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INITIAL CHECKOUT PROCEDURE

See Section 2.1 for Unpacking and Inspection instructions.

CAUTION

Meters are internally connected for either 115V or 230V AC power, or 5V DC power. Check label on meter for proper supply voltage.

REQUIRED EQUIPMENT

1. 115V or 230V 50-60 Hz power source (6 watts) or 5V DC at 900mA.
2. Three wire AC power cord, or two wire DC power cord.
3. Flat blade screwdriver (1/4" blade).
4. Piece of copper buss wire.
5. 100 Ohm resistor.

TEST EQUIPMENT

1. Connect AC power as follows: (See Figure 1)
   a. AC power HI (Blk) to TB1-1.
   b. AC power LO (Wht) to TB1-2.
   c. AC power GND (Grn) to TB1-3.
2. Connect DC power (Option C3) as follows: (See Figure 1)
   a. +5V DC to TB1-2.
   b. 5V DC Return to TB1-3.
3. For Thermocouple Meters connect a piece of copper wire between TB1-5 and TB1-6.
4. Apply power and examine the display. The readout should show the approximate ambient temperature in °C or °F as applicable.
5. For RTD meters connect a 100 Ohm resistor between TB1-5 and TB1-6. Then connect a piece of copper wire between TB1-4 and TB1-5.
6. Apply power and examine the display. The readout should show approximately zero.
SECTION 1
DESCRIPTION

1.1 General

The Newport Model 267B Digital Pyrometers are low cost, reliable instruments which digitally display the magnitude of a wide range of thermocouple inputs in degrees of celsius or fahrenheit.

A single plug-in range module contains all the signal conditioning for a specific thermocouple or platinum RTD. Modules are precalibrated at the factory and require no additional calibration when installed on the 267B main board. Less than five minutes is required to change ranges in the field.

The Model 267B is a line-operated meter with 14.2mm high 7 segment LED readout. The housing is an unbreakable thermoplastic case. Zero adjustment is easily accessible with the lens removed.

Accuracy at the low end of each range is not degraded by normal mode noise because the 267B performs true bipolar signal integration around zero.

Data output lines are parallel BCD, compatible with TTL and DTL. External control signals are also TTL and DTL compatible and increase the flexibility and ease of interfacing the Model 267B with other instruments.
1.2 Specifications

1.2.1 Input

Configuration ............... Potentiometric and isolated.

Polarity .................... Bipolar with negative sign.

Zero ......................... Automatic with negligible long term drift. Thermal emf's from input terminals, signal conditioning and basic meter is less than 0.5uV/°C.

Full Scale Voltage .......... 20mV to 200mV

Overvoltage Protection ..... 130V RMS for TC or 6Vp for RTD without damage.

Impedance

RTD .......................... 1000 Megohm

TC ............................ 100 Megohm

TC Break Detection .......... 66 Nanoamps current source with 100 Megohm impedance.

Lead Resistance

TC ............................ 250 Ohms max for rated TC accuracy.

RTD ............................ 10 Ohms Maximum per conductor. Add 0.012% R per Ohm for 0.01° resolution and 0.005% R per Ohm for 0.1° resolution to overall RTD accuracy.

NMR @ 50/60 Hz ............... 60dB

CMR with 250 Ohm Imbalance ... 120dB AC power to Signal low. 120dB Digital Gnd to Signal low.

CMV (DC to 60 Hz) .......... 500 volts peak.

NOTE: ADDING C3 OPTION INCREASES INPUT NOISE ONE MICROVOLT.
1.2.2 Signal Conditioning

TC Reference Junction ........ From 10-40°C ambient, 0.03 deg/deg for base metals and 0.05 deg/deg for noble metals with 1 degree resolution. 0.015 deg/deg for base metals with 0.1 resolution. Sensor offset adjusted to zero from front panel.

RTD Bridge Network ........... From 10-40°C ambient, 0.01 deg/deg for platinum with 0.1 and 1.0 degree resolution and 0.0025 deg/deg for platinum with 0.01 degree resolution. Adjustment of Sensor offset to zero from panel automatically corrects meter calibration for RTD resistance deviations from the nominal 100 Ohm value.

