

DC/DC converters,
switched mode

with galvanic separation

Touch protected to
EN 60529 (IP20)

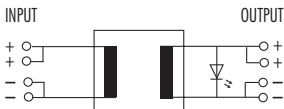
MDD
Input 24 V DC
Output 24 V DC

MDD
Input 24 V DC
Output 12 V DC

MDD
Input 24 V DC
Output 5 V DC



Circuit diagram



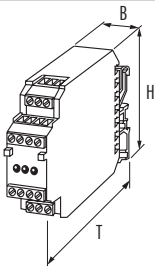
Ordering data		Art.-No.	Art.-No.	Art.-No.
Output data				
24 V DC/0.3 A	7 W	85655		
12 V DC/0.7 A	8 W		85656	
5 V DC/1.5 A	7.5 W			85657

Input	
Input voltage	24 V DC
Input current	0.6 A
Input fuse (external)	2.0 A T

Output			
Output voltage	24 V DC SELV $\pm$ 2 %	12 V DC SELV $\pm$ 2 %	5 V DC SELV $\pm$ 2 %
Max. output current	0.3 A	0.7 A	1.5 A
Ripple	< 0.2 % eff		
Output fuse	short-circuit and overload protected, restart after overload by sensor supply removal		

General data	
Guidelines	EN 61204-3
Test voltage input/output	4 kV AC
Temperature range	0...+50 °C, no condensation
Mounting method	DIN-rail mounting to EN 60715 (TH35 resp. G32)
Weight	0.12 kg
Dimensions	H x B x T
	75 x 22.5 x 102 mm

Dimension drawing



Notes

DC/DC converters,
switched mode

with galvanic separation

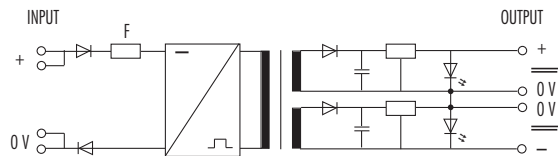
Touch protected to
EN 60529 (IP20)

MDD
Input 24 V DC
Output ± 10 V DC



MDD
Input 24 V DC
Output ± 15 V DC

Circuit diagram

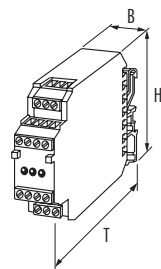


Ordering data		Art.-No.	Art.-No.
	Output data		
± 10 V DC / 2 x 250 mA	5 W	85658	
± 15 V DC / 2 x 250 mA	7 W		85659

Input		
Input voltage	24 V DC	
Input current	0.85 A	
Input fuse (external)	2.0 A T	
Output		
Output voltage	± 10 V DC SELV ± 5 %	± 15 V DC SELV ± 5 %
Max. output current	2 x 250 mA	
Ripple	< 0.2 % eff	
Output fuse	short-circuit and overload protected, restart after overload by sensor supply removal	

General data		
Guidelines	EN 61204-3	
Test voltage input/output	4 kV AC	
Temperature range	0...+50 °C, no condensation	
Mounting method	DIN-rail mounting to EN 60715 (TH35 resp. G32)	
Weight	0.12 kg	
Dimensions	H x B x T	75 x 22.5 x 102 mm

Dimension drawing



Notes

DC/DC converters AC/DC converters

Touch protected to
EN 60529 (IP20)

GLS

Input 24 V DC
Output regulated
5 V DC



GSS

Input 24 V DC
Output switched mode
5 V DC



NG

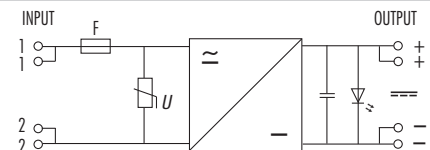
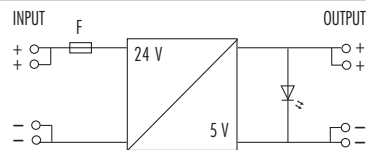
Input 24 V AC
Output regulated
24 V DC



NT

Input 24 V AC
Output adjustable
via potentiometer

Circuit diagram



Ordering data

Output data		Art.-No.	Art.-No.	Art.-No.	Art.-No.
5 V DC/1.2 A	6 W	85600			
5 V DC/ 4 A	20 W		85650		
24 V DC/3.5 A	84 W			85740	
5...35 V DC/3.5 A	122 W				85660

