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PS1600L Series
1600W Programmable DC Power Supplies
(With Touch Screen LCD Display)

Technical Specifications

Model	PS	16-100L	20-80L	32-50L	40-40L	60-26L	80-20L	100-16L	120-13L	160-10L	300-5L	400-4L	600-2.67L	800-2L	1000-1.6L
Output Voltage (*1)	V	16	20	32	40	60	80	100	120	160	300	400	600V	800	1000
Output Current (*2)	A	100	80	50	40	26.67	20	16	13.33	10	5.33	4	2.67	2	1.6
Rated Output Power	W	1600													
Efficiency 230Vac @ full load	%	80	83	83	85	85	85	85	85	85	85	85	87	87	87
Constant Voltage Mode															
Max. Load regulation (*3)	mV	0.01% of Vrated + 2mV													
Max. Line Regulation (*4)	mV	0.01% of Vrated													
Ripple (rms): BW=5Hz~300 kHz (*5)	mV	5	5	5	5	5	7	8	8	10	15	15	20	30	50
Ripple (rms): BW= 5Hz~1MHz (*6)	mV	8	8	8	8	8	8	8	12	15	18	18	25	40	60
Ripple & Noise (pp): 20 MHz (*6)	mV	30	50	50	60	60	75	75	75	75	120	80	500	90	120
Remote sense compensation/wire (*7)	V	1	1	2	2	2	2	2	2	2	2	3	5	5	5
Constant Current Mode															
Max. Load regulation 0 ~ 100% (*8)	mA	0.02% of Irated + 5mA													
Max. Line Regulation (*4)	mA	0.01% of Irated + 2mA													
Ripple rms, 5Hz~300kHz	mA	35	35	35	30	28	25	22	20	20	12	12	5	5	4
Ripple rms, 5Hz~1MHz	mA	50	50	50	40	35	30	27	25	20	15	12	8	6	5
Ripple (pp) BW=20 MHz (*9)	mA	130	120	120	100	90	80	70	60	60	50	40	30	25	22
Programming Speed (into resistive load) (*10)															
Rise time (10% to 90%)	100% load	ms	12	15	20	25	28	30	35	50	80	120	130	150	200	250
	10% load	ms	8	10	18	20	25	25	30	40	70	110	120	130	180	220
Fall time (90% to 10%)	100% load	ms	20	20	22	22	25	35	50	80	100	180	190	200	220	250
	10% load	ms	200	210	225	240	250	350	400	600	800	850	900	1000	1200	1500
	No Load	s	1.2	1.2	1.5	2.0	2.5	3.0	3.5	4.5	6	8	9	10	12	15

