Power Delivery Solutions

Product Information

Weidmüller

Contents

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.

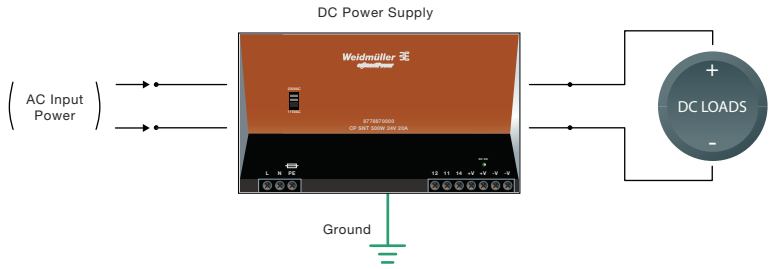
In addition, Weidmuller's electronic fuses improve failure identification and location time and reduce associated costs, since these fuses can be wired to a control room, enabling personnel to remotely identify the failure without testing multiple load circuits. This can cut troubleshooting time and 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?



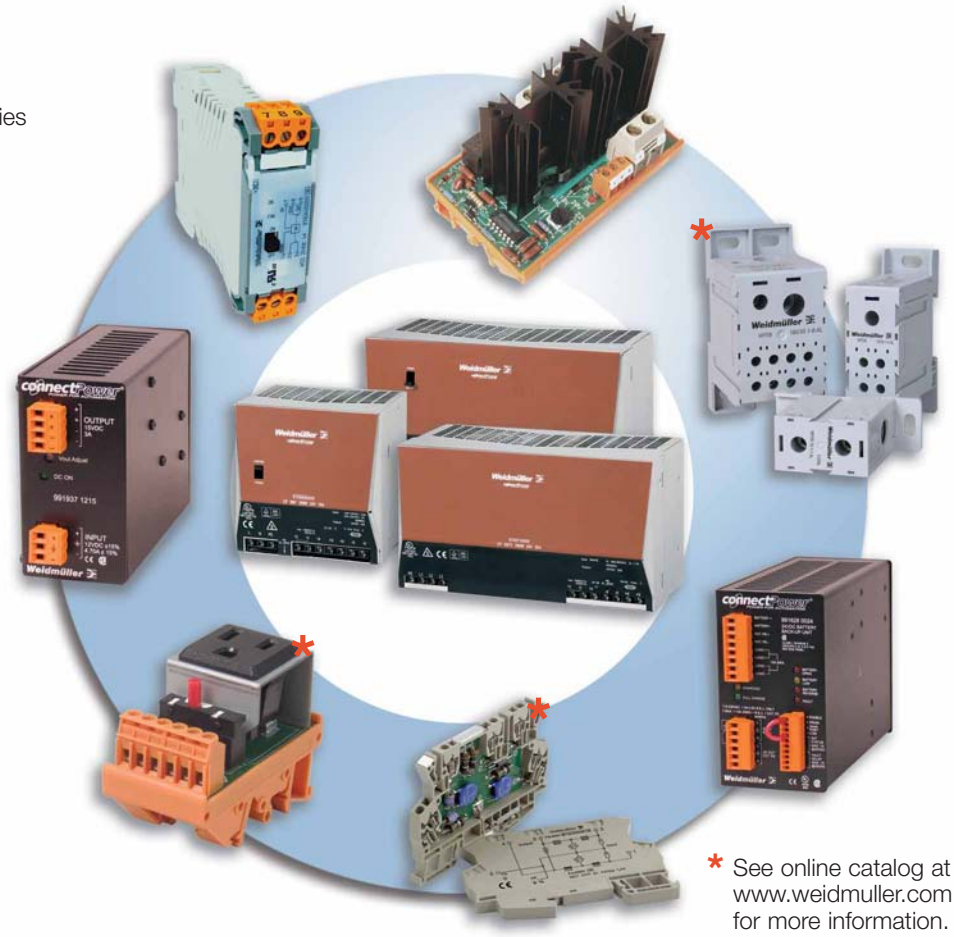
- The reliability of a DC power system (for control electronics) is not limited to the reliability of a single power supply
- Reliability of power to all loads as well as the reliability of the input AC power, must be taken into account.

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

Weidmuller 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

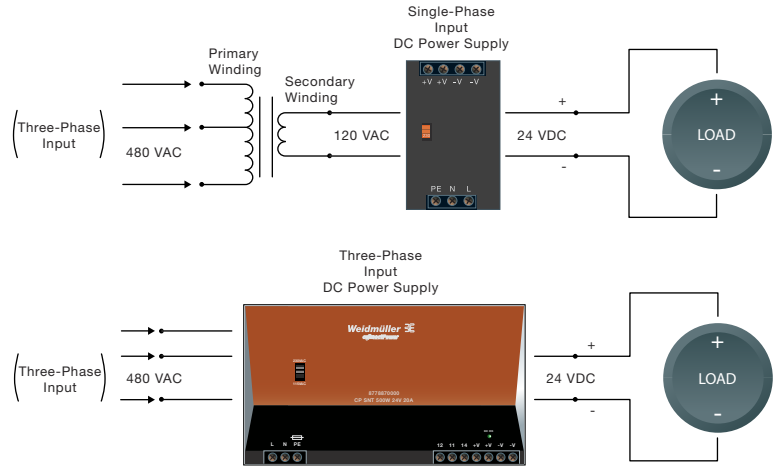
Three-Phase Input Power Supplies

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.

Eliminate Step-Down Transformers



- 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 61mm (2.4”).

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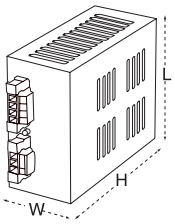


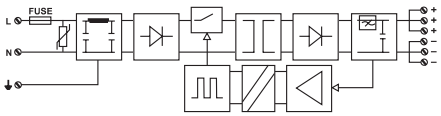
Approvals:

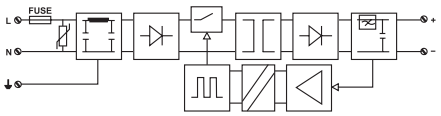
LISTED

CP SNT 12W 0.5A

CP SNT 24W

Diagram/Schematic Circuit Diagram





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

Ordering Data	Type	Order No.
	CP SNT 12W 0.5A	
Output voltage/maximum current	**24 VDC / 0.5 A**	**9918840024**

Type	Order No.
CP SNT 24W	
24 VDC / 1 A	**9928890024**
28 VDC / 1 A	**9928890028**
15 VDC / 1.5 A	**9928890015**
12 VDC / 1.5 A	**9928890012**
5 VDC / 2 A	**9928890005**

Technical Data			
Input voltage	**Minimum**	**85 VAC, 120 VDC**	**85 VAC, 120 VDC**
	Typical	**115-230 VAC ± 10%, 50/60 Hz**	**115-230 VAC ± 10%, 50/60 Hz**
	Maximum	**265 VAC, 300 VDC**	**265 VAC, 300 VDC**
Input current	**at 115 VAC**	**260 mA RMS ± 20%**	**480 mA RMS ± 20%**
(Average values for reference only)	**at 230 VAC**	**180 mA RMS ± 20%**	**270 mA RMS ± 20%**
	at 125 VDC	**125 mA ± 20%**	**280 mA ± 20%**
	at 250 VDC	**65 mA ± 20%**	**140 mA ± 20%**
Input protection	Fuse	2 A slow fuse (internal, not user serviceable)	2 A slow fuse (internal, not user serviceable)
	Inrush current	Thermistor	Thermistor
	Overvoltage protection	Varistor	Varistor
Switching frequency		100 kHz PWM	100 kHz PWM
Efficiency at maximum load		80%	78%
Maximum ripple		0.1% RMS V_{p-p}	0.3% RMS V_{p-p}
Regulation	Load (10-100% load)	0.2%	2% (12, 15 and 5 V) 0.5% (24 and 28 V)
	at input voltage	0.2% 85 VAC - 265 VAC In	0.2%
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit	Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Maximum capacity at output		8000 µF	8000 µF
Hold time	at 115 VAC	30 ms	35 ms
(Maximum output current following input loss)	at 230 VAC	80 ms	160 ms
Temperature	Storage	-40°C…+85°C (-40°F…+185°F)	-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)	-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	20…85% RH non-condensing
	Storage temperature	20…90% RH	20…90% RH
Galvanic isolation	Input-output	3 kV RMS	3 kV RMS
	Input/output to mounting rail	4 kV RMS	4 kV RMS
	Input to ground	1.5 kV RMS	1.5 kV RMS
	Output to ground	500 V RMS	500 V RMS
Wire size		0.1…4.0 mm^2 (26…12 AWG)	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.)	90.5 x 52 x 62.5 mm (3.56 x 2.05 x 2.46 in.)
Weight		140 g (0.311 lbs.)	160 g (0.35 lbs.)
Mounts on mounting rail		TS 35 DIN rail	TS 35 DIN rail

