Operation Manual

MODEL 3351

Microcomputer Based Conductivity/Resistivity Transmitter

JENCO ELECTRONICS, LTD.

MANUFACTURER OF PRECISION INSTRUMENTS

CONTENTS

GENERAL INTRODUCTION

Thank you for selecting the JENCO Model 3351. The 3351 Conductivity/Resistivity Transmitter is a rugged microprocessor based instrument assembled in a watertight 1/8 DIN case, designed for use in laboratories and process control applications.

The system displays Conductivity / Resistivity or Temperature status in one large LCD screen.

The model 3351 microprocessor performs a self-diagnostic routine every time the user resets the unit, After device resets, it will provide the user with basic information on the stability of the instrument.

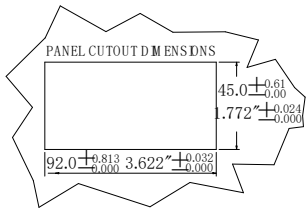
A setup CD is included in the instrument package. After installation, it allows the user to communicate with the instrument by a computer through RS485 serial connection.

INITIAL INSPECTION

Carefully unpack the unit and accessories. Inspect for damages made in shipment. If any damage is found, notify your **Jenco** representative immediately. All packing materials should be saved until satisfactory operation is confirmed.

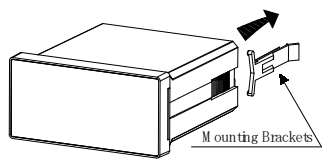
USING THE JENCO MODEL 3351

A. Mounting Procedure



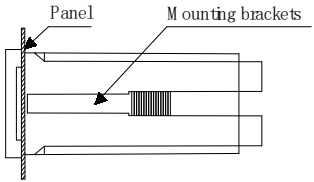
DRAWING 1

1. Make a cutout on any panel, with a thickness of 1/16 inch (1.5mm) to 3/8 inch (9.5mm). Refer to **DRAWING 1**.



DRAWING 2

2. Remove the mounting assembly from the controller and insert the controller into the cutout. Refer to **DRAWING 2**.



DRAWING 3

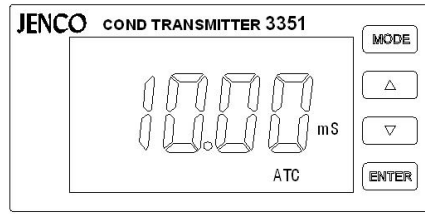
3. Replace the mounting bracket assembly onto the controller and secure the controller to the mounting panel. Refer to **DRAWING 3**.

【Note】:

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

B. Front Panel

The front panel consists of a 4-digit LCD display and 4 keys.



1. **[MODE]** key:

   1a. In the **Measure mode**, this key will switch the display in sequence from Conductivity, Temperature and back to Conductivity again or from Resistivity, Temperature and back to Resistivity again.

   1b. In the **Calibration/Setting mode**, pressing this key for three seconds will move you back to the previous parameter in the case when recalibration / resetting is required.

2. **[UP]** key:

   2a. In the **Calibration mode**, pressing this key will increase the numeral increment. In the **Setting mode**, pressing this key will show the next possible option and increase the numeral increment.

   2b. In the **Measure mode,** pressing this key and **[ENTER]** key at the same time, the unit will enter the **Calibration mode**.

3. **[DOWN]** key:

   3a. In the **Calibration mode**, pressing this key will decrease the numeral increment. In the **Setting mode**, pressing this key will show the next possible option and decrease the numeral increment.

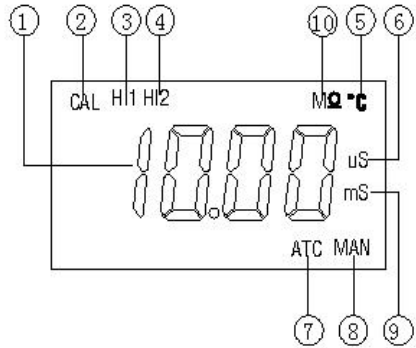
   3b. In the **Measure mode**, pressing this key and **[ENTER]** key at the same time, the unit will enter the **Setting mode.**

4. **[ENTER]** key:

   In any mode where the user can change the settings, pressing this key will save the new settings. If no change has been made then pressing this key will just lead

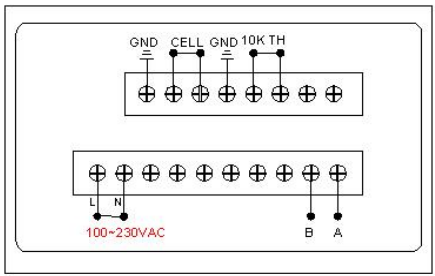
the user to the next setting.

