive temperature coefficient) are selected by the manufacturer of the motor depending on:

- the motor insulation class according to IEC/EN 60034-11,
- the special characteristics of the motor, such as the conductor cross-section of the windings, the permissible overload factor etc.
- special conditions prescribed by the user, such as the permissible ambient temperature, risks resulting from locked rotor, extent of permitted overload etc.

One temperature sensor must be embedded in each phase winding. For instance, in case of three-phase squirrel cage motors, three sensors are embedded in the stator windings. For pole-changing motors with one winding (Dahlander connection), 3 sensors are also sufficient. Pole-changing motors with two windings, however, require The sensors are suitable for embedding in motor windings with rated operating voltages of up to 600 V AC. Conductor length: 500 mm per sensor. A 14 V varistor can be connected in parallel to protect the sensors from overvoltage. Due to their characteristics, the thermistor motor protection relays can also be used with PTC temperature sensors of other manufacturers which comply with DIN 44 081 and DIN 44 082 6 sensors.

If an additional warning is required before the motor is switched off, separate sensors for a correspondingly lower temperature must be embedded in the winding. They have to be connected to a second control unit.

Ordering details CM-MSS accessories

Rated response	Color coding	Type	Order code	Price	Weight
temperature T _{NF}				1 pce	(1 pce) kg (lb)
70 °C	white-brown	C011-70 ¹⁾	GHC0110003R0001		0.02 (0.044)
80 °C	white-white	C011-80 ¹⁾	GHC0110003R0002		0.02 (0.044)
90 °C	green-green	C011-90 ¹⁾	GHC0110003R0003		0.02 (0.044)
100 °C	red-red	C011-100 ¹⁾	GHC0110003R0004		0.02 (0.044)
110 °C	brown-brown	C011-110 ¹⁾	GHC0110003R0005		0.02 (0.044)
120 °C	gray-gray	C011-120 ¹⁾	GHC0110003R0006		0.02 (0.044)
130 °C	blue-blue	C011-130 ¹⁾	GHC0110003R0007		0.02 (0.044)
140 °C	white-blue	C011-140 ¹⁾	GHC0110003R0011		0.02 (0.044)
150 °C	black-black	C011-150 ¹⁾	GHC0110003R0008		0.02 (0.044)
160 °C	blue-red	C011-160 ¹⁾	GHC0110003R0009		0.02 (0.044)
170 °C	white-green	C011-170 ¹⁾	GHC0110003R0010		0.02 (0.044)
150 °C	black-black	C011-3-150 ²⁾	GHC0110033R0008		0.05 (0.11)

¹⁾ Temperature sensor C011, standard version acc, to DIN 44081

Technical data

Characteristic data	Sensor type C011
Cold-state resistance	50 -100 Ω at 25 °C
Warm-state resistance ± 5 up to 6 K of rated	
response temperature T _{NF}	10 000 Ω
Thermal time constant, sensor open 1)	< 5 s
Permitted ambient temperature	+180 °C

Rated response tempera-	PTC resistance R	PTC resista	nce R2) at PTC temp	peratures of:
ture \pm tolerance $T_{_{ m NF}} \pm \Delta T_{_{ m NF}}$	from -20 °C to T _{NF}	T_{NF} - ΔT_{NF}	$T_{NF} + \Delta T_{NF}$	T _{NF} + 15 K
	- 20 K	(UPTC \leq 2.5 V)	(UPTC \leq 2.5 V)	(UPTC ≤ 7.5 V)
70 ±5 °C		≤ 570 Ω	≥ 570 Ω	
80 ±5 °C		≥ 370 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	2 370 12	[-
90 ±5 °C				
100 ±5 °C				
110 ±5 °C				
120 ±5 °C	≤ 100 Ω	- FFO O	~ 1000 O	~ 4000 O
130 ±5 °C		≤ 550 Ω	≥ 1330 Ω	≥ 4000 Ω
140 ±5 °C				
150 ±5 °C				
160 ±5 °C				
170 ±7 °C		≤ 570 Ω	≥ 570 Ω	-

¹⁾ Not embedded in windings.

²⁾ Triple temperature sensor C011-3

²⁾ For triple temperature sensor take values x 3.

Thermistor motor protection relays Technical data - CM-MSS

Technical data

Data at T = 25 °C and rated values, unless otherwise indicated

Supply circuit - Input circui	<u>t </u>	CM-MSS.x1	CM-MSS.x2	CM-MSS.x3
Rated control supply voltage	e U _s A1-A2	24-240 V AC/DC	24 V AC/DC	220-240 V AC
	A2-A3	-	-	110-130 V AC
Rated control supply voltage	e U _s tolerance	-15+10 %		
Rated frequency	······································	15-400 Hz	50-60 Hz	•
Electrical insulation between	n supply circuit and measuring circuit	yes	no	yes
Power failure buffering time	•	20 ms	i	······································
Supply circuit - Measuring	circuit / Sensor circuit			
Number of circuits		1 (CM-MSS.51: 2)		
Sensor type	······································		44081, DIN/EN 44082)	
······································	sors connected in series, cold state	< 750 Ω		······································
Overtemperature			MCC 10 /10 /00 /00 0 7	kO + 50/)
monitoring		•	······································	
<u>.</u>		•	0.12 /.10 /.22 /.23: 1.2 K	≥4 ⊥ U70)
Maximum voltage in sensor				······································
		3.7 V		
Acrimum current in account		5.5 V		······································
Maximum current in sensor		3.7 mA	-2 0 v 400 == -+ 0 5	
Maximum sensor cable leng		•	n ² , 2 x 400 m at 2.5 mm ²	-
	ontrol supply voltage tolerance	0.50 % (CM-MSS.12	i	
Accuracy within the tempera			2 /.13 /.22 /.23: 0.5 %/K)
Repeat accuracy (constant		on request		
Reaction time of the safety	······································	< 100 ms		
Hardware fault tolerance (H	F1)	0		
Control circuit				
Control function		see "Selection table (CM-MSx range" on page	139
Maximum no-load voltage		5.5 V		
Max. current		0.6 mA (CM-MSS.12	/.13 /.22 /.23: 1.2 mA)	
Maximum cable length		2 x 100 m at 0.75 mn	n ² , 2 x 400 m at 2.5 mm ²	2
ndication of operational sta	ates			
Control supply voltage	U	LED green		
Relay status		LED yellow		
Fault message	F	LED red		
Output circuit				
Kind of output		see "Selection table	CM-MSx range" on page	139
Operating principle		closed-circuit princip	······································	
Contact material		AgNi alloy, Cd free		•••••••••••••
Rated operational voltage U	(IEC/EN 60947-1)	250 V AC		······································
	/ Minimum switching current	24 V / 10 mA		······································
	/ Maximum switching current	see data sheet		······································
Rated operating current I	AC-12 (resistive) at 230 V	4 A		······································
IEC/EN 60947-5-1)	AC-15 (inductive) at 230 V	3 A	•••••••••••••••••••••••••••••••••••••••	······································
	DC-12 (resistive) at 24 V	4 A	······································	······································
	DC-13 (inductive) at 24 V	2 A		······································
AC Rating (UL 508)	utilization category (Control Circuit Rating Code)			
	maximum rated operational voltage	300 V AC		
	maximum continuous thermal current at B 300			
	maximum making/breaking apparent power at B 300	3600/360 VA		
	general purpose rating		······································	
Mechanical lifetime	gonoral parpood rating	30 x 10 ⁶ switching cy	cles	
Electrical lifetime	at AC12 230 V AC 4 A			
	at AC12, 230 V AC, 4 A	0.1 x 10 ⁶ switching cy		NA NAOO 51 - 2 AV
Maximum fuse rating to achievorotection	e short-circuit n/c contact	10 A tast-acting (CM-	-MSS.12, CM-MSS.13, C	M-MSS.51: 6 A)
31010011011	n/o contact	10 A fast-acting		

Thermistor motor protection relays Technical data - CM-MSS

MTBF		on request	
Duty time		100 %	
***************************************		.	
		97 x 109 x 30 mm (3.82 x 4.29 x 1.18 in)	
Weight		see "Ordering details" on page 140	
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool	
		any	
Minimum distance to other units vertical		10 mm (0.394 in) if switching curren	t > 2 A
		10 mm (0.394 in) if switching current > 2 A	
• • • • • • • • • • • • • • • • • • • •		UL 94 V-0	
		IP50	
		IP20	
Electrical connection		Screw connection technology	Easy Connect Technology (push-i
Connection capacity	fine-strand with(out) wire end	1 x 0.5-2.5 mm ² (1 x 18-14 AWG) 2 x 0.5-1.5 mm ² (2 x 18-16 AWG)	2 x 0.5-1.5 mm ² (2 x 18-16 AWG)
		1 x 0.5-4 mm ² (1 x 20-12 AWG) 2 x 0.5-2.5 mm2 (2 x 20-14 AWG)	2 x 0.5-1.5 mm ² (2 x 20-16 AWG)
Stripping length		8 mm (0.32 in)	·····
Tightening torque	·······	0.6-0.8 Nm (7.08 lb.in)	-
Wire end ferrule		according to DIN 46228-1-A,	-
		DIN 46228-4-E	
Environmental data			
Ambient temperature ranges operation storage		-25+60 °C (-13+140 °F)	
		-40+85 °C (-40+185 °F)	
Damp heat, cyclic (IEC/EN 60068-2-30)		6 x 24 h cycle, 55 °C, 95 % RH	
Climatic class (IEC/EN 60721-	3-3)	3K5 (no condensation, no ice formation)	
Vibration, sinusoidal (IEC/EN 60255-21-1)		Class 2	
Shock (IEC/EN 60255-21-2)		Class 2	
Isolation data			
Rated insulation voltage U _i (IEC/EN 60947-1, IEC/EN 60664-1)	Supply circuit / Measuring circuit ¹⁾	300 V AC (CM-MSS.x2: n/a)	
	Supply circuit / Output circuits		
	Measuring circuit ¹⁾ / Output circuits		
	Output circuit 1 / Output circuit 2		
Rated impulse	Supply circuit / Measuring circuit ¹⁾		
withstand voltage U _{imp} (IEC/EN 60947-1, IEC/EN 60664-1)	Supply circuit / Output circuits		
	Measuring circuit ¹⁾ / Output circuits	4 kV / 6 kV	
	Output circuit 1 / Output circuit 2		
Basic insulation (IEC/EN 60664-1)	Supply circuit / Measuring circuit ¹⁾		
	Supply circuit / Output circuits	600 V AC	
	Measuring circuit ¹⁾ / Output circuits	600 V AC	
	Output circuit 1 / Output circuit 2	300 V AC	
Test voltage, routine test (IEC/EN 60255-27)	Supply circuit / Measuring circuit ¹⁾	2.5 kV, 50 Hz, 1 min. (CM-MSS.x2: n/a)	
	Supply circuit / Output circuits	2.5 kV, 50 Hz, 1 min.	
	Measuring circuit ¹⁾ / Output circuits	2.5 kV, 50 Hz, 1 min.	
Test voltage, type test (IEC/EN 60255-27)	Supply circuit / Measuring circuit ¹⁾	6 kV / 1.2 - 50 µs (CM-MSS.x2: n/a)	
	Supply circuit / Output circuits	6 kV / 1.2 - 50 μs	
	Measuring circuit ¹⁾ / Output circuits	6 kV / 1.2 - 50 μs	
	Output circuit 1 / Output circuit 2	6 kV / 1.2 - 50 μs	
Protective separation (IEC/EN 61140, EN 50178)	Supply circuit / Measuring circuit ¹⁾	yes, up to 300 V	
	Supply circuit / Output circuits	yes (CM-MSS.x2: n/a)	
		yes	
••••	Measuring circuit ¹⁾ / Output circuits	yes	
 	Measuring circuit ¹⁾ / Output circuits Output circuit 1 / Output circuit 2		·····

¹⁾ Potential of measuring circuit = Potential of control circuit

Thermistor motor protection relays Technical data - CM-MSS

Standards		
Product standard		EN 60947-5-1, EN 60947-8
Low Voltage Directive		2014/35/EC
EMC directive		2014/30/EC
ATEX directive		2014/34/EC (only ATEX variants "Selection table CM-MSx range" on page 139)
RoHS directive	•	2011/65/EC
Electromagnetic compatibility		
nterference immunity to		IEC/EN 61000-6-1, IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3, 6 kV contact discharge, 8 kV air discharge
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m (1 GHz), 3 V/m (2 GHz), 1 V/m (2.7 GHz)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz
surge	IEC/EN 61000-4-5	Level 3, Installation class 3, supply circuit and measuring circuit 1 kV L-L, 2 kV L-N
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3, 0.15-80 MHz, 10 V, 80 % AM (1kHz)
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	Class 3
harmonics and interharmonics	IEC/EN 61000-4-13	Class 3
Additional interference immunity accord 60255-1 (reference on EN 60255-26_20		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	10 V/m (80 MHz - 3 GHz)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	10 V at stated frequencies
damped oscillatory waves	IEC/EN 61000-4-18	Signal lines, symmetric coupling: 1 kV peak voltage Power supply, asymmetric coupling: 2.5 kV peak voltage
nterference emissions		IEC/EN 61000-6-3, IEC/EN 61000-6-4
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B
high-frequency radiated	Germanischer Lloyd	increased requirements in the emergency call frequency band

Thermistor motor protection relays Technical data - CM-MSE

Technical data

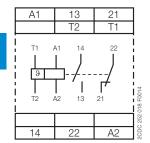
Data at $T_a = 25$ °C and rated values, unless otherwise indicated

Supply circuit - Input circuit	CM-MSE
Rated control supply voltage U power consumption 1SVR550805R9300	24 V AC approx. 1.5 A
1SVR550800R9300	110-130 V AC approx. 1.5 A
1SVR550801R9300	220-240 V AC approx. 1.5 A
Rated control supply voltage U _s tolerance	-15+10 %
Rated frequency	50-60 Hz
Measuring circuit	
Monitoring function T1-T2	temperature monitoring by means of PTC sensors
Number of sensor circuits	1
Sensor circuit	
Temperature threshold (relay de-energizes)	2.7-3.7 kΩ
Temperature hysteresis (relay energizes)	1.7-2.3 kΩ
Short-circuit threshold (relay de-energizes)	<18 Ω
Short-circuit hysteresis (relay energizes)	>45 Ω
Maximum total resistance of sensors connected in series (cold state) Maximum sensor cable length for short-circuit detection	≤1.5 kΩ 2 x 100 m at 0.75 mm², 2 x 400 m at 2.5 mm²
Response time	2 x 100 m at 0.73 mm, 2 x 400 m at 2.5 mm
Output circuit	1100 mb
•	1 n/o contact
'	
Operational principle	closed-circuit principle (output relay de-energizes if the measured value exceeds/drops below the adjusted threshold)
Contact material	AgCdO
Rated voltage VDE 0110, IEC 664-1, IEC 60947-1 Maximum switching voltage	250 V
Rated operating current I AC-12 (resistive) at 230 V	
(IEC/EN 60947-5-1) AC-15 (inductive) at 230 V	3 Å
DC-12 (resistive) at 24 V	4 A
DC-13 (inductive) at 24 V	2 A
AC Rating (UL 508) utilization category (Control Circuit Rating Code)	
maximum rated operational voltage	300 V AC
maximum continuous thermal current at B 300 maximum making/breaking apparent power at B 300	
general purpose rating	1250 V AC - 1 A
Mechanical lifetime	30 x 10 ⁶ switching cycles
Electrical lifetime at AC12, 230 V AC, 4 A	0.1 x 10 ⁶ switching cycles
Maximum fuse rating to achieve short-circuit n/c contact	10 A fast-acting
	10 A fast-acting
General data	
Dimensions (W x H x D)	22.5 x 78 x 78.5 mm (0.89 x 3.07 x 3.09 in)
Duty time	100 %
Weight Mounting position	approx. 0.11 kg (0.24 lb)
Degree of protection housing / terminals	any
Ambient temperature range operation	-20+60 °C
	-40+85 °C
Mounting	DIN rail (IEC/EN 60715)
Electrical connection	
Wire size fine strand with wire end ferrule	
fine strand without wire end ferrule	2 x 0.75-1.5 mm² (2 x 18-16 AWG)
	2 x 1-1.5 mm ² (2 x 18-16 AWG)
Stripping length	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)
Tightening torque	0.6-0.8 Nm (5.31-7.08 lb.in)
Standards	
	IEC 255-6, EN 60255-6
Product standard	
Low Voltage Directive	2006/95/EC
Low Voltage Directive EMC Directive	2006/95/EC 2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC
Low Voltage Directive EMC Directive Electromagnetic compatibility	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-5 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6)	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V) 6 g
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6) Resistance to vibration (IEC 68-2-6)	Level 3 (6 kV / 8 kV) Level 3 (2 kV / 5 kHz) Level 3 (2 kV / 5 kHz) Level 3 (10 V/m) Level 3 (10 V
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-5 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6)	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V) 6 g
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6) Resistance to vibration (IEC 68-2-6)	Level 3 (6 kV / 8 kV) Level 3 (2 kV / 5 kHz) Level 3 (10 V/m)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6) Resistance to vibration (IEC 68-2-6) Environmental testing (IEC 68-2-30) Electromagnetic compatibility Rated voltage between supply, measuring and output circuit	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V) 6 g 10 g 24 h cycle time, 55 °C, 93 % rel., 96 h
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-4 surge IEC/EN 61000-4-5 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6) Resistance to vibration (IEC 68-2-6) Environmental testing (IEC 68-2-30) Electromagnetic compatibility Rated voltage between supply, measuring and output circuit Rated impulse withstand voltage between all isolated circuits	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V) 6 g 10 g 24 h cycle time, 55 °C, 93 % rel., 96 h
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge IEC/EN 61000-4-2 radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3 electrical fast transient /burst IEC/EN 61000-4-3 surge IEC/EN 61000-4-4 conducted disturbances, induced by radio- frequency fields Operational reliability (IEC 68-2-6) Resistance to vibration (IEC 68-2-6) Environmental testing (IEC 68-2-30) Electromagnetic compatibility Rated voltage between supply, measuring and output circuit Rated impulse withstand voltage between all isolated circuits Test voltage between all isolated circuits	Level 3 (6 kV / 8 kV)
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge	2004/108/EC, 91/263/EEC, 92/31/EEC, 93/68/EEC, 93/67/EEC Level 3 (6 kV / 8 kV) Level 3 (10 V/m) Level 3 (2 kV / 5 kHz) Level 3/4 (1/2 kV) Level 3 (10 V) 6 g 10 g 24 h cycle time, 55 °C, 93 % rel., 96 h 250 V 4 kV / 1.2 - 50 µs 2.5 kV, 50 Hz, 1 min. 3
Low Voltage Directive EMC Directive Electromagnetic compatibility electrostatic discharge	Level 3 (6 kV / 8 kV) Level 3 (6 kV / 8 kV) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (7 kV / 5 kHz) Level 3 (8 kV / 5 kHz) Level 3 (10 kV / 5 kHz) Level 3 (10 kV / 5 kHz) Level

Thermistor motor protection relays Notes

Thermistor motor protection relays Connection diagrams

CM-MSS.11, CM-MSS.21



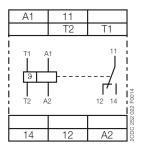
A1 - A2Control supply voltage

13 - 14n/o contact

21 – 22 n/c contact

T1 - T2 Measuring circuit

CM-MSS.12



A1 - A2Control supply voltage

11 - 12/14 c/o contact

T1 – T2 Measuring circuit

CM-MSS.13

A1 A3	11 T2	T1	
T1 A1 9 T2 A2	A3 	11 12 14	2CDC 252 020 F0014
			252
14	12	A2	SCDC

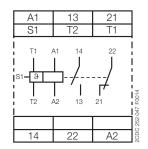
A1 - A2Control supply voltage 220-240 V AC

A2 - A3 Control supply voltage 110-130 V AC

11 - 12/14c/o contact

T1 - T2 Measuring circuit

CM-MSS.31



A1 - A2Control supply voltage

13 – 14 n/o contact

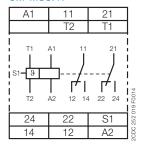
21 – 22 n/c contact

S1 - T2 Automatic reset

(iumpered)

Measuring circuit T1 - T2

CM-MSS.22, CM-MSS.32, CM-MSS.41



Control supply voltage 24 V AC/DC A1 – A2

1st c/o (SPDT) 11 - 12/14

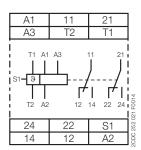
21 - 22/242nd c/o (SPDT) contact

S1 - T2 Automatic reset

(jumpered)

T1 - T2 Measuring circuit

CM-MSS.23, CM-MSS.33



A1 - A2Control supply voltage 220-240 V AC

Control supply

A2 - A3 voltage 110-130

V AC

11 - 12/141st c/o (SPDT)

contact

21 - 22/24 2nd c/o (SPDT)

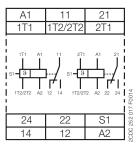
contact

S1 - T2 Automatic reset

(jumpered)

T1 – T2 Measuring circuit

CM-MSS.51



A1 – A2 Control

supply voltage 220-240 V AC

11 - 12/14 1st c/o (SPDT)

contact

2nd c/o (SPDT) 21 - 22/24

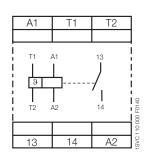
contact

S1 - 1T2/2T2 Automatic reset (jumpered)

1T1 - 1T2/2T2 Measuring circuit 1

2T1 - 1T2/2T2 Measuring circuit 2

CM-MSE



Control supply voltage A1 – A2 24 V AC

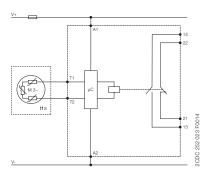
Sensor circuit

T1-T2 13-14 Output contact -

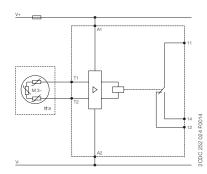
Closed circuit principle

Thermistor motor protection relays Circuit diagram

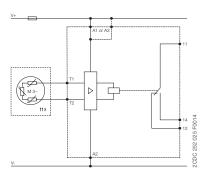
CM-MSS.11, CM-MSS.21



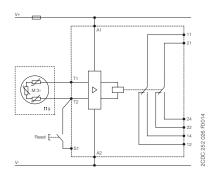
CM-MSS.12



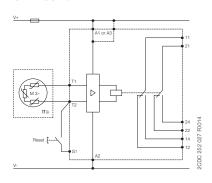
CM-MSS.13



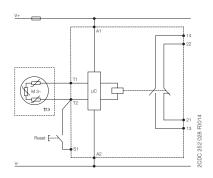
CM-MSS.22



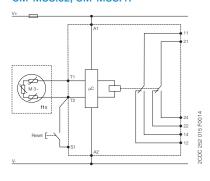
CM-MSS.23



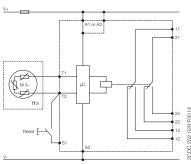
CM-MSS.31



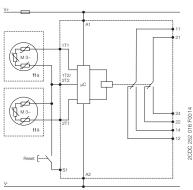
CM-MSS.32, CM-MSS.41



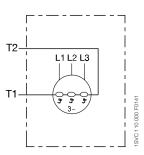
CM-MSS.33



CM-MSS.51



CM-MSE



Temperature monitoring relays Product group picture



Temperature monitoring relays Table of contents

Temperature monitoring relays

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Benefits and advantages, Applications	151
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Selection	153
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Function diagrams	155
Overview, Functional description and diagrams	156
Connection diagrams, Resistance thermometer sensors	157
Technical data - CM-TCS.xx	158
Technical data - C51x	160

Temperature monitoring relays Benefits and advantages, Applications

Overview

The temperature monitoring relays can be used for temperature measurement in solid, liquid and gaseous media. The temperature is acquired by the sensor in the medium, evaluated by the device and monitored to determine whether it is within an operating range (range monitoring function) or has exceeded or fallen below a threshold.

Characteristics CM-TCS

- Adjustable sensor type: PT100
- Functionality like overtemperature monitoring, undertemperature monitoring, temperature window monitoring
- All configurations and adjustments by front-face operating elements
- Precise adjustment with direct reading scales
- One or two threshold values
- Hysteresis 2...20 % adjustable
- Operating temperature range -40...+60 °C
- 1 x 2 c/o or 2 x 1 c/o configurable
- Open- or closed-circuit principle configurable
- Short-circuit monitoring and interrupted wire detection
- 22.5 mm (0.89 in) width
- LEDs for status indication

Functional description

The temperature monitoring relays CM-TCS monitor overtemperature, undertemperature, or temperatures between two threshold values (window monitoring) with PT100 sensor. As soon as the temperature falls below or exceeds the threshold value the output relays change their positions according to the configured functionality and the front-face LEDs display the current status. Regardless of the selected configuration, the device is monitoring its measuring circuit for interrupted wires or short-circuits.

Characteristics C512 + C513

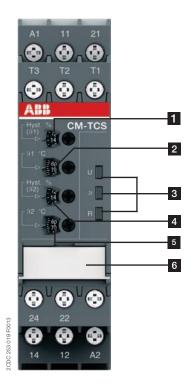
- Adjustable sensor types: PT100, PT1000, KTY83, KTY84, NTC-B57227-K333-A1
- Measuring principle for 2-wire and 3-wire sensors
- Temperature monitor for 1-3 sensor circuits
- Adjustable over-, undertemperature monitoring or range monitoring function
- 2 thresholds
- Hysteresis for both thresholds (1-99 Kelvin)
- Adjustable time delay from 0-999 s affects to both thresh-
- Storage function selectable via external signal (Y1-Y2)
- Non volatile storage of parameter settings
- 1 n/o (for wire-break and short-circuit detection) and 2 c/o
- Multifunctional digital display
- 3 LEDs for status indication
- Open- or closed-circuit principle selectable
- 45 mm wide housing with 24 terminals

C512

- Temperature monitor for 1 sensor circuit

- Temperature monitor for 1-3 sensor circuits
- In the 3-sensor version the status of the single sensors is displayed if the temperature exceeds or falls below the threshold. This way it can be easily determined which one of the connected sensors has exceeded or dropped below either one or both threshold values.

Temperature monitoring relays Operating controls



- 1 Adjustment of the hysteresis for threshold value 91
- 2 Adjustment of the threshold value 91
- 3 Indication of operational states

U: green LED - status indication of control supply voltage 9: red LED - fault message, state of measuring input R: yellow LED - status indication of the output relays

- 4 Adjustment of the hysteresis for threshold value 92
- 5 Adjustment of the threshold value 92
- 6 DIP switch functions / marker label (on page 2/104)
 - Overtemperature monitoring

 - Temperature window monitoring activated ™ Temperature window monitoring de-activated
 - Closed-circuit principle
 - Open-circuit principle
 - 2 x 1 c/o (SPDT) contact
 - 1 x 2 c/o (SPDT) contacts

Temperature monitoring relays Selection

	Order number	1SVR 730 740 R9100	1SVR 740 740 R9100	1SVR 730 740 R0100	1SVR 740 740 R0100	1SVR 730 740 R9200	1SVR 740 740 R9200	1SVR 730 740 R0200	1SVR 740 740 R0200	1SVR 730 740 R9300	1SVR 740 740 R9300	1SVR 730 740 R0300	1SVR 740 740 R0300		1SAR 700 100 R0005	1SAR 700 100 R0010	1SAR 700 110 R0010
	Type	CM-TCS.21S	CM-TCS.21P	CM-TCS.11S	CM-TCS.11P	CM-TCS.22S	CM-TCS.22P	CM-TCS.12S	CM-TCS.12P	CM-TCS.23S	CM-TCS.23P	CM-TCS.13S	CM-TCS.13P		C512-24	C512-W	C513-W
Rated control supply voltage U _s			,	,	,	,	,	,	,	,	,	,	,	,	,	,	
24 V AC/DC			•			•	•			•	•	ļ			•	ļ	
24-240 V AC/DC				•	•			•	•			•	•			•	•
Technology			:	:		:	:	:	:	:	:	:	:		:	:	
analogue					•		•	•	•		•		•		<u> </u>	ļ	ļ
digital															•	•	•
Sensor circuits (2 or 3 wire)			:	:	:	:		:	:	:	:	:	:		:	:	-
number of temperature sensors		1	1	1	1	;	1		1	1	1	1	1			1	3
number of thresholds		2	2	2	2	2	2	2	2	2	2	2	2		2	2	3
Sensor type																	
PT100		•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
PT100, KTY83, KTY84, NTC, PT1000															•	•	•
Measuring temperature range																	
-50+50 °C			•	•	•												
0+100 °C						•	•	•	•								
0+200 °C										•	•	•	•				
-50+500 °C															•	•	•
Monitoring function																	
overtemperature		•	•	•		•	•	•	•	•	•	•	•		•	•	•
undertemperature		•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
window temperature		•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
Operating principle																	_
open or closed principle		•	•	•	•	•	•	•	•	•	•	•	•		•	•	•
Output contacts			,	,			,	,		,	,		,		,	,	-
n/o		ļ	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	<u>.</u>	<u></u>		<u>.</u>	<u>.</u>	<u>.</u>			. .	1	1
<u>c/o</u>		2	2	2	2	2	2	2	2	2	2	2	2		2	2	2

Temperature monitoring relays Ordering details



CM-TCS



Description

The temperature monitoring relays of CM-TCS and C51x range are able to measure temperatures of solids, liquids and gaseous media using different types of sensors. Overtemperature and undertemperature monitoring as well as open- or closed-circuit principle is configurable for all devices. As soon as the temperature falls below or exceeds the set threshold value the output relays change their positions according to the configured functionality and the frontface LED's display the current status.

Ordering details - Temperature monitoring relays CM-TCS

Rated control supply voltage		Temperature sensors	Туре	Order code	Price	Weight (1 pce)
					1 pce	kg (lb)
	-50+50 °C		CM-TCS.11S	1SVR730740R0100		0.151 (0.333)
	-30+30 C	*	CM-TCS.11P	1SVR740740R0100		0.140 (0.309)
24-240 V AC/DC	0+100 °C		CM-TCS.12S	1SVR730740R0200		0.151 (0.333)
24-240 V AU/DU	0+100 0	PT100	CM-TCS.12P	1SVR740740R0200		0.140 (0.309)
	0+200 °C		CM-TCS.13S	1SVR730740R0300		0.151 (0.333)
			CM-TCS.13P	1SVR740740R0300		0.140 (0.309)
	-50+50 °C		CM-TCS.21S	1SVR730740R9100		0.138 (0.304)
			CM-TCS.21P	1SVR740740R9100		0.127 (0.280)
04.1/ 40/00	0 .400.00		CM-TCS.22S	1SVR730740R9200		0.138 (0.304)
24 V AC/DC	0+100 °C		CM-TCS.22P	1SVR740740R9200		0.127 (0.280)
	0 000 00		CM-TCS.23S	1SVR730740R9300		0.138 (0.304)
	0+200 °C	7	CM-TCS.23P	1SVR740740R9300		0.127 (0.280)

S: screw connection P: push-in connection

Ordering details - Temperature monitoring relays C51x

Rated control supply voltage		Temperature sensors	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V AC/DC		:	C512-24	1SAR700100R0005		0.32 (0.71)
24-240 V AC/DC	-50+500 °C	O KTY84, KTY83	C512-W	1SAR700100R0010		0.33 (0.73)
24-240 V AC/DC			C513-W	1SAR700110R0010		0.34 (0.75)

Ordering details - replaceable cover C51x

Use for	Language	Туре		Price 5 pce	Weight (1 pce) kg (lb)
C512	German	C512-D	1SVR700101R0100		
C512	English	C512-E	1SVR700102R0100		
C513	German	C513-D	1SVR700111R0100		
C513	English	C513-E	1SVR700112R0100		



Further documentation temperature monitoring relays on www.abb.com

Temperature monitoring relays Function diagrams

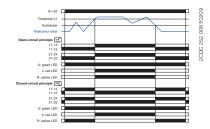
CM-TCS - Overtemperature monitoring, 1 x 2 c/o contacts was

With this configuration, settings via 92 have no influence on the operating function (92 disabled).

Open-circuit principle:

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value exceeds the adjusted threshold value ϑ 1, the output relays energize. If the measured value drops again below the adjusted threshold value §1 minus the adjusted hysteresis, the output relays de-energize. Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.



Overtemperature monitoring, 2 x 1 c/o contact

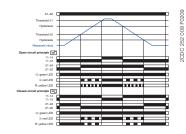
Open-circuit principle:

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value exceeds the adjusted threshold value $\vartheta 2$, output relay R2 (prewarning) energizes. If the measured value exceeds the adjusted threshold value ϑ 1, output relay R1 (final switch-off) energizes.

If the measured value drops again below the adjusted threshold value 91 minus the adjusted hysteresis, output relay R1 (final switch-off) de-energizes. If the measured value drops below the adjusted threshold value $\vartheta 2$ minus the adjusted hysteresis, output relay R2 (prewarning) de-energizes.

Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.



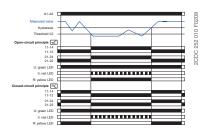
Undertemperature monitoring, 1 x 2 c/o contacts [120]

With this configuration, settings via 91 have no influence on the operating function (91 disabled).

Open-circuit principle:

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value drops below the adjusted threshold value 92, the output relays energize. If the measured value exceeds again the adjusted threshold value 92 plus the adjusted hysteresis, the output relays de-energize. Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.



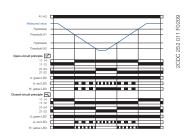
Undertemperature monitoring, 2 x 1 c/o contact

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value drops below the adjusted threshold value 91, output relay R1 (prewarning) energizes. If the measured value drops below the adjusted threshold value $\vartheta 2$, output relay R2 (final switch-off) energizes.

If the measured value exceeds again the adjusted threshold value 92 plus the adjusted hysteresis, output relay R2 (final switch-off) de-energizes. If the measured value exceeds the adjusted threshold value ϑ 1 plus the adjusted hysteresis, output relay R1 (prewarning) de-energizes.

Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.



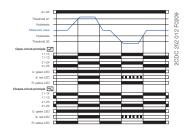
Temperature window monitoring, 1 x 2 c/o contacts was

Open-circuit principle:

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value exceeds the adjusted threshold value $\vartheta 1$ or drops below the adjusted threshold value $\vartheta 2$, the output relays energize. If the measured value drops again below the adjusted threshold value \$1 minus the adjusted hysteresis or exceeds again the adjusted threshold value 92 plus the adjusted hysteresis, the output relays deenergize.

Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.



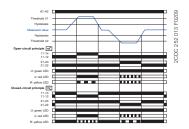
Temperature window monitoring, 2 x 1 c/o contact

If the measured value is correct, the output relays remain de-energized when control supply voltage is applied. If the measured value exceeds the adjusted threshold value 91 or drops below the adjusted threshold value 92, output relay R1 (> 91) or R2 (< 92) respectively energizes.

If the measured value drops again below the adjusted threshold value $\vartheta 1$ minus the adjusted hysteresis or exceeds again the adjusted threshold value 92 plus the adjusted hysteresis, output relay R1 (>91) or R2 (<92) respectively deenergizes.

Closed-circuit principle:

The behavior is inverse to the one with open-circuit principle.

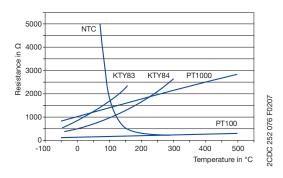


Temperature monitoring relays Overview, Functional description and diagrams

Functional description Digital tripping devices

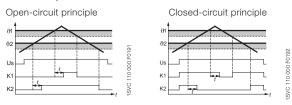
Once the temperature has reached the set threshold of $\upsilon 1$, output relay K1 changes its switching state after the set time delay t has elapsed (K2 reacts in the same way for υ 2).

Characteristic curves of resistance sensors

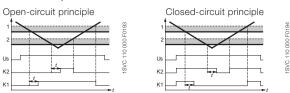


Function diagrams

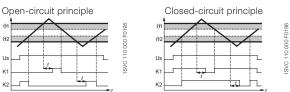
Overtemperature - C512/C513



Undertemperature - C512/C513

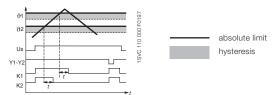


Range monitoring - C512/C513



Function principle with storage function - C512/C513

using overtemperature with closed-circuit principle as an example



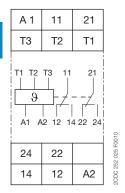
DIP switches CM-TCS

Position	4	3	2	1
ON †	2x1 c/o	closed	3	1/3
OFF	1x2 c/o	open	\mathbb{X}	3

	ON	OFF (default)
DIP switch 1 Monitoring principle	Overtemperature monitoring flovertemperature monitoring is selected, the CM-TCS recognizes temperatures above the selected threshold and trips the output relay according to the selected operating principle.	Undertemperature monitoring Important If undertemperature monitoring is selected, the CM-TCS recognizes temperatures below the selected threshold and trips the output relay according to the selected operating principle.
DIP switch 2 Temperature window monitoring	Temperature window monitoring activated if temperature window monitoring is selected, the CM-TCS monitors over- and undertemperature. If temperature window monitoring is activated, DIP switch 1 is disabled.	Temperature window monitoring de-activated 🔀 Temperature window monitoring is de-selected.
DIP switch 3 Operating principle of the output relays	Closed-circuit principle Closed-circuit principle is selected, the output relays are energized. They de-energize if a fault is occuring.	Open-circuit principle If open-circuit principle is selected, the output relays are deenergized. They energize if a fault is occuring.
DIP switch 4 2 x 1 c/o contact, 1 x 2 c/o contacts	2×1 c/o (SPDT) contact $^{\mbox{\scriptsize 2100}}$ If operating principle 2 x 1 c/o contact is selected, the output relay R1 (11-12/14) reacts to threshold value $\vartheta1$ and the output relay R2 (21-22/24) reacts to threshold value $\vartheta2$.	1 x 2 c/o (SPDT) contacts \(\frac{1\text{12.00}}{2\text{00}} \) If operating principle 1 x 2 c/o contacts is selected, both output relays R1 (11-12/14) and R2 (21-22/24) react synchronously to one threshold value. Overtemperature monitoring: Settings of the threshold value \(\frac{9}{2} \) have no effect on the operation. Undertemperature monitoring: Settings of the threshold values \(\frac{9}{2} \) have no effect on the operation.

Temperature monitoring relays Connection diagrams, Resistance thermometer sensors

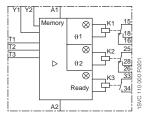
Connection diagrams



CM-TCS

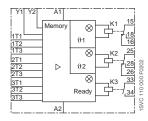
A1-A2 Control supply voltage 11-12/14 Output relay R1 21-22/24 Output relay R2

T1, T2, T3 Measuring input, connection PT100



C512

A1-A2	Rated control supp
	voltage
15-16/18	Output contacts
25-26/28	
33-34	
T1-T3	Sensor connection
Y1-Y2	Connection for
	storage bridge



C513

Rated control suppy
voltage
Output contacts
Sensor connection 1
Sensor connection 2
Sensor connection 3
Connection for

storage bridge

Connection of resistance thermometer sensors

2-wire measurement

When using 2-wire temperature sensors the sensor resistance and the wire resistance are added together.

The resulting systematic errors must be taken into account when adjusting the tripping device. PT100

A jumper must be connected between the terminals T2 and T3.

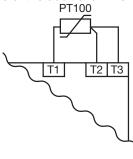
The following table can be used for PT100 sensors to determine the temperature errors caused by the line length.

When using resistance sensors with two-wire connection a bridge must be inserted between terminals T2 and T3.

3-wire measurement

To minimize the influence of the wire resistance, a three-wire connection is usually used. By means of the additional wire

two measuring circuits are created. One of these two circuits is used for reference. This way, the tripping device can calculate and take into account the wire resistance automatically.



Error caused by the line

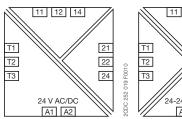
The error resulting from the line resistance amounts to approx. 2.5 Kelvin/Ohm. If the resistance of the line is not known and it is not possible to measure it, the error caused by the line can be estimated using the following table.

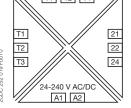
Temperature error

(depending on the line length and conductor cross section for PT100 sensors at an ambient temperature of 20 °C, in K)

Line length in m	Wire size mm²					
	0.50	0.75	1	1.5		
0	0.0	0.0	0.0	0.0		
10	1.8	1.2	0.9	0.6		
25	4.5	3.0	2.3	1.5		
50	9.0	6.0	4.5	3.0		
75	13.6	9.0	6.8	4.5		
100	18.1	12.1	9.0	6.0		
200	36.3	24.2	18.1	12.1		
500	91.6	60.8	45.5	30.2		

Electrical isolation







Protective searation acc. to IEC/EN 61140; EN 50178

Temperature monitoring relays Technical data - CM-TCS.xx

Туре			CM-TCS.11/12/13	CM-TCS.21/22/23
Input circuit				
Rated control su	pply voltage U _s A1-	-A2	24-240 V AC/DC	24 V AC/DC
Rated control su	pply voltage U _s tolerance		-15+10 %	····
Typical current /	power / consumption 24 V	DC	33 mA / 0.8 VA	18 mA / 0.45 VA
71	115 V		12.5 mA / 1.5 VA	n/a
	230 V		13 mA / 2.9 VA	n/a
Rated frequency			15-400 Hz	50/60 Hz 45-65 Hz
Frequency range Power failure but	······································		13.5-440 Hz 20 ms	: 40-00 ⊓2
Measuring circu				, T2, T3
Sensor type			PT100	
Connection of th	e sensor 2-v	vire	yes, jumper between T2-T3	
NA it it f t		vire	yes, use terminal T1, T2, T3	
Monitoring funct			overtemperature, undertemperature -50+50 °C	e or window monitoring
range			0+100 °C	
3 3			0+200 °C	-
Number of possi			2	
	adjusted threshold value		typ. ±5 % of the range end value 2-20 % of threshold value, min. 1 °C	
Measuring princi	ed to the threshold value		2-20 % of threshold value, min. 1 °C continuous current	<i>j</i>
	า the sensor circuit		0.8 mA	
	nt in sensor circuit		0.9 mA	
Interrupted wire			yes, indicated via LED status	
Short-circuit det			yes, indicated via LED status	
	the rated control supply voltage tolerance		< 0.2 °C / or < 0.01 %/K < 0.2 °C / or < 0.01 %/K	
Repeat accuracy	the temperature range y (constant parameters)		< 0.2 % of full scale	
Maximum measu			320 ms	
Output circuit				
Kind of output			2 x 1 or 1 x 2 c/o (SPDT) contacts of	configurable
Operating princip	ple		open- or closed-circuit principle co	nfigurable ¹⁾
Contact material			AgNi alloy, Cd free	
	al voltage (IEC/EN 60947-1) ing voltage / Minimum switching current		250 V AC / 300 V DC 24 V / 10 mA	
Maximum switch	ning voltage / Maximum switching current		see 'Load limit curves'	
Rated operating		0 V		
(IEC/EN 60947-1	-5) AC-15 (inductive 23	0 V	3 A	
	DC-12 (resistive) 2			
AC Rating (UL50	DC-13 (inductive) 2		B 300, pilot duty general purpose (2	250 V 4 A cos @ 0.75)
AC hatting (OLSO	maximum rated operational volta			230 V, 4 Α, 608 ψ 0.73)
	maximum continuous thermal current at B 3		4 A	
	maximum making/breaking apparent powe	r at	3600/360 VA	•
Mechanical lifetii		300	30 x 10 ⁶ switching cycles	
			0.1 x 10 ⁶ switching cycles	
Maximum fuse ra		act	6 A fast-acting	•
protection	11/0 COTIL	act	10 A fast-acting	
Conventional the	ermal current I _{th} acc. IEC/EN 60947-1		4 A	
General data				
Dimensions (W x			22.5 x 85.6 x 103.7 mm (0.89 x 3.37	7 x 4.08 in)
Mounting position	41		Screw connection technology	Easy Connect Technology (push-in)
Weight	net weight CM-TCS	3.1x	0.151 kg (0.333 lb)	0.140 kg (0.309 lb)
			0.138 kg (0.304 lb)	0.127 kg (0.280 lb)
	gross weight CM-TCS	3.1x	0.176 kg (0.388 lb)	0.165 kg (0.364 lb)
			0.163 kg (0.360 lb)	0.152 kg (0.335 lb)
Degree of protect	tormin		IP50 / IP20	
Ambient tempera	termir ature range operat		-40+60 °C	
	storage/transp		-40+85 °C	
Mounting	W		DIN rail (IEC/EN 60715), snap-on m	ounting without any tool

¹⁾ Closed-circuit principle: Output relay(s) de-energize(s) if measured value exceeds or falls below the adjusted threshold value

Temperature monitoring relays Technical data - CM-TCS.xx

Туре		CM-TCS.11/12/13	CM-TCS.21/22/23
Electrical connection			
Wire size fine-strand without wire end ferrule	22, 24	Screw connection technology 1 x 0.5-2.5 mm² (1 x 20-14 AWG) 2 x 0.5-1.5 mm² (2 x 20-16 AWG) 1 x 0.2-2.5 mm² (1 x 24-14 AWG) 2 x 0.2-1.5 mm² (2 x 24-16 AWG)	Easy Connect Technology (Push-in) 2 x 0.5-1.5 mm² (2 x 20-16 AWG) connection with lever 2 x 0.2-1.5 mm² (2 x 24-16 AWG) connection with lever
fine-strand with wire end ferrule	22, 24 T1, T2, T3	1 x 0.5-2.5 mm ² (1 x 20-14 AWG) 2 x 0.5-1.5 mm ² (2 x 20-16 AWG) 1 x 0.2-2.5 mm ² (1 x 24-14 AWG) 2 x 0.2-1.5 mm ² (2 x 24-16 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG) connection: push-in 2 x 0.2-1.5 mm² (2 x 24-16 AWG) insulated ferrule (DIN 46228-4-E): connection: push-in ferrule (DIN 46228-1-A): < 0.5 mm², connection with lever ≥ 0.5 mm², connection: push-in
rigic	22, 24	1 x 0.5-4 mm² (1 x 20-12 AWG) 2 x 0.5-2.5 mm² (2 x 20-14 AWG) 1 x 0.2-4 mm² (1 x 24-12 AWG) 2 x 0.2-2.5 mm² (2 x 24-14 AWG)	2 x 0.5-1.5 mm² (2 x 20-16 AWG) connection: push-in 2 x 0.2-1.5 mm² (2 x 24-16 AWG) < 0.5 mm², connection with lever ≥ 0.5 mm², connection: push-in
Stripping length Tightening torque		8 mm (0.32 in) 0.5 Nm (4.43 lb.in) 0.6 - 0.8 Nm (5.31 - 7.08 lb.in)	-
Standards			
Product standard Low Voltage Directive EMC Directive RoHS Directive		IEC/EN 60255-1, IEC/EN 60255-27, E 2006/95/EC 2004/108/EC 2011/65/EC	-N 50178
Environmental data	an austian /atauana / tuanan aut	10 .0000/40 .0500/40 .0500	
Ambient temperature ranges Climatic category Damp heat, cyclic Vibration, sinusoidal Shock	operation/storage/ transport	-40+60°C/-40+85°C/-40+85°C 3K5 (no condensation, no ice formati 6 x 24 h cycle, 55 °C, 95 % RH Class 2 Class 2	ion)
Isolation data			
Rated impulse withstand voltage	supply circuit / measuring circuit		-
U _{imp} between all isolated circuits (IEC/EN 60947-1, IEC/EN 60664-1)	supply circuit / output circuits measuring circuit / output circuits output circuit 1 / output circuit 2	4 kV 4 kV 4 kV	
Pollution degree (IEC/EN 60664-1) Overvoltage category (IEC/EN 60664-1) Rated insulation voltage U (IEC/EN 60947-1, IEC/EN 60664-1)	supply circuit / measuring circuit supply circuit / output circuits measuring circuit / output circuits output circuit 1 / output circuit 2	300 V 300 V 300 V	
Basis isolation for rated control supply voltage (IEC/EN 60664-1)	supply circuit / measuring circuit supply circuit / output circuits measuring circuit / output circuits output circuit 1 / output circuit 2	250 V AC / 300 V DC 250 V AC / 300 V DC 250 V AC / 300 V DC	
Protective separation (IEC/EN 61140, EN 50178) Test voltage between all isolated circuits, routine test (IEC/EN 60255-5,	supply circuit / measuring circuit supply circuit / output circuits measuring circuit / output circuits supply circuit / measuring circuit supply circuit / output circuits	250 V AC / 300 V DC 250 V AC / 300 V DC 2.0 kV, 50 Hz, 1 s	250 V AC / 250 V DC 250 V AC / 250 V DC
IEC/EN 61010-1) Test voltage between all isolated circuits, type test (IEC/EN 60255-5)	measuring circuit / output circuits supply circuit / measuring circuit supply circuit / output circuits measuring circuit / output circuits	2.0 kV, 50 Hz, 1 s 4.0 kV, 50 Hz, 1 s 4.0 kV, 50 Hz, 1 s	-
Electromagnetic compatibility			
Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	IEC/EN 61000-6-1, IEC/EN 61000-6- Level 3, 6 kV / 8 kV Level 3, 10 V/m (1 GHz) / 3 V/m (2 GHz)	
electrical fast transient/burst surge	IEC/EN 61000-4-4 IEC/EN 61000-4-5	114/11 a a u t la	ircuit and measuring circuit 1 kV L-L, 2
conducted disturbances, induced by radio-frequency fields voltage dips, short interruptions and	IEC/EN 61000-4-6		
voltage variations harmonics and interharmonics	IEC/EN 61000-4-13	Class 3	
Interference emission high-frequency radiated high-frequency conducted	IEC/CISPR 22, EN 55022 IEC/CISPR 22, EN 55022	EN 61000-6-3, EN 61000-6-4 Class B Class B	

Temperature monitoring relays Technical data - C51x

Туре		C512	C513
Input circuit	'		
Rated control supply voltage U	A1-A2 2	24 V AC/DC	-
	A1-A2 2	24-240 V AC/DC	
Power consumption	AC <	< 7 VA	
Rated control supply voltage U _s tolerance	DC <	< 4 W -15+10 %	
	L	-13+10 %	
Rated frequency	AC		
Sensor circuit	1	77400 PT4000 KTV00 KTV04 N	ITO.
Sensor type Sensor current		PT100, PT1000, KTY83, KTY84, N yp. 1 mA	IIC_
		yp. 0.2 mA	·····
Wire-break detection)	yes (not for NTC)	
Short-circuit detection		/es	
3-wire connection		yes (2-wire connection of sensors	with terminals T2 and T3 bridged)
Measuring circuit			
Setting accuracy at T _a = 20 °C (T ₂₀)	<	< ±2 K ± 1 digit	
Accuracy within the temperature range	(0.05 °C / °C deviation from T ₂₀	
Response time		500 ms	
Hysteresis settings		1-99 kelvin	·····
Tripping delay		1-99 kelvin	
Output circuit)-999 s	
Kind of output		2 c/o + 1n/o	2 c/o + 1 n/o
······································		2 C/O + 111/O n/a	: 2 0/0 + 1 11/0
		.//а З А	·····
		1 A	
		D.1 A	
Mechanical lifetime	3	30 x 10 ⁶ switching cycles	
Electrical lifetime (AC-15 at 3 A)		0.1 x 10 ⁵ switching cycles	
Max. fuse rating to achieve short-circuit protection		4 A, operating class gL/gG	
General data		45 405 0 00 (4.77 4.47	0.00 :-1
Dimensions (W x H x D) Tightening torque		45 x 105.9 x 86 mm (1.77 x 4.17 x 3 0.8-1.2 Nm	3.39 In)
Mounting position		3.0-1.2 MIII any	
		P 40 / IP 20	·····
Ambient temperature range	operation -	25+60 °C	
		40+80 °C	
Mounting]	DIN rail (IEC/EN 60715)	
Electrical connection			
Wire size		1 x 4 mm ² (1 x 12 AWG), 2 x 2.5 m	
	in wire end terrule 1	1 x 2.5 mm ² (1 x 14 AWG), 2 x 1.5 i	mm² (2 x 16 AWG)
Standards	Ti	FO 00701 0 0	
Environmental conditions Low Voltage Directive		EC 60721-3-3 EC 60947-5-1, VDE 0660	
		EC 60947-3-1, VDE 0660 EN 61000-6-2	
Interfe		EN 61000-6-4	·····
Vibration resistance (IEC 68-2-6)		5-26 Hz / 0.75 mm	
Shock resistance (IEC 68-2-27)		15 g / 11 ms	
Isolation data			
Rated insulation voltage		300 V AC	
Pollution degree	3	3	

Liquid level monitors and controls Product group picture



Liquid level monitors and controls Table of contents

Liquid level monitors and controls

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Cascading of several devices, application examples	169
Technical data - CM-ENE	170
Technical data - CM-ENS	171

Liquid level monitors and controls Benefits and advantages

CM-ENS.1x

- Control of one or two liquid levels (min/max)
- Fill or drain function
- Adjustable response sensitivity 5-100 kΩ

CM-ENS.2x

- Control of one or two liquid levels (min/max)
- Fill (UP) or Drain (DOWN), adjustable via front-face potentiometer
- Adjustable response sensitivity 0.1-1000 kΩ

CM-ENS.31

- Control of one or two liquid levels (min/max)
- Fill (UP) or Drain (DOWN), adjustable via front-face potentiometer
- Adjustable response sensitivity 0.1-1000 kΩ
- Selectable ON- or OFF-delay
- 2 c/o (SPDT) contacts

All CM-ENS devices

- Devices with wide rated control supply voltage 24-240 V AC/DC
- Cascadable
- High EMC immunity
- 3 LEDs for the indication of operational states
- Screw connection technology or Easy Connect Technology
- Housing material for highest fire protection classification UL 94 V-0
- Tool-free mounting and demounting on DIN rail
- 22.5 mm (0.89 in) width

ABB's liquid level monitoring relays are the ideal solution to regulate and control liquid levels and ratios of mixtures of conductive fluids. The assortment includes single- or multifunctional devices which can be used for overflow protection, dry-running protection of pumps, filling and draining applications as well as max. and min. level alarming.



Global availability

You will find ABB control products in any application and corner of the world. They are in skyscrapers or windfarms, in offshore platforms or industrial areas which power the world. Approved by local and international standards. We believe in the strength of our brand and products - which is supported by our global service network to ensure your peace of mind.

- Latest approvals supports your installation complies to your local standards
- The product can be used in all installations in the world
- Giving you the confidence of world-wide sourcing - no matter where you build, install or operate your equipment



Reliable in harsh conditions

Our engineers thrive on the challenge to develop products that need to operate in the most difficult electrical, mechanical and environmental conditions. Our solutions protect your application from overloads, network irregularities, mechanical wear, and environmental stresses ensuring your peace of mind. When you buy an ABB product, you buy extensive environmental testing guarantee.

- High immunitiy against electromagnetic disturbances due to advanced measuring technology
- Operation in environment with high vibrations

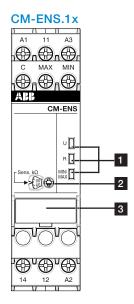


Improve installation efficiency

In everything we do, we think of the customer and the application first. Our engineers constantly look for ways to simplify the installation process by developing innovative product designs which facilitate the product assembly and avoid mounting errors. ABB product can improve our customers' productivity and machinery quality.

- Simplified wiring even in case of different cable diameters
- Easy to adjust via front-face potentiometer
- Tool-free mounting and demounting
- Tool free installation due to push-in technology

Liquid level monitors and controls Operating controls



1 Indication of operational states with LEDs

U: green LED - Status indication of control supply voltage 1 control supply voltage applied

R: yellow LED - Status indication of the output relays nergized

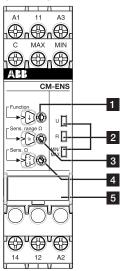
MIN/MAX: yellow LED - Status indication of the electrodes 7 MIN and MAX wet MIN wet

2 Adjustment of the response sensitivity

R: yellow LED - relay status U: green LED - control supply voltage

3 Marker label

CM-ENS.2x



1 Adjustment of the function

↑ Fill **↓** Drain

2 Indication of operational states

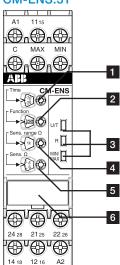
U: green LED - Status indication of control supply voltage control supply voltage applied

R: yellow LED - Status indication of the output relays 1 energized

MIN/MAX: yellow LED - Status indication of the electrodes MIN and MAX wet L MIN wet

- 3 Adjustment of the response sensitivity range
- 4 Adjustment of the response sensitivity
- 5 Marker label

CM-ENS.31



- 1 Adjustment of the time delay
- 2 Adjustment of the function

ON-delayed Fill ON-delayed Drain OFF-delayed Fill OFF-delayed Drain

3 Indication of operational states

U: green LED - Status indication of control supply voltage control supply voltage applied The time delay is running

R: yellow LED - Status indication of the output relays 7 energized

MIN/MAX: yellow LED - Status indication of the electrodes MIN and MAX wet
MIN wet

- 4 Adjustment of the response sensitivity range
- 5 Adjustment of the response sensitivity

Liquid level monitors and controls Selection

	1SVR 550 855 R9500	1SVR 550 850 R9500	1SVR 550 851 R9500	1SVR 550 855 R9400	1SVR 550 850 R9400	1SVR 550 851 R9400	1SVR 730 850 R0100	1SVR 740 850 R0100	1SVR 730 850 R2100	1SVR 740 850 R2100	1SVR 730 850 R0200	1SVR 740 850 R0200	1SVR 730 850 R2200	1SVR 740 850 R2200	1SVR 730 850 R0300	1SVR 740 850 R0300
	CM-ENE MIN	CM-ENE MIN	CM-ENE MIN	CM-ENE MAX	CM-ENE MAX	CM-ENE MAX	CM-ENS.11S	CM-ENS.11P	CM-ENS.13S	CM-ENS.13P	CM-ENS.21S	CM-ENS.21P	CM-ENS.23S	CM-ENS.23P	CM-ENS.31S	CM-ENS.31P
24-240 V AC/DC 24 V AC 110-130 V AC 220-240 V AC																
Number of electrodes (including ground reference)	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
0-100 kOhm 5-100 kOhm 0.1-1000 kOhm							adj									
Dry running protection Overflow protection Liquid level control																
Open-circuit principle Closed-circuit principle Open- or closed-circuit principle											sel	sel	sel	sel	sel	sel
0.1-10 s																
n/o c/o (SPTD)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
Push-in terminals Double-chamber cage connection terminals										•						

adj: adjustable sel: selectable

Liquid level monitors and controls Ordering details



CM-ENE MIN



CM-ENS.3x





Suspension electrode



Further documentation liquid level monitoring relays on www.abb.com

Description

The liquid level monitoring relay CM-ENS monitors and controls the liquid level and ratios of mixtures of conductive fluids. It is used for filling and draining applications, to protect pumps against dry-running, tanks against overflow and for signalization of the status of the monitored

Liquid level monitoring relays are

Suitable for		Not suitable for	
spring water	acids, bases	chemically pure water	ethylene glycol
drinking water	liquid fertilizers	fuel	concentrated alcohol
sea water	milk, beer, coffee	oils	paraffin
sewage	non-concentrated alcohol	explosive areas (liquid gas)	lacquers

Ordering details

Characteristics	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
		1SVR550855R9500		0.15 (0.33)
	CM-ENE MIN	1SVR550850R9500		0.15 (0.33)
Can "Calaction" on page 101		1SVR550851R9500		0.15 (0.33)
See "Selection" on page 181.		1SVR550855R9400		0.15 (0.33)
	CM-ENE MAX	1SVR550850R9400		0.15 (0.33)
		1SVR550851R9400		0.15 (0.33)

Ordering details

Characteristics	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
			1 pce	Kg (ID)
	CM-ENS.11S	1SVR730850R0100		0.124 (0.273)
	CM-ENS.11P	1SVR730850R2100		0.117 (0.258)
	CM-ENS.13S	1SVR740850R0100		0.153 (0.337
	CM-ENS.13P	1SVR740850R2100		0.145 (0.320
See "Selection" on page 181.	CM-ENS.21S	1SVR730850R0200		0.125 (0.276
See Selection on page 161.	CM-ENS.21P	1SVR740850R0200		0.117 (0.258
	CM-ENS.23S	1SVR730850R2200		0.154 (0.340
	CM-ENS.23P	1SVR740850R2200		0.147 (0.324
	CM-ENS.31S	1SVR730850R0300		0.143 (0.315
	CM-ENS.31P	1SVR740850R0300		0.134 (0.295

S: screw connection

P: push-in connection

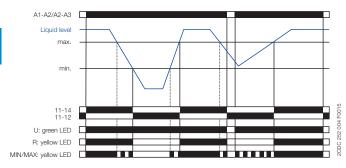
Ordering details - Bar electrodes							
Description	Material no.	Туре	Order code	Price	Weight (1 pce)		
				1 pce	kg (lb)		
Compact support for 3 bar electrodes		CM-KH-3	1SVR450056R6000		0.06 (0.132)		
Distance plate for 3 bar electrodes	-	CM-AH-3	1SVR450056R7000		0.06 (0.132)		
Counter nut for 1" thread		CM-GM-1	1SVR450056R8000		0.06 (0.132)		
Length: 300 mm	1.4301	CM-SE-300	1SVR450056R0000		0.08 (0.176)		
Length: 600 mm	1.4301	CM-SE-600	1SVR450056R0100		0.08 (0.176)		
Length: 1000 mm	1.4301	CM-SE-1000	1SVR450056R0200		0.08 (0.176)		

Ordering details - Suspension electrodes

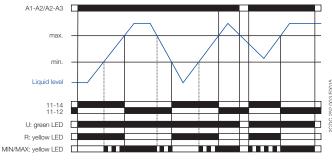
g action of the property of th							
Description	Material no.	Туре	Order code	Price	Weight (1 pce) kg (lb)		
CM-HE suspension electrode	1.4104	CM-HE	1SVR402902R0000		0.074 (0.163)		
CM-HC suspension electrode	1.4104	CM-HC	1SVR402902R1000		0.09 (0.198)		
CM-HCT supsension electrode suitable for drink water	1.4301	CM-HCT	1SVR402902R2000		0.09 (0.198)		

Liquid level monitors and controls Function diagrams

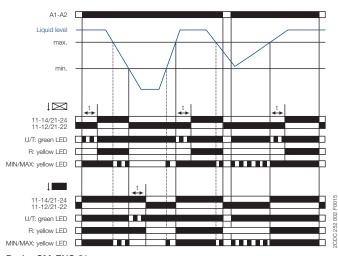
CM-ENS



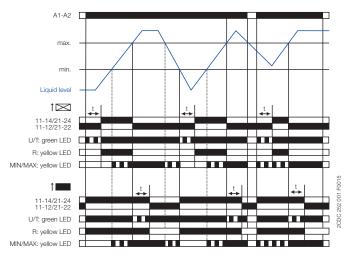
Drain: CM-ENS.1x, CM-ENS.2x



Fill: CM-ENS.2x

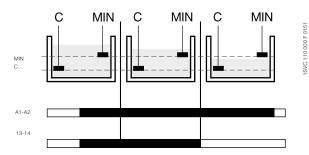


Drain: CM-ENS.31

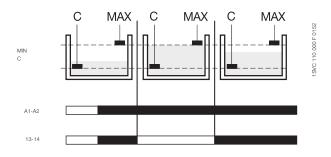


Fill: CM-ENS.31

CM-ENE MIN



CM-ENE MAX



The liquid level relays CM-ENE MIN and CM-ENE MAX are used to monitor levels of conductive liquids, for example in pump control systems for dryrunning or overflow monitoring.

