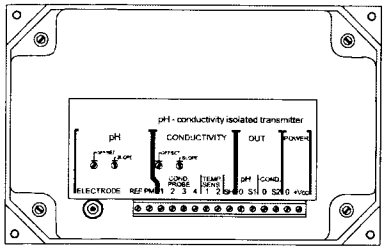
Instruction Manual

CDTX-300
pH/Conductivity
Isolated Transmitter

0 to 14 pH = 4 to 20 mA

0 to 10 mS = 4 to 20 mA



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M-3872/1002

Dear Customer,

Thank you for choosing an Omega Enginnering product. This manual will provide you with the necessary information for the correct operation of the meter. Please read it carefully before using the meter.

This instrument is in compliance with the CE directives.

PRELIMINARY EXAMINATION

Remove the instrument from the packing material and examine it carefully. If any damage has occurred during shipment, immediately notify Omega Customer Service.

Note: Conserve all packing material until the instrument has been observed to function correctly. Any defective item must be returned in its original packing.

GENERAL DESCRIPTION

CDTX-300 is a pH/EC transmitter specially designed for long distance measurements of pH and Conductivity in industrial applications. It can be either panel or wall-mounted.

The pH and conductivity signals are isolated to avoid any interference with the receiving device.

Probes connectors, power supply, contacts and calibration trimmers are easy to reach directly on the front panel.

For in-line applications the recommended conductivity probe is the CDE-300.

CDE-300 is a 4-ring conductivity probe with platinum sensors and an internal temperature sensor to compensate reading for temperature changes.

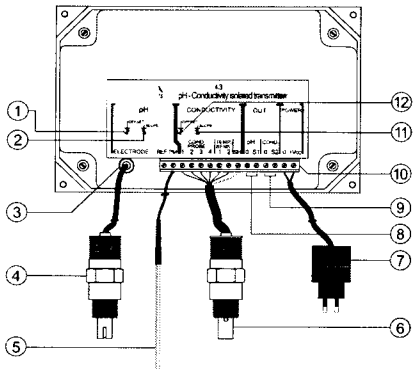
Probe has external threads for easy installation in continuous flow-thru monitoring, for either in-line or tank applications.

It can resist up to 80°C (176°F) and 6 bar (87 psi).

The instrument is supplied with a differential input. A CDTX-300-MP matching pin of stainless steel can be connected to prevent potential grounding problems and ensure longer life to the electrode.

Measurements are accurate and the meter can be calibrated at one or two points.

FUNCTIONAL DESCRIPTION



1. pH Offset Calibration Trimmer
2. pH Slope Calibration Trimmer
3. BNC connector for pH Electrode
4. pH electrode (not included)
5. Potential Matching Pin (included)
6. Conductivity Probe (not included)
7. 12-24 VDC power adapter (not included)
8. pH Output Terminals
9. Conductivity Output Terminals
10. Power Supply Terminals
11. Conductivity Slope Calibration Trimmer
12. Conductivity Offset Calibration Trimmer

SPECIFICATIONS

Range	pH	0 - 14
	conductivity	0 - 10 mS/cm
Accuracy (@25°C/77°F)	pH	±0.5% f.s
	conductivity	±2% f.s.
Typical EMC Deviation	pH	±2% f.s.
	conductivity	±2% f.s.
Output	pH	4÷20 mA (isolated)
	conductivity	4÷20 mA (isolated)
Temp.Compensation	Automatic from 0 to 60°C with B=2%/°C	
Calibration	Manual with two trimmers	
	pH	Offset: ±2pH; Slope: 80÷110%
	conductivity	Slope: ±20%
pH Probes	CDTX-300-MP (included)	
conductivity Probe	CDE-300 (not included) with cell constant 2.1	
Power supply	External, 12 to 24 VDC (not included)	
Dimensions	160 x 105 x 31mm (6.2 x 4.1 x 1.2")	
Weight	280 g (9.9 oz)	

CONNECTIONS

pH ELECTRODE CONNECTION

- Connect the pH electrode to the BNC connector and the Potential Matching Pin to the PM terminal.

CONDUCTIVITY PROBE CONNECTION

- Probe wires are color coded for an easy operating. Follow the table below for proper installation.

Terminal #	Probe Wire Color
Cond.Probe 1	green
Cond.Probe 2	white
Cond.Probe 3	red
Cond.Probe 4	blue
Temp.Sens. 1	brown
Temp.Sens. 2	grey
SHIELD	yellow-green

POWER CONNECTION

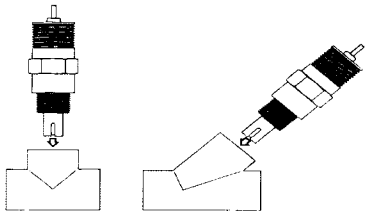
- Connect a 2-wire cable to the 12-24 VDC power source paying attention to its polarity.

OUTPUT CONNECTION

- Connect the pH output terminals to the pH receiver with a 2-wire cable, and the conductivity output terminals to the conductivity receiver with a second 2-wire cable. Pay attention to the polarity. At these contacts voltages vary proportionally to the measured pH and conductivity values between 4 and 20 mA.

