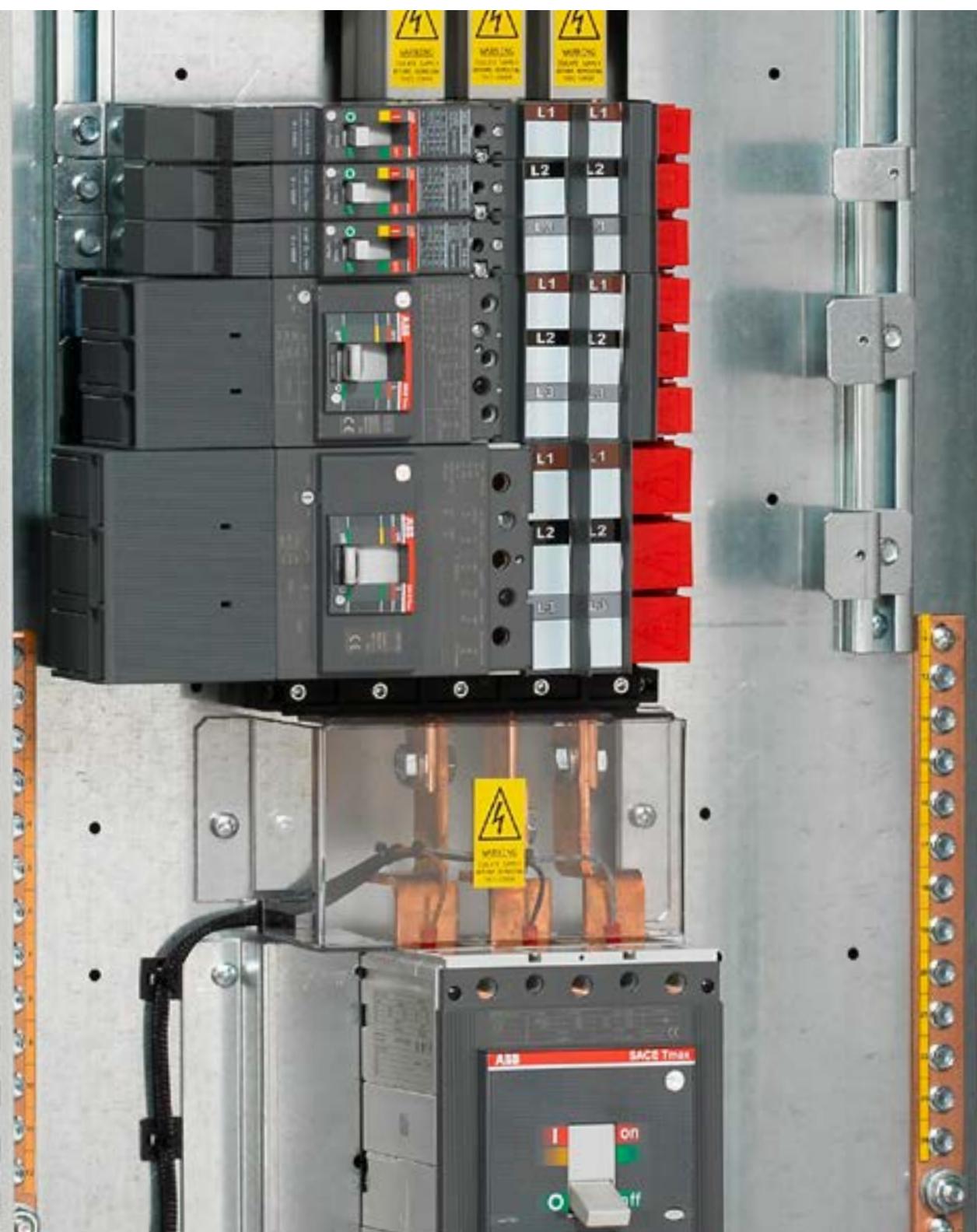


PRODUCT OVERVIEW

ArTu Panel boards

400A & 800A



The ArTu PB Panelboard is a simple, robust and easily mountable distribution panel. Customisation from standard to extremely diverse applications is possible thanks to the use of plug-in base technology and the variety of modular accessories available either in pre-assembled or kit form for over the counter supply.

Table of contents

004–006	Overview
007–017	Selection and ordering guide
018–	Compliance with IEC 61439-1 Standard
019–023	ArTu PB Technical information
024–033	Technical details
034–041	Metering
043–045	Surge protection

ArTu PB panelboard

Overview

The ArTu PB panelboard is available wall mounted as standard, and in three configurations of 6/8, 12/16 and 18/24 outgoing ways, giving you the ability to build your own custom panelboard.

The new system allows you to fit F1, XT1 and XT3, three pole and single pole MCCBs to the same copper system using the new plug in bases designed by ABB. Side cable chambers are available in a width of 390mm which can be fitted on either side of the main structure. There is also an option of adding top, bottom and metering extension boxes. As standard the panelboard is fitted with a plain door but, an optional glazed version is available.

Key features

- Robust metalwork system
- Outgoing ways up to 250A
- Shrouding for spare ways and busbar covers for unused ways are both available for additional safety
- Comprehensive range of surge protection and metering solutions available

General characteristics

- Compliance with IEC 61439-1 & 2
- ASTA Certified busbars
- Rated at 415V, 50-60Hz
- Rated current/Icw
- Up to 400A/35kA flat busbar
- Rated impulse withstand voltage Uimp 8kV
- Rated short-circuit short-time withstand current Icw up to 65kA
- Rated short-circuit peak current Icp up to 143kA
- IP43 ingress protection with door
- Colour light grey RAL 7035
- Supplied with plain door as standard.
- Supplied without incomer, wide variety of options available
- Earth and neutral terminals are included
- 4 pole and 1250A versions are available please contact us for further details



ArTu PB panelboard

General characteristics

Surge Protection options

Complete portfolio of surge protection options available for Type 1-3 protection using either the Furse or ABB Quicksafe ranges.

Wide range of metering options

Metering chambers available with cutouts to house 96 x 96 meters. Blank cutout covers are also available for future addition.

Modular range of metalwork depth:

240mm; width: 690, 890mm; height: 1250, 1650, 2050mm

Easy to access or expand

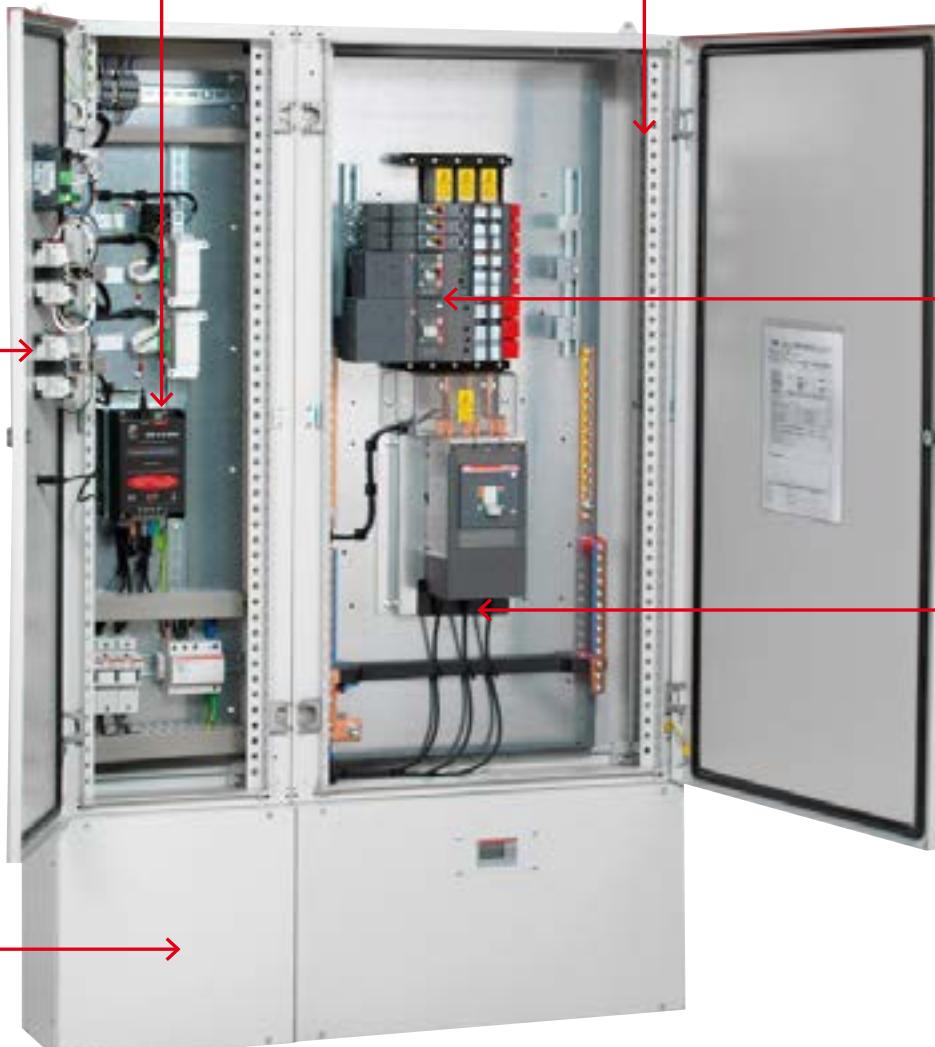
Removable side covers allow side access, future expansion of panelboard layout or additional accessory fitment.

Adaptability

ABB's plug in bases allow the use of different frame sizes of outgoing mccb to be used.

