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Primary switch mode power supplies

CP range

Benefits and advantages



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- Primary switch mode power supplies
 - High efficiency of approx. 90 %
 - Low power dissipation and low heating
 - Long lifetime
- Wide range of AC or DC supply voltages
 - World wide use also in high fluctuating networks and battery-powered plants
- Constant and adjustable output voltage (depending on type)
- Use in very harsh industrial environments
 - Reliable construction
 - According to EMC Directives
EN 61000-6-2 (Interference immunity) and
EN 61000-6-4 (Interference emission)
- Open-circuit, overload and short-circuit proof
- Integrated input fuse
- Safety
 - Closed construction
 - Touch-proof connecting terminals
 - Electrical isolation
- Easy and fast mounting
 - Mounting on DIN rail
- Status LED
- Example of application
 - Supply of programmable logic controllers (PLC)
e. g. AC1131

Primary switch mode power supplies

CP-S and CP-C range

Features



Special features of CP-S and CP-C range

- Output current 5 A, 10 A and 20 A
- Integrated power reserve of up to 50 %
- Parallel operation for increased capacity and redundancy
- 5 A and 10 A devices with pluggable connecting terminals

CP-S range

- Input voltage adjustable via front-face selector switch
- Output voltage fixed at 24 V DC

CP-C range

- Autorange input 85-264 V AC, 100-350 V DC
- Output voltage adjustable 22-28 V DC
- Power factor correction (PFC) acc. to EN 61000-3-2
- Function module pluggable onto the front side
 - CP-C MM: Messaging module with relay outputs "INPUT OK" and "OUTPUT OK" and REMOTE ON/OFF function to switch on and off the power supply externally.

Integrated power reserve

The new CP-S and CP-C range power supplies feature an integrated power reserve of up to 50 %. No oversized electricity supply is needed, especially under heavy load conditions.

Pluggable connecting terminals

Extended flexibility in operation due to pluggable connecting terminals (this feature is not offered on all devices).

Adjustable output voltage

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

Pluggable function modules

The CP-C range power supplies can be equipped with pluggable modules to add additional functions. One messaging and one current-balancing module are available. Thus, the power supplies can be ideally adapted to the relevant application.



	CP-5/3.0	CP-6/3.0	CP-12/2.0	CP-12/2.0 adj	CP-24/0.3	CP-24/0.5	CP-24/1.0	CP-24/1.5 adj	CP-24/2.0	CP-24/2.0 adj	CP-24/4.2	CP-24/5.0	CP-24/5.0 adj	CP-24/10 adj	CP-24/20 adj	CP-48/0.7	CP-S 24/5.0	CP-S 24/10.0	CP-S 24/20.0	CP-C 24/5.0	CP-C 24/10.0	CP-C 24/20.0	
■ existing □ pending																							
Approvals																							
UL 508	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
UL1604 (Class 1, Div. 2), CSA 22.2 (hazardous locations)	■	■	■	■		■	■	■	■	■	■	■	■			■	□	□	□	□	□	□	□
UL 1310 (Class 2) (low voltage limited energy)	■	■	■	■		■																	
UL 60950 (safety for information technology equipment)														■	■		■	■	■	■	■	■	■
CB scheme						■	■			■							■	■	■	■	■	■	■
GOST	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
						■	■			■							■	■	■	■	■	■	■
Marks																							
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
						■	■		■		■	■					■	■	■	■	■	■	■

Primary switch mode power supplies

CP range

Ordering information



CP-24/0.5



CP-24/1.0



CP-24/2.0



CP-24/5.0



CP-48/0.7

Compared with conventional power supplies, CP range power supplies provide many advantages:

- DIN rail mountable compact modules
- Low weight
- High efficiency
- Low heating
- Wide supply voltage range
- Constant output voltage
- Short-circuit and overload proof
- Input protection by internal fuse
- Safe isolation acc. to EN 50178 (VDE 0160)

Constant output voltage

Type	Supply voltage	Output voltage	Catalog number	Pack. unit pieces	Weight 1 piece kg/lb
CP-5/3.0	90-260 V AC/ 105-260 V DC	5 V DC / 3 A	1SVR 423 418 R3000	1	0.22/0.49
CP-6/3.0	90-260 V AC/ 105-260 V DC	6 V DC / 3 A	1SVR 423 418 R4000	1	0.22/0.49
CP-12/2.0	90-260 V AC/ 105-260 V DC	12 V DC / 2 A	1SVR 423 418 R1000	1	0.22/0.49
CP-24/0.3	90-260 V AC/ 105-260 V DC	24 V DC / 0.3 A	1SVR 423 418 R2000	1	0.22/0.49
CP-24/0.5	90-260 V AC/ 105-260 V DC	24 V DC / 0.5 A	1SVR 423 414 R0000	1	0.22/0.49
CP-24/1.0	90-260 V AC/ 105-260 V DC	24 V DC / 1 A	1SVR 423 418 R0000	1	0.22/0.49
CP-24/2.0	90-140 V AC	24 V DC / 2 A	1SVR 423 417 R0000	1	0.30/0.66
CP-24/2.0	140-260 V AC/ 160-260 V DC	24 V DC / 2 A	1SVR 423 417 R1000	1	0.30/0.66
CP-24/4.2	90-260 V AC/ 127-260 V DC	24 V DC / 4.2 A	1SVR 423 416 R1000	1	0.58/1.28
CP-24/5.0	90-260 V AC/ 127-260 V DC	24 V DC / 5 A	1SVR 423 416 R0000	1	0.58/1.28
CP-48/0.7	90-260 V AC/ 105-260 V DC	48 V DC / 0.7 A	1SVR 423 418 R6000	1	0.22/0.49

Primary switch mode power supplies

CP range

Ordering information



CP-24/1.5 adj



CP-24/5.0 adj



CP-24/10 adj



CP-24/20 adj



CP-RUD

Adjustable output voltage

Type	Supply voltage	Output voltage	Catalog number	Pack. unit pieces	Weight 1 piece kg/lb
CP-12/2.0 adj	90-260 V AC/ 105-260 V DC	12 V DC / 2 A	1SVR 423 418 R1100	1	0.22/0.49
CP-24/1.5 adj	90-260 V AC/ 105-260 V DC	24 V DC / 1.5 A	1SVR 423 418 R5000	1	0.22/0.49
CP-24/2.0 adj	140-260 V AC/ 160-260 V DC	24 V DC / 2 A	1SVR 423 417 R1100	1	0.28/0.616
CP-24/5.0 adj	90-260 V AC/ 127-260 V DC	24 V DC / 5 A	1SVR 423 416 R0100	1	0.58/1.28
CP-24/10 adj	93-132 V AC/ 187-264 V AC	24 V DC / 10 A	1SVR 423 415 R0000	1	1.05/2.31
CP-24/20 adj	93-132 V AC/ 187-264 V AC	24 V DC / 20 A	1SVR 423 415 R1000	1	2.20/4.84

Redundant module

Type	Input current	Output current	Catalog number	Pack. unit pieces	Weight 1 piece kg/lb
CP-RUD	5 A max.	5 A max.	1SVR 423 418 R9000	1	0.15/0.33

Monitors two CP range power supplies with an output current of up to 5 A each. If one power supply fails, CP-RUD automatically switches to the alternate supply without interruption of the load current.
Max. voltage 40 V.

