

# B&R Power Supply PS110

## 1. General Information

Features of the B&R power supply PS110:

- Input: AC 115V / 230V, DC 240 - 375V
- Output: 24 - 28 V / 240 W
- Power boost up to 288 W
- High overload current, no switch-off
- 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                                                                               |
|--------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 0PS110.1     | 24 VDC power supply, 1 phase, 10 A, Input 115/230 VAC, manual-select, DIN rail mounting |  |
|              |                                                                                         |                                                                                     |

Table 1: PS110 - Order data

### 3. Technical Data

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

| Name                                                                                  | PS110                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Information                                                                   |                                                                                                                                                                                           |
| C-UL-US Listed                                                                        | Yes                                                                                                                                                                                       |
| Input                                                                                 |                                                                                                                                                                                           |
| Nominal Input Voltage                                                                 | AC 100 - 120 / 220 - 240 V (switchable), 47 - 63 Hz                                                                                                                                       |
| Admissible Limits                                                                     | AC 85 - 132 V / 176 - 264 V<br>DC 240 - 375 V<br><b>Note:</b> Always leave the switch in the 230 V position for DC inputs.                                                                |
| Nominal Input Current                                                                 | <6 A (switch in 115 V position)<br><2.8 A (switch in 230 V position)                                                                                                                      |
| Idle Current for DC <sub>in</sub>                                                     | 8 mA (preserves battery sources)                                                                                                                                                          |
| Starting Current                                                                      | Typ. <30 A at 264 VAC and cold restart                                                                                                                                                    |
| Fuse Protection<br>Internal<br>External                                               | Internal fuse (not accessible)<br>Not necessary, but it is recommended to use<br>a standard thermomagnetic 10 A, B-type circuit breaker<br>which is also used to protect the input lines. |
| Transient Immunity                                                                    | Transient resistance acc. to VDE 0160 / W2 (750 V / 1.3 ms), over entire load range.                                                                                                      |
| Hold-Up Time                                                                          | >25 ms (at 196 VAC, 24 V / 10 A)<br>(see "Hold-Up Time" on Page 7)                                                                                                                        |
| Output                                                                                |                                                                                                                                                                                           |
| Output Voltage                                                                        | 24 - 28 VDC adjustable by (covered) front potentiometer<br>Preset: 24,5 V±0.5%<br>Adjustable range guaranteed                                                                             |
| Voltage Regulation                                                                    | Better 2% V <sub>out</sub> overall                                                                                                                                                        |
| Residual Ripple                                                                       | <30 mV <sub>pp</sub> (20 MHz bandwidth, 50 Ω measurement)                                                                                                                                 |
| Over-Voltage Protection                                                               | Typ. 35 V                                                                                                                                                                                 |
| Output Noise Suppression                                                              | Radiated EMI values below EN 61000-6-3 (Class B) even with long, unshielded output cables                                                                                                 |
| Permitted Output Load<br>T <sub>amb</sub> =0°C - 60°C<br>T <sub>amb</sub> =0°C - 45°C | With convection cooling<br>24 V / 10 A (240 W) respectively 28 V / 8.6 A (240 W)<br>24 V / 12 A (288 W) respectively 28 V / 10.3 A (288 W)<br>Short-term also at 60°C                     |
| Protection Functions                                                                  | Output is protected against short-circuit, open circuit and overload                                                                                                                      |
| Derating                                                                              | Typ. 6 W/K (at T <sub>amb</sub> =+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                                                                                                                                                                  |

