

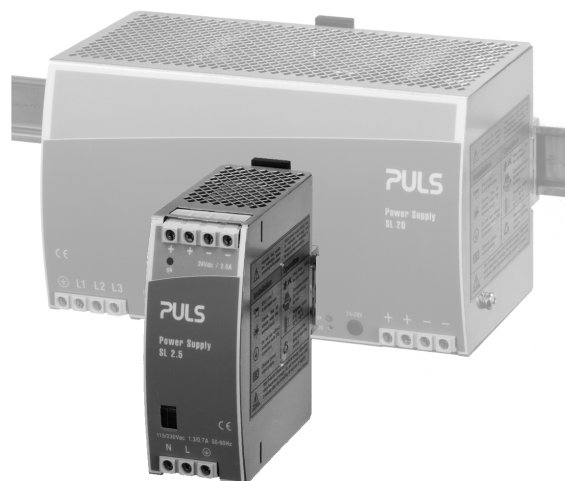
The future is here

PULS

## The SilverLine

12...56V / 40W...960W:

- Top efficiency
- Class B in input *and* output
- Simple fusing
- Reserves (Overload Design™)
- Parallel operation
- Fast, safe mounting



Data sheet

PULS, as the pioneer and specialist of DIN rail power supply units, has once again seized the initiative. We developed a new generation of switched-mode power supplies capable of meeting the requirements of the future, in both technical specification and price: SilverLine.

### The SilverLine family ...

is a comprehensive power supply product line totally user oriented towards customer wishes and requirements. Most of all, this means:

### Safety and EMC

All SilverLine units undergo stringent tests to comply with international standards. Thus, they meet easily the requirements under EN 55022 and EN 55011 Class B (Emitted Interference) as well as EN 61000-6-2 (Immunity to Interference) at their highest level. For the whole product range there are units available which meet the requirements of EN 61000-3-2 (Limits for harmonic current emissions). Moreover, they provide a **radio interference suppression** in the output, so that interference is not emitted even by long unscreened output cables. In addition, the bigger units have

- an **active transient-filter** to render mains voltage peaks harmless;
- **active limiting of starting-current** working even when the unit is restarted when hot! This means that ordinary circuit-breakers which you incorporate in the incoming line provide adequate protection.

Moreover, in addition to the usual international licences (IEC 60950, EN 60950, UL 60950, CUL CSA-C22.2 No 60950) the SilverLine has EN 50178, EN 60204-1 and UL508 LISTED.

### Installation

With our novel retaining system the DIN rail presents an ideal easy to fit solution, just insert and click into place. The unit attaches as though bolted down, even when subjected to vibration or lateral pressure, and if you need to detach it you don't even need a screwdriver.

### Incredible: 88...93% efficiency!

Providing advantages, in

- **Size:** The units are up to 50% smaller than competitive products.
- **Reliability:** due to the high efficiency the units stay cool and so are very reliable. The SL20, for example, has over 500,000 hours MTBF and the SL2.5 even has 740,000 hours (at an ambient temperature of 40°C and full load).

### Ease of use

With the SL20 everything is arranged neatly, clearly and well-labeled on the front panel. The large and robust terminals are on the unit's front lower or upper edge and easily accessible. Their position ensures the connecting cables are kept away from any source of heat and will, therefore, need no thermal protection. Since input and output are clearly apart from each other, it is impossible to confuse them.

### Finally: reserves

So that a small overload does not immediately cause the unit to fail, the SilverLine has a

- **20-30% reserve capacity:** This means that for example the 20 A unit can supply up to 25 A for approx. up to one minute even at high temperature. If run at a maximum temperature of 45°C (instead of 60°C) or with forced-air cooling you can draw this current on a long-term basis.
- **PULS Overload Design™:** When overloaded, most units deliver up to

150...200% of their nominal current – continuously, i.e. without switch-off or hiccup.

- You can also **operate** several units (of the same type) **in parallel**. Without any start-up problems and – if wished – with current sharing.

Three features remained unchanged. There, we could find nothing to top it:

- **Metal housing.**
- **Small-meshed ventilation grid** so that screws etc. cannot fall into the housing.
- Our quality requirements with respect to manufacture and testing.