Span Tempco ................. From 10-40°C

Thermocouple ............... 0.006% R/Deg

RTD

0.1° and 0.01°
Resolution ............... 0.0007% R/Deg
1° Resolution ............... 0.006% R/Deg

1.2.3 Conversion

Technique ...................... TC-Dual Slope, average value RTD-Dual Slope Ratiometric, average value.

Signal Integration .......... 100ms

Reading Rate ................. Int. 3-4/sec, Ext 0 to 3-4/sec.

Linearization ............... POLYLOG (patent applied for)
1.2.4 Display

Type ..................... 14.2mm, 7 segment LED
Symbols ..................... -88.8.8
Decimal Points .............. Any of Three
Overload ..................... 3 Least Significant Digits flash.
Leading Zero Blanking ...... 2 Most Significant Digits blank

1.2.5 Digital Signals

Logical '0' ..................... 0 to .6V (Input)
                              0 to .4V (output)
Logical '1' ..................... 2.4 to 5.5V (Input)
                              2.4 to 5.5V (Output)
1 Unit Load ..................... Logical '0' 1.6mA
                             Logical '1' .04mA

Hold .......................... '0' = Hold data
                             Input load = 1 Unit load

Data Ready ........................ '0' = Valid data
                                  Output drive = 3 Unit loads

BCD Parallel Data .............. '1' = True
                              Output drive = 3 Unit loads

+ Polarity ...................... '1' = Positive
                              Output drive = 1 Unit load

Overload ........................ '1' = Overload output drive = 3 Unit loads

1.2.6 Power

Input Voltage ..................... 115V +10% 50/60 Hz
                                  230V +10% 50/60 Hz Option C1
                                  100V +10% 50/60 Hz Option C5
                                  5V DC +5% @ 900mA Option C3

Input Power ..................... 6 watts @ nominal input

Output Voltage ..................... +4.5V to 5.1V @ 50mA without options
1.2.7 General

Operating Temperature ........ 0°C to 50°C
Storage Temperature ........ -25°C to 70°C
Humidity ...................... Up to 95% at 40°C
Weight ......................... 540g or 1.2 lb.
Case Material ................. Thermoplastic per UL 94V-1

Case Size

Bezel (W x H x T) .......... (96 x 48 x 5.08)mm or
................................ (3.78 x 1.89 x 0.20) in.

Depth Behind Bezel
With Connector ............... 135.4mm or 5.33 in.

Panel Cutout (W x H) ..... (92 x 45)mm or
................................ (3.62 x 1.77) in.

Connectors ..................... Barrier Strip, Signal and
Power. 36 Pin connector,
BCD output. 36 Pin connector
options. (SAE SCC 78D/1-2
ELCO 00-6007-036-450-012,
TRW/CINCH 251-18-90-160)
### Temperature Sensor Ranges & Accuracy at 25°C

