Data sheet

SL20 with remote shut-down

SL20.115

- Input: AC 115/230V **auto select**
- Output: 24...28V / 480W (600W)
- 90% efficiency
- Ideal for parallel operation
- Remote shut-down

CB scheme IEC60950

UL508 LISTED IND. CONT. EQ. 18 WM, 60°C

UL60950 E137006 CUL/CSA-C22.2 No 60950

Type approval acc. to:
- IEC / EN60950
- EN50178 Overvolt. cat. III
- EN60204

EMC and Low Volt. Directive

Datasheet

Input

Input voltage	AC 100-120V/220-240V, 47-63Hz, auto select
Rated tolerances • Continuous operation • Short-term (1 min) at 24V/20A	 AC 85...132V resp. AC 184...264V AC 85...140V resp. AC 170...280V
Input current I_n	<10A (115V range); <5A (230V range)

Inrush current limiting with active bypass of the limiting resistor (NTC).

Inrush current I_{pk}	<18A @ AC 264V (T_{amb} = +25°C, cold start) <37A @ AC 264V (T_{amb} = +50°C, cold start)
Fuse loading I^2t	<5A^{2}s (T_{amb} = +25°C, cold start) <8A^{2}s (T_{amb} = +50°C, cold start)

To be fused with a 16A, B-type 'circuit-breaker' switch based on the usual thermomagnetic overload sensing principle (used anyway to fuse the input lines).

EN 61000-3-2 (harmonic current emissions [PFC]) is fulfilled

Transient handling	Transient resistance acc. to VDE 0160 / W2 (750V/1.3ms), for *all* load conditions.
Hold-up time	30ms at 24V/20A, AC 230V$_{in}$ 30ms at 24V/20A, AC 120V$_{in}$ 15ms at 24V/20A, AC 100V$_{in}$

Efficiency, Reliability

Efficiency	typ. 90.5% (AC 230V, 24V/20A)
Losses	typ. 50W (AC 230V, 24V/20A)
MTBF	519.000h acc. to Siemensnorm SN29500 (24V/20A, 230V, T_{amb} = 40°C)
Life cycle (electrolytics)	The unit exclusively uses longlife electrolytics, specified for +105°C (cf. 'The SilverLine', p.2). High reliability, as • only five aluminium electrolytics and • no small aluminium electrolytics are used.

Further information

Further information, especially about
- EMC, Connections, Safety, Approvals, Mechanics and Mounting see page 2 of the „The SilverLine" data sheet.
- For detailed dimensions see SilverLine mechanics data sheet SL20.

Output (signal terminals see overleaf)

Output voltage	DC 24...28V, adjustable by (covered) front panel potentiometer. Adjust. range guaranteed.
Output noise suppression	Radiated EMI values below EN50081-1, even when using long, unscreened output cables.
Ambient temperature range T_{amb}	Operation: 0°C...+70°C (>60°C: Derating) Storage: -25°C...+85°C

Rated continuous loading with convection cooling:

• T_{amb}=0°C - 60°C	24V/20A resp. 28V/18A short-term (<30s) 24V/25A resp. 28V/22A
Derating	12W/K (at T_{amb} = 60-70°C)
Voltage regulation	better than 2% over all
Ripple	(incl. spikes (20MHz bandw.), 50Ω measurem.
• Output charact. S	<20mV$_{PP}$ (<0.1%)
• Output charact. P	<40mV$_{PP}$ (In: AC 230V, Out: 24V/20A)
(S/P: **S**ingle/**P**arallel Mode)	<100mV$_{PP}$ (In: AC 184V, Out: 24V/20A)
Over-voltage protection	At 33V ± 10%: switch to hiccup mode

Front panel indicators:
- Green LED on, when $V_{out} > U_T$, where U_T is appr. 2V below V_{out} adjusted (24V...28V)
- Red LED on, when $V_{out} < U_T$

Parallel operation	Yes, up to ten SL20

To achieve current sharing the output V/I characteristic can be altered to be 'softer' (25V at 0.4A, 24V at 20A). This is done by repositioning an external bridge connection (without opening the unit).

Power Back Immunity	max. 30V

Construction / Mechanics

Housing dimensions and Weight

• W x H x D	220mm x 124mm x 102mm (+ DIN rail)
• Free space for ventilation	above/below 70mm recommended left/right 25mm recommended
• Weight	2,5kg

Design advantages:
- All connection blocks are easy to reach as mounted on the front panel.
- PVC insulated cable can be used for all connections, as the connection blocks are mounted in the cooler area on the underside of the unit.

Order information

Order number	Description
SL20.115	
SLZ02	(wall mounting set; contains 2 pcs.)