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

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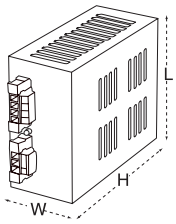

Approvals:

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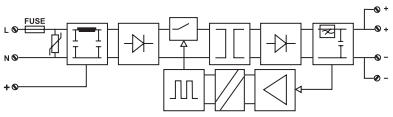
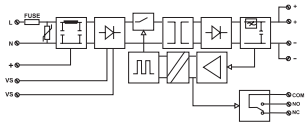
CP SNT 55W

CP SNT 160W

Diagram/Schematic Circuit Diagram





Ordering Data	Type	Order No.	Type	Order No.
	CP SNT 55W		CP SNT 160W	
Output voltage/maximum current	**24 VDC-28 VDC / 2.3 A**	**9927480024**	**24 VDC-28 VDC / 6.5 A**	**9925340024**
	48 VDC / 1.04 A	**9927480048**	**5 VDC / 10 A**	**9925340005**
	12 VDC - 15 VDC / 3 A	**9927480012**	**12 VDC / 10 A**	**9925340012**
	5 VDC / 3 A	**9927480005**	**48 VDC / 3.25 A**	**9925340048**

Technical Data			
Input voltage	**Minimum**	**85 VAC, 120 VDC**	**85 VAC / 195 VAC**
	Typical	**115-230 VAC ± 10%, 50/60 Hz**	**115 VAC / 230 VAC ± 10%, (selectable) 50/60Hz**
	Maximum	**265 VAC, 300 VDC**	**138 VAC / 250 VAC**
Input current	**at 115 VAC**	**1.10 A RMS ± 20%**	**2.9 A RMS ± 20%**
(Average values for reference only)	**at 230 VAC**	**0.55 A RMS ± 20%**	**1.45 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)	6.3 A slow fuse (internal, not user serviceable)
	Inrush Current	Thermistor	Thermistor
	Overvoltage	Varistor	Varistor
Switching frequency		100 kHz PWM	65 kHz PWM
Efficiency at maximum load		80%	85%
Maximum ripple		0.1% RMS V_{p-p}	0.2% RMS V_{p-p}
Regulation	load (10-100% load)	1.0%	2.0%
	at Input voltage	0.8%	0.5%
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit	Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Output surge capability			13 A / 1 sec
Maximum capacity at output		10,000 µF	6000 µF
Parallel connection for load sharing			up to 3 devices (passive current division)
Hold time	at 115 VAC	30 ms	30 ms
(Maximum output current following input loss)	at 230 VAC	180 ms	30 ms
Temperature	Storage	-40°C…+85°C (-40°F…+185°F)	-40°C…+85°C (-40°F…+185°F)
	Operating	-40°C…+50°C (-4°F…+122°F) full rated load Derating: 24 V-1.5 A at 60°C (140°F)	-10°C…+50°C (-40°F…+122°F) max. full rated load Derating: 24 V-5.2 A at 60°C (140°F)
Humidity	Operating temperature	20…85% RH non-condensing	20…85% RH non-condensing
	Storage temperature	20…90% RH	20…90% RH
Galvanic isolation	Input-output	3 kV RMS	3 kV RMS
	Input/output to mounting rail	3 kV RMS	3 kV RMS
	Input to ground	1.5 kV RMS	1.5 kV RMS
	Output to ground	500 V RMS	500 V RMS
Wire size		0.1…4.0 mm^2 (26…12 AWG)	0.1…4.0 mm^2 (26…12 AWG)
Dimensions (L x W x H)		98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)	127 x 57 x 175 mm (5.00 x 2.24 x 6.9 in.)
Weight		478 g (1.05 lbs.)	880 g (1.94 lbs.)
Mounts on mounting rail		TS 35 DIN rail, Chassis	TS 35 DIN rail, Chassis
Fault relay			Changeover contact, 30 VDC / 125 VAC @ 1 A max.
			Passive Power Factor Correction

Approvals/Certifications		
	CSA, UL 508 Listed, CE	CSA, UL 508 Listed, CE
	CSA Class 1 Div. 2 and Zone 2 for 9927480012 and 9927480024	CSA Class 1 Div. 2 and Zone 2 for 9925340024
	UL 1310 (Class 2) for 9927480024	

Accessories	Order No.	Order No.
Chassis Mounting Kit	**7920560000**	**7920560000**
Side mount Bracket—DIN rail		**7940000542**

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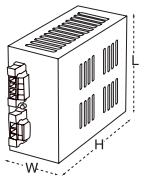
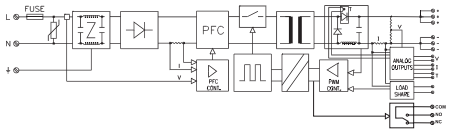


Approvals:

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		
	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
	Output surge capability	18.5 A / 300 mSec		
	Thermal	Heat sink temperature > 100°C (212°F)		
Adjustable output voltage		**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		– universal input voltage with PFC (active power factor corrections)		
the following additional functions		– 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

	Order No.
Chassis Mounting Kit	**7920560000**[1)]

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

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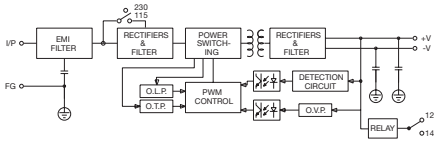
Approvals: CE cULus LISTED

CP SNT 70W 24V 3A

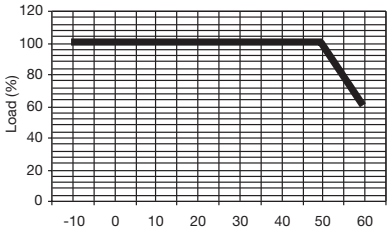
CP SNT 120W 24V 5A



Block diagram for supplies with switchable input voltage

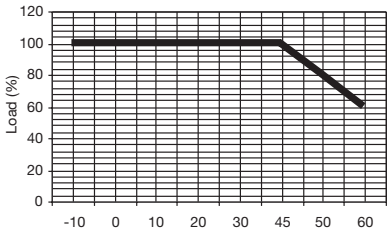
Derating Curves

Output load/ambient temperature



Derating Curves

Output load/ambient temperature



Ordering Data	Type	Qty.	Order No.
	CP SNT 70W 24V 3A	1	**8708660000**
	CP SNT 120W 24V 5A	1	**8708670000**

Technical Data			
Input	Input voltage	85…264 VAC; 120…370 VDC	88…132 VAC/176…264 VAC reversible; 250...370 VDC
	Input current	2.0 A @ 100…240 VAC	3.0 A @ 115 VAC; 2.0 A @ 230 VAC
	Input frequency	50/60 Hz	50/60 Hz
	Recommended mains fuse/internal fuse	Fusible link 2.5 A (T) / 250 V	Fusible link 4 A (T) / 250 V
	Overvoltage protection	Varistor	Varistor
Output	Output voltage	24…28 VDC (adjustable via potentiometer)	24…28 VDC (adjustable via potentiometer)
	Output current	3.0 A	5 A
	max. output power	72 W	120 W
	max. residual ripple	100 mV_{p-p} / bandwidth 20 Mhz V RMS	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	105%…150% $I_{const.}$ of max. output power for up to 5 seconds, automatic restart
	Overvoltage protection	29…34 V with automatic restart	29…34 V with automatic restart
	Holdup time by mains failure: 115 VAC / 230 VAC	10 ms / 20 ms	20 ms / 20 ms
	Load regulation	2%	2%
	Redundancy or load sharing	With diode module recommended	With diode module recommended
	Status relay/change-over contact	250 VAC (max. 30 VDC) / 1A	250 VAC (max. 30 VDC) / 1A
Insulation co-ordination			
	Galvanic isolation output-ground	0.5 kVAC	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC	1.5 kVAC
	Galvanic isolation input-output	3 kVAC	3 kVAC

