B&R Power Supply PS305

1. General Information

Features of the B&R power supply PS305:

- Input: 3 AC 400 V - 500 V
- Output: 24-28 V / 120 W
- Power boost up to 144 W
- High overload current, no switch-off
- 3 phase wide range input
- Robust mechanics and EMC
- DIN rail mounting, unit holds even with vibrations or lateral pressure
- Clearly arranged and user-friendly
- Large, robust screw terminals
- Sealed metal housing
- Fine ventilation grid

2. Order Data

Model number	Short description	Figure
0PS305.1	24 VDC power supply, 3-phase, 5 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	

Table 1: PS305 - order data

3. Technical Data

Also see "Technical data" data sheet, which is delivered with the power supply.

Product ID	PS305
General Information	
C-UL-US Listed	Yes
Input	
Input voltage, nominal	3 AC 400-500 V, ± 15%, 47-63 Hz, suitable for IT power systems Even if one phase fails, the unit's operation with nominal current can be continued (limitations: EN 61000-3-2 (harmonic current emissions) is then not fulfilled, the unit has noise suppression level A instead of level B, and the hold-up time is shorter). Continued operation with two phases is also permissible; however, it reduces the unit's reliability and lifetime.
Admissible limits Continuous operation Short-term (1 min)	at 24 V / 5 A AC 340-576 V DC 450-820 V AC 300-620 V DC 420-890 V
Input current, nominal	3 x 0.5 A
Starting current	Typ. <25 A at 575 VAC and cold restart
Fusing Iternal External	 No With three standard thermomagnetic 3x10 A, B-type, circuit-breakers, which are also used to protect the input lines
Harmonic current emissions	According to EN 61000-3-2
Hold-up time	>16 ms (3 phase operation at 400 VAC, 24 V / 5 A) >10 ms (2 phase operation at 400 VAC, 24 V / 5 A)
Output	
Output voltage	24-28 VDC, adjustable by (covered) front panel potentiometer, Default: 24.5 V ± 0.5% Adjustable range guaranteed
Voltage regulation	Better than 2% V_{out} overall
Ripple/noise	<25 mV_{PP} (20 MHz bandwidth, 50 Ω measurement)
Overvoltage protection	Typ. 33 V
Output noise suppression	Radiated EMI values below EN 50081-1 (Class B), even with long, unshielded output cables
Continuous loading	5 A at 24 V (for detailed information, see “Continuous loading" on page 4)
Protection functions	Output is protected against short-circuit, open circuit and overload
Derating	Typ. 3 W/K (at T_{amb}=+60 °C to +70 °C)
Parallel operation	Yes (not recommended because current sharing is not available)
Power back immunity	34 V
Operation indicator	Green LED on front panel (goes out at V_{out}<20 V)

Table 2: PS305 - technical data

Product ID	PS305
Efficiency, reliability	
Efficiency	Typ. 89% (400 VAC, 24 V / 5 A),
Loss	Typ. 15 W (400 VAC, 24 V / 5 A)
MTBF (reliability)	410,000 h acc. to Siemens standard SN 29500 (24 V / 5 A, 400 VAC, T_U = +40 °C)
Life cycle (electrolytics)	The unit exclusively uses long-life electrolytics, specified for +105 °C
Start / overload behavior	
Startup delay	Typ. 100 ms
Startup time	Approx. 5-20 ms, depending on load
Overload behavior	• Special overload design (see "Output characteristics" on page 6) • 20% power boost • No switch-off, no hiccup if overloaded • High overload current (up to typ. 2 · I_{Nom}), V_{out} is gradually reduced with increasing voltage. • 6 A short-term, at 45 °C or forced cooling, even continuous
Advantages	• High short-circuit current, therefore large "start window": power supply starts securely even with heavy or demanding loads (DC/DC converters, motors) • Secondary fuses operated reliably
Connection	
Terminals	Robust screw terminals
Connection cross section Input / output	Solid: 1.5 - 6 mm² / flexible: 1.5 - 4 mm² 2 connectors per output
Current handling capacity	30 A per output
Grid	9 mm distance between adjacent connectors
Operational conditions	
Environmental temperature during operation	-10 °C to +70 °C (starting at 60 °C derating)
Relative humidity during operation	Max. 95%, non-condensing
Storage and transport conditions	
Storage temperature	-25 to +85 °C
Relative humidity during storage	Max. 95%, non-condensing
Transport temperature	-25 to +85 °C
Relative humidity during transport	Max. 95%, non-condensing
Mechanical characteristics	
Dimensions Width Height Depth	 73 mm 124 mm 117 mm (+ DIN rail)
Weight	730 g
Housing	Robust sealed metal housing with fine ventilation grid (◇ 3.5 mm, IP20)

Table 2: PS305 - technical data (cont.)

