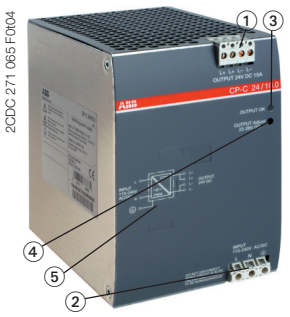
Power supply CP-C 24/10.0

Primary switch mode power supply

Data sheet



① OUTPUT L+, L-: terminals - output

② INPUT L, N, PE: terminals - input

③ OUTPUT OK: green LED - output voltage OK

④ OUTPUT Adjust: rotary potentiometer - adjustment of output voltage

⑤ Circuit diagram

Features

- Wide input range: 110-240 V AC (85-264 V AC, 100-350 V DC)
- Output voltage adjustable from 22-28 V DC, default setting 24 V DC ±0.5 %
- Rated output current 10 A
- Open-circuit, overload and continuous short-circuit proof
- Power reserve up to 20 %
- High efficiency of typ. 89 %
- Low power dissipation and low heating
- Pluggable double connecting terminals
- Integrated input fuse
- Parallel operation for increased power and to enable redundancy
- Power factor correction acc. to EN 61000-3-2
- LED for status indication
- Messaging module CP-C MM available as accessory
- Redundancy unit CP-A RU and control module CP-A CM (for CP-A RU) available as accessories

Approvals

	UL 508, CAN/CSA C22.2 No.107.1	Approval refers to rated input voltage U_{in}
	UL 1604 (Class I, Div 2, hazardous locations), CAN/CSA C22.2 No.213	Approval refers to rated input voltage U_{in}
	UL 60950, CAN/CSA C22.2 No.60950	Approval refers to rated input voltage U_{in}
	EAC	

Marks

CE

RCM

Order data

Type	Input voltage range	Rated output voltage / current	Order code
CP-C 24/10.0	85-264 V AC / 100-350 V DC	24 V DC / 10 A	1SVR 427 025 R0000

Order data - Accessories

Type	Description	Order code
CP-C MM	**Messaging module** The CP-C MM indicates the correct function of the power supply unit via LEDs and energized output relay.	1SVR 427 081 R0000
CP-A RU	**Redundancy unit** The CP-A RU provides decoupling of two CP power supply units.	1SVR 427 071 R0000
CP-A CM	**Control module** The CP-A CM provides monitoring of the input signals of the redundancy unit CP-A RU.	1SVR 427 075 R0000

Power supply CP-C 24/10.0

Primary switch mode power supply

Data sheet

Application

The primary switch mode power supply CP-C 24/10.0 has two voltage inputs. This enables the supply with AC or DC. Furthermore the CP-C 24/10.0 is equipped with two generous capacitors, which ensure mains buffering of at least 50 ms. That is why the devices can be used worldwide also in high fluctuating networks and battery-powered plants.

Due to their reliable construction, the devices can be used in very harsh industrial environments.

The power reserve of up to 20 % enables trouble-free starting of heavy loads, so that no oversized power supply is needed.

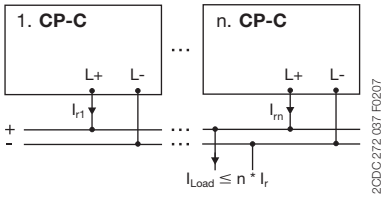
Operating mode

Parallel operation

In order to increase power and to enable redundancy, up to 5 devices can be connected in parallel. For a symmetric distribution it is advisable to execute the line connections with the same cross sections and same lengths.

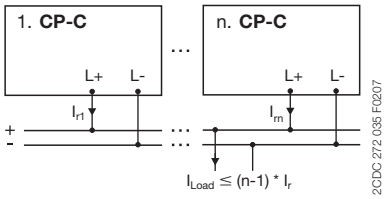
Parallel operation, increased power - without CP-A RU

For n parallel connected devices, the output current can be increased to n x I_r. It is advisable to use parallel connection if a power supply unit does not cover the current requirement of the most powerful consumer. Otherwise the consumers should be spread among individual devices independent of one other.



