pH Sensors

Specifications

pH Range: 2 to 12 (0 to 14 short periods)

Temperature: -10 to 135 °C (14 to 275 °F)

Maximum Pressure: 58 psig (600 Pa abs, 4 bar)

Wetted Materials: Glass and EPDM

Process connections:

Hx338: PG 13.5 thread
Hx348: none

Cable Connector: S7 connector plug, single pole or VP Variopol connector

Cable Compatibility: any AS7 connector plug, single pole; or VP Variopol connector

Compatible Mounting Accessory:

Hx338: Insertion or Retraction Mounting Assembly
Hx348: Pressurized Mounting Assembly

Figure 1. pH Sensors

⚠ WARNING

Do not exceed temperature and pressure limitations of 130 °C (266 °F) and 72 psig (600 kPa, 6 bar).

CAUTION

Internal electrolyte fill solution may cause skin or eye irritation.

⚠ WARNING

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

CAUTION
SENSOR/PROCESS APPLICATION COMPATIBILITY

The wetted sensor materials may not be compatible with process composition and operating conditions. Application compatibility is entirely the responsibility of the user.

CAUTION

Hydrofluoric acid and the mixture of Hydrochloric acid and thiourea is toxic and highly corrosive. Avoid skin contact, wear protective gloves. Use only in a well ventilated area. Do not inhale fumes. In case of an accident, consult a doctor immediately.

Storage

1. It is recommended that electrodes be stored in their original shipping containers until needed.
2. Do not store at temperatures below -5 °C (23 °F).
3. Electrodes should be stored with a protective cap containing KCI solution (PN 9210342).
4. For overnight storage, immerse the sensor in tap water or 4 pH buffer solution.
5. pH glass electrodes slowly deteriorate in storage. There is no specific expiration date. However the calibration procedure described on page 4 should be followed to determine that the sensors calibrate properly.

Electrode preparation

1. Remove electrode from shipping container.
2. Remove the protective boot covering the electrode bulb.
3. Rinse away salt film with clean water, then shake the electrode so that the internal solution fills the bulb, thus removing any air trapped there.

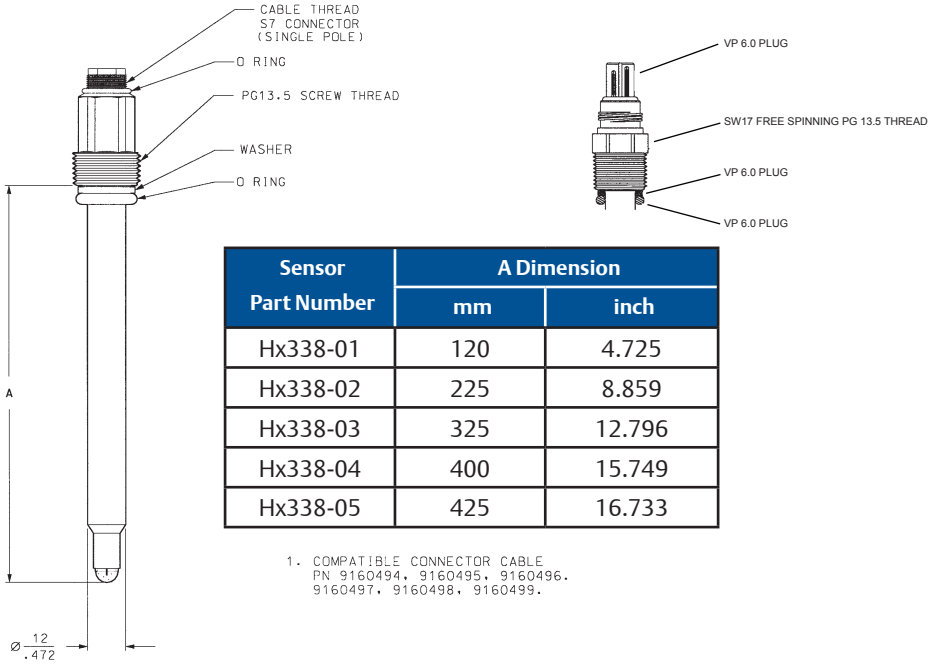
Note

Do not allow lubricant coat electrode bulb or reference junction. If it does, wipe it clean before installation.

