

PHM-100

PORTABLE HANDHELD TRANSDUCER INDICATOR

OPERATORS MANUAL



Transducer
Techniques®

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I. DESCRIPTION

The PHM-100 is a portable, hand-held digital indicator for strain gage bridge type transducers such as load cells, torque sensors and pressure sensors. It provides bridge excitation, balance and span adjustment, shunt calibration, decimal point selection and digital display. When PEAK HOLD is in the ON position, the highest static or dynamic signal is captured in less than one millisecond and displayed until reset. The PHM-100 operates on a standard 9 volts battery for 60 hours and indicates if the battery is low.

II. SET UP PROCEDURE

Method 1: Shunt calibration with TTI transducers.

1. Plug in transducer (see Fig.2 for transducer connector wiring schematic).
2. Turn on the power via ON/OFF slide switch (located on right side).
3. Turn off the PEAK HOLD switch.
4. The gain is factory set for a transducer with a maximum 2mV/V output, as shown in Fig.3,d. Refer to Fig.3,b,c for the proper setting for a 2 to 20mV/V output transducer.
5. With zero load applied to the transducer, rotate the BAL potentiometer towards + or - in order to obtain 0000 on the display.
6. Depress CALIBRATION button (CALIBRATION button to remain depressed through step 6). Adjust the SPAN potentiometer to display the engineering unit equivalent for a 87.325 KOHms shunt resistor, as stated on the TRANSDUCER TECHNIQUES sample CERTIFICATE OF CALIBRATION, Fig. 1, Example 1, supplied with TTI transducers. Release CALIBRATION button.
7. Repeat steps 5 and 6, if necessary.
8. Place the decimal point, via DECIMAL POINT switch, as follows:

DECIMAL POINT

Switch Position	Reading Format
0	XXXXX
1	XXXX.X
2	XXX.XX
3	XX.XXX
4	X.XXXX

Release CALIBRATION button.

Fig. 1

```
<<<  CERTIFICATE OF CALIBRATION  >>>

SERIAL NUMBER:      SAMPLE CERTIFICATE   DATE OF CALIBRATION:  11/11/1993
SENSOR MODEL:       HSW-20K              DATE OF RECALIBRATION: 11/11/1994
JOB NUMBER:         0
TECHNICIAN:         AE

      TENSION          MV/V          MV/V
      LOAD            INC.          DEC.
      LBS.

      0                0              0
    10000             1.0026         1.0031
    20000             2.0051

NON-LINEARITY          .03          PCT FS
NON-REPEATABILITY      .02          PCT FS
HYSTERESIS              .03          PCT FS

      <<  SHUNT CALIBRATION  >>

      PCT      LOAD      SIGNAL      SHUNT      SHUNT
      LOAD      LBS      MV/V      K OHMS      PINS
      50.2      10034.4  1.0060      87.325      (-E, -S)
    100.3      20068.8  2.0120      43.575      (-E, -S)

      <<  DIGITAL PANEL METER MODEL DPM-2 SCALE FACTOR >>
      DPM-2 SCALE FACTOR      .0000

* CALIBRATION COMPUTED FROM THREE (3) RUNS INCREASING AND DECREASING.
* TRACEABLE TO NIST TEST # 57914
* CALIBRATION PERFORMED AT 10 VDC
* MAXIMUM BRIDGE EXCITATION 12 VDC

      WIRING
      COLOR CODE
=====
      RED  +EXCITATION
      BLK  -EXCITATION
      GRN  +SIGNAL
      WHT  -SIGN
```

Example 1

METHOD 2 Using a known load (Dead Weight calibration).

1. Follow Method 1, steps 1 through 5.
2. Apply a known load (dead weight) to the transducer.
3. Adjust the span potentiometer to display engineering unit equivalent
4. Place decimal point (see decimal point for Reading Format options Method 1, step 8).
5. Remove known load (dead weight) and readjust bal potentiometer, if necessary.

Fig. 2

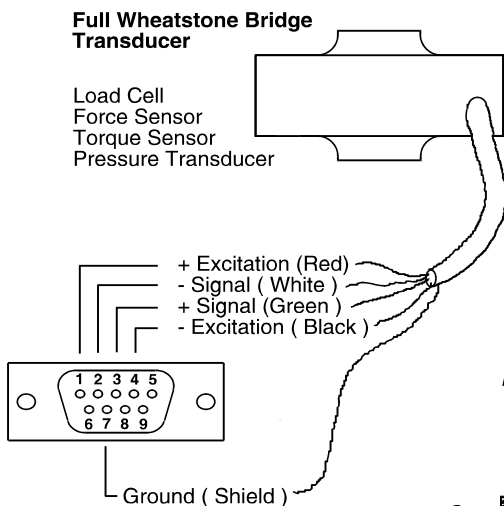
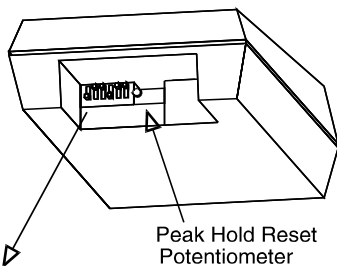


Fig. 3



- a** Inverting Polarity
0 To 2 mV/V
- b** Inverting Polarity
2 To 20 mV/V
- c** Non Inverting Polarity
2 To 20 mV/V
- d** Non Inverting Polarity
0 To 2 mV/V

III. CONTINUOUS MODE

1. Complete the set up procedures.
2. Set the polarity switch for positive transducer output voltage, Fig. 3.
3. Apply load to the transducer.

