

DP277

2 Outputs

DIN Rail Power Supply, 240 Watt



- High efficiency: 85%
- ACin autoselect: 115/230V
- WxHxD = 225x110x130mm
- 2 regulated output voltages
- Over-Temperature Protection (OTP)
- Over-Voltage Protection (OVP)
- Meets EMV standards
VDE 0160/2, EN 61000-4, NAMUR,
EN 50081-1 (EN 55022/B) and EN 50082-2
- Design meets VDE 0551



Power Supply DP277

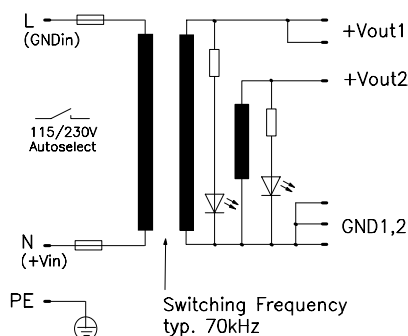
Industrial systems very often require 12V and 24V within one system. The dual-output DP277 can supply controllers, sensors, actuators and other electronic equipment simultaneously. Both outputs are stable over the total load range, and have excellent ripple and noise values of <30mVpp.

The most important economic benefits of this unit includes: the replacement of two separate conventional supplies; low weight; small size; quick single-handed installation on DIN rails (TS35).

Safety is a major feature. Disturbances according to EN 61000-4 and VDE 0160 pulses - class 2 are filtered and regulated by the power supply, even at full load. It is also protected against over-voltage, over-temperature, and short-circuits.

Isolation is equivalent to safety transformers according to VDE 0551, and meets VBG 4.

Schematic:



Vout	Iout	Pout	Features	Order-No.
Vout1 +24V	10A	240W	ACin autoselect, OTP, OVP	DP277.102
Vout2 +12V	3A	36W		
Max. total power:		240W		

Warranty: 2 years from date of delivery.

Output

Voltage Vout1 adjustable	min. ± 5%	Position of trimmer see page 4.
Vout2 adjustable	min. ± 5%	Position of trimmer see page 4.
Accuracy	max. ± 1%	Includes: production-adjustment, line regulation, and load regulation.
Sense lines	None	Not available.
Minimum load	None	Not necessary.
Output power Pout	max. 240W	Total power.
Pout1	max. 240W	Flex. power rail sharing, see p. 3.
Pout2	max. 36W	Flex. power rail sharing, see p. 3.
Noise, Ripple Vout1/2	max. 30 / 10mVpp	20Hz...200kHz.
incl. spikes Vout1/2	max. 50 / 20mVpp	20Hz...20MHz.
Over-voltage protection		
Vout1	typ. 26.4V max. ± 4%	By independant second regulator.
Vout2	typ. 13.2V max. ± 3%	By thyristor.
Derating	6W/K	+55° to +70°C Ta.
Operating indicator	2 green LEDs	Vout1/2, see page 4.
Isolation Vout to Vin	SELV	EN 60 950, VDE 0805.
All outputs are protected against open-circuit, short-circuit, and overload.		

Input

Mechanical: Al/Mg alloy housing, snap-on mounting for DIN rail TS35/7.5 (EN 50 022), WxHxD = 225 x 110 x 130mm, the depth includes the DIN-rail mounting, see page 4.

Weight: App. 1450g

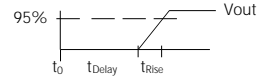
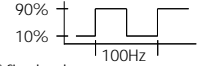
Screw terminals: Input 1 terminal, max. 2.5mm², output 2/1/3 terminals, each max. 2.5mm², see page 4.

Line input AC 1	110...120V AC	115V-operation (ACin autoselect).
· Range	92...132V AC	Full spec.
	80...92V AC	Derated, see page 2.
Line input AC 2	220...240V AC	230V-operation (ACin autoselect).
· Range	184...264V AC	Full spec.
	150...184V AC	Derated, see page 2.
Line frequency	47...63Hz	DC or 400Hz, see page 2.
Input current rms.	max. 4.0Aeff. / 1.8Aeff.	@ 115 / 230V AC.
Noise suppression	EN 55 022/B	10kHz...30MHz, conducted.

