

# Power Supply CP-ASI/4.0 DC/DC

## Primary switch mode DC/DC converter for AS-interface

The DC/DC converter of ABB's CP-ASI power supply range is specifically designed with integrated data decoupling for the supply of AS-interface systems.

Up to 62 slaves (binary I/O devices) can be supplied with a single two-conductor cable.



2CDC271003S0012

### Characteristics

- Rated output voltage 30.5 V DC
- Rated output current 4.0 A
- Rated output power 122 W
- Rated input voltage 24 V DC
- High efficiency of up to 90.5 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -25...70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Tool-free mounting on DIN rail as well as demounting
- LEDs for the indication of operational states

### Approvals



UL 508, CAN/CSA C22.2 No.107.1<sup>1)</sup>



UL 60950-1, CAN/CSA C22.2 No. 60950-1<sup>1)</sup>

<sup>1)</sup> Approvals refer to rated input voltage  $U_{in}$

### Marks

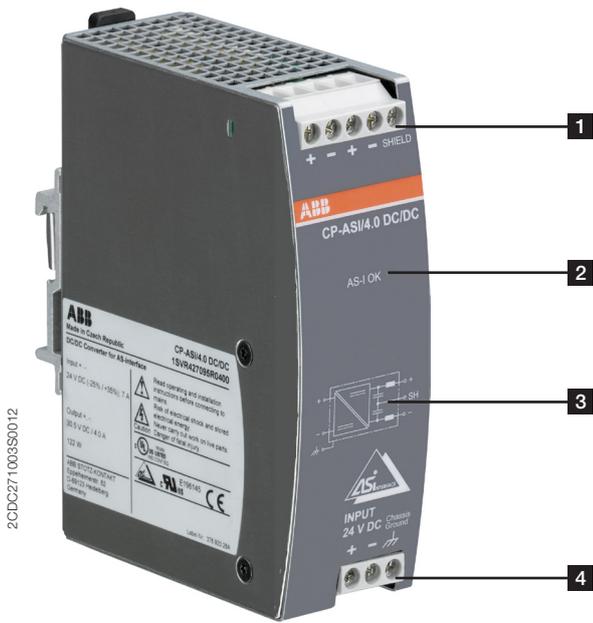


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### Order data

Type	Input voltage range	Rated output voltage	Rated output current	Order code
CP-ASI/4.0 DC/DC	18-32.4 V DC	30.5 V DC	4.0 A	1SVR427095R0400

## Functions



### 1 Output

+, -, +, -, SHIELD: output terminals

### 2 Indication of operational states

AS-I OK: green LED – output voltage OK

### 3 Circuit diagram

### 4 Input

+, -,  $\perp$ : input terminals

## Application

The DC/DC converter is specifically designed with integrated data decoupling for the supply of AS-interface systems. It operates at a rated input voltage of 24 V DC and can therefore be used in combination with standard switch mode power supplies.

Up to 62 binary I/O devices can be connected and supplied according to the AS-interface bus technology with a single two-conductor cable. The communication signals are modulated onto the slaves' DC supply voltage of the AS-Interface system, which therefore requires a specific power supply with integrated data decoupling.

## Operating mode

The specific supply of AS-interface systems with energy is realized by connecting the DC/DC converter in series to a standard 24 V DC switch mode power supply. Additional loads to the switch mode power supply need to be connected in parallel to the DC/DC converter taking into consideration the maximum output power of the power supply.

The green LED “AS-I OK” is on during normal operation, i.e. when the output voltage exceeds 24 V DC, and is off at overload.

## Installation

The device must be installed by qualified persons only and in accordance with the specific national regulations (e.g. VDE, etc.). The devices are maintenance-free chassis-mounted units.