General Specifications			
Temperature	Operating	-10°C…+55°C (+14°F…+131°F)	-10°C…+55°C (+14°F…+131°F)
	Storage	-20°C…+85°C (-4°F…+185°F)	-20°C …+85°C (-4°F…+185°F)
Efficiency under max. load		80%	84%
Status display		LED green	LED green
Standards		EN 60950	EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		no	no
Mounting position		Horizontal on mounting rail TS35	Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm	above/below ≥ 3 cm
Weight		approx. 0.55 kg (1.21 lbs.)	approx. 0.65 kg (1.43 lbs)
Type of connection		Screw	Screw
Clamping area		0.1…4.0 mm^2 (26…12 AWG)	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.)	125 x 65.5 x 110.0 mm (4.92 x 2.58 x 4.33 in.)

Approvals/Certifications		
	CE cULus 508 (C1D2 approvals pending)	CE cULus 508 (C1D2 approvals pending)

NEW

Single Phase Input Supplies—General Purpose Solutions

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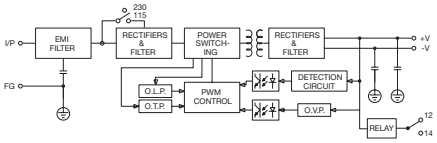
Approvals: CE cULus LISTED

CP SNT 250W 24V 10A

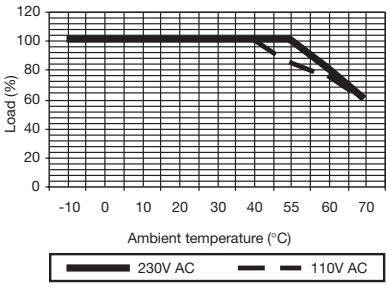
CP SNT 500W 24V 20A



Block diagram for supplies with switchable input voltage

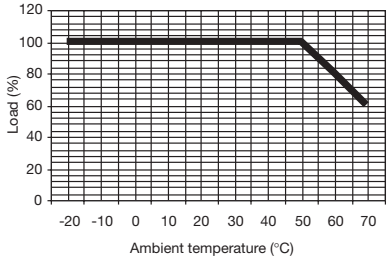
Derating Curves

Output load/ambient temperature



Derating Curves

Output load/ambient temperature



Ordering Data	Type	Qty.	Order No.
	CP SNT 250W 24V 10A	1	**8708680000**

Ordering Data	Type	Qty.	Order No.
	CP SNT 500W 24V 20A	1	**8778870000**

Technical Data		CP SNT 250W 24V 10A	CP SNT 500W 24V 20A
Input	Input voltage	88…132 VAC / 176…264 VAC reversible; 250…370 VDC	88…132 VAC / 176…264 VAC reversible; 250…370 VDC
	Input current	3.6 A @ 115 VAC / 2.0 A @ 230 VAC	9.0 A @ 115 VAC / 6.0 A @ 230 VAC
	Input frequency	50/60 Hz	50/60 Hz
	Recommended mains fuse/internal fuse	Fusible link 5 A (T) / 250 V	Fusible link 10 A (T) / 250 V
	Overvoltage protection	Varistor	Varistor
Output	Output voltage	24…28 VDC (adjustable via potentiometer)	24…28 VDC (adjustable via potentiometer)
	Output current	10 A	20 A
	max. output power	240 W	480 W
	max. residual ripple	100 mV_{p-p} / bandwidth 20 Mhz	100 mV_{p-p} / bandwidth 20 Mhz
	Surge capability	105%…150% $I_{const.}$ of max. output power for up to 5 seconds, automatic restart	105%…150% $I_{const.}$ of max. output power for up to 5 seconds, automatic restart
	Overvoltage protection	30…36 V with automatic restart	30…36 V with automatic restart
	Holdup time by mains failure: 115 VAC / 230 VAC	10 ms / 15 ms	10 ms / 15 ms
	Load regulation	2%	2%
	Redundancy or load sharing	With diode module recommended	With diode module recommended
	Status relay/change-over contact	250 VAC (max. 30 VDC) / 1A	250 VAC (max. 30 VDC) / 1A
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC	1.5 kVAC
	Galvanic isolation input-output	3 kVAC	3 kVAC
General Specifications			
Temperature	Operating	-10°C…+55°C (+14°F…+131°F)	-10°C…+55°C (+14°F…+131°F)
	Storage	-20°C…+85°C (-4°F…+185°F)	-20°C…+85°C (-4°F…+185°F)
Efficiency under max. load		84%	86%
DC output status display		LED green	LED green
Standards		EN 60950	EN 60950
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3	EN 55011, EN 55022, EN 55024, EN 61000-6-2, 3
Power factor correction		yes	yes
Mounting position		Horizontal on mounting rail TS35	Horizontal on mounting rail TS35
Mounting clearance		above/below ≥ 3 cm	above/below ≥ 3 cm
Weight		approx. 1.6 kg (3.5 lbs.)	approx. 2 kg (4.4 lbs.)
Type of connection		Screw	Screw
Clamping area		0.1…4.0 mm^2 (26…12 AWG)	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.)	125 x 227.5 x 110.0 (4.92 x 8.96 x 4.33 in.)
Approvals/Certifications			
		CE cULus 508 VDE 60950	CE cULus 508 VDE 60950

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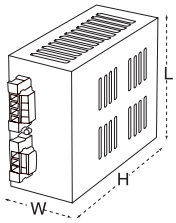
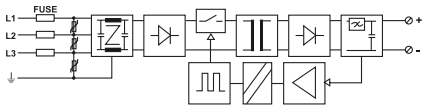


Approvals:

CP SNT 55W 2.3A
3 Phase Input

CP SNT 160W 6.5A
3 Phase Input

Diagram/Schematic Circuit Diagram



Ordering Data	Type	Order No.	Type	Order No.
	CP SNT 55W 2.3A 3 Phase		CP SNT 160W 6.5A 3 Phase	
Output voltage/maximum current	24 VDC / 2.3 A	**9917790324**	**24 VDC-28 VDC / 6.5 A**	**9925340324**

Technical Data			
Input voltage	**Minimum**	**306 VAC**	**342 VAC**
	Typical	**360 - 480 VAC**	**480 VAC**
	Maximum	**550 VAC**	**528 VAC**
Input current	**at 360 VAC**	**120 mA / Phase**	**0.36 A / Phase**
(Average values for reference only)	**at 230 VAC**	**100 mA / Phase**	**0.34 A / Phase**
Input protection	Fuse	3 x 1 A slow fuse (internal)	3 x 12 A slow fuse (internal)
	Inrush Current	Thermistor	Thermistor
	Overvoltage	Varistor	Varistor
Switching frequency		100 kHz	100 kHz PWM
Efficiency at maximum load		85%	83%
Maximum ripple		0.1% RMS	0.2% RMS
Regulation	Load (10-100% load)	1.0%	2%
	at Input voltage	0.8%	0.5%
Fault relay			Changeover contact, 30 VDC / 125 VAC @ 1 A max.
Output surge		10A / 180 ms typ.	13A / 1 sec.
Overload protection		Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit	Overcurrent shutdown with automatic restart plus thermal shutdown/short circuit
Maximum capacity at output		10,000 µF	10,000 µF
Parallel connection for load sharing			up to 3 devices (passive current division)
Hold time	at 360 VAC	120 ms	50 ms
(Maximum output current following input loss)	at 480 VAC	120 ms	70 ms
Temperature	Storage	-40°C…+85°C (-40°F…+185°F)	-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)	-10°C…+50°C (-4°F…+122°F)
Humidity	Operating	20…85% RH non-condensing	20…85% RH non-condensing
	Storage	20…90% RH non-condensing	20…90% RH
Galvanic isolation	Input-output	3 kV RMS	3 kV RMS
	Input/output to mounting rail	3 kV RMS	3 kV RMS
	Input to ground	1.5 kV RMS	1.5 kV RMS
	Output to ground	500 V RMS	500 V RMS
Wire size		0.1…4.0 mm^2 (26…12 AWG)	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.)	138.2 x 58.4 x 177.8 mm (5.44 x 2.3 x 7 in.)
Weight		526 g (1.16 lbs.)	993 g (2.2 lbs.)
Mounts on mounting rail		TS 35 DIN rail, Chassis	TS 35 DIN rail, Chassis
Approvals/Certifications			
		CSA, cULus 508 Listed, CE	cULus 508 Listed, CE

