

## LP 4 Power Supplies 1 and 3 Phase



Thank you for having chosen one of our products for your work. We are certain the LP4 System Power Supplies will meet your application requirements.

### Application

The power supplies LP4 Series can be used in areas from extreme industrial environment, and complies with the latest technical standard. Before working with the unit, read these instructions carefully and completely. All these power supplies are single output, IP20, have Mounting DIN Rail IEC 60715/TH35, Class 1 isolation devices suitable for SELV and PELV solutions.

### Safety and warning notes



**WARNING** – Explosion Hazard Do not disconnect Equipment unless power has been switched off or the area is known to be non-hazardous.

**WARNING** – Explosion Hazard. Substitution of components may impair suitability for class 1, Division 2.

**WARNING** – Switch off the system before connecting the module. Never work on the machine when it is live. The device must be installed in according with UL508. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to idle. Danger of fatal Injury!

### Connection:

**Cable Connection:** The following cable cross-sections may be used:

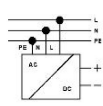
	Solid (mm <sup>2</sup> )	Stranded (mm <sup>2</sup> )	AWG	Torque (Nm)	Stripping Length
Input:	0.2 – 2.5	0.2 – 2.5	24 – 14	0.5 – 0.6 Nm	7 mm
	4.0	6.0	30 – 10	0.8 – 1.0 Nm	7 mm
Output:	0.2 – 2.5	0.2 – 2.5	24 – 14	0.5 – 0.6 Nm	7 mm
	4.0	6.0	30 – 10	0.8 – 1.0 Nm	7 mm
Signal:	0.2 – 2.5	0.2 – 2.5	24 – 14	0.5 – 0.6 Nm	7 mm
	4.0	6.0	30 – 10	0.8 – 1.0 Nm	7 mm

The connection is made by the screw type 2.5 mm<sup>2</sup> terminal blocks. Use only copper cables that are designed for operating temperatures of > 75 °C. Wiring terminal shall be marked to indicate the proper connection for the power supply.

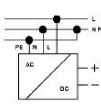
### Input - Output power connection:

Input:	Output:
LP41xxxx series	1 phasig
LP43xxxx series	3 phasig
	12-24 Vdc Anschluss

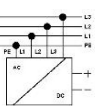
1 Phase L N PE



1 Phase L N PE



3 Phase

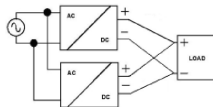


### Signalling:

Red led (Dc ok) status:	Jumper Setting
Output voltage OK: Lights up permanently	Hiccup Mode / Manual Reset / Continuous Mode
Switch off, in overload and short circuit conditions	Manual Reset / Continuous Mode
Blink, in overload and short circuit conditions	Hiccup Mode

### Parallel Connection, to Increase Output Power:

- Made parallel connection with same model of power supply to increase the output power.
- Adjust the output approximately to the same value ( $\pm 20mV$ ) applying 1-2 A load to all devices output before connecting them in parallel.
- Easy parallel connections Jumper. In LP4 for more power, you must change position of the jumper to enable parallel connection. In this mode you can put in parallel up to 4 power supply



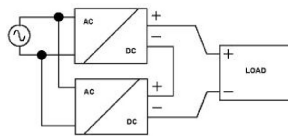
Easy Parallel connection OFF (factory selection)



Easy Parallel connection ON

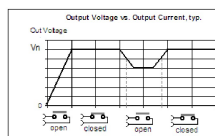
### Serial connection:

- It is possible to connect as many units in series as needed, providing the sum of the output voltage does not exceed 150Vdc.
- Voltagues with a potential above 60Vdc are not SELV any more and can be dangerous. Such voltagues must be installed with a protection against touching.
- For serial operation use power supplies of the same type.
- Earthing of the output is required when the sum of the output voltage is above 60Vdc.
- Keep an installation clearance of 15mm (left/right) between two power supplies and avoid installing the power supplies on top of each other. Note: Avoid return voltage (e.g. from a decelerating motor or battery) which is applied to the output terminals.



### Power Good Output Function

Output are used for preventive function monitoring of the power supply. An electrically isolated signal contact is available. The signal contact Closes when output power is OK and Opens when output voltage falls (see following table).



Nominal Voltage	Threshold Voltage
12Vdc	11Vdc $\pm 5\%$
24Vdc	20 Vdc $\pm 5\%$

This feature is particularly useful in redundant applications

### Power Good Contact rating:

Max. DC1: 30 Vdc 1 A;	Resistive load (EN 60947-4-1)
AC1: 60 Vac 1A	
Min.: 1mA at 5 Vdc	Min permissible load

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### Protection:

**On the primary side:** the device is equipped with an internal fuse; follow the next page table. If the internal fuse is blown (fails opens), it is most probable that there is a fault in the device. If this failure occurs, the device must be checked in the factory. **Caution:** in two phase Input models, Double pole / Neutral Fusing.