Installation

For sensor orientation, see Figure 3.
For wiring, see see Figures 4 through 10.

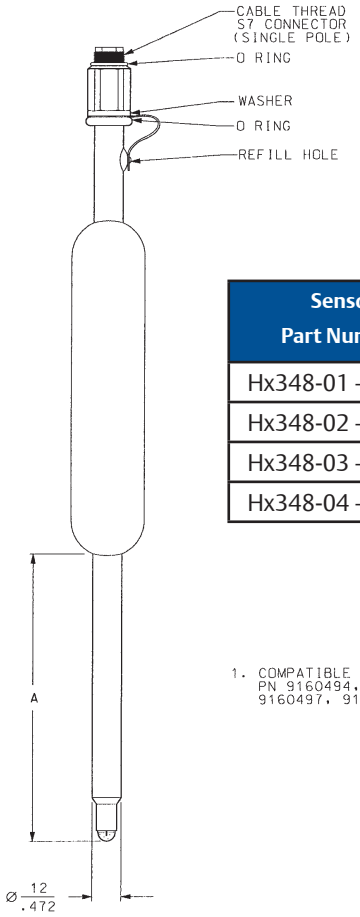
Figure 2. Hx338 Dimensional Drawing



Sensor Part Number	A Dimension	
	mm	inch
Hx338-01	120	4.725
Hx338-02	225	8.859
Hx338-03	325	12.796
Hx338-04	400	15.749
Hx338-05	425	16.733

1. COMPATIBLE CONNECTOR CABLE PN 9160494, 9160495, 9160496, 9160497, 9160498, 9160499.

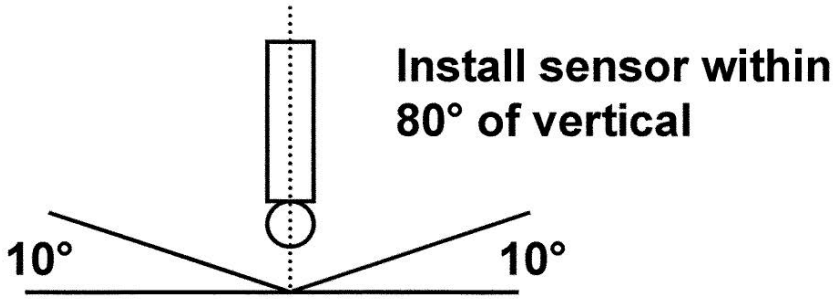
Figure 3. Hx348 Dimensional Drawing



Sensor Part Number	A Dimension	
	mm	inch
Hx348-01 – 11/12	120	4.73
Hx348-02 – 11/12	150	5.91
Hx348-03 – 11/12	200	7.88
Hx348-04 – 11/12	250	9.85

1. COMPATIBLE CONNECTOR CABLE PN 9160494, 9160495, 9160496, 9160497, 9160498, 9160499.

Figure 4. Sensor Orientation



Two Point Buffer Calibration

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 buffer solution reads a mV value of approximately zero, and pH buffers read approximately ±59.1 mV for each pH unit above or below pH 7. 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 value.

1. Immerse sensor in the first buffer solution. Allow sensor to equilibrate to the buffer temperature (to avoid errors due to temperature differences between the buffer solution and sensor temperature) and wait for reading to stabilize. Value of buffer can now be acknowledged by analyzer/transmitter.
2. Once the first buffer has been acknowledged by the analyzer/transmitter, rinse the buffer solution off of the sensor with distilled or deionized water.
3. Repeat steps 1 and 2 using the second buffer solution.
4. The theoretical slope value, according to the Nernst equation for calculating pH, is approximately 59.17 mV/pH. Over time the sensor will age, both in the process and in storage, and will result in reduced slope values. To ensure accurate readings, it is recommended that the electrode be replaced when the slope value falls below 47 to 49 mV/pH.

