B&R Power Supply PS305

1. General Information

Features of the B&R power supply PS305:

- Input: 3 x 400 - 500 VAC
- Output: 24 - 28 VDC / 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
- Closed metal housing
- Fine ventilation grid

2. Order Data

Model Number	Short Description	Image
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

See also data sheet "Technical data", which is delivered with the power supply.

Name	PS305
General Information	
C-UL-US Listed	Yes
Input	
Nominal Input Voltage	3 x 400 - 500 VAC, ± 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 340 - 576 VAC or 450 - 820 VDC 300 - 620 VAC or 420 - 890 VDC
Nominal Input Current	3 x 0.5 A
Starting Current	Typ. <25 A at 575 VAC and cold restart
Fuse Protection Internal 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 VDC / 5 A) >10 ms (2 phase operation at 400 VAC, 24 VDC / 5 A)
Output	
Output Voltage	24 - 28 VDC adjustable by (covered) front potentiometer Default: 24,5 V ±0.5% Adjustable range guaranteed
Voltage Regulation	Better 2% V_{out} overall
Residual Ripple	<25 mV_{PP} (20 MHz bandwidth, 50 Ω measurement)
Over-Voltage Protection	Typ. 33 V
Output Noise Suppression	Radiated EMI values below EN 61000-6-3 (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. 6 W/K (at T_{amb}=+60°C to +70°C)
Parallel Operation	Yes (not recommended because current balancing is not available)
Power Back Immunity	34 V
Operation Indicator	Green LED on front panel (goes out when V_{out}<20 V)

Table 2: PS305 - Technical data

Name	PS305
Efficiency, Reliability	
Efficiency	Typ. 89% (400 VAC, 24 VDC / 5 A)
Loss	Typ. 15 W (400 VAC, 24 VDC / 5 A)
MTBF (Reliability)	410.000 h (24 V / 5 A, 400 VAC, T_U = +40°C)
Life Cycle (Electrolytic Capacitors)	The unit exclusively uses long-life electrolytic capacitors, specified for +105°C
Start / Overload Behavior	
Startup Delay	Typ. 100 ms
Startup Time	Approx. 5 - 20 ms depending on the load
Overload Behavior	• Special overload design (see “Output characteristics" on Page 6) • 20% power reserve • 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
Load 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 °C to +85 °C
Relative humidity during storage	Max. 95%, non-condensing
Transport temperature	-25 °C to +85 °C
Relative humidity during transport	Max. 95%, non-condensing

Table 2: PS305 - Technical data (cont.)

Name	PS305
Mechanical Characteristics	
Dimensions (W x H x D [mm])	73 x 124 x 117 (+ rail)
Weight	730 g
Housing	Robust sealed metal housing with fine ventilation grid (◇ 3.5 mm, IP20)
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 50 mm recommended Left/right 15 mm recommended
Special Features	• All operational elements (incl. terminals) should be clearly labeled and easy to reach on the front pane of the device. • Inputs and outputs are strictly separated from each other (input below, output above) and therefore cannot be mixed up.

Table 2: PS305 - Technical data (cont.)

Specifications are valid for 3 x 400 VAC input voltage, +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