Parallel operation, redundancy - without CP-A RU

Redundant circuits are suitable to increase the operational reliability in case of errors. If a fault occurs in the first power supply circuit (called initial fault), the power supply of all consumers will be taken over by the second, redundant supply circuit. For this reason the power supply units to be connected in parallel are dimensioned in such a way that the total current requirement of all consumers can be completely covered by one power supply unit.



Adjustable output voltage

The CP-C range power supplies feature a continuously adjustable output voltage of 22 to 28 V DC. Thus they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.

Extended function with accessories

Indication of the correct function of the power supply with CP-C MM

The messaging module CP-C MM can be plugged onto a CP-C range primary switch mode power supply. It indicates the correct function of the power supply unit via LEDs and energized output relay.

The power supply unit can be switched off by closing of a volt-free (dry/floating) contact at the “REMOTE OFF” input.

If the supply voltage at the input of the power supply falls below 82 V AC (70 V DC), the output relay “INPUT OK” (contacts 11-12/14) de-energizes and the LED “INPUT OK” turns off.

If the output voltage of the power supply falls below 19.8 V DC, the output relay “OUTPUT OK” (contacts 21-22/24) de-energizes and the LED “OUTPUT OK” turns off.

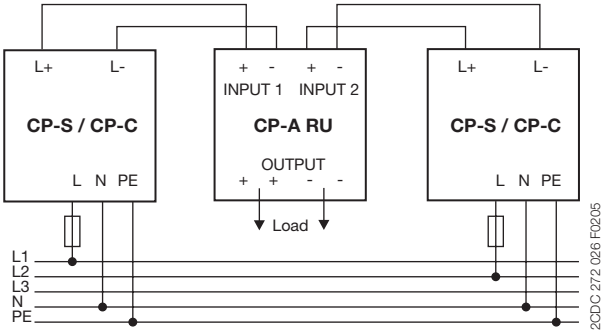
Output voltage monitoring is only possible in decoupled parallel operation.

Parallel operation, true redundancy with decoupling provided by the CP-A RU

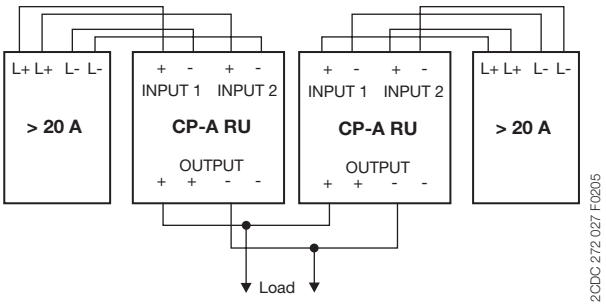
Redundant circuits are used to increase the operational reliability and eliminate power supply outages. Events that can cause a power supply failure include: incorrect wiring, blown fuses or failure of a single power supply. If a fault event occurs (called initial fault) in the first power supply circuit, power to all loads is then supplied by the second (redundant) power supply. For this reason, both power supplies must be sized to handle the total current requirement of all loads. The primary and the redundant power supplies are decoupled from one another by the CP-A RU unit.

It automatically switches from the primary to the redundant supply after a fault. It decouples the output of the failed power supply from the redundant supply preventing the initial fault from shorting or compromising the redundant supplies’ output. In this way, uninterrupted supply of power to all loads is guaranteed.

When available, the two power supplies should be connected to different input voltage phases, to avoid loss of power caused by a blown fuse on the primary side of the power supplies.



Decoupling of power supply units with output currents > 20 A



Control of input voltages of CP-A RU with CP-A CM

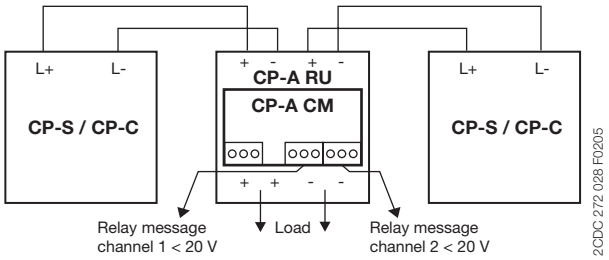
The control module CP-A CM indicates the presence of both input voltages of the CP-A RU via LEDs and energized output relays.

