

CATALOG

# CP-S.1 power supply range

## Primary switch mode power supplies



- Space-saving design and small footprint
- High efficiency and long product lifetime
- Power reserve functionality to start heavy loads
- Worldwide approvals, incl. marine

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**The new family of CP-S.1 power supplies are the right fit for OEM machine building applications. Space-saving design, a complete 24 V DC offering of up to 960 W and a metal enclosure perfectly matches the high requirements of this segment.**

**Together with CP-C.1, CP-E and CP-D, ABB can provide complete and suitable power supply solutions for all applications - from high-end to economic - from industry control to building segment. ABB is your reliable power supplier partner globally.**

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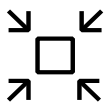
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# CP-S.1 power supply range

## Benefits and advantages



CP-S.1 power supplies: high efficiency and reliability delivered in a compact footprint. Designed for a huge variety of applications, including machine building segments, this advanced range boosts an integrated 150 % power reserve for five seconds and operates at an efficiency of up to 94 %. With overheat protection, active power factor correction, a broad certified AC and DC input range and extensive worldwide approvals including marine, the all-new CP-S.1 power supplies are a preferred choice for multiple industrial applications.



**Space saving**

### Outstanding power to space ratio

In comparison to other power supply ranges on the market, ABB's CP-S.1 range achieves space savings up to 50 %. Together with the high-efficiency and reduced power losses features, CP-S.1 is a space and cost saving solution for applications where size matters.



**Continuous operation**

### System reliability

The power reserve functionality provides additional power of starting heavy loads. CP-S.1 offers 150 % of the nominal current for five seconds to start e.g. heavy loads reliably. Together with ABBs redundancy modules CP-C.1-A-RU as well as buffer modules CP-B range - buffering the load in case of power losses on grid side - increase the availability and finally the system reliability further. Coated PCBA completes CP-S.1 range offering for OEM machine builders.



**Global availability**

### Global availability

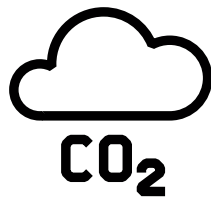
CP-S.1 range can be used in multiple installations in the world. A certified wide AC and DC input voltage range as well as a variety of approvals incl. marine, giving you the confidence of world-wide sourcing – no matter where you build, install or operate your equipment.

## CP-S.1 power supply range

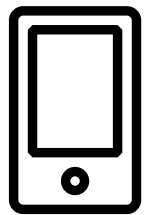
### CO<sub>2</sub> reduction



CP-S.1 power supplies operate at an astonishing efficiency of up to 94%. By increasing the efficiency by just 2 %, 1,4 tons of CO<sub>2</sub> can be saved over the lifetime of ten years of a 40 A power supply at nominal load. This corresponds to the CO<sub>2</sub> emissions of 167.000 numbers of smartphone charges.



**1400**  
kilograms of CO<sub>2</sub>  
reduction over the  
lifetime



**>160,000**  
Smartphones  
charged



#### Main benefits

##### Complete offering

A complete 24 V DC offering from 3 A up to 40 A in metal enclosure suits perfectly to OEM machine building requirements.

##### Small footprint

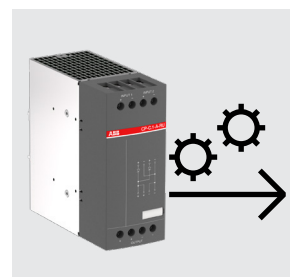
CP-S.1 power supplies can save the valuable installation space of the control cabinet due to compact design and high efficiency.

##### Robust design

Coated PCBA and marine certification enable CP-S.1 power supplies being the perfect match for e.g. Wind, Solar, Marine applications.

##### Redundancy units

True redundancy could be achieved by using the optional redundancy unit CP-C.1-A-RU.



# CP-S.1 power supplies

## Operating controls

**OUTPUT L+, L-:**  
Output terminals  
24 V DC

**OUTPUT Adjust:**  
Rotary potentiometer - Adjustment of  
output voltage  
24-28 V DC

**Circuit diagram**

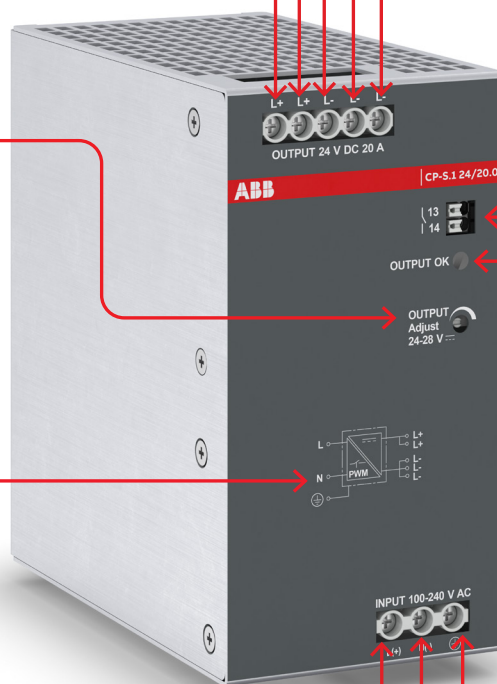
**Additional L(-)  
terminal for e.g.  
grounding**

**13-14: Relay output**  
Relay output to  
signal 'Output OK'

**OUTPUT OK: green  
LED for indication of  
24 V DC**

- on: output voltage  
>92% of adjusted  
voltage
- flashes: output  
voltage <90% of  
adjusted voltage

**INPUT L(+), N(-), PE\*:**  
Input terminals  
100 - 240 V AC /  
100 - 250 V DC





**CP-S.1 power supplies not only take up less space in the control cabinet, but also help reduce environmental impact.**





# CP-S.1 power supplies

## Selection table

|                      |                             | Order number | 1SVR320361R1000 | 1SVR320561R1000 | 1SVR320661R1000 | 1SVR320761R1000 | 1SVR320861R1000 |
|----------------------|-----------------------------|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                      |                             |              | CP-S.1          |                 |                 |                 |                 |
| Rated output current | 3 A                         | ■            |                 |                 |                 |                 |                 |
|                      | 5 A                         |              | ■               |                 |                 |                 |                 |
|                      | 10 A                        |              |                 | ■               |                 |                 |                 |
|                      | 20 A                        |              |                 |                 |                 | ■               |                 |
|                      | 40 A                        |              |                 |                 |                 |                 | ■               |
| Rated output power   | 72 W                        | ■            |                 |                 |                 |                 |                 |
|                      | 120 W                       |              | ■               |                 |                 |                 |                 |
|                      | 240 W                       |              |                 | ■               |                 |                 |                 |
|                      | 480 W                       |              |                 |                 |                 | ■               |                 |
|                      | 960 W                       |              |                 |                 |                 |                 | ■               |
| Rated input voltage  | 100-240 V AC                | ■            | ■               | ■               | ■               | ■               |                 |
|                      | 100-250 V DC                | ■            | ■               | ■               | ■               | ■               |                 |
|                      | 110-240 V AC                |              |                 |                 |                 |                 | ■               |
|                      | 110-250 V DC                |              |                 |                 |                 |                 | ■               |
| Features             | Power reserve design        | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Adjustable output voltage   | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Integrated input fuse       | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Short-circuit stable        | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Fold-forward behavior (U/I) | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Fold-back behavior (hiccup) |              |                 |                 |                 |                 |                 |
|                      | Power factor correction     | no           | act             | act             | act             | act             | act             |
|                      | Signalling contact          | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Extended temp. range        | ■            | ■               | ■               | ■               | ■               | ■               |
|                      | Parallel connection         | 3            | 3               | 3               | 3               | 3               | 3               |
|                      | Serial connection           | 2            | 2               | 2               | 2               | 2               | 2               |
|                      | Coated PCBA                 | ■            | ■               | ■               | ■               | ■               | ■               |

pas = passive, act = active



### Characteristics

- Rated supply voltage range from 100-240 V AC / 100-250 V DC
- Rated output voltage 24 V DC
- Rated output current of 3.0 A, 5.0 A, 10.0 A, 20.0 A and 40.0 A
- High efficiency of up to 94 %
- Power reserve design of 150 % for 5 s
- Output voltage adjustable via front-face rotary potentiometer "OUTPUT Adjust", 24-28 V
- Low power dissipation and low heating
- Free convection cooling (no forced cooling)
- Coated PCBAs
- Open-circuit, overload and short-circuit protection
- Integrated input fuse
- DC OK - signaling output "13-14" (relay)
- CP-C.1-A-RU redundancy unit offers true redundancy, available as accessory
- Various approvals and marks



Thanks to their small footprint and high efficiency, CP-S.1 power supplies are versatile and with their wide application range, they can be found everywhere, including the ones listed below.

