Quick Start Guide
LIQ-QSG-Hx338, Rev M
July 2017

Rosemount™ Hx338

Steam Sterilizable and Autoclavable pH Sensor

ROSEMOUNT™

EMERSON™

Safety Information

⚠ WARNING!

Do not exceed temperature and pressure limitations of 266 °F (130 °C) and 43 psig (600 kPa, 4 bar).

⚠ WARNING!

HIGH PRESSURE AND TEMPERATURE HAZARD

Before removing the senosr, reduce the process pressure to 0 psig and cool down the process temperature.

Failure to reduce the pressure and temperature may cause serious injury to personnel.

⚠ WARNING!

CORROSIVE SUBSTANCE

Internal electrolyte solution may cause skin or eye irritation.

⚠ WARNING!

TOXIC AND CORROSIVE SUBSTANCE

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

⚠ CAUTION!

EQUIPMENT DAMAGE

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

Contents

1 Plan

1.1 Unpacking

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 and then shake the electrode so that the internal solution fills the bulb, thus removing any air trapped there.

Note

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

1.2 Storage and handling

Proper storage and handling instructions of the electrodes must be followed to ensure correct measurements.

1. Store the electrodes in their original shipping containers until needed.
2. Do not store at temperatures below -5 °C (23 °F).
3. Store the electrodes with a protective cap containing KCl solution (PN 9210342).
4. For overnight storage, immerse the sensor in tap water or 4 pH buffer solution.
5. Use the startup and calibration procedure described in *Section 3.1* to properly calibrate the sensors.

