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1. GENERAL

The Digital Milliohm meter featured with its accuracy & readability. The circuit of this instrument with the voltage regulator and temperature compensation so that the accuracy of these instrument will not be influenced due to the unstable AC power source and the alternation of temperature.

The digital milliohm meter is specially produced for the low resistor or switch, relay, jacks, plugs, connectors, sockets, and electrolytic capacitor manufactures QC use & general electronic factory IQC use. Can be applied to measure the initial contact resistance.

2. SPECIFICATIONS.

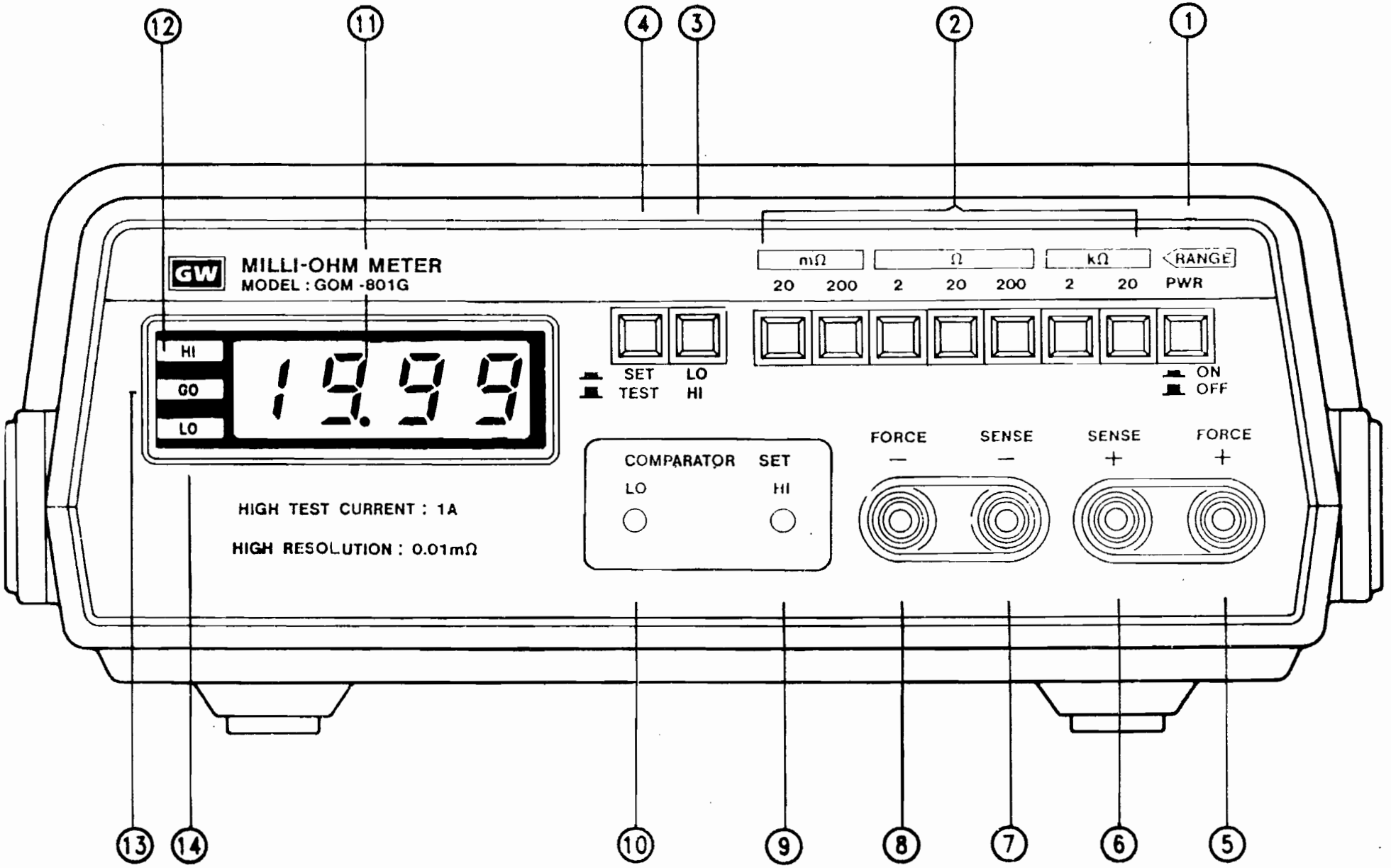
Meter: 3½ Digital panel meter.
Test Range: 20, 200mΩ, 2, 20, 200Ω, 2, 20kΩ full scale 7 ranges.
Accuracy: ±0.2% rdg + 4 Digit (±0.2% rdg + 6 Digit FOR 20 mΩ range only)
Test Signal: Approx, D C0.2V
Test Current: 20,200m Ω Range 1A
2 Ω " 0.1 A
20 Ω " 10 mA
20052 " 1 mA
2k Ω " 100μA
20k Ω " 10μA
Power Source: 11OV 50/60Hz or **220V** 50Hz, Approx. 25VA
Dimensions: 245(W) x 95(H) x 280(D) mm.
Weight: 2Kg.