The threshold values for the output relays are adjustable separately per channel from 14 to 28 V. If, by a fault (e.g. failure of a power supply, blown fuse), the voltage in a channel drops below the adjusted threshold value, the corresponding output relay de-energizes. The green LEDs “IN 1”, “IN 2” glow, if the corresponding voltage exceeds the adjusted threshold value. The green LED “OUT” glows, if the output voltage is higher than 3 V.

Examples of application with accessories

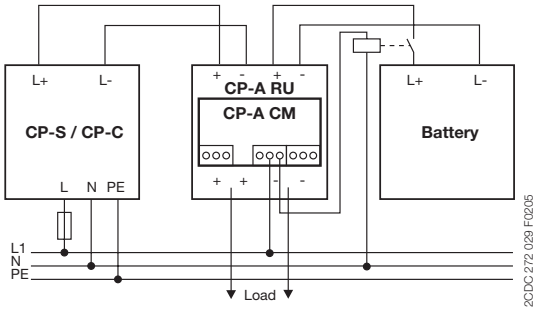
**CP-A RU with CP-A CM for monitoring of two power supplies -
In case of fault: Fault signal**

If both relays are de-energized, the voltages of both channels are below the adjusted threshold value (e.g. 20 V). This could mean, that both power supply units failed or are switched off, or that there is an overload on the secondary side. Momentary de-energization of the relays may be caused by inrush current of a connected load, during starting.
If one of the two relays de-energizes, this can indicate that the primary power supply unit failed or is switched off, and the redundant power supply is now supplying power to the load.



**CP-A RU with CP-A CM for monitoring of one power supply -
In case of fault: Transfer to an alternative power supply**

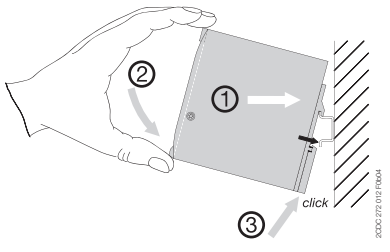
The following example of application shows transferring to an alternative power supply (in this example a battery) after a failure in the primary power supply unit.



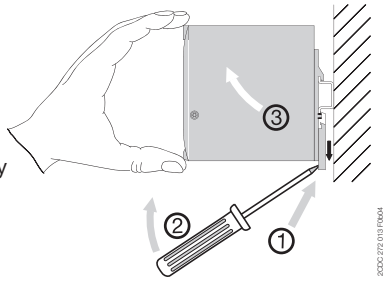
Installation

Mounting

The switch mode power supply can be snapped on a DIN rail (TH 35-15 or TH 35-7.5 according to IEC/EN 60715) as shown in the accompanying picture. For that the device is set with its mounting rail slide on the upper edge of the mounting rail and locked by lifting it downwards.

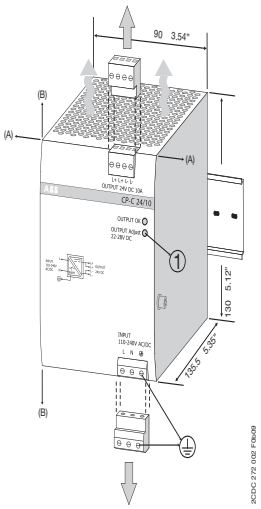


Installation



Demounting

Remove the switch mode power supply as shown in the accompanying picture. For that the latching lever is pulled downwards by means of the screwdriver. Then the device can be unhinged from the mounting rail edge and removed.



Mounting position

The devices have to be mounted horizontally with the input terminals on the bottom.

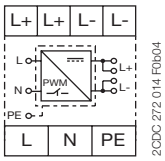
In order to ensure a sufficient convection, the minimum distance to other modules must not be less than 80 mm in vertical direction and 10 mm in horizontal direction.

Electrical connection of primary and secondary side

Connect the input terminals L and N. The protective earth conductor PE must be connected. Actuate plug connector only when power is off. The installation must be executed acc. to EN 60950, provide a suitable disconnecting device (e. g. line protection switch) in the supply line. The input side is protected by an internal input fuse.

Rate the lines for the maximum output current or provide a separate fuse protection. We recommend to choose the cable section as large as possible in order to minimize voltage drops. Observe the polarity. Actuate plug connector only when power is off. The device is overload, short-circuit and open-circuit proof. The secondary side of the power supply is electrically isolated from the input and internally not earthed (SELV) and can therefore be earthed by the user according to the needs with L+ or L- (PELV).