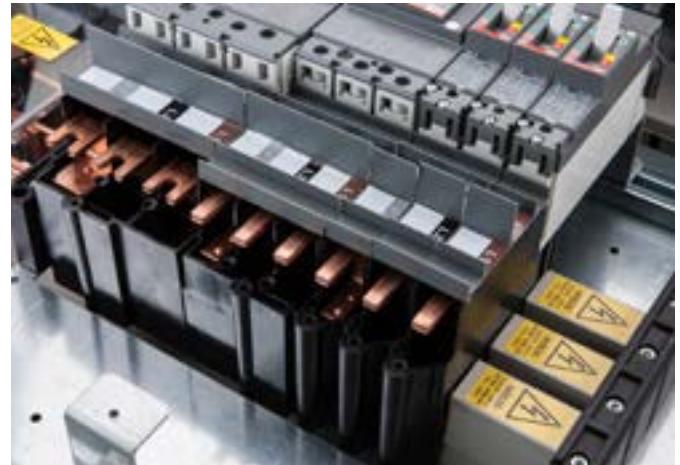
Flexibility

Incoming options from 250 - 800A, 3 pole, which include shrouding for extra safety.



ArTu PB panelboard

The details which make the difference



Flexibility

Flexible incoming options from 250A-800A including shrouding for additional safety.

Plug in technology

Flexible outgoing options



Easy Access

Removable side covers in addition to top and bottom gland plates ensure there are a variety of access points for efficient assembly, installation and maintenance.

Modular design

Top / bottom extension boxes and side cable/ metering chambers of one depth (240mm) allow for additional accessories or cabling to be added.

ArTu PB Panelboard

Order process



ArTu Panel board

Order codes

ArTu Panel boards

Ways	Outgoing MCCB Type	Copper Rating (A)	Dimensions (mm)			Order Code
			Height	Width	Depth	
6/8	F1(SP) / XT1 / XT3	400A	1250	690	240	CU640PB3MD
	F1(SP) / XT1 / XT3	800A	1250	690	240	CU680PB3MD
	F1(SP) / XT1 / XT3	400A	1650	690	240	CU124PB3MD
12/16	F1(SP) / XT1 / XT3	800A	1650	690	240	CU128PB3MD
	F1(SP) / XT1 / XT3	400A	2050	690	240	CU184PB3MD
18/24	F1(SP) / XT1 / XT3	800A	2050	690	240	CU188PB3MD

Note:

F1(SP) ratings: Up to 125A

XT1 ratings: Up to 160A

XT3 ratings: Up to 250A

ArTu Pan Assemblies

Ways	Outgoing MCCB Type	Copper Rating (A)	Dimensions (mm)			Order Code
			Height	Width	Depth	
6/8	F1(SP) / XT1 / XT3	400A	1250	690	240	CU640PA3MD
	F1(SP) / XT1 / XT3	800A	1250	690	240	CU680PA3MD
	F1(SP) / XT1 / XT3	400A	1650	690	240	CU124PA3MD
12/16	F1(SP) / XT1 / XT3	800A	1650	690	240	CU128PA3MD
	F1(SP) / XT1 / XT3	400A	2050	690	240	CU184PA3MD
18/24	F1(SP) / XT1 / XT3	800A	2050	690	240	CU188PA3MD

Note:

F1(SP) ratings: Up to 125A

XT1 ratings: Up to 160A

XT3 ratings: Up to 250A

Selection and ordering guide

Incomer and inner cover options



Incomer options

Incomers below include the connection kit and terminal shrouds. Incoming devices are provided with front terminals as standard. If larger/different orientation of cables are required select alternative terminals accordingly.

Order inner cover to suit.

400/800A rated panelboards

Description	Inner Cover Type	Order Code
250A 3P Switch disconnector	2	PB-2503SD
250A 3P 36kA Thermomagnetic (TMD) MCCB	2	PB-2503MCCB
400A 3P Direct connection kit	1	400DC3/4P
400A 3P Switch disconnector	3	PB-4003SD
400A 3P 36kA Electronic (LS/I) MCCB - LS/I	3	PB-4003MCCB
630A 3P Switch disconnector	3	PB-6303SD
630A 3P 50kA Electronic (LS/I) MCCB - PR221DS-LS/I	3	PB-6303MCCB
800A 3P Direct connection kit	1	800DC3P
800A 3P Switch disconnector – T6D800	4	PB-8003SD
800A 3P 50kA Electronic (LS/I) MCCB - PR221DS-LS/I	4	PB-8003MCCB

Selection and ordering guide

Incomer and inner cover options



For 400/800A rated panelboards

Description	Inner Cover Type	Order Code
Direct connection inner cover kit for 400/800A rated panelboard	1	P6X6DC
250A TP XT3/T3 Inner cover kit	2	P6X6T3
400/630A TP T5 Inner cover kit	3	P6X6T5
800A TP T6 Inner cover kit	4	P6X6T6

Selection and ordering guide

Plug in bases and outgoing MCCBs

Plug in bases - for custom panel boards only

Description	Order Code
	
F1 SP L1/L3	PLF11L1/L3P
F1 SP L2	PLF11L2P
XT1	PLT13P
XT3	PLT33P
T5 TP (Only available for fitment into 1250A)	PLT53PT

Note:

Both L1/L3 and L2 need to be ordered for SP device
(2 x PLF11L1/L3P + 1 x PLF11L2P = typical arrangement for 6 single pole mccb's)

Outgoing devices - A1C125 and A1N125 (Thermal Magnetic) MCCB - Single phase

Description	Order Code
	
16A SP 18kA	1SDA068745R1
20A SP 25kA	1SDA066686R1
25A SP 25kA	1SDA066687R1
32A SP 25kA	1SDA068755R1
40A SP 25kA	1SDA066689R1
50A SP 25kA	1SDA066690R1
63A SP 25kA	1SDA068766R1
80A SP 25kA	1SDA066693R1
100A SP 25kA	1SDA066695R1
125A SP 25kA	1SDA066696R1

Outgoing devices - XT1B 3 pole (Thermal Magnetic) MCCB - Three phase*

Description	Order Code
	
16A 3P 18kA	1SDA014 883R1
20A 3P 18kA	1SDA014885R1
25A 3P 18kA	1SDA014886R1
32A 3P 18kA	1SDA014887R1
40A 3P 18kA	1SDA014888R1
50A 3P 18kA	1SDA014889R1
63A 3P 18kA	1SDA014891R1
80A 3P 18kA	1SDA002813R1
100A 3P 18kA	1SDA014310R1
125A 3P 18kA	1SDA014892R1
160A 3P 18kA	1SDA014894R1

* requires front connection terminal for connection to the plug-in base - see page 15

Selection and ordering guide

Plug in bases and outgoing MCCBs

Outgoing devices - XT1C 3 pole (Thermal Magnetic) MCCB*

Description	Order Code
16A 3P 25kA	1SDA014 895R1
20A 3P 25kA	1SDA014 8974R1
25A 3P 25kA	1SDA014 896R1
32A 3P 25kA	1SDA014 897R1
40A 3P 25kA	1SDA014 898R1
50A 3P 25kA	1SDA014 899R1
63A 3P 25kA	1SDA014 900R1
80A 3P 25kA	1SDA014 901R1
100A 3P 25kA	1SDA014 902R1
125A 3P 25kA	1SDA014 903R1
160A 3P 25kA	1SDA014 904R1

* requires front connection terminals for connecting to the plug-in base - see page 15

Outgoing devices - XT1N 3 pole (Thermal Magnetic) MCCB*

Description	Order Code
16A 3P 36kA	1SDA018803R1
20A 3P 36kA	1SDA018804R1
25A 3P 36kA	1SDA018805R1
32A 3P 36kA	1SDA014 905R1
40A 3P 36kA	1SDA014906R1
50A 3P 36kA	1SDA014 907R1
63A 3P 36kA	1SDA014908R1
80A 3P 36kA	1SDA014 909R1
100A 3P 36kA	1SDA014910 R1
125A 3P 36kA	1SDA014911R1
160A 3P 36kA	1SDA014912R1

* requires front connection terminals for connecting to the plug-in base - see page 15

Outgoing devices - XT1S 3 pole (Thermal Magnetic) MCCB*

Description	Order Code
16A TP 50kA	1SDA080830R1
20A TP 50kA	1SDA080831R1
25A TP 50kA	1SDA080832R1
32A TP 50kA	1SDA080833R1
40A TP 50kA	1SDA080834R1
50A TP 50kA	1SDA067431R1
63A TP 50kA	1SDA067432R1
80A TP 50kA	1SDA067433R1
100A TP 50kA	1SDA067434R1
125A TP 50kA	1SDA067435R1
160A TP 50kA	1SDA067436R1

* requires front connection terminals for connecting to the plug-in base - see page 15

Selection and ordering guide

Plug in bases and outgoing MCCBs

Outgoing devices - XT3N 3 pole (Thermal Magnetic) MCCB

Description	Order Code
 63A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068053R1
80A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068054R1
100A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068055R1
125A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068056R1
160A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068057R1
200A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068058R1
250A TP 36kA MCCB - XT3N250 (Th /Mag) - TMD	1SDA068059R1

Outgoing devices - XT3S 3 pole (Thermal Magnetic) MCCB

Description	Order Code
 63A 3P 50kA	1SDA068215R1
80A 3P 50kA	1SDA068216R1
100A 3P 50kA	1SDA068217R1
125A 3P 50kA	1SDA068218R1
160A 3P 50kA	1SDA068219R1
200A 3P 50kA	1SDA068220R1
250A 3P 50kA	1SDA068221R1

Selection and ordering guide

Accessories

Top/bottom extension modules

Description	Dimensions (mm)	Order Code
For 250 - 800A panelboard	365H x 690W x 240D	RC1000
For side extension or meter chamber *	365H x 390W x 240D	RC2000

Note:

When fitting side extension/side metering modules together with a top or bottom extension box please order the required number of RC2000 extension modules to suit.