Accessories	Order No.	Order No.
Chassis Mounting Kit	**7920560000**	**7920560000**
L Bracket Mounting Kit—Panelmount	**7940000543**	**7940000543**
Side mount Bracket—DIN rail		**7940000542**

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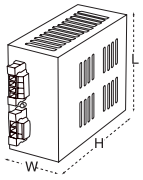
POWER FOR AUTOMATION



Approvals:

c UL us LISTED CE

CP SNT 300W 12.5A 3 Phase Input

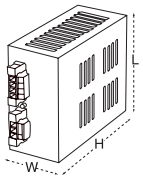
CP SNT 600W 25A 3 Phase Input

Ordering Data		Type	Order No.	Type	Order No.
		CP SNT 300W 12.5A 3 Phase	**7924740324**	CP SNT 600W 25A 3 Phase	**7920210324**
Output voltage/maximum current		**24 VDC / 12.5 A**		**24 VDC / 25 A**	
Technical Data					
Input voltage	**Minimum**	**342 V**		**342 V**	
	Typical	**380-480 V ± 10%, 50/60 Hz, 3 phase**		**480 V, 50-60 Hz**	
	Maximum	**528 V**		**528 V**	
Input current	**Min Vin**			**1.4 A**	
(Average values for reference only)	**Typ Vin**	**0.75 A per phase @380 V, 0.6 A per phase @480 V**		**1.2 A**	
	Max Vin			**1.1 A**	
Input protection	External Input Breaker	2 A, 600 V thermal breaker or		6 A, 3 pole 480 VAC	
		4 A / 500 V time delay fuse recommended			
	Inrush Current	Thermistor		Thermistor	
	Overvoltage	Varistor		Varistor	
Switching frequency		100 kHz		100 kHz	
Output	Voltage Nominal	24 V @ 12.5 A, 28 V @ 10.7 A		24 V	
	Voltage Adj. Range	23-28 V		23-28 V (pot. adj.)	
	Current Nominal	12.5 A		25 A	
	Current Surge	19 A		50 A	
	Current Surge Time	1 second		1 second	
	Surge Cycle Time	4 seconds		60 seconds	
Efficiency at maximum load		80%		88%	
Regulation	Load (10-100% load)	5%		± 4%	
	Line	0.5%		± 1%	
Protection	Overload	Overcurrent shutdown with automatic restart and overvoltage protection		Overcurrent shutdown with automatic restart and overvoltage protection	
	Short Circuit	Auto restart		Auto restart	
	Overvoltage	V_{out} > 28 VDC		V_{out} > 30.5 VDC	
	Undervoltage	V_{out} < 22 VDC		V_{out} < 20 VDC	
	Over Temperature			V_{out} heatsink temperature > 100°C (212°F)	
	Over Current			26.5A typical @24 V for >1 second	
Max. load capacitance		5000 µF		10,000 µf	
Hold time	@380 V	12 ms typ (full output current after loss of input)		12 ms typ (full output current after loss of input)	
	@480 V	28 ms typ (full output current after loss of input)		18 ms typ (full output current after loss of input)	
Temperature	Storage	-40°C…+85°C (-40°F…+185°F)		-40°C…+85°C (-40°F…+185°F)	
	Operating	0°C…+50°C (32°F…+122°F)		-10°C…+50°C (-4°F…+122°F)	
Humidity	Storage	20%-90% RH non-condensing		5% ~95%	
	Operating	20…85% RH non-condensing		20…85% non-condensing	
Galvanic isolation	Input-output	3 kV RMS		3 kVAC	
	Input to ground	1.5 kV RMS		1.5 kVAC	
	Output to ground	500 V RMS		500 VAC	
Wire size	Input	0.1…4.0 mm² (26…12 AWG)		0.08…2.5 mm² (22…12 AWG)	
	Output	0.5…16.0 mm² (22…8 AWG)		0.5…16.0 mm² (22…8 AWG)	
	I/O	0.08…2.5 mm² (22…12 AWG)		0.08…2.5 mm² (22…12 AWG)	
Dimensions (L x W x H)		170 x 160 x 82 mm (6.7 x 6.3 x 3.2 in.)		173 x 238 x 135 mm (6.8 x 9.4 x 5.3 in.)	
Weight		1.4 kg (3.1 lbs.)		3.1 kg (6.75 lbs.)	
Mounts on mounting rail		TS 35 DIN rail or Chassis (Chassis brackets are included)		TS 35 DIN rail or Chassis (Chassis brackets are included)	
Special features	Cooling			Fan cooled with temp. controlled fan speed[1]	
	Load Sharing	Parallel operation for increased current or redundance[2]		Maximum 2 units[2]	
	Redundancy	Maximum 2 units		No maximum[3]	
	Fault relay	Form C contacts (1A max @ 30 VDC or 125 VAC; 10 mA min @ 5 VDC)		Form C contacts (1A @ 30 VDC or 30 VAC)	
	V_{out}			0…10 VDC = 0…30 VDC	
	T_{out}			0…10 V = 0°C…+100°C (+32°F…+212°F) (internal temperature)	
	I_{out}			0…10 V = 0…50 A	
Miscellaneous	Indicator	Green LED (DC on)		Green LED (DC on)	
Approvals/Certifications					
		cULus 508 Listed, CE		cULus 508 Listed, CE	

Accessories	Order No.	Order No.
Chassis Mounting Kit	**7920560000**[4]	**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.

connectPower
POWER FOR AUTOMATION



Approvals:

c UL us LISTED CE

CP SNT 1000W 40A
3 Phase Input

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 mm² (22…12 AWG)		
	Output	0.5…16 mm² (22…6 AWG)		
	I/O	0.08…2.5 mm² (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.

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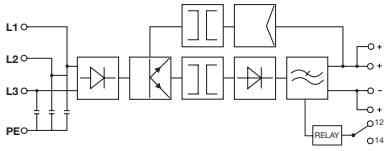
POWER FOR AUTOMATION

CP SNT3 250W 24V 10A

CP SNT3 500W 24V 20A

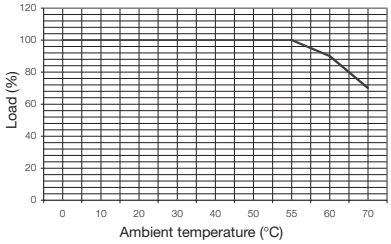
Approvals: CE, cULus LISTED, cULus



Block diagram

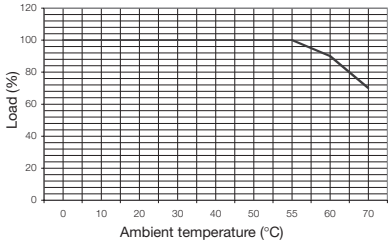
Derating Curves

Output load / ambient temperature



Derating Curves

Output load / ambient temperature



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

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

Technical Data			
Input	Input voltage	3 x 400 VAC / 340 min…575 max VAC	3 x 400 VAC / 340 min…575 max VAC
	Input current	0.95 A @ 400 VAC	1.7 A @ 400 VAC
	Input frequency	47…63 Hz	47…63 Hz
	Recommended mains fuse	external via 3 circuit breakers up to 6 A, trip curve characteristic C	external via 3 circuit breakers up to 16 A, trip curve characteristic C
Output	Output voltage	24…28 VDC (adjustable via potentiometer)	24…28 VDC (adjustable via potentiometer)
	Output current	10 A	20 A
	max. output power	250 W	480 W
	max. residual ripple	< 100 mV_{p-p} / bandwidth 20 MHz	< 100 mV_{p-p} / bandwidth 20 MHz
	Surge capability	105%…130% $I_{const.}$ of max. output power for up to 5 seconds, automatic restart	105%…130% $I_{const.}$ of max. output power for up to 5 seconds, automatic restart
	Overvoltage protection	29...34 V with automatic restart	29...34 V with automatic restart
	Holdup time when 400 VAC mains fail	> 10 ms at nominal load	> 10 ms at nominal load
	Load regulation	< 2%	< 2%
	Redundancy or load sharing	directly with same type (maximum 2 power supplies of same rating), alternatively with diode module	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	250 VAC (max. 30 VDC) / 1 A
Insulation co-ordination	Galvanic isolation output-ground	0.5 kVAC	0.5 kVAC
	Galvanic isolation input-ground	1.5 kVAC	1.5 kVAC
	Galvanic isolation input-output	3 kVAC	3 kVAC