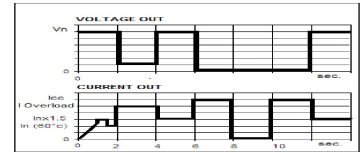
**On the secondary side:** the devices are electrically protected against: Over Load, Over Voltage Output (typ.35 Vdc), and Short circuit automatically.

### Short circuit and overload Protections Mode:

Depending on the users application loads, the LP 4 Line offers three types of protection modes which are available by removing the plastic window and changing the Jumper to the desired setting as shown below:

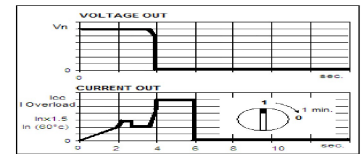
#### 1) HICCUP MODE (default factory Jumper setting)

- General purpose mode, used for normal load.
- In case of short-circuit or overloading, the output current is interrupted. The device tries again to re-establish output voltage and normal condition about every 2 second till the problem is cleared.



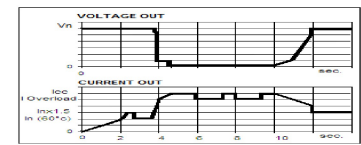
#### 2) MANUAL RESET (manual Restart by Operator)

- This protection mode is particularly suggested in applications where safety procedures require that reset be carried out only by an authorized person.
- In case of short-circuit or overload, the output current is interrupted. In order to restart the output it is necessary to switch-off the input circuit for about 1 minute.



#### 3) Continuous Output" Mode

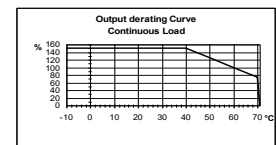
- In case of short-circuit or overload, the output current is kept at high values with near zero voltage. In case of short circuit the current can reach up to 3 times the rated current at 60°C. This protection mode is used to meet the requirements of demanding loads such as motors, solenoid valves, lamps, PLC with highly capacitive input circuits and other loads with marked transient overload behavior



The output of the device is electrically protected against overload and short circuit. For the nominal voltage and nominal current at temperature condition, please see technical data. The device can supply at the nominal Current without switching off. As the overload increases, the output voltage is reduced until zero.

### Temperature Ratings

Surrounding air temperature 50 °C for LP 4, for the other 60°C. At the temperature of 70°C the output current will be 75% - 50% of In. The equipment does not switch off in case of ambient temperature above 70°C or thermal overload. The devices are protected for Over temperature conditions "worst case"; in this situations the device Shut-down the output and automatic restart when temperature inside fall.



### Standards and Certification

#### Electrical Safety:

Assembling device: UL508, IEC/EN 60950 (VDE 0805) and EN 50178 (VDE 0160).

Installation according: IEC/EN 60950.

Input / Output separation: SELV EN 60950-1 and PELV EN 60204-1. Double or reinforced insulation.

#### EMC Standards Immunity:

EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5.

#### EMC Standards Emission:

EN 61000-6-4, EN 61000-3-2.

#### Standards Conformity:

Safety of Electrical Equipment Machines: EN 60204-1.

#### CE

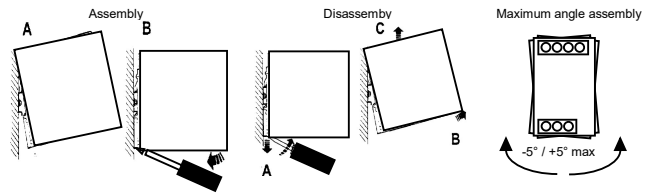
The CE mark in According to EMC 2014/30/UE and Low voltage directive 2014/35/UE

#### UL Listed 508

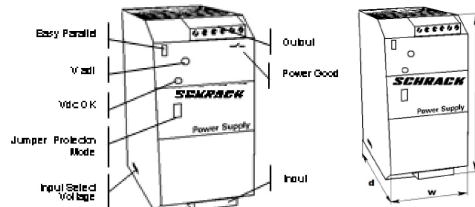


### Rail Mounting:

Other models / modules must have a minimum vertical and horizontal distance of 10 cm to this power supply in order to guarantee sufficient auto convection. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high!