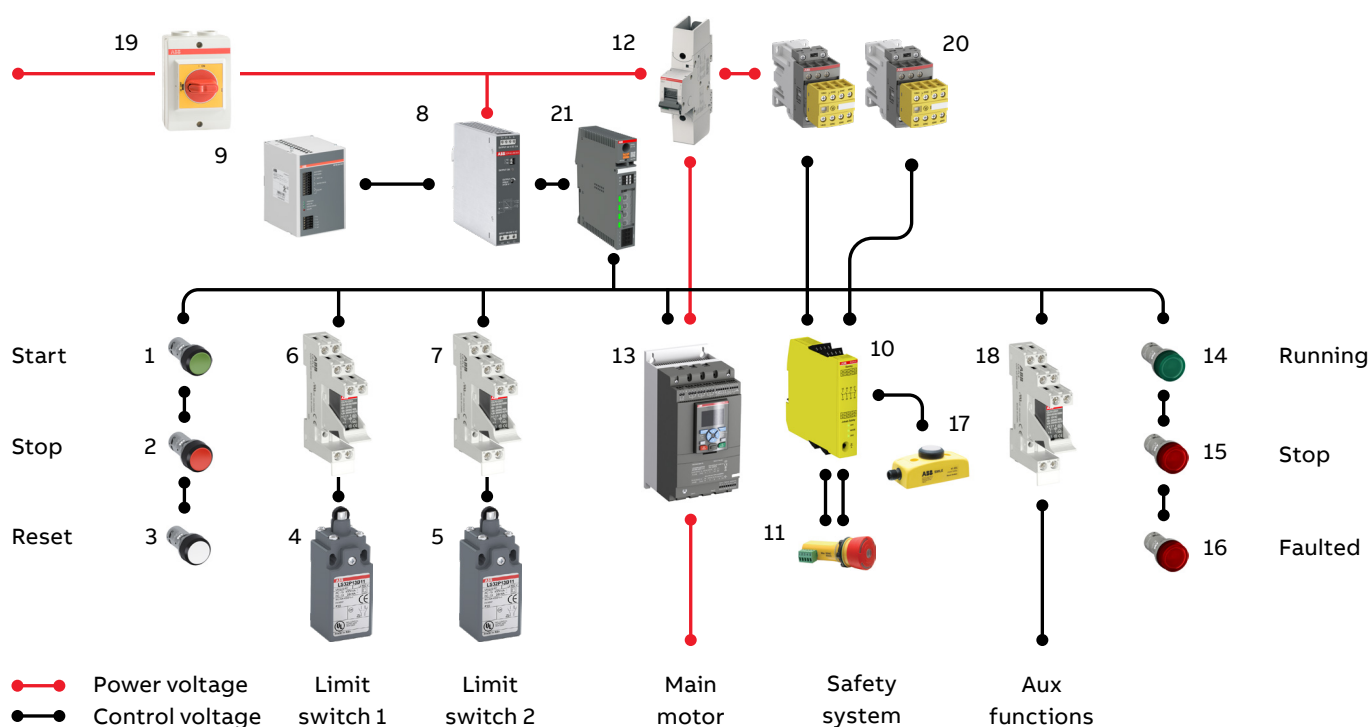
**Robotics****Material handling****Packaging****EV charging****Food & Beverage****Genset/UPS****Marine****Renewables**

## CP-S.1 power supplies

## Application example Softstarter and Safety<sup>\*)</sup>

A sawmill or lumber mill is a facility where logs are processed into lumber. Modern sawmills use a motorized saw to cut logs lengthwise to make long pieces, and crosswise to determine length according to standard or custom sizes (dimension lumber). The "portable" sawmill is of simple operation. The log lies flat on a steel bed, and the motorized saw cuts the log horizontally along the length of the bed by the operator manually pushing the saw. The simplest type of sawmill consists of a chainsaw and a custom-made jig ("Alaskan sawmill"), with similar horizontal operation. Energy management is a point of great interest.

**Application example: Softstarter and Safety (SIL3/PLe, motor power/starting: <15 kW)**



| #  | Order code      | Description                                                                                                                                          |
|----|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 1SFA619100R1012 | Pushbutton CP1-10G-10                                                                                                                                |
| 2  | 1SFA619100R1041 | Pushbutton CP1-10R-01                                                                                                                                |
| 3  | 1SFA619100R1015 | Pushbutton CP1-10W-10                                                                                                                                |
| 4  | 1SBV010510R1211 | Limit switch 30 mm wide, 1 ISO M 16x1.5 cable entry on the bottom, plain plastic plunger actuator and 1 N.O. + 1 N.C. snap action (Zb type) contacts |
| 5  | 1SBV010510R1211 | Limit switch 30 mm wide, 1 ISO M 16x1.5 cable entry on the bottom, plain plastic plunger actuator and 1 N.O. + 1 N.C. snap action (Zb type) contacts |
| 6  | 1SVR405600R1000 | Pluggable interface relay CR-P024DC1 1c/o, A1-A2 = 24 V DC, 250 V/16 A with socket                                                                   |
| 7  | 1SVR405600R1000 | Pluggable interface relay CR-P024DC1 1c/o, A1-A2 = 24 V DC, 250 V/16 A with socket                                                                   |
| 8  | 1SVR320661R1000 | Power supply CP-S.1 24/10.0, In: 100-240 V AC, 100 - 250 V DC, Out: 24 V DC                                                                          |
| 9  | 1SVR427060R1000 | Buffer module CP-B 24/10.0, 24 V DC / 10 A, energy storage 13.700 Ws                                                                                 |
| 10 | 2TLA010050R0000 | Sentry safety relay SSR10 24 V                                                                                                                       |
| 11 | 2TLA030054R0100 | Emergency stop INCA 1                                                                                                                                |
| 12 | 2CCS861002R0064 | High-performance miniature circuit breaker S801S-C6-R                                                                                                |
| 13 | 1SFA898103R7000 | Softstarter PSTX30-600-70                                                                                                                            |
| 14 | 1SFA619403R5022 | Pilot light CL2-502G 24 V AC/DC                                                                                                                      |
| 15 | 1SFA619403R5021 | Pilot light CL2-502R 24 V AC/DC                                                                                                                      |
| 16 | 1SFA619403R5021 | Pilot light CL2-502R 24 V AC/DC                                                                                                                      |
| 17 | 2TLA030053R0000 | Reset button Smile 11 RA                                                                                                                             |
| 18 | 1SVR405600R1000 | Pluggable interface relay CR-P024DC1 1 c/o, A1-A2 = 24 V DC, 250 V/16 A with socket                                                                  |
| 19 | 1SCA022399R6590 | Safety switch OTP16KA3M                                                                                                                              |
| 20 | 1SBL176082R3022 | 2x Contactor AFS16Z-30-22-30 24 V DC                                                                                                                 |
| 21 | 2CDE601102R0110 | Electronic protection device Entry EPD24-E4 1-10                                                                                                     |

\*) Disclaimer: This bill of material shows one possible combination of devices. It should not be used in real projects without taking technical and other guidelines into account.  
Please select the size of devices including power supplies according to the specific requirements of the application.

