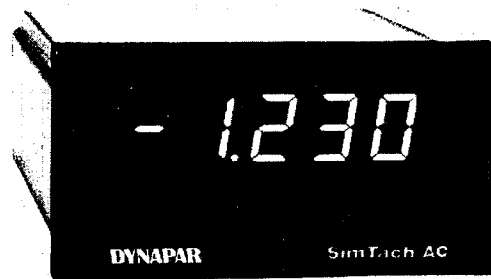


Introduction

The SimTach family of digital panel meters offers a full complement of input ranges and indicating features in a compact and economical package designed for the industrial environment.

The signed, 3-1/2 digit display provides clear indication of the machine or process variable with large, bright red LEDs. The "dead front" design offers superior contrast and allows easy readability, even at a distance. A selection of models with multiple range selections accommodate almost any DC or AC voltage and current. Setup and calibration is simplified through simple jumper selections, with provisions for scaling to display process or engineering units. Installation is convenient with pluggable terminal strip connectors.

The SimTach digital panel meters combine the latest analog-to-digital conversion circuitry and state-of-the-art construction for the most cost-effective and reliable indicators in industrial applications.



Features

- Multiple ranges: Operating range selected by jumpers
- Shallow, 4" (100mm) depth behind panel
- Pluggable terminal strip connector for easy installation and service
- Large, bright red LED display
- \pm 3-1/2 digit range with 4-1/2 digit display; indicates to 19990
- Selectable "dummy" zero in least significant digit position
- Fast or slow input filter for improved response
- Provision for scaling to display engineering units
- Built-in overrange indication
- Fits standard 1/8 DIN panel cutout
- Selectable decimal point position in display
- NEMA 4 / IP65 panel seal with panel gasket (provided)
- Heavy-duty Aluminum enclosure and panel mounting straps

