Quick Start Guide
00825-0200-3499, Rev AB
November 2019

Rosemount™ 499ACL-02

Total Chlorine Sensor

ROSEMOUNT™

EMERSON.

Safety information

⚠ CAUTION

Sensor/process application compatibility

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

Application compatibility is entirely the operator's responsibility.

⚠ CAUTION

Equipment damage

Do not exceed pressure and temperature specifications

Pressure: 65 psig (549 kPa abs) max.
Temperature: 32 to 122 °F (0 to 50 °C)

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

Contents

1 First steps

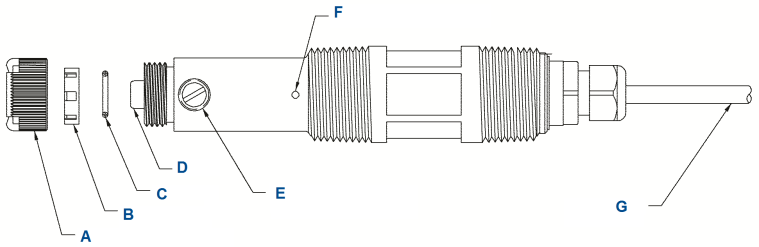
1.1 Unpack and inspect

Procedure

1. Inspect the shipping container. If it is damaged, contact the shipper immediately for instructions.
2. If there is no apparent damage, unpack the container. Be sure all items shown on the packing list are present. If items are missing, notify Emerson immediately.

1.2 Product description

Figure 1-1: Rosemount 499ACL-02 Sensor Parts



A. Membrane retainer
B. Membrane assembly
C. O-ring
D. Cathode
E. Electrolyte fill plug (wrap with pipe tape)
F. Pressure equalizing port
G. Sensor cable (integral cable shown)

1.3 Specifications

Table 1-1: Sensor Specifications

Physical characteristics	Specifications
Pressure	0 to 65 psig (101 to 549 kPa abs)
Temperature (operating)	32 to 122 °F (0 to 50 °C)
Process connection	1-in. male national pipe thread (MNPT)
Wetted parts	Noryl®, Viton®, and silicone

Table 1-1: Sensor Specifications *(continued)*

Physical characteristics	Specifications
Cathode	Gold
Linearity	2% (typical)

2 Install

The sensor is intended for use only in the Rosemount TCL sample conditioning system for total chlorine. Consult the instruction manual for the Rosemount TCL sample conditioning system for more information.

3 Wire

NOTICE

For additional wiring information on this product, including sensor combinations not shown here, please refer to the Liquid Transmitter Wiring Diagrams.

Figure 3-1: Rosemount 499ACL-02 Sensor Wiring to Rosemount 1056 and 56 Transmitters

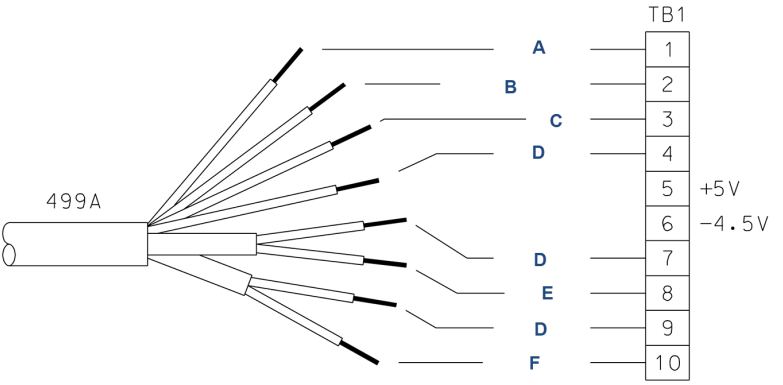


Table 3-1: Rosemount 499ACL-02 Sensor Wiring to Rosemount 1056 and 56 Transmitters

Terminal number	Letter	Wire color	Description
1	A	White	Resistance temperature device (RTD) return
2	B	White/red	RTD sense
3	C	Red	RTD in
4	D	Clear	RTD shield
5	N/A	N/A	+5 V out
6	N/A	N/A	-4.5 V out
7	D	Clear	Anode shield
8	E	Gray	Anode
9	D	Clear	Cathode shield

Table 3-1: Rosemount 499ACL-02 Sensor Wiring to Rosemount 1056 and 56 Transmitters *(continued)*

Terminal number	Letter	Wire color	Description
10	F	Orange	Cathode

Figure 3-2: Rosemount 499ACL-02 Sensor Wiring to Rosemount 5081 Transmitter

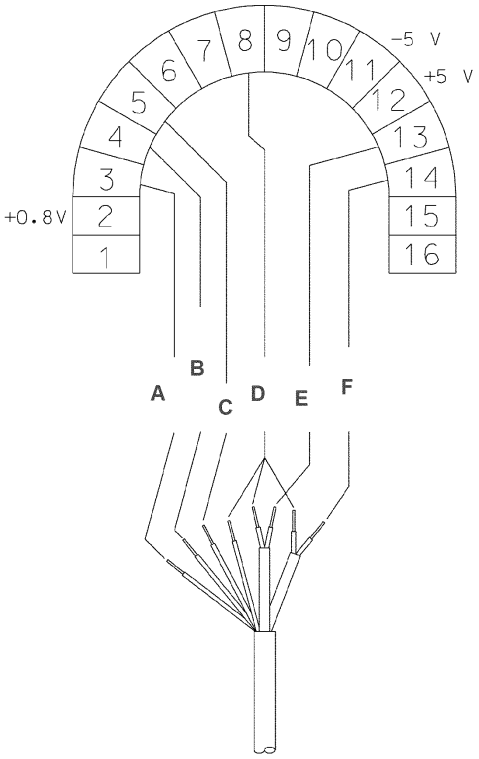


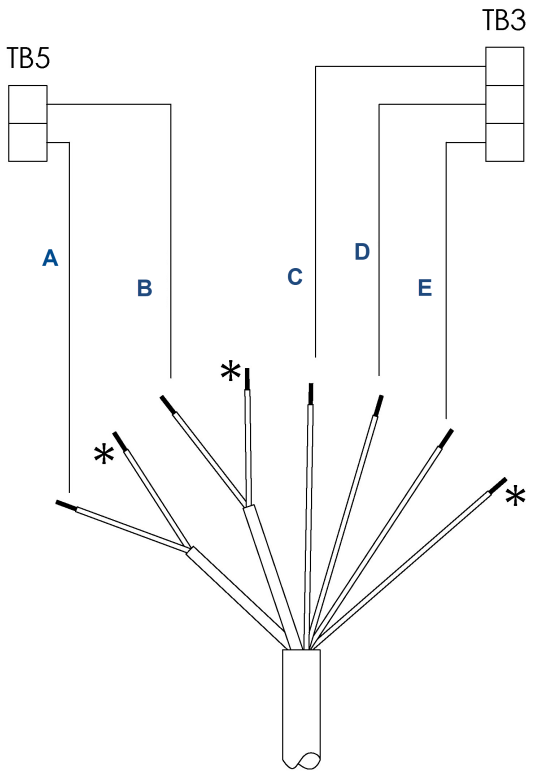
Table 3-