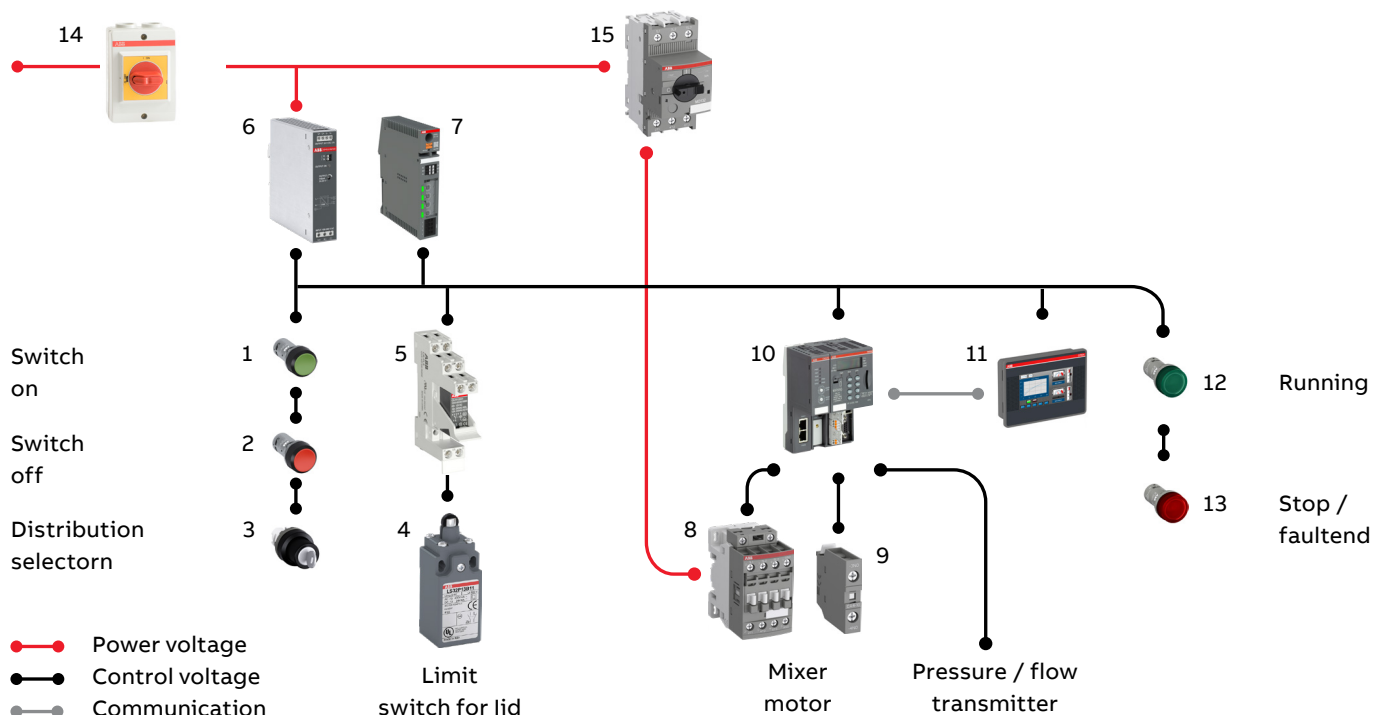


# CP-S.1 power supplies

## Application example food & beverage<sup>\*)</sup>

The term mixer refers to containers which are filled with liquids and / or solids and then rotate to mix the contents. Mixers are used extensively not only in the food and beverage sector but also in many other applications like chemicals and road construction. In many mixers, heating and/or cooling may also be required. Subjected to application requirements, mixer control systems are working independently or connected to PLCs /DCS. Safety and F&B standards are very important for mixers.

### Application example: Mixers (motor power/starting: 3 kW / direct-online starter (DOL))



| #  | Order code      | Desription                                                                                                                             |
|----|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1  | 1SFA619100R1012 | Pushbutton CP1-10G-10                                                                                                                  |
| 2  | 1SFA619100R1041 | Pushbutton CP1-10R-01                                                                                                                  |
| 3  | 1SFA611284R1001 | Selector switch M3SSK2-101                                                                                                             |
| 4  | 1SBV010310R1211 | 30 mm wide, 1 ISO M16 x 1.5 cable entry on the bottom, plain plastic plunger actuator and 1 N.O + 1 N.C snap action (Zb type) contacts |
| 5  | 1SVR405600R1000 | Pluggable interface relay CR-P024DC1 1c/o, A1-A2=24 V DC, 250 V/16 A with socket                                                       |
| 6  | 1SVR320361R1000 | Power supply CP-S.1 24/10.0 In: 100-240 V AC Out: 24 V DC/10.0 A                                                                       |
| 7  | 2CDE601102R0110 | Electronic protection device Entry EPD24-E4 1-10                                                                                       |
| 8  | 1SBL237001R1100 | Contacteur AF26-30-00-11, 24-60 V 50/60 Hz 20-60 V DC                                                                                  |
| 9  | 1SBN010110R1010 | Auxiliary contact block CA4-10                                                                                                         |
| 10 | 1SAP111100R0270 | Scalable PLC AC500, CPU PM592-ETH with PROFINET IO CM579-PNIO                                                                          |
| 11 | 1SAP504100R0001 | CP604 Control Panel 4.3" TFT touch screen                                                                                              |
| 12 | 1SFA619403R5022 | Pilot light CL2-502G 24 V AC/DC                                                                                                        |
| 13 | 1SFA619403R5021 | Pilot light CL2-502R 24 V AC/DC                                                                                                        |
| 14 | 1SCA022399R6590 | Safety switch OTP16KA3M                                                                                                                |
| 15 | 1SAM350000R1010 | Manual Motor Starter MS132-10                                                                                                          |

<sup>\*)</sup> Disclaimer: This bill of material shows one possible combination of devices. It should not be used in real projects without taking technical and other guidelines into account. Please select the size of devices including power supplies according to the specific requirements of the application.





# CP-S.1 power supplies

## Ordering details



CP-S.1 24/3.0



CP-S.1 24/20.0



CP-C.1-A-RU

### Description

ABB's new generation of CP-S.1 power supplies for machine building applications deliver high efficiency, high reliability and a minimized footprint. This advanced range of power supplies has an integrated 150 % power reserve functionality for up to 5 s and operate at an efficiency of up to 94 %. They come equipped with overheat protection and active power factor correction\*, combined with a broad AC and DC input voltage range and extensive worldwide approvals. Make the all-new CP-S.1 power supplies your preferred choice for professional DC applications. UL listing as well as marine approvals complete the assortment offering.

CP-S.1 power supplies have a rated output voltage of 24 V DC that is adjustable via a front-face rotary potentiometer "OUTPUT Adjust". The power supplies are available with rated output currents of 3.0 A, 5.0 A, 10 A, 20 A and 40 A. The rated output power ranges from 72 - 960 W and the rated supply voltage range from 100-240 V AC / 100-250 V DC. The typical efficiency is up to 94 % with low power dissipation and low heating. CP-S.1 power supplies have free convection cooling (no forced cooling with ventilators) and operate at an ambient temperature range from -25...+60 °C without derating (+70 °C with derating). They feature an open-circuit and are overload and short-circuit stable as well as an integrated input fuse.

Additionally, true redundancy for critical applications can be achieved with the optional redundancy units CP-C.1-A-RU which is available as an accessory. One LED on the front of the power supplies indicates the status and a transistor DC OK - signalling output "13-14".

