KEPCO®
THE POWER SUPPLIER™

MODIFICATION OF STANDARD

KEPCO MODEL BOP 200-1DC

The Kepco Model BOP 200-1DC has been modified from a standard Kepco Model BOP 200-1D, to be stable handling a) capacitive loads up to 10 mF (for d-c or very low frequency output modulation) or b) capacitive loads defined by the minimum load impedance required to maintain the unit in voltage mode (typically sine, triangle and square wave output).

INSTRUCTION MANUAL CORRECTIONS:

This modification makes the BOP more suitable for a wide variety of applications such as single quadrant stable d-c operation of motors; resistive loads with a high capacitance in parallel (<10mF); solar cell/solar panel testing; piezoelectric device driving/testing; capacitor testing, capacitive; transducer driving/testing or powering industrial or lab-type applications for capacitive or capacitive-resistive loads.

Static Mode. Specifications representing the unit's accuracy in Voltage mode are identical with the standard BOP models when used in static mode with capacitive loads up to 10000µF.

Dynamic Mode. When in dynamic mode, driving a a capacitive load in Voltage mode is best to observe the following bandwidth limits to minimize output distortion:

Bandwidth Limits: sine wave: 4kHz, triangular wave: 1kHz, square wave: 700Hz,

Maximum capacitance allowed is defined as the minimum capacitance reactance (impedance) which will maintain the unit in voltage mode. This is calculated by

$X_c = V_{max}/I_{max}$

where

X_c = minimum impedance (capacitance reactance) (Ohms)

V_{max} = maximum output voltage required to preserve voltage mode (Volts)

I_{max} = maximum output current required to preserve voltage mode of operation (current limit) Amps

For BOP 200-1DC, X_c = 200/1 = 200 Ohms minimum impedance.

KEPCO, INC. ● 131-38 SANFORD AVENUE ● FLUSHING, NY. 11355 U.S.A. ● TEL (718) 461-7000 ● FAX (718) 767-1102
email: hq@kepcopower.com ● World Wide Web: www.kepcopower.com

From the impedance formula $X_C = \frac{1}{2 \times \pi \times f \times C}$

the minimum load capacitance can be calculated by

$$C = \frac{1}{2 \times \pi \times f \times X_C} \text{ where}$$

C = Maximum Load capacitance (F)
f = Output Frequency (Hz) (within bandwidth limits defined above)
X_C = 200 Ohms (as defined above for BOP 200-1DC)

Assuming a frequency of 500Hz, the maximum load capacitance C which will maintain the unit in voltage mode is

$$C = \frac{1}{2 \times \pi \times 500 \times 200} = 1.591\mu F, \text{ rounded to } 1.6\mu F$$

To keep within the dynamic waveform bandwidth limits noted above (1kHz for triangular wave, 700Hz for square wave) bandwidth can be reduced by limiting input signal frequency or by the use of an external capacitor. For BOP 200-1DC models, identified by the indicator between the two front panel meters labeled REMOTE (W DIG ON)/OUT ON (W DIG OFF), connect the external capacitor (values between 4.7nF and 470nF, minimum rating: 50V) across pins 12 and 14 of the rear programming connector. The larger the capacitance, the lower the bandwidth. A variable capacitive decade may provide precise tuning for input waveforms other then sine waves.

In Current Mode the dynamic specifications are: 3-dB bandwidth of 2.5kHz and rise/ fall time of 150µs.