Quick Start Guide
00825-0100-3960, Rev AB
March 2020

Rosemount™ TF396

TUpHFET™ Combination pH Sensor

ROSEMOUNT™

EMERSON.

Essential instructions

Read this page before proceeding!

Emerson designs, manufactures, and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, you must properly install, use, and maintain them to ensure they continue to operate within their normal specifications. You must adhere to the following instructions and integrate them into your safety program when installing, using, and maintaining Emerson's Rosemount products. Failure to follow the proper instructions may cause any one of the following situations to occur: loss of life, personal injury, property damage, damage to this instrument, and warranty invalidation.

- Read all instructions prior to installing, operating, and servicing the product.
- If this Quick Start Guide is not the correct one, call 1-800-854-8257 or 949-757-8500 to request the correct Quick Start Guide. Save this Quick Start Guide for future reference.
- If you do not understand any of the instructions, contact your Emerson representative for clarification.
- Follow all warnings, cautions, and instructions marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- Install equipment as specified in the installation instructions of the appropriate Reference Manual and per applicable local and national codes. Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, use qualified personnel to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, and VOID YOUR WARRANTY. Look-alike substitutions may result in fire, electrical hazards, or improper operation.

⚠ WARNING

Hazardous area installation

This sensor is not intrinsically safe or explosion-proof.

Installations near flammable liquids or in hazardous locations must be carefully evaluated by qualified on-site safety personnel.

To secure and maintain an instrinsically safe installation, use an appropriate transmitter/safety barrier/sensor combination.

The installation system must be in accordance with the governing approval agency (FM, CSA, or BASEEFA/CENELEC) hazardous area classification requirements.

Consult your transmitter Reference Manual for details.

Proper installation, operation, and servicing of this sensor in a hazardous area installation is entirely the operator's responsibility.

⚠ CAUTION

The wetted sensor materials may not be compatible with process composition and operating conditions.

Application compatibility is entirely the operator's responsibility.

Warranty

Seller warrants that the firmware will execute the programming instructiosn provided by Seller, and that the Goods manufactured or services provided by Seller will be free from defects in materials or workmanship under normal use and care until the expiration of the applicable warranty period. Goods are warranted for twelve (12) months from the date of intial installation or eighteen (18) months from the date of shipment by Seller, whichever period expires first. Consumables, such as glass electrodes, membranes, liquid junctions, electrolyte, O-rings, catalytic beads, etc. and services are warranted for a period of 90 days from the date of shipment or provision.

Products purchased by Seller for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that Seller has no liability for Resale Products beyond making a reasonable commercial effeort to arrange for procurement and shipping of the Resale Products.

If Buyer discovers any warranty defects and notifies Seller thereof in writing during the applicable warranty period, Seller shall, at its option, promptly correct any errors that are found by Seller in the firmware or Services, or repair or replace F.O.B. point of manufacture that portion of Goods or firmware found by Seller to be defective, or refund the purchase price of the defective portion of the Goods/Services.

All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources, unsuitable environmental conditions, accident, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or by any other party except as may be agreed upon in writing in advance by an authorized Seller representative. All costs of dismantling, reinstallation and freight and the time and expenses of Seller's personnel for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by Seller.

Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by an authorized representative of Seller. Except as otherwise expressly provided in the Agreement, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES.

Contents

1 Description and specifications

1.1 Features and applications

The ion-selective field effect transistor (ISFET) pH electrode provides a stable pH measurement.

Its rate of response can be ten times faster than glass electrodes, enabling better process control. Its short response time and increased stability at low temperatures makes it suitable for use in cold processes like brine or water for cooling. Aging effects caused by temperature fluctuations or large changes of process pH are greatly reduced, providing longer intervals between calibration and maintenance of the sensor.

Because there is no glass bulb, you can use the sensor in many applications that restrict or prohibit pH glass electrodes due to the risk of broken glass getting into the process. It may also provide longer sensor life in processes that will break or crack pH glass bulbs. By allowing direct installation into the process, costs for laboratory analysis of sample lines are greatly reduced.

The TUpH Reference technology includes a large area reference junction for minimum maintenance requirements. The reference junction provides an electrical connection between the reference electrode and the sample and helps maintain a stable reference potential, regardless of the change in sample pH. The TUpH reference electrode junction (the entire plastic tip surrounding the ISFET electrode) maintains a steady reference signal, even in dirty applications, by resisting plugging (a common cause of pH signal drift). This large reference junction area (400 times greater than typical PTFE or ceramic junctions) is made of micron-sized reference pathways, allowing for ionic exchange, but preventing plugging by larger particles; the junction continues to send a pH signal even in the dirtiest of applications. The field-proven TUpH reference junction technology results in greatly reduced maintenance requirements.

The TUpH helical reference pathway resists reference poisoning. Ions diffuse through the reference pathways, and a charge is passed to the reference element. The reference element must be protected from contamination by poisoning ions such as sulfide, mercury, cyanide, and ammonia that will cause reference drifts and offsets. The TUpH sensor's long internal reference pathway hinders the contaminants' migration to the reference element thereby providing an increased sensor life.

Emerson has specifically designed all TUpH sensor models for improved performance in harsh, dirty, or abrasive applications where large quantities or suspended solids are present.

The Rosemount TF396 offers a watertight sensor-to-cable connector that prevents cable twisting and eliminates the need for rewiring when replacing the sensor. The sensor cable includes an integral preamplifier cap with mating connector and is compatible with most Rosemount transmitters.