### Prepared for the future: PULS SilverLine



EN 60950  
EN 50178  
EN 61000-6-3  
EN 61000-6-2

IEC60950  
(CB scheme)

## Common SilverLine features

As it should be for a family of power supply units, all the members of the SilverLine family contain many of the same features. In addition to their mechanical and connector features, these include their EMC and safety characteristics, as well as their test/reliability qualities. In this area, PULS uncompromisingly makes (indeed has always made) high demands on its equipment. You can see it for yourself! (You will find more detailed information on the units in the relevant specific data sheets)

### Electromagnetic Compatibility (EMC)

Emissions	Class B (EN 55011, EN 55022) conducted and radiated noise EN 61000-6-3 and EN 61000-3-2 fulfilled
	Specific feature at SL10.100/101, SL20.100, SL20.110, SL20.113: These units as a stand-alone application comply not with EN 61000-3-2 (harmonic current emissions). These units comply with EN 55011 and EN 55022 (class B) and EN 61000-6-4.
Immunity	EN 61000-6-2 (includes EN 61000-6-1)
• Static Discharge (ESD)	EN 61000-4-2, Level 4 (withstands 8 kV direct discharge, 15 kV air discharge)
• Electromagnetic radiated fields	EN 61000-4-3, Level 3 (10 V/m)
• Burst, coupled to: – ACin lines – DCout lines	EN 61000-4-4, Level 4 (4 kV) Level 3 (2 kV)
• Surge transients – Differential (L <sub>n</sub> →PE) – Common mode (L <sub>1</sub> →L <sub>2</sub> , etc.)	EN 61000-4-5, Installation class 4 (4 kV) (SLD2.5: class 3 (2 kV)) Installation class 4 (2 kV) (SLD2.5: class 3 (1 kV))
• Conducted noise immunity	EN 61000-4-6, Level 3 (10V, 150 kHz-80 MHz)
• Mains voltage dips	EN 61000-4-11 (see „Input“)
• Transient immunity	Transient resistance acc. to VDE 0160 / W2 over entire load range

### Connections

Connections	Screw terminals, connector size range: solid: 0.5- 6 mm <sup>2</sup> flexible: 0.5 - 4 mm <sup>2</sup> solid: 0.5- 6 mm <sup>2</sup> flexible: 0.5 - 4 mm <sup>2</sup>
• Input	
• Output (SL40 output see SL40 data sheet)	Output: 2 connectors per output, current handling capacity: 30 A each

PVC insulated cable can be used to connect to the unit, no thermal protection is needed even with the big units (20 A, 40 A). All connection blocks are easy to reach as mounted at the front panel.

This technical information is valid for +25°C ambient temperature and 5 min. run-in time at rated conditions, unless otherwise stated. Some values may differ for DC/DC converters (see individual data sheets for details). The data sheet is subject to change without prior notice.

### Your partner in power supply:

### Temperature Range, Lifetime, MTBF, Tests

Temperature range	
• storage	-25°C ... +85°C
• operation	-10°C ... +70°C (SL10-40: 0°C ... +70°C), derating above 60°C
• humidity	max. 95% non-condensing

We use only high quality components to guarantee a long, reliable lifetime of our products. The SilverLine uses for example only electrolytic caps which maintain their nominal capacity at 105°C for at least 2,000 hours (partly 3,000 hours). This means:

- with uninterrupted(!) operation and 40°C ambient temperature, the units have a **lifetime** of at least 5 to 10 years.

Comparison measurements showed that our competitors' units are partly distinctly (factor 2-4) worse than our units due to inferior quality or higher internal temperatures. Reliability information (MTBF) is specified individually in the specific data sheet for each unit.

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

- Functional test (100 % test per unit, Test certificate enclosed)
- In-circuit test
- Run-in / Burn-in (Full load, T<sub>amb</sub> = +60°C, on/off cycle)

### Safety, Approvals

- Electronic current limiting, protects against overload and short circuit:
- Independent over-voltage protection protects against any faults in the control circuit of the power supply.
- Over-temperature protection: This operates by linearly reducing the output power limit above a certain temperature
- Phase monitoring (units with three-phases input only): If an input phase is lost and as a consequence the unit is overloaded, it switches into hiccup-mode. If the load can be supplied with two input phases, the unit will continue.

Safe low voltage SELV (EN 60950, VDE0100/T. 410), PELV (EN 50178) Degree/Class of prot. IP20 (EN 60529)/I (EN 60950)

The SilverLine complies with all major **safety approvals** for the EU (EN 60950, EN 60204-1), the USA (UL 60950, UL 508 LISTED), Canada (CUL CSA-C22.2 No. 60950), and CBScheme (IEC 60950) and meets the European Standard for electronic equipment in **electrical power installations** EN 50178.

### Mechanics

Robust sealed 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 (wall mounting set SLZ02 [optional] required)



### PULS GmbH

Arabellastraße 15  
D-81925 München  
Tel.: +49 89 9278-0  
Fax: +49 89 9278-199  
www.puls-power.com