Side extension modules - 390mm width

Height (mm)	Description	Order Code
1250	Cable container	PB-SIDECABLE-12
1650	Cable container	PB-SIDECABLE-16
2050	Cable container	PB-SIDECABLE-20

Plinths

Description	Order Code
Four corner feet 100mm high for main structure of 250 - 1250A	ZL1000
Finishing profile plinth for 250 - 800A panelboard	ZL1001
Finishing profile plinth for 1250A panelboard	ZL1101
Two feet 100mm high for side extension or side metering module	ZL3000
Finishing profile for side extension or side metering module	ZL2001

Note:

Plinths cannot be used when bottom extension boxes are fitted. This applies to the main panelboard structure as well as side extension and metering modules.

Selection and ordering guide

Accessories

Single pole breakers – front terminals for copper aluminium cables FC CuAl (single piece)

3 pole breakers - front connection terminals for copper cables FC Cu (set of 3pcs)

Description	Order Code
F1 (Single pole) 2.5 - 25mm ²	1SDA066234R1
F1 (Single pole) 25 - 50mm ²	1SDA066240R1
XT1*	1SDA066905R1*
XT3	1SDA066913R1

* required when fitting outgoing XT1 frame size MCCBs to their plug-in bases

Terminal shroud for MCCB



General accessories



Description	Order Code
Busbar shroud 630mm long (3 pcs)	SZ630
MCCB blanking module for inner door (210mm)	SZ-BP1
F1 / XT1 Busbar shroud 10pcs	MODT1
XT3 Busbar shroud 10pcs	MODT3
T5 Busbar shroud 10pcs	MODT5
Wall fixing brackets (Pack of 2)	AL2000
Side by side kit to join side extension box to panelboard (1 pack)	AA1000
Neutral/ earth bar additional kit	AK1NEMD
Neutral/ earth bar extension kit for panelboards up to 800A	EX1NEMD
Neutral shroud 250 - 800A – pair	AD1082
Aluminium gland plate for 250 - 800A panelboards	ALF0600

Selection and ordering guide

Incoming metering kits and metering side chambers



Includes RC2000 enclosure, meter, fixing brackets, CT, terminals, wiring looms for breaker – terminals, terminals to CT & CT to meter.

Incoming metering modules using B24-112-100 MID approved class 1 meter with active energy, pulse output and RS-485 communication

Description	Order Code
250A Incoming metering module	PB-METMOD250-B
400A Incoming metering module	PB-METMOD400-B
630A Incoming metering module	PB-METMOD630-B
800A Incoming metering module	PB-METMOD800-B
1000A Incoming metering module	PB-METMOD1000-B
1250A Incoming metering module	PB-METMOD1250-B

Incoming metering modules using M2M MODBUS network analyser with active energy, pulse/alarm output and RS-485 communication

Description	Order Code
250A Incoming metering module	PB-METMOD250-M2M
400A Incoming metering module	PB-METMOD400-M2M
630A Incoming metering module	PB-METMOD630-M2M
800A Incoming metering module	PB-METMOD800-M2M

Metering chamber for outgoing metering

Suitable size PB	Description	Order Code
6 W	PB Side metering chamber 1250 x 390 x 240mm (with 3 x 92 x 92 cutouts)	PB-SIDEMET-12
12 W	PB Side metering chamber 1650 x 390 x 240mm (with 6 x 92 x 92 cutouts)	PB-SIDEMET-16
18 W	PB Side metering chamber 2050 x 390 x 240mm (with 9 x 92 x 92 cutouts)	PB-SIDEMET-20
92 x 92 Blank covers (un-used way)		EV1136

Note:

Includes cable connection loom to power meters

Selection and ordering guide

Outgoing meter kits, surge protection kits and other accessories



Includes meter, CT, terminals, wiring looms for breaker – terminals, terminals to CT & CT to meter.

Outgoing metering modules for 3 pole breakers using M2M MODBUS network analyser with active energy, pulse/alarm output and RS-485 communication

Description	Order Code
0 - 63A Outgoing metering kit	PBMET63-M2M
80 - 125A Outgoing metering kit	PBMET125-M2M
160 - 250A Outgoing metering kit	PBMET250-M2M

Outgoing metering modules using B24-112-100 MID approved class 1 meter with active energy, pulse output and RS-485 communication

Description	Order Code
For 3 pole breakers	
0 - 63A Outgoing metering kit	PBMET63-B
80 - 125A Outgoing metering kit	PBMET125-B
160 - 250A Outgoing metering kit	PBMET250-B
For single pole breakers	
0 - 63A Outgoing v with single core CT inc B24 - 112 - 100 meter	PBMET63-S-B
80 - 125A Outgoing metering kit with single core CT inc B24 - 112 - 100	PBMET125-S-B

Surge protection kits

Description	Order Code
Surge Protection kit Type 1 & 2 . Includes 63A breaker protection	PB-SOULE
Surge Protection kit Furse Type 1, 2 & 3. Includes 63A breaker protection and remote display	PB-FURSE

Note:

A side extension box with hinged door must be used to house the surge protection kit. In addition the MCCB protection device for the surge protection will require the use of one three phase outgoing way. Fuse protection options may be available upon request. Please ask for details if required.

Other accessories

Description	Order Code
Neutral shroud 250 - 800A – pair	AD1082
Neutral shroud 1250A – pair	AD1084
Aluminium gland plate for 250 - 800A panelboards	ALF0600

Compliance with IEC 61439-1 Standard

The ArTu PB Panelboards have undergone type tests in accordance with the IEC 61439-1 Standards. The results of these tests guarantee the performances of the ArTu switchboards and, by using the metalwork structures, ABB SACE air, modular and mouldedcase circuit-breakers, means that the end switchboard constructor does not have to carry out any further type tests when following the selection criteria and assembly instructions for the various components. These results, which are indicated below, can be referred to for the declaration of conformity of the switchboard.

Dielectric properties (Ref. par. 8.2.2 of the Standard)

ArTu PB	
Rated service voltage:	up to 690V AC
Rated insulation voltage:	up to 1000V AC
Rated impulse withstand voltage:	8kV

Short-circuit withstand current (Ref. par. 8.2.3 of the Standard)

	ArTu PB up to 400A	ArTu PB up to 800A
Short-circuit withstand current:	phase-phase 35kA (1s)	50kA (1s)
	phase-neutral 21kA (1s)	30kA (1s)
Rated max. peak short-circuit current:	73.5kA	110kA

Insulation distances (Ref. par. 8.2.5. of the Standard)

The insulation distances are guaranteed by following the ABB SACE metalwork structure and circuit-breaker assembly and mounting instructions.

Mechanical operation (Ref. par. 8.2.6 of the Standard)

Mechanical operation is verified by following the assembly and mounting instructions of the ABB SACE metalwork structures and circuit-breakers.

Degree of protection (Ref. par. 8.2.7 of the Standard) According to CEI EN 60529 (CEI 70-1 publication IEC 529)

ArTu PB	
With door	IP 43

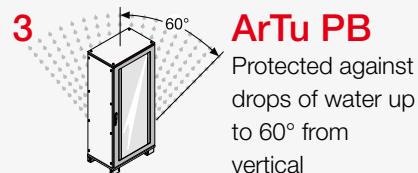
01 IP degrees of protection

1st number: protection against solid bodies
2nd number: protection against liquids

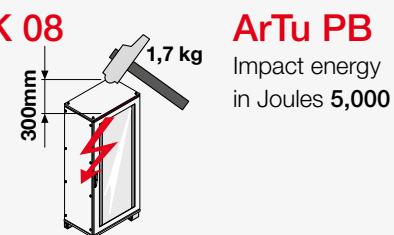
02 IK mechanical resistance

Figure defined by the IEC EN 50102 Standard

—
01



—
02



ArTu PB Technical information

In depth technical information

Mechanical characteristics

Material

ArTu PB structure	1.2mm thick pickled steel sheet
Panels	1.2/1.5mm thick steel sheet
Doors	1.5mm hot galvanised steel sheet. 4mm thick glass tempered from inside

Mechanical characteristics

Painting

Structure colour	Grey orange-peel RAL 7035																				
Base strip colour	Grey orange-peel RAL 7012																				
Standard cycle	Sheet washing Phosphating with iron salt base Drying in tunnel at 100°C																				
External and internal painting with electrostatic application of thermosetting powder enamel with epoxy polyester binders. Grey orange-peel RAL 7035 colour, total thickness: 60/70 micron.																					
	Polymerisation in oven at 180°C.																				
Paint characteristics	<table border="1"> <tr> <td>Binder:</td> <td>epoxy</td> </tr> <tr> <td>Specific gravity:</td> <td>1,61g/cm3</td> </tr> <tr> <td>Theoretical coverage:</td> <td>10,4 m2/Kg. with a film thickness of 60 microns</td> </tr> <tr> <td>Melting point:</td> <td>85-95 °C (Kofler bench method)</td> </tr> <tr> <td>Granulometry</td> <td>standard distribution between 5 and 100 micron with average size particles between 30 and 40 micron. Hardening: 12 min. at 190 °C (temperature of object)</td> </tr> <tr> <td>Hardness:</td> <td>1H - 2H</td> </tr> <tr> <td>DIN 53152 bending elasticity:</td> <td>unaltered on 1/4" spindle</td> </tr> <tr> <td>DIN 53151 reticular adherence:</td> <td>GT O (100%)</td> </tr> <tr> <td>Erchem elasticity:</td> <td>SEN DIN 53156: > 6mm</td> </tr> <tr> <td>Gardner resistance to impact:</td> <td>25 Kg. x cm.</td> </tr> </table>	Binder:	epoxy	Specific gravity:	1,61g/cm3	Theoretical coverage:	10,4 m2/Kg. with a film thickness of 60 microns	Melting point:	85-95 °C (Kofler bench method)	Granulometry	standard distribution between 5 and 100 micron with average size particles between 30 and 40 micron. Hardening: 12 min. at 190 °C (temperature of object)	Hardness:	1H - 2H	DIN 53152 bending elasticity:	unaltered on 1/4" spindle	DIN 53151 reticular adherence:	GT O (100%)	Erchem elasticity:	SEN DIN 53156: > 6mm	Gardner resistance to impact:	25 Kg. x cm.
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DIN 53151 reticular adherence:	GT O (100%)																				
Erchem elasticity:	SEN DIN 53156: > 6mm																				
Gardner resistance to impact:	25 Kg. x cm.																				