1.2 Specifications

Measurement range	2 to 12 pH
Measuring element	Ion-selective field effect transistor (ISFET)
Repeatability	±0.05 pH
Response time to pH change	99% in 30 seconds step change
Wetted materials	Code -01: Polypropylene, EPDM, ryton, silicone Code -02: 316 stainless steel, titanium, polypropylene, EPDM, ryton, silicone
Process connections	Code -01: 1-in. (25.4 mm) male national pipe threads (MNPT), front and rear facing Code -02: 2-in. (50.8 mm) Tri-Clamp connection
Temperature range	32 to 212 °F (0 to 100 °C) at 50 psig (344.7 kPa [abs])
Pressure range	-10 to 100 psig (32 to 790 kPa [abs]) at 122 °F (50 °C)
Minimum process conductivity	75 µS/cm; nominal: 100 µS/cm
Cable lengths	20 ft., 50 ft. (6.1 m, 15.2 m)
Weight/shipping weight	1 lb./2 lb. (0.45 kg/0.9 kg)

2 Install

2.1 Unpack and inspect

⚠ WARNING

Buffer solution in the vinyl boot may cause skin or eye irritation.

⚠ CAUTION

Wet electrode tip at all times to maximize storage life.

⚠ CAUTION

Cable connection at back of sensor body is fragile.

Do not overtighten.

Procedure

1. Inspect the outside of the carton for any damage. If you detect damage, contact the carrier immediately.
2. Inspect the hardware. Make sure all the items on the packing list are present and in good condition. Notify the factory if any part is missing.

Postrequisites

If the sensor appears to be in satisfactory condition, proceed to .

Note
Save the original packing cartons and materials as most carriers require proof of damage due to mishandling, etc. Also, if you need to return the sensor to the factory, you must pack it in the same manner as it was received. Refer to for return instructions. If storing the sensor, fill the vinyl boot with pH buffer solution and replace it on the sensor tip until you are ready to use it.

2.2 Mount

Emerson has designed the sensor to be located in industrial process environments.

Do not exceeed temperature and pressure limitations at any time. A caution label regarding this matter is attached to the sensor. Please do not remove this label. See Figure 2-1.

⚠ WARNING

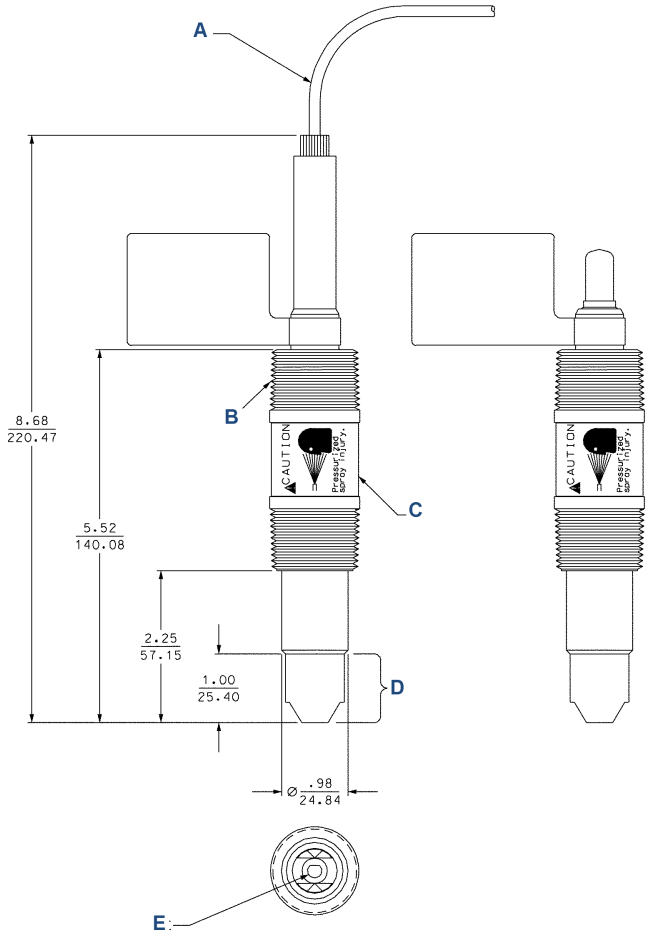
Internal electrolyte fill solution may cause skin or eye irritation.

⚠ CAUTION

Cable connection at back of sensor body is fragile.

Do not overtighten.

Figure 2-1: Dimensional Drawing



A. *Connection, preamp cap adapter with cable. PN 23991-02/03*
B. *1-in. MNPT (two places)*
C. *1-in. wrench opening*
D. *Reference*
E. *Electrode*

⚠ WARNING

Pressurized spray injury

US and foreign patents pending.

Do not exceed pressure and temperature specifications. From 32 to 122 °F (0 to 50 °C): maximum pressure: 100 psig (790 k Pa). From 122 to 212 °F (50 to 100 °C): maximum pressure: 50 psig (345 kPa).

Remove pressure and allow to cool before removal.

Read and follow manual.

In most cases, you can simply install the pH sensor as shipped and obtain readings with an accuracy of ±0.6 pH. To obtain greater accuracy or to verify proper operation, calibrate the sensor as a loop with its compatible transmitter.

