

TSR10

High Power Adjustable DC Power Supply

The TSR10 is a 10 kW, 3-phase input voltage 360 - 440 VAC power supply with an adjustable DC output voltage between 0.5 V and 50 V and output current between 0.5 A and 200 A.

The power supply has been designed for the industrial and laboratory applications, featuring front panel display for setting and monitoring output voltage and current within a 3U profile.

Key Features & Benefits

- High Power Density, 10 kW in 3U height and 19" rack mounting
- High Power Factor >0.95
- Efficiency at full load >90%
- 3-phase Input Voltage 360 - 440 VAC
- Remote Analog Programming and Monitoring
- Continuous Encoders for Voltage and Current Adjustment (Coarse & Fine mode)
- Adjustable OVP and OCP Protections
- Short Circuit and Feedback Voltage Proof
- Over Temperature Protection
- Independent Remote ON/OFF and Remote Enable/Disable
- CAN Communication Interface
- Triple Fan, Forced Air Cooling

Applications

- Test and Measurement
- Automated Systems
- Component Device Testing
- Semiconductor Processing & Burn-in
- Aerospace & Satellite Testing



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1. MODEL SELECTION

| MODEL | INPUT VOLTAGE RANGE | NOMINAL OUTPUT VOLTAGE | OUTPUT VOLTAGE RANGE | MAX OUTPUT CURRENT | MAX OUTPUT POWER | AVAILABILITY |
|-------|-------------------------|------------------------|----------------------------|--------------------|------------------|-----------------|
| TSR10 | 360 – 440 VAC, 50 Hz | 40 V | Adjustable 0.5 – 50 VDC | 200 ADC | 10 kW | Consult factory |

2. INPUT SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | MIN | NOM | MAX | UNIT |
|---------------------------|----------------------------|------|-----|-----|------|
| Input Voltage | 3-phase | 360 | 400 | 440 | VAC |
| Input Frequency | | 47 | 50 | 53 | Hz |
| Power Factor | | 0.97 | | | |
| Inrush Current | | | | 35 | A |
| Total Harmonic Distortion | Compliant to IEC 61000-3-2 | | | | |
| Upstream Protection | gG fuse (IEC60269-1) | | 25 | | A |

3. OUTPUT SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | MIN | NOM | MAX | UNIT |
|-------------------------------|--|----------------------------|-----|------------|-----------------|
| Output Voltage | Adjustable when operated as current source | 0.5 | 40 | 50 | VDC |
| Output Current | Adjustable when operated as current source | 0.5 | 200 | 200 | ADC |
| Output Power | | | 10 | | kW |
| Efficiency | Full Power | 90 | | | % |
| Operation Mode | Constant voltage / constant current auto cross-over. Operation allowed on any load from short-circuit to open-circuit | | | | |
| Regulation - Constant Voltage | Line 0.1 % of Full Scale Load 0.2 % of Full Scale | | | | |
| | Ripple and Noise | < 1 MHz 20 Hz to 20 MHz | | 25 100 | mVrms mVpkpk |
| Regulation - Constant Current | Line 0.1 % of Full Scale Load 0.1 % of Full Scale | | | | |
| | Ripple and Noise | < 1 MHz 20 Hz to 20 MHz | | 100 100 | mVrms mVpkpk |
| | Stability: < +/- 2x10 ⁻² over 8 h | | | | |

4. PROTECTION SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION |
|------------|--|
| Protection | Adjustable Over Voltage |
| | Adjustable Over Current |
| | Short Circuit and Feedback Voltage Proof |
| | Over-temperature (OTP) |
| | Safe/Auto Start |
| | Front Panel Lock |
| | Phase Loss Detection |

5. PROGRAMMING, MONITORING AND CONTROL

| PARAMETER | DESCRIPTION / CONDITION |
|--------------|---|
| Control | Analog programming / monitoring 0-5 V or 0-10 V User Selectable |
| | Auto restart after power cut |
| | Mains, Output Voltage and Current Indication |
| | Front panel lock selectable from front panel and or from software |
| | Independent Remote ON/OFF and Remote Enable/Disable |
| | Continuous Encoders for Voltage and Current Adjustment (Coarse & Fine mode) |
| | Last Setting Memory |
| Remote Reset | |

NOTE: The detail description of the Front Panel control you can find in the document BCA.00260.