<table>
<thead>
<tr>
<th>SENSOR TYPE</th>
<th>MATERIAL</th>
<th>RANGE</th>
<th>CONFORMITY ERROR</th>
<th>OVERALL ERROR ±1/2 LSD</th>
<th>RESOLUTION</th>
<th>RANGE OPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Iron</td>
<td>-120 to +760°C</td>
<td>±0.78°C</td>
<td>±1.2°C</td>
<td>1°C</td>
<td>JC1</td>
</tr>
<tr>
<td></td>
<td>Constantan</td>
<td>-200 to +1400°F</td>
<td>±1.0°C</td>
<td>±1.7°F</td>
<td>1°F</td>
<td>JF1</td>
</tr>
<tr>
<td>K</td>
<td>Chromel</td>
<td>-155 to +1370°C</td>
<td>±1.0°C</td>
<td>±1.7°C</td>
<td>1°C</td>
<td>KC1</td>
</tr>
<tr>
<td></td>
<td>Alumel</td>
<td>-225 to +2500°F</td>
<td>±1.3°C</td>
<td>±2.5°F</td>
<td>1°F</td>
<td>KF1</td>
</tr>
<tr>
<td>T</td>
<td>Copper</td>
<td>-200 to 0°C</td>
<td>±2.0°C</td>
<td>±2.7°C</td>
<td>1°C</td>
<td>TC1</td>
</tr>
<tr>
<td></td>
<td>Constantan</td>
<td>0 to +400°C</td>
<td>±0.58°C</td>
<td>±0.78°C</td>
<td>1°C</td>
<td>TC2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-90.0 to +400.0°C</td>
<td>±0.13°C</td>
<td>±0.33°C</td>
<td>0.1°C</td>
<td>TC2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-150.0 to +750.0°F</td>
<td>±0.19°C</td>
<td>±0.56°F</td>
<td>0.1°F</td>
<td>TC2</td>
</tr>
<tr>
<td>E</td>
<td>Chromel-</td>
<td>-145 to +1000°C</td>
<td>±0.95°C</td>
<td>±1.5°C</td>
<td>1°C</td>
<td>EC1</td>
</tr>
<tr>
<td></td>
<td>Constantan</td>
<td>-100.0 to +400.0°C</td>
<td>±0.11°C</td>
<td>±0.33°C</td>
<td>0.1°C</td>
<td>EC2</td>
</tr>
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<td></td>
<td></td>
<td>-250 to +1830°F</td>
<td>±1.33°F</td>
<td>±2.2°F</td>
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<td>EF1</td>
</tr>
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<td></td>
<td>-110.0 to +400.0°F</td>
<td>±0.1°F</td>
<td>±0.3°F</td>
<td>0.1°F</td>
<td>EF2</td>
</tr>
<tr>
<td>R</td>
<td>13% Rhodium-Pt</td>
<td>-50 to +1750°C</td>
<td>±2.48°C</td>
<td>±3.4°C</td>
<td>1°C</td>
<td>RC1</td>
</tr>
<tr>
<td></td>
<td>Pt vs Pt</td>
<td>-58 to +3180°F</td>
<td>±5.5°F</td>
<td>±7.0°F</td>
<td>1°F</td>
<td>RF1</td>
</tr>
<tr>
<td>S</td>
<td>10% Rhodium-Pt</td>
<td>-50 to +1750°C</td>
<td>±2.1°C</td>
<td>±3.0°C</td>
<td>1°C</td>
<td>SC1</td>
</tr>
<tr>
<td></td>
<td>Pt vs Pt</td>
<td>-58 to +3180°F</td>
<td>±5.5°F</td>
<td>±7.0°F</td>
<td>1°F</td>
<td>SF1</td>
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<tr>
<td>B</td>
<td>Platinum 30%</td>
<td>+250 to +1800°C</td>
<td>±2.85°C</td>
<td>±3.8°C</td>
<td>1°C</td>
<td>BC1</td>
</tr>
<tr>
<td></td>
<td>Rhodium vs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Platinum 6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rhodium</td>
<td>+500 to +3300°F</td>
<td>±4.8°F</td>
<td>±6.5°F</td>
<td>1°F</td>
<td>BF1</td>
</tr>
<tr>
<td>W</td>
<td>W5% Re-</td>
<td>0 to +2200°C</td>
<td>±3.6°C</td>
<td>±4.7°C</td>
<td>1°C</td>
<td>WC2</td>
</tr>
<tr>
<td></td>
<td>W26% Re-</td>
<td>0 to +4000°F</td>
<td>±6.4°F</td>
<td>±8.5°F</td>
<td>1°F</td>
<td>WF2</td>
</tr>
<tr>
<td></td>
<td>Chromel vs</td>
<td>-268.0 to +51.0°C</td>
<td>±0.32°C</td>
<td>±0.55°C</td>
<td>0.1°C</td>
<td>GC1</td>
</tr>
<tr>
<td></td>
<td>Au-0.07 at %Fe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTD</td>
<td>DIN</td>
<td>-200.0 to +780.0°C</td>
<td>±0.05°C</td>
<td>±0.44°C</td>
<td>0.1°C</td>
<td>PC1</td>
</tr>
<tr>
<td></td>
<td>NBS</td>
<td>-200.0 to +630.0°C</td>
<td>±0.05°C</td>
<td>±0.35°C</td>
<td>0.1°C</td>
<td>PC2</td>
</tr>
<tr>
<td></td>
<td>DIN</td>
<td>-20.00 to +78.00°C</td>
<td>±0.005°C</td>
<td>±0.044°C</td>
<td>0.1°C</td>
<td>PC3</td>
</tr>
<tr>
<td></td>
<td>NBS</td>
<td>-20.00 to +78.00°C</td>
<td>±0.005°C</td>
<td>±0.044°C</td>
<td>0.1°C</td>
<td>PC4</td>
</tr>
<tr>
<td></td>
<td>Pt US Std</td>
<td>-200.0 to +78.00°C</td>
<td>±0.05°C</td>
<td>±0.44°C</td>
<td>0.1°C</td>
<td>PC5</td>
</tr>
<tr>
<td></td>
<td>100 Ω US Std</td>
<td>-20.00 to +78.00°C</td>
<td>±0.005°C</td>
<td>±0.044°C</td>
<td>0.1°C</td>
<td>PC6</td>
</tr>
<tr>
<td></td>
<td>NBS</td>
<td>-330 to +1160°F</td>
<td>±0.5°F</td>
<td>±1.1°F</td>
<td>1°F</td>
<td>PF1</td>
</tr>
<tr>
<td></td>
<td>US Std</td>
<td>-200.0 to +78.00°F</td>
<td>±0.05°F</td>
<td>±0.44°F</td>
<td>0.1°F</td>
<td>PF2</td>
</tr>
<tr>
<td></td>
<td>US Std</td>
<td>-330 to +1160°F</td>
<td>±0.5°F</td>
<td>±1.1°F</td>
<td>1°F</td>
<td>PF3</td>
</tr>
<tr>
<td></td>
<td>DIN</td>
<td>+80.0 to +780.0°F</td>
<td>±0.2°C</td>
<td>±0.6ºK</td>
<td>0.1ºK</td>
<td>PK2</td>
</tr>
</tbody>
</table>
Overall error: Includes all error sources (basic meter, signal conditioner, linearizer conformity, etc.) at 25°C.

