



- Up to 10 kW O/P Power
- 3U Full-Rack
- Front Panel Encoder & Tactile Switch Inputs
- 4-Digit Displays for V & I
- RS-485 & CAN Interface – Standard Models
- IEEE488.2 or LAN, USB – Optional Interfaces
- Rear Panel Analog Programmability
- 3-Phase, 3-Wire & Protective Earth
- Wide I/P Voltage Range
- Series and Parallel Operation for higher power output

## 1.0 VBV Product Family

Each model of the VBV product-family delivers up to 10 KW of stable DC output power with automatic crossover feature and is a high-performance, feature-rich programmable DC power supply housed in an industry-standard 3U, Full-rack enclosure. Output DC Voltage and DC Current can be programmed using (1) front panel encoders, (2) rear panel analog programming interface or (3) RS-485 / CAN Host communication control. Factory installed IEEE 488.2 or LAN, USB interface options are also available. CAN message IDs can be factory customized per user format and requirements.

## 2.0 Applications

- Automated Test Equipment (ATE)
- Electroplating
- Factory Automation & Process Control
- Telecom & IT Industry
- Semiconductor Manufacturing
- Fuel-Cell Test Stands
- Renewable & alternate Energy R&D
- Battery Charging & Testing
- Aerospace & Defense
- Component Testing & Quality Control
- Research Labs & Educational Labs

## 3.0 Model Highlights

	DC OUTPUT		RIPPLE [5Hz ~ 1MHz]		RIPPLE + NOISE [20MHz]	SOURCE EFFECT		LOAD EFFECT	
	VOLTS <sup>1</sup> (V)	AMPS <sup>2</sup> (A)	CV	CC		CV <sup>4</sup>	CC <sup>4</sup>	CV <sup>5</sup>	CC <sup>6</sup>
			r.m.s (mV)	r.m.s (mA) <sup>3</sup>	CV mV (p-p)	mV	mA	mV	mA
VBV 10-700	0-10	0-700	20	3000	60	10	700	7	700
VBV 20-500	0-20	0-500	20	1800	60	20	500	14	500
VBV 30-334	0-30	0-334	20	1200	60	30	334	21	334
VBV 40-250	0-40	0-250	20	300	60	4	125	8	250
VBV 50-200	0-50	0-200	20	150	75	5	100	10	200
VBV 60-167	0-60	0-167	20	150	75	6	84	12	167
VBV 80-125	0-80	0-125	25	50	100	8	62.5	16	125
VBV 100-100	0-100	0-100	25	40	100	10	50	20	100
VBV 150-67	0-150	0-67	25	30	150	15	34	30	67
VBV 300-34	0-300	0-34	60	15	200	30	17	60	34
VBV 400-25	0-400	0-25	60	10	300	40	13	80	25
VBV 600-17	0-600	0-17	60	7	350	60	9	120	17

**Notes:**

1. Minimum voltage is guaranteed to be within 0.5% of the rated output voltage
2. Minimum current is guaranteed to be within 0.5% of rated output current
3. Measured at 10% - 100% of rated O/P voltage and rated O/P current
4. Measured @ constant load at 350~528VAC
5. Measured at constant I/P voltage from no-load to full-load
6. Measured at constant I/P voltage for a 10% to 100% of rated output voltage change

**4.0 Remote Sensing, Response Time, Efficiency & Drift**

MODEL	Remote Sense drop/line V	Response Time				Efficiency % (@ Max O/P Power) 100 VAC	Temp. Coeff. PPM/ °C
		0 to V <sub>0</sub> mS	V <sub>0</sub> to 0	V <sub>0</sub> to 0	Transient <sup>7</sup> mS		
			Full Load mS	No Load S			
VBV 10-700	1	80	50	0.6	1	86	200 PPM/ °C (of rated V <sub>0</sub> after 30 minutes warmup)
VBV 20-500	1	80	50	0.8	1	87	
VBV 30-334	1.5	80	80	0.9	1	87	
VBV 40-250	2	80	80	1	1	88	
VBV 50-200	3	80	80	1.5	1	88	
VBV 60-167	3	80	80	1.5	1	88	
VBV 80-125	4	100	150	2	1	88	
VBV 100-100	5	100	150	2	1	89	
VBV 150-67	5	100	150	2.5	3	90	
VBV 300-34	5	100	150	2.5	3	91	
VBV 400-25	5	100	150	4	3	91	
VBV 600-17	5	100	300	7	3	91	

Notes:

7) Conditions: Time for Output to recover within 1% of its rated voltage for a load change 50-100% or 100-50% of rated output current; load change and for a set point change from 50% to 100%.

