



Test Report

Vatturkar Industrial

	Standard	Actual
Product		
Model		
Sr. No.		
CC / range		
Cal. Factor		

This is to certify that the products mentioned above have been tested and calibrated at our works and have been found working satisfactorily as per the technical specifications of the product.

WARANTY CERTIFICATE

We certify that the instrument mentioned above has been tested by us and is guaranteed for a period of 12 months from the date of dispatch. We undertake to make good by replacement or repair defects arising due to faulty design, material and or workmanship within the above mentioned period. Provided that the part in respect to which the complaint is made, is sent at the purchaser's expense.

The warrantee is valid subject to :

The meter or part there of not being subjecty to alteration, accident abuse or misuse. The installation having been done as per guide lines in the manual.

Client: \_\_\_\_\_

Date of Dispatch \_\_\_\_\_ For Vatturkar Industrial

Manufacturer & Marketed by:

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Vatturkar Industrial

www.vatmeter.com



mhoCounter

Conductivity / TDS Indicator or Controller

OPERATION MANUAL

Serving the Industry since 1993

Dear Customer,

Thanks & congratulations on your purchase of the VATS product. For the care & maintenance of your product, pl. go through the manual. We wish you a long & trouble free life of our product.

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**Precautions: STOP! read this carefully before you proceed**

- Before use of the product, please check for Chemical compatibility, temperature, Pressure parameters of the liquid.
- Before installation or removal of the CELL, depressurize & vent the system.
- Sensor Cap to be tightened only with hands, do not use any tools.
- Follow safety measures - Use Helmet, gloves, goggles during installation
- Please do not alter product construction
- VATS sensors may not work properly for downstream liquid flow from a certain height because of gravity.

## A. Conductivity Sensor (Cell) Details

### Cell Introduction

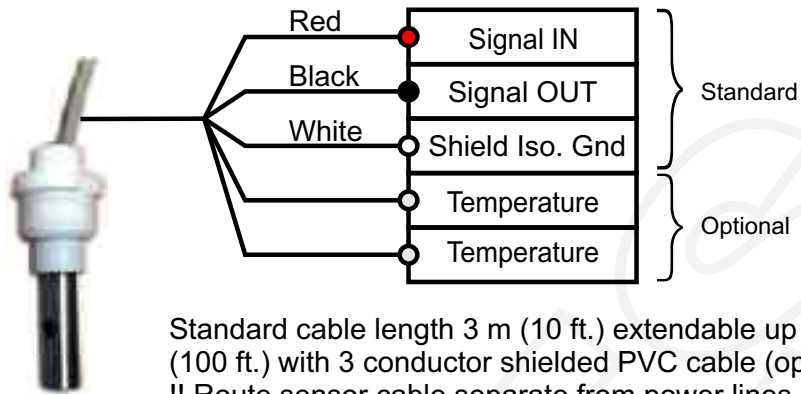
VATS Conductivity Cell is an insertion type sensor, in a robust & compact housing. VATS Conductivity/Resistivity sensors are designed to provide versatile installation and accurate sensing across a very broad dynamic range. Coupled with VATS meters a range with  $\pm 2\%$  of reading accuracy is achieved without the need for troublesome sensor platinization. Standard wiring allows connection without costly "patch cords." Further the Cells are available in a range of a Cell Constant from 0.01, 0.1 & 1 for various applications to satisfy the most demanding needs.

### Technical Specifications

O-rings	: Silicon,
Insulator material	: Epoxy resin, PTFE
Electrodes	: 316 Stainless Steel or Titanium
Pressure Rating	
Std. Polypro fitting	: 6.9 bar (100 psi) @ 100°C (212 °F)
Opt. 316 SS fitting	: 13.8 bar (200 psi) @ 120°C (248 °F)
Sanitary Connection	: 6.9 bar (100 psi) @ 120°C (248°C)
Cable Length	: 3 meter (std.)
Sensor weight	: 600 gm (approx.)
Conductivity range	
For 0.01 Cell	: 0.01 - 99.9 $\mu\text{S}/\text{Cm}$ (TDS: 0.09 - 66.5 PPM)
For 0.10 Cell	: 0.9 - 999 $\mu\text{S}/\text{Cm}$ (TDS: 0.599 - 665 PPM)
For 1.00 Cell	: 9 - 9999 $\mu\text{S}/\text{Cm}$ (TDS: 0.66 - 6665 PPM)

### Material of Construction (MOC)

	Body	Electrode	Cable	Temp Sensor
Standard	NYLON	SS 316	PVC 2 core shielded	—
Optional	PVDF PTFE	Titanium HestAlloy-C	PTFE 4core shielded	PT-100



Standard cable length 3 m (10 ft.) extendable up to 30 m (100 ft.) with 3 conductor shielded PVC cable (optional 5 core)  
 !! Route sensor cable separate from power lines !!