Input

Input voltage	24 V DC +10 % - 15 %	15...40 V DC	22...28 V AC; 26...40 V DC	10...32 V AC; 12...42 V DC
Input current	1.2 A	1 A (at 24 V DC: 4 A)	3.5 A	max. 3 A
Frequency	—		50/60 Hz	
Input fuse	2.0 A T		4.0 A T	6.3 A T

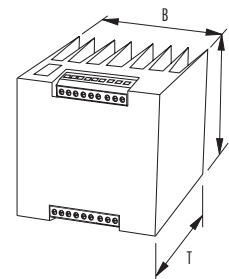
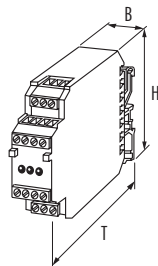
Output

Output voltage	5 V DC SELV $\pm 5 \%$		24 V DC SELV $\pm 3 \%$	5...35 V DC SELV ($U_{OUTmax.} = U_N - 5 V$)
Max. output current	1.2 A	4 A	3.5 A	
Ripple	< 0.2 % eff		< 0.3 % eff	< 0.3 V _{ss}
Output fuse	short-circuit protected		not short-circuit protected	short-circuit protected

General data

Temperature range	-20...+60 °C, no condensation			
Mounting method	DIN-rail mounting to EN 60715 (TH35 resp. G32)			
Weight	0.2 kg	0.13	0.8 kg	
Dimensions	H x B x T	75 x 45 x 102 mm	75 x 22.5 x 102 mm	90 x 90 x 130 mm

Dimension drawing



Notes

DC/DC converters
primary switched mode

with galvanic separation

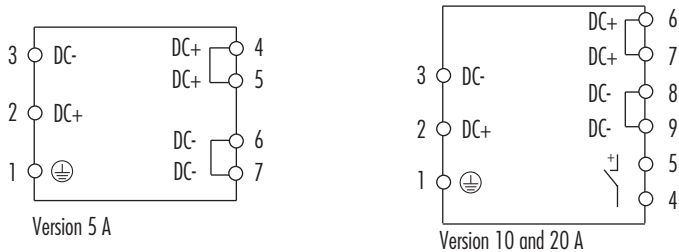
Short-circuit and overload
protected

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EN 60529 (IP20)

MPD Input voltage 40...60 V DC	MPD Input voltage 70...160 V DC	MPD Input voltage 100...160 V DC	MPD Input voltage 100...160 V DC
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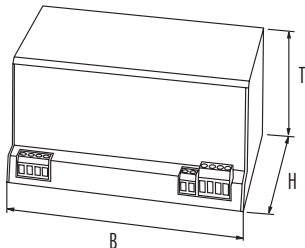
Circuit diagram



Ordering data		Art.-No.	Art.-No.	Art.-No.	Art.-No.
Output data					
24 V DC/ 5 A	120 W		857710		
24 V DC/10 A	240 W			857688	
24 V DC/20 A	480 W	857691			857689

Input				
Input voltage	40...60 V DC	70...160 V DC	100...160 V DC	
Input current	11.2 A (48 V DC)	1.35 A (110 V DC)	2.5 A (110 V DC)	4.9 A (110 V DC)
Inrush current 1 ms	no	< 10 A	no	no
Primary fusing	max. 35 A	10 A	10 A	16 A
Output				
Output voltage SELV	24 V DC, ± 1 %; 22...28 adjustable	24 V DC, + 3 – 1 %	24 V DC, ± 1 %; 22...28 adjustable	
Nominal output current	20 A (60 °C); 24 A (40 °C)	5 A (60 °C); 6 A (40 °C)	10 A (60 °C); 12 A (40 °C)	20 A (60 °C); 24 A (40 °C)
Efficiency	0.9	0.85	0.89	0.9
Mains failure bridging	> 2.5 ms (48 V DC)	> 10 ms (110 V DC)	> 3 ms (110 V DC)	
Ripple; Spikes	< 20 mV eff; < 100 mV ss			
Protection	short-circuit and overload protected, switch off at phase failure, pre-warning and switching off when overloaded ¹⁾ , alarm signal with relay contact ¹⁾			
LED-indicator	green LED in operation, red LED shut down ¹⁾ , yellow LED pre-warning of overloaded or high temperature ¹⁾			
Parallel usage/serial usage	yes/yes	no/yes	yes/yes	
Alarm output ^{1) 2)}	electr. relay max. 60 V DC/ 0.2 A, collective alarm for all faults and pre-warnings, quit via green reset button			
Test stop button ¹⁾	for test purposes, the secondary voltage can be switched off short term with the test stop button			
General data				
Guidelines	EN 60950-1, EN 61204-3, EN 55022 B			
Temperature range	0...+60 °C			
Relative humidity	30...90 %, no condensation			
Mounting method	DIN-rail mounting to EN 60715 (TH35), additional plate for screw mounting Art.-No. 89500			