Connection diagram(s)



L+, L-	Output voltage
L, N	Input voltage
PE	Protective earth

Safety instructions and warnings



The device must be installed by qualified persons only and in accordance with the specific national regulations (e. g. VDE, etc.).
The CP-C 24/10.0 is a chassis-mounted unit. It is maintenance-free and does not contain any integral setting elements and should therefore not be opend.

Before any installation, maintenance or modification work:

- Disconnect the system from the supply network and protect against switching on!

Before start of operation the following must be ensured:

- Connect to main according to the specific national regulations for class of protection I.
- Power supply cables and unit must be sufficiently fused. A disconnecting device has to be provided for the end product to disengage unit and supply cables from supply mains if required.
- The protective earth conductor must be connected to the terminal PE.
- Rate the output lines for the output current of the power supply and connect them with the correct polarity.
- In order to ensure sufficient air-cooling the distance to the other devices has to be considered.
- Screws at the enclosure are for internal grounding. Do not remove them! Do not connect cable!

Attention! Improper installation/operation may impair safety and cause operational difficulties or destruction of the unit.

In operation pay attention to:

- Do not modify the installation (primary and secondary side)! High current! Risk of electric arcs and electric shock (danger to life)!
- (Dis)connect the plug connector only when the power is off.
- Risk of burns: Depending on the operation conditions the enclosure can become very hot.
- If the internal fuse blows, most probably the device is defect. In this case, an examination of the switch mode power supply by the manufacturer is necessary.

Attention! Danger to life!



Disconnect the system from the supply network before executing any works at the device and protect against switching on! The power supply contains components with high stored energy and circuits with high voltage! Do not introduce any objects into the unit and do not open the unit.
With some units of this range the output is capable of providing hazardous energy. Ensure that the service personnel is protected against inadvertent contact with parts carrying energy.

Power supply CP-C 24/10.0

Primary switch mode power supply

Data sheet

Technical data

Data at T_a = 25 °C, U_{in} = 230 V AC and rated values, unless otherwise indicated

Input circuits - Supply circuits		1SVR 427 025 R0000
Rated input voltage U_{in}	L, N	110-240 V AC
Typical input current	at 110-240 V AC	2.6-1.2 A
Typical power consumption		269 W
Input voltage range	AC	85-264 V AC
	DC	100-350 V DC (at U > 264 V use additionally an appropriate external fuse)
Frequency range	AC	47-63 Hz
	DC	0 Hz
Inrush current limiting		< 33 A
I^2t at cold start		approx. 0.2 A^2s
Discharge current towards PE		< 3,5 mA
Power failure buffering time		min. 40 ms
Transient overvoltage protection		Varistors
Internal input fuse (apparatus protection, not accessible)		6.3 A slow-acting
Power factor correction (PFC)		yes, active

Indication of operational states		1SVR 427 025 R0000
Output voltage	OUTPUT OK: green LED	⎍: output voltage OK

Output circuits		1SVR 427 025 R0000
Rated output voltage	L+, L+, L-, L-	24 V DC
Tolerance of the output voltage		± 1 %
Adjustment range of the output voltage		22-28 V DC, default setting 24 V DC ±0.5 %
Rated output power		240 W
Rated output current I_r	$T_a \leq$ 60 °C	10 A
Peak output current (power reserve)	$T_a \leq$ 40 °C	typ. ≤ 12.25 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C	2.5 % per Kelvin temperature increase
Deviation	load change statical 10-90 %	typ. <± 0.05 %
	load change dynamical 10-90 %	typ. <± 3 %
	change of input voltage ± 10 %	typ. <± 0.05 %
Control time		typ. < 1 ms
Starting time after applying supply voltage		< 200 ms
Rise time	10-90 %	typ. < 4 ms
Residual ripple and switching peaks	BW = 20 MHz	typ. < 50 mV_{pp}
Parallel connection		yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical
Series connection		yes, to increase voltage, for decoupling refer to the application manual
Resistance to reverse feed		approx. 35 V DC
Characteristic curve of output		U/I characteristic curve with power reserve
Short-circuit protection		continuous short-circuit stability
Current limiting at short circuit		approx. 19 A
Overload protection		thermal protection
Starting of capacitive loads		unlimited

