CONDUCTIVITY METER

CT-650

FILTRA CONSULTANTS AND ENGINEERS LTD.
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TECHNICAL SPECIFICATIONS:

METER	
1. Physical dimensions Panel cut out	105 X 105 X 130 mm 92 mm X 92mm
2. Enclosure	ABS Weather proof/IP 65
3. Mounting	Field/Panel
4. Parameter sampling rate	< 2 seconds
5. Resolution	0.001/0.01/0.1/1 depending on range
6. Accuracy	±2% of FSD
7. Power supply	230V A.C./110V A.C./24V D.C.
8. Control relays	1 no 5 A @ 230 VAC (Programable through entire range with programmable control delay & hysteresis)
9. Alarms	In built buzzer with blinking LED
10. Display	4 Digit 7 SEGMENT LED
11. Calibration/Set point	Using front panel keypad.
12. Output	4-20 mA D.C.Current RS-485 } (Optional)
13. Range	0.5 to 1999 µS/cm² (other ranges optional)
SENSOR	
1. MOC	SS-316/ABS
2. End connection	½" & ¾" BSPM
3. Cell constant(K)	0.01/0.1/1.0
4. Cable	2 core shielded 3 meter length.
5. Max.operating pressure	5 kg/cm²
6. Max.operating temperature	60 °C 100 °C (With Automatic Compensation)
7. Sensor holder	3/4" Tee(MOC : ABS/Norryl)

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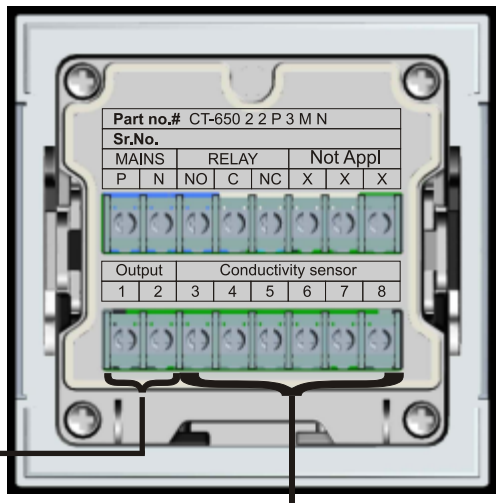
GETTING AQUAINTED WITH THE METER:

The meter has weather proof housing in compliance with the **IP-65 Certificate,** which makes it rugged and reliable. It can be used on sites exposed to rain, dust and robust handling. Basically, it comes in two parts viz. meter & sensor.

Sensor: It is the sensing element of meter, which senses the conductivity and sends the signal to the meter.

Meter: This is the unit that processes the information received from the sensor, displays the actual conductivity/TDS in line and gives alarm if Cond./TDS exceeds the set value.

WIRING CONNECTIONS:



Description	3	4	5	6	7	8
Without Temperature sensor	X	X	X	R	B	Sh
With Temperature sensor	X	G	Y	R	B	X

Part no.	Description	Terminal details	1	2
CT-650 1 C 2 **N**	With relay output only	Not appl.	X	X
CT-650 1 C 2 **C**	4-20 mA current O/P with relay	Current O/P	+	-
CT-650 1 C 2 **R**	RS-485 O/P with relay	RS 485 O/P	+	-

METER OPERATION

In regular operation, the Conductivity Meter displays the actual Conductivity/ TDS in the Line. Pressing the view key will display all the settings in the meter like Cell constant, Constant factor, Output ON value, Output OFF value, Temperature.

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PROGRAMMING THE SET POINT

Follow the below given instructions for programming the set point.

KEY	DISPLAY
Menu	dMod (Display mode)
Menu	µSM (i.e. micro Semens/cm)
Above conductivity unit can be changed to PPM by pressing ACK. key	
Menu	Set1
Menu	rAnG (Range) previously set value
What is this range? This range defines the maximum & minimum limits for the Set point.	
RANGE	**POSSIBLE SET POINTS**
19.99	00.00<Set point<19.99
199.9	000.0<Set point<199.9
1999	0000<Set point<1999
Use ACK.key to change the range	
Menu	Previously set value
Use ACK. & VIEW key to set desired value.	
If the Conductivity goes above the set point value, then the high LED will start blinking and the relay will get energized with an in built Buzzer.	
Menu	*Hys1
Menu	Previously set value
Use ack & view key to set this hysteresis value	
Menu	End
Menu	Actual reading

*Hys1:
The percentage value for which the relay will not reset after getting energized. e.g. If Set1 is set at 0200 and the hysteresis is kept at 10 then relay will get energized the moment Conductivity exceeds 200 (after the set control delay) and will remain energized until the value falls below 180.

