DESCRIPTION

The Model 380R RTD Converter Module accepts a resistance bulb input and provides a 4 to 20 mA output proportional to the bulb resistance. The module may be used with either two-wire or three-wire RTDs, and with RTD spans as small as 5 ohms.

The input of the module is isolated from both the output and the power source. This permits grounding of the input without affecting the measurement, and permits grounded inputs with common mode voltages up to 100 Vdc.

The output can be changed to 10 to 50 mA by placing jumpers on the foil side of the module's circuit board; refer to RANGE CHANGE.

SPECIFICATIONS

Input: ......................... RTD Sensor, 2 or 3 wire. Minimum span of 5 ohms.

Zero Offset: ............... For best accuracy, offset should not exceed ten times the input span.

Sensor Current: ............. 1 mA, max.

Isolation: ........................ Input circuit electrically isolated from output and power circuits allowing the input to operate at up to 100 Vdc off ground.

Output:

Standard ...................... 4 to 20 mA into 0 to 1000 ohms. (0 to 900 Ohms for 24 Vdc Card Cage Encl.).

Alternate ..................... 10 to 50 mA into 0 to 400 Ohms. (0 to 360 Ohms for 24 Vdc Card Cage Encl.).

Current Limiting ............. The output will limit at approx. 150% of full scale when the input is over-ranged.

Accuracy: .................... ± 0.35% of span

NOTE

Standard test conditions — 100 Ohm 3-wire bulb with 10 Ohm span; 100 Ohm resistive source, 4 to 20 mA into 500 Ohm resistive load; 25°C ambient; 15 and 24 Vdc supply.

INSTALLATION

The RTD Converter Module must be installed in a Card Cage Enclosure. It can be plugged into any of the numbered slots in the enclosure, refer to your drawings for the designated slot, or choose a slot for the module.

The safety keys in the Card Cage Enclosure must be set before the module is plugged in. Service Instructions SD3801 identifies these safety keys and gives the procedure for setting them. The positions of the keys for the RTD Converter Module are as follows:

Left Key: H (horizontal)

Right Key: V (vertical)

Input and output wiring connections are made on the terminal strips in the Card Cage Enclosure. There is a terminal strip for each module slot; the terminal strips are numbered to correspond to the slot numbers. Refer to the Connection Diagram in this instruction and to Service Instructions SD3801.

CALIBRATION

GENERAL

The Model 380R RTD Converter Module is shipped pre-calibrated for use with the RTD type and RTD range specified on your purchase order. Refer to the sticker on the module for the calibration data.

Due to wide variations in RTD types and ranges, selected resistors are used to achieve the input/output range relationship. The module should be returned to the factory for recalibration if a different RTD type or range is to be used. Such return shipments must be accompanied by: the name of the RTD manufacturer, the model number of the RTD, the temperature range to be measured, and the resistance values (from the manufacturers tables) for the min/max temperatures of the new range.

ZERO & SPAN ADJUSTMENT

1. Connect a precision, resistance decade box to the input terminals and a digital multimeter to the output terminals (refer to the Connection Diagram). The output must be measured to 0.1% accuracy for proper results.

2. Adjust the decade box to the minimum value of the module's input range.

3. Adjust the ZERO trip for a 4.0 mA output (10 mA for a 10 to 50 mA output range).

4. Adjust the decade box to the maximum value of the module's input range.

5. Adjust the SPAN trip for a 20.0 mA output (50 mA for a 10 to 50 mA output range).

6. Repeat steps 2 through 5 until the calibration end points are correct.

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RANGE CHANGE

The module, as shipped, has a 4 to 20 mA output. The output can be changed to 10 to 50 mA by soldering two jumper wires on the foil side of the circuit board. The jumpers are designated J1 and J2; these designations appear on the circuit board (see component location drawing).

After making the range change, the module must be recalibrated; refer to CALIBRATION.

MAINTENANCE

Except for annual cleaning and periodic calibration, the module requires no routine maintenance.

If the module does not operate properly when initially installed, check the input and output circuit wiring. Most problems on new installations can be traced to wiring mistakes. Also, verify that the equipment associated with the input and output circuits is functioning and properly calibrated.

If a problem is traced to the module, remove the module and give it a full bench check.