General Specifications			
Temperature	Operating	-10°C…+55°C (+14°F…+131°F)	-10°C…+55°C (+14°F…+131°F)
	Storage	-20°C…+85°C (-4°F…+185°F)	-20°C …+85°C (-4°F…+185°F)
Efficiency under max. load		88%	88%
Status display		LED green	LED green
Standards		EN 60950 (SELV)	EN 60950 (SELV)
EMC standards		EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3	EN 55011, EN 55022, EN 55024, EN 61000-6-2,-3
Power factor correction		yes	yes
Mounting position		Horizontal on mounting rail TS 35	Horizontal on mounting rail TS 35
Mounting clearance		above/below ≥ 3 cm	above/below ≥ 3 cm
Weight		approx. 1.5 kg (3.31 lbs.)	approx. 3.0 kg (6.6 lbs.)
Type of connection		Screw	Screw
Clamping area		4 / 0.13 / 6 mm^2 (12 / 26 / 10 AWG)	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.)	125 x 227.5 x 110.0 mm (4.92 x 8.96 x 4.33 in.)

Approvals/Certifications		
	CE, cULus 508, cULus 60950	CE, cULus 508, cULus 60950

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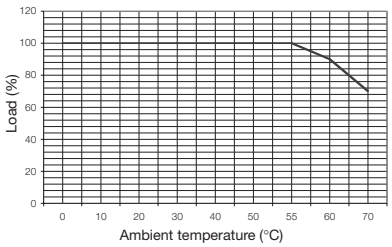
POWER FOR AUTOMATION

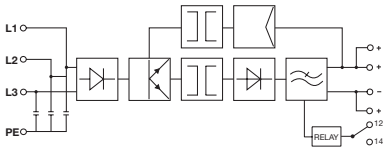
CP SNT3 1000W 24V 40A

Approvals: CE, cULus LISTED, cULus

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
	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
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. 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

CE cULus 508 cULus 60950

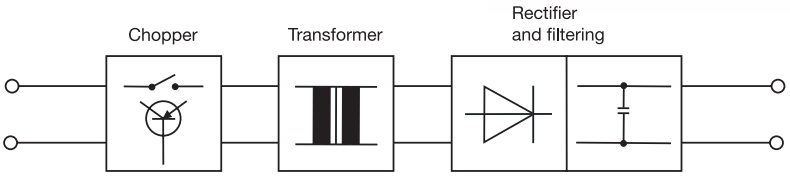
DC to DC converters enable customers to derive low voltage DC signals from either 12 VDC or 24 VDC sources. They are typically connected at the output of a DC power source and can deliver DC voltages of 5, 12, 15 or 24 volts. DC voltage converters (DC to DC converters) are intended in particular for 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.

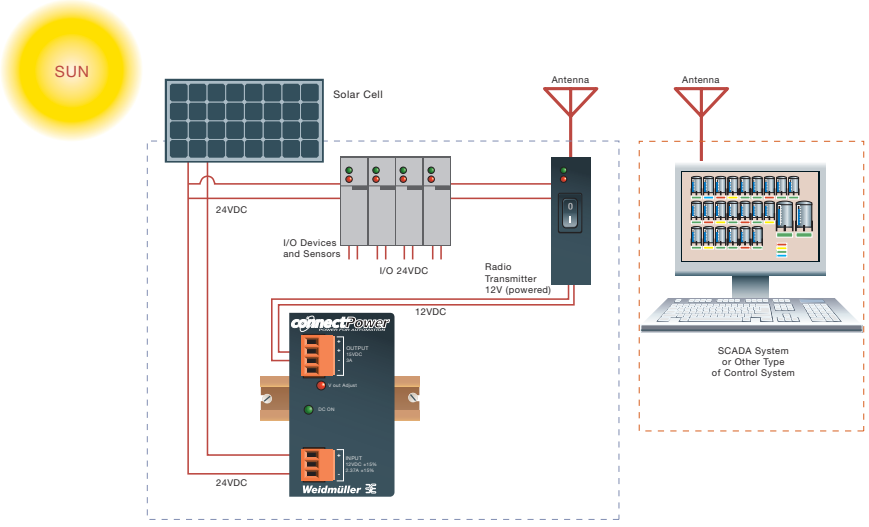
Typical applications include feeding TTL level circuits (5 VDC) and providing emergency power to low voltage circuits.

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

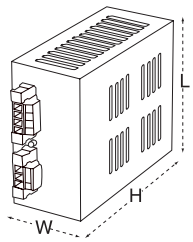


Remote Monitoring



- 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.

connectPower
POWER FOR AUTOMATION



Approvals:

CP-DCDC 50W
12 VDC Input

CP-DCDC 50W
24 VDC Input

Ordering Data	Type	Order No.
	CP-DCDC 50W	
Output voltage/maximum current	**22 - 24 VDC @ 2 A**	**9919371224**
	15 VDC @ 3 A	**9919371215**
	12 VDC @ 3 A	**9919371212**
	5 VDC @ 8 A	**9919371205**

Technical Data			
Input voltage		**12 VDC**	**24 VDC**
	Minimum	**10.2 VDC**	**18 VDC**
	Typical	**12 VDC**	**24 VDC**
	Maximum	**16 VDC**	**30 VDC**
Input Current for output of:	5 VDC @8A	4.53 A	2.3 A
	12 VDC @3A	3.88 A	1.93 A
	15 VDC @3A	4.7 A	2.37 A
	24 VDC @2A	4.96 A	2.49 A
Input protection	Fuse	internal (not user serviceable) 2 A	internal (not user servicable) 2 A
Switching frequency		180 kHz PWM	330 kHz PWM
Efficiency at Maximum load		80% (75% 5 VDC @8 A)	80% (75% 5 VDC @8 A)
Maximum ripple		0.2% RMS	0.2% RMS
Overload protection		Overvoltage switch-off with automatic reset/short circuit	Overvoltage switch-off with automatic reset/short circuit
Maximum capacity at output		10,000 µF (8000 µF 5 VDC @8 A)	8000 µF
Hold time	5 VDC @8A	2.5 mS	7.8 mS
	12 VDC @3A	3.8 mS	10 mS
	15 VDC @3A	3.5 mS	7 mS
	24 VDC @2A	3.5 mS	7 mS
Temperature	Storage	-40°C…+85°C (-40°F…+185°F)	-40°C…+85°C (-40°F…+185°F)
	Operating	-10°C…+50°C (+14°F…+122°F) full rated load	-10°C…+50°C (+14°F…+122°F) full rated load
Humidity	Operating temperature	20…85% RH	20…85% RH
	Storage temperature	20…90% RH non-condensing	20…90% RH non-condensing
Galvanic isolation	Input to output	500 VAC RMS	500 VAC RMS
	Input/output to rail	4 KV RMS	4 KV RMS
	Input to ground	500 VAC RMS	500 VAC RMS
	Output to ground	500 VAC RMS	500 VAC RMS
Wire size		0.1…4.0 mm^2 (26…12 AWG)	0.1…4.0 mm^2 (26…12 AWG)
Dimensions (L x W x H)		98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)	98 x 57 x 131 mm (3.86 x 2.24 x 5.16 in.)
Weight		454 g (1 lb.)	454 g (1 lb.)
Mounts on mounting rail		TS 35 DIN rail, Chassis w/ optional kit	TS 35 DIN rail, Chassis w/ optional kit