### Before installation



**DANGER!**

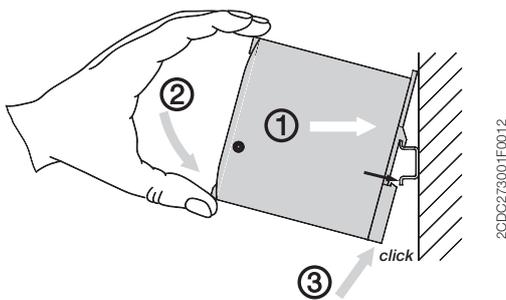
**Components with high stored energy and circuits with high voltage**

**Danger to be electrocuted!**

- ▶ Disconnect the system from the supply network and protect against switching on before any installation, maintenance or modification work.
- ▶ Do not introduce any objects into the unit and do not open the unit.
- ▶ Ensure that the service personnel is protected against inadvertent contact with parts carrying energy.

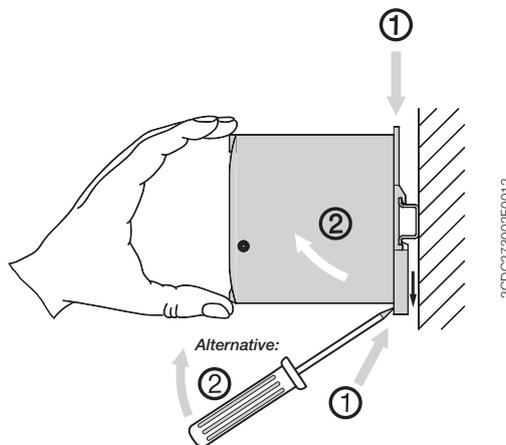
### Mounting

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 side on the upper edge of the mounting rail and locked by lifting it downwards.



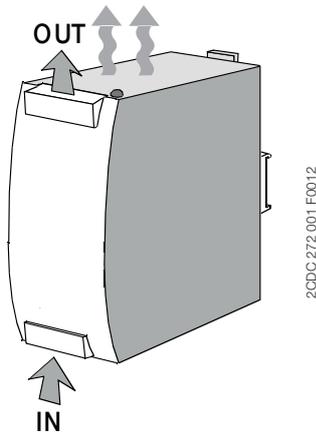
### Demounting

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. Alternatively the upperside of the latching lever can be pressed to release the device. Then in both cases the device can be unhinged from the mounting rail edge and removed.

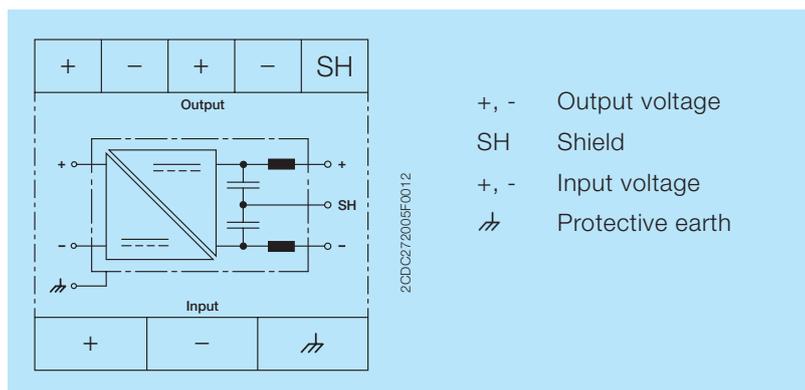


## Mounting position

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 should not be less than 15 mm (0.59 in) in vertical and 25 mm (0.98 in) horizontal direction.



## Electrical connection



### Preparations:

- Connect to mains according to the specific national regulations.
- Power supply cables and unit must be sufficiently fused. A disconnecting device has to be provided for the power supply to disengage unit and supply cables from supply mains if required.
- We recommend to choose the cable section as large as possible in order to minimize voltage drops.
- In order to ensure sufficient air-cooling the distance to other devices has to be considered.

### Instructions:

1. Connect the input terminals + and -.
2. Connect the protective earth conductor to terminal ⏏.
3. Provide a suitable disconnecting device (e.g. line protection switch) in the supply line acc. to IEC/EN 60950-1.
4. Rate the lines for the maximum output current (considering the short-circuit current) or provide a separate fuse protection. The input side is protected by an internal input fuse.
5. Observe the polarity.