1.3 Specifications

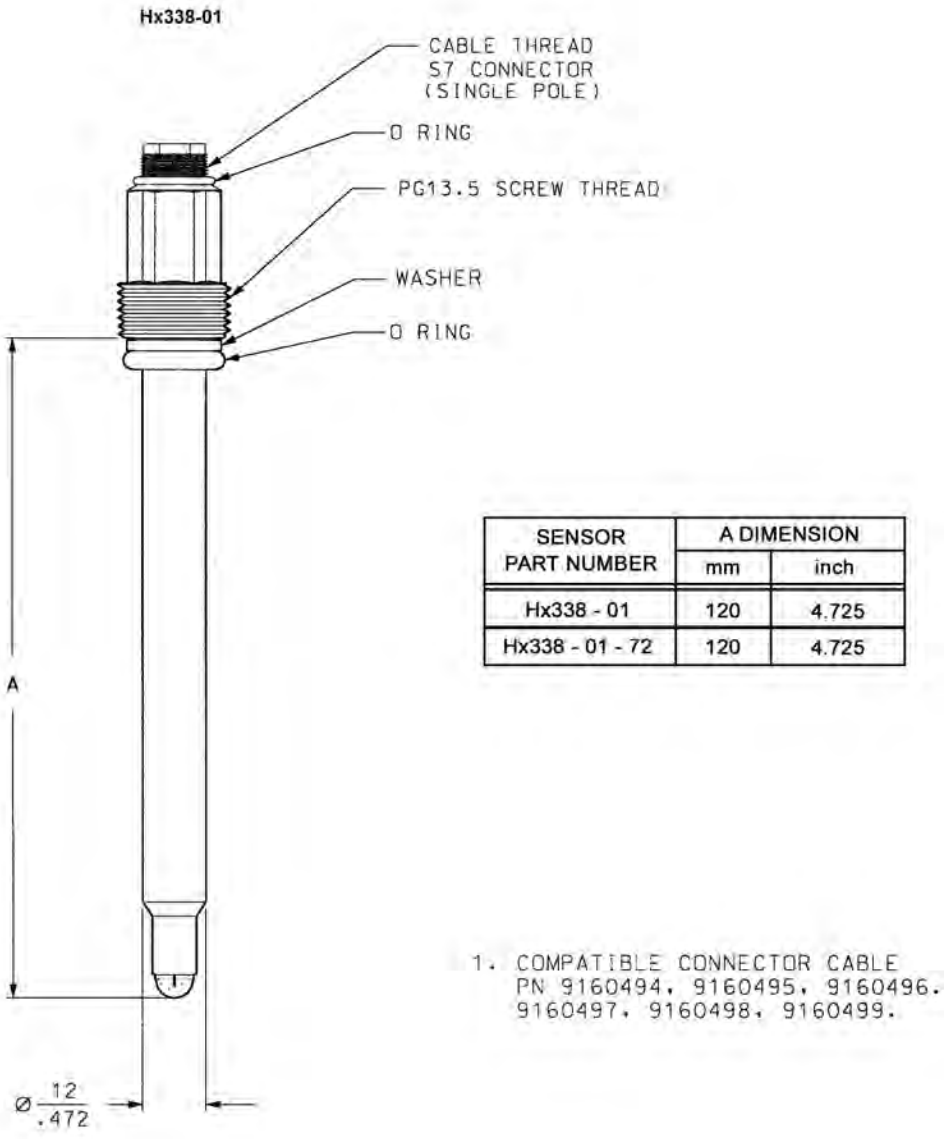
Table 1-1: Specifications

Hx338 pH Sensor Specifications	Materials and Units
Operating Temperature Range	32 to 266 °F (0 to 130 °C)
Maximum Pressure	43 psig (600 kPa abs, 4 bar)
pH Range	2 to 12 (0 to 14 short periods)
Wetted Materials	Glass, EPDM (FDA approved), Ceramic (Diaphragm)
Process Connections	PG 13.5 Threads
Cable Connector	Single Pole S7 Connector Plug or VP6 Cable Connection
Minimum Conductivity of Sample	50 µS/cm

2 Install

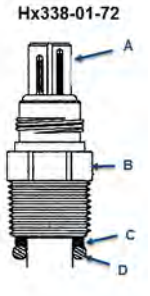
2.1 Installing the sensor

Figure 2-1: Rosemount Hx338 dimensional drawing



SENSOR PART NUMBER	A DIMENSION	
	mm	inch
Hx338 - 01	120	4.725
Hx338 - 01 - 72	120	4.725

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



A. VP 6.0 plug
B. SW17 free spinning PG 13.5 thread
C. Washer
D. O-ring

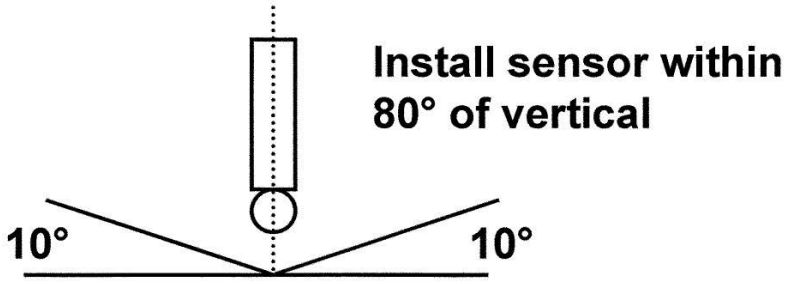
Procedure

1. Mount the sensor in a vertical pipe run with flow from top to bottom.

   If the sensor must be mounted in a horizontal pipe run, orient the sensor in the or 9 o'clock position.

