

DP257 2 Outputs DIN Rail Power Supply, 230 Watt

- ◆ High efficiency: 85%
- ◆ 2 regulated, and galvanic isolated outputs
- ◆ ACin 115/230V manual switch
- ◆ WxHxD = 225x130x100mm
- ◆ Isolated electronic short-circuit protection for both outputs
- ◆ Meets EMV standards
EN 50081-1 (EN 55022/B), EN 50082-2,
NAMUR, EN 61000-4 and VDE 0160/2
- ◆ Design meets VDE 0551



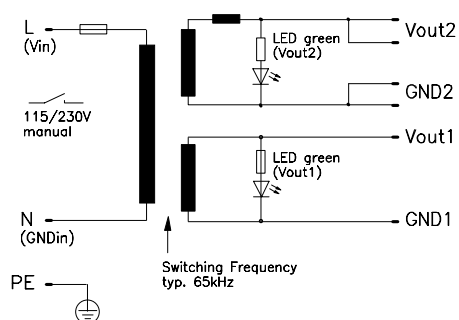
Power Supply DP257

Industrial systems very often require 5V and 24V within one system. The dual-output DP257 can supply controls, sensors, actuators and other electronic equipment simultaneously. Both outputs are stable over the total load range, and have excellent ripple and noise values of <40mVpp. Even when the 24V output is short circuited the 5V output continues to operate without interruption.

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

Changes of line voltage and other disturbances (according to EN 61000-4, and VDE 0160 pulses - class 2 for total load range!) are filtered and regulated by the power supply. It is also protected against over-voltage and short-circuits. Isolation is equivalent to safety transformers according to VDE 0551, and meets VBG 4.

Schematic:



Mechanical: Al/Mg alloy housing, snap-on mounting for DIN rail TS35/7.5 (EN 50 022), WxHxD = 225 x 130 x 100mm, the depth includes the DIN-rail mounting, see page 4.

Weight: App. 1340g

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

Vout	Iout	Pout	Features	Order-No.
Vout1 5.1V	8A	41W	OVP, Vout1/2 adjustable	DP257.105
Vout2 24V	9A	216W		
Max. total power:		230W		

Warranty: 2 years from date of delivery.

Output

Voltage Vout1 adjustable	min. ± 5%	See page 2.
Vout2 adjustable	min. ± 4%	See page 2.
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. 230W	Total power.
Pout1 at Vout1	max. 41W	Flex. power rail sharing, see p. 3.
Pout2 at Vout2	max. 216W	Flex. power rail sharing, see p. 3.
Noise, Ripple Vout1/2 incl. spikes	max. 40mVpp	20Hz...200kHz.
	max. 50mVpp	20Hz...20MHz.
Over-voltage protection		Threshold accuracy ± 4%.
Vout1	typ. 6.25V	By thyristor.
Vout2	typ. 30V	By independent second regulator.
Derating	5W/K	+60° to +70°C Ta.
Operating indicator	2 green LEDs	On the front (Vout1/2).
Isolation Vout to Vin	SELV	EN 60 950, VDE 0805.
Isolation Vout1 to Vout2	500V AC	
All outputs are protected against open-circuit, short-circuit, and overload.		

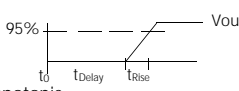
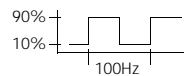
Input

Line input AC 1	100...127V AC	Switch position 115V.
· Range	88...132V AC	Full spec.
	80...88V AC	Derated, see page 2.
	132...150V AC	Derated, see page 2.
Line input AC 2	220...240V AC	Switch position 230V.
· Range	187...264V AC	Full spec.
	150...187V AC	Derated, see page 2.
	264...300V AC	Derated, see page 2.
Line frequency	47...63Hz	DC or 400Hz, see page 2.
Input current rms.	max. 6.0Aeff. / 2.8Aeff.	@ 115 / 230V AC.
Noise suppression	EN 55 022/B	

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Output (continued)