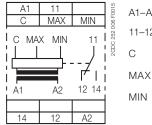
The measuring principle is based on the occurring resistance change when moisting single-pole electrodes. The single-pole electrodes (see also section Accessories) are connected to the terminals C and MIN or MAX.

If the supply voltage is applied to A1-A2 and the electrodes are wet, the output relay of the CM-ENE MIN is energized and the output relay of the CM-ENE MAX

The output relay of the CM-ENE MIN de-energizes if the electrodes are no longer wet. The output relay of the CM-ENE MAX energizes if the electrodes are no longer wet.

Liquid level monitors and controls Connection diagrams

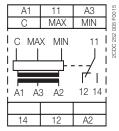
CM-ENS.11, CM-ENS.21



A1-A2 11-12/14 Control supply voltage 1 c/o (SPDT) contact Reference electrode

Maximum level electrode Minimum level electrode

CM-ENS.13, CM-ENS.23



A1-A2 A3-A2 11-12/14 С

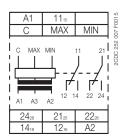
MAX MIN

Control supply voltage 220-240 V AC Control supply voltage 110-130 V AC 1 c/o (SPDT) contact

Reference electrode Maximum level electrode

Minimum level electrode

CM-ENS.31



11₁₅-12₁₆/14₁₈

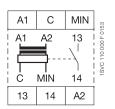
2125-2226/2428 С

MAX

Control supply voltage 1 c/o (SPDT) contact 2nd c/o (SPDT) contact Reference electrode Maximum level electrode

MIN Minimum level electrode

CM-ENE MIN

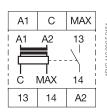


A1-A2 С MIN 13-14

Rated control supply voltage Reference electrode Minimum level Output contact -open-circuit

principle

CM-ENE MAX



A1-A2 С MIN 13-14

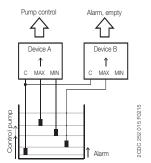
Rated control supply voltage Reference electrode Maximum level Output contact -open-circuit

principle

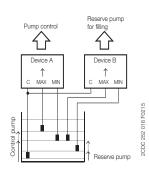
Liquid level monitors and controls Cascading of several devices, application examples

Two devices in one tank

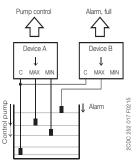
Several CM-ENS can be used in one tank. This extends the functionality with a pre-warning by two additional electrodes. In this way, two additional alarm outputs for exceeding or dropping below the normal level can be implemented in addition to the filling levels MAX and MIN.



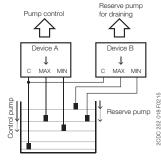
Fillling with alarm empty



Filling with reserve pump

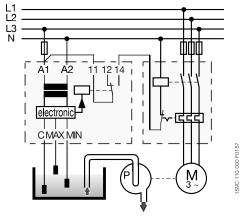


Draining with alarm full

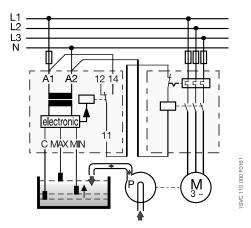


Draining with reserve pump

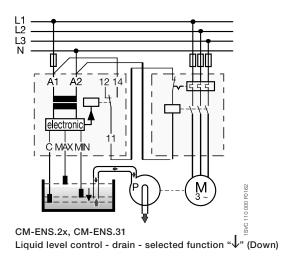
Application examples



CM-ENS.1x Liquid level control - drain



CM-ENS.2x, CM-ENS.31 Liquid level control - fill - selected function "1" (UP)



Liquid level monitors and controls Technical data - CM-ENE

Туре	CM-ENE MIN	CM-ENE MAX
Supply circuit		•
	24 V AC	approx. 1.5 VA
	110-130 V AC	
		approx. 1.2 VA
A1-AZ	220-240 V AC	approx. 1.4 VA
Rated control supply voltage U _s tolerance	-15+15 %	
Rated frequency	50-60 Hz	••••
Duty time	100 %	
		NAMY 0
Measuring circuit		C, MAX-C
Monitoring function	dry-running protection	overflow protection
Response sensitivity	0-100 kΩ, not adjustable	
Maximum electrode voltage	30 V AC	
Maximum electrode current	1.5 mA	•••••
Electrode supply line max. cable capacity		••••
max. cable length	30 m	
Timing circuit		
Time delay	<u> </u> -	.
Tripping delay	fixed approx. 200 ms	
Indication of operational states		
Output relay energized	R: yellow LED	
		0.14
Output circuits		3-14
Kind of output	1 n/o contact	
Operational principle 1)	open-circuit principle	closed-circuit principle
Contact material	AgCdO	
Rated operational voltage U _e (IEC/EN 60947-1)		•
	- / -	
Mininimum switching voltage / minimum switching current		
Maximum switching voltage	250 V	.
Rated operational current I AC-12 (resistive) 230 V	4 A	
(IEC/EN 60947-5-1) AC-15 (inductive) 230 V	13 A	•
DC-12 (resistive) 24 V		···•
DC-13 (inductive) 24 V		
AC rating (UL 508) Utilization category (Control Circuit Rating Code)	B 300	
max. rated operational voltage	300 V AC	••••••
max. continuous thermal current at B 300	15 A	••••
max. making/breaking apparent power at B 300		
Mechanical lifetime	30 x 10 ⁶ switching cycles	
Electrical lifetime (AC-12, 230 V, 4 A)	0.3 x 10 ⁶ switching cycles	
Max. fuse rating to achieve short-circuit n/c contact	-	
protection n/o contact	10 A fast-acting	••••
General data	J	
	100 E v 70 v 70 E mana (0 00 v 0 07 v 0	(m) (m)
Dimensions (W x H x D)	22.5 x 78 x 78.5 mm (0.89 x 3.07 x 3	3.09 In)
Mounting position	any	
Degree of protection enclosure / terminals	IP50 / IP20	
Ambient temperature range operation / storage	-20+60 °C / -40+85 °C	••••
Mounting	DIN rail (IEC/EN 60715)	••••
	Birrair (IEO/Eirroof To)	
Electrical connection	007545. 0/0 //2 //2 //2	
	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)	···•
fine-strand without wire-end ferrule		
riaid	2 x 0.75-1.5 mm ² (2 x 18-16 AWG)	
Stripping length	10 mm (0.39 inch)	
Tightening torque	0.6-0.8 Nm	····
Standards	1 2.2 3.0	
	TIEO OFF O EN OCCES O	
Product standard	IEC 255-6, EN 60255-6	
Low Voltage Directive	2006/95/EC	
EMC Directive	2004/108/EC	
Electromagnetic compatibility		2, EN 61000-6-4
		L, Lit 01000 0 T
	Level 3 (6 kV / 8 kV)	
radiated, radio-frequency, electromagnetic field IEC/EN 61000-4-3		
	Level 3 (2 kV / 5 kHz)	
surge IEC/EN 61000-4-5	Level 4 (2 kV L-L)	
conducted disturbances, induced by radio- IEC/EN 61000-4-6	Level 3 (10 V)	
frequency fields	, ,	
Resistance to vibration (IEC 68-2-6)	6 g	•••••
Mechanical resistance (IEC 68-2-6)	10 g	
Isolation data		
Rat. insulation volt. betw. supply, meas. & output circuit (VDE 0110, IEC 60947)	250 V	
Rated impulse withstand voltage between all isolated circuits	4 kV / 1.2-50 μs	••••••
(VDE 0110, IEC 664)	/= [
	0.5 137 50 11- 1	
Test voltage between all isolated circuits	2.5 kV, 50 Hz, 1 min.	.
Pollution category (VDE 0110, IEC 664, IEC 255-5)	3/C	
Overvoltage category (VDE 0110, IEC 664, IEC 255-5)	III / C	
Environmental testing (IEC 68-2-30)	24 h cycle time, 55 °C, 93 % rel., 96	h
	1 =	••

¹⁾ Open-circuit principle: Output relay energizes if the measured value exceeds/drops below the adjusted threshold. Closed-circuit principle: Output relay de-energizes if the measured value exceeds/drops below the adjusted threshold.

Liquid level monitors and controls Technical data - CM-ENS

Туре		CM-E	NS.1x	CM-I	ENS.2x	CM-E	ENS.31					
Supply circuit												
Rated control supply CM-ENS.11, CM-ENS.21, CM-ENS.31: A1-A2 voltage U _S CM-ENS.13, CM-ENS.23: A1-A2				.		.						
voltage o _s	CM-ENS.13, CM-ENS.23: A1-A	I										
	CM-ENS.13, CM-ENS.23: A3-A	2 110-130 V A	iC									
Rated control supply voltag	ge U _s tolerance	-15+10 %										
Rated frequency		50-60 Hz		••••••		•••••••	. •••••••					
Frequency range	······································	47-63 Hz	• • • • • • • • • • • • • • • • • • • •	····		·····•	••••••					
			W	25 mA / 0.0	3 W	25 mA / 0.6	 3 W					
Typical callent, petrol co.	110-130 V A			20 mA / 2.6 VA		8 mA / 1.1 VA						
	220-240 V A			8.5 mA / 2		10 mA / 2.4						
	24-240 V AC/D			11 mA / 2.6		11 mA / 2.6						
				11 IIIA / 2.0) VA	11 IIIA / 2.0						
Power failure buffering time			•	···•		····•	· •····					
Start-up time t _s	Range 5-100 kg				-	· •· · · · · · · · · · · · · · · · · ·						
	Range 0.1-1 kg			max. 900 ms		•						
	Range 1-10 kg	.5 -	- max. 900 ms									
	Range 10-100 kg	Ω -	- max. 1.3 s			•	• • • • • • • • • • • • • • • • • • • •					
Range 100-1000 kΩ		2 -		max. 6.3 s								
Measuring circuit			MAX-	-MIN-C								
Sensor type		electrode										
Monitoring function		fill or drain	•	fill or drain	, selectable		· •·····					
Measuring principle		conductivity	/ measurem	nent			. *					
Number of electrodes Response sensitivity		3 adjustable:	5-100 kO	adiustable:	0.1-1000 kg	0	· •·····					
Maximum electrode voltage	0 0		6 V AC				• • • • • • • • • • • • • • • • • • • •					
Maximum electrode curren		1 mA	1 mA 2 mA									
		max cable				e max cable	max cab					
Electrode supply line	Range 5-100 k	capacity Ω 10 nF	lenght 100 m	capacity	lenght	capacity	lenght					
Liectrode Supply line	Range 0.1-1 kg		-	200 nF	1000 m	200 nF	1000 m					
	Range 1-10 kg	Ω -	-	200 nF	1000 m	200 nF	1000 m					
	Range 10-100 kg	5 -	-	20 nF	100 m	20 nF	100 m					
Max. measuring cycle	Range 100-1000 k Range 5-100 k	Ω 1000 ms	-	4 nF	20 m	4 nF	20 m					
wax. measuring cycle	Range 0.1-1 kg	Ω -	•	700 ms		<u>i</u>	. •					
	Range 1-10 kg	Ω -	- 700 ms									
	Range 10-100 kg	- 1.1 s					· •····					
Timing always	Range 100-1000 kg	.2 -		5 s								
Timing circuit Time delay		1-				0.1-30 s, a	diuetabla					
Time delay						ON- or OFF-delay						
Indication of operational st	tates					•						
Control supply voltage				U: green LED								
Output relay energized							R: Yellow LED					
Electrode / alarm status		R: Yellow LE	ΞD	···•	···	····•						
			ΞD									
Output circuits	11 -12 /14	R: Yellow LE MAX/MIN: Y	ED Yellow LED	tact		relay 1st c	/o (SPDT)					
Output circuits	11 ₁₅ -12 ₁₆ /14	R: Yellow LE MAX/MIN: Y	ED Yellow LED	tact		relay, 1st c.	/o (SPDT)					
Output circuits	11 ₁₅ -12 ₁₆ /14 21 ₁₅ -22 ₁₆ /24	R: Yellow LE MAX/MIN: Y	ED Yellow LED	tact		contact relay, 2nd o	· • · · · · · · · · · · · · · · · · · ·					
Output circuits Kind of output		R: Yellow LE MAX/MIN: Y	ED /ellow LED (SPDT) con			contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle		R: Yellow LE MAX/MIN: Y relay, 1 c/o relay - open-circuit	ED Yellow LED (SPDT) con t principle		osed-circuit	contact relay, 2nd o	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material	21 ₁₅ -22 ₁₆ /24	R: Yellow LE MAX/MIN: Yellow 18 relay, 1 c/o open-circuit AgNi alloy, (ED Yellow LED (SPDT) con t principle		osed-circuit	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U	21 ₁₅ -22 ₁₆ /24 J _e IEC/EN 60947-	R: Yellow LE MAX/MIN: Yellow 18 relay, 1 c/o open-circuit AgNi alloy, (1 250 V AC	ED /ellow LED (SPDT) con t principle Cd free		osed-circui	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U	21 ₁₅ -22 ₁₆ /24	R: Yellow LE MAX/MIN: Yellow, 1 c/o relay, 1 c/o open-circuit AgNi alloy, 0	ED Yellow LED (SPDT) con I principle Od free		osed-circui	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage	21 ₁₅ -22 ₁₆ /24 U _a IEC/EN 60947- b / minimum switching current ge / Maximum switching current _e (IEC/EN 60947-5-1) AC-12 (resistive) 230	R: Yellow LE MAX/MIN: Yellow LE MAX/MIN: Yellow Relay, 1 c/o Open-circuit AgNi alloy, (1 250 V AC 12 V / 10 m, See data sh V 4 A	ED Yellow LED (SPDT) con I principle Od free		osed-circui	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage	J ₁₅ -22 ₁₆ /24 J _e IEC/EN 60947- b / minimum switching current ge / Maximum switching current (IEC/EN 60947-5-1) AC-12 (resistive) 230 AC-15 (inductive) 230	R: Yellow LE MAX/MIN: \\ R: Yellow LE MAX/MIN: \\ relay, 1 c/o open-circuit AgNi alloy, (1 250 V AC 12 V / 10 m, see data sh V 4 A V 3 A	ED Yellow LED (SPDT) con I principle Od free		osed-circui	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage	J _e IEC/EN 60947- by / minimum switching current ge / Maximum switching current (IEC/EN 60947-5-1) AC-12 (resistive) 230 AC-15 (inductive) 230 DC-12 (resistive) 24	R: Yellow LE MAX/MIN: \\ R: Yellow LE MAX/MIN: \\ relay, 1 c/o open-circuit AgNi alloy, (1) 1 250 V AC 12 V / 10 m, see data sh V 4 A V 3 A V 4 A	ED Yellow LED (SPDT) con I principle Od free		osed-circui	contact relay, 2nd o contact	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage Rated operational current I	J _e IEC/EN 60947- 21 ₁₅ -22 ₁₆ /24 J _e IEC/EN 60947- 3/ minimum switching current ge / Maximum switching current a(IEC/EN 60947-5-1) AC-12 (resistive) 230 AC-15 (inductive) 230 DC-13 (inductive) 24 DC-13 (inductive) 24	R: Yellow LE MAX/MIN: Yellow LE MAX/MIN: Yellow Relation open-circuit AgNi alloy, (1) 1 250 V AC 1 2 V / 10 m, see data sh V 4 A V 3 A V 2 A	ED Yellow LED (SPDT) con I principle Od free A eets	open- or c		contact relay, 2nd o contact t principle (sel	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage Rated operational current I	Je IEC/EN 60947- p / minimum switching current pe / Maximum switching current (IEC/EN 60947-5-1) AC-12 (resistive) 230	R: Yellow LE MAX/MIN: \(\) Relay, 1 c/o Open-circuit AgNi alloy, (1 250 V AC 12 V / 10 m, see data sh V 4 A V 4 A V 2 A D) B 300, pilot	ED Yellow LED (SPDT) con I principle Od free A eets	open- or c		contact relay, 2nd o contact t principle (sel	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage Rated operational current I	J _e IEC/EN 60947- b / minimum switching current ge / Maximum switching current (IEC/EN 60947-5-1) AC-12 (resistive) 230 AC-15 (inductive) 230 DC-13 (inductive) 24 DC-13 (inductive) 24 accurate a control circuit Rating Code max. rated operational voltage	R: Yellow LE MAX/MIN: \(\) relay, 1 c/o open-circuit AgNi alloy, (1 250 V AC 12 V / 10 m, see data sh V 4 A V 3 A V 4 A V 2 A B) B 300, pilot e 300 V AC	ED Yellow LED (SPDT) con I principle Od free A eets	open- or c		contact relay, 2nd o contact t principle (sel	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage U Minimum switching voltage Maximum switchting voltage Rated operational current I AC rating (UL 508) Uti	Je IEC/EN 60947- p / minimum switching current pe / Maximum switching current (IEC/EN 60947-5-1) AC-12 (resistive) 230	R: Yellow LE MAX/MIN: \\	CSPDT) con (SPDT) con t principle Cd free A eets duty gener	open- or cl		contact relay, 2nd o contact t principle (sel	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage Uninimum switching voltage Maximum switching voltage Maximum switching voltage Maximum switching voltage Act rating (UL 508) Uti	J _e IEC/EN 60947- b / minimum switching current ge / Maximum switching current ge / Maximum switching current ge / Maximum switching current AC-12 (resistive) 230 AC-15 (inductive) 230 DC-12 (resistive) 24 DC-13 (inductive) 24 Ilization category (Control Circuit Rating Code max. rated operational voltag max. continuous thermal current at B 30 ax. making/breaking apparent power at B 30	R: Yellow LE MAX/MIN: \) relay, 1 c/o open-circuit AgNi alloy, (1 250 V AC 12 V / 10 m, see data sh V 4 A V 3 A V 4 A V 2 B B 300, pilot e, 300 V AC 0 5 A 0 3600/360 V 10 x 10° swi	CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR	open- or cl		contact relay, 2nd o contact t principle (sel	c/o (SPDT)					
Output circuits Kind of output Operational principle Contact material Rated operational voltage Uninimum switching voltage Maximum switchting voltage Rated operational current I AC rating (UL 508) Uti	J _e IEC/EN 60947- b / minimum switching current ge / Maximum switching current ge / Maximum switching current ge (IEC/EN 60947-5-1) AC-12 (resistive) 230 AC-15 (inductive) 230 DC-12 (resistive) 24 DC-13 (inductive) 24 Ilization category (Control Circuit Rating Code max. rated operational voltag max. continuous thermal current at B 30 ax. making/breaking apparent power at B 30 30 V, 4 A)	R: Yellow LE MAX/MIN: \\	ED Yellow LED (SPDT) con t principle Cd free A eets duty gener A itching cycl- vitching cycl-	open- or cl		contact relay, 2nd o contact t principle (sel	ectable)					

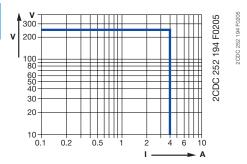
Liquid level monitors and controls Technical data - CM-ENS

Туре		CM-ENS.1x	CM-ENS.2x	CM-ENS.31
General data		JIII ZITOLIX	: Jill LITOILA	5.77 2110101
MTBF		on request		
Duty time		100 %		• • • • • • • • • • • • • • • • • • • •
Dimensions (W x H x D)	product dimensions packaging dimensions	30 x 97 x 109 mm (1.1		
Weight Mounting position		see "Ordering details" any	on page	•
Minimum distance to other units		CM-ENS.x1: not neces		
Degree of protection	housing / terminals	······		•••••••••••
Material of housing		UL 94 V-0		.,
Mounting Electrical connection		DIN rail (IEC/EN 60715	s), snap-on mounting withou	ut any tool
Electrical connection		Screw connection tec	hnology Fasy Conne	ect Technology (push-in
Wire size	wire end ferrule	1 x 0.5-2.5 mm ² (1 x 2 2 x 0.5-1.5 mm ² (2 x 2 1 x 0.5-4 mm ² (1 x 20-	0-14 AWG) 2 x 0.5-1.5 0-16 AWG)	mm² (2 x 20-16 AWG) mm² (2 x 20-16 AWG)
		2 x 0.5-2.5 mm ² (2 x 2	0-14 AWG)	
Stripping length		8 mm (0.32 in)	00 lb !-\	
Tightening torque Standards		0.6 - 0.8 Nm (5.31 - 7.	08 lb.in) <u>:</u> -	
Product standard		IEC/EN 60255-1		
Other standards		EN 50178, IEC/EN 602	204	
Low Voltage Directive		2006/95/EC		
RoHS Directive		2011/65/EC		
EMC Directive		2004/108/EC		
Environmental data Ambient temperature ranges	operation	-25+60 °C		
Ambient temperature ranges	storage	•		
Damp heat, cyclic (IEC/EN 60068-2-3		6 x 24 h cycle, 55 °C,	95 % BH	• • • • • • • • • • • • • • • • • • • •
Climatic category (IEC/EN 60721-3-3)	O)	3K5 (no condensation		••••••
Vibration, sinusoidal (IEC/EN 60255-2	1-1)	Class 2	, no loc formation,	•
Shock (IEC/EN 60255-21-2)	i/	Class 2	·····•	•
Isolation data				
Rated impulse withstand voltage	supply circuit / measuring circuit	4 kV		
U _{imp} between all isolated circuits	supply circuit / output circuits	4 kV	·····	•
(IEC/EN 60947-1, IEC/EN 60664-1)	measuring circuit / output circuits	4 kV		•••••
	output circuit 1 / output circuit 2	4 kV		• • • • • • • • • • • • • • • • • • • •
Pollution degree (IEC/EN 60664-1)		3	*	***************************************
Overvoltage category (IEC/EN 60664-	1)	III	· · · · · · · · · · · · · · · · · · ·	
Rated insulation voltage U (IEC/EN 6064-1)	supply circuit / measuring circuit supply circuit / output circuits	300 V	····•	•
	measuring circuit / output circuits	300 V	····•	······································
••••	output circuit 1 / output circuit 2	300 V		
Basis isolation for rated control	supply circuit / measuring circuit	250 V AC / 300 V DC		
supply voltage (IEC/EN 60664-1)	supply circuit / output circuits measuring circuit / output circuits			• • • • • • • • • • • • • • • • • • • •
	output circuit 1 / output circuit 2	250 V AC / 300 V DC		
Protective separation	supply circuit / measuring circuit	250 V AC / 300 V DC		
(IEC/EN 61140, EN 50178)	supply circuit / output circuits			•
Test voltage between all	measuring circuit / output circuits supply circuit / measuring circuit	2.0 kV, 50 Hz 1 s		
isolated circuits, routine test	supply circuit / output circuits	2.0 kV, 50 Hz, 1 s		
(IEC/EN 60255-5)	measuring circuit / output circuits	2.0 kV, 50 Hz, 1 s		
Test voltage between all isolated	supply circuit / measuring circuit	2.0 kV, 50 Hz, 1 s		
circuits, type test (IEC/EN 60255-5)	measuring circuit / output circuits			
Electromagnetic compatibility		, =.0, 00 112, 10		
Interference immunity to		EN 61000-6-1, EN 610	000-6-2, EN60255-26	
electrostatic discharge radiated, radio-frequency,	IEC/EN 61000-4-2 IEC/EN 61000-4-3	Level 3 (6 kV / 8 kV) Level 3 (10 V/m)		······································
electromagnetic field electrical fast transient / burst	IFC/FN 61000-4-4	Level 3, 2 KV / 5 kHz	.	
surge	IEC/EN 61000-4-4	Level 3, installation cla	ass 3, supply circuit and me	-
conducted disturbances, induced by radio-frequency	IEC/EN 61000-4-6			
fields voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11			
Interference emission		IEC/EN 61000-6-3, IE	C/EN 61000-6-4 CM-ENS.x3: Class B	
high-frequency radiated	IEC/CISPR 22, EN 55022	CM-ENS.x1: Class A,	CM-ENS.x3: Class B	
high-frequency conducted	IEC/CISPR 22, EN 55022	UIVI-ENS.XI: Class A,	UIVI-EINO.XJ: UIBSS B	

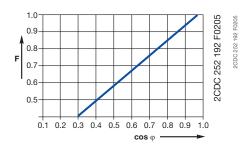
General technical data, Accessories, Current transformers Technical diagrams - CM-range

Load limit curves

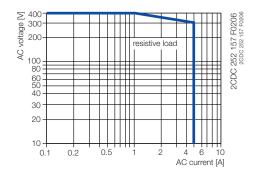
CM-S (22.5 mm), CM-E (22.5 mm), CM-UFD.M22 AC load (resistive)



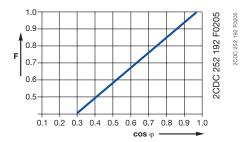
Derating factor F for inductive AC load



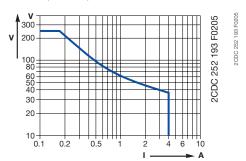
CM-N (45 mm) AC load (resistive)



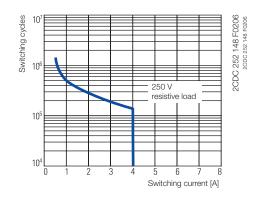
Derating factor F for inductive AC load



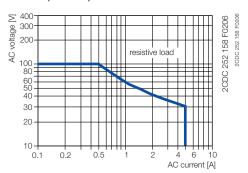
DC load (resistive)



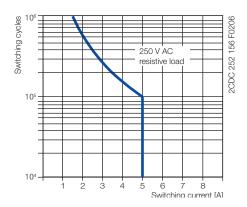
Contact lifetime



DC load (resistive)

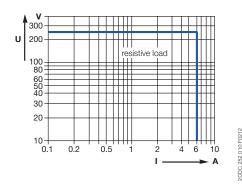


Contact lifetime

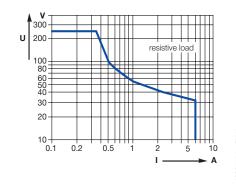


General technical data, Accessories, Current transformers Technical diagrams - CM-range

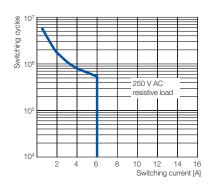
Load limit curves CM-UFD.M21



AC load (resistive)



DC load (resistive)

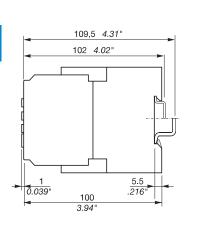


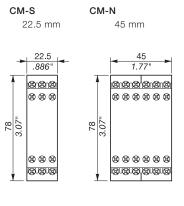
Contact lifetime

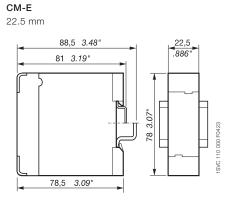
General technical data, Accessories, Current transformers Dimensional drawings

Measuring and monitoring relays CM range old housing

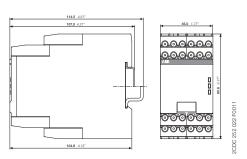
Dimensions in mm



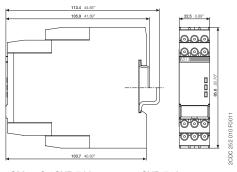




Measuring and monitoring relays CM range new housing

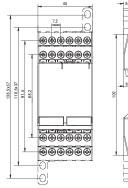


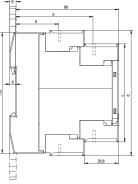
CM-xxN 1SVR 750 xxx xxx, 1SVR 760 xxx xxx 45 mm

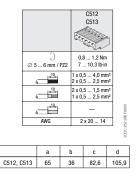


CM-xxS 1SVR 730 xxx xxx, 1SVR 740 xxx xxx 22.5 mm

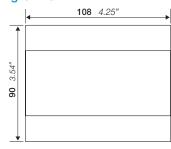
Temperature monitoring relays







Dimensional drawing CM-UFD.Mxx 3.54" 6

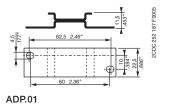


45 mm

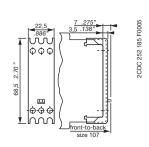
C512/C513

General technical data, Accessories, Current transformers Ordering details - CM-range accessories

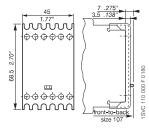
Accessories







Sealable cover COV.01



Sealable cover COV.02

Descrip- tion	For type	Width in mm	for devices	Type	Order code	Price pce	Pkg qty	Weight (1 pce) g (oz)
Adapter for screw	CM-S CM-S.S/P	22.5		ADP.01	1SVR430029R0100		1	18.4 (0.65)
	CM-N CM-N.S/P	45		ADP.02	1SVR440029R0100		1	36.7 (1.30)
Marker label	CM-S, CM-N CM-S.S/P CM-N.S/P		without DIP switches	MAR.01	1SVR366017R0100		10	0.19 (0.007)
	CM-S, CM-N		with DIP switches	MAR.02	1SVR430043R0000		10	0.13 (0.005)
	CM-S.S/P CM-N.S/P		with DIP switches	MAR.12	1SVR730006R0000		10	0.152 (0.335)
Sealable transparent cover	CM-S	22.5		COV.01	1SVR430005R0100		1	5.2 (0.18)
	CM-N	45		COV.02	1SVR440005R0100		1	7.7 (0.27)
	CM-S.S/P	22.5		COV.11	1SVR730005R0100		1	4.0 (0.129)
	CM-N.S/P	45	:	COV.12	1SVR750005R0100		1	7 (0.247)

General technical data, Accessories, Current transformers Ordering details - CM-CT current transformers



CM-CT



with mounted accessories



CM-CT-A mounted on DIN rail

Plug-in current transformers CM-CT

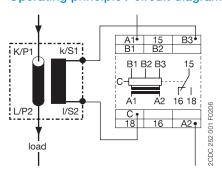
- Without primary conductor though with foot angle, insulating protective cap and bar fastening screws
- Primary / rated current from 50 A to 600 A
- Secondary current of 1 A or 5 A
- Class 1

Rated primary current	Secondary current	Burden class	Type	Order code	Price pce	Weight (1 pce) g (oz)	
50 A		1 VA / 1	CM-CT 50/1	1SVR450116R1000		0.31 (0.683)	
75 A		1.5 VA / 1	CM-CT 75/1	1SVR450116R1100		0.31 (0.683)	
100 A		2.5 VA / 1	CM-CT 100/1	1SVR450116R1200		0.276 (0.608)	
150 A		2.5 VA / 1	CM-CT 150/1	1SVR450116R1300		0.32 (0.705)	
200 A	1 A	2.5 VA / 1	CM-CT 200/1	1SVR450116R1400		0.222 (0.489)	
300 A		5 VA / 1	CM-CT 300/1	1SVR450117R1100		0.29 (0.639)	
400 A		5 VA / 1	CM-CT 400/1	1SVR450117R1200		0.27 (0.595)	
500 A		5 VA / 1	CM-CT 500/1	1SVR450117R1300		0.29 (0.639)	
600 A		5 VA / 1	CM-CT 600/1	1SVR450117R1400		0.24 (0.529)	
50 A		1 VA / 1	CM-CT 50/5	1SVR450116R5000		0.3 (0.661)	
75 A		1.5 VA / 1	CM-CT 75/5	1SVR450116R5100		0.31 (0.683)	
100 A		2.5 VA / 1	CM-CT 100/5	1SVR450116R5200		0.31 (0.683)	
150 A	5 A	2.5 VA / 1	CM-CT 150/5	1SVR450116R5300		0.28 (0.617)	
200 A		5 VA / 1	CM-CT 200/5	1SVR450116R5400		0.29 (0.639)	
300 A		5 VA / 1	CM-CT 300/5	1SVR450117R5100		0.252 (0.556)	
400 A		5 VA / 1	CM-CT 400/5	1SVR450117R5200		0.26 (0.573)	
500 A		5 VA / 1	CM-CT 500/5	1SVR450117R5300		0.208 (0.459)	
600 A		5 VA / 1	CM-CT 600/5	1SVR450117R5400		0.21 (0.463)	

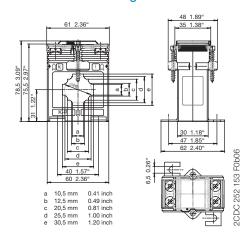
Ordering details - Accessories

Description	Туре	Order code		Weight
				(1 pce)
			10 pces	g (oz)
Snap-on fastener for DIN rail mounting of CM-CT	CM-CT A	1SVR450118R1000		0.009 (0.02)

Operating principle / circuit diagram



Dimensional drawing



General technical data, Accessories, Current transformers Notes

Primary switch mode power supplies Product group picture



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Primary switch mode power supplies Overview

Modern power supply units are a vital component in most areas of energy management and automation technology. ABB as your global partner in these areas pays the utmost attention to the resulting requirements. Innovation is the key to a substantial enlargement of our power supply product program:

CP-D range Distribution panel design



- Output voltages 12 and 24 V DC
- Output currents 0.42, 0.83, 1.3, 2.1, 2.5, 4.2 A
- Power range 10, 30, 60, 100 W
- Wide range input 100-240 V AC (90-264 V AC, 120-375 V DC)
- High efficiency of up to 89 %
- Low power dissipation and low heating
- Heights of only 91 mm (3.583 in)
- Distribution panel design

CP-E range up to 100 W **Economy range**



- Rated output voltages 5, 12, 24 V DC, adjustable
- Output currents from 0.625 up to 10 A
- Power range from 15 up to 60 W
- High efficiency of up to 90 %
- Low power dissipation and low heating
- Wide ambient temperature range from -40 to +70 °C

CP-E above 100 W Economy range **CP-T Three-phase range**



- Rated output voltages 12, 24, 48 V DC, adjustable
- Output currents 5, 10, 20, 40 A
- Power range CP-E 120, 240, 480 W CP-T: 120, 240, 480, 960 W
- High efficiency up to 90% (CP-E) / 93% (CP-T)
- Low power dissipation and low heating
- Wide ambient temperature range from -40 to +70 °C

CP-C.1 range High-performance range



- Rated output voltage 24 V DC, adjustable
- Output current 5 A, 10 A and 20 A
- Typical efficiency of up to 94 %
- Power reserve design delivers up to 150 % of the nominal output current
- Signaling outputs for DC OK and power reserve mode
- High power density leads to very compact and small devices

CP-B range Short time buffers



- Ultra cap based buffer modules for short time UPS systems
- Rated input voltage 24 V DC
- Rated currents 3, 10, 20 A
- Expandable with CP-B EXT.2 module
- LEDs for status indication
- High efficiency, higher than 90%
- Signaling and status outputs
- Buffer times at 100% load current from 13 s to 38 s (depending on device)

Primary switch mode power supplies Approvals and marks

		CP-D	CP-E	CP-T	CP-C.1 ¹⁾	CP-B	Redundancy units
CUL US	UL 508, CAN/CSA C22.2 No.107.1	All	All	All		All	-
c FL °us	UL 1310, CAN/CSA C22.2 No.223 (Class 2 Power Supply)	All except: CP-D 24/4.2	All except: CP-E 12/10.0, CP-E 24/5.0, CP-E 24/10.0, CP-E 24/20.0, CP-E 48/5.0, CP-E 48/10.0	-		-	-
c 711 °us	UL 60950, CAN/CSA C22.2 No.60950	All	All	All		-	All except CP-D RU
c FL °us	ANSI/ISA-12.12 (Class I, Div. 2, hazardous locations) CAN/CSA C22.2 No. 213	-	All	All		-	-
CB scheme	CB Scheme	All	-	-		-	All except CP-D RU
EAC	EAC	All	All	All		All	All except CP-D RU
(W)	ccc	All	All	-		-	-
coc	GB4943, GB9254, GB17625.1	-	-	All		-	-
CE	Communauté Européenne	All	All	All		All	All
	RCM	All	All	All		-	Available CP-A RU, CP-D RU Pending CP-A CM

¹⁾ CP-C.1 approvals pending

Primary switch mode power supplies Selection table - Single-phase

		Order number	1SVR427041R1000	1SVR427043R1200	1SVR427041R0000	1SVR427043R0100	1SVR427044R0200	1SVR427045R0400	1SVR427033R3000	1SVR427032R1000	1SVR427035R1000	1SVR427030R0000	1SVR427031R0000	1SVR427032R0000	1SVR427034R0000	1SVR427035R0000	1SVR427036R0000	1SVR427030R2000	1SVR427031R2000	1SVR427034R0000	1SVR427035R2000		1SVR360563R1001	1SVR360663R1001	1SVR360763R1001
												Si	ngle	-pha									_		
	1	5 V DC			. (CP-I)							:	СР	-E		:	:	:	:	:	С	P-C	.1
Rated output vo		2 V DC					<u>.</u>													<u>.</u>					
		4 V DC		-					 																
		3 V DC		 				_	 					_			_					.		_	
Rated output cu		0.42 A																							
	0	.625 A																							
		0.75 A	ļ	<u>.</u>			<u>.</u>		 			П							ļ	ļ	ļ	<u>.</u>			ļļ
		0.83 A		ļ			<u>.</u>		 										<u> </u>	<u> </u>	<u>.</u>	<u>.</u>	ļ	ļ	ļļ
		1.25 A	ļ	ļ			<u> </u>		 											ļ	ļ	<u>.</u>	ļ		ļļ
	***************************************	1.3 A 2.1 A	ļ	_			<u>.</u>		 										<u>.</u>		ļ	<u>.</u>			<u> </u>
		2.5 A	ļ						 										ļ		ļ	<u>.</u>			
	***************************************	3 A	·····	<u>.</u>															.		<u></u>				
	***************************************	4.2 A	ł						 _										 			 			
	***************************************	5 A							 																
		10 A																							
		20 A																							
Rated output po	ower	10 W		<u>.</u>			<u>.</u>		 										ļ	ļ	ļ			ļ	<u>.</u>
	·····	15 W 18 W	ļ				<u>.</u>					_							ļ		ļ				ļ
		30 W	ļ				<u> </u>		 																
	***************************************	60 W	ļ	-		-			 																
	***************************************	100 W							 					-											-
		120 W							 										.						
		240 W																							
		480 W																							
Rated input voltage	100 - 24										<u></u>				<u></u>	<u></u>				ļ <u></u>	ļ				
voltage	115/230 V AC auto 115 - 230		ļ				<u>.</u>		 								_		ļ			ļ			ļl
	110 - 230		ļ						 																
-	110 - 120		ļ						 														-		-
	220 - 240		·····	 			.		 										 			.			
DC input	120 - 370	O V DC																							
voltage range	90 - 37						Ī													Ī					
	210 - 370																								
	90 - 300																								
Features	Power reserve								 								_					<u>.</u>			
	Adjustable output Integrated inp				_																				
	Short circuit											H										.			
	Fold forward beha								 -													<u>.</u>			
-	Fold back behavior							_						_					_		_	-		_	
	Power factor cor										pas				pas	pas	act			pas	act				
•	Ambient temp.	rating																					Ī		
	-25°C (-40°C) to Parallel conn		ļ					-	 _		3				3	3	3			3	3		5	5	5
	Serial conn										2				2	2	2			2	2		2	1	2

Primary switch mode power supplies Selection table - Three-phase

		Order number	1SVR427054R0000	1SVR427055R0000	1SVR427056R0000	1SVR427057R0000	1SVR427054R2000	1SVR427055R2000	1SVR427056R2000
						e-pl		•	
			_			CP-1	<u> </u>		,
Rated output v	oltage	24 V DC 30.5 V DC 48 V DC							
Rated output of	current	2.8 A						_	
		3 A	ļ				<u></u>		
		5 A							
		8 A 10 A		_				_	
		10 A 20 A		-				_	
		40 A			-				-
Rated output p	nower	85 W				_			-
riated output p	ower	120 W							
		122 W							
		240 W							
		244 W	ļ			ļ			ļ
		480 W							
		960 W			-				
Rated input voltage	85-132 V A	C, 184-264 V AC							
voltage	3 x 4	00 - 800 V AC							
DC input		18-32.4 V DC							
voltage range	4	80 - 820 V DC							
Features	Adjustable	output voltage							
	Integr	ated input fuse							
		rt circuit stable							
		d behavior (U/I)	Ш						
	***************************************	ehavior (hiccup)							
		ctor correction nt temp. rating	ļ						<u>.</u>
	-25°C (-40°C) to 70°C							
		rial connection		2	2	2	2	2	2
	Suited for	AS-Interfaces							

CP-D range Product group picture



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CP-D range

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CP-D range Benefits and advantages

Characteristics

- Output voltages 12 V, 24 V DC
- Adjustable output voltages (devices > 10 W)
- Output currents 0.42 A / 0.83 A / 1.3 A / 2.1 A / 2.5 A / 4.2 A
- Power range 10 W, 30 W, 60 W, 100 W
- Wide range input 100-240 V AC (90-264 V AC, 120-375 V DC)
- High efficiency of up to 89 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40 °C...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- U/I characteristic (fold-forward behaviour at overload no switch-off)
- LEDs for status indication
- Light-grey housing in RAL 7035
- Approvals / Marks (depending on device, partly pending): c⊕us, c**PL**us, [ff], ⋘ / C €, ፟

Benefits

Width and structural form ①

With their width between 18 to 90 mm only, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels.

Wide range input ②

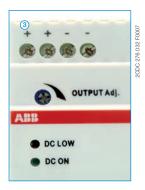
Optimised for world-wide applications: The CP-D power supplies can be supplied with 90-264 V AC or 120-375 V DC.

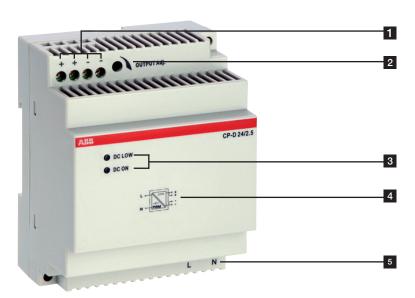
Adjustable output voltage 3

The CP-D range types > 10 W feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.









- 1 OUTPUT ++/--: terminals output
- 2 OUTPUT Adjust: potentiometer adjustment of output voltage
- 3 Indication of operational states

DC ON: green LED - output voltage applied DC LOW: red LED - output voltage too low

- 4 Circuit diagram
- 5 INPUT L, N: terminals input

CP-D range Ordering details



CP-D 12/0.83, CP-D 24/0.42



CP-D 12/2.1, CP-D 24/1.3



CP-D 24/2.5

Description

The CP-D range of modular power supply units in MDRC design (modular DIN rail components) is ideally suited for installation in distribution panels. This range offers devices with output voltages of 12 V DC and 24 V DC at output currents of 0.42 A to 4.2 A. Thanks to a high thermal efficiency corresponding to low power and heat dissipation, the devices can be operated without forced cooling. All devices feature the U/I output characteristic (fold forward behaviour). All power supply units in the CP-D range are approved according to all relevant international standards.

Ordering details

Input voltage range	Rated output voltage / current	tage / Type Order code			Weight (1 pce) kg (lb)
90-264 V AC/ 120-375 V DC	12 V DC / 0.83 A	CP-D 12/0.83	1SVR427041R1000		0.06 (0.13)
90-264 V AC/ 120-375 V DC	12 V DC / 2.1 A	CP-D 12/2.1	1SVR427043R1200		0.19 (0.41)
90-264 V AC/ 120-375 V DC	24 V DC / 0.42 A	CP-D 24/0.42	1SVR427041R0000		0.06 (0.13)
90-264 V AC/ 120-375 V DC	24 V DC / 1.3 A	CP-D 24/1.3	1SVR427043R0100		0.19 (0.41)
90-264 V AC/ 120-375 V DC	24 V DC / 2.5 A	CP-D 24/2.5	1SVR427044R0200		0.25 (0.56)
90-264 V AC/ 120-375 V DC	24 V DC / 4.2 A	CP-D 24/4.2	1SVR427045R0400		0.32 (0.71)



Further documentation CP-D power supplies on www.abb.com

Туре	CP-D 12/0.83	CP-D 12/2.1
Input circuit - supply circuit		L, N
Rated input voltage U _{in}	100-240 V AC	
Input voltage range	90-264 V AC / 120-375 V DC	
Frequency range AC	47-63 Hz	
	200 mA / 12.68 W	502 mA / 31.14 W
typical power consumption at 230 V AC	128.3 mA / 13.01 W	277 mA / 31.2 W
Inrush current limiting at 230 V AC	30 A (max. 3 ms)	50 A (max. 3 ms)
Power failure buffering time	min. 30 ms	-
nternal input fuse	1 A slow-acting / 250 V AC	2 A slow-acting / 250 V AC
Power factor correction (PFC)	no	
Indication of operational states		
Output voltage DC ON: green LED	: output voltage applied	
DC LOW: red LED		
Output circuit	+, -	++,
Rated output voltage	12 V DC	
Folerance of the output voltage	±1 %	
Adjustment range of the output voltage	-	12-14 V DC
Rated output power	10 W	25 W
Rated output current I, $T_a \le 60 ^{\circ}\text{C}$		2.1 A
Derating of the output current $60 ^{\circ}\text{C} < \text{T}_a \le 70 ^{\circ}\text{C}$	2.5 %/°C	2.171
Maximum load change statical	may 1 %	
Adviation	may 1 %	
change of output voltage within the input voltage range Control time		
	< 1 ms 1000 ms	
voltage		
Rise time at rated load		
Residual ripple and switching peaks BW = 20 MHz	50 mV	
Parallel connection	yes, using CP-D RU	
Series connection	yes, to increase voltage	
Resistance to reverse feed	18 V / 1 s	
Output circuit - No-load, overload and short-circuit behaviour		
Characteristic curve of output	U/I characteristic curve	
Short-circuit protection	continuous short-circuit stability	
Short-circuit behaviour	continuation with output power lin	niting
Current limiting at short circuit	typ. 1.4 A	typ. 5.9 A
Overload protection	output power limiting	<u>i</u>
Overvoltage protection	15-16.5 V DC	
No-load protection	continuous no-load stability	
Starting of capacitive loads	unlimited	
General data	1	
Efficiency	typ. 78 %	typ. 82 %
Duty time	100 %	1-75. 62 /6
Dimensions (W x H x D)	18 x 91 x 57.5 mm	53 x 91 x 57.5 mm
	(0.71 x 3.58 x 2.26 in)	(2.09 x 3.58 x 2.26 in)
Veight	0.066 kg (0.13 lb)	0.196 kg (0.41 lb)
Material of housing	plastic	
Mounting	DIN rail (IEC/EN 60715), snap-on r	mounting without any tool
Mounting position	horizontal	
Minimum distance to other units horizontal / vertical	25 mm / 25 mm (0.98 in / 0.98 in)	
Degree of protection housing / terminals	IP20 / IP20	
Protection class		····

Туре		CP-D 12/0.83	CP-D 12/2.1		
Electrical connection - Input circuit / Output cir					
Wire size fine-s	trand with wire end ferrule	, , ,	0.2-2.5 mm ² (24-14 AWG)		
Ohdere beer Learneth	rigid	0.2-2.5 mm² (26-12 AWG)	0.2-2.5 mm² (24-12 AWG)		
Stripping length		4-5 mm (0.16-0.2 in) 0.6 Nm (5 lb.in)	7 mm (0.28 in) 0.7 Nm (6 lb.in)		
Tightening torque		0.6 Nm (5 lb.in)	0.7 Nm (6 lb.in)		
Environmental data					
Ambient temperature range	'	-40+70 °C			
		-40+60 °C			
	storage	-40+85 °C			
Damp heat (cyclic) (IEC/EN 60068-2-30)		4 x 24 cycles, 40 °C, 95 % RH			
Vibration (sinusoidal) (IEC/EN 60068-2-6)		50 m/s², 10 Hz - 2 kHz			
Shock (half-sine) (IEC/EN 60068-2-27)	•••••	40 m/s², 22 ms			
Isolation data					
Rated insulation voltage U _i ii	nput circuit / output circuit	3 kV AC			
Pollution degree	•	2			
Overvoltage category (UL/IEC/EN 60950-1)		II			
Standards					
Product standard		EN 61204			
Low Voltage Directive		2006/95/EC			
EMC Direcitve	•••••	2004/108/EC			
Electrical safety		UL 508, UL 60950-1, EN 60950-1			
Protective low voltage		SELV (EN 60950-1)			
Electromagnetic compatibility					
Interference immunity to		EN 61000-6-2			
electrostatic discharge	IEC/EN 61000-4-2	Level 4 (4 kV / 8 kV)	Level 4 (4 kV / 15 kV)		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)	<u> </u>		
electrical fast transient/burst	IEC/EN 61000-4-4	Level 4 (4 kV)			
surge	IEC/EN 61000-4-5	Level 3 (2 kV L-L)			
conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-6	, ,			
Interference emission		EN 61000-6-3			
high-frequency radiated	IEC/CISPR 22, EN 55022				
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B			

[&]quot;Approvals and marks" on page 182

Туре	CP-D 24/0.42	CP-D 24/1.3	CP-D 24/2.5	CP-D 24/4.2
Input circuit - supply circuit		L	, N	
Rated input voltage U _{in}	100-240 V AC			
Input voltage range	90-264 V AC /120	0-375 V DC	•••••	
Frequency range AC	47-63 Hz	•	•	
	184 mA / 11.62 W	600 mA / 37.92 W	1120 mA / 69.3 W	1800 mA / 117.3 W
	120.6 mA / 12 W	344 mA / 38.16 W	660 mA / 70.1 W	900 mA / 114.4 W
Inrush current limiting at 230 V AC	30 A (max. 3 ms)	50 A (max. 3 ms)	60 A (max. 3 ms)	•
Power failure buffering time	min. 30 ms	•	min. 60 ms	•
Internal input fuse	1 A slow-acting	2 A slow-acting /	•••••	3.15 A slow-acting
Power factor correction (PFC)	/ 250 V AC	250 V AC		/ 250 V AC
Indication of operational states	1			
Output voltage DC ON: green LED	☐ : output v	oltage applied		
DC LOW: red LED	☐ : output v	oltage too low		•
Output circuit	+	-, -	++	·,
Rated output voltage	24 V DC		•	
Tolerance of the output voltage	±1 %	. •		•
Adjustment range of the output voltage	-	24-28 V DC	•	•
Rated output power	10 W	30 W	60 W	100 W
Rated output current I _r			$T_a \le 55$ °C: 2.5 A	$T_a \le 60 ^{\circ}\text{C}$: 4.2 A
Derating of the output current	$60 ^{\circ}\text{C} < T_a \le 70 ^{\circ}\text{C}$:	60 °C < T _a ≤ 70 °C: 2.5 %/°C	$55 ^{\circ}\text{C} < \text{T}_{a} \le 70 ^{\circ}\text{C}$:	$60 ^{\circ}\text{C} < \text{T}_{\text{a}} \le 70 ^{\circ}\text{C}$:
Maximum load change statical		2.5 %/°C	2.5 %/°C	2.5 %/°C
deviation change of output voltage within the input voltage range				
With Control time	< 1 ms			
	1000 ms	. •	•	
Rise time at rated load				
Residual ripple and switching peaks BW = 20 MHz	1			
Parallel connection	yes, using CP-D	RU		•
Series connection	yes, to increase	. .		
Resistance to reverse feed	35 V / 1 s			
Output circuit - No-load, overload and short-circuit behaviour				
Characteristic curve of output	U/I characteristic	curve		
Short-circuit protection	continuous short	-circuit stability		•
Short-circuit behaviour	continuation with	output power limit	ting	•
Current limiting at short circuit	typ. 0.78 A	typ. 4.2 A	typ. 6.05 A	typ. 11.5 A
Overload protection	output power lim	iting	•••••	
Overvoltage protection	30-33 V DC			
No-load protection	continuous no-lo	ad stability		
Starting of capacitive loads	unlimited			
General data				
Efficiency	typ. 80 %	typ. 83 %	typ. 86 %	typ. 89 %
Duty time	100 %	. •		
Dimensions (W x H x D)	18 x 91 x 57.5 mm (0.71 x 3.58 x 2.26 in)	53 x 91 x 57.5 mm (2.09 x 3.58 x 2.26 in)	71 x 91 x 57.5 mm (2.80 x 3.58 x 2.26 in)	89.9 x 91 x 57,5 mm (3.54 x 3.58 x 2.26 in)
Weight	0.066 kg (0.13 lb)	0.196 kg (0.41 lb)	0.252 kg (0.55 lb)	0.386 kg / (0.72 lb)
Material of housing	plastic	. 1	· i.	<u></u>
Mounting	DIN rail (IEC/EN 6	30715), snap-on m	ounting without an	y tool
Mounting position	horizontal	•	•	•
Minimum distance to other units horizontal / vertical	25 mm / 25 mm ((0.98 in / 0.98 in)	•	•••••
Degree of protection housing / terminals	IP20 / IP20	. •		
Protection class	II			

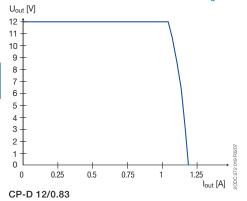
Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

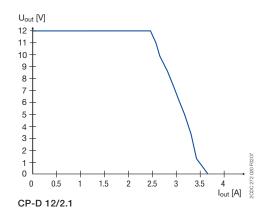
Туре		CP-D 24/0.42	CP-D 24/1.3	CP-D 24/2.5	CP-D 24/4.2
Electrical connection - Input circuit / Output circuit			•	-	
Wire size fine-stra	nd with wire end ferrule	0.2-1.5 mm ² (24-16 AWG)	0.2-2.5 mm ² (24-	14 AWG)	
	rigid	0.2-2.5 mm ²	0.2-2.5 mm ² (24-	12 AWG)	···•··································
<u></u>		(26 12 AMC)	1		
Stripping length		4-5 mm (0.16-0.2	in)	7 mm (0.28 in)	···•······
Tightening torque		0.6 Nm (5 lb.in)		0.7 Nm (6 lb.in)	
Environmental data					
Ambient temperature range	'	-40+70 °C			
		-40+60 °C		-40+55 °C	-40+60 °C
	storage	-40+85 °C	•		
Damp heat (cyclic) (IEC/EN 60068-2-30)	***************************************	4 x 24 cycles, 40	°C, 95 % RH		*
Vibration (sinusoidal) (IEC/EN 60068-2-6)		50 m/s², 10 Hz - 2	2 kHz		
Shock (half-sine) (IEC/EN 60068-2-27)		40 m/s², 22 ms			
Isolation data					
Rated insulation voltage U _i inpu	ut circuit / output circuit	3 kV AC		4 kV AC	3 kV AC
Pollution degree		2	•••••	<u>i</u>	
Overvoltage category (UL/IEC/EN 60950-1)		II	•••••		
Standards					
Product standard		EN 61204			
Low Voltage Directive		2006/95/EC	•		···•
EMC Direcitve		2004/108/EC	•	···•·······	···•··································
Electrical safety		UL 508, UL 6095	0-1, EN 60950-1		···•······
Protective low voltage	•	SELV (EN 60950-		···•·······	···•··································
Electromagnetic compatibility					
Interference immunity to		EN 61000-6-2			
electrostatic discharge	IEC/EN 61000-4-2	Level 4 (4 kV / 8 kV)	Level 4 (4 kV / 15 kV)		Level 4 (4 kV / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)			
electrical fast transient/burst	IEC/EN 61000-4-4	Level 4 (4 kV)	•••••		
surge	IEC/EN 61000-4-5	Level 3 (2 kV L-L)			····•
conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-6	, ,			
Interference emission	•	EN 61000-6-3			···
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B	•		
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B	•		

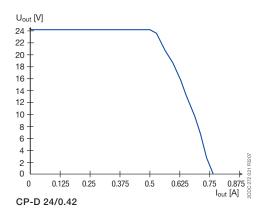
[&]quot;Approvals and marks" on page 182

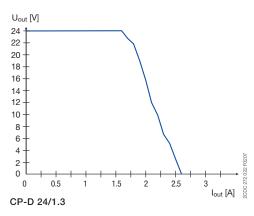
CP-D range Technical diagrams

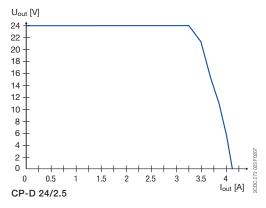
Characteristic curve of output at $T_a = 25$ °C

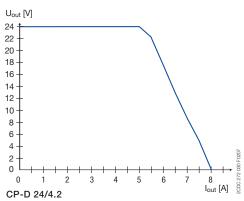




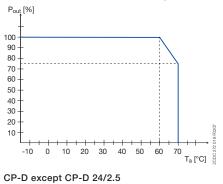


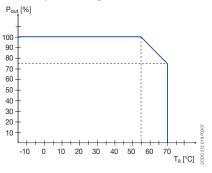






Characteristic curve of temperature at rated output voltage

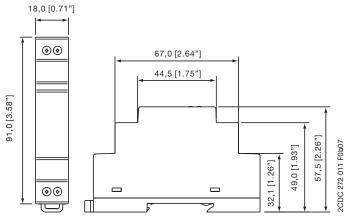


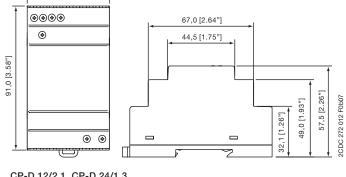


CP-D 24/2.5

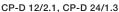
CP-D range Dimensional drawings

Dimensional drawings dimensions in mm

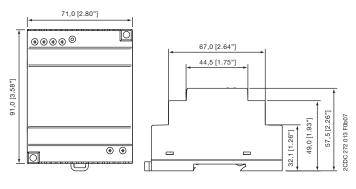


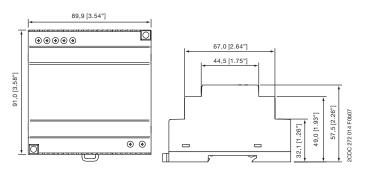


CP-D 12/0.83, CP-D 24/0.42



53,0 [2.09"]





CP-D 24/2.5

CP-D 24/4.2

CP-E range Product group picture



CP-E range Table of contents

CP-E range

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CP-E range Benefits and advantages

Characteristics

- Output voltages 5 V, 12 V, 24 V, 48 V DC
- Adjustable output voltages
- Output currents 0.625 A / 0.75 A / 1.25 A / 2.5 A / 3 A / 5 A / 10 A / 20 A
- Power range 15 W, 18 W, 30 W, 60 W, 120 W, 240 W, 480 W
- High efficiency of up to 90 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- U/I characteristic curve on devices > 18 W (fold-forward behaviour at overload - no switch-off)
- Redundancy units offering true redundancy
- LED(s) for status indication
 - Signalling output/contact for output voltage OK Transistor on 24 V devices > 18 W and < 120 W
 - Solid-state on 24 V devices ≥ 120 W
- Approvals / Marks (depending on device, partly pending):
- c⊕us, c¶us, [ff[, @ / C €, &

Benefits

Signalling output/contact ①

The CP-E range 24 V devices > 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis.

Wide range input ②

Optimised for world-wide applications: The CP-E power supplies can be supplied within a wide range of AC or DC voltage.

Adjustable output voltage ③

The CP-E range types feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.

Redundancy units 4

For decoupling of parallelized power supply units ≤ 40 V. Thus, true redundancy can be achieved.

Further information about redundancy unit on page 229.











- 1 INPUT L, N, PE: terminals input
- 2 Circuit diagram
- 3 single/parallel: sliding switch adjustment of single or parallel operation
- 4 Indication of operational states

DC ON: green LED - green LED - output voltage OK DC LOW: red LED - output voltage too low

OUTPUT L+, L+, L-, L-: terminals - output

CP-E range Ordering details



CP-E 12/2.5



CP-E 48/5.0

Description

This range offers types with output voltages from 5 V DC to 48 V DC at output currents of 0.625 A to 20 A. The high thermal efficiency of up to 90 %, corresponding to very low power and heat dissipation, allows operation without forced cooling. The functionality has been enhanced while the number of different types has been considerably reduced.

Of course all power supplies of the CP-E range are approved in accordance with all relevant international standards.