3. EXPLANATION OF PANEL (FIG. **1)**

1. Power Switch: When push the switch the power is ON.
2. Range Selector Switch: This switch selects the ranges in 20, 200mΩ, 2, 20, 200Ω, 2, 20KΩ 7 steps.
3. HI/LO Selector Switch: .When test-set selector switch is set at "SET" position. The HI/LO selector switch is used for setting the high & low value of the user wanted.
4. Test/set Selector Switch: Be used for testing when the switch is pulled. Otherwise, the switch is used for set HI/LO value.
5. Force Terminal "+": This is one of the test terminals.
6. Sensor Terminal "+": This is one of the test terminals.
7. Sensor Terminal "-": This is one of the test terminals.
8. Force Terminal "-": This is one of the test terminals.
9. HI Set **VR:** Be used for setting the high value.
10. LO Set VR: Be used for setting the low value.
11. Panel Meter: Indicate the test value.
12. HI Indicator: When the test value exceed to the high set value, the indicator is light ON.
13. GO Indicator: When the test value is between the .high set & low set value, the indicator is light ON.
14. LO Indicator: When the test value is iower than the low set value, the indicator is light ON.

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4. PRELIMINARY NOTES.

If you don't know the about value of the resistor before you test the resistor, start the test range from the higher value step. If you cannot read out the value when you set the high value step, choose the lower value range.

5. CIRCUIT DESCRIPTION (FIG. 2)

5-1. DVM Circuit

The DVM is an A/D converter using IC U302.

5-2. 10 or 100 Times Signal **Amplifier**

The signal amplifier using IC U401.

5-3. Range Select & Measurement

Test range selector switch which selects the range in 7 steps. Using standard resistor will not infulence it's accuracy due to the alternation or temperature.

5-4. Constant Current Source

The circuit using IC U201, U202 & transistors Q203, Q204 to produce constant current.

5-5. Set Reference, Comparator and HI, *GO,* LO Indicator

The set reference is consists of resistor and var'iable resistors. The comparator using IC U403, U404. The HI, GO, LO indicator using transistors Q401-Q-407.