				5.1V	24V	
Voltage regulation:						
· Line regulation		max.	%	± 0.1	± 0.1	88...132V AC / 187...264V AC, I _{out} = 100%.
· Load regulation stat.	Δ U _{stat}	max.	%	± 0.5	± 0.25	I _{out} = 50%
· Load regulation dyn.	Δ U _{dyn}	max.	%	± 8	± 2	D I _{out2} = 10%...90%...10%, rise time dt = typ. 20μs.
Response time	t _s	max.	ms	2	0.8	Till ΔV _{out} is within < 0.5% of final value.
· Temperature coefficient		typ.	%/K	± 0.01	± 0.01	
Ripple		max.	mVpp	40	40	20Hz...200kHz, @AC nom., I _{out} = 100%.
· incl. spikes		max.	mVpp	50	50	20Hz...20MHz, @AC nom., I _{out} = 100%.
Current limitation						
· Threshold		min/max.	A	8.5-12	9.5-11.5	Fixed.
· Characteristic						See graph on page 3.
· Short-circuit		max.	A	—	9.5-12.0	Periodic restart of V _{out1} when exceeding the current limit.
Start delay	t _{Delay}	typ.	ms	330	350	After switch on.
V _{out} rise-up time	t _{Rise}	typ.	ms	5	23	Approximately monotonic.
On and off characteristic						Unit off/on.
Power back immunity	U _{Back}	max.	V	—	35	



Input (continued)

AC input range 1 / 2		V AC		88...132 / 187...264		Full spec.
DC input range		V DC		250...300		Full spec.
Derated AC range 1 / 2		V AC		80...88 / 150...187, 150 / 300 for 0.5s		
Derated DC range		V DC		176...250		Power derating typ. 20% (no start below 196V).
		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...400		Increased leakage currents.
In-rush current		max.	A	50		Cold-start, NAMUR standard met (T _a = +25° C).
Hold-up time		min.	ms	18		@ 88V AC, I _{out} = 100%, see figure on page 3.
		min.	ms	25		@ 187V AC, I _{out} = 100%, see figure on page 3.
Power factor	λ	typ.		0.63		@ 88V AC, I _{out} = 100%.
Internal fuse				5x20mm T8A/250V (IEC127/2-5)		To replace, see page 4.
Input range selection				Manual (230V AC set at factory)		115/230V switch, position see page 4.

Logic Functions

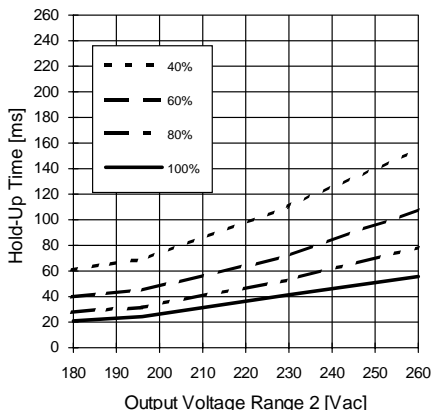
V _{out} adjustable		min.	%	± 5	± 4	If you adjust V _{out1} downwards or V _{out2} upwards you have to adjust the other output in the same direction.
				Position of trimmers see page 4.		