Power supply CP-C 24/10.0

Primary switch mode power supply

Data sheet

General data		1SVR 427 025 R0000
Power dissipation		typ. < 29 W
Dimensions (W x H x D)		93.5 x 130 x 135.5 mm (3.68 x 5.12 x 5.35 inches)
Material of enclosure	cover	zinc-coated sheet-steel
	enclosure shell	aluminium
Efficiency		typ. 89 %
Weight		approx. 1.34 kg (approx. 2.95 lb)
Mounting position		horizontal
Minimum distance to other units		
normal operation mode	horizontal	10 mm (0.39 inch)
	vertical	80 mm (3.15 inch)
Mounting		DIN rail (IEC/EN 60715), snap-on mounting
Degree of protection	enclosure / terminals	IP20 / IP20
Class of protection (EN 61140)		I

Electrical connection		1SVR 427 025 R0000
Input circuit		
Wire size	fine-strand with wire end ferrule	0.2-2.5 mm² (24-14 AWG)
	fine-strand without wire end ferrule	0.2-2.5 mm² (24-14 AWG)
	rigid	0.2-2.5 mm² (24-14 AWG)
Stripping length		7 mm (0.28 inches)
Tightening torque		0.4 Nm
Output circuit		
Wire size	fine-strand with wire end ferrule	0.12-2.5 mm² (26-14 AWG)
	fine-strand without wire end ferrule	0.12-2.5 mm² (26-14 AWG)
	rigid	0.12-2.5 mm² (26-14 AWG)
Stripping length		8 mm (0.31 inches)
Tightening torque		0.4 Nm

Environmental data		1SVR 427 025 R0000
Ambient temperature range	operation	-25...+70 °C
	rated load	0...+60 °C (without derating)
	storage	-40...+85 °C
Damp heat (IEC/EN 60068-2-30)		93 % at +40 °C, no condensation
Climatic category (IEC/EN 60721)		3k3
Vibration (IEC/EN 60068-2-6)		
Shock (IEC/EN 60068-2-27)		

Power supply CP-C 24/10.0

Primary switch mode power supply

Data sheet

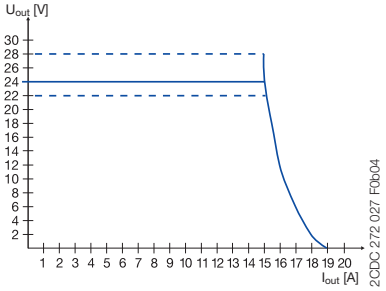
Isolation data		1SVR 427 025 R0000
Rated insulation voltage U_i between all isolated circuits (IEC/EN 60950-1; EN 50178)	input / output	300 V
	input / PE	300 V
	output / PE	50 V
Rated impulse withstand voltage U_{imp} between all isolated circuits (IEC/EN 60950-1; EN 50178)	input / output	4 kV; 1.2/50 µs
	input / PE	2.5 kV; 1.2/50 µs
	output / PE	500 V; 1.2/50 µs
Power-frequency withstand voltage (test voltge) (routine test / type test)	input / output	1.5 kV AC / 3.0 kV AC
	input / PE	1.5 kV AC / 3.0 kV AC
	output / PE	500 V DC / 500 V DC
Pollution degree (IEC/EN 60950; EN 50178)		2
Overvoltage category (IEC/EN 60950; EN 50178)		II

Standards / Directives	1SVR 427 025 R0000
Standards	IEC/EN 60950-1, IEC/EN 61204
Low Voltage Directive	2014/35/EU
Protective low voltage	SELV (IEC/EN 60950-1)
EMC Directive	2014/30/EU
RoHS-Directive	2011/65/EU

Electromagnetic compatibility		1SVR 427 025 R0000
Interference immunity to		IEC/EN 61000-6-2, IEC/EN 61204-3
electrostatic discharge	IEC/EN 61000-4-2	Level 4 (8 kV / 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 4 (4 kV)
surge	IEC/EN 61000-4-5	Level 4 (2 kV symmetrical) Level 3 (3 kV asymmetrical)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission		IEC/EN 61000-6-3, IEC/EN 61204-3
high-frequency radiated	IEC/CISPR 22, EN 55022	Class B
high-frequency conducted	IEC/CISPR 22, EN 55022	Class B