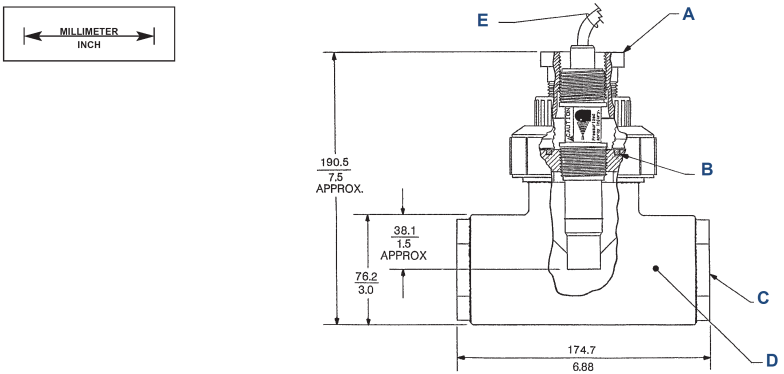
2.2.1 Flow through and insertion mounting

The sensor has a 1-in. MNPT process connection at the front of the sensor for mounting into a 1½-in. tee or the process pipes.

See Figure 2-1 through Figure 2-8 for installation configurations.

Note
Do not use large pipe wrenches to tighten the sensor into a flange or other type of mounting.

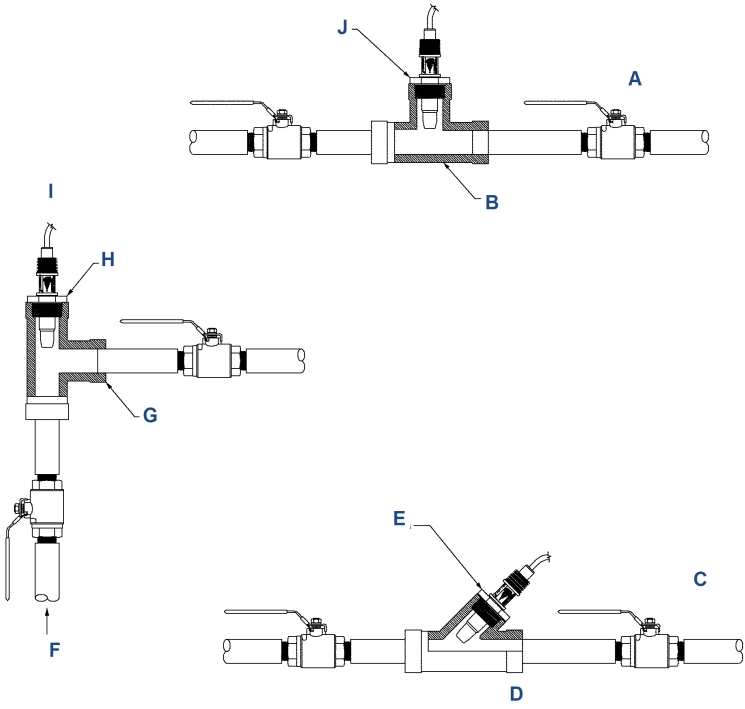
Figure 2-2: Flow-Through Tee with Adapter (PN 915240-xx*)



A. Adapter retrofit PN 33211-00.
B. O-ring must be in place prior to use.
C. Process connection threads: two places.
D. 2-in. (50.8 mm) scheduled 80 "T".
E. Sensor cable with connector - not shown.

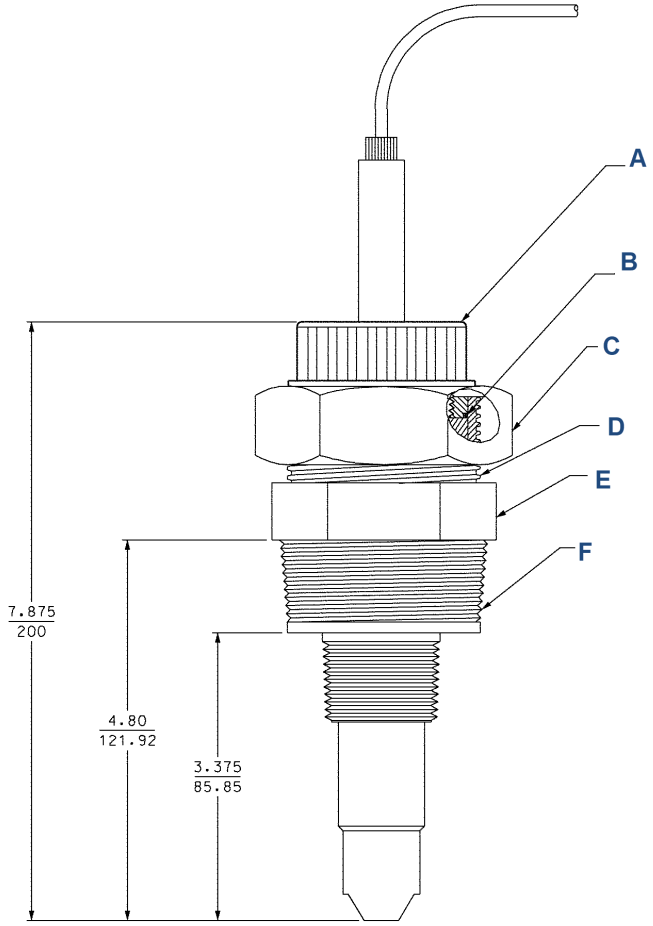
xx*	Process connection threads
03	¾ in.
04	1 in.
05	1½ in.