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Output (continued)

				+24V	+12V	
Voltage regulation:						
· Line regulation		max.	%	± 0.02	± 0.02	92...132V AC / 184...264V AC, I _{out} = 100%.
· Load regulation stat.	Δ U _{stat}	max.	%	± 0.1	± 0.1	I _{out} = 50%, D I _{out} = ±50%.
· Load regulation dyn.	Δ U _{dyn}	max.	%	± 2	± 2	D I _{out} = 10%...90%...10%, rise time dt = typ. 20μs.
Response time	t _s	max.	μs	500	500	Till ΔV _{out} is within < 0.5% of final value.
· Temperature coefficient		typ.	%/K	± 0.01	± 0.01	
Ripple		max.	mVpp	30	10	20Hz...200kHz, @AC nom, I _{out} = 100%.
· incl. spikes		max.	mVpp	50	20	20Hz...20MHz, @AC nom, I _{out} = 100%.
Current limitation						
· Threshold		min/max.	A	105% ... 130% of I _{out}		Fixed.
· Short-circuit		max.	A	1.4 x I _{out}	1.3 x I _{out}	
Start delay	t _{Delay}	typ.	ms	400	400	@ 115V AC
	t _{Delay}	typ.	ms	30	30	@ 230V AC
V _{out} rise-up time	t _{Rise}	typ.	ms	70	70	
On and off characteristic						



Input (continued)

AC input range 1 / 2	V AC	92...138 / 184...264	Full spec.
DC input range	V DC	250...300	Full spec, for autoselect operation take the polarity into consideration, see page 4.
Derated AC range 1 / 2	V AC	80...92 / 150...184, 150 / 300 for 0.5s	No start below 92V AC / 184V AC
Derated DC range	V DC	170...250	Power derating typ. 10%.
	V DC	300...370	Full spec, but air- and leakage distances not longer than stated in VDE 0805.
Frequency range	Hz	47...63	Full spec.
Derated frequency range	Hz	63...440	Increased leakage currents.
In-rush current	max.	A	20
Hold-up time	min.	ms	17
	min.	ms	20
Power factor λ	typ.	0.60	@ 230V AC, NAMUR standard met (T _a = 25° C).
Internal fuse		5x20mm T4A/250V	@ 92V AC, I _{out} = 100%.
Input range selection		Automatic	@ 184V AC, I _{out} = 100%, see figure on page 3.
			@ 92V AC, I _{out} = 100%.
			L and N, as per IEC 127/2-5. To replace, see page 4.
			ACin autoselect.

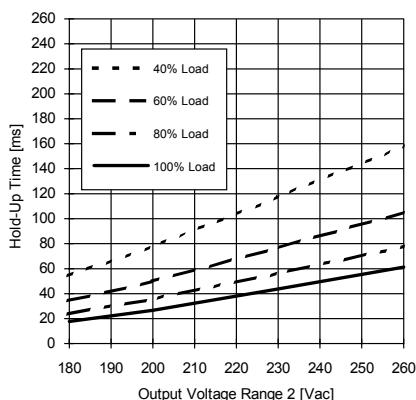
Logic Functions

Vout1/2 adjustable	min.	%	± 5	± 5	Trimmer position see page 4.
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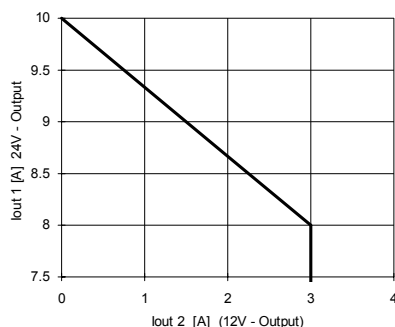
Electromagnetic Compatibility