Primary switch mode power supplies CP-S range (standard) Ordering information



CP-S 24/5.0



CP-S 24/10.0



CP-S 24/20.0

Features of CP-S range

- Output currents of 5 A, 10 A and 20 A
- Integrated power reserve up to 50 %
- Parallel operation for increased capacity and redundancy
- 5 A and 10 A devices with pluggable connecting terminals
- 10 A and 20 A devices with front-face selector switch to adjust supply voltage range:
110-120 V AC or 220-240 V AC
- Constant output voltage of 24 V DC

Type	Rated input voltage	Rated output voltage / current	Catalog number	Pack. ① Piece	Weight 1 Piece kg / lb
CP-S 24/5.0	110-240 V AC	24V DC / 5 A	1SVR 427 014 R0000	1	0.96 / 2.11
CP-S 24/10.0	110-120 V AC/ 220-240 V AC	24 V DC / 10 A	1SVR 427 015 R0100	1	1.07 / 2.35
CP-S 24/20.0	110-120 V AC/ 220-240 V AC	24 V DC / 20 A	1SVR 427 016 R0100	1	2.83 / 6.23

① Packing unit

Primary switch mode power supplies

CP-C range

Ordering information



CP-C 24/5.0



CP-C 24/10.0



CP-C 24/20.0



CP-C MM

Features of CP-C range

- Output currents of 5 A, 10 A and 20 A
- Integrated power reserve up to 50 %
- Parallel operation for increased capacity and redundancy
- 5 A and 10 A devices with pluggable connecting terminals
- Autorange input 85-264 V AC, 100-350 V DC
- Output voltage adjustable in a range of 22-28 V DC
- Power factor correction (PFC) acc. to EN 61000-3-2
- Function module CP-C MM pluggable onto the front side

Type	Rated input voltage auto ranging	Rated output voltage / current	Catalog number	Pack. ① Piece	Weight 1 Piece kg / lb
CP-C 24/5.0	80-264 V AC 100-350 V DC	22-28V DC / 5 A	1SVR 427 024 R0000	1	0.96 / 2.12
CP-C 24/10.0	80-264 V AC 100-350 V DC	22-28 V DC / 10 A	1SVR 427 025 R0000	1	1.34 / 2.95
CP-C 24/20.0	80-264 V AC 100-350 V DC	22-28 V DC / 20 A	1SVR 427 026 R0000	1	3.15 / 6.94

Pluggable module for CP-C range

Messaging module CP-C MM

- LED for status indication
- Relay outputs "Input OK" and "Output OK"
- REMOTE ON/OFF function to switch on and off the power supply externally

Type	Description	Catalog number	Pack. ① Piece	Weight 1 Piece kg / lb
CP-C MM	Messaging module	1SVR 427 081 R0000	1	

① Packing unit

Primary switch mode power supplies

CP-5/3.0, CP-6/3.0, CP-12/2.0 (adj), CP-24/3.0

Technical data

Type		CP-5/3.0	CP-6/3.0	CP-12/2.0	CP-12/2.0adj	CP-24/0.3
Input circuit L+, L-						
Rated input voltage	AC	90-260 V AC				
	DC	105-260 V DC				
Frequency range	AC	47-440 Hz				
Supply voltage fail. bridging time	at 100 % load	min. 10 ms				
Rated input current	at 90 V AC	0.4 A	0.5 A	0.6 A	0.7 A	0.2 A
	at 260 V AC	0.2 A	0.25 A	0.27 A	0.3 A	0.1 A
Inrush current at 25 °C (m 2 ms)		7.5 A	7.5 A	7.5 A	33 A	7.5 A
Internal input fuse		3 A (slow-acting)				
Output circuit L, N						
Rated output voltage		5 V DC	6 V DC	12 V DC	12 V DC	24 V DC
Tolerance of the output voltage		± 3 %				
Adjustment range of the output voltage		-	-	-	9-15 V DC max. 36 W	-
Rated output current / rated output power		3 A / 15 W	3 A / 18 W	2 A / 24 W	2 A / 24 W	0.3 A / 7 W
Residual ripple	max.	50 mV _{PP}	50 mV _{PP}	300 mV _{PP}	200 mV _{PP}	100 mV _{PP}
Input voltage regulation	max.	± 0.5 %	± 0.5 %	± 0.1 %	± 0.5 %	± 0.5 %
Deviation with load change 10-90 %	statical max.	± 2.5 %	± 2.5 %		± 0.5 %	
	dynamical max.			5 %		
Short-circuit protection		overcurrent switch-off with automatic restart				
Overload protection		overtemperature and overcurrent switch-off				
Reset after thermal overload switch-off		disconnection of AC input voltage 30 s min.				
Input current harmonics		no limitation				
Indication of operational states		green LED, output voltage OK				
Standards						
Electrical safety		EN 50178 (VDE 0160) / UL 508 / CSA 22.2				
Galvanic isolation, safe isolation	acc. to	IEC 664-1		EN 60950		IEC 664-1
		DIN VDE 0106-101				
Electromagnetic compatibility						
Interference immunity						
electrostatic discharge (ESD)	acc. to EN 61000-4-2	EN 61000-6-2 level 3 - 6/8 kV				
electromagnetic field	acc. to EN 61000-4-3	level 3 - 10 V/m				
fast transients (Burst)	acc. to EN 61000-4-4	level 4 - 4 kV				
powerful impulses (Surge)	acc. to EN 61000-4-5	3 kV				
HF line emission	acc. to EN 61000-4-6	level 3 - 10 V				
Interference emission						
Rated noise	acc. to EN 55011	EN 61000-6-4 class B				
Approvals / Marks						
Approvals		see table of approvals				
Marks		see table of approvals				
General data						
Efficiency	at nonimal AC load	approx. 78 %	approx. 80 %	approx. 80-83 %	approx. 79-84 %	approx. 70 %
Dimensions	(W x H x D) mm	45 x 78 x 100	45 x 78 x 100	45 x 78 x 100	45 x 78 x 100	45 x 78 x 120
Weight		approx. 0.22 kg (0.49 lb)				
Minumim distance to other units	horizontal / vertical	10 mm / 50 mm				
Schutzart	terminals	IP20				
	enclosure	IP50	IP50	IP50	IP20	IP50
Degree of protection		1				
Mounting		DIN rail (EN 50022)				
Mounting position		horizontal				
Wire size		2 x 2.5 mm ² (2 x 14 AWG)				
Environmental data						
Temperature range	operation	0...+55 °C				
	storage	-25...+75 °C				
Clearances and creepage distances						
overvoltage category 2, pollution degree 2						
Isolation data						
Insulation voltage		2.5 kV AC (routine test), 3 kV AC (type test)				