Product ID	PS305
Installation	Mounting on DIN rail (TS35/7.5 or TS35/15, 1 to 1.5 mm thick), therefore: • Simple snap-on system • Sits safely and firmly on the DIN rail • No tools required for removal
Ventilation/cooling	Above/below 25 mm recommended Left/right 15 mm recommended
Special features	• All operational elements (incl. terminals) are clearly labeled and are easy to reach as they are mounted on the front pane. • Inputs and outputs are separated from each other (input below, output above) and therefore cannot be mixed up.

Table 2: PS305 - technical data (cont.)

Specifications are valid for 3x400 VAC, +25 °C ambient temperature and 5 min run-in time, unless otherwise stated. They are subject to change without prior notice.

3.1 Continuous loading

Detailed information about continuous loading of the power supply with convection cooling (see “Output characteristics" on page 6):

Operation	T_{amb}	I_{out} at 24 V	I_{out} at 28 V
3 phase	-10 °C to + 60 °C -10 °C to +45 °C	5 A 6 A*	4.3 A 5.1 A*
2 phase	-10 °C to + 60 °C	5 A	4.3 A
DC in	-10 °C to + 60 °C -10 °C to +45 °C	5 A 6 A*	4.3 A 5.1 A*

Table 3: PS305 - continuous loading

Notes:

Values indicated with * are only allowed for a short time (<1 min), or for a longer time at 60 °C or with forced ventilation.

4. Dimensions

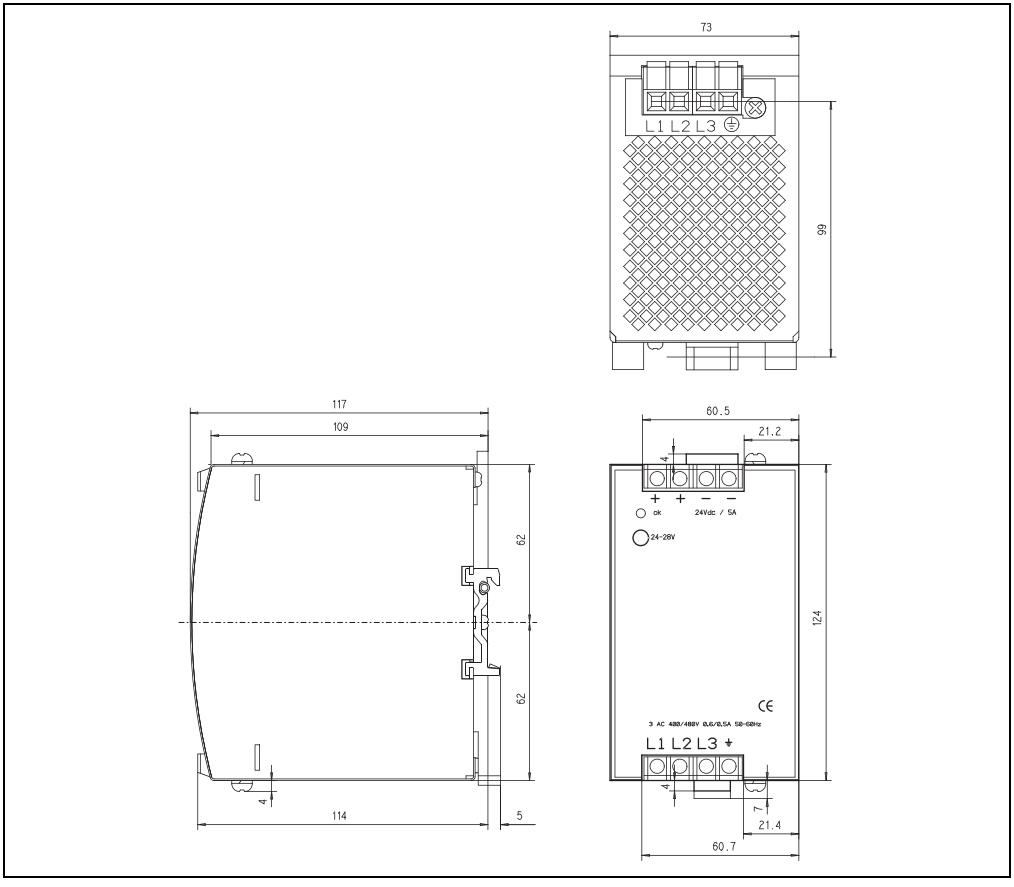

Figure 1: PS305 - dimensions

5. Installation

Also see the basic installation manual "Installation and Operation". The basic installation manual is delivered with each power supply.