Connect the 'shield' terminal on the AS-i power supply to the machine ground so that the AS-i system is symmetrically operated against this machine ground. This improves noise sensitivity in case of symmetrical interference on the AS-i cable. The device is overload, short-circuit and open-circuit proof. The secondary side of the power supply unit is electrically isolated from the input.

## Operation



**DANGER!**

**High current**

**Risk of electric arcs and electric shocks!**

- ▶ Do not modify the installation (primary and secondary side).
- ▶ Intended use.



**CAUTION!**

**Depending on the operation conditions the enclosure can become very hot**

**Risk of burns!**

- ▶ In order to ensure sufficient air-cooling the distance to other devices has to be considered.

The device is intended for use as a primary switch mode power supply for AS-interface systems. Any other usage is not supported by the manufacturer. Other usage may impair safety and cause operational difficulties or destruction of the unit.

## Service

The internal fuse is not user-replaceable. If the internal fuse blows, most probably the device is defective. In this case, an examination of the switch mode power supply by the manufacturer is necessary.

## Technical data

Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 24\text{ V DC}$  and rated values, unless otherwise indicated

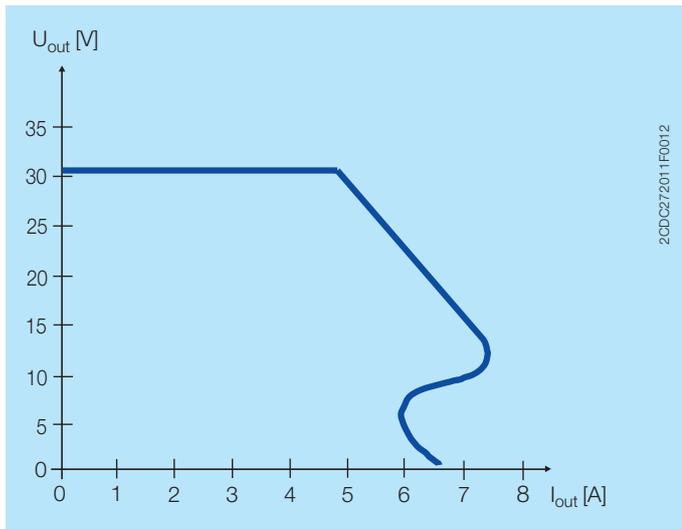
<b>Input circuit – Supply circuit</b>		<b>+, -</b>
Rated input voltage $U_{in}$		24 V DC
Input voltage range		18.0-32.4 V DC
Allowed voltage between input and earth (ground)		max. 60 V DC / 42.4 V AC
Allowed input ripple voltage		max. 5 $V_{pp}$ , 47 Hz - 40 kHz
Continuous input voltage with no damage to the DC/DC converter		max. 36.0 V DC
Turn-on voltage		typ. 17.5 V DC
Shut-down voltage		typ. 14.0 V DC
		typ. 35 V DC
Typical input current		5.6 A
Typical power consumption		132 W
Inrush current limiting / $I^2t$ (cold start)		< 1.8 A / approx. 1.0 A <sup>2</sup> /s
Power failure buffering time		max. 0.5 ms
Transient overvoltage protection		varistor
Reverse input polarity protection		included, unit does not start at reversed polarity
Internal input fuse		10 A slow acting
<b>Indication of operational states</b>		
Output voltage	AS-I OK	LED green
<b>Output circuit</b>		<b>+, -</b>
Rated output power		122 W
Rated output voltage		30.5 V DC
Tolerance of the output voltage		± 3 %
Rated output current $I_o$	$T_a \leq 60\text{ °C}$	4.0 A
Derating of the output current	$60\text{ °C} < T_a \leq 70\text{ °C}$	2.5 % / °C
Control time		< 2 ms
Starting time after applying the supply voltage		max. 1 s (typ. 650 ms)
Rise time	at rated load	typ. 100 ms
	with 5 mF	typ. 200 ms
Residual ripple	BW = 500 kHz	typ. < 50 mV <sub>pp</sub>
Switching peaks	BW = 20 Hz - 20 MHz	typ. < 100 mV <sub>pp</sub>
<b>Output circuit – No-load, overload and short-circuit behaviour</b>		
Characteristic curve of output		U/I characteristic curve
Short-circuit protection		continuous short-circuit stability
Short-circuit behavior		continuation with output power limiting
Current limiting at short circuit	min / max	5.0 A / 9.0 A
Overload protection		output power limiting
No-load protection		continuous no-load stability
Overtemperature protection		yes, automatic recovery after temperature went down