Primary switch mode power supplies

CP-24/0.5, CP-24/1.0, CP-24/1.5 adj, CP-24/2.0

Technical data

Type		CP-24/0.5	CP-24/1.0	CP-24/1.5adj	CP-24/2.0	CP-24/2.0
Input circuit	L+, L-					
Rated input voltage	AC	90-260 V AC			90-140 V AC	140-260 V AC
	DC	105-260 V DC			-	160-260 V DC
Frequency range	AC	47-440 Hz			47-63 Hz	47-440 Hz
Supply voltage fail. bridging time	at 100 % load	min. 10 ms				
Rated input current	max. at 90 V AC	0,35 A	0,6 A	0,8 A	1 A	-
	max. at 140 V AC	-	-	-	-	0,65 A
	max. at 260 V AC	-	0,27 A	0,38 A	-	-
	typ. at 115 V AC	0,27 A	-	-	-	-
	typ. at 230 V AC	0,14 A	-	-	-	-
Inrush current at 25 °C (m 2 ms)	at 140 V	-	-	-	18 A	-
	at 260 V	33 A	7,5 A	33 A	-	7,5 A
Internal input fuse		0.8 A (slow-acting)		3 A (slow-acting)		
Output circuit	L, N					
Rated output voltage		24 V DC				
Tolerance of the output voltage		± 3 %				
Adjustment range of the output voltage		-	-	21-28 V DC	-	-
		max. 36 W				
Rated output current / rated output power		0.5 A / 12 W	1 A / 24 W	1.5 A / 36 W	2 A / 48 W	
Residual ripple	max.	200 mV _{PP}	300 mV _{PP}		200 mV _{PP}	200 mV _{PP}
Input voltage regulation	max.	± 0.5 %	± 0.1 %	± 0.5 %	± 0.5 %	
Deviation with load change 10-90 %	statical				max. ± 0.5 %	
	dynamical	max. 5 %				
Short-circuit protection		overcurrent switch-off with automatic restart				
Overload protection		overtemperature and overcurrent switch-off				
Reset after thermal overload switch-off		automatic reset after cooling down	disconnection of AC input voltage 30 s min.			
Input current harmonics				no limitation		
Indication of operational states		green LED, output voltage OK				
Standards						
Electrical safety		EN 50178 (VDE 0160) / UL 508 / CSA 22.2				
Galvanic isolation, safety isolation	acc. to	EN 60950	IEC 664-1	EN 60950	IEC 664-1	IEC 664-1
		DIN VDE 0106-101				
Electromagnetic compatibility						
Interference immunity		EN 61000-6-2				
electrostatic discharge (ESD)	acc. to EN 61000-4-2	level 3 - 6/8 kV				
elektromagnetic field	acc. to EN 61000-4-3	level 3 - 10 V/m				
fast transients (Burst)	acc. to EN 61000-4-4	level 4 - 4 kV				
powerful impulses (Surge)	acc. to EN 61000-4-5	2/4 kV	3 kV			
HF line emission	acc. to EN 61000-4-6	level 3 - 10 V				
Interference emission		EN 61000-6-4				
Radiated noise	acc. to EN 55011	class B				
Approvals / Marks						
Approvals		see table of approvals				
Marks		see table of approvals				
General data						
Efficiency	at nominal AC-load	ca. 80-84 %	ca. 82-84 %	ca. 83-85 %	86 %	
Dimensions	(W x H x D) mm	22.5 x 78 x 120	45 x 78 x 100			45 x 78 x 120
Weight		approx. 0.22 kg (0.49 lb)			0.3 kg (0.66 lb)	
Minimum distance to other units	horizontal / vertical	10 mm / 50 mm				
Degree of protection	terminals	IP20				
	enclosure	IP20	IP50	IP20	IP20	IP20
Protection class		2 (terminal covers required)	1			
Mounting		DIN rail (EN 50022)				
Mounting position		horizontal				
Wire size		2 x 2.5 mm ² (2 x 14 AWG)				
Environmental data						
Temperature range	operation	0...+55 °C				
	storage	-25...+75 °C				
Clearances and creepage distances		overvoltage category 2, pollution degree 2				
Isolation data						
Insulation voltage		2.5 kV AC (routine test), 3 kV AC (type test)				

Primary switch mode power supplies

CP-24/2.0 adj, CP-24/4.2, CP-24/5.0 (adj), CP-48/0.7

Technical data

Type		CP-24/2.0 adj	CP-24/4.2	CP-24/5.0	CP-24/5.0 adj	CP-48/0.7
Input circuit						
	L+, L-					
Rated input voltage	AC	140-260 V AC		90-260 V AC		90-260 V AC
	DC	160-260 V DC		127-260 V DC		105-260 V DC
Frequency range	AC	47-440 Hz		47-63 Hz		47-440 Hz
Supply voltage fail. bridging time	at 100 % load			min. 20 ms		min. 10 ms
Rated input current	max. at 90 V AC	-	1.5 A	1.8 A	1.8 A	0.8 A
	max. at 140 V AC	0.7 A	-	-	-	-
	max. at 260 V AC	0.45 A	-	-	-	0.4 A
	typ. at 115 V AC	-	1.1 A	1.3 A	1.3 A	-
	typ. at 230 V AC	-	0.52 A	0.63 A	0.63 A	-
Inrush current at 25 °C (m 2 ms)	at 260 V AC	33 A		40 A		33 A
Internal input fuse		3 A (slow-acting)		2 A (slow-acting)		3 A (slow-acting)
Output circuit						
Rated output voltage		24 V DC				48 V DC
Tolerance of the output voltage		± 3 %				
Adjustment range of the output voltage		21-28 V DC max. 48 W	-	-	23-28 V max. 120 W	-
Rated output current / rated output power		2 A / 48 W	4.2 A / 100 W (T _a m 55 °C)	5 A / 120 W (T _a m 40 °C)		0.7 A / 33 W
Derating	T _a > 40 °C	-	-	-1.33 W/°C		-
	T _a > 45 °C	-	-	-	-	-10 mA/°C
	T _a = 55 °C	-	-	4.2 A / 100 W		-
	V _{IN} < 105 V AC / 120 V DC	-	-	-	-	-6.667 mA/V
Residual ripple	max.	100 mV _{PP}	200 mV _{PP}	200 mV _{PP}	200 mV _{PP}	300 mV _{PP}
Input voltage regulation	max.	± 0.5 %		± 0.05 %		± 0.5 %
Deviation with	statical	max. ± 0.5 %				
load change 10-90 %	dynamical	max. 5 %				
Short-circuit protection		overcurrent switch-off with automatic restart				
Overload protection		overtemperature and overcurrent switch-off				
Reset after thermal overload switch-off		disconnection of AC input voltage 30 s min.				
Input current harmonics		no limitation	acc. to EN 61000-3-2 A			no limitation
Indication of operational states		green LED, output voltage OK				
Standards						
Electrical safety		EN 50178 (VDE 0160) / UL 508 / CSA 22.2				
Galvanic isolation, safety isolation	acc. to	EN 60950, DIN VDE 0106-101				
Electromagnetic compatibility						
Interference immunity		EN 61000-6-2				
electrostatic discharge (ESD)	acc. to EN 61000-4-2	level 3 - 6/8 kV				
electromagnetic field	acc. to EN 61000-4-3	level 3 - 10 V/m				
fast transients (Burst)	acc. to EN 61000-4-4	level 4 - 4 kV	level 3 - 2 kV			4 kV
powerful impulses (Surge)	acc. to EN 61000-4-5	3 kV	2 kV			3 kV
HF line emission	acc. to EN 61000-4-6	level 3 - 10 V				
Interference emission		EN 61000-6-4				
Radiated noise	acc. to EN 55011	class B	class A			class B
Approvals / Marks						
Approvals		see table of approvals				
Marks		see table of approvals				
General data						
Efficiency	at nominal AC load	approx. 86 %	approx. 77-85 %	approx. 77-85 %	approx. 77-85 %	approx. 83-85 %
Dimensions	(W x H x D) mm	45 x 78 x 120	90 x 78 x 120	90 x 78 x 120	90 x 78 x 120	45 x 78 x 100
Weight	approx.	0.28 kg (0.62 lb)	0.58 kg (1.28 lb)			0.22 kg (0.49 lb)
Minimum distance to other units	horizontal / vertical	10 mm / 50 mm				
Degree of protection	terminals / enclosure	IP20 / IP20				
Protection class		1				
Mounting		DIN rail (EN 50022)				
Mounting position		horizontal				
Wire size		2 x 2.5 mm ² (2 x 14 AWG)				
Environmental data						
Temperature	operation	0...+55 °C				
	storage	-25...+75 °C				
Clearances and creepage distances		overvoltage category 2, pollution degree 2				
Isolation data						
Insulation voltage	routing test	2.5 kV AC		1.5 kV AC		2.5 kV AC
	type test			3 kV AC		

