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Sensor Installation Overview

NOTE: THE FOLLOWING INFORMATION IS INTENDED TO PROVIDE THE USER WITH A PREVIEW OF WHAT WILL BE REQUIRED TO INSTALL THE MODEL PH87 SENSOR ASSEMBLY. PLEASE REVIEW THE DIAGRAM AND GUIDELINES BEFORE PROCEEDING.

Typical Sensor Installation Diagram

Shown with Optional /B Ball Valve

Sensor Installation Guidelines:

[1]. Install the model PH97 sensor in pipe or vessel between 15° and 90° from horizontal.
[2]. Connect flex conduit with adequate service loop to junction box.
[3]. Connect the sensor cable to the terminals inside the junction box.
[4]. Keep cable run between junction box and pH / ORP instrument as short as possible.
Sensor Assembly Instructions—Stage 1

BEGIN STAGE #1 ASSEMBLY OF THE MODEL PH87 BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] THROUGH [F] IN ORDER AS SHOWN BELOW:

[STEP B]. SLIDE PACKING GLAND, ITEM NO. 3, ONTO SHEATH, ITEM NO. 4. KEEP LOCKING NUT AND FERRULES LOOSE BUT ATTACHED TO PACKING GLAND

[STEP A]. INSTALL PACKING GLAND O-RING, ITEM NO. 3d, INTO PACKING GLAND BODY, ITEM NO. 3c.

[STEP D]. THREAD SENSOR CABLE THROUGH SHEATH AND SLIDE THE SENSOR INTO SHEATH UNTIL IT STOPS AGAINST FLARED END

[STEP C]. STRETCH O-RINGS, ITEM NO. 2, INTO GROOVES ON SENSOR

[STEP F]. THREAD SENSOR CABLE THROUGH COUPLER TUBE, ITEM NO. 1, THEN SLIDE COUPLER TUBE INTO SHEATH UNTIL IT CONTACTS SENSOR.

[STEP E]. STRETCH O-RING, ITEM NO. 1a, INTO GROOVE ON COUPLER TUBE, ITEM NO. 1.

PLEASE NOTE
REFER TO PAGES 16 AND 17 OF THE SENSOR ASSEMBLY AND ITEMIZED PART LIST FOR ALL THESE COMPONENTS.
[STEP G]. THREAD SENSOR CABLE THROUGH COUPLER TUBE, ITEM NO. 1, THEN SLIDE COUPLER TUBE INTO SHEATH UNTIL IT CONTACTS SENSOR.

THE COUPLER TUBE AND SENSOR SHOULD BE THREADED TOGETHER UNTIL BOTH ARE SEATED AGAINST THE ENDS OF THE SHEATH.
[STEP H]. REMOVE JUNCTION BOX COVER AND THERAD SENSOR CABLE THROUGH JUNCTION BOX ASSEMBLY (JUNCTION BOX AND PROVIDED PIPE NIPPLE). THREAD JUNCTION BOX ASSEMBLY PIPE NIPPLE INTO SENSOR COUPLER ASSEMBLY, ITEM NO. 1. INSTALL SUITABLE FLEX CONDUIT LONG ENOUGH TO ALLOW FOR SERVICING OR REPLACEMENT OF SENSOR.

[STEP I]. CONNECT THE SENSOR WIRES TO THE 5-TERMINAL STRIP IN THE JUNCTION BOX IN THE FOLLOWING ORDER. THE RED TC WIRE CONNECTS TO TERMINAL #1 AND THE BLACK TC WIRE TO TERMINAL #2. CONNECT THE SENSOR REFERENCE (BLACK) TO #3, THE SOLUTION GROUND (GREEN) TO TERMINAL #4 AND PH (CLEAR) TO TERMINAL #5. THREAD THE EXTENSION CABLE THROUGH CONDUIT. ATTACH THE LABELED WIRES TO THE TERMINALS IN THE SAME ORDER AS THE SENSOR WIRES LISTED ABOVE. REPLACE THE JUNCTION BOX COVER.
Sensor Assembly Instructions-Stage1 (Continued)

THE STAGE #1 ASSEMBLY OF THE pH97 SENSOR IS NOW COMPLETE AND SHOULD APPEAR AS ONE OF THE TWO ASSEMBLIES SHOWN BELOW.

**STEP J.** PERFORM A 2-POINT CALIBRATION WITH PH BUFFER SOLUTIONS BEFORE PROCEEDING FURTHER WITH THE ASSEMBLY AND INSTALLATION.