Table 2: PS110 - Technical data

| Name                                       | PS110                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency, Reliability                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Efficiency                                 | Typ. 90% (230 VAC, 24 V / 10 A)                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Loss                                       | Typ. 26.7 W (230 VAC, 24 V / 10 A)                                                                                                                                                                                                                                                                                                                                                                                                                       |
| MTBF (Reliability)                         | 425,000 h (24 V / 10 A, 230 VAC, $T_U = +40^{\circ}\text{C}$ )                                                                                                                                                                                                                                                                                                                                                                                           |
| Life Cycle (Electrolytic Capacitors)       | The unit exclusively uses long-life electrolytic capacitors, specified for $+105^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                        |
| Start / overload behavior                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Startup delay                              | Typ. 100 ms                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Startup time                               | Approx. 5 - 20 ms depending on the load                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Overload Behavior                          | <ul style="list-style-type: none"> <li>• Special overload design (see "Output characteristics" on Page 6)</li> <li>• 20% power reserve</li> <li>• No switch-off, no hiccup if overloaded</li> <li>• High overload current (up to <math>1.6 I_{\text{Nom}}</math>), <math>V_{\text{out}}</math> is gradually reduced with increasing current</li> <li>• 12 A short-term, at <math>45^{\circ}\text{C}</math> or forced cooling, even continuous</li> </ul> |
| Advantages                                 | <ul style="list-style-type: none"> <li>• High short-circuit current, therefore large "start window": power supply starts securely even with heavy or demanding loads (DC/DC converters, motors)</li> <li>• No "sticking" as can occur with fold-back characteristics</li> <li>• Secondary fuses operated reliably</li> </ul>                                                                                                                             |
| Connection                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Terminals                                  | Robust screw terminals                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Connection Cross Section<br>Input / Output | Solid: 1.5 - 6 mm <sup>2</sup> / flexible: 1.5 - 4 mm <sup>2</sup><br>2 connectors per output                                                                                                                                                                                                                                                                                                                                                            |
| Load Capacity                              | 30 A per output                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Grid                                       | 9 mm distance between adjacent connectors                                                                                                                                                                                                                                                                                                                                                                                                                |
| Additional Features                        | <ul style="list-style-type: none"> <li>• All terminals are easy to reach as mounted on the front panel.</li> <li>• Inputs and outputs are distinctly separate from each other and cannot be mixed up</li> </ul>                                                                                                                                                                                                                                          |
| Operational Conditions                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Environmental Temperature During Operation | $0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$ (starting at $60^{\circ}\text{C}$ derating)                                                                                                                                                                                                                                                                                                                                                                 |
| Relative Humidity During Operation         | Max. 95%, non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Storage and Transport Conditions           |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Storage Temperature                        | $-25^{\circ}\text{C}$ to $+85^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                           |
| Relative Humidity During Storage           | Max. 95%, non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Transport Temperature                      | $-25^{\circ}\text{C}$ to $+85^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                           |
| Relative Humidity During Transport         | Max. 95%, non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Table 2: PS110 - Technical data (cont.)

## B&R Power Supply PS110

| Name                                                | PS110                                                                                                                                                                                                                                      |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mechanical Characteristics                          |                                                                                                                                                                                                                                            |
| Dimensions (W x H x D [mm])                         | 120 x 124 x 102 (+ rail)                                                                                                                                                                                                                   |
| Weight                                              | 980 g                                                                                                                                                                                                                                      |
| Housing                                             | Robust sealed metal housing with fine ventilation grid ( $\Diamond$ 3.5 mm, IP20)                                                                                                                                                          |
| Installation                                        | Mounting on DIN rail (TS35/7.5 or TS35/15, 1 to 1.5 mm thick), therefore: <ul style="list-style-type: none"><li>• Simple snap-on system</li><li>• Sits safely and firmly on the DIN rail</li><li>• No tools required for removal</li></ul> |
| Ventilation / Cooling<br>Free Space for Ventilation | Normal convection, no fan required<br>Above/below 25 mm and 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.                                                                                                                    |

Table 2: PS110 - Technical data (cont.)

Specifications are valid for 230 VAC input voltage, +25°C ambient temperature, and 5 min run-in time unless otherwise stated. They are subject to change without prior notice.