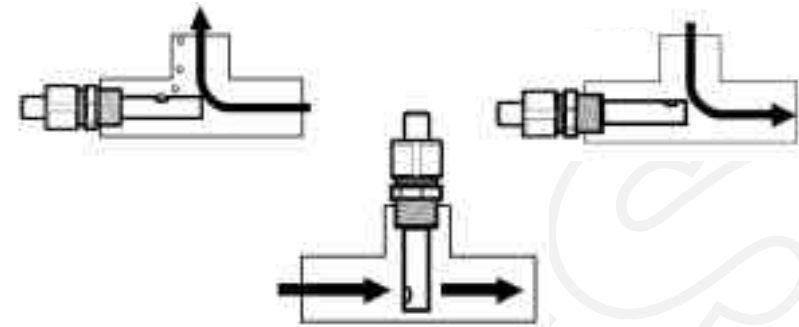
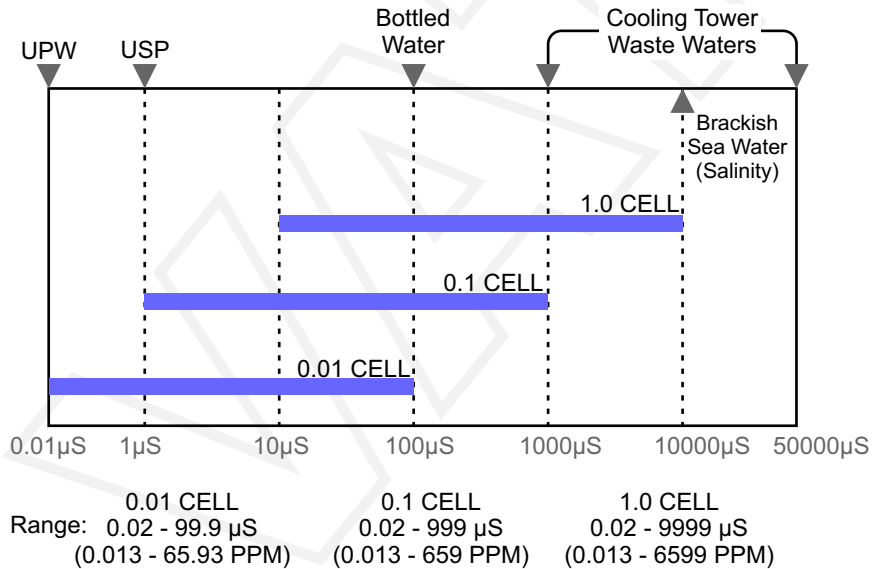


Fig.1 Installation Tips in various conditions

**Installation Guidelines**

**1. Operating Range Selection Chart**



**2. Placement of the fitting**

- Select a sensor location free of air bubbles and sediment buildup. The cell consists of holes to release any bubbles that may form in the flow. The flow should ideally hit the cell as shown in fig.1
- Conductivity measurements are adversely affected by substances that coat the electrodes.

**Features**

- Flow-through design eliminate bubble entrapment or sediment build-up
- Controlled surface finish ensures accuracy and repeatability
- Removable/reversible sensor fitting design
- Built-in strain relief
- Proper electrode clearance reduces possible DI resin or particle entrapment, critical with 0.01 cell designs
- In-line or submersible mounting
- PTFE insulator

**Application:**

- Pure Water Treatment
  - \* Reverse Osmosis
  - \* De-ionization
  - \* Distillation
- Boiler Condensate
- Semiconductor Water Production
- Rinse water monitoring and control
- Chemical Concentrations
- Cleaner and De-greaser Concentrations
- TDS
- Salinity
- USP Purified Water and WFI Water Production

## B. Electronic Monitors

The VATS mhoCounter is yet another step forward to deliver convenience & to the point technology in a compact package. With our experience of a wide range of installations, we came out with easy to fit conductivity / TDS meters. The mhoCounter CT-10 is a conductivity indicator & mhoCounter CT-11 is the meter with relay output option, which is programmable. Microprocessor based electronics allow wide operating range and long term signal stability. Optional relays provide control for adjustment or alarms. Also the meter comes with saddle mounting option or standard fittings to adopt to any process flow solution.