Approvals/Certifications		
	CSA, UL Listed, CE	CSA, UL Listed, CE
	CSA Class 1 Div. 2 and Zone 2	CSA Class 1 Div. 2 and Zone 2

Accessories	Order No.	Order No.
Chassis Mounting Kit	**7920560000**	**7920560000**
L Bracket Mounting Kit—Panelmount	**7940000543**	**7940000543**

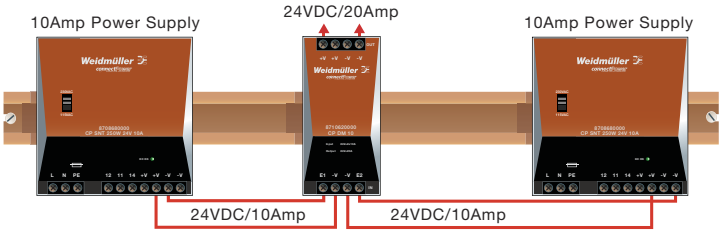
Redundancy, Load Sharing, Increased Power Delivery

Weidmuller'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.

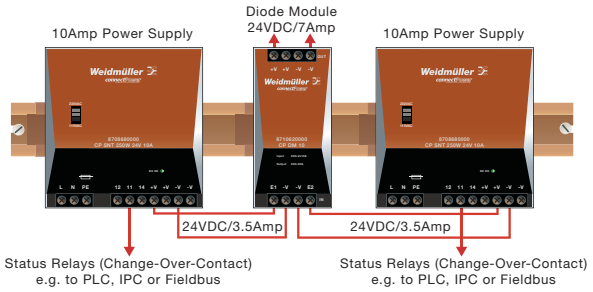
It is important to keep in mind that before paralleling power supplies, their output voltage must be calibrated to be within ±50mV of each other, and the parallel connection must be positioned as close as possible to the load.

Parallel Connection for Increased Power Delivery



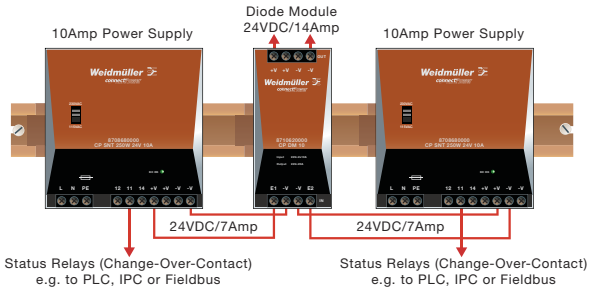
- The amount of power needed is provided by two power supplies combined in parallel

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



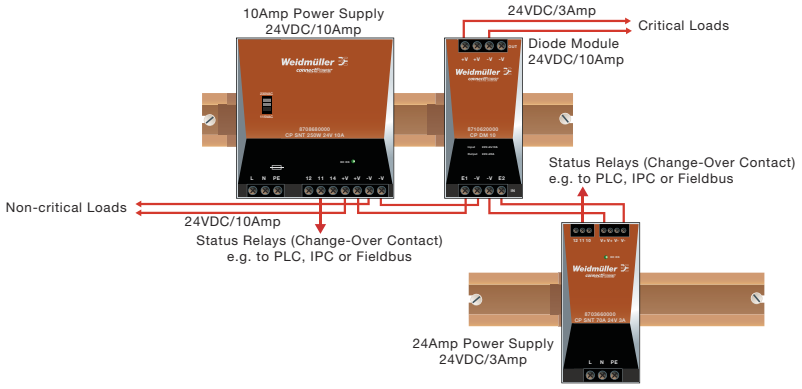
- Diode modules provide galvanic isolation between power supplies
- Use status relays for remote alarm indication

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.

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CP DM 10
10A per Input Diode Module

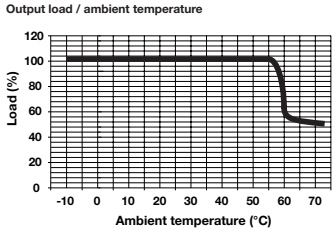
CP DM 20
20A per Input Diode Module

Approvals:

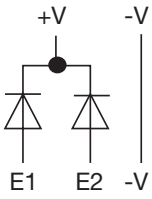
CE cULus LISTED

Derating Curve

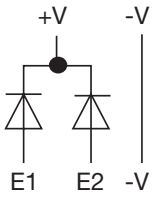
3/5/10/20A



Schematic



Schematic



Ordering Data	Type	Qty.	Order No.
	CP DM 10	1	**8710620000**

Ordering Data	Type	Qty.	Order No.
	CP DM 20	1	**8768650000**

Technical Data		CP DM 10	CP DM 20
Input	Input voltage	40 VDC max.	40 VDC max.
	Input current	10 A per input max.	20 A per input max.
Output	Output voltage	V_{in} - 0.5 typ.	V_{in} - 0.5 typ.
	Output current	20 A max.	40 A max.
General Specifications			
Temperature	Operating	-10°C…+55°C (+14°F…+131°F)	-10°C…+55°C (+14°F…+131°F)
	Storage	-20°C…+85°C (-4°F…+185°F)	-20°C…+85°C (-4°F…+185°F)
Efficiency under max. load		approx. 95.5% at 24 VDC	approx. 95% at 24 VDC
Mount onto mounting rail		Mounting rail TS35 to DIN 50022	Mounting rail TS35 to DIN 50022
Mounting position		Horizontal	Horizontal
Mounting		Clearance: side ≥ 4 cm; above/below ≥ 10 cm	Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight		approx. 0.15 kg (0.33 lbs.)	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.)	125.0 x 55.5 mm x 110.0 (4.92 x 2.19 x 4.33 in.)
Type of Connection		Screw	Screw
Clamping area input (nominal / min. / max.)		4 / 0.13 / 6 mm^2 (12 / 26 / 10 AWG)	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)	10.0 / 0.32 / 16.0 mm^2 (8 / 22 / 6 AWG)
Indication signals	Voltage	None	None
	Alarm	None	None
Fault Relay	Voltage	None	None
	Current	None	None
	Configuration	None	None
	Set point	None	None
Other	Voltage drop input-output	0.5 V typ.	0.5 V typ.
	Fan	None	None
Terminations	Input/output	N/A	N/A
	Alarm contact	N/A	N/A
Approvals/Certifications		CE cULus	CE cULus

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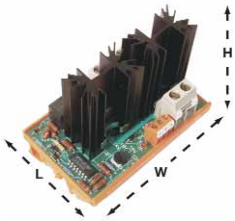


CP DM 30 (SP-RS-RED./PARR.30A)
15A per Input Diode Module

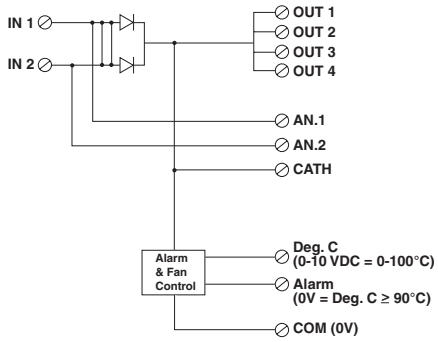
RSD-40A
20A per Input or 40A Input per Unit
Diode Module with Status Indication

Ordering Data	Type	Order No.	Type	Order No.
	CP DM 30 with voltage sensing and fault relay	**998739**	RSD-40A (20 A per input max.) (2 x 20)	**7940005219**
	CP DM 30 without voltage sensing	**998786**	RSD-40A (40 A input per unit max., 2 units required) (1 x 40)	**7940005218**