OPERATIONAL GUIDE

- To minimize thermal drifts due to extreme temperature fluctuations and in case of outdoors measurements, it is recommended to protect the transmitter with a proper casing.
- Connect pH electrode, conductivity probe, power supply and receiving devices to the transmitter by following the previous instructions.
- Remove the protective cap from the pH electrode and immerse it into the sample, at least 4 cm.
- When using the matching pin, dip it together with the pH electrode; otherwise, connect its terminal to the reference with a jumper wire.
- Immerse the conductivity probe in the sample.
- For continuous flow-thru measurements, the probes can be easily installed in any standard ½" pipe tee. Use Teflon tape between the probe and the pipe to ensure a leak free joint. Take care not to overtighten it, as excessive pressures can cause probe damage.



Note: to prevent damage to the electrode, disconnect the pH electrode before turning the meter off.

CALIBRATION

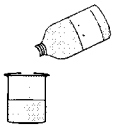
For better accuracy, frequent calibration of the instrument is recommended. In addition, the instrument must be recalibrated for pH:

a) Whenever the electrode is replaced.

b) After testing aggressive chemicals.

c) At least once a month.

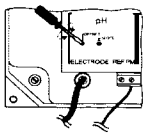
pH CALIBRATION

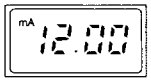


Pour small quantities of pH 7.0 and pH 4.0 solution into two clean beakers.
Calibration with pH 4.0 solution is recommended for measuring acidic samples. Use pH 10.0 solution if subsequent samples are alkaline.

- Connect a multimeter to the pH output terminals and set it to current readings.
- Turn the transmitter on.
- Rinse the electrode and immerse it in a pH 7.0 buffer together with the grounding probe. Stir gently and then wait for the reading to stabilize.

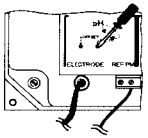
- Adjust the pH Offset Calibration Trimmer with a small screwdriver until the multimeter displays 12.00 mA.

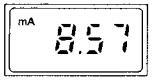




- Rinse the pH electrode and the grounding probe, and immerse them in pH 4.0 (or pH 10.0) buffer. Stir gently and wait for a couple of minutes.

- Adjust the pH Slope Trimmer until the multimeter shows the corresponding mA value of the second buffer (8.57 mA for pH 4 and 15.43 mA for pH 10 solution).

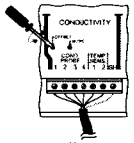


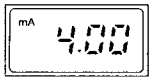


The pH calibration is now complete.

CONDUCTIVITY CALIBRATION

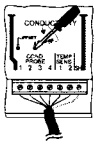
- Connect a multimeter to the conductivity output terminals and set it to current readings.
- Turn the transmitter on.
- The CDE-300 conductivity probe must be dry.
- Adjust the Conductivity Offset Calibration Trimmer with a small screwdriver until the multimeter displays 4.00 mA.

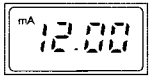




- Pour a small quantity of 5.00 mS/cm calibration solution in a beaker.
- Immerse completely the tip of the conductivity probe in the conductivity solution.
- Tap the probe and stir it to ensure that no air bubbles are trapped inside the sleeve. In the case of in-line applications, to better simulate the installation ambient, put the probe tip close to the bottom edge of the beaker.

- Allow the reading to stabilize and then adjust the conductivity Slope Calibration Trimmer until the multimeter displays 12.00 mA.





The conductivity calibration is now complete.

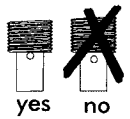
MAINTENANCE

pH ELECTRODE MAINTENANCE

- Do not be alarmed if white crystals appear around the electrode protective cap. This is normal with pH electrodes and they dissolve when rinsed with water.
- When not in use, rinse the electrode with tap water to minimize contamination and store it with a few drops of storage or pH 7 solution in the protective cap. DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.
- If the electrode has been left dry, soak the tip in a storage or pH 7 solution for at least one hour to reactivate it.
- To minimize clogging and provide longer life for the pH electrode, it is recommended to clean it monthly. Immerse the tip of the electrode for one hour and then rinse it with tap water.

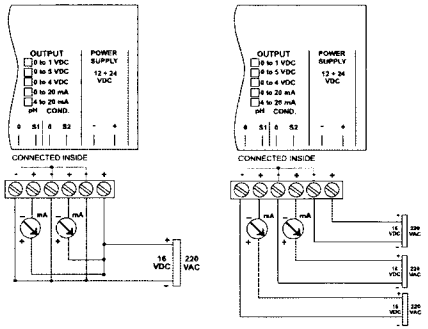
CONDUCTIVITY PROBE MAINTENANCE

- Remove the conductivity probe and rinse it with tap water. If a more thorough cleaning is desired, remove the protective plastic sleeve and clean the platinum sensors with a nonabrasive cloth or cleaning solution. Reinsert the sleeve while paying attention that the hole touches the threaded edge.



OUTPUT

The output must be feed by an external power supply, which can be the same used for the meter. Carefully follow the first connection diagram.
If an additional power supply is used to feed the inputs, follow the second connection schema. Note that the negative sockets are connected with the negative power supply.



WARRANTY

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KID WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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