### Ordering details

| Description    | Rated input voltage        | Rated output voltage | Rated output current | Output power | Order code      |
|----------------|----------------------------|----------------------|----------------------|--------------|-----------------|
| CP-S.1 24/3.0  | 100-240 V AC, 100-250 V DC | 24 V DC              | 3.0 A                | 72 W         | 1SVR320361R1000 |
| CP-S.1 24/5.0  |                            |                      | 5.0 A                | 120 W        | 1SVR320561R1000 |
| CP-S.1 24/10.0 |                            |                      | 10.0 A               | 240 W        | 1SVR320661R1000 |
| CP-S.1 24/20.0 |                            |                      | 20.0 A               | 480 W        | 1SVR320761R1000 |
| CP-S.1 24/40.0 | 110-240 V AC, 110-250 V DC |                      | 40.0 A               | 960 W        | 1SVR320861R1000 |
| CP-C.1-A-RU    | 10 - 56 V DC               | 12 - 48 V DC         | 2 x 20 A or 1 x 40 A | -            | 1SVR360060R1001 |

\*) Not equipped with 72 W variant (3A).

# CP-S.1 power supplies

## Technical details

Data at  $T_a = 25^\circ\text{C}$  and rated values ( $U_{in} = 230\text{ V AC}$ ), unless otherwise indicated

| Type                                                   |                                                       |                                | CP-S.1 24/3.0                                                                                                                                    | CP-S.1 24/5.0      | CP-S.1 24/10.0      | CP-S.1 24/20.0      | CP-S.1 24/40.0                             |
|--------------------------------------------------------|-------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|---------------------|--------------------------------------------|
| Input circuit - Supply circuit (L(+), N(-))            |                                                       |                                |                                                                                                                                                  |                    |                     |                     |                                            |
| Rated input voltage U <sub>in</sub>                    |                                                       |                                | 100 - 240 V AC, 100 - 250 V DC                                                                                                                   |                    |                     |                     | 110 - 240 V AC, 110 - 250 V DC             |
| Input voltage range                                    |                                                       |                                | 85 - 264 V AC / 90 - 277 V DC                                                                                                                    |                    |                     |                     | 103 - 264 V AC / 103 - 277 V DC            |
| Input current range at rated output power              | 100 - 240 V AC                                        |                                | 0.95 - 1.46 A                                                                                                                                    | 0.67 - 1.45 A      | 1.25 - 2.8 A        | 2.55 - 5.8 A        | 5.0 - 11.5 A                               |
|                                                        | 100 - 250 V DC                                        |                                | 0.35 - 1.0 A                                                                                                                                     | 0.58 - 1.63 A      | 1.12 - 3.15 A       | 2.28 - 6.4 A        | 4.48 - 13.5 A                              |
| Typical input current                                  | at 115 V AC                                           |                                | 1.52 A                                                                                                                                           | 1.24 A             | 2.45 A              | 4.85 A              | 9.5 A                                      |
|                                                        | at 230 V AC                                           |                                | 0.95 A                                                                                                                                           | 0.67 A             | 1.25 A              | 2.55 A              | 5.0 A                                      |
| Max. power consumption                                 | at 230 V AC                                           |                                | 82 W                                                                                                                                             | 132 W              | 258 W               | 517 W               | 1,022 W                                    |
| Rated frequency                                        |                                                       |                                | DC, 50 / 60 Hz                                                                                                                                   |                    |                     |                     |                                            |
| Frequency range                                        |                                                       |                                | AC 45 - 65 Hz                                                                                                                                    |                    |                     |                     |                                            |
| Inrush current limiting, cold state                    |                                                       |                                | ≤ 11 A                                                                                                                                           | ≤ 11 A             | ≤ 11 A              | ≤ 12.8 A            | ≤ 19 A                                     |
| Let-through energy I <sup>2</sup> t, cold state        |                                                       |                                | at 230 V AC < 1.5 A²s                                                                                                                            | < 1.2 A²s          | < 1.7 A²s           | < 3 A²s             | < 5 A²s                                    |
| Discharge current towards PE                           |                                                       |                                | < 3.5 mA                                                                                                                                         |                    |                     |                     |                                            |
| Hold-up time                                           | at 115 V AC                                           |                                | > 10 ms                                                                                                                                          | > 20 ms            | > 15 ms             | > 15 ms             | > 20 ms                                    |
|                                                        | at 230 V AC                                           |                                | > 20 ms                                                                                                                                          | > 30 ms            | > 20 ms             | > 20 ms             | > 20 ms                                    |
| Internal input fuse                                    |                                                       |                                | Yes                                                                                                                                              |                    |                     |                     |                                            |
| Recommended backup fuse for wire protection at 1.5 mm² |                                                       |                                | 1 pole miniature circuit breaker ABB type S 200 (for USA/CAN: use appropriate branch circuit 20 A fuse acc. to regional and national regulation) |                    |                     |                     |                                            |
| characteristic                                         |                                                       |                                | B or C                                                                                                                                           |                    |                     |                     |                                            |
| max. rating                                            |                                                       |                                | 16 A                                                                                                                                             |                    |                     |                     |                                            |
| Power Factor Correction (PFC)                          |                                                       |                                | no                                                                                                                                               | yes, active        |                     |                     |                                            |
| Transient over-voltage protection                      |                                                       |                                | yes, varistor                                                                                                                                    |                    |                     |                     |                                            |
| User interface - Indication of operational states      |                                                       |                                |                                                                                                                                                  |                    |                     |                     |                                            |
| Output voltage                                         | LED ,OUTPUT OK'                                       | Green                          | > 92 % adjusted U <sub>out</sub>                                                                                                                 |                    |                     |                     |                                            |
|                                                        | LED ,OUTPUT OK'                                       | Flash                          | < 90 % adjusted U <sub>out</sub>                                                                                                                 |                    |                     |                     |                                            |
| Output circuits - power output (L+, L-)                |                                                       |                                |                                                                                                                                                  |                    |                     |                     |                                            |
| 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                                     |                                                       |                                | 72 W                                                                                                                                             | 120 W              | 240 W               | 480 W               | 960 W                                      |
| Rated output current I <sub>R</sub>                    | -25°C ≤ T <sub>a</sub> ≤ 60 °C                        |                                | 3 A                                                                                                                                              | 5 A                | 10 A                | 20 A                | -                                          |
|                                                        | -25°C ≤ T <sub>a</sub> ≤ 55 °C                        |                                | -                                                                                                                                                |                    |                     |                     | 40 A                                       |
| Dynamic Boost output current                           | -25°C ≤ T <sub>a</sub> ≤ 60 °C                        |                                | 4.5 A (5 s) /                                                                                                                                    | 7.5 A (5 s) /      | 15 A (5 s)          | 30 A (5 s)          | 60 A (5 s) / -25°C ≤ T <sub>a</sub> ≤ 55°C |
| Short-circuit current limiting                         |                                                       |                                | < 5.2 A                                                                                                                                          | < 8.62 A           | < 17.25 A           | < 34.5 A            | < 70 A                                     |
| Derating of the output current                         | 60 °C ≤ T <sub>a</sub> ≤ 70 °C                        |                                | 2.5 % / K                                                                                                                                        |                    |                     |                     | -                                          |
|                                                        | 55 °C ≤ T <sub>a</sub> ≤ 70 °C                        |                                | -                                                                                                                                                |                    |                     |                     | 2 % / K                                    |
| Deviation width of output voltage                      | Load effect/ load regulation                          | static load change: 25 - 100 % | < 1 %                                                                                                                                            | < 1 %              | < 1 %               | < 1 %               | < 1 %                                      |
|                                                        |                                                       | dynamic load change:           | 0 % - 100 %: < 3 %                                                                                                                               | 0 % - 100 %: < 3 % | 10 % - 100 %: < 3 % | 10 % - 100 %: < 5 % | 10 % - 100 %: < 3 %                        |
|                                                        | Transient response of voltage to load current changes | recovery time T <sub>R</sub>   | < 1 ms                                                                                                                                           | < 1 ms             | < 1 ms              | < 1 ms              | < 1 ms                                     |
|                                                        |                                                       | Change of input voltage        | within the rated input voltage                                                                                                                   | < 0.5%             | < 0.5%              | < 0.5%              | < 0.5%                                     |
| Starting time after applying the supply voltage        |                                                       |                                | < 1,500 ms                                                                                                                                       | < 1,500 ms         | < 1,500 ms          | < 1,500 ms          | < 1,500 ms                                 |
| Residual ripple and switching peaks                    |                                                       |                                | BW = 20 MHz < 75 mV <sub>pp</sub> , class A                                                                                                      |                    |                     |                     |                                            |
| Parallel connection                                    |                                                       |                                | yes, up to 3                                                                                                                                     |                    |                     |                     |                                            |
| Series connection                                      |                                                       |                                | yes, 2                                                                                                                                           |                    |                     |                     |                                            |



