



Power Delivery Solutions

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Introduction—Power Delivery Solutions

One of the biggest challenges facing process control and manufacturing automation managers today is minimizing unplanned downtime and their associated costs. Weidmuller's Reliable Power Delivery Solutions for control electronics offer solutions to these problems.

In analyzing the cause for unplanned plant standstills, Weidmuller identified a number of problems attributed to inadequate design practices for automation and control electronics when uptime is a key design goal. Weidmuller has developed its new Power Delivery Solutions for control with high uptime as a key design objective.

Among others, these solutions address the problem of protecting switched mode DC power supplies against load failures. Switched mode, regulated DC power supplies are designed to initiate a protective self-shutdown routine in the event of an overload or short-circuit condition at their output. When this happens, the switched mode power supply may stop providing power to its DC circuits.

However, despite the fact that the switched mode DC power supply has protected itself from damage, the circuits

that depend on this power supply may experience a loss-of-power condition or malfunction. This can likely create an entire control panel shutdown and ultimately unplanned service interruptions. Therefore, it is necessary to isolate overloads or short-circuit occurrences from the rest of the active elements in a control panel. Weidmuller has solved this problem through its WAVEGUARD electronic fusing system, which prevents load failures from propagating back to the DC power delivery system, prevents drops in DC power to the control panel, and eliminates nuisance-tripping.

In addition, Weidmuller's electronic fuses improve failure identification and location time and reduce associated costs, since these fuses can be wired to a control room, enabling personnel to remotely identify the failure without testing multiple load circuits. This can cut troubleshooting time and associated costs by more than 50 percent, and ultimately prevent further revenue losses.

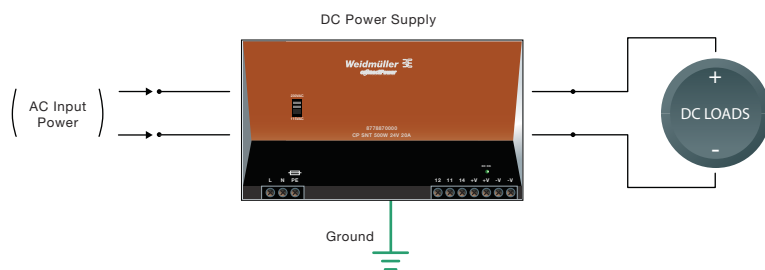
Diode modules are another component of Weidmuller's Power Delivery Solutions for control that can increase the reliability of a process control system. They enable parallel connectivity of two or more power

supplies for power redundancy, or they can be used to deliver increased power to the load.

Weidmuller offers a full range of single phase and three phase advanced and general purpose Power Delivery Solutions available in 24 VDC and other output voltage variants. All power supplies have power boost capability and all Power Delivery Solutions components are TS-35 DIN-rail-mountable.

No industry can afford unplanned downtime because of an overload condition or a short-circuit in control panel electronics. Weidmuller support teams combined with products like electronic fuses, diode modules, switched mode DC power supplies, and battery back up units (BBUs) provide the most reliable Power Delivery Solution available for process control and automation control panels in the industry today.

Why Weidmuller's Power Delivery Solutions?



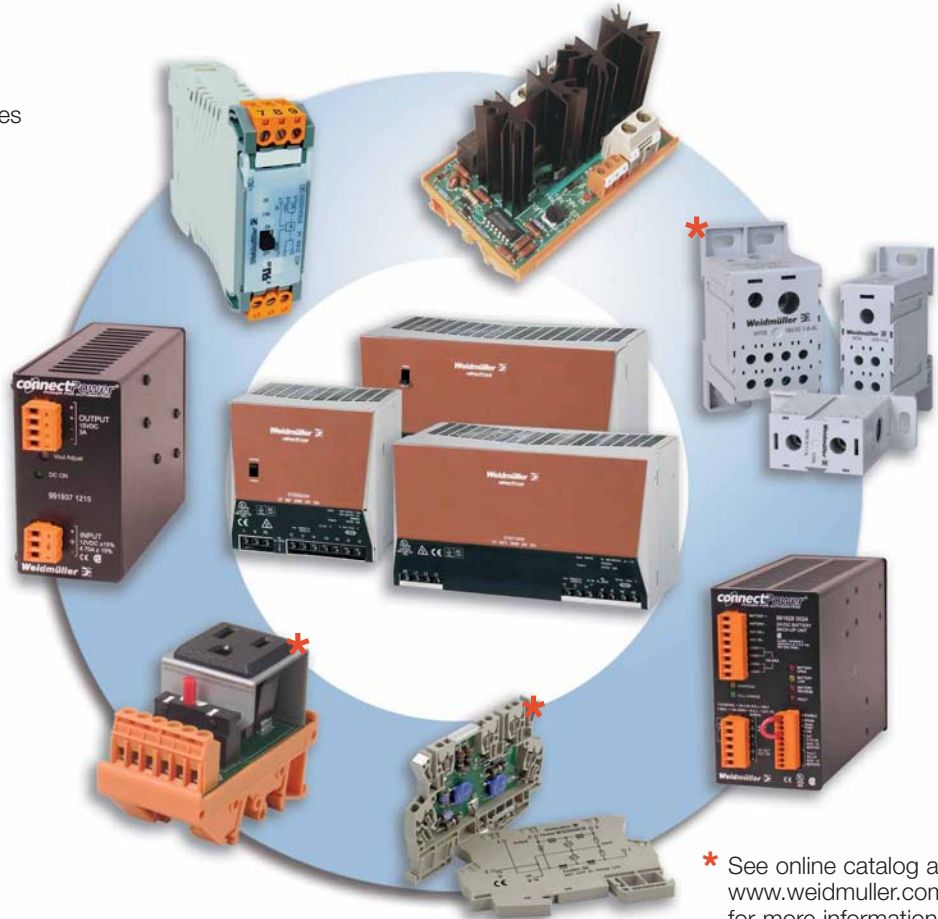
- The reliability of a DC power system (for control electronics) is not limited to the reliability of a single power supply
- Reliability of power to all loads as well as the reliability of the input AC power, must be taken into account.

What are Weidmuller's Power Delivery Solutions?

Power Delivery Solutions are the result of our understanding and expertise in designing reliable and efficient DC power systems for control panels.

They include:

- WAVEGUARD Electronic Fuses
- DC Switch Mode Power Supplies
- DC-to DC converters
- Diode Modules
- Battery Back-up Units for DC Power Management
- AC Outlets
- Overvoltage Protection
- Power Distribution Blocks



* See online catalog at www.weidmuller.com for more information.

Solving DC Power System Problems

Switch mode DC power supplies are typically used for power delivery in control panels, but even a highly reliable power supply is not sufficient to ensure a reliable Power Delivery Solution. A faulty load may cause a protective power supply shutdown, essentially bringing down all circuits feeding off of the supply. A faulty AC Power Distribution System affects both the load side and the AC input side, so AC Power Distribution System break downs must be prevented.

Weidmuller Power Delivery Solutions are designed to solve these common DC power for control problems:

- Protect and Monitor DC Power of Control Systems
- Provide Uninterrupted DC Power with Redundancy
- Provide Uninterrupted DC Power with Redundancy and Fault Indication
- Guarantee DC Power to Critical Loads
- Eliminate Step-down Transformers
- Manage Medium and Large Inductive Loads

For these and other power system problems, Weidmuller's experienced design and applications engineers can provide custom solutions to address your specific applications needs.

Introduction – Power Delivery Products

Weidmüller offers two categories of Power Delivery Solutions: General Purpose and Advanced Features products. General Purpose Products fulfill minimum power delivery requirements, while Advanced Features products are designed for more demanding applications. All power supplies are certified for safe use in industry and small installations. They are tested under harsh environmental conditions and have a proven performance record.

General Purpose Power Delivery Solutions:

- Market includes OEMs, panel shops, and control manufacturers
- Fulfill the power and current demands of the application
- Have an efficient form factor
- Provide a cost-effective power delivery solution for basic functionality requirements



Advanced Features Power Delivery Products:

- Fulfill the demand for high quality power delivery solutions
- Designed with packaging advantages that include a rugged housing, ability to panel mount, pluggable connectors and load sharing capability
- Feature up to 200% of maximum rated output for a specified amount of time (power boost)
- Available with low residual ripple (< 10mV in some cases)
- Most models have universal AC/DC input
- Longer hold-up time for most models
- Feature greater galvanic isolation between input and output
- Operate over a broader range of ambient temperatures
- Many available in 5, 12, 24, 28, and 48V versions

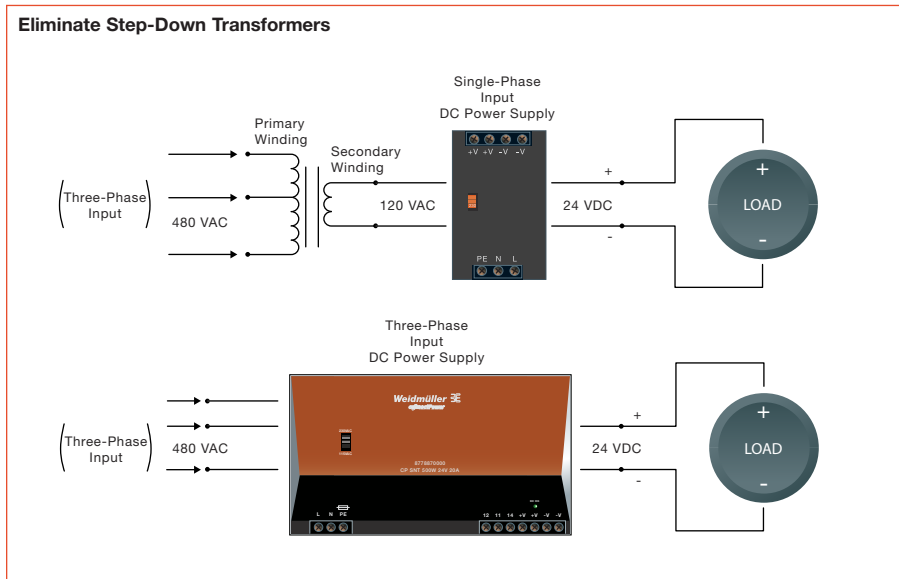


Three-Phase Input Power Supplies

Weidmuller offers three-phase input DC power supplies in both General Purpose and Advanced Features models. Use of a three-phase power supply in your application eliminates the need for a step-down transformer.

Advanced feature models range from the compact CP-SNT 55W and 160W, to the 300W, 600W and 1000W three-phase supplies. These supplies feature a high output surge capability, over current protection, output status LED, and rugged metal housings.

General purpose three-phase power supplies are available in 250W, 500W and 1000W models.

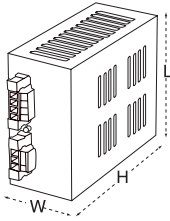


- By using a DC power supply with three phase input capability, you can reduce wiring material and component cost
- Eliminates the need for step-down transformers (480V down to 120V)
- Frees up room in the control panel
- Reduces weight of assembly
- Simplifies design

Power Supplies Mounting Kits

A mounting bracket kit is available for use with the CP-DCDC 50W, CP-SNT 55W and CP-SNT 160W families of power supplies that allow them to be mounted flat on a panel. The power supplies are not available from the factory with the bracket installed - it is ordered separately and installed by the customer. The DIN rail mounting foot must be removed. Center-to-center dimension for mounting holes is 61 mm (2.4").