Tests carried out on degreased and phosphated sheets with film thickness of 60/70 micron.
The painting has passed the resistance tests to saline fog (193 hours).

Ambient characteristics

Painting

Type of installation	indoors				
Installation conditions	Wall / Floor-mounted				
Service climate (t° / r.h. %)	<table border="1"> <tr> <td>constant</td> <td>23°C/83% - 40°C/93%</td> </tr> <tr> <td>variable</td> <td>23°C/98% - 40°C/98%</td> </tr> </table>	constant	23°C/83% - 40°C/93%	variable	23°C/98% - 40°C/98%
constant	23°C/83% - 40°C/93%				
variable	23°C/98% - 40°C/98%				
Ambient temperature limits	<table border="1"> <tr> <td>operating</td> <td>-5°C +40°C</td> </tr> <tr> <td>storage</td> <td>-25°C +55°C</td> </tr> </table>	operating	-5°C +40°C	storage	-25°C +55°C
operating	-5°C +40°C				
storage	-25°C +55°C				

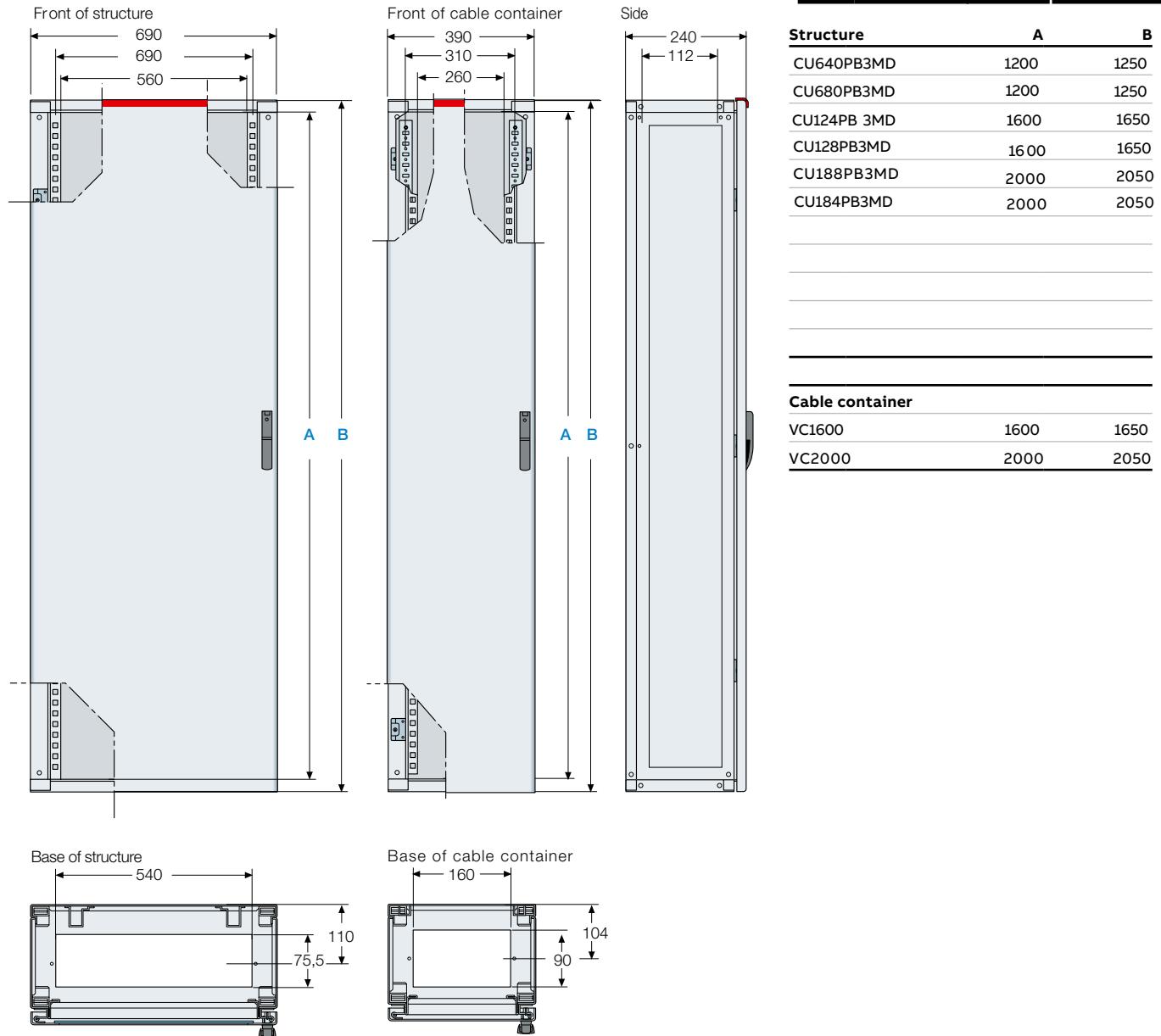
When correctly selected and assembled, as per the indications given in this catalogue and in the instruction manual, they allow construction of switchboards complying with the IEC 61439-1 Standard and on the basis, what is foreseen by the Low Voltage Directive of the European Community (Directive 73/23/EEC, Law 791/1977).

The above is only valid if the switchboard is designed and constructed when:

- selecting the materials according to the performances indicated in the ABB catalogues;
- sizing the conductors according to the prescriptions of the IEC 61439-1 and CEI 64-8 Standards;
- carrying out the individual tests foreseen under the IEC 61439-1 Standard successfully.

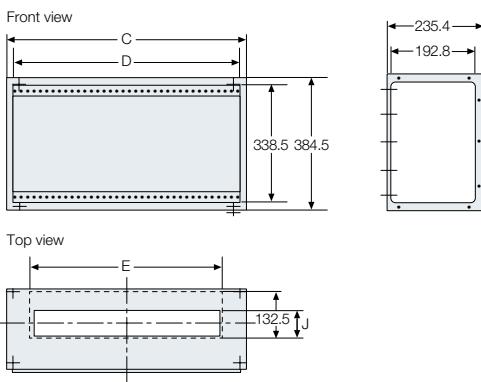
ArTu PB Technical information

Overall dimensions



ArTu PB Technical information

Top/bottom extension box dimensions

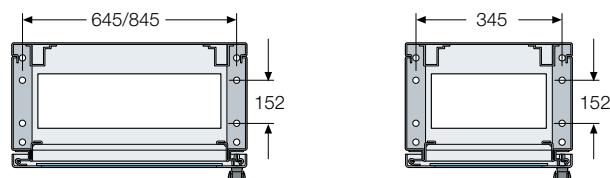
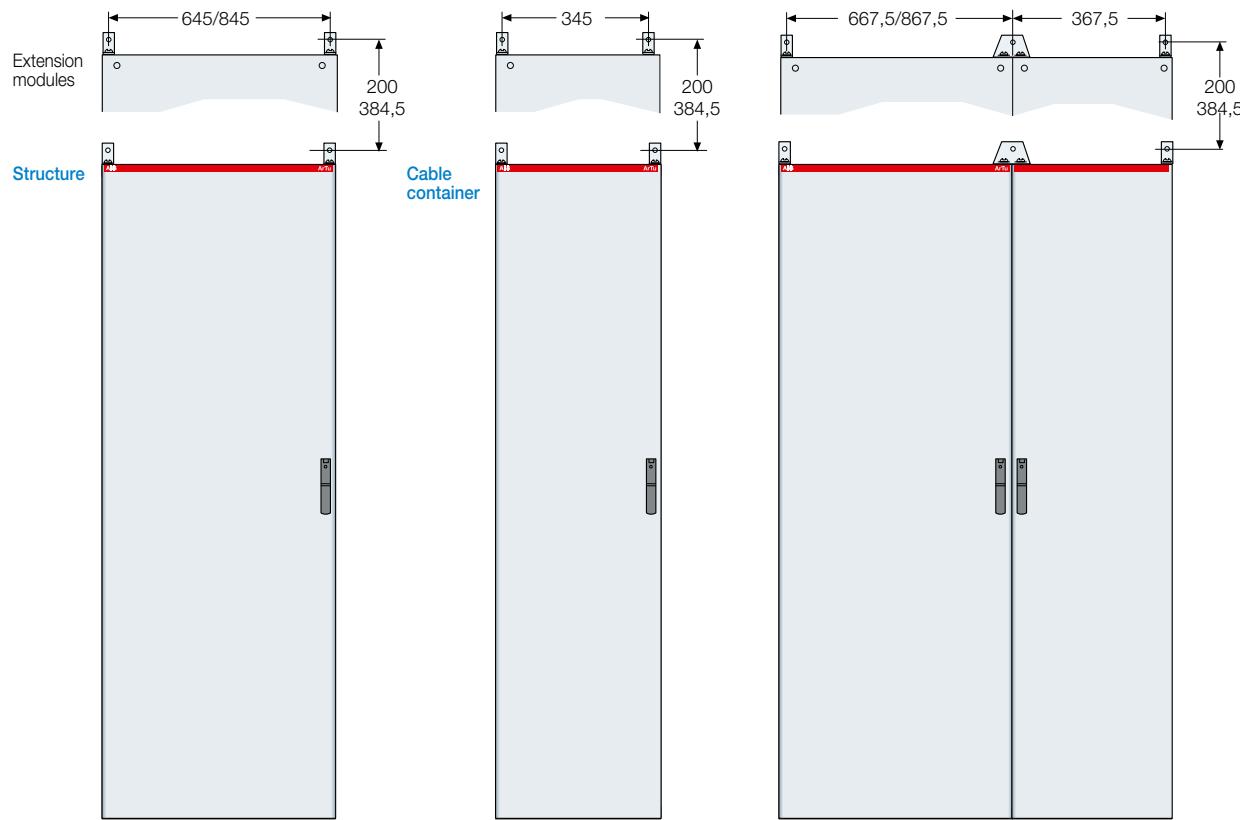