INSTALLATION GUIDELINES

SENSOR

The conductivity sensor is supplied with 3/4" installation tee with female threading. The fitting can be connected to the sampling point by flexible tubing. The outlet tubing/piping must be looped such that the sensor fitting remains filled with water always (as shown below).

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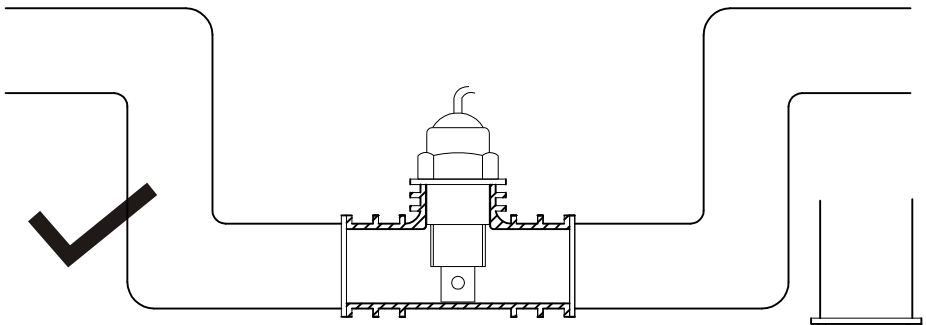
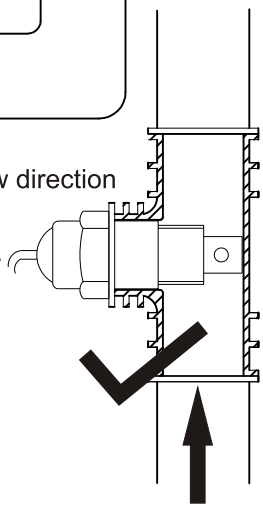
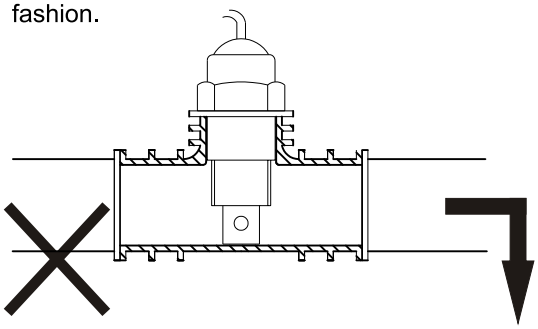


If sensor has to be connected in vertical line then flow direction should be from bottom to top(as shown)



Presence of air bubble in the line can result in erroneous or fluctuating readings. Avoid mounting in following fashion.

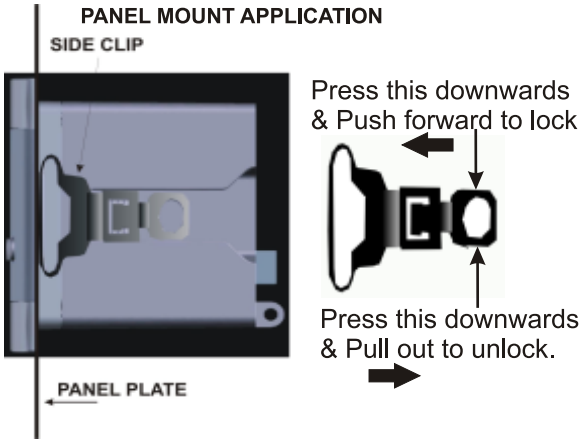


Incase the sensor is removed from the fitting,DO NOT APPLY GREASE ON THE SENSOR.

METER

The meter is designed to suit field,panel as well as sensor mount application as shown below.

PANEL MOUNT APPLICATION



SENSOR MOUNT APPLICATION

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ON SITE CALIBRATION OF METER:

The Conductivity Meter supplied comes duly calibrated by experienced professionals from our factory. Incase the need arises for onsite calibration please follow the below guideline :

Dip the sensor in known conductivity solution

KEY PRESSED	DISPLAY
Left & Middle simultaneously	PASS:0000
Enter password 0123 using Left & Middle key	
Menu	CnSt
Menu	Previously set Constant value*
Use Left & Middle key to set this constant value	
Menu	OFSt
Menu	Previously set Offset value
What is this offset value? This value offsets the reading shown by the sensor when it is in air (i.e. not in sample)Max.value 00.49	
Menu	End
Menu	Actual reading

***Note**: The constant is changed in proportion to the variation in the reading i.e. if the reading shown is 10% higher than the actual value, then the constant needs to be reduced by 10%.