Emissions according to 50081-1					EN 50081-2 is also satisfied
· Radio interference, EN 55011, EN 55022				Class B	Conducted 10kHz...30MHz.
Immunity according to 50082-2					EN 50082-1 is also satisfied
· Electrostatic discharge ESD, EN 61000-4-2				8kV direct discharge (level 4)	
				15kV air discharge (level 4)	
· Radiated fields, EN 61000-4-3				10V/m (level 3)	ACin, Vout and SYM lines: length = 1m.
· Fast transients, EN 61000-4-4				4kV (level 4)	Coupled to ACin line.
				2kV (level 3)	Coupled to DCout line.
				2kV (level 4) cap. coupling	Coupled to Vout and SYM lines.
· Surge transients, EN 61000-4-5				4kV (isolation class 4)	Common mode, unit on.
				2kV (isolation class 4)	Differential mode, unit on.
				5kV	Common mode, unit off.
· Transient voltage, IEC 255				Satisfied	
· NAMUR-prescription				750V / 1.3ms (class 2)	Valid for total load range.
· Transient resistance, VDE 0160 §5.3.1.1.2				300V AC / 0.5s	
· Over-voltage resistance (PULS standard)					

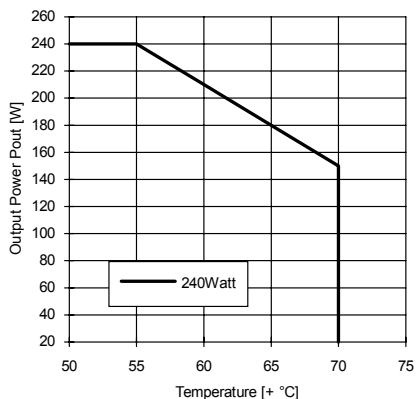
Minimum Hold-Up Time



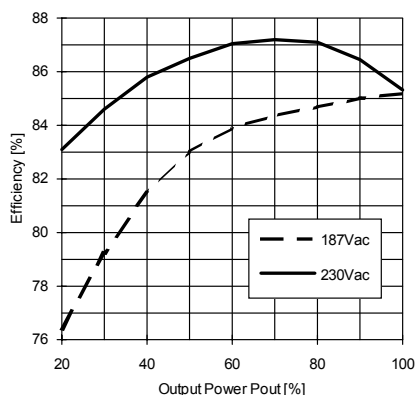
Typ. Output Characteristic



Typ. Derating over Temperature



Typ. Efficiency



Protection

Unit protection			
· Overload	Yes		See current limit, OTP.
· Short-circuit proof	Yes		
· Open-circuit proof	Yes		
· Over-temperature (OTP) typ.	+100° C int. temp.		Switch-off.
	typ. +95° C int. temp.		Switch-on (automatically).
· Reverse battery prot.	—		Take care of polarity, see page 4.
· ACin range selection	Automatic		ACin autoselect.
Load protection			
· Over-voltage (OVP)	Yes		
Threshold Vout1	typ. 26.4V	max. ± 4%	Independant second regulator.
Vout2	typ. 13.2V	max. ± 3%	Thyristor.

Safety

Electrical safety			
· Test voltage (each unit) according to EN 60 950 for t = 2sec	3kV AC 2.5kV AC 500V AC		Primary / secondary. Primary / PE. Secondary / PE.
· Air- and leakage distance	8mm 4mm		Primary / secondary. Primary / PE.
· Isolation resistance	min. 5MΩ		VDE 0551.
· Protection class	I		VDE 0106 part 1, IEC 536 .
· Protection system	IP20		DIN 40050, IEC 529.
· Leakage current	max. 0.75mA		EN 60 950 (47...63Hz line) .
· Safe low voltage	SELV		EN 60 950, VDE 0805, VDE 0160.
· Over-voltage class	II		VDE 0110 part 1, IEC 664.
Touch safety			
Penetration protection	Finger test > Ø 3mm		VDE 0100 §6, EN 60 950, VBG4. e.g. screws, small parts etc.

Operation and Ambient Area

Application class			KSF	DIN 40040.
Operation temperature			max. 0° ... +70°C	Ta (measured at 1cm distance).
· Derated range			+55° ... +70°C	Derating, see diagram.
Storage temperature			typ. -20° ... +100°C	Ta.
Humidity			max. 95%	Non-condensing.
Mechanical usage			See page 4	
· Distance to cable channels			See page 4	
· Lateral spacing			None	No gap needed.
Cooling			Normal convection	Don't obstruct air flow.
Dirt protection level			max. 2	VDE 0110 part 1.
Vibration			0.075mm	IEC 68-2-6 (10...60Hz).
Shock			11ms / 15g	IEC 68-2-27 (3 shocks).
Operation height			max. 2,000m	Above sea level.