Primary switch mode power supplies

CP-24/10 adj, CP-24/20 adj

Technical data

Type		CP-24/10 adj	CP-24/20 adj		
Input circuit					
Rated input voltage		93-132 V AC, 187-264 V AC			
Frequency range		47-63 Hz			
Supply voltage fail. bridging time	at 100 % load (115 V AC)	20 ms	15 ms		
Rated input current	max. at 93 V AC	4.3 A	8.9 A		
typ. at 115 V AC	3.5 A	7.2 A			
typ. at 230 V AC	1.7 A	3.5 A			
Inrush current at 25 °C	at 115 V AC	35 A (m 1 ms)	33 A (m 2 ms)		
at 230 V AC	69 A (m 1 ms)	65 A (m 2 ms)			
Internal input fuse		6.3 A (slow-acting)	12 A (slow-acting)		
Output circuit					
Rated output voltage		24 V DC			
Tolerance of the output voltage		± 1 %			
Adjustment range of the output voltage		24-28 V DC			
Rated output current / rated output power					
Derating for V_{IN} 93-132 V AC	T m 60 °C	10 A / 240 W	20 A / 480 W		
or V_{IN} 187-264 V DC	T > 60 °C	-2%/°C			
T = 70 °C		8 A / 192 W	16 A / 384 W		
Residual ripple		max. 50 mV _{pp}			
Input voltage regulation		max. ± 0.2 %			
Deviation with	statical	-			
load change 10-90 %	dynamical	max. ± 0.3 %			
(± 1.5 % parallel operation)					
Short-circuit and overload protection		overload limiting			
(typ. 110 % of nominal current)					
Reset after thermal overload		-			
Overvoltage protection		triggered at typ. 140 %			
of nominal output voltage					
Parallel operation (Option)		up to 5 devices (has to be			
activated by internal jumper)					
Input current harmonics		no limitation			
Indication of operational states		green LED, Output voltage OK			
Standards					
Electrical safety		EN 60950 / UL 508 / UL 60950 / CSA 22.2			
Galvanic isolation, safety isolation	acc. to	EN 60950			
Electromagnetic compatibility					
Interference immunity		EN 61000-6-2			
electrostatic discharge (ESD)	acc. to EN 61000-4-2	4/8 kV			
electromagnetic field	acc. to EN 61000-4-3	level 3 - 10 V/m			
fast transients (Burst)	acc. to EN 61000-4-4	level 3 - 2 kV			
powerful impulses (Surge)	acc. to EN 61000-4-5	2/4 kV			
HF line emission	acc. to EN 61000-4-6	10 V			
Interference emission		EN 61000-6-4			
Radiated noise	acc. to EN 55011	Class B			
Approvals / Marks					
Approvals		see table of approvals			
Marks		see table of approvals			
General data					
Efficiency	at nominal AC load	typ. 90 %	typ. 88 %		
Dimensions	(W x H x D) mm	100 x 125 x 125	220 x 125 x 125		
Weight	approx.	1.05 kg (2.31 lb)	2.2 kg (4.84 lb)		
Minimum distance to other units	horizontal 7 vertical	10 mm / 50 mm			
Degree of protection	terminals / enclosure	IP 20 / IP20			
Protection class		1			
Mounting		DIN rail (EN 50022)			
Mounting position		horizontal			
Wire size		2.5 mm ² (14 AWG)			
Environmental data					
Temperature range	operation	-25...+70 °C			
storage		-25...+85 °C			
Clearances and creepage distances		overvoltage category 2, pollution degree 2			
Isolation data					
Insulation voltage		3 kV AC (type test)			

Primary switch mode power supplies

CP-S and CP-C range

Technical data

Data at $T_a = 25\text{ °C}$, $V_{IN} = 230\text{ V AC}$ and nominal values, if nothing else indicated

Type	CP-S ..., CP-C ...	24/5.0	24/10.0	24/20.0
Input circuit	L, N			
Rated input voltage			CP-C: 110-240 V AC	
switch position	110		CP-S: 110-120 V AC	
	230		CP-S: 220-240 V AC	
Input voltage range	AC	85-264 V AC	CP-C: 85-264 V AC	CP-C: 85-264 V AC
	DC	100-350 V DC ¹⁾	CP-C: 100-350 V DC ¹⁾	CP-C: 100-350 V DC ¹⁾
switch position	110 AC		CP-S: 85-132 V AC	
	230 AC		CP-S: 184-264 V AC	
	DC		CP-S: 220-350 V DC ¹⁾	
Frequency range	AC		47-63 Hz	
	DC		0 Hz	
Current consumption	at 110-240 V AC	approx. 2.2-1.2 A	CP-C: approx. 3.5-1.6 A	CP-C: approx. 5.5-2.5 A
	at 110-120 V AC	-	CP-S: approx. 4.2-4.0 A	CP-S: approx. 9.0-8.0 A
	at 220-240 V AC	-	CP-S: approx. 2.4-2.2 A	CP-S: approx. 4.5-4.0 A
Power consumption		typ. 135 W	typ. 269 W	typ. 538 W
Inrush current / I ² t (cold start)		< 23 A / approx. 0.9 A ² s	CP-S: < 40 A / approx. 1.8 A ² s CP-C: < 33 A / approx. 0.2 A ² s	CP-S: < 70 A / approx. 8 A ² s CP-C: < 40 A / approx. 1.9 A ² s
Power failure buffering at nominal load	typ.	> 100 ms	CP-S: > 50 ms CP-C: > 40 ms	CP-S: typ. > 50 ms CP-C: typ. > 40 ms
Starting time after applying supply voltage	typ.	< 100 ms	CP-S: < 10 ms CP-C: < 5 ms	CP-S: typ. < 20 ms CP-C: typ. < 370 ms
Transient overvoltage protection			varistors	
Internal input fuse (apparatus protection, not accessible)		4 A (slow-acting)	6.3 A (slow-acting)	12 A (fast acting)
Discharge current for PE			< 3.5 mA	
Output circuit	L+, L+, L-, L-	short-circuit, no-load and overload proof		
Rated output voltage			24 V DC	
Tolerance of the output voltage			-1...+5 %	
Adjustment range of the output voltage			CP-S: fix CP-C: 22-28 V DC, default setting 24 V w0.5 %	
Rated output power		120 W	240 W	480 W
Rated output current	$T_a < 60\text{ °C}$	5 A	10 A	20 A
Peack output current (power reserve)	$T_a < 40\text{ °C}$	typ. m 7.25 A	typ. m 12.25 A	typ. m 22.5 A
Derating	$60\text{ °C} < T_a < 70\text{ °C}$	2.5 % per Kelvin temperature increase		
Deviation with		CP-S: < w0.1 %	CP-S: < w0.1 %	CP-S: < w0.1 %
load change 10-90 %	statical typ.	CP-C: < w0.05 %	CP-C: < w0.05 %	CP-C: < w0.05 %
	dynamical typ.		< w3 %	
control time	typ.		< 1 ms	
change of the input voltage of w10 %	typ.		< w0,05 %	
Response time	10-90 % typ.	< 30 ms	CP-S: < 5 ms CP-C: < 4 ms	CP-S: < 15 ms CP-C: < 12 ms
Residual ripple and switching peaks	20 MHz typ.		< 50 mV _{PP}	
Parallel connection		yes, up to 5 devices, to enable redundancy and to increase capacity, current not symmetrical		
Series connection to increase voltage		yes, for decoupling		
Resistance to reverse feed		yes, limited to approx. 35 V DC		
Power factor correction (PFC)		CP-S: no, CP-C: yes		
Indication of operational states		OUTPUT OK: green LED		
Overload performance		see also V/I and I/T curves		
Short circuit		continuation with current limitation		
Current limitation at short circuit		approx. 11 A	approx. 19 A	approx. 25 A
Short circuit protection		continuous short circuit stability		
Overload protection		thermal protection		
Starting of capacitive loads		unlimited		
General data				
Power dissipation		typ. < 15 W	typ. < 29 W	typ. < 58 W
Efficiency			> 88 %	
MTBF			350.000 h	
Dimensions	W x H x D	56.25 x 126 x 130 mm	90 x 126 x 130 mm	180 x 126 x 130 mm
Weight		approx. 0.96 kg / 2.11 lb	approx. 1.07 kg / 2.35 lb	approx. 2.83 kg / 6.23 lb
Minimum distance to other units	horizontal		10 mm	
	vertical		80 mm	