Start / Overload Behaviour

Startup delay	typ. 0.55s
Rise time	appr. 20-80ms, depending on load
Overload behaviour	Puls Overload Design (see right-hand diagram)

Advantages:
- No disconnection/hiccup, thus overloading is possible also for a longer period of time (load start-up), ideal for parallel operation.
- High overload/short-circuit current due to straight characteristic; each bias point of the V/I characteristic extends 20A.

Advantage: Due to the high and continuously supplied overload current the unit starts reliably even with awkward loads (DC-DC converters, motors). No 'sticking' can occur as, for example, with fold-back characteristics, and secondary fuses trigger more reliably.

Signal terminals

The remote On/off control is activated via the signal terminals 'Remote Shutdown 1 and 2'. The unit is delivered with the signal terminals jumpered (control state is 'On' with the terminals jumpered).

a) Remote shut-down by switch:
Unit turns on when the signal terminals 'Remote Shutdown 1 and 2' are closed by a switch (R<10Ω).
- Connect the switch contact with the signal terminals Remote Shutdown 1 and 2, only! Ensure the switch contact is not connected to the output voltage or in contact with any separate voltages.
- Unit is in standby mode with open switch contact (R>100kΩ)

b) Remote shut-down by control voltage:
Positive voltage is applied to 'Remote Shutdown 1' against minus output (reference potential)
- Unit turns on, when positive voltage (3...30V, 0.3...2mA) is applied to 'Remote Shutdown 1' against the minus output
- Unit switches off at <0.6V
- Input voltages of 0.6...3V and negative voltages are not defined

Parallel operation / cascading of outputs:
- Use a multi-pole switch with one switch contact for each power supply unit (1 x On); connection of the signal terminals with one switch contact is not permissible when being used in parallel operation

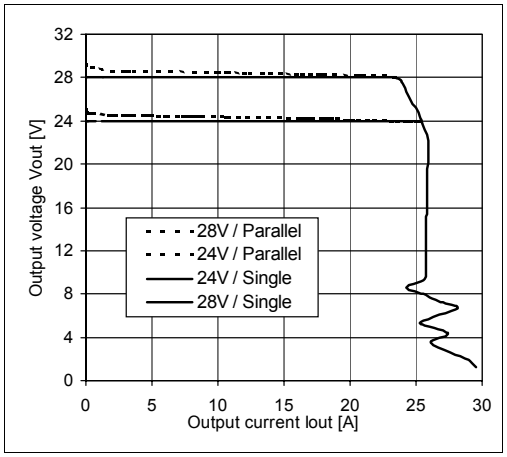
Additional control features with parallel operation:
Unit turns on:
- positive voltage (4...30V) is applied to 'Remote Shutdown 1' against negative output voltage

Unit switches off:
- 0...0.5V_{in} is applied to 'Remote Shutdown 1'

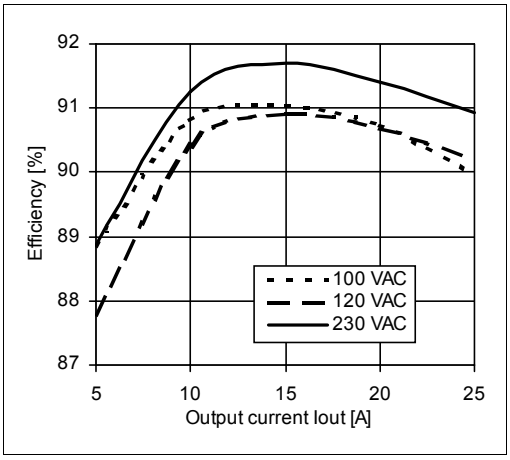
Note:
- Connection of the terminals 'Remote Shutdown 1' is possible with parallel operation; do not use the terminals 'Remote Shutdown 2'
- Only connect the signalling lines at one single point of the negative output voltage; a voltage drop between the connection point and the minus terminals must not exceed 0.5V, even at maximum load!

Additional data regarding remote shut-down:
- Output current < 5mA (mean)
- Power consumption <2.5W
- Residual voltage at zero load <3V
- Startup delay <500ms
- Switching operations per min. <10

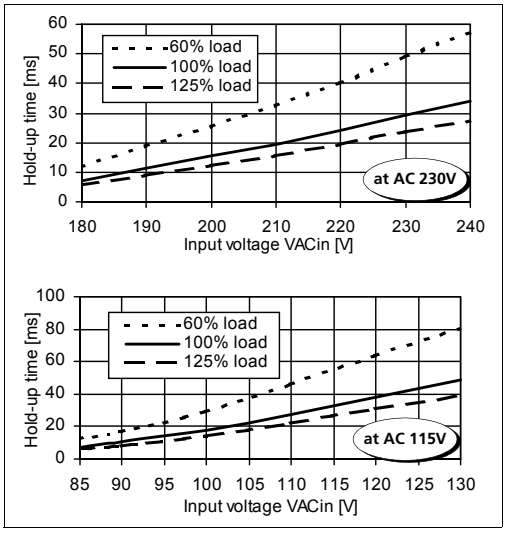
Output characteristic (typ.)