Figure 2-3: Flow-Through and Insertion Installations



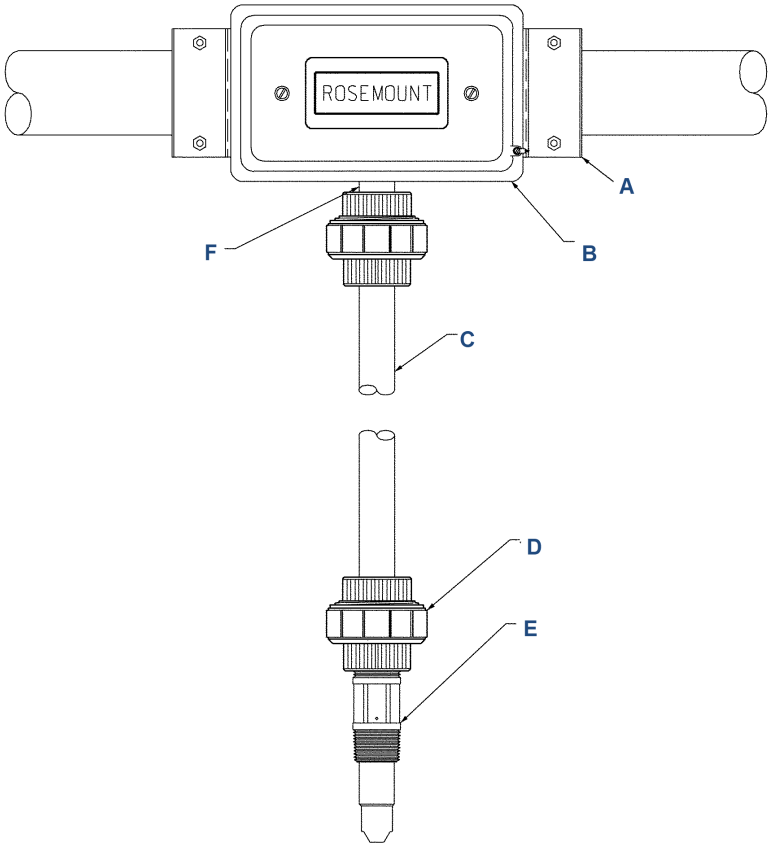
A. *Straight flow shown*
B. *1½-in. pipe tee with reducing bushing PN 2002011*
C. *Pipe "Y" installation shown*
D. *1½-in. Pipe "Y" (by others)*
E. *1½-in. x 1 in. reducing bushing PN 933044*
F. *Flow*
G. *1½-in. pipe tee with reducing bushing PN 2002011*
H. *1½-in. x 1-in. reducing bushing*
I. *Angle flow shown*

Figure 2-4: Rosemount™ TF396 with Insertion Mounting Adapter PN 23242-02



A. Peek adapter 1-in. FNPT x ¾-in. FNPT (reversible).
B. 1-135 Viton O-ring. O-ring must be in place prior to use (PN 9550175).
C. Nut, hex union 2-in. 3-in. wrench opening (304 stainless steel).
D. 2.531.8 Acme thread (typ).
E. Neck, union fitting (316 stainless steel). 2⅝-in. wrench opening.
F. 1½-in. MNPT.

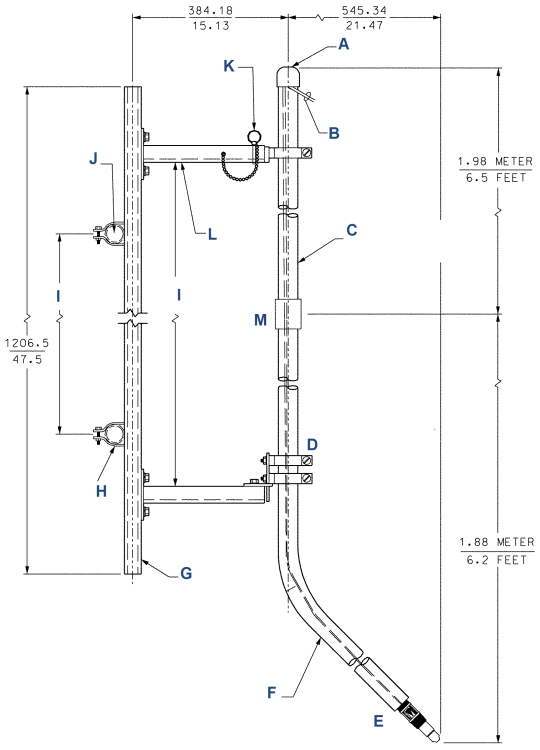
Figure 2-5: Submersion Installations



Regularly check to make sure connections are water tight.