¹⁾ (at $V > 264\text{ V}$ use additionally an appropriate external fuse)

Primary switch mode power supplies

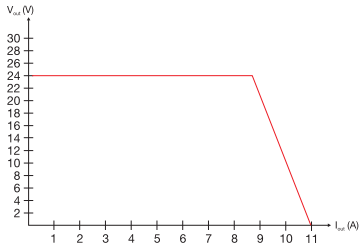
CP-S and CP-C range

Technical data

Type	CP-S ..., CP-C ...	24/5.0	24/10.0	24/20.0
General data				
Degree of protection	enclosure	IP 20		
	terminals	IP 20		
Material of enclosure	enclosure shell	aluminium		
	cover	zinc-coated sheet steel		
Protection class	acc. to EN 61140	1		
Mounting		DIN rail (EN 50022), snap-on mounting		
Mounting position		horizontal		
Electrical connection - Input circuit				
Wire size	stranded	1)		-
	with wire end ferrule	0.2-2.5 mm ² (22-14 AWG)		2.5-10 mm ² (14-8 AWG)
	without wire end ferrule	0.2-2.5 mm ² (22-14 AWG)		0.5-10 mm ² (20-8 AWG)
	rigid	0.2-2.5 mm² (22-14 AWG)		0.5-16 mm² (20-6 AWG)
Stripping length		7 mm (0.27 inches)		12 mm (0.47 inches)
Torque		0.4 Nm		1.2-1.5 Nm
Electrical connection - Output circuit				
Wire size	feindrähtig	1)		-
	with wire end ferrule	0.12-2.5 mm ² (26-14 AWG)		2.5-10 mm ² (14-8 AWG)
	without wire end ferrule	0.12-2.5 mm ² (26-14 AWG)		0.5-10 mm ² (20-8 AWG)
	rigid	0.12-2.5 mm² (26-14 AWG)		0.5-16 mm² (20-6 AWG)
Stripping length		8 mm (0.315 inches)		12 mm (0.47 inches)
Torque		0.4 Nm		1.2-1.5 Nm
Environmental data				
Temperature range	operation	-25...+70 °C		
	full load	0...+60 °C (without Derating)		
	storage	-40...+85 °C		
Humidity	acc. to IEC 60068-2-3	93 % bei +40 °C, no condensation		
Polution dergee	acc. to EN 50178	2		
Climatic category	acc. to EN 60721	3K3		
Vibration	acc. to IEC 68-2-6	1-57 Hz, amplitude w0.075 mm 57-100 Hz, 5 g		
Shock	acc. to IEC 68-2-27	30 g all directions		
Isolation data				
Insulation voltage	input / output	3 kV AC (type test), 1.2 kV AC (routine test)		
	input / PE	1.5 kV AC (type test), 1.2 kV AC (routine test)		
	output / PE	350 V AC (routine test)		
Standards				
Product standard		EN 61204		
Low Voltage Directive		73/23/EEC		
EMC Directive		89/336/EEC		
Electrical safety		EN 50178, EN 60950, UL 60950, UL 508		
Protective low voltage		SELV (EN 60950)		
Approvals / Marks				
Approvals	(based on rated input voltage)	cULus 508, UL 60950, CB scheme, GOST und CCC; UL 1604 (Class I, Div. 2) (pending)		
Marks		CE and C-Tick		
Electromagnetic compatibility				
Interference immunity		EN 61000-6-2		
electrostatic discharge (ESD)	acc. to EN 61000-4-2	level 4 - 8 kV / 15 kV		
electromagnetic field	acc. to EN 61000-4-3	level 3 - 10 V/m		
fast transients (Burst)	acc. to EN 61000-4-4	level 4 - 4 kV		
powerful impulses (Surge)	acc. to EN 61000-4-5	level 4 - 2 kV symmetrical, level 3 - 3 kV asymmetrical		
HF line emission	acc. to EN 61000-4-6	level 3 - 10 V		
Interference emission		EN 61000-6-3		
electromagnetic field	acc. to EN 55022	Class B		
HF line emission	acc. to EN 55022	Class B		
Data sheet	CP-S	2CDC 114 008 D01**	2CDC 114 009 D01**	2CDC 114 010 D01**
	CP-C	2CDC 114 011 D01**	2CDC 114 012 D01**	2CDC 114 013 D01**

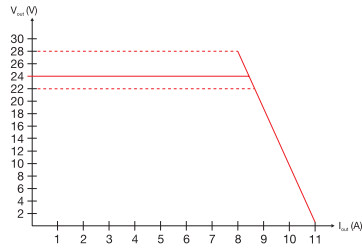
Load limit curves

Output curve at 25 °C



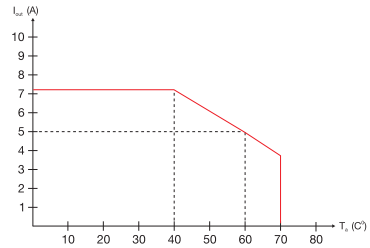
CP-S 24/5.0

Output curve at 25 °C

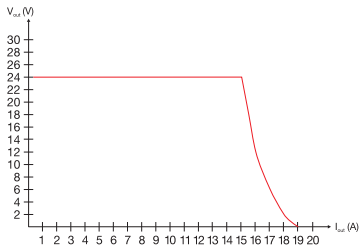


CP-C 24/5.0

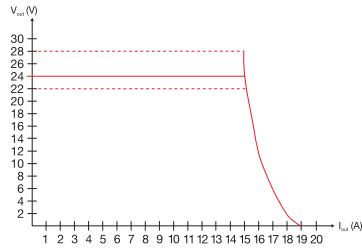
Temperature curve at $V_{out} = 24\text{ V DC}$