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



Hold-up time (min., at V_{out}=24V)



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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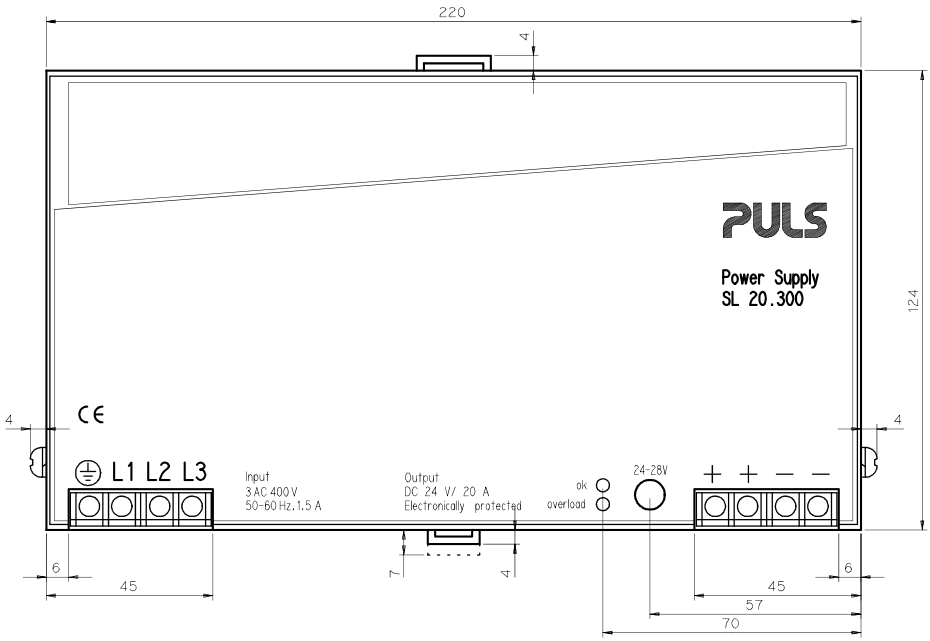
Data sheet

Mechanics

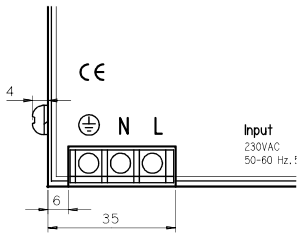
SL20

- Innovative DIN-Rail mount, unit holds even at vibration or lateral pressure
- Clearly arranged and user oriented
- Large, robust screw terminals
- Sealed metal housing
- Fine ventilating grid

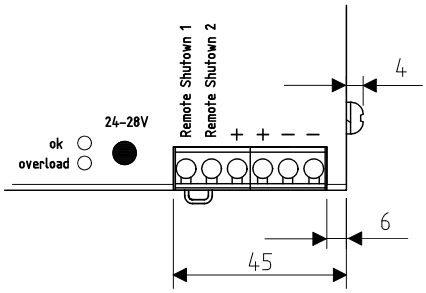
Front view SL20.300



Input terminals SL20.1xx



Output terminals SL20.115



Construction / Mechanics

Housing dimensions and Weight

• W x H x D	220 mm x 124 mm x 102 mm (+ DIN rail)
• Free space for ventilation	above/below 70 mm recommended left/right 25 mm recommended
• Weight	1.5 kg (SL20.100) / 1.8 kg (SL20.110, SL20.300) 2.5 kg (SL20.111, SL20.115)

Robust metal housing with
fine ventilat. grid (◇ 3,5 mm, IP20), to keep out small parts (e.g. screws)

Mounting	on DIN-Rail (TS35/7.5 or TS35/15, 1...1.5 mm thick) therefore • Simple snap-on system • Sits safely and firmly on the DIN-Rail • No tools required to remove or backplane-mounted (two optional screw mounting sets SLZ01 required)

Connections

Connections	Screw terminals, connector size range:
• Input/Output	solid 0.5- 6 mm^2 / flexible 0.5 - 4 mm^2
• Current handling capacity	30 A per output
• Grid	Two connectors per output, 9 mm (SL20.115: 6 mm) distance between adjacent connectors

