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.

RoHS Compliant

EOL

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

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
	Stability: < +/-2x10^{-3} over 8 h					
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

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5. PROGRAMMING, MONITORING AND CONTROL

PARAMETER	DESCRIPTION / CONDITION
Control	Analog programing / 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
	Compliance and mark for European Conformity (CE) to Low Voltage Directive (LVD – 2014/35/EU) and Electro Magnetic Compatibility (EMC – 2014/30/EU) Regulation.		
Safety Standards	Latest edition of the following standards: CSA/UL60950-1, EN60950-1 and IEC60950-1.		
EMMISIONS			
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 mm²) 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	

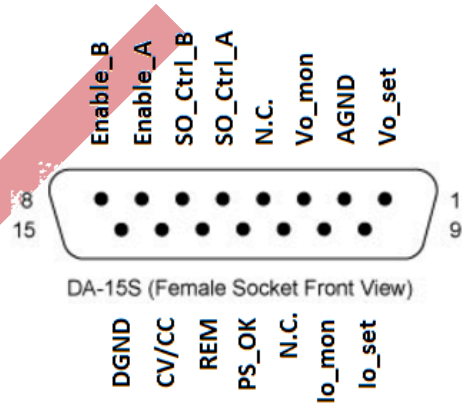

Figure 1a. Signal Connector

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8.2 AC INPUT

Four screw terminals (max 16 mm^2) 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