Ordering details - CP-E < 100 W

Input voltage range	Rated output voltage / current	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
90-264 V AC / 120-375 V DC	5 V DC / 3 A	CP-E 5/3.0	1SVR427033R3000		0.15 (0.33)
85-264 V AC / 90-375 V DC	12 V DC / 2.5 A	CP-E 12/2.5	1SVR427032R1000		0.29 (0.64)
90-132 V AC, 180-264 V AC / 210-375 V DC	12 V DC / 10 A	CP-E 12/10.0	1SVR427035R1000		1.00 (2.20)
90-264 V AC / 120-375 V DC	24 V DC / 0.75 A	CP-E 24/0.75	1SVR427030R0000		0.15 (0.33)
85-264 V AC / 90-375 V DC	24 V DC / 1.25 A	CP-E 24/1.25	1SVR427031R0000		0.29 (0.64)
85-264 V AC / 90-375 V DC	24 V DC / 2.5 A	CP-E 24/2.5	1SVR427032R0000		0.36 (0.79)

Ordering details - CP-E \geq 120 W

Input voltage range	Rated output volt- age / current	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
90-132 V AC, 180-264 V AC / 210-375 V DC	24 V DC / 5 A	CP-E 24/5.0	1SVR427034R0000		1.00 (2.20)
90-132 V AC, 180-264 V AC / 210-375 V DC	24 V DC / 10 A	CP-E 24/10.0	1SVR427035R0000		1.36 (3.01)
90-264 V AC / 120-375 V DC	24 V DC / 20 A	CP-E 24/20.0	1SVR427036R0000		1.90 (4.18)
85-264 V AC / 90-375 V DC	48 V DC / 0.625 A	CP-E 48/0.62	1SVR427030R2000		0.29 (0.64)
85-264 V AC / 90-375 V DC	48 V DC / 1.25 A	CP-E 48/1.25	1SVR427031R2000		0.36 (0.79)
90-132 V AC, 180-264 V AC / 210-375 V DC	48 V DC / 5 A	CP-E 48/5.0	1SVR427034R2000		1.36 (3.01)
90-264 V AC / 120-375 V DC	48 V DC / 10 A	CP-E 48/10.0	1SVR427035R2000		1.90 (4.19)



Further documentation CP-E power supplies on www.abb.com

Туре		CP-E 5/3.0	CP-E 12/2.5	CP-E 12/10.0
Input circuit		01 2 0/0.0	L, N	01 2 12/10.0
Rated input voltage U _{in}		100-240 V AC		
- 111				auto select
Input voltage range		90-264 V AC / 120-375 V DC	85-264 V AC / 90-375 V DC	90-132 V AC, 180-264 V AC / 210-375 V DC
Frequency range AC		47-63 Hz	· •	
Typical input current	at 115 V AC	335 mA	560 mA	2.2 A
	at 230 V AC	210 mA	330 mA	0.83 A
Typical power consumption		19.8 W	35.9 W	143 W
Inrush current limiting	at 115 V AC	10 A (max. 3 ms)	20 A (max. 3 ms)	24 A (max. 5 ms)
	at 230 V AC	18 A (max. 3 ms)	40 A (max. 3 ms)	48 A (max. 5 ms)
Discharge current	input / output	0.25 mA		· i
	input / PE	3.5 mA	•••••	•••••
Power failure buffering time	at 115 V AC	min. 20 ms	min. 20 ms	min. 25 ms
	at 230 V AC	min. 75 ms	min. 30 ms	min. 30 ms
Internal input fuse	······	2 A slow-acting / 250 V	AC	3.15 A slow-acting /
	<u>.</u>		•••••	250 V AC
Power factor correction (PFC)		no		yes, passive, 0.7
Indication of operational states				
Output voltage	green LED	OK: T: output voltage OK		OUTPUT OK: Significant Country of the Country of th
	red LED	LOW:	output voltage OK	OUTPUT LOW: T :
		output voltage too low		output voltage too low
Output circuit		L+,L-	1	+, L-, L-
Rated output voltage		5 V DC	12 V DC	
Tolerance of the output voltage		0+1 %		. p
Adjustment range of the output voltage		4.5-5.75 V DC	12-14 V DC	11.4-14.5 V DC
Rated output power		15 W	30 W	120 W
Rated output current I _r	T _a ≤ 60 °C	3.0 A	2.5 A	10 A
Derating of the output current	60 °C < T _a ≤ 70 °C		2.5 %/°C	
Maximum deviation with	load change statical		±0.5 %	±1 % (single mode) ±5 % (parallel mode)
chan	ge of output voltage within the input voltage range	±1 %	±0.5 %	±0.5 %
Control time	iliput voltage range	< 2 ms	<u>:</u>	· <u>i</u>
Starting time after applying the supply voltage	ge at I	max. 1 s		
3 · · · · · · · · · · · · · · · · · · ·	with 3500 μF	-	max. 2 s	-
	with 7000 μF	max. 1.5 s	-	max. 1.5 s
Rise time	'	max. 150 ms	<u> </u>	
	with 3500 µF	-	max. 500 ms	-
	· ·	max. 500 ms	-	max. 500 ms
Fall time		max. 150 ms		
Residual ripple and switching peaks	BW = 20 MHz	50 mV		
Parallel connection	BW = 20 WHZ	yes, to enable redunda	ncv	configurable, to
Taraner connection		you, to chaple reduring	ПОУ	increase power,up to 3 devices, min. 0.1 I - max. 0.9 I
Series connection		yes, to increase voltage		yes, to increase voltage, max. 2 devices
Resistance to reverse feed		1 s - max. 7.5 V DC	1 s - max.18 V DC	max. 18 V DC
Output circuit - No-load, overload and shor	t-circuit behaviour	*	•	
Characteristic curve of output		Hiccup-mode	U/I characteristic curve	
Short-circuit protection		continuous short-circui	t proof	••••••
Short-circuit behaviour		Hiccup-mode	continuation with outpu	it power limiting
Overload protection		output power limiting	·:	
No-load protection		continuous no-load sta	bility	
Starting of capacitive loads		7000 μF	3500 μF	7000 μF
		I.	:	<u> </u>

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Туре		CP-E 5/3.0	CP-E 12/2.5	CP-E 12/10.0
General data				
Power dissipation		typ. 5 W	typ. 5.6 W	typ. 24 W
Efficiency		typ. 75 %	typ. 84 %	typ. 84 %
Duty time		100 %		
Dimensions (W x H x D)		22.5 x 90 x 114 mm (0.89 x 3.54 x 4.49 in)		63.2 x 123.6 x 123.6 mn (2.49 x 4.87 x 4.87 in)
Weight		0.144 kg (0.317 lb)	0.287 kg (0.633 lb)	0.888 kg (1.958 lb)
Material of housing		Plastic	••••	Metal
Mounting		DIN rail (IEC/EN 60715	5), snap-on mounting wit	hout any tool
Mounting position	•	horizontal	•	••••
Minimum distance to other units	horizontal / vertical	25 mm / 25 mm (0.98	in / 0.98 in)	
Degree of protection	housing / terminals	IP20 / IP20		
Protection class		I	•	•
Electrical connection - input circuit / output				
Wire size fin	e-strand with wire end ferrule	0.2-2.5 mm ² (24-14 AV	VG)	0.2-4 mm ² (24-11 AWG)
fine-s	trand without wire end ferrule			0.2-6 mm ² (24-10 AWG)
	rigid			
Stripping length	••••	6 mm (0.24 in)		8 mm (0.31 in)
Tightening torque	input / output	0.6 Nm (5 lb.in)		1.0 Nm (9 lb.in) /
Continuo mandal data				0.62 Nm (5.5 lb.in)
Environmental data Ambient temperature range	operation	-20+70 °C	-40+70 °C	-35+70 °C
Ambient temperature range	rated load		-40+60 °C	-35+60 °C
	storage		-40+85 °C	-40+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)	storage	95 RH, % without con	:	-40+00 0
Vibration (sinusoidal) (IEC/EN 60068-2-6)			X, Y, Z each axis, 60 mi	n for oooh ovio
Shock (half-sine) (IEC/EN 60068-2-27)		15 C 11 mg 2 gyan 6	faces, 3 times for each	fooo
Isolation data		15 G, 11 IIIS, 5 axes, t	iaces, s times for each	lace
	innut singuit / subsub singuit	0.147.40		
Rated insulation voltage U _i	input circuit / output circuit input / PE		····•	.
	·	0.5 kV AC; 0.71 kV DC		<u>.</u>
Dollution dograp	Output / PE		,	.
Pollution degree		2 		
Overvoltage category (UL/IEC/EN 60950-1)		11		
Standards Product standard		EN 61004 0		
		EN 61204-3	···•	
Low Voltage Directive		2006/95/EC		
EMC directive		2004/108/EC		
RoHS directive	<u>.</u>	2011/65/EC	EN 00050 4 III 0005	0.4.111.500
Electrical safety		EN 60950-1, UL 60950-1, UL 508	EN 60950-1, UL 6095 EN 61558-1, EN 61558	
Protective low voltage		SELV (EN 60950)		
Electromagnetic compatibility		LEO/EN COOR -		
Interference immunity to		IEC/EN 61000-6-2	727777	
electrostatic discharge	IEC/EN 61000-4-2		15 kV / contact discharg	e 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	, , ,	,	
electrical fast transient/burst		· ·	z) Level 4 (4 kV / 5 kHz)	
surge		L-L Level 3 (2 kV) / L-F	PE Level 4 (4 kV)	
conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-6	, ,		
power frequency magnetic fields	IEC/EN 61000-4-8			
voltage dips, short interruptions and voltage	IEC/EN 61000-4-11			•
		interruptions: >95 % 5	บบบ ms	
	•	IEC/EN 61000-6-3		
Interference emission	IEC/CISPR 22, EN 55022	IEC/EN 61000-6-3 Class B		
variations Interference emission high-frequency radiated high-frequency conducted		Class B		

[&]quot;Approvals and marks" on page 182

Туре		CP-E 24/0.75	CP-E 24/1.25	CP-E 24/2.5	
Input circuit			L, N	·	
Rated input voltage U _{in}		100-240 V AC			
Input voltage range	ū ū		90-264 V AC / 120-375 V DC 85-264 V AC / 90-375 V DC		
Frequency range AC	•••••••••••••••••••••••••••••••••••••••	47-63 Hz		••••••	
Typical input current	at 115 V AC	335 mA	560 mA	1060 mA	
	at 230 V AC	210 mA	330 mA	590 mA	
Typical power consumption	······································	22.8 W	36.7 W	69.2 W	
Inrush current limiting	at 115 V AC	10 A (max. 3 ms)	20 A (max. 3 ms)	20 A (max. 3 ms)	
	at 230 V AC	18 A (max. 3 ms)	40 A (max. 3 ms)	40 A (max. 3 ms)	
Discharge current	input / output	0.25 mA			
······································	input / PE	3.5 mA			
Power failure buffering time	at 115 V AC		min. 20 ms		
	at 230 V AC	min. 75 ms	min. 30 ms		
nternal input fuse	•••••	2 A slow-acting / 250 V	AC		
Power factor correction (PFC)		no	•		
Indication of operational states					
Output voltage	green LED	OK: T: output voltage OK	OUTPUT OK: J	l: output voltage OK	
	red LED	LOW: T:	-	-	
Output circuit		L+,L-	L	.+, L+, L-, L-	
Rated output voltage		24 V DC	·	, , ,	
Folerance of the output voltage	······	0 +1 %			
Adjustment range of the output voltage		21.6-28.8 V DC	24-28 V DC		
Rated output power	······································	18 W	30 W	60 W	
Rated output current I,	T _a ≤ 60 °C	0.75 A	1.25 A	2.5 A	
Doroting of the output ourrent	60 °C - T - 70 °C		:	<u>i</u>	
Signalling output for output voltage OK	DC OK	=	transistor		
Maximum deviation with	load change statical	±2 %	±0.5 %		
	change of output voltage within the	±1 %	±0.5 %		
	input voltage range				
Control time	·····	< 2 ms			
Starting time after applying the supply v	9	max. 1 s			
	with 3500 μF	-	max. 2 s	-	
	with 7000 μF		-	max. 1.5 s	
Rise time		max. 150 ms	.,		
	with 3500 μF		max. 500 ms	-	
<u>.</u>	with 7000 μF	max. 500 ms	-	max. 500 ms	
Fall time		max. 150 ms			
Residual ripple and switching peaks	BW = 20 MHz	50 mV			
Parallel connection Series connection		yes, to enable redunda			
Resistance to reverse feed	······································	yes, to increase voltage	-		
Output circuit - No-load, overload and	short-circuit behaviour				
Characteristic curve of output		Hiccup-mode U/I characteristic curve			
Short-circuit protection		continuous short-circui	t proof		
Short-circuit behaviour		Hiccup-mode	continuation with c	output power limiting	
Overload protection		output power limiting			
No-load protection		continuous no-load sta	bility	······································	
Starting of capacitive loads	······································	7000 μF	3500 μF	7000 µF	

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

α 11				
Туре		CP-E 24/0.75	CP-E 24/1.25	CP-E 24/2.5
General data				
Power dissipation		typ. 4.45 W	typ. 5.5 W	typ. 8.8 W
Efficiency	······································	typ. 77 %	typ. 86 %	typ. 89 %
Duty time		100 %		
Dimensions (W x H x D)		22.5 x 90 x 114 mm (0.89 x 3.54 x 4.49 in)	40.5 x 90 x 114 mm (1.59 x 3.54 x 4.49 in)	
Weight		0.143 kg (0.315 lb)	0.270 kg (0.60 lb)	0.331 kg (0.73 lb)
Material of housing		Plastic		
Mounting		DIN rail (IEC/EN 60715)), snap-on mounting wit	hout any tool
Mounting position		horizontal		
Minimum distance to other units	horizontal / vertical	25 mm / 25 mm (0.98 i	n / 0.98 in)	
Degree of protection	housing / terminals	IP20 / IP20		
Protection class		I		
Electrical connection - input circuit / c				
Wire size	fine-strand with wire end ferrule	0.2-2.5 mm ² (24-14 AW	(G)	
	fine-strand without wire end ferrule			
·····	rigid	/0.0/.:		
Stripping length	······································	6 mm (0.24 in)		
Tightening torque	input / output	0.6 Nm (5 lb.in)		
Environmental data				
Ambient temperature range	·	-20+70 °C	-40+70 °C	
		-20+60 °C	-40+60 °C	
	storage	-20+85 °C 95 % RH, without cond	-40+85 °C	
Damp heat (cyclic) (IEC/EN 60068-2-30				
Vibration (sinusoidal) (IEC/EN 60068-2	-6)	10-500 Hz, 2 G, along		
Shock (half-sine) (IEC/EN 60068-2-27)		15 G, 11 ms, 3 axes, 6	faces, 3 times for each	face
Isolation data	ionut aireuit / autout aireuit	0.14/.40		
Rated insulation voltage U _i	input circuit / output circuit	1.5 kV AC		·····•
		L		·····•
Dollution dograp	Output / PE	0.5 kV AC; 0.71 kV DC		
Pollution degree Overvoltage category (UL/IEC/EN 609	50.1)			
		11		
Standards Product standard		EN 61204-3		
Low Voltage Directive	······	2006/95/EC		
EMC directive		2004/108/EC		
RoHS directive		2011/65/EC		·····
Electrical safety		EN 50178, EN 60950-1, UL 60950-1, UL 508	EN 60950-1, UL 6095 EN 61558-2-17; EN 60	50-1, UL 508, EN 61558 0204-1
Protective low voltage		SELV (EN 60950)		
Electromagnetic compatibility		LEO/EN 2:222		
Interference immunity to	IEO/EN 04000 1 0	IEC/EN 61000-6-2	F1377	
electrostatic discharge		Level 4 (air discharge 1	5 KV / contact discharg	je & KV)
radiated, radio-frequency, electromagr		, , ,		
electrical fast transient/burst		Level 4 (4 kV / 2.5 kHz)		
surge		L-L Level 3 (2 kV) / L-P	L Level 4 (4 KV)	
conducted disturbances, induced by ra frequency fields		,		<u>.</u>
power frequency magnetic fields	IEC/EN 61000-4-8	L		
	oltage IEC/EN 61000-4-11	dip: >95 % 10 ms / >30	0 % 500 ms, interruptio	ns: >95 % 5000 ms
variations		IEC/EN 61000-6-3		
variations Interference emission	IEC/CISPR 22, EN 55022	Class B		
voltage dips, short interruptions and vovariations Interference emission high-frequency radiated high-frequency conducted	IEC/CISPR 22, EN 55022 IEC/CISPR 22, EN 55022 IEC/EN 61000-3-2	Class B Class B		

[&]quot;Approvals and marks" on page 182

Туре		CP-E 24/5.0	CP-E 24/10.0	CP-E 24/20.0
Input circuit			L, N	
Rated input voltage U _{in}		115 / 230 V AC auto s	elect	115-230 V AC
Input voltage range		90-132 V AC, 180-264 V AC / 210-375 V DC	90-132 V AC, 180-264 V AC / 210-375 V DC	90-264 V AC, 120-375 V DC
Frequency range AC	•	47-63 Hz		
Typical input current .		2.2 A	4.0 A	4.9 A
<u></u>	at 230 V AC		1.55 A	2.5 A
Typical power consumption	•	140 W	270 W	539 W
Inrush current limiting		24 A (max. 5 ms)	30 A (max. 5 ms)	25 A (max. 5 ms)
	.	48 A (max. 5 ms)	60 A (max. 5 ms)	50 A (max. 5 ms)
Discharge current	input / output			
	input / PE			
Power failure buffering time	at 115 V AC	min. 25 ms		
	at 230 V AC	min. 30 ms		
Internal input fuse		3.15 A slow-acting / 250 V AC	6.3 A slow-acting / 250 V AC	10 A slow-acting / 250 V AC
Power factor correction (PFC)		yes, passive, 0.7		yes, active 115 V AC: 0.99 230 V AC: 0.97
Indication of operational states				
Output voltage	_		l: output voltage OK	
	red LED	OUTPUT LOW: J	7: output voltage too lo	W
Output circuit			L+, L+, L-, L-	
Rated output voltage		24 V DC		
Tolerance of the output voltage	•	0+1 %	•	•
Adjustment range of the output voltage	•	22.5-28.5 V DC		•
Rated output power	•••••	120 W	240 W	480 W
Rated output current I _r	T _a ≤ 60 °C	5 A	10 A	-
	T _a ≤ 55 °C	-	-	20 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 %/°C	<u>k</u>	-
	55 °C < T _a ≤ 70 °C	-	-	2.5 %/°C
Signalling contact for output voltage OK		solid-state (max. 60 V	'DC, 0.3 A)	i
Minimum fuse rating to achieve short-circuit protection	13-14	≥ 60 V DC, ≤ 0.3 A fa	ast-acting	
Maximum deviation with loa	nd change statical	±1 % (single mode), ±5 % (parallel mode)		
change of out	put voltage within	±0.5 %		
the in	put voltage range		.	
Control time	• • • • • • • • • • • • • • • • • • • •	< 2 ms		
Starting time after applying the supply voltage	at I _r	max. 1 s	р	
	with 3500 μF	max. 1.5 s	-	-
	with 7000 μF	-	max. 1.5 s	
Rise time	•	max. 150 ms		,
	with 3500 μF	max. 500 ms	-	-
	with 7000 μF	-	max. 500 ms	
-all time		max. 150 ms	····	
Residual ripple and switching peaks	BW = 20 MHz	50 mV	100 mV	
Parallel connection	•	configurable, to increa	ase power, up to 3 devic	es, min. 0.1 lr - max. 0.
Series connection		yes, to increase voltag	ge, max. 2 devices	
Resistance to reverse feed	•	max. 35 V DC	····•	·····•
Output circuit - No-load, overload and short-circuit beha	aviour	1		
Characteristic curve of output		U/I characteristic curv	/e	
Short-circuit protection	•	continuous short-circ	uit proof	
Short-circuit behaviour	•	continuation with outp	***************************************	·····•
Overload protection	•	output power limiting		·····
No-load protection	•	continuous no-load st	tability	····•
•		1	,	

Туре	-	CP-E 24/5.0	CP-E 24/10.0	CP-E 24/20.0
General data				
Power dissipation		typ. 20 W	typ. 35 W	typ. 63 W
Efficiency	•••••	typ. 86 %	typ. 89 %	typ. 89 %
Duty time	•••••	100 %	•	•
Dimensions (W x H x D)		63.2 x 123.6 x 123.6 mm (2.49 x 4.87 x 4.87 in)	83 x 123.6 x 123.6 mm (3.27 x 4.87 x 4.87 in)	175 x 123.6 x 123.6 mm (6.89 x 4.87 x 4.87 in)
Weight	•••••	0.882 kg (1.945 lb)	1.334 kg (2.941 lb)	1.850 kg (4.079 lb)
Material of housing	•••••	Metal	. 4	
Mounting	······································	DIN rail (IEC/EN 60715),	, snap-on mounting with	out any tool
Mounting position	••••••	horizontal		••••••
Minimum distance to other units	horizontal / vertical	25 mm / 25 mm (0.98 ir	n / 0.98 in)	•••••
Degree of protection	housing / terminals	IP20 / IP20		-
Protection class	•	I		***************************************
Electrical connection - input circuit / output ci	rcuit			
Wire size fine-	strand with wire end ferrule	0.2-4 mm ² (24-11 AWG)		
f	ine-strand without wire end ferrule rigid	0.2-6 mm² (24-10 AWG)		
Stripping length		8 mm (0.31 in)		
Tightening torque	input / output	1.0 Nm (9 lb.in) / 0.62 N	lm (5.5 lb.in)	•••••
Environmental data				
Ambient temperature range	operation	-35+70 °C	-40+70 °C	
	rated load	-35+60 °C	-40+60 °C	-40+55 °C
	storage	-40+85 °C	-40+85 °C	•
Damp heat (cyclic) (IEC/EN 60068-2-30)	•	95 %RH, without conde	ensation	•
Vibration (sinusoidal) (IEC/EN 60068-2-6)	•		X, Y, Z each axis, 60 mir	
Shock (half-sine) (IEC/EN 60068-2-27)		15 G, 11 ms, 3 axes, 6	faces, 3 times for each	face
Isolation data				
Rated insulation voltage U _i	input circuit / output circuit	3 kV AC		
		1.5 kV AC		
	output / PE	0.5 kV AC; 0.71 kV DC		•
	signalling contact / PE	0.5 kV DC	•	•
Pollution degree	•	2		•
Overvoltage category (UL/IEC/EN 60950-1)	•	II		
Standards				
Product standard		EN 61204-3		
Low Voltage Directive		2006/95/EC	•	
EMC directive		2004/108/EC		
RoHS directive	•	2011/65/EC	•	•
Electrical safety		EN 60950-1, UL 60950-60204-1	-1, UL 508, EN 61558-1,	EN 61558-2-17; EN
Protective low voltage		SELV (EN 60950)		
Electromagnetic compatibility				
Internet and the second of the		IEO/EN 01000 0 0		
	E-0/E-1	IEC/EN 61000-6-2	E 1777	
electrostatic discharge	IEC/EN 61000-4-2	Level 4 (air discharge 1	5 kV / contact discharge	e 8 kV)
electrostatic discharge radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 4 (air discharge 1: Level 3 (10 V/m)		
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst	IEC/EN 61000-4-3	Level 4 (air discharge 1 Level 3 (10 V/m) Level 4 (4 kV / 5 kHz)	Level 4 (4 kV / 2.5 kHz	
Interference immunity to electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio-	IEC/EN 61000-4-3	Level 4 (air discharge 1 Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE	Level 4 (4 kV / 2.5 kHz	
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	Level 4 (air discharge 1: Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE Level 3 (10 V)	Level 4 (4 kV / 2.5 kHz	
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio- frequency fields power frequency magnetic fields	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	Level 4 (air discharge 1: Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE Level 3 (10 V) Level 4 (30 A/m)	Level 4 (4 kV / 2.5 kHz E Level 4 (4 kV)	
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio- frequency fields power frequency magnetic fields voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	Level 4 (air discharge 1: Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE Level 3 (10 V) Level 4 (30 A/m) dip: >95 % 10 ms / >30 interruptions: >95 % 50	Level 4 (4 kV / 2.5 kHz E Level 4 (4 kV)	
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio- frequency fields power frequency magnetic fields voltage dips, short interruptions and voltage variations Interference emission	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6 IEC/EN 61000-4-8 IEC/EN 61000-4-11	Level 4 (air discharge 1: Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE Level 3 (10 V) Level 4 (30 A/m) dip: >95 % 10 ms / >30 interruptions: >95 % 50 IEC/EN 61000-6-3	Level 4 (4 kV / 2.5 kHz E Level 4 (4 kV)	
electrostatic discharge radiated, radio-frequency, electromagnetic field electrical fast transient/burst surge conducted disturbances, induced by radio- frequency fields power frequency magnetic fields voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5 IEC/EN 61000-4-6	Level 4 (air discharge 1: Level 3 (10 V/m) Level 4 (4 kV / 5 kHz) L-L Level 3 (2 kV) / L-PE Level 3 (10 V) Level 4 (30 A/m) dip: >95 % 10 ms / >30 interruptions: >95 % 50	Level 4 (4 kV / 2.5 kHz E Level 4 (4 kV)	

[&]quot;Approvals and marks" on page 182

Data at $T_a = 25$ °C, $U_{in} = 230$ V AC and rated values, unless otherwise indicated

Туре		CP-E 48/0.62	CP-E 48/1.25	CP-E 48/5.0	CP-E 48/10.0
Input circuit			L,	, N	
Rated input voltage U _{in}		100-240 V AC		115 / 230 V AC auto select	115-230 V AC
Input voltage range		85-264 V AC / 90-375 V DC		90-132 V AC, 180-264 V AC / 210-375 V DC	90-264 V AC, 120-375 V DC
Frequency range AC		47-63 Hz	•		1
Typical input current	at 115 V AC	560 mA	1060 mA	4.0 A	4.9 A
	at 230 V AC	330 mA	590 mA	1.55 A	2.5 A
Typical power consumption		35.7 W	69.0 W	267 W	528 W
Inrush current limiting	at 115 V AC	20 A (max. 3 ms)	20 A (max. 3 ms)	30 A (max. 5 ms)	25 A (max. 5 ms
G			40 A (max. 3 ms)		
Discharge current	······································	0.25 mA	i ro / (max. o mo)	Eco / (max. o mo)	Loo / (max. o me
3	input / PE		•	•	•
		min. 20 ms	•	min OF mo	min OF ma
Tower failure barrering time	at 230 V AC		•	min. 25 ms	min. 25 ms
Internal input fuse	at 200 V AO	min. 30 ms		6.3 A slow-	10 A slow-
·		2 A slow-acting / 250 V AC		acting / 250 V AC	acting / 250 V AC
Power factor correction (PFC)				0.7	yes, active
		no		yes, passive, 0.7	115 V AC: 0.99 230 V AC: 0.97
Indication of operational states		ı		:	1200 17101 0101
Output voltage	green LED	OUTPUT OK: 5	l: output volta	age OK	
	red LED		ii odtpat voite	.go o.t OUTPUT LOW: Г	:
		-	-	output voltage to	
Output circuit			L+, L+	, L-, L-	
Rated output voltage		48 V DC			
Tolerance of the output voltage		0+1 %	•	•••••	•
Adjustment range of the output voltage		48-55 V DC	•	47-56 V DC	•
Rated output power		30 W	60 W	240 W	480 W
Rated output current I,	T _a ≤ 60 °C	0.625 A	1.25 A	5 A	-
	T __ ≤ 55 °C	_	_	_	10 A
Derating of the output current	d	2.5 %/°C	<u> </u>	<u> </u>	-
	$55 ^{\circ}\text{C} < \text{T}_{\text{a}} \le 70 ^{\circ}\text{C}$	2.0 70/ 0	:	:	2.5 %/°C
Signalling output for output voltage OK	DC OK	-	-	-	2.5 %/ C
Maximum deviation with		-	-	- 1 % (single med	-
Maximum deviation with	load change statical	±0.5 %		±1 % (single mode) ±5 % (parallel mode)	
	change of output voltage within	±0.5 %		±0.5 %	
Control times	the input voltage range		<u></u>	10.0 /0	
Control time		< 2 ms	***************************************	•	•
Starting time after applying the supply ve		max. 1 s	,	,	,
	with 3500 μF	max. 2 s	-	-	-
	with 7000 μF	-	max. 1.5 s	max. 1.5 s	
Rise time	at rated load	max. 150 ms			
	with 3500 μF	max. 500 ms	-	-	-
	with 7000 μF	-	max. 500 ms	max. 500 ms	•
Fall time		max. 150 ms	•	•	•
Residual ripple and switching peaks	BW = 20 MHz	50 mV	•····	100 mV	•
Parallel connection		yes, to enable redundancy up to 3 devices, min. 0.1 I, - max. 0.9 I,			
Series connection		vos to increase voltago		yes, to increase wax. 2 devices	
Resistance to reverse feed		1 s - max. 63 V DC			•
Output circuit - No-load, overload and s	short-circuit behaviour				
Characteristic curve of output		U/I characteristic	curve		
Short-circuit protection		continuous short-	•	•	
Short-circuit behaviour			output power limit	ina	
Overload protection			*	9	
No-load protection		output power limi	•	•	
Starting of capacitive loads		continuous no-lo	*·····		7000 5
Starting of Capacitive loads		3500 μF	7000 μF	unlimited	7000 μF

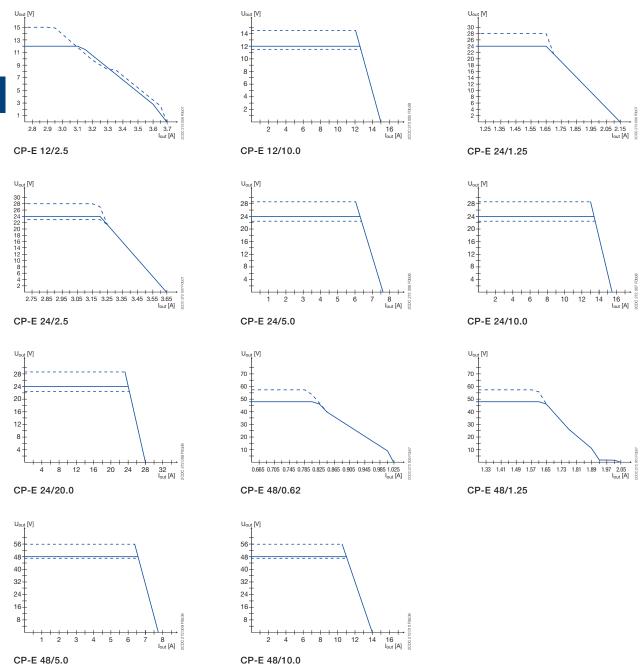
Data at $T_a = 25$ °C, $U_{in} = 230$ V AC and rated values, unless otherwise indicated

Туре		CP-E 48/0.62	CP-E 48/1.25	CP-E 48/5.0	CP-E 48/10.0
General data					
Power dissipation		typ. 4.9 W	typ. 7.8 W	typ. 32 W	typ. 60 W
Efficiency			typ. 89 %	typ. 90 %	•••••
Duty time		100 %		•	•••••
Dimensions (W x H x D)			••••••		175 x 123.6 x
		40.5 x 90 x 114 m (1.59 x 3.54 x 4.49		123.6 mm (3.27 x 4.87 x	123.6 mm (6.89 x 4.87 x
		(1.09 x 3.04 x 4.48	J 111)	1 97 in)	4.87 in)
Weight		0.264 kg (0.582 lb)	0.316 kg (0.697 lb)	1.322 kg (2.915 lb)	
Material of housing		Plastic		Metal	
Mounting				ounting without any	, tool
Mounting position		horizontal	07 10), 311ap 011111	January Without any	, 1001
Minimum distance to other units	horizontal / vertical		0.00 in / 0.00 in)		*
		25 mm / 25 mm (0	J.98 In / U.98 In)		•
Degree of protection	housing / terminals	IP/20 / IP20			•
Protection class		I			
Electrical connection - input circuit /					
Wire size	fine-strand with wire end ferrule			0.2-4 mm ² (24-11	AWG)
	fine-strand without wire end ferrule	0.2-2.5 mm ² (24-1	4 AWG)	0.0.0 3./04.40	A)A(O)
	rigid			0.2-6 mm ² (24-10	AWG)
Stripping length		6 mm (0.24 in)		8 mm (0.31 in)	•
Tightening torque	input / output	0.6 Nm (5 lb.in)	•	1.0 Nm (9 lb.in) / (0.62 Nm /5.5 lb i
Environmental data		0.0 14111 (3 15.111)		1.0 14111 (9 10.111) / 1	0.02 NIII (3.3 Ib.i
Ambient temperature range	operation	T 40 = 20.00			
Ambient temperature range	***************************************	-40+70 °C			·
	rated load	10			-40+55 °C
	storage	-40+85 °C			•
Damp heat (cyclic) (IEC/EN 60068-2-		95 % RH, without	condensation		
Vibration (sinusoidal) (IEC/EN 60068-		10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis			
Shock (half-sine) (IEC/EN 60068-2-27	7)	15 G, 11 ms, 3 axes, 6 faces, 3 times for each face			
Isolation data					
Rated insulation voltage U _i	input circuit / output circuit	3 kV AC			
	input / PE		• • • • • • • • • • • • • • • • • • • •	•••••	•
		0.5 kV AC; 0.71 kV	V DC	•••••	•
Pollution degree		2	. 50	. *	***************************************
Overvoltage category (UL/IEC/EN 60	950-1)				•
Standards		II			
Product standard		T =			
	····	EN 61204-3			*
Low Voltage Directive		2006/95/EC			•
EMC directive		2004/108/EC			
RoHS directive		2011/65/EC			
Electrical safety		EN 60950-1, UL 609	950-1, UL 508, EN 6	1558-1, EN 61558-2-	17; EN 60204-1
Protective low voltage		SELV (EN 60950)	•••••	•••••	***************************************
Electromagnetic compatibility					
Interference immunity to		IEC/EN 61000-6-2	2		
electrostatic discharge	IEC/EN 61000-4-2		• • • • • • • • • • • • • • • • • • • •	at diaghauga 0 14/	•
g .		Level 4 (air discha	arge 15 kV / contac	ot discharge 8 kV)	•
radiated, radio-frequency, electromaç field	gnetic IEC/EN 61000-4-3	Level 3 (10 V/m)			
	IEC/EN 61000-4-4			1 14/411//01	
electrical tast transient/burst		Level 4 (4 kV / 5 k	•	Level 4 (4 kV / 2.5	KHZ)
surge	IEC/EN 61000-4-5	L-L Level 3 (2 kV)	/ L-PE Level 4 (4 k	.V)	•
conducted disturbances, induced by frequency fields	radio- IEC/EN 61000-4-6	Level 3 (10 V/m)			
power frequency magnetic fields	IEC/EN 61000-4-8	Level 4 (30 A/m)	•••••	•	•
voltage dips, short interruptions and	voltage IEC/EN 61000-4-11		/ >30 % 500 ms,	interruptions: >95	% 5000 ms
variations					<u>.</u>
		HEC/EN 61000 C			
Interference emission	IEC/CIODD 30 EN 55000	IEC/EN 61000-6-0	<u>.</u>	•••••	•
variations Interference emission high-frequency radiated	IEC/CISPR 22, EN 55022	Class B			
Interference emission	IEC/CISPR 22, EN 55022			Class D	

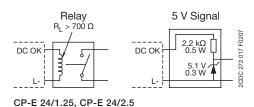
[&]quot;Approvals and marks" on page 182

CP-E range Technical diagrams, Wiring instructions

Output curve at T_a = 25 °C



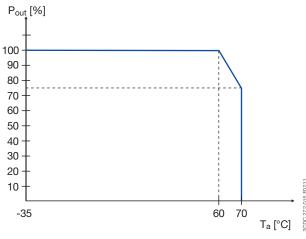
Wiring instructions



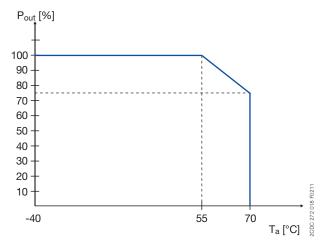
CP-E range

Technical diagrams, Dimensional drawings

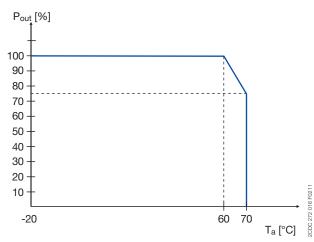
Temperature behaviour at T_a = 25 °C



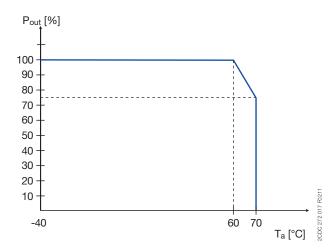
CP-E 12/10.0, CP-E 24/5.0



CP-E 24/20.0, CP-E 48/10.0

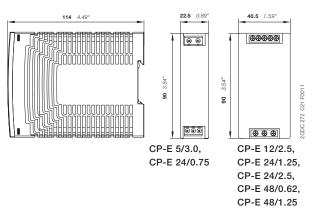


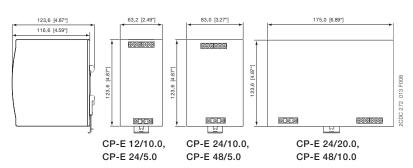
CP-E 5/3.0, CP-E 24/0.75



CP-E 12/2.5, CP-E 24/1.25, CP-E 48/0.62, CP-E 24/2.5, CP-E 48/1.25, CP-E 24/10.0, CP-E 48/5.0

Dimensional drawings dimensions in mm





CP-T range Product group picture



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CP-T range Benefits and advantages

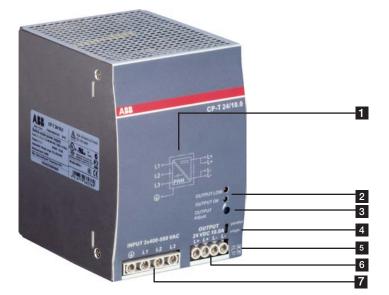
Characteristics

- Rated output voltages 24 V, 48 V DC
- Output voltage adjustable via front-face rotary potentiometer "OUTPUT Adjust"
- Rated output currents 5 A, 10 A, 20 A, 40 A
- Rated output powers 120 W, 240 W, 480 W, 960 W
- Three-phase operation (see derating note)
- Two-phase operation (25 % derating possible, see derating note)
- Supply range 3 x 400-500 V AC (3 x 340-575 V AC, 480-820 V DC)
- Typical efficiency of 93 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 °C 1)
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Redundancy unit CP-A RU offering true redundancy, available as accessory
- LEDs for status indication
- Signalling contact "13-14" (solid state) for output voltage
- Approvals / marks (depending on device, partly pending):
- ω, c**π**us, [Π, @ / C€, &

^{1) 480} W variants: -30...+70°C







Benefits

Signalling output ①

The devices of the CP-T series offer a solid state output for function monitoring and remote diagnostics.

Wide input range

Wide range input optimized for world-wide applications: The CP-T power supplies can be used in 340 - 575 V AC or 480 - 820 V DC supply systems.

Adjustable output voltage ②

The CP-T range feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line lenath.

- 1 Circuit diagram
- 2 Indication of operational states

DC ON: green LED - green LED - output voltage OK DC LOW: red LED - output voltage too low

- 3 OUTPUT Adjust: potentiometer adjustment of output voltage
- 4 single/parallel: sliding switch adjustment of single or parallel operation
- 5 Signalling contact

OUTPUT 13-14: terminals - signalling contact A solid-state output indicates the error-free operation of the output voltage.

- 6 OUTPUT L+, L+, L-, L-: terminals output
- 7 INPUT L1, L2, L3, PE: terminals input

CP-T range Ordering details



CP-T 24/5.0



CP-T 24/10.0, CP-T 48/5.0



CP-T 24/20.0, CP-T 48/10.0

Description

The CP-T range of three-phase power supply units is the youngest member of ABB's power supply family. In terms of design and functionality, the new range perfectly supplements the existing products and extends the range appropriately. The devices can be supplied with a threephase voltage as well as with two-phase mains. Here, ABB offers power supply units with 24 V DC and 48 V DC outputs with 5 A, 10 A, 20 A and 40 A and efficiency of up to 92 %. As in the case of all products, they are designed for an ambient temperature of up to 70 °C. All products can be supplied within an AC supply voltage range between 340 to 575 V AC and a DC supply voltage range between 480 to 820 V DC.

Ordering details

Input voltage range	Rated output voltage /	Туре	ype Order code		Weight (1 pce)
	current			1 pce	kg (lb)
340-575 V AC / 480-820 V DC	24 V DC / 5 A	CP-T 24/5.0	1SVR427054R0000		0.80 (1.77)
340-575 V AC / 480-820 V DC	24 V DC / 10 A	CP-T 24/10.0	1SVR427055R0000		1.05 (2.31)
340-575 V AC / 480-820 V DC	24 V DC / 20 A	CP-T 24/20.0	1SVR427056R0000		1.75 (3.86)
340-575 V AC / 480-820 V DC	24 V DC / 40 A	CP-T 24/40.0	1SVR427057R0000		3.20 (7.05)
340-575 V AC / 480-820 V DC	48 V DC / 5 A	CP-T 48/5.0	1SVR427054R2000		1.05 (2.31)
340-575 V AC / 480-820 V DC	48 V DC / 10 A	CP-T 48/10.0	1SVR427055R2000		1.75 (3.86)
340-575 V AC / 480-820 V DC	48 V DC / 20 A	CP-T 48/20.0	1SVR427056R2000		3.40 (7.50)



Further documentation CP-T power supplies on www.abb.com

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Туре	CP-T 24/5.0	CP-T 24/10.0	CP-T 24/20.0	CP-T 24/40.0
Input circuit		L1,	L2, L3	
Rated input voltage U _{in}	3 x 400-500 V A	С		
Input voltage range	340-575 V AC	••••••	***************************************	***************************************
	480-820 V DC	•	•	•
Frequency range AC	47-63 Hz		•••••	•
Typical input current	0.36 A	0.65 A	1.1 A	1.72 A
Typical power consumption	135 W	270 W	538 W	1058 W
Inrush current limiting	10 A	20 A		30 A
Power failure buffering time	min. 20 ms		•	min. 15 ms
Internal input fuse per phase	2 A / 600 V AC		T 3.15 A / 500 V AC	T 5 A / 500 V AC
Recommended backup fuse	3 pole miniature	circuit breaker AB	B Type S203	*
Power factor correction (PFC)	Yes, passive	••••••	•••••	•
Discharge current towards PE	< 3.5 mA	•	•	•
input / output	< 0.25 mA		····	•
Indication of operational states				
Output voltage OUTPUT OK: green LED	output voltage C	K		
OUTPUT LOW: red LED	output voltage to	oo low		•
Output circuit		L+, L-	+, L-, L-	
Rated output voltage	24 V DC		, ,	
Tolerance of the output voltage	0+1 %	. •		•
Adjustment range of the output voltage	22.5-28.5 V DC			•
Rated output power	120 W	240 W	480 W	960 W
Rated output current I, T _s ≤ 60 °C	5 A	10 A	20 A	40 A
Derating of the output current $60 ^{\circ}\text{C} < T_a \le 70 ^{\circ}\text{C}$	2.5 %/°C	. i	<u>i</u>	3.5 %/°C
Signalling contact 13-14	solid state (max.	60 V DC, 0.3 A)		<u> </u>
for output voltage OK Threshold	17.6-19.4 V			•
Insulation voltage	500 V DC	. •		•
	≥ 60 V DC, ≤ 0.	3 A fast-acting		
Maximum deviation with load change statical	±1 %	±1 % (single mod	de)	•
	-	±5 % (parallel mo	ode)	•
change of output voltage	± 0.5 %			•
within the input voltage range Control time at nominal load				•
				•
the event veltage	max. 1 s	. •		•
, σ				•
	max. 150 ms			•
				•
Fall time Residual ripple and switching peaks BW = 20 MHz	max. 150 ms	. *	······································	
				80 mV
Parallel connection	not supported	to 2 devices, mir	increase power, up n. 0.1 I _r - max 0.9 I _.)	up to 2 devices, min. 0.1 I _r - max. 0.9 I _r use active current balancing
Series connection	not supported	yes, to increase	voltage, max. 2 dev	ices
Resistance to reverse feed	approx. 35 V	. <u>i</u>		•
Output circuit - No-load, overload and short-circuit behaviour	1 **			
Characteristic curve of output	combined U/I ch	aracteristic curve	U/I- or Hiccup- mode adjustable	hiccup / fold back behavior
Short-circuit protection	continuous shor	t-circuit proof	<u>i</u>	<u>i</u>
Short-circuit behaviour	current limiting			•
Overload protection	hiccup mode			•
No-load protection	continuous no-lo	ad stability		•
Overtemperature protection			erature went down	•
Starting of capacitive loads	3500 μF	7000 µF	7000 µF	7000 μF
	M.	: M.	1 m.	m.

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

		OD T 04/5 0	OD T 04/40 0	OD T 04/00 0	OD T 04/40 0	
Type		CP-T 24/5.0	CP-T 24/10.0	CP-T 24/20.0	CP-T 24/40.0	
General data Efficiency		typ. 89 %	typ. 90 %		typ. 92 %	
Duty time		100%	typ. 90 %	•••••	: LYD. 92 70	
Dimensions (W x H x D)		74.3 x 124 x 118.8 mm (2.92 x 4.88 x 4.68 in)	89 x 124 x 118.8 mm (3.5 x 4.88 x 4.68 in)	150 x 124 x 118.8 mm (5.91 x 4.88 x 4.68 in)	275.8 x 124 x 118.8 mm (10.86 x 4.88 x 4.68 in)	
Weight		0.78 kg (1.72 lb)	1.045 kg (2.30 lb)	1.657 kg (3.653 lb)	3.275 kg (7.220 lb)	
Material of housing		Metal				
Mounting Mounting position		DIN rail (IEC EN 60715), snap-on mounting without any tool horizontal			iy tool	
Minimum distance to other units horiz	zontal / vertical sing / terminals	1 25 mm / 25 mm (0.98 in / 0.98 in)				
Electrical connection - input circuit / output circuit / signal						
Wire size fine-strand with v	vire end ferrule	0.2-4 mm² (24-11 AWG)				
fine-strand without wire end fe		,				
	rigid	0.2-6 mm² (24-10 AWG)				
Stripping length		8 mm (0.31 in)			······································	
Tightening torque	input / output	1 Nm (9 lb.in) / 0.6 Nm (5.5 lb.in)			1 Nm (9 lb.in) / 1.8 Nm (15.6 lb.in)	
Environmental data Ambient temperature range	operation	-40+70 °C		-30+70 °C	-40+70 °C	
Ambient temperature range	rated load	-40+60 °C		-30+70 °C	-40+60 °C	
	storage	1	•	-30+60 C	-40+60 C	
Damp heat (cyclic) (IEC/EN 60068-2-30)		95 % without condensation				
Vibration (sinusoidal) (IEC/EN 60068-2-6)		2 g, 10-500 Hz, 2G, each along X, Y, Z axes 60 min / cycle 15 g, 11 ms, 3 axes, 6 faces, 3 times for each face				
Shock (half-sine) (IEC/EN 60068-2-27)		15 g, 11 ms, 3 ax	es, 6 faces, 3 time	es for each face		
Isolation data						
Rated insulation voltage U _i input circuit / output circuit input / PE						
	0.5 kV AC; 0.71 kV DC					
signalli	ng output / PE	0.5 kV DC				
Pollution degree		2	•		•	
Standards						
Product standard		EN 61204-3				
Low Voltage Directive		2006/95/EC				
EMC directive		2004/108/EC				
RoHS directive	2011/65/EC					
Electrical safety		EN 60950-1, UL 60950-1, UL 508, EN 61558-1, EN 61558-2-17; EN 60204-1				
Protective low voltage		SELV				
Electromagnetic compatibility		<u> </u>				
Interference immunity to		IEC/EN 61000-6-	2			
		Level 4 (air discharge 15 kV / contact discharge 8 kV)				
radiated, radio-frequency, electromagnetic IEC. field	/EN 61000-4-3	Level 3 (10 V/m)				
electrical fast transient/burst IEC	/EN 61000-4-4	Level 4 (4 kV / 2.5 kHz)	Level 4 (4 kV / 5 k	,		
surge IEC	/EN 61000-4-5	L-L Level 3 (2 kV)	/ L-PE Level 4 (4 k	·····································		
conducted disturbances, induced by radio- IEC. frequency fields	/EN 61000-4-6					
	/EN 61000-4-8	Level 4 (30 A/m)	***************************************	• • • • • • • • • • • • • • • • • • • •		
power inequency inagricus includ		t	mo / > 20 % 0.5 mg	s, interruptions: >9	5 % 250 ms	
voltage dips, short interruptions and voltage IEC/	EN 61000-4-11	dips: >95 % 0.5 r	115 / >30 % 0.3 1118	,, interruptione. > 0		
voltage dips, short interruptions and voltage IEC/ variations	EN 61000-4-11	dips: >95 % 0.5 r IEC/EN 61000-6-				
voltage dips, short interruptions and voltage IEC/ variations Interference emission	EN 61000-4-11			, monaphone. 20		
voltage dips, short interruptions and voltage IEC/ variations Interference emission high-frequency radiated IEC/CISPF		IEC/EN 61000-6-		,, interruptione. 20		

[&]quot;Approvals and marks" on page 182

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Туре		CP-T 48/5.0	CP-T 48/10.0	CP-T 48/20.0			
Input circuit		L1, L2, L3					
Rated input voltage U _{in}		3 x 400-500 V AC					
Input voltage range		340-575 V AC					
		480-820 V DC					
Frequency range AC		47-63 Hz					
Typical input current		0.65 A	1.1 A	1.72 A			
Typical power consumption		264 W	535 W	1050 W			
Inrush current limiting		20 A	······	30 A			
Power failure buffering time		min. 20 ms		min. 15 ms			
Internal input fuse	per phase	2 A / 600 V AC	T3.15 A / 500 V AC	T 5 A / 500 V AC			
Power factor correction (PFC)		yes, passive	i	i			
Discharge current	towards PE	L					
	input / output						
Indication of operational states							
Output voltage OUTPUT OK: green LED		output voltage OK					
OUTPUT LOW: red LED				·····			
Output circuit		L+, L+, L-, L-					
Rated output voltage		48 V DC					
olerance of the output voltage		0+1 %					
Adjustment range of the output voltage		47-56 V DC					
Rated output power		240 W	480 W	960 W			
Rated output current I,	T _a ≤ 60 °C	5 A	10 A	20 A			
Derating of the output current	$T_a = 00^{\circ} \text{C}$ 60 °C < $T_a \le 70$ °C	2.5 %/°C	1071	3.5 %/°C			
Maximum deviation with		±1 % (single mode) ± 5 % (parallel mode)					
Waximam deviation with	load onlingo statioal						
change of	output voltage within the input voltage range		.,,				
Control time	at rated load	< 2 ms					
Starting time after applying the supply voltage		max. 1 s					
Starting time after applying the supply voltage	with 7000 μF						
Rise time	at rated load						
The time							
Fall time	Ψιτι 7000 μι	max. 500 ms					
	BW = 20 MHz			80 mV			
Residual ripple and switching peaks Parallel connection	DVV = 20 IVITIZ	configurable, to increase power, up to 2 devices, min. 0.1 I _r - max 0.9 I _r)		to increase power, up			
Taraner connection				to 2 devices, min. 0.1 - max. 0.9 I, use active current balancing			
Series connection		yes, to increase voltage, max. 2 devices					
Resistance to reverse feed		approx. 35 V	approx. 63 V	approx. 63 V			
Output circuit - No-load, overload and short-circu	uit behaviour	approxi oo t	approxit co .	approx. oo .			
Characteristic curve of output	an bonaviou	combined U/I and hiccup mode	U/I or hiccup mode, configurable	hiccup mode / fold back behavior			
Short-circuit protection		continuous short-circuit proof					
Short-circuit behaviour		current limiting					
Overload protection		hiccup mode					
No-load protection		continuous no-load stability					
Over temperature protection	ves, automatic recovery after temperature went down						
	7000 µF						

CP-T range Technical data

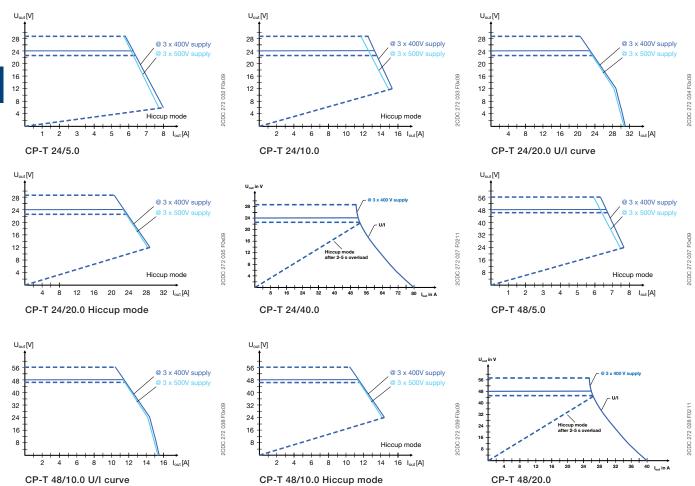
Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Туре		CP-T 48/5.0	CP-T 48/10.0	CP-T 48/20.0
General data			•	
Efficiency		typ. 91 %		typ. 93 %
Duty time	•	100%		·· · ·····
Dimensions (W x H x D)		89 x 124 x 118.8 mm (3.5 x 4.88 x 4.68 in)	150 x 124 x 118.8 mm (5.91 x 4.88 x 4.68 in)	275.8 x 124 x 118.8 mr (10.86 x 4.88 x 4.68 in)
Weight	······································	1.045 kg (2.30 lb)	1.657 kg (3.653 lb)	3.275 kg (7.22 lb)
Material of housing	······································	Metal	<u>i</u>	
Mounting	······································	DIN rail (IEC EN 60715)	, snap-on mounting with	out any tool
Mounting position		horizontal	,, -	
Minimum distance to other units	horizontal / vertical	25 mm / 25 mm (0.98 i	n / N 98 in)	······································
Degree of protection	housing / terminals			··•····
Protection class	Tiousing / terminals	11 20 / 11 20		
		I	<u>.</u>	
Electrical connection - input circuit / output c				1004
	e-strand with wire end ferrule			0.2-4 mm ² (24-11 AWG) / 0.5-10 mm ² (20-8 AWG)
fine-st	rand without wire end ferrule	0.2-6 mm² (24-10 AWG	i)	(2007, 11, 10)
Stripping longth	rigid	8 mm (0.31 in)		
Stripping length		, ,	/E E lla i.a\	: 1 Nee /0 II- !> /
Tightening torque	input / output	1 Nm (9 lb.in) / 0.6 Nm	(ni.di c.c)	1 Nm (9 lb.in) / 1.8 Nm (15.6 lb.in)
Environmental data		40 70.00	70.00	. 10 70 00
Ambient temperature range		-40+70 °C	-30+70 °C	-40+70 °C
		-40+60 °C	-30+60 °C	-40+60 °C
	storage	-40+85 °C	-40+85 °C	-40+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)		95 % without condensation		
Vibration (sinusoidal) (IEC/EN 60068-2-6)		10-500 Hz, 2G, each along X, Y, Z axes 6 min / cycle		
Shock (half-sine) (IEC/EN 60068-2-27)		15G, 11 ms, 3 axes, 6	Faces, 3 times for each f	ace
Isolation data				
Rated insulation voltage U _i	input circuit / output circuit	3 kV AC		
	input / PE	1.5 kV AC		
	output / PE	0.5 kV AC; 0.71 kV DC	······································	••••••
Pollution degree		2		···•·····
Standards				
Product standard		EN 61204-3		
Low Voltage Directive	······································	2006/95/EC		
EMC directive		2004/108/EC		
RoHS directive		2011/65/EC		
Electrical safety		EN 60950-1, UL 60950-1, UL 508, EN 61558-1, EN 61558-2-16; EN 60204-1		
Protective low voltage		SELV		······································
Electromagnetic compatibility		l		
nterference immunity to		IEC/EN 61000-6-2		
electrostatic discharge	JEC/EN 61000-4-2		15 kV / contact discharge	e 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3			
electrical fast transient/burst	IEC/EN 61000-4-4	Level 4 (4 kV / 5 kHz)	···•··································	
surge	IEC/EN 61000-4-5	L-L Level 3 (2 kV) / L-P	E Level 4 (4 kV)	
conducted disturbances, induced by radio-	IEC/EN 61000-4-6	i i		
requency fields power frequency magnetic fields	IEC/EN 61000-4-8	, ,		
voltage dips, short interruptions and voltage	IEC/EN 61000-4-11	dips: >95 % 0.5 ms / >	30 % 0.5 ms	···
variations Interference emission		interruptions: >95 % 25 IEC/EN 61000-6-3		
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B		
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B		······································
limits for harmonic current	IEC/EN 61000-3-2	Class A	······································	
emissions		1		

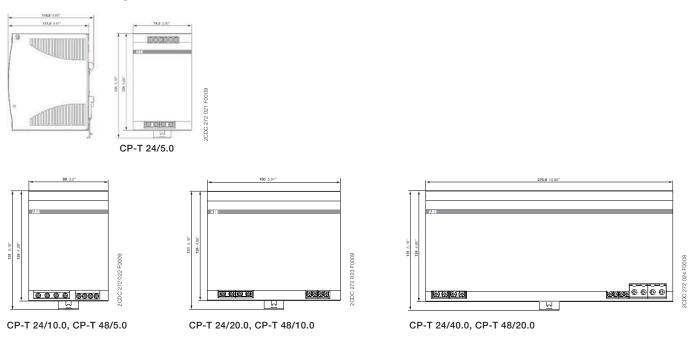
[&]quot;Approvals and marks" on page 182

CP-T range Technical diagrams, Dimensional drawings

Technical diagrams, dimensions in mm Output curve at $T_a = 25$ °C

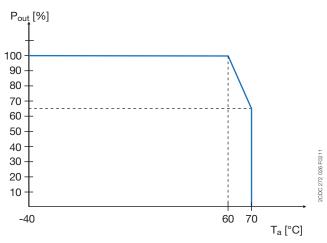


Dimensional drawings dimensions in mm

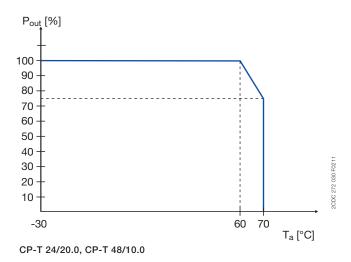


CP-T range Technical diagrams

Temperature curve at rated load



CP-T 24/40.0, CP-T 48/20.0



Pout [%] 100 90 80 70 60 50 40 2CDC 272 025 F0211 30 20 10 -40 60 70 T_a [°C]

CP-T 24/5.0, CP-T 24/10.0, CP-T 48/5.0

CP-C.1 range Product group picture



CP-C.1 range Product group picture

CP-C.1

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CP-C.1 range Benefits and advantages

Characteristics

- Rated output voltage 24 V DC
- Power reserve design delivers up to 150 % at T_a ≤ 40 °C
- Output voltage adjustable via front-face rotary potentiometer "OUTPUT Adjust", 22.5-28.5 V
- Input voltage range 100-240 V AC, 90-300 V DC
- High efficiency
- Low power dissipation and low heating
- Free convection cooling (no forced cooling)
- Ambient temperature range during operation -25...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- DC OK signaling output "13-14" (Relay), Power reserve signaling output "I > I_n (Transistor)
- Redundancy unit CP-A RU offering true redundancy, available as accessory
- Approvals / Marks (depending on device, partly pending): CB SEMIF47 / CE,

Benefits

Power reserve

The primary switch mode power supply CP-C.1 is equipped with a power reserve to handle particularly heavy loads for example during the start-up of a process or a motor. The CP-C.1 will deliver up to 50 % of the rated current to secure the operation of the application also on heavy loads. This status is indicated by the yellow LED giving a clear visual status of the operation mode.

Signaling output

A signaling output relay is part of the CP-C.1 power supply. A transistor output switches to show that the device is now running on power reserve mode. This signaling could be used as a way to communicate to a higher level control system e.g. a PLC. The CP-C.1 includes an output relay to indicate the status of the voltage (OUTPUT OK).

Depending on the logic of the higher level control system an appropriate action is initiated by forwarding the signal. The receptor of this signal could be a contactor, a signal tower or an interface relay.



Continuous operation

- Power reserve design to allow performance with up to 50 % more current
- Redundancy setup of the application possible to allow parallel operation
- Long lifetime
- High peak currents for switching on capacitive loads are supported



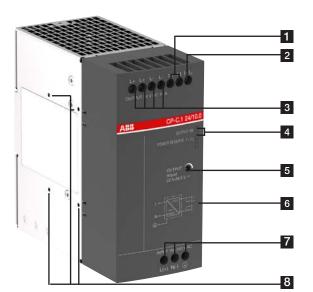
Project cost reduction

- Up to 94 % efficiency saves money for energy during operation
- Less need for external cooling in the
- Small size to reduce space needed in panel



Harsh environment

- Applicable in environments from -25 to +70°C
- High MTBF values



- 1 13-14: Relay output to signal output OK
- 2 I > I_p: Power reserve transistor output
- 3 OUTPUT L+, L-: Output terminals
- 4 Indication of operational states

OUTPUT OK: Green LED

POWER RESERVE I > IR: Yellow LED

- 5 OUTPUT Adjust: Rotary potentiometer -Adjustment of output voltage 22.5-28.5 V DC
- 6 Circuit diagram
- 7 INPUT L(+), N(-), o/PE: Input terminals
- 8 Side mounting screw holes for DIN rail adapter / lateral mounting

CP-C.1 range Ordering details



CP-C.1 24/5.0





CP-C.1 24/10.0



CP-C.1 24/20.0

Description

The CP-C.1 power supplies are ABB's high-performance and most advanced range. With excellent efficiency, high reliability and innovative functionality it is prepared for the most demanding industrial applications. These power supplies have up to 50 % integrated power reserve and operate at an efficiency of up to 94 %. They are equipped with overheat protection and active power factor correction. Combinded with a broad AC and DC input range and extensive worldwide approvals the CP-C.1 power supplies are the preferred choice for professional DC applications.