Long Term Stability: 0.05% error/yr for one degree resolution base metal thermocouples and Pt RTD except for 0.01°C resolution RTD.

0.1% error/yr for fractional degree resolution base metal thermocouples.

0.2% error/yr for noble metal, tungsten, gold 0.07 at 9% Fe thermocouples and 0.01°C resolution Pt RTD.

Calibration of RTD Range Options:

1. PC1 and PC3 are calibrated to DIN standard 43760 with Alpha = .00385.

2. PC2, PC4, PF1 and PF2 are calibrated to IPTS-68 (NBS Monograph 125) with Alpha = .003925.

3. PC5, PC6, PF3 and PF4 are calibrated to a U.S. standard with Alpha = .003902.

SECTION 2
RECEIVING AND INSPECTION

2.1 Unpacking and Inspection

Your Model 267B was fully inspected and tested, then carefully packed before shipment. Unpack the meter and inspect for obvious shipping damage.

2.2 Mechanical Installation

The Outline and Mounting drawing illustrates the mounting method for your digital pyrometer. The unit is inserted from the front of the panel and held in place by two slide retainers. The panel thickness may be between .75 mm (.03") and 6.35 mm (.25").
SECTION 3
OPERATING INSTRUCTIONS

3.1 Pin Assignments

3.1.1 Connector TB1

<table>
<thead>
<tr>
<th>TBL-PIN</th>
<th>AC OPERATION</th>
<th>5 DC OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC Power HI</td>
<td>N/C</td>
</tr>
<tr>
<td>2</td>
<td>AC Power LO</td>
<td>+ 5 Volts</td>
</tr>
<tr>
<td>3</td>
<td>AC Power GND</td>
<td>5V Return</td>
</tr>
</tbody>
</table>

**FUNCTION**

<table>
<thead>
<tr>
<th>TBL-PIN</th>
<th>TC OPERATION</th>
<th>RTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>TC Guard Shield</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TC (-) Input*</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>TC (+) Input*</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: For Option GCI the thermocouple polarity must be reversed.*