NOTE: REFER TO PH 97 SENSOR INSTRUCTIONS FOR WIRING AND CALIBRATION PROCEDURES.
Sensor Assembly Instructions-/B Ball Valve Option

BEGIN ASSEMBLY OF THE /B BALL VALVE OPTION FOR MODEL PH87 SENSOR BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] THROUGH [D] IN ORDER AS SHOWN BELOW:

PLEASE NOTE: /B OPTION IS REQUIRED (OR CUSTOMER SUPPLIED BALL VALUE IS REQUIRED) FOR RETRACTION OF PH87 WHILE PROCESS IS UNDER PRESSURE.
Sensor Assembly Installation Instructions-/B Ball Valve (Continued)

COMPLETE /B BALL VALVE OPTION ASSEMBLY OF THE MODEL PH87 BY FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [E] AND [F] IN ORDER AS SHOWN BELOW:

[STEP E]. APPLY TEFLOM TAPE TO PIPE THREADS OF PACKING GLAND FITTING AND SLIDE FITTING TO SENSOR END OF SHEATH. INSTALL STAGE #1 SUBASSEMBLY INTO VALVE TAKING CARE NOT TO FORCE THE SENSOR INTO THE BALL PORTION OF THE VALVE TO PREVENT BREAKAGE OF THE GLASS BULB.

[STEP F]. SECURELY TIGHTEN PACKING GLAND FITTING INTO VALVE ASSEMBLY TO PROVIDE A PROPER SEAL.

THE ASSEMBLY OF THE PH87 SENSOR IS NOW COMPLETE AND SHOULD APPEAR AS SHOWN. DO NOT TIGHTEN PACKING GLAND LOCKING NUT OR OPEN BALL VALVE UNTIL SENSOR ASSEMBLY IS READY TO GO ON-STREAM.
**Sensor Assembly In-Service Instructions—/B Ball Valve Option**

**STEP A.** TO PLACE ASSEMBLY INTO SERVICE OPEN BALL VALVE COMPLETELY.

Caution: OPENING VALVE SUBJECTS SENSOR ASSEMBLY TO LINE PRESSURE. IF THE SENSOR IS NOT RETRACTED COMPLETELY AGAINST STOP, OPENING THE VALVE COULD RESULT IN THE SENSOR SUDDENLY RETRACTING THE REMAINING DISTANCE CAUSING DAMAGE TO THE SENSOR ASSEMBLY OR INJURY TO THE SERVICE PERSON.

**PLEASE NOTE**

REFER TO PAGES 16 AND 17 OF THE SENSOR ASSEMBLY AND ITEMIZED PART LIST FOR ALL THESE COMPONENTS.

**STEP B.** INSERT STAGE #1 SUBASSEMBLY INTO PROCESS.

**STEP C.** SECURE SENSOR IN PLACE BY TIGHTENING LOCKING NUT AND FERRULES OF GLAND FITTING, ITEM NO.3.

DO NOT INSERT TIP OF SENSOR BEYOND INSIDE WALL OF PROCESS PIPE TO AVOID TORQUE AND POSSIBLE BREAKAGE.

THE FINAL ASSEMBLY IS NOW READY TO BE PLACED INTO SERVICE, WITH PACKING GLAND LOCKING NUT ENGAGED BUT NOT TIGHTENED AND SENSOR IN THE RETRACTED POSITION.

THE IN-SERVICE ASSEMBLY SHOULD APPEAR AS SHOWN BELOW.
Sensor Service Instructions


[STEP A]. LOOSEN LOCKING NUT AND FERRULES OF GLAND FITTING, ITEM NO. 3. CAUTION: THE SENSOR ASSEMBLY IS STILL UNDER PRESSURE. LOOSENING THE LOCKING NUT COULD RESULT IN THE SENSOR RETRACTING SUDDENLY AND WITH A GREAT DEAL OF FORCE. THIS COULD CAUSE DAMAGE TO THE SENSOR ASSEMBLY OR INJURY TO THE SERVICE PERSON.

[STEP B]. FULLY RETRACT STAGE #1 SUBASSEMBLY SHAFT.
Sensor Service Instructions (Continued)

BEFORE SERVICING REMOVE THE MODEL PH97 SENSOR FROM SERVICE FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [C] AND [D] IN ORDER AS SHOWN BELOW:

[STEP C]. CLOSE BALL VALVE COMPLETELY.

[STEP D]. COMPLETELY UNTHEARD GLAND FITTING, ITEM NO.4, FROM VALVE ASSEMBLY
Sensor Service Instructions (continued)


[STEP E]. REMOVE STAGE #1 ASSEMBLY FROM VALVE ASSEMBLY.

WITH THE STAGE #1 SUBASSEMBLY COMPLETELY REMOVED FROM THE VALVE ASSEMBLY THE SENSOR MAY NOW BE TESTED OR REPLACED.