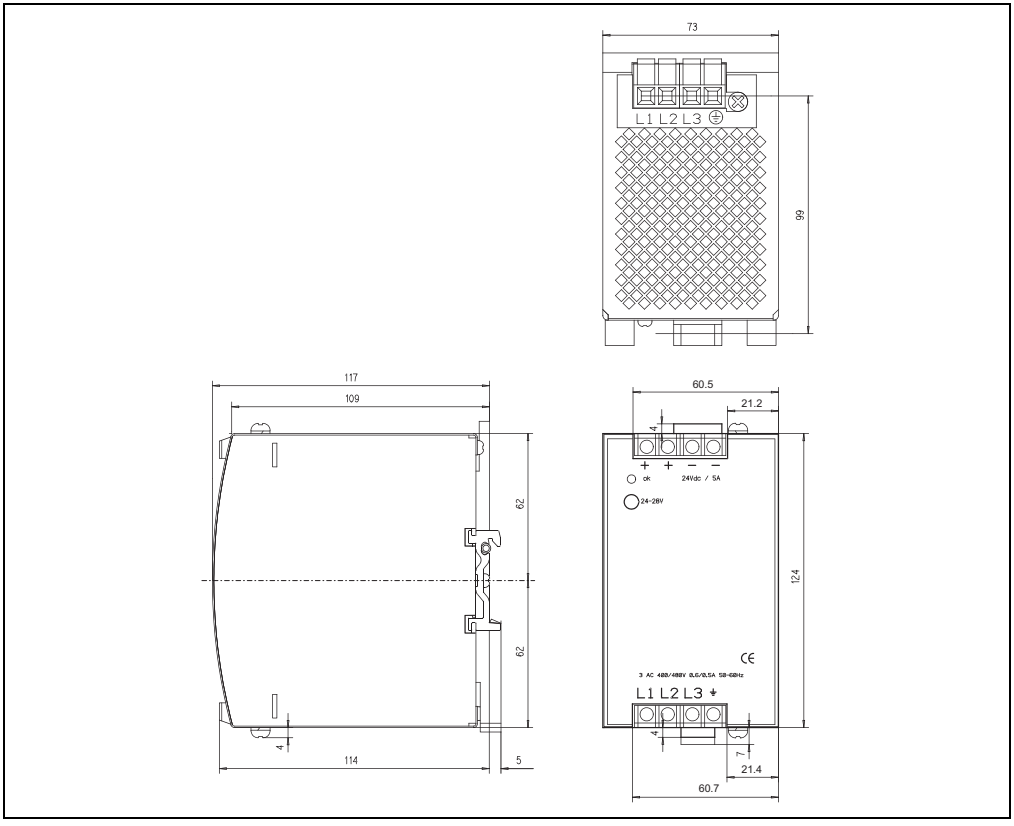

Figure 1: PS305 - Dimensions

5. Installation

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

6. Diagrams

6.1 Output characteristics

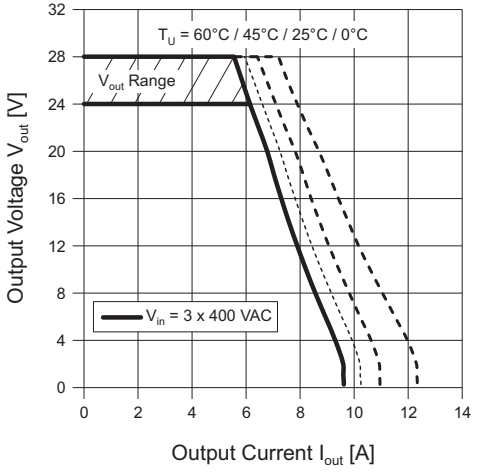

Figure 2: PS305 - Output characteristics (min.)

6.2 Efficiency

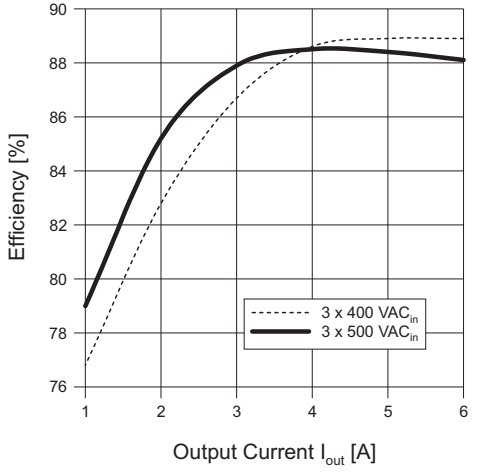

Figure 3: PS305 - Efficiency (min., at V_{out} = 24 V)