Efficiency and Power Loss

DP277.102	typ. 85% / 42.4W	@ 230V ACin, Iout = 100%.
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Reliability and Lifetime

MTBF according to Siemens standard SN29500		
typ.	200,000h	230VAC, Iout = 100%, +40° C Ta.
Only long life (> 2,000h @105° C) electrolytic capacitors are used.		
Function test	100%	Test certificate enclosed.
In-circuit test	Yes	
Run-in (burn-in)	24h	Full load, Ta = +55° C, on/off cycle.

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Fuse

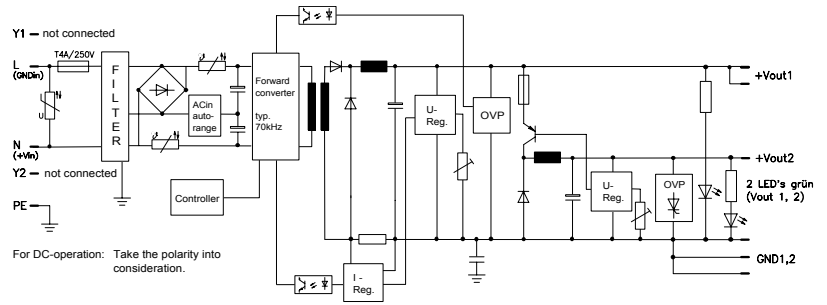
The PSU has electronic protection against external short-circuits. In case of an internal defect, a fuse disconnects the unit. It can only be replaced by opening the unit which should be done by the supplier.

Installation for Operating

Install DIN rail TS35/7.5 horizontally, ensuring correct orientation.

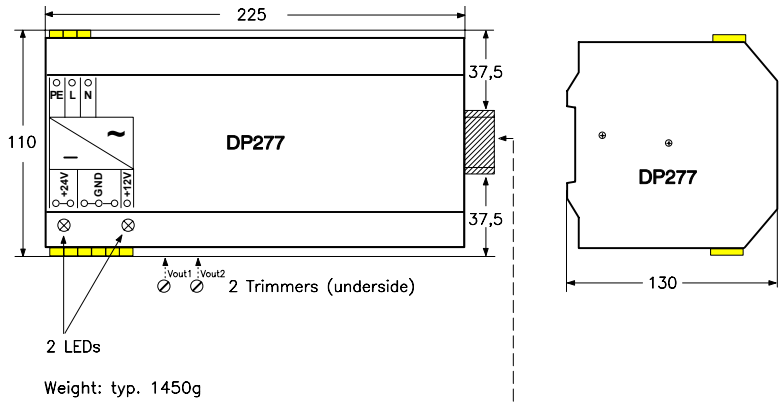
For other installation considerations consult your representative. Ensure free air flow.

Schematic



Dimensions and Connections

Fully enclosed Al/Mg alloy housing.
All mechanical dimensions are in mm.



Weight: typ. 1450g

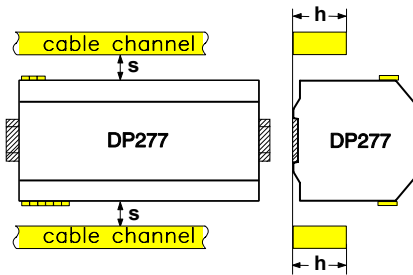
Snap the unit direct on the DIN rail TS35/7.5!

Install DIN rail horizontally. For vertical installation contact PULS.

The width of 225mm includes the lateral case screws.

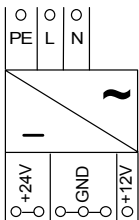
Do not remove any screws on box, as internal safety connections could be disconnected!

h	s (min)	
38mm	15mm	= e.g. KL25/35
66mm	30mm	= e.g. KL25/60



Required mounting dimensions

Connections at alternating voltage

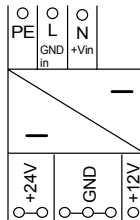


Screw terminals:

max. 2,5mm² cross section

Take care of standards which must be satisfied, e.g. VDE 0100 or EN 60950.

Connections at direct voltage



Modifications (contact supplier)

Negative temperature co-efficient for battery loads.

Other DC input voltage ranges.

Other output voltage ranges.

Lower cost versions.