Single Phase Input Supplies – Advanced Features Products

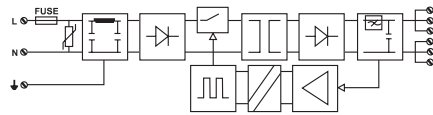


Approvals:



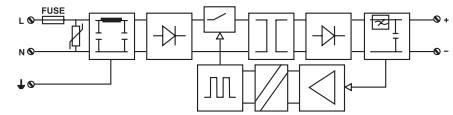
Diagram/Schematic Circuit Diagram

CP SNT 12W 0.5A



– secondary through plug-in jumpers ZQV cross-connectable to other WAVE-modules

CP SNT 24W



Ordering Data

Output voltage/maximum current

Technical Data

Input voltage	Minimum	85 VAC, 120 VDC
	Typical	115-230 VAC ± 10%, 50/60 Hz
	Maximum	265 VAC, 300 VDC
Input current	at 115 VAC	260 mA RMS ± 20%
	at 230 VAC	180 mA RMS ± 20%
	at 125 VDC	125 mA ± 20%
	at 250 VDC	65 mA ± 20%
Input protection	Fuse	2 A slow fuse (internal, not user serviceable)
	Inrush current	Thermistor
	Overvoltage protection	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		80%
Maximum ripple		0.1% RMS V_{p-p}
Regulation	Load (10-100% load)	0.2%
	at input voltage	0.2% 85 VAC - 265 VAC In
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
	Maximum capacity at output	8000 µF
	Hold time	at 115 VAC
(Maximum output current following input loss)	at 230 VAC	80 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-40°C...+50°C (-4°F...+122°F) full rated load Derating: 33% at 60°C (140°F)
Humidity	Operating temperature	20...85% RH non-condensing
	Storage temperature	20...90% RH
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	4 kV RMS
	Input to ground	1.5 kV RMS
Output to ground	500 V RMS	
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		90 x 18 x 112.5 mm (3.54 x 0.71 x 4.43 in.)
Weight		140 g (0.311 lbs.)
Mounts on mounting rail		TS 35 DIN rail

Approvals/Certifications

CSA, UL 508 Listed, CE

Ordering Data

Type CP SNT 12W 0.5A Order No. 9918840024

Technical Data

Input voltage	Minimum	85 VAC, 120 VDC
	Typical	115-230 VAC ± 10%, 50/60 Hz
	Maximum	265 VAC, 300 VDC
Input current	at 115 VAC	480 mA RMS ± 20%
	at 230 VAC	270 mA RMS ± 20%
	at 125 VDC	280 mA ± 20%
	at 250 VDC	140 mA ± 20%
Input protection	Fuse	2 A slow fuse (internal, not user serviceable)
	Inrush current	Thermistor
	Overvoltage protection	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		78%
Maximum ripple		0.3% RMS V_{p-p}
Regulation	Load (10-100% load)	2% (12, 15 and 5 V) 0.5% (24 and 28 V)
	at input voltage	0.2%
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
	Maximum capacity at output	8000 µF
	Hold time	at 115 VAC
(Maximum output current following input loss)	at 230 VAC	160 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-20°C...+50°C (-4°F...+122°F) full rated load Derating: 33% at 60°C (140°F)
Humidity	Operating temperature	20...85% RH non-condensing
	Storage temperature	20...90% RH
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	4 kV RMS
	Input to ground	1.5 kV RMS
Output to ground	500 V RMS	
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		90.5 x 52 x 62.5 mm (3.56 x 2.05 x 2.46 in.)
Weight		160 g (0.35 lbs.)
Mounts on mounting rail		TS 35 DIN rail

Approvals/Certifications

CSA, UL 508 Listed, CE

Ordering Data

Type CP SNT 24W Order No. 9928890024

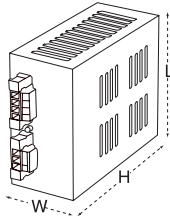
Technical Data

Input voltage	Minimum	85 VAC, 120 VDC
	Typical	115-230 VAC ± 10%, 50/60 Hz
	Maximum	265 VAC, 300 VDC
Input current	at 115 VAC	480 mA RMS ± 20%
	at 230 VAC	270 mA RMS ± 20%
	at 125 VDC	280 mA ± 20%
	at 250 VDC	140 mA ± 20%
Input protection	Fuse	2 A slow fuse (internal, not user serviceable)
	Inrush current	Thermistor
	Overvoltage protection	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		78%
Maximum ripple		0.3% RMS V_{p-p}
Regulation	Load (10-100% load)	2% (12, 15 and 5 V) 0.5% (24 and 28 V)
	at input voltage	0.2%
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
	Maximum capacity at output	8000 µF
	Hold time	at 115 VAC
(Maximum output current following input loss)	at 230 VAC	160 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-20°C...+50°C (-4°F...+122°F) full rated load Derating: 33% at 60°C (140°F)
Humidity	Operating temperature	20...85% RH non-condensing
	Storage temperature	20...90% RH
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	4 kV RMS
	Input to ground	1.5 kV RMS
Output to ground	500 V RMS	
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		90.5 x 52 x 62.5 mm (3.56 x 2.05 x 2.46 in.)
Weight		160 g (0.35 lbs.)
Mounts on mounting rail		TS 35 DIN rail

Approvals/Certifications

CSA, UL 508 Listed, CE
CSA Class 1 Div. 2 and Zone 2 for 9928890012 and 9928890024
UL 1310 (Class 2) for 9928890024

Single Phase Input Supplies – Advanced Features Products

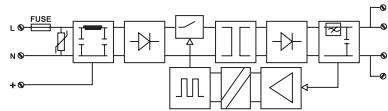


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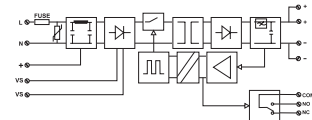


Diagram/Schematic Circuit Diagram

CP SNT 55W



CP SNT 160W



Ordering Data

Output voltage/maximum current

Technical Data

Input voltage	Minimum	85 VAC, 120 VDC
	Typical	115-230 VAC ± 10%, 50/60 Hz
	Maximum	265 VAC, 300 VDC
Input current	at 115 VAC	1.10 A RMS ± 20%
(Average values for reference only)	at 230 VAC	0.55 A RMS ± 20%
	at 125 VDC	590 mA ± 20%
	at 250 VDC	315 mA ± 20%
Input protection	Fuse	2 A slow fuse (internal, not user serviceable)
	Inrush Current	Thermistor
	Overvoltage	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		80%
Maximum ripple		0.1% RMS V_{D-P}
Regulation	load (10-100% load)	1.0%
	at Input voltage	0.8%
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Output surge capability		10,000 µF
Maximum capacity at output		30 ms
Parallel connection for load sharing		180 ms
Hold time	at 115 VAC	-40°C...+85°C (-40°F...+185°F)
(Maximum output current following input loss)	at 230 VAC	-40°C...+50°C (-4°F...+122°F) full rated load
Temperature	Storage	Derating: 24 V-1.5 A at 60°C (140°F)
	Operating	20...85% RH non-condensing
Humidity	Operating temperature	20...90% RH
	Storage temperature	3 kV RMS
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	1.5 kV RMS
	Input to ground	500 V RMS
	Output to ground	0.1...4.0 mm ² (26...12 AWG)
Wire size		98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)
Dimensions (L x W x H)		478 g (1.05 lbs.)
Weight		TS 35 DIN rail, Chassis
Mounts on mounting rail		
Fault relay		

Approvals/Certifications

Accessories

Chassis Mounting Kit
Side mount Bracket – DIN rail

Type Order No.

CP SNT 55W	
24 VDC-28 VDC / 2.3 A	9927480024
48 VDC / 1.04 A	9927480048
12 VDC - 15 VDC / 3 A	9927480012
5 VDC / 3 A	9927480005

Type Order No.

CP SNT 160W	
24 VDC-28 VDC / 6.5 A	9925340024
5 VDC / 10 A	9925340005
12 VDC / 10 A	9925340012
48 VDC / 3.25 A	9925340048

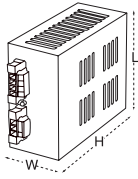
Input voltage	85 VAC, 120 VDC
	115-230 VAC ± 10%, 50/60 Hz
	265 VAC, 300 VDC
Input current	1.10 A RMS ± 20%
(Average values for reference only)	0.55 A RMS ± 20%
	590 mA ± 20%
	315 mA ± 20%
Input protection	2 A slow fuse (internal, not user serviceable)
	Thermistor
	Varistor
Switching frequency	100 kHz PWM
Efficiency at maximum load	80%
Maximum ripple	0.1% RMS V_{D-P}
Regulation	load (10-100% load)
	at Input voltage
Overload protection	Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Output surge capability	10,000 µF
Maximum capacity at output	30 ms
Parallel connection for load sharing	180 ms
Hold time	at 115 VAC
(Maximum output current following input loss)	at 230 VAC
Temperature	Storage
	Operating
Humidity	Operating temperature
	Storage temperature
Galvanic isolation	Input-output
	Input/output to mounting rail
	Input to ground
	Output to ground
Wire size	
Dimensions (L x W x H)	
Weight	
Mounts on mounting rail	
Fault relay	
Approvals/Certifications	
	CSA, UL 508 Listed, CE
	CSA Class 1 Div. 2 and Zone 2 for 9927480012 and 9927480024
	UL 1310 (Class 2) for 9927480024

Input voltage	85 VAC / 195 VAC
	115 VAC / 230 VAC ± 10%, (selectable) 50/60Hz
	138 VAC / 250 VAC
Input current	2.9 A RMS ± 20%
(Average values for reference only)	1.45 A RMS ± 20%
Input protection	6.3 A slow fuse (internal, not user serviceable)
	Thermistor
	Varistor
Switching frequency	65 kHz PWM
Efficiency at maximum load	85%
Maximum ripple	0.2% RMS V_{D-P}
Regulation	load (10-100% load)
	at Input voltage
Overload protection	Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Output surge capability	13 A / 1 sec
Maximum capacity at output	6000 µF
Parallel connection for load sharing	up to 3 devices (passive current division)
Hold time	30 ms
(Maximum output current following input loss)	30 ms
Temperature	Storage
	Operating
Humidity	Operating temperature
	Storage temperature
Galvanic isolation	Input-output
	Input/output to mounting rail
	Input to ground
	Output to ground
Wire size	
Dimensions (L x W x H)	
Weight	
Mounts on mounting rail	
Fault relay	
Approvals/Certifications	
	CSA, UL 508 Listed, CE
	CSA Class 1 Div. 2 and Zone 2 for 9925340024

	Order No.
	7920560000

	Order No.
	7920560000
	7940000542

Single Phase Input Supplies – Advanced Features Products



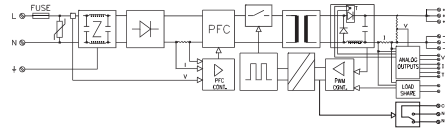
Approvals:



CP SNT 300W



Diagram/Schematic Circuit Diagram



Ordering Data

Type	Order No.
CP SNT 300W	9916250024

Technical Data

Input voltage	Minimal	86 VAC, 100 VDC		
	Typical	115-230 VAC ± 10% 50/60 Hz		
	Maximum	265 VAC, 200 VDC		
Input current at 300 W	at 115 VAC	3.3 A ± 10%		
	at 230 VAC	1.65 A ± 10%		
	at 100 VDC	3.7 A ± 10%		
	at 200 VDC	1.85 A ± 10%		
Input power factor		0.99 (under all load conditions)		
Input current		Sinusoidal (active power factor corrected)		
Topology		Boost PFC / forward PWM		
Input protection	Fuse	5 A slow blow 5x20 mm		
	Inrush current	Thermistor		
	Overvoltage	Varistor		
Switching frequency		100 kHz ± 5%		
Efficiency	at max.load	80% typical		
Output ripple		at 100 kHz: 2 mV _{p-p}		
Regulation	Load (10-100%)	1%		
	Line (86-265 VAC RMS)	0.2%		
Protection	Overvoltage	V _{out} > 30 VDC		
	Undervoltage	V _{out} < 14 VDC		
Output surge capability	Overload	at V _{out} = 22 VDC, I _{out} > 13.8 A	at V _{out} = 24 VDC, I _{out} > 13.5 A	at V _{out} = 28 VDC, I _{out} > 11.6 A
	Thermal	18.5 A / 300 mSec		
Adjustable output voltage		Heat sink temperature > 100°C (212°F)		
		22 VDC...28 VDC (pot. adj.)		
Rated output current		at V_{out} = 22 VDC...13.6 A		
		at V_{out} = 24 VDC...12.5 A		
		at V_{out} = 28 VDC...10.7 A		
LED indicator		Current limiting: LED yellow	Fault: LED red	On: LED green
Shut down		Power supply goes to fault mode overvoltage, undervoltage or over temperature for more than 2 sec. fault relay drops out/short circuit		
The 300 W power supply offers the following additional functions		– universal input voltage with PFC (active power factor corrections)		
		– analog monitoring function of the output voltage 0...30 V corresponds to 0...10 V ± 3%		
		of the output current 0...15 A corresponds to 0...10 V ± 3%		
		of the internal temperature 0°C...+100°C (+32°F...+212°F) corresponds to 0...10 V ± 3%		
		– Fault relay, 1 changeover, closed-circuit current principle		
Monitoring output impedance		10 kΩ min. or 5 mA max.		
Load share		Current increase up to 60 A by wiring up to 5 300 W power supplies in parallel (active current division)		
Maximum capacity at output		10,000 µF		
Hold time	at 115 VAC	40 ms		
	at 230 VAC	40 ms		
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)		
	Operating	-20°C...+50°C (-4°F...+122°F) Testing done to -10°C		
	Derating	Output current derating of approx. 20% at 60°C (140°F)		
Galvanic isolation	Input-output	3 kV RMS		
	Input/output to mounting rail	3 kV RMS		
	Input to ground	1.5 kV RMS		
	Output to ground	500 V RMS		
Dimensions (L x W x H)		104 x 240 x 155 mm (4.10 x 9.45 x 6.10 in.)		
Weight		1180 g (2.60 lbs.)		
Mounting		TS 35 DIN rail, chassis		

Approvals/Certifications

CSA, UL 508 Listed, CE

Accessories

Chassis Mounting Kit

Order No.