2. Orient the sensor within 80 ° of vertical. See *Figure 2-2*.

Figure 2-2: Sensor Orientation



3. Wire the sensor to the transmitter. See wiring diagrams below.

Figure 2-3: Rosemount Hx338-01-72 wiring to Rosemount 1066 Transmitter

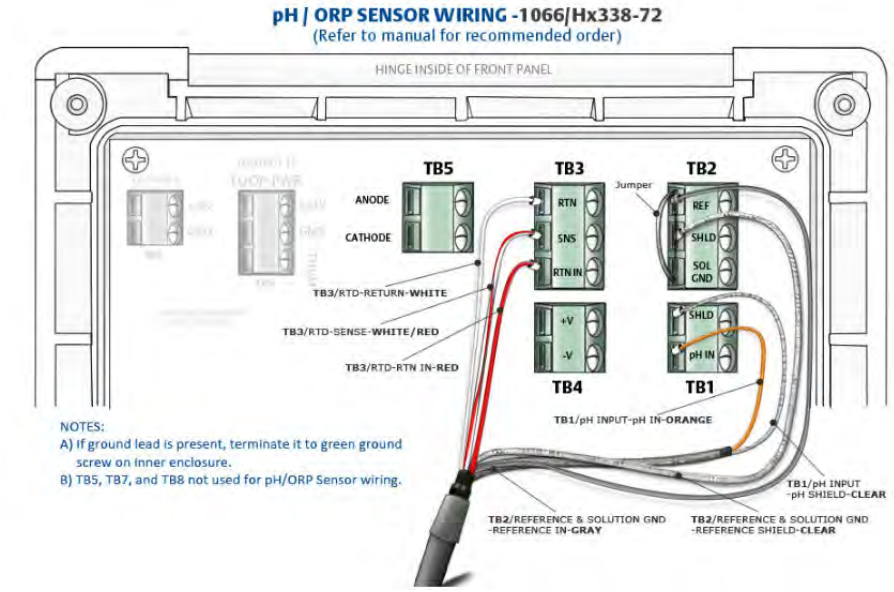


Figure 2-4: Rosemount Hx338-01 wiring to Rosemount 1066 Transmitter