# CP-S.1 power supplies

## Technical details

| Type                                                    |                                        | CP-S.1 24/3.0                                                                                                          | CP-S.1 24/5.0                          | CP-S.1 24/10.0                         | CP-S.1 24/20.0                                           | CP-S.1 24/40.0                         |
|---------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------------------------|----------------------------------------|
| No-load, overload and short-circuit behavior            |                                        |                                                                                                                        |                                        |                                        |                                                          |                                        |
| Characteristic curve of output                          |                                        | U/I characteristic curve                                                                                               |                                        |                                        | U/I characteristic curve combined with foldback behavior |                                        |
| Short-circuit protection                                |                                        | continuous short-circuit stability                                                                                     |                                        |                                        |                                                          |                                        |
| Short-circuit behavior                                  |                                        | current limiting                                                                                                       |                                        |                                        |                                                          |                                        |
| Resistance to reverse feed                              |                                        | ≤ 35 V DC                                                                                                              |                                        |                                        |                                                          |                                        |
| Overvoltage protection                                  |                                        | yes, < 35 V                                                                                                            |                                        |                                        |                                                          |                                        |
| Overload protection                                     |                                        | constant current limitation                                                                                            |                                        |                                        |                                                          |                                        |
| Overtemperature protection                              |                                        | protection by switch off in case of overtemperature (thermal)                                                          |                                        |                                        |                                                          |                                        |
| No-load protection                                      |                                        | continuous no-load stability                                                                                           |                                        |                                        |                                                          |                                        |
| Starting of capacitive loads                            |                                        | Yes                                                                                                                    |                                        |                                        |                                                          |                                        |
| Signaling outputs - OUTPUT OK signaling output          |                                        |                                                                                                                        |                                        |                                        |                                                          |                                        |
| Type of output                                          | 13 - 14                                | relay, n/o contact                                                                                                     |                                        |                                        |                                                          |                                        |
| ON (contact closed)                                     |                                        | 92 % adjusted U <sub>out</sub>                                                                                         |                                        |                                        |                                                          |                                        |
| OFF (contact open)                                      |                                        | 90 % adjusted U <sub>out</sub>                                                                                         |                                        |                                        |                                                          |                                        |
| Contact ratings                                         | max. switching voltage / current       | 30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)                                                                       |                                        |                                        |                                                          |                                        |
|                                                         | min. switching voltage / current       | 5 V DC / 1 mA                                                                                                          |                                        |                                        |                                                          |                                        |
| General data                                            |                                        |                                                                                                                        |                                        |                                        |                                                          |                                        |
| Efficiency                                              | at rated load                          | > 89 %                                                                                                                 | > 90 %                                 | > 93 %                                 | > 93 %                                                   | > 94 %                                 |
| Power losses                                            | at rated load                          | < 10 W                                                                                                                 | < 12 W                                 | < 18 W                                 | < 37 W                                                   | < 62 W                                 |
|                                                         | at 50 % of rated load                  | < 6.5 W                                                                                                                | < 9.5 W                                | < 14 W                                 | < 24 W                                                   | < 45 W                                 |
|                                                         | at no load                             | < 2.8 W                                                                                                                | < 3.5 W                                | < 5 W                                  | < 6 W                                                    | < 6.5 W                                |
| Duty time                                               |                                        | 100 %                                                                                                                  |                                        |                                        |                                                          |                                        |
| MTBF                                                    | acc. to MIL 217 HDBK GB 25             | on request                                                                                                             |                                        |                                        |                                                          |                                        |
| Dimensions (W x H x D)                                  |                                        | see dimensional drawings                                                                                               |                                        |                                        |                                                          |                                        |
| Material of housing                                     | cover                                  | zinc-coated sheet-steel                                                                                                |                                        |                                        |                                                          |                                        |
|                                                         | housing shell                          | aluminium                                                                                                              |                                        |                                        |                                                          |                                        |
|                                                         | front                                  | plastic, PC GE8B35, V0                                                                                                 |                                        |                                        |                                                          |                                        |
| Mounting                                                |                                        | DIN rail (IEC/EN 60715), snap-on mounting                                                                              |                                        |                                        |                                                          |                                        |
| Mounting position                                       |                                        | position 1 (standard orientation); other mounting positions possible with derating / deratings are available on demand |                                        |                                        |                                                          |                                        |
| Minimum distance to other units                         | horizontal                             | 30 mm                                                                                                                  |                                        |                                        |                                                          |                                        |
|                                                         | vertical                               | 50 mm                                                                                                                  |                                        |                                        |                                                          |                                        |
| Degree of protection (IEC/EN 60529)                     | housing / terminals                    | IP20 / IP20                                                                                                            |                                        |                                        |                                                          |                                        |
| Protection class (IEC/EN 61140)                         |                                        | I                                                                                                                      |                                        |                                        |                                                          |                                        |
| Electrical connection - Input circuits (L(+), N(-), PE) |                                        |                                                                                                                        |                                        |                                        |                                                          |                                        |
| Connecting capacity                                     | rigid                                  | 0.5-2.5 mm <sup>2</sup><br>(20-14 AWG)                                                                                 | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG) | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG) | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG)                   | 0.5-10.0 mm <sup>2</sup><br>(20-8 AWG) |
|                                                         | fine-strand with(out) wire end ferrule | 0.5-2.5 mm <sup>2</sup><br>(26-14 AWG)                                                                                 | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG) | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG) | 0.5-4.0 mm <sup>2</sup><br>(20-12 AWG)                   | 0.5-10.0 mm <sup>2</sup><br>(20-8 AWG) |
| Stripping length                                        |                                        | 9 mm                                                                                                                   | 9 mm                                   | 9 mm                                   | 9 mm                                                     | 10 mm                                  |
| Tightening torque                                       |                                        | 0.5 Nm<br>4.43 lb.in                                                                                                   | 0.5 Nm<br>4.43 lb.in                   | 0.5 Nm<br>4.43 lb.in                   | 0.5 Nm<br>4.43 lb.in                                     | 1.47 Nm<br>13.0 lb.in                  |
| Recommended screw driver                                |                                        | PH0 /<br>Ø 3.5 x 0.6 mm                                                                                                | PH1 /<br>Ø 4.0 x 0.8 mm                | PH1 /<br>Ø 4.0 x 0.8 mm                | PH1 /<br>Ø 4.0 x 0.8 mm                                  | PH2 /<br>Ø 5.5 x 1.0 mm                |