Dimension drawing (mm)



	H x B x T	Weight
5 A	132 x 110 x 72	0.8 kg
10 A	132 x 198 x 101	1.7 kg
20 A	132 x 243 x 123	2.5 kg

Notes

¹⁾ Units from 10 A onwards. Other versions on request.
²⁾ Units decoupling through diode block at parallel usage.

DC/DC converters primary switched mode

with galvanic separation

Short-circuit and overload
protected

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MPD

Input voltage
120...300 V DC

MPD

Input voltage
115...300 V DC

MPD

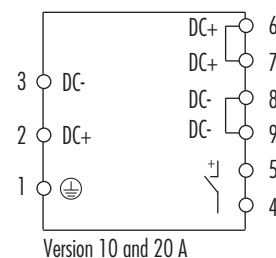
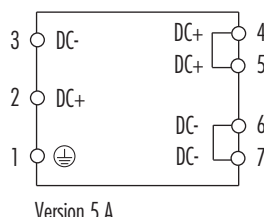
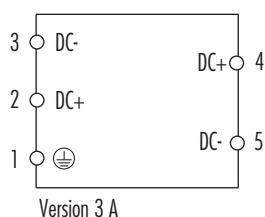
Input voltage
200...300 V DC

MPD

Input voltage
200...300 V DC

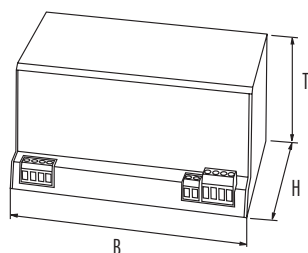


Circuit diagram



Ordering data		Art.-No.	Art.-No.	Art.-No.	Art.-No.
	Output data				
24 V DC/ 3 A	72 W	857687			
24 V DC/ 5 A	120 W		857651		
24 V DC/10 A	240 W			857652	
24 V DC/20 A	480 W				857653
Input					
Input voltage		120...300 V DC	115...300 V DC	200...300 V DC	
Input current	(220 V DC)	0.39 A	0.63 A	1.2 A	2.4 A
Inrush current 1ms		< 10 A		no	
Primary fusing		10 A		16 A	
Output					
Output voltage SELV		24 V DC, + 3 –1 %	24 V DC, + 3 –1 %	24 V DC, ± 1 %; 22...28 adjustable	
Nominal output current		3 A (60 °C); 3.5 A (40 °C)	5 A (60 °C); 6 A (40 °C)	10 A (60 °C); 12 A (40 °C)	20 A (60 °C); 24 A (40 °C)
Efficiency		0.84	0.85	0.89	0.9
Mains failure bridging		> 30 ms (220 V DC)		> 10 ms (245 V DC)	> 15 ms (245 V DC)
Ripple; Spikes		< 20 mV eff; < 100 mV ss			
Protection		short-circuit and overload protected, switch off at phase failure ¹⁾ , alarm signal with relay contact ¹⁾			
LED-indicator		green LED in operation, red LED shut down ¹⁾ , yellow LED pre-warning and switching off when overloaded ¹⁾			
Parallel usage/serial usage		no/yes		yes/yes	
Alarm output ^{1) 2)}		electr. relay max. 60 V DC/ 0.2 A, collective alarm for all faults and pre-warnings, quit via green reset button			
Test stop button ¹⁾		for test purposes, the secondary voltage can be switched off short term with the test stop button			
General data					
Guidelines		EN 60950-1, EN 61204-3, EN 55022 B			
Temperature range		0...+60 °C			
Relative humidity		30...90 %, no condensation			
Mounting method		DIN-rail mounting to EN 60715 (TH35), additional plate for screw mounting Art.-No. 89500			
Dimension drawing (mm)					

Dimension drawing (mm)



	H x B x T	Weight
3 A	132 x 75 x 71	0.6 kg
5 A	132 x 110 x 72	0.8 kg
10 A	132 x 198 x 101	1.7 kg
20 A	132 x 243 x 123	2.5 kg

Notes

¹⁾ Units from 10 A onwards. Other versions on request.