Ordering details - CP-C.1

Input voltage range	Rated output voltage / current	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
100-240 V AC, 90-300 V DC	24 V DC / 5 A	CP-C.1 24/5.0	1SVR360563R1001		0.96 (2.11)
100-240 V AC, 90-300 V DC	24 V DC / 10 A	CP-C.1 24/10.0	1SVR360663R1001		1.07 (2.35)
100-240 V AC, 90-300 V DC	24 V DC / 20 A	CP-C.1 24/20.0	1SVR360763R1001		2.83 (6.23)



Further documentation CP-C.1 power supplies on www.abb.com

CP-C.1 range Technical data

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Time		OD 04 04/5 0	OD 04 04/40 0	OD 04 04/00 0
Туре		CP-C.1 24/5.0	CP-C.1 24/10.0	CP-C.1 24/20.0
Input circuit - supply circuit				
Rated input voltage U _{in}		100-240 V AC	•	
Input voltage range		85-264 V AC	•	
Pated fraguency	DC	90-300V DC DC, 50/60 Hz	•	
Rated frequency Frequency range		45-65Hz		
Typical power consumption		132 W	256 W	508 W
Typical input current	at 115 V AC		2.3 A	4.6 A
***	at 230 V AC	0.6 A	1.2 A	2.3 A
Discharge current towards PE	•	< 3.5 mA	•	
Inrush current limiting	cold state	< 15 A	< 20 A	< 30 A
Hold-up time	at 115 V AC	min. 50 ms	min. 40 ms	min. 40 ms
	at 230 V AC	min. 50 ms	min. 40 ms	min. 40 ms
Internal input fuse	······	T4.0A, not exchangeable		
Recommended backup fuse for wire protection 1.5 mm ²	1 at	1 pole miniature circuit	breaker ABB type S 200	
	characteristic max. rating		•	
Power factor correction (PFC)	max. rating	yes, active	•	••••••
Transient overvoltage protection		yes, varistor	•••••	•••••
Indication of operational states				
Output voltage LED 'OUTPUT	OK ' (green) ON	92 % adjusted U _{out}		
	Flashing	90 % adjusted U _{out}	•	
Power reserve LED	'I > I _B ' yellow OFF	I ≤ I _R	•	
Fower reserve LED			•	
	ON			
Output circuit - power output				
Rated output voltage	······	24 V DC	•	
Tolerance of the output voltage		± 1 %	•	
Adjustment range of the output voltage		22.5-28.5 V DC	240 W	400 \\
Rated output power Rated output current I,	-25 °C < T _a < 70 °C	120 W	10.0 A	480 W 20.0 A
	-25 C < I _a < 70 C	3.0 A		1
Reserve output current	-25 °C < T _a < 40 °C	1	15.0 A continuously	26.0 A continuously
Short-circuit current limit		7.6 A	15.5 A	27.7 A
Derating of the output current	60 °C < T _a < 70 °C	2.5 %/°C		3.5 %/°C
Deviation width	oad change statical 10-90%	< 1 %, class C acc. to I	EC/EN 61204	
of output voltage change of input voltage w	dynamical 0-100%	< 5%, class B acc. to IE	C/EN 61204	
change of input voltage w	ithin the input voltage range	< 1 ms, class A acc. to	IEC/EN 61204	
Control time	at rated load	< 0.1 %, class A acc. to	IEC/EN61204	
Starting time after applying the supply voltage Rise time		< 500 ms, class C acc.	to IEC/EN 61204	
Fall time	at rated toad	< 20 ms	•	
Residual ripple and switching peaks	BW = 20 MHz	< 120 mVpp, class A ac	c to IEC/EN 61204	
Parallel connection	511 - 20 III IZ	ves. up to 5 devices, to	enable redundancy and	
		to increase power, curre		
Series connection		yes, max. 2 devices to i		
Output circuit - No-load, overload and short-o	ircuit behaviour		-	
Characteristic curve of output		U/I characteristic curve	with power reserve	
Short-circuit protection	······································	continuous short-circuit		
Short-circuit behaviour		current limiting		
Resistance to reverse feed		≤ 35 V DC	•	
Over temperature protection		protection by switch off	in case of overtemperat	ure (thermal protection
Overland protection	<u>.</u>	automatic restart	••••••••••••••••••••••••••••••••••••••	
Overload protection	······	constant current limitati		
No-load protection Starting of capacitive loads		continuous no-load stat	אווורא	
Signalling outputs - OUTPUT OK signalling ou	tout	y = 0		
Type of output	13-14	rolay n/o contact		
ON (contact closed)	13-14	relay, n/o contact 92 % adjusted U _{out}	•	
			•	
OFF (contact open)		90 % adjusted U _{out}	•	
	. switching voltage / current		C - 1 A (resistive load)	
	. switching voltage / current	5 V DC / 1 mA	<u> </u>	
Signalling outputs - POWER RESERVE signall	ing output			
Type of output	l > l _R	transistor, short-circuit	proof	
Active / ON (closed)		1 > 1 _R		
OFF (open)		I ≤ I _R	•••••	
Ratings	voltage / current	24 V DC / ≤ 20 mA	••••••	
90	voltage / Current	121 V DO / 3 ZO IIIA		

CP-C.1 range Technical data

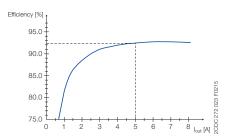
Туре		CP-C.1 24/5.0	CP-C.1 24/10.0	CP-C.1 24/20.0
General data				
Efficiency	at rated output power	up to 93 %	up to 94 %	up to 94 %
Power losses	at rated output power	12 W	16 W	28 W
	at 50% of rated output power		12 W	17 W
********	at no load		<u></u>	
Duty time		100 %	······································	······································
MTBF	acc. to MIL 217 HDBK	on request	······································	••••••
Dimensions (W x H x D)		40.0 x 129.4 x 136.0	60.0 x 129.4 x 136.0	82.0 x 129.4 x 136.0
		mm (1.575 x 5.094 x	mm (2.36 x 5.094 x	mm (3.23 x 5.094 x
		5.354 in)	5.354 in)	5.354 in)
Weight		"Ordering details" on p		
Minimum distance to other units	horizontal / vertical	max. 25 mm (0.98 in)	ago zzz.	
Degree of protection		max. 25 mm (0.98 in)		······································
Material of housing	cover / housing shell / front		I / aluminium / plactic D	^6 \/ ^
	cover / flousing shell / front		ap-on mounting without	
Mounting			ap-on mounting without	arry toor
Mounting position	enclosure / terminals	see data sheet		
Degree of protection (IEC/EN 60529)	enciosure / terminais	IP20 / IP20 		
Protection class (EN 61140)		I		
Electrical connection - Input circuit, Outp	out circuit, Signalling output			
Wire size		see data sheets	·····	
Stripping length		see data sheets		
Tightening torque		see data sheets		
Environmental data				
Ambient temperature range	operation	-25+70 °C (-13 +15	58 °F)	
		-25+60 °C (-13 +14		······································
		-40+85 °C (-40+18		
		-40+85 °C (-40+18		
Climatic category (IEC/EN 60721-3-1)	storana	1K2 (-40+85 °C / -40		-
Climatic category (IEC/EN 60721-3-1)	transportation	2K2 (-40+05 °C / -40	1+100 1/ 1 ±185 °F)	
Climatic category (IEC/EN 60721-3-2)	operation	3K3 (-25+70 °C / -13	150 °E\	<u> </u>
Damp heat, cyclic (IEC/EN 60068-2-30)	operation	Test Db: 55°C, 2 cycles	+130 F)	·· · ············
Vibration, half-sine (IEC/EN 60068-2-6)		Test Fc: 10-58 Hz, amp		·· · ·····
VIDIATION, Hall-Sine (IEC/EN 60066-2-6)				-
Ob 1. b - - - (EO / EN 00000 0 07)		58-150 Hz, 2 g, 10 swe		
Shock, half-sine (IEC/EN 60068-2-27)		lest Ea: 30 g, 6 ms, 3	pulses each axis, bump	-
A111		20 g, 11 ms, 100 pulse	s each axis	
Altitude	without restriction	2000 m		
Isolation data				
Rated impulse withstand voltage	input circuit / output circuit	4 kV (1.2/50 μs)		
U _{imp} (EN 50178)	input circuit / PE			
	input circuit / relay contact			
	output circuit / relay contact	0.5 kV (1.2/50 μs)		
	relay contact / PE	0.5 kV (1.2/50 µs)		
	output circuit / PE			
Rated insulation voltage	input circuit / output circuit			
Ui (EN 50178)	input circuit / PE			
	input circuit / relay contact	300 V		
	output circuit / relay contact	50 V		
	relay contact / PE	50 V		•••••
	output circuit / PE	50 V		
Overvoltage category (EN 50178)	< 2000m		······································	
	20005000m		······································	
	< 2000m			
	20005000m	tii	······································	······································
Pollution degree (IEC/EN 60950-1; EN 50178		2		······································
Test voltage, type test (IEC/EN 60950-1)	input circuit / output circuit			
.55t 75.tago, typo toot (IEO/EIN 00000-1)	input circuit / PE			
	relay contact / output circuit			•••••
	output circuit / PE			
Toet voltago, routino toet				···•··································
Test voltage, routine test	input circuit / output circuit			
	input circuit / PE			•••••
	relay contact / output circuit			
Distriction consisting (IEO/EN 000E0 1)	output circuit / PE			···•··································
Protective separation (IEC/EN 60950-1)	input circuit / output circuit			
0	input circuit / relay contact	res		
Standards				
Product standard		IEC/EN 61204		
Low Voltage Directive		2014/35/EC		
EMC Directive		2014/30/EC		
RoHS directive	·····	2011/65/EC		•••••
Electrical safety	·····	IEC/EN 60950-1	·····	•••••
Industrial control equipment	·····	UL 508 / CSA 22.2 No	107.1	
Electronic equipment for use in power ins	tallations	EN 50178		
Safety extra low voltage		PELV (EN 50178)		
Protective extra low voltage		SELV (IEC/EN 60950-1)	
Limitation of harmonic line currents	<u>.</u>	IEC/EN 61000-3-2	<i>I.</i>	
Limitation of Harmonic line currents		1LO/LIN 01000-0-2		

CP-C.1 range Technical data

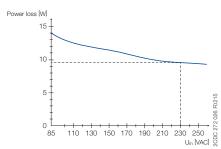
Type		CP-C.1 24/5.0	CP-C.1 24/10.0	CP-C.1 24/20.0
Electromagnetic compatibility			•	•
Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC)		IEC/EN 61204-3		
Interference immunity to		IEC/EN 61000-6-1 and	IEC/EN 61000-6-2	
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 4, 8kV / 15 kV		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m		•
electrical fast transient / burst	IEC/EN 61000-4-4	Level 3, 2 kV	Level 4, 4 kV	Level 4, 4 kV
surge	IEC/EN 61000-4-5	Level 3, L-N 2 kV, Leve	el 4: L/N-PE 4 kV	
conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-6	Level 3, 10 V		
Testing and measurement techniques – Power frequency magnetic field immunity test	IEC/EN 61000-4-8	30 A/m (A)	30 A/m (A) [1000 A/m succesfull tested]	30 A/m (A)
damped oscillatory magnetic fields	IEC/EN 61000-4-10	-	Level 4, 30 A/m	-
voltage dips, short interruptions and voltage variations immunity tests	IEC/EN 61000-4-11	Class 3		· i.
voltage variations harmonics and interharmonics	IEC/EN 61000-4-13	-	Class 3	-
conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	IEC/EN 61000-4-16		Level 3, 10 V	-
Interference emission		IEC/EN 61000-6-3 and	IEC/EN 61000-6-4	IEC/EN 61000-6-4
limits for harmonic current emissions	IEC/EN 61000-3-2	Class A		:
limitation of voltage changes ect.	IEC/EN 61000-3-3	compliant		-
Information technology equipment radio disturbance characteristics limits and methods of measurement	IEC/CISPR 22, EN 55022	Class B		Class A
industrial scientific and medical (ISM) radio- frequency equipment electromagnetic disturbance characteristics limits and methods of measurement	IEC/CISPR 11, EN 55011	Class B		Class A
Voltage sags	SEMI F47	passed		
Federal Communications Commission	FCC15	compliant		

CP-C.1 range Technical diagrams

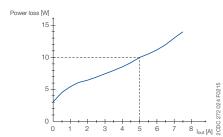
Efficiency diagrams CP-C.1 24/5.0



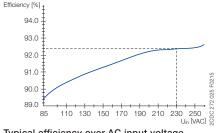
Typical efficiency over output current



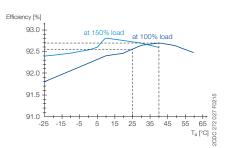
Typical power loss over AC input voltage



Typical power loss over output current

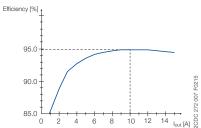


Typical efficiency over AC input voltage

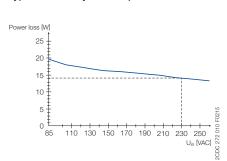


Typical efficiency over ambient temperature

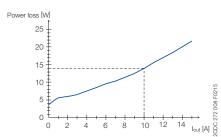
Efficiency diagrams CP-C.1 24/10.0



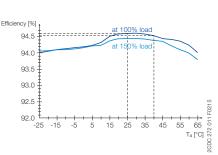
Typical efficiency over output current



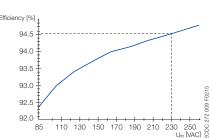
Typical power loss over AC input voltage



Typical power loss over output current



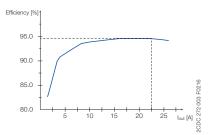
Typical efficiency over ambient temperature

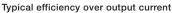


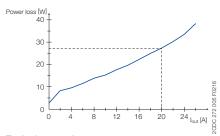
Typical efficiency over AC input voltage

CP-C.1 range Technical diagrams, Dimensional drawings

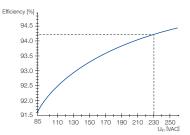
Efficiency diagrams CP-C.1 24/20.0



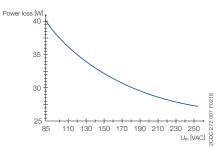




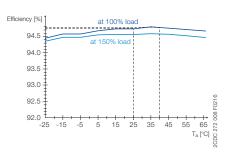
Typical power loss over output current



Typical efficiency over AC input voltage

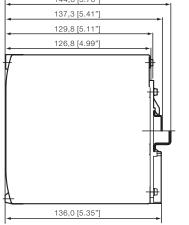


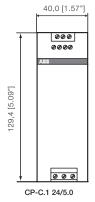
Typical power loss over AC input voltage

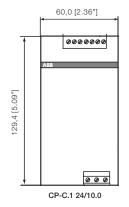


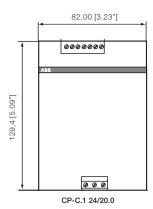
Typical efficiency over ambient temperature

Dimensional drawings dimensions in mm



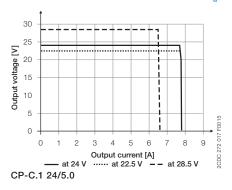


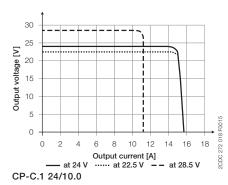


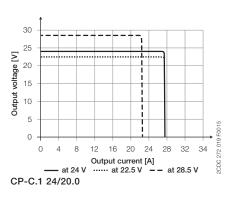


CP-C.1 range Technical diagrams

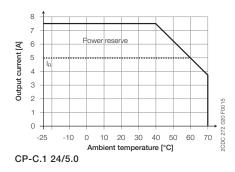
Characteristic curve of output at T_a = 25 °C

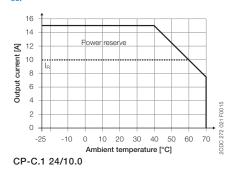


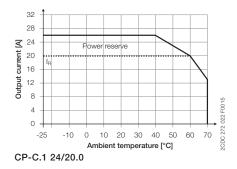




Characteristic curve of temperature at U_{out} = 24 V







Redundancy units Ordering details



CP-A RU + CP-A CM



CP-A RU



CP-RUD



CP-D RU



Further documentation of redundancy units on www.abb.com

Description

Whenever the highest availability and reliability are the key requirement a true redundancy setup of two power supplies is the solution which means two power supplies are connected to a redundancy unit. In case one power supply fails, the other one keeps supplying the load. Furthermore, even short-circuit in one power supply will not affect the other one which keeps supplying the load. Additionally, the CP-A RU redundancy module can be equipped with a control module (CP-A CM) to monitor both inputs for undervoltage and react accordingly by switching an output relay.

Ordering details

Description	Suitable for decoupling of two 24 V DC power supply units	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
2 inputs each up to 20 A and 1 output up to 40 A	≤ 40 V and ≤ 40 A	CP-A RU	1SVR427071R0000		0.89 (1.96)
Control module for CP-A RU redundancy units	-	CP-A CM	1SVR427075R0000		0.063 (0.14)
2 inputs each up to 2.5 A and 1 output up to 5 A	≤ 35 V and < 5 A	CP-RUD	1SVR423418R9000		0.15 (0.33)

Ordering details - CP-D RU for decoupling of two CP-D power supply units

		Rated output voltage / current	Туре	Order code	Weight (1 pce) kg (lb)
9-35 V DC	2 x 5 A	24 V DC / 1 x 10 A	CP-D RU	1SVR427049R0000	0.075 (0.165)

Туре		CP-A RU	CP-A RU
Input aircuit Supply sircuit			in combination with CP-A CM
Input circuit - Supply circuit			-/ -, +/ -)
Rated input voltage U _{in}		24 V DC	10.00.77.00
Input voltage range per channel		10-28 V DC	13-28 V DC
Rated input current lin per channel Maximum input current per channel		1-20 A 30 A for 300 s	
Transient overvoltage protection			
Output circuit		yes	(, , /)
Rated output voltage U _{out}		24 V DC	(++/)
Voltage drop		typ. 0.6 V, max. 0.9 V	
Rated output current I _{out}		1-40 A	
Output ratings per channel	T _ 60 °C	10-28 V DC / 40 A	13-28 V DC / 40 A
output ratings per chamiler	T _a = 00 °C	10-28 V DC / 30 A	13-28 V DC / 30 A
Derating 6		2.5 % per Kelvin temperature incl	
Peak output current	$0.0 < T_a = 70.0$	60 A for 300 s	i ease
Resistance to reverse feed		< 40 V	
General data		< 40 V	
Dimensions (W x H x D)		56.5 (60 ¹⁾) x 130 x 135.5 mm; (2.5	22 (2.36.1)\ x 5.12 x 5.35 in\
Weight		0.89 kg (1.96 lb)	(2.00) X 0.12 X 0.00 III)
		10 mm / 50 mm (0.39 in / 1.97 in)	
	ousing / terminals		
		aluminium / zinc-coated sheet sto	
Protection class	doing drien / cover	²	
Mounting		DIN rail (IEC/EN 60715)	
Mounting position		horizontal	
Electrical connection - Input circuit / Output circuit		110112011141	
	th wire end ferrule	2.5-10 mm² (14-8 AWG)	
***************************************		0.5-10 mm² (20-8 AWG)	
		0.5-16 mm² (20-6 AWG)	
Stripping length		12 mm (0.47 in)	
Tightening torque		1.2-1.5 Nm	
Environmental data			
Ambient temperature range	operation	-25+70 °C	
	rated load	-25+60 °C (without derating)	
	***************************************	-40+85 °C	
Damp heat (IEC/EN 60068-2-3)		93 % at 40 °C, no condensation	-
Climatic category (IEC/EN 60721)		3K3	
Vibration (IEC/EN 60068-2-6)	••••••		
Shock (IEC/EN 60068-2-27)			
Isolation data			
	/ output / housing	500 V AC (routine test)	
Pollution degree (EN 50178)		2	
Standards			
Product standard		IEC/EN 61204	
Low Voltage Directive	······	2006/95/EC	
EMC Directive		2004/108/EC	
		EN 50178, EN 60950, UL 60950,	UL 508
Electromagnetic compatibility			
Interference immunity to		IEC/EN 61000-6-2	
	EC/EN 61000-4-2	Level 3 (air discharge ±8 kV, cont	tact discharge ±6 kV)
	EC/EN 61000-4-3		
· · · · · · · · · · · · · · · · · · ·	EC/EN 61000-4-4		
······································	EC/EN 61000-4-5		
······································	EC/EN 61000-4-6		
frequency fields			
		IEC/EN 61000-6-3	
Interference emission		1EO/EN 01000-0-3	
Interference emission high-frequency radiated IEC/CISI	PR 22 / EN 55022	Class B	

¹⁾ incl. lateral screw
2) This device is designed for connection to a safety extra-low voltage source. If no safety extra-low voltage is used at the input side, the lateral screw can be used for grounding of the housing (protection class I).

[&]quot;Approvals and marks" on page 182

Туре	CP-A CM
Input circuit - Supply circuit	
Rated input voltage U.	24 V DC
Input voltage range	13-28 V DC
Rated input current at rated sense load and 24 V DC	120 mA
	approx. 1 W
Measuring circuit	11-12/14, 21-22/24
•	,
Monitoring function	undervoltage monitoring
Measuring voltage	rated operational voltage
Thresholds	14-28 V
Hysteresis, related to the threshold value	fix: 3-5 %
Accuracy, tolerance	10 % of full-scale value
Maximum measuring cycle	6 ms
Indication of operational states	
Status of input 1 IN 1: green LED	L: voltage at input 1 > than threshold 1 = no faults present
Status of input 2 IN 2: green LED	L: voltage at input 2 > than threshold 2 = no faults present
Output status OUT: green LED	L: U _{OUT} > 3 V = no faults present
Output circuit	+, +, -
Kind of output	relays, 2 x 1 c/o contact
Contact material	AgNi
Operating principle	Agini closed-circuit principle
Rated operational voltage U _B (IEC/EN 60947-1, VDE 0110)	250 V
	24 V / 10 mA
Minimum switching voltage / Minimum switching current	
Maximum switching voltage / Maximum switching current	250 V / 1 A
Rated operational current I AC-12 (resistive) at 230 V (IEC/EN 60947-5-1) AC-15 (inductive) at 230 V	1 A
7.0 10 (1.10001170) 41 200 1	1 A
DC-12 (resistive) at 24 V	1 A
DC-13 (inductive) at 24 V	1 A
Mechanical lifetime	30 x 10 ⁶ switching cycles
Electrical lifetime	0.1 x 10 ⁶ switching cycles
Rating according UL 508 General purpose (GP) 250 V AC	1 A
Maximum fuse rating to achieve n/o contact	2 A, gL
short-circuit protection n/c contact	2 A, gL
Sense output (+, +, -)	1 SVR 427 075 R0000
Sense output voltage	13-28 V DC
Sense output current	0.1 A
Maximum fuse rating	For applications acc. UL the sense output shall be provided
	with a listed DC fuse 3 A
General data	
Duty time	100 %
Dimensions (W x H x D, when mounted)	56.5 x 54 x 24 mm (2.22 x 2.13 x 0.94 in)
Material of housing	plastic
Weight	0.063 kg (0.14 lb)
Degree of protection housing / terminals	IP20 / IP20
Protection class	207 20
Mounting	
	snap-on mounting, without any tool
Mounting position	plugged onto the redundancy unit CP-A RU
Electrical conection Wire size fine-strand with wire end ferrule	
	0.2-2.5 mm ² (24-14 AWG)
fine-strand without wire end ferrule	,
rigid	0.2-4 mm² (24-12 AWG)
Stripping length	7.5 mm (0.3 in)
Tightening torque	0.4-0.6 Nm
Isolation data	
Rated insulation voltage U _i (IEC/EN 60947-1, EN 50178, VDE 0160)	250 V
Rated impulse withstand voltage U _{imp} (type test) between all circuits	2.5 kV
(IEC 664, VDE 0110)	
Power-frequency withstand voltage test (routine test) between all circuits	1.2 kV AC
Protective separation (EN 50178) between input and output	yes
Pollution degree	2
Overvoltage category	I
Environmental data	
Ambient temperature range operation	-25+70 °C
storage	-40+85 °C
Damp heat (IEC/EN 60068-2-3)	93 %at 40 °C, no condensation
Climatic category (IEC/EN 60721)	3K3
Vibration (IEC/EN 60068-2-6)	
Shock (IEC/EN 60068-2-27)	
<u> </u>	

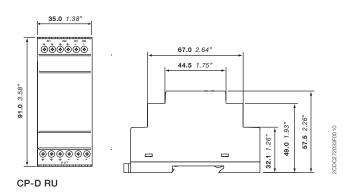
Туре		CP-RUD
Input circuit - Supply circuit		A: U1+/-U ; B: U2+/-U
Rated input voltage U _{in}		24 V DC
Input voltage range	······································	5-35 V DC
Rated input current I per channel	······································	0.5-2.5 A
Maximum input current per channel	······································	10 A for 300 s
Transient overvoltage protection	······································	no
Output circuit		L+, L+, L+, L-, L-, L-
Rated output voltage U _{out}		24 V DC
Voltage drop	······································	typ. 0.6 V, max. 0.7 V
Rated output current I _{out}	······································	0.5-5 A
Peak output current	······································	20 A for 150 s
Resistance to reverse feed	······································	< 35 V
General data		
Dimensions (W x H x D)		22.5 x 78 x 100 mm (0.89 x 3.07 x 4.02 in)
Weight		0.135 kg (0.30 lb)
Minimum distance to other units	horizontal / vertical	10 mm / 10 mm (0.39 in / 0.39 in)
Degree of protection	housing / terminals	IP20 / IP20
Material of housing	housing shell / cover	plastic / plastic
Protection class	•••••••••••••••••••••••••••••••••••••••	-
Mounting		DIN rail (IEC/EN 60715)
Mounting position		horizontal
Electrical connection - Input circuit / Output circuit		
Wire size fine-stran	nd with wire end ferrule	2 x 0.75-2.5 mm ² (2 x 18-14 AWG)
fine-strand v	vithout wire end ferrule	
	rigid	2 x 0.5-4 mm² (2 x 20-12 AWG)
Stripping length	•••••••••••••••••••••••••••••••••••••••	7 mm (0.28 in)
Tightening torque	••••••••••••••••	0.6-0.8 Nm
Environmental data		
Ambient temperature range		-20+60 °C
		-20+60 °C -40+85 °C
Damp heat (IEC/EN 60068-2-3)	otorago	93 % at 40 °C, no condensation
Climatic category (IEC/EN 60721)	······································	-
Vibration (IEC/EN 60068-2-6)	······································	
Shock (IEC/EN 60068-2-27)	······································	
Isolation data		
	nput / output / housing	-
Pollution degree (EN 50178)		2
Standards		
Product standard		
Low Voltage Directive		2006/95/EC
EMC Directive		2004/108/EC
Electrical safety		EN 50178
Electromagnetic compatibility		
Interference immunity to		IEC/EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	
electrical fast transient/burst		i i i i i i i i i i i i i i i i i i i
surge	IEC/EN 61000-4-5	L
conducted disturbances, induced by radio-	IEC/EN 61000-4-6	Level 3 (10 V)
frequency fields Interference emission		IEC/EN 61000-6-3
high-frequency radiated	IEC/CISPR 22 / EN 55022	Class B
high-frequency conducted	IEC/CISPR 22 / EN 55022	Class B
	120/01011122/211100022	01000 5

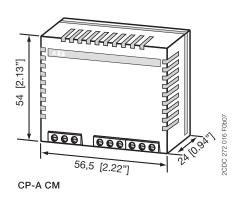
¹⁾ incl. lateral screw

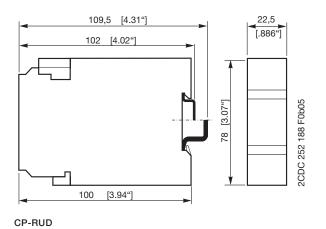
²⁾ This device is designed for connection to a safety extra-low voltage source. If no safety extra-low voltage is used at the input side, the lateral screw can be used for grounding of the housing (protection class I).

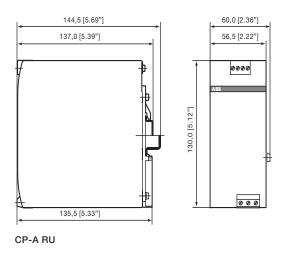
Туре		CP-D RU
Input circuit - Supply circuit		IN 1 + + -, IN 2 + + -
Rated input voltage U _{in}		24 V DC
Input voltage range		9-35 V DC
Rated input current I _{in} per channel		5 A
Maximum input current per channel		10 A for 300 s
Transient overvoltage protection		no
Output circuit		OUT + + +,
Rated output voltage U _{out}		24 V DC
Voltage drop		typ. 0.5 V
Rated output current I _{out}		10 A
Resistance to reverse feed		< 35 V
General data		
MTBF		on request
Duty time		100 %
Dimensions (W x H x D)	product dimensions	
		134 x 94 x 48 mm (5.28 x 3.70 x 1.89 in)
Weight	_	0.075 kg (0.165 lb)
	gross weight	0.130 kg (0.286 lb)
Material of housing		plastic
Mounting		DIN rail, snap-on mounting without any tool
Mounting position		horizontal
Minimum distance to other units	horizontal / vertical	25 mm (0.98 in) / 25 mm (0.98 in)
Electrical connection - Input circuit / Output circ		
Wire size f	ine-strand with (out)wire end ferrule	
	rigid	0.2-2.5 mm ² (24-12 AWG)
Stripping length		7.0 mm (0.28 in)
Tightening torque	•	0.67 Nm (6 lb.in)
Environmental data		
Ambient temperature range	operation	-40+70 °C
	storage	
Relative humidity	RH at 40 °C	20-95 %, no condensation
Vibration (IEC/EN 60068-2-6)		Mounting by rail: 10-500 Hz, 2 G, along X, Y, Z each axis, 60 min for each axis
Shock (IEC/EN 60068-2-27)		15 G, 11 ms, 3 axis, 6 faces, 3 times for each face
Standards		
Product standard		IEC/EN 61204-3
Low Voltage Directive	···········	2006/95/EC
EMC Directive		2004/108/EC
RoHS Directive	•	2011/65/EC
Electromagnetic compatibility		
Interference immunity to		EN 55024
electrostatic discharge	IEC/EN 61000-4-2	Level 3, air discharge 8 kV, contact discharge 4 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m
electrical fast transient/burst	IEC/EN 61000-4-4	Level 3, 2 kV / 5 kHz
conducted disturbances, induced by radio-frequ	uency fields IEC/EN 61000-4-6	Level 3, 10 V
Interference emission		EN 55022
high-frequency radiated	IEC/CISPR 22 / EN 55022	Class B
high-frequency conducted	IEC/CISPR 22 / EN 55022	Class B

Redundancy units Dimensional drawings









CP-B range Product group picture



CP-B range Table of contents

CP-B

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CP-B range Benefits and advantages

Power supply systems have to be highly reliable in most areas of energy management and automation technology. Often batteries are used for supporting the supply system in case of mains failures. Batteries have limited lifetimes depending on environmental parameters and have to be maintained regularly, which causes efforts and costs.

Using the latest ultra-capacitor technology, ABB offers an innovative and completely maintenance free new product for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

The CP-B range is an ultra-capacitor buffer energy storage for power supply units which ensures a short term uninterrupted power supply system. In case of a power loss, the energy stored in the capacitor guarantees that the load is continually provided up to several hundred seconds depending on the load current.

Characteristics

- 3 buffer modules for buffering 24 V DC: CP-B 24/3.0 (3 A / 1 kWs1) CP-B 24/10.0 (10 A / 10 kWs1) CP-B 24/20.0 (20 A / 8 kWs1)
- CP-B 24/3.0 and CP-B 24/20.0 expandable with additional extension module(s) CP-B EXT.2 (2 kWs1))
- LEDs for status indication
- Relay contacts for status messaging
- Very high backup times (e.g. with CP-B 24/10.0 up to 8 minutes at 1 A load current)
- Short charging times
- High efficiency, higher than 90%
- Wide temperature range
- DIN rail mountable, compact housing
- Extended temperature range -40...60 °C

Advantages in comparison to battery buffers:

- Maintenance free
- No deep discharge
- Temperature resistant
- (UL508, CSA22.2 No 14), **III** approvals

¹⁾ internal energy buffer

		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0	CP-B EXT.2
Order code		1SVR427060R0300	1SVR427060R1000	1SVR427060R2000	1SVR427065R0000
Rated input voltage		24 V DC	24 V DC	24 V DC	· –
Rated current		3 A DC	10 A DC	20 A DC	3 A DC
Energy storage (min.)		1.000 Ws	10.000 Ws	8.000 Ws	2.000 Ws
Typical charging time	100 %	65 s	134 s	135 s	:
at load current	0 %	56 s	82 s	62 s	
Typical	100 %	13 s	38 s	15 s	
buffering time ¹⁾	50 %	28 s	76 s	30 s	
at load current	25 %	66 s	140 s	60 s	
•	10 %	148 s	380 s	150 s	

¹⁾ buffering time ≈

energy storage x 0.9

current x output voltage



1 Input terminals

SHUT-DOWN+, SHUT-DOWN-: Input signal terminals INPUT OK, BUFFER STATUS, FAILURE: Signalling contact – terminals L_{IN} , L_{IN} : Input voltage terminals

2 Indication of operational states

OPERATION: Buffer module in operation (standby or buffering) INPUT OK: Input voltage applied

3 Output terminals

 $\rm L+_{OUT}, \ L-_{OUT}, \ L-_{OUT}:$ Output voltage terminals

CP-B range Ordering details



CP-B 24/3.0



CP-B 24/10.0



CP-B 24/20.0



Further documentation CP-B power supplies on www.abb.com

Description

Ultra capacitor based buffer units of the CP-B range offer highest reliability also in harsh enivronment. Due to the ultra-cap based technology the units are maintenance free, there will be no deep discharge and these products offer a very wide operational ambient temperature

CP-B range buffer units are an excellent solution to avoid voltage drops, for example in solar applications.

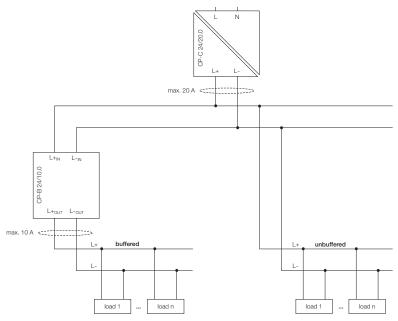
Ordering details

Rated input voltage	Rated current	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	3 A DC	CP-B 24/3.0	1SVR427060R0300		0.55 (1.21)
24 V DC	10 A DC	CP-B 24/10.0	1SVR427060R1000		2.10 (4.63)
	20 A DC	CP-B 24/20.0	1SVR427060R2000		2.20 (4.85)

Ordering details - Extension unit for CP-B 24/3.0 and CP-B 24/20.0

Rated voltage	Voltage range	Туре		Weight (1 pce) kg (lb)
24 V DC	0-26.4 V DC	CP-B EXT.2	1SVR427065R0000	1.00 (2.20)

Example of application



CP-B range Technical data

Туре		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0	
Input circuit - Supply circuit			L+ _{IN} L- _{IN}		
Rated input voltage U _{in}		24 V DC			
Input voltage range	•••••••••••••••••••••••••••••••••••••••	23.7-26.4 V DC	23.9-27 V DC	23.4-27.4 V DC	
Minimum charging potential		23.7 V DC	23.9 V DC	23.4 V DC	
Rated input current	•	3 A DC	10 A DC	20 A DC	
Inrush current limiting	••••••••••••••••••••••••••••••	50 A / 1 ms	35 A / 2 ms	35 A / 2 ms	
Transient overvoltage protection	••••••	suppressor diode	varistor / suppressor diode	varistor / suppressor diode	
Internal input fuse (apparatus protection, not accessi	ble)	4 A slow acting	15 A (FK2)	30 A (FK2)	
Internal fuse capacitors circuit (not accessible)			25 A (FK2)		
Kind of input	SHUT-DOWN	-	control input	control input	
	rated voltage	-	24 V DC	24 V DC	
	voltage range	-	6-45 V DC	6-45 V DC	
Output circuit			L+ _{out} L- _{out} L- _{out}		
Rated output power Rated output voltage Uout		69 W 24 V DC	240 W	480 W	
Output voltage (buffer mode)		23.0 V DC	23.2 V DC	23.2 V DC	
Tolerance of the output voltage		+210 %		,	
Rated output current Ir	Ta m 60 °C	3 A DC	10 A DC	20 A DC	
Peak output current (fully loaded capacitors required)	Ta m 60 °C	6 A DC (min. 1.5 s)	20 A DC (10 A power supply + 10 A CP-B, min. 1.5 s)	40 A DC (min. 1.5 s)	
Control of limiting current		-	10.3 A DC ±0.1A	-	
Shut-down if limiting current is exceeded Short-circuit protection (only via external fuse)		- no continuous short-cir	after 1.5 s	-	
Internal output fuse (not accessible)	•••••••••••••••••	-	15 A (FK2)	-	
Required external fuse	••••••••••••••••••••••••	3.15 A slow acting	10 A slow acting	25 A slow acting	
Current limiting at output circuit	•	-	1.051.2 x l _r	-	
Breaking capacity of output circuit	t= 2.5 ms	-	24 V DC, 10 A	=	
Power failure buffering time 1)		load-dependent, min. 13 s at 100 % load	load-dependent, min. 38 s at 100 % load	load-dependent, min. 15 s at 100 % load	
Overload protection	INDUT OK	thermal protection			
Kind of output	· · · · · · · · · · · · · · · · · · ·	n/o contact	: - / + +	•	
•••	BUFFER STATUS	-	n/o contact		
Contact material	FAILURE	- Ag + Au-clad	c/o contact		
Minimum switching voltage / Minimum switching curr	ent	5 V DC / 1 mA	•••••	•	
Maximum switching voltage / Maximum switching cur Mechanical lifetime		50 V AC / 1.0 A, 30 V DC / 0.5 A 5 x 10 ^e switching cycles			
Electrical lifetime Maximum fuse rating to achieve short-circuit protection	n/o or n/o contact	0.1 x 10 ⁶ switching cycl	es	•	
General data	11/0 OF 11/C CONTACT	1.0 A AC / 0.5 A DC			
Maximum internal power consumption		7 W	20 W	40 W	
Power consumption with unloaded output	······································	0.75 W	3 W	1.6 W	
Energy storage (min.)	······································	1000 Ws	10000 Ws	8000 Ws	
Typical charging time at load current	100 %	65 s	134 s	135 s	
Tuning I har fforting times at least a surrout!	0 % 100 %		82 s 38 s	62 s 15 s	
Typical buffering time at load current ¹⁾			76 s	30 s	
	25 %	66 s	140 s	60 s	
	10 %	148 s	380 s	150 s	
Efficiency		greater than 90 %			
Dimensions (W x H x D)	'	60 x 99 x 120 mm (2.36 x 3.90 x 4.72 in)	116 x 170 x 147 mm (4.57 x 6.69 x 5.79 in)	84 x 197 x 213 mm (3.31 x 7.76 x 8.39 in)	
Weight Material	net weight cover / housing shell	0.55 kg (1.21 lb) steel sheet powdered	2.1 kg (4.63 lb)	2.2 kg (4.85 lb)	
Mounting	cover / nousing sneii	DIN rail (IEC/EN 60715)	, snap-on mounting with	out any tool	
Mounting position	······································	horizontal	, onap on mounting with	Sat arry toor	
Minimum distance to other units	horizontal	not necessary	•••••	•	
•••	······································	40 mm (1.58 in)	•••••	80 mm (3.15 in)	
Pollution degree		2	•••••	/	
Degree of protection	housing / terminal	IP20	•••••	•	
Protection class (IEC/EN 61140)	<u>Y</u>		on: power supply fulfills o	lass III)	
Electrical connection - Input circuit / Output circuit		pull spring terminals		pluggable screw type terminals	
	n(out) wire end ferrule	0.08-1.0 mm² (28-18 AWG)	0.08-1.5 mm² (28-18 AWG)	0.2-4.0 mm² (24-12 AWG)	
	rigid	0.08-1.5 mm² (28-16 AWG)	0.08-4.0 mm² (28-16 AWG)	0.2-6.0 mm² (24-10 AWG)	
Stripping length		6.0 mm (0.24 in)		7.0 mm (0.28 in)	

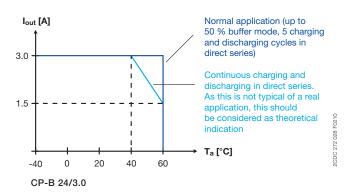
CP-B range

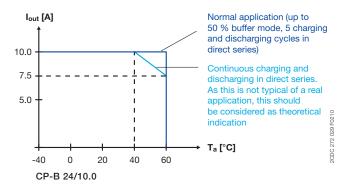
Technical data, Technical diagrams

Туре	CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0	
Input circuit - Supply circuit		L+ _{IN} L- _{IN}	•	
Signalling circuit				
Wire size fine-strand with		0.08-1.0 mm ² (28-18 AW		0.14-1.0 mm ² (26-16 AWG)
	rigid	0.08-1.5 mm ² (28-16 AW	/G)	0.14-1.5 mm ² (28-16 AWG)
Stripping length		6.0 mm (0.24 in)		7.0 mm (0.28 in)
Environmental data		T		
Ambient temperature	operation			
	storage	-40+60 °C		
Standards				
Product standard		EN 50178		
Low Voltage Directive		2006/95/EC		
EMC Directive	······	2004/108/EC		
RoHS Directive		2011/65/EC		
Electrical safety		EN 50178, EN 60950, U	L 508	
Electromagnetic compatibility				
Interference immunity to		IEC/EN 61000-6-1, IEC/	EN 61000-6-2	
electrostatic discharge		Level 3, 6 kV / 8 kV		
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3, 10 V/m (27-1000) MHz) / Level 2, 3 V/m	ı (1400-2700 MHz)
electrical fast transient/burst	IEC/EN 61000-4-4	Level 3, 2(1) kV / 5 kHz		
surge	IEC/EN 61000-4-5	Level 1, 0.5 kV		
conducted disturbances, induced by radio- frequency fields	IEC/EN 61000-4-6	Level 3, 10 V (150 kHz-8	30 MHz)	
voltage dips, short interruptions and voltage variations	IEC/EN 61000-4-11	buffered by ultra-capac		
Interference emission		EN 61000-6-3, EN 6100	0-6-4	
high-frequency radiated	DIN EN 55011	B/C1		
high-frequency conducted	DIN EN 55011	B/C1		

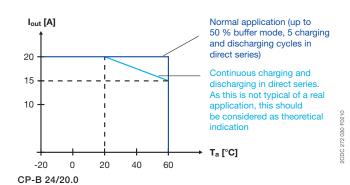
[&]quot;Approvals and marks" on page 182

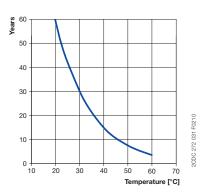
Technical diagrams Output curve at $T_a = 25$ °C





Caracteristic curve of the temperature at rated load



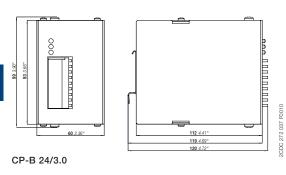


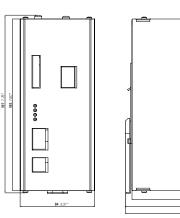
Capacitor's life span over temperature

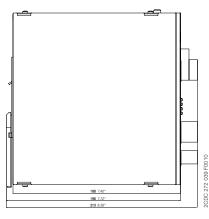
¹) buffering time ≈ energy storage x 0.9 load current x output voltage

CP-B range Dimensional drawings

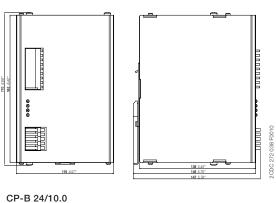
Dimensions in mm and inches

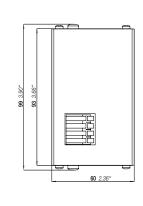


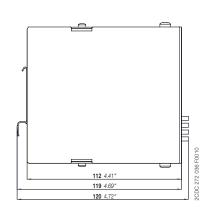




CP-B 24/20.0







-0 24/10.0

CP-B EXT.2

CP-B range Technical data

Data at T_a = 25 °C and rated values, unless otherwise indicated

Туре	CP-B EXT 2.0
Extension circuit	EXT+ EXT+ EXT- EXT-
Rated voltage	24 V DC
Voltage range	0-26.4 V DC
Rated current	3 A DC
nternal input fuse (apparatus protection, not accessible)	4 A slow acting (PTC)
Short-circuit protection	via internal 3 A fuse
Overload protection	only in combination with CP-B 24/3.0 or CP-B 24/20.0
Indication of operational states	
	status information and fault messages of the buffer module
	apply
General data Power consumption without load	0.5 W
Energy storage (min.)	2000 Ws
	ensions 60 x 99 x 120 mm (2.36 x 3.90 x 4.72 in)
	ensions 85 x 220 x 170 mm (3.35 x 8.66 x 6.69 in)
	t weight 1.00 kg (0.20 lb)
Material cover / housi	
Mounting	DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position	horizontal
Minimum distance to other units ho	orizontal not necessary
	vertical 40 mm (1.58 in)
Pollution degree	2
Degree of protection housing /	terminal IP20
Protection class (IEC/EN 61140)	III SELV / PELV (condition: power supply fulfills class III)
Electrical connection - Extension circuit	
	d ferrule 0.08-1.0 mm² (28-18 AWG)
	rigid 0.08-1.5 mm² (28-16 AWG)
Stripping length	6.0 mm (0.24 in)
Signalling circuit	0.0 11111 (0.24 11)
	d ferrule 0.08-1.0 mm² (28-18 AWG)
wine size	
Ctripping langth	rigid 0.08-1.5 mm² (28-16 AWG)
Stripping length	6.0 mm (0.24 in)
Environmental data	novation
·	peration -40+60 °C
	storage -40+60 °C
Vibration, sinusoidal based on IEC/EN 60	, , , , , , , , , , , , , , , , , , , ,
Shock, half-sine based on IEC/EN 600	68-2-27 15 g, 11 ms, 3 axes, 6 faces, 3 times for each face
Standards	
Product standard	EN 50178
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC
RoHS Directive	2011/65/EC
Electrical safety	EN 50178, EN 60950, UL 508
Electromagnetic compatibility	· · · · · · · · · · · · · · · · · · ·
nterference immunity to	IEC/EN 61000-6-1, IEC/EN 61000-6-2
electrostatic discharge IEC/EN 61	000-4-2 Level 3, 6 kV / 8 kV
· ·	000-4-3 Level 3, 10 V/m (27-1000 MHz) / Level 2, 3 V/m (1400-2700 MHz)
	000-4-4 Level 3, 2(1) kV / 5 kHz
	000-4-5 Level 1, 0.5 kV
5	000-4-5 Level 1, 0.3 kV 000-4-6 Level 3, 10 V (150 kHz-80 MHz)
fields	
voltage dips, short interruptions and voltage variations IEC/EN 610	00-4-11 buffered by ultra-capacitors
ntorforonce emission	FN 61000 6 2 FN 61000 C 4
Interference emission	EN 61000-6-3, EN 61000-6-4
	N 55011 B/C1
high-frequency conducted DIN El	N 55011 B/C1

[&]quot;Approvals and marks" on page 182

Electronic protection devices EPD24 Product group picture



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Electronic protection devices EPD24 Ordering details



EPD24-TB-101-3A

The protection devices EPD24 extend the ABB product range of Modular DIN rail components by electronic overcurrent protection modules for selective protection of 24 V DC load circuits. This protection is achieved by a combination of active electronic current limitation in the case of a

If a fault occurs in a load circuit, the protection device EPD24 will detect this rapidly and reliably, disable the power output transistor and hence interrupt the current flow in the defective circuit. The maximum possible overcurrent is always limited to 1.3...1.8 times the selected rated current. An activation of capacitive loads up to 20,000 µF is possible, deactivation only occurring in the case of overloads or short circuits. Selective deactivation of the defective current circuit means undefined error states and a complete system stop are prevented.

Features

- Selective load protection, one electronic tripping characteristic.

short circuit and an overload deactivation from 1.1 x l_x upwards.

- Active current limitation for safe connection of capacitive loads up to 20,000 μF and on overload/short circuit.
- Current ratings 0.5 A...12 A.
- Reliable overload disconnection with 1.1 x I_N
- Manual ON/OFF button
- Clear status and failure indication through LED and integrated auxiliary contact.
- Integral fail-safe element adjusted to current rating.
- Width per unit only 12.5 mm.
- Rail mounting
- Ease of wiring through busbar LINE+ and 0 V as well as signal bars.
- UL- and CSA-approvals allow international use of the devices.

Ordering details

Ratedcurrent I _N	bbn 40 16779 EAN	Туре	Order code	Price	Pkg	Weight
Α					qty	(1 pce) kg (lb)
0.5	829960	EPD24-TB-101-0.5A	2CDE601101R2905		4	0.065 (1.433)
1	829984	EPD24-TB-101-1A	2CDE601101R2001		4	0.065 (1.433)
2	830003	EPD24-TB-101-2A	2CDE601101R2002		4	0.065 (1.433)
3	830027	EPD24-TB-101-3A	2CDE601101R2003		4	0.065 (1.433)
4	830041	EPD24-TB-101-4A	2CDE601101R2004		4	0.065 (1.433)
6	830065	EPD24-TB-101-6A	2CDE601101R2006		4	0.065 (1.433)
8	830089	EPD24-TB-101-8A	2CDE601101R2008		4	0.065 (1.433)
10	830102	EPD24-TB-101-10A	2CDE601101R2010		4	0.065 (1.433)
12	830126	EPD24-TB-101-12A	2CDE601101R2012		4	0.065 (1.433)

Ordering details

3						
Description	bbn 40 16779 EAN	Type	Order code	Price	Pkg qty	Weight (1 pce) kg (lb)
Busbars for LINE+ and 0 V, grey insulation, length 500 mm ¹⁾	830140	EPD-BB500	2CDE605100R0500		10	0.2 (0.441)
Signal Bars for aux. contacts, grev insulation, length 21 mm	830164	EPD-SB21	2CDE605200R0021		10	0.4 (0.882)

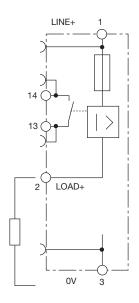
¹⁾ Max. load with one line entry Imax = 50 A (recommended: mid line entry) Max. load with two line entries Imax = 63 A

Electronic protection devices EPD24 Technical data

Wiring diagramm

EPD24-TB-101 without signal input with signal output F (Single signal, N/O)

Operating condition: 13-14 closed Fault condition: 13-14 open



Operating data	
Operating voltage U _B	24 V DC (1832 V)
Current rating I _N	fixed current ratings: 0.5, 1, 2, 3, 4, 6, 8, 10, 12 A
Closed current I	ON condition: typically 2030 mA depending on signal output
Staus indication by means of	Green: unit is ON load circuit / Power-MOSFET is switched on
	Orange: in the event of overload or short circuit until electronic disconnection
	Red: unit electronically disconnected load circuit/Power-MOSFET OFF undervoltage (U _B < 8 V) after switch-on till the end of the delay period
	OFF: manually switched off or device is dead
	potential-free auxiliary contact F
	ON/OFF/ condition of switch
Load circuit	
Load output	Power-MOSFET switching output (high slide switch)
Overload disconnection	typically 1.1 x I _N (1.051.35 x I _N)
Short-circuit current I _K	active current limitation
Trip time	see time/current characteristics
For electronic disconnection	typically 3 s at I_{Load} > 1.1 x I_{N} typically 100 ms3 s at I_{Load} > 1.8 x I_{N} (or 1.5 x I_{N} /1.3 x I_{N} ,
Temperature disconnection	internal temperature monitoring with electronic disconnection
Low voltage monitoring load output	with hysteresis, no reset required: load »OFF« at U _s < 8 V
Starting delay t _{Start}	typically 0.5 sec after every switch-on and after applying U _B
Disconnection of load circuit	electronic disconnection
Free-wheeling circuit	suitable external free-wheeling circuit to be used with inductive load
Several load outputs must not be conne	ected in parallel
Signal output	
Electrical data	potential-free auxiliary contact max. 30 V DC/0.5 A, min. 10 V DC/10 mA
ON condition LED green	voltage U _B applied, switch is in ON position no overload, no short circuit
OFF condition LED off	device switched off (switch is in OFF position) no voltage \mathbf{U}_{B} applied
Fault condition LED orange	overload condition $> 1.1 \times I_N$ up to electronic disconnection
Fault condition LED red	electronic disconnection upon overload or short circuit Device switched off with control signal (switch is in ON position)
Aux. contact	single signal, make contact contact open, terminal 13-14
Fault	signal output fault conditions no operating voltage U _B ON/OFF switch is in OFF position red LED lighted (electronic disconnection)

Electronic protection devices EPD24 Technical data

General data	
Fail-Safe element	backup fuse for EPD24 not required because of the integral redundant fail-safe element
Housing material	moulded
Mounting	symmetrical rail to EN 50022-35x7.5
Ambient temperature	0+50 °C (without condensation, see EN 60204-1)
Storage temperature	-20+70 °C
Humidity	96 hrs/95 % RH/40 °C to IEC 60068-2-78, test Cab. climate class 3K3 to EN 60721
Vibration	3 g, test to IEC 60068-2-6 test Fc
Degree of protection	housing: IP20 DIN 40050 terminals: IP20 DIN 40050
EMC (EMC directive, CE logo)	emission: EN 61000-6-3 susceptibility: EN 61000-6-2
Isolations coordination (IEC 60934)	0.5 kV/pollution degree 2 reinforced insulation in operating area
Dielectric strength	max. 32 V DC (load circuit)
Isolation resistance (OFF condition)	n/a, only electronic disconnection
Approvals/Declarations of conformity	UL 2367 Solid State Overcurrent Protectors UL 1604, (class I, division 2, groups A, B, C, D) UL 508 CSA C22.2 No. 213 (class I, division 2) CSA C22.2 No. 142 CE logo
Dimensions (B x H x T)	12.5 x 80 x 83 mm
Weight	approx. 65 g
Terminals	Line+/LOAD+/0V
Screw terminals	M4
Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve	0.5 – 10 mm²
Multi-lead connection (2 identical cables) rigid/flexible	0.5 – 4 mm²
Flexible with wire end ferrule without plastic sleeve	0.5 – 2.5 mm²
Flexible with TWIN wire end ferrule with plastic sleeve	0.5 – 6 mm ²
Nire stripping length	10 mm
Tightening torque (EN 60934)	1.5 – 1.8 Nm
Terminals	aux. contacts
Screw terminals	M3
Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve	0.25 - 2.5 mm²
Wire stripping length	8 mm
Tightening torque (EN 60934)	0.5 Nm

Table 1: voltage drop, current limitation, max. load current								
current rating	typically voltage drop	active current	max. load current at 1	max. load current at 100 % ON duty				
I _N	U _{on} at I _n	limitation (typically)	T _{ambient} = 40 °C	T _{ambient} = 40 °C				
0.5 A	70 mV	1.8 x I _N	0.5 A	0.5 A				
1 A	80 mV	1.8 x I _N	1 A	1 A				
2 A	130 mV	1.8 x I _N	2 A	2 A				
3 A	80 mV	1.8 x I _N	3 A	3 A				
4 A	100 mV	1.8 x I _N	4 A	4 A				
6 A	130 mV	1.8 x I _N	6 A	5 A				
8 A	120 mV	1.5 x I _N	8 A	7 A				
10 A	150 mV	1.5 x I _N	10 A	9 A				
12 A	180 mV	1.3 x I _N	12 A	10.8 A				

Attention: when mounted side-by-side without convection the ERD24 should not carry more than 80 % of its rated load with 100 % ON duty due to thermal effects.

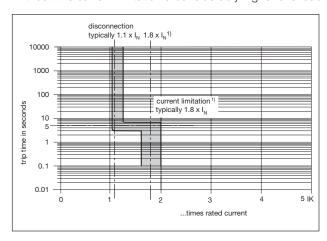
Electronic protection devices EPD24 Technical information

Time/Current characteristic curve (Tambient = 25 °C)

The trip time is typically 3 s in the range between 1.1 and 1.8 x I_{N}^{-1}

Electronic current limitation occurs at typically $1.8 \times I_N^{(1)}$ which means that under all overload conditions (independent of the power supply and the resistance of the load circuit) the max. overload before disconnection will not exceed 1.8 x $I_N^{(1)}$ times the current rating. Trip time is between 100 ms and 3 sec (depending on overload or at short circuit).

Without this current limitation a considerably higher overload current would flow in the event of an overload or short circuit.



Maximum cable lenghts

EPD24 reliably trips from 0 Ω up to max. circuit resistance R_{max}.

Calculation of R_{max}

Selected rating I _N (A)	3	6
Operating voltage $U_{\rm s}$ (V DC) (= 80 % of 24 V) $^{\rm 2)}$	19.2	19.2
Trip current $I_{ab} = 1.25 \times I_{N}$ (A) (EPD24 trips after 3 s)	3.75	7.50
$R_{max}(\Omega) = (U_{B}/I_{ab}) - 0.050$	5.07	2.51

 $^{^{2)}}$ Voltage drop of EPD24 and tolerance of trip point (typically 1.1 x $I_N = 1.05 \dots 1.35 \times I_N$) have been taken into account

Selection table for the incoming cable lengths with different cable cross-sections

Cable cross section A (mm²)	0.14	0.25	0.34	0.5	0.75	1.00	1.50	
Cable length L (m) (= single length)	cable resistance (Ω) = (ρ_0 x 2 x L) / A $^{3)}$							
5	1.27	0.71	0.52	0.36	0.24	0.18	0.12	
10	2.54	1.42	1.05	0.71	0.47	0.36	0.24	
15	3.81	2.14	1.57	1.07	0.71	0.53	0.36	
20	5.09	2.85	2.09	1.42	0.95	0.71	0.47	
25	6.36	3.56	2.62	1.78	1.19	0.89	0.59	
30	7.63	4.27	3.14	2.14	1.42	1.07	0.71	
35	8.90	4.98	3.66	2.49	1.66	1.25	0.83	
40	10.17	5.70	4.19	2.85	1.90	1.42	0.95	
45	11.44	6.41	4.71	3.20	2.14	1.60	1.07	
50	12.71	7.12	5.24	3.56	2.37	1.78	1.19	
75	19.07	10.68	7.85	5.34	3.56	2.67	1.78	
100	25.34	14.24	10.47	7.12	4.75	3.56	2.37	
125	31.79	17.80	13.09	8.90	5.93	4.45	2.97	
150	38.14	21.36	15.71	10.68	7.12	5.34	3.56	
175	44.50	24.92	18.32	12.46	8.31	6.23	4.15	
200	50.86	28.48	20.94	14.24	9.49	7.12	4.75	
225	57.21	32.04	23.56	16.02	10.68	8.01	5.34	
250	63.57	35.60	26.18	17.80	11.87	8.90	5.93	

³⁾ Resistivity of copper $\rho 0 = 0.0178 (\Omega \times mm^2)/m$ Example 1: max. length for 1.5 mm2 and 3 A: 214 m Example 2: max. length for 1.5 mm2 and 6 A: 106 m

Example 3: mixed wiring: (Control cabinet --- sensor/actuator level) R1 = 40 m for 1.5 mm^2 and R2 = 5 m for 0.25 mm^2 : R1 = 0.95 Ω , R2 = 0.71 Ω , total (R1 + R2) = 1.66 Ω

 $^{^{1)}}$ Current limitation typically 1.8 x I $_{\rm N}$ at I $_{\rm N}$ = 0.5 A...6 A Current limitation typically 1.5 x I $_{\rm N}$ at I $_{\rm N}$ = 8 A or 10 A Current limitation typically 1.3 x I $_{\rm N}$ at I $_{\rm N}$ = 12 A

Electronic protection devices EPD24 Approvals, Safety instructions

Please note

The user must ensure that the cable cross sections of the relevant load circuit are suitable for the current rating of the EPD24 used. Automatic start-up of machinery after shut down must be prevented (Machinery Directive 98/37/EG and EN 60204-1). In the event of a short circuit or overload the load circuit will be disconnected electronically by the EPD24.

Information on UL approvals/CSA approvals



UL1604

UL File # E 339238



CSA C22.2 No. 213 (Class I, Division 2)

CSA File # 2305929

Operating Temperature Code T5

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only **WARNING:**
- Exposure to some chemicals may degrade the sealing properties of materials used in the following device: relay Sealant Material:
 - Generic Name: Modified diglycidyl ether of bisphenol A
 - Supplier: Fine Polymers Corporation
 - Type: Epi Fine 4616L-160PK
- Casing Material:
 - Generic Name: Liquid Crystal Polymer
 - Supplier: Sumitomo Chemical
 - Type: E4008, E4009, or E6008

RECOMMENDATION:

- Periodically inspect the device named above for any degradation of properties and replace if degradation is found

WARNING - EXPLOSION HAZARD:

- Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous
- Substitution of any components may impair suitability for Class I, Division 2



UL2367

Non-hazardous use - UL File # E 339236



Non-hazardous use - UL File # E 149922



CSA C22.2 No. 14

CSA C22.2 No. 142 - CSA File # E 2305929

Class 2

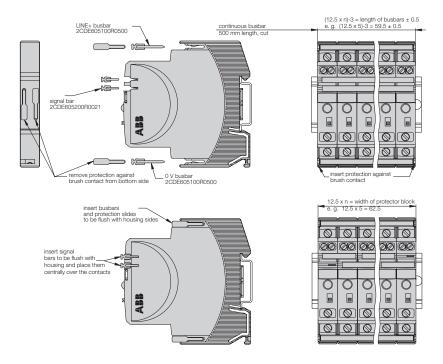
Meets requirement for Class 2 current limitation (EPD24 ... -0,5 A/1 A/2 A/3 A)

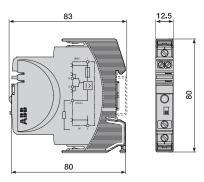
Electronic protection devices EPD24 Installation guidelines

The EPD24 features an integral power distribution system.

The following wiring modes are possible with various pluggable current and signal busbars:

- LINE+ (24 V DC)
- 0 V
 - Caution: The electronic devices EPD24 require a 0 V connection
- Auxiliary contacts





Mounting procedure

Before wiring insert busbars into protector block. A maximum of 10 connection cycles are permissible using connecting busbars.

Recommendation

After 10 units the busbars should be interrupted and receive a new entry live.

Table of length for busbars

(Order code 2CDE605100R0500)

No. of units	2	3	4	5	6	7	8	9	10
Length of busbar (mm) ± 0.5 mm	22	34.5	47	59.5	72	84.5	97	109.5	122

Analog signal converters Product group picture



Analog signal converters Table of contents

Analog signal converter

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Analog signal converters Overview

CC-E range



- Universally configurable devices and single-function devices
- Adjustment and operating elements on the front side
- Safe operation by electrical 3-way isolation
- Unambiguous and clear connecting terminal markings

Conversion, measurement and separation of

- Standard signals (0-5 V, 0-10 V, 0-20 mA, 4-20 mA)
- Temperature signals of RTD sensors (PT 100)
- Thermocouple signals (types J and K)
- Current measurement signals (0-5 A, 0-20 A AC/DC)

Characteristics of single-function devices

No adjustment or balancing necessary.

Characteristics of universal devices

- The required input and output ranges can be configured by means of directly accessible DIP switches positioned on the side
- Gain adjustment of ±5 % by means of an adjustment potentiometer on the front-side
- Offset adjustment of ±5 % by means of adjustment potentioneters on the front-side

CC-U range



- 8 different standard signal outputs on one device
- Input and output side universally configurable
- Also available with 2 threshold relay outputs
- Adjustment and operating elements on the front side
- Safe operation by electrical 3-way isolation
- Plug-in connecting terminals, unambiguously and clearly marked

Conversion, measurement and separation of

- Standard signals
- Signals of RTD sensors (PT10, PT100, PT1000)
- Thermocouple signals
- TRMS values of currents and voltages

Characteristics

- The required input and output ranges can be configured for all devices by means of directly accessible DIP switches positioned on the side.
- Due to the wide input range of the gain and offset stages all input signals between the minimum and the maximum input value can be universally converted to all common output signals.
- Devices for DC or AC (50/60 Hz) supply available.

■ existing

▲ existing for some devices □ pending

Approv	als	CC-E/STD	CC-E I/I	CC-U/STD	CC-U/STDR	CC-E/RTD	CC-U/RTD	CC-E/TC	CC-U/TC	CC-U/TCR	CC-E/I	CC-E I _{AC} /ILPO	CC-U/I	CC-U/V
c UL us	UL 508, CAN/CSA C22.2 No.14		•	•	•				•	•	•	•	•	-
CUL US	UL 1604 (Class I, Div 2, hazardous locations), CAN/CSA C22.2 No.213	A		•		A	•	•	•		•		•	•
CB	CB scheme													
(X)	CCC				•					•				
Marks														
C€	CE	-	-	-	-	-	-	-	-	-	-	-	-	•
&	C-Tick		•	•	•	•	•	•	•	•	•	•	•	-

Analog signal converters Overview

Applications for analog signal processing and correct solution using CC-E and CC-U converters

Nearly every process includes a control system that receives data by means of analog signals and then evaluates the data and sets the respective parameters correspondingly. When transmitting analog signals numerous problems may arise which can disturb or even block an ideal behavior of the

Below we have listed some processing problems together with the respective solutions to solve these problems:

Signal conversion

Sometimes the available signals cannot be processed by the controller or the actuator. In this case, signal converters are required to convert the input signal (or different input signals) to the desired output signal.

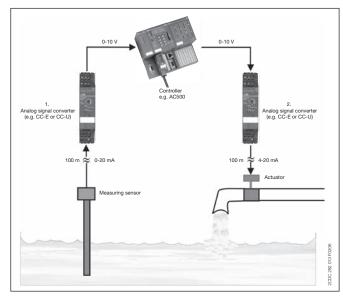
Signal amplification

If long lines or high burdens have to be operated, it may be necessary to amplify the signal. CC analog signal converters require only low input power and provide high output power. Thus, there are no restrictions for the converter's position on the line, i.e. it can be used

- for signal refreshing (1) at the end of the line (low input
- or for signal amplification (2) at the beginning of the line (high output power).

Signal filtering

Particularly on long lines or in rough industrial environments the signals are exposed to high electromagnetic interferences. The frequency of the coupled interference signals may be in the range of the common mains frequency (50 Hz) or even much higher (in case of frequency converters). According to the specific requirements, analog signal converters are available which provide reliable suppression of those interferences by means of an input low-pass filter.



Signal separation

Protection against overvoltage

The increased use of micro-electronics make controls much more sensitive against overvoltages, resulting from lightning discharges or switching processes. Suppression diodes are incorporated in the input of the CC analog signal converters which enable the converters to arrest overvoltages with low energy level (resulting from switching processes) by themselves. The products furthermore provide electrical isolation between input, output and supply circuit for protection of the controller connected to the output.