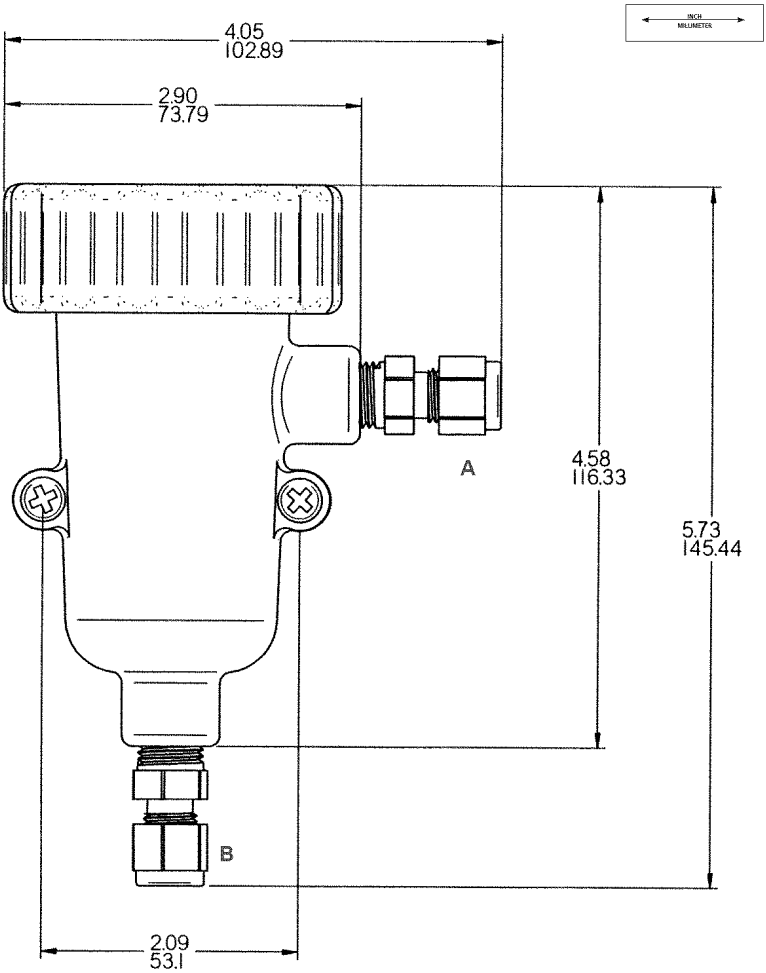
A. *2-in. pipe mounting bracket PN 2002565*
B. *Junction box: PN 23550-00 (without preamp)*
C. *1-in. pipe by others*
D. *2 x 1-in. FNPT CPVC union PN 9320057*
E. *Rosemount TF396*
F. *Flexible conduit required*

Figure 2-6: Submersion Installations (Continued)



A. End cap PVC.
B. Sensor cable.
C. 1½-in. PVC pipe schedule 80.
D. 1½-in. pipe clamp, three places.
E. Sensor Rosemount TF396. Regularly check to make sure connections are watertight.
F. Sweep pipe with 1-in. FNPT adapter.
G. Unistrut 1⅝ x 1⅝ in. aluminum.
H. 1½-in. pipe clamp, two places.
I. Can be any convenient dimension.
J. Customer handrail two places.
K. Locking pin with bead chain.
L. Mounting channel aluminum two places.
M. Coupling.

Figure 2-7: Low Flow Cell PN 24901-00

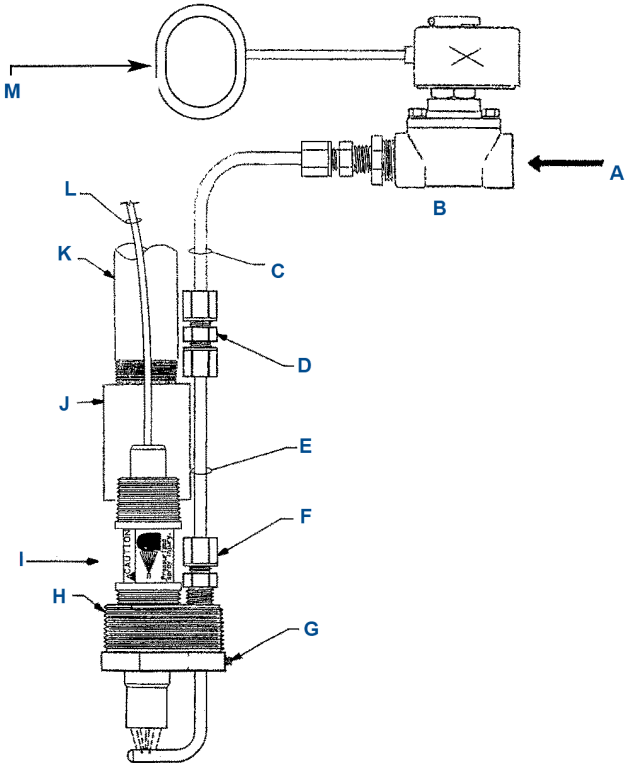


Inlet and outlet connections are stainless steel and take ¼-in. OD tubing. Flow cell is polycarbonate with ¼-in. FNPT fittings.

Wetted materials	
Body	Acrylic
Nut	CPVC
Fittings	316 stainless steel
Seals	Buna N

Flow cell ratings	
Temperature	32 to 122 °F (0 to 50 °C)
Maximum pressure	65 psig (549 kPa [abs])
Flow rate	2 to 5 gph (7.6 to 18.9 lph)

Figure 2-8: Jet Spray Cleaner PN 12707-00



A. Cleaning solution by others
B. Solenoid valve or manual valve (supplied by others)
C. Corrosion resistant tubing (supplied by others)
D. Polypropylene ¼-in. compression fitting.
E. ¼-in. 316 stainless steel
F. ¼-in. polypropylene
G. Stainless set screw for adjustable spray nozzle height
H. 2-in. NPT threads
I. Sensor
J. 1-in. PVC coupling for submersible applications (supplied by others)
K. 1-in. PVC or stainless conduit (supplied by others)
L. Cable
M. Timer (supplied by others or use Model 1054 or 54 timer)

2.2.2 Submersion mounting

The sensor has a 1-in. MNPT process connection at the back. You can use a standard 1-in. union to mount the sensor to a 1-in. SCH 80 CPVC or PVDF standpipe.

See Figure 2-5. Tapered pipe threads in plastic tend to loosen after installation. Therefore, Emerson recommends using Teflon™ tape on the threads and checking the tightness of the connection frequently to ensure that no loosening has occurred. To prevent rain water or condensation from running into the sensor, Emerson recommends a weatherproof junction box. Run the sensor cable through a protective conduit for isolation from electrical interference or physical abuse from the process. Install the sensor within 80 ° of vertical with the electrode facing down. Do not run the sensor with power or control wiring.