**5.0 Analog Programming (Rear Panel)**

5.1	Voltage Programming <sup>8</sup>	User Selectable 0 - 5V / 0 - 10V for 0 –100 % of Vout User Selectable 0 - 5kΩ / 10kΩ for 0 –100 % of Vout
5.2	Current Programming <sup>9</sup>	User Selectable 0 - 5V / 0 - 10V for 0 –100 % of Iout User Selectable 0 - 5kΩ / 10kΩ for 0 –100 % of Iout
5.3	Output ON/OFF Control	User Selectable logic: 0 V / 5 V , or by Dry Contact
5.4	Enable/Disable	Dry Contact: Open = O/P OFF, Short = O/P ON. Max allowed voltage on Enable Pin = 7V

Notes:

8) Accuracy and Linearity +/-0.5% in voltage programming mode and +/-1% in resistance programming mode of Rated Output Voltage

9) Accuracy and Linearity +/-1% in voltage programming mode and +/-1.5% in resistance programming mode of Rated Output Current

**6.0 Analog Monitoring (Rear Panel)**

6.1	Voltage Monitoring	User Selectable 0 - 5V / 0 - 10V (Accuracy +/-1%)
6.2	Current Monitoring	User Selectable 0 - 5V / 0 - 10V (Accuracy +/-1%)
6.3	Power Supply GOOD signal	TTL: High=GOOD, Low=Output OFF/FAIL
6.4	CV/CC indicator	Open Collector. High = CV, Low = CC. Max. pull-up voltage = 15V

## 7.0 Interface RS-485 & CAN

7.1	RS-485	Default Baud Rate: 9600 bps (Adjustable: 9600,19200)
7.2	CAN	Baud Rate: 500kbps (Message IDs factory configured per user requirement)
7.3	Voltage Prog. Resolution	0.02% of rated output voltage
7.4	Voltage Prog. Accuracy	± 0.5% of rated output voltage
7.5	Current Prog. Resolution	0.05% of rated output current
7.6	Current Prog. Accuracy	± 0.5% of rated output current
7.7	Voltage Read Back Resolution	0.02% of rated output voltage
7.8	Voltage Read Back Accuracy	0.2% of rated output voltage
7.9	Current Read Back Resolution	0.02% of rated output current
7.10	Current Read Back Accuracy	0.5% of rated output current
7.11	OVP/UVL Prog. Resolution	0.1% of rated output voltage
7.12	OVP/UVL Prog. Accuracy	1% of rated output voltage

## 8.0 Front Panel Controls & Indications

8.1	Voltage & Current Adjust	Separate Encoders for Volt & Current. Fine control is selectable.
8.2	OVP & UVL Adjust	Using Voltage Encoder subsequent to pressing “OVP/UVL” Key
8.3	Output ON/OFF	Enable / Disable Output using “OUT” Key
8.4	Address Setting	Using Voltage Encoder and “REM” Key (31 Addresses)
8.5	Baud Rate Setting(RS-485)	Using Current Encoder and “REM” key (Selectable: 9600 & 19200 bps)
8.6	AC Disconnect	2 - Pole Circuit Breaker
8.7	Set Point adjust & View	Using “PREV” Key and respective encoders
8.8	Front Panel Lock	Depressing “PREV” key toggles between Lock & Unlock options
8.9	Power Restart Modes	Depressing “OUT” Key toggles between Auto & Safe mode options
8.10	Foldback Trip (CV to CC)	Foldback trip can be armed & disarmed using “FOLD” Key
8.11	LED Indications	CV, CC, ON, Fine, Preview, Fold, Remote & Fault
8.12	Display	4-Digits each for Voltage & Current (accuracy 0.5% +/- 1 Count)