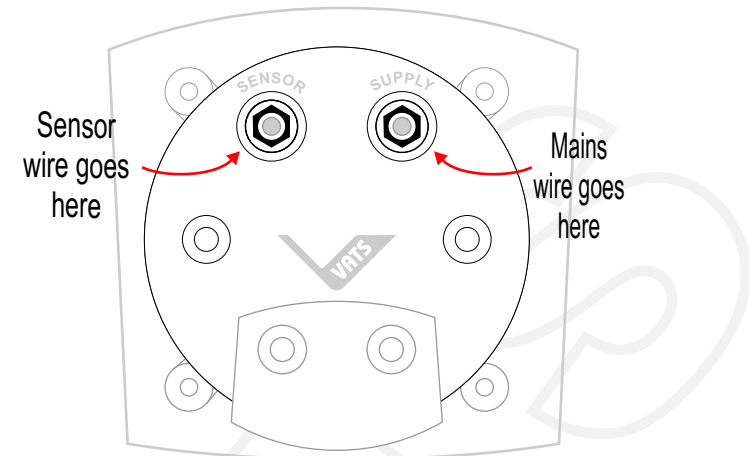
### Technical Specifications

Function	Conductivity & TDS indication & relay output
Accuracy	+/- 2%
Meter Dimensions	111 x 106 x 68 mm
Display	4 Digit Customized LCD
Mounting	On line type vertical or horizontal
Installation	Solventable T or Clamp-on Saddle
Protection	Weatherproof Enclosure
Programming	Through front panel keys.
Power Supply*	Universal 70V AC to 270V AC SMPS
Standard Fittings	(1/2", 1", 1 1/2") T; (2", 2 1/2", 3", 4") saddle.

### Features:

- Easy installation options (clamp-on saddle / adaptor)
- Display in  $\mu\text{S}/\text{CM}$ , ppm (TDS)
- Relay options
- Customized 4 digit LCD
- Weather proof enclosure
- Tactile keys on front panel
- Easy programming with front panel keys
- Branded meter at the most economic price.
- Clearly marked terminal labels

*Ensure proper connection of mains, wrong connection may spoil the meter.  
While extending the cable, use recommended type only, with proper insulation.  
Avoid noise interference. Do not pass the sensor wire parallel to power cable.  
If this is unavoidable - pass the sensor cable through noise protected tray.*



Back view of the mhoCounter

Fig. 2

### Getting Started

The front panel keys are used to program or view the status. The keys and their functions are explained below:

#### KEY1

Long Press - To enter program mode  
And then to shift Digit Left to Right.



KEY1



KEY2



KEY3

#### KEY2

To Increment (scroll) selected digit (in program mode)  
Long Press - To view Conductivity / TDS reading (in normal mode)

#### KEY3

To confirm the setting value (& move to next step)

#### Display Details:

- SET & PASSWORD Indication for waiting of password.
- CAL Indication for calibration.
- TDS Indication for Total dissolved solid mode.
- CONDUCTIVITY Indication for Conductivity mode.
- RLY Relay mode indication.
- $\mu\text{S}/\text{cm}$  Unit for Conductivity.
- PPM Unit for TDS.
- ERROR! Display error indication.



VATS Conductivity / TDS meters are micro-controller based. These user friendly units provide site calibration and facility to set different functions. Code no. entry has been provided to enter the program mode. Different code nos. for different parameters are provided as below:

- PASSWORD 0010 - To toggle Display bet. conductivity & TDS (Unit -  $\mu\text{S}$  or PPM)
- PASSWORD 0031 - To enter & edit the CELL constant
- PASSWORD 0011 - To set relay parameters

**TIMEOUT** - On no activity or input; the display returns to normal within 10 seconds  
**ERROR!** - If wrong password is entered (other than 0010, 0031, 0011) the display shows **PASSWORD ERROR!** & returns to normal within 2 seconds

Example shown for password 0010 - Toggle display between Conductivity or TDS

To enter programming mode, press & hold KEY1 for 3 seconds. The display shows first digit blinking



The first zero is blinking - using the same key (KEY1) advance it to 3rd digit. The display shows 3rd digit blinking.



Using the scroll key (KEY2) increment the digit (scroll thru 0 to 9), after the desired digit is displayed, press KEY1 to advance to next digit, the display shows



Enter the digit by scrolling with KEY2, once the password is entered confirm by pressing ENTER (KEY3) Now you have entered the program mode depending on your password.