# CP-S.1 power supplies

## Technical details

| Type                                                                 |                                        | CP-S.1 24/3.0                                                                    | CP-S.1 24/5.0           | CP-S.1 24/10.0          | CP-S.1 24/20.0          | CP-S.1 24/40.0                   |
|----------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|----------------------------------|
| Output circuits (L+, L+, L-, L-)                                     |                                        |                                                                                  |                         |                         |                         |                                  |
| Stripping length                                                     |                                        | 9 mm                                                                             | 9 mm                    | 9 mm                    | 9 mm                    | 10 mm                            |
| Tightening torque                                                    |                                        | 0.5 Nm<br>4.43 lb.in                                                             | 1.13 Nm<br>10 lb.in     | 1.13 Nm<br>10 lb.in     | 1.13 Nm<br>10 lb.in     | 1.47 Nm<br>13.0 lb.in            |
| Recommended screw driver                                             |                                        | PH0 /<br>Ø 3.5 x 0.6 mm                                                          | PH1 /<br>Ø 4.0 x 0.8 mm | PH1 /<br>Ø 4.0 x 0.8 mm | PH1 /<br>Ø 4.0 x 0.8 mm | PH2 /<br>Ø 5.5 x 1.0 mm          |
| Signalling output (13-14)                                            |                                        |                                                                                  |                         |                         |                         |                                  |
| Connecting capacity                                                  | rigid                                  | 0.15 - 0.8 mm <sup>2</sup> (26 - 18 AWG)                                         |                         |                         |                         |                                  |
|                                                                      | fine-strand with(out) wire end ferrule | 0.15 - 0.8 mm <sup>2</sup> (26 - 18 AWG)                                         |                         |                         |                         |                                  |
| Stripping length                                                     |                                        | 7 mm                                                                             |                         |                         |                         |                                  |
| Connection terminals                                                 |                                        | push-in                                                                          |                         |                         |                         |                                  |
| Environmental data                                                   |                                        |                                                                                  |                         |                         |                         |                                  |
| Ambient temperature range                                            | operation                              | -25...+70 °C (-13... +158 °F)                                                    |                         |                         |                         |                                  |
|                                                                      | rated output power                     | -25...+60 °C (-13... +140 °F)                                                    |                         |                         |                         | -25...+55 °C<br>(-13... +131 °F) |
|                                                                      | storage                                | -40...+85 °C (-40... +185 °F)                                                    |                         |                         |                         |                                  |
|                                                                      | transportation                         | -40...+85 °C (-40... +185 °F)                                                    |                         |                         |                         |                                  |
| Climatic class (IEC/EN 60721-3-1)                                    | storage                                | 1K2                                                                              |                         |                         |                         |                                  |
| Climatic class (IEC/EN 60721-3-2)                                    | transportation                         | 2K2                                                                              |                         |                         |                         |                                  |
| Climatic class (IEC/EN 60721-3-3)                                    | operation                              | 3K3                                                                              |                         |                         |                         |                                  |
| Damp heat, cyclic (IEC/EN 60068-2-30)                                |                                        | test Db: 55 °C, 2 cycles                                                         |                         |                         |                         |                                  |
| Vibration (IEC/EN 60068-2-6)                                         |                                        | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis |                         |                         |                         |                                  |
| Shock, half-sine (IEC/EN 60068-2-27)                                 |                                        | test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis  |                         |                         |                         |                                  |
| Location classes (according DNVGL)                                   |                                        | temperature: B / humidity: B / vibration: A / enclosure: A                       |                         |                         |                         |                                  |
| Coated PCBA                                                          |                                        | yes                                                                              |                         |                         |                         |                                  |
| Isolation data                                                       |                                        |                                                                                  |                         |                         |                         |                                  |
| Rated impulse withstand voltage<br>U <sub>imp</sub> (IEC/EN 62477-1) | input circuit / output circuit         | 4 kV (1.2/50 µs)                                                                 |                         |                         |                         |                                  |
|                                                                      | input circuit / PE                     | 4 kV (1.2/50 µs)                                                                 |                         |                         |                         |                                  |
|                                                                      | input circuit / relay contact          | 4 kV (1.2/50 µs)                                                                 |                         |                         |                         |                                  |
|                                                                      | output circuit / relay contact         | 0.8 kV (1.2/50 µs)                                                               |                         |                         |                         |                                  |
|                                                                      | relay contact / PE                     | 0.8 kV (1.2/50 µs)                                                               |                         |                         |                         |                                  |
|                                                                      | output circuit / PE                    | 0.8 kV (1.2/50 µs)                                                               |                         |                         |                         |                                  |
| Rated insulation voltage U <sub>i</sub><br>(IEC/EN 62477-1)          | input circuit / output circuit         | 300 V                                                                            |                         |                         |                         |                                  |
|                                                                      | input circuit / PE                     | 300 V                                                                            |                         |                         |                         |                                  |
|                                                                      | input circuit / relay contact          | 300 V                                                                            |                         |                         |                         |                                  |
|                                                                      | output circuit / relay contact         | 50 V                                                                             |                         |                         |                         |                                  |
|                                                                      | relay contact / PE                     | 50 V                                                                             |                         |                         |                         |                                  |
|                                                                      | output circuit / PE                    | 50 V                                                                             |                         |                         |                         |                                  |
| Overvoltage category<br>(IEC/EN 62477-1)                             | < 2000 m                               | III                                                                              |                         |                         |                         |                                  |
|                                                                      | 2000...5000 m                          | II                                                                               |                         |                         |                         |                                  |
| Overvoltage category<br>(IEC/EN 61010-1/IEC/<br>EN 61010-2-201)      | < 2000 m                               | II                                                                               |                         |                         |                         |                                  |
|                                                                      | 2000 ...5000 m                         | II                                                                               |                         |                         |                         |                                  |
| Pollution degree                                                     | input circuit / ground                 | 2                                                                                |                         |                         |                         |                                  |
| Protective separation<br>IEC/EN 61010-1, 61010-2-201                 | input circuit / output circuit         | yes                                                                              |                         |                         |                         |                                  |
|                                                                      | input circuit / relay output           | yes                                                                              |                         |                         |                         |                                  |