Recommended pH Sensor Standardization

For maximum accuracy, the sensor can be standardized on-line or with a process grab sample after a buffer calibration has been performed and the sensor has been conditioned to the process. Standardization accounts for the sensor junction potential and other interferences. Standardization will not change the sensor's slope but will sim ply adjust the analyzer's reading to match that of the known process pH.

Maintenance

Electrodes should respond rapidly. Sluggishness, offsets, and erratic readings are indicators that the electrodes may need cleaning or replacement.

1. To remove oil deposit, clean the electrode with a mild non-abrasive detergent.
2. To remove scale deposits, soak electrodes for 30 to 60 minutes in a 5% hydrochloric acid solution.
3. Temperature effect on life expectancy: If glass electrode life expectancy is 100% @ 25 °C (77 °F), then it will be approximately 25% @ 80 °C (176 °F), and approximately 5% @ 120 °C (248 °F).

Figure 5. VP 6.0 Cable Description, PN 23645-06 and 23645-07

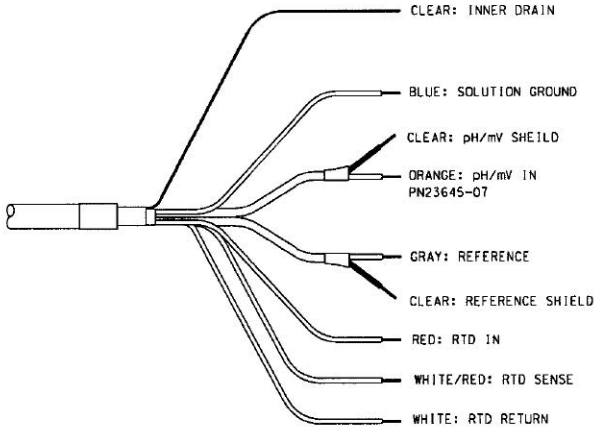


Figure 6. Wiring to 54, 54e, 81, 3081, 4081, 5081, and remote junction box PN 23555-00