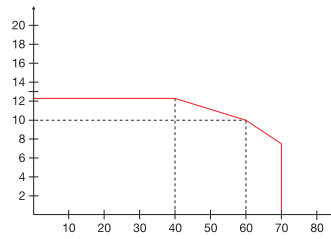
CP-S 24/5.0, CP-C 24/5.0



CP-S 24/10.0

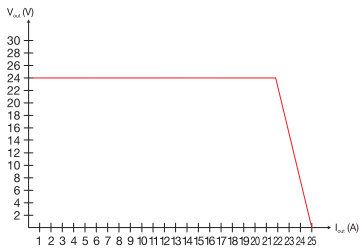


CP-C 24/10.0

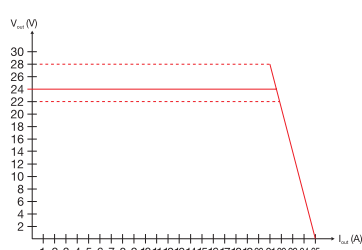


CP-S 24/10.0, CP-C 24/10.0

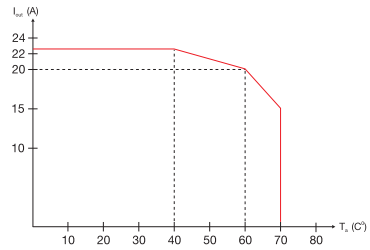
13



CP-S 24/20.0



CP-C 24/20.0

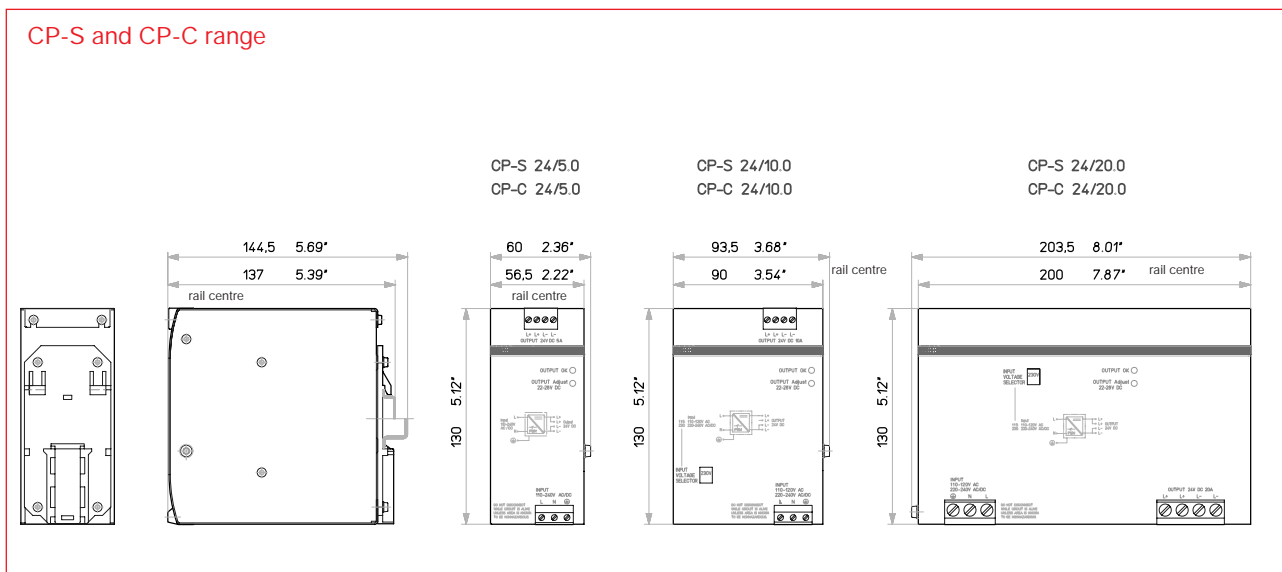
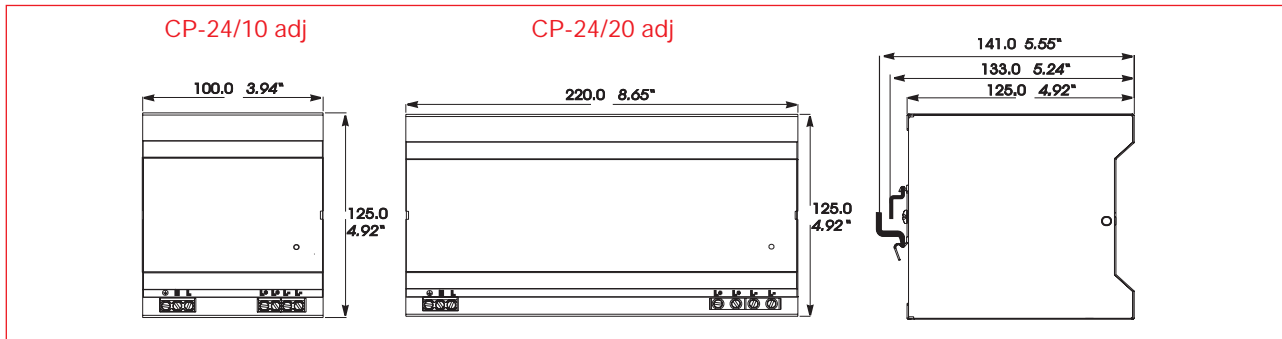
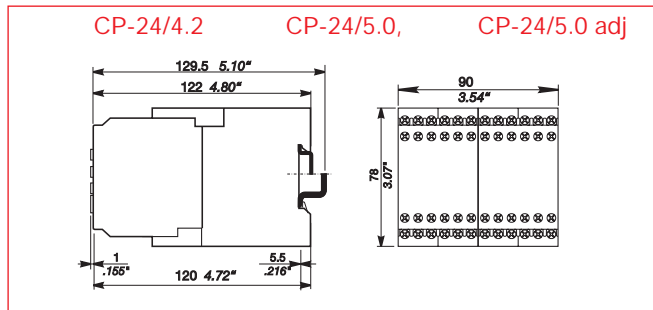
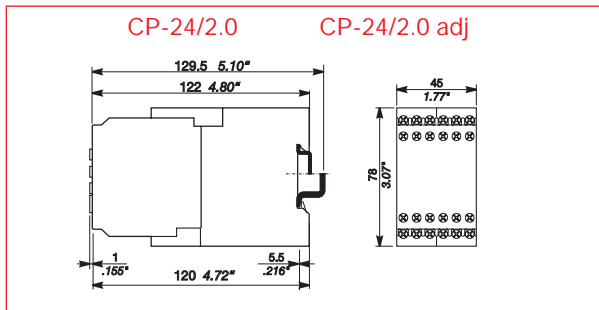
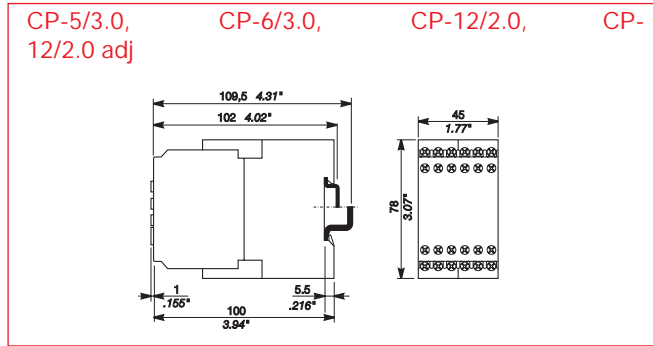
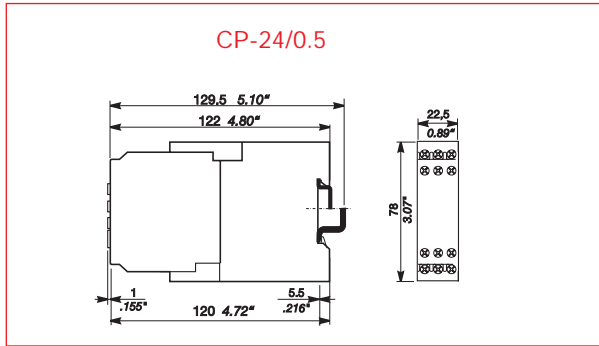