Electromagnetic Compatibility

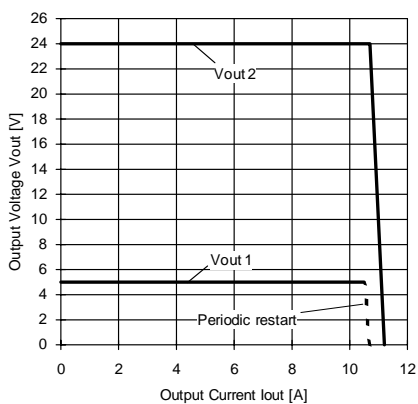
Emissions according to EN 50081-1						EN 50081-2 is also satisfied.
· Radio interference, EN 55011, EN 55022				Class B		
Immunity according to EN 50082-2				No degradation of performance		EN 50082-1 is also satisfied.
· Electrostatic discharge ESD				8kV direct discharge (level 4)		
EN 61000-4-2				15kV air discharge (level 4)		
· Radiated fields, EN 61000-4-3				10V/m (level 3)		80MHz...1000MHz, ACin, Vout and signal lines: l = 1m.
· Fast transients, EN 61000-4-4				4kV (level 4)		Coupled to ACin line.
				2kV (level 3)		Coupled to DCout line.
				2kV		Coupled to Vout lines.
· Surge transients, EN 61000-4-5				4kV (isolation class 4)		Common mode, unit on.
				2kV (isolation class 4)		Differential mode, unit on.
				500V		Differential respectively common mode.
· Conducted disturb., ENV 50141 (draft of IEC 801-6)				10V (level 3)		150kHz...80MHz.
Immunity according to further standards						
· Transient voltage, IEC 255				5kV		Common mode, unit off.
· NAMUR-prescription				Satisfied		
· Transient resistance, VDE 0160 §5.3.1.1.2				750V / 1.3ms (class 2)		Valid for total load range.
· Over-voltage resistance (PULS standard)				150 / 300V AC / 0.5s		Switch position 115 / 230V AC.

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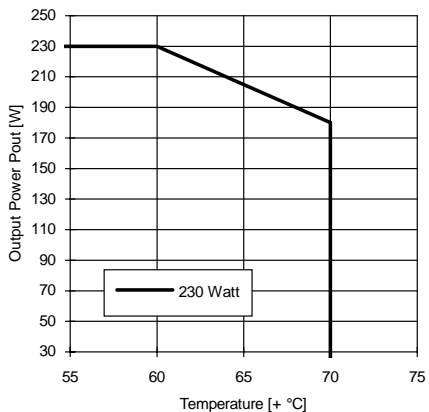
Minimum Hold-Up Time



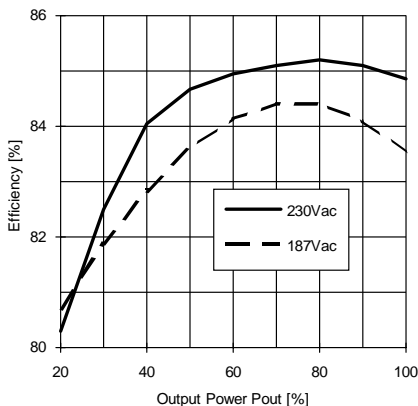
Typ. Output Characteristic



Typ. Derating over Temperature



Typ. Efficiency



Protection

Unit protection		
· Overload	Yes	See current limit.
· Short-circuit proof	Yes	Automatic voltage recovery.
· Open-circuit proof	Yes	
· Over-temperature (OTP)	Yes	
· Reverse battery prot.	Yes	
· ACin range selection	Manual	Switch for 115/230V AC.
Load protection		
· Over-voltage (OVP)	Yes	
Threshold	Vout1	typ. 6.25V
	Vout2	typ. 30V
Accuracy	Vout1	max. ± 4%
	Vout2	max. ± 4%
		By thyristor. Independent second regulator.

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.
· PE resistance	< 0.1Ω	VDE 0805.
· 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	Finger test	VDE 0100 §6, EN 60 950, VBG4.
Penetration protection	> Ø 3mm	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	+60° ... +70°C	Derating, see diagram.
Storage temperature	typ. -20° ... +100°C	Ta.
Humidity	max. 95%	Non-condensing.
Mechanical usage	Vertical	See page 4.
· Lateral spacing	8mm	To neighbouring units.
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

DP257.105 typ. 85% / 40.5W @ 230V ACin, Iout = 100%.

Reliability and Lifetime

MTBF according to Siemens standard SN29500	typ. To be discovered	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 = +60° C, on/off cycle.