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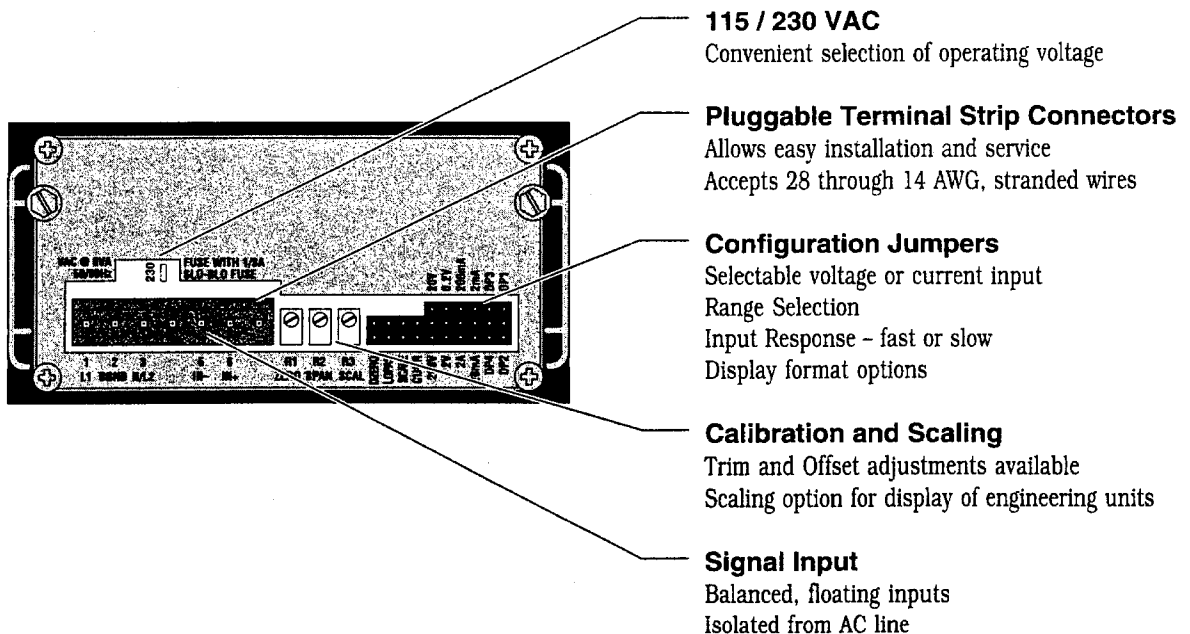
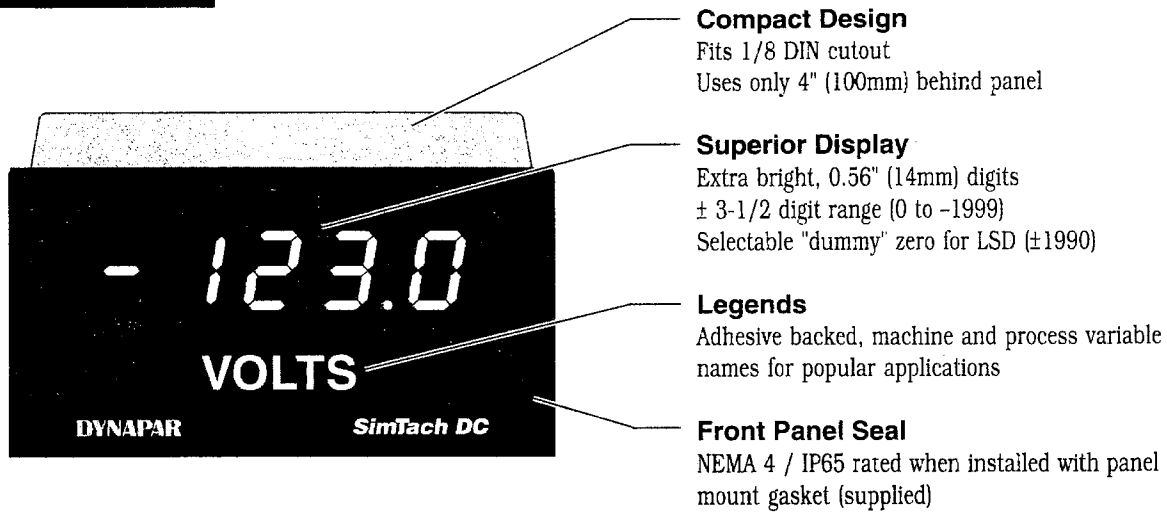
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**Technical Manual
200363**

Dynapar brand

**SimTach
Volts/Amps
Meters**

CONSTRUCTION



SPECIFICATIONS

Input Power

AC: Terminals 1 (L1) and 3 (N/L2)
95 to 130 VAC (or 190 to 260 VAC,
selectable), 50/60 Hz, 6 VA

Display

Type: 7-segment red LED
Number: 4-1/2 digits plus minus sign
Height: 0.56" (14mm)
Decimal Point: none, .X, .XX, .XXX or .XXXX
jumper selectable

Inputs

Signal Terminals 5 (-) and 6 (+)
Ranges: 0 to 0.2, 2.0, 20 or 200 volts; 0 to 2,
20, 200 or 2000 mA (jumper selectable)
Response Times (for 90% change): Fast, 0.5 sec;
Slow 2.0 sec (jumper selectable)
Impedance: 1 M Ω (0.2 V range) to 100 M Ω (200
V range) min., voltage inputs; 100 Ω max. (2
mA range) to 1 Ω (200 mA range) max.,
current inputs
Accuracy: 0.1% of full scale, ± 1 digit
Stability: ± 100 ppm/ $^{\circ}$ C
Common Mode Rejection: 80 dB at 50-60 Hz (DC
model)
Frequency Response: 10 Hz to 3 kHz (AC model)

Adjustments

Zero: approx. 100 counts
Span: approx. 100 counts at full scale
Scaling: continuously adjustable from 10 to
100% of full scale

Mechanical

Enclosure Dimensions: 3.5"x1.7" (91x44 mm)
Bezel Dimensions: 3.78"x1.98" (96x50 mm)
Panel Cutout Size: 1/8 DIN, 3.62"x1.77" (92x45
mm)
Panel Thickness: 1/16" (2 mm) to 1/2" (13 mm)
Depth Behind Panel: 4" (100 mm)

Environmental

Operating Temp.: 4 to 140 $^{\circ}$ F. (-20 to 60 $^{\circ}$ C.)
Storage Temp.: -40 to 185 $^{\circ}$ F. (-40 to 85 $^{\circ}$ C.)
Ambient Humidity: 0 to 85% noncondensing
Front Panel Seal: NEMA 4 / IP65 when installed
with panel gasket (supplied)

CAUTION:

In applications where
excessive current or surges
may be present, the signal
input should be protected
with a fast acting fuse in
series with the input.