<b>General data</b>		
MTBF		on request
Power dissipation		typ. < 12.7 W (24 V DC, 4.0 A)
Efficiency		typ. 90.5 %
Duty time		100 %
Dimensions (W x H x D)	product dimensions	40 x 131 x 107 mm (1.58 x 5.16 x 4.21 in)
	packaging dimensions	151 x 65 x 140 mm (5.94 x 2.56 x 5.51 in)
Weight	net weight	0.488 kg (1.076 lb)
	gross weight	0.750 kg (1.287 lb)
Material of housing		metal
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool
Mounting position		horizontal
Minimum distance to other units	horizontal / vertical	15 mm / 25 mm (0.59 / 0.99 in)
Degree of protection	housing / terminals	IP 20
Protection class		I
<b>Electrical connection</b>		
Wire size	fine-strand with wire end ferrule	0.5-4 mm <sup>2</sup> (20-12 AWG)
	fine-strand without wire end ferrule	0.5-4 mm <sup>2</sup> (20-12 AWG)
	rigid	0.5-6 mm <sup>2</sup> (20-10 AWG)
Stripping length		7 mm (0.28 in)
Tightening torque		0.8 Nm (7.08 lb.in)
<b>Environmental data</b>		
Ambient temperature ranges	operation	-25...+70 °C
	rated load	-25...+60 °C
	storage	-40...+85 °C
Vibration		2-17.8 Hz, amplitude ± 1.6 mm
	sinusoidal (IEC/EN 60068-2-6)	17.8 Hz - 500 Hz, 2 g
Shock, half-sine (IEC/EN 60068-2-27)		30 g (6 ms), 20 g (11 ms)
<b>Isolation data</b>		
Rated insulation voltage $U_i$ (IEC/EN 60950-1, EN 50178)	input / output	50 V
	input / ground	50 V
	output / ground	50 V
	shield / output	50 V
	shield / ground	50 V
Rated impulse withstand voltage $U_{imp}$ (EN 50178)	input / output	1.5 kV 1.2/50 µs
	input / ground	0.8 kV 1.2/50 µs
	output / ground	500 V 1.2/50 µs
Power-frequency withstand voltage test (test voltage) (routine test / type test)	input / output	1.5 kV AC / 1.5 kV AC
	input / ground	1.5 kV AC / 1.5 kV AC
	output / ground	500 V AC / 500 V AC
Pollution degree (IEC/EN 60950-1)		2
Overvoltage category (IEC/EN 60950-1, EN 50178)	input	II (IEC/EN 60950-1), III (EN 50178)
	output	II (IEC/EN 60950-1), II (EN 50178)
<b>Standards / Directives</b>		
EMC Directive		2014/30/EU
RoHS Directive		2011/65/EU

<b>Electromagnetic compatibility</b>		
Interference immunity to		IEC/EN 61000-6-2
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	input circuit: Level 3 (2 kV) output circuit: Level 2 (1 kV)
surge	IEC/EN 61000-4-5	input circuit: L-L Level 2 (1 kV) / L-PE Level 3 (2 kV) output circuit: Level 1 (0.5 kV)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 (10 V, 150 kHz - 80 MHz)
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