3 Wire the sensor

Figures in this section provide the guidelines for wiring the sensor to various transmitters. To determine which wiring guideline to use, locate the model number of the transmitter to be installed.

⚠ WARNING

Electrical shock

Serious injury may result.

Do not connect sensor cable to power lines.

1. If you need to extend the cable (maximum distance from sensor to transmitter is 250 ft. [76.2 m]), use a high quality eleven conductor double shielded instrument cable available from Rosemount™.

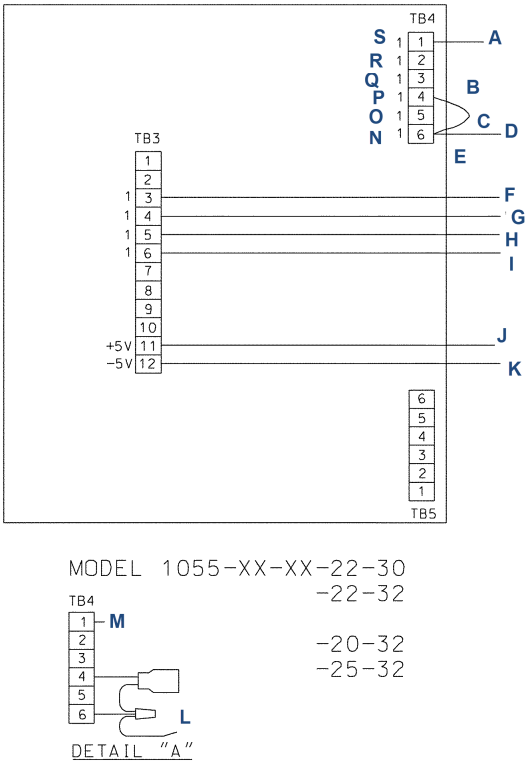
   Note
   If the cable is too long, loop up the excess cable. If you need to shorten the cable, cut and terminate each conductor neatly and make sure that the overall (outermost) drain wire is not shorted out with either of the two inner drain wires (shields).

2. Run signal cable in a dedicated conduit (preferably an earth grounded metallic conduit) and keep it away from AC power lines. For your convenience, Emerson has furnished a wire nut kit (in a plastic bag wrapped around the cable.

   Note
   For maximum EMI/RFI protection when wiring from the sensor to the junction box, connect the outer braid of the sensor to the outer braided shiedl of the extension cable. Terminate the outer braid of the extension cable at earth ground with an appropriate cable gland fitting that provides a secure connection to the instrument cable.

The sensor has a mating cable with built-in preamplifier and comes with a shielded cable. Handle the cable carefully and keep it dry and free of corrosive chemicals at all times. Take extreme care to prevent it from being twisted, damaged, or scraped by rough, sharp edges or surfaces. Please refer to through for wiring the sensor.

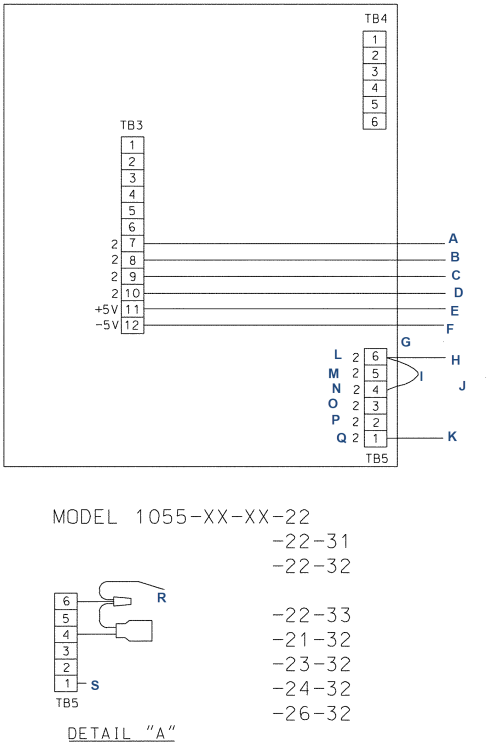
Figure 3-1: Wiring to Rosemount 1055: TB3 and TB4



A. *White/black (pH mV).*
B. *Refer to image below for TB3 and TB5 connections. RC jumpers required for dual measurement only. See detail.*
C. *Jumper.*
D. *Black (reference in).*
E. *N/C - orange (no connection).*
F. *Yellow (mV drain).*
G. *White (resistance temperature device in).*
H. *Red/black (resistance temperature device sense).*
I. *Red (resistance temperature device return).*
J. *Blue.*
K. *Green.*
L. *Black.*
M. *White/black.*
N. *Reference in.*
O. *Reference shield.*

P. *Solution ground.*
Q. *pH/mV shield (preamp).*
R. *pH/mV shield (no preamp).*
S. *pH/mV in.*

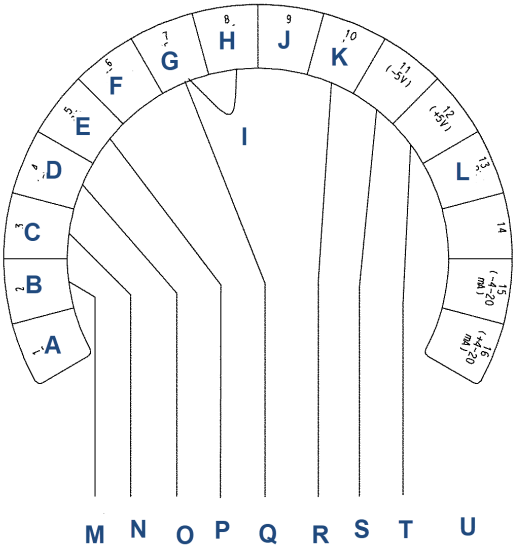
Figure 3-2: Wiring to Rosemount 1055: TB5