OPERATION MODES

The meter can be operated in two modes (based on relay operation):

1. ALARM MODE: In this there are two options:

i) AcK (Acknowledge) : In this mode, the relay will get energized and reset once Ack. key is pressed.

ii) nAcK (No Acknowledge) : In this mode relay will be energized as long as Cond. value is across the set point. One can't reset the relay with Ack. Key

2. AUTO RESET MODE: In this mode, the relay gets automatically reset after 2 seconds.

KEY TO BE PRESSED	DISPLAY
VIEW & ACK.Simultaneously	PASS
ENTER PASSWORD 0234 USING ACK. & VIEW KEY	

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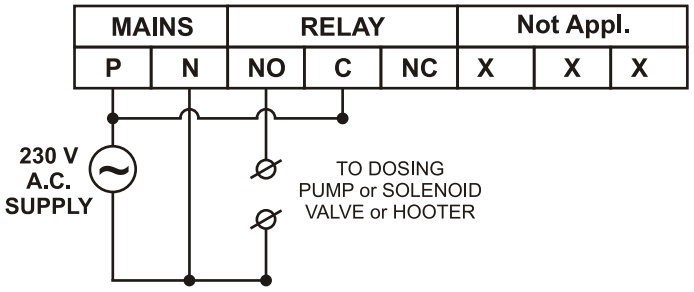
MENU	Cdly (control delay)
What is this ? This is the delay for which processor will ignore increase in Conductivity/TDS value & will energize relay after this much time (in seconds).	
MENU	0010
Use ACK. & VIEW key to change this time	
MENU	rlop
MENU	AlrM(Alarm)
Use ack. key to make it AUtr(Auto reset)	
MENU	Ack
Use ACK. key to make it nAck	
MENU	END
MENU	Actual reading

TYPICAL WIRING DIAGRAM OF A DOSING PUMP or SOLENOID VALVE or HOOTER THROUGH RELAY :



Not Appl.					Sensor		
X	X	X	X	X	R	B	Sh

IN CASE OF 4-20mA OUTPUT:

In case of field transmitter, the meter takes the sensor input & gives 4-20mA output current. The factory settings for ZERO(value of Cond/TDS at which transmitter would give 4 mA current) & SPAN (value of Cond./TDS at which transmitter would give 20 mA current) are:

Reading(µS/cm or ppm)	Current Output(mA)
00.00	4mA
	20mA

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To change the Zero & Span settings follow the guideline below:

KEY TO BE PRESSED	DISPLAY
VIEW & ACK	PASS 0000
ENTER THE PASSWORD 0678 USING VIEW & ACK. KEY	
MENU	Type
MENU	Norm
What is this ? Normally meter gives 4 mA @ ZERO value and 20 mA @ SPAN value , in some cases one might require 4 mA @ SPAN and 20 mA @ ZERO value. In that case make this as inV (Inverse) with ACK key.	
MENU	Zero
MENU	Previously set ZERO value
Use VIEW & ACK.key to change the value	
MENU	SPAN
MENU	Previously set SPAN value
Use VIEW & ACK.key to change the value	
MENU	END

Instrument also works as 4_20 mA current simulator.It gives 4 mA & 20 mA current for the calibration of other instruments.Follow the below guideline:

KEY TO BE PRESSED	DISPLAY
VIEW & ACK	PASS
ENTER THE PASSWORD 0420 USING VIEW & ACK. KEY	
MENU	4 mA
MENU	Instrument will give 4 mA current
VIEW	20 mA
MENU	Instrument will give 20 mA current
VIEW	End
MENU	Actual reading