## 4. Dimensions

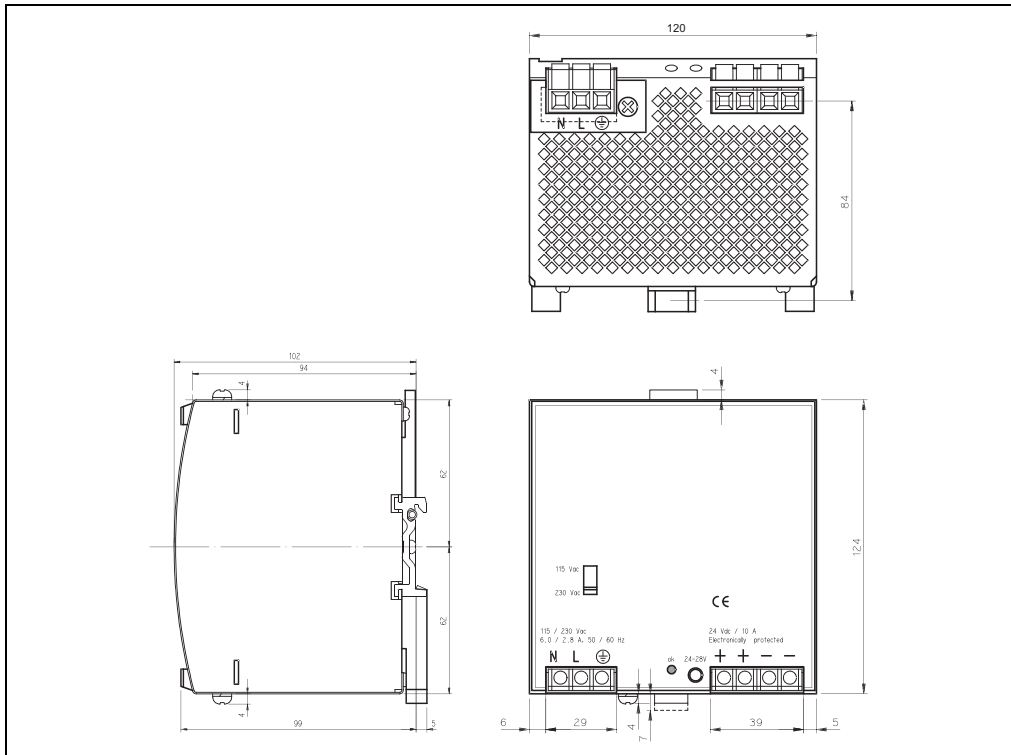


Figure 1: PS110 - Dimensions

## 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

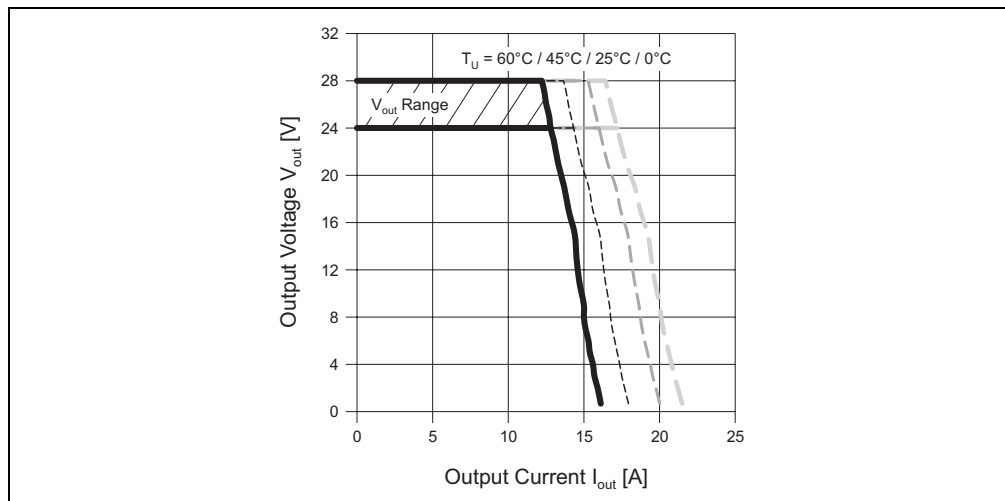


Figure 2: PS110 - Output characteristics (min.)