CONFIGURATION

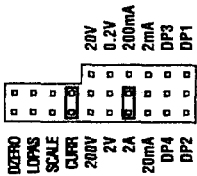
Input Range Selection

Place a jumper on a pair of pins next to one of the four voltage ranges; choose the range that is higher than the maximum expected signal level.

For current inputs, jumper one of the four current ranges, AND add a jumper to the CURR pin pair.

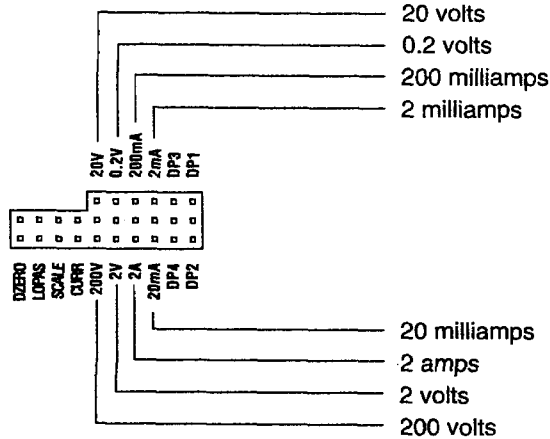
EXAMPLE:

The jumper on the pin pair, shown below, configures the input for a 2A range.



NOTE:

Also jumper the CURR pin pair when selecting a current range.



Display Options

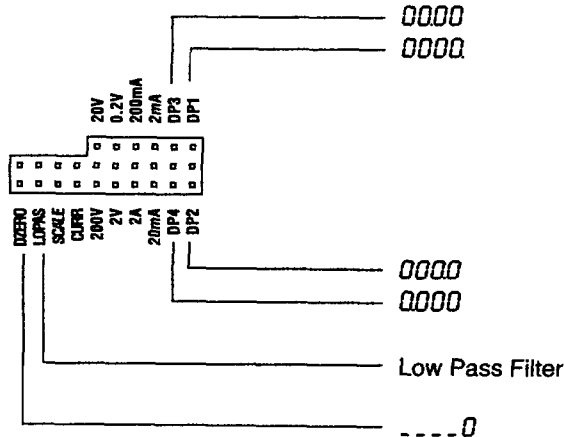
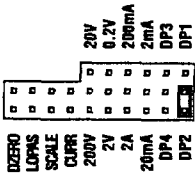
Place a jumper on a pair of pins next to one of the four DPx decimal point options to add a decimal point to the display.

A jumper may be added on the LOPAS pair of pins to filter the input and "slow down" the response to a rapidly changing input.

Jumper the pair of pins next to DZERO position to set the least significant digit to 0.

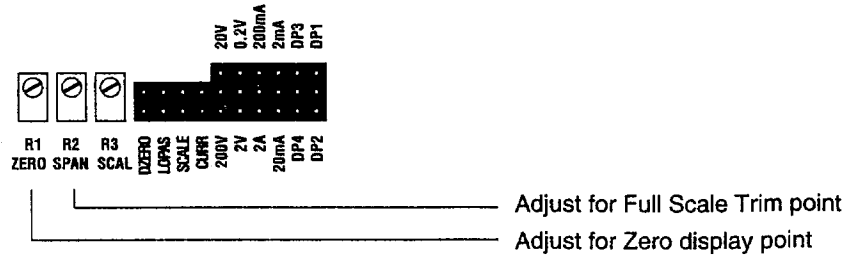
EXAMPLE:

The jumper on the pin pair, shown below, configures the display to show two decimal places.