- Protection against ground loops If components are used which refer to ground, the measuring signals can be falsified by a so-called ground loop. In this case, certain parts of the signal are transmitted via earth and not via the analog transmission line, thus causing incorrect evaluation of the signal. The electrical isolation between the input and the output disconnects these ground loops and thus enables correct signal transmission.

Analog signal converters - CC-E range Benefits and advantages



- 1 Terminals M, K, J, H, G
- 2 Terminal explanation
- 3 Adjustment of gain
- 4 Adjustment of offset
- 5 Indication of operational states

U - control supply voltage applied

CC-E range

- Universally configurable devices and single-function devices
- Adjustment and operating elements on the front side
- Safe operation by electrical 3-way isolation
- Unambiguous and clear connecting terminal markings

Conversion, measurement and separation of

- Standard signals (0-5 V, 0-10 V, 0-20 mA, 4-20 mA)
- Temperature signals of RTD sensors (PT 100)
- Thermocouple signals (types J and K)
- Current measurement signals (0-5 A, 0-20 A AC/DC)

Characteristics of single-function devices

- No adjustment or balancing necessary.

Characteristics of universal devices

- The required input and output ranges can be configured by means of directly accessible DIP switches positioned on the side
- Gain adjustment of ± 5 % by means of an adjustment potentiometer on the front-side
- Offset adjustment of ±5 % by means of adjustment potentiometers on the front-side

CC-E/STD analog signal converter with 3-way electrical isolation

- 2 universally configurable devices (type CC-E/STD)
- 2x10 single-function devices
- "Plug and Work", no adjustment of single-function devices required

CC-E/RTD temperature signal converter for RTD sensors, linearized with 3-way electrical isolation

- 2 universally configurable devices (type CC-E/RTD)
- 2x12 single-function devices
- Plug and Work", no adjustment of single-function devices required
- Temperature signal converter for PT100 sensors
- 2- or 3-wire connection

CC-E/TC analog signal converter for thermocouple signals of the types J and K with 3-way electrical isolation

- 2 universally configurable devices (type CC-E/TC)
- 2x6 single-function devices
- "Plug and Work", no adjustment of single-function devices required
- Integrated cold-junction compensation

CC-E/I measuring converter for current signals 0-5 A, 0-20 A, AC/DC with 3-way electrical isolation

- 2 universally configurable devices (type CC-E/I)
- 2x6 single-function devices
- "Plug and Work", no adjustment of single-function devices required

CC-E $I_{\rm AC}$ /ILPO measuring converter without auxiliary power for sinusoidal currents 0-1 A, 0-5 A, output 4-20 mA

- Measuring converter for sinusoidal currents (0-1 A, 0-5 A)
- Measuring range selection by front-face sliding switch
- 4-20 mA output current in proportion to input current
- no additional power supply required

Loop-powered current/current isolator without external power supply for analog current signals of 0-20 mA and 4-20 mA

- Electrical isolation between input and output
- Very low internal voltage drop ≤ 2.5 V
- Available with one or two independent channels
- Width only 18 mm (1 and 2 channels)

Analog signal converters - CC-E range Ordering details - Standard signal converters

Ordering details - Standard signal converters



CC-E/I



CC-E V/V



CC-E I/I-2

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	CC-E/STD ¹⁾	1SVR011700R0000		0.088 (0.194)
		0-10 V	CC-E V/V	1SVR011710R2100		0.083 (0.183)
	0-10 V	0-20 mA	CC-E V/I	1SVR011711R1600		0.084 (0.185)
		4-20 mA	CC-E V/I	1SVR011712R1700		0.084 (0.187)
		0-10 V	CC-E I/V	1SVR011713R1000		0.082 (0.181)
24 V DC	0-20 mA	0-20 mA	CC-E I/I	1SVR011714R1100		0.084 (0.187)
		4-20 mA	CC-E I/I	1SVR011715R1200		0.084 (0.185)
		0-10 V	CC-E I/V	1SVR011716R1300		0.084
	4-20 mA	0-20 mA	CC-E I/I	1SVR011717R1400		(0.185)
		4-20 mA	CC-E I/I	1SVR011718R2500		0.084 (0.187)
	-10+10 V	-10+10 V	CC-E V/V	1SVR011719R2600		0.082 (0.181)
	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	0-5 V, 0-10 V, 0-20 mA, 4-20 mA	CC-E/STD	1SVR011705R2100		0.090 (0.198)
	0-10 V	0-10 V	CC-E V/V	1SVR011720R2300		0.096 (0.212)
		0-20 mA	CC-E V/I	1SVR011721R1000		0.087 (0.192)
		4-20 mA	CC-E V/I	1SVR011722R1100		0.091 (0.200)
110-240 V AC		0-10 V	CC-E I/V	1SVR011723R1200		0.091 (0.200)
	0-20 mA	0-20 mA	CC-E I/I	1SVR011724R1300		0.088
		4-20 mA	CC-E I/I	1SVR011725R1400		(0.194)
		0-10 V	CC-E I/V	1SVR011726R1500		0.096 (0.212)
	4-20 mA	0-20 mA	CC-E I/I	1SVR011727R1600		0.087 (0.192)
		4-20 mA	CC-E I/I	1SVR011728R2700		0.088 (0.194)
	-10+10 V	-10+10 V	CC-E V/V	1SVR011729R2000		0.086 (0.190)
loop powered	0-20 mA,	0-20 mA, 4-20 mA	CC-E I/I-1 ²⁾	1SVR010200R1600		0.038 (0.084)
	4-20 mA	0-20 IIIA, 4-20 IIIA	CC-E I/I-2 ²⁾	1SVR010201R0300		0.044 (0.097)



²⁾ CC-E-I/I-1 has 1 channel, CC-E-I/I-2 has 2 channels



Further documentation analog signal converters CC-E on www.abb.com

Analog signal converters - CC-E range Ordering details - RTD converters



Ordering details - RTD converters

Supply voltage range	Input signal	Output signal	Туре	Order code	Price	Weight (1 pce)
		0-10 V, 0-20 mA,			1 pce	kg (lb) 0.091
	refer to table ¹⁾	4-20 mA	CC-E/RTD ²⁾	1SVR011701R2500		(0.200)
		0-10 V	CC-E RTD/V	1SVR011730R2500		0.084 (0.185)
	PT100 0100 °C	0-20 mA	CC-E RTD/I	1SVR011731R1200		0.086
		4-20 mA	CC-E RTD/I	1SVR011732R1300		(0.190)
		0-10 V	CC-E RTD/V	1SVR011733R1400		0.083 (0.183)
	PT100 -50+50 °C	0-20 mA	CC-E RTD/I	1SVR011734R1500		0.084 (0.185)
24 V DC		4-20 mA	CC-E RTD/I	1SVR011735R1600		0.084 (0.187)
		0-10 V	CC-E RTD/V	1SVR011736R1700		0.084 (0.185)
	PT100 0300 °C	0-20 mA	CC-E RTD/I	1SVR011737R1000		0.084 (0.187)
		4-20 mA	CC-E RTD/I	1SVR011738R2100		0.101
	PT100 -50+250 °C	0-10 V	CC-E RTD/V	1SVR011739R2200		0.084 (0.185)
		0-20 mA	CC-E RTD/I	1SVR011740R0700		0.084
		4-20 mA	CC-E RTD/I	1SVR011741R2400		(0.187)
	refer to table ¹⁾	0-10 V, 0-20 mA, 4-20 mA	CC-E/RTD	1SVR011706R2200		0.093 (0.205)
	PT100 0100 °C	0-10 V	CC-E RTD/V	1SVR011788R2400		0.086 (0.190)
		0-20 mA	CC-E RTD/I	1SVR011789R2500		0.088 (0.194)
		4-20 mA	CC-E RTD/I	1SVR011790R2200		0.089 (0.196)
		0-10 V	CC-E RTD/V	1SVR011791R1700		0.087 (0.192)
	PT100 -50+50 °C	0-20 mA	CC-E RTD/I	1SVR011792R1000		0.089
110-240 V AC		4-20 mA	CC-E RTD/I	1SVR011793R1100		(0.196)
		0-10 V	CC-E RTD/V	1SVR011794R1200		0.087 (0.192)
	PT100 0300 °C	0-20 mA	CC-E RTD/I	1SVR011795R1300		0.089
		4-20 mA	CC-E RTD/I	1SVR011796R1400		(0.196)
		0-10 V	CC-E RTD/V	1SVR011797R1500		0.086 (0.190)
	PT100 -50+250 °C	0-20 mA	CC-E RTD/I	1SVR011798R2600		0.089 (0.196)
		4-20 mA	CC-E RTD/I	1SVR011799R2700		0.088 (0.194)



Further documentation analog signal converters CC-E on www.abb.com

¹⁾ Refer to "Technical data" on page 262.

² B 1604 Class I, Div.2 (universal device)

(0.190)

Analog signal converters - CC-E range Ordering details - Thermocouple converters



CC-E TC

Supply voltage range	Input signal	Output signal	Type	Order code	Price	Weight
voitage range					1 pce	(1 pce) kg (lb)
	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	CC-E/TC ¹⁾	1SVR011702R2600		0.089 (0.196)
		0-10 V	CC-E TC/V	1SVR011750R0100		0.087 (0.192)
	type J 0600 °C	0-20 mA	CC-E TC/I	1SVR011751R2600		0.084 (0.187)
24 V DC		4-20 mA	CC-E TC/I	1SVR011752R2700		0.102
		0-10 V	CC-E TC/V	1SVR011753R2000		0.084
	type K 01000 °C	0-20 mA	CC-E TC/I	1SVR011754R2100		(0.185)
		4-20 mA	CC-E TC/I	1SVR011755R2200		0.086 (0.190)
	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	CC-E/TC	1SVR011707R2300		0.088 (0.194)
		0-10 V	CC-E TC/V	1SVR011760R0300		0.084 (0.187)
	type J 0600 °C	0-20 mA	CC-E TC/I	1SVR011761R2000		0.088 (0.194)
110-240 V AC		4-20 mA CC-E TC/I 1SVR011762R2		1SVR011762R2100		0.1 (0.220)
		0-10 V	CC-E TC/V	1SVR011763R2200		0.086 (0.190)
	type K 01000 °C	0-20 mA	CC-E TC/I	1SVR011764R2300		0.088 (0.194)
		4-20 mA	CC-E TC/I	1SVR011765R2400		0.086

CC-E TC/I

1SVR011765R2400

4-20 mA



Further documentation analog signal converters CC-E on www.abb.com

¹⁾ B 1604 Class I, Div.2 (universal device)

Analog signal converters - CC-E range Ordering details - Measuring converters



Ordering details - Measuring Converters

Supply voltage range	Input signal	Output signal	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	CC-E/I ¹⁾	1SVR011703R2700		0.096 (0.212)
	0-5 A, 0-20 A,	0-10 V	CC-E I _{AC} /V	1SVR011770R0500		0.090 (0.198)
	AC	0-20 mA	CC-E I _{AC} /I	1SVR011771R2200		0.092
24 V DC		4-20 mA	CC-E I _{AC} /I	1SVR011772R2300		(0.203)
24 1 00		0-10 V	CC-E I _{DC} /V	1SVR011773R2400		0.092 (0.207)
	0-5 A, 0-20 A, DC	0-20 mA	CC-E I _{DC} /I	1SVR011774R2500		0.091 (0.200)
		4-20 mA	CC-E I _{DC} /I	1SVR011775R2600		0.093 (0.205)
	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	CC-E/I	1SVR011708R0400		0.099 (0.218)
		0-10 V	CC-E I _{AC} /V	1SVR011780R1100		0.092 (0.203)
	0-5 A, 0-20 A, AC	0-20 mA	CC-E I _{AC} /I	1SVR011781R0600		0.092 (0.207)
110-240 V AC		4-20 mA	CC-E I _{AC} /I	1SVR011782R0700		0.095 (0.209)
	0-5 A, 0-20 A,	0-10 V	CC-E I _{DC} /V	1SVR011783R0000		0.093 (0.205)
	DC	0-20 mA	CC-E I _{DC} /I	1SVR011784R0100		0.095
		4-20 mA	CC-E I _{DC} /I	1SVR011785R1100		(0.209)
loop powered	0-1 A, 0-5 A, AC	4-20 mA	CC-E I _{AC} /ILPO ²⁾	1SVR010203R0500		0.052 (0.115)

^{1) 1604} Class I, Div.2 (universal device)



Further documentation analog signal converters CC-E on www.abb.com

²⁾ for sinusoidal currents

Analog signal converters - CC-E range DIP switch settings, Dimensional drawings

CC-E/STD, CC-E x/x (universal devices)

	1			-	Sw	itcł	_		
Input	Output	1	2	3	4	5	6	7	8
	05 V	Т							П
05 V	010 V								П
	020 mA								
	420 mA								
010 V	05 V								
	010 V								П
	020 mA								
	420 mA								
	05 V								П
	010 V								
020 mA	020 mA								
	420 mA								
	05 V								
420 mA	010 V								П
	020 mA								
	420 mA				Ш			Ш	

	요
	002
	282
egend	2
ON	2
OFF	S

4	
22	
Щ	
02	
0	

CC-E/RTD

	<u> </u>		(Sw	itcl	า	
Input	Output		2	3	4	5	6
	010 V						Ш
0100 °C	0-20 mA						
	4-20 mA					Ш	
	0-10 V						
0300 °C	0-20 mA			Ш			Ш
	4-20 mA					Ш	
0500 °C	0-10 V		Ш	Ш			Ш
	0-20 mA		Ш				Ш
	4-20 mA			Ш		Ш	
	0-10 V	Ш					Ш
-50+50 °C	0-20 mA						ш
	4-20 mA	Ш				Ш	
	0-10 V	Ш					Ш
-50+250 °C	0-20 mA	Ш		Ш			Ш
	4-20 mA	Ш		Ш		Ш	
	0-10 V	Ш					Ш
-50+450 °C	0-20 mA	Ш	Ш	Ш			Ш
	4-20 mA	Ш	Ш			Ш	
High fail safe	·						
Low fail safe							



2CDC 282 006 F0208

CC-E/TC

		Switch						
Input	Output	1	2	3	4	5	6	
TO I	010 V							8
TC-J: 0600 °C	020 mA							F0208
0600 C	420 mA							
TC-K:	010 V							200
01000 °C	020 mA							282 (
01000 °C	420 mA							
High fail safe								DC
Low fail safe								2CD

	282 OU3 E0204
Legend	30 (
ON	
OFF	
no influence	0

CC-E/I

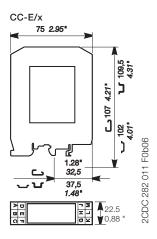
	0			8				
Input	Output	1	2	3	4	5	6	F0208
I - DC	010 V	Ш						
I - AC	010 V							005
I - DC	020 mA	Ш						282
I - AC	020 IIIA							
I - DC	420 mA							2CDC
I - AC	420 IIIA							2C



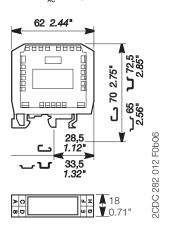
Input range selection - CC-E/I

Input range 5 A			-
Connected lines Used terminals Terminal marking	5 A	20 A	S c
Input range 20 A			
Connected lines Used terminals Terminal marking		20 A	<u></u>

Dimensional drawings

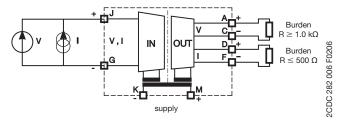


CC-E I_{AC}/ILPO, CC-E I/I

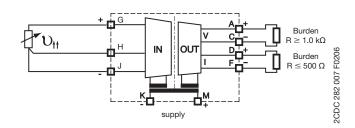


Analog signal converters - CC-E range Wiring instructions

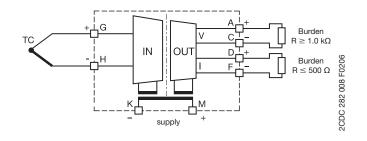
CC-E/STD, CC-E x/x (universal devices)



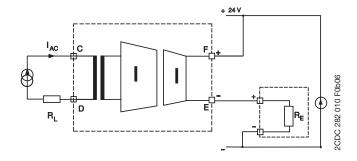
CC-E/RTD



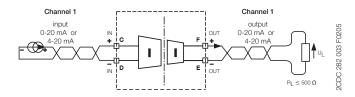
CC-E/TC



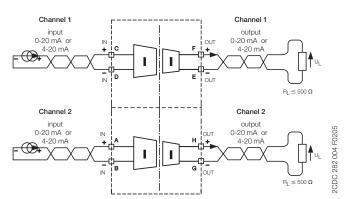
CC-E I_{AC}/ILPO



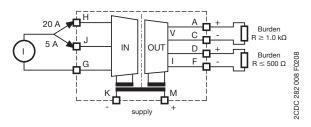
CC-E I/I-1



CC-E I/I-2



CC-E I/I



Analog signal converters - CC-E range Technical data

Туре	CC-E/STD	/ CC-E x/x	CC-E/RTD 3)	CC-E/TC
Input circuits - Analog inputs J-G-H	Current	Voltage	Temperature sensors	Thermocouples
				(IEC 584-1 and 2)
Input signal	Standar	d signals	PT100	TC.K, TC.J
Rated input range	020 mA / 420 mA	05 V /	-50+500 °C	TC.K: 01000 °C, TC.J: 0600 °C
Limitation of input signals		± 11 V		
Influence of line resistance	-	•	< 0.01 %/Ω	< 0.5 % / 100 Ω
Gain adjustment range Offset adjustment range	1+ 5 % (unive	ersal devices ersal devices	i) 	•
Input impedance	50 Ω	1 ΜΩ	-	-
Suppression at 50 Hz	-		-	> 35 dB
Common-mode rejection	-		100 dB	
Output circuits - Analog outputs D-F, A-C			rent	Voltage
Output signal	0-20 mA, 4	-20 mA	•••••	0-5 V, 0-10 V
Output burden	≤ 500 Ω			≥1.0 KΩ
Accuracy 1)	± 0.5 % of f	ull-scale		
Residual ripple	< 0.5 %			
Response time	200 μs		10 ms	
Transmission frequency	2 kHz		80 Hz	2 Hz (up to -3 dB)
Reaction to input circuit interruption			High fail safe: Output vomeasuring range 2) Low fail safe: Output vocurrent = 0 mA	_
Supply circuits K-M		DC versions		AC versions
Supply voltage	24 V DC			110-240 V AC - 50/60 Hz
Supply voltage tolerance	-15+15 %			-15+10 %
Power consumption	1.5 W typ.			1.5 VA typ.
Indication of operational states		_		
Rated control supply voltage U _s	U: green LE	:D		
General data				
Ambient temperature rangeoperation / storage		-20+80 °C		
Temperature coefficient	± 500 ppm/	′°C	•	
Degree of protection (DIN 40050)	IP20	T-X		
Mounting position		lots on top a		
Mounting	DIN rail (IEC	C/EN 60715),	snap-on mounting	
Electrical connection	·			
Wire size rigid	0.2-4 mm ² (24-12 AWG)		
fine-strand with(out) wire end ferrule)	•••••
Stripping length	7 mm (0.28			
Tightening torque	0.5 Nm (4.4	lb.in)		
Electromagnetic compatibility	EN 04000 1	2.0		
Interference immunity electrostatic discharge (ESD) IEC/EN 61000-4-2	EN 61000-6		•	
electrostatic discharge (ESD) IEC/EN 61000-4-2 electromagnetic field(HF radiation IEC/EN 61000-4-3		NV / ±0 KV)	•	
resistance)	10 V/III			
fast transients (Burst) IEC/EN 61000-4-4	Level 3 (+2	kV / 5 kH)	•	•••••
powerful impulses (Surge) IEC/EN 61000-4-5	±2 kV / ±1 k		• · · · · · · · · · · · · · · · · · · ·	•••••
HF line emission IEC/EN 61000-4-6	10 V	***************************************	•••••	•••••
Interference emission EN 61000-6-4	Class B			
Isolation data				
Test voltage between all isolated circuits	2.5 kV AC			
Rated insulation voltage	-		-	<u>-</u>

¹⁾ Includes non-linearity and factory setting, influenced by supply voltage and output load.

Approvals see "Overview" on page 253

²⁾ Only -/RTD and -/TC: Single-function devices respond with Low fail safe to input signal interruptions.

³⁾ When connecting a 2-wire sensor, the terminals J and H have to be jumpered.

Analog signal converters - CC-E range Technical data

Туре	CC-E I/I-1 / CC-E I/I-2
Input circuits - Analog inputs	Current
Input current I _{IN}	0-20 mA, 4-20 mA
Min. input current	< 100 μΑ
Max. input current	50 mA ¹⁾ (V _{IN} < 18 V)
Input voltage U _{IN}	$< 2.5 \text{ V} + (I_{1N} \times R_{L})$
Input voltage drop U _i	$< 2.5 \text{ V } (20 \text{ mA, RL} = 0 \Omega)$
Max. input voltage	18 V ¹⁾ (I _{IN} < 50 mA)
Output circuits	
Output current I _{OUT}	0-20 mA, 4-20 mA
Output load R _L Output voltage U _{out}	0-500 Ω I _{out} x RL
Residual ripple	$<$ 20 mV _{pp} (500 Ω , 20 mA)
Response time (0-100 %)	$< 15 \text{ ms} (0-500 \ \Omega. 20 \text{ mA}).$
Acquirecture	< 5 ms (500 q, 20 mA, 25 °C)
Accuracy Load influence (0-500 Ω)	≤ 0.1 % of full-scale (20 mA) ≤ ±0.05 % / 100 Ω,
2000 111100100 (0 000 12)	\leq -0.1 % / 100 Ω (25 °C)
General data	
Width of the enclosure	18 mm
Weight 1 char	nel approx. 0.037 kg (0.082 (0.181) lb) nel approx. 0.044 (0.097) kg (0.097 lb)
Mounting position	any
Degree of protection enclosure / termin	
	age -25+60 °C / -40+85 °C
Temperature coefficient	< ±50 ppm / °C DIN rail (IEC/EN 60715)
Mounting Electrical connection	DIN raii (IEC/EN 607 15)
	igid 0.2-4 mm² (24-12 AWG)
fine-strand with(out) wire end fer	rule 0.2-2.5 mm² (24-14 AWG)
Stripping length	7 mm (0,28 inch)
Tightening torque Standards	0.5 Nm (4.4 lb.in)
Product standard	EN 50178
Low Voltage Directive	2006/95/EC
EMC Directive	2004/108/EC
Electromagnetic compatibility	TEN 04000 0 0
Interference immunity electrostatic discharge (ESD) EN 61000-	EN 61000-6-2 4-2 Level 3 (±6 kV / ±8 kV)
electrostatic discriging (ESD) EN 01000- electromagnetic field (HF radiation EN 61000- resistance)	4-2 Level 3 (±0 kv / ±0 kv)
resistance)	10 V/m
	4-4 Level 3 (±2 kV / 5 kH)
powerful impulses (Surge) EN 61000-	4-5 ±2 kV / ±1 kV
HF line emission EN 61000-	
magnetic fields EN 61000- Interference emission	4-8 30 A/m EN 61000-6-4
Radiated noise EN 55	
Operational reliability (EN 68-2-6)	4 q
Mechanical resistance (EN 68-2-6)	10 g
Environmental testing (IEC 68-2-30 Db)	24 h cycle, 55 °C, 93 % rel., 96 h
Isolation data Insulation voltage input / output	500 V _{eff} / 50 Hz
Insulation voltage input / output Insulation voltage between channels	5 kV _{eff} / 50 Hz (device with 2 channels)
Pollution category	2
Overvoltage category	

 $^{^{\}rm th}$ The input parameters have to be limited to the indicated maximum values. Approvals see "Overview" on page 253

Analog signal converters - CC-E range Technical data

Туре	CC	;-E/I	CC-E I _{AC} /ILPO
		G-H	C-D
Input circuits - Analog inputs	AC current		2 meas. ranges selectable
Rated input range	0-5 A / 0-20 A	0-5 A / 0-20 A	0-1 A / 0-5 A / sinusoidal
Measuring frequency			50/60 Hz
Overload capacity of inputs input range 1	10 x I _{Nom} (50 A) for	r max. 1 s	10 x I _{Nom} (50 A) for max. 2 s
input range 2	10 x I _{Nom} (200 A) fe	or max. 1 s	10 x I _{Nom} (200 A) for max. 2 s
Gain adjustment range	±5 % (universal d	evices)	-
Offset adjustment range	±5 % (universal d		-
Input impedance / resistance	5A: 65 mΩ	20 A : 2.5 mΩ	5 m Ω
Output circuits - Analog outputs	D-F Current	A-C Voltage	F-E passive current output in pro-
			portion to input current
Output signal	0-20 mA / 4-20 mA	0-10 V	4-20 mA
Output burden / load	≤ 500 Ω	≥ 1.0 Ω	12 V DC: 150 Ω, 24 V DC: 750 Ω
			30 V DC: 1050 Ω
Accuracy 1)	± 2 % of full-scale)	
Offset adjustment range	±5 % (universal d	evice)	± 5 %
Gain adjustment range	±5 % (universal d	evice)	± 20 %
Residual ripple	< 0.5 %	•••••	
Response time	0.5 s		0.6 s
	DC or 50/60 Hz		AC: 50/60 Hz
Reaction to input circuit interruption	Low fail safe: outp		-
		current < 400 μA	
Supply circuits K-M	DC versions	AC versions	
Supply voltage	24 V DC	110-240 V AC 50/60 Hz	12-30 V DC
Supply voltage tolerance	-15+15 %	-15+10 %	-
Power consumption	typ 1.5 W	typ 1.5 VA	-
Indication of operational states			•
Supply voltage	U: green LED		-
General data			
Ambient temperature rangeoperation / storage	0+60 °C / -20	+80 °C	-20+60 °C / -40+80 °C
Temperature coefficient	± 500 ppm/°C		300 ppm/°C
Degree of protection (DIN 40050)	IP20		
	ventilation slots o		
Mounting	DIN rail (IEC/EN 6	0715), snap-on mo	ounting
Electrical connection	0.0.4	414(0)	
Wire size rigid fine-strand with(out) wire end ferrule	0.2-4 mm ² (24-12	AVVG)	
Stripping length	0.2-2.5 mm (24-17 mm (0.28 inch)	4 AVVG)	
Tightening torque	0.5 Nm (4.4 lb.in)		
Electromagnetic compatibility	10.0 14111 (7.7 10.111)		
Interference immunity	EN 61000-6-2		
electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (±6 kV / ±	8 kV)	•
electromagnetic field (HF radiation resistance) IEC/EN 61000-4-3	10 V/m		
fast transients (Burst) IEC/EN 61000-4-4	Level 3 (±2 kV / 5	kH)	
powerful impulses (Surge) IEC/EN 61000-4-5			
HF line emission IEC/EN 61000-4-6			
Interference emission EN 61000-6-4	Class B		
Isolation data	0.511/40		
Test voltage (between all isolated circuits)	2.5 kV AC		050 1/40
Rated insulation voltage	-		250 V AC

 $^{^{\}rm tj}$ Includes non-linearity and factory setting, influenced by supply voltage and output load. Approvals see "Overview" on page 253

Analog signal converters - CC-U range Overview

CC-U range

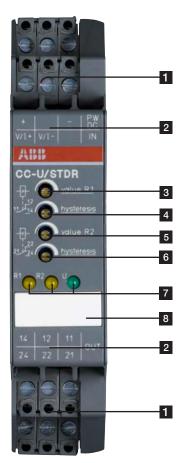
- 8 different standard signal outputs on one device
- Input and output side universally configurable
- Also available with 2 threshold relay outputs
- Adjustment and operating elements on the front side
- Safe operation by electrical 3-way isolation
- Plug-in connecting terminals, unambiguously and clearly marked

Conversion, measurement and separation of

- Standard signals
- Signals of RTD sensors (PT10, PT100, PT1000)
- Thermocouple signals
- TRMS values of currents and voltages

Characteristics

- The required input and output ranges can be configured for all devices by means of directly accessible DIP switches positioned on the side.
- Due to the wide input range of the gain and offset stages all input signals between the minimum and the maximum input value can be universally converted to all common output signals.
- Devices for DC or AC (50/60 Hz) supply available.



- 1 Terminals +, V/I+, V/I-, PW DC, IN, -
- 2 Terminal explanation
- 3 Adjustment of resistance value R1
- 4 Adjustment of hysteresis
- 5 Adjustment of resistance value R2
- 6 Adjustment of hysteresis
- 7 Indication of operational states

R1 yellow LED - resistance value R1 R2 yellow LED - resistance value R2 U green LED - supply voltage

8 Marker label

Analog signal converters - CC-U range Overview

CC-U/STD universal signal converter with 3-way electrical isolation

- More than 120 configurations possible
- Configurable output signal response on input voltage signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- Very fast signal transmission enables use in control systems

CC-U/RTD universal signal converter for PT10, PT100, PT1000 temperature sensors (acc. to IEC 751 and JIS C 16041), linearized with 3-way electrical isolation)

- Configurable output signal response on input signal interruption (low / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- 2- or 3-wire connection

CC-U/STDR universal signal converter for standard signals, with 2 threshold relay outputs and with 3-way electrical isolation

- Standard signal converter with 7 setting ranges
- 2 threshold relay outputs with one c/o contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply

CC-U/TC universal signal converter for thermocouples with 3-way electrical isolation

- Temperature signal converter for thermo-couples of the types K, J, T, S, E, N, R, B
- Continuously adjustable voltage signal input 0-10 mV and 0-50 mV
- Differential temperature meas. possible (see "Wiring instructions" on page 271)
- Configurable output signal response on input signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- Cold-junction compensation selectable

CC-U/V universal measuring converter for RMS values of 0-600 V, with 3-way electrical isolation

- RMS converter for voltage signals up to 600 V of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply

CC-U/TCR universal signal converter for thermocouples, with 2 threshold relay outputs and 3-way electrical isolation

- Temperature signal converter for thermocouples of the types K, J, T, S
- 2 threshold relay outputs with one change-over contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply
- Integrated cold-junction compensation

CC-U/I universal measuring converter for RMS values of 0-1 A and 0-5 A, with 3-way electrical isolation

- RMS converter for current signals up to 1 A and up to 5 A of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply

¹⁾ Japanese standard

Analog signal converters - CC-U range Ordering details



CC-U/STDR

Ordering details - Standard Signal Converters

Supply voltage range	Input signal	Output signal	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC		refer to table	CC-U/STD	1SVR040000R1700		0.125 (0.276)
110-240 V AC, 100-300 V DC		reier to table	00-0/510	1SVR040001R0400		0.126 (0.278)
24-48 V DC, 24 V AC	refer to table	0 - /-	CC-U/	1SVR040010R0000		0.142
110-240 V AC, 100-300 V DC			STDR ¹⁾	1SVR040011R2500		(0.313)



CC-U/RTD

Ordering details - RTD Converters

Supply voltage range	Input signal	Output signal	Туре		Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC	votov to toblo	vofov to tololo	CC-U/RTD	1SVR040002R0500		0.126 (0.278)
110-240 V AC, 100-300 V DC	refer to table	refer to table	OG-0/RID	1SVR040003R0600		0.128 (0.282)



CC-U/TC

Ordering details - Thermocouple Converters

Supply voltage range	Input signal	Output signal	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC		refer to table	CC-U/TC	1SVR040004R0700		0.130 (0.287)
110-240 V AC, 100-300 V DC	rofor to toblo		00-0/10	1SVR040005R0000		0.128 (0.282)
24-48 V DC, 24 V AC	refer to table	0.0/0	CC-U/TCR ¹⁾	1SVR040014R2000		0.145
110-240 V AC, 100-300 V DC	2 c/o		00-0/TOR*	1SVR040015R2100		(0.320)



CC-U/I

Ordering details - Measuring Converters

Supply voltage range	Input signal	Output signal	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24-48 V DC, 24 V AC			CC-U/I ²⁾	1SVR040006R0100		0.128 (0.282)
110-240 V AC, 100-300 V DC	refer to table	refer to table	CC-0/I ^{-/}	1SVR040007R0200		0.127 (0.280)
24-48 V DC, 24 V AC	Teler to table	Telel to table	CC-U/V ³⁾	1SVR040008R1300		0.128
110-240 V AC, 100-300 V DC			υυ-υ/ ν	1SVR040009R1400		(0.282)

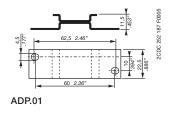
¹⁾ with relay output

²⁾ for current RMS values

³⁾ for voltage RMS values

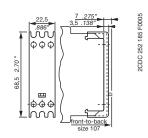
Analog signal converters - CC-U range Ordering details - Accessories

Ordering details - Accessories



For type	Width in mm	Туре	Order code	Price	Pkg qty	Weight (1 pce) g (oz)
CC-U	22.5	ADP.01	1SVR430029R0100		1	18.4 (0.65)
CC-U		MAR.01	1SVR366017R0100		10	0.19 (0.007)
CC-U	22.5	COV.01	1SVR430005R0100		1	5.2 (0.18)
				•		





Sealable cover - COV.01

Analog signal converters - CC-U range DIP switch settings

CC-U/STD

Input	Г		S	wit	ch	1			Gain	Coarse	
IIIput	1	2	3	4	5	6	7	8	Gain	Type	
Potentiometer	Г		Г	Г	П				0	0	
050 mV	Г	Г	Г	Г	П				AD	С	
0100 mV									45	5	
0250 mV									01	1	
0500 mV				Г					79	8	
01 V				Г	П				34	3	
02.5 V				Г	П				0	0	
05 V									57	6	
010 V									2	2	
15 V						Ш			79	8	
2 10 V						Ш			24	3	
-10+10 V				Ш		Ш			0	0	
0125 mV				Г					34	3	
08 V				Г	П				34	3	
-22.5+22.5 mV				Ш		Ш			BF	D	
-11+11 V				Ш		Ш			0	0	
2.57.5 V						Ш			57	6	
3.339.99 V									34	4	
100 V				Ш					2	2	
1000 mV				Ш					45	5	
01 mA				Г	П	П			AD	В	
020 mA									24	3	
420 mA					L	Ш			45	4	
1050 mA						Ш			01	1	2
204 mA				Ш					45	4	3
200 mA				Ш					42	3	ū
-0.45+0.45 mA									BF	D	2CDC 282 019 E0203
-55+55 mA									46	5	8
High fail safe *)							Ш		-	-	Š
Low faile safe *)									-	-	2
No fail safe *)								Γ	-	-	5

*) Detection of input voltage signal interruptions:

If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail

If "No fail safe" is configured, input signal interruptions are not detected.

Output							
Output	1		wit 13		5	16	
05 V						П	
010 V			П			П	
15 V	Ш					П	
210 V							
-10+10 V	П	П	П			П	
-5+5 V		П	П			П	
-100 V		П				П	
-50 V							
06.66 V		L			Ш		
-10+3.33 V		L		Ш			
-5+1.66 V		L		Ш	Ш	П	
08 V				П	П	П	
04 V							
-102 V							
-51 V							
1.256.25 V							
-7.5+2.5 V							
-3.75+1.25 V	ш		ш	Ш	Ш		
1.668.33 V	ш	L			Ш	П	
-6.66+6.66 V	Ш						
-3.33+3.33 V	Ш						
-80 V	ш	┖	Ш	Ш			
-40 V	Ш		Ш				
01 mA					Ш		
020 mA	Ш		Ш			Ш	
420 mA	ш	_	Ш		_	Ш	
010 mA			Ш		Ш	ш	
00.5 mA			ш		Щ	Ш	
013.33 mA		_			Ш	ш	
0666 µA		L	Ш			Ш	
016 mA		L	Ш			Ш	
0800 μΑ		L	Ш		L	Ш	
08 mA		L	Ш		Ш	Ш	
0400 μA	Ш	_	Ш		╚	Ш	33
2.512.5 mA	Ш		Ш		Ш	ш	8
125625 μA							P P
3.3316.66 mA		L	\Box				8
166833 μA			Ĺ			Ц	잃
0.21 mA					Ĺ	╚	5
210 mA							2CDC 282 020 F0203
100500 μA							2
	-	4					

	003 F0204
Legend	282
ON	3
OFF	2
no influence	Č

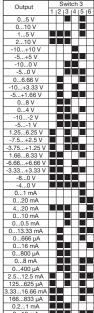
CC-U/STDR with relay output

	П		Sw	itcl	1		1
Input	1	2	3	4	5	6	
010 V				Г	Г	П	
05 V	Ш	П	П	П	Г		
01 V	П		Г	Г	Г		
-10+10 V	П	Г		Г	Г	П	4
15 V							320
020 mA							100
420 mA				L	L		8
Output							2CDC 282 005 F0204
Closed-circuit principle						Ш	
Open-circuit principle							20

CC-U/RTD

	nput				ch			Switch 2			Gain			
Type			2	3	4	5	6	1	2	3	4	5	6	Coarse
	0500 °C			П	Г	Г	П	Г	L	Г	Ш			F
	0550 °C				Г	Г	П	Г	L	Г	Ш			E
	0600 °C			П	Г	Г	П	Г		Г				D
PT10	0650 °C		П	П	Г	Г	Г	Г		Г	П			С
1110	0700 °C			П	Г	Г	П	Г		Г				В
	0750 °C			П	Г	Г		Г		Г				A
	0800 °C				П	Г		Г						9
	0850 °C					П								8
	050 °C					П								F
	060 °C				Г	П			Г					E
	070 °C				П	П			Г			П		В
	080 °C				П	П	П		Г					A
	090 °C					П	П		Г					9
PT100	0100 °C				Г	Г	Г		Г				П	8
	0200 °C				Г	Г			Г					3
	0300 °C				Г	П								2
	0400 °C					П								1
	0500 °C				Г	Г			Г			П		0
	010 °C				П	П		Г	Г	Г				8
	020 °C	П	П		Г	Г	П	Г	Г	Г	П			3
	030 °C				Г	Г	П	Г	Г	Г				2
PT1000	040 °C				Г	Г	Г	Г	Г	Г				1
	050 °C				П	П		Г	П	П				0
	060 °C													0
	il safe *)													-
High fa	il safe *)													-

*) Detection of input signal interruptions: If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).





Analog signal converters - CC-U range DIP switch settings

CC-U/V

0.44		-	Sw	itc	h		1
Output	1				15	16	
05 V	Т	Т		Т		П	
010 V			Т	П			
15 V				Н		П	
210 V				г		П	
-10+10 V	Т	Т	Т		Т	П	
-5+5 V		Т	Т			П	
-100 V		Г				П	
-50 V	Г	Г				П	
06.66 V				П		П	
-10+3.33 V	П		Т		Г	П	
-5+1.66 V	Г		Т			П	
08 V							
04 V	Г			Г		П	
-102 V						П	
-51 V	Г					П	
1.256.25 V		Г		Г		П	
-7.5+2.5 V		П					
-3.75+1.25 V		Г				П	
1.668.33 V				П		П	
-6.66+6.66 V			П		Г	П	
-3.33+3.33 V			П			П	
-80 V						П	
-40 V						П	
01 mA		П	П	П		П	
020 mA	Г	Г	П	Г			
420 mA				Г	Г		
010 mA		Г		Г			
00.5 mA	Г	Г		Г		П	
013.33 mA				П		▢	
0666 µA	Г	Ш	Г	Г	Ш		
016 mA	Г			Г	П		
0800 μΑ	П	Ш	L	Г	П		
08 mA	Γ						
0400 μΑ				Г			2
2.512.5 mA		Γ					120
125625 µA		Г		Г			2CDC 282 029 F0203
3.3316.66 mA	L			L	Ц	Ц	100
166833 µA							32
0.21 mA				Г			28
210 mA							8
100500 μA				Г		П	SC

Legend
ON
OFF
no influence

CC-U/TC

Output Switch 3 05 V 010 V 15 V 210 V -10+10 V -5+5 V -100 V 06.66 V 04 V 04 V -104 V 04 V -102 V -51 V 1.2562 S V
05 V 010 V 15 V 210 V -10+10 V -5+5 V -100 V -50 V -50 V -10333 V -5+1.66 V 04 V -102 V -51 V
010 V 15 V 210 V -10+10 V -5+5 V -100 V -50 V -666 V -104 3.3 V -54 1.66 V 08 V 04 V -102 V -51 V -1.256.25 V
15 V 210 V -5+10 V -5+16 V -104 33 V -5+1.66 V 08 V 04 V -102 V -51 V -102 V -51 V -102 V -51 V -102 V -51 V -12.5625 V
210 V
-10+10 V
-10+10 V
-100 V -50 V 0666 V -10+3.33 V -5+1.66 V 08 V 04 V -102 V -51 V -1256.25 V
-50 V 06.66 V 104333 V -5+1.66 V 08 V 04 V 102 V -51 V 1.256.25 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V 105 V
0666 V -10+3.33 V -5+1.66 V 08 V 04 V -102 V -51 V 1.256.25 V
-10+3.33 V
-5+1.66 V
08 V
04 V
-102 V
-51 V
1.256.25 V
1.256.25 V
-7.5+2.5 V
-3.75+1.25 V
1.668.33 V
-6.66+6.66 V
-3.33+3.33 V
-80 V
-40 V
01 mA
020 mA
420 mA
010 mA
00.5 mA
013.33 mA
0666 µА
016 mA
0800 µА
08 mA
0400 μA
2.512.5 mA
125625 μA
3.3316.66 mA
166833 μA
0.21 mA
210 mA
100500 μA

	Input		S	wit	ch	1			S	wit			
Type	Range	1	2	3	4	5	6	1	2	3	4	5	6
	0-100900 °C	П				П		L	L	Г			Г
K	0-2501350 °C					П		L	L	Г		Ш	Г
J	0-100750 °C		Г		Г	П		L	L	Г			Г
_	0-100400 °C	П			Г	Г					П	П	Г
Т	-150-0400 °C	П			Г	Г	П					П	Г
S	0-2501550 °C	П			Г			Г		Г			Г
_	0-100700 °C	П											Г
Е	0-2001000 °C												Г
	0-100650 °C												
Ν	0-2001300 °C									Г			Г
R	0-2501350 °C	П		Ш		Ш	ш	Г	L	Г			Г
п	0-4501700 °C	П						Г		Г	П		Г
В	0-7001750 °C	П						Г	Г	Г		П	Г
	0-210 mV	П						Г		Г			Г
mV	0-1050 mV	П						Г					Г
L	ow fail safe *)							П	П	П			
Н	igh fail safe *)												

*) Detection of input signal interruptions:

If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).

Legend ON OFF

CC-U/I

0.1.1	Switch									
Output	1	12	13	14	15	16				
05 V	T	Т		Т						
010 V		Т		Т		П				
15 V				Т		П				
210 V				Т	$\overline{}$	П				
-10+10 V	T	Т				П				
-5+5 V	Т	Т	Т			П				
-100 V		Г				П				
-50 V	Т	Г				П				
06.66 V				Г		П				
-10+3.33 V			Г		Г	П				
-5+1.66 V						П				
08 V				Г		П				
04 V						П				
-102 V	Γ					П				
-51 V						П				
1.256.25 V		Г		Г		П				
-7.5+2.5 V		Г			Г	П				
-3.75+1.25 V		Г			Ш	П				
1.668.33 V			Г	Г		П				
-6.66+6.66 V										
-3.33+3.33 V						П				
-80 V										
-40 V	Ш	L	Ш	L	Ш					
01 mA					Ш					
020 mA					Ш	Ш				
420 mA	Ш	L				Ш				
010 mA						ш				
00.5 mA			Ш		Ш					
013.33 mA		L			Ш	ш				
0666 µA		L			Ш					
016 mA		L	Ш			ш				
0800 μΑ		L	Ш							
08 mA		L	Ш		Ш	ш				
0400 μΑ			Ш		Ш					
2.512.5 mA										
125625 μA	Ш	Ĺ		Ĺ		Ш				
3.3316.66 mA						Ш				
166833 µA										
0.21 mA				Γ	Г					
210 mA					Ш					
100500 μA				Ι_		П				

Legend
ON
OFF
no influence

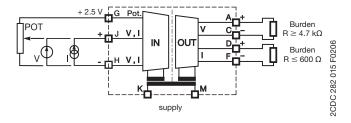
CC-U/TCR with relay output

		_					_	
	Input		. :	Sw	itcl	h		
Type	Range	1	2	3	4	5	6	
	0240 °C							
J	0480 °C			L	L			
	01200 °C			Г	Г	Г		
	0250 °C	Ш	П	Г	L	Г		
K	0500 °C	Ш	П	L	L	Г		
	01350 °C		П	Г	Г	Г		
	-150+120 °C		Г	Г				
Т	0220 °C		П	Г		Г		
	0400 °C							
	0210 °C		Ш	П	L			4
s	0380 °C		Ш	L	L	Г		1 22
١٠	0860 °C		Ш	Г	Г	Г		Œ
	01550 °C		Ш					Š
	Output			Г				2CDC 282 004 F0204
Close	d-circuit principle							8
Open	-circuit principle							8

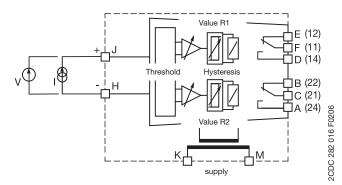
Legend
ON
OFF
no influence

Analog signal converters - CC-U range Wiring instructions

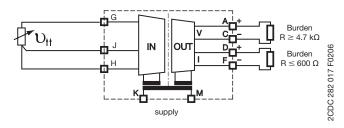
CC-U/STD



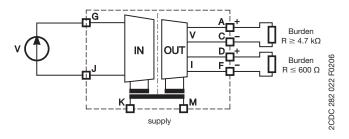
CC-U/STDR with relay output



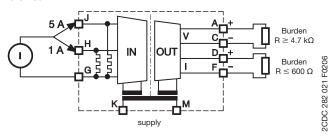
CC-U/RTD



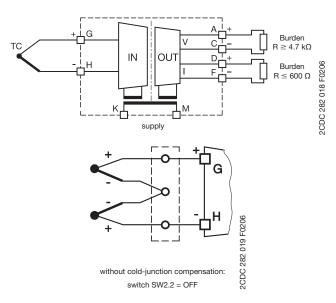
CC-U/V



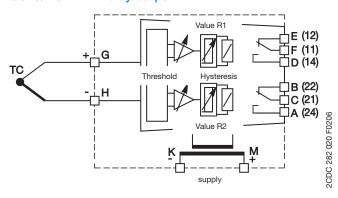
CC-U/I



CC-U/TC



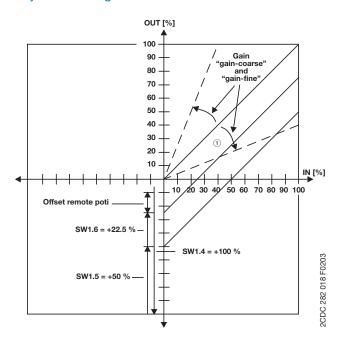
CC-U/TCR with relay output



Analog signal converters - CC-U range Technical information

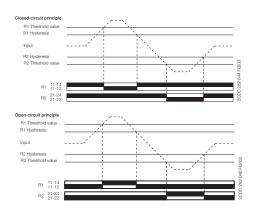
CC-U/STD

Adjustment range



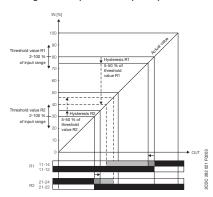
CC-U/STDR with relay output

Function diagrams



Switching points

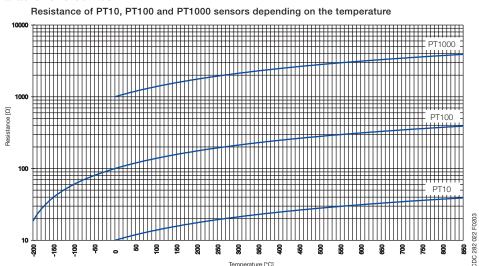
Switching points of the output relay depending on the input range, configuration open-circuit principle



Analog signal converters - CC-U range Technical information

CC-U/RTD

Characteristic curves

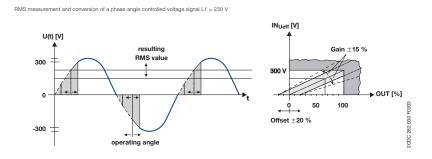


CC-U/V

Input range selection

Calaatina innut sanaa hu	Switch	1
Selecting input range by		
front-face rotary switch	position	
0100 V	1	١.
0150 V	2	000
0250 V	3	اِ ا
0300 V	4	ا ا
0400 V	5	0,000
0450 V	6	3
0550 V	7	8
0 600 V	8	(

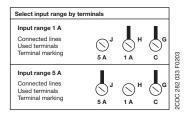
Example of application



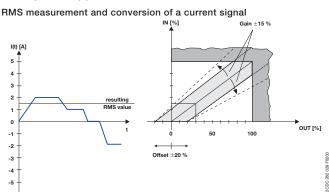
Analog signal converters - CC-U range Technical information

CC-U/I

Input range selection



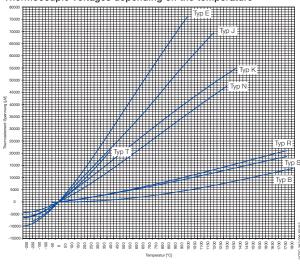
Example of application



CC-U/TC

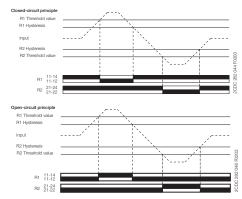
Characteristic curve





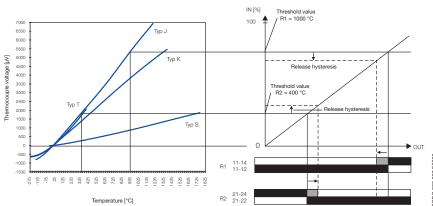
CC-U/TCR with relay output

Function diagrams



Switching points

Switching points of the output relay depending on the input range, configuration open-circuit principle



Analog signal converters - CC-U range Technical data

Туре		CC-U/STD)	CC-U/RTD 3)	CC-U/TC			
Input circuits - Analog inputs J-G-H				Temperature sen-	Thermocouples			
production of production of the production of th			meter	sors	(IEC 584-1 and 2)			
Input signal	0-20 mA	0-100 mV		PT10, PT100,	TC.K TC.J			
input digital	4-20 mA		-1 MΩ ²⁾	PT1000	TC.T TC.S			
	10-50 mA			(IEL 751 and JICC	TC.E TC.N			
	0-1 mA	1-5 V 0-10 V		1604)	TC.R TC.B			
		2-10 V						
		± 10 V		· · · · · · · · · · · · · · · · · · ·				
Limitation of input signals	± 55 mA	± 11 V		-	-			
Rated input range	-	-	-	Max. temperature	refer to temperature			
				adjustable: 6-60 °C for PT1000	specs. of individual			
				50-500 °C for PT100				
				500-850 °C for PT10	0.01.0/./100.0			
Influence of line resistance	-	- 45 1/	<u>.</u>	0.015 °C/ Ω	< 0.01 % / 100 Ω			
Gain adjustment range (universal devices)	0.9- 110 mA	45 mV - 22 V	-	see DIP switch setti	ngs			
Offset adjustment range (universal devices)	-137.5+		. i	± 5 %	± 10 %			
Input impedance		ent ranges	•••••	-	- 10 70			
without detection of input signal interruption	51 Ω	6 MΩ	3 G Ω		-			
with detection of input signal interruption	51 Ω	3.5 MΩ	9.5 GΩ	-	-			
Suppression at 50 Hz	† - · · · · · · · · · · · · · · · · · ·	-	-	-	> 40 dB			
Common-mode rejection	-	-	-	120 dB	105 dB			
Output circuits - Analog outputs D-F, A-C		Cu	rrent	<u></u>	Voltage			
Output signal	0-20 mA	, 4-20 mA		0-5 V, 1-5 V	, 0-10 V, 2-10 V, ± 10 V			
Output burden	≤ 600 Ω			≥ 4.7 KΩ				
Accuracy 1)	L	f full-scale	•••••	•·····	±0.1 % of full-scale			
Residual ripple	-		••••••	< 0.15 %	-			
Response time	200 µs		••••••	10 ms	200 ms			
Transmission frequency	1 kHz			80 Hz	2 Hz (to -3 dB)			
Supply circuits K-M		DC ve	ersions	······································	AC versions			
Rated supply voltage	24-48 V [DC	••••••••	110-240 \	/ AC			
Supply voltage range	24-48 V [DC / 24 V A	/ AC / 100-300 V DC					
Supply voltage tolerance	DC: -15	+10 %						
Rated frequency	0 Hz or 50/60 Hz							
Power consumption	2 W at 24 V DC 4.5 VA at 230 V AC							
Indication of operational states								
Supply voltage	U: green	LED						
General data								
Ambient temperature rangeoperation / storage		°C / -40	·					
Temperature coefficient	±150 ppr	n/°C		±250 ppm/°C	±200 ppm/°C at min. offset			
					±400 ppm/°C at			
					max. offset			
Mounting position	any			***************************************	***************************************			
Mounting	DIN rail (IE	EC/EN 60718	5), snap-on r	mounting / screw mount	ting with adapter			
Electrical connection								
	+			minals 0.2-2.5 mm ² (2				
fine-strand with(out) wire end ferrule			screw teri	minals 0.2-2.5 mm ² (2	4-12 AVVG)			
Stripping length	7 mm (0.	.		• · · · · · · · · · · · · · · · · · · ·	•			
Tightening torque	0.4 Nm (3	3.5 lb.in)						
Electromagnetic compatibility	EN 6100	162						
Interference immunity	EN 61000	J-6-2 £6 kV / ±8	L/ /\					
electrostatic discharge (ESD) IEC/EN 61000-4-2	······	EU NV / ±ŏ	r.v.)	•				
electromagnetic field (HF radiation resistance) IEC/EN 61000-4-3 fast transients (Burst) IEC/EN 61000-4-4		±2 kV / 5 kI	 ⊔\	•••••	***************************************			
	·····	.						
powerful impulses (Surge) IEC/EN 61000-4-5 HF line emission IEC/EN 61000-4-6		. 1 T\ V		•••••				
Interference emission EN 61000-6-4	4		•••••	•				
Isolation data	JIUSS D							
Isolation data Isolation test (between all isolated circuits)	1.5 kV			, 				
Test voltage (between all isolated circuits)	1.5 kV / 5	50 Hz		•	•			
root voitage (between an isolated offolits)	1.0 KV / C	JU 1 1Z						

 $^{^{\}eta}$ Includes non-linearity and factory setting, influenced by supply voltage and output load. 2 Detection of an input signal break (fail safe) and resistance > 10 k Ω results in a linearity of ± 0.2 %.

When connecting a 2-wire sensor, the terminals J and H have to be jumpered. Approvals see "Overview" on page 253

Analog signal converters - CC-U range Technical data

Туре		CC-L	I/STDR		CC-U/TCR				
Input circuits - Analog inputs	J-H	Current	Voltage		Thermocouples				
					(IEC 584-1 and 2)				
Measuring signal / input range		0-20 mA 4-20 mA	0-1 V / 1-5 V 0-10 / ±10 V		TC.K, TC.J TC.T, TC.S				
Input resistance		approx. 50 Ω	approx. 1.5 MΩ						
Adjustable threshold			selected inp	out range	······································				
Adjustable hysteresis		5-50 % of threshold							
Repeat accuracy (constant para	meters)	±0.5 % of	full-scale	•••••••••••••••••••••••••••••••••••••••	······································				
Output circuits - Relay outputs	E-D-F, B-C-A			Relay, 2 c/o conf	tacts				
Rated switching voltage		250 V AC							
Rated switching current	AC-12 (resistive) 230 V	4 A		•					
············	AC-15 (inductive) 230 V	3 A		•••••••••••••••••••••••••••••••••••••••					
	DC-12 (resistive) 24 V	4 A	•••••	•••••••••••••••••••••••••••••••••••••••					
	DC-13 (inductive) 24 V	2 A		•••••••••••••••••••••••••••••••••••••••	••••••				
AC rating U	tilization category (Control Circuit Rating Code)	B 300	•••••	•••••••••••••••••••••••••••••••••••••••	······································				
(UL 508)	max. rated operational voltage	300 V AC		•••••••••••••••••••••••••••••••••••••••	•				
	max. continuous thermal current at B 300	5 A	•••••	•••••••••••••••••••••••••••••••••••••••	······································				
n	nax. making/breaking apparent power at B 300	3600/360	VA	•••••••••••••••••••••••••••••••••••••••					
Minimum switching voltage		12 V	•••••	•••••••••••••••••••••••••••••••••••••••					
Minimum switching current / pov	ver	10 mA / 0.	6 VA (W)	•••••••••••••••••••••••••••••••••••••••					
Response time	••••••	10 ms							
Mechanical lifetime		30 x 10 ⁶ sı	vitching cycl	es					
Electrical lifetime	at AC-12, 230 V, 4 A	0.1 Mio. sv	vitching cycle	es					
Supply circuits	K-M		DC version	S	AC versions				
Rated supply voltage		24-48 V D	<u> </u>	110-2	240 V AC				
Supply voltage range		24-48 V D	C / 24 V AC	110-2	240 V AC / 100-300 V DC				
Supply voltage tolerance		DC: -15+15 % AC: -15+10 %							
Rated frequency		0 Hz or 50/60 Hz							
Power consumption		2 W at 24	V DC	4.5 V	A at 230 V AC				
Indication of operational states				•					
Supply voltage		U: green L							
1st / 2nd output relay energized		R1: yellow LED / R2: yellow LED							
General data									
Ambient temperature range	operation / storage	-20+60 °	C / -40+80	°C					
Temperature coefficient	•	±300 ppm/°C							
Mounting position	•	any							
Mounting		DIN rail (IEC	/EN 60715), s	nap-on mounting / sc	rew mounting with adapter				
Electrical connection									
Wire size	rigid				.5 mm² (24-12 AWG)				
	fine-strand with(out) wire end ferrule	plug-connector with screw terminals 0.2-2.5 mm ² (24-12 AWG)							
Stripping length		7 mm (0.28 inch)							
Tightening torque		0.4 Nm (3.	5 ib.in)						
Electromagnetic compatibility									
Interference immunity		EN 61000-							
electrostatic discharge (ESD)	IEC/EN 61000-4-2	4	kV / ±8 kV)						
electromagnetic field (HF radia	tion resistance) IEC/EN 61000-4-3								
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2							
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1	kV						
HF line emission	IEC/EN 61000-4-6	10 V							
Interference emission	EN 61000-6-4	Class B							
Isolation data									
Insulation voltage (between all is	olated circuits)	2.5 kV							
Test voltage (between all isolate	d circuits)	2.5 kV							

 $^{^{\}mbox{\tiny 1)}}$ When connecting a 2-wire sensor, the terminals J and H have to be jumpered. Approvals see "Overview" on page 253

Analog signal converters - CC-U range Technical data

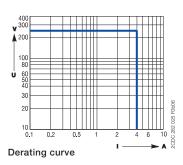
Туре		CC-U/I	CC-U/V					
Input circuits - Analog inputs	J-G-H	any current signals,	any voltage signals,					
		RMS measurement	RMS measurement					
Rated input range		0-1 A 0-5 A	0-100 V, 0-150V, 0-250 V 0-300 V, 0-400 V, 0-450 V 0-550 V, 0-600 V					
Measuring frequency		0-600 Hz						
Overload capacity of inputs	input range 1	10 x I _{Nom} (10 A) for max. 2 s	-					
	input range 2		-					
Gain adjustment range		±15 %						
Offset adjustment range		±20 %						
Input impedance / resistance		1A: 60 mΩ, 5 A: 12 mΩ	> 800 kΩ					
Output circuits - Analog outputs	D-F, A-C	Current	Voltage					
Output signal		0-20 mA, 4-20 mA	0-5 V, 1-5 V, 0-10 V, 2-10 V, ± 10 V					
Output load	••••••••••	≤ 600 Ω	≥ 4.7 KΩ					
Accuracy ¹⁾		±0.5 % of full-scale	•					
Temperature coefficient		±250 ppm/°C max.	±300 ppm/°C max.					
Residual ripple		< 0.15 %						
Response time		150 ms						
Supply circuits	K-M	DC versions	AC versions					
Rated supply voltage		24-48 V DC	110-240 V AC					
Supply voltage range		24-48 V DC, 24 V AC	110-240 V AC, 100-300 V DC					
Supply voltage tolerance		DC: -15+15 %	AC: -15+10 %					
Rated frequency		0 Hz or 50/60 Hz	•					
Power consumption		2 W at 24 V DC	4.5 VA at 230 V AC					
Indication of operational states								
Supply voltage		U: green LED						
General data								
Ambient temperature range	operation / storage	ge -20+60 °C / -40+80 °C						
Mounting position		any						
Mounting		DIN rail (IEC/EN 60715), snap-on m	ounting / screw mounting with adapter					
Electrical connection								
Wire size		plug-connector with screw terminals 0.2-2.5 mm2 (24-12 AWG)						
fine-strand w	vith(out) wire end ferrule	plug-connector with screw term	ninals 0.2-2.5 mm2 (24-12 AWG)					
Stripping length		7 mm (0.28 inch)						
Tightening torque		0.4 Nm (3.5 lb.in)						
Standards								
Product standard		-						
Low Voltage directive		2006/95/EC						
EMC directive		2004/108/EC						
RoHS directive		2011/65/EC						
Electromagnetic compatibility								
Interference immunity		EN 61000-6-2						
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (±6 kV / ±8 kV)						
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	10 V/m						
fast transients (Burst)	IEC/EN 61000-4-4	Level 3 (±2 kV / 5 kH)						
powerful impulses (Surge)	IEC/EN 61000-4-5	±2 kV / ±1 kV						
HF line emission	IEC/EN 61000-4-6	10 V						
Interference emission	EN 61000-6-4	Class B						
Isolation data		T4.5.137						
Insulation voltage (between all isolated circuits)		1.5 kV						
Test voltage (between all isolated circuits)		1.5 kV / 50 Hz						

 $^{^{\}rm 1)}$ Includes non-linearity and factory setting, influenced by supply voltage and output load. Approvals see "Overview" on page 253

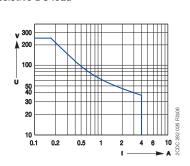
Analog signal converters - CC-U range Technical diagr., Connection diagr., Dimensional drawings

Technical diagrams Load limit curves CC-U/xxR

Resistive AC load

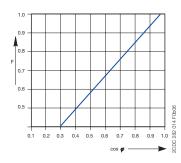


Resistive DC load



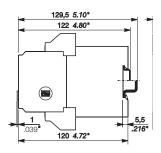
Connection diagram CC-U/x Width 22.5 mm (0.89 in)



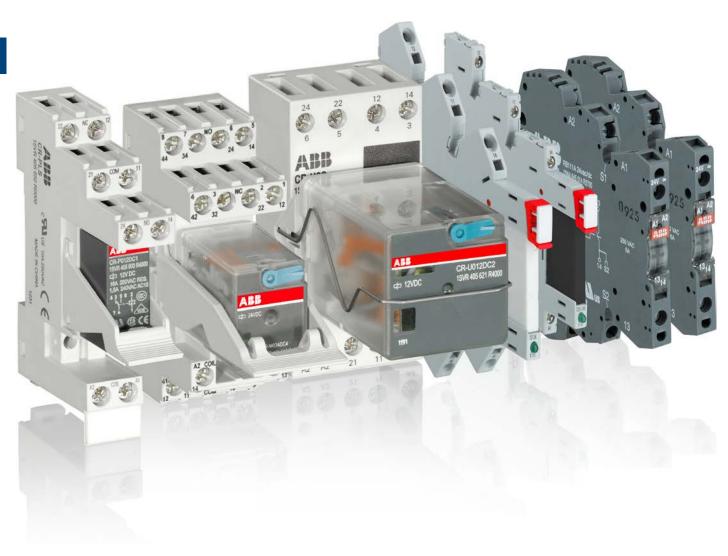


Dimensional drawings Dimensions in mm and inches

CC-U/x, CC-U/xR



Interface relays and optocouplers Product group picture



Interface relays and optocouplers Table of contents

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Interface relays and optocouplers Benefits and advantages

Slim relays and optocouplers CR-S Range



- Standard slim relays (5 mm), optocouplers (5 mm), sockets (6.2 mm) and accessories
- Combination of 9 different rated control supply voltages

DC versions: 5 V, 12 V, 24 V

AC/DC versions: 12 V, 24 V, 48 V, 60 V, 110 V, 230 V

Output relay: 1 c/o (SPDT) contact (6 A), standard and

gold-plated

Output optocoupler: Transistor 100 mA - 48 V DC, MOS-FET 2 A - 24 V DC, Triac 2 A - 240 V AC

- Cadmium-free contact material
- All sockets with LED
- Screw and spring connection terminals
- Jumper bar (red, black, blue), marker and separator available as accessories

Pluggable pcb relays CR-P



- 9 different coil voltages
 - DC versions: 12 V, 24 V, 48 V, 110 V
 - AC versions: 24 V, 48 V, 110 V, 120 V, 230 V
- Output contacts:
 - 1 c/o contact (16 A) or
 - 2 c/o contacts (8 A)
 - optionally equipped with gold contacts
- Logical or standard sockets
- Cadmium-free contact material
- Width of socket: 15.5 mm
- Pluggable function modules
 - Reverse polarity protection/Free wheeling diode
 - LED indication
 - RC elements
 - Overvoltage protection

Pluggable miniature relays CR-M



- 2 different coil voltages
 - DC versions: 12 V, 24 V, 48 V, 60 V, 110 V, 125 V, 220 V
 - AC versions: 24 V, 48 V, 110 V, 120 V, 230 V
- Output contacts
 - 2 c/o contacts (12 A) or
 - 3 c/o contacts (10 A) or
 - 4 c/o contacts (6 A)
 - optionally equipped with gold contacts, LED and free wheeling diode
- Integrated test button for manual actuation and locking of the output contacts (blue = DC, orange = AC) that can be removed if necessary
- With or without integrated LED
- Logical or standard sockets
- Cadmium-free contact material
- Width on socket: 27 mm
- Pluggable function modules
 - Reverse polarity protection/Free wheeling diode
 - LED indication
 - RC elements
 - Overvoltage protection

Pluggable universal relays CR-U



- 12 different coil voltages
 - DC versions: 12 V, 24 V, 48 V, 110 V, 125 V, 220 V
 - AC versions: 24 V, 48 V, 60 V, 110 V, 120 V, 230 V
- Output contacts
 - 2 c/o contacts (10 A) or
 - 3 c/o contacts (10 A)
- Integrated test button for manual actuation and locking of the output contacts (blue = DC, orange = AC) that can be removed if necessary
- With or without integrated LED
- Cadmium-free contact material
- Width on socket: 38 mm
- Pluggable function modules
 - Reverse polarity protection/Free wheeling diode
 - LED indication
 - RC elements
 - Overvoltage protection
 - Multifunction time module

Interface relays and optocouplers Benefits and advantages, approvals

R600 series interface relays and optocouplers



Boxed slim relays and optocouplers modules 6 mm or 12 mm

- 8 different rated control supply voltages:

DC versions: 5 V, 12 V, 24 V

AC/DC versions: 24 V, 48-60 V, 115 V, 230 V, 60-230 V

- Output relay: 1 n/c contact, 1 n/o contact, 1 c/o (SPDT) contact, 2 c/o (SPDT) contacts

Output optocoupler: Transistor 100 mA - 58 V DC. MOS-FET 2 A / 5 A - 58 V DC, Triac 1 A / 2 A - 230 V AC

- Devices with output contacts protected by built in RC circuit, which result in increased contact life
- Devices with leakage current protection on the input side
- All products with LED for the indication of the operational
- Screw or spring-type terminals
- Jumper bars and separator end section as accessories

Approvals and marks

■ exis	_			Re	lays			Sockets			Modules						
			6														
Appro	vals	Relays	Optocouplers	CR-P	CR-M	CR-U	R600	CR-S sockets	CR-PLS CR-PSS	CR-PLC	CR-ML CR-MSS	CR-MSF	CR-U.S CR-U.E	CR-USM		CR-P/M	CR-U
74	ANSI/UL 508																6)
c 7 1	CAN/CSA C22.2 No.14								1)		2)		3)				6)
®	CAN/CSA C22.2 No.14																
<u></u>	VDE	8)			4)			8)									
ERC	EAC																
Lings.	Lloyds Register				5)												
(11)	CCC																
@	CQC																
⊛	RMRS				7)	7)											
Marks																	
CE	CE																

¹⁾ except CR-PLSx

²⁾ except CR-M...LC

³⁾ except CR-U3E

⁴⁾ except 125 V DC devices

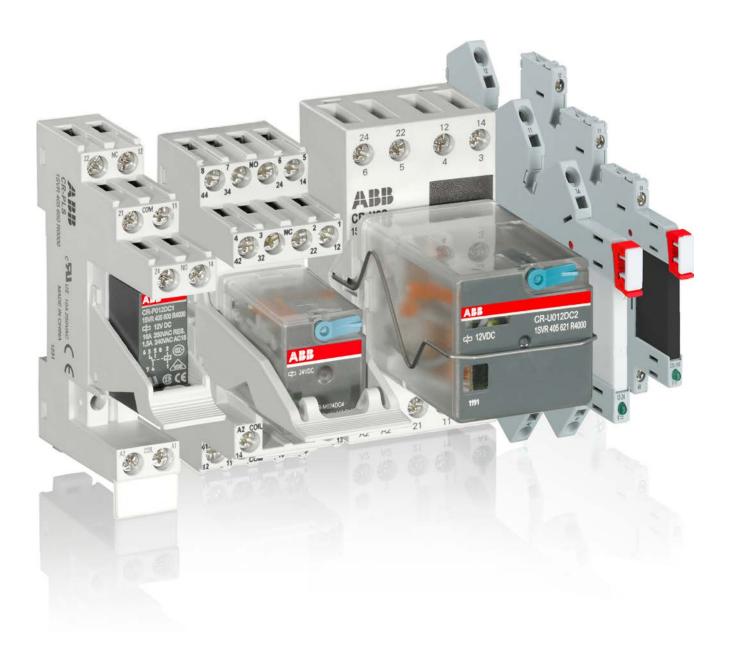
⁵⁾ only devices with 4 c/o contacts

⁶⁾ except CR-U61D, CR-U61DV

⁷⁾ except 60 V and 125 V devices

⁸⁾ only relays and sockets with screw terminals

Pluggable interface relays Product group picture



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Pluggable interface relays

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Pluggable interface relays Socket types

Kind of connecting terminals

Kinds of sockets

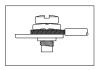
Standard sockets - Position of connecting terminals: Coil connection (A1-A2) on lower socket side, contact connections (n/o and n/c contacts) on the lower and upper socket side.