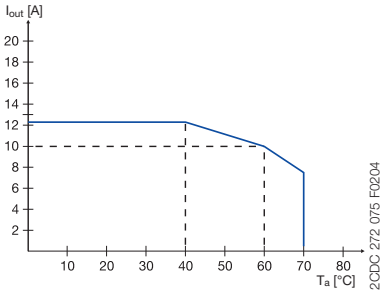
Technical diagrams

Characteristic curve of output



Characteristic curve of output at T_a = 25 °C

Characteristic curve of temperature



Characteristic curve of temperature at U_{out} = 24 V

The switch mode power supply CP-C 24/10.0 is able to supply at 24 V DC output voltage and at an ambient temperature of

- ≤ 40 °C a continuous output current of typ. ≤ 12.25 A
- ≤ 60 °C the rated current of 10 A

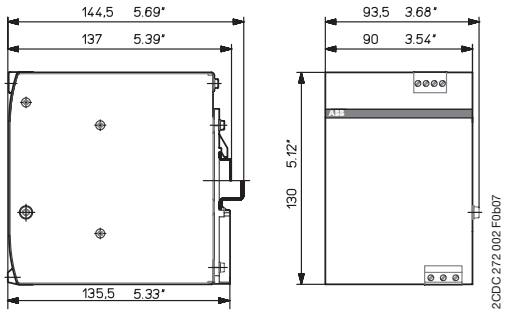
At ambient temperatures of:

- > 60 °C the output power has to be reduced by 2.5 % per Kelvin temperature increase.
- > 70 °C i.e. thermal overload, the device will switch-off.

If the switch mode power supply is loaded with an output current > 12.25 A, the operating point is passing through the U/I characteristic curve shown.

Dimensions

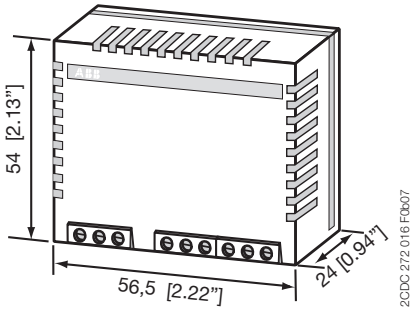
in mm



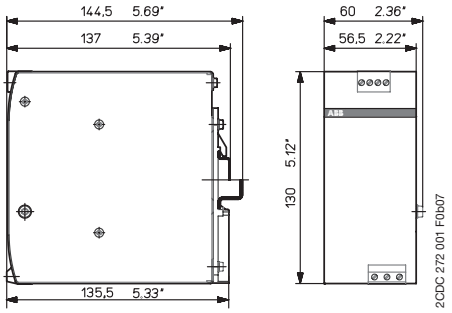
CP-C 24/10.0

Dimensions accessories

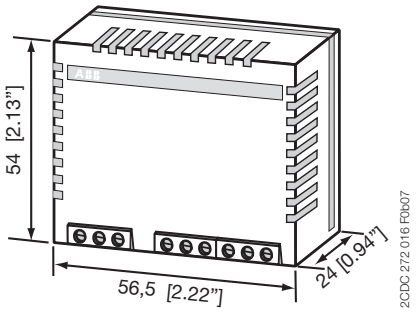
in mm



CP-C MM



CP-A RU



CP-A CM

Further Documentation

Document title	Document type	Document number
Electronic Products and Relays	Technical catalogue	2CDC 110 004 C02xx
Power Supply Units	Application manual	2CDC 114 048 M020x
Messaging module CP-C MM	Data sheet	2CDC 114 014 D0202
Redundancy unit CP- A RU	Data sheet	2CDC 114 036 D0202
Control module CP-A CM	Data sheet	2CDC 114 037 D0202

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Power supplies.

CAD system files

You can find the CAD files for CAD systems at http://abb-control-products.partcommunity.com
-> Low Voltage Products & Systems -> Control Products -> Power Supplies.

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