7920560000¹⁾

1) Order 2 mounting kits for power supply shown above.

Single Phase Input Supplies – General Purpose Solutions

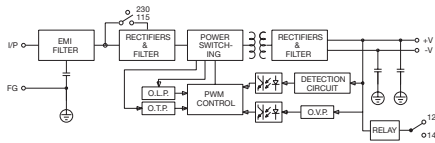


Approvals:

CP SNT 70W 24V 3A



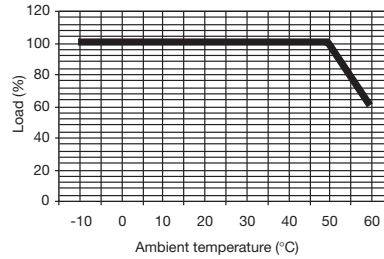
CP SNT 120W 24V 5A



Block diagram for supplies with switchable input voltage

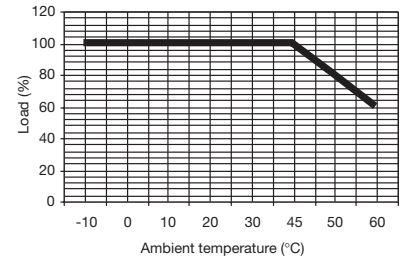
Derating Curves

Output load/ambient temperature



Derating Curves

Output load/ambient temperature



Ordering Data

Technical Data

Input	Input voltage	85...264 VAC; 120...370 VDC
	Input current	2.0 A @ 100...240 VAC
	Input frequency	50/60 Hz
	Recommended mains fuse/internal fuse	Fusible link 2.5 A (T) / 250 V
	Oversvoltage protection	Varistor
Output	Output voltage	24...28 VDC (adjustable via potentiometer)
	Output current	3.0 A
	max. output power	72 W
	max. residual ripple	100 mV _{p-p} / bandwidth 20 Mhz V RMS
	Surge capability	105%...150% I _{const.} of max. output power for up to 5 seconds, automatic restart
	Oversvoltage protection	29...34 V with automatic restart
	Holdup time by mains failure: 115 VAC / 230 VAC	10 ms / 20 ms
	Load regulation	2%
	Redundancy or load sharing	With diode module recommended
	Status relay/change-over contact	250 VAC (max. 30 VDC) / 1A
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC
	Galvanic isolation input-output	3 kVAC

General Specifications

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		80%
Status display		LED green
Standards		EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		no
Mounting position		Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 0.55 kg (1.21 lbs.)
Type of connection		Screw
Clamping area		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		125 x 55.5 x 110.0 mm (4.92 x 2.18 x 4.33 in.)

Approvals/Certifications

Type	Qty.	Order No.
CP SNT 70W 24V 3A	1	8708660000

Type	Qty.	Order No.
CP SNT 120W 24V 5A	1	8708670000

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		84%
Status display		LED green
Standards		EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		no
Mounting position		Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 0.65 kg (1.43 lbs.)
Type of connection		Screw
Clamping area		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		125 x 65.5 x 110.0 mm (4.92 x 2.58 x 4.33 in.)

CE 508 (C1D2 approvals pending)

Type	Qty.	Order No.
CP SNT 120W 24V 5A	1	8708670000

Type	Qty.	Order No.
CP SNT 120W 24V 5A	1	8708670000

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		84%
Status display		LED green
Standards		EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		no
Mounting position		Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 0.65 kg (1.43 lbs.)
Type of connection		Screw
Clamping area		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		125 x 65.5 x 110.0 mm (4.92 x 2.58 x 4.33 in.)

CE 508 (C1D2 approvals pending)

Single Phase Input Supplies – General Purpose Solutions

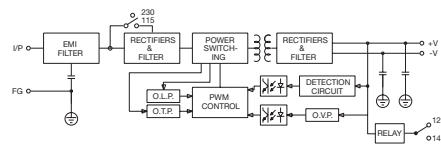


Approvals:

CP SNT 250W 24V 10A



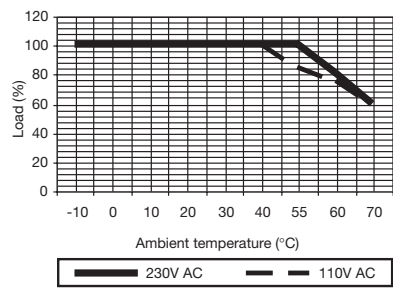
CP SNT 500W 24V 20A



Block diagram for supplies with switchable input voltage

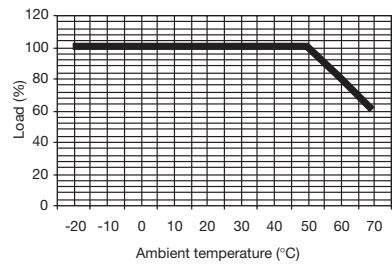
Derating Curves

Output load/ambient temperature



Derating Curves

Output load/ambient temperature



Ordering Data

Technical Data

Input	Input voltage	88...132 VAC / 176...264 VAC reversible; 250...370 VDC
	Input current	3.6 A @ 115 VAC / 2.0 A @ 230 VAC
	Input frequency	50/60 Hz
	Recommended mains fuse/internal fuse	Fusible link 5 A (T) / 250 V
	Overvoltage protection	Varistor
Output	Output voltage	24...28 VDC (adjustable via potentiometer)
	Output current	10 A
	max. output power	240 W
	max. residual ripple	100 mV _{p-p} / bandwidth 20 Mhz
	Surge capability	105%...150% I _{const.} of max. output power for up to 5 seconds, automatic restart
	Overvoltage protection	30...36 V with automatic restart
	Holdup time by mains failure: 115 VAC / 230 VAC	10 ms / 15 ms
	Load regulation	2%
	Redundancy or load sharing	With diode module recommended
	Status relay/change-over contact	250 VAC (max. 30 VDC) / 1A
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC
	Galvanic isolation input-output	3 kVAC

Type	Qty.	Order No.
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CP SNT 250W 24V 10A	1	8708680000
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Type	Qty.	Order No.
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CP SNT 500W 24V 20A	1	8778870000
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General Specifications

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		84%
DC output status display		LED green
Standards		EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		yes
Mounting position		Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 1.6 kg (3.5 lbs.)
Type of connection		Screw
Clamping area		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		125 x 125.5 x 110.0 mm (4.92 x 4.94 x 4.33 in.)

General Specifications

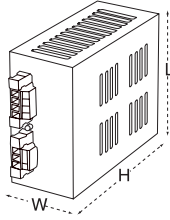
Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		86%
DC output status display		LED green
Standards		EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		yes
Mounting position		Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 2 kg (4.4 lbs.)
Type of connection		Screw
Clamping area		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		125 x 227.5 x 110.0 mm (4.92 x 8.96 x 4.33 in.)

Approvals/Certifications

508 60950

508 60950

Three Phase Input Supplies – Advanced Features Products



Approvals:

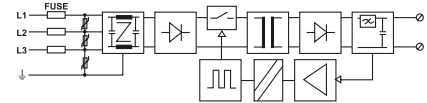


Diagram/Schematic Circuit Diagram

CP SNT 55W 2.3A
3 Phase Input



CP SNT 160W 6.5A
3 Phase Input



Ordering Data

Output voltage/maximum current

Technical Data

Input voltage	Minimum	306 VAC
	Typical	360 - 480 VAC
	Maximum	550 VAC
Input current	at 360 VAC	120 mA / Phase
(Average values for reference only)	at 230 VAC	100 mA / Phase
Input protection	Fuse	3 x 1 A slow fuse (internal)
	Inrush Current	Thermistor
	Oversvoltage	Varistor
Switching frequency		100 kHz
Efficiency at maximum load		85%
Maximum ripple		0.1% RMS
Regulation	Load (10-100% load)	1.0%
	at Input voltage	0.8%
Fault relay		
Output surge		10A / 180 ms typ.
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Maximum capacity at output		10,000 µF
Parallel connection for load sharing		
Hold time	at 360 VAC	120 ms
(Maximum output current following input loss)	at 480 VAC	120 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-15°C...+50°C (+32°F...+122°F) full rated load
		Derating: 10% at 60°C (140°F)
Humidity	Operating	20...85% RH non-condensing
	Storage	20...90% RH non-condensing
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	3 kV RMS
	Input to ground	1.5 kV RMS
	Output to ground	500 V RMS
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		108 x 60 x 168 mm (4.25 x 2.36 x 6.61 in.)
Weight		526 g (1.16 lbs.)
Mounts on mounting rail		TS 35 DIN rail, Chassis

Approvals/Certifications

Accessories

Chassis Mounting Kit	
L Bracket Mounting Kit—Panelmount	
Side mount Bracket—DIN rail	

Type	Order No.
CP SNT 55W 2.3A 3 Phase	
24 VDC / 2.3 A	9917790324

Input voltage	Minimum	360 VAC
	Typical	480 VAC
	Maximum	528 VAC
Input current	at 360 VAC	0.36 A / Phase
(Average values for reference only)	at 230 VAC	0.34 A / Phase
Input protection	Fuse	3 x 12 A slow fuse (internal)
	Inrush Current	Thermistor
	Oversvoltage	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		83%
Maximum ripple		0.2% RMS
Regulation	Load (10-100% load)	2%
	at Input voltage	0.5%
Fault relay		Changeover contact, 30 VDC / 125 VAC @ 1 A max.
Output surge		13A / 1 sec.
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Maximum capacity at output		10,000 µF
Parallel connection for load sharing		up to 3 devices (passive current division)
Hold time	at 360 VAC	50 ms
(Maximum output current following input loss)	at 480 VAC	70 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-10°C...+50°C (-4°F...+122°F)
Humidity	Operating	20...85% RH non-condensing
	Storage	20...90% RH
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	3 kV RMS
	Input to ground	1.5 kV RMS
	Output to ground	500 V RMS
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		138.2 x 58.4 x 177.8 mm (5.44 x 2.3 x 7 in.)
Weight		993 g (2.2 lbs.)
Mounts on mounting rail		TS 35 DIN rail, Chassis

CSA, cULus 508 Listed, CE

Type	Order No.
CP SNT 160W 6.5A 3 Phase	
24 VDC-28 VDC / 6.5 A	9925340324

	Order No.
	7920560000
	7940000543

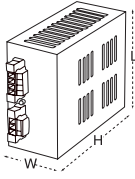
Type	Order No.
CP SNT 160W 6.5A 3 Phase	
24 VDC-28 VDC / 6.5 A	9925340324