Logical sockets - Position of connecting terminals: Coil connection (A1-A2) on lower socket side, all contact connections (common contacts, n/o and n/c contacts) on upper socket side.

Details see connection diagrams





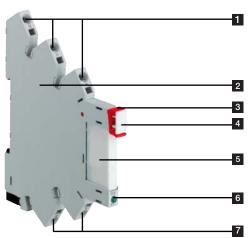


Screw type

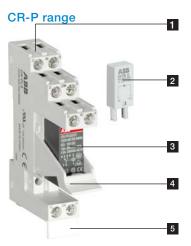
Spring type

Fork type

CR-S Range

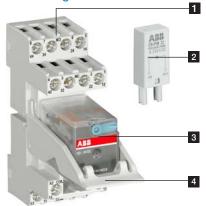


- 1 Output contacts
- 2 Socket
- 3 Relay holder
- 4 Marker
- 5 Interface relay
- 6 LED green: Control supply voltage applied
- 7 Control supply voltage



- 1 Socket
- 2 Pluggable function module
- 3 Interface relay
- 4 Holder
- 5 Marker label

CR-M range



- 1 Socket
- 2 Pluggable function module
- 3 Interface relay
- 4 Holder



- 1 Socket
- 2 Pluggable function module
- 3 Interface relay
- 4 Holder

Pluggable interface relays Ordering details - CR-S range



CR-S Interface relay



CR-S optocoupler

S = screw connection type Z = spring connection type



Rated control supply voltage	Outputs	Contact ratings	Туре	Order code	Price	Pkg	Weight (1 pce)
cappi) remage		· · · · · · · · · · · · · · · · · · ·				qty	kg (lb)
5 V DC			CR-S005VDC1R	1SVR405501R1010			
12 V DC	1 c/o (SPDT)		CR-S012VDC1R	1SVR405501R2010			0.005
24 V DC	standard	250 V, 6 A	CR-S024VDC1R	1SVR405501R3010		10	0.005
48 V DC	contacts		CR-S048VDC1R	1SVR405501R4010			(0.011)
60 V DC	1		CR-S060VDC1R	1SVR405501R5010			
5 V DC	:	:	CR-S005VDC1RG	1SVR405501R1020			
12 V DC	1 c/o (SPDT)	12 V, 250 mA	CR-S012VDC1RG	1SVR405501R2020			0.005
24 V DC	gold plated	(3W) ¹⁾	CR-S024VDC1RG	1SVR405501R3020		10	(0.005
48 V DC	contacts	(300)"	CR-S048VDC1RG	1SVR405501R4020			(0.011)
60 V DC			CR-S060VDC1RG	1SVR405501R5020			

Ordering details - CR-S range pluggable optocoupler

Rated control supply voltage	Outputs	Туре	Order code	Price		Weight (1 pce) kg (lb)
041//00	Transistor, 100 mA - 48 V DC	CR-S024VDC1TRA	1SVR405510R3050		40	0.004
24 V DC	MOS-FET, 2 A - 24 V DC Triac, 2 A - 240 V AC	CR-S024VDC1MOS CR-S024VDC1TRI	1SVR405510R3060 1SVR405510R3070		10	(0.009)

Ordering details - CR-S range complete interface relays (relay + socket)

Rated control supply voltage	Outputs	Contact ratings	Type	Order code	Price	Pkg qty	Weight (1 pce) kg (lb)	
24 V AC/DC			CR-S024VADC1CRS	1SVR405541R3110				
		CR-S024VADC1CRZ	1SVR405541R3210					
	1 c/o (SPDT) standard contacts	250 V,	CR-S110VADC1CRS	1SVR405541R6110		10	0.03	
TTU V AG/DC			6 A	CR-S110VADC1CRZ	1SVR405541R6210		10	(0.066)
230 V AC/DC				CR-S230VADC1CRS	1SVR405541R7110			
230 V AO/DO			CR-S230VADC1CRZ	1SVR405541R7210				
24 V AC/DC	/DC		CR-S024VADC1CRGS	1SVR405541R3120				
24 V AO/DO		10.11	CR-S024VADC1CRGZ	1SVR405541R3220				
110 V AC/DC	1 c/o (SPDT) gold plated	12 V, 250 mA	CR-S110VADC1CRGS	1SVR405541R6120		10	0.03	
TIU V AG/DC	gold plated		(3W) ¹⁾	CR-S110VADC1CRGZ	1SVR405541R6220		10	(0.066)
230 V AC/DC		(0)	CR-S230VADC1CRGS	1SVR405541R7120				
			CR-S230VADC1CRGZ	1SVR405541R7220				

¹⁾ If specified maximum values exceeded, the gold plating is destroyed. The maximum values of the standard contacts are then valid.

Ordering details - CR-S range sockets

Rated control supply voltage	Connection type	Type	Order code	Price	Pkg qty	Weight (1 pce) kg (lb)	
					Чіў	Kg (ID)	
6-24 V DC	Screw	CR-S006/024VDC1SS	1SVR405521R1100				
	Spring	CR-S006/024VDC1SZ	1SVR405521R1200				
10.041/40/50	Screw	CR-S012/024VADC1SS	1SVR405521R3100				
12-24 V AC/DC	Spring	CR-S012/024VADC1SZ	1SVR405521R3200				:
48-60	Screw	CR-S048/060VADC1SS	1SVR405521R5100				40
V AC/DC	Spring	CR-S048/060VADC1SZ	1SVR405521R5200		10	(0.055)	
110-125	Screw	CR-S110/125VADC1SS	1SVR405521R6100			:	
V AC/DC 220-240 V AC/DC	Spring	CR-S110/125VADC1SZ	1SVR405521R6200			:	
	Screw	CR-S220/240VADC1SS	1SVR405521R7100				
	Spring	CR-S220/240VADC1SZ	1SVR405521R7200			:	

Ordering details - CR-S range accessories

Version	Туре	Order code	Price	Pkg qty	Weight (1 pce) kg (lb)
Jumper bar 20 pole, blue color	CR-SJB20-BLUE	1SVR405598R0700			0.000
Jumper bar 20 pole, red color	CR-SJB20-RED	1SVR405598R0800		: 1() :	0.008
Jumper bar 20 pole, black color	CR-SJB20-BLACK	1SVR405598R0900			(0.018)
Marker block	CR-SM	1SNB041391R0610		10	0.0036 (0.0079)
Separator	CR-SSEP	1SVR405599R0000		10	0.012 (0.026)



Further documentation CR-S Range on www.abb.com

Pluggable interface relays Ordering details - CR-P range





CR-PLS

Ordering details - CR-P range

Rated control supply voltage	Outputs	Contact ratings	Type	Order code	Price	Pkg	Weight (1 pce)
						qty	kg (lb)
12 V DC			CR-P012DC1	1SVR405600R4000			
24 V DC			CR-P024DC1	1SVR405600R1000			
48 V DC			CR-P048DC1	1SVR405600R6000			
110 V DC			CR-P110DC1	1SVR405600R8000			
24 V AC	1 c/o (SPDT)	250 V, 16 A	CR-P024AC1	1SVR405600R0000		10	(0.014
48 V AC			CR-P048AC1	1SVR405600R5000			(0.001)
110 V AC			CR-P110AC1	1SVR405600R7000			
120 V AC			CR-P120AC1	1SVR405600R2000			
230 V AC			CR-P230AC1	1SVR405600R3000			
12 V DC			CR-P012DC2	1SVR405601R4000			
24 V DC			CR-P024DC2	1SVR405601R1000			
48 V DC			CR-P048DC2	1SVR405601R6000			
110 V DC			CR-P110DC2	1SVR405601R8000			0.014
24 V AC	2 c/o (SPDT)	250 V, 8 A	CR-P024AC2	1SVR405601R0000		10	(0.014
48 V AC			CR-P048AC2	1SVR405601R5000			,3.00./
110 V AC			CR-P110AC2	1SVR405601R7000			
120 V AC			CR-P120AC2	1SVR405601R2000			
230 V AC			CR-P230AC2	1SVR405601R3000			



Ordering details - CR-P range with gold contacts

Rated control supply voltage		Contact ratings	Туре	Order code	Price		Weight (1 pce)
						qty	kg (lb)
24 V DC		PDT) 250 V. 8 A	CR-P024DC2	1SVR405606R1000		10	0.014
24 V AC	2 c/o (SPDT)		CR-P024AC2G	1SVR405606R0000			
110 V AC	gold contact	250 V, 6 A	CR-P110AC2G	1SVR405606R7000		10	(0.031)
230 V AC			CR-P230AC2G	1SVR405606R3000			



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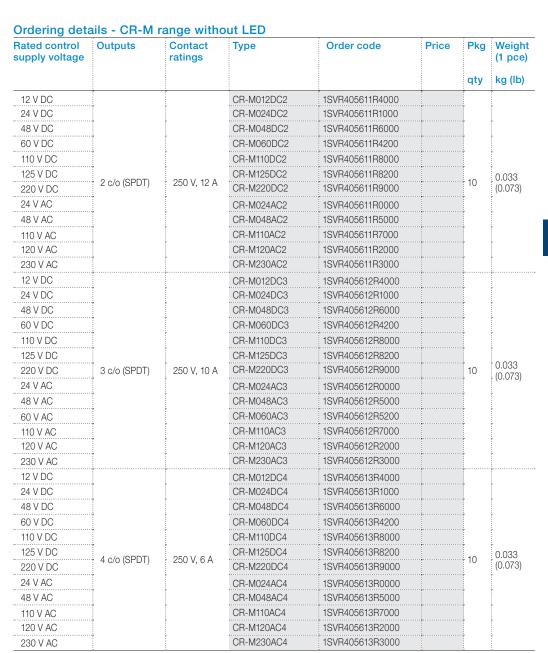
Further documentation CR-P range on www.abb.com

Ordering	details	- Access	ories
Oracinig	actans	70003	01103

Version	Connection terminal	Type	Order code	Price	Pkg	Weight (1 pce)
					qty	kg (lb)
Logical socket with protective separation	screw	CR-PLS	1SVR405650R0000		10	0.045 (0.099)
Logical socket	screw	CR-PLSx	1SVR405650R0100			0.043 (0.095)
	spring	CR-PLC	1SVR405650R0200			0.042 (0.093)
Standard socket	screw	CR-PSS	1SVR405650R1000			0.038 (0.084)
Plastic holder for socket		CR-PH	1SVR405659R0000		10	0.002 (0.004)
Jumper bar for sockets with screw connection		CR-PJ	1SVR405658R5000			0.018 (0.040)
Marker		CR-PM	1SVR405658R0000		10	0.0002 (0.0004)

Pluggable interface relays Ordering details - CR-M range







Pluggable interface relays Ordering details - CR-M range



CR-M

Rated control supply voltage	Outputs	Contact ratings	Туре	Order code	Price	Pkg	Weight (1 pce)
						qty	kg (lb)
12 V DC			CR-M012DC2L	1SVR405611R4100			
24 V DC			CR-M024DC2L	1SVR405611R1100			
48 V DC			CR-M048DC2L	1SVR405611R6100			
60 V DC			CR-M060DC2L	1SVR405611R4300			
110 V DC			CR-M110DC2L	1SVR405611R8100			0.033
125 V DC	0 / (ODDT)	0501/404	CR-M125DC2L	1SVR405611R8300		10	
220 V DC	2 c/o (SPDT)	250 V, 12 A	CR-M220DC2L	1SVR405611R9100		10	(0.073)
24 V AC			CR-M024AC2L	1SVR405611R0100			-
48 V AC			CR-M048AC2L	1SVR405611R5100			
110 V AC			CR-M110AC2L	1SVR405611R7100			-
120 V AC			CR-M120AC2L	1SVR405611R2100			
230 V AC			CR-M230AC2L	1SVR405611R3100			
12 V DC			CR-M012DC3L	1SVR405612R4100			
24 V DC			CR-M024DC3L	1SVR405612R1100			-
48 V DC			CR-M048DC3L	1SVR405612R6100			
60 V DC			CR-M060DC3L	1SVR405612R4300			•
110 V DC			CR-M110DC3L	1SVR405612R8100			
125 V DC	2 a/a (CDDT)	250 V, 10 A	CR-M125DC3L	1SVR405612R8300		10	0.033
220 V DC	·· 3 c/o (SPDT)	250 V, 10 A	CR-M220DC3L	1SVR405612R9100		10	(0.073)
24 V AC			CR-M024AC3L	1SVR405612R0100			
48 V AC			CR-M048AC3L	1SVR405612R5100			
110 V AC			CR-M110AC3L	1SVR405612R7100			-
120 V AC			CR-M120AC3L	1SVR405612R2100			
230 V AC			CR-M230AC3L	1SVR405612R3100			
12 V DC			CR-M012DC4L	1SVR405613R4100			
24 V DC			CR-M024DC4L	1SVR405613R1100			
48 V DC			CR-M048DC4L	1SVR405613R6100			
60 V DC			CR-M060DC4L	1SVR405613R4300			
110 V DC			CR-M110DC4L	1SVR405613R8100			
125 V DC	4 c/o (SPDT)	250 V, 6 A	CR-M125DC4L	1SVR405613R8300		10	0.033
220 V DC	4 0/0 (3FDT)	250 V, 0 A	CR-M220DC4L	1SVR405613R9100		10	(0.073)
24 V AC			CR-M024AC4L	1SVR405613R0100			
48 V AC			CR-M048AC4L	1SVR405613R5100			
110 V AC			CR-M110AC4L	1SVR405613R7100			
120 V AC			CR-M120AC4L	1SVR405613R2100			
230 V AC			CR-M230AC4L	1SVR405613R3100			:

Ordering details - CR-M range with LED and free-wheeling diode

Ordering dete	Sidering details - On-in range with LED and free-wheeling diode										
Rated control supply voltage		Contact ratings	Туре	Order code			Weight (1 pce) kg (lb)				
24 V DC	4 c/o (SPDT)	250 V, 6 A	CR-M024DC4LD	1SVR405614R1100			0.033 (0.073)				



Ordering deta	ilis - CR-IVI ra	ange with	gold contacts				
Rated control supply voltage	Outputs	Contact ratings	Туре	Order code	Price		Weight (1 pce) kg (lb)
24 V DC		250 V, 6 A	CR-M024DC4G	1SVR405618R1000		10	0.033 (0.073)
24 V AC	4 - /- (ODDT)		CR-M024AC4G	1SVR405618R0000			
110 V AC	4 c/o (SPDT)		CR-M110AC4G	1SVR405618R7000			
230 V AC			CR-M230AC4G	1SVR405618R3000			



Further documentation CR-M range on www.abb.com

Pluggable interface relays Ordering details - CR-M range



CR-M



CR-M4SS



Rated control supply voltage	Outputs	Outputs Contact ratings	Туре	Order code	Price	Pkg qty	Weight (1 pce)
							kg (lb)
12 V DC			CR-M012DC4LG	1SVR405618R4100			
24 V DC			CR-M024DC4LG	1SVR405618R1100			:
48 V DC	-		CR-M048DC4LG	1SVR405618R6100			
60 V DC			CR-M060DC4LG	1SVR405618R4300		10	(0.033
110 V DC			CR-M110DC4LG	1SVR405618R8100			(0.070)
125 V DC	4 a /a (CDDT)	050 1/ / 0 4	CR-M125DC4LG	1SVR405618R8300			
220 V DC	4 c/o (SPDT)	250 V / 6 A	CR-M220DC4LG	1SVR405618R9100			
24 V AC			CR-M024AC4LG	1SVR405618R0100			
48 V AC			CR-M048AC4LG	1SVR405618R5100			
110 V AC	7		CR-M110AC4LG	1SVR405618R7100		10	0.033 (0.073)
120 V AC			CR-M120AC4LG	1SVR405618R2100			
230 V AC			CR-M230AC4LG	1SVR405618R3100	-		

Ordering details - CR-M range with gold contacts and LED

Ordering details - CR-M range with gold contacts, LED and free-wheeling diode

Rated control supply voltage	i i	Contact ratings	Туре	Order code	Price		Weight (1 pce)
						qty	kg (lb)
12 V DC	4 e/e (CDDT)		CR-M012DC4LDG	1SVR405618R4400		10	0.033
24 V DC	4 c/o (SPDT)		CR-M024DC4LDG	1SVR405618R1400		10	(0.073)

Ordering details - Accessories

/ersion	Connection terminal	Type	Order code	Price	Pkg	Weight (1 pce)
					qty	kg (lb)
Logical socket for 2 c/o		CR-M2LS	1SVR405651R1100			0.055 (0.121)
Logical socket for 3 c/o	screw	CR-M3LS	1SVR405651R2100		10	0.062 (0.137)
Logical socket for 2/4 c/o		CR-M4LS	1SVR405651R3100			0.066 (0.146)
Logical socket for 2 c/o		CR-M2LC	1SVR405651R1200		10	0.065 (0.143)
Logical socket for 2/4 c/o	spring	CR-M4LC	1SVR405651R3200			0.066 (0.146)
Standard socket for 2 c/o		CR-M2SS	1SVR405651R1000		10	0.066 (0.146)
Standard socket for 3 c/o	screw	CR-M3SS	1SVR405651R2000			0.068 (0.150)
Standard socket for 2/4 c/o		CR-M4SS	1SVR405651R3000			0.070 (0.154)
Standard socket for 2 c/o		CR-M2SF	1SVR405651R1300		0.040 (0.088)	
Standard socket for 2/4 c/o	fork type	CR-M4SF	1SVR405651R3300		10	0.048 (0.106)
Plastic holder		CR-MH	1SVR405659R1000		10	0.003
Metal holder		CR-MH1	1SVR405659R1100		10	0.0005
Jumper bar for sockets with screw connection		CR-MJ	1SVR405658R6000		10	0.029 (0.064)
Marker		CR-MM	1SVR405658R1000		10	0.0005 (0.001)



Further documentation CR-M range on www.abb.com

Pluggable interface relays Ordering details CR-P/M functional modules

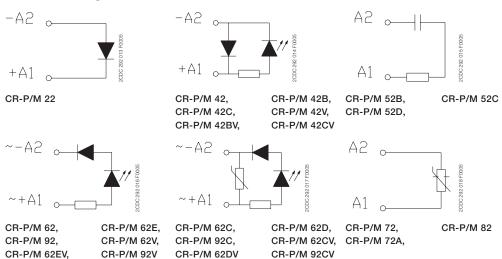


Rated control supply voltage	Description	Version	Type	Order code	Price	Pkg	Weight (1 pce)
						qty	kg (lb)
6-220 V DC	Diode - Reverse polarity protection/free wheeling diode	A1+, A2-	CR-P/M 22	1SVR405651R0000		10	0.003 (0.007)
C 04 V DC		red, A1+, A2-	CR-P/M 42	1SVR405652R0000			
6-24 V DC	Diode and	green, A1+, A2-	CR-P/M 42V	1SVR405652R1000			
24-60 V DC	LED - Reverse	red, A1+, A2-	CR-P/M 42B	1SVR405652R4000		10	0.003
24-00 V DC	polarity protection/free	green, A1+, A2-	CR-P/M 42BV	1SVR405652R4100		10	(0.007)
110 V DC	wheeling diode	red, A1+, A2-	CR-P/M 42C	1SVR405652R9000			
TIO V DC		green, A1+, A2-	CR-P/M 42CV	1SVR405652R9100			
6-24 V AC/DC			CR-P/M 52B	1SVR405653R0000			
24-60 V AC/DC	Spark		CR-P/M 52D	1SVR405653R4000		10	0.003
110 V AC/DC	quenching		CR-P/M 52C	1SVR405653R1000		10	(0.007)
6-24 V AC/DC		red, for DC A1+, A2-	CR-P/M 62	1SVR405654R0000			
		green, for DC A1+, A2-	CR-P/M 62V	1SVR405654R1000			
24-60 V AC/DC	Diode, LED and reverse polarity	red, for DC A1+, A2-	CR-P/M 62E	1SVR405654R4000		10	0.003
L+ 00 V A0/D0	protection	green, for DC A1+, A2-	CR-P/M 62EV	1SVR405654R4100			(0.007)
110 V DC		red, for DC A1+, A2-	CR-P/M 92	1SVR405654R0100			
110-230 V AC		green, for DC A1+, A2-	CR-P/M 92V	1SVR405654R1100			
6-24 V AC/DC		red, for DC A1+, A2-	CR-P/M 62C	1SVR405655R0000			
		green, for DC A1+, A2-	CR-P/M 62CV	1SVR405655R1000			
24-60 V AC/DC	Varistor and LED	red, for DC A1+, A2-	CR-P/M 62D	1SVR405655R4000		10	0.003
24-60 V AC/DC	Overvoltage gr protection A1 re- A2 gr	green, for DC A1+, A2-	CR-P/M 62DV	1SVR405655R4100			(0.007)
110 V DC		red, for DC A1+, A2-	CR-P/M 92C	1SVR405655R0100			
110-230 V AC		green, for DC A1+, A2-	CR-P/M 92CV	1SVR405655R1100			
24 V AC	Overveltees		CR-P/M 72	1SVR405656R0000			0.000
115 V AC	Overvoltage		CR-P/M 72A	1SVR405656R1000		10	(0.002

Connection diagrams

protection

230 V AC



CR-P/M 82

1SVR405656R2000

(0.004)

Pluggable interface relays Ordering details - CR-U range





CR-U2S

Ordering details - CR-U range without LED

Rated control supply voltage	Outputs	Contact ratings	Туре	Order code	Price	Pkg qty	Weight (1 pce) kg (lb)
12 V DC			CR-U012DC2	1SVR405621R4000			
24 V DC	:		CR-U024DC2	1SVR405621R1000			
48 V DC			CR-U048DC2	1SVR405621R6000			
110 V DC	:		CR-U110DC2	1SVR405621R8000			
220 V DC	0 a/a (CDDT)	050 1/ 10 4	CR-U220DC2	1SVR405621R9000		10	0.083
24 V AC	2 c/o (SPDT)	250 V, 10 A	CR-U024AC2	1SVR405621R0000		10	(0.183)
48 V AC	:		CR-U048AC2	1SVR405621R5000			ľ .
110 V AC	:		CR-U110AC2	1SVR405621R7000			
120 V AC	:		CR-U120AC2	1SVR405621R2000			
230 V AC			CR-U230AC2	1SVR405621R3000			
12 V DC			CR-U012DC3	1SVR405622R4000			
24 V DC			CR-U024DC3	1SVR405622R1000			
48 V DC			CR-U048DC3	1SVR405622R6000			
110 V DC			CR-U110DC3	1SVR405622R8000			
125 V DC			CR-U125DC3	1SVR405622R8200			
220 V DC	2 a/a (CDDT)	050 V 10 A	CR-U220DC3	1SVR405622R9000		10	0.083
24 V AC	3 c/o (SPDT)	250 V, 10 A	CR-U024AC3	1SVR405622R0000		10	(0.183)
48 V AC			CR-U048AC3	1SVR405622R5000			
60 V AC			CR-U060AC3	1SVR405622R5200			İ
110 V AC	:		CR-U110AC3	1SVR405622R7000			
120 V AC	:		CR-U120AC3	1SVR405622R2000			
230 V AC	-		CR-U230AC3	1SVR405622R3000			

Ordering details - CR-U range with LED

Rated control supply voltage	Outputs	Contact ratings	Туре	Order code	Price	Pkg	Weight (1 pce)
						qty	kg (lb)
12 V DC	:		CR-U012DC2L	1SVR405621R4100			:
24 V DC	Ī		CR-U024DC2L	1SVR405621R1100			
48 V DC			CR-U048DC2L	1SVR405621R6100			
110 V DC			CR-U110DC2L	1SVR405621R8100			
220 V DC	2 c/o (SPDT)	250 V, 10 A	CR-U220DC2L	1SVR405621R9100		10	0.083
24 V AC	2 6/0 (31 11)	200 V, 10 A	CR-U024AC2L	1SVR405621R0100		10	(0.183)
48 V AC			CR-U048AC2L	1SVR405621R5100			
110 V AC	<u> </u>		CR-U110AC2L	1SVR405621R7100			
120 V AC			CR-U120AC2L	1SVR405621R2100			
230 V AC			CR-U230AC2L	1SVR405621R3100			
12 V DC			CR-U012DC3L	1SVR405622R4100			
24 V DC			CR-U024DC3L	1SVR405622R1100		Ī	
48 V DC	:		CR-U048DC3L	1SVR405622R6100			
110 V DC			CR-U110DC3L	1SVR405622R8100			•
220 V DC	0 a/a (CDDT)	0501/404	CR-U220DC3L	1SVR405622R9100		10	0.083
24 V AC	3 c/o (SPDT)	250 V, 10 A	CR-U024AC3L	1SVR405622R0100		10	(0.183)
48 V AC	Ī		CR-U048AC3L	1SVR405622R5100			
110 V AC	Ī		CR-U110AC3L	1SVR405622R7100			:
120 V AC	Ţ	<u> </u>	CR-U120AC3L	1SVR405622R2100			ŀ
230 V AC	Ī		CR-U230AC3L	1SVR405622R3100			

Ordering details - Accessories

Version	Туре	Order code	Price	Pkg	Weight
				qty	(1 pce) kg (lb)
Socket for 2 c/o and module	CR-U2S	1SVR405670R0000			
Socket for 3 c/o and module	CR-U3S	1SVR405660R0000		10	
Socket for 3 c/o	CR-U3E	1SVR405660R0100			
Socket small for 2 c/o	CR-U2SM	1SVR405670R1100			
Socket small for 3 c/o	CR-U3SM	1SVR405660R1100			
Holder for CR-U socket	CR-UH	1SVR405669R0000			



Further documentation CR-U range on www.abb.com

Pluggable interface relays Ordering details - CR-U accessories



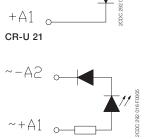


Ordering details - CR-U range

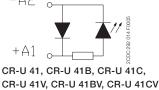
Rated control supply voltage	Description	Version	Туре	Order code	Price	Pkg	Weight (1 pce)
						qty	kg (lb)
6-220 V DC	Diode - Reverse polarity protection/free wheeling diode	A1+, A2-	CR-U 21	1SVR405661R0000		10	0.007 (0.015)
6-24 V DC		red, A1+, A2-	CR-U 41	1SVR405662R0000			
0-24 V DC	Diode and LED -	green, A1+, A2-	CR-U 41V	1SVR405662R1000			
24-60 V DC	Reverse polarity	red, A1+, A2-	CR-U 41B	1SVR405662R4000		10	0.007
24-00 V DC	protection/free	green, A1+, A2-	CR-U 41BV	1SVR405662R4100		10	(0.015)
110 V DC	wheeling diode	red, A1+, A2-	CR-U 41C	1SVR405662R9000			
110 4 DC		green, A1+, A2-	CR-U 41CV	1SVR405662R9100			
6-24 V AC/DC			CR-U 51B	1SVR405663R0000			
24-60 V AC/DC	Spark		CR-U 51D	1SVR405663R4000		10	0.007
110 V AC/DC	quenching		CR-U 51C	1SVR405663R1000		10	(0.015)
6-24 V AC/DC		red, for DC A1+, A2-	CR-U 61	1SVR405664R0000			
0-24 V AO/DO		green, for DC A1+, A2-	CR-U 61V	1SVR405664R1000			
24-60 V AC/DC		red, for DC A1+, A2-	CR-U 61E	1SVR405664R4000		10	0.007
2+ 00 V NO/DO	Diode and LED	green, for DC A1+, A2-	CR-U 61EV	1SVR405664R4100		10	(0.015)
110 V DC		red, for DC A1+, A2- CR-U 91 1SVR405664R0100					
110-230 V AC		green, for DC A1+, A2-	CR-U 91V	1SVR405664R1100			
6-24 V AC/DC		red, for DC A1+, A2-	CR-U 61C	1SVR405665R0000			
		green, for DC A1+, A2-	CR-U 61CV	1SVR405665R1000			
24-60 V AC/DC	Varistor and LED	red, for DC A1+, A2-	CR-U 61D	1SVR405665R4000		10	0.007
	Overvoltage protection	green, for DC A1+, A2-	CR-U 61DV	1SVR405665R4100			(0.015)
110 V DC		red, for DC A1+, A2-	CR-U 91C	1SVR405665R0100			
110-230 V AC		green, for DC A1+, A2-	CR-U 91CV	1SVR405665R1100			
24 V AC	Overvoltage		CR-U 71	1SVR405666R0000			0.007
115 V AC	protection,		CR-U 71A	1SVR405666R1000		10	(0.007
230 V AC	varistor		CR-U 81	1SVR405666R2000			
24-240 V AC/DC	Multifunction time module	pluggable onto CR-U2S and CR-U3S	CR-UT	1SVR405667R0000		10	0.014 (0.031)

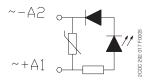
Connection diagrams

-A2 __

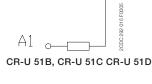




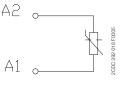




CR-U 61C, CR-U 61CV, CR-U 61D, CR-U 61DV, CR-U 91C, CR-U 91CV



All CR-U modules can be plugged onto sockets CR-U2S and CR-U3S.



CR-U 71, CR-U 71A, CR-U 81

Pluggable interface relays Technical data - CR-P, CR-M, CR-U

Input circuit - coil data **CR-P** range

	Rated control supply voltage U _s	Rated frequency	Make voltage (at 20 °C)	Maximum- voltage (at 55 °C)	Break voltage	Rated power	Coil re- sistance (at 20 °C)	Tolerance of coil resistance
DC coils	12 V DC 24 V DC 48 V DC 110 V DC	- - -	8.4 V DC 16.8 V DC 33.6 V DC 77 V DC	30.6 V DC 61.2 V DC 122.4 V DC 280 V DC	$\geq 0.1 \text{ U}_{\text{S}}$ $\geq 0.1 \text{ U}_{\text{S}}$ $\geq 0.1 \text{ U}_{\text{S}}$ $\geq 0.1 \text{ U}_{\text{S}}$	0.4-0.48 W 0.4-0.48 W 0.4-0.48 W 0.4-0.48 W	360 Ω 1440 Ω 5700 Ω 25200 Ω	± 10% ± 10% ± 10% ± 10%
AC coils	24 V AC 48 V AC 110 V AC 120 V AC 230 V AC	50 / 60 Hz 50 / 60 Hz 50 / 60 Hz 50 / 60 Hz 50 / 60 Hz	19.2 V AC 38.4 V AC 88 V AC 96 V AC 184 V AC	28.8 V AC 57.6 V AC 132 V AC 144 V AC 276 V AC	\geq 0.15 U _s \geq 0.15 U _s \geq 0.15 U _s \geq 0.15 U _s \geq 0.15 U _s	0.75 VA 0.75 VA 0.75 VA 0.75 VA 0.75 VA	400 Ω 1550 Ω 8900 Ω 10200 Ω 38500 Ω	± 10% ± 10% ± 10% ± 10% ± 10%

CR-M range

	Rated control supply volt- age U _s	Rated frequency	Make voltage (at 20 °C)	Maximum voltage (at 55 °C)	Break volt- age	Rated power	Coil resistance (at 20 °C)	Tolerance of coil resistance
DC coils	12 V DC	-	9.6 V DC	13.2 V DC	≥ 0.1 U _s	0.9 W	160 Ω	± 10%
	24 V DC	-	19.2 DC	26.4 V DC	≥ 0.1 U _s	0.9 W	640 Ω	± 10%
	48 V DC	-	38.4 V DC	52.8 V DC	≥ 0.1 U _s	0.9 W	2600 Ω	± 10%
	60 V DC	-	48 V DC	66 V DC	≥ 0.1 U _s	0.9 W	4000 Ω	± 10%
	110 V DC	-	88 V DC	121 V DC	≥ 0.1 U _s	0.9 W	13600 Ω	± 10%
	125 V DC	-	100 V DC	137.5 V DC	≥ 0.1 U _s	0.9 W	16000 Ω	± 10%
	220 V DC	-	176 V DC	242 V DC	≥ 0.1 U _s	0.9 W	54000 Ω	± 10%
AC coils	24 V AC	50 / 60 Hz	19.2 V AC	26.4 V AC	≥ 0.2 U _s	1.6 VA	158 Ω	± 10%
	48 V AC	50 / 60 Hz	38.4 V AC	52.8 V AC	≥ 0.2 U _s	1.6 VA	640 Ω	± 10%
	60 V AC	50 / 60 Hz	48 V AC	66 V AC	≥ 0.2 U _s	1.6 VA	930 Ω	± 10%
	110 V AC	50 / 60 Hz	88 V AC	121 V AC	≥ 0.2 U _s	1.6 VA	3450 Ω	± 10%
	120 V AC	50 / 60 Hz	96 V AC	132 V AC	≥ 0.2 U _s	1.6 VA	3770 Ω	± 10%
	230 V AC	50 / 60 Hz	184 V AC	253 V AC	≥ 0.2 U _s	1.6 VA	16100 Ω	± 10%

CR-U range

	Rated control supply voltage U _s	Rated frequency	Make voltage (at 20 °C)	Maximum voltage (at 55 °C)	Break volt- age	Rated power	Coil re- sistance (at 20 °C)	Tolerance of coil resistance
DC coils	12 V DC	-	9.6 V DC	13.2 V DC	≥ 0.1 Us	1.5 W	110 Ω	± 10 %
	24 V DC	-	19.2 V DC	26.4 V DC	≥ 0.1 Us	1.5 W	430 Ω	± 10 %
	48 V DC	-	38.4 V DC	52.8 V DC	≥ 0.1 Us	1.5 W	1750 Ω	± 10 %
	110 V DC	-	88.0 V DC	121.0 V DC	≥ 0.1 Us	1.5 W	9200 Ω	± 10 %
	125 V DC	-	100 V DC	137.5 V DC	≥ 0.1 Us	1.5 W	11000 Ω	± 10 %
	220 V DC	-	176.0 V DC	242.0 V DC	≥ 0.1 Us	1.5 W	37000 Ω	± 10 %
AC coils	24 V AC	50 / 60 Hz	19.2 V AC	26.4 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)	75 Ω	± 10 %
	48 V AC	50 / 60 Hz	38.4 V AC	52.8 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)		± 10 %
	60 V AC	50 / 60 Hz	48.0 V AC	66.0 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)		± 10 %
	110 V AC	50 / 60 Hz	88.0 V AC	121.0 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)	1700 Ω	± 10 %
	120 V AC	50 / 60 Hz	96.0 V AC	132.0 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)		± 10 %
	230 V AC	50 / 60 Hz	184.0 V AC	253.0 V AC	≥ 0.15 U _s	2.8 VA (50 Hz) 2.5 VA (60 Hz)		± 10 %

Pluggable interface relays Technical data - CR-P, CR-M, CR-U

Туре		CR-P1	CR-P2	CR-M2	CR-M3	CR-M4	CR-U2	CR-U3					
Output circuit	r(s)	11-12/14	11-12/14 21-22/24	11-12/14 21-22/24	11-12/14 21-22/24 31-32/34	11-12/14 21-22/24 31-32/34 41-42/44	11-12/14 31-32/34	11-12/14 21-22/24 31-32/34					
Kind of output	t	Relay, 1 c/o	Relay, 2 c/o	Relay, 2 c/o	Relay, 3 c/o	Relay, 4 c/o	Relay, 2 c/o	Relay, 3 c/o					
Contact mater		AgNi	AgNi AgNi/Au 5 µm	AgNi	AgNi	AgNi AgNi/Au 5 µm	AgNi						
	l voltage U _e (VDE 0110, IEC 60947-1)	250 V		.,			,						
Minimum swite	ching voltage	5 V		10 V (AgNi); {	5 V (AgNi/Au)		10 V						
Maximum swit	tching voltage DC	300 V DC		250 V DC									
	AC	440 V AC		250 V AC			440 V AC						
Minimum swite		5 mA (AgNi), 2	mA (AgNi/Au)	5 mA (AgNi)	5 mA (AgNi)	2 mA (AgNi/Au)	5 mA						
Rated free air	thermal current I _{th}	16 A	8 A	12 A	10 A	6 A	10 A						
Rated	AC-12 (resistive) 230 V AC-15 (inductive) 230 V	16 A	8 A 1.5 A	12 A	10 A	6 A	10 A 1.5 A	·····					
operational current	AC-15 (inductive) 230 V AC-15 (inductive) 120 V		1.5 A	1.5 A	1.5 A	1 A 1.5 A	3 A						
(IEC 60947-	DC-12 (resistive) 24 V	16 A	8 A 2 A	12 A 2.5 A	10 A	6 A 2 A	10 A	······································					
5-1)	DC-13 (inductive) 24 V		2 A	2.5 A	2.5 A	2 A	2 A	··•···					
	DC-13 (inductive) 120 V DC-13 (inductive) 250 V		•••	•••••									
AC rating	Utilization category (pilot duty) (Contact rating code designation)	B300	•	B300		•	B300						
(UL 508)	max. rated operational voltage	300 V AC	••••	300 V AC		•••••	300 V AC	······					
	Max. continuous thermal current at utilization category	5 A		5 A	5 A	2.5 A	5 A						
	Max. making / breaking apparent power at utilization category	3600 / 360 V	A	3600 / 360 V	'A	1800 / 180 VA	3600/360 VA	\					
	Utilization category (resistive) (CSA22.2 No.14)	16 A, 250 V AC	8 A, 250 V AC	10 A, 250 V AC 12 A, 150 V AC		5 A, 250 V AC 10 A, 150 V AC	10 A, 250 V single-phase	AC (resistive +)					
DC rating *	Utilization category (pilot duty) (Contact rating code designation)	R300											
(UL 508; NEMA ICS-5)	Max. rated operational voltage	300 V DC	00 V DC										
,	Max. continuous thermal current at utilization category	1 A	··•				··•						
	Max. making / breaking apparent power at utilization category	28 VA											
	Utilization category (resistive) (CSA22.2 No.14)	-	10 A, 24 V DC	-			10 A, 28 V D	С					
• · · · · · · · · · · · · · · · · · · ·	king (inrush) current	30 A	15 A	24 A	20 A	12 A	20 A						
Minimum swite		0.3 W (AgNi), 0.0	05 W (AgNi/Au)	0.3 W (AgNi),	0.1 W (AgNi/A	u)	0.3 W	.					
Maximum swit (breaking) pov		4000 VA	2000 VA	3000 VA	2500 VA	1500 VA	2500 VA						
Contact resist	ance	≤ 100 mΩ		.,				.					
Maximum ope	erating rated load AC-1	600 switching	g cycles/h	1200 switchii	ng cycles/h								
frequency	without load	72000 switch	ning cycles/h	18000 switch	ning cycles/h		12000 switch	ning cycles/h					
Mechanical life	etime	> 3 x 10 ⁷ swit		> 2 x 10 ⁷ swi		· ·· ·····							
Electrical lifeti	me electrical AC1 (resistive)	> 0.7 x 10 ⁵ switching cycles (16 A, 250 V)	> 10 ⁵ switching cycles (8 A, 250 V)	> 10 ⁵ switchii (12 A, 250 V)	(10 A, 250 V)	(6 A, 250 V)	> 10 ⁵ switchi (12 A, 250 V)						
	COS φ	see reduction	·····	<u>i</u>	<u>i</u>	<u>.i</u>	<u>i.</u>						
Response time	······································	typ. 7 ms		typ. 13 ms (Γ	OC),10 ms (AC)	- -	typ. 18 ms (Γ	DC), 12 ms (AC)					
Release time		typ. 3 ms		typ. 3 ms (D0	· · • · · · · · · · · · · · · · · · · ·		*	C), 10 ms (AC)					
Isolation data		71		: 71 (2)	,, V /		: 71 (8)	,, ()					
Rated insulation		400 V AC		250 V AC									
Insulation clas	······	C250 / B400		C250 / B250		•••••	C250	······································					
Rated	between coil and contacts	5 kV AC		2.5 kV AC		•••••							
impulse	between open contacts	1 kV AC		1.5 kV AC									
withstand voltage U _{imp}	between c/o (SPDT) contacts	-	2.5 kV AC	2.5 kV AC		≥ 2 kV AC	2 kV AC						
	ween coil and contacts	≥ 10 mm		≥ 2.5 mm		≥ 1.6 mm	·············						
• • • • • • • • • • • • • • • • • • • •	ancebetween coil and contacts	≥ 10 mm		= 2.0 ≥ 4 mm		≥ 3.2 mm	≥ 4.2 mm						
Overvoltage c	······································			 									
Pollution degr		3		3		2	3						
	s are based on different type tests but the	1 -	ad by the alll us a			1 	<u> : *</u>						

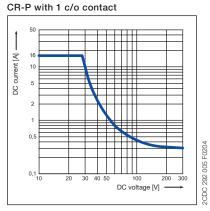
^{*} Those ratings are based on different type tests but they are not covered by the cULus or CSA approvals.

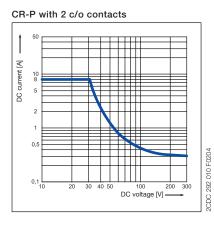
Pluggable interface relays Technical data, load limit curves - CR-P, CR-M, CR-U

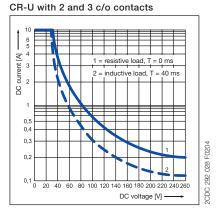
Туре		CR-P1	CR-P2	CR-M2	CR-M3	CR-M4	CR-U2	CR-U3						
General data			•	•	•									
Dimensions (W x H x D) when	mounted	12.7 x 29 x 1	5.7 mm	21.2 x 27.5 x	35.6 mm		35 x 35 x 54.4	mm						
Weight		14 g (0.031 lk	D)	35 g (0.077 lb)	•••••	83 g (0.18 lb)							
Mounting		on socket (se	ee accessories)										
Mounting position		any		•	•	•	•							
Degree of protection		IP 67 IP 40												
Electrical connection														
Connection		by socket												
Environmental data														
Ambient temperature range	operation	DC: -40+85 AC: -40+70	5 °;) °C	DC: -40+70	°; AC: -40+5	5 °C								
	storage	-40 +85 °C)											
Vibration resistance 10-150	n/o contact	10 g		5 g			5 g							
Hz	n/c contact	10 g	5 g	5 g			5 g							
Shock resistance	n/o contact	30 g	20 g	10 g			10 g							
	n/c contact	30 g	20 g	5 g			10 g							
Standards														
Product standard		IEC/EN 6025 60664-1, IEC	5-23, IEC/EN E/EN 61810-1	IEC/EN 60255 IEC/EN 61810		0810-1,	IEC/EN 60255-1							
Low Voltage Directive		2006/95/EC	·····	••••	•••••	••••••••								

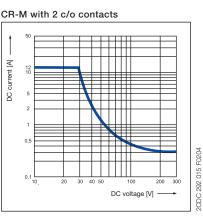
Approvals see page 5/6.

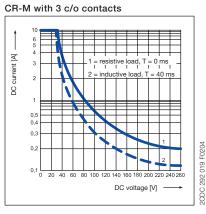
Load limit curves - Maximum switching power at resistive DC load

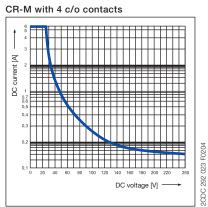












Pluggable interface relays Technical data - Sockets for CR-P and CR-M

Output circ	cuits	CR-PLS	CR-PLS(x)	CR-PSS	CR-PLC	CR-MxLS	CR-MxSS	CR-MxSF	CR-MxLC
Output circ		11-12/14, 21-2	22/24			11-12/14, 21-	22/24,		
Number of		2				2, 3 or 4		2 or 4	
Rated volta	0	250 V AC	300 V AC	250 V AC		250 V AC			300 V AC
Rated curre	ent	2 x 10 A ¹⁾	2 x 12 A ¹⁾	2 x 10 A ¹⁾		7 A			10 A
General da	nta								
Dimensions module (L x	s without holder and x W x H)	76 x 15.8 x 62 mm (2.992 x 0.622 x 2.441 in)	78.5 x 15.5 x 61 mm (3.011 x 0.610 x 2.402 in)	76 x 15.8 x 42.8 mm (2.992 x 0.622 x 1.685 in)	97.5 x 16.3 x 45.2 mm (3.839 x 0.642 x 1.780 in)	75 x 27.2 x 60.8 mm (2.952 x 1.071 x 2.394 in)	75.2 x 27.2 x 42.6 mm (2.961 x 1.071 x 1.677 in)	29 mm (2.626	95 x 31 x 42.5 mm (3.74 x 1.22 x 1.67 in)
Degree of p	protection terminals	IP 20 B (EN 6	0529)	·· i ······	·· i ······			·· i ······	
Temperatu		-40+70 °C		-40+70 °C	·····	-40+70 °C		·····	-25+85 °C
	storage	-40+70 °C	-40+85 °C	-40+70 °C		-40+70 °C	•••••	••••••	4
Connection		screw connec			spring connection	screw conne	ction	fork type screw	spring connection
Maximum r connecting	number of wires per terminal	2			2 (one per connection point)	2		-	2 (one per connection point)
Wire size	rigid		•••••	•••••		2 x 2.5 mm ² (2 x 14 AWG)		0.2 - 1.5 mm ²
		2 x 2.5 mm² (,		0.2-1.5 mm ² (24-16 AWG)			(2 x 16 AWG)	(24 x 16 AWG)
	with wire end ferule	2 x 1.5 mm ² (2	2 x 16 AWG)		1	2 x 1.5 mm ² (2 x 16 AWG)		
Stripping le	ength	-		•••••	••••	7 mm (0.28 ir		-	-
Tightening	torque	0.6 Nm	0.8 Nm	0.6 Nm		0.6 Nm (5.31	lb.in)		
Maximum	with 0.2 mm ²	_		-	10 N	_	-		10 N
clamping	with 1.5 mm ²		<u>-</u>	-	40 N	-	-		40 N
force	with wire end ferrule								> 40 N
Mounting Material		DIN rail (IEC/E PA 6+GF - V2	=N 60715)	.	·· · ····	PA 6+GF - V2	······	·· · ····	
Materiai	contacts					CuZn33	<u>′</u>		•••••
	contact surface		5 u tippod	5 u Nii		5 μ Ni	······································	6 μ Ni	5 μ tinned
	terminals	ΒμΝi	5 μ tinned 8 μ galvanized	8 u Ni	XCrNi Steel	8 μ Ni	•••••	:0 µ 141	CCSC
	combi screw M3		Ni	. о р тт	-	8.8 Steel, 5µ	Ni	······································	-
Isolation da		, - <u></u>				<u> </u>			•
Insulation v	/oltage	> 5 kV	> 3 kV	> 5 kV		> 3 kV		> 4 kV	
Isolation be contacts	etween coil and	EN 61984	•		VDE 0106 / 101	EN 61984		-	DIN EN 61140, VDE 0140-1
Clearance	and creepage distance	EN 61984			DIN EN 60664-1	EN 61984		DIN EN 6066	
Standards						_		_	
Products s		EN 61984		·····	·····	EN 61984	······	<u>-</u>	-
Low Voltag		2006/95/EC				2006/95/EC			
EMC Direct	tive	-				2004/108/EC			

 $^{^{1)}}$ Loads >10 A (>12 A for CR-PLSx) require jumpering of terminal 11 with 21, 12 with 22, and 14 with 24

Pluggable interface relays Technical data - Sockets for CR-U

Output circuits	CR-U2S	CR-U3S	CR-U3E	CR-UxSM
Output circuits	11-12/14, 21-22/24,	•	·	•
Number of poles	2	3		2 or 3
Rated voltage	250 V AC		300 V AC	2 or 3 250 V
Rated current	10 A		······	· · · · · · · · · · · · · · · · · · ·
General data				
Dimensions without holder and	75.3 x 37.3 x 26 mm	75.3 x 38.1 x 26 mm	70 x 38 x 26 mm	61.8 x 38.1 x 26 mm
module (L x W x H)	(2.965 x 1.469 x 1.024 in)	(2.965 x 1.500 x 1.024 in)	(2.756 x 1.496 x 1.024 in)	(2.756 x 1.500 x 1.024 in)
Degree of protection terminals Temperature range operation	IP 20 B (EN 60529)			
Temperature range operation	-40+70 °C	•	-40+85 °C	-40+70 °C
storage	I-40+70 °C	••••	-40+85 °C	-40+70 °C
Wire size rigid	2 x 2.5 mm ² (2 x 14 AWG)		······································	
fine-strand	2 x 2.5 mm ² (2 x 14 AWG) 2 x 1.5 mm ² (2 x 16 AWG)			
with wire end ferule	2 x 1.5 mm ² (2 x 16 AWG)	•••••		······································
Tightoning torque	O C NIm	••••	0.8 Nm	0.6 Nm
Mounting	DIN rail (IEC/EN 60715)	••••	••••••	••••••
Material socket	PA 6+GF - V2			
contacts	CuZn33	•	•	
contact surface	16 H NII			3 u Ni
tarminale	R II Ni		8 u galvanized	3 μ Ni 10 μ Ni
combi screw M3	8.8 Steel. 5µ Ni	····	p. 90.10	Steel, 8 µ Ni
Isolation data	1 / - F			/ - r
Insulation voltage	> 2 kV			
Isolation between coil and	EN 61984	·····		
contacts				
Clearance and creepage distance	EN 61984	····	······	
Standards	1			
Products standard	EN 61984: 2001			
Low Voltage Directive	2006/95/EC	·····		

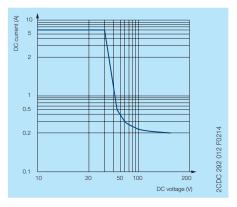
Pluggable interface relays Technical data - CR-S range

	Rated control supply voltage U _s	Make voltage (at 23 °C)	Maxium voltage (at 55 °C)	Break vo	oltage	Rated power	Coil resistance (at 23 °C)	Tolerance of coil resistance
CR-S005VDC1R(G)	5 V DC	3.75 V DC	7.5 V DC	0.25 V D	C	170 mW	147 Ω	± 10 %
CR-S012VDC1R(G)	12 V DC	9 V DC	18 V DC	0.6 V DC)	170 mW	848 Ω	± 10 %
CR-S024VDC1R(G)	24 V DC	18 V DC	36 V DC	1.2 V DC	 }	170 mW	3390 Ω	± 15 %
CR-S048VDC1R(G)	48 V DC	36 V DC	72 V DC	2.4 V DC	 }	210 mW	10600 Ω	± 15 %
CR-S060VDC1R(G)	60 V DC	45 V DC	90 V DC	3 V DC		210 mW	16600 Ω	± 15 %
Output circuits						!		
Dutput circuits Cind of output Contact material Rated operational volta	ge U ((EC/EN 609	47-1)			11-12/ 1 c/o (AgSn0	SPDT) D ₂ / AgSnO ₂ /Au		
Minimum switching volt Maximum switching vol Minimum switching cur Rated free air thermal c	age tage rent				12 V D		mA (AgSnO ₂ /Au)	
Rated operational curre	nt (IEC/EN 60947-	AC AC DC DC DC	D12 (resistive) D15 (inductive) D15 (inductive) D12 (resistive) D13 (inductive) D13 (inductive)	120 V 24 V 24 V 120 V 250 V	6 A 1.5 A 3 A 6 A 1 A 0.22 A			
AC rating (UL 508; NEM	,	(Cont	lization category act rating code o	designation))			
DC rating (UL 508; NEM		Uti (Cont	lization category act rating code of	(pilot duty) designation)	R300			
Maximum making (inrus Minimum switching pov					15 A, 1 100 m	240 V AC A/12 V (AgSnO ₂)	/ 50 mW (AgSn	O ₂ /Au)
Maximum switching (br Contact resistance Maximum operating fre			rate	ed load AC1	100 m 360 sv	VA, 250 V AC Ω (at 1 A/ 6 V D witching cycles/h	l	
Mechanical lifetime Electrical lifetime				··········	1 x 10 (n/c) 3	switching cycles switching cycle x 10 ⁴ switching x 10 ⁴ switching	s cycles (at +85 °C	C)
Response time Release time solation data					8 ms 4 ms			
Rated insulation voltage					250 V	AC		
Rated impulse withstand	voltage U _{imp}		between coil a between op between coil a	en contacts	1000 \	/ AC 1 min		
Creepage distance Overvoltage category Pollution degree General data			between coil a	and contacts	8 mm III 2	(0.315 in)		
Dimensions (W x H x D) Veight Vounting					5 g (0.0		0.196 x 0.590 in	
Mounting position Degree of protection Electrical connection					any RT II a	nd RT III		
Connection					by soc	ket		
nvironmental data	200			oporci:	10	%F %C		
Ambient temperature ra /ibration resistance (10		 			0+40 10 Hz			
Shock resistance		·····		n/o contact	Functi	onal 49 m/s² / De onal 49 m/s² / De	estructive 980 m	
Standards				, 0 00111401				., <u>.</u>
Product standard		<u> </u>			IEC 61	810-1		

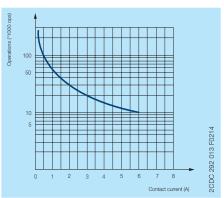
Pluggable interface relays Technical data - CR-S range sockets

Input circuits	CR-S 6-24 V	CR-S 12-24 V	CR-S 48-60 V	CR-S 110-125 V	CR-S 220-240 V
Rated control supply voltage U _s	6-24 V DC	2-24 V AC/DC	48-60 V AC/DC	110-125 V AC/DC	220-240 V AC/DC
Rated control supply voltage U _s tolerance	(0.8-1.2) U	(0.8-1.1) U	···· } ·····		··· · ································
Typical current	11-29 mA	11-16 mA	3.6-4.5 mA	3.6 mA	3.6 mA
Response time	8 ms		·····		
Release time	4 ms	•••••	····•	····•	
Status device	green LED	•••••	•••••	•••••	•••••••••••••••••••••••••••••••••••••••
Protective circuit	yes		••••••		•••••••••••••••••••••••••••••••••••••••
Output circuits					
Output circuits	11-12/14				
Number of poles	1				
Rated voltage	250 V AC			····	
Rated current	6 A				
General data for CR-S with screw connection terminal					
Dimensions without holder (L x W x H)		9 mm (3.476 x 0.24			
Degree of protection (EN 60529)		ction (EN 60529) IP	20 (terminals)		
	-40+70 °C	·····•	····•	-40+55 °C	···•··································
	0+40 °C				
Connection type	Screw			···•	······································
Maximum nuber of wires per connection terminal	2				
Wire size rigid	1 x 2.5 mm ² (1 x	(14 AWG) ; 2 x 1.5 (14 AWG); 2 x 1.5 r	mm² (2 x 16 AWG)	···•	
fine-strand	1 x 2.5 mm ² (1 x	(14 AWG); 2 x 1.5 r	nm² (2 x 16 AWG)	···•	··•·········
with wire end ferule	1 x 2.5 mm ² (1 x	(14 AWG); 2 x 1.0 r	nm² (2 x 18 AWG)		
Tightening torque	0.5 Nm (4.426 lb 7 mm (0.276 in)	o.in)			······································
Stripping length		·····•	····•	···•	······································
Mounting (IEC/EN 60715)	DIN rail				
	PA6 +GF-V2				······································
contacts contact surface					······································
	CuZn40, 3 μ Ni				
combi screw M3				······································	······································
General data for CR-S with spring connection terminal	110				
Dimensions without holder (L x W x H)	88.3 x 6.3 x 70.	9 mm (3.476 x 0.24	8 x 2.789 in)		
Degree of protection (EN 60529)		ction (EN 60529) IP			······································
Temperature range operation	-40+70 °C	λ		-40+55 °C	
storage	0+40 °C		····•	···•	•••••
Connection type	Spring	•••••	••••••	••••••	•••••••••••••••••••••••••••••••••••••••
Maximum nuber of wires per connection terminal	1				
Wire size		G) rigid, fine-stranc	and with wire end	ferule	
Stripping length	7 mm (0.276 in)				
Mounting (IEC/EN 60715)	DIN rail				······································
	PA6 +GF-V2	·····•	····•	····•	······································
contacts					······································
contact surface		.	.	.	······································
spring terminals	SUS301				
Isolation data Isolation between coil and contacts	5000 V AC				
Resistance to shock coil to contact	1000 V AC	<u>.</u>		···•	
Clearance and creepage distance	IEC/EN 61984		····•	····•	
Standards	ILO/LIN 01804				
Product stancard	IEC/EN 61984: 2	2001			
Low Voltage Directive	2006/95/EC	= = = :	····•		
	1======================================				

Load limit curves - Max. DC load breaking capacity

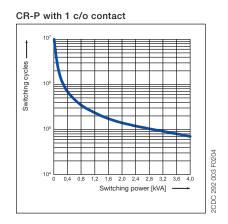


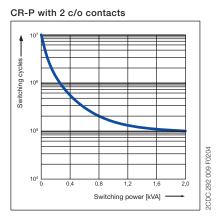
Endurance curve

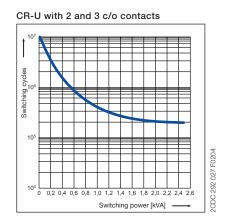


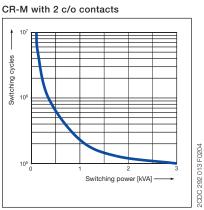
Pluggable interface relays Load limit curves

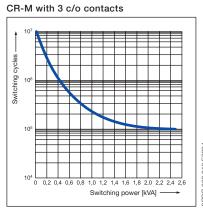
Load limit curves - Electrical lifetime at resistive AC load

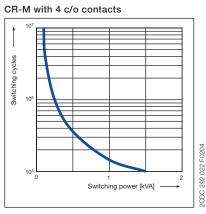




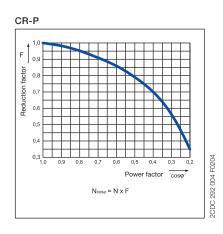


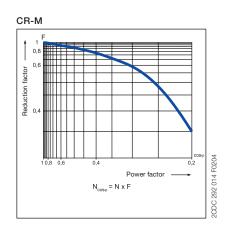


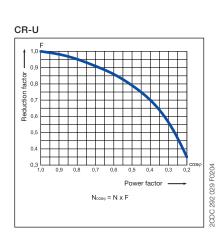




Reduction factor F at inductive AC load

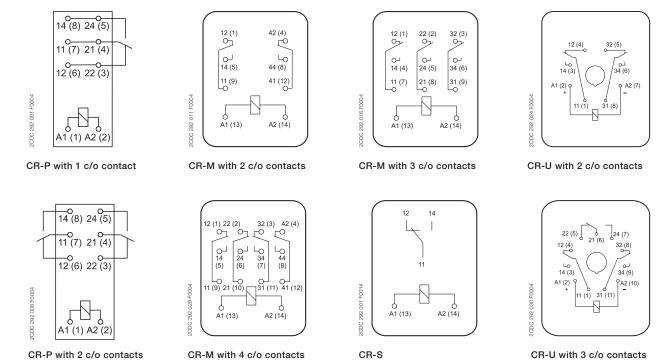




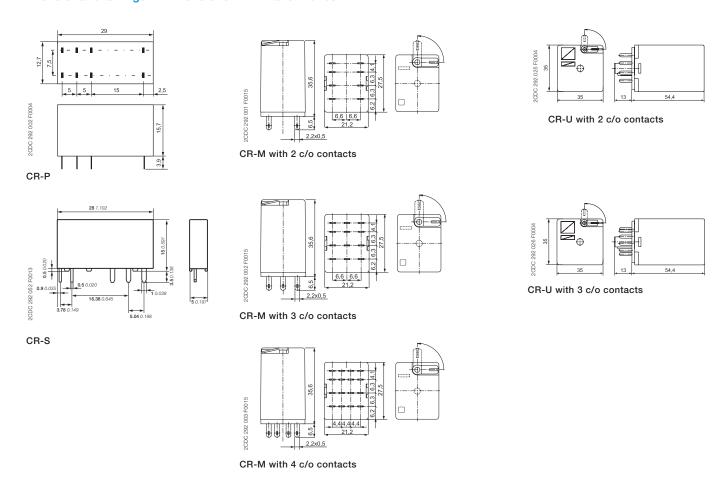


Pluggable interface relays Connection diagrams, Dimensional drawings

Connection diagrams

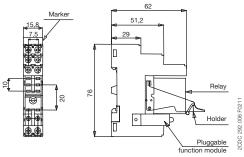


Dimensional drawings Dimensions in mm and inches

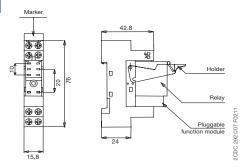


Pluggable interface relays Dimensional drawings

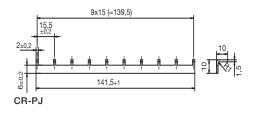
Dimensions in mm and inches

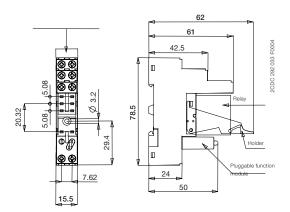


CR-PLS - screw connection

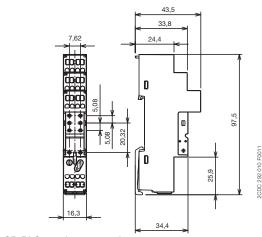


CR-PSS - screw connection

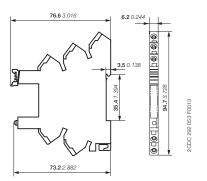




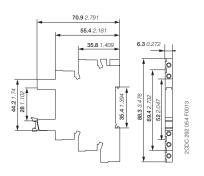
CR-PLSx - screw connection



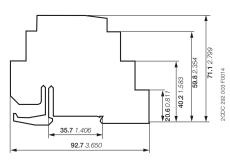
CR-PLC - spring connection



Spring socket for CR-S range interface relays

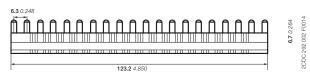


Screw socket for CR-S range interface relays



Separator for CR-S

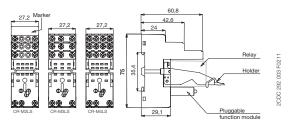
Jumper



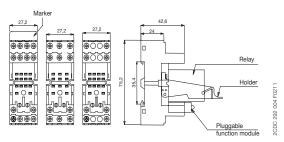
Jumper bar CR-S

Pluggable interface relays Dimensional drawings

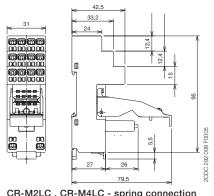
Dimensions in mm and inches



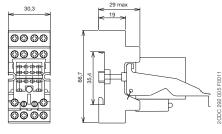
CR-M2LS - CR-M3LS - CR-M4LS - screw connection



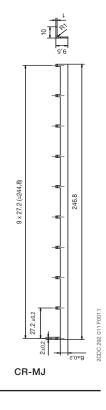
CR-M2SS - CR-M3SS - CR-M4SS - screw connection

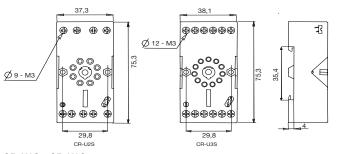




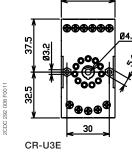


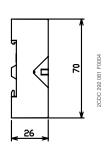
CR-MxSF - screw connection

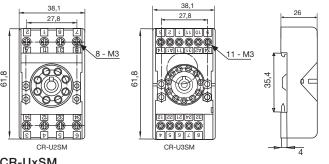












CR-UxSM

Boxed interface relays and optocouplers R600 range Product group picture



Boxed interface relays and optocouplers R600 range Table of contents

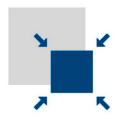
Boxed interface relays and optocouplers R600 range

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Boxed interface relays and optocouplers R600 range Overview

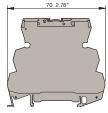
ABB's R600 range of boxed interface relays and optocouplers are used for electrical isolation, amplification and signal matching between the control unit and the sensor/actuator level. The space saving design and different connection terminal possibilities optimize your panel installation.