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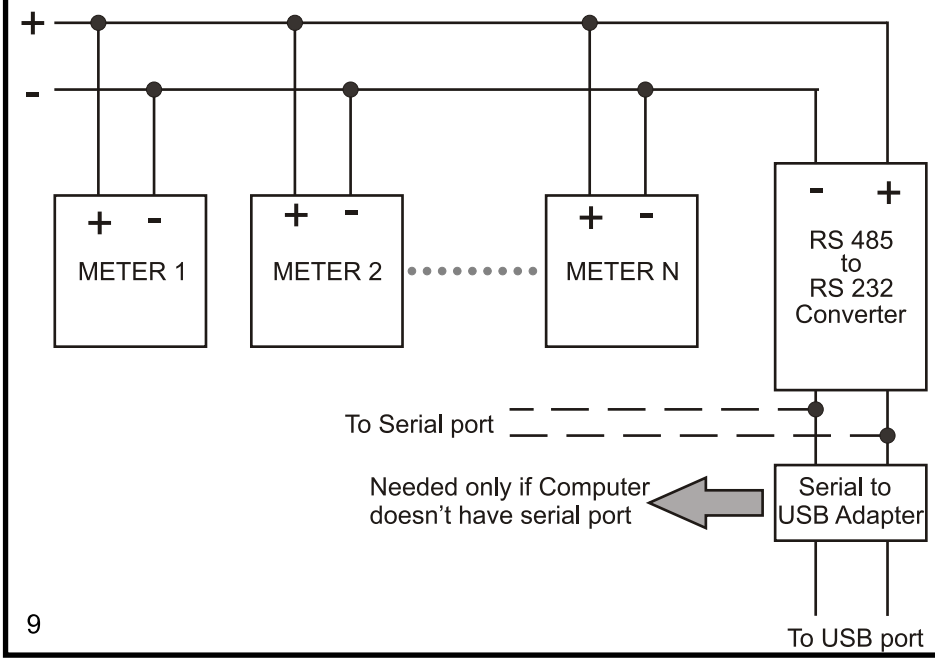
IN CASE OF RS-485 OUTPUT:

In case of Conductivity meter with RS-485 output, if number of instruments are connected through same wire (as shown below) then each instrument should have it's specific address(called as meter address).To set the meter address follow the below guideline.

KEY TO BE PRESSED	DISPLAY
VIEW & ACK Simultaneously	PASS then 0000
ENTER THE PASSWORD 0345 USING VIEW & ACK. KEY	
MENU	bd.rt (Baud Rate)
MENU	4800
Use ACK. Key to make it 9600.	
MENU	Addr(Address)
MENU	Previously set meter address
Use VIEW & ACK.key to change the address.	
MENU	E.nd
MENU	Actual value

Connection diagram for number of meters(with Rs485 O/P) to Computer:



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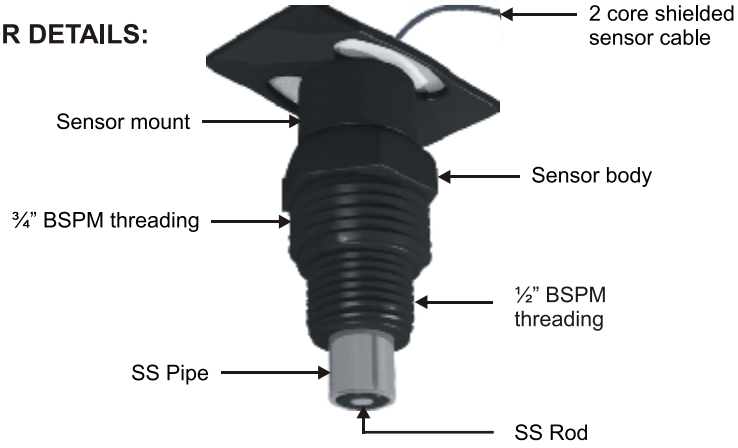
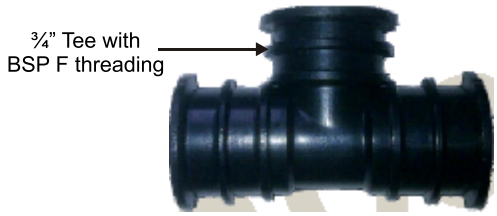
SENSOR DETAILS:





TROUBLESHOOTING

Trouble	Probable Cause	Action
Display Shows Erroneous reading	Wrong wiring	Connect the wires as per drawing
	Sensor not dipped in the line properly	Loop the outlet tubing such that the tee always remains flooded with water
	Deposition on the sensor	Remove the sensor and clean it with polish paper
No display	High voltage	Check MOV/FUSE, if it is burnt then replace it with new one
Frequent Fuse failure	MOV short	Replace MOV* as well as FUSE**

*MOV – 14mm Dia. and 320 V AC

** FUSE – 630 mA

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CHECK SHEET

GENERAL:

Date:

Name of Client / Dealer:

Serial no. :

No. of months in use:

Installation / Location: Indoor / Outdoor

Type of Application: Demineraliser / RO / MB /

Other – Please Specify :

Line Temperature: °C (max.)

Line Pressure: kg/cm²

PROBLEMS ENCOUNTERED:

No Display:

Erroneous Reading:

Breakage: Sensor / Meter

Erroneous Relay Operation:

Any Other - Please specify:

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