C. LCD screen



1. Major LCD display.
2. **CAL –** This icon will be displayed if the meter is in the **Calibration/Setting mode.**
3. **HI1 –** This icon will be displayed if the meter is in the **Setup Identification (ID).**
4. **HI2 –**This icon will be displayed if the meter is in the **RS485 Communication Setup**
5. ℃ **–** Temperature and unit display.
6. **uS –** Unit indicator.
7. **ATC –**This icon will be displayed when a temperature probe is connected.
8. **MAN –**This icon will be displayed if the no temperature probe is not connected.
9. **mS –** Unit indicator.
10. **MΩ –** Unit indicator.

D. Rear connectors



* Specify “L’ = “Live Lead” 100 to 230 VAC Volts and “N” = “Neutral Lead”

1. Connect the AC line to the rear of the instrument. The model 3351 can be powered by 100~240V AC source at 50/60 HZ. Make sure the **EARTH** connector is connected to the earth lead of the AC power line.

2. The metallic shield of the conductivity electrode must be connected to the "GND", otherwise the readings would be unstable.

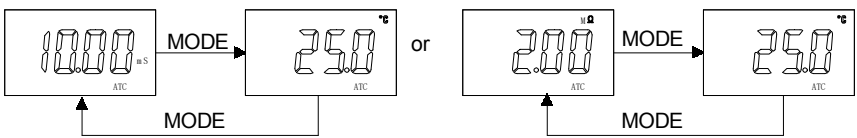
【Note】:

(1) Make sure that the power is unplugged before wiring your probes etc.

(2) Make sure you connect the AC power cord to the correct AC terminals. Incorrect connection may damage the unit permanently.

E. Measure mode

Turning on the unit will always display the **Measure mode**. This instrument is designed to provide 2 distinct measurements: Conductivity, Temperature or Resistivity, Temperature.



1. **Conductivity –** Current conductivity of the solution.

2. **Resistivity –**Current resistivity of the solution.

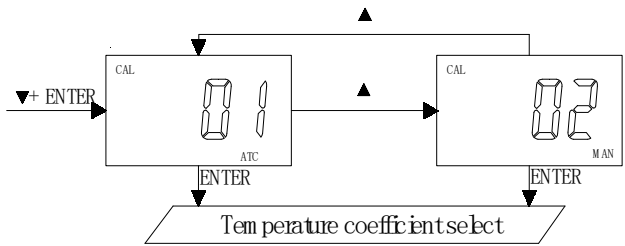
3. **Temperature –** Current temperature of the solution.

【Note】: Pressing **[MODE]** key in the **Measure mode** will cycle the display between the two modes above.

F. Setting mode

Pressing **[DOWN]** key and **[ENTER]** key at the same time, the meter will enter into the **Setting mode**.

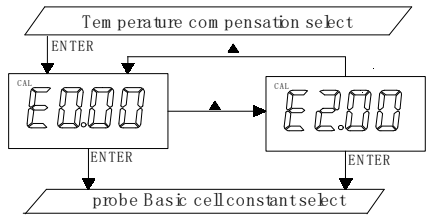
1. **Temperature compensation select**:



Pressing **[UP]** key or **[DOWN]** key in this screen will cycle the display between 01 (Thermistor: 10k ohm), 02 (Manual) modes above.

Select the preferred temperature compensation mode, press **[ENTER]** key to save, and enter the next setting screen.