6. Diagrams

6.1 Output characteristics

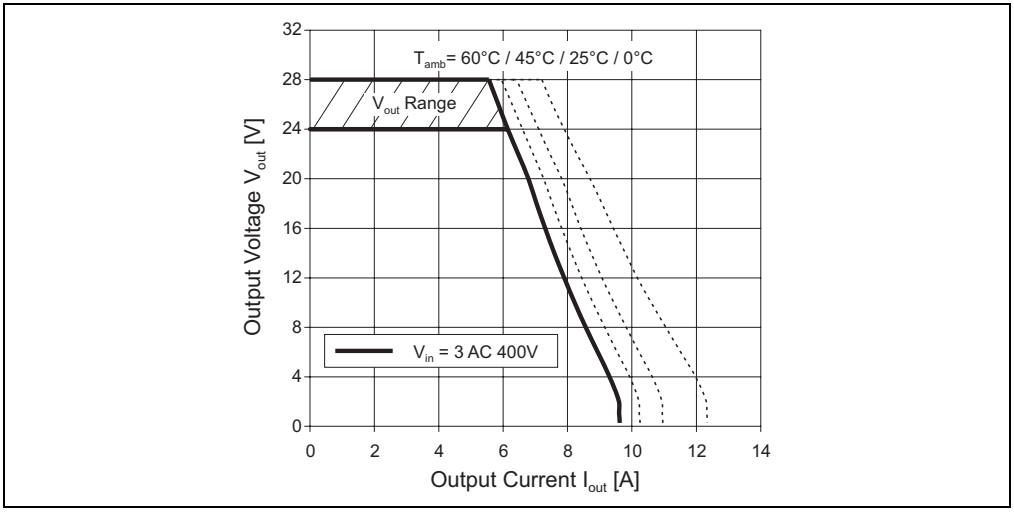

Figure 2: PS305 - output characteristics (min.)

6.2 Efficiency

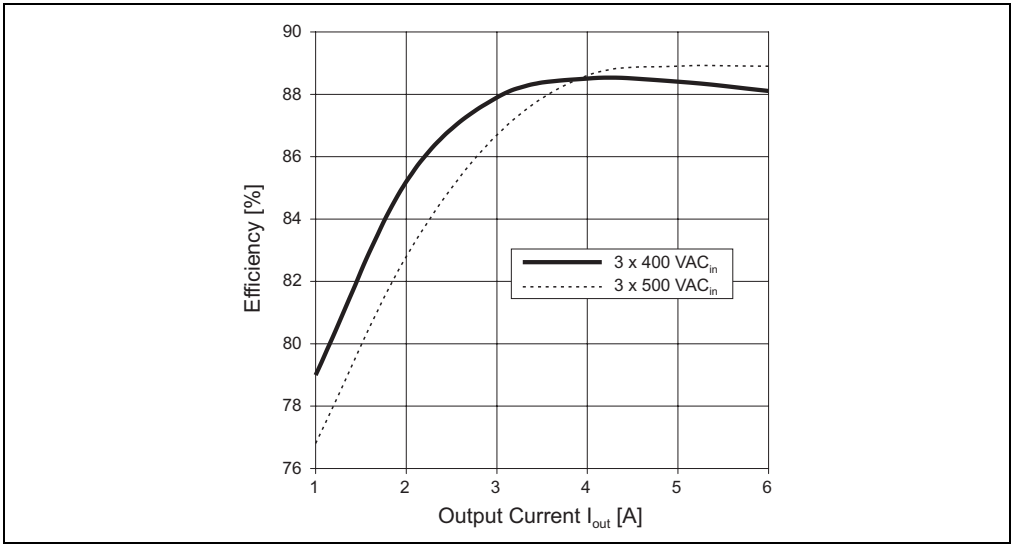

Figure 3: PS305 - efficiency (min., at V_{out} = 24 V)