Description	Code	C	D	E	J
Connection box for main board only	RC1000	690	644	540	75
Connection box for cable container	RC2000	390	344	240	90

ArTu PB Technical information

Side cable & metering chamber dimensions

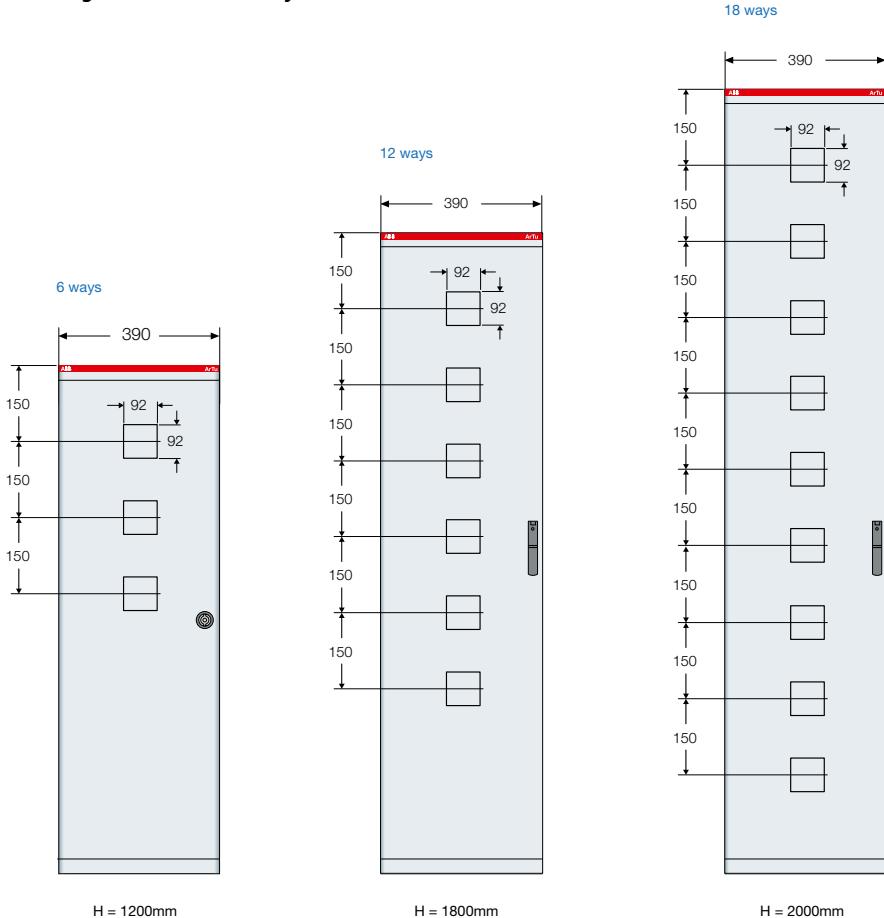
Metering/side chamber



ArTu PB Technical information

Overall dimensions

Metering chamber with side by side kit included



Metering chamber with side by side kit included

Type	Height (mm)	Order code
Metering cable chamber 6way	1250	PB-SIDEMET-1250
Metering cable chamber 12way	1650	PB-SIDEMET-1650
Metering cable chamber 18way	2050	PB-SIDEMET-2050

Note:

BIM information and drawings available on request.

Technical details

F1 single pole MCCBs

Overview

Standard conformity	IEC 60947-2
Rated service voltage	240V AC
Rated insulation voltage	690V
Type of release	Thermomagnetic (TMF)
Utilisation category	A
Rated frequency	50/60 Hz
Ambient temp	40°C
Operating altitude	2000m
Rated impulse withstand voltage	6kV
No of poles	1P
Standard current ratings (I_n)	16 - 125A
Thermal release setting	$1 \times I_n$
Magnetic release setting	$10 \times I_n$
Rated short circuit making capacity I_{cm} (230V)	52.5kA
Rated ultimate short-circuit breaking capacity I_{cu} (230V)	25kA
Rated service short-circuit breaking capacity I_{cs} 220/230V (% I_{cu})	50%
Weight	0.245Kg
Max cable size using FC CuAl terminals	2.5mm ² – 50mm

Technical details

XT1 MCCBs

Overview

Standard conformity	IEC 60947-2
Rated service voltage	690V AC
Rated insulation voltage	800V
Type of release	Thermomagnetic (TMD/TMF)
Utilisation category	A
Rated frequency	50/60 Hz
Ambient temp	40°C
Operating altitude	2000m
Rated impulse withstand voltage	8kV
No of poles	3 or 4*
Standard current ratings (I_n)	16 - 160A
Thermal release setting	$0.7 - 1 \times I_n$
Magnetic release setting	$10 \times I_n$
Rated short circuit making capacity I_{cm} (415V)	75.6kA for XT1N and 105 kA for XT1S
Rated ultimate short-circuit breaking capacity I_{cu} (415V)	Available up to 70kA
Rated service short-circuit breaking capacity I_{cs} 415V (% I_{cu})	100% for XT1N and 75% for XT1S
Weight	1.1Kg
Included front terminal lug connection for outgoing cable	16mm wide, 6.5mm Ø (25mm ²)
Max cable size using either FC Cu or FC CuAl terminals	2.5mm ² – 70mm rigid copper

* For 4 pole options contact your local ABB sales engineer or visit <https://new.abb.com/low-voltage/products/circuit-breakers/tmax>

Technical details

XT3 MCCBs

Overview

Standard conformity	IEC 60947-2
Rated service voltage	690V AC
Rated insulation voltage	800V
Type of release	Thermomagnetic (TMD/TMF)
Utilisation category	A
Rated frequency	50/60 Hz
Ambient temp	40°C
Operating altitude	2000m
Rated impulse withstand voltage	8kV
No of poles	3 or 4*
Standard current ratings (I_n)	63 - 250A
Thermal release setting	0.7 - 1 $\times I_n$
Magnetic release setting	10 $\times I_n$
Rated short circuit making capacity I_{cm} (415V)	75.6kA for XT1N and 105 kA for XT1S
Rated ultimate short-circuit breaking capacity I_{cu} (415V)	Available up to 50kA
Weight	1.2Kg
Included front terminal lug connection for outgoing cable	24mm wide, 8.5mm Ø (50/70mm ²)
Max cable size using either FC Cu or FC CuAl terminals	240mm ² rigid

* For 4 pole options contact your local ABB sales engineer or visit <https://new.abb.com/low-voltage/products/circuit-breakers/tmax>

Note: For incoming cables above 150mm² please consider the bending radius and physical size of the glanding plate. The customer would have to make any aditional amendments to the cable entries themselves. ABB can supply additional side cable chambers or larger gland plates upon request.

Technical details

T5 MCCBs

— Overview

Standard conformity	IEC 60947-2
Rated service voltage	690V AC
Rated insulation voltage	800V
Type of release	Thermomagnetic (TMD/TMF)
Utilisation category	A
Rated frequency	50/60 Hz
Ambient temp	40°C
Rated impulse withstand voltage	8kV
No of poles	3 or 4*
Standard current ratings (I_n)	63 - 250A
<hr/>	
Thermomagnetic release	
Thermal release setting	0.7 - 1 $\times I_n$
Magnetic release setting	10 $\times I_n$
<hr/>	
Electronic release	
L setting:	0.4 - 1 $\times I_n$
S/I setting:	1 - 10 $\times I_n$
Rated short circuit making capacity I_{cm} (415V)	75.6kA for T5N and 105 kA for T5S, max. 440kA
Rated ultimate short-circuit breaking capacity I_{cu} (415V)	Available up to 200kA
Rated service short-circuit breaking capacity I_{cs} (415V) (% I_{cu})	10 0%
Weight	3.25Kg
Included front terminal lug connection for outgoing cable	35mm wide, 10.5mm Ø 2 x 185mm ²
Max cable size using either FC Cu or FC CuAl terminals	300mm ² rigid

* For 4 pole options contact your local ABB sales engineer or visit <https://new.abb.com/low-voltage/products/circuit-breakers/tmax>

** TMA version is rated at 500A, Electronic & Switch disconnector/Non auto versions are fully rated at 630A.

Note: For incoming cables above 150mm² please consider the bending radius and physical size of the glanding plate. The customer would have to make any additional amendments to the cable entries themselves. ABB can supply additional side cable chambers or larger gland plates upon request.