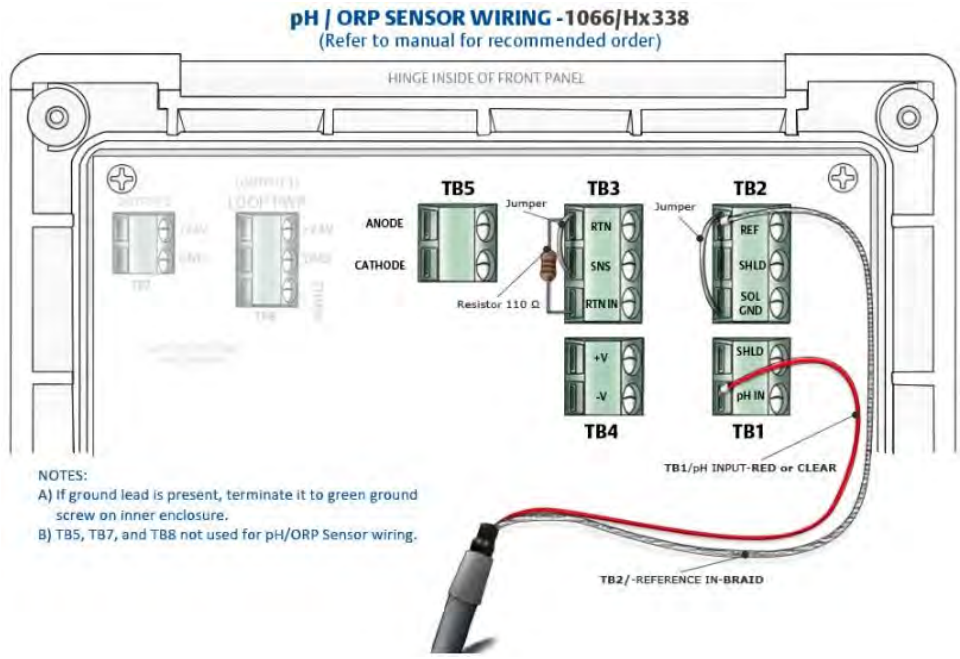


Figure 2-5: Rosemount Hx338-01-72 wiring to Rosemount 5081 Transmitter

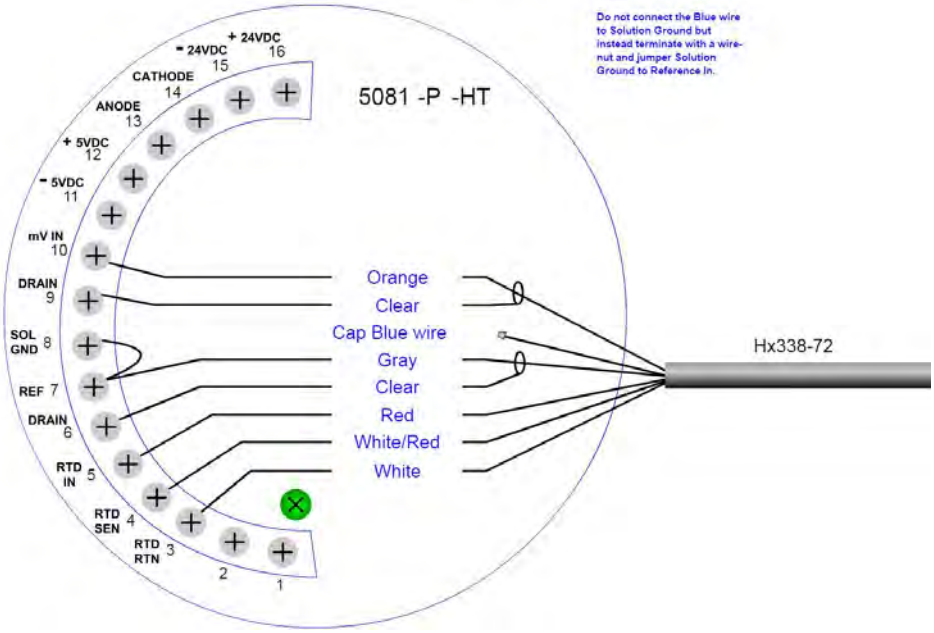


Figure 2-6: Rosemount Hx338-01 wiring to Rosemount 5081 Transmitter

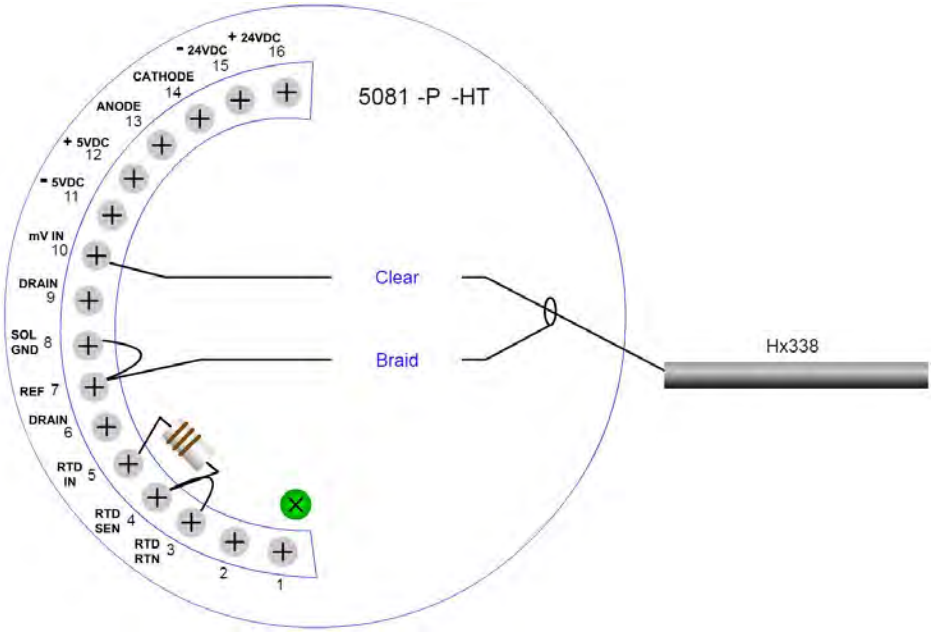


Figure 2-7: Rosemount Hx338-01-72 wiring to Rosemount 1057 Transmitter