Input voltage	Minimum	342 VAC
	Typical	480 VAC
	Maximum	528 VAC
Input current	at 360 VAC	0.36 A / Phase
(Average values for reference only)	at 230 VAC	0.34 A / Phase
Input protection	Fuse	3 x 12 A slow fuse (internal)
	Inrush Current	Thermistor
	Oversvoltage	Varistor
Switching frequency		100 kHz PWM
Efficiency at maximum load		83%
Maximum ripple		0.2% RMS
Regulation	Load (10-100% load)	2%
	at Input voltage	0.5%
Fault relay		Changeover contact, 30 VDC / 125 VAC @ 1 A max.
Output surge		13A / 1 sec.
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Maximum capacity at output		10,000 µF
Parallel connection for load sharing		up to 3 devices (passive current division)
Hold time	at 360 VAC	50 ms
(Maximum output current following input loss)	at 480 VAC	70 ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)
	Operating	-10°C...+50°C (-4°F...+122°F)
Humidity	Operating	20...85% RH non-condensing
	Storage	20...90% RH
Galvanic isolation	Input-output	3 kV RMS
	Input/output to mounting rail	3 kV RMS
	Input to ground	1.5 kV RMS
	Output to ground	500 V RMS
Wire size		0.1...4.0 mm ² (26...12 AWG)
Dimensions (L x W x H)		138.2 x 58.4 x 177.8 mm (5.44 x 2.3 x 7 in.)
Weight		993 g (2.2 lbs.)
Mounts on mounting rail		TS 35 DIN rail, Chassis

cULus 508 Listed, CE

Type	Order No.
CP SNT 160W 6.5A 3 Phase	
24 VDC-28 VDC / 6.5 A	9925340324
	7920560000
	7940000543
	7940000542

Three Phase Input Supplies – Advanced Features Products



Approvals:



**CP SNT 300W 12.5A
3 Phase Input**



**CP SNT 600W 25A
3 Phase Input**



Ordering Data	
Output voltage/maximum current	
Technical Data	
Input voltage	Minimum
	Typical
	Maximum
Input current	Min Vin
(Average values for reference only)	Typ Vin
	Max Vin
Input protection	External Input Breaker
	Inrush Current
	Overvoltage
Switching frequency	
Output	Voltage Nominal
	Voltage Adj. Range
	Current Nominal
	Current Surge
	Current Surge Time
	Surge Cycle Time
Efficiency at maximum load	
Regulation	Load (10-100% load)
	Line
Protection	Overload
	Short Circuit
	Overvoltage
	Undervoltage
	Over Temperature
	Over Current
Max. load capacitance	
Hold time	@380 V
	@480 V
Temperature	Storage
	Operating
Humidity	Storage
	Operating
Galvanic isolation	Input-output
	Input to ground
	Output to ground
Wire size	Input
	Output
	I/O
Dimensions (L x W x H)	
Weight	
Mounts on mounting rail	
Special features	Cooling
	Load Sharing
	Redundancy
	Fault relay
	V _{out}
	T _{out}
	I _{out}
Miscellaneous	Indicator
Approvals/Certifications	
Accessories	
Chassis Mounting Kit	

Type	Order No.
CP SNT 300W 12.5A 3 Phase	7924740324
24 VDC / 12.5 A	
342 V	
380-480 V ± 10%, 50/60 Hz, 3 phase	
528 V	
0.75 A per phase @380 V, 0.6 A per phase @480 V	
2 A, 600 V thermal breaker or 4 A / 500 V time delay fuse recommended	
Thermistor	
Varistor	
100 kHz	
24 V @ 12.5 A, 28 V @ 10.7 A	
23-28 V	
12.5 A	
19 A	
1 second	
4 seconds	
80%	
5%	
0.5%	
Overcurrent shutdown with automatic restart and overvoltage protection	
Auto restart	
V _{out} > 28 VDC	
V _{out} < 22 VDC	
5000 µF	
12 ms typ (full output current after loss of input)	
28 ms typ (full output current after loss of input)	
-40°C...+85°C (-40°F...+185°F)	
0°C...+50°C (32°F...+122°F)	
20%-90% RH non-condensing	
20...85% RH non-condensing	
3 kV RMS	
1.5 kV RMS	
500 V RMS	
0.1...4.0 mm ² (26...12 AWG)	
0.5...16.0 mm ² (22...8 AWG)	
0.08...2.5 mm ² (22...12 AWG)	
170 x 160 x 82 mm (6.7 x 6.3 x 3.2 in.)	
1.4 kg (3.1 lbs.)	
TS 35 DIN rail or Chassis (Chassis brackets are included)	
Parallel operation for increased current or redundancy ²⁾	
Maximum 2 units	
Form C contacts (1A max @ 30 VDC or 125 VAC; 10 mA min @ 5 VDC)	
Green LED (DC on)	
cULus 508 Listed, CE	
	Order No.
	7920560000⁴⁾

Type	Order No.
CP SNT 600W 25A 3 Phase	7920210324
24 VDC / 25 A	
342 V	
480 V, 50-60 Hz	
528 V	
1.4 A	
1.2 A	
1.1 A	
6 A, 3 pole 480 VAC	
Thermistor	
Varistor	
100 kHz	
24 V	
23-28 V (pot. adj.)	
25 A	
50 A	
1 second	
60 seconds	
88%	
± 4%	
± 1%	
Overcurrent shutdown with automatic restart and overvoltage protection	
Auto restart	
V _{out} > 30.5 VDC	
V _{out} < 20 VDC	
V _{out} heatsink temperature > 100°C (212°F)	
26.5A typical @24 V for >1 second	
10,000 µF	
12 ms typ (full output current after loss of input)	
18 ms typ (full output current after loss of input)	
-40°C...+85°C (-40°F...+185°F)	
-10°C...+50°C (-4°F...+122°F)	
5% -95%	
20...85% non-condensing	
3 kVAC	
1.5 kVAC	
500 VAC	
0.08...2.5 mm ² (22...12 AWG)	
0.5...16.0 mm ² (22...8 AWG)	
0.08...2.5 mm ² (22...12 AWG)	
173 x 238 x 135 mm (6.8 x 9.4 x 5.3 in.)	
3.1 kg (6.75 lbs.)	
TS 35 DIN rail or Chassis (Chassis brackets are included)	
Fan cooled with temp. controlled fan speed ¹⁾	
Maximum 2 units ²⁾	
No maximum ³⁾	
Form C contacts (1A @ 30 VDC or 30 VAC)	
0...10 VDC = 0...30 VDC	
0...10 V = 0°C...+100°C (+32°F...+212°F) (internal temperature)	
0...10 V = 0...50 A	
Green LED (DC on)	
cULus 508 Listed, CE	
	Order No.
	7920560000

1) This allows for horizontal or vertical mounting without derating.

2) The output voltages of each power supply should be adjusted to within 100mV. Use similar sizes and length of cables to connect the output of each power supply to the load. Consult factory for increased current capacity.

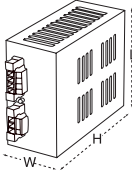
3) No limit to the number of units connected in parallel for redundancy.

4) Order 2 mounting kits for power supply shown above.

Three Phase Input Supplies – Advanced Features Products



**CP SNT 1000W 40A
3 Phase Input**



Approvals:



Ordering Data		Type	Order No.
		CP SNT 1000W 40A 3 Phase	7918960324
Technical Data			
Input voltage	Minimum	342 VAC	
	Typical	480 VAC ± 10% 50/60 Hz, 3 phase	
	Maximum	528 VAC	
Input current		at $V_{min} = 1.9$ A RMS	at $V_{nom} = 1.4$ A RMS
			at $V_{max} = 1.3$ A RMS
Input protection	External Input Breaker	6A, 3 pole 480 VAC	
	External Input Fuse	6A, 480 VAC Slow Blow	
	Inrush Current	40A Maximum	
	Overvoltage	Varistor	
	Surge Immunity L-L	2 kV	
	L-G	4 kV	
Switching frequency		65 kHz	
Output	Voltage Nominal	24 VDC	
	Voltage Adj. Range	23...28 VDC	
	Current Nominal	40 A	
	Maximum Start-up Current	70 A	
	Current Surge	80 A	
	Current Surge Time	1 second	
	Surge Cycle Time	60 seconds	
	Maximum Load Capacitance	10,000 µF	
Efficiency	at Maximum load	90%	
Output ripple		< 20 mV RMS	
Regulation	Load (10-100%)	5%	
	Line	1%	
Protection	Short Circuit	Auto restart	
	Overvoltage	$V_{out} > 30.5$ VDC	
	Undervoltage	$V_{out} < 20$ VDC	
	Over Temperature	V_{out} heatsink temperature > 100°C (212°F)	
	Over Current	43 A typical @ 24 V for >1 second	
Hold time		at $V_{min} = 14$ ms	at $V_{nom} = 20$ ms
			at $V_{max} = 28$ ms
Temperature	Storage	-40°C...+85°C (-40°F...+185°F)	
	Operating	-10°C...+50°C (+14°F...+122°F) (Full Power)	
Humidity	Storage	5...95%	
	Operating	20...85% non-condensing	
Galvanic Isolation	Input to Output	3k VAC	
	Input to Ground	1.5 kVAC	
	Output to Ground	500 VAC	
Wire Size	Input	0.08...2.5 mm ² (22...12 AWG)	
	Output	0.5...16 mm ² (22...6 AWG)	
	I/O	0.08...2.5 mm ² (22...12 AWG)	
Dimensions (L x W x H)		182 x 268 x 133 mm (7.2 x 10.6 x 5.3 in.)	
Weight		3800 g (8.35 lbs.)	
Mounting		TS 35 DIN rail, chassis (Recommended Clearance: Leave 4 in. (10 cm) free space on venting sides)	
Special Features	Cooling	Fan cooled ¹⁾	
	Load Sharing	Maximum 2 units ²⁾	
	Redundancy	No maximum ³⁾	
	Fault Relay	Form C contacts (1A @ 30 VDC or 30 VAC)	
	V_{out}	0...10 VDC = 0...30 VDC	
	T_{out}	0...10V = 0°C...+100°C (+32°F...+212°F) (internal temperature)	
	I_{out}	0...10V = 0...50A	
Miscellaneous	Indicator	Green LED (DC on)	
	Power Factor	0.9 typical @ 380 VAC	0.87 typical @ 480 VAC
Approvals/Certifications		cULus 508 Listed, CE	

1) This allows for horizontal or vertical mounting without derating.

2) The output voltages of each power supply should be adjusted to within 100mV. Use similar sizes and length of cables to connect the output of each power supply to the load. Consult factory for increased current capacity.

3) No limit to the number of units connected in parallel for redundancy.

Three Phase Input Supplies – General Purpose Solutions



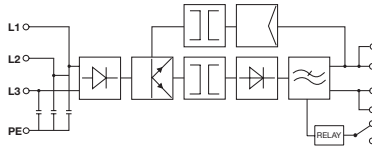
CP SNT3 250W 24V 10A



CP SNT3 500W 24V 20A



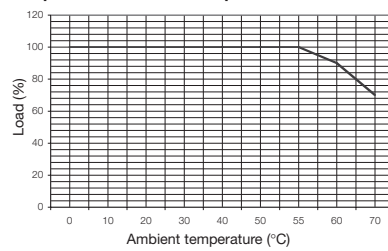
Approvals:



Block diagram

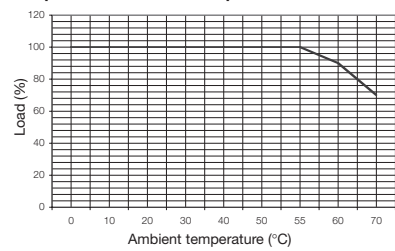
Derating Curves

Output load / ambient temperature



Derating Curves

Output load / ambient temperature



Ordering Data

Technical Data

Input	Input voltage	3 x 400 VAC / 340 min...575 max VAC
	Input current	0.95 A @ 400 VAC
	Input frequency	47...63 Hz
	Recommended mains fuse	external via 3 circuit breakers up to 6 A, trip curve characteristic C
Output	Output voltage	24...28 VDC (adjustable via potentiometer)
	Output current	10 A
	max. output power	250 W
	max. residual ripple	< 100 mV _{p-p} / bandwidth 20 MHz
	Surge capability	105%...130% I _{const.} of max. output power for up to 5 seconds, automatic restart
	Oversvoltage protection	29...34 V with automatic restart
	Holdup time when 400 VAC mains fail	> 10 ms at nominal load
	Load regulation	< 2%
	Redundancy or load sharing	directly with same type (maximum 2 power supplies of same rating), alternatively with diode module
	Status relay/change-over contact	250 VAC (max. 30 VDC) / 1 A
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC
	Galvanic isolation input-output	3 kVAC

General Specifications

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		88%
Status display		LED green
Standards		EN 60950 (SELV)
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
Power factor correction		yes
Mounting position		Horizontal on mounting rail TS 35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 1.5 kg (3.31 lbs.)
Type of connection		Screw
Clamping area		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Dimensions (L x W x H)		125 x 125.5 x 110 mm (4.92 x 4.94 x 4.33 in.)