CP-S 24/20.0, CP-C 24/20.0

Primary switch mode power supplies

CP, CP-S and CP-C range

Approximate dimensions



Linear power supplies


CP-L range

Ordering information

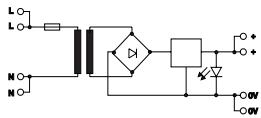


CP-L

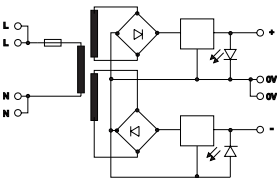
Compact linear power supplies providing many advantages:

- Universal combination base for snap-on mounting to all common DIN/EN rails (acc. to EN 50022 and EN 50035)
- All power supplies are available for supply voltage 115 V or 230 V AC
- All power supplies provide stabilized (regulated) DC output voltage with low residual ripple of $\pm 1\%$
- Double connecting terminals on the supply and the output side allow easy potential distribution by line looping
- The output is short-circuit and overload proof
- LED for status indication
-  approved

Type	Supply voltage	Output voltage	Catalog number	Pack. ① pcs.	Weight 1 pc. kg/lb
CP-L5/1.0	115 V AC	5 V DC / 1 A	1SVR 419 500 R 3000	1	0.82/1.80
	230 V AC	5 V DC / 1 A	1SVR 419 500 R 3100	1	0.82/1.80
CP-L12/0.5	115 V AC	12 V DC / 0.5 A	1SVR 419 501 R 1000	1	0.82/1.80
	230 V AC	12 V DC / 0.5 A	1SVR 419 501 R 1100	1	0.82/1.80
CP-L12/1.0	115 V AC	12 V DC / 1 A	1SVR 419 501 R 3000	1	0.78/1.72
	230 V AC	12 V DC / 1 A	1SVR 419 501 R 3100	1	0.78/1.72
CP-L15/0.5	115 V AC	15 V DC / 0.5 A	1SVR 419 502 R 1000	1	0.82/1.80
	230 V AC	15 V DC / 0.5 A	1SVR 419 502 R 1100	1	0.82/1.80
CP-L15/1.0	115 V AC	15 V DC / 1 A	1SVR 419 502 R 3000	1	0.78/1.72
	230 V AC	15 V DC / 1 A	1SVR 419 502 R 3100	1	0.78/1.72
CP-L24/0.25	115 V AC	24 V DC / 0.25 A	1SVR 419 503 R 0000	1	0.82/1.80
	230 V AC	24 V DC / 0.25 A	1SVR 419 503 R 0100	1	0.82/1.80
CP-L24/0.75	115 V AC	24 V DC / 0.75 A	1SVR 419 503 R 2000	1	1.05/2.31
	230 V AC	24 V DC / 0.75 A	1SVR 419 503 R 2100	1	1.05/2.31



5 V DC, 12 V DC,
15 V DC, 24 V DC



± 12 V DC stabilized
 ± 15 V DC stabilized

Type	Supply voltage	Output voltage	Catalog number	Pack. ① pcs.	Weight 1 pc. kg/lb
CP-L ± 12 /0.5	115 V AC	± 12 V DC / 0.5 A	1SVR 419 511 R 1000	1	1.07/2.35
	230 V AC	± 12 V DC / 0.5 A	1SVR 419 511 R 1100	1	1.07/2.35
CP-L ± 15 /0.5	115 V AC	± 15 V DC / 0.5 A	1SVR 419 512 R 1000	1	1.07/2.35
	230 V AC	± 15 V DC / 0.5 A	1SVR 419 512 R 1100	1	1.07/2.35

① Pack. unit / pieces

Linear power supplies

CP-L range

Technical data



115 V AC supply		CP-L5/1.0 CP-L12/1.0	CP-L12/0.5 CP-L15/1.0	CP-L15/0.5 CP-L24/0.75	CP-L24/0.25 CP-L± 15/0.5	CP-L± 12/0.5
Catalog number	1 SVR 419 ...	500 R 3000	501 R 1000 501 R 3000	502 R 1000 502 R 3000	503 R 0000 503 R 2000	511 R 1000 512 R 1000
Input						
Supply voltage		103-127 V AC				
Frequency, AC input		47-63 Hz				
Supply voltage fail. bridging time at 100 % load		5 ms min.				
Input current at nom. load	typ. at 0.25 A	-	-	-	0.14 A	-
	typ. at 0.5 A	-	0.14 A	0.14 A	-	0.32 A / 0.35 A
	typ. at 0.75 A	-	-	-	0.35 A	-
	typ. at 1 A	0.16 A	0.32 A	0.35 A	-	-
Internal input fuse	typ. at 0.25 A	-	-	-	0.2 A (slow-act.)	-
	typ. at 0.5 A	-	0.2 A (slow-act.)	0.2 A (slow-act.)	-	0.4 A (slow-act.)
	typ. at 0.75 A	-	-	-	0.4 A (slow-act.)	-
	typ. at 1 A	0.2 A	0.4 A (slow-act.)	0.4 A (slow-act.)	-	-
Output						
Output voltage		5 V DC	12 V DC	15 V DC	24 V DC	± 12 V DC / ± 15 V DC
Output current		1 A	0.5 A / 1 A	0.5 A / 1 A	0.25 A / 0.75 A	0.5 A
Residual ripple				± 1 %		
Short-circuit protection		overcurrent switch-off with automatic restart				
Overload protection		overtemperature and overcurrent switch-off				
Reset after thermal overload switch-off		automatic reset after cooling				
Standards						
Electrical safety		EN 50178 (VDE 0160)				
Galvanic isolation		safe isolation acc. to EN 60950				
Isolation testing		type test 4 kV AC, routine test 4 kV AC				
Clearances and creepage distances		overvoltage category 3, degree of pollution 2				
Electromagnetic compatibility acc. to EN 61000-6-2	ESD	EN 61000-4-2		6/8 kV		
	HF radiation	EN 61000-4-3 level 3		10 V/m		
	Burst	EN 61000-4-4 level 3		2 kV		
	Surge	EN 61000-4-5		2 kV		
	conducted HF, input	EN 61000-4-6		10 V		
Input current harmonics		no limitation				
Degree of protection, terminals		IP20				
Degree of protection, enclosure		IP20				
Protection class		2, if the unit is covered additionally				
General data						
Operational state indication		green LED				
Operating temperature		-20...+50 °C				
Storage temperature		-40...+80 °C				
Wire size		screw terminals 2.5 mm ² (AWG 14)				
Weight	approx.	0.82 kg*	0.82 kg/0.78 kg*	0.82 kg/0.78 kg*	0.82 kg/1.05 kg*	1.07 kg*
Dimensions (W x H x D) in mm	at 0.25 A	-	-	-	100 x 104 x 79 (3.94 x 4.09 x 3.11 ")	-
	at 0.5 A	-	100 x 104 x 79 (3.94 x 4.09 x 3.11 ")		-	135 x 104 x 90 (5.31 x 4.09 x 3.54 ")
	at 0.75 A	-	-	-	135 x 104 x 90 (5.31 x 4.09 x 3.54 ")	-
	at 1 A	-	100 x 104 x 90 (3.94 x 4.09 x 3.54 ")	-	-	-
Mounting note		Normal mounting position: Horizontally, mounted on DIN rail. Distances to other devices: 20 mm on both sides, top 100 mm, bottom 50 mm.				