# CP-S.1 power supplies

## Technical details

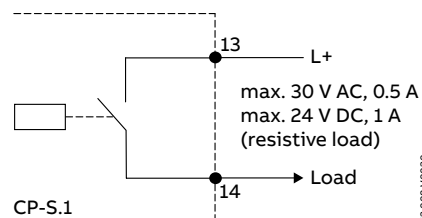
| Type                                                                                                                                            | CP-S.1 24/3.0                                                                        |                                                                         | CP-S.1 24/5.0 | CP-S.1 24/10.0 | CP-S.1 24/20.0 | CP-S.1 24/40.0 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------|----------------|----------------|----------------|
| Standards / Directives                                                                                                                          |                                                                                      |                                                                         |               |                |                |                |
| Low Voltage Directive                                                                                                                           | 2014/35/EU, IEC/EN 61204                                                             |                                                                         |               |                |                |                |
| EMC directive                                                                                                                                   | 2014/30/EU                                                                           |                                                                         |               |                |                |                |
| RoHS directive                                                                                                                                  | 2011/65/EU incl. 2015/863/EU                                                         |                                                                         |               |                |                |                |
| WEEE directive                                                                                                                                  | 2012/19/EU                                                                           |                                                                         |               |                |                |                |
| Electrical safety                                                                                                                               | IEC/EN 61010-1. IEC/EN 61010-2-201                                                   |                                                                         |               |                |                |                |
| Process control equipment                                                                                                                       | UL 61010-1, UL 61010-2-201/ CAN/CSA C22.2 No. 61010-1-12, CAN/CSA-IEC 61010-2-201:18 |                                                                         |               |                |                |                |
| Protective extra low voltage                                                                                                                    | PELV_ IEC/EN 61010-2-201                                                             |                                                                         |               |                |                |                |
| Safety extra low voltage                                                                                                                        | SELV_ IEC/EN 61010-2-201                                                             |                                                                         |               |                |                |                |
| Limitation of harmonic line currents                                                                                                            | IEC/EN 61010-2-201                                                                   |                                                                         |               |                |                |                |
| Electromagnetic compatibility                                                                                                                   |                                                                                      |                                                                         |               |                |                |                |
| Low-voltage power supplies, d.c. output – Part 3:                                                                                               | IEC/EN 61204-3                                                                       |                                                                         |               |                |                |                |
| Electromagnetic compatibility (EMC)                                                                                                             |                                                                                      |                                                                         |               |                |                |                |
| Interference immunity to                                                                                                                        |                                                                                      | IEC/EN 61000-6-2                                                        |               |                |                |                |
| electrostatic discharge (ESD)                                                                                                                   | IEC/EN 61000-4-2                                                                     | contact discharge air discharge, level 4, 8 kV / 15 kV (criterion A)    |               |                |                |                |
| radiated, radio-frequency, electromagnetic field                                                                                                | IEC/EN 61000-4-3                                                                     | 80 to 1000 MHz, 10 V/m (criterion A), 1.4 to 6 GHz, 3 V/m (criterion A) |               |                |                |                |
| electrical fast transient / burst                                                                                                               | IEC/EN 61000-4-4                                                                     | level 4, 4 kV / 2 kV (criterion A)                                      |               |                |                |                |
| surge                                                                                                                                           | IEC/EN 61000-4-5                                                                     | level 4, L/N 3 kV (criterion A); level 4, L, N / PE 4 kV (criterion A)  |               |                |                |                |
| conducted disturbances, induced by radio-frequency fields                                                                                       | IEC/EN 61000-4-6                                                                     | level 3, 10 V (criterion A)                                             |               |                |                |                |
| voltage dips, short interruptions and voltage variations                                                                                        | IEC/EN 61000-4-11                                                                    | class 3                                                                 |               |                |                |                |
| harmonics and interharmonics                                                                                                                    | IEC/EN 61000-4-13                                                                    | class 3 (criterion A)                                                   |               |                |                |                |
| conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz                                                                      | IEC/EN 61000-4-1                                                                     | level 3, 10 V                                                           |               |                |                |                |
| Interference emission                                                                                                                           |                                                                                      | IEC/EN 61000-6-3; IEC/EN 61000-6-4                                      |               |                |                |                |
| limits for harmonic current emissions                                                                                                           | IEC/EN 61000-3-2                                                                     | class A                                                                 |               |                |                |                |
| limitation of voltage changes etc.                                                                                                              | IEC/EN 61000-3-3                                                                     | compliant                                                               |               |                |                |                |
| information technology equipment radio disturbance characteristics limits and methods of measurement                                            | EC/CISPR 32, EN 55032                                                                | class B                                                                 |               |                |                |                |
| industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement | EC/CISPR 11, EN 55011 EN 50204                                                       | class B                                                                 |               |                |                |                |
| Voltage sags                                                                                                                                    | SEMI F47-0706                                                                        | passed                                                                  |               |                |                |                |
| Federal Communications Commission                                                                                                               | FCC15                                                                                | compliant                                                               |               |                |                |                |
| EMC according DNV/GL                                                                                                                            | DNVGL-CG-0339                                                                        | all locations including bridge and open deck class B                    |               |                |                |                |
| Weight                                                                                                                                          | 550 g                                                                                | 690 g                                                                   | 830 g         | 1.355 g        | 2.490 g        |                |



# CP-S.1 power supplies

## Technical diagrams

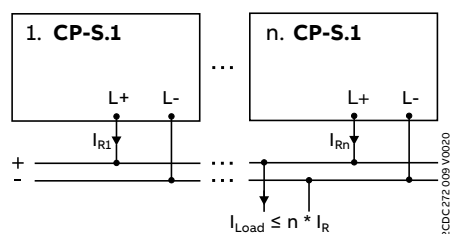
### Wiring instructions



Output OK, relay output

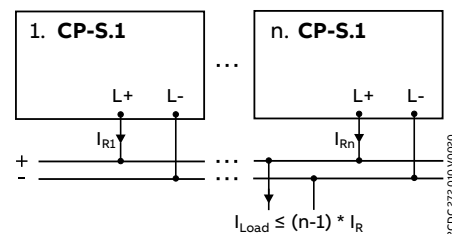
Rated voltage limits of the signaling output relay:  
Acc. UL 61010-1: 30 V RMS, 42.4 V peak, 60 V DC

2CDC 272 008 V0020



Parallel operation, increased power ( $n \leq 3$ )

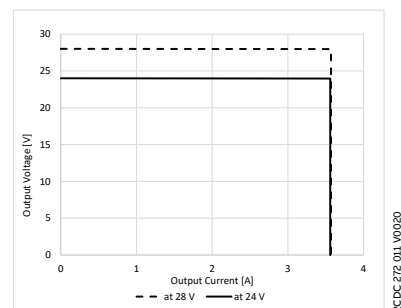
2CDC 272 009 V0020



Parallel operation, redundancy ( $n \leq 3$ )