## 9.0 Protective Functions

9.1	Max. OVP Trip Point setting	110% of Rated Output Voltage		
9.2	Minimum OVP Trip point setting	$V_o \leq 20V$ Models	$20V \leq V_o \leq 40V$ Models	$60V \leq V_o \leq 600V$ Models
		1V	2V	5V
9.3	Over Current Protection	0 – 100 % Constant O/P Current with “FOLD” disarmed. Output shutdown with “FOLD” armed		
9.4	Over Temp. Protection	Latched / Unlatched, user selectable		

## 10.0 Input AC Specifications

10.1	Input Voltage	350 - 528 VAC; 47-to-63 Hz; Three Phase – Wye or Delta, 4 wire total (3 phase and 1 protective earth terminal)
10.2	Input Current	21A @ rated output power
10.3	Power Factor	0.88 @ passive PFC
10.4	Inrush Current	< 30 A
10.5	Phase Imbalance	≤ 5%
10.6	Leakage Current	Less than 3.5 mA

### 11.0 Series/Parallel Operation

11.1	Parallel Operation	Paralleling up to 4 identical units in Master/Slave mode
11.2	Series Operation	Up to 2 identical units in Series with external anti-parallel diodes. Voltage not to exceed +/- 600V to Chassis ground.

### 12.0 Environmental Conditions

12.1	Operating Temperature	0 - 50 °C, at full load,
12.2	Storage Temperature	-20 to 70 °C
12.3	Operating Humidity	20 - 90% RH (non-condensing)
12.4	Storage Humidity	10-90% RH (non-condensing)
12.5	Altitude	Operating: 3000m (10000ft), derate O/P current by 2% /100m above 2000m, non-operating: 40000 ft (12000m)

### 13.0 Mechanical

13.1	Cooling	Forced air cooling from Front to Rear.
13.2	Dimensions (WxHxD)	W: 429.26mm, H: 132.6mm, D: 533.4mm (excluding mating connectors, encoder knobs, handles etc.)
13.3	Weight	33 Kg (72.75 Lbs)
13.4	AC input connector	PC Terminal Block AC inlet, Phoenix P/N: 1913730 with strain relief
13.5	Output connector	10 ≤ Vout ≤ 80V : Bus Bar arrangement; 100 ≤ Vout ≤ 600V: PC Terminal Block, Phoenix P/N: 1762741
13.6	Audible Noise	< 65 dB(A) at full load and measured 1m from the front panel

### 14.0 SAFETY<sup>10</sup>

14.1	Compliant Standards	C E Mark, UL60950, EN60950 listed (a) RS-485, CAN, GPIB, USB, LAN = SELV level for all models up to 400V. They are not SELV for model voltages > 400V (b) O/P is SELV for model voltages ≤ 40V (c) O/P is hazardous for models > 40V
14.2	Dielectric Withstand Voltage	(a) I/P to GND: 2828 VDC for 1 min for all models (b) O/P to GND: 1000 VDC for 1min for Models with Vout ≤ 40V; 2121 VDC for Models with 40 < Vout ≤ 300V; 2688 VDC for models 300 < Vout ≤ 600V (c) I/P to O/P: 4242 VDC for 1 min for Models with Vout ≤ 40V; 3535 VDC for Models with 40 < Vout ≤ 300V; 3535 VDC for models with 300 < Vout ≤ 600V (d) Hazardous O/P to SELV: 2670 VDC for 1 min for all models with 40 < Vout ≤ 600V (e) I/P to SELV: 4242 VDC for 1 min for models with Vout ≤ 400V; 2828 VDC for Models with 300 < Vout ≤ 600V
14.3	Insulation Resistance	> 100 MΩ @ 25 C , 70 % RH , 500 VDC