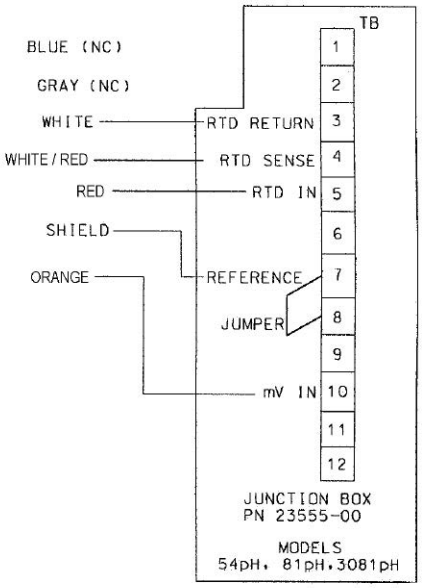


Figure 7. Wiring to 1055-22-32

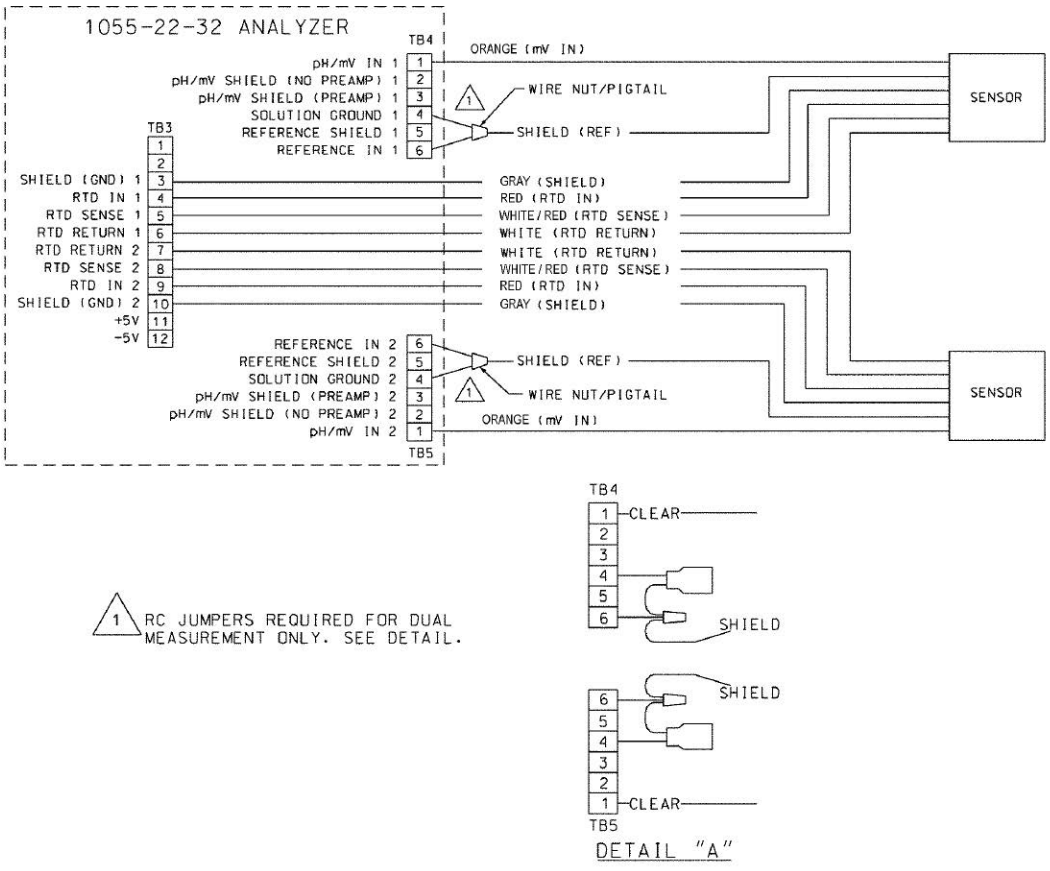


Figure 8. Wiring to 1055-10-22-32