²⁾ Units decoupling through diode block at parallel usage.

Rectifier modules, single-phase

Touch protected to EN 60529 (IP20)

NG 2
max. 2.6 A

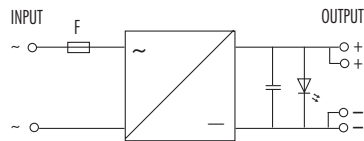


NG 5
max. 5 A

NG 10
max. 10 A

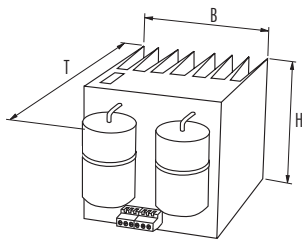
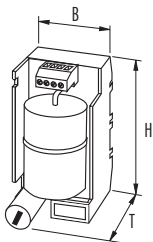


Circuit diagram



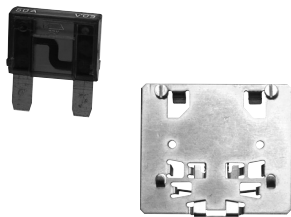
Ordering data		Art.-No.	Art.-No.	Art.-No.
Output data				
24 V DC/ 2.6 A	62 W	85700		
24 V DC/ 5 A	120 W		85710	
24 V DC/ 10 A	240 W			85730
Input				
Input voltage		max. 41 V AC		max. 29 V AC
Input current		rel. output current		
Frequency		50/60 Hz (or extra using for DC)		
Input fuse		3.15 A T (5 x 20 mm)	8 A T (5 x 20 mm)	16 A T (5 x 20 mm)
Output				
Output voltage		24 V DC SELV (at U _F approx. 21 V AC)		
Max. output current		2.6/ ¹⁾ 1.8 A	5/ ¹⁾ 4 A	10 A
Ripple		< 5 % eff		
Output fuse		—		
Output filter		smoothed with smoothing capacitor and LED		
General data				
Temperature range		-20...+60 °C		
Mounting method		DIN-rail mounting to EN 60715 (TH35)		
Weight		0.2 kg		0.8 kg
Dimensions	H x B x T	86 x 45 x 65 mm	90 x 67.5 x 81 mm	90 x 90 x 135 mm

Dimension drawing



Notes

¹⁾max. current shown at $\vartheta_U=60\text{ °C}$



FKS, MNS, MES, MBW

Flat automotive fuses (FKS) for use with MNG, MEN and MDG power supplies.
Snap adapter (MNS) allows MNG up to 5 A to be mounted on DIN-rail.
Snap adapter (MES) allows MEN up to 5 A to be mounted on DIN-rail.
Snap adapter (MBW) allows MCS up to 10 A to be side mounting.

from page 4.9.2



UPS components

Using the UPS accessories, the MPS primary switch modes from 10 A upwards can be used to create a UPS power source.