15.0 Compliance Standards<sup>10</sup>

15.1	Radiated emission	EN55011A, FCC part 15-A
15.2	Voltage dips	EN61000-4-11
15.3	Conducted emission	EN55011A, FCC part 15-A
15.4	Surge Immunity	EN61000-4-5, 1KV line – line, 2KV line - ground
15.5	Radiated Immunity	EN61000-4-3, 3V/m
15.6	Conducted Immunity	EN61000-4-6, 3V
15.7	ESD	EN61000-4-2, Air-disch: 8KV , Contact disch: 4KV
15.8	Fast transients	EN61000-4-4, 2KV

Notes:

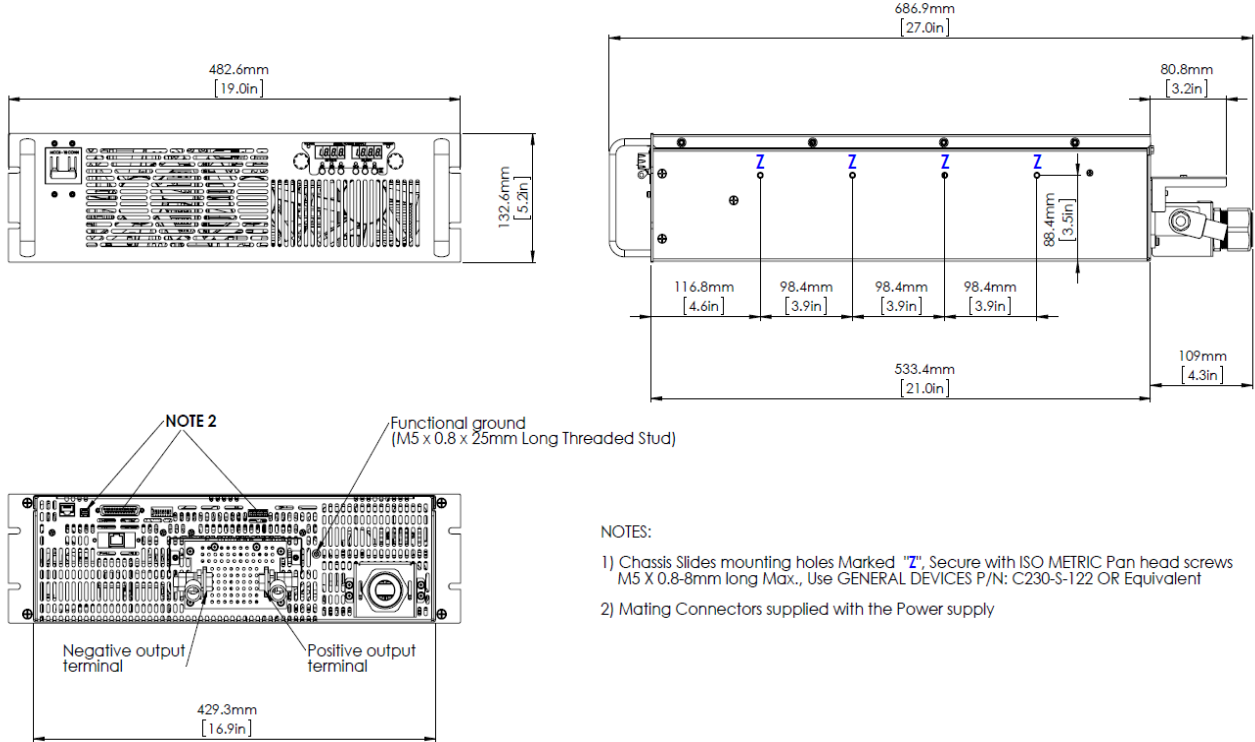
10) Certification yet to be obtained.

16.0 Reliability



With 2 years extended warranty

17.0 Outline Drawing



NOTES:

- 1) Chassis Slides mounting holes Marked "Z", Secure with ISO METRIC Pan head screws M5 X 0.8-8mm long Max., Use GENERAL DEVICES P/N: C230-S-122 OR Equivalent
- 2) Mating Connectors supplied with the Power supply

All Specifications are subject to change without notice