IV. PEAK HOLD MODE

After completing the set up procedure the unit is ready to function in the peak hold mode:

1. Set the Polarity Switch as follows:
 - a. Positive transducer output voltage - Fig. 3,c,d.
 - b. Negative transducer output voltage - Fig. 3,a,b.
2. Turn ON PEAK HOLD mode.
3. Depress and release RESET button (see NOTE).
4. Apply load to the transducer.
5. Read peak value of the measurement.
6. For next evaluation start with step 3.

NOTE:

If the reset action does not bring the display to zero + 6 counts, then adjust potentiometer in the battery compartment, fig. 3, and reset the unit again. Clockwise adjustment increases the number and counter clockwise adjustment decreases.

V. TROUBLESHOOTING

THIS INSTRUMENT CONTAINS NO USER SERVICEABLE PARTS
SERVICE SHOULD BE PERFORMED ONLY BY TRANSDUCER TECHNIQUES INC

SYMPTOM / PROBLEM	ACTION
Blank display with power on	Check battery connections Replace battery
Balance does not respond	Check connector wiring (Fig. 2) Check polarity switch settings (Fig. 3)
Peak hold is inactive	Turn peak hold switch on Depress reset button Reverse signal polarity via polarity switch (Fig.3).

TECHNICAL SUPPORT
(800) 344-3965
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VI. SPECIFICATIONS

Signal Conditioner

Type: Full external bridge
Bridge Resistance: 350 to 1000 Ohms
Balance Range: 40% of full scale
Shunt Calibration: Push button, single point,
shunt resistance of 87.325 KOhms

Bridge Amplifier

Type: Bipolar differential
Input Sensitivity: HIGH: 2mV for 19999 counts min.
LOW: 20mV for 19999 counts min.
(via gain switch)
Display Adjust: 0 to full scale

Peak Capture

Type: Analog
Response Time: Less than 1ms
Droop Rate: 0.15%/min max.
(approx. 28 counts at full scale)
Capture Sense: Bidirectional
(via polarity switch)

Bridge Excitation

Type: Constant voltage
Output: 1.21VDC
Output Current: 15mA, short circuit protection

General

Nonlinearity: 1 count full scale
Scale Factor Tempco: 7ppm/C max.
Noise: 2 counts max.
Balance Stability: 0.2% for 8 hours
Operating Temperature: 0 to 50 C
Size: 5.7 x 3.1 x inches
Weight: 0.6 lbl. approx.
Connector: 9 pins D connector
Power: 9 VDC battery for 60 hours,
low battery annunciator

WARRANTY / REPAIR POLICY

Limited Warranty on Products

Any of our products which, under normal operating conditions, proves defective in material or in workmanship within one (1) year from the date of shipment by Transducer Techniques, will be repaired or replaced free of charge provided that you obtain a return material authorization from Transducer Techniques and send the defective product, transportation charges prepaid with notice of the defect, and establish that the product has been properly installed, maintained, and operated within the limits of rated and normal usage.

Replacement product will be shipped F.O.B. our plant. The terms of this warranty do not extend to any product or part thereof which, under normal usage, has an inherently shorter useful life than one year. The replacement warranty detailed here is the Buyer's exclusive remedy, and will satisfy all obligations of Transducer Techniques, whether based on contract, negligence, or otherwise. Transducer Techniques is not responsible for any incidental or consequential loss or damage which might result from a failure of any Transducer Techniques product. This express warranty is made in lieu of any and all other warranties, express or implied, including implied warranty of merchantability or fitness for particular purpose. Any unauthorized disassembly or attempt to repair voids this warranty.

Obtaining Service Under Warranty

Advance authorization is required prior to the return to Transducer Techniques. Before returning the items either write to the Repair Department c/o Transducer Techniques, 42480 Rio Nedo, Temecula, CA 92590, or call (909) 719-3965 with: 1) a part number; 2) a serial number for the defective product; 3) a technical description of the defect; 4) a no-charge purchase order number (so products can be returned to you correctly); and, 5) ship to and bill to addresses. Shipment to Transducer Techniques shall be at Buyer's expense and repaired, or replacement items will be shipped F.O.B. our plant in Temecula, CA. Non-verified problems or defects may be subject to a \$75 evaluation charge. Please return the original calibration data with the unit.

Obtaining Non-Warranty Service

Advance authorization is required prior to the return to Transducer Techniques. Before returning the items, either write to the Repair Department c/o Transducer Techniques, 42480 Rio Nedo, Temecula, CA 92590, or call (909) 719-3965 with: 1) a model number; 2) a serial number for the defective product; 3) a technical description of the malfunction; 4) a purchase order number to cover Transducer Techniques' repair cost; and, 5) ship to and bill to addresses. After the product is evaluated by Transducer Techniques, we will contact you to provide the estimated repair costs before proceeding. The minimum evaluation charge is \$75. Shipment to Transducer Techniques shall be at Buyer's expense and repaired items will be shipped to you F.O.B. our plant in Temecula, CA. Please return the original calibration data with the unit.

Repair Warranty

All repairs of Transducer Techniques' products are warranted for a period of 90 days from the date of shipment. This warranty applies only to those items which were found defective and repaired; it does not apply to products in which no defect was found and returned as is, or merely recalibrated. Out of warranty products may not be capable of being returned to the exact original specifications or dimensions.

FOR TECHNICAL SUPPORT, CALL

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Load Cells Force/Torque Sensors TM

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MADE IN U.S.A.

SEP/01