[STEP F]. BEFORE TESTING THE SENSOR BE SURE THAT IT IS CLEAN

[STEP G]. TO TEST SENSOR PERFORM A 2-POINT CALIBRATION WITH PH BUFFER AS SHOWN BELOW.

IF THE SENSOR TESTS WITHIN ACCEPTABLE LIMITS REINSTALL AND PLACE SENSOR BACK IN SERVICE BY FOLLOWING ASSEMBLY INSTRUCTIONS.

IF TESTING PROVES SENSOR TO BE FAULTY CONTINUE WITH THE SERVICE INSTRUCTIONS FOR SENSOR REPLACEMENT.
Sensor Replacement Instructions

BEFORE SERVICING REMOVE THE MODEL PH87 SENSOR FROM SERVICE FOLLOWING THE STEP-BY-STEP INSTRUCTIONS [A] AND [D] IN ORDER AS SHOWN BELOW:

[STEP A]. REMOVE JUNCTION BOX COVER AND DISCONNECT ALL WIRES FROM TERMINALS.

[STEP B]. WHILE FIRMLY GRIPING THE SENSOR AND THE SHEATH AT THE SAME TIME UNTREAD THEM FROM THE COUPLER ASSEMBLY BUT DO NOT COMPLETELY DISENGAGE THREADS.

[STEP C]. WHILE FIRMLY GRIPING SHEATH PUSH ON COUPLER TUBE JUNCTION BOX ASSEMBLY TO UNSEAT SENSOR O-RINGS

[STEP D]. COMPLETELY UNTREAD SENSOR FROM COUPLER TUBE ASSEMBLY.

CONTINUE WITH SERVICE INSTRUCTIONS AT STEP "N".
Sensor Replacement Instructions (Continued)

DISASSEMBLE THE ASSEMBLY INTO THE COMPONENT PARTS AS SHOWN IN ONE OF THE ILLUSTRATIONS BELOW. TO INSTALL A NEW SENSOR AND RETURN THE MODEL PH87 TO SERVICE FOLLOW THE ASSEMBLY INSTRUCTIONS STARTING FROM STAGE #1 STEP "D" (PAGE 4)

FIGURE 1: STANDARD ASSEMBLY READY FOR SENSOR REPLACEMENT

FIGURE 2: ASSEMBLY WITH SENSOR MOUNTED JUNCTION BOX READY FOR SENSOR REPLACEMENT
Sensor Housing Assembly

ALL O-RINGS REQUIRE PROPER LUBRICATION PRIOR TO SERVICING. WE RECOMMEND USING PARKER O LUBE OR EQUIVALENT. FOLLOW THE LUBRICATION INSTRUCTIONS PROVIDED BY THE MANUFACTURER.

P H S E N S O R
(SEE MODEL PH97 SPEC SHEET)

JUNCTION BOX

PLEASE NOTE
REFER TO PAGES 15 AND 16 OF THE SENSOR ASSEMBLY AND ITEMIZED PART LIST FOR ALL THESE COMPONENTS

2 REQUIRED
**Sensor Housing Assembly**

These are the individual part numbers for the items shown in the exploded view on the previous page. Part numbers for a complete assembly are listed on next two pages, on the specific drawing.

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<th>Description</th>
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<td>M1234TV-A</td>
<td>Coupler Assembly, Kynar (PVDF), N=21”</td>
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<td>M1234DW</td>
<td>Compression Fitting, Nut</td>
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<td>3b</td>
<td>M1234DX</td>
<td>Compression Fitting, Ferrule, Kynar (PVDF)</td>
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<td>M1234JQ-A</td>
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<td>M1234EE</td>
<td>Junction Box Assembly, Sensor Mount</td>
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<td>9</td>
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"C" = MINIMUM CLEARANCE REQUIRED FOR SENSOR REMOVAL

"R" = FULLY RETRACTED

3/4" FNPT

15.65" FULLY INSERTED

"N" = FULLY INSERTED

1 1/4" MNPT

PH87 With /B Ball Valve Insertion Assembly:
Dimensions & Clearance Requirements

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<th>MODEL NO.</th>
<th>&quot;N&quot; LENGTH Insertion Length</th>
<th>&quot;R&quot; DIMENSION Retraction Distance</th>
<th>&quot;C&quot; DIMENSION Minimum Clearance</th>
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PH87 Insertion Assembly:
Dimensions & Clearance Requirements

"C" = MINIMUM CLEARANCE REQUIRED FOR SENSOR REMOVAL
"R" = FULLY RETRACTED
3/4" FNPT
9.65" FULLY INSERTED
"N" = FULLY INSERTED
1" MNPT

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<th>&quot;R&quot; DIMENSION Retraction Distance</th>
<th>&quot;C&quot; DIMENSION Minimum Clearance</th>
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