Technical Data				
Input	Input voltage	14-24 VDC	24 VDC nominal
	Input current	15 A per input max.	20 A per input max. / 40 A (7940005218)
Output	Output voltage	24 VDC	24 VDC
	Output current	30A Maximum	40 A Maximum
General Specifications			
Temperature	Operating	0°C…+50°C (32°F…+122°F) (40°C rise (104°F) above ambient at 30 A)	0°C…+40°C (32°F…+104°F) ambient
	Storage	-20°C…+85°C (-4°F…+185°F)	
Efficiency under max. load		95%	95%
Mount onto mounting rail		TS32 or TS35 mm DIN rails	TS32 or TS35 mm DIN rails
Mounting position		Horizontal	Horizontal
Mounting		Clearance: side ≥ 4 cm; above/below ≥ 10 cm	Clearance: side ≥ 4 cm; above/below ≥ 10 cm
Weight		226.8 g (0.5 lbs.)	317.5 g (0.7 lbs.)
Dimensions (L x W x H)		70 x 110 x 90 mm (2.75 x 4.33 x 3.5 in.)	109.2 x 109.2 x 99 mm (4.3 x 4.3 x 3.9 in.)
Type of Connection		Screw	Screw
Clamping area input (nominal / min. / max.)		4 / 0.32 / 16 mm² (12 / 22 / 6 AWG)	1.5 / 0.32 / 16 mm² (14 / 22 / 6 AWG)
Clamping area output (nominal / min. / max.)		4 / 0.32 / 16 mm² (12 / 22 / 6 AWG)	1.5 / 0.32 / 16 mm² (14 / 22 / 6 AWG)
Indication signals	Voltage	None for 998786 Actual voltage for 998739	"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])
	Alarm	None	24 VDC under normal operating conditions 0 VDC if heatsink temperature exceeds 90°C (194°F)
Fault Relay	Voltage	125 VAC Maximum	N/A
	Current	6 A Maximum	N/A
	Configuration	1 Form C / SPDT	N/A
	Set point	14-24 VDC, ± 5% typ.	N/A
Other	Voltage drop input-output	0.38 V typ.	0.40 V typ.
	Fan	None	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])
Terminations	Input/output	2.5 mm² (26…14 AWG)	13 mm² (22…6 AWG)
	Alarm contact	26…12 AWG	26…14 AWG
Approvals/Certifications			
		UL recognized,	cULus Listed

RSD-40A Schematics

7940005218



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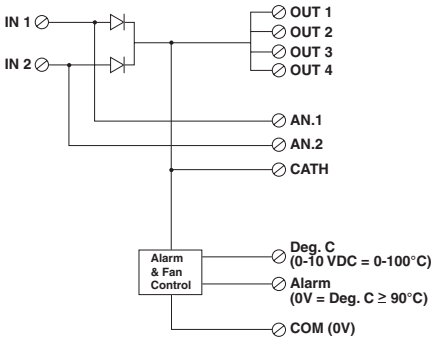


Introduction—Battery Back Up Unit for DC Power Management

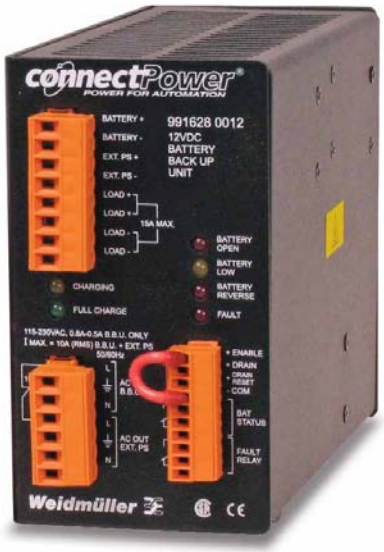
Weidmuller's Battery Back Up Unit (BBU) is designed to be the heart of an uninterruptible DC power management system. The connectPower BBU combines with Weidmuller power supplies and a customer-supplied battery pack to form a scalable DC power system. This enables users to put together a system uniquely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

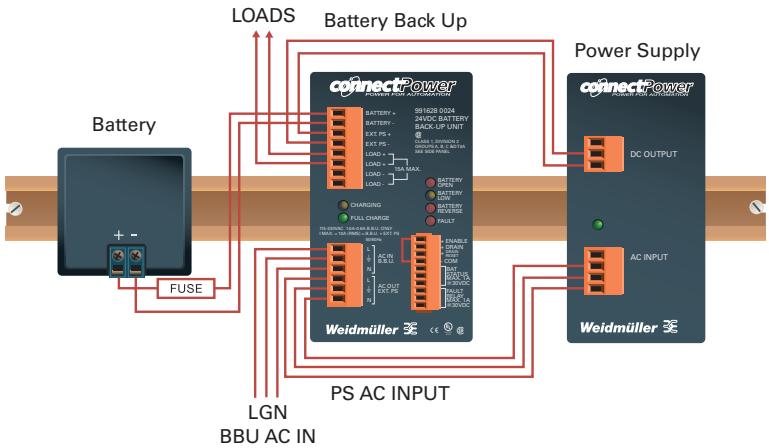
With the BBU Power Supply, 2A of battery charging current is available at 24 VDC, and 3A with the 12 VDC units. Extensive monitoring is provided via LEDs. Relay contacts provide battery status indication and fault indication.

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



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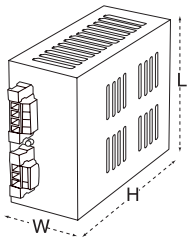
POWER FOR AUTOMATION



Approvals:

BBU
12 VDC Input

BBU
24 VDC Input

Ordering Data	Type	Order No.
	BBU 12 VDC	**9916280012**
	BBU 24 VDC	**9916280024**

Technical Data			
Input voltage	**Minimum**	**85 VAC**	**85 VAC**
	Typical	**115-230 VAC ± 10%**	**115-230 VAC ± 10%**
	Maximum	**265 VAC**	**265 VAC**
Input current	**at 115 VAC**	**0.8 A**	**1.0 A**
	at 230 VAC	**0.5 A**	**0.6 A**
Input protection	Fuse	2 A slow blow (internal, not user serviceable)	2 A slow blow (internal, not user serviceable)
	Input current	Thermistor 40 A maximum	Thermistor 40 A maximum
	Overvoltage	Varistor	Varistor
Output	Voltage Nominal	12 VDC syst.	24 VDC syst.
	Current	15 A maximum	15 A maximum
	Surge Current from no load	20 A max for 300 mS	20 A max for 300mS
		30 A max for 100 mS	30 A max for 100mS
Load voltage		12-14 V	24-28 V
AC current		10 A	10 A
Switching time		< 0.5 mS	< 0.5 mS
Protection	Battery Polarity Protection	Limited by internal 4.0 A fuse	Limited by internal 4.0 A fuse
	Battery Overvoltage	16 V	32 V
	Battery Undervoltage	9.3 V	18.3 V
	BBU Over Temperature	120°C (248°F) ±10%	120°C (248°F) +10%
	Charger Short Circuit	Continuous	Continuous
	Load Short Circuit	Continuous	Continuous
Hold Time	at 115 VAC	46 ms	24 ms
	at 230 VAC	226 ms	190 ms
Temperature	Storage	-20°C…+85°C (-4°F…+185°F)	-20…+85°C (-4°F…+185°F)
	Operating	-20°C…+50°C (-4°F…+122°F)	-20…+50°C (-4°F…+122°F)
Humidity	Storage temperature	20…90%	20…90%
	Operating temperature	20…85% non-condensing	20…85% non-condensing
Galvanic Isolation	Input to output	3 KV	3 KV
	Input/output to rail	3 KV	3 KV
	Input to ground	1.5 KV	1.5 KV
	Output to ground	500 V	500 V
Wire Size	Power Connections	0.1…4 mm^2 (26…12 AWG)	0.1…4 mm^2 (26…12 AWG)
	Control inputs/relay outputs	0.5…1.5 mm^2 (28…14 AWG)	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.)	127.5 x 72.5 x 161 mm (5.02 x 2.85 x 6.34 in.)
Weight		950 g (2.09 lbs.)	950 g (2.09 lbs.)
Control inputs	Enable	dry contact/open collector	dry contact/open collector
Status outputs	Drain	dry contact/open collector	dry contact/open collector
	Drain Reset	dry contact/open collector	dry contact/open collector
	Battery Status	Form C Relay and LED	Form C Relay and LED
	Fault	Form C Relay and LED	Form C Relay and LED
Battery Charger	Charge Current	3.0 A	2.0 A
	Full Charge	Regulates to 13.65 V	Regulates to 27.3V
	Battery Reverse	LED	LED
	Battery Open	LED	LED
	Battery Low	Yellow LED on below 11 V	Yellow LED on below 22 V
Battery Capacity	Minimum	3 AH	2 AH
	Maximum	scalable	scalable
Mounting		TS 35 DIN rail (optional direct panel mount)	TS 35 DIN rail (optional direct panel mount)
Connections		plug and socket	plug and socket
Approvals/Certifications			
		CSA, UL 508 Listed, CE, CSA Class 1 Div. 2 and Zone 2	CSA, UL 508 Listed, CE, CSA Class 1 Div. 2 and Zone 2

Accessories	Order No.	Order No.
Chassis Mounting Kit	**7920560000**	**7920560000**

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 then 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.