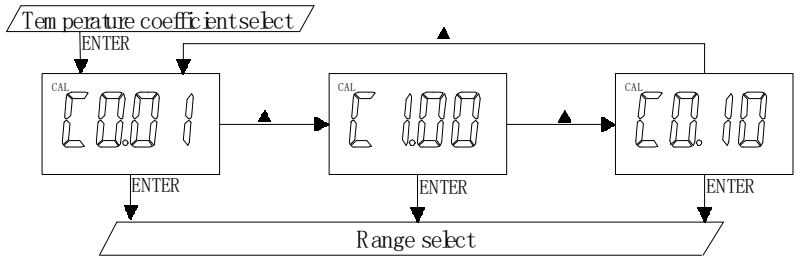
2. **Temperature Coefficient select**:



Pressing **[UP]** key or **[DOWN]** key in this screen will cycle the display between E2.00, E0.00 above.

Select the preferred coefficient, press **[ENTER]** key to save, and enter the next setting screen.

3. **Probe Basic cell constant select**:

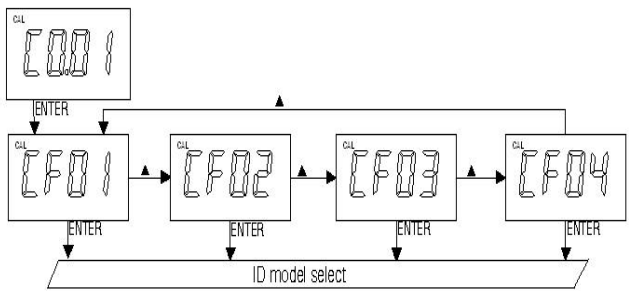


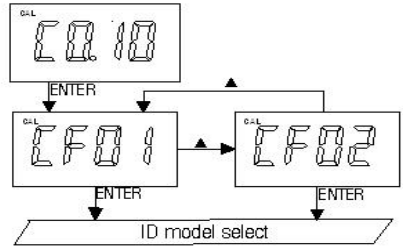
Pressing **[UP]** key or **[DOWN]** key in this screen will cycle the display from C1.00, C0.10 to C0.01 basic cell constant above.

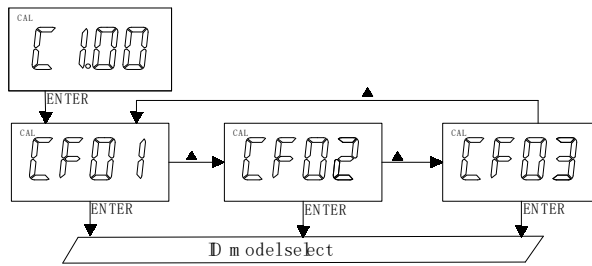
Select the preferred basic cell constant, press **[ENTER]** key to save, and enter the next setting screen.

4. **Range select:**

Pressing **[UP]** key or **[DOWN]** key in this screen will cycle the display from CF01/0.000~1.999uS/cm, CF02/0.00~19.99uS/cm, CF03/0.000~1.999MΩ, CF04/0.00~19.99MΩ (**Basic cell K is C0.01)** or CF01/0.00~19.99uS/cm, CF02/0.0~199.9uS/cm (**Basic cell K is C0.10)** or CF01/0.0~199.9uS/cm, CF02/0~1999uS/cm, CF03/0.00~19.99mS/cm (**Basic cell K is C1.00)** above. Select the preferred basic cell constant , press **[ENTER]** key to save, and enter the next setting screen.




CAL
C0.10
ENTER
CAL
CF01
CAL
CF02
ENTER
ENTER
ID model select


CAL
C 100
ENTER
CAL
CF01
CAL
CF02
CAL
CF03
ENTER
ENTER
ENTER
ID model select

G. RS485 Setting mode

A setup CD is included in the instrument package. After installation, it allows the user to communicate with the instrument by a computer through RS485 serial connection.

It is recommended to use a standard shield twisted pair cable for optimum RS-485 communications.

1. Setup Identification (ID)

Press both [Down] and [Enter] button at the same time. The “CAL” shall display on the upper left corner of the screen. When “HI1” is shown on the screen, user enters into the “ID Option” interface. Press [Up] or [Down] key for choosing the identification (ID) number. Press [Enter] and store the identification number in the memory. After successfully storing the identification the system automatically enters into the “RS485 Communication Setup” interface.

