PULS MiniLine:
practical, versatile and reliable like
the SilverLine – yet small like no other:

PULS

CE

c UL us LISTED

CB scheme



Data sheet

MiniLine
with plug-in screw terminals



- 24-28 V DC/50 W output power
- 100-240 V Wide Range Input (85-264 V AC permitted)
- DCok output
- PULS Overload Design™ (does not switch off at overload but delivers up to 1.5 times nominal current)
- with load sharing for reliable parallel operation
- NEC Class 2 Power Supply

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Mini is more.

ML50e111/040506

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Technical Data ML50.111

PLUG Connectors

Input

Input voltage	AC100-240V (Wide Range), 47...63 Hz Admiss. limits: AC 85...264V (DC 85...375V)
Input current	<1.0A (@ AC 100V_{in}, 50W P_{out}) <0.6A (@ 196 V AC_{in}, 50W P_{out})
External Fusing	Not required, unit provides internal fuse (T3AH, not accessible)
Transient immunity	Transient resistance acc. to VDE 0160 / W2 (750V / 1.3ms), over entire load range
Hold-up time (see diagram below)	>171ms @ AC 230V, 24V / 2.1A >97ms @ AC 196V, 24V / 2.1A >17ms @ AC 100V, 24V / 2.1A

Efficiency, Reliability

Efficiency	typ. 88.5% (AC 230V, 24V / 2.1A) (see also diagram below)
Losses	typ. 6.8W (AC 230V, 24V / 2.1A)
MTBF (Reliability)	ca. 600.000 h acc. to Siemensnorm SN 29500 (24V/2.1A, AC 230V, T_{amb} = +40°C)

Prior to shipment, *every* unit undergoes the following tests in order to isolate any defective units which might suffer an early failure:

- Run-in / burn-in (Full load, T_{amb} = +60°C, on/off cycle)
- Functional test (100 %)

Construction, Mechanics, Installation

Robust plastic housing (US Patent No. D442, 923S), fine ventilation grid on three housing sides to keep out small parts (e.g. screws), IP20

Dimensions and weight	
• W x H x D	45mm x 75mm x 91mm (+ DIN rail) Depth incl. connectors: 98mm (+ DIN rail)
• Weight	240g
Mounting orientation	 (cf. 'Output')
Ventilation/Cooling	Normal convection, no fan required
• Free space f. cooling	recom'd.: 25mm on sides with ventilation grid

Easy snap-on mounting onto the DIN-rail (TS35/7,5 or TS35/15).
Unit sits safely and firmly on the rail; no tools required even to remove

Connection	by plug connectors, 2 terminals/output; mating connectors enclosed

Connector size range – input:

• flexible/solid cable	0.5 - 2.5mm² (22-12 AWG)
• Wire strip length	Ferrules admissible, 7mm recommended

Connector size range – output:

• flexible cable	0.3 - 2.5mm² (28-12 AWG)
• solid cable	0.3 - 4mm² (28-12 AWG)
• Wire strip length	Ferrules admissible, 6mm recommended

Design details – for your advantage:

- Standard plugs, meet various connector families (e.g CombiCon)
- Plugs allow measurement access

Output (incl. Logic)

Output voltage	DV 24-28V, adj. by front panel potentiometer
• preset	24V ±0.5% @ 2.1A *(25V at no load, see 'Parallel operation')*
Voltage regulation	stat. ±2.5% V_{out} *(see 'Parallel operation')* dyn. ±2% V_{out} overall
Ripple/Noise	<50mV_{PP} (20MHz bandw., 50Ω measurem.)
Overvoltage prot. (OVP)	<40V
Output noise suppression	Radiated EMI values below EN 61000-6-3, even when using long (>2m), unscreened output cables
Rated continuous loading	up to 2.1A @ 24V / up to 1.8A @ 28V depending on built-in orientation, V_{in} and T_{amb} (convection cooling); for details see derating diagram below
Overload behaviour	**PULS Overload Design™:** No switch-off at overload/short-circuit, instead: up to 1.5 · I_{rated}. So you need no oversizing to start awkward loads.
Protection	Unit is protected against (also permanent) short-circuit, overload and open-circuit
Derating	see diagram below
Parallel operation	Yes; load sharing by inclined characteristic curve (ΔV = -1V between I_{out} = 0A and I_{out} = I_{rated})
Power back immunity	35V
Operation indicator	Green LED (DC OK), threshold: V_{out} = 20V
DC OK output	To feed a 24V relay (R_{coil} > 700Ω). Relay operates, if output voltage exceeds threshold value Free-wheeling diode for relay is included in the power supply unit
• Threshold	V_{out} = 20V ±4%

Environmental Data, EMC, Safety

Ambient temperature range (measured 25mm below unit)	
• storage, transport	-25°C ... +85°C
• operation	-10°C ... +70°C (for derating see diagram below)
Humidity	max. 95% (without condensation)
Electromagnetic emissions (EME)	EN 61000-6-3 (includes EN 61000-6-4) Class B (EN 55011, EN 55022)
Electromagnetic immunity (EMI)	EN 61000-6-2 (includes EN 61000-6-1)
Safe low voltage:	SELV (EN60950, VDE0100/T.410), PELV (EN50178)
Prot. class/degree:	Class I (EN60950) / IP20 (EN60529)

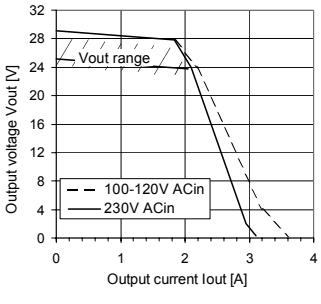
The PSU complies with all major **safety approvals** for EU (EN 60950, EN 60204-1, EN 50178), USA (UL 60950, E137006, UL508 LISTED, E198865), Canada (CAN/CSA-C22.2 No 60950 [CUR], CAN/CSA-C22.2 No. 14 [CUL]), CB Scheme (IEC 60950).

Further design details – for your advantage:

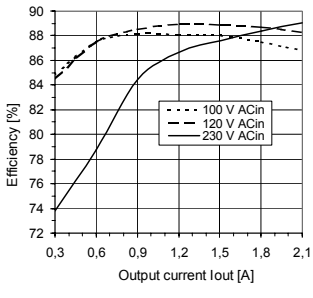
- All terminals are easy to reach as mounted on the front panel.
- Input and output are strictly apart from each other (below/above) and have different wire access (90°/270° wiring), so cannot be mixed up

Diagrams

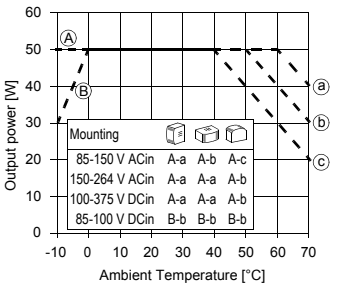
Output characteristic V_{out}/I_{out} (min.)



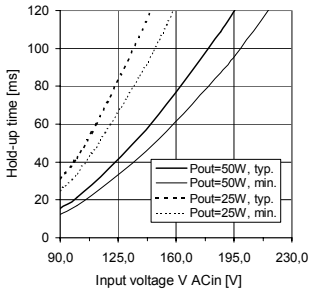
Efficiency (@ V_{out} = 24V, typ.)



Derating of output power



Hold-up time with ACin (@ V_{out} = 24V, typ. + min.)



Product information (ML50e111/040506), Rev.: 6. May 2004.
Unless otherwise stated, specifications are valid for AC 230V input voltage, +25°C ambient temperature, and 5 min. run-in time. They are subject to change without prior notice..
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