Technical details

T6 MCCBs

— Overview

Standard conformity	IEC 60947-2
Rated service voltage	690V AC
Rated insulation voltage	1000V
Type of release	Thermomagnetic (TMA) / Electronic
Utilisation category	B (630-800A)
Rated frequency	50/60 Hz
Ambient temp	40°C
Rated impulse withstand voltage	8kV
No of poles	3 or 4*
Type of release	Thermomagnetic
Thermal release setting	0.7 - 1 x I _n
Magnetic release setting	10 x I _n
Electronic release	
L setting:	0.4 - 1 x I _n
S/I setting:	1 - 10 x I _n
Rated short circuit making capacity I _{cm} (415V)	75.6kA for T6N and 105 kA for T6S, max. 220kA
Rated ultimate short-circuit breaking capacity I _{cu} (415V)	Available up to 100kA
Rated service short-circuit breaking capacity I _{cs} (415V) (%I _{cu})	100% for T6N, T6S and T6H
Weight	9.5Kg
Included front terminal lug connection for outgoing cable	40mm wide, 2 x 7 mm Ø (1 or 2 x 70mm ²)
Max cable size using either FC Cu or FC CuAl terminals	185mm ² rigid

* For 4 pole options contact your local ABB sales engineer or visit <https://new.abb.com/low-voltage/products/circuit-breakers/tmax>

Note: For incoming cables above 150mm² please consider the bending radius and physical size of the glanding plate. The customer would have to make any additional amendments to the cable entries themselves. ABB can supply additional side cable chambers or larger gland plates upon request.

Metering

M2M Network analyser

Technical data

Auxiliary power supply

Voltage range	[V]	From 24 to 240 V AC/DC From 48 to 240 V AC/DC M2M I/O From 24 to 240 V DC and from 48 to 240 V AC M2M ETHERNET, M2M PROFIBUS
Frequency range	[Hz]	45 - 65
Protection fuse		T 0.5 A from 24 V to 100 V T 0.25 A from 100 V to 240 V

Power consumption	[VA]	7 max
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Measurement type		Sampling TRMS
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Measurement accuracy

Voltage		±0.5% F.S. ±1 digit
Current		±0.5% F.S. ±1 digit
Frequency		40.0 - 99.9 Hz: ± 0,2% ± 0,1 100 - 500 Hz: ± 0,2% ± 1
Power factor		± 1% ± 1 digit (from cosφ= 0.3 Inductive to cosφ = 0.3 Capacitive)
Active power		± 1% ± 0.1% F.S (from cosφ= 0.3 Inductive to cosφ = 0.3 Capacitive)
Active energy		Class 1

Measurement range

Voltage		From 10 to 500 approx. TRMS VL-N. No decimal places
Current		From 50 mA to 5 A TRMS 2 decimal places displayed
Frequency		From 40 to 500
		1 decimal place displayed up to 99.9 and in integers above 100
Power factor		2 decimal places displayed

Installation

Distribution networks		Low and medium voltage Low voltage M2M LV, M2M LV MODBUS Single-phase connection Three-phase with neutral - Three-phase without neutral
Current inputs	[A]	Always use external CT Primary from 1 to 10,000 A AC approx. Secondary 5 A and 1 A AC approx.
		N.B.: In case of VT secondary at less than 100 V the accuracy class is reduced to 2.5% F.S. ±1 digit, in the range 5-100% F.S.
Voltage inputs	[V]	Direct insertion up to 500 AC approx. Indirect insertion with VT: Primary from 60 to 60,000 V AC approx - secondary from 60 to 190 V AC N.B.: In case of VT secondary at less than 100 V the accuracy class is reduced to 2.5% F.S. ±1 digit, in the range 5-100% F.S.
Protection fuse for voltage inputs	[A]	0.1

Data update frequency		2 times/second
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Harmonic distortion count	[Hz]	Band measurement up to 500
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Metering

M2M Network analyser

Technical data (continued)

Energy measurement		
Single-phase maximum value		10 GWh / GVarh / GVAh
Three-phase maximum value counted		30 GWh / GVarh / GVAh
Energy balance maximum value		10 GWh / GVarh / GVAh with sign
Input pulses maximum energy value		40 GWh / GVarh
Terminal characteristics		
Current inputs		Cross section 6 mm ² - Step 6.35 mm
Voltage inputs		Cross section 2.5 mm ² - Step 7.62 mm
Impulsive outputs		Cross section 2.5 mm ² - Step 5.08 mm
RS485 Serial port		Cross section 2.5 mm ² - Step 5.08 mm
Relay outputs		Cross section 2.5 mm ² - Step 5.08 mm
Overall dimensions		
		96 mm x 96 mm x 77 mm (Depth inside switchboard: 57 mm)
Weight		
Weight	[Kg]	0.400 max
Standards		
Overall dimensions		IEC 61554
Protection degree		IEC 60529
Accuracy class		IEC 60688, IEC 61326-1, IEC 62053-21, IEC 62053-23, IEC 62053-31.
Electrical safety		IEC 61010-1
User interface		
Display		Scrolling text in user-selectable language
Display type		LCD with backlighting which can be set by user
Display dimensions	[mm]	72 x 57
Communication interface		
RS485 (M2M MODBUS, M2M LV MODBUS, M2M ALARM, M2M I/O)		
- Protocol		Modbus RTU
- Electrical standard		RS485 with optical isolation
- Baud rate		4.8, 9.6, 19.2 kbps
- Parity number		Odd, Even, None
- Stop bit		1, 2
- Address		1 - 247
- Connectors		4 - pole terminal (integrated 120 Ohm termination)
Profibus (M2M PROFIBUS)		
- Protocol		Profibus with slave DP-V0 function in compliance with IEC 61158 regulations
- Electrical standard		RS485 with optical isolation
- Baud rate		Automatic detection [9.6 - 12 Mbps]
- LED indicators		Green for communication status and Red for communication error
- Address		0 - 126
- Connectors		DB 9 female connector (do not use connectors with 90° cable outlet)
Ethernet (M2M ETHERNET)		
- Protocol		Modbus TCP/IP
- Connectors		RJ45

Metering

M2M Network analyser

— Technical data (continued)

Digital output programmed as pulse

Contact supply external voltage	[V]	48 max (peak AC/DC)
Maximum current	[mA]	100 (peak AC/DC)
Pulse duration counted	[ms]	50 OFF (min) / 50 ON closed contact
Pulse frequency counted		10 pulses/s (max)

Digital output programmed as alarm

Contact supply external voltage	[V]	48 max (peak AC/DC)
Maximum current	[mA]	100 (peak AC/DC)
Alarm activation delay	[s]	1 - 9 00 s (programmable)
Alarm return hysteresis		0 - 40% (programmable)

Relay output (M2M ALARM)

Normal current	[A]	16 AC1 - 3 A C15
Max. instantaneous current	[A]	30
Nominal voltage	[V]	250 V AC
Max. instantaneous voltage	[V]	400 V AC
Nominal load	[VA]	4000 AC1 - 7 50 AC15

Analogue output (M2M I/O)

Programmable electrical parameters	Span [0 - 20 mA or 4 - 20 mA]
Load	Typical 250 Ohm, max 600 Ohm

Digital inputs (M2M I/O)

Nominal voltage	[V]	24 V DC (absorption = 13 mA)
Maximum voltage	[V]	32 V DC (absorption = 22 mA)
Max. voltage for OFF status	[V]	8 V DC
Min. voltage for ON status	[V]	18 V DC

Hour counters

Countdown timer	Countdown of system operating time with the activation of a programmable threshold on total current. Upon expiry of the maintenance period set an icon will appear on the display.
Count-up timer	Operational time of device

Climatic conditions

Storage	[°C]	from -10 to +60
Operation	[°C]	from -5 to +55
Relative humidity	Max 93% (non-condensing) at 40°C	

Protection degree

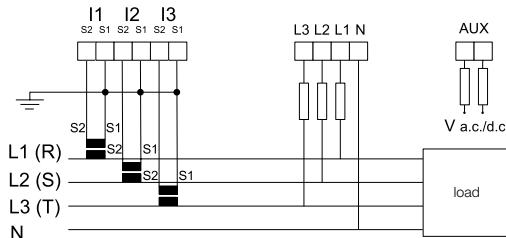
Frontal	IP50
At terminals	IP25

Metering

M2M Network analyser

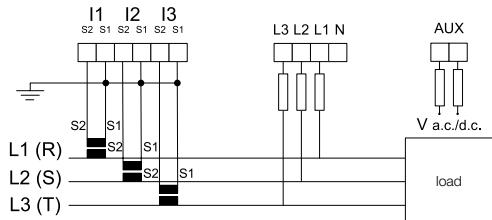
Wiring diagrams

Three-phase + neutral with 3 CT

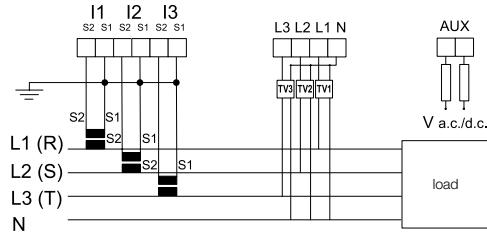


Three-phase with 3 CT

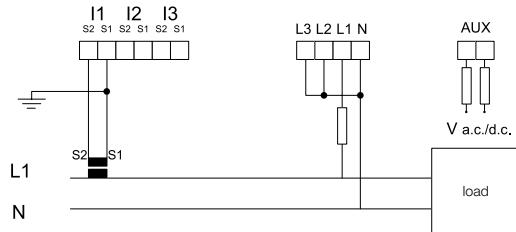
Three-phase with 3 CT



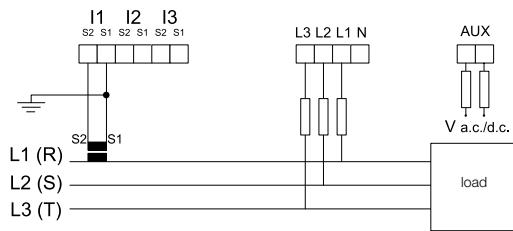
Three-phase + neutral with 3 CT and 3 VT