6. SAFETY, REGULATORY AND EMI SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | CRITERION | |
|---------------------------------|--|---|-------------|
| Insulation | Input to output: Input to chassis: | 1500 VAC | |
| Safety Standards | Compliance and mark for European Conformity (CE) to Low Voltage Directive (LVD – 2014/35/EU) and Electro Magnetic Compatibility (EMC – 2014/30/EU) Regulation. Latest edition of the following standards: CSA/UL60950-1, EN60950-1 and IEC60950-1. | | |
| EMMISSIONS | | | |
| Radiated Emissions | EN55011 | Class A | |
| Conducted Emissions | EN55011 | Class A | |
| Mains Harmonics | EN61000-3-2 | | |
| Flicker | EN61000-3-3 | | |
| Inrush Current | EN61000-3-3 | | |
| IMMUNITY | | | |
| Electrostatic Discharge | EN61000-4-2 | 4 kV / 8 kV contact / air | Criterion B |
| Radiated Electromagnetic Field | EN61000-4-3 | 80 MHz - 1 GHz, 3 V/m | Criterion A |
| Electrical Fast Transient Burst | EN61000-4-4 | 1.0 kV | Criterion B |
| Surge Immunity | EN61000-4-5 | 1.0 kV Line to Earth 0.5 kV Line to Line | Criterion B |
| RF Conducted Immunity | EN61000-4-6 | 3 Vrms 1 kHz 80% AM modulation | Criterion A |
| Voltage Dips & Interruptions | EN61000-4-11 | | Criterion C |

7. ENVIRONMENTAL SPECIFICATIONS

| PARAMETER | DESCRIPTION / CONDITION | MIN | NOM | MAX | UNIT |
|-----------------------|--|----------|-----|----------|-------|
| Humidity | | 10 | | 90 | RH |
| Operating Temperature | Ambient air temperature Over temperature protection | 10 55 | 25 | 40 60 | °C |
| Storage Temperature | | -25 | | 80 | °C |
| Noise | | | | 66 | dB(A) |

8. CONNECTORS

| PARAMETER | DESCRIPTION / CONDITION |
|------------------|--|
| Input Terminals | Screw terminals (6 mm ²) with IP2x isolation according to IEC60529 |
| Output Terminals | Fixing lugs protected by isolating covers to avoid accidental short-circuits. |
| Signal Connector | 15-pin DA-15S (Female) |

8.1 SIGNAL INTERFACE

| PIN | PIN NAME | REF. GND | PIN DESCRIPTION | NOTE |
|-----|-----------|----------|--|--|
| 1 | Vo_set | AGND | Vout Voltage Programming 0 ~ 100 %, 0 ~ 5 V or 0 ~ 10 V, user-selectable | Accuracy & Linearity: ± 1 % of rated output voltage. |
| 9 | Io_set | AGND | Iout Voltage Programming 0 ~ 100 %, 0 ~ 5 V or 0 ~ 10 V, user-selectable | Accuracy & Linearity: ± 1 % of rated output current. |
| 3 | Vo_mon | AGND | Output Voltage Monitor 0 ~ 5 V or 0 ~ 10 V | Accuracy: ± 1 % of rated output voltage, user selectable |
| 10 | Io_mon | AGND | Output Current Monitor 0 ~ 5 V or 0 ~ 10 V | Accuracy: ± 1 % of rated output current, user selectable |
| 2 | AGND | | Analog Ground | |
| 5 | SO Ctrl_A | DGND | Shut-Off (SO) Control by Dry Contact: Open = EN, Short = DIS | |
| 6 | SO Ctrl_B | - | | Internally connected with the DGND |
| 7 | Enable_A | DGND | Enable/Disable dry contact; Open = Off, Short = On; Max. voltage across Enable/Disable contacts = 10 V | |
| 8 | Enable_B | - | | Internally connected with the DGND |
| 12 | PS_OK | DGND | Power Supply OK (PS_OK) Signal. TTL High = OK, 0 V = Fail (500 Ω series impedance) | |
| 13 | CV/CC | DGND | CV/CC Signal CV: TTL High (5 V), Max source current = 10 mA; CC: TTL Low (0 V), Max sink current = 10 mA | |
| 14 | REM | DGND | Remote/Local Signal Signals operating mode; Open collector: Local = Open (Vmax = 30 V), Remote = On (Imax = 10 mA) | |
| 15 | DGND | | Digital Ground | |

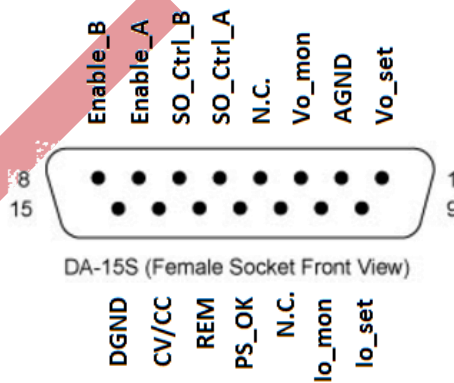


Figure 1a. Signal Connector

8.2 AC INPUT

Four screw terminals (max 16 mm²) for three phase input (L1, L2, L3) and PE wire.

8.3 SENSE CONNECTOR

Two position terminal for positive and negative sense connection.