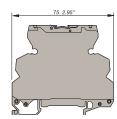
The broad portfolio of R600 range offers the most suitable interface solution for your application.



Space saving

Thanks to the 6 mm slim and 70 mm short housing, you maximize the foot print of your panel. The 75 mm depth allows you use in a compact cabinet.





Spring clamp module





Easy to install

The R600 interface relays and optocouplers are easy to mount by snapping onto a DIN-rail which is according to IEC/EN 60715.

Time saving wiring thanks to jumper bar.









Global availability

Applicable all over the world according to the highest standards. You will find R600 boxed interface relays and optocouplers in any application and every corner of the









Boxed interface relays and optocouplers R600 range Benefits and advantages

Marine certification

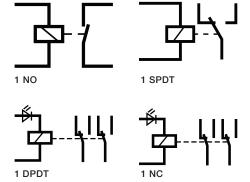
R600 Range offers the LR approval, which allows usage of the boxed interface relays and optocouplers in many applications around the marine segment. The performance of the R600 Range has proven by successfully passing tests required harshest conditions.





Complete product line

1 n/o, 1 n/c, 1 c/o, 2 c/o output configuration. Standard contact material for switching high current signals as well as gold-plated contacts for reliable switching of low current signals.

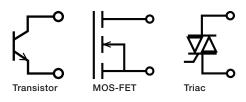


Optocoupler with transistor, MOS-FET and triac output for longer life-time, higher reliability and quiet operation.

Screw and spring connection terminals.





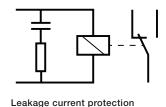


Safe operation

High resistance to vibration and shock thanks to the relay soldered inside of the

Wrong relay replacement or relay lose not possible.

Devices with immunity to the leakage currents.



Clear functioning status

Green LED for the status of the supply control voltage applied.



Boxed interface relays R600 range Selection

	Order number	1SNA645034R2300	1SNA645036R2500	1SNA645534R2500	1SNA645073R0000	1SNA645035R2400	1SNA645075R0000	1SNA645535R2600	1SNA645019R0400	1SNA645519R0600	1SNA645014R2700	1SNA645018R0300	1SNA645518R0500	1SNA645514R2100	1SNA645001R0300	1SNA645005R0700	1SNA645501R0500	1SNA645505R0100	1SNA645012R2500	1SNA645512R2700	1SNA645071R0000	1SNA645571R0000	1SNA645072R0000	1SNA645572R0000	1SNA645002R0400	1SNA645006R0000	1SNA645502R0600	1SNA645506R0200	
	Туре	RB121P-5VDC	RB121PG-5VDC	RBR121P-5VDC	RB121-12VDC	RB121P-12VDC	RB121G-12VDC	RBR121P-12VDC	RB101R-24VUC	RBR101R-24VUC	RB111-24VUC	RB111R-24VUC	RBR111R-24VUC	RBR111-24VUC	RB121-24VUC	RB121G-24VUC	RBR121-24VUC	RBR121G-24VUC	RB122G-24VUC	RBR122G-24VUC	RB121-24VDC	RBR121-24VDC	RB121G-24VDC	RBR121G-24VDC	RB121-48-60VUC	RB121G-48-60VUC	RBR121-48-60VUC	RBR121G-48-60VUC	
Input voltage				:	:			:					:					:			:	:	:						
5 V DC		=	•	-																		ļ							
12 V DC	••••••	ļ			•	•	•	•																					
24 V DC		ļ							•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					
48-60 V DC						<u>.</u>																<u>.</u>			•	•	•	•	
115 V DC																						<u>.</u>							
230 V DC		ļ																											
60-230 V DC	•••••					ļ							<u>.</u>																
24 V AC		ļ				<u></u>			•	•	•	•	•	•	•	•	•	•	•	•									
48-60 V AC						<u>.</u>																			•	•	•	•	
115 V AC						<u>.</u>																<u>.</u>							
230 V AC																													
60-230 V AC							<u> </u>															<u> </u>							
Output rating			;		:	;	;	:	;	;	;	;	;		:			;	;		:	:		;		:	:	;	
10 mA - 6 A		•		•	•	•	ļ	•	•	•	•	•	•	•	•		•				•	•			•		-		
3 mA - 6 A			•			ļ	•						<u>.</u>			•		•					•	•		•		•	
1 mA - 8 A																			•	•									
Output contact	S		,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	,	
c/o		1	1	1	1	1	1	1				ļ	<u>.</u>		1	1	1	1	2	2	1	1	1	1	1	1	1	1	
n/o	. <u>.</u>					<u>.</u>			<u>.</u>		1	1	1	1															
n/c									1	1																			
Terminal type																													
Screw		•	•		•	•	•		•		•	•			•	•			•		•		•		•	•			
Spring				-				•		•			•	•			•	•		•		•		•			•	•	

1SNA645040R1500	1SNA645540R1700	1SNA645003R0500	1SNA645007R0100	1SNA645046R0700	1SNA645503R0700	1SNA645507R0300	1SNA645041R0200	1SNA645541R0400	1SNA645016R2100	1SNA645017R2200	1SNA645004R0400	1SNA645008R1200	1SNA645011R2400	1SNA645504R0000	1SNA645508R1400	1SNA645511R2600	1SNA645013R2600	1SNA645513R2000	1SNA645020R0100	1SNA645520R0300
RB122G-48-60VUC	RBR122G-48-60VUC	RB121-115VUC	RB121G-115VUC	RB121R-115VUC	RBR121-115VUC	RBR121G-115VUC	RB122G-115VUC	RBR122G-115VUC	RB111-115VUC	RB111-230VUC	RB121-230VUC	RB121G-230VUC	RB121R-230VUC	RBR121-230VUC	RBR121G-230VUC	RBR121R-230VUC	RB122G-230VUC	RBR122G-230VUC	RB121-60-230VUC	RBR121-60-230VUC
•	•	•	•	•	•	•	•	•	•											
	•					-		•				•				•			•	•
		•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•
2	2	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	2	2	1	1
•	•	-	•	•	-	-	-	•	•	•	-	•	•	•	-	•	-	•	•	•

Boxed interface relays R600 range Ordering details



R600 - 6 mm



R600 - 12 mm

1 n/c contact: 250 V, 10 mA - 6 A, width 12 mm

Rated control supply voltage	Connection type	Particularities	Туре	:	qty	Weight (1 pc) kg (lb)
24 V AC/DC	Screw	RC circuit parallel to	RB101R-24VUC	1SNA645019R0400	_	0.04
24 V AO/DO	Spring	output contact	RBR101R-24VUC	1SNA645519R0600	O .	(0.088)

1 n/o contact: 250 V, 10 mA - 6 A, width 6 mm

Rated control supply voltage	Connection type	Particularities	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
24 V AC/DC	Screw		RB111-24VUC	1SNA645014R2700		
115 V AC/DC	Screw		RB111-115VUC	1SNA645016R2100	10	0.02
230 V AC/DC	Screw		RB111-230VUC	1SNA645017R2200	10	(0.044)
24 V AC/DC	Spring		RBR111-24VUC	1SNA645514R2100		

1 n/o contact: 250 V, 10 mA - 6 A, width 12 mm

Rated control supply voltage	Connection type	Particularities	Туре		qty	Weight (1 pc) kg (lb)
24 V AC/DC	Screw	RC circuit parallel to	RB111R-24VUC	1SNA645018R0300	E	0.04
24 V AU/DU	Spring	output contact	RBR111R-24VUC	1SNA645518R0500	υ	(0.088)

1 c/o (SPDT) contact: 250 V, 10 mA - 6 A, width 6 mm

Rated control supply voltage	Connection type	Particularities	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
5 V DC	Screw	A1-A2 polarized	RB121P-5VDC	1SNA645034R2300		
12 V DC	Screw	A1-A2 polarized	RB121P-12VDC	1SNA645035R2400		
12 V DC	Screw		RB121-12VDC	1SNA645073R0000		
24 V DC	Screw		RB121-24VDC	1SNA645071R0000		•
24 V AC/DC	Screw		RB121-24VUC	1SNA645001R0300		
48-60 V AC/DC	Screw		RB121-48-60VUC	1SNA645002R0400		
115 V AC/DC	Screw		RB121-115VUC	1SNA645003R0500		
230 V AC/DC	Screw		RB121-230VUC	1SNA645004R0400	10	(0.044)
5 V DC	Spring	A1-A2 polarized	RBR121P-5VDC	1SNA645534R2500		(0.044)
12 V DC	Spring	A1-A2 polarized	RBR121P-12VDC	1SNA645535R2600		
24 V DC	Spring		RBR121-24VDC	1SNA645571R0000		
24 V AC/DC	Spring		RBR121-24VUC	1SNA645501R0500		
48-60 V AC/DC	Spring		RBR121-48-60VUC	1SNA645502R0600		
115 V AC/DC	Spring		RBR121-115VUC	1SNA645503R0700		
230 V AC/DC	Spring		RBR121-230VUC	1SNA645504R0000		

1 c/o (SPDT) contact: 250 V, 3 mA - 6 A, gold-plated contacts, width 6 mm

Rated control supply voltage	Connection type	Particularities	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
5 V DC	Screw	A1-A2 polarized	RB121PG-5VDC	1SNA645036R2500		
12 V DC	Screw		RB121G-12VDC	1SNA645075R0000		
24 V DC	Screw		RB121G-24VDC	1SNA645072R0000		
24 V AC/DC	Screw		RB121G-24VUC	1SNA645005R0700		
48-60 V AC/DC	Screw		RB121G-48-60VUC	1SNA645006R0000		
115 V AC/DC	Screw		RB121G-115VUC	1SNA645007R0100	10	0.02
230 V AC/DC	Screw		RB121G-230VUC	1SNA645008R1200	10	(0.044)
24 V DC	Spring		RBR121G-24VDC	1SNA645572R0000		
24 V AC/DC	Spring		RBR121G-24VUC	1SNA645505R0100		
48-60 V AC/DC	Spring		RBR121G-48-60VUC	1SNA645506R0200		•
115 V AC/DC	Spring		RBR121G-115VUC	1SNA645507R0300		•
230 V AC/DC	Spring		RBR121G-230VUC	1SNA645508R1400		



Further documentation R600 range on www.abb.com

Boxed interface relays R600 range Ordering details

1 c/o (SPDT) contact: 250 V, 10 mA - 6 A, width 12 mm

Rated control supply voltage	Connection type	Particularities	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
60-230 V AC/DC	Screw		RB121-60-230VUC	1SNA645020R0100		
115 V AC/DC	Screw	Leakage current protec-	RB121R-115VUC	1SNA645046R0700		7
230 V AC/DC	Screw	tion, RC circuit parallel to input	RB121R-230VUC	1SNA645011R2400		0.04
60-230 V AC/DC	Spring		RBR121-60-230VUC	1SNA645520R0300	- 5	(0.088)
230 V AC/DC	Spring	Leakage current protection, RC circuit parallel to input	RBR121R-230VUC	1SNA645511R2600		

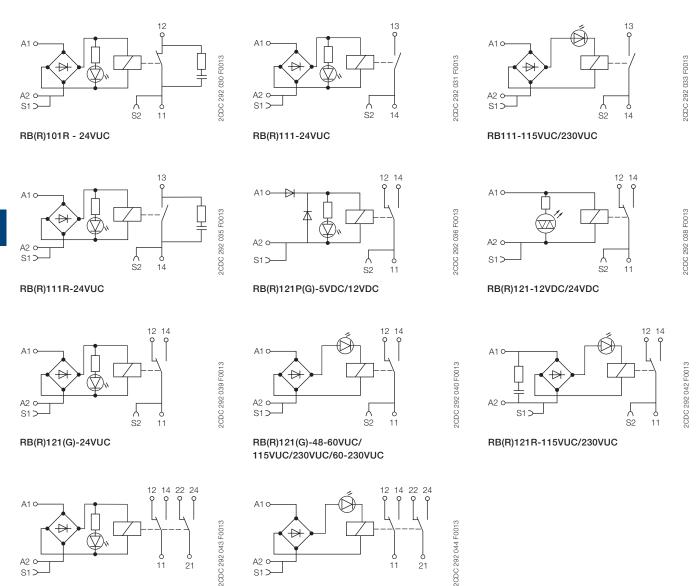
2 c/o (SPDT) contacts: 250 V, 1 mA - 8 A, gold-plated contacts, width 12 mm $\,$

Rated control supply voltage	Connection type	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
24 V AC/DC	Screw	RB122G-24VUC	1SNA645012R2500		
48-60 V AC/DC	Screw	RB122G-48-60VUC	1SNA645040R1500		
115 V AC/DC	Screw	RB122G-115VUC	1SNA645041R0200		
230 V AC/DC	Screw	RB122G-230VUC	1SNA645013R2600	_	0.04
24 V AC/DC	Spring	RBR122G-24VUC	1SNA645512R2700	5	(0.088)
48-60 V AC/DC	Spring	RBR122G-48-60VUC	1SNA645540R1700		
115 V AC/DC	Spring	RBR122G-115VUC	1SNA645541R0400		
230 V AC/DC	Spring	RBR122G-230VUC	1SNA645513R2000		

Ordering details - Accessories

Description	Type	Order code	Pkg qty	Weight (1 pc) kg (lb)
Jumper bar, 10 poles	BJ612-10	1SNA290488R0100	10	0.05 (0.11)
Jumper bar, 20 poles	BJ612-20	1SNA206754R0000		0.01 (0.022)
Separator end section	SC612	1SNA290474R0200		0.05 (0.11)
Front marking blank cards, 100 pcs.	RC610	1SNA233000R0100		
Terminal marking blank cards, 100 pcs.	RC65	1SNA232000R0000		

Boxed interface relays R600 range Connection diagrams



RB(R)122G-115VUC/230VUC

RB(R)122G-24VUC/48-60VUC

RB(R)111R-

Boxed interface relays R600 range Technical data

	RB(R))101R-	RB(R)111R-	
	24VUC		24VUC	
Input circuit			•	
Rated control supply voltage U	24 V AC/DC			
Rated control supply voltage U	DC -15 %, +20 %			
	AC -/+ 10 %			
Rated frequency	50/60 Hz			
Typical power consumption	0.24 W			
Typical current	10 mA			
Drop-out voltage at 20 Indication of operational states green I	l °C 4.5 V LED	voltage applied		
	i. control supply	voltage applied		
Output circuit	40			
	-12 relay, 1 n/c contact		rolay 1 n/o contact	
Rated operational voltage U _e (IEC/EN 60947-1)	250 V AC		relay, 1 n/o contact	
Minimum switching voltage	12 V			
Maximum switching voltage	250 V AC			
Minimum switching current	10 mA			
Rated free air thermal current I _{th}	6 A			
Rated operational AC-12 (resistive) 23	80 V 6 A			
current i AC-15 (inductive) 23				
(IEC/EN 60947-5-1) AC-15 (inductive) 12 DC-12 (resistive) 2				
DC-12 (resistive) 2				
DC-13 (inductive) 1				
DC-13 (inductive) 22	20 V 0.1 A			
AC rating (UL 508; Utilization category (p				
NEMA IĈŜ-5) DC rating (UL 508; Utilization category (r	uty)			
NEMA ICS-5)	uty)			
Minimum switching power	0.6 W / 0.6 VA			
Mechanical lifetime	1 x 10 ⁷ switching cycles			
Electrical lifetime at AC		S		
Max. fuse rating to achieve short-circuit protection Response time	6 A fast 5 ms			
Release time	8 ms			
		PP (P) 4		
		RB(R)1		
	24VUC	115VUC	230VUC	
Input circuit		115VUC	230VUC	
Rated control supply voltage U _s	24 V AC/DC		230VUC 230 V AC/DC	
Rated control supply voltage U _s Rated control supply voltage U _s DC	24 V AC/DC -15 %, +20 %	115VUC	230VUC	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance DC AC	24 V AC/DC -15 %, +20 % -/+ 10 %	115VUC	230VUC 230 V AC/DC	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance Rated frequency	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz	115 V AC/DC	230VUC 230 V AC/DC -15 %, +10 %	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance Rated frequency Typical power consumption	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W	115 V AC/DC	230VUC 230 V AC/DC -15 %, +10 %	
Rated control supply voltage U _s Rated control supply voltage U _s Colorance Rated frequency Typical power consumption Typical current Drop-out voltage at 20 °C	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC	230VUC 230 V AC/DC -15 %, +10 %	
Rated control supply voltage U _s Rated control supply voltage U _s Colerance Rated frequency Typical power consumption Typical current	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s Colorance Rated frequency Typical power consumption Typical current Drop-out voltage at 20 °C	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated control supply voltage U _s AC AC Rated frequency AC AC AC AC AC AC AC AC AC AC AC AC AC	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s Tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V T: control supply volta	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated control supply voltage U _s AC AC Rated frequency AC AC AC AC AC AC AC AC AC AC AC AC AC	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Cutput circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s Tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _e (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s Tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Cutput circuit Kind of output Rated operational voltage Maximum switching voltage Minimum switching voltage Minimum switching current Rated free air thermal current I _{th}	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Rated operational AC-12 (resistive) 230 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Rated operational Rated operational AC-12 (resistive) 230 V current I _s AC-15 (inductive) 230 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Rated operational Rated operational AC-12 (resistive) 230 V current I _s AC-15 (inductive) 230 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Cutput circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s AC-12 (resistive) 230 V Current I _s AC-15 (inductive) 230 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V T : control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational current I _g RAC-12 (resistive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V 1: control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1 A 0.2 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _e (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _g Rated operational Current I _g Current I _g AC-12 (resistive) 230 V AC-15 (inductive) 230 V DC-12 (resistive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 110 V DC-13 (inductive) 120 V	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V T: control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.4 0.2 A 0.1 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Green LED Output circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational Current I _g Rated operational operational Current I _g Rated operational operation	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V 1: control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1 A 0.2 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Coutput circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s (IEC/EN 60947-5-1) Rated operational Current I _s (IEC/EN 60947-5-1) Co-12 (resistive) 230 V Co-13 (inductive) 230 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) (pilot duty)	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V T: control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.4 0.2 A 0.1 A	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _s Maximum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s AC-12 (resistive) 230 V AC-15 (inductive) 230 V AC-15 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) NEMA ICS-5) (pilot duty) DC rating (UL 508; NEMA ICS-5) (pilot duty)	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V 1: control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.4 0.2 A 0.1 A B300	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational current Rated operational current Rated operational current Rated operational current Rated operational voltage Minimum switching voltage Minimum current Rated operational voltage Maximum switching power	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.4 0.2 A 0.1 A B300 R300 R300 0.6 W / 0.6 VA	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Output circuit Kind of output Rated operational voltage U _s (IEC/EN 60947-1) Minimum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s (IEC/EN 60947-5-1) Rated operational Current I _s (IEC/EN 60947-5-1) AC-15 (inductive) 230 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 210 V DC-13 (inductive) 220 V AC rating (UL 508; Utilization category NEMA ICS-5) NEMA ICS-5) (pilot duty) Minimum switching power Mechanical lifetime	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.5 A 3 A 6 A 0.1 A B300 R300 R300 0.6 W / 0.6 VA 1 x 10 switching cycles	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s Tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Coutput circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s (IEC/EN 60947-5-1) RC-12 (resistive) 230 V AC-15 (inductive) 230 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) (pilot duty) DC rating (UL 508; NEMA ICS-5) (pilot duty) Minimum switching power Mechanical lifetime Electrical lifetime Electrical lifetime AC-15	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V Telay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.4 0.2 A 0.1 A B300 R300 R300 0.6 W / 0.6 VA	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Cutput circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching voltage Minimum switching current Rated free air thermal current I _{th} Rated operational Current I _s Rated operational Current I _s Rot-15 (inductive) 230 V DC-13 (inductive) 230 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; Utilization category NEMA ICS-5) DC rating (UL 508; Utilization category NEMA ICS-5) NEMA ICS-5) NEMA ICS-5) (pilot duty) Minimum switching power Mechanical lifetime Electrical lifetime Electrical lifetime Electrical systems AC-15 inductive page of the page o	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V age applied	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA 27 V	
Rated control supply voltage U _s Rated control supply voltage U _s DC tolerance Rated frequency Typical power consumption Typical current Drop-out voltage Indication of operational states Cultiput circuit Kind of output Rated operational voltage Maximum switching voltage Maximum switching voltage Minimum switching voltage Minimum switching current Rated operational Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operational Current I _s Rated operatio	24 V AC/DC -15 %, +20 % -/+ 10 % 50/60 Hz 0.24 W 10 mA 4.5 V T : control supply volta relay, 1 n/o contact 250 V AC 12 V 250 V AC 10 mA 6 A 6 A 1.5 A 3 A 6 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 A 1.7 Switching cycles 1 x 10 ⁵ switching cycles 1 x 10 ⁵ switching cycles 1 x 10 ⁵ switching cycles	115 V AC/DC 115 V AC/DC 0.46 W 4 mA 17 V age applied	230VUC 230 V AC/DC -15 %, +10 % 0.8 W 3.5 mA 27 V	

RB(R)101R-

Boxed interface relays R600 range Technical data

Rated control supply voltage U	-/+ 10 % 50/60 Hz .2 W 0.24 W 0.33 W 0.54 W 0.46 W 0.8 W	· · · · · · · · · · · · · · · · · · ·	
Rated control supply voltage U	0 % -15 %, +10 % 50/60 Hz 2 W 0.24 W 0.33 W 0.54 W 0.46 W 0.8 W		
tolerance	-/+ 10 % 50/60 Hz .2 W 0.24 W 0.33 W 0.54 W 0.46 W 0.8 W	5 V DC 12 V DC	
Rated frequency	50/60 Hz .2 W 0.24 W 0.33 W 0.54 W 0.46 W 0.8 W	-15 %, +20 %	
Q.2 W Q.2 W Q.24 W Q.33 W Q.54 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.46 W Q.4	.2 W 0.24 W 0.33 W 0.54 W 0.46 W 0.8 W	-	
Typical current		- 02W 02W	
Drop-out voltage	2 IIIA - 10 IIIA - 11 IIIA - 13 IIIA - 14 IIIA - 13.3 IIIA		Typical power consumption Typical current
Output circuit Kind of output 11-12/14 relay, 1 c/o (SPDT) contact Rated operational voltage U_(IEC/EN 60947-1) 250 V AC Minimum switching voltage 12 V / gold-plated contacts: 5 V Maximum switching voltage 250 V AC Maximum switching current 10 mA7 gold-plated contacts: 3 mA at 20 V Rated operational current I_name 10 mA7 gold-plated contacts: 3 mA at 20 V Rated operational current I_name AC-15 (inductive) 230 V 5.4 Current I_name AC-15 (inductive) 120 V 3 A Current I_name AC-15 (inductive) 120 V 3 A DC-13 (inductive) 120 V 3 A AC-15 (inductive) 120 V 4 A DC-13 (inductive) 120 V 5 A AC-15 (inductive) 120 V 5 A DC-13 (inductive) 120 V 1 A B300 DC-13 (inductive) 120 V 1 A B300 NEMA ICS-5) (Dilot dutt) NEMA ICS-5) (Dilot dutt) Mechanical lifetime 1 x 10° switching cycles Electrical lifetime 1 x 10° switching cycles Response time 8 ms 5 ms 5 ms 5 ms 8 ms 8 ms 8 ms 8 ms 8 ms 8 ms 15 ms Release time 115 V AC/DC 230 V AC/DC <td>2 V 4.5 V 8 V 8 V 17 V 27 V</td> <td>1.2 V 2.2 V</td> <td>Drop-out voltage at 20 °C</td>	2 V 4.5 V 8 V 8 V 17 V 27 V	1.2 V 2.2 V	Drop-out voltage at 20 °C
Rind of output	ontrol supply voltage applied	: control	indication of operational states green LED
Rated operational voltage U_s (EC/EN 60947-1) 250 V AC			Output circuit
Minimum switching voltage) (SPDT) contact		
Maximum switching outrent Max. fuer air thermal current Max. fuer air tilefilme At A-15 Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Max. fuer air tilefilme Ac A-15 Ac A-15 Max. fuer air tilefilme Ac A-15 Ac A-15 Max. fuer air tilefilme Ac A-15 Ac A-15 Ac A-15 Max. fuer air tilefilme Ac A-15 Ac A			
Minimum switching current	I-plated contacts: 5 V		
Rated operational AC-12 (resistive) 230 V 6 A	old-plated contacts: 3 mA at 20 V		
Rated operational AC-12 (resistive) 230 V 6.A	ya piatoa contacto. C mir at 20 v		Rated free air thermal current I
AC-15 (inductive) 230 V 1.5 A		6 A	Rated operational AC-12 (resistive) 230 V
DC-12 (resistive) 24 V 6 A DC-13 (inductive) 12 V 1 A DC-13 (inductive) 12 V 1 A DC-13 (inductive) 12 V 0.7 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V 0.1 A DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 22 V DC-13 (inductive) 23 V V DC-13 (inductive) 24 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC			current I AC-15 (inductive) 230 V
DC-13 (inductive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 110 V DC-13 (inductive) 120 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive) 220 V DC-14 (inductive)			
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DC-13 (inductive) 220 V DC rating (UL 508; Vilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; V DC Part			
AC rating (UL 508; Utilization category (pilot duty)			
NEMA ICS-5			AC rating (UL 508: Utilization category
NEMA IOS-5			NEMA ICS-5) (pilot duty)
Minimum switching power 0.6 W / 0.6 VA; gold plated contacts: 0.06 V / 0.06 VA Mechanical lifetime 1 x 107 switching cycles Electrical lifetime at AC-15 Max. fuse rating to achieve short-circuit protection 6 A fast Response time 5 ms 5 ms 5 ms 5 ms 8 ms Release time 8 ms 8 ms 8 ms 8 ms 8 ms 8 ms 8 ms 8 ms 15 vuc 230 vuc Input circuit Rated control supply voltage U _s 115 v AC/DC 230 v AC/DC Rated control supply voltage U _s DC -20%, +15% -10%, +15% tolerance AC -/+ 10 % -10%, +15% Rated frequency 50/60 Hz Typical power consumption 2 W 2.8 W Typical current 18 mA 12 mA Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED I control supply voltage applied		R300	NEMA 100 E)
Mechanical lifetime	6 VA: gold plated contacts: 0.06 V / 0.06 VA	0.6.W./0.6.VA·a	
Electrical lifetime at AC-15 1 x 105 switching cycles Max, fuse rating to achieve short-circuit protection 6 A fast Response time 5 ms 5 ms 5 ms 5 ms 5 ms 8 ms 15 ms Release time 8 ms 8 ms 8 ms 8 ms 15 ms	itching cycles	1 x 10 ⁷ switching	
Response time			
Release time			
TISYUC 230VUC	ms 5 ms 5 ms 5 ms 6 ms 7 ms ms 8 ms 8 ms 15 ms 16 ms		
Rated control supply voltage U _s 115 V AC/DC 230 V AC/DC Rated control supply voltage U _s DC -20%, +15% -10%, +15% tolerance AC -/+ 10 % -/+ 10 % Rated frequency 50/60 Hz	230VUC	115VUC	
Rated control supply voltage U stolerance DC P20%, +15% -10%, +15% tolerance AC -/+ 10 % -/+ 10 % Rated frequency 50/60 Hz 2 W 2.8 W Typical power consumption 2 W 2.8 W Typical current 18 mA 12 mA Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED I : control supply voltage applied	000 V AC/DC	115 \/ AC/DC	nput circuit
tolerance AC -/+ 10 % Rated frequency 50/60 Hz Typical power consumption 2 W 2.8 W Typical current 18 mA 12 mA Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED I control supply voltage applied			
Rated frequency 50/60 Hz Typical power consumption 2 W 2.8 W Typical current 18 mA 12 mA Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED I: control supply voltage applied	% <u>:</u> -1U%, +13%		
Typical power consumption 2 W 2.8 W Typical current 18 mA 12 mA Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED T: control supply voltage applied			
Drop-out voltage at 20 °C 17 V 27 V Indication of operational states green LED : control supply voltage applied	2.8 W		Typical power consumption
Indication of operational states green LED [control supply voltage applied			
	•		Jrop-out voltage at 20 °C
	ontroi suppiy voitage applied	i i: control s	
Output circuit Kind of output 11-12/14 relay, 1 c/o (SPDT) contact	(SPDT) contact	relay 1 c/o (SDD	•
Rated operational voltage U _a (IEC/EN 60947-1) 250 V AC	אןטרטון סטוומטנ		
Minimum switching voltage 12 V			- 6.
Maximum switching voltage 250 V AC			
Minimum switching current 10 mA		10 mA	Minimum switching current
Rated free air thermal current I _{th} 6 A		6 A	Rated free air thermal current I _{th}
Rated operational AC-12 (resistive) 230 V 6 A			
,		1.5 A	current I _e AC-15 (inductive) 230 V
DC-12 (lesistive) 24 V 0 A		1.5 A 3 A	current AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V
DC-13 (inductive) 110 V 0.2 A		1.5 A 3 A 6 A	current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V
DC-13 (inductive) 220 V 0.1 A		1.5 A 3 A 6 A 1 A	current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V
		1.5 A 3 A 6 A 1 A 0.2 A 0.1 A	current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 220 V
		1.5 A 3 A 6 A 1 A 0.2 A 0.1 A	current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; Utilization category
		1.5 A 3 A 6 A 1 A 0.2 A 0.1 A B300	Current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 220 V AC rating (UL 508; VIEI/EMA ICS-5) AC-15 (inductive) 230 V AC-15 (inductive) 120 V DC-13 (inductive) 220 V (III) 220 V (III) 24 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V (III) 24 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24
		1.5 A 3 A 6 A 1 A 0.2 A 0.1 A	AC-15 (inductive) 230 V
NEMA IČS-5) (pilot đuty)	3 VA	1.5 A 3 A 6 A 1 A 0.2 A 0.1 A B300	Current I AC-15 (inductive) 230 V (IEC/EN 60947-5-1) AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) (pilot duty)
NEMA IČS-5) (pilot duty) Minimum switching power 0.6 W / 0.6 VA Mechanical lifetime 1 x 10 ⁷ switching cycles	itching cycles	1.5 A 3 A 6 A 1 A 0.2 A 0.1 A B300 R300 0.6 W / 0.6 VA 1 x 10 ⁷ switching	current I (IEC/EN 60947-5-1) AC-15 (inductive) 230 V AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) Utilization category (pilot duty) DC rating (UL 508; NEMA ICS-5) Utilization category (pilot duty) DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) Utilization category (pilot duty) DC-13 (inductive) DC-13 (inductive) 220 V DC-13 (inductive) 220 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (inductive) 240 V DC-13 (
NEMA ICS-5) (pilot duty) Minimum switching power 0.6 W / 0.6 VA Mechanical lifetime 1 x 10 ⁷ switching cycles Electrical lifetime at AC-15 1 x 10 ⁵ switching cycles	itching cycles	1.5 A 3 A 6 A 1 A 0.2 A 0.1 A B300 R300 0.6 W / 0.6 VA 1 x 10 ⁷ switching 1 x 10 ⁵ switching	current I (IEC/EN 60947-5-1) AC-15 (inductive) 230 V AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 110 V DC-13 (inductive) 220 V AC rating (UL 508; NEMA ICS-5) DC rating (UL 508; Vilization category (pilot duty) DC Company (pilot duty) Utilization category (pilot duty) MEMA ICS-5) Minimum switching power Mechanical lifetime Electrical lifetime AC-15 (inductive) 230 V AC-15 (inductive) 120 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25 V DC-13 (inductive) 25
NEMA IČS-5) (pilot duty) Minimum switching power 0.6 W / 0.6 VA Mechanical lifetime 1 x 10 ⁷ switching cycles	itching cycles itching cycles	1.5 A 3 A 6 A 1 A 0.2 A 0.1 A B300 R300 0.6 W / 0.6 VA 1 x 10 ⁷ switching 1 x 10 ⁵ switching 6 A fast	current I (IEC/EN 60947-5-1) AC-15 (inductive) 230 V AC-15 (inductive) 120 V DC-12 (resistive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 24 V DC-13 (inductive) 220 V DC-13 (inductive) 220 V AC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) DC rating (UL 508; Utilization category NEMA ICS-5) (pilot duty) Minimum switching power Mechanical lifetime Electrical lifetime at AC-15 Max. fuse rating to achieve short-circuit protection

Boxed interface relays R600 range Technical data

		RB(R)122G				
		24 V UC	48-60 V UC		115 V UC	230 V UC
Input circuit			•		•	
Rated control supply v	voltage U _s	24 V AC/DC	48 V AC/DC	60 V AC/DC	115 V AC/DC	230 V AC/D0
Rated control supply v	oltage U_ DC	-15 %, +20 %	i	······•	······•	-15 %, +10 %
olerance	AC	-/+ 10 %	•••••	••••••		••••••
Rated frequency	••••	50/60 Hz	***************************************	••••••		
Typical power consum	ption	0.48 W	0.62 W	0.96 W	0.58 W	1.15 W
ypical current		20 mA	13 mA	16 mA	5 mA	5 mA
rop-out	at 20 °C	5.4 V	8.8 V	8.8 V V	20 V	10 V
ndication of operatior	nal states green LED	☐ : contro	ol supply voltage ap	plied		
Output circuit		1				
Kind of output	11-12/14	relay, 1st c/o (S	SPDT) contact			
'	21-22/24	relay, 2nd c/o (SPDT) contact	••••••	••••••••	••••••
Rated operational voltag	e U _e (IEC/EN 60947-1)	250 V AC				•••••••
Minimum switching vo	Itage	5 V			······································	
Maximum switching vo	oltage	250 V DC - 250) V AC			
ninimum switching cu		1 mA	•••••	••••••		••••••
Rated free air thermal	current I _{th}	8 A	***************************************	•••••	•••••	••••••
Rated operational	AC-12 (resistive) 230 V	8 A	•••••		•••••	••••••
urrent İ	AC-15 (inductive) 230 V	1.5 A	***************************************			••••••
EC/EN 60947-5-1)	DC-12 (resistive) 24 V	8 A	•••••	••••••		••••••
	DC-13 (inductive) 24 V	1 A	***************************************	••••••		••••••
	DC-13 (inductive) 110 V	0.2 A				
	DC-13 (inductive) 220 V	0.1 A				
linimum switching po	ower	5 mW / 5 mVA				
Mechanical lifetime		2 x 10 ⁷ switchir				
lectrical lifetime	at AC-15	1 x 105 switchir	ng cycles			· · · · · · · · · · · · · · · · · · ·
	eve short-circuit protection	10 A fast		······		······
Response time		6 ms	10 ms	10 ms	6 ms	6 ms
Release time		10 ms	14 ms	14 ms	15 ms	15 ms

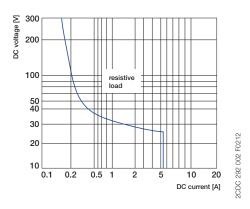
General technical data - Interface relays

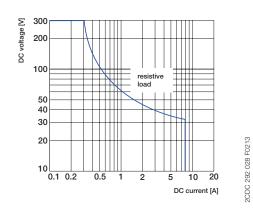
General technical data - interiace rei	ays	
	RB	RBR
General data		
Material of housing	UL 94 V0	
Mounting	DIN Rail	
Degree of protection housing terminal		
Electrical connection	Screw terminal	Spring-type terminal
Wire size fine-stran	d 0.22-2.5 mm² (24-14 AWG)	
rigi	d 0.2-4 mm² (24-12 AWG)	0.2-2.5 mm² (24-14 AWG)
Stripping length	9 mm (0.354 in)	
Tightening torque	0.4-0.6 Nm (3.5-5.3 lb.in)	n/a
Environmental data		
Ambient temperature ranges storag	e -40+80 °C (-40+176 °F) n -20+70 °C (-4+158 °F) 1)	
operatio	n -20+70 °C (-4+158 °F) ¹⁾	
Isolation data		
Rated insulation voltage U	250 V	
Rated impulse withstand input / output	t 4 kV	
Rated impulse withstand input / outpu voltage U _{imp} shock coil / outpu	it 4 kV	
output / outpu		
Overvoltage category		
Pollution degree	2	
Standards		
Product standards	EN 60947-5-1	
Low Voltage Directive	2014/35/EC	
RoHS Directive	2011/65/EC	

¹⁾ Over 55 °C, blocks have to be mounted on horizontal rail with 10 mm spacing between each block. For vertical rail mounting use temperature is 15 °C less decreased.

Boxed interface relays R600 range Dimensional drawings, Load limit curves

Load limit curves





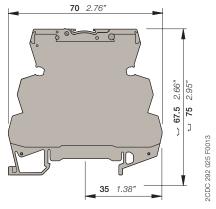
Versions with 1 n/o, 1 n/c or 1 c/o contact

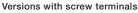
Versions with 2 c/o contacts

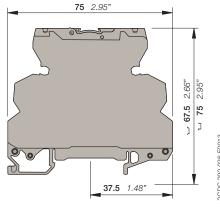
	DC-12	AC-12	DC-13	AC-15
24 V	6 A	6 A	1	3 A
110/120 V	0.3 A	6 A	0.2 A	3 A
220/230 V	0.2 A	6 A	0.1 A	3 A

Dimensions

in mm and inches







Versions with spring-type terminals

Boxed interface relays R600 range Notes

Boxed interface optocouplers R600 range Selection

	Order number	1SNA645047R0000	1SNA645547R0200	1SNA645021R2600	1SNA645521R2000	1SNA645549R1400	1SNA645022R2700	1SNA645522R2100	1SNA645050R1700	1SNA645550R1100	1SNA645051R0400	1SNA645025R2200	1SNA645024R2100	1SNA645551R0600	1SNA645525R2400	1SNA645524R2300	1SNA645053R0600	1SNA645553R0000	1SNA645054R0700	1SNA645058R1300	1SNA645026R2300	1SNA645526R2500	1SNA645559R1600	1SNA645027R2400	1SNA645029R0600	1SNA645527R2600	1SNA645529R0000	1SNA645062R0700	1SNA645028R0500
	Туре	OBIC0100-5-12VDC	OBRIC0100-5-12VDC	OBIC0100-24VDC	OBRICO100-24VDC	OBRIC0100-48-60VUC	OBIC0100-115-230	OBRIC0100-115-230	OBOC2000-5-12VDC	OBROC2000-5-12VDC	OBOC2000-24VDC	OBOC2000-24VUC	OBOC5000-24VDC	OBROC2000-24VDC	OBROC2000-24VUC	OBROC5000-24VDC	OBOC2000-48-60VUC	OBROC2000-48-60VUC	OBOC2000-115VUC	OBOC5000-115VUC	OBOC2000-230VUC	OBROC2000-230VUC	OBROC5000-230VUC	OBOA1000-24VDC	OBOA2000-24VDC	OBROA1000-24VDC	OBROA2000-24VDC	OBOA1000-115VUC	OBOA1000-230VUC
Input voltage			:						:		:																		=
5-12 V DC	· • • • • • • • • • • • • • • • • • • •	-	•						•	•																			
24 V DC				•	•				<u>.</u>		•	•	•	•	•	•								•	•	•	•		
48-60 V DC																	-	•											
115-230 V DC	· · • · · · · · · · · · · · · · · · · ·		<u>.</u>				•	•																					
115 V DC 230 V DC							•	•													•	•	•					•	•
24 V AC																													
48-60 V AC									<u>.</u>			-			•														
115-230 V AC									<u>.</u>								-	•											
115 V AC	· · • · · · · · · · · · · · · · · · · ·						-	-	<u>.</u>																				
230 V AC	- - •																			-			•					-	•
Output rating																													_
100 mA						_			:														:						=
1 A	· · • · · · · · · · · · · · · · · · · ·		<u>.</u>						<u>.</u>																				
2 A	· · • · · · · · · · · ·								ļ	_	<u> </u>													•		•		•	-
5 A									•	•	•	•	-	•	•	-	•	•	•		•	-	_		•		•		
Output voltage								<u> </u>					•			•				•			•						ᅴ
58 V DC	-		•	•	•	-	•		•	•	•	•	•	•	•	•	•	•			•	•	•						\dashv
230 V AC	· · • · · · · · · · · · · · · · · · · ·		<u>.</u>						<u>.</u>																				
400 V AC																									•	•	•		
Terminal type								<u> </u>																-		-		=	-
Screw	-	•		•			•		•		•	•	•				•		•	•	•			•	•			•	
Spring			•		•			•		•				•	•	•		•				•	•			•	•		

Boxed interface optocouplers R600 range Ordering details



R600 - 6 mm



R600 - 12 mm

Transistor output, 58 V DC, 100 mA, width 6 mm

Rated control supply voltage	Connection type	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)
5 - 12 V DC	Screw	OBIC0100-5-12VDC	1SNA645047R0000		
24 V DC	Screw	OBIC0100-24VDC	1SNA645021R2600	10	0.02
48 - 60 V AC/DC	Screw	OBIC0100-48-60VUC	1SNA645049R1200	10	(0.044)
115 - 230 V AC/DC	Screw	OBIC0100-115-230	1SNA645022R2700		
5 - 12 V DC	Spring	OBRIC0100-5-12VDC	1SNA645547R0200		
24 V DC	Spring	OBRIC0100-24VDC	1SNA645521R2000	10	0.02
48 - 60 V AC/DC	Spring	OBRIC0100-48-60VUC	1SNA645549R1400	10	(0.044)
115 - 230 V AC/DC	Spring	OBRIC0100-115-230	1SNA645522R2100		

MOS-FET output, 58 V DC, 2 A, width 6 mm

Rated control supply voltage	Connection type	Туре	Order code	Pkg qty	Weight (1 pc) kg (lb)	
5 - 12 V DC	Screw	OBOC2000-5-12VDC	1SNA645050R1700			
24 V DC	Screw	OBOC2000-24VDC	1SNA645051R0400			
24 V AC/DC	Screw	OBOC2000-24VUC	1SNA645025R2200	10	0.02	
48 - 60 V AC/DC	Screw	OBOC2000-48-60VUC	1SNA645053R0600	10	(0.044)	
115 V AC/DC	Screw	OBOC2000-115VUC	1SNA645054R0700			
230 V AC/DC	Screw	OBOC2000-230VUC	1SNA645026R2300			
5 - 12 V DC	Spring	OBROC2000-5-12VDC	1SNA645550R1100			
24 V DC	Spring	OBROC2000-24VDC	1SNA645551R0600		0.00	
24 V AC/DC	Spring	OBROC2000-24VUC	1SNA645525R2400	10	(0.044)	
48 - 60 V AC/DC	Spring	OBROC2000-48-60VUC	1SNA645553R0000		(0.044)	
230 V AC/DC	Spring	OBROC2000-230VUC	1SNA645526R2500			

MOS-FET output, 58 V DC, 5 A, width 6 mm

Rated control supply voltage	Connection type	Туре		Pkg qty	Weight (1 pc) kg (lb)
24 V DC	Screw	OBOC5000-24VDC	1SNA645024R2100	10	0.02
115 V AC/DC	Screw	OBOC5000-115VUC	1SNA645058R1300	10	(0.044)
24 V DC	Spring	OBROC5000-24VDC	1SNA645524R2300	10	0.02
230 V AC/DC	Spring	OBROC5000-230VUC	1SNA645559R1600	10	(0.044)

Triac output, 400 V AC, 1 A, width 6 mm

Rated control supply voltage	Connection type	Туре		Pkg qty	Weight (1 pc) kg (lb)
24 V DC	Screw	OBOA1000-24VDC	1SNA645027R2400		
115 V AC/DC	Screw	OBOA1000-115VUC	1SNA645062R0700	10	0.03
230 V AC/DC	Screw	OBOA1000-230VUC	1SNA645028R0500		(0.066)
24 V DC	Spring	OBROA1000-24VDC	1SNA645527R2600	10	

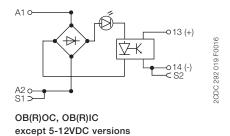
Triac output, 230 V AC, 2 A, width 12 mm

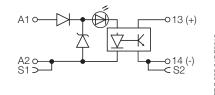
Rated control supply voltage	Connection type	Туре		qty	Weight (1 pc) kg (lb)
24 V DC	Screw	OBOA2000-24VDC	1SNA645029R0600	5	0.03
24 V DC	Spring	OBROA2000-24VDC	1SNA645529R0000	5	(0.066)

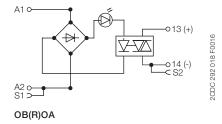
Ordering details - Accessories

Description	Type	Order code	Pkg qty	Weight (1 pc) kg (lb)
Jumper bar, 10 poles	BJ612-10	1SNA290488R0100		
Jumper bar, 20 poles	BJ612-20	1SNA206754R0000		
Separator end section	SC612	1SNA290474R0200	10	
Front marking blank cards, 100 pcs.	RC610	1SNA233000R0100		
Terminal marking blank cards, 100 pcs.	RC65	1SNA232000R0000		

Boxed interface optocouplers R600 range Connection diagrams







OB(R)IC0100-5-12VDC OB(R)OC2000-5-12VDC

Boxed interface optocouplers R600 range Technical data

		OB(R)IC0100					
	5-12 V DC	•••••	24 V DC	48-60 V UC	•	115-230	
Input circuit				•			
Input voltage Frequency	5 V DC	12 V DC	24 V DC	48 V AC/DC	60 V AC/DC	115 V AC/DC 230 V AC/DC	
Frequency	-	•		50/60 Hz		-	
Input current	5 mA	9 mA	4 mA	4 mA	5 mA	7 mA (AC) 11.5 mA (AC) 16 mA (DC) 25 mA (DC)	
Pull-in voltage	4 V	•	15 V	25 V	•	60 V AC / 70 V DC	
Typ. switch-on time	10 µs	······•		5 ms	••••••		
Typ. switch-off time	500 µs	•••••	•••••	20 ms	•••••	••••••	
Operating frequency	1000 Hz				20 Hz	••••••	
Operating frequency Permissible leakage current	0.9 mA	•••••	1.0 mA	0.9 mA	••••	1.6 mA	
Output circuit	11(13+)- 14						
Kind of output	Transistor						
Rated operational voltage	4.5-58 V D	C	••••••	•	•••••	••••••	
Minimum switching current	1 mA				•••••	••••••	
Maximum switching current	100 mA	••••••		•	••••	••••	
Leakage current at max. switching voltage	< 50 μΑ	•					
Rated operational DC-12 (resistive) 58 V	0.1 A						
current le (IEC/EN 60947-5-1)							
Residual voltage typical	1 V	•			•		
maximum		•••••		•	•••••	•	
Max. fuse rating to achieve short-circuit protection	100 mA fas	t				•••••	
Isolation data	l						
Rated insulation voltage U	250 V						
Rated impulse withstand voltage U	2.5 kV				•••••	•••••	
Overvoltage category	ll .	······		•		······································	
Pollution degree	2	•••••	•••••	•	•••••	•••••	

		OB(R)OC2000						
	5-12 V DC		24 V DC	24 V UC	48-60 V U	С	115 V UC	230 V UC
Input circuit			•				•	•
Input voltage	5 V DC	12 V DC	24 V DC	24 V AC/DC	2 48 V AC/ DC	60 V AC/ DC	115 V AC/ DC	230 V AC/ DC
Frequency	_			50/60 Hz				
Input current	5 mA	9 mA	5.4 mA	6.3 mA	4 mA	5.1 mA	4.2 mA	4 mA
Pull-in voltage Typ. switch-on time	4 V		12 V	15 V	27 V		50 V	80 V
Typ. switch-on time	15 µs		30 µs	1 ms	5 ms		500 µs	1 ms
Typ. switch-off time	250 µs		400 µs	7 ms	20 ms		10 ms	15 ms
Operating frequency	2000 Hz		1000 Hz	60 Hz	20 Hz		50 Hz	35 Hz
Permissible leakage current	1 mA		0.8 mA	0.9mA	1 mA		0.3 mA	
Output circuit	11(13+)- 14	1	•					
Kind of output	MOS-FET							
Rated operational voltage	4.5-58 V D)C	••••	••••		••••	•••••	•••••
Minimum switching current	1 mA	••••••	••••	••••••		•••••••	·····	
Maximum switching current	2 A	•••••••	• • • • • • • • • • • • • • • • • • • •	••••		•••••	·····•	···•····
Leakage current at max. switching voltage	< 50 µA	••••••	••••••	••••		••••	•••••	···
Rated operational DC-12 (resistive) 58 V		••••	• • • • • • • • • • • • • • • • • • • •	••••••		·····	·····	·········
current (IEC/EN 60947-5-1)								
Residual voltage typical	0.1 V	•••••••	•••••••	••••	·········	·····•	·····•	···•····
maximum	0.5 V	····•	····•	•••••		····•	•••••	···
Max. fuse rating to achieve short-circuit protection		ast	••••					······
Isolation data								
Rated insulation voltage U	250 V							
Rated impulse withstand voltage U	2.5 kV	••••••	***************************************	•••••		••••	•••••	···
Overvoltage category	[II	••••	••••	•		•	•••••	•••••
Pollution degree	2	••••	••••	•		•	•	

Boxed interface optocouplers R600 range Technical data

		OB(R)OC5000-	
	24VDC	115VUC	230VUC
Input circuit		•	·
Input voltage	24 V DC	115 V AC/DC	230 V AC/DC
Frequency	-	50/60 Hz	
Input current	5.4 mA	4.2 mA	4 mA
Pull-in voltage	12 V	50 V	80 V
Typ. switch-on time	30 µs	500 μs	1 ms
Typ. switch-off time	400 µs	10 ms	15 ms
Operating frequency	1000 Hz	50 Hz	: 35 Hz
Permissible leakage current	0.8 mA	0.3 mA	0.3 mA
Output circuit	11(13+)- 14	•	
Kind of output	MOS-FET		
Rated operational voltage Minimum switching current	4.5-58 V DC	••••••	
Minimum switching current	1 mA	•	•
Maximum switching current	5 A	•	***************************************
Leakage current at max. switching voltage	5 A < 50 μA	•	
Minimum switching current Maximum switching current Leakage current at max. switching voltage Rated operational current I _e (IEC/EN 60947-5-1)	5 A		
Residual voltage typical	0.1 V		
maximum	0.5 V		•
Max. fuse rating to achieve short-circuit protection	6 A ultra-fast		
Isolation data			
Rated insulation voltage U	250 V		
Rated insulation voltage U _i Rated impulse withstand voltage U _{imp}	2.5 kV	***************************************	••••••••••••
Overvoltage category	II	••••••	••••••••••••••••
Pollution degree	2	•••••	***************************************

			OB(R)OA1000-		OB(R)OA2000
		24VDC	115VUC	230VUC	24VDC
Input circuit				•	
Input voltage		24 V DC	115 V AC/DC	230 V AC/DC	24 V DC
Frequency		T -	50/60 Hz		-
Input current	•	3.6 mA	4.15 mA	4.6 mA	3.6 mA
Pull-in voltage		14 V	60 V	135 V	14 V
Typ. switch-on time		150 µs	2.2 ms	2.5 ms	150 μs
Typ. switch-off time		1 ms	18 ms	25 ms	1 ms
Operating frequency		500 Hz	25 Hz	20 Hz	500 Hz
Permissible leakage curr	ent	1 mA			1 mA
Output circuit		11(13+)- 14			
Kind of output		Triac			Triac
Rated operational voltage Minimum switching curre		24-400 V AC			10-230 V AC
Minimum switching curre	ent	25 mA			25 mA
Maximum switching curre	ent	1 A			2 A
Leakage current at may	switching voltage	1 A < 500 μA			2 A < 500 μA
Rated operational	AC-12 (resistive) 400 V	1 A			-
current I (IEC/EN 60947-5-1)	AC-12 (resistive) 230 V	-			2A
Residual voltage	typical	1 V			1 V
-	maximum	1.6 V			1.6 V
Max. fuse rating to achieve	short-circuit protection	4 A ultra-fast			4 A ultra-fast
Isolation data					
Rated insulation voltage U		400 V			230 V
Rated impulse withstand vo	oltage U _{imp}	4 kV	•••••••••••		4 kV
Overvoltage category		[II	••••••	•••••	II
Pollution degree		2			2

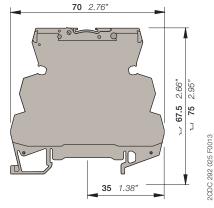
Boxed interface optocouplers R600 range Technical data, Dimensions

General technical data - Optocouplers

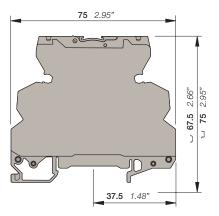
		ОВ	OBR
General data			
Material of housing		UL 94 V0	
Mounting	······	DIN Rail	
Degree of protection	housing / terminals	IP20 NEMA1	
Electrical connection		Screw terminal	Spring-type terminal
Wire size	fine-strand	0.22-2.5 mm ² (24-14 AWG)	0.2-2.5 mm² (24-14 AWG)
	rigid	0.2-4 mm² (24-12 AWG)	0.2-2.5 mm ² (24-14 AWG)
Stripping length		9 mm (0.354 in)	
Tightening torque		9 mm (0.354 in) 0.4-0.6 Nm (3.5-5.3 lb.in)	n/a
Environmental data			
Ambient temperature ranges	storage	-40+80 °C (-40+176 °F)	
	operation	-20+70 °C (-4+158 °F)	
Standards			
Product standards		EN 60947-5-1	
Low Voltage Directive		2014/35/EC	
RoHS Directive	•••••	2011/65/EC	

Dimensions

in **mm** and inches



Versions with screw terminals



Versions with spring-type terminals

Logic relays Product group picture



Logic relays Table of contents

Logic relays

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Logic relays System overview

Concept

CL range logic relays are suitable for small and mediumsized control tasks and are able to substitute logic wiring in a quick and simple manner.

They can be used for applications in control as well as for timing functions, e.g.

- in buildings, lighting systems, air-conditioning systems, general control functions,
- in small machines and systems or
- as stand-alone control module for small applications.

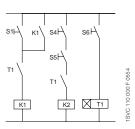
Steps to the application of CL range

- CL range can be used easily, rapidly and comfortably without any time-consuming planning and programming.
- The user can discover the advantages and the benefit of these logic relays in no time at all.
- CL range provides for the control statements according to a simple circuit diagram.
- Setup, storage, simulation and documentation are performed using the compact and user-friendly CL-SOFT software (CL-LAS.PS002).