Approvals/Certifications

Type	Qty.	Order No.
CP SNT3 250W 24V 10A	1	8708700000

Type	Qty.	Order No.
CP SNT3 250W 24V 10A	1	8708700000

508 60950

Type	Qty.	Order No.
CP SNT3 500 W 24V 20A	1	8708710000

Type	Qty.	Order No.
CP SNT3 500 W 24V 20A	1	8708710000

508 60950

Three Phase Input Supplies – General Purpose Solutions



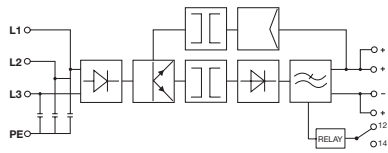
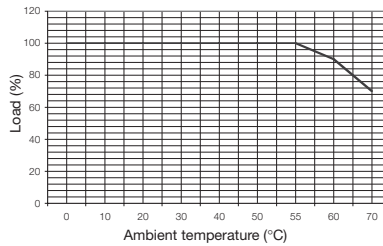
CP SNT3 1000W 24V 40A



Approvals:

Derating Curves

Output load / ambient temperature



Block diagram

Ordering Data

Type	Qty.	Order No.
CP SNT3 1000W 24V 40A	1	8708730000

Technical Data

Input	Input voltage	3 x 400 VAC / 340 min...575 max VAC
	Input current	3.4 A @ 400 VAC
	Input frequency	47...63 Hz
	Recommended mains fuse	external via 3 circuit breakers up to 16 A, trip curve characteristic C
Output	Output voltage	24...28 VDC (adjustable via potentiometer)
	Output current	40 A
	max. output power	960 W
	max. residual ripple	< 100 mV _{p-p} / bandwidth 20 MHz
	Surge capability	105%...130% I _{const.} of max. output power for up to 5 seconds, automatic restart
	Overvoltage protection	29...34 V with automatic restart
	Holdup time when 400 VAC mains fail	> 10 ms at nominal load
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC
	Galvanic isolation input-output	3 kVAC
	Load regulation	< 2%
Redundancy or load sharing	directly with same type (maximum 2 power supplies of same rating)	
Status relay/change-over contact	250 VAC (max. 30 VDC) / 1 A	

General Specifications

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		88%
Status display		LED green
Standards		EN 60950 (SELV)
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
Power factor correction		yes
Mounting position		Horizontal on mounting rail TS 35
Mounting clearance		above/below ≥ 3 cm
Weight		approx. 3.0 kg (6.6 lbs.)
Type of connection		Screw
Clamping area		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Dimensions (L x W x H)		125 x 280 x 150 mm (4.92 x 11.02 x 5.91 in.)

Approvals/Certifications

Introduction – DC-DC Converters

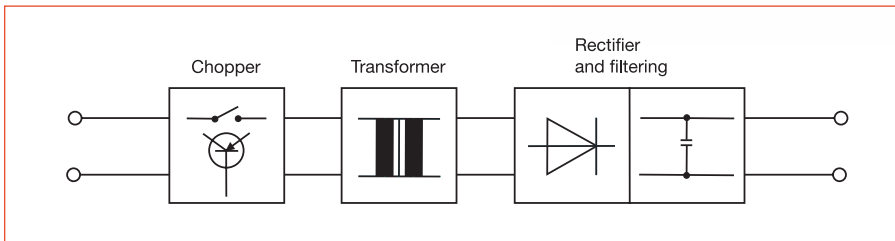
DC to DC converters enable customers to derive low voltage DC signals from either 12 VDC or 24 VDC sources. They are typically connected at the output of a DC power source and can deliver DC voltages of 5, 12, 15 or 24 volts. DC voltage converters (DC to DC converters) are intended in particular for the decentralized power supply of circuits, assemblies and modules. DC voltage converters are often required for emergency generators to supply electrical devices from batteries or other DC systems.

The CP-DCDC 50W family is available in 2 input versions and 4 output versions, making them very versatile.

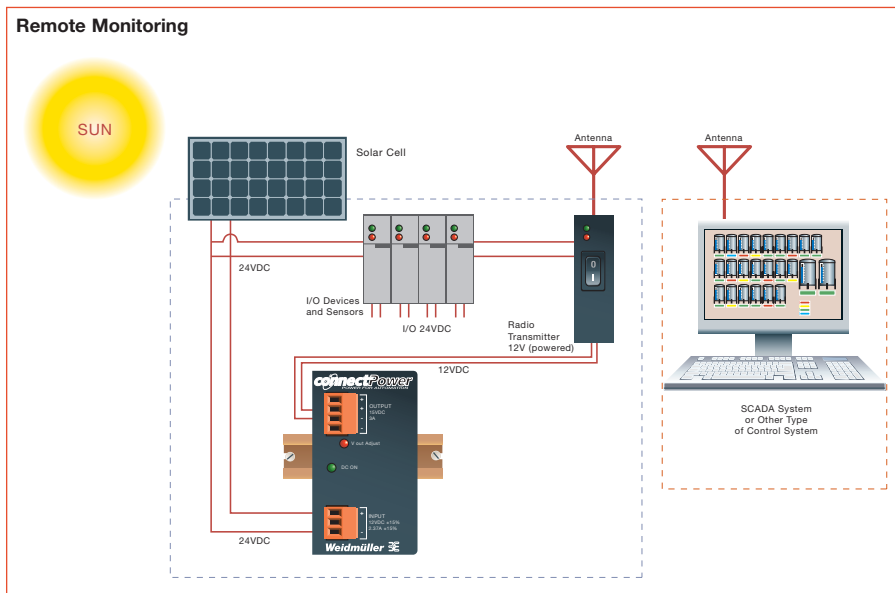
Typical applications include feeding TTL level circuits (5 VDC) and providing emergency power to low voltage circuits.

DC-DC Converters

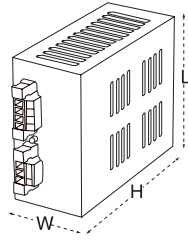
- 12V and 24V input versions
- 5V, 12V, 15V and 24V output variations
- User adjustable output voltage
- Input and output plug-socket connectors
- Output status LED
- DIN rail (TS35) mountable
- Chassis mountable with optional hardware
- Just 57mm (2.24") wide
- Robust metal housing
- CSA Class 1 Div 2 and Zone 2
- UL508 listed



Remote Monitoring



- DC-DC converter used to convert solar array output (24 VDC in this case) that is used for powering 24 VDC input/output devices, to 12 VDC used for power to lower cost radio transmitter. The transmitter panel (remote monitoring system) transmits information to SCADA system that can monitor the conditions/physical properties at the remote site, taking corrective actions, alarming, or simply providing information on conditions at remote site.



CP-DCDC 50W
12 VDC Input



CP-DCDC 50W
24 VDC Input



Approvals:



Ordering Data

Output voltage/maximum current

Technical Data

Input voltage

	Minimum
	10.2 VDC
	Typical
	12 VDC
	Maximum
	16 VDC

Input Current for output of:	
5 VDC @8A	4.53 A
12 VDC @3A	3.88 A
15 VDC @3A	4.7 A
24 VDC @2A	4.96 A

Input protection Fuse

Switching frequency

Efficiency at Maximum load

Maximum ripple

Overload protection

Maximum capacity at output

Hold time

Temperature

Humidity

Galvanic isolation

Wire size

Dimensions (L x W x H)

Weight

Mounts on mounting rail

Approvals/Certifications

Accessories

Chassis Mounting Kit

L Bracket Mounting Kit—Panelfount

Type Order No.

CP-DCDC 50W	
22 - 24 VDC @ 2 A	9919371224
15 VDC @ 3 A	9919371215
12 VDC @ 3 A	9919371212
5 VDC @ 8 A	9919371205

12 VDC

10.2 VDC

12 VDC

16 VDC

4.53 A

3.88 A

4.7 A

4.96 A

internal (not user serviceable) 2 A

180 kHz PWM

80% (75% 5 VDC @8 A)

0.2% RMS

Overvoltage switch-off with automatic reset/short circuit

10,000 µF (8000 µF 5 VDC @8 A)

2.5 mS

3.8 mS

3.5 mS

3.5 mS

Storage -40°C...+85°C (-40°F...+185°F)

Operating -10°C...+50°C (+14°F...+122°F) full rated load

20...85% RH

Storage temperature 20...90% RH non-condensing

Input to output 500 VAC RMS

Input/output to rail 4 KV RMS

Input to ground 500 VAC RMS

Output to ground 500 VAC RMS

0.1...4.0 mm² (26...12 AWG)

98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)

454 g (1 lb.)

TS 35 DIN rail, Chassis w/ optional kit

CSA, UL Listed, CE

CSA Class 1 Div. 2 and Zone 2

Order No.

7920560000

7940000543

Type Order No.

CP-DCDC 50W	
22-24 VDC @ 2 A	9919372424
15 VDC @ 3 A	9919372415
12 VDC @ 3 A	9919372412
5 VDC @ 8 A	9919372405

24 VDC

18 VDC

24 VDC

30 VDC

2.3 A

1.93 A

2.37 A

2.49 A

internal (not user serviceable) 2 A

330 kHz PWM

80% (75% 5 VDC @8 A)

0.2% RMS

Overvoltage switch-off with automatic reset/short circuit

8000 µF

7.8 mS

10 mS

7 mS

7 mS

Storage -40°C...+85°C (-40°F...+185°F)

Operating -10°C...+50°C (+14°F...+122°F) full rated load

20...85% RH

Storage temperature 20...90% RH non-condensing

Input to output 500 VAC RMS

Input/output to rail 4 KV RMS

Input to ground 500 VAC RMS

Output to ground 500 VAC RMS

0.1...4.0 mm² (26...12 AWG)

98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)

454 g (1 lb.)

TS 35 DIN rail, Chassis w/ optional kit

CSA, UL Listed, CE

CSA Class 1 Div. 2 and Zone 2

Order No.

7920560000

7940000543

Introduction – Diode Modules for Redundancy

Redundancy, Load Sharing, Increased Power Delivery

Weidmüller's diode modules are designed to enhance the ConnectPower series of DC power supplies and provide a more reliable Power Delivery Solution. They are cost effective products that enable redundancy as well as load sharing between power supplies, thus extending the useful life of the power supply.

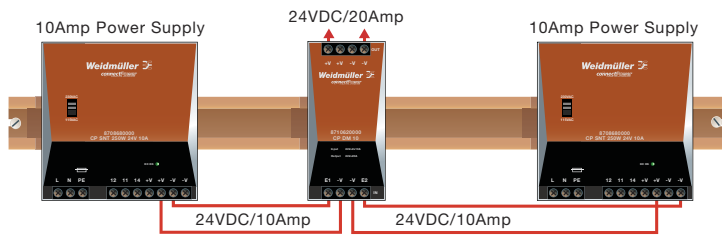
Diode modules can increase the reliability of a Power Delivery Solution by preventing current feedbacks between paralleled power supplies.