* 0.78 kg = 1.72 lb
0.82 kg = 1.80 lb
1.05 kg = 2.31 lb
1.07 kg = 2.35 lb

Linear power supplies

CP-L range

Technical data

230 V AC supply		CP-L5/1.0 CP-L12/1.0	CP-L12/0.5 CP-L15/1.0	CP-L15/0.5 CP-L24/0.75	CP-L24/0.25 CP-L± 15/0.5	CP-L± 12/0.5
Catalog number	1 SVR 419 ...	500 R 3100	501 R 1100 501 R 3100	502 R 1100 502 R 3100	503 R 0100 503 R 2100	511 R 1100 512 R 1100
Input						
Supply voltage		207-253 V AC				
Frequency, AC input		47-63 Hz				
Supply voltage fail. bridging time at 100 % load		5 ms min.				
Input current at nom. load	typ. at 0.25 A	-	-	-	0.07 A	-
	typ. at 0.5 A	-	0.07 A	0.07 A	-	0.16 A / 0.175 A
	typ. at 0.75 A	-	-	-	0.175 A	-
	typ. at 1 A	0.08 A	0.16 A	0.175 A	-	-
Internal input fuse	at 0.25 A	-	-	-	0.125 A (slow-act.)	-
	at 0.5 A	-	0.125 A (slow-act.)	0.125 A (slow-act.)	-	0.2 A (slow-act.)
	at 0.75 A	-	-	-	0.2 A (slow-act.)	-
	at 1 A	0.125 A (slow-act.)	0.2 A (slow-act.)	0.2 A (slow-act.)	-	-
Output						
Output voltage		5 V DC	12 V DC	15 V DC	24 V DC	± 12 V DC / ± 15 V DC
Output current		1 A	0.5 A / 1 A	0.5 A / 1 A	0.25 A / 0.75 A	0.5 A
Residual ripple		± 1 %				
Short-circuit protection		overcurrent switch-off with automatic restart				
Overload protection		overtemperature and overcurrent switch-off				
Reset after thermal overload switch-off		automatic reset after cooling				
Standards						
Electrical safety		EN 50178 (VDE 0160)				
Galvanic isolation		safe isolation acc. to EN 60950				
Isolation testing		type test 4 kV AC, routine test 4 kV AC				
Clearances and creepage distances		overvoltage category 3, degree of pollution 2				
Electromagnetic compatibility	ESD			EN 61000-4-2	6/8 kV	
acc. to EN 61000-6-2	HF radiation			EN 61000-4-3 level 3	10 V/m	
	Burst			EN 61000-4-4 level 3	2 kV	
	Surge			EN 61000-4-5	2 kV	
	conducted HF, input			EN 61000-4-6	10 V	
Input current harmonics		no limitation				
Degree of protection, terminals		IP20				
Degree of protection, enclosure		IP20				
Protection class		2, if the unit is covered additionally				
General data						
Operational state indication		green LED				
Operating temperature		-20...+50 °C				
Storage temperature		-40...+80 °C				
Wire size		screw terminals 2.5 mm ² (AWG 14)				
Weight	approx.	0.82 kg*	0.82 kg/0.78 kg*	0.82 kg/0.78 kg*	0.82 kg/1.05 kg*	1.07 kg*
Dimensions (W x H x D) mm	at 0.25 A	-	-	-	100 x 104 x 79 (3.94 x 4.09 x 3.11 ")	-
	at 0.5 A	-	100 x 104 x 79 (3.94 x 4.09 x 3.11 ")		-	135 x 104 x 90 (5.31 x 4.09 x 3.54 ")
	at 0.75 A	-	-	-	135 x 104 x 90 (5.31 x 4.09 x 3.54 ")	-
	at 1 A	-	100 x 104 x 90 (3.94 x 4.09 x 3.54 ")	-	-	-
Mounting note		Normal mounting position: Horizontally, mounted on DIN rail. Distances to other devices: 20 mm on both sides, 100 mm on top, 50 mm on bottom.				

* 0.78 kg = 1.72 lb
0.82 kg = 1.80 lb
1.05 kg = 2.31 lb
1.07 kg = 2.35 lb

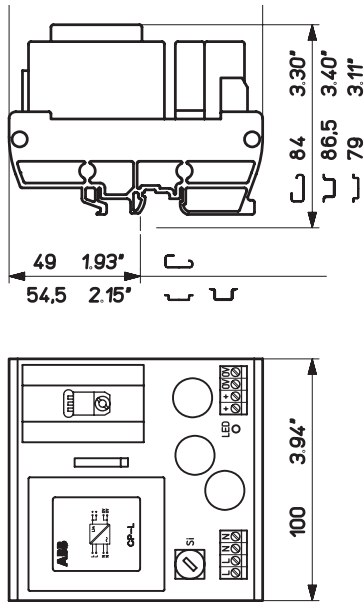
Linear power supplies

CP-L range

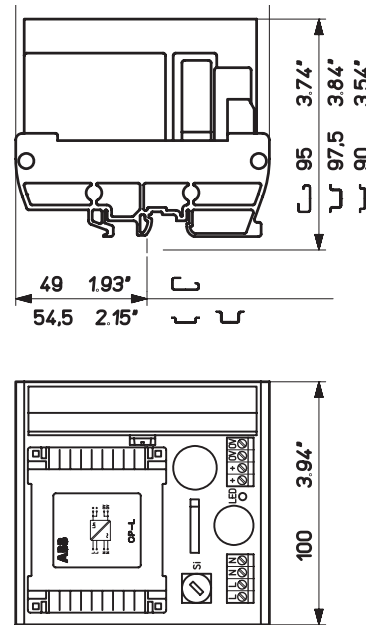
Approximate dimensions

Dimensions in mm

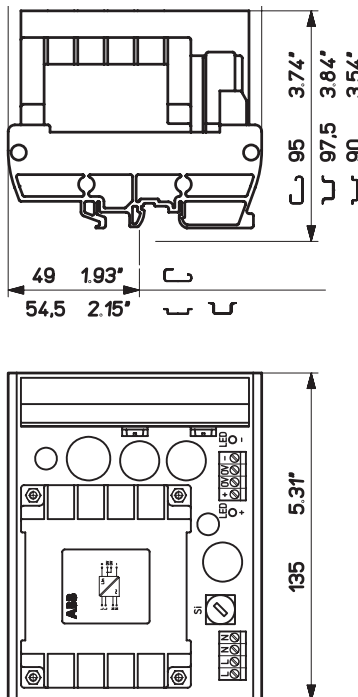
CP-L12/0.5, CP-L15/0.5, CP-L24/0.25



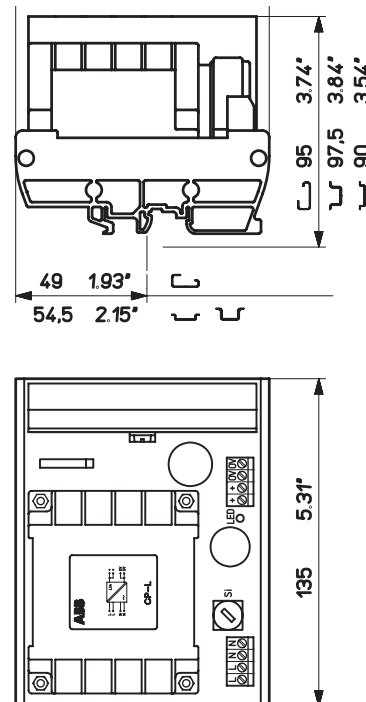
CP-L5/1.0, CP-L12/1.0, CP-L15/1.0



CP-L±12/0.5, CP-L±15/0.5



CP-L24/0.75





Notes