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Recovery Time (Transient Response Time) (*11)																
Recovery within		mV	80	80	80	80	80	100	120	150	200	300	400	500	600	800
Time @ 50 – 100 % load step		µs	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Max deviation @ 230 V mains		V	0.15	0.15	0.15	0.15	0.15	0.25	0.5	0.8	1.0	1.5	1.8	2.0	2.5	3.0
Output Impedance (CV Mode)	0-1kHz	mΩ	<1	<1	<2	<10	<10	<10	<10	<10	<10	<20	<20	<20	<30	<40
	1-00kHz	mΩ	<5	<5	<10	<30	<30	<30	<30	<30	<30	<60	<60	<60	<80	<100
Temperature Coefficients	CV & CC	ppm/℃	100 ppm/℃ of rated voltage & current (after 30 min of warm up time and during 8 hrs)													
Output Stability	CV & CC	ppm	100 ppm of rated voltage & current (after 30 min of warm up time and during 8 hrs (@ at constant load, line & temperature)													
Analog Programing (Standard) (25 Pin D connector on rear panel)																
Voltage Programing	Vout	-	0 ~ 100%, 0 ~ 5 V/ 0 ~ 10V (User selectable), Accuracy: ± 0.5 % of Vrated, Input Impedance: 1 MΩ													
	Iout	-	0 ~ 100%, 0 ~ 5 V/ 0 ~ 10V (User selectable), Accuracy: ± 1 % of Irated, Input Impedance: 1 MΩ													
Resistor Programming	Vout	-	0 ~ 100%, 0~5/10 kΩ full scale (user selectable), Accuracy and Linearity: ± 1% of Vrated													
	Iout	-	0 ~ 100%, 0~5/10 kΩ full scale (user selectable), Accuracy and Linearity: ± 1% of Irated													
Output Voltage Monitoring		-	0 ~ 5 V/ 0 ~ 10V (User selectable), Accuracy: ±1 % of Vrated, Output Impedance: <150 Ω / 4 mA max													
Output Current Monitoring		-	0 ~ 5 V/ 0 ~ 10V (User selectable), Accuracy: ±1 % of Irated, Output Impedance: <150 Ω / 4 mA max													
V reference		-	5.1 V ± 15 mV													
Isolated Analog Programing (Optional)																
Voltage Programing	Vout	-	0 ~ 10 V, Accuracy: ± 1 % of Vout rated, Input impedance: 1 MΩ													
	Iout	-	0 ~ 10 V, Accuracy: ± 1 % of Iout rated, Input impedance: 1 MΩ													
Output Voltage Monitoring		-	0 ~ 10 V, Accuracy: ±1 % of Vout rated, Output impedance: 150 Ω / 4 mA max													
Output Current Monitoring		-	0 ~ 10 V, Accuracy: ±1 % of Iout rated, Output impedance: 150 Ω / 4 mA max													
V reference		-	5.1 V ± 15 mV													
Status Outputs & Controls																
Status outputs		-	Power Supply OK	PS OK = Logic 1 / Any Fault: = Logic 0												
		-	AC Fail	Logic 0												
		-	DC Fail	Logic 0 (for DC fail by ± 5% of set value)												
		-	CV / CC Status	CV = Logic 0 / CC = Logic 1												
		-	Output ON Status	Output ON = Logic 1 / Output OFF= Logic 0												
		-	OVP Status	OVP = Logic 0 / Else = Logic 1												
		-	OTP Status	OTP = Logic 0 / Else = Logic 1												
		-	Local/Remote Status	Local = Logic 0 / Remote = Logic 1												
		-	Interlock	Short = Output Enabled / Open = Output Disabled												
Remote shutdown		V	With +5V or relay contacts.													
Remote Programing																
RS232/USB/RS485/LAN		-	ADC: 16 Bits, DAC: 16 Bits													
Voltage Programing		-	Accuracy: 0.05% of Vrated, Resolution: Better than 15 bit or 0.002% of Vrated													
Current Programing		-	Accuracy: 0.1% of Irated, Resolution: Better than 15 bit or 0.002% of Irated													
Voltage Monitor (Readback)		-	Accuracy: 0.1% Vrated, Resolution: Better than 15 bit or 0.002% of Vrated													
Current Monitor (Readback)		-	Accuracy: 0.3% Irated, Resolution: Better than 15 bit or 0.002% of Irated													
OVL & UVL Programing		-	Accuracy: 0.05% Vrated, Resolution: Better than 15 bit or 0.002% of Vrated													