A. *Red (resistance temperature device return).*
B. *Red/black (resistance temperature device sense).*
C. *White (resistance temperature device in).*
D. *Yellow (mV drain).*
E. *Blue.*
F. *Green.*
G. *N/C: orange (no connection).*
H. *Black reference in.*
I. *Jumper.*
J. *Refer to image above for TB3 and TB4 connections. RC jumpers required for dual measurement only. See detail.*
K. *Reference in.*
L. *Reference shield.*
M. *Solution ground.*
N. *pH/mV shield (preamp).*
O. *pH/mV shield (no preamp).*

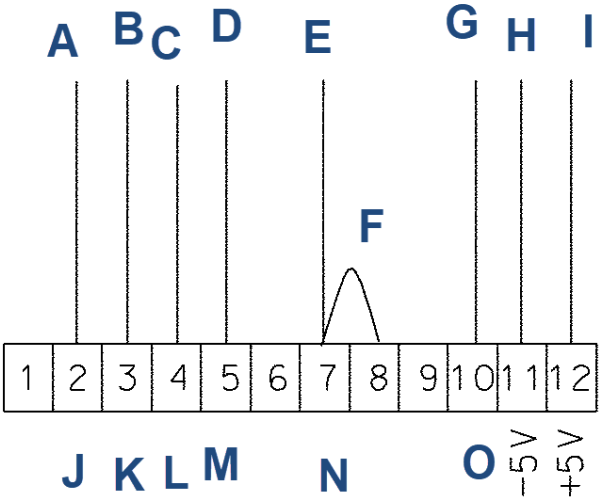
P. pH/mV in.
Q. Black.
R. White/black.

Figure 3-3: Wiring to Rosemount 3081, 4081, and 5081



A. Earth ground
B. Shield inner drain
C. Resistance temperature device return
D. -Resistance temperature device sense
E. Resistance temperature device in
F. Reference ground braid
G. Reference in
H. Solution ground
I. pH guard
J. pH in
K. +Resistance temperature device sense
L. Yellow (mV drain)
M. Red (resistance temperature device return)
N. Red/black (resistance temperature device sense)
O. White (resistance temperature device in)
P. Black (reference in)
Q. White/black (pH/mV)
R. Green
S. Blue
T. Orange (no connection)

Figure 3-4: Wiring to Rosemount 54e



A. *Yellow (resistance temperature device shield)*
B. *Red (resistance temperature device return)*
C. *Red/black (resistance temperature device sense)*
D. *White (resistance temperature device in)*
E. *Black (reference in)*
F. *Jumper*
G. *White/black (pH mV)*
H. *Green*
I. *Blue*
J. *Innder drain*
K. *Resistance temperature device return*
L. *Resistance temperature device sense*
M. *Resistance temperature device in*
N. *Reference in*
O. *pH/mV in*

4 Start up and calibrate

4.1 Prepare sensor

In most cases, you can simply install the pH sensor as shipped and obtain readings with an accuracy of ±0.6 pH. To obtain greater accuracy or to verify proper operation, calibrate the sensor as a loop with its compatible transmitter.

4.2 pH calibration

After establishing a temporary connection between the sensor and the transmitter, you may perform a buffer calibration.

Consult the appropriate pH transmitter reference manual for specific calibration and standardization procedures or see below for recommended two-point buffer calibration.

4.2.1 Recommended two-point buffer calibration

Prerequisites

Select two stable buffer solutions, preferably pH 4.0 and 10.0. pH buffers other than pH 4.0 and pH 10.0 can be used as long as the pH values are at least two pH units apart.

Note
A pH 7.0 buffer solution reads an mV value of zpprozimately zero, and pH buffers read approximately 59.1 mV for each pH unit above or below 7.0. Check the pH buffer manufacturer specifications for millivolt values at various temperatures, since it may affect the actual value of the buffer solution mV/pH values.

Procedure

1. Immerse sensor in the first buffer solution. Allow sensor to adjust to the buffer temperature (to avoid errors due to temperature differences between the buffer solution and sensor temperature) and wait for reading to stabilize.
   The transmitter can now acknowledge the value of the buffer.
2. Rinse the buffer solution off of the sensor with distilled or deionized water.
3. Repeat Step 1 and Step 2 using the second buffer solution.

Once the transmitter has acknowledged both buffer solutions, a sensor slope (mV/pH) is established. You can find the slope value within the transmitter.

4.2.2 Recommended pH sensor standardization

For maximum accuracy, you can standardize the sensor online or with a process grab sample after performing a buffer calibration and conditioning the sensor to the process. Standardization accounts for the sensor junction potential and other interferences. Standardization will not change the sensor's slope, but will simply adjust the transmitter's reading to match that of the known process pH.

Procedure

1. While obtaining a process solution sample, record the pH value that is shown on the transmitter display.

   Emerson recommends taking the sample close to the sensor.

2. Measure and record the pH of the process solution with another temperature compensated, calibrated pH instrument.

   For best results, perform standardization at the process temperature.