from page 4.9.3

FKS Automotive type fuse

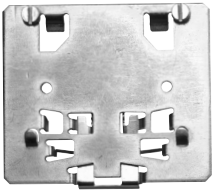
Snap foot adapter for DIN-rail

Screw mounting

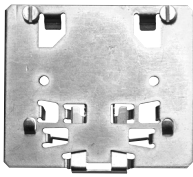
FKS Automotive type fuse



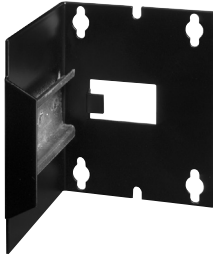
MNS Snap foot for DIN-rail allows MNG



MES Snap foot for DIN-rail allows MEN



MBW Adapter for side mounting allows MCS



Automotive type fuse				Art.-No.			
FKS	2 A	gray	small	90400			
FKS	3 A	violet	small	90401			
FKS	4 A	pink	small	90402			
FKS	5 A	light brown	small	90403			
FKS	7.5 A	brown	small	90404			
FKS	10 A	red	small	90405			
FKS	15 A	light blue	small	90406			
FKS	20 A	yellow	small	90407			
FKS	25 A	white	small	90408			
FKS	30 A	light green	small	90409			
FKS	40 A	orange	large	90411			
FKS	50 A	red	large	90412			
FKS	60 A	blue	large	90413			
Snap foot adapter					Art.-No.	Art.-No.	Art.-No.
MNS	allows MNG	1 A		89430			
		2.5 A		89431			
		3.5 A		89432			
		5 A		89433			
MES	allows MEN	1 A			89440		
		2.5 A			89441		
		5 A			89443		
MBW	allows MCS	2.5 A				89851	
		5 A				89852	
		10 A				89853	
MBW	allows MCS-B	0.6...2.5 A				89851	
		5.0...10 A				89853	
Screw mounting plate							Art.-No.
allows MCS-B		10 A					89514

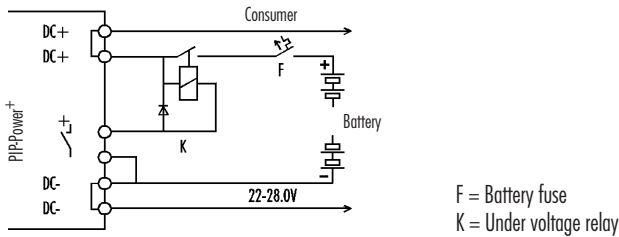
Note The power supplies can be supplied with the snap adapter already mounted (on request).

- Batteries
- Under voltage relays
- Battery fuses

UPS components



Circuit diagram



Batteries 12 V (2 required) ¹⁾					Art.-No.
	Capacity	dimensions (L x B x H)	battery holder	mounting	
A512/ 2.0S	12 V/ 2 Ah	178.5 x 34.1 x 60.5 mm	1 x H1	E1	89631
A512/ 3.5S	12 V/3.5 Ah	134.0 x 66.8 x 60.0 mm	2 x H2	E2	89632
A512/ 6.5S	12 V/6.5 Ah	152.0 x 65.5 x 94.5 mm	1 x H1	E1	89634
A512/ 10.0S	12 V/ 10 Ah	152.0 x 98.0 x 94.5 mm	2 x H2	E2	89636
A512/ 25.0S	12 V/ 25 Ah	176.0 x 167.0 x 126.0 mm	2 x H2	E2	89639
A512/ 40.0A	12 V/ 40 Ah	210.0 x 175.0 x 175.0 mm	2 x H3	E2	89641
A512/ 55.0A	12 V/ 55 Ah	210.0 x 175.0 x 175.0 mm	2 x H3	E2	89643

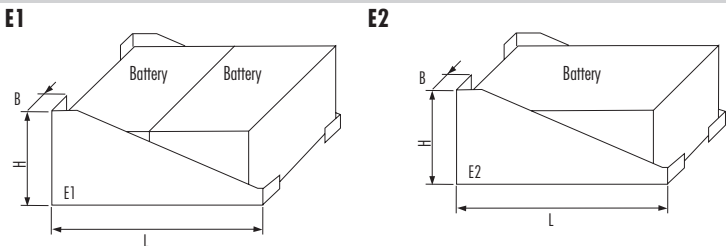
Battery - under voltage relay		Art.-No.
Relay 1 + 2	10 A + 20 A	89510
Relay 3	40 A	89513

Fuse		Art.-No.
Battery fuse model 1	10 A	89520
Battery fuse model 2	20 A	89522
Battery fuse model 3	40 A	89524

Battery holder		Art.-No.
	dimensions (L x B x H)	
H 1	132.0 x 30.0 x 85.0 mm	89530
H 2	177.0 x 40.0 x 137.0 mm	89531
H 3	277.0 x 40.0 x 195.0 mm	89532

Diode block for redundancy		Art.-No.
Diode block	40 A	896014

Mounting diagrams



Note	
¹⁾ Attention: For all UPS application 2 x 12 V batteries are necessary	