It is important to keep in mind that before paralleling power supplies, their output voltage must be calibrated to be within $\pm 50\text{mV}$ of each other, and the parallel connection must be positioned as close as possible to the load.



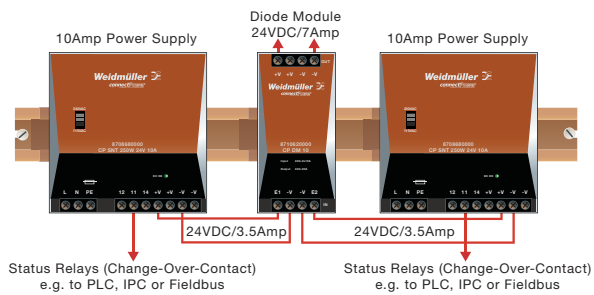
Introduction – Diode Modules for Redundancy

Parallel Connection for Increased Power Delivery



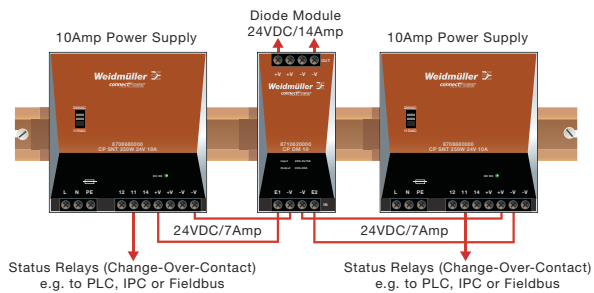
- The amount of power needed is provided by two power supplies combined in parallel

Provide Uninterrupted DC Power with Redundancy and Fault Indication (this example supplying 7A to load)



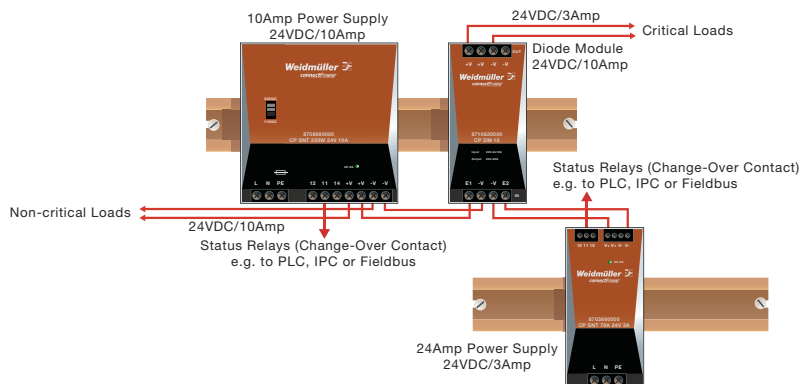
- Diode modules provide galvanic isolation between power supplies
- Use status relays for remote alarm indication

Increase DC Power Delivery to Control Systems (this example supplying 14A to load)



- The amount of power needed is provided by two power supplies combined in parallel
- Use status relays for remote alarm indication

Guarantee DC Power to Critical Loads (this example supplying 3A to critical load)



- Under normal operating conditions, the critical load is provided by both the 10A and 3A power supply
- If the larger power supply fails, the critical load will continue to be maintained by the 3A power supply
- This ensures uninterrupted power to the critical load

Note: Two power supplies in parallel must be calibrated to within ± 50 mv of each other.

Diode Modules for Redundancy



CP DM 10
10A per Input Diode Module

CP DM 20
20A per Input Diode Module

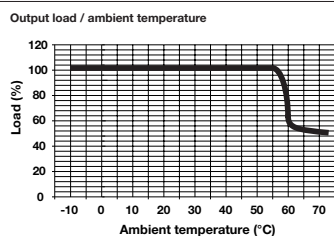


Approvals:

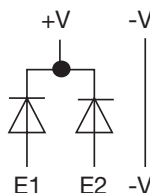


Derating Curve

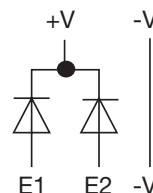
3/5/10/20A



Schematic



Schematic



Ordering Data

Type	Qty.	Order No.
CP DM 10	1	8710620000

Type	Qty.	Order No.
CP DM 20	1	8768650000

Technical Data

Input	Input voltage	40 VDC max.
	Input current	10 A per input max.
Output	Output voltage	$V_{in} - 0.5$ typ.
	Output current	20 A max.

Input	Input voltage	40 VDC max.
	Input current	10 A per input max.
Output	Output voltage	$V_{in} - 0.5$ typ.
	Output current	20 A max.

Input	Input voltage	40 VDC max.
	Input current	20 A per input max.
Output	Output voltage	$V_{in} - 0.5$ typ.
	Output current	40 A max.

General Specifications

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		approx. 95.5% at 24 VDC
Mount onto mounting rail		Mounting rail TS35 to DIN 50022
Mounting position		Horizontal
Mounting		Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight		approx. 0.15 kg (0.33 lbs.)
Dimensions (L x W x H)		125.0 x 55.5 mm x 110.0 (4.92 x 2.19 x 4.33 in.)
Type of Connection		Screw
Clamping area input (nominal / min. / max.)		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Clamping area output (nominal / min. / max.)		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Indication signals	Voltage	None
	Alarm	None
Fault Relay	Voltage	None
	Current	None
	Configuration	None
	Set point	None
Other	Voltage drop input-output	0.5 V typ.
	Fan	None

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		approx. 95% at 24 VDC
Mount onto mounting rail		Mounting rail TS35 to DIN 50022
Mounting position		Horizontal
Mounting		Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight		approx. 0.5 kg (1.1 lbs.)
Dimensions (L x W x H)		125.0 x 55.5 mm x 110.0 (4.92 x 2.19 x 4.33 in.)
Type of Connection		Screw
Clamping area input (nominal / min. / max.)		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Clamping area output (nominal / min. / max.)		10.0 / 0.32 / 16.0 mm ² (8 / 22 / 6 AWG)
Indication signals	Voltage	None
	Alarm	None
Fault Relay	Voltage	None
	Current	None
	Configuration	None
	Set point	None
Other	Voltage drop input-output	0.5 V typ.
	Fan	None

Temperature	Operating	-10°C...+55°C (+14°F...+131°F)
	Storage	-20°C...+85°C (-4°F...+185°F)
Efficiency under max. load		approx. 95% at 24 VDC
Mount onto mounting rail		Mounting rail TS35 to DIN 50022
Mounting position		Horizontal
Mounting		Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight		approx. 0.5 kg (1.1 lbs.)
Dimensions (L x W x H)		125.0 x 55.5 mm x 110.0 (4.92 x 2.19 x 4.33 in.)
Type of Connection		Screw
Clamping area input (nominal / min. / max.)		4 / 0.13 / 6 mm ² (12 / 26 / 10 AWG)
Clamping area output (nominal / min. / max.)		10.0 / 0.32 / 16.0 mm ² (8 / 22 / 6 AWG)
Indication signals	Voltage	None
	Alarm	None
Fault Relay	Voltage	None
	Current	None
	Configuration	None
	Set point	None
Other	Voltage drop input-output	0.5 V typ.
	Fan	None

Terminations

Input/output	N/A
Alarm contact	N/A

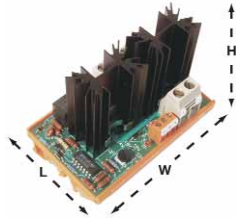
Input/output	N/A
Alarm contact	N/A

Input/output	N/A
Alarm contact	N/A

Approvals/Certifications



Diode Modules for Redundancy



CP DM 30 (SP-RS-RED./PARR.30A)
15A per Input Diode Module



RSD-40A
20A per Input or 40A Input per Unit
Diode Module with Status Indication



Ordering Data

Technical Data

Input	Input voltage
	Input current
Output	Output voltage
	Output current

General Specifications

Temperature	Operating
	Storage

Efficiency under max. load	
Mount onto mounting rail	
Mounting position	
Mounting	
Weight	
Dimensions (L x W x H)	
Type of Connection	
Clamping area input (nominal / min. / max.)	
Clamping area output (nominal / min. / max.)	
Indication signals	Voltage

	Alarm
--	-------

Fault Relay	Voltage
	Current
	Configuration
	Set point
Other	Voltage drop input-output
	Fan

Terminations	Input/output
	Alarm contact

Approvals/Certifications

Type **Order No.**

CP DM 30 with voltage sensing and fault relay	998739
CP DM 30 without voltage sensing	998786

Technical Data

Input voltage	14-24 VDC
Input current	15 A per input max.
Output voltage	24 VDC
Output current	30A Maximum

General Specifications

Operating	0°C...+50°C (32°F...+122°F)
	(40°C rise (104°F) above ambient at 30 A)
Storage	-20°C...+85°C (-4°F...+185°F)

Efficiency	95%
Mounting	TS32 or TS35 mm DIN rails
Position	Horizontal
Clearance	Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight	226.8 g (0.5 lbs.)
Dimensions	70 x 110 x 90 mm (2.75 x 4.33 x 3.5 in.)
Connection	Screw
Clamping area input	4 / 0.32 / 16 mm ² (12 / 22 / 6 AWG)
Clamping area output	4 / 0.32 / 16 mm ² (12 / 22 / 6 AWG)
Indication signals	None for 998786
	Actual voltage for 998739

	Alarm
--	-------

Fault Relay	Voltage
	Current
	Configuration
	Set point
Other	Voltage drop input-output
	Fan

Terminations	Input/output
	Alarm contact

Approvals/Certifications

UL recognized,

Type **Order No.**

RSD-40A (20 A per input max.) (2 x 20)	7940005219
RSD-40A (40 A input per unit max., 2 units required) (1 x 40)	7940005218

Technical Data

Input voltage	24 VDC nominal
Input current	20 A per input max. / 40 A (7940005218)
Output voltage	24 VDC
Output current	40 A Maximum

General Specifications

Operating	0°C...+40°C (32°F...+104°F) ambient
-----------	-------------------------------------

Efficiency	95%
Mounting	TS32 or TS35 mm DIN rails
Position	Horizontal
Clearance	Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight	317.5 g (0.7 lbs.)
Dimensions	109.2 x 109.2 x 99 mm (4.3 x 4.3 x 3.9 in.)
Connection	Screw
Clamping area input	1.5 / 0.32 / 16 mm ² (14 / 22 / 6 AWG)
Clamping area output	1.5 / 0.32 / 16 mm ² (14 / 22 / 6 AWG)

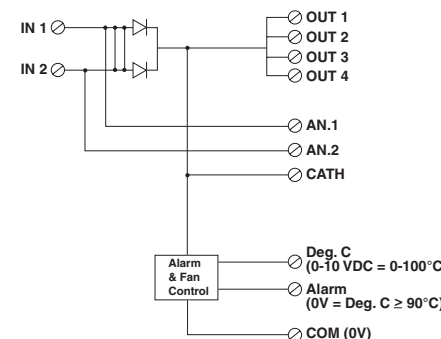
Indication signals	"AN.1" = input 1 (2 x 20 A version)
	"AN.2" = input 2 (2 x 20 A version)
	"AN.1" = "AN.2" = input voltage (1 x 40 A version)
	"CATH" = output voltage
	0-10 VDC = 0°C...+100°C (32°F...+212°F)
	15 VDC Max. output (150°C [302°F])
	24 VDC under normal operating conditions
	0 VDC if heatsink temperature exceeds 90°C (194°F)
	N/A
	N/A
	N/A
	N/A
	0.40 V typ.

Fan	Turns on when heatsink temperature exceeds 60°C (140°F)
	Proportional control (fan speed increases as heatsink temperature increases—fully on at 80°C [176°F])
	13 mm ² (22...6 AWG)
	26...14 AWG

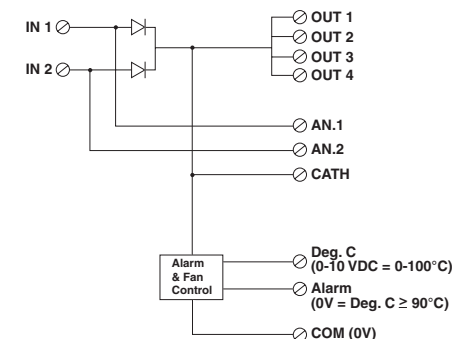
cULus Listed

RSD-40A Schematics

7940005218



7940005219



Introduction – Battery Back Up Unit for DC Power Management

Weidmüller's Battery Back Up Unit (BBU) is designed to be the heart of an uninterruptible DC power management system. The connectPower BBU combines with Weidmüller power supplies and a customer-supplied battery pack to form a scalable DC power system. This enables users to put together a system uniquely tailored to their needs.