- Pin 1: Sense +
- Pin 2: Sense -

Opposite connector: Phoenix Contact: PN: 1803578

8.4 COMMUNICATION CONNECTOR

Three position terminal for CAN communication (CAN H, CAN L).

- Pin 1: CAN L
- Pin 2: Not Connect
- Pin 3: CAN H

Opposite connector: Phoenix Contact: PN:1803581

NOTE: The detail description of the CAN communication and commands is described in BCA.00261.

8.5 DIP SWITCH

Three position DIP switch for 5 V / 10 V signal level. On = 10 V, Off = 5 V.

- First position: Vout Monitoring, 5 V / 10 V
- Second position: Iout Monitoring, 5 V / 10 V
- Third position: Voltage / Current Set, 5 V / 10 V



Figure 1b. Signal Connectors on rear panel

9. MECHANICAL SPECIFICATIONS

| PARAMETER | CONDITIONS / DESCRIPTION |
|------------------------|---|
| Dimensions (W x H x D) | 480 x 132.5 (3U) x 646 mm (see Fig.2) |
| Weight | 40 kg max |
| Cooling | Air (from rear to front, no cooling opening at top or bottom cover) |
| Enclosure | IP20 |

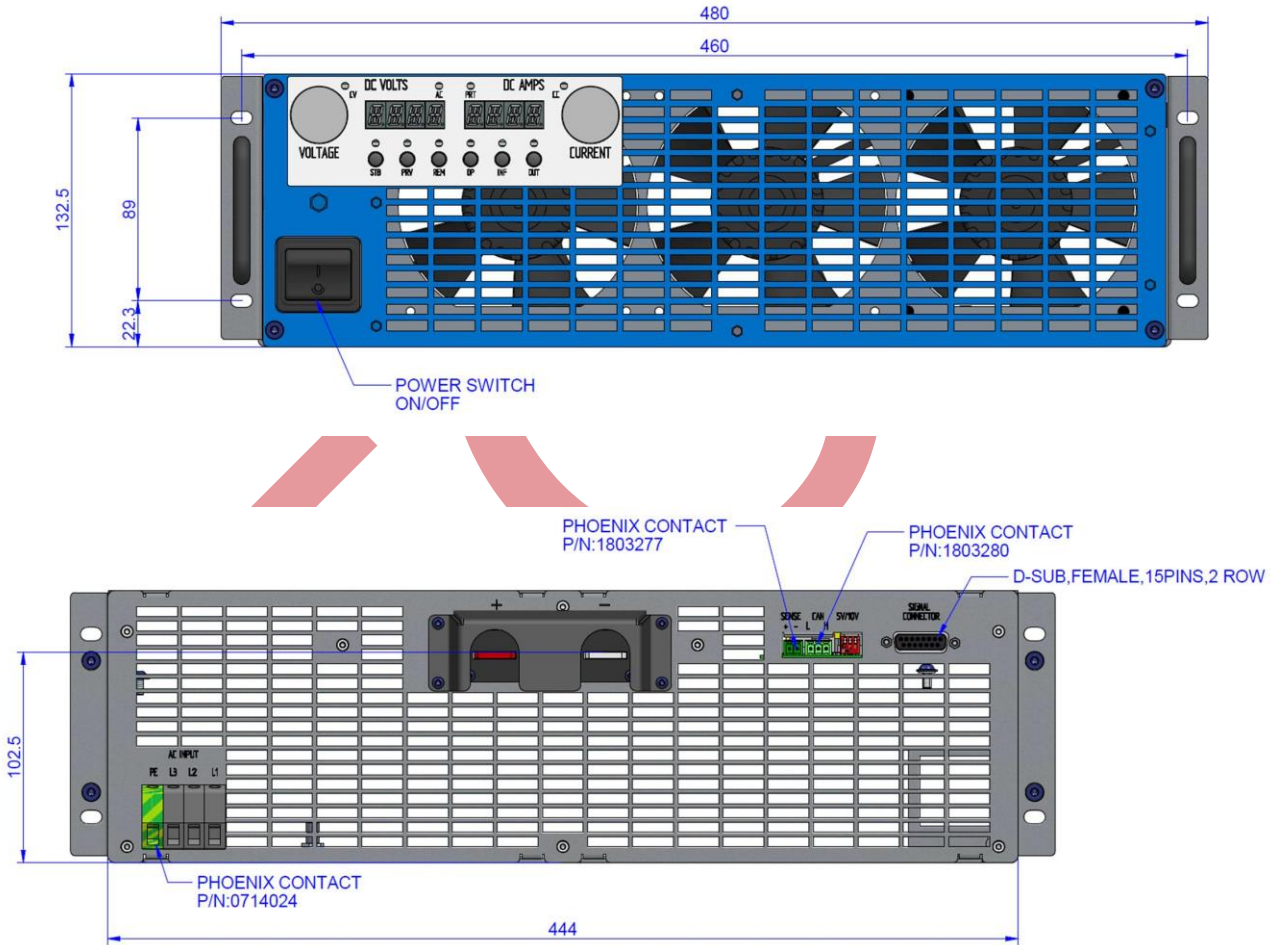


Figure 2a. Mechanical Dimensions, front and rear view

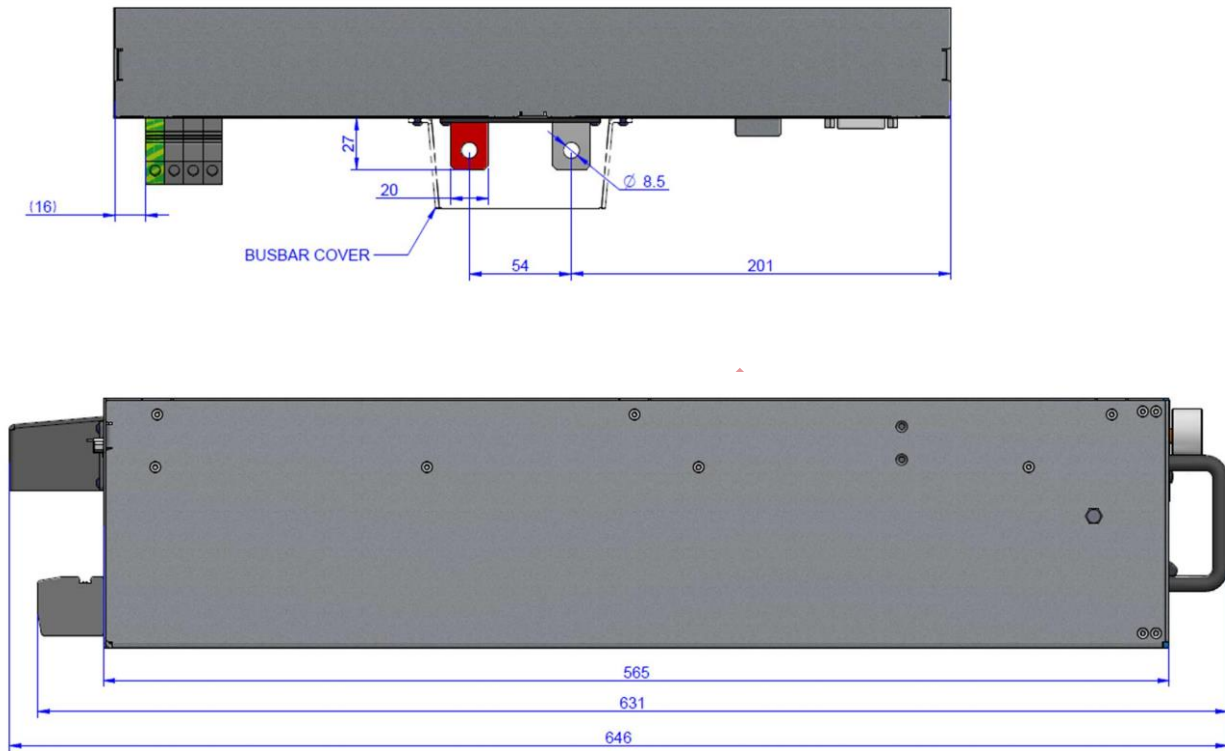
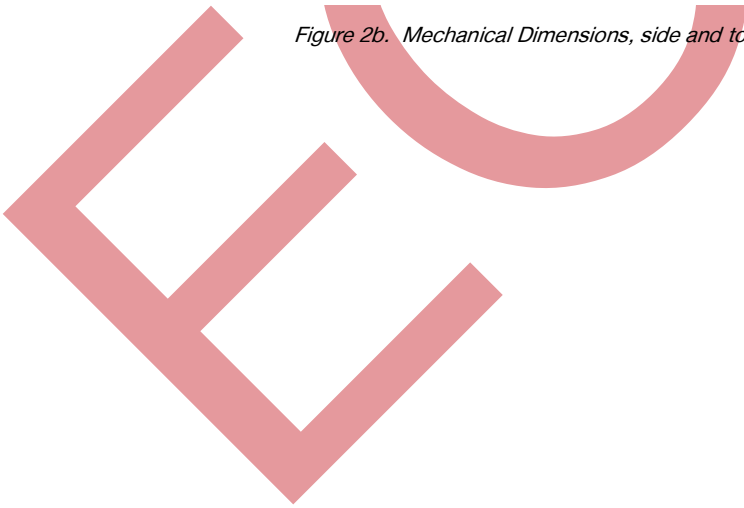


Figure 2b. Mechanical Dimensions, side and top view



For more information on these products consult: tech.support@psbel.com

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