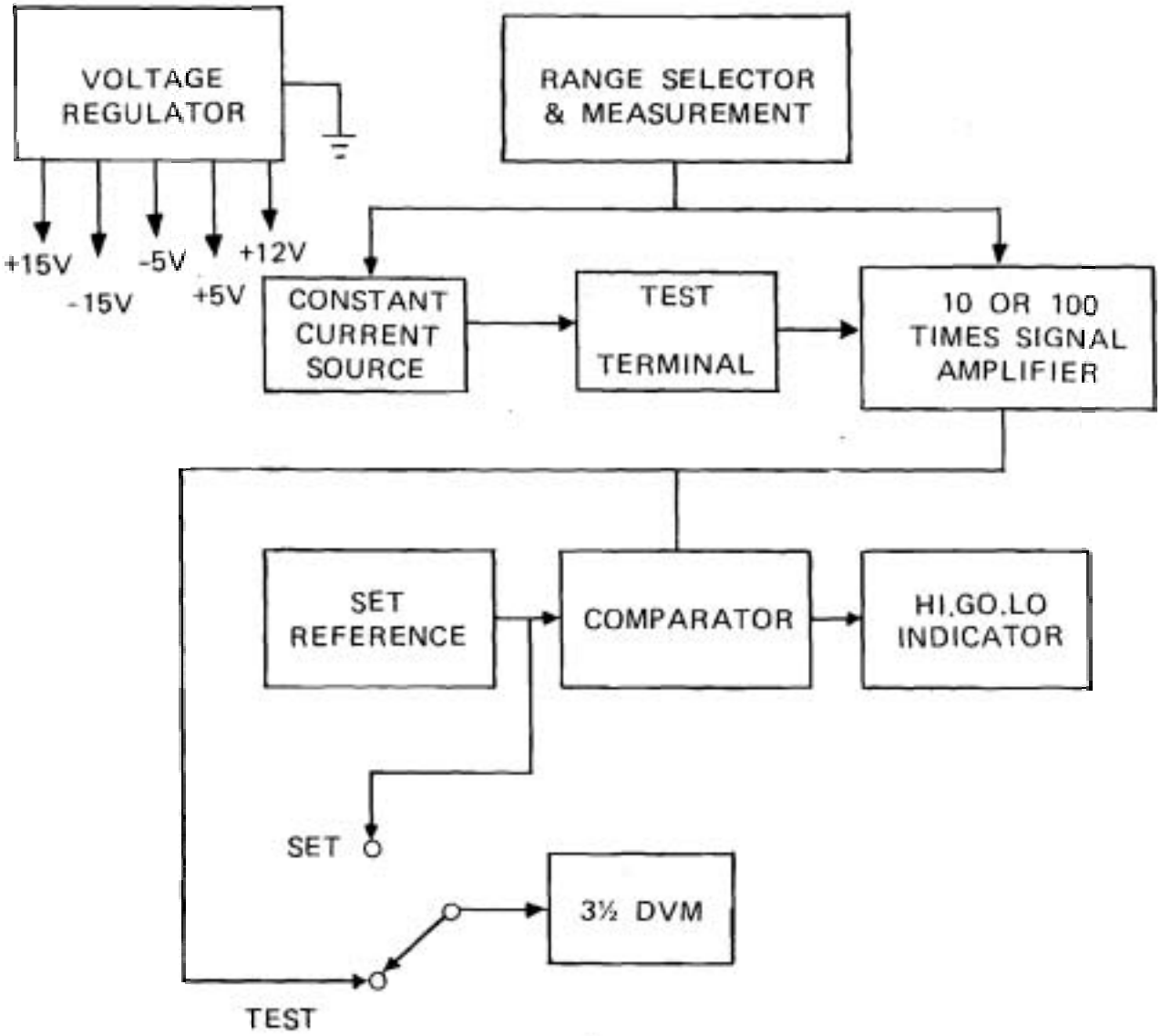
5-6. Voltage Regulator Circuit

The power supply has regulated ±5V, ±15V output. The ±15V, -5V voltage regulator circuit use the reference voltage produced. By utilizing the zener diodes D201, D202, D301 conducts series control by transistors Q201, Q202, Q301 to obtain the regulated voltage. The +5V voltage regulator circuit uses IC U301 voltage regulator.

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FIG. 2



6. OPERATION

6-1 Preliminary operation.

1. Set the power switch at off.
2. Make sure that line voltage is correct for the input power voltage.
3. Plug power cord into the power outlet.
4. Turn on the power switch and allow about 10 minutes for the unit to warm up. So that it is stabilized.