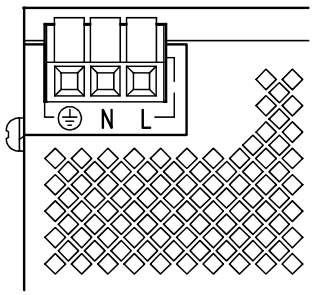
Design advantages:

- All connection blocks are easy to reach as mounted at the front panel. Input/output strictly apart from each other, thus no mixing up
- PVC insulated cable can be used for all connections, no thermal protection is needed

Order information

Order number	Description
SL20.100 / .101	AC 230 V, no PFC / incl. PFC
SL20.110 / .111	Auto select, no PFC / incl. PFC
SL20.115	Auto select, remote switch-off
SL20.300 / .301	3 AC 400 V / 3 AC 480 V
SLZ01	Screw mounting set, two needed per unit

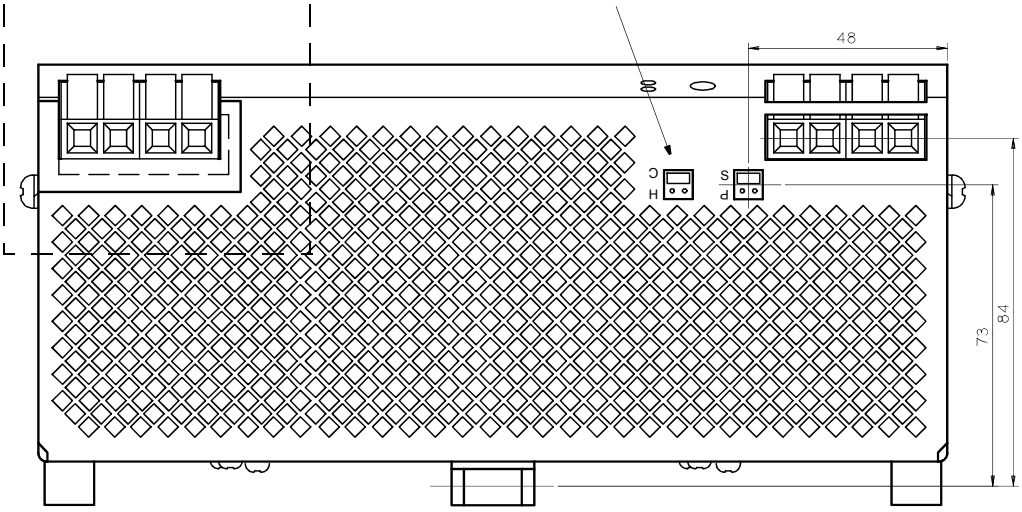
Input terminals
SL20.1xx bottom view



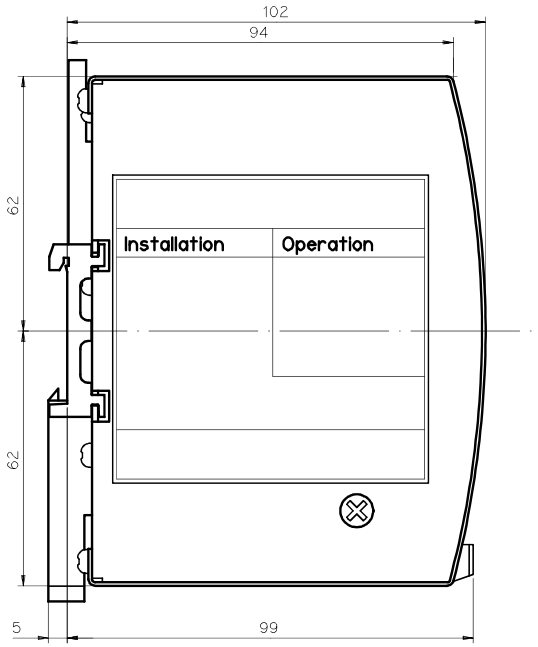
Input terminals
SL20.30x bottom view

only SL20.110/.111

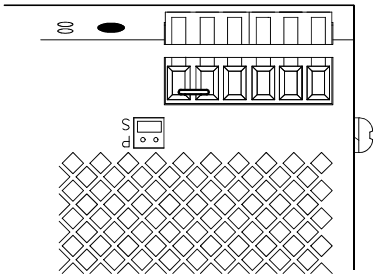
Bottom view SL20



Side view SL20



Output terminals
SL20.115 bottom view



This 'mechanics data sheet' exclusively deals with the mechanical properties of the product. For further information (especially concerning electrical properties), please refer to the generic data sheet of the SL20 and to the basic data sheet „The SilverLine" dealing with common features of all SilverLine units. This data sheet is subject to change without prior notice

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