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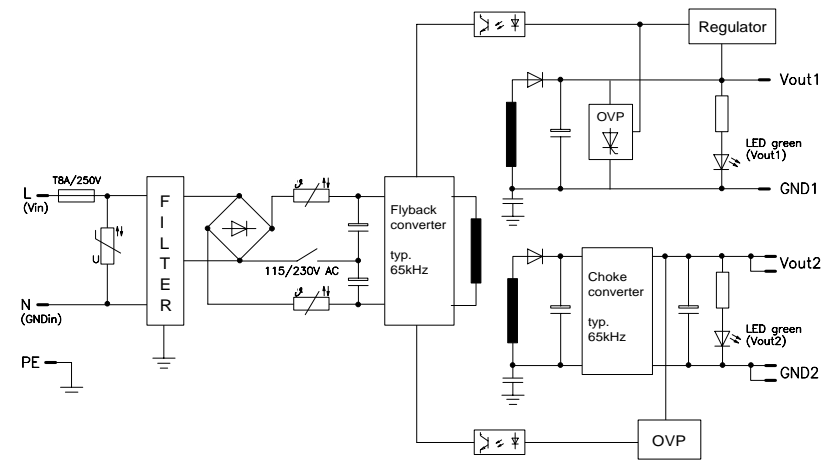
Fuse

Schematic

Installation for Operating

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

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



Dimensions and Connections

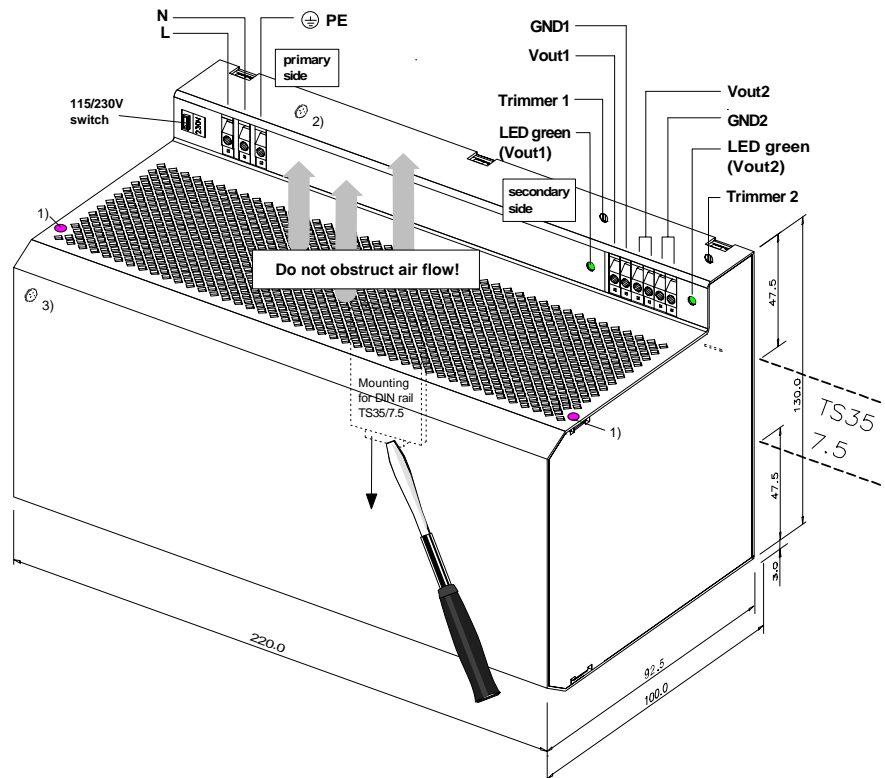
Fully enclosed Al/Mg alloy housing. All mechanical dimensions are in mm.

- 1) The height of the plastic studs is 3.5mm total for top and bottom.
- 2) Do not remove PE screw.
- 3) The height of this screw head is max. 2.5mm.

Screw terminals:

On the front side. These accept wire of up to 4mm² cross section (single-core cable) or 2.5mm² cross section (multi-core flex). Remove 9 to 15mm of insulation from wire.

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



Caution:

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

Modifications (contact supplier)

- Other DC input ranges.
- Other output voltages.
- Lower cost versions.