These full-featured units have all the diagnostics needed to monitor the status of the power system. These DC power management units interface with the DC power supplies in the control cabinet. In addition, they monitor the status of the DC loads and the DC batteries. If the AC is removed or experiences a voltage sag, the load is switched seamlessly to the batteries. When the AC line is restored, the batteries are recharged and maintained.

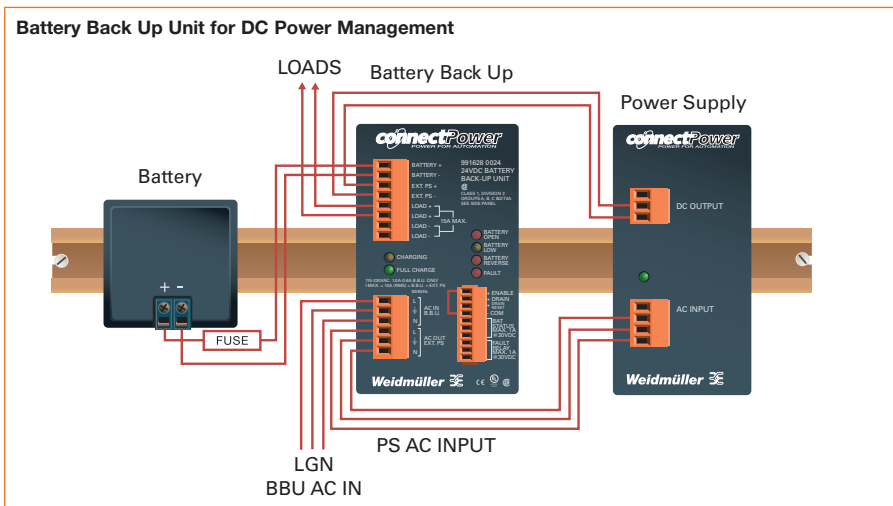
With the BBU Power Supply, 2A of battery charging current is available at 24 VDC, and 3A with the 12 VDC units. Extensive monitoring is provided via LEDs. Relay contacts provide battery status indication and fault indication.

Battery Back Up Units:

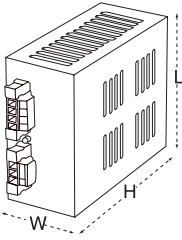
- DC backup system that actively manages DC battery banks
- Increases system uptime by providing DC power to load in the event of an AC power failure
- If the input fails, the load is switched seamlessly to batteries
- Continuously monitors DC output voltage of power supply
- Extensive monitoring is provided via LEDs and outputs



Battery Back Up Unit for DC Power Management



Battery Back Up Unit for DC Power Management



Approvals:



**BBU
12 VDC Input**



**BBU
24 VDC Input**



Ordering Data

Technical Data

Input voltage	Minimum	85 VAC
	Typical	115-230 VAC ± 10%
	Maximum	265 VAC
Input current	at 115 VAC	0.8 A
	at 230 VAC	0.5 A
Input protection	Fuse	2 A slow blow (internal, not user serviceable)
	Input current	Thermistor 40 A maximum
	Overvoltage	Varistor
Output	Voltage Nominal	12 VDC syst.
	Current	15 A maximum
	Surge Current from no load	20 A max for 300 ms 30 A max for 100 ms
Load voltage		12-14 V
AC current		10 A
Switching time		< 0.5 ms
Protection	Battery Polarity Protection	Limited by internal 4.0 A fuse
	Battery Overvoltage	16 V
	Battery Undervoltage	9.3 V
	BBU Over Temperature	120°C (248°F) ±10%
	Charger Short Circuit	Continuous
	Load Short Circuit	Continuous
Hold Time	at 115 VAC	46 ms
	at 230 VAC	226 ms
Temperature	Storage	-20°C...+85°C (-4°F...+185°F)
	Operating	-20°C...+50°C (-4°F...+122°F)
Humidity	Storage temperature	20...90%
	Operating temperature	20...85% non-condensing
Galvanic Isolation	Input to output	3 KV
	Input/output to rail	3 KV
	Input to ground	1.5 KV
	Output to ground	500 V
Wire Size	Power Connections	0.1...4 mm ² (26...12 AWG)
	Control inputs/relay outputs	0.5...1.5 mm ² (28...14 AWG)
Dimensions (L x W x H)		127.5 x 72.5 x 161 mm (5.02 x 2.85 x 6.34 in.)
Weight		950 g (2.09 lbs.)
Control inputs	Enable	dry contact/open collector
Status outputs	Drain	dry contact/open collector
	Drain Reset	dry contact/open collector
	Battery Status	Form C Relay and LED
	Fault	Form C Relay and LED
Battery Charger	Charge Current	3.0 A
	Full Charge	Regulates to 13.65 V
	Battery Reverse	LED
	Battery Open	LED
	Battery Low	Yellow LED on below 11 V
Battery Capacity	Minimum	3 AH
	Maximum	scalable
Mounting		TS 35 DIN rail (optional direct panel mount)
Connections		plug and socket
Approvals/Certifications		
CSA, UL 508 Listed, CE, CSA Class 1 Div. 2 and Zone 2		
Accessories		
Chassis Mounting Kit		

Type	Order No.
BBU 12 VDC	9916280012

Type	Order No.
BBU 24 VDC	9916280024

Input voltage	Minimum	85 VAC
	Typical	115-230 VAC ± 10%
	Maximum	265 VAC
Input current	at 115 VAC	1.0 A
	at 230 VAC	0.6 A
Input protection	Fuse	2 A slow blow (internal, not user serviceable)
	Input current	Thermistor 40 A maximum
	Overvoltage	Varistor
Output	Voltage Nominal	24 VDC syst.
	Current	15 A maximum
	Surge Current from no load	20 A max for 300ms 30 A max for 100ms
Load voltage		24-28 V
AC current		10 A
Switching time		< 0.5 ms
Protection	Battery Polarity Protection	Limited by internal 4.0 A fuse
	Battery Overvoltage	32 V
	Battery Undervoltage	18.3 V
	BBU Over Temperature	120°C (248°F) +10%
	Charger Short Circuit	Continuous
	Load Short Circuit	Continuous
Hold Time	at 115 VAC	24 ms
	at 230 VAC	190 ms
Temperature	Storage	-20...+85°C (-4°F...+185°F)
	Operating	-20...+50°C (-4°F...+122°F)
Humidity	Storage temperature	20...90%
	Operating temperature	20...85% non-condensing
Galvanic Isolation	Input to output	3 KV
	Input/output to rail	3 KV
	Input to ground	1.5 KV
	Output to ground	500 V
Wire Size	Power Connections	0.1...4 mm ² (26...12 AWG)
	Control inputs/relay outputs	0.5...1.5 mm ² (28...14 AWG)
Dimensions (L x W x H)		127.5 x 72.5 x 161 mm (5.02 x 2.85 x 6.34 in.)
Weight		950 g (2.09 lbs.)
Control inputs	Enable	dry contact/open collector
Status outputs	Drain	dry contact/open collector
	Drain Reset	dry contact/open collector
	Battery Status	Form C Relay and LED
	Fault	Form C Relay and LED
Battery Charger	Charge Current	2.0 A
	Full Charge	Regulates to 27.3V
	Battery Reverse	LED
	Battery Open	LED
	Battery Low	Yellow LED on below 22 V
Battery Capacity	Minimum	2 AH
	Maximum	scalable
Mounting		TS 35 DIN rail (optional direct panel mount)
Connections		plug and socket
Approvals/Certifications		
CSA, UL 508 Listed, CE, CSA Class 1 Div. 2 and Zone 2		
Accessories		

Battery Back Up Unit for DC Power Management – Operation

Functional Outline

The BBU is at its basic level a scalable UPS for 12 VDC or 24 VDC power. It is the heart or center of the system with everything wired through it. In this way it can monitor the status of the AC mains, the AC to the power supply, the DC out of the power supply and the battery condition. The BBU does NOT have built-in batteries. The batteries are sized based on the current and time demand for the back-up power.

The typical system is comprised of the following: the BBU, the battery pack and the power supply. The power supply is sized as per normal requirements (how much current is needed). The batteries are sized based on the amount of back-

up current and the length of time that the current is required. There is no upper limit to the size of the batteries; we do not recommend that a battery pack smaller than 4Ahr be used due to the bulk charge rates of the BBU (3A for the 12V version and 2A for the 24V version), as they may be damaged with a bulk charge at this level.

Under normal conditions the BBU operates as a battery charger. It trickles the batteries to a minimum voltage (if necessary) then bulk charges at a rate of 3A for the 12V version and 2A for the 24V version until the batteries reach 14.75V / 29.5V. At this point the BBU floats the batteries to 13.65V / 27.3V.

The BBU switches the output current from Power supply to Battery through an internal Mosfet. This allows the unit to switch over in milliseconds.

The BBU has two form C relays, one for Battery status and the other for Fault monitoring. There are three inputs as follows: Enable, Drain and Drain Reset. These I/O are explained in detail below.

Digital Inputs

Enable:

A connection between the "Enable" and "COM" terminals enables the BBU. If terminals are open circuit (Disabled), the BBU functions as a battery charger only. In the event of AC failure the batteries are not connected to the load via the BBU. The BBU is factory preset as Enabled.

Drain:

A temporary short between the "Drain" and "COM" terminals switches the load to the batteries until the battery voltage reaches 11/22V. At this point the AC power is returned to the power supply and the BBU starts recharging the batteries. The Drain cycle can also be reset / terminated by activating the "Drain Reset" input.

Drain Reset:

A temporary short between the "Drain Reset" and "COM" terminals disables the Drain cycle to the batteries.

Diagnostic LEDs

Full Charged LED (green):

On when battery voltage is 14.75/29.5V or greater.

Bat Status relay is energized.

Once fully charged the BBU drops the charge voltage to 13.65/27.3V ("float" voltage).

Battery Low LED (yellow):

On when battery voltage is <11/22 VDC.

Bat Status relay is off.

If the battery voltage drops below 9.7/18.7V the load is switched off.

Charging LED (yellow):

On when BBU is charging the batteries.

Off when the "Full Charged" LED is on.

Fault LED (red):

On when AC fails.

On when the external power supply voltage is <11V/21.5V.

On when the batteries are not connected.

On when the battery voltage is <9.7/18.7V.

Fault relay de-energizes for the above conditions.

Battery Reverse LED (red):

Batteries connected in reverse.

Fault relay de-energizes and fault LED turns on.

There is an internal fuse that will open to prevent damage to BBU or to the batteries.

Battery Open LED (red):

No batteries connected – takes approx.

60 seconds to detect after turning on

BBU.

Fault LED is on and Fault relay is

de-energized.

Relay Outputs

Bat Status:

Battery status, this changes state based on whether the batteries are charging or fully charged.

See Diagnostic LEDs (Full Charge, Battery Low and Full Charge) for more detailed information.