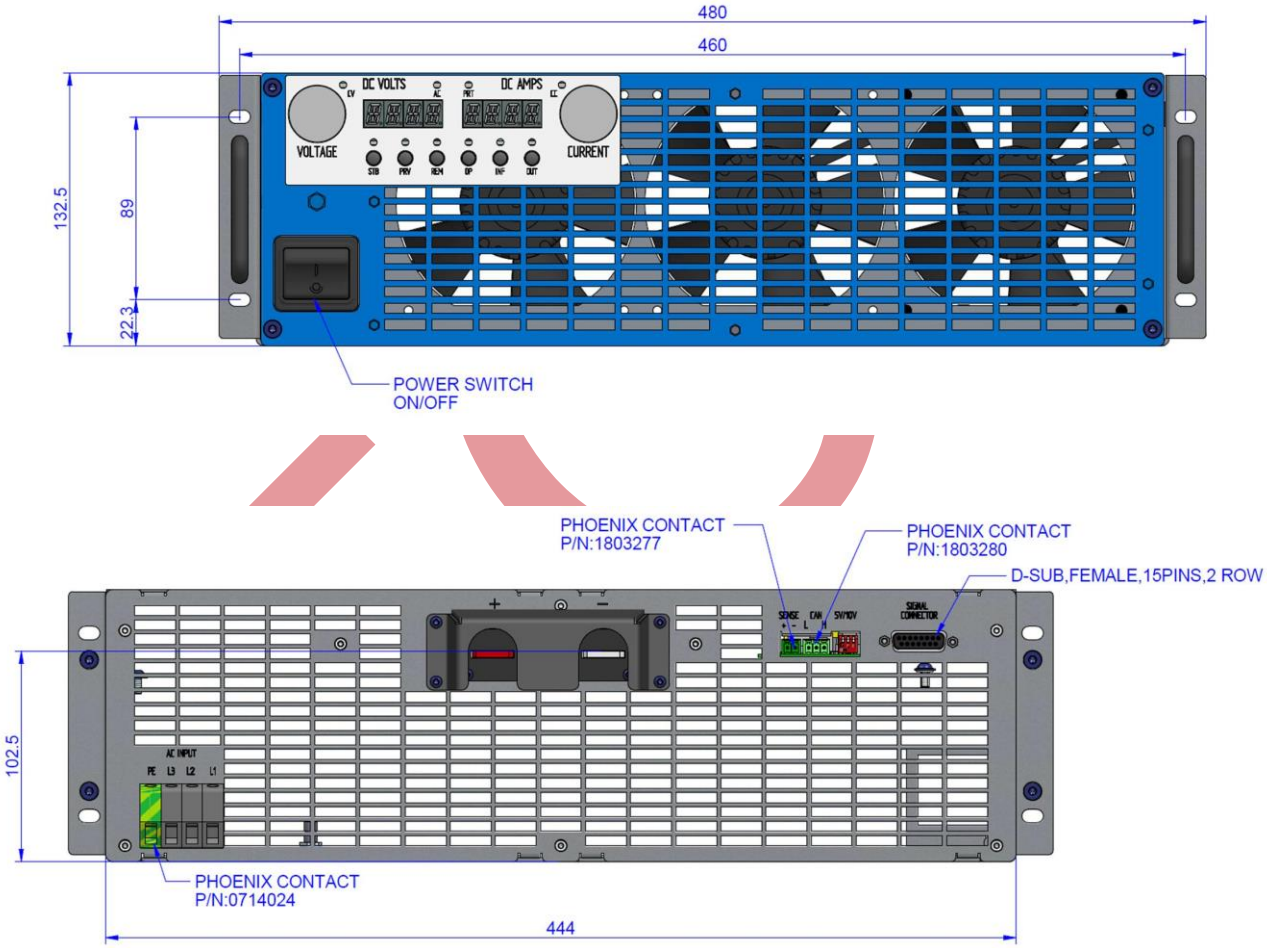

Figure 2a. Mechanical Dimensions, front and rear view

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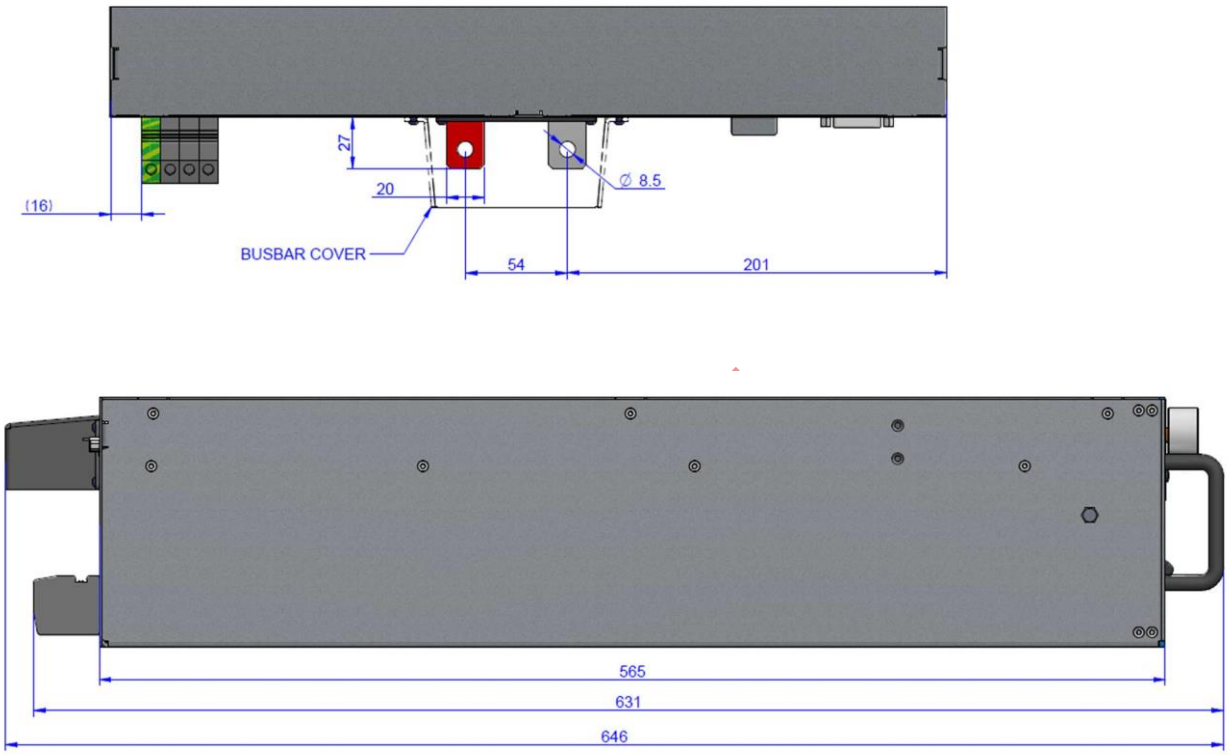

Figure 2b. Mechanical Dimensions, side and top view

EC

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

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