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Display & Front Panel Controls																
Display Type			3.7” Capacitive Touch Screen LCD Display, Simultaneous display of voltage (5 digit) and current (5 digit)													
Display Scale	Voltage	V	0-16.000	0-20.000	0-32.000	0-40.000	0-60.000	0-80.000	0-100.00	0-120.00	0-160.00	0-300.00	0-400.00	0-600.00	0-800.00	0-1000.0
	Current	A	0-100.00	0-80.000	0-50.000	0-40.000	0-26.666	0-20.000	0-16.000	0-13.333	0-10.000	0-5.333	0-4.000	0-2.666	0-2.000	0-1.600
Display Resolution	Voltage	V	1mV	1mV	1mV	1mV	1mV	1mV	10mV	10mV	10mV	10mV	10mV	10mV	10mV	100mV
	Current	A	10mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA	1mA
Accuracy	Voltage	-	± (0.05% of Vrated + 5mV)													
	Current	-	± (0.05% of Irated + 5mA)													
Front Panel controls		-	Mains ON/ OFF, Voltage and Current setting with Encoders, Output On/Off													
Display on LCD		-	Voltage & Current Set Value, Voltage & Current Read Value, Output ON/OFF, CV/CC Mode, Menu Selection, Over Voltage Protection, Under Voltage Protection, Over Temperature Protection, Foldback Protection (user selectable CV/CC fold mode) with programmable fold delay time setting (0.1 s to 25.5 s), AC-Fail, Master/Slave mode, Front Panel Lock with Password Protection, Remote/Local Mode, Communication Menu with different interfaces (USB/RS232/RS485/LAN), Baud Rate Setting (4800..to..57600), Ethernet IP address setting, System Info (Sr.No / Firmware ver.), etc.													
Other Features																
Protections		-	Over voltage protection (OVP displayed & Output gets switched off), Under voltage protection (UVP displayed & Output gets switched off), Over Current (CC Limit is active), Short Circuit (CC Limit is active), Over temperature (OTP displayed & Output gets switched off) Fold Back (programmable CV/CC mode & fold delay time; Foldback displayed & Output gets switched off)													
Output Terminals		-	Bus bar with M5 bolts													
Parallel operation		-	Up to 4 identical units in Master/Slave mode for parallel operation with equal current sharing													
Serial operation		-	2 Units in series, max 600 V to chassis										No series operation			
Daisy chain		-	31 Power supplies can be connected in Daisy chain													
Input Characteristics																
Mains Input		V	195 ~ 270V, 50 / 60Hz (47 ~ 63Hz), Single Phase Input connector: IEC320/C14, EN 60320/14 Standby Power: 30 Watts @ 230V (Vout max, No load) Internal Fuse L: 20 A Fast, 6.3 x 32 mm ceramic fuse.													
Power Factor		-	0.99 @ full load / 0.98 @ 50% load													
Turn On Delay		ms	5 s (approx.) after mains switched ON													
Inrush current		A	<30													
Hold up Time		ms	20													
Environment Conditions																
Operating Temperature		℃	0 ~ +50℃; with 100% load; derated 75% at 60℃													
Storage		℃	-40 ~ + 85℃													
Humidity		%	10 ~ 95% non-condensing at 40℃, max. 75% non-condensing at 50℃													
Safety/EMC																
Insulation		-	Insulation: Input to Output: 3750 V for 1 min, Input to case: 2500 Vdc, Output to case: 600 V, Insulation resistance: 100 MΩ at 25℃, 70% RH, 500 Vdc													
Safety Standard		-	EN 60950-1 / IEC61010													
EMC Standards		-	ESD: EN 61000-4-2: 2009, Fast Transients: EN 61000-4-4: 2012 Conducted Immunity: EN 61000-4-6, Radiated Immunity: EN 61000-4-3 Voltage dips & Interruption: EN 61000-4-11 Harmonics: EN 61000-3-2, Flicker: EN 61000-3-3													

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General Specifications																
Dimensions (WxDxH)		mm	443x530x43.5		443x481x43.5											
			(1U, 19” Rack size) excluding connectors, terminals, switches, front and back panel controls, handles etc													
Weight		kg	9 kg (Approx.)													
Cooling		-	Forced air cooling with variable fan speed. Air flow from front panel to rear of power supply.													
Interfaces																
Interfaces	Standard	-	Analog Programing, USB / RS232 / RS485, LAN, Master/Slave (SCPI Command set and LabView Driver provided for digital communication)													
	Optional	-	Isolated Analog Programming, External GPIB													
Accessories																
Standard Accessories			Mains Cable, USB Cable, RS485 Cable, Safety Cover for Output Terminals (for power supplies with output voltage more than 60V)													

		Description	Ordering Code
Optional Accessories		Bus bars for series operation	BBS
		Bus bars for parallel operation	BBP
		Master/Slave Cable	MSC
		Increased output power (voltage by 10%)	IOP10V
		Increased output power (current by 10%)	IOP10I
		Output Cable	OC
		Input Cable (>2mtr)	IC
		Isolated Analog Built-in	IAB
		Isolated Analog External	IAE
		19” Rack mount kit	RAK
		Rack & Integration	RAI
		Analog connector	CON
		Polarity Reversal Switch with LAN	PRD
		Reverse Battery Protection	BRP
		External Blocking Diode	BD
Software	Standard	Datalogging & Sequencing Software	DLS
	Optional	Solar Simulation Software	SSS
		Battery Cycler (with external electronic load):	BCS
Calibration Report	Standard	In-house (Traceable to National Standards)	-
	Optional	NABL Accredited	CAL-NA
Calibration Interval		12 months from the date of last calibration (Recommended)	

Subject to change without notice

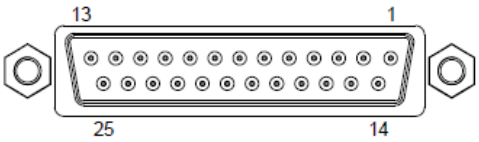
NOTES:

Unit warm up time is 30 min.
Unless otherwise noted, specifications are warranted over the ambient temperature range of 0° to 50℃