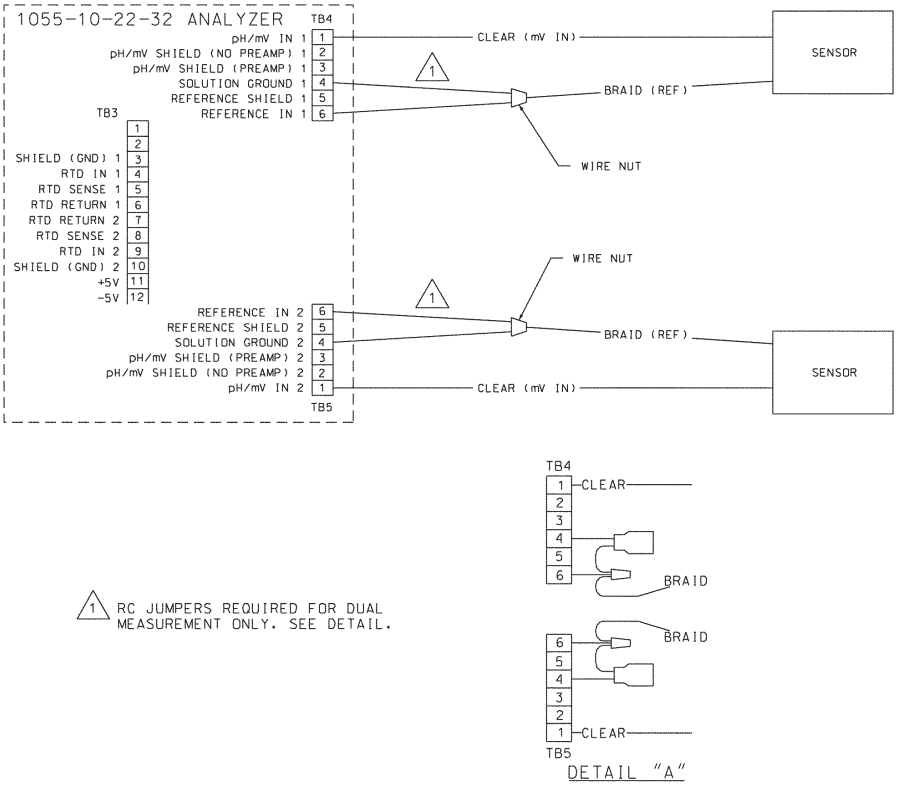
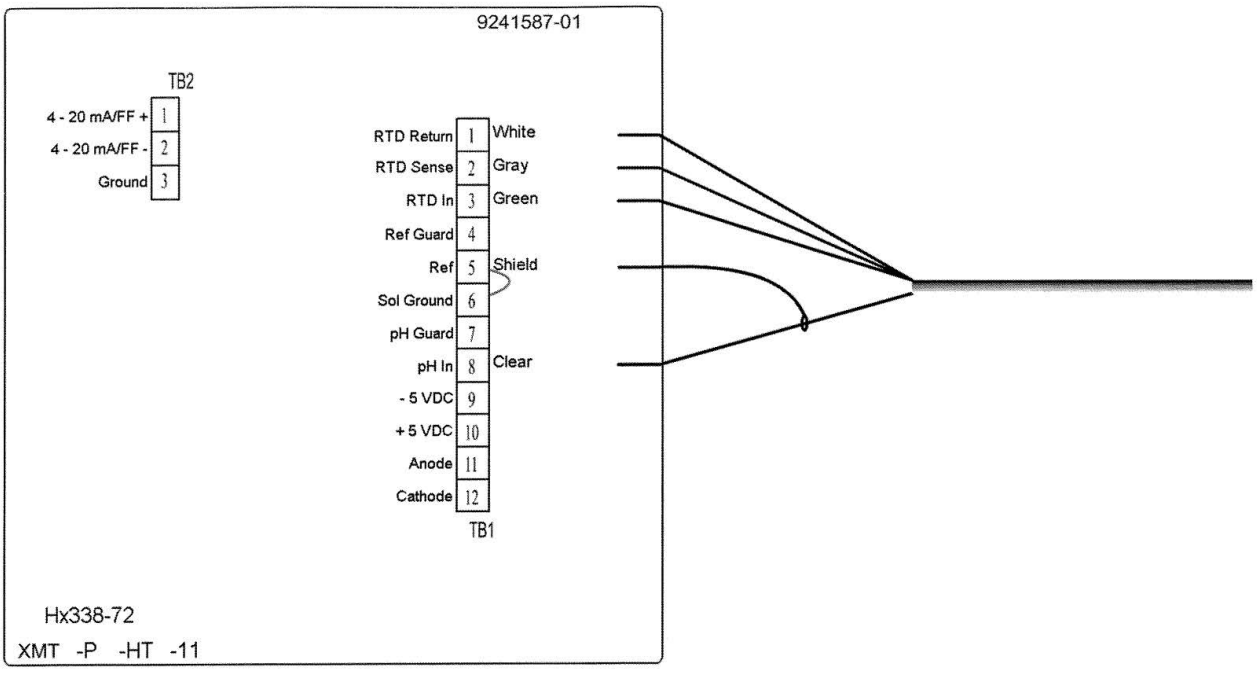
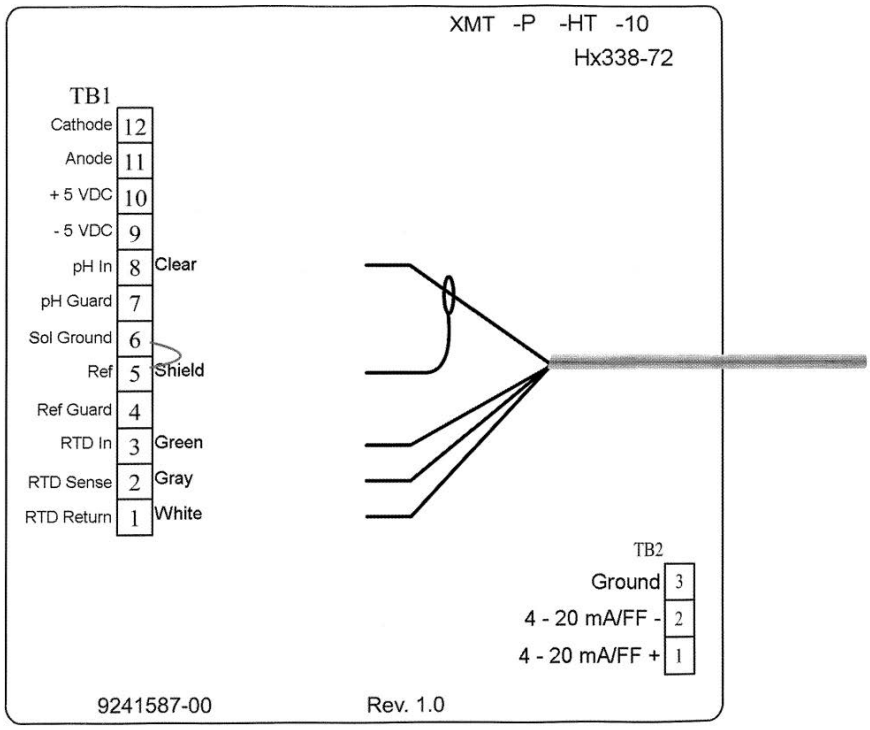