*So this is the logic of programming the meter.  
 Let us explore the programming modes in detail.*

## A. Operation mode selection (PASSWORD - 0010)

1. As explained above enter password 0010,
  2. With KEY2 select the display unit between CONDUCTIVITY & TDS
  3. Press ENTER (KEY3) to confirm your choice
- This sets the meter to display the Conductivity or TDS with the appropriate unit ( $\mu\text{S}$  or PPM)

## B. CELL constant selection (PASSWORD - 0031)

1. As explained above enter password 0031, the display shows **CC**
2. With KEY2 scroll between the CELL CONSTANT : 0.01, 0.1, 1.0
3. Press ENTER (KEY3) to confirm your choice.
4. After confirmation the display will ask for Actual CELL Constant
5. Use KEY1 & KEY2 to edit Actual CELL Constant, ENTER (KEY3) to confirm

If Cell Constant = 1 then Actual CC will change from 0.9 to 1.1 ( $\pm 10\%$ )  
 If Cell Constant = 0.1 then Actual CC will change from 0.09 to 0.11 ( $\pm 10\%$ )  
 If Cell Constant = 0.01 then Actual CC will change from 0.009 to 0.011 ( $\pm 10\%$ )

After confirmation, if value is not in the range then the display shows **ERROR!** and returns to Actual CC menu & the process repeats

## C. Relay Parameters Selection (PASSWORD - 0011)

**!! Note down the Cell Constant value before entering RELAY Set point Menu !!**

1. As explained before, enter password 0011, display shows **rlsp** (Relay Set Point)
2. Use KEY2 & KEY3 to edit Relay Set Point - ENTER (KEY3) to confirm.
3. Now the display shows **dp** (decimal point)
4. Use KEY2 to edit decimal point, press ENTER (KEY3) to confirm.

If Cell Constant = 1 then range of Relay Set Point is 1 to 9999.  
 If Cell Constant = 0.1 then range of Relay Set Point is 0.09 to 999.  
 If Cell Constant = 0.01 then range of Relay Set Point is 0.01 to 99.9.

After confirmation, if the value is not in the range then the display shows **ERROR!** and returns to the sub menu (rlsp or dp) & the process repeats

5. After confirmation, if the set point is within range, the display will show **hyst** - i.e. Hysterisis. (to control the chattering of the relay on set point)
6. Use KEY1 & KEY2 to edit the value within 1 to 10 press KEY3 to confirm.  
 If the hysteresis value is not in the range of the relay set point, the display returns to Hysteresis menu & the process repeats.  
 If the value is valid, the display returns to normal.

This finishes the programming part. Now you have set the meter to your own preferences. Be sure to go through the trouble shooting page to know more.

All VATS products are sent to you after a thorough quality check. In case the meter displays a faulty reading or no reading, pl. go through this trouble shooting guidelines.

If the problem persists, get in touch with us by filling out the information given in the check sheet on the next page.

Trouble	Probable cause	Action required
Display remains zero	No flow through the sensor T fitting	Open the sampling valve. Mount the Tee as shown in the configurations. Keep the outlet tubing at a higher point than the inlet such that the sensor always remains dipped in water.
	Air trapped in the tee	
	Sensor not inserted in the correct plane.	
	Sensor wire cut not connected.	Check for physical damages and or wires joined properly
Display shows a reading of <b>Or</b> (over-range)	This means that conductivity of water is higher than the range of meter	Use a CELL of correct range or wait for the conductivity to drop down
Reading getting displayed but not correct.	Mainly applicable where sensor wire is extended	Ensure that the meters are Connected to the corresponding sensor, by cheking the Serial nos. Avoid extending the sensor cable with non-standard extra wire.
	Meter and sensor are not matching.( applicable for panel mounted meters)	
	Sensor not clean	Ensure sensor is free of any coating or scale or grease.
	Earthing not connected or improper earthing	Provide proper earthing. Voltage between phase & earth should be 230 V. voltage bet neutral & earth should be < 5 V.
No display	No supply	Check input supply and make proper connections

Name of Client/Dealer:			
Model: Conductivity Indicator CT-10	<input type="checkbox"/>	Serial Number:	
Model: Conductivity Controller CT-11	<input type="checkbox"/>	Date:	
Meter reading in PPM	<input type="checkbox"/>	Location: outdoor	<input type="checkbox"/>
Meter reading in $\mu\text{S/cm}$	<input type="checkbox"/>	Location: indoor	<input type="checkbox"/>
CELL CONSTANT 0.01	<input type="checkbox"/>	CELL CONSTANT 1	<input type="checkbox"/>
CELL CONSTANT 0.1	<input type="checkbox"/>	CC other _____	<input type="checkbox"/>
Types of Problem			
No display	<input type="checkbox"/>	Reading remains Zero	<input type="checkbox"/>
Fluctuating reading	<input type="checkbox"/>	Steady but wrong reading	<input type="checkbox"/>
Breakage	<input type="checkbox"/>	Gradual fading of display	<input type="checkbox"/>
Display shows over range only	<input type="checkbox"/>	Any other	<input type="checkbox"/>
If any other problem pl. specify:			
Checklist filled by:		Date:	
Company name:			

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