6.3 Hold-up time, 3-phase

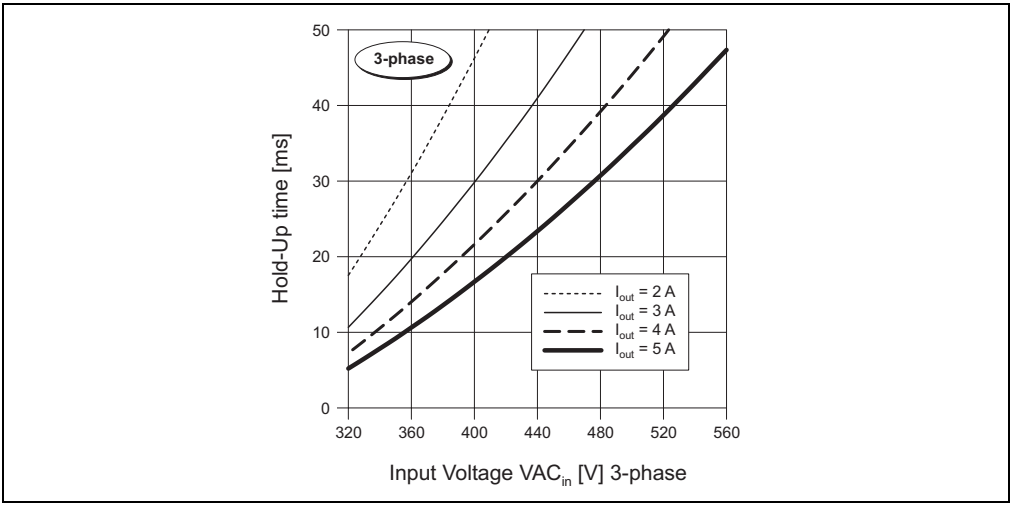

Figure 4: PS305 - Hold-up time, 3 phase (min., at V_{out} = 24 V)

6.4 Hold-up time, 2-phase

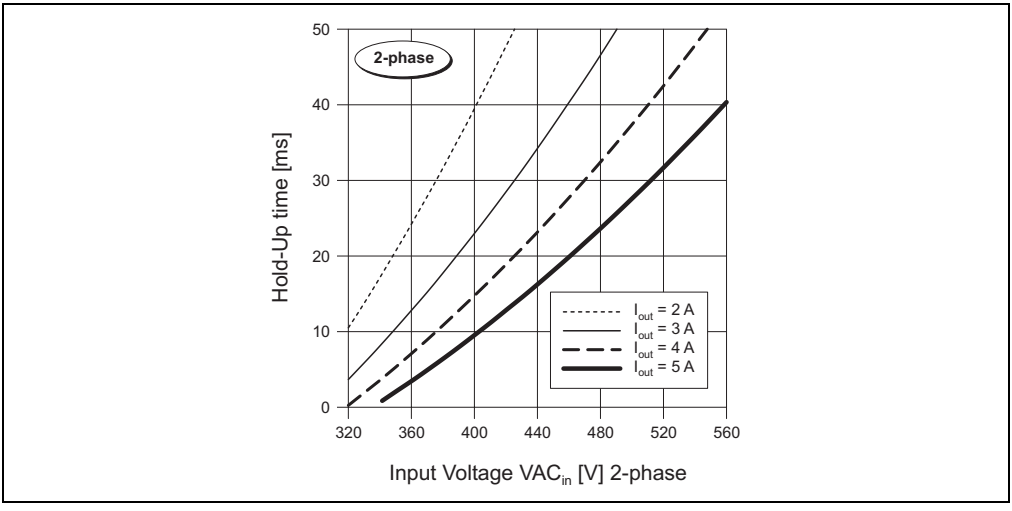

Figure 5: PS305 - Hold-up time, 2 phase (min., at V_{out} = 24 V)

7. Standards and Certifications

Electromagnetic emissions (EME)	EN 61000-6-3 (also includes EN 61000-6-4) Class B (EN 55011, EN 55022) incl. Annex A through noise suppression
Immunity to disturbances Static discharge (ESD) Electromagnetic radiated fields Burst, coupled to: AC_{in} lines DC_{out} 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 (also includes EN 61000-6-1) 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 Low Volt. Directive UL60950 E137006 CUL/CSA-C22.2 No 60950 UL508 LISTED IND. CONT. EQ. 18 WM, 60°C IEC60950 EN60950 EN50178 EN61000-6-3 EN61000-6-2	

Table 4: PS305 - Standards and certifications