Calibration and Adjustments

Although calibrated at the factory, the units may be adjusted for Zero and Full Scale. Each potentiometer provides approximately a 100 count range around the 0 and full scale display.

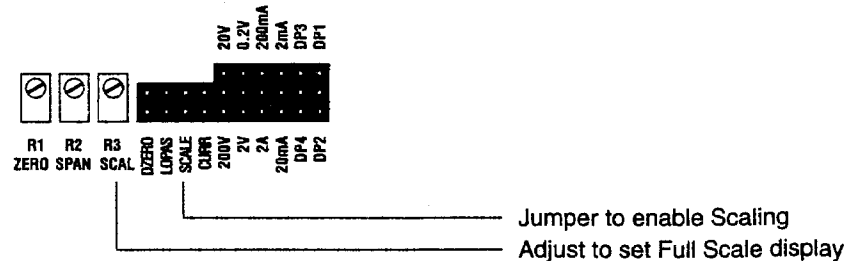


NOTE:
For the best accuracy, repeat the Zero, Span and Scaling adjustments.

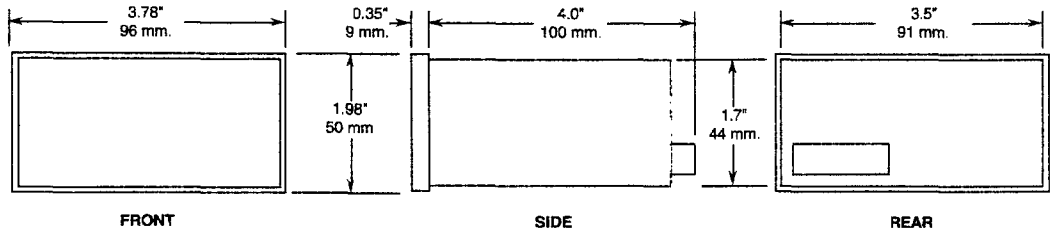
Display Scaling

The Full Scale display may be adjusted to read engineering units rather than simple voltage or current.

Enable scaling with a jumper on the pair of pins next to SCALE, then apply a signal input and adjust the SCAL pot to show the desired value.



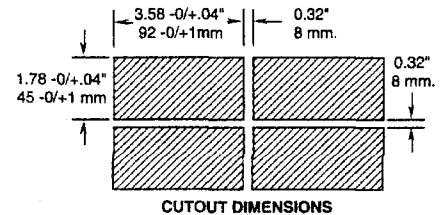
PANEL MOUNTING



Panel Mounting

Make a panel cutout as shown in the diagram at right. Observe proper clearances when installing multiple units. If the installation requires a front panel seal, apply the adhesive gasket (included with the unit) to the outside of the panel.

Next, slide the unit through the cutout. Insert the panel mounting straps into the slotted guides in the enclosure. Tighten the 5/8" long hex washer head screws securely with a 3/16" hex driver. **DO NOT** over-tighten!



WIRING

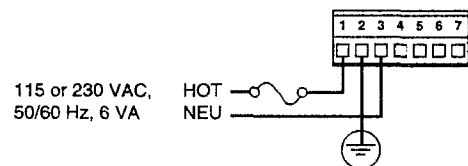
WARNING!
In installation and use of this product, comply with the national electrical code; federal, state and local codes, and any other applicable safety codes. In addition, turn off power and take other necessary precautions during installation, service and repair to prevent personal injury, property loss and equipment damage.

AC Power Input

Select 115 or 230 VAC operation with a flat blade screwdriver through the panel cutout (unit is shipped set for 230 VAC).

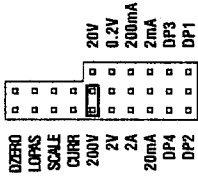
Connect AC power to terminal 1 (L1) through a 1/8 A., "slow blow" type fuse and to terminal 3 (N/L2), as shown in the diagram on the right. Connect terminal 2 (BGND) to Building (Earth) Ground.

AC power should be from a separate branch circuit that is noise-free and does not feed heavy loads.