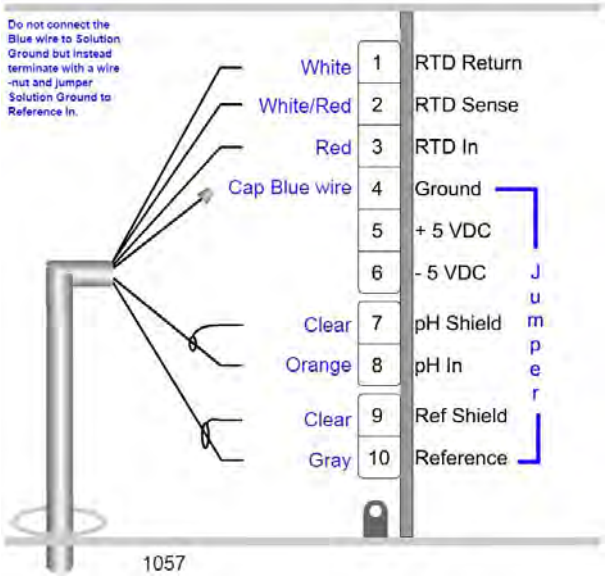


Figure 2-8: Rosemount Hx338-01 wiring to Rosemount 1057 Transmitter

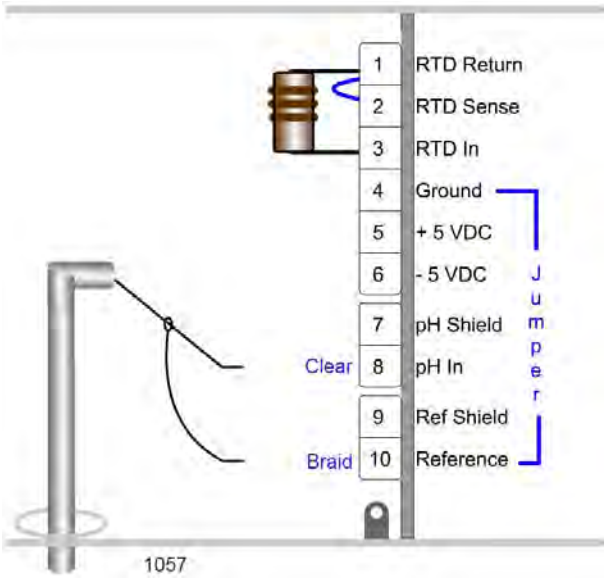


Figure 2-9: Rosemount Hx338-01-72 wiring to Rosemount 1056 and Rosemount 56 Transmitters

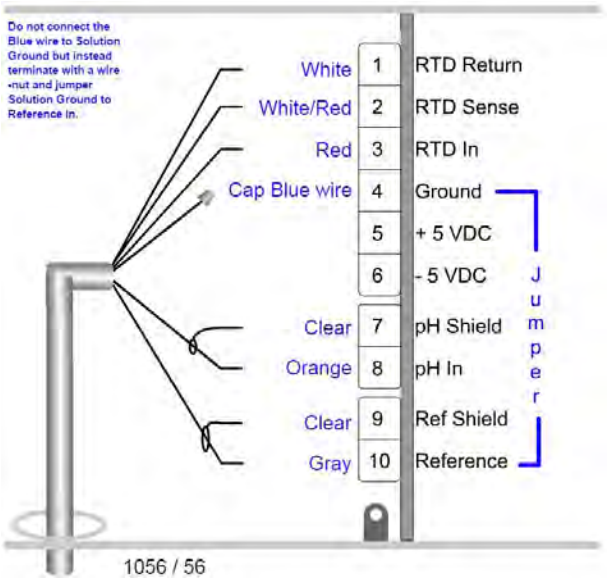
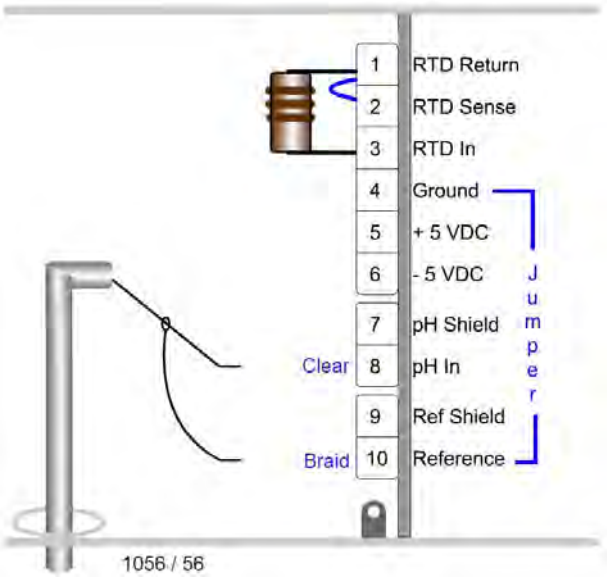