REAR VIEW OF UNIT

Figure 2
3.1.2 Connector J1

<table>
<thead>
<tr>
<th>J1-PIN</th>
<th>FUNCTION</th>
<th>J1-PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No Connection</td>
<td>A</td>
<td>Spare</td>
</tr>
<tr>
<td>2</td>
<td>Spare</td>
<td>B</td>
<td>No Connection</td>
</tr>
<tr>
<td>3</td>
<td>No Connection</td>
<td>C</td>
<td>Spare</td>
</tr>
<tr>
<td>4</td>
<td>Blank</td>
<td>D</td>
<td>1 Bit</td>
</tr>
<tr>
<td>5</td>
<td>COMP</td>
<td>E</td>
<td>2 Bit</td>
</tr>
<tr>
<td>6</td>
<td>SIG</td>
<td>F</td>
<td>4 Bit</td>
</tr>
<tr>
<td>7</td>
<td>Clock</td>
<td>G</td>
<td>8 Bit</td>
</tr>
<tr>
<td>8</td>
<td>80 Bit</td>
<td>H</td>
<td>100 Bit</td>
</tr>
<tr>
<td>9</td>
<td>40 Bit</td>
<td>J</td>
<td>200 Bit</td>
</tr>
<tr>
<td>10</td>
<td>20 Bit</td>
<td>K</td>
<td>400 Bit</td>
</tr>
<tr>
<td>11</td>
<td>10 Bit</td>
<td>L</td>
<td>800 Bit</td>
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<tr>
<td>12</td>
<td>1K Bit</td>
<td>M</td>
<td>+ Polarity</td>
</tr>
<tr>
<td>13</td>
<td>2K Bit</td>
<td>N</td>
<td>Data Ready</td>
</tr>
<tr>
<td>14</td>
<td>4K Bit</td>
<td>P</td>
<td>Hold</td>
</tr>
<tr>
<td>15</td>
<td>+5V</td>
<td>Q</td>
<td>Ext OL (In)</td>
</tr>
<tr>
<td>16</td>
<td>Signal Gnd</td>
<td>R</td>
<td>Digital Gnd</td>
</tr>
<tr>
<td>17</td>
<td>Signal In</td>
<td>S</td>
<td>Conv</td>
</tr>
<tr>
<td>18</td>
<td>OL</td>
<td>T</td>
<td>REF</td>
</tr>
</tbody>
</table>

Connector Type
- ELCO: 00-6007-036-450-012
- TRW/CINCH: 251-18-90-160
- SAE: SCC18D/1-2

Figure 3
Connector Pin Orientation As Viewed
From The Rear Of The Meter

NOTE: For an interconnect cable longer than 6 inches
see Section 3.4.1
3.2 Power

3.2.1 Input Voltage

The standard meter operates from 115V ±10% 60 Hz. It consumes about 6 watts. A three wire connection should be used to connect power to the meter. Two conductors provide power to the meter and the third provides a ground for noise rejection.

Option C1 is 230V ±10%, 50 Hz operation. To change the meter in the field, from 115 to 230V operation, use the following procedure. See Figure 4

1. Remove power lines from meter and remove the meter from the case.
2. Remove the two jumpers on the transformer W1 and W2.
3. Add jumper between E6 and E7 on the printed circuit board. The meter is now wired for 230V.

To change the meter from 230V to 115V operation, reverse the above steps.

3.2.2 Input Fuse

The power input to the Model 267B is protected by a carbon composition resistor fuse. If the meter does not light and it is suspected that the fuse has been blown, check the continuity of the primary circuit. The resistance from power Hi to power Lo will be approximately 118 Ohms for a 115V meter and 470 Ohms for the 230V meter. If the fuse is blown, it is imperative that it is replaced by an identical part, failure to do so will void the warranty. The fuse is an Allen-Bradley 1/8W, 10 ohm, ±10% carbon composition resistor Newport part number 8111109.

3.2.3 Output Voltage

The +5V output is a regulated supply with the voltage range 4.5V to 5.1V. A maximum current of 50mA is available for external use when meter is without options 05, 06, F3 or F4.
3.3 Signal Input

3.3.1 Signal

For best results a shielded thermocouple should be used for the input signal, with the shield terminated to Signal Guard at the connector TBI-4.