2. RS485 Communication Setup

This unit uses MODBUS protocol to transmit data over RS-485. After entering the "RS485 Communication Setup" interface, the "HI 2" shall lit up. Press [Up] or [Down] key and choose between the three MODBUS protocol options of "None", "Odd" and "Even". Press [Enter] and return to the measurement interface.

H. Conductivity/Resistivity Calibration mode

The model 3351 uses 1-point calibration for conductivity or resistivity.

In the **Measure mode**, pressing **[UP]** key and **[ENTER]** key at the same time to allow the meter to go to the **Conductivity / Resistivity calibration mode**.

At the **Conductivity / Resistivity calibration mode**, the "**CAL**" icon and a conductivity/resistivity reading will display. Rinse the conductivity probe in distilled water and immerse it into the standization solution. Allow temperature reading to stabilize, press **[UP]** key or **[DOWN]** key to change this reading to that of the standization solution value, then press **[ENTER]** key to save. Calibration is now completed.

ERROR DISPLAY AND TROUBLESHOOTING

Conductivity/ Resistivity Display	Temperature Display	Display Mode	Possible cause(s) [Action(s)]
"OvEr"	-10.0~120.0°C	Measure mode	Reading is over the specified range. [Change range to higher level]
“Undr”	-10.0~120.0°C	Measure mode	Reading is under user specified range. [Change range to lower level] [Immerse the conductivity probe into standization solution.]
"OvEr"	"OvEr"	Measure mode	a. Temperature > 120.0°C. [Bring standization solution to

			lower temperature.] [Replace temperature probe.] b. No temperature sensor. [Adjust the manual temperature to -10~120°C.]
"OvEr"	“Undr”	Measure mode	a. Temperature < -10.0°C. [Bring standization solution to higher temperature.] [Replace temperature probe.] b. No temperature sensor. [Adjust the manual temperature to -10~120°C.]

SPECIFICATIONS

Conductivity/Resistivity:

Basic Cell K	Range	Resolution	Accuracy
0.01	0.000~1.999uS/cm 0.00~19.99MΩ	0.001uS/cm 0.01MΩ	±0.5%FS ± 1 digit
0.01	0.00~19.99uS/cm 0.000~1.999MΩ	0.01uS/cm 0.001MΩ	±0.5%FS ± 1 digit
0.10	0.00~19.99uS/cm	0.01uS/cm	±0.5%FS ± 1 digit
0.10	0.0~199.9uS/cm	0.1uS/cm	±0.5%FS ± 1 digit
1.00	0.0~199.9uS/cm	0.1uS/cm	±0.5%FS ± 1 digit
1.00	0~1999uS/cm	1uS/cm	±0.5%FS ± 1 digit
1.00	0.00~19.99mS/cm	0.01mS/cm	±0.5%FS ± 1 digit
Temperature	-10.0 to 120.0 °C	0.1 °C	±0.3 °C

Conductivity/Resistivity:	
Cell Constant	0.01, 0.1, 1.0; 2 wire.
Reference Temperature	25.0 °C, factory set.
Temperature Coefficient	2.00 or 0.00%, user selectable.
Temperature:	
Temperature sensor	Thermistor: 10k ohm at 25 °C,
(User selectable)	Manual
RS485 :	Use MODBUS protocol to transmit data over RS-485
General:	
Power:	100VAC to 240VAC , 50/60Hz
Ambient Temperature range	0.0 to 50.0 °C
Case	IP65, 1/8DIN case, depth 90mm
Weight	290g

WARRANTY

Jenco warrants this product to be free from significant deviations in material and workmanship for a period of 1 year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse, within the year period, please return-freight-prepaid and the correction of the defect will be made free of charge. If you purchased the item from our **Jenco** distributors and it is under warranty, please contact them to notify us of the situation. **Jenco** Service Department alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

RETURN OF ITEMS

Authorization must be obtained from one of our representatives before returning items for any reason. When applying for authorization, have the model and serial number handy, including data regarding the reason for return. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. **Jenco** will not be responsible for damage resulting from

careless or insufficient packing. A fee will be charged on all authorized returns.

【Note】 **: Jenco** reserves the right to make improvements in design, construction and appearance of our products without notice.

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