6.3 Hold-up time, 3 phase

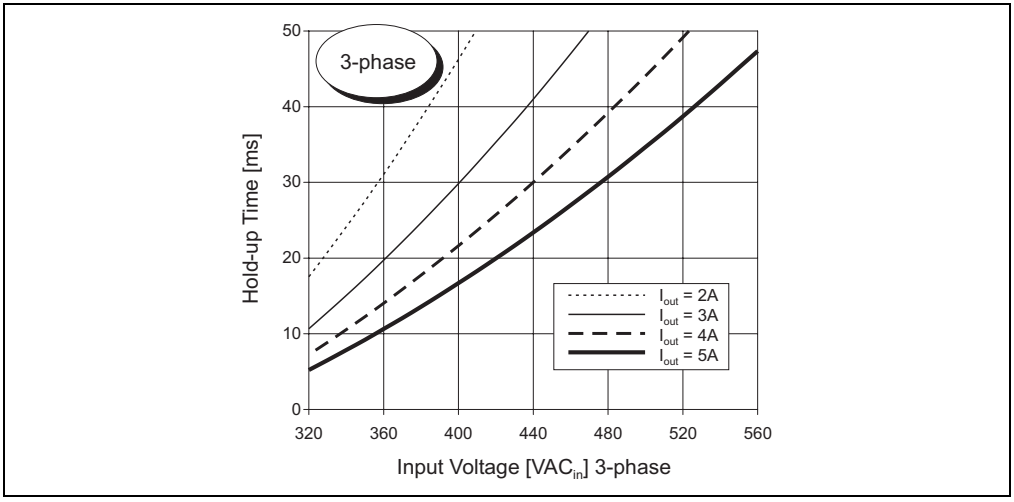

Figure 4: PS305 - hold-up time, 3 phase (min., at V_{out} = 24 V)

6.4 Hold-up time, 2 phase

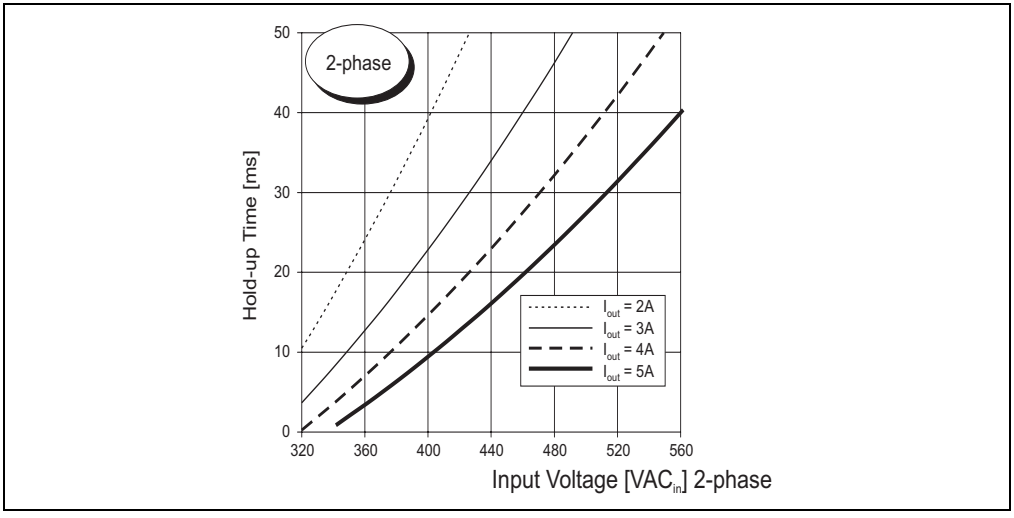

Figure 5: PS305 - hold-up time, 2 phase (min., at V_{out} = 24 V)

7. Standards and Certifications

Electromagnetic emissions (EME)	EN 50081-1 (includes EN 50081-2) Class B (EN 55011, EN 55022) conducted and radiated noise, incl. Annex A, thanks to noise suppression
Immunity to disturbances Static discharge (ESD) Electromagnetic radiated fields Burst, coupled to: ACin lines DCout lines Surge transients Differential (L_n->PE) Common mode (L_1->L_2/N) Conducted noise immunity Mains breaks Transient immunity	EN 61000-6-2 (includes EN 55024) EN 61000-4-2, Level 4 (withstands 8 kV direct discharge, 15 kV air discharge) EN 61000-4-3, Level 3 (10 V/m), ENV 50204 (10 V/m) EN 61000-4-4, Level 4 (4 kV) EN 61000-4-4, Level 3 (2 kV) EN 61000-4-5, Installation class 4 (4 kV) (SLD2.5: class 3 (2 kV)) EN 61000-4-5, Installation class 4 (2 kV) (SLD2.5: class 3 (1 kV)) EN 61000-4-6, Level 3 (10 V, 150 kHz-80 MHz) EN 61000-4-11 Transient resistance according to VDE 0160 / W2 over entire load range
Safe low voltage	SELV (EN 60950, VDE0100/T.410), PELV (EN 50178)
Protection class/degree	Class I (EN 60950) / IP20 (EN 60529)
The power supply PS305 complies with all major **safety certifications** for EU (EN 60950, EN 60204-1), USA (UL 1950, UL508 LISTED), Canada (CUL/CSA-C22.2 No 60950), CB Scheme (IEC 60950), and meets the European Standard for **electronic equipment** in electrical power installations EN 50178.	
EMC and w Volt. Directive Guidelines UL1950 E137006 CUL/CSA-C22.2 No 950-M90 UL508 LISTED IND. CONT. EQ. 18 WM, 60°C IEC60950 EN60950 EN50178 IEC50081-1 EN61000-6-2	

Table 4: PS305 - standards and certifications