Signal Guard and Analog Ground are internally connected. Analog Ground and Digital Ground are optically isolated.

3.3.2 Ground Precautions

It is essential that the ground connections to the Model 267B be proper for accurate readings. The input guard is internally connected to Analog Ground through a low internal resistance.

A shielded thermocouple must not have the shield connected at both the thermocouple and at Signal Guard (TBI-4).

3.3.3 Input Range Change

All Model 267B pyrometers are shipped with a single plug-in range module that contains all the signal conditioning for a specific thermocouple or platinum RTD. Range modules are precalibrated at the factory and require no additional calibration when installed on the 267B main board. Less than five minutes is required to change ranges in the field using the following procedure:

a. Remove AC power from meter.

b. Remove lens, two screws, clamp rings and slide retainers shown in Outline and Mounting drawing. (See Dwg. # 06896)

c. Remove top half of case.

d. Locate the range module mounting screw in Figure 4 and remove.

e. Now lift range module straight up being careful not to bend the pins connecting the range module with the main board.

f. For Options PC3, PC4 or PC6 solder jump "C" Decimal #2 on Display Board. (See Figure 4)

g. For Option PCL, cut jumper "A" and solder jump "B" on main board. (See Fig. 4)

h. To install new range module reverse above procedure.

i. It is necessary to rezero the meter when changing sensors.
3.4 Digital Signal Outputs

3.4.1 BCD Parallel

All BCD outputs are TTL and DTL compatible.

<table>
<thead>
<tr>
<th>Logical</th>
<th>Voltage Range</th>
<th>Source/Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>'1'</td>
<td>2.4 to 5.1V</td>
<td>0.28mA</td>
</tr>
<tr>
<td>'0'</td>
<td>0 to 0.4V</td>
<td>4.8mA</td>
</tr>
</tbody>
</table>

The data outputs are parallel BCD. The outputs are stable and valid while Data Ready (pin P) is low. For interconnect cable of up to 3 feet add 4 10K resistors from pin 15 to pin F, 9, L and 14.

3.4.2 + Polarity

<table>
<thead>
<tr>
<th>Logical</th>
<th>Voltage Range</th>
<th>Source/Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>'1'</td>
<td>2.4 to 5.1V</td>
<td>0.08mA</td>
</tr>
<tr>
<td>'0'</td>
<td>0 to 0.4V</td>
<td>1.6mA</td>
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</tbody>
</table>

The + Polarity output is a logical '1' when the meter indicates a positive reading.

3.4.3 Data Ready

<table>
<thead>
<tr>
<th>Logical</th>
<th>Voltage Range</th>
<th>Source/Sink</th>
</tr>
</thead>
<tbody>
<tr>
<td>'1'</td>
<td>2.4 to 5.1V</td>
<td>0.28mA</td>
</tr>
<tr>
<td>'0'</td>
<td>0 to 0.4V</td>
<td>4.8mA</td>
</tr>
</tbody>
</table>

Data Ready will go to a logical '0' at the end of a conversion cycle and to a logical '1' at the beginning of a conversion cycle.

3.4.4 Overload

<table>
<thead>
<tr>
<th>Logical</th>
<th>Voltage Range</th>
<th>Source/Sink</th>
</tr>
</thead>
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<tr>
<td>'1'</td>
<td>2.4 to 5.1V</td>
<td>0.28mA</td>
</tr>
<tr>
<td>'0'</td>
<td>0 to 0.4V</td>
<td>4.8mA</td>
</tr>
</tbody>
</table>

Overload will go to a logical '1' if the display is equal to or greater than the BCD bit internally programmed on range module. It is stable while Data Ready is low. The Overload bit will reset during each conversion cycle.
3.4.5 **Conv.**

Logical '1'  2.4 to 5.1V, source 0.32mA  
Logical '0'  0 to 0.4V, sink 6.4mA  

**Conv.** will go to a logical '0' at the beginning of a conversion cycle and a logical '1' at the end of a conversion cycle.