Figure 2-10: Rosemount Hx338-01 wiring to Rosemount 1056 and Rosemount 56 Transmitters



3 Calibration and maintenance

3.1 Two point buffer calibration

Prerequisites

Select two stable buffer solutions, preferably pH 4.0 and 7.0 (pH buffers other than pH 4.0 and pH 7.0 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 approximately zero, and pH buffers read approximately ±59.1 mV for each pH unit above or below pH 7.0. Check the pH buffer manufacturer specifications for millivolt values at various temperatures, as it may affect the actual value of the buffer solution mV/pH value.

Procedure

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.

   The value of the buffer can now be acknowledged by the transmitter.
2. Once the first buffer has been acknowledged by the 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.

   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 this 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.

3.2 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 simply adjust the transmitter's reading to match that of the known process pH.

4 Troubleshooting

4.1 Cleaning or replacing the electrodes

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

1. Use a mild non-abrasive detergent to clean and remove oil deposits from the electrode.
2. Soak electrodes for 30 to 60 minutes in a 5% hydrochloric acid solution to remove scale deposits.

   Temperature effect on life expectancy: If glass electrode life expectancy is 100% at 25 °C (77 °F), then it will be approximately 25% at 80 °C (176 °F), and approximately 5% at 120 °C (248 °F).

4.2 Accessories

Part number	Description
24281-00	15 ft (4.6 m) cable with mating VP8 connector
24281-01	25 ft (7.6 m) cable with mating VP8 connector
24281-02	2.5 ft (0.8 m) cable with mating VP8 connector
24281-05	4 ft (1.3 m) cable with mating VP8 connector
24281-06	10 ft (3 m) cable with mating VP8 connector
24281-07	20 ft (6.1 m) cable with mating VP8 connector
24281-08	30 ft (9.1 m) cable with mating VP8 connector
23645-06	15 ft (4.6 m) cable with mating VP8 connector with BNC on transmitter end
23645-07	15 ft (4.6 m) cable with mating VP8 connector with bare wires on transmitter end
9160494	3.3 ft (1 m) cable with AS7 connector, bare wire on analyzer end
9160495	16.4 ft (5 m) cable with AS7 connector, bare wire on analyzer end
9160496	32.8 ft (10 m) cable with AS7 connector, bare wire on analyzer end
9160498	16.4 ft (5 m) cable with AS7 connector, BNC on analyzer end
9160478	Insertion assembly, 70 mm insertion, for 120 mm sensor, G 1-1/4 in.
9160483	15 degree weld-in socket, G 1-1/4 in. thread, 44 mm
9260484	Service kit for insertion mounting assembly
9210012	Buffer solution, pH 4.01, 16 oz
9210013	Buffer solution, pH 6.86, 16 oz
9210014	Buffer solution, pH 9.18, 16 oz

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2017

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