3. Adjust the transmitter value to the standardized value.

4.3 Configure transmitter

Configuration requirements: For proper operation, transmitters capable of advanced sensor diagnostics must have this feature turned off. (Refer to the appropriate transmitter's reference manual for complete instructions.

Rosemount™ 54e pH/ORP

Go to **Program** → **Configure** → **Diagnostics**. Edit diagnostics and select Off.

Rosemount 1055

Go to **Program** → **Measurement** → **Sensor 1 or Sensor 2** → **pH**. At the screen prompt `Glass Fault Enable?`, select No.

Rosemount 81, 3081, 4081, or 5081

From the ***Program*** menu, select dIAG and toggle it to OFF.

5 Maintenance

The sensor requires minimum maintenance.

Keep the sensor clean and free of debris and sediment at all times. Determine the frequency of cleaning by the nature of the solution being measured. To clean, wipe or brush the sensor with a soft cloth or brush. Remove the sensor from the process and check it in buffer solutions periodically.

⚠ WARNING

Before removing the sensor, be absolutely certain that the process pressure is reduced to 0 psig and the process temperature is at a safe level.

If the sensor will not calibrate, refer to your transmitter reference manual for proper test procedures. If you determine that the sensor has failed, discard and replace it.

5.1 Automatic temperature compensator

The temperature compensator element is temperature sensitive and can be checked with an ohmmeter. Resistance increases with temperature.

The Pt100 will read 110 ohms at 77 °F (25 °C). Resistance varies with temperature. Determine it with Table 5-1 or the following formula:

$R_T=R_0 [I+R_1 (T-20)]$

Where R_T = Resistance and T = Temperature in °C

See Table 5-2 for R_0 and R_1 values.

Table 5-1: Temperature vs. Resistance of Automatic Temperature Compensated Elements

Temperature in °C	Resistance (ohms) ±1% Pt100
0	100.0
10	103.8
20	107.7
25	109.6
30	111.5
40	115.4
50	119.2
60	123.1
70	126.9

Table 5-1: Temperature vs. Resistance of Automatic Temperature Compensated Elements *(continued)*

Temperature in °C	Resistance (ohms) ±1% Pt100
80	130.8
90	134.6
100	138.5

Table 5-2: R_0 and R_1 Values for Temperature Compensation Elements

Temperature compensation element	R_0	R_1
Pt100	107.7	.00385

5.2 Clean electrode

If the electrode is coated or dirty, clean as follows:

Procedure

1. Remove the sensor from the process.
2. Wipe the ISFET silicone surface with a soft, clean, lint-free cloth or tissue. If this does not remove the dirt or coating, go to Step 3.

   Detergents clean oil and grease; acids remove scale.
3. Wash the sensor tip in a mild detergent solution and rinse it in clean water. If this does not clean the ISFET, go to Step 4.
4. **⚠ WARNING**

   The solution used during the following check is an acid.

   Handle with care.
   Follow the directions of the acid manufacturer.
   Wear the proper protective equipment.
   Do not let the solution come in contact with skin or clothing.
   If contact with skin is made, immediately rinse with clean water.

   Wash the sensor tip in a dilute 5% hydrochloric acid solution and rinse with clean water.

   Soaking the sensor overnight in the acid solution can improve cleaning action.

   Note
   Erroneous pH results may result immediately after acid soak, due to reference junction potential build-up.

Postrequisites

Replace the sensor if cleaning does not restore sensor operation.

6 Return of material

To expedite the repair and return of instruments, proper communication between the customer and the factory is important. Before returning a product for repair, call +1 800 999 9307 for a Retrun Materials Authorization (RMA) number.

6.1 Warranty repair

The following is the procedure for returning instruments still under warranty.

1. Call Rosemount™ for authorization.
2. To verify warranty, supply the factory sales order number of the original purchase order number. In the case of individual parts or sub-assemblies, you must supply the serial number on the unit.
3. Carefully package the materials and enclose your *Letter of Transmittal*. If possible, pack the materials in the same manner as they were received.
4. Send the package prepaid to:
   Emerson Automation Solutions
   8200 Market Boulevard
   Chanhassen, MN 55317, USA
   Attn: Factory Repair
   RMA No._____
   Mark the package: `Returned for Repair`
   Model No._____

6.2 Non-warranty repair

The following is the procedure for returning instruments that are no longer under warranty for repair.

1. Call Rosemount™ for authorization.
2. Supply the purchase order number and make sure to provide the name and telephone number of the individual to be contacted should additional information be needed.
3. Do steps 3 and 4 in Warranty repair.

Note
Consult the factory for additional information regarding service or repair.

7 China RoHS table

表格 1：含有 China RoHS 管控物质超过最大浓度限值的部件型号列
Table 1: List of Model Parts with China RoHS Concentration above MCVs

部件名称 Part Name	有害物质 / Hazardous Substances					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent Chromium (Cr +6)	多溴联苯 Polybrominated biphenyls (PBB)	多溴联苯醚 Polybrominated diphenyl ethers (PBDE)
传感器组件 Sensor Assembly	X	O	O	O	O	O

本表格系依据 SJ/T11364 的规定而制作。
This table is proposed in accordance with the provision of SJ/T11364
O: 意为该部件的所有均质材料中该有害物质的含量均低于 GB/T 26572 所规定的限量要求。
O: Indicate that said hazardous substance in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.
X: 意为在该部件所使用的所有均质材料里，至少有一类均质材料中该有害物质的含量高于 GB/T 26572 所规定的限量要求。
X: Indicate that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

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