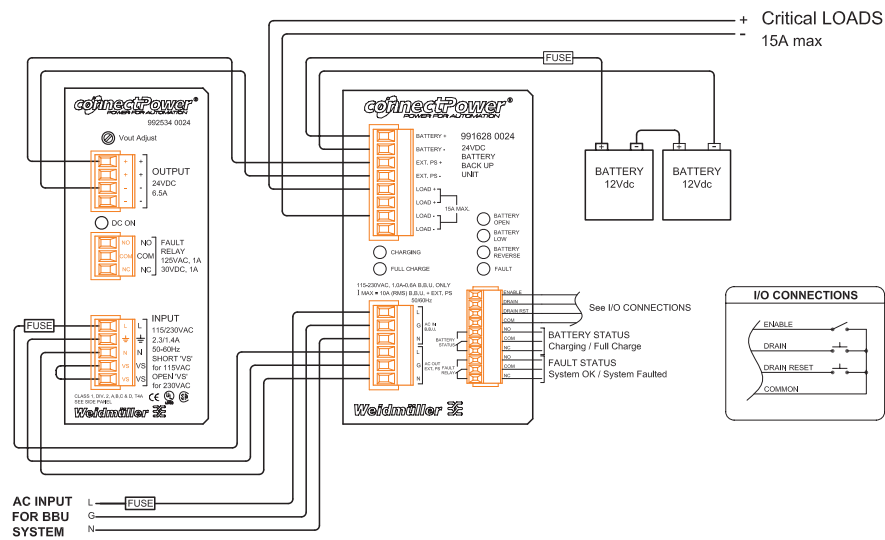
Fault Relay:

De-energizes under a fault condition.

See Diagnostic LEDs (Fault LED, Battery Reverse, and Battery Open) for more detailed information.

Battery Back Up Unit for DC Power Management – Operation

Typical Schematic



- The 15A Critical Load limit is a limit of the BBU itself and not the power supply.
- This schematic is representative of a 24 VDC system. For a 12 VDC system use a 12 VDC battery pack, a 12 VDC power supply and a 12 V BBU, part number 991628 0012.
- The fuses may be replaced by another means of circuit protection, i.e. circuit breakers.
- It is recommended to monitor the power supply Fault/Status relay/output if available.
- The power supply shown is for illustration purposes only. The power supply needs to be chosen based on load requirements.

Recommendations for Operation

A drain cycle should be run as often as the application permits, six to twelve times per year is recommended. This allows the batteries to maintain their capacity, and it also allows you to validate their condition by monitoring the length of time that it takes to recharge. By knowing the capacity of the battery, you can calculate the **approximate** length of time that it will take to recharge by monitoring the “Bat Status” relay.

Example

30Ahr battery at 24 VDC
The 24 VDC BBU has a bulk charge current of 2A

The formula to calculate the time to recharge a dead battery is:
 $(30\text{Ahr} / 2\text{A}) \times 2 = \mathbf{30\text{ hrs}}$

The formula to calculate the time to recharge after a drain cycle is:
 $((30\text{Ahr} / 2\text{A}) \times 0.56) \times 2 = \mathbf{16.8\text{ hrs}}$

The “x 2” in both formulas is because we overcharge the batteries so that they are fully charged—otherwise they only charge to just above 90%.

When running a drain cycle, the system only discharges the batteries to 22V / 11V. The batteries still have a fair bit of capacity left.

Please note that these formulas are NOT exact and are only approximations. This is due to variables such as actual battery capacity tolerance, temperature, voltage drop in cables, rate of discharge, etc.

It is recommended to use at least a 25% hysteresis on the calculated number of hours. Keep in mind that the battery capacity will decrease over time, and this is normal. **The best thing to do is to run a test on a known good set of batteries at room temperature and base the midpoint on the actual number of hours it takes to recharge after a drain cycle.**

In systems that run 24/7, there is never a good time to run the drain cycle. In these cases it is recommended to upsize the batteries as much as possible. It is still recommended to run drain cycles in these conditions. This is one of the key features of this product allowing you to validate the condition of the batteries. Please keep in mind that the batteries are NOT completely drained by running a drain cycle. The drain cycle runs the batteries to a voltage of 22V / 11V. In the worst case scenario, if you happen to lose power during a drain cycle, the drain cycle will reset at a battery voltage of 22V / 11V. The BBU will continue to power the load until the batteries reach 18V / 9V. Then and only then it will shut down power to the load. Because of this, and assuming that the batteries are bigger than needed, you shouldn't have a situation that leaves you without power.

We cannot stress how important it is to choose the batteries carefully for your application. The BBU is designed to work with many types of batteries, and works well with sealed lead acid, Gel cell and automotive / marine batteries. When selecting batteries keep in mind variables such as temperature extremes, cycle frequency (frequency of power outages) and many other environmental conditions. Many battery types can vent, creating a dangerous condition in a sealed panel. **Please consult the battery manufacturer for recommendations specific to your application.**

The temperature to which batteries are subjected is **very** important. Many manufacturers do not recommend recharging batteries if they are colder than 0°C (32°F) or hotter than 40°C (104°F). Again, please consult the battery manufacturer for recommendations.

Introduction – Electronic Fusing System WAVEGUARD

Weidmüller's WAVEGUARD Electronic Fusing System dramatically enhances the reliability of an automation control panel.

WAVEGUARD Electronic Fuses are used by connecting them in series between a switch mode DC power supply and each of the loads in a control panel. These electronic fuses constantly monitor the current delivered to their assigned load and measure the delivery time, and when an overload or short circuit current is detected, they open the load's circuit within microseconds. The electronic fuse will isolate the failing circuit before the DC power supply initiates a self-shutdown routine (most DC power supplies take milliseconds to initiate the self-shutdown routine). This ensures continued delivery of power to the rest of the circuits in the automation control panel.

When either an overload or a short circuit occurs, the WAVEGUARD Electronic Fuse will not only prevent the entire process or machines dependent on the control panel from shutting down, but it will also facilitate quick problem resolution by isolating the specific failure and indicating which circuit has failed via fault contact and LED indication.

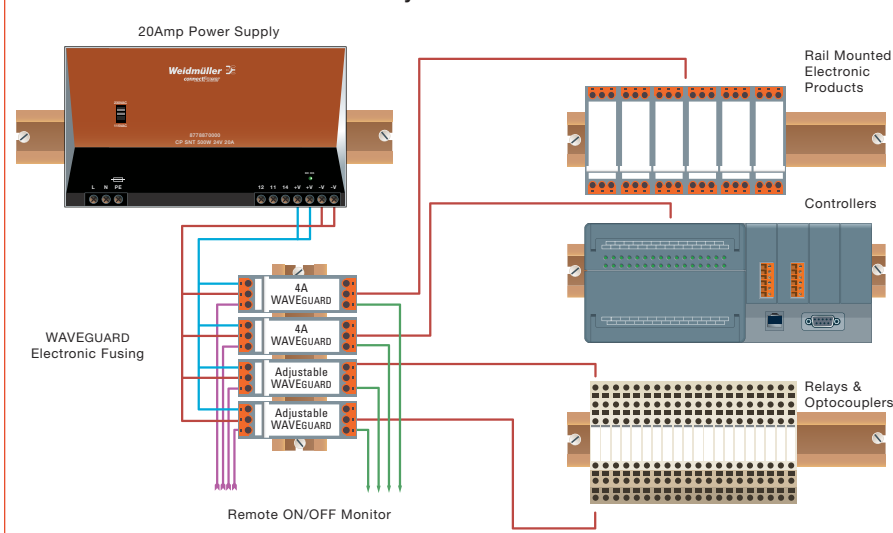
WAVEGUARD Electronic fuses offer a number of advantages over melting fuses and conventional electromechanical circuit breakers.



WAVEGUARD Electronic Fuses:

- Are transistor-based switching solutions that are not affected by temperature changes. Operation points of melting fuses and electromechanic circuit breakers are dependent on ambient temperature changes.
- Provide remote monitoring and reset inputs to reduce maintenance costs
- Have local monitoring and electrical resetting inputs so you can quickly troubleshoot to get the system up and running within minutes.
- Ride through peak in-rush current at system start up to prevent nuisance tripping.
- Are DIN-rail mountable, and are available in a fixed current rating of 4.0 Amps, and adjustable rating of 0.5 to 5.0 Amps.

Protect and Monitor DC Power of Control Systems

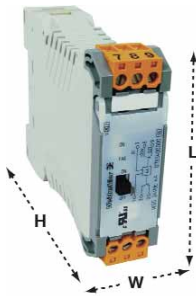


- Prevents a failure on a single load from shutting down an entire panel or system
- WAVEGUARD electronic fuses are connected in series between the power supply and each of the loads
- WAVEGUARD fuses can be remotely monitored and reset for control panel troubleshooting

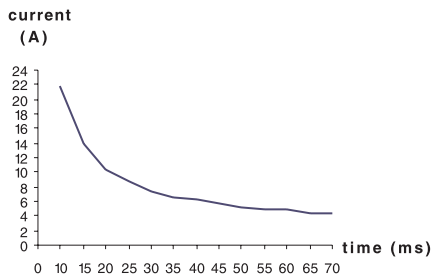
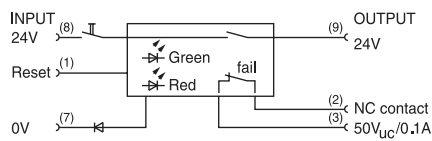
Electronic Fusing System WAVEGUARD

WGS 24VDC 4.00A

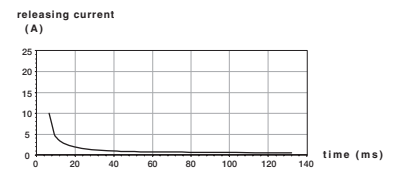
WGS 24VDC ADJ 0.5...5.0A



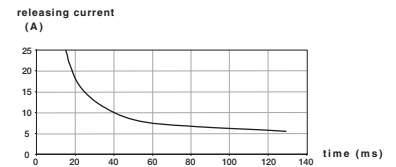
Approvals:



Characteristic curve
Releasing current: 0.5A



Releasing current: 5.0A



Ordering Data	
Screw connection	

Technical Data	
Input	Rated voltage
	Rated current
	Reset
Output	Differential relay/signal contact
	Signaling delay
Temperature	Operating
	Storage

Status indicator	
Standards	
EMC standards	
Sliding switch	

Clamping range (rating / min. / max.)	Screw connection
Dimensions (L x W x H)	

Approvals/Certifications

Type	Order No.
WGS 24VDC 4.00A	878340000

Rated voltage	24 VDC
Rated current	4.00 A
Reset	Pulse >100 ms +24 V, falling edge "ON".
Differential relay/signal contact	Break cont. elem. max. 50V/0.05A; only extra-low voltage
Signaling delay	3.5 ms typ.
Operating	0°C...+55°C (+32°F...+131°F)
Storage	-20°C...+85°C (-4°F...+185°F)
LED green: OK	
LED red: Tripped	
Standards	EN 50178
EMC standards	EN 61000-6-1, 2, 4; EN 55011
"OFF" - 10 sec. waiting - "ON"	
Clamping range (rating / min. / max.)	2.50/0.50/2.50 mm ² (14 AWG)
Dimensions (L x W x H)	72 x 22.5 x 92.4 mm (2.83 x 0.88 x 3.64 in.)

UL US CE

Type	Order No.
WGS 24VDC ADJ 0.5...5.0A	871027000

Rated voltage	24 VDC
Rated current	0.5...5.0 A
Reset	Pulse >100 ms +24 V, falling edge "ON".
Differential relay/signal contact	Break cont. elem. max. 50V/0.05A; only extra-low voltage
Signaling delay	3.5 ms typ.
Operating	0°C...+55°C (+32°F...+131°F)
Storage	-20°C...+85°C (-4°F...+185°F)
LED green: OK	
LED red: Tripped	
Standards	EN 50178
EMC standards	EN 61000-6-1, 2, 4; EN 55011
"OFF" - 10 sec. waiting - "ON"	
Clamping range (rating / min. / max.)	2.50/0.50/2.50 mm ² (14 AWG)
Dimensions (L x W x H)	72 x 22.5 x 92.4 mm (2.83 x 0.88 x 3.64 in.)

UL US CE

Cyclical auto-reset not permitted; T_u = 23°C (73.4°F) single module

Argentina
Australia
Austria
Bahrain
Belarus
Belgium
Brazil
Bulgaria
Canada
Chile
China
Colombia
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hong Kong
Hungary
India
Indonesia
Iran
Ireland
Israel
Italy
Japan
Korea
Luxembourg

Malaysia
Mexico
Morocco
Netherlands
New Zealand
Norway
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