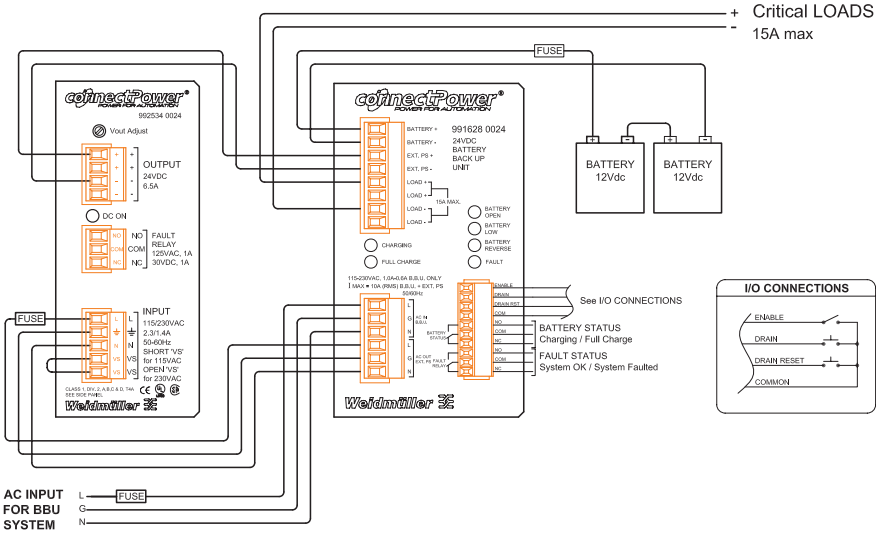
Battery Open LED (red):
No batteries connected – takes approx. 60 seconds to detect after turning on BBU.
Fault LED is on and Fault relay is de-energized.

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.

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:
(30Ahr / 2A) x 2 = **30 hrs**

The formula to calculate the time to recharge after a drain cycle is:
((30Ahr / 2A) x 0.56) x 2 = **16.8 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% hysterisis 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 then 0°C (32°F) or hotter then 40°C (104°F). Again, please consult the battery manufacturer for recommendations.

Weidmuller'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.

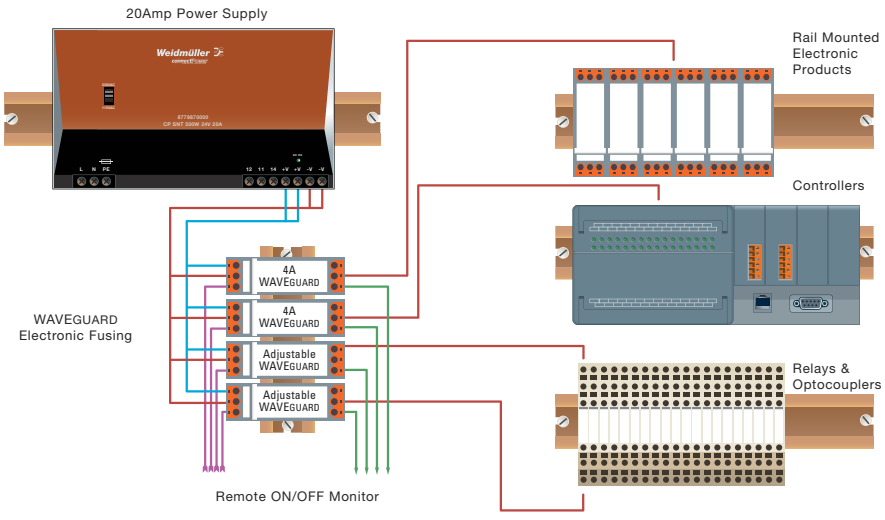
When either an overload or a short circuit occurs, the WAVEGUARD Electronic Fuse will not only prevent the entire process or machines dependent on the control panel from shutting down, but it will also facilitate quick problem resolution by isolating the specific failure and indicating which circuit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

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

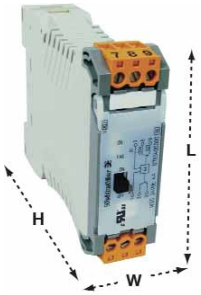
WAVEGUARD Electronic Fuses:

- 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

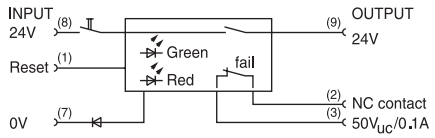


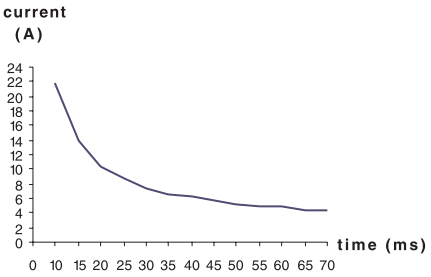
Approvals:

cULus CE

WGS 24VDC 4.00A

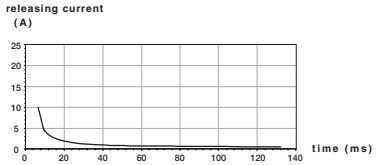
WGS 24VDC ADJ 0.5…5.0A



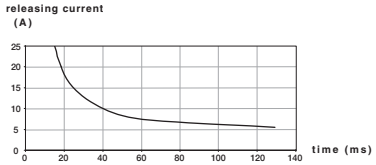


Characteristic curve

Releasing current: 0.5A



Releasing current: 5.0A



Ordering Data	Type	Order No.	Type	Order No.
Screw connection	WGS 24VDC 4.00A	**8783400000**	WGS 24VDC ADJ 0.5…5.0A	**8710270000**

Technical Data				
Input	Rated voltage	24 VDC		24 VDC
	Rated current	4.00 A		0.5…5.0 A
	Reset	Pulse >100 ms +24 V, falling edge “ON”.		Pulse >100 ms +24 V, falling edge “ON”.
Output	Differential relay/signal contact	Break cont. elem. max. 50V/0.05A; only extra-low voltage		Break cont. elem. max. 50V/0.05A; only extra-low voltage
	Signaling delay	3.5 ms typ.		3.5 ms typ.
Temperature	Operating	0°C…+55°C (+32°F…+131°F)		0°C…+55°C (+32°F…+131°F)
	Storage	-20°C…+85°C (-4°F…+185°F)		-20°C…+85°C (-4°F…+185°F)
Status indicator		LED green: OK LED red: Tripped		LED green: OK LED red: Tripped
Standards		EN 50178		EN 50178
EMC standards		EN 61000-6-1, 2, 4; EN 55011		EN 61000-6-1, 2, 4; EN 55011
Sliding switch		“OFF” - 10 sec. waiting - “ON”		“OFF” - 10 sec. waiting - “ON”
Clamping range (rating / min. / max.)	Screw connection	2.50/0.50/2.50 mm^2 (14 AWG)		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.)		72 x 22.5 x 92.4 mm (2.83 x 0.88 x 3.64 in.)
Approvals/Certifications				
		cULus CE		cULus CE

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

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Belgium
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Finland
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Greece
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