### 6.2 Efficiency

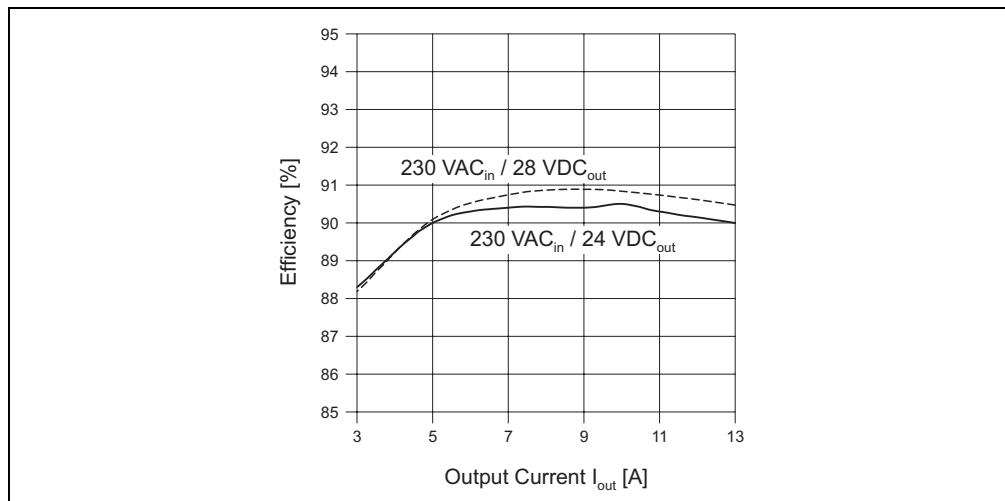


Figure 3: PS110 - Efficiency (typ.)

## 6.3 Hold-Up Time

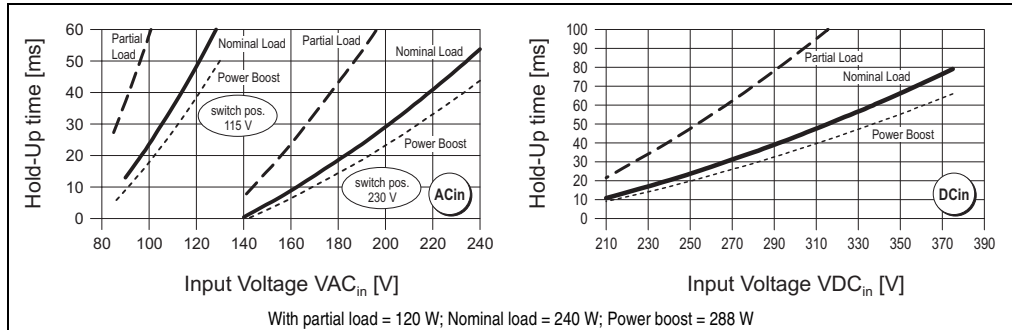


Figure 4: PS110 - Hold-up time (typ., at  $V_{out} = 24\text{ V}$ )

## 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<br>Static discharge (ESD)<br>Electromagnetic radiated fields<br>Burst, coupled to:<br>AC <sub>in</sub> lines<br>DC <sub>out</sub> lines<br>Surge transients<br>Differential ( $L_1 \rightarrow PE$ )<br>Common mode ( $L_1 \rightarrow L_2/N$ )<br>Conducted noise immunity<br>Mains breaks<br>Transient immunity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | EN 61000-6-2 (also includes EN 61000-6-1)<br>EN 61000-4-2, Level 4 (withstands 8 kV direct discharge, 15 kV air discharge)<br>EN 61000-4-3, Level 3 (10 V/m), ENV 50204 (10 V/m)<br><br>EN 61000-4-4, Level 4 (4 kV)<br>EN 61000-4-4, Level 3 (2 kV)<br><br>EN 61000-4-5, Installation class 4 (4 kV) (SLD2.5: class 3 (2 kV))<br>EN 61000-4-5, Installation class 4 (2 kV) (SLD2.5: class 3 (1 kV))<br>EN 61000-4-6, Level 3 (10 V, 150 kHz - 80 MHz)<br>EN 61000-4-11<br>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 PS110 complies with all major <b>safety certifications</b> 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 <b>electronic equipment</b> in electrical power installations EN 50178.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <br/> <b>EMC and Low Volt. Directive</b> </div> <div style="text-align: center;"> <br/> <b>UL60950 E137006 CUL/CSA-C22.2 No 60950</b> </div> <div style="text-align: center;"> <br/> <b>UL508 LISTED IND. CONT. EQ. 18 WM, 60°C</b> </div> <div style="text-align: center;"> <br/> <b>IEC60950</b> </div> <div style="text-align: center;"> <br/> <b>EN60950 EN50178 EN61000-6-3 EN61000-6-2</b> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Table 3: PS110 - Standards and certifications