3.4.6 **Clock**

Logical '1'  2.4 to 5.1V, source 0.28mA  
Logical '0'  0 to 0.4V, sink 4.8mA  

Clock is 80 KHz. It is available during the conversion cycle and if gated off with (SIG) signal time it can be used as a serial BCD output.

3.4.7 **SIG**

Logical '1'  2.4 to 5.1V, source 0.32mA  
Logical '0'  0 to 0.4, sink 8mA  

SIG will go to a logical '1' at the beginning of signal integrate and will go to logical '0' at the end of signal integrate.

3.4.8 **REF**

Logical '1'  2.4 to 5.1V, source 0.08mA  
Logical '0'  0 to 0.4V, sink 1.6mA  

REF will go to a logical '1' at the beginning of reference integrate and will go to logical '0' at the end of reference integrate.

3.5 **Digital Signal Inputs**

3.5.1 **Hold**

Logical '1'  2.0V, source 0.04mA  
Logical '0'  0.8V, sink 1.2mA  

When a logical '0' is applied to the **Hold** input, the meter will finish the conversion cycle it is on and will hold that reading. If it is applied before the beginning of a conversion, the meter will not start that conversion. Upon a logical '1' at the **Hold** input, a new conversion will begin within 360msec.
3.5.2 EXT OL

Logical '1' 2.0V, source 0.28mA
Logical '0' 0.8V, sink 4.8mA

When a logical '0' is applied to the EXT OL input, the three least significant digits will flash if the input is derived from a BCD bit gated with REF.

3.5.3 Blank

Logical '1' 2.0V, source 0.32mA
Logical '0' 0.8V, sink 6.4mA

When a logical '0' is applied to the Blank input, the three least significant digits will go blank.

3.5.4 Comp.

Logical '1' 1.5V, source 0.0mA
Logical '0' 0.8V, sink 4.8mA

When a logical '0' is applied to the Comp. input, the digital logic is forced to readout the programmed overload point.

Note: This input must be interfaced with an open collector device.

3.5.5 Decimal Points

Any of three decimal points can be lighted by connecting the appropriate jumper with a bridge of solder as shown in Figure 4.

Note: Except for .01 degree meters the decimal point is programmed by the plug in range module.
SECTION 4
ADJUSTMENT AND CALIBRATION

4.1 The Model 267B was calibrated at the factory with a precision source. Frequent calibration is not necessary due to the stability and internal accuracy of the meter. All adjustments are sealed except the zero adjustment which is accessible with the lens removed. The user should adjust the zero pot for each thermocouple used.

If the plug-in range module requires calibration, return to the factory for calibration. Be sure to pack in a shipping container of sufficient size to allow ample packing material around unit to prevent damage in shipping.

4.2 Calibration Verification for Thermocouples.

The following procedure should be used to verify the calibration of thermocouple type meters.

1. Connect test cables as shown in Figure 5.

2. Apply power and allow meter to warm up for ten minutes.

3. Apply zero volts from calibrated voltage source and verify readout of ±0.0°C or 32°F. Adjust zero pot if required (see Figure 4 for location.)

4. Verify that the 267B is calibrated to the international Practical Temperature Scale, IPTS-68, as published in NBS Monograph 125 issued March 1974 or ASTM E230-72 or ASA C96.2-1973.

4.3 Calibration Verification for RTD's.

The following procedure should be used to verify the calibration of RTD type meters.

1. Connect test cables as shown in Figure 6.

2. Apply power and allow meter to warm up for ten minutes.

3. Apply appropriate resistance from the calibrated resistance source from one of three standards listed in section 1.2.8.
ICE BATH
Figure 5
REAR VIEW OF UNIT

NOTE: ALL THREE WIRES MUST BE THE SAME LENGTH AND GAGE.

3 WIRE RTD CALIBRATION

Figure 6
NOTES: DIMENSIONS IN MILLIMETERS ± 0.25 MM AND IN (INCHES) ± 0.01 IN.
## TABULATION BLOCK

<table>
<thead>
<tr>
<th>OPTION</th>
<th>PARTS LIST NO</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
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