### Dimension and Lay-out:



## Technical datas

LP4 power supply	1 Phase 24Vdc					3 Phase 24Vdc	1 Phase 12Vdc	
Modell/Model	LP412402--	LP412405--	LP412406--	LP412412--	LP412422--	LP432422--	LP411205--	LP411210--
Leistung/Wattage	40-70W	95-120W	120-180W	240-330W	480-600W	480-600W		
<b>Primärseite/INPUT DATA</b>								
Nenneingangsspannung/ Nominal Input Voltage	115 - 230Vac	115 - 230Vac Input selectable	115 - 230Vac Input selectable	115 - 230Vac Input selectable	115 - 230Vac Input selectable	400 - 500Vac	115 - 230Vac	115 - 230Vac Input selectable
Spannungsbereich (Eingang)/ Input Voltage Range	90 - 264Vac	90 - 135Vac 170 - 264Vac 238 - 370Vdc	90 - 135Vac 170 - 264Vac 238 - 370Vdc	90 - 135Vac 170 - 264Vac 238 - 370Vdc	90 - 135Vac 170 - 264Vac 238 - 370Vdc	330 - 550Vac	90 - 264	90 - 135Vac 180 - 264Vac
Frequenz/Frequency	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%	47 - 63 Hz ±6%
Eingangsstrom/Input Current	1.0 - 0.7A	1.8 - 0.9A	2.8 - 1.3A	3.3 - 2.2A	8.5 - 4.2 A	1.7A max	1.0 - 0.7A	2.8 - 1.3A
Interne Sicherung/Internal Fuse	4A	4A	4A	6.3A	10A	6.3A	4A	4A
Empfohlenen externe Sicherung/ External Fuse (recommended)	6A	10A	10A	16A	16A	16A	6A	10A
<b>SEKUNDÄRSEITE/OUTPUT DATA</b>								
Ausgangsspannung - Fabrikeinstellung ±3%/ Output Voltage Factory Setting ±3%	24Vdc	24Vdc	24Vdc	24Vdc	24Vdc	24Vdc	12 Vdc	12 Vdc
Einstellungsbereich/ Adjustment range	22 - 27Vdc	22 - 27Vdc	22 - 27Vdc	22 - 27Vdc	22 - 27Vdc	22 - 27Vdc	10 - 15.5	10 - 14
Nennstrom/Continuous Current bei/at T < 40°C (In)	2.0A(115) - 3.0A(230)	5.0A	7.5A	14A	25A	25A	4.0A(115) - 6.0A(230)	14A
Nennstrom/Continuous Current bei/at T < 50°C (In)	1.5A(115) - 2.5A(230)	4.5A	6.0A	12A	22A	22A	3.0A(115) - 5.0A(230)	12A
Nennstrom/Continuous Current bei/at T < 60°C (In)	-	4.0A	5.0A	10A	20A	20A	2.0A(115) - 3.0A(230)	10A
Kurzschlussstrom/ Short circuit current (Icc)	7.0A	12A	16A	30A	60A	60A	10A	20A
<b>UMGEBUNGSBEDINGUNGEN/CLIMATIC DATA</b>								
Umgebungstemperatur (in Betrieb) Ambient Temperature operation	-25 - +70°C	-25 - +70°C	-25 - +70°C	-25 - +70°C	-25 - +70°C	-25 - +70°C	-25 - +70°C	-25 - +70°C
Leistungsreduzierung/Derating T <sup>a</sup> > (In)	> 50° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C	> 60° 2.5% °C
Umgebungstemperatur (außer Betrieb) Ambient Temperature Storage	-40 - +85°C	-40 - +85°C	-40 - +85°C	-40 - +85°C	-40 - +85°C	-40 - +85°C	-40 - +85°C	-40 - +85°C
Max. relative Luftfeuchtigkeit bei 25°C/ Max Relative Humidity at 25 °C	95%	95%	95%	95%	95%	95%	95%	95%
<b>ALLGEMEINE DATEN/GENERAL DATA</b>								
Isolationsspannung/Isolation Voltage (IN / OUT)	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac	3000Vac
Isolationsspannung/Isolation Voltage(IN / PE)	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac	1605Vac
Isolationsspannung/Isolation Voltage(OUT / PE))	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500Vac	500 Vac
Schutzgrad/Protection Class (EN/IEC 60529)	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Lebensdauer/Reliability (MTBF IEC 61709)	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h	> 500 000 h
Klemmen/Connection Terminal Blocks Screw Type	2,5mm	2,5mm	2,5mm	2,5mm	4 mm	4 mm	2,5 mm	2,5 mm
Abmessungen/Dimension (w-h-d)	50x120x50 mm	55x110x105 mm	55x110x105 mm	72x115x135 mm	85x120x140mm	85x120x140mm	50x120x50	55x110x105
Gewicht/Weight	0.30 kg approx	0.56 kg approx	0.56 kg approx	0.85 kg approx	1.2 kg approx	1.2 kg approx	0.30 kg approx	0.60 kg approx