NOTE:

When using a voltage input, select one of the four ranges (0.2V, 2V, 20V or 200V).

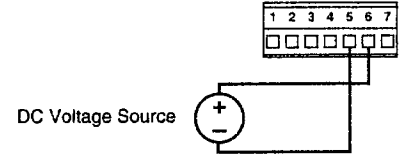


DC Voltage Input

Select the appropriate range by placing a jumper on the two pins next to the voltage desired.

For DC Voltage indication, connect the signal input to terminal 6 (+) and terminal 5 (-) as shown on the right.

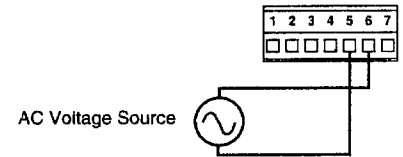
If a negative value is displayed, reverse the + and - connections.



AC Voltage Input

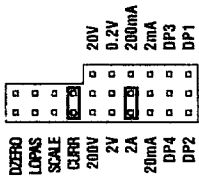
Select the appropriate range by placing a jumper on the two pins next to the voltage desired.

For AC Voltage indication, connect the signal input to terminal 6 (+) and terminal 5 (-) as shown on the right.



NOTE:

When using a current input, select one of the four ranges (2mA, 20mA, 200mA or 2A), and jumper the CURR pin pair.

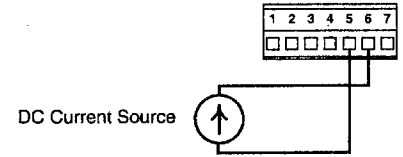


DC Current Input

Select the appropriate range by placing a jumper on the two pins next to the current desired and the CURR pin pair.

For DC Current indication, connect the signal input to terminal 6 (+) and terminal 5 (-) as shown on the right.

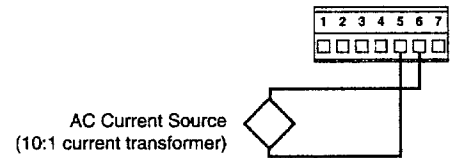
If a negative value is displayed, reverse the + and - connections.



AC Current Input

Select the appropriate range by placing a jumper on the two pins next to the current desired and the CURR pin pair.

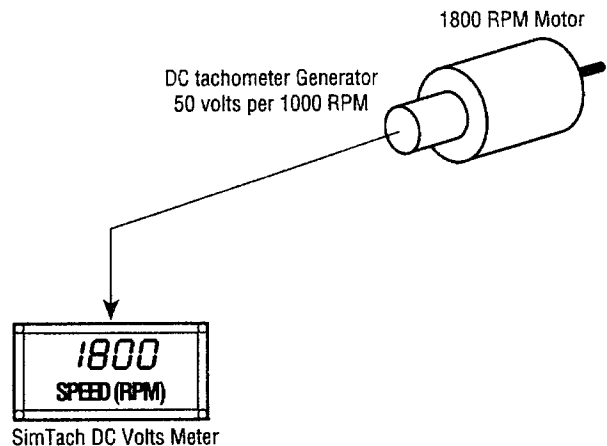
For AC Current indication, connect the signal input to terminal 6 (+) and terminal 5 (-) as shown on the right.



CAUTION:

In applications where excessive current or surges may be present, the signal input should be protected with a fast acting fuse in series with the input.

ACTUAL SPEED



OBJECTIVE

Use a SimTach DC voltmeter (model number ST B S 0) to monitor a tachometer-generator signal and display the actual running speed of a motor.

BACKGROUND

A tachometer-generator (tach) provides a DC voltage output that is proportional to shaft speed. In this example, the output signal is 50 volts per 1,000 RPM. Mount the tach directly on the motor and couple the tach and motor with a flexible shaft coupling.