Single-phase with 1 CT



Balanced three-phase with 1 CT

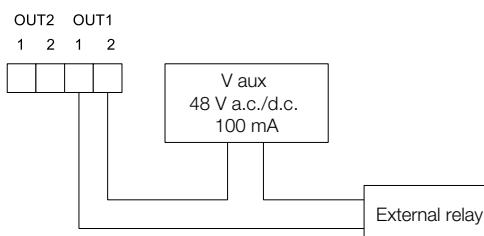


Not suitable for the M2M LV and M2M LV MODBUS models.

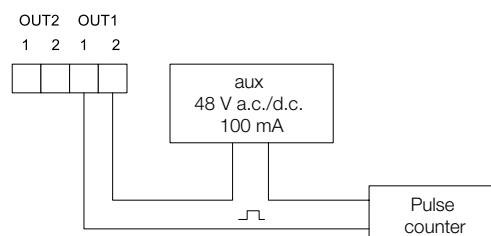
M2M communications

Analogue and digital output connections, digital inputs

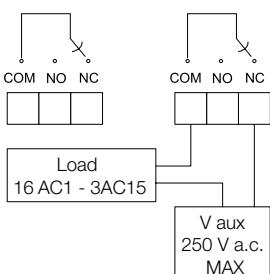
Digital outputs as alarms with external relay for control of loads



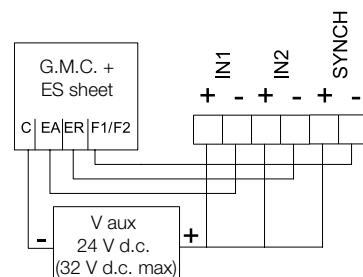
Digital outputs as pulses



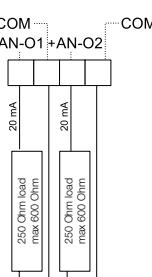
M2M ALARM electromechanical relay outputs



M2M I/O digital inputs (example in NPN mode)



M2M I/O analogue outputs



Metering

B24 series meters

Technical data

B24	
Voltage/current inputs	
Nominal voltage	3 x 230/400 V AC
Voltage range	3 x 220-240 V AC (-20% - +15%)
Power dissipation voltage circuits	1.6 VA (0,7 W) total
Power dissipation current circuits	0.007 VA (0.007 W) per phase at 230 V AC and I_b
Base current I_b	5:00 am
Rated current I_n	1:00 am
Reference current I_{ref}	5:00 am
Transitional current I_{tr}	0.05 A
Maximum current I_{max}	6:00 am
Minimum current I_{min}	0.02 A
Starting current I_{st}	< 1 mA
Terminal wire area	0.5 - 10 mm ²
Recommended tightening torque	1.5 Nm
Communication	
Terminal wire area	0.5 - 1 mm ²
Recommended tightening torque	0.25 Nm
Transformer ratios	
Configurable current ratio (CT)	1/9 - 9999/1
Pulse indicator (LED)	
Pulse frequency	5000 imp/kWh
Pulse length	40 ms
General data	
Frequency	
Accuracy Class	B (Cl. 1) or C (Cl. 0,5 S) and Reactive Cl. 2
Active energy	0.5%, 1%
Display of energy	7 digit LCD
Environmental	
Operating temperature	-40°C - +70°C
Storage temperature	-40°C - +85°C
Humidity	75% yearly average, 95% on 30 days/year
Resistance to fire and heat	Terminal 960 °C, cover 650°C (IEC 60695-2-1)
Resistance to water and dust	IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.
Mechanical environment	Class M2 in accordance with the Measuring Instrument Directive (MID), (2004/22/EC).
Electromagnetic environment	Class E2 in accordance with the Measuring Instrument Directive (MID), (2004/22/EC).
Outputs	
Current	2 - 100 mA
Voltage	5 - 240 V AC/DC. For meters with only 1 output 5 - 40 VDC.
Pulse output frequency	Programmable: 1 - 9 99999 imp/kWh
Pulse length	Programmable: 10 - 990 ms
Terminal wire area	0.5 - 1 m m ²
Recommended tightening torque	0.25 Nm

Metering

B24 series meters

— Technical data (continued)

Inputs

Voltage	0 - 240 V AC/DC
OFF	0 - 12 V AC/DC
ON	57 - 240 V AC/24 - 240 V DC
Min. pulse length	30 ms
Terminal wire area	0.5 - 1 m m ²
Recommended tightening torque	0.25 Nm

EMC compatibility

Impulse voltage test	6 kV 1.2/50μs (IEC 60060-1)
Surge voltage test	4 kV 1.2/50μs (IEC 61000-4-5)
Fast transient burst test	4kV (IEC 61000-4-4)
Immunity to electromagnetic HF-fields	80 MHz - 2 GHz (IEC 61000-4-6)
Immunity to conducted disturbance	150kHz - 80MHz (IEC 61000-4-6)
Immunity to disturbance with harmonics	2kHz - 150kHz
Radio frequency emission	EN 55022, class B (CISPR22)
Electrostatic discharge	15 kV (IEC 61000-4-2)
Standards	IEC 62052-11, IEC 62053-21 class 1 & 2, IEC 62053-22 class 0,5 S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GB/T 17215.312-2008 class 1 & 2, GB/T 17215.322-2008 class 0,5 S, GB 4208-2008, EN 50470-1, EN 50470-3 category A, B & C

Mechanical

Material	Polycarbonate in transparent front glass. Glass reinforced polycarbonate in bottom case and upper case. Polycarbonate in terminal cover.
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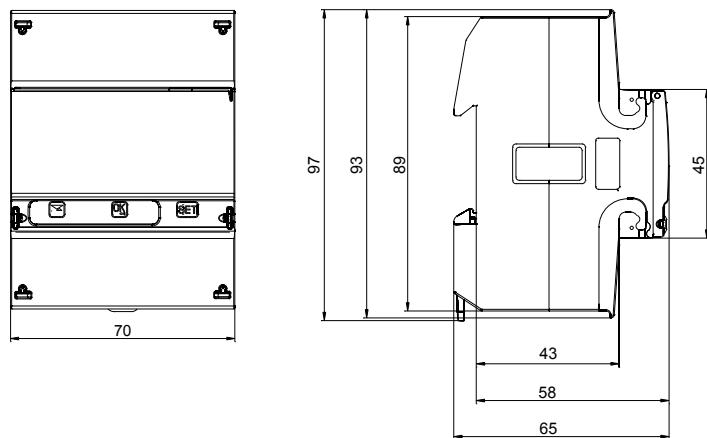
Dimensions

Width	35 mm	70 mm
Height	97 mm	97 mm
Depth	65 mm	65 mm
DIN modules	2	4

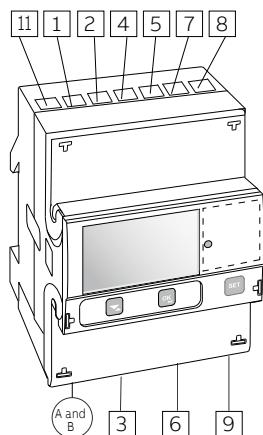
Metering

B24 schematics

Dimensions



Wiring diagrams



Current in [1 4 7]

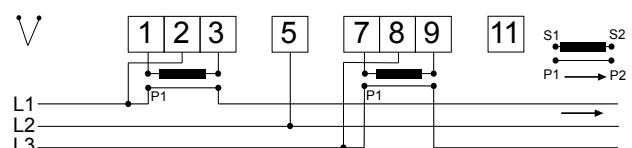
Voltage [2 5 8]

Current out [3 6 9]

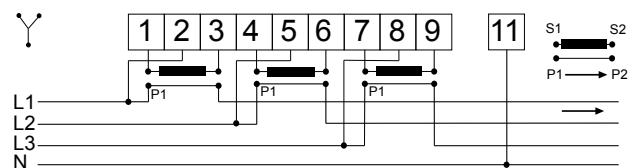
Neutral [11]

B24

3 wire connection, 2 elements



4 wire connection, 3 elements

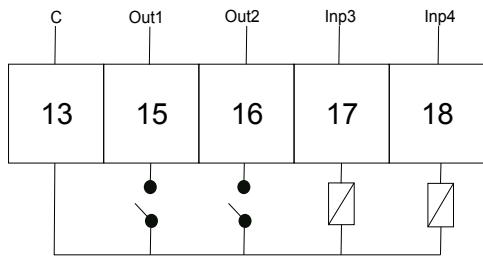


Metering

ABB B24 communications

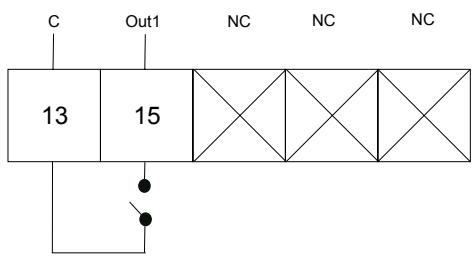
Inputs/outputs

2 outputs, 2 inputs



External power supply needed 5-240 VAC/VDC...