*1: Minimum output voltage guaranteed to maximum 0.2% of rated output voltage.
*2: Minimum output current guaranteed to maximum 0.4% of rated output current.
*3: Measured from 0 ~ 100% load at constant input voltage, at the sensing point in local sense.
*4: Measured from 195~270Vac, at constant load.
*5: Measured in DMM
*6: Measured in DSO with JEITA RC-9131C (1:1) probe
*7: The maximum voltage on the power supply terminals must not exceed the rated voltage.
*8: Measured from 0 ~ 100% load voltage change of units rated voltage at constant input voltage.
*9: Measured at rated output voltage and rated output current.
*10: Measured at rated output voltage.
*11. Measured at local sense, output set point 10-100%

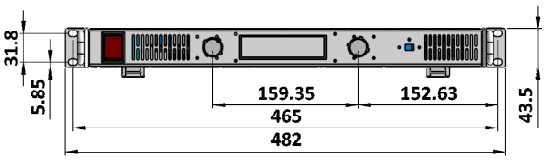
Rear panel

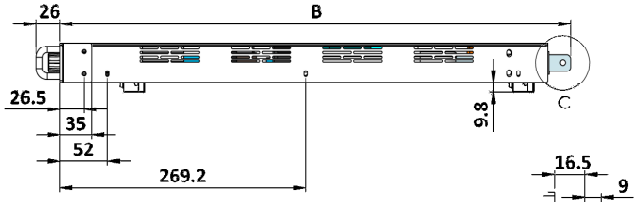
Connections Analog Programming Connector

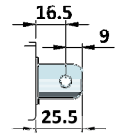


Pin 1	Interlock +
Pin 2	Ground Analog Programming
Pin 3	Ground Analog Programming
Pin 4	Reserved, Please do not connected any circuit to this pin !
Pin 5	Over Voltage Status
Pin 6	Over Temperature Status
Pin 7	Reference Voltage output 5.1 V
Pin 8	Not Connected
Pin 9	Voltage Programming input
Pin 10	Current Programming input
Pin 11	Voltage Monitoring Output
Pin 12	Ground Analog Programming
Pin 13	CV / CC Status
Pin 14	Interlock –
Pin 15	Remote Shut Down input
Pin 16	Power Supply status
Pin 17	DC Output ON status
Pin 18	Reserved, Please do not connected any circuit to this pin !
Pin 19	AC Fail status output
Pin 20	DC Fail status output
Pin 21	Remote Control status output
Pin 22	Ground Analog Programming
Pin 23	Ground Analog Programming
Pin 24	Current Monitoring Output
Pin 25	Not connected

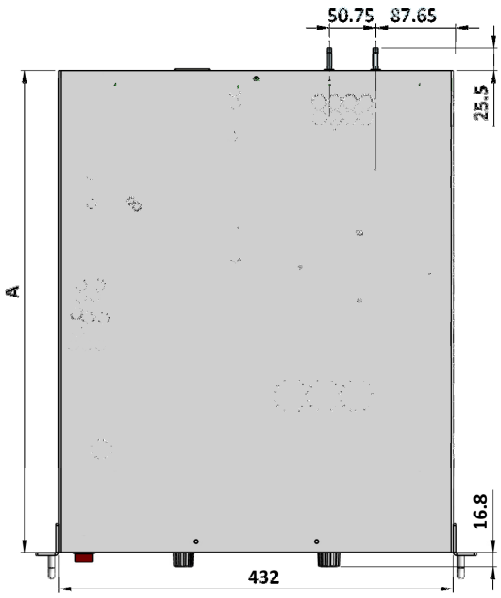
Outline Drawing PS1600L Series





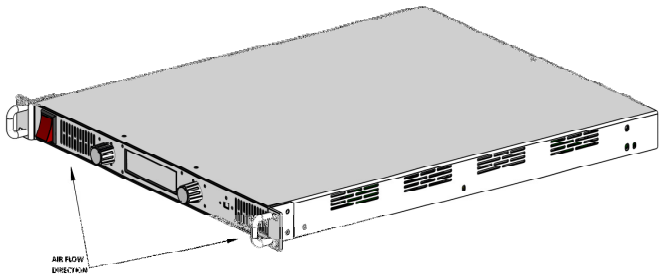


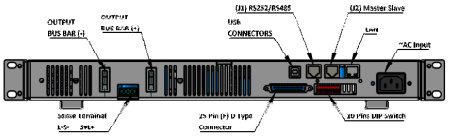
DETAIL C
SCALE 1 : 2



Note:

A	Current	Depth
1.	≥80A	530mm
2.	<80A	481mm
B	Current	Depth
1.	≥80A	560mm
2.	<80A	500mm





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