SETUP

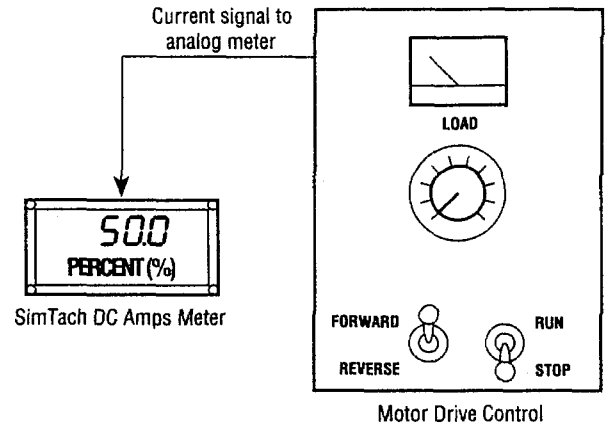
Connect the tach output signal to the (+) and (-) terminals of the meter. If negative numbers are displayed, reverse the (+) and (-) connections. Use a jumper to select the 200V range, since the motor rating of 1800 RPM will produce 90 volts at the tach output:

$$1800 \text{ RPM} \times (50 \text{ volts} \div 1,000 \text{ RPM}) = 90 \text{ volts}$$

Enable display scaling by placing a jumper on SCALE. Run the motor near maximum and read the motor speed with a handheld tachometer or the tacho voltage with a voltmeter. Adjust the R3 SCALE potentiometer clockwise to increase the reading or counter-clockwise to decrease the reading until it matches the known motor speed.

Do not jumper the DZERO (dummy zero) or DPx (decimal points) to set the display format to XXXX. For smoother response to speed variations or fluctuations, select the LOPAS (low pass filter) operation with a jumper.

MOTOR LOAD



OBJECTIVE

To provide a digital display of the percentage of motor load, use a SimTach DC Amps meter (model ST B S 0) driven by the motor drive analog meter signal.

BACKGROUND

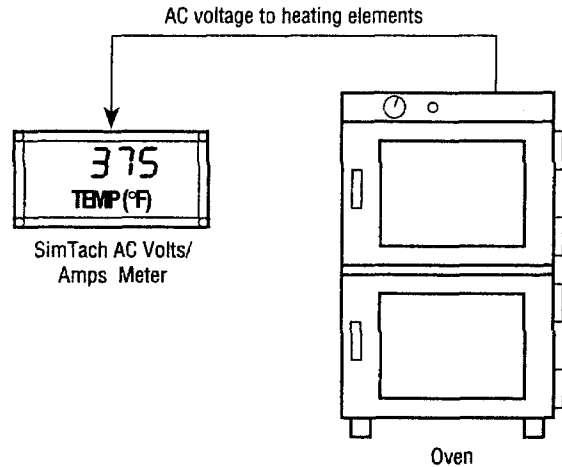
The analog meter uses a 0–1 mA signal internally provided by the control. Connect the SimTach inputs in series by removing the + signal from the analog meter and routing it to the (+) terminal. Connect the (-) terminal back to the + signal of the analog meter. If negative numbers are displayed, reverse the connections at the (+) and (-) terminals of the SimTach.

SETUP

Use jumpers to select CURR input and a 2mA range, since the maximum current to the analog meter is 1mA. The 1mA signal will generate a display reading of 1000. Select the DP2 (decimal point 2) option to have the display readout XXX.X percent.

Do not jumper the DZERO (dummy zero) or SCALE (display scaling). For smoother response to speed variations or fluctuations, select the LOPAS (low pass filter) operation with a jumper.

OVEN TEMPERATURE



OBJECTIVE

To add a display of oven temperature setting, use a SimTach AC Volts/Amps meter (model ST C S 0).

BACKGROUND

The temperature of this electric oven is set by a phase control circuit, which changes the AC voltage applied to the oven's heater elements. The range of voltage is 100 to 200 VAC, representing temperature settings from 250°F to 500°F.