RECOMMENDED SPARES

There are no recommended spare parts for the RTD Converter Module.

One spare module is recommended for every 1 to 10 in service.

WARRANTY

The Company warrants all equipment manufactured by it and bearing its name plate, and all repairs made by it, to be free from defects in material and workmanship under normal use and service. If any part of the equipment herein described, and sold by the Company, proves to be defective in material or workmanship and if such part is within twelve months from date of shipment from the Company's factory, returned to such factory, transportation charges prepaid, and if the same is found by the Company to be defective in material or workmanship, it will be replaced or repaired, free of charge, i.e., Company's factory. The Company assumes no liability for the consequences of its use or misuse by Purchaser, his employees or others. A defect in the meaning of this warranty, in any part of said equipment shall not, when such part is capable of being repaired or replaced, operate to void said equipment. This warranty is expressly in lieu of all other warranties, guarantees, obligations, or liabilities, expressed or implied, of the Company or its representatives. All statutory or implied warranties other than this one, are hereby expressly negated and excluded.

Warranty repair or replacement requires the equipment to be returned to one of the following addresses:

Equipment manufactured or sold by MOORE PRODUCTS CO.

MOORE PRODUCTS CO.

Sunbury Iron Plate
Spring House, PA. 19477

Equipment manufactured or sold by MOORE INSTRUMENT CO.

MOORE INSTRUMENTS LTD.T.E.E.
234 West of Mississippi Rd. Hwy. 7
Brantford, Ontario, Canada

The warranty will be null and void if repair is attempted without prior authorization by a member of the MOORE PRODUCTS CO. Service Department.
TABLE 1 Selected Resistor Values

Please note: Value of R57 and R58 combined equals 1/2 value of R51.

1. For RTD Spans of 5Ω to 200Ω, R51 = 6.1KΩ

<table>
<thead>
<tr>
<th>RTD range (Ω)</th>
<th>R51 (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 Ω to 1100Ω</td>
<td>32.6KΩ</td>
</tr>
<tr>
<td>1100 Ω to 1500Ω</td>
<td>25.9KΩ</td>
</tr>
<tr>
<td>1500 Ω to 1700Ω</td>
<td>21.7KΩ</td>
</tr>
<tr>
<td>1700 Ω to 1900Ω</td>
<td>18.7KΩ</td>
</tr>
<tr>
<td>1900 Ω to 2100Ω</td>
<td>16.0KΩ</td>
</tr>
</tbody>
</table>

2. For RTD Spans of 200 to 400Ω, R51 = 12.4KΩ

<table>
<thead>
<tr>
<th>RTD range (Ω)</th>
<th>R51 (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 Ω to 1200Ω</td>
<td>6.1KΩ</td>
</tr>
<tr>
<td>1200 Ω to 1600Ω</td>
<td>4.3KΩ</td>
</tr>
<tr>
<td>1600 Ω to 2000Ω</td>
<td>3.4KΩ</td>
</tr>
<tr>
<td>2000 Ω to 2400Ω</td>
<td>2.8KΩ</td>
</tr>
<tr>
<td>2400 Ω to 2800Ω</td>
<td>2.4KΩ</td>
</tr>
</tbody>
</table>

3. For RTD Spans of 400 to 800Ω, R51 = 24.3KΩ

<table>
<thead>
<tr>
<th>RTD range (Ω)</th>
<th>R51 (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 Ω to 1400Ω</td>
<td>12.4KΩ</td>
</tr>
<tr>
<td>1400 Ω to 2200Ω</td>
<td>6.6KΩ</td>
</tr>
<tr>
<td>2200 Ω to 3000Ω</td>
<td>1.6KΩ</td>
</tr>
</tbody>
</table>

4. For RTD Spans of 800 to 1600Ω, R51 = 49.9KΩ

<table>
<thead>
<tr>
<th>RTD range (Ω)</th>
<th>R51 (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 Ω to 1600Ω</td>
<td>14.9KΩ</td>
</tr>
</tbody>
</table>

ALL RESISTORS ARE 1/8 WATT, 1% METAL FILM T-8 RESISTORS.

RESISTORS (See table 1)

- Other issues

NOTE 1. Resistors ±10%, ±1% unless otherwise specified.