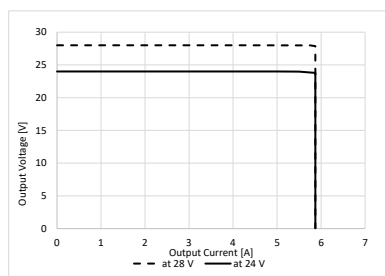
2CDC 272 010 V0020

### U/I characteristic curves of output at $T_a = 25^\circ\text{C}$



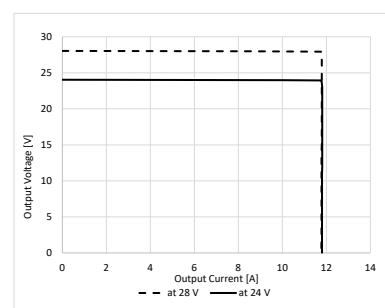
CP-S.1 24/3.0

2CDC 272 011 V0020



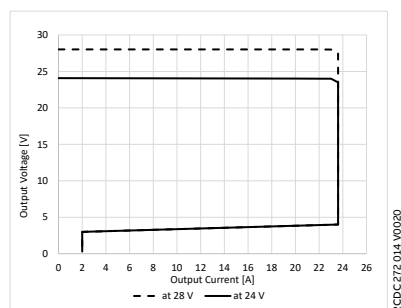
CP-S.1 24/5.0

2CDC 272 012 V0020



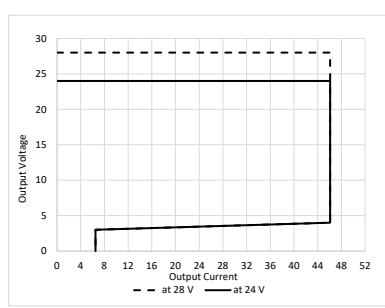
CP-S.1 24/10.0

2CDC 272 013 V0020



CP-S.1 24/20.0

2CDC 272 014 V0020



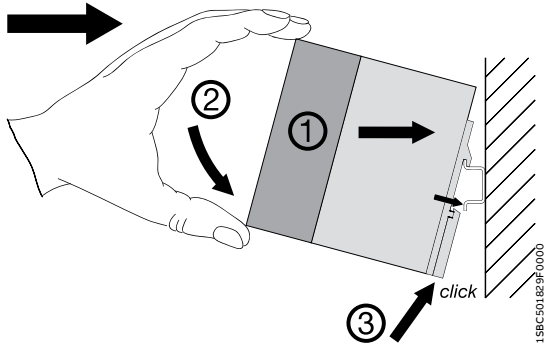
CP-S.1 24/40.0

2CDC 272 015 V0020

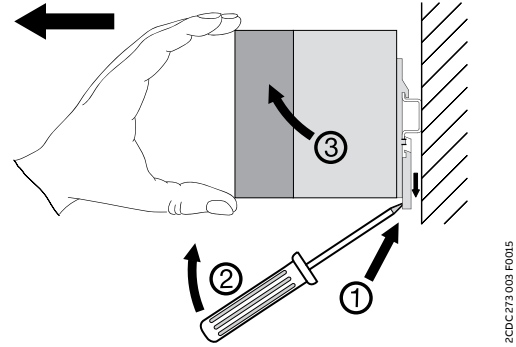
# CP-S.1 power supplies

## Technical diagrams

### Mounting and dismounting

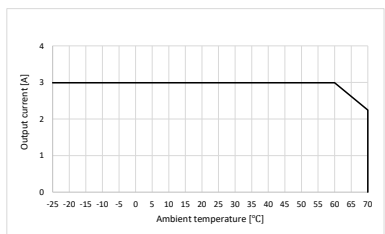


Mounting



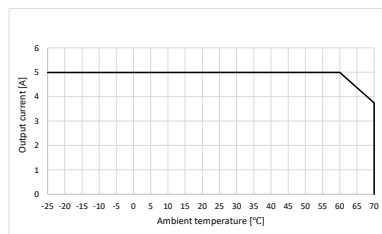
Dismounting

### Characteristic curves of temperature $T_{out} = 24$ V DC



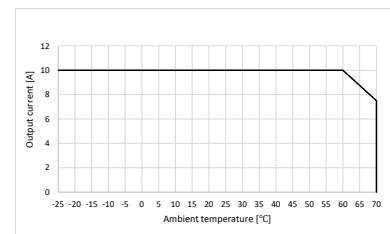
CP-S.1 24/3.0

2CDC 272 016 V0020



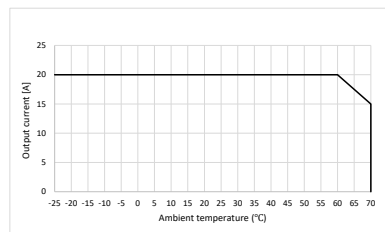
CP-S.1 24/5.0

2CDC 272 017 V0020



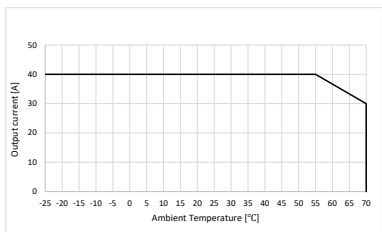
CP-S.1 24/10.0

2CDC 272 018 V0020



CP-S.1 24/20.0

2CDC 272 019 V0020



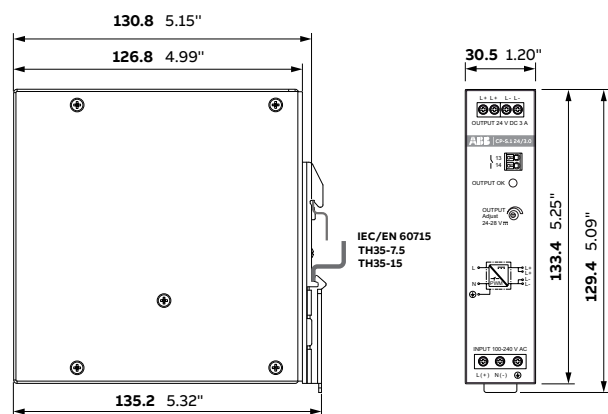
CP-S.1 24/40.0

2CDC 272 020 V0020

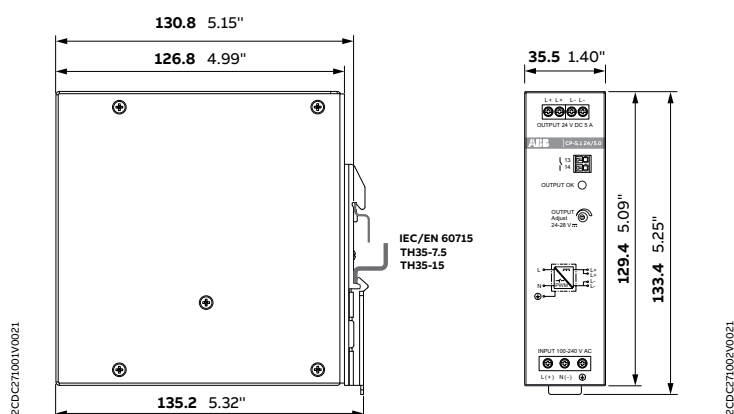
# CP-S.1 power supplies

## Technical diagrams

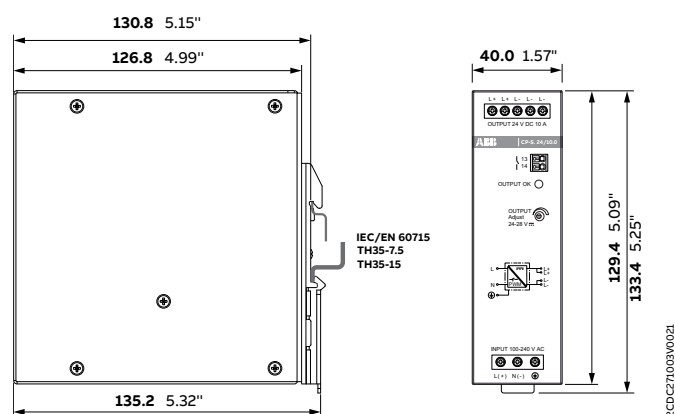
**Dimensional drawings**  
in mm and inches



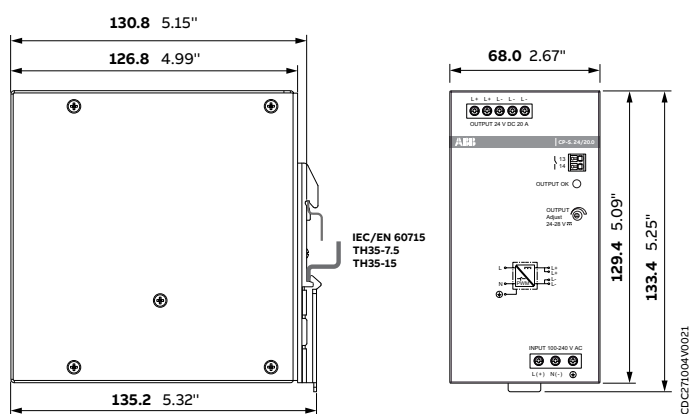
CP-S.124/3.0



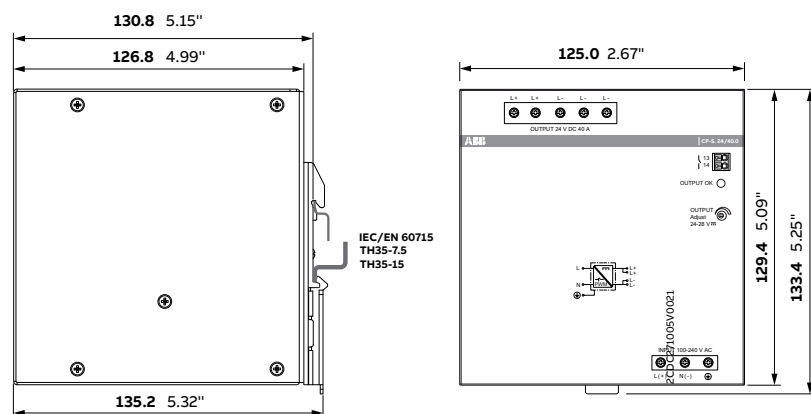
CP-S.124/5.0



CP-S.124/10.0



CP-S.124/20.0



CP-S.124/40.0







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