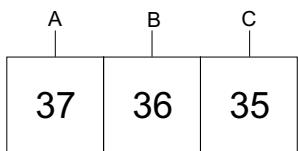
1 output



External power supply needed 5-40 VDC...

Communication

RS-485



TRUONE ATS

The world's first true purpose-built automatic transfer switch, engineered to incorporate switch and controller in one seamless unit.



Surge Protection

Furse ESP415 M1 R series

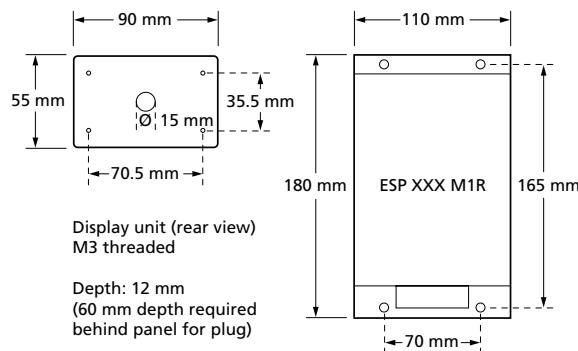
ESP M1R, M2R & M4R Series - Technical specification

Electrical Specification	ESP 415 M1R
ABB order code	7TCA0 85460R0115
Nominal voltage - Phase-Neutral U_o (RMS)	240 V
Maximum voltage - Phase-Neutral U_c (RMS)	280 V
Temporary Overvoltage TOV $U_T^{(1)}$	350 V
Short circuit withstand capability	25 kA/50 Hz
Working voltage (RMS)	346-484 V
Frequency range	47-63 Hz
Max. back-up fuse (see installation instructions)	125 A
Leakage current (to earth)	< 250 mA
Indicator circuit current	< 10 mA
Volt free contact: ⁽²⁾	Screw terminal
- Current rating	1 A
- Nominal voltage (RMS)	250 V
Transient Specification	ESP 415 M1R
Type 1 (BS EN/EN), Class I (IEC)	
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA
Let-through voltage Up at I_n	<1.3 kV
Impulse discharge current 10/350 μ s /imp (to	4 kA
Let-through voltage Up at $I_{imp}^{(3)}$	750 V
Impulse discharge current (per phase) $I_{imp}^{(5)}$	16 kA
Type 2 (BS EN/EN), Class II (IEC)	
Nominal discharge current 8/20 μ s (per mode) I_n	20 kA
Let-through voltage Up at $I_n^{(3)}$	<1.3 kV
Maximum discharge current I_{max} (L/N-PE, L/N) ⁽⁴⁾	40 kA, 40 kA
Type 3 (BS EN/EN), Class III (IEC)	
Let-through voltage at U_{oc} of 6 kV 1.2/50 μ s and μ sc of 3 kA 8/20 μ s (per mode) ^(3,6)	600 V
Mechanical Specification	ESP 415 M1R
Temperature range	-40 to +80 °C
Connection type	Screw terminal - maximum torque 1.5 Nm (ESP M1R), 2.5 Nm (ESP M2R) 5.6 Nm (ESP M4R)
Conductor size (stranded)	16 mm ² 16 mm ² 25 mm ² 25 mm ² 50 mm ² 50 mm ²
Earth connection	Screw terminal - maximum torque 1.5 Nm (ESP M1R), 2.5 Nm (ESP M2R) 5.6 Nm (ESP M4R)
Volt free contact	Connect via screw terminal with conductor up to 2.5 mm ² (stranded) - maximum torque 0.25 Nm
Degree of protection (IEC 60529)	IP20
Display connection	Display connection 6 way 1 metre interconnection cable - 2 or 4 metre cable optional
Case material	Unit - Steel, Display - FR Polymer UL-94 V0
Weight: – Unit	1.0 kg
– Packaged	1.1 kg

Surge protection systems

Furse ESP415 M1 R series

Dimensions



Installation

Installation of the protector unit is identical to the ESP M1. Position remote display, making sure that the cable is long enough, is unimpeded within the cabinet, and allows a minimum of 60 mm behind the panel front (for the interconnection cable). For TT installations, contact Furse.

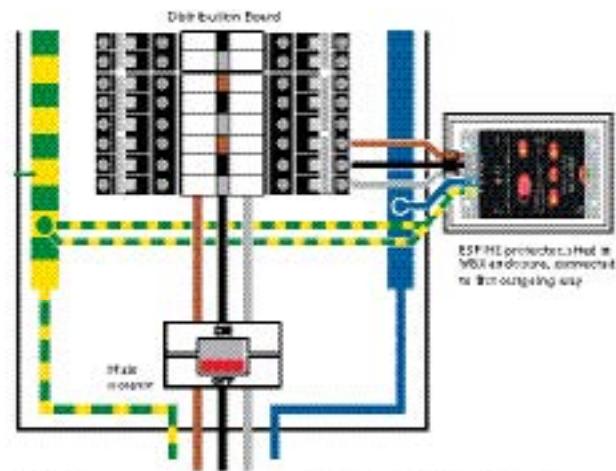
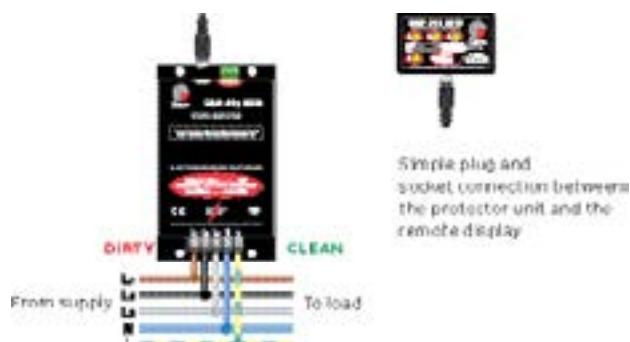
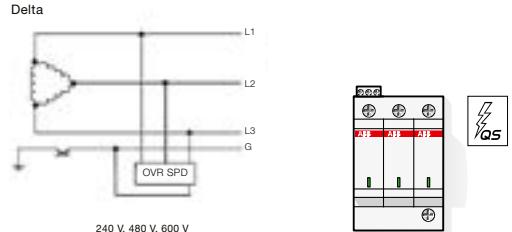


Figure 6 - Three phase ESP protector connected to the nearest exhibit outgoing (POB) to the incoming supply. The unit also provides the means of isolation, once there is no further space within the distribution board the ESP unit has been mounted with a separate enclosure, directly alongside the board. Note the double connector in worth, in order to accommodate for the line connecting leads.

Surge Protection

OVR Type 1+2 surge protection kit



TNC - 230 and 400 V networks - General technical data

Types	OVR T1-T2 3L 12.5-275s P QS	
with auxiliary contact (TS)	OVR T1-T2 3L 12.5-275s P TS QS	
Electrical features		
Standard	IEC 61643-11 / EN 61643-11	
Type / test class	T1-T2/I - II	
Protected lines(1)	3	
System network	TNC - TNS - TT	
Type of current	AC 45-65 Hz	
Nominal system voltage Un	230 / 400 V	
Max. cont. operating voltage Uc	275 V	
Nominal DC voltage Undc L-PE / Undc L-L	320 / 640 V DC	
Max. DC cont. operating voltage Ucdc L-PE	355 / 710 V DC	
Maximum impulse current limp (10/350)	12.5 kA	
Max. Imp current Tot limp (10/350)	37.5 kA	
Nominal discharge current In (8/20)	30 kA	
Maximum discharge current Imax (8/20)	80 kA	
Follow current interrupting rating Ifi	-	
Voltage protection level Up at In	1.1 kV	
Voltage protection level Up at 3 kA	0.5 kV	
TOV (Temporary overvoltage) withstand Ut (L-N: 5 s./N-PE: 200 ms)	337 V / -	
Response time	25 ns	
Short-circuit withstand capability Isccr	100 kA	
Backup protection fuse (gG - gL)	≤ 160 A	
maximum rating circuit breaker (B or C)	≤ 125 A	
Pluggable cartridge	Yes	
Integrated thermal disconnector	Yes	
State indicator	Yes	
Safety reserve	Yes	
Auxiliary contact (TS)	Yes (TS option)	
Installation		
Wire range (L, N, PE) solid wire	2.5...35 mm ²	
stranded wire	2.5...25 mm ²	
Stripping length (L, N, PE)	12.5 mm	
Tightening torque (L, N, PE)	2.8 Nm	
Auxiliary contact (TS)		
Contacts information	1 NO - 1 NC	
Min. load	12 DC - 10 mA	
Max. load	250 V AC - 1 A	
Connection cross-section	1.5 mm ²	
Miscellaneous characteristics		
Stocking and operating temperature	0...+80 °C	
Degree of protection	IP20	
Fire resistance according to UL 94	VO	
Dimensions mm	h x w x d 88 x 53.4 x 76.7 mm	
inches	h x w x d 3.46 x 2.1 x 3.02 in	
Dimensions with mm	h x w x d 95.8 x 53.4 x 76.7 mm	
auxiliary contact (TS) inches	h x w x d 3.77 x 2.1 x 3.02 in	
Replacement cartridges		
Phase product ID	Type	OVR T1-T2 12.5-275s C QS
	Order code	2CTB815710R2600

Notes

Additional information

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