Software characteristics (CL-SOFT)

- Display on a PC monitor according to IEC, ANSI
- Different languages to choose from
- Easy installation on all Microsoft WindowsTM operating systems

Logic links instead of wiring



Documentation (download from the internet)

Logic relay manual: 1SVC440795M0100 Remote display manual: 1SVC440795M2100 Display system manual: 1SVC440795M1100

Technical data overview

Logic relays

- 8 or 12 digital inputs
- 4 or 6 digital relay outputs
- optionally with 4 or 8 transistor outputs
- 128 rungs
- 3 contacts as n/o or n/c contacts in series plus 1 coil per rung
- optionally with 2 or 4 analog inputs (not 100-240 V AC version)
- power flow display for checking the circuit diagram (devices with display)
- expansions for local or remote level
- enclosure color RAL 7035
- DIN rail mounting

Display system

- useable as compact HMI logic relay
- fully graphic, backlit display module
- 12 digital inputs
- 4 digital relay outputs
- optionally with 4 transistor outputs
- 256 rungs
- 4 contacts as n/o or n/c contacts in series plus 1 coil
- optionally with 4 analog inputs (not 100-240 V AC ver-
- networking-compatible via CL-NET
- front panel mounting
- expansion for local

Remote display

- Remote display up to a distance of 5 m
- Illustration of text and status displays
- Remote adjustment via keypad
- Front panel mounting

Software

- 16 timing relays 0.01-99:59 h
- 16 counting relays for up-, down counting
- 8 weekly timer, 8 annual timers
- 16 analog value comparators
- 16 freely editable display texts
- 32 markers or auxiliary relays

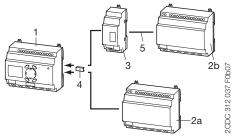
Logic relays System overview

Logic relays

Stand alone Expandable 6. 8b 6.8b 2CDC 312 001 F0b08

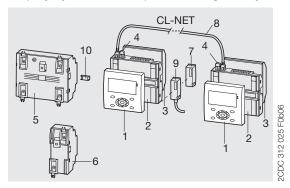
- 1a Logic relay CL-LS..
- Expandable logic relay CL-LM.. 1b
- Power supply CP-D... 2
- 3 I/O expansion CL-LER.., CL-LET.. for logic relays CL-LM..
- Coupler unit CL-LEC.. for remote expansion of logic relays CL-LM.. 4
- 5 Memory module CL-LAS.MD003 for logic relays CL-LS.., CL-LM..
- 6 Connecting cable CL-LAS.TK001, CL-LAS.TK002 to connect PC
- 7 CL-LINK plug CL-LAS.TK011
 - to connect expansion to logic relays CL-LM..
- 8a Remote display connection module CL-LDC.S..
- 8b Connecting cable CL-LAD.TK007
 - to connect a remote displays to a logic relay
- 9 Display module CL-LDD..

Expansion of logic relays*



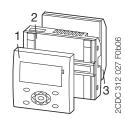
- Logic relay CL-LM..
- 2 I/O expansion CL-LER.., CL-LET..
 - 2a local expansion
 - 2b remote expansion
- 3 Coupler unit CL-LEC.. for remote expansion of logic relays CL-LM..
- CL-LINK plug CL-LAS.TK011 for expansion of logic relays CL-LM.. 4
- 5 up to 30 m
 - * max. 1 expansion per logic relay

Display system → Compact HMI logic relay



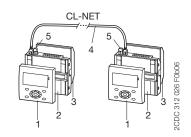
- Display module CL-LDD..
- 2 Display base module CL-LDC.LN..
- 3 Display I/O module CL-LDR.., CL-LDT..
- 4 Termination resistor CL-LAD.TK009
- 5 I/O expansion CL-LER.., CL-LET..
- 6 Coupler unit CL-LEC.. for remote expansion
- Memory module CL-LAD.MD004 for display base module
- 8 Connecting cable CL-LAD.TK002, CL-LAD.TK003, CL-LAD.TK004
- Connecting cable CL-LAD.TK001, CL-LAD.TK011 to connect PC
- CL-LINK plug CL-LAS.TK011 for expansion of logic relays CL-LM..
- e.g. door of switchgear cabinet

Stand alone with I/O module



- Display CL-LDD..
- Remote display connection module CL-LDC.S.. incl. connecting cable
- Display base module CL-LDC.L..

Communication via CL-NET



- Display CL-LDD...
- 2 Display base module CL-LDC.LN.. for CL-NET
- 3 Display I/O module CL-LDR.., CL-LDT..
- 4 Connecting cable CL-LAD.TK002. CL-LAD.TK003, CL-LAD.TK004
- 5 Termination resistor CL-LAD.TK009

Logic relays Approvals and marks

	■ existing □ pending		Logic relays		Expansions		Display system				Acces	sories			
Appro	ovals	CL-LSR	CL-LST	CL-LMR	CL-LMT		CL-LER	CL-LET	CL-LEC	CL-LDD	CL-LDC	CL-LDR	CL-LDT	CL-LAS	CL-LAD
(l)	UL	•	•	•	•			•	•	•	•			1)	2)
@	CAN/CSA C22.2 No.14	-		•	•			-	•	•	•			1)	2)
®	CAN/CSA C22.2 No.213 (hazardous locations)	-	-	-	•		-	-	-	•	-	•	•	1)	2)
(i)	GL	-		•	•					•	3)	4)	•		
ERE	EAC														
Llouds Register Trees America	Lloyds Register	-		•	•					•	3)	4)	•		
Mark	Marks														
CE	CE	•		•	•			•	•	•				•	•
C	C-Tick														

 $^{^{\}mbox{\tiny 1)}}$ not for: CL-LAS-PS002, CL-LAS.TD001, CL-LAS.FD001, CL-LAS.TK002, CL-LAS.TK011

not for: CL-LAD-PSUU2, CL-LAS.IDUU1, CL-LAS.IDUU1, CL-LAS.IDUU1, CL-LAD.IDU01, CL-LAD.IDU01, CL-LAD.IDU01, CL-LAD.IDU02 not for: CL-LDC.SDC2, CL-LDC.SAC2, CL-LDC.LAC2, CL-LDC.LNAC2 not for: CL-LDR.16AC2

Logic relays

Ordering details - Stand alone logic relays



CL-LSR



CL-LST

Ordering details - Logic relays stand alone

Rated opera- tional voltage	Display + Keypad	Timer	Input / Output	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
041440	•	•		CL-LSR.C12AC1	1SVR440712R0300		
24 V AC		•		CL-LSR.CX12AC1	1SVR440712R0200		
••••••	•			CL-LSR.12AC2	1SVR440713R0100		
100-240 V AC	•	•		CL-LSR.C12AC2	1SVR440713R0300		
		-	8 inputs / 4 relay outputs	CL-LSR.CX12AC2	1SVR440713R0200		0.20 (0.44)
40.1/00	•	•		CL-LSR.C12DC1	1SVR440710R0300		
12 V DC		•		CL-LSR.CX12DC1	1SVR440710R0200		
•	•			CL-LSR.12DC2	1SVR440711R0100		
24 V DC	•	-		CL-LSR.C12DC2	1SVR440711R0300		
		•		CL-LSR.CX12DC2	1SVR440711R0200		
24 V DC	•	•	8 inputs / 4 transistor	CL-LST.C12DC2	1SVR440711R1300		
		•	outputs	CL-LST.CX12DC2	1SVR440711R1200		



CL-LDD.K

Rated operational voltage	Description	Type	Order code	Price 1 pce	Weight (1 pce) kg (lb)
-	Graphic display 132 x 64 pixel	CL-LDD.XK	1SVR440839R4500		0.14 (0.30)
-	Graphic display 132 x 64 pixel, with keypad	CL-LDD.K	1SVR440839R4400		0.13 (0.29)
24 V DC	Module to displace the display from the logic relay, incl.	CL-LDC.SDC2	1SVR440841R0000		0.16 (0.36)
100-240 V AC	connecting cable CL-LAD. TK007, 5m, lenght adaptable	CL-LDC.SAC2	1SVR440843R0000		0.16 (0.36)



Logic relays

Ordering details - Expandable logic relays



CL-LMR



CL-LER



CL-LEC

Rated operational voltage	Display + Keypad	Timer	Input / Output	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
24 V AC	•	•		CL-LMR.C18AC1	1SVR440722R0300		
24 V AC		•		CL-LMR.CX18AC1	1SVR440722R0200		
100-240 V AC	•	•		CL-LMR.C18AC2	1SVR440723R0300		
100-240 V AC	***************************************	•	12 inputs / 6 relay	CL-LMR.CX18AC2	1SVR440723R0200		0.36 (0.79)
12 V DC	•	•	outputs	CL-LMR.C18DC1	1SVR440720R0300		0.30 (0.79)
12 V DC		•		CL-LMR.CX18DC1	1SVR440720R0200		
24 V DC	•	•		CL-LMR.C18DC2	1SVR440721R0300		
24 V DC		•		CL-LMR.CX18DC2	1SVR440721R0200		
24 V DC	•	•	12 inputs, 8 transistor	CL-LMT.C20DC2	1SVR440721R1300		0.36 (0.79)
		•	outputs	CL-LMT.CX20DC2	1SVR440721R1200		0.30 (0.79)

Rated opera- tional voltage	Description	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
-	2 relay outputs	CL-LER.20	1SVR440709R5000		0.07 (0.15)
100-240 V AC	10 inpute 6 relevantante	CL-LER.18AC2	1SVR440723R0000		0.26 (0.57)
24 V DC	- 12 inputs, 6 relay outputs	CL-LER.18DC2	1SVR440721R0000		0.22 (0.49)
24 V DC	12 inputs, 8 transistor outputs	CL-LET.20DC2	1SVR440721R1000		0.21 (0.46)
-	Coupler unit for remote expansion with a distance of up to 30 m	CL-LEC.CI000	1SVR440709R0000		0.07 (0.15)

Logic relays Ordering details - Accessories



CL-LAS.PS002



CL-LAS.TK001



CL-LAS.MD003

Ordering details - CL-LA

Description	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
Software for programming and control of CL range devices. Installation CD-ROM for Microsoft WindowsTM.	CL-LAS.PS002	1SVR440799R8000		0.10 (0.21)
Memory module for logic relays Memory size: 32 kB	CL-LAS.MD003	1SVR440799R7000		0.02 (0.04
Cable with serial interface to connect PC and logic relay. Length: 2 m	CL-LAS.TK001	1SVR440799R6000		0.10 (0.22)
Cable with USB interface to connect PC and logic relay. Length: 2 m	CL-LAS.TK002	1SVR440799R6100		0.06 (0.13)
Cable for point-to-point connection of remote- display connection module and logic relay, length: 5m, adaptable	CL-LAD.TK007	1SVR440899R6600		0.20 (0.44)
Fixing brackets for screw mounting of logic relay, expansion, display base module	CL-LAS.FD001	1SVR440799R5000		0.01 (0.01)
Spare plug (CL-LINK) for connection of logic relay to expansion	CL-LAS.TK011	1SVR440799R5100		0.10 (0.22)
Primary switch mode power supplies, Rated input voltage: 100-240 V AC Rated output voltage/current: 24 V DC / 0.42 A	CP-D 24/0.421)	1SVR427041R0000		0.06 (0.13)
Primary switch mode power supplies, Rated input voltage: 100-240 V AC Rated output voltage/current: 24 V DC / 1.3 A	CP-D 24/1.32)	1SVR427043R0100		0.19 (0.41)

 $^{^{}ij}$ replaces CL-LAS.SD001, technical data see chapter "Primary switch mode power supplies" replaces CL-LAS.SD002, technical data see chapter "Primary switch mode power supplies"

Logic relays

Ordering details - Display systems



CL-LDD.K



CL-LDC.LN..



CL-LAD.MD004



CL-LAD.TK001



CL-LAD.TK002

Rated opera- tional voltage	Description	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
-	Display module Graphic display 132 x 64 pixel	CL-LDD.XK	1SVR440839R4500		0.14 (0.30)
-	Display module Graphic display 132 x 64 pixel, with keypad	CL-LDD.K	1SVR440839R4400		0.13 (0.29)
24 V DC	Display base module CPU /	CL-LDC.LDC2	1SVR440821R0000		0.40 (0.00)
100-240 V AC	power supply	CL-LDC.LAC2	1SVR440823R0000		0.16 (0.36)
24 V DC	Display base module CPU / power supply,	CL-LDC.LNDC2	1SVR440821R1000		0.47 (0.00)
100-240 V AC	networking-compatible (CL-NET)	CL-LDC.LNAC2	1SVR440823R1000		0.17 (0.38)
100-240 V AC	Display I/O module	CL-LDR.16AC2	1SVR440853R0000		0.17 (0.29)
24 V DC	12 inputs, 4 relay outputs	CL-LDR.16DC2	1SVR440851R0000		0.17 (0.38)
24 V DC	Display I/O module 12 inputs, 4 relay outputs, 1 analog output	CL-LDR.17DC2	1SVR440851R2000		0.17 (0.38)
24 V DC	Display I/O module 12 inputs, 4 transistor outputs	CL-LDT.16DC2	1SVR440851R1000		0.14 (0.30)
24 V DC	Display I/O module 12 inputs, 4 transistor out- puts, 1 analog output	CL-LDT.17DC2	1SVR440851R3000		0.14 (0.30)

Ordering details - CL-LAD

Description	Туре	Order code	Price 1 pce	Weight (1 pce) kg (lb)
Memory module for display base modules Memory size: 256 kB	CL-LAD.MD004	1SVR440899R7000		0.02 (0.03)
Cable with serial interface to connect PC and display base module	CL-LAD.TK001	1SVR440899R6000		0.11 (0.23)
Cable with USB interface to connect PC and display base module	CL-LAD.TK011	1SVR440899R6700		
Network cable (CL-NET) to connect 2 display base modules Length: 0.3 m	CL-LAD.TK002	1SVR440899R6100		0.05 (0.12)
Network cable (CL-NET) to connect 2 display base modules Length: 0.8 m	CL-LAD.TK003	1SVR440899R6200		0.07 (0.14)
Network cable (CL-NET) to connect 2 display base modules Length: 1.5 m	CL-LAD.TK004	1SVR440899R6300		0.08 (0.18)
Cable for point-to-point connection of remote display connection modules and display base module, length adaptable, Length: 5 m	CL-LAD.TK005	1SVR440899R6400		0.20 (0.44)
Cable for point-to-point connection of 2 display base modules, length adaptable. Length: 5 m	CL-LAD.TK006	1SVR440899R6500		0.12 (0.26)
Termination resistor, content: 2 pieces	CL-LAD.TK009	1SVR440899R6900		0.01 (0.02)
Protective cover, transparent, for harsh envi- ronmental conditions and application in the food industry	CL-LAD.FD001	1SVR440899R1000		0.03 (0.07)
Protective cover, transparent and sealable	CL-LAD.FD011	1SVR440899R2000		0.03 (0.07)
Assembly tool for mounting of display modules	CL-LAD.FD002	1SVR440899R3000		

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LSR.C12DC1	CL-LSR12DC2 CL-LST.C12DC2	CL-LSR.C12AC1	CL-LSR12AC2
Input circuit - supply cir	rcuit				
Rated operational voltage		12 V DC	24 V DC	24 V AC	100-240 V AC
Rated operational voltage	ge tolerance	-15+30 %	-15+20 %	-15+10 %	***************************************
Operational voltage rand	ae	10.2-15.6 V DC	20.4-28.8 V DC	20.4-26.4 V AC	85-264 V AC
Rated frequency		0 Hz	-	50/60 Hz	
Rated frequency toleran	ice	_		±5 %	
Residual ripple	•••••	≤ 5 % typ. 140 mA	····· - ·····	-	
Input current	at 12 V DC	typ. 140 mA	<u>:-</u>	<u> </u>	<u></u>
	at 24 V DC		typ. 80 mA	<u>:-</u>	<u>-</u>
	at 24 V AC	-		typ. 200 mA	- 10 1
	at 115/120 V AC (60 Hz) at 230/240 V AC (50 Hz)	-	-	-	typ. 40 mA typ. 20 mA
Power failure buffering (at 230/240 V AC (50 HZ)	10 ms	<u>i</u> -	20 ms	:typ. 20 mA
Power dissipation	at 12 V DC			-	<u>.</u>
1 ower alcorpation	at 24 V DC	- vv	typ. 2 W		
	at 24 V ΔC	_	=	typ 5 VA	
	at 115/120 V AC	_	-	-	typ. 5 VA
	at 230/240 V AC		-	-	typ. 5 VA
Туре		CL-LMR.C18DC1	CL-LMR.C18DC2	CL-LMR.C18AC1	CL-LMR.C18AC2
		CL-LIVIR.C16DC1	CL-LMT.C20DC2	GL-LIVIN.G16AG1	GL-LIVIR.GTOAG2
Input circuit - supply cir	rcuit	140.1/.00			100 040 1/ 10
Rated operational voltage		12 V DC	24 V DC	24 V AC	100-240 V AC
Rated operational voltage		-15+30 %	-15+20 %	-15+10 %	
Operational voltage range		10.2-15.6 V DC	20.4-28.8 V DC	20.4-26.4 V AC	85-264 V AC
Rated frequency	•	0 Hz		50/60 Hz	······
Rated frequency toleran	ice	-	<u>.</u>	±5 %	
Residual ripple	-+ 40 \/ DO	- ≤ 5 % typ. 200 mA	···· ;	-	
Input current	at 12 V DC	typ. 200 mA	- 140 ma A		-
	at 24 V DC at 24 V AC	-	typ. 140 mA	typ. 300 mA	-
	at 115/120 V AC (60 Hz)	<u> </u>		:typ. 500 IIIA	typ. 70 mA
	at 230/240 V AC (50 Hz)	_		_	typ. 35 mA
Power failure buffering (10 ms	····· · ······	20 ms	
Power dissipation	at 12 V DC		=	-	
	at 24 V DC	-	typ. 3.5 W	i =	-
	at 24 V AC	-	-	typ. 7 VA	-
	at 115/120 V AC	-	-	-	typ. 10 VA
	at 230/240 V AC	-			typ. 10 VA
Туре		CL-LER.18DC2	CL-LER.18AC2		
.,,,,,		CL-LET.20DC2			
Input circuit - supply cir					
Rated operational voltage	ge U _e	24 V DC	100-240 V AC		
Rated operational voltage	ge tolerance	-15+20 %	-15+10 %	·····	
Operational voltage rand	ae	20.4-28.8 V DC	85-264 V AC	:	
Rated frequency		0 Hz	50/60 Hz		
Rated frequency toleran	ice	-	±5 %		
Residual ripple		≤ 5 %	-		
Input current	at 24 V DC	tvp. 140 mA	-		
	at 115/120 V AC (60 Hz)	-	typ. 70 mA		
	at 230/240 V AC (50 Hz)		typ. 35 mA		
Power failure buffering (IEC/EN 61131-2)	10 ms	20 ms	<u> </u>	<u>_</u>
Power dissipation	at 24 V DC	typ. 3.4 W	-		
	at 115/120 V AC		typ. 10 VA		
	at 230/240 V AC	-	typ. 10 VA	i	<u>i</u>

Data at $\rm T_{\rm a}$ = 25 °C and rated values, if nothing else indicated.

Туре		CL-LSR.C12DC1	CL-LSR12DC2 CL-LST.C12DC2	CL-LSR.C12AC1	CL-LSR.C12AC2
Input circuit - Digital in	puts	12 V DC	24 V DC	24 V AC	115 / 230 V AC
Number Inputs can be used as a Indication of operational	al states	8 2 (I7, I8) LCD-Display (if existin	g)		-
Electrical isolation	from voltage supply between digital inputs from the outputs	no			
Rated operational		12 V/ DC	24 V DC	24 V AC	
voltage U _e	U _e on "0" signal		< 5 V DC (I1-I8)	0-6 V AC (sinusoidal)	0-40 V AC (sinusoidal)
Rated frequency	U _e on "1" signal	8 V DC (l1-l8)	> 15 V DC (I1-I6), > 8 V DC (I7, I8)	> 9.5 V DC, 14-26.4 V AC (sinusoidal) (I1-I6), > 7 V AC (sinusoidal) (I7.I8) 50-60 Hz	79-264 V AC (sinusoidal)
Input current		3.3 mA (at 12 V DC,	3.3 mA (at 24 V DC,	4 mA	6x0.25 mA
on "1" signal		I1-I6), 1.1 mA (at 12 V DC, I7, I8)	16-17), 2.2 mA (at 24 V DC, 17, 18)	(at 24 V AC, 50 Hz, I1-I6), 2 mA (at 24 V AC, 50 Hz, I7,I8), 2 mA (at 24 V DC, I7, I8)	(at 115 V AC, 60 Hz, I1-I6), 6x0.5 mA (at 230 V AC, 50 Hz, I1-I6) 2x4 mA (at 115 V AC, 60 Hz, I7, I8), 2x6 mA (at 230 V AC, 50 Hz,
Time delay	debounce ON	20 ms		80 ms (at 50 Hz), 66 2/3	ms (at 60 Hz)
from "0" to "1"	debounce OFF	typ. 0.3 ms (I1-I6), typ. 0.35 ms (I7, I8)	typ. 0,25 ms (I1-I8)	20 ms (at 50 Hz), 16 2/3	ms (at 60 Hz)
Time delay from "1" to "0"	debounce ON			80 ms (at 50 Hz), 66 2/3 ms (at 60 Hz)	80 ms (at 50 Hz, I1-I6), 66 2/3 ms (at 60 Hz, I1-I6) 160 ms (at 50 Hz, I7, I8), 150 ms (at 60 Hz, I7, I8)
	debounce OFF	typ. 0.3 ms (I1-I6), typ. 0.15 ms (I7, I8)	-	20 ms (at 50 Hz), 16 2/3 ms (at 60 Hz)	20 ms (at 50 Hz, I1-I6), 16 2/3 ms (at 60 Hz, I1-I6) 100 ms (at 50 Hz, I7. I8), 100 ms (at 60 Hz, I7, I8)
Cable length (unshielde Maximum cable length		100 m -		- 40 m	- 40 m (l1-l6), 100 m (l7, l8)
Frequency counter	Number	2 (13. 14)		_	100 (17, 18)
	counting frequency	< 1 kHz		-	-
		square-wave		-	-
Rapid counter inputs	pulse / pause ratio Number	1:1		-	-
Hapid Counter Inputs	counting frequency	∠ (II, I∠) ∠ 1 kHz	·····•		
		square-wave	•••••	-	-
	pulse / pause ratio		•	_	-
Cable length (shielded)		< 20 m		=	-
Input circuit - Analog in		0 (17, 10)			:
Number Electrical isolation	from voltage supply	2 (17, 18)	·····•	·····	-
Liectifical isolation	from the digital inputs		•••••		-
	from the outputs				-
	from PC interface,	no	***************************************	•	-
	memory module, CL-NET, CL-LINK				
Input type		DC voltage			-
Signal range		0-10 V DC	.	.	-
Resolution	analog	0.01 V 0.01 V; 10 Bit (value 1	-1023)	·····•	_
Input impedance	uigitai	11.2 k Ω	1920]	·····•	-
Accuracy of the	two CL devices				-
actual value	within one device	±2 %, ±0.12 V			-
Conversion time	Input delay ON	20 ms			-
analog/digital	Input delay OFF		······•		-
Input current		< 1 mA	·····•		=
Cable length (shielded)		< 30 m			<u>-</u>

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LMR.C18DC1	CL-LMR.C18DC2 CL-LMT.C20DC2	CL-LMR.C18AC1	CL-LMR.C18AC2
nput circuit - Digital inp	outs	12 V DC	24 V DC	24 V AC	115 / 230 V AC
Number nputs can be used as a ndication of operational Electrical isolation	from voltage supply between digital inputs from the outputs from PC interface, memory module, CL-NET.	4 (I7, I8, I11, I12) LCD-Display (if existing) no no yes no			<u> -</u>
Rated operational	CL-LINK	12 V DC	24 V DC	24 V AC	
oltage U _e	U _e on "0" signal		:< 5 V DC	0-6 V AC (sinusoidal)	0-40 V AC (sinusoidal)
	Ս _e on "1" signal	8 V DC (I1-I12)	(I1-I12, R1-R12) > 15 V DC (I1-I6, I9, I10) > 8 V DC (I7, I8, I11, I12)	14-26.4 V AC (sinusoidal) (I1-I6, I9, I10) > 7 V AC (sinusoidal) (I7,I8; I11, I12)	79-264 V AC (sinusoidal)
Rated frequency		- 3.3 mA	3.3 mA	50-60 Hz 4 mA	6x0.25 mA
on "1" signal		(at 12 V DC, I1-I6, I9-I12), 1.1 mA (at 12 V DC, I7, I8)	(at 24 V DC, I1-I6, I9, I10), 2.2 mA (at 24 V DC, I7, I8, I11, I12)	(at 24 V AC, 50 Hz, 11-16, 19, 110), 2 mA (at 24 V AC, 50 Hz, 17, 18, 111, 112), 2 mA	(at 115 V AC, 60 Hz, 11-16), 6x0.5 mA (at 230 V AC, 50 Hz, 11-16) 2x4 mA (at 115 V AC, 60 Hz, 17, 18), 2x6 mA (at 230 V AC, 50 Hz, 17, 18), 4x0.25 mA (at 115 V AC, 60 Hz, 19-112), 4x0.5 mA (at 230 V AC, 50 Hz, 14x0.5 mA (at 230 V AC, 50 Hz, 19-112), 4x0.5 mA (at 230 V AC, 50 Hz, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10
Time a delay	debounce ON			00 ma (at E0 H=) 00 0/0	Î9-I12)
from "0" to "1"	debounce OFF	typ. 0.3 ms (I1-I6, I9, I10), typ. 0.35 ms (I7, I8, I11, I12)	typ. 0.25 ms	80 ms (at 50 Hz), 66 2/3 20 ms (at 50 Hz), 16 2/3	ms (at 60 Hz)
Fime delay from "1" to "0"	debounce ON debounce OFF	20 ms typ. 0.4 ms (I1-I6, I9, I10),		80 ms (at 50 Hz), 66 2/3 20 ms (at 50 Hz), 16 2/3	ms (at 60 Hz) ms (at 60 Hz)
Cable length (unshielded Maximum cable length p	d)	100 m		max. 40 m, typ. 40 m (I9, I10)	typ. 40 m (l1-l6, l9-l12) typ. 100 m (l7, l8)
requency counter	number	2 (13, 14)		_	-
	counting frequency pulse shape	< 1 KHZ sauare-wave		-	-
	pulse / pause ratio	1:1		<u> </u> -	-
Rapid counter inputs	counting frequency	< 1 kHz		- -	<u>:-</u> -
	pulse shape	square-wave		-	-
Cable length (shielded)	pulse / pause ratio	< 20 m	· <u>······</u>	-	-
Input circuit - Analog in	puts				
Number Electrical isolation	from voltage supply from the digital inputs from the outputs from PC interface, memory module, CL-NET, CL-LINK	no yes			- - - - -
nput type		DC voltage			-
Signal range Resolution	analog	0-10 V DC 0.01 V		<u>.</u>	- -
		0.01 V; 10 Bit (value 1-10	023)		-
nput impedance Accuracy of the	two CL devices	11.2 k Ω +3 %		•	-
actual value	within one device	±2 %, ±0.12 V			-
Conversion time analog/digital	Input delay ON Input delay OFF				-
nput current	iriput delay OFF	< 1 mA			- -
Cable length (shielded)		< 30 m			-

Data at $\rm T_{\rm a}$ = 25 $^{\circ}\rm C$ and rated values, if nothing else indicated.

Туре		CL-LER.18DC2, CL-LET.20DC2	CL-LER.18AC2
Input circuit - Digital	inputs	24 V DC	115 / 230 V AC
Number		12	
Inputs can be used as		-	
Indication of operation	nal states	-	
Electrical isolation	from voltage supply	no	
	between digital inputs		
	from the outputs		
	from PC interface,	no	
	memory		
	module, CL-NET,		
<u></u>	CL-LINK		······
Rated operational		24 V DC	
voltage U _e	U _e on "0" signal	< 5 V DC (I1-I12, R1-R12)	0-40 V AC (sinusoidal)
	U _e on "1" signal	-	79-264 V AC (sinusoidal)
Rated frequency		-	50-60 Hz
Input current	•••••••••••	3.3 mA (at 24 V DC, R1-R12)	12x0.25 mA (at 115 V AC, 60 Hz, R1-R12),
on "1" signal			12x0.5 mA (at 230 V AC, 50 Hz, R1-R12)
Time delay	debounce ON	20 ms	80 ms (at 50 Hz, I1-I12, R1-R12),
from "0" to "1"			66 2/3 ms (at 60 Hz, I1-I12, R1-R12)
	debounce OFF	typ. 0.25 ms (R1-R12)	20 ms (at 50 Hz, I1-I12, R1-R12),
			16 2/3 ms (at 60 Hz, I1-I12, R1-R12)
Time delay	debounce ON	20 ms	80 ms (at 50 Hz, I1-I12, R1-R12),
from "1" to "0"			66 2/3 ms (at 60 Hz, I1-I12, R1-R12)
	debounce OFF	-	20 ms (at 50 Hz, I1-I12, R1-R12),
			16 2/3 ms (at 60 Hz, I1-I12, R1-R12)
Cable length (unshield		100 m	-
Maximum cable length	h per input	-	typ. 40 m (I1-I6, I9-I12, R1-R12),
			typ. 100 m (I7, I8)

Data at T_a = 25 °C and rated values, if nothing else indicated.

Туре	Туре		CL-LMR	CL-LER.20
			CL-LER	
Output circuit - Relay output	ts	T.	7.0	10
Number Outputs in groups of		4	6	2
Parallel switching of outputs t	to increase canacity	not permissible		
Fusing of the output relay	to increase capacity	circuit-breaker B16 or fu	ise 8 A (slow-acting)	
Electrical isolation	from voltage supply		200 0 7 (0.0 11 0.0 11.19)	······································
	from the inputs		-	•••••
	from PC interface, memory module,	no	•	•••••
	CL-NET, CL-LINK			
	protective separation	300 V AC		
Machanical lifetime	basic isolation	10x106 switching cycles		
Mechanical lifetime Rung	conventional thermal current (10 A UL)	To A	<u> </u>	
lang	recommended for load 12 V AC/DC	5 > 500 mA		•••••
	short-circuit proof $\cos \varphi = 1$;	16 A		***************************************
	characteristic B16 at 600 A			
	short-circuit proof $\cos \varphi = 0.5$ up to 0.7;	16 A	•	•
	characteristic B16 at 900 A			
	Rated impulse withstand voltage U _{imp}			
	contact-coil			
	Rated operational voltage U _e	250 V AC		
Rated insulation voltage U		250 V AC	***************************************	
Protective separation (EN	between coil and contact	300 V AC		•••••
50178)	between two contacts	300V AC		
Making capacity	AC-15, 250 V AC, 3 A (600 ops./h)	300.000 switching cycle	es .	
	DC13, L/R ≤ 150 ms, 24 V DC, 1 A	200.000 switching cycle	es .	
	(500 ops./h)			
Breaking capacity	AC-15, 250 V AC, 3 A (600 ops./h)	300.000 switching cycle	es -	
	DC13, L/R \leq 150 ms, 24 V DC, 1 A (500 ops./h)	.		
Incandesent lamp load	(300 Ops./II) 1000 W at 230/240 V AC	125 000 switching cycles		
moundoscrit lamp load	500 W at 115/120 V AC	25.000 switching cycles	·	
Fluorescent lamp load	10 x 58 W at 230/240 V AC	25.000 switching cycles	·	
•	with electrical control gear	-		
	10 x 58 W at 230/240 V AC		5	•
	uncompensated		•••••	
	1 x 58 W at 230/240 V AC		;	
Pwitobing fraguancy	conventional compensated mechanical operations	10/106		
Switching frequency	switching frequency	/10 Hz		
	resistive load / lamp load			
	inductive load		•••••	
JL/CSA				
Continuous current at 240 V		10 A AC		
Continuous current at 24 V		8 A DC		
4C	Utilization catagory (Control Circuit Rating			
	Codes)		•	
	max. rated operational voltage			
	max. continuous thermal current cos φ = 1 at B 300			
	max. making / breaking apparent power			
	(Make/Break) cos φ ≠ 1 at B 300			
DC	Utilization catagory (Control Circuit Rating			•
	Codes)			
	max. rated operational voltage			
	max. continuous thermal current at R 300		•	
	max. making / breaking apparent power			
	(Make/Break) at R 300	'		

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LST	CL-LMT	CL-	LET
Output circuit - Transistor out	outs	Ι.			
Number		4	8		
Rated operational voltage U _e		24 V DC			
Operational voltage range		20.4-28.8 V DC		······································	
Residual ripple	0" - '	≤ 5 %			
Supply current	on "U" signal	typ. 9 mA / max. 16	mA typ. 18 mA / max.	32 mA	
Reverse voltage protection	on "U" signal on "1" signal	yes (Attention: If sup outputs, causes a sh	ply voltage is reversed, port circuit.)	applying voltage	at the
Electrical isolation	from voltage supply	yes	······	······································	
	from the inputs	yes			
	from PC interface, memory module, CL-NET, CL-LINK				
Rated operational current I _e on,,1" signal DC		max. 0.5 A			
Lamp load without R _v		max. 0.5 A 5 W			
Residual current on "0" signal p	er channel	< 0.1 mA		••••••••••	
Max. output voltage	on "0" signal at external load < 10 MΩ	2.5 V			
	on "1" signal at le = 0.5 A	. U = Ue - 1 V			
Short-circuit protection	D < 40 0	yes, thermal (analysi	s results from diagnosis	s input I16, I15; R	15, R16)
Snort-circuit tripping current to	$r R_a \le 10 \text{ m}\Omega$	$0.7 \text{ A} \leq \text{I}_{\text{e}} \leq 2 \text{ A per}$			
Total short-circuit current		8 A	16 A	·····	
Peak short-circuit current		16 A	32 A		
Thermal tripping	anatast raciativa land D . 100 kO	yes			
depending on active channels	constant resistive load $R_L < 100 \text{ k}\Omega$	40.000 switching cyc	cies/fi		
Parallel connection of outputs	with resistive load, inductive load with	aroun 1: 01-04	group 1: Q1-Q4,	group 1: S1	-S4 group
araner connection of carpute	external	group i. Qi Qi	group 2: Q5-Q8	2: S5-S8	O+, group
	suppressor, combination within one group		9		
	number of outputs	max. 4		•	
	max. total current	2 A (Attention! Outputsame length of time.)	its must be actuated si	multaneously and	d for the
ndication of operational states	of the outputs	LCD-Display (if exist	' na)		
nductive load ¹⁾ without external	suppressor		::9/	••••••	
$\Gamma_{0.95} = 1 \text{ ms},$ $R = 48 \Omega,$	utilization factor	0.25 g		••••••••••••	
	duty time	100 %			
_ = 16 mH	max. switching frequency f = 0,5 Hz				
2010	(max. duty time = 50 %)			······································	
OC13,	utilization factor duty time				
$\Gamma_{0.95} = 72 \text{ ms},$ $R = 48 \Omega,$	duty time max. switching frequency f = 0,5 Hz	1500 switching cycle	99		
L = 1.15 H	(max. duty time = 50 %)				
$\Gamma_{0.95} = 15 \text{ ms},$ $R = 48 \Omega,$	utilization factor	0.25 g		•••••	
R = 48 Ω,	duty time	100 %			
L = 0.24 H	max, switching frequency f = 0.5 Hz	1500 switching cycle	es .		
La alto a 45 de Tale a 41) de 19	(max. duty time = 50 %)				
nductive load ¹⁾ with external su		1 0			
	demand factor duty time	1400 0/			
	max. switching frequency		sor		
	max. duty time				
1) For inductive leading, without or	vternal suppression of the transistor outputs, the follo				

¹⁾ For inductive loading, without external suppression of the transistor outputs, the following applies: $T_{0.95}$ = time in ms, until 95 % of the steady-state current is achieved. $T_{0.95}$ 3 × $T_{0.65}$ = 3 × L/R.

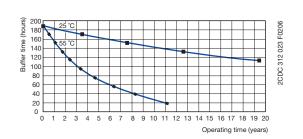
Data transfer rate in the CL-NET network: bus lengths of 40 m and over only attainable with cables with additional cross-section and connection adapter.

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LSR, CL-LST	CL-LMR CL-LMT	CL-LER.20
			CL-LET, CL-LER.18	CL-LEC.CI000
General data				
Dimensions (W x H x D)		71.5 mm x 90 mm x 58 mm (2.81 inch x 3.54 inch x 2.28 inch)	107.5 mm x 90 mm x 58 mm (4.23 inch x 3.54 inch x 2.28 inch)	35.5 mm x 90 mm x 58 mm (1.40 inch x 3.54 inch x 2.28 inch)
Weight	••••••	1	0.2 kg (0.66 lb)	0.07 kg (0.15 lb)
Mounting			35 mm or screw mounting	
Mounting position	•••••	horizontal / vertical		***************************************
Electrical connection				
Wire sizefir		0.2-4 mm² (22–12 AWG) 0.2-2.5 mm² (22–12 AWG)	3)	
Max. tightening torque	•••••••••••••••••••••••••••••••••••••••	0.6 Nm	•••••	***************************************
Environmental data				
Ambient temperature range	operation storage	-40+70 °C	o IEC 60068-2-1, heat ac	cc. to IEC 60068-2-2
LCD-Display (clearly legible) Condensation		0+55 °C avoid condensation with	a quitable methode	
Humidity, no condensation (IEC/EN 60068-2-30)		5-95 %	i suitable memous	•
Air pressure (operation)		795-1080 hPa	•	•
Degree of protection (IEC/EN 60529)		IP20		
Vibration (IEC/EN 60068-2-6)		acceleration 2 g)	litude 0.15 mm), 57-150 l	Hz (constant
Shock resistance (half-sine 15 g / 11 ms) (IEC/EN 60 Drop (IEC/EN 60068-2-31) height of fall Free fall, packaged (IEC/EN 60068-2-32)	068-2-27)	18 Shocks 50 mm 1 m	•	
Insulation data		I		
Overvoltage category Pollution degree (DIN EN 60947) Rating of air and creepage distances Insulation resistance		II 2 EN 50178, UL 508, CSA EN 50178	C22.2, No. 142	
Standards		LIV 00170		
Standards and directives		EN 55011 EN 55022 IE	C/EN 61000-4, IEC 6006	88-2-6 JEC 60068-2-27
Electromagnetic compatibility		LIV 00011, LIV 00022, 1L	O/ LIV 01000 +, 120 0000	00 2 0, 120 00000 2 21
Interference immunity				
electrostatic discharge (ESD) electromag. field (HF radiation resistance) fast transients (Burst) powerful impulses (Surge)	IEC/EN 61000-4-3 IEC/EN 61000-4-4		al (AC) 2 kV.	kV)
HF line emission	IEC/EN 61000-4-6		innethoal (DO) 0.5 KV)	•
Interference suppression (EN 55011, EN 55022) Real time clock	120/214 01000-4-0	class B		
Back-up time		see diagram		<u>.</u>
Accuracy		typ. ±5 (±0.5 h/year)		-
Repeat accuracy of the time relay				
Accuracy (from value)		±1		-
Resolution	range "S"	10 ms	•	-
	range "M:S"	1 s	•	=
Potentian behaviour	range "H:M"	ı mın		<u> </u>
Retention behaviour		Lt 000 000 (120)		:
Write cycles of retention memory (minimum)		1.000.000 (10 ⁶)		-

Technical diagram

Back-up time of the real time clock



Data at T_a = 25 °C and rated values, if nothing else indicated.

Туре	CL-LDD
Input circuit - Supply circuit	
Power failure buffering (IEC/EN 61131-2)	10 ms
General data	
Dimensions (W x H x D)	with keypad:
	86.5 x 86.5 x 21.5 mm (3.41 x 3.41 x 0.85 inch)
	without keypad:
	86.5 x 86.5 x 20 mm (3.41 x 3.41 x 0.79 inch)
Weight	0.13 kg (0.29 lb)
Mounting	2 x 22.5 mm, with 2 retainers screwed
Mounting position	horizontal / vertical
Environmental data	
Ambient temperature range	operation -25+55 °C (cold acc. to IEC 60068-2-1, heat acc. to IEC 60068-2-2)
	storage -40+70 °C
LCD-Display (clearly legible)	l-5+50 °C.
	-100 °C (with backlit / continuous operation)
Condensation	avoid condensation with suitable methods
Humidity, no condensation (IEC/EN 60068-2-30)	5-95 %
Air pressure (operation)	5-95 % 795-1080 hPa
Air pressure (operation) Degree of protection (IEC/EN 60529) Vibration (IEC/EN 60068-2-6)	IIP65
Vibration (120) 214 00000 2 0)	10-57 Hz (constant amplitude 0.15 mm), 57-150 Hz (constant acceleration 2 g)
Shock resistance (half-sine 15 g / 11 ms) (IEC/EN 60068-2-27)	18 Shocks
Drop (IEC/EN 60068-2-31) height of fall	50 mm
Free fall, packaged (IEC/EN 60068-2-32)	1 m
Insulation data	<u> </u>
Pollution degree (DIN EN 60947)	3
Rating of air and creepage distances	EN 50178, UL 508, CSA 22.2, No 142
nsulation resistance	EN 50178
Standards	
Standards and directives	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4.
	IEC 60068-2-6, IEC 60068-2-27
Electromagnetic compatibility	,
Interference immunity	
electrostatic discharge (ESD)	IEC/EN 61000-4-2 Level 3 (air discharge 8 kV, contact discharge 6 kV)
electromag. field (HF radiation resistance)	IEC/EN 61000-4-3 10 V/m
fast transients (Burst)	IEC/EN 61000-4-41 aval 3 (supply cable 2 kV signal lines 2 kV)
powerful impulses (Surge)	IEC/EN 61000-4-5 Level 3 (supply cable symmetrical 2 kV, CL-LDC.LAC2)
i i	Level 2 (0.5 kV supply cable symmetrical, CL-LDC.LAC2)
HF line emission	IEC/EN 61000-4-6 10 V
Interference suppression (EN 55011, EN 55022)	class B
	10,000 5

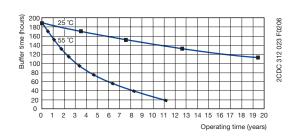
Data at $T_a = 25$ °C and rated values, if nothing else indicated.

		T					
Type Input circuit - Supply circuit		CL-LDC.SDC2	CL-LDC.SAC2	CL-LDC.LDC2	CL-LCD.LAC2	CL-LDC.LNDC2	CL-LDC.LNAC
Rated operational voltage U		24 V DC	100-240 V AC	24 V DC	100-240 V AC	24 V DC	100-240 V AC
Rated operational voltage toleran	ce	-15+20 %	-15+10 %	-15+20 %	-15+10 %	-15+20 %	-15+10 %
Operational voltage range		20.4-28.8 V DC		20.4-28.8 V DC		20.4-28.8 V DC	
Frequency		0 Hz	50/60 Hz	0 Hz	50/60 Hz	0 Hz	50/60 Hz
Frequency tolerance	•••••	-	± 5 %	-	± 5 %	-	± 5 %
Residual ripple	- 04 V DC	≤ 5 %	=	≤ 5 %	-	≤ 5 %	-
Input current	at 115/120 V AC (60 Hz)	typ. 185 mA	typ. 90 mA	typ. 200 mA	typ. 90 mA	typ. 200 mA	typ. 90 mA
	at 230/240 V AC (50 Hz)		typ. 60 mA	_	typ. 60 mA	_	typ. 60 mA
Power failure buffering (IEC/EN 6		10 ms	typ. oo ma	. <u>i.</u>	typ. oo ma	<u>i. </u>	typ. oo ma
Power dissipation	at 24 V DC	1.5 W	-	3.4 W	-	3.4 W	-
•	at 115/120 V AC		typ. 11 VA	-	typ. 11 VA	-	typ. 11 VA
	at 230/240 V AC	-	typ. 15 VA	-	typ. 15 VA	-	typ. 15 VA
Network - point-to-point connec	ction						
Number of stations		1		-			
Data transfer rate	CL-LS, CL-LM			-	•	•	
	CL-LDD	19.2 kBaud			•••	•	
Distance		max. 5 m		-			
Electrical isolation	to voltage supply			-		•	
Farmination and an	to connected device		was to al	=			
Termination system Network - CL-NET		spring-type te	пппа	<u>:</u> -		-	
				*			
Number of stations Data transfer rate	6 m	max. 1		<u>-</u>		max. 8	
Data transfer rate						1000 kBit/s	
	25 m 40 m	-			•••••	500 kBit/s 250 kBit/s	•••••
	125 m	-		•••••	•••••	125 kBit/s	•••••
	300 m	-	••••	•••••	•••••	50 kBit/s	•••••
	700 m	<u> </u>			•••••	20 kBit/s	
	1000 m	-		•••••	•••••	10 kBit/s	•••••
Electrical isolation	to voltage supply	-	•••••	•••••	•••••	yes	•••••
	to inputs	-		••••••	•••••••	yes	•••••
	to outputs			•••••	•••••	yes	•••••
	to PC interface,	-	•••••	•••••	•••••	yes	•••••
	memory module,						
	CL-NET, CL-LINK				•••••	<u>.</u>	
Bus terminator (first and last stati	on)	-				yes	
Termination system		-				RJ45, 8 pole	
General data							
Dimensions (W x H x D)		75 x 58 x 36.2		107.5 x 90 x 30			
	·····	(2.95 x 2.28 x		(4.23 x 3.54 x		•	
Weight		0.164 kg (0.36		0.145 kg (0.32		IN 11 /1EO /EN /	00715
Mounting		plugged onto	CL-LDD	plugged onto (CL-LDD or on D	IN rail (IEC/EN 6	50715)
Mounting position Electrical connection - Supply o	irouit				-		
		100 0/05	0./0./	0)			
Wire size	fine-strand with wire		mm² (24-12 AW	G)			
	end ferrule		2 (0.4 40 A)A(0)				
Electrical connection Data askl		ju.2 mm² / 4 m	m ² (24-12 AWG))			
Electrical connection - Data cable Wire size	fine-strand with wire	0 08 mm ² / 1 F	5 mm² (28-12	1_		0.2 mm ² / 2.5 i	mm² (2/1-12
WALLE SIVE	end ferrule		7 IIIII (40-14			AWG)	111111 (24-12
		0.08 mm ² / 2.5	5 mm² (28-12	<u></u>	•••••	0.2 mm ² / 4 mi	m² (24-12 AW)
	rigia	AWG)	(20 12				(12 / 144
Environmental data		- /		<u> </u>			
Ambient temperature range	oneration	-25 +55 °C (c	cold acc. to IFC	60068-2-1, hea	t acc to IEC 60	1068-2-21	
and one tomporature range		-40+70 °C	,0,0 d00. t0 ILO	55000 Z-1, 116a	. 400. 10 120 00		•••••
Condensation	otorage.		sation with suita	ble methods	•••••	•••••	
Humidity, no condensation (IEC/E	EN 60068-2-30)	5-95 %			•••••	•••••	•••••
Air pressure (operation)	•••••••••••••••••••••••••••••••••••••••	795-1080 hPa			•••••	•••••	
<u></u>	2001	IP20	••••••	••••••	••••	•••••	••••••
Degree of protection (IEC/EN 605	029)	11 20					

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре	CL-LDC.	CL-LDC.	CL-LDC.	CL-LCD.	CL-LDC.	CL-LDC.
	SDC2	SAC2	LDC2	LAC2	LNDC2	LNAC2
Shock (half-sine 15 g / 11 ms) (IEC/EN 60068-2-27)	18 Shocks		•			•
Drop (IEC/EN 60068-2-31) height of fall	50 mm					
Free fall, packaged (IEC/EN 60068-2-32)	1 m					
Insulation data						
Degree of protection (DIN EN 60947)	2					
Rating of air and creepage distances	EN 50178, UL	508, CSA 22.2,	, No 142			*
Isolation resistance	EN 50178					
Standards						
Standards and directives	EN 61000-6-1, 2-27	EN 61000-6-2	, EN 61000-6-3	, EN 61000-6-4	I, IEC 60068-2-	6, IEC 60068-
Electromagnetical compatibility						
Interference immunity						
electrostatic discharge (ESD) IEC/EN 61000-4-2	Level 3 (air dis	charge 8 kV, co	ontact discharge	e 6 kV)		
electromag. field (HF radiation IEC/EN 61000-	10 V/m					
resistance) 4-3				••••		•
fast transients (Burst) IEC/EN 61000-4-4	Level 3 (supply	/ cable 2 kV, sig	gnal lines 2 kV)			
powerful impulses (Surge) IEC/EN 61000-4-5	Level 3 (supply	/ cable symmet	rical 2 kV, CL-LI	DC.LAC2)		
	Level 2 (1 kV s	upply cable	Level 2 (0.5 kV	supply cable s	ymmetrical, CL-	LDC.LAC2)
LIE!' IEO/EN 04000 4.0	symmetrical)			•••••		***************************************
HF line emission IEC/EN 61000-4-6	•					•
Interference suppression (EN 55011, EN 55022) Real time clock	class B					
Back-up time			iono dinaram			
Accuracy	- see diagram - typ. ± 5 s/day (± 0,5 h/year)				•	
Repeat accuracy of the time relay	-		:typ. ± 5 8/day	(± 0,5 11/year)		
Accuracy (from value)	1_		± 0.02 %			
Resolution range "S"	_	•••••	± 0.02 70	•		•
range "M:S"	-	•••••	1 s	•••••	•••••	•
range "H:M"	-	•••••	1 min	•••••		•
			2			
Retention behaviour						

Technical diagram Back-up time of the real time clock



Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LD16DC2	CL-LDR.16AC2
Input circuit - Digital inputs		24 V DC	115/230 V
Number		12	
Inputs can be used as analog inputs	}	[4 (17, 18, 111, 112)	-
Indication of operational states		-	LCD-Display (if existing)
Electrical isolation	from supply voltage		
	from digital inputs		
	from the outputs		
	from PC interface, memory module,		
	CL-NET, CL-LINK	4	
Rated operational voltage U _e		24 V DC	-
	U _e on "0" signal	< 5 V DC (I1-I6, I9, I10), < 8 V DC (I7, I8, I11, I12)	0-40 V AC (sinusoidal)
	U _z on "1" signal	> 15 V DC (I1-I6, I9, I10), > 8 V DC (I7, I8, I11, I12)	79-264 V AC
	6		(sinusoidal)
Rated frequency		0 Hz	50-60 Hz
Input current on "1" signal		3.3 mA (at 24 V DC, I1-I6, I9, I10),	12x0.2 mA (at 115 V AC,
		2.2 mA (at 24 V DC, I7, I8, I11, I12)	60 Hz, I1-I12),
			12x0.5 mA (at 230 V
			AC, 50 Hz, I1-I12)
Time delay from "0" to "1"	debounce ON	20 ms	10 ms (at 50 Hz),
			100 ms (at 60 Hz)
	debounce OFF	typ. 0.1 ms (I1-I4), typ. 0.25 ms (I5-I12)	10 ms (at 50 Hz),
			100 ms (at 60 Hz)
Time delay	debounce ON	20 ms	10 ms (at 50 Hz),
from "1" to "0"			100 ms (at 60 Hz)
	debounce OFF	typ. 0.1 ms (I1-I4), typ. 0.4 ms (I5, I6, I9, I10),	10 ms (at 50 Hz),
		typ. 0.2 ms (I7, I8, I11, I12)	100 ms (at 60 Hz)
Cable length (unshielded)		100 m	-
Maximum cable length per input		-	typ. 60 m
Frequency counter		4 (11, 12, 13, 14)	-
	counting frequency	1< 3 kHz	-
	pulse shape	square-wave	-
12.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.	pulse / pause ratio	11:1	-
Incremental counter		2 (11 + 12, 13 + 14)	-
	counting frequency		-
	signal offset	square-wave	-
	pulse / pause ratio	190	
Rapid counter inputs		4 (11, 12, 13, 14)	
Hapid Counter inputs	counting frequency		
		square-wave	_
	pulse / pause ratio		-
Cable length (shielded)	paide / padde ratio	< 20 m	_
Input circuit - Analog inputs		1 2 2	:
Number		4 (17, 18, 111, 112)	
Electrical isolation	to voltage supply		
Electrical isolation	to voltage supply to digital inputs		
	to digital inputs to outputs		
	to PC interface, memory modul,	lyes	. <u>:</u>
	CL-NET, CL-LINK	yes	
Input type	OLIVEI, OPENIN	DC voltage	_
Signal range	······································	0-10 V DC	-
Resolution	analog	0.01 V	=
		0.01 V; 10 Bit (value 0-1023)	-
Input impedance	digital	11.2 kΩ	-
Accuracy of the actual value	two CL-LD	± 3 %	-
,	devices		
	within one device		-
Conversion time analog/digital		each cycle	-
Input current		< 1 mÅ	-
Cable length (shielded)		< 30 m	=
			•

Data at T_a = 25 °C and rated values, if nothing else indicated.

Type Output circuit - Analog outputs		CL-LD16DC2	CL-LD17DC2	CL-LDR.16AC2
Number			ia	
	rom voltage supply	<u> </u> -	no	-
	m the digital inputs		no	
	the digital outputs		yes	_
	interface, memory	_	yes	=
	e, CL-NET, CL-LINK		,00	
Output type	·2	-	DC voltage	-
Signal range	•••••	-	0-10 V DC	-
Max. output current	•	-	0.01 A	-
Burden resistance	•	-	1 kΩ	-
Overload and short-circuit protection		-	yes	-
Resolution	analog	-	0.01 V DC	-
	digital	-	10 Bit, (value: 0-1023)	-
Setting time		-	100 ms	-
Accuracy	-25+55 °C	-	2 %	-
	25 °C	-	1 %	-
Conversion time		-	each CPU cycle	<u> </u>
General data				
Dimensions (W x H x D)		CL-LDR: 89 x 90 x 44 mm		89 x 90 x 44 mm
			x 25 mm (3.5 x 3.54 x 0.98	(3.5 x 3.54 x 1.73 inch)
		inch)		
Weight		CL-LDR: 0.15 kg (0.33 lb) /		0.15 kg (0.33 lb)
Mounting		snap-on power supply u	ınıt	
Mounting position		horizontal / vertical		
Electrical connection				
Wire size fine-strand w		0.2 mm ² / 2.5 mm ² (24-1		
	rigid	0.2 mm ² / 4 mm ² (24-12	AWG)	
Electrical connection - Data cable				
Wire size fine-strand w		0.08 mm ² / 1.5 mm ² (28		
	rigid	0.08 mm² / 2.5 mm² (28	-12 AWG)	
Environmental data				
Ambient temperature range			o IEC 60068-2-1, heat ac	cc. to IEC 60068-2-2)
	storage	-40+70 °C		
Condensation		avoid condensation with	ı suitable methods	
Humidity, no condensation (IEC/EN 60068-2-30)	•	5-95 %	<u></u>	
Atmospheric pressure (operation)		795-1080 hPa		
Degree of protection (IEC/EN 60529)		IP20	13	1-71
Vibration (IEC/EN 60068-2-6)		acceleration 2 g)	litude 0.15 mm), 57-150 l	HZ (CONSTANT
Shock (half-sine 15 g / 11 ms) (IEC/EN 60068-2-27)		18 Shocks	-	· · · · · · · · · · · · · · · · · · ·
Drop (IEC/EN 60068-2-31) height of fall	•	50 mm		
Free fall, packaged (IEC/EN 60068-2-32)	•••••	1 m		•
Insulation data		1 111		
		0		
Pollution degree Rating of air and creepage distances	•	∠ EN 50178, UL 508, CSA	C22.2 No. 142	
Isolation resistance		EN 50178, OL 500, OSA	. UZZ.Z, NO. 14Z	•••••
Standards		LIN 00170		
		EN 01000 0 1/0/0/4 15/	2/EN 01000 4 JEO 00000 0	0.0.150.00000.0.07
Standards and directives		<u> </u> ο 1000-0-1/-2/-3/-4, IEC	C/EN 61000-4, IEC 60068-2	2-0, 150 00008-2-21
Electromagnetic compatibility				
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 3 (air discharge 8	kV, contact discharge 6	kV)
electromag. field (HF radiation res.)	IEC/EN 61000-4-3			
fast transients (Burst)		Level 3 (supply cable 2		
powerful impulses (Surge)	IEC/EN 61000-4-5	2 kV (supply cable symr	netrical),	
UE line emission	IEC/EN 61000-4-6	Level 2 (0.5 kV supply c	able symmetrical)	•••••
HF line emission Interference suppression (EN 55011, EN 55022)		class B		
interiore suppression (EN 30011, EN 30022)		UIASS D		

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Type		CL-LDR
Output circuit - Relay outputs		
Number		4
Outputs in groups of		-
Parallel switching of outputs to in	crease capacity	not permissible
Fusing of the output relay		circuit-breaker B16 or fuse 8 A (slow-acting)
Electrical isolation	from voltage supply	
Electrical lociation	from the inputs	
	from PC interface, memory module, CL-NET,	
	CL-LINK	
	protective separation	
	Basic isolation	
Mechanical lifetime	Dasic isolation	10x10 ⁶ switching cycles
Rung	conventional thermal current (10 A UL)	
nully	recommended load 12 V AC/DC	
	short-circuit proof cos φ = 1;	
	characteristic B16 at 600 A	

	short-circuit proof $\cos \varphi = 0.5$ up to 0.7;	
	characteristic B16 at 900 A Rated impulse withstand voltage U _{imp} contact-coil	
	nated impulse withstand voitage U _{imp} contact-coll	U KV
	Rated operational voltage U	250 V AC
Rated insulation voltage U		250 V AC
Protective separation (EN 50178)	between coil and contact	1
Protective separation (EN 50178)		
Making capacity	between two contacts	
Making capacity	AC-15, 250 V AC, 3 A (600 ops./h)	
Describe somethy	DC13, L/R ≤ 150 ms, 24 V DC, 1 A (500 ops./h) AC-15, 250 V AC, 3 A (600 ops./h)	200,000 switching cycles
Breaking capacity	AC-15, 250 V AC, 3 A (600 ops./n)	1000,000 switching cycles
Incorderent Inno Inno	DC13, L/R ≤ 150 ms, 24 V DC, 1 A (500 ops/h)	125 000 switching cycles
Incandesent lamp load	1000 W at 230/240 V AC	25.000 switching cycles 25.000 switching cycles
Fluorescent lesson lead		
Fluorescent lamp load	10 x 58 W at 230/240 V AC	
	with electrical control gear	
	10 x 58 W at 230/240 V AC	
	uncompensated	
	1 x 58 W at 230/240 V AC	
	conventional compensated	
Switching frequency	mechanical operations	
	switching frequency	
	resistive load / lamp load	
	inductive load	U.5 HZ
UL/CSA		
Continuous current at 240 V		10 A AC
Continuous current at 24 V		8 A DC
AC	Utilization category (Control Circuit Rating Codes)	B 300 Light Pilot Duty
	max. rated operational voltage	300 V AC
	max. continuous thermal current cos j = 1 at B 300	
	max. making / breaking apparent power	3600/360 VA
	(Make/Break) cos φ ≠ 1 at B 300	
DC	Utilization category (Control Circuit Rating Codes)	
	max. rated operational voltage	
	max. continuous thermal current at R 300	
	max. making / breaking apparent power	128/28 VA

Data at $T_a = 25$ °C and rated values, if nothing else indicated.

Туре		CL-LDT
Output circuit - Transistor output	s	
Number		4
Rated operational voltage U _e Operational voltage range		24 V DC
Operational voltage range		20.4-28.8 V DC
Residual ripple		-
Supply current	on "0" signal	typ. 18 mA / max. 32 mA
	on "1" signal	typ. 24 mA / max. 44 mA yes (Attention: If supply voltage is reversed,
Reverse voltage protection		applying voltage at the outputs, causes a short circuit.)
Electrical isolation	from voltage supply	yes
	from the inputs	yes
	from PC interface, memory module,	yes
Detect energtional ourrent Lon 1"	signal DC	max. 0.5 A
nated operational current i _e on, i	signal DC	5 W (Q1-Q4)
Lamp load without H _v		5 W (Q1-Q4)
Residual current on "0" signal per	channel	< 0.1 mA
Max. output voltage	on "O sidhal at external load < 10 MZ	2.5 V
	on "1" signal at I _e = 0.5 A	
Short-circuit protection		thermal (Q1-Q4), (analysis results from diagnosis input I16)
Short-circuit tripping current for R	_a ≤ 10 mΩ	$0.7 \text{ A} \leq I_e \leq 2 \text{ A per output}$
1010101011 0110011 00110111		8 A
Peak short-circuit current		16 A
Thermal tripping		yes
active channels and their load)	istant resistive load ${ m R}_{_{ m L}}$ < 100 k Ω (depending on	40.000 switching cycles/h
Parallel connection of outputs	with resistive load, inductive load with external suppressor, combination within one group	
	number of outputs	max. 4
	max. total current	2 A (Attention! Outputs must be actuated simultaneously
Indication of operational states of	the outpute	and for the same length of time.) LCD-Display (if existing)
Inductive load1) without external si		
	utilization factor	0.25 g
$T_{0.95} = 1 \text{ ms},$ R = 48 Ω ,	duty time max. switching frequency f = 0,5 Hz	100 %
L = 16 mH	max. switching frequency f = 0,5 Hz	1500 switching cycles
<u></u>	(max. duty time = 50 %)	0.25 g
DC13,	utilization factor	0.25 g
$T_{0.95} = 72 \text{ ms},$ $R = 48 \Omega,$	duty time max. switching frequency f = 0,5 Hz	100 %
L = 1.15 H	max. switching frequency f = 0,5 Hz (max. duty time = 50 %)	Toou switching cycles
	utilization factor	
$T_{0.95} = 15 \text{ ms},$ $R = 48 \Omega,$		
L = 0.24 H	max. switching frequency f = 0,5 Hz	1500 switching cycles
	(max. duty time = 50 %)	
Inductive load ¹⁾ with external supp		
	demand factor	1 g
	duty time max. switching frequency max. duty time	
1) For inductive loading, without extern	max. Switching frequency max. duty time	

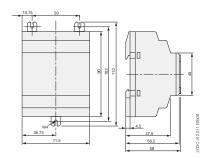
¹⁾ For inductive loading, without external suppression of the transistor outputs, the following applies: $T_{0.95}$ = time in ms, until 95 % of the steady-state current is achieved. $T_{0.95}$ 3 × $T_{0.65}$ = 3 × L/R.

Data transfer rate in the CL-NET network: bus lengths of 40 m and over only attainable with cables with additional cross-section and connection adapter.

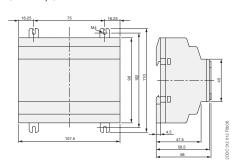
Logic relays Dimensional drawings

Dimensional drawings dimensions in mm

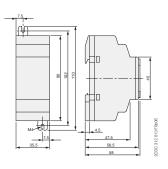
CL-LSR, CL-LST



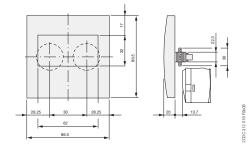
CL-LMR, CL-LMT



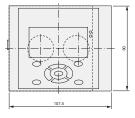
CL-LER.20



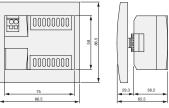
CL-LDD



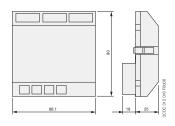
CL-LDD.K + CL-LDC.L.. + (CL-LDR or CL-LDT)



CL-LDC.S..



CL-LDR, CL-LDT



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