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BWD INSTRUMENTS

**242A
DUAL D.C.
POWER SUPPLY**

INSTRUCTION MANUAL

ISSUE 7

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INSTRUMENT HANDBOOK

MODEL bwd 242A

D.C. POWER SUPPLY

1. GENERAL

Model bwd 242A dual high stability, all Silicon Solid State D.C. Power Supply provides both Constant Voltage and Constant Current operation over the full operating range. Front panel switching enables the supply to be used up to the following ratings.

- | | |
|----------------|--------------------------|
| 1. INDEPENDENT | 2 x 0 -36V at 0 - 2 Amp. |
| 2. SERIES | 0 - 72V at 0 - 2 Amp. |
| 3. PARALLEL | 0 - 36V at 0 - 4 Amp. |

Integrated Circuit control and reliable silicon semi-conductors coupled with the advanced circuit design provide very high stabilisation and regulation with low ripple.

Using a single unit, switched to any of the three modes of operation, the output may be programmed by several sources to provide the following operation.

1. Remote Load Sensing.
2. Constant Voltage Remote Resistance Programming.
3. Constant Voltage Remote Voltage Programming.
4. Constant Current Remote Resistance Programming.
5. Constant Current Remote Voltage Programming.

With two or more units, not necessarily of the same model, (See Section 4 for list of compatible supplies) the following operational modes can be used.

6. Auto Series with two or more units.
7. Auto Tracking, +ve to +ve, +ve to -ve, -ve to -ve, using two or more units.
8. Auto Parallel with two or more units.

The MASTER SUPPLY of any of the above modes using multiple supplies may be programmed internally or by any of the modes 1 to 5.

NOTE: For reliable operation, at least 2" of free space must be left at the rear of the heatsinks to ensure free flow of air past the power devices.

2. PERFORMANCE

	<u>Independent Nos. 1 & 2.</u>	<u>Series</u>	<u>Parallel</u>
2.1 <u>Constant Voltage Output</u>	Output current should be 40mA (80mA on PARA) less than S/C current.		
Continuously variable without switching Current Range	0 - 36V 0 - 2A	0 - 72V 0 - 2A	0 - 36V 0 - 4A
Line Regulation for a 10% line change	0.002%+100 μ V	0.005%+200 μ V	0.005%+200 μ V
Output Impedance			
DC - 1kHz	1m Ω	1m Ω	1m Ω
1kHz - 10kHz	10m Ω	10m Ω	10m Ω
10kHz - 1MHz	100m Ω	100m Ω	100m Ω
Ripple at full load	2mV P-P	or	300 μ V RMS
Response Time 0 - 100% load to within 10mV of output. 20mV in Series and parallel.	60 μ Sec	60 μ Sec	100 μ Sec
Temperature Stability 0 to 50 $^{\circ}$ C	(0.01% + 2mV) per $^{\circ}$ C		
Long Term Stability 1,000 hours Constant load and temperature	0.1% + 2mV		
2.2 <u>Constant Current Output</u>	Maximum output voltage should be 100mV below O/C voltage.		
Continuously variable without switching	0 - 2.0A	0 - 2.0A	0 - 4.0A
Upper Voltage Limit	0 - 36	0 - 72	0 - 36
Line Regulation for a 10% line change	.02% + 100 μ A		
Output Impedance DC - 100Hz	100K Ω	10K Ω	10K Ω
Current Ripple	500 μ A RMS	500 μ A RMS	1mA RMS
Response Time 0V to upper voltage limit to within 4% of nominal output	See Page 8	See Page 22	See Page 34

2. PERFORMANCE (Cont'd.)

2.3 Remote Loading Sensing (Constant Voltage)

$$R_o = 2(2R_{\text{lead}})^2 \times 10^{-2} + 1 \times 10^{-3} \Omega$$

- when
- (i) All four leads (output and sensing) have identical resistance.
 - (ii) R lead is the resistance of one lead only.
 - (iii) R_o is the output resistance at the load.
 - (iv) The voltage drop across any one lead does not exceed 0.5V.

2.4 Remote Programming, Constant Voltage

- (i) Resistance Programming.
The output voltage will vary at a rate determined by the programming co-efficient $1.3\text{k}\Omega$ per volt (i.e. the output voltage will increase one volt for each $1.3\text{k}\Omega$ added in series with the programming terminals. Accuracy $\pm 10\%$.
- (ii) Voltage Programming.
The output voltage will vary in a 1 to 1 ratio with the programming voltage. Accuracy within 10mV.
Slewing Rate : $10\mu\text{S}/\text{V}$ (Current Limit set to 2A).

2.5 Remote Programming, Constant Current

- (i) Resistance Programming.
The output current will vary at a rate determined by the programming co-efficient 337Ω per amp. Accuracy $\pm 10\%$.
The upper limit on current is dependent on the constant current vernier at all times.
- (ii) Voltage Programming.
The output current will vary at a rate determined by the programming co-efficient 500mV per amp. The upper limit on current is dependent on the constant current vernier setting. Accuracy $\pm 5\%$ above 1A.

2.6 Auto Series

Two or more supplies may be connected in series noting that the maximum voltage of each supply is 36V. Also the current overloads of each supply are operative at the current set by the respective current verniers.

2.7 Auto Parallel

Two or more units may be connected in parallel, thereby doubling the available output current. The maximum current from each supply is dependent on the setting of the current vernier.