Figure 9. Wiring to Xmt-P-HT-10



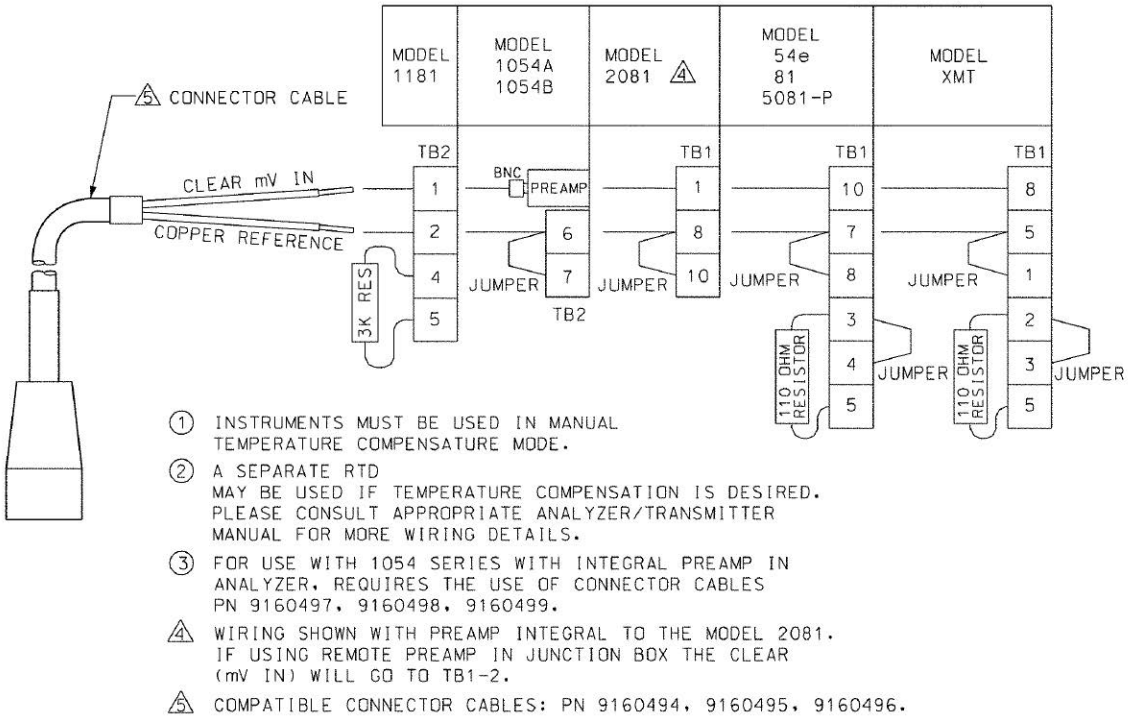
If there is no temperature compensation (RTD), then install a 100-ohm resistor between TB1-1 and TB1-3, and install a jumbper between TB1-1 and TB1-2.

Figure 10. Wiring to Xmt-P-HT-10 (Panel Mount)



If there is no temperature compensation (RTD), then install a 100-ohm resistor between TB1-1 and TB1-3, and install a jumper between TB1-1 and TB1-2.

Figure 11. Wiring Drawing For Hx338 and Hx348 with S7 Connector



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