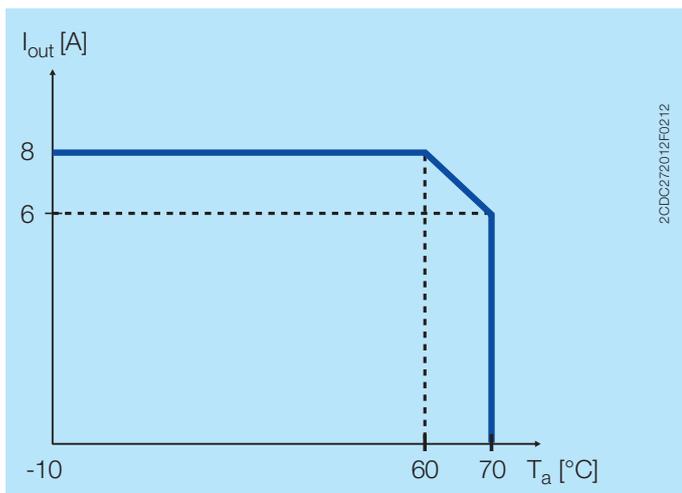
## Technical diagrams

### Output behaviour



Characteristic curve of output at  $T_a = 25\text{ °C}$

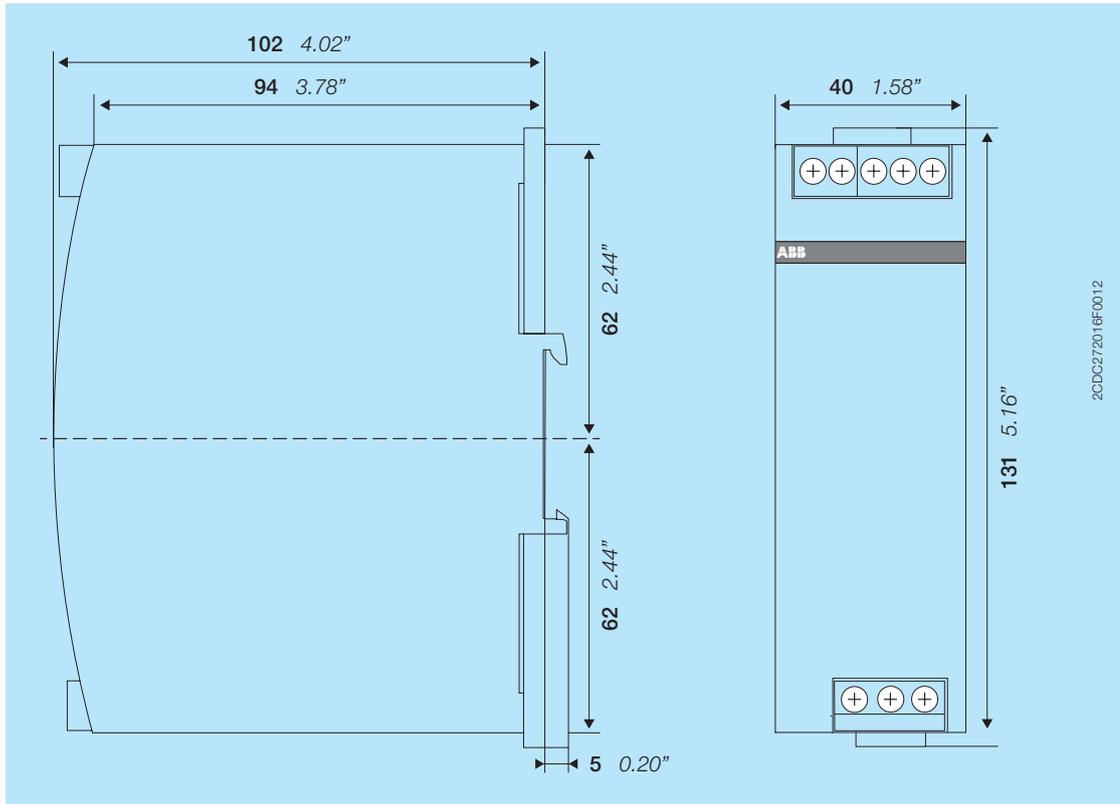
### Temperature behaviour



Characteristic curve of temperature at rated load

## Dimensions

in **mm** and inches



## 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
CP-ASI/4.0 DC/DC	Instruction manual	1SVC 427 091 M0000

You can find the documentation on the internet at [www.abb.com/lowvoltage](http://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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