6-2. Measurement of Resistor

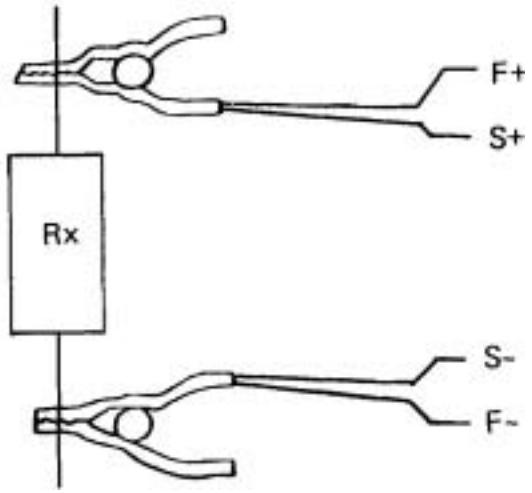


FIG. 3

1. Connect unknow resistor. To the test terminals as shown in Fig. 3
2. The range selector is set at the position where readings can be obtained.

6-3. Measurement of Switch

1. Connect the switch to be tested as shown in Fig. 4
2. The range selector is set at the position where readings can be obtained.

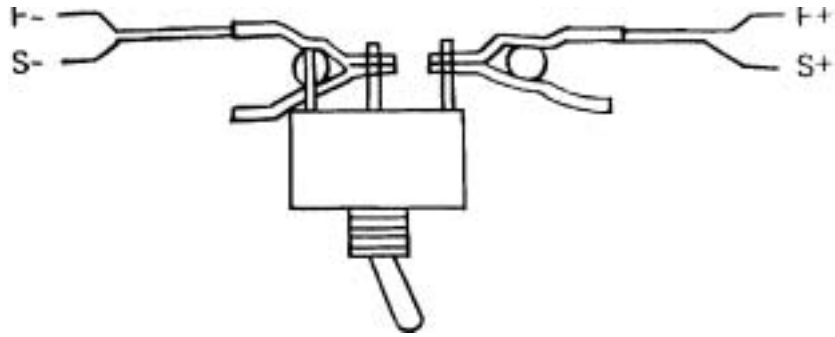


FIG. 4

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7. CALIBRATION

7-1. Current Source Adjustment

1. Set power switch on. Arid warm up the instrument about 30 minutes.
2. Set the range selector switch at "20Ω" range, and set the test-set selector switch at test position.
3. Connect a 4½ DMM between +, – Force test terminals, and set the DMM in DCA function and 20mA range then adjust VR201 until the DMM indicate 10.000mA.
4. Set the range selector switch at other range, and check the current whether is 1A (200mΩ), 100mA (2Ω), 1mA (200Ω), 100μA (2KΩ), 10μA (20KΩ). IF not, and the error more than ±0.2%, then must change the value ot R211, R212, R214, R215, R216.
5. Set the range selector switch at 20mΩ range.
6. Connect 3 19.00mΩ resistor between test terminals, and DMM between U401 pin No. 10 and ground, then adjust VR401 until the DMM indicate 1.900V.
7. Set the range selector switch at 200mΩ range.
8. Connect a 190.0mΩ resistor between test terminals, and adjust VR402 until the DMM indicate 1.900V.
9. Set the range selector switch at 200Ω range.
10. Connect a 190.0 Ω resistor between test terminals, and adjust VR301 until the display indicate 190.0Ω.
11. Check the other range with a correspondable resistor connected to the test terminals.

7-2. Set Adjustment

1. Set the range selector switch at 20KΩ range, and set the test-set selector switch at test position, HI-LO selector switch set at HI position.
2. Connect a 19.000KΩ Resistor between test terminals.
3. Turn the HI set VR until Hi indicator just on, then set the test-set selector switch at set position, and adjust VR403 until the display indicate 18.99KΩ.
4. Set HI-LO selector switch at LO position, test-set selector switch set at test position.
5. Adjust LO set VR until LO indicator just On, then set the test-set selector switch at set position, and adjust VR404 until the display indicate 19.01KΩ.
6. Repeat item 4.5.

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