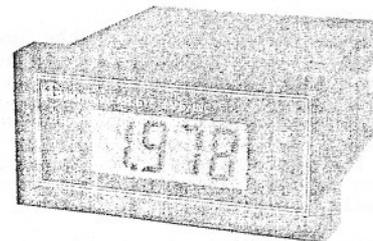




RM-351/OHM/XX VDC
RM-351TB/OHM/XX VDC
DIGITAL PANEL OHMMETERS

INSTRUCTIONS



INTRODUCTION

The instruments described in these instructions are three and one-half-digit, fixed range digital panel ohmmeters. Connections to the RM-351/OHM/XX VDC are made via two card-edge connectors. Connections to the RM-351TB/OHM/XX VDC are made via two terminal blocks.

The alphabetical letters "XX", used in the model numbers throughout these instructions, designate the DC voltage required to operate the instruments. This numerical voltage value is displayed as part of the model number shown on the case of the instrument.

A DC-to-DC converter with transformer coupling provides a high degree of isolation between the power supply and the resistance measurement circuits. The meters are available in any one of seven ranges: 20 ohm, 200 ohm, 2 kilohm, 20 kilohm, 200 kilohm, 2 megohm or 20 megohm. Changing from one range to another is accomplished by changing a single resistor, either internally or externally.

The liquid-crystal display provides 0.6-inch-high numerals. Calibration is readily accomplished by adjustment of two potentiometers accessible at front of the instrument.

SPECIFICATIONS

RESISTANCE RANGES: 0 to 19.99Ω /199.9Ω /1.999 kΩ /19.99 kΩ /199.9 kΩ /1.999 MΩ or 19.99 MΩ

ACCURACY: ±[0.25% Reading ±1 digit] (+18°C to +28°C)

DISPLAY: 0.6" high, LCD

UPDATE RATE: 3 rdg/sec, nominal

POWER: A DC voltage source, preferably a voltage-regulated power supply. The voltage should be within 5% of the voltage shown in the model number on the instrument case. For example, if the model number is RM-351/OHM/12 VDC, the power supply should be 12 VDC ±5%. Power required is approximately 0.5 watt.

SIZE: See figures 1 and 2

WEIGHT: Approx. 8 oz (227 g)

COMMON-MODE COMPLIANCE: ±100V

DECIMAL LOCATION: May be positioned by jumper on connector to any one of three locations: X.X.X.X

OVERLOAD INDICATION: Left-most digit is the numeral 1; remaining digits are blank.

CONSTRUCTION

The RM Series Digital Panel Ohmmeters each contain two printed

circuit board assemblies mounted one above the other. The lower assembly is the display/main board assembly which is essentially a DC voltmeter set in the 1.999-volt range for the six highest resistance ranges and set in the 199.9 mV range for the 20-ohm resistance range. The upper assembly contains a resistance-to-voltage converter, and a power supply. For the RM-351/OHM/XX VDC, all interconnections between upper and lower assemblies are made via the mating connectors. For the RM-351TB/OHM/XX VDC, all interconnections between upper and lower assemblies are made via terminal blocks.

MOUNTING DATA.

A rectangular panel cutout is recommended for mounting the instruments. The recommended dimensions are:

92 millimeters +1, -0 mm (3.622 inches +0.040, -0 in.)

43 millimeters +1, -0 mm (1.693 inches +0.040, -0 in.)

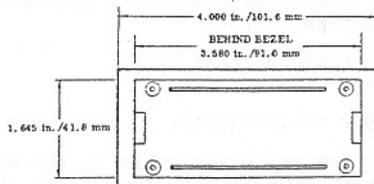
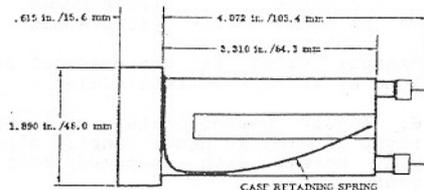


Figure 1. Card-Edge Configuration

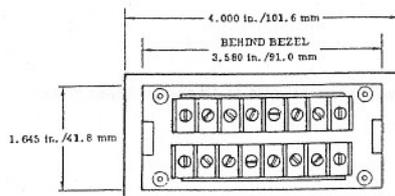
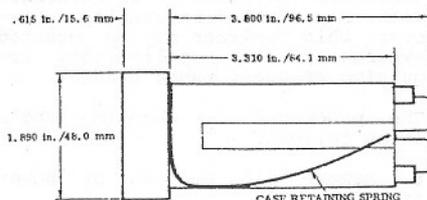


Figure 2. Terminal Block Configuration

The meters will also fit the DIN/NEMA standard cutout, 92 mm x 45 mm (3.622 x 1.772 in.) and the widely used 99.7 mm x 42.72 mm (3.925 in. x 1.682 in.) cutout.

Any panel thickness from 1.524 mm (0.060 in.) to 4.57 mm (0.18 in.) may be used.

To mount the meter, remove the retaining spring from its holes in the sides of the meter at the rear. Insert the meter from the front of the panel cutout. Replace the retaining spring and slide it behind the mounting panel to fasten the meter in place. It does not matter whether the retaining spring swings from above or below the meter.

MATING CONNECTORS (RM-351/OHM/XX VDC)

1. SOURCES. Any of the following connectors may be used to mate with the RM-351/OHM/XX VDC

Manufacturer	Connector Part No.
Viking	2VH15/1AB5 091-0024-000*
Stanford Applied Engineering	SAM-15S/1-2 007900*
Masterite Industries	S014GR15-SR-H-X 60217-1*
Microplastics, Inc.	MP-0156-15-SP-1 04-0001-000*

*Polarizing Key Part No.

The mating connector for the display/main board assembly (the lower assembly) should have a polarizing key installed between contacts 1 and 2. This connector with polarizing key installed is available from NLS; part number is 46-107-1. The mating connector for the resistance-to-DC converter and power supply assembly (upper assembly) should have a polarizing key installed between contacts 2 and 3. The NLS part number for this connector with key installed is 46-107-2. One each of these connectors is furnished with each instrument.

2. MOUNTING. Before mounting the connectors, check to ensure that one of them has a polarizing key between contacts 1 and 2 and the other has a polarizing key between contacts 2 and 3. The first connector mounts between the lower bosses and the second between the upper bosses. The locations of the polarizing keys should correspond to slots in the printed circuit boards. Use the screws provided (4-40 x 7/16" RHD PHH) to fasten the connectors to the case.

3. WIRING. Figure 3 provides wiring information for the connectors. Connect contacts 1, 3, 9 and 11 of the upper connector to the

corresponding contacts on the lower connector. Connect the unknown resistance between contacts 5 and 7 of the upper connector. To display a decimal point, jumper between contact 5 and contact 7, 13 or 15 on the lower connector, depending upon which decimal point is to be displayed. See below.

DECIMAL LOCATION 1 . 0 . 0 . 0
CONTACT NO. 15 13 7

Connect the DC power to contacts 13 and 15 on the upper connector; common to contact 13 and positive to contact 15.

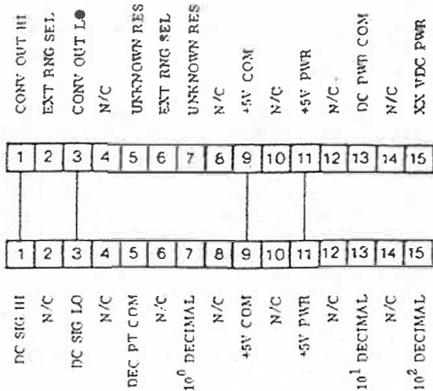


Figure 3. Connector Diagram for RM-351/OHM/XX VDC

TERMINAL BLOCK WIRING (RM-351TB/OHM XX VDC)

Figure 4 provides wiring information for the terminal blocks. Connect terminals 1, 2, 5 and 6 of the upper terminal block to the corresponding terminals on the lower terminal block. Connect the unknown resistance between terminals 3 and 5 of the upper terminal block. To display a decimal point, jumper between terminal 3 and terminal 4, 7 or 8 on the lower terminal block, depending upon which decimal point is to be displayed. See below.

DECIMAL LOCATION 1 . 0 . 0 . 0
TERMINAL NO. 8 7 4

Connect the DC power to terminals 7 and 8 of the upper terminal block; common to terminal 7 and positive to terminal 8.

CALIBRATION.

- Using a knife or a small screwdriver blade, carefully pry off the front panel to gain access to the calibration potentiometers.
- Adjust power supply voltage to within 2% of its nominal value.
- Allow a 5-minute warm-up period.

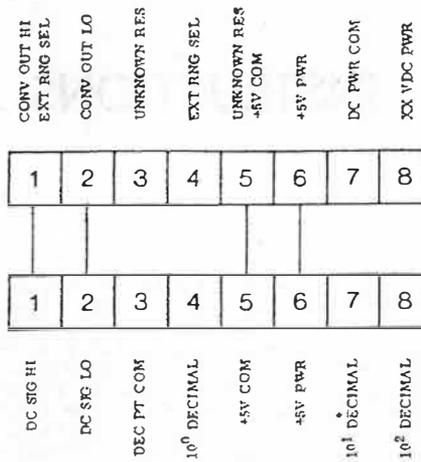


Figure 4. Terminal Block Diagram for RM-351TB/OHM/XX VDC

4. Short circuit leads which connect to unknown resistance. Adjust potentiometer at upper right of display panel until display reads 000.

5. Remove short circuit and connect leads to a standard resistance as follows:

RANGE OF INSTRUMENT	STANDARD* RESISTANCE
20 Ohms	19.00 Ohms
200 Ohms	190.0 Ohms
2 kOhms	1.900 kOhms
20 kOhms	19.00 kOhms
200 kOhms	190.0 kOhms
2 MOhms	1.900 MOhms
20 MOhms	19.00 MOhms

*Actual value is not critical as long as it is near full scale.

6. Adjust potentiometer at lower right of display panel until display agrees with standard resistance.

7. Disconnect standard resistance and power input.

8. Replace front panel.

RANGE MODIFICATION.

As indicated in table I, the ohmmeter range is determined by the voltage range of the lower P.C. board assembly and the value of resistor R7 on the upper board assembly. The ohmmeter is furnished with R7 mounted internally. However, this resistor may be mounted externally for applications requiring frequent range changes.

The procedure for changing ranges is as follows:

- Remove all sources of power from the meter.

Table I. Value of R7 for Range Modification

RESISTANCE RANGE WHEN LOWER ASSY IS IN	RESISTANCE RANGE WHEN LOWER ASSY IS IN	R7* ON UPPER BOARD ASSEMBLY
200 MV RING	200 Ohms	249 Ohms
	2 kOhms	2.49 kOhms
	20 kOhms	24.9 kOhms
	200 kOhms	249 kOhms
	2 MOhms	2.49 MOhms
	20 MOhms	24.9 MOhms

*1% Tolerance, 50 ppm/°C temperature coefficient.

2. (RM-351OHM/XX VDC) Remove the four screws fastening mating connectors to meter case and unplug the two mating connectors.

3. Remove front panel (see step 1 under Calibration).

4. Remove the two screws behind front panel.

5. Slide meter out of case.

6. Install resistor specified in Table I to attain desired range. Note that this resistor should be placed in the upper board assembly between P.C. pads E1 and E2. (Pad identification is etched on the P.C. board.) If external mounting of this resistor is desired, remove resistor from P.C. board.

7. Reassemble meter.

8. For external mounting of the range resistor on an RM-351/OHM/XX VDC, mount the resistor between upper mating connector pins 2 and 6. For external mounting of this resistor on an RM-351TB/OHM/XX VDC, mount the resistor between terminal block terminals 1 and 4.

9. Calibrate meter.

10. If a decimal indication is required, refer to the applicable paragraphs on wiring (connectors or terminal blocks).

MAINTENANCE.

1. GENERAL. To facilitate maintenance, all integrated circuits on the lower board assembly are plug-in components. They can be easily removed and installed without soldering. They include the LCD display, the ICL7106CPL chip and the CD4049AE chip.

2. COMPONENT ACCESS. To gain access to the components within the meter, perform the first five steps under Range Modification.

Specifications Subject to Change without Notice



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