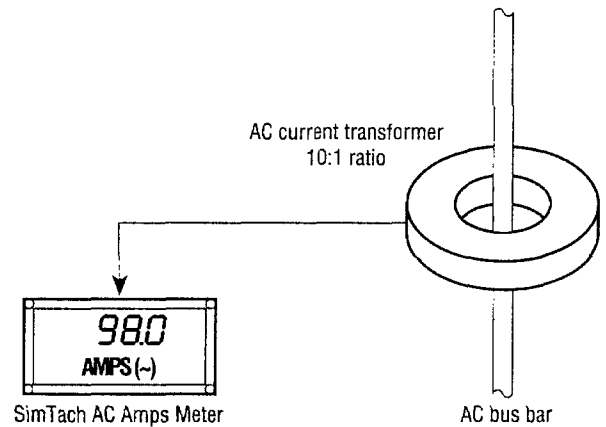
SETUP

Connect the power leads going to the heater elements to the (+) and (-) terminals of the meter. Select the 200V range with a jumper to allow for the maximum input voltage of 200VAC.

Enable display scaling by placing a jumper on SCALE. Use a thermometer or voltmeter and temperature probe to adjust the R3 SCALE potentiometer to have the meter read 500 when the oven temperature is set to 500°F.

Do not jumper the DZERO (dummy zero) or DPx (decimal points) to set the display format to XXX. For smoother response to speed variations or fluctuations, select the LOPAS (low pass filter) operation with a jumper.

AC BUSS CURRENT



OBJECTIVE

To provide a monitor of AC current through a power buss, use an AC current transformer and a SimTach AC Amps meter (model ST C S 0).

BACKGROUND

An AC current transformer allow sensing of a high AC current by generating a smaller proportional current. The proportion is specified in the turns ratio; a turns ration of 100:1 means that 1 Amp is generated when 100 Amps is being sensed.

SETUP

Select and install an appropriate AC current transformer. Connect the signal leads to the meter (+) and (-) terminals. For a maximum input of 1 Amp, select CURR operation and 2000mA (2 Amp) range. Since 1 Amp will generate a display reading of 1000, select the DP2 (decimal point 2) option to have the display readout XXX.X Amps.

Do not jumper the DZERO (dummy zero) or SCALE (display scaling). For smoother response to speed variations or fluctuations, select the LOPAS (low pass filter) operation with a jumper.

ORDERING INFORMATION

Model	Description
ST B S 0	SimTach DC Volts/Amps Meter
ST C S 0	SimTach AC Volts/Amps Meter

Model	Description
ST L S 0	SimTach Current Loop Meter
ST L S 1	SimTach Current Loop Meter with excitation supply
ST P S 0	SimTach Process Volts Meter
ST P S 1	SimTach Process Volts Meter with excitation supply

WARRANTY

Standard products manufactured by the Company are warranted to be free from defects in workmanship and material for a period of one year from the date of shipment, and products which are defective in workmanship or material will be repaired or replaced, at the option of the Company, at no charge to the Buyer. Final determination as to whether a product is actually defective rests with the Company. *The obligation of the Company hereunder shall be limited solely to repair and replacement of products that fall within the foregoing limitations, and shall be conditioned upon receipt by the Company of written notice of any alleged defects or deficiency promptly after discovery within the warranty period, and in the case of components or units purchased by the Company, the obligation of the Company shall not exceed the settlement that the Company is able to obtain from the supplier thereof. No* products shall be returned to the Company without its prior consent. Products which the Company consents to have returned shall be

shipped F.O.B. the Company's factory. The Company cannot assume responsibility or accept invoices for unauthorized repairs to its components, even though defective. The life of the products of the Company depends, to a large extent, upon the type of usage thereof, and THE COMPANY MAKES NO WARRANTY AS TO FITNESS OF ITS PRODUCTS FOR SPECIFIC APPLICATIONS BY THE BUYER NOR AS TO PERIOD OF SERVICE UNLESS THE COMPANY SPECIFICALLY AGREES OTHERWISE IN WRITING AFTER THE PROPOSED USAGE HAS BEEN MADE KNOWN TO IT.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

SERVICE

If this product requires service, call the number below for an Return Material Authorization (RMA) number, pack it in a sturdy carton with the RMA number clearly marked on the outside, and ship prepaid to: Service Department at the address below.

Please Include:

1. A description of problem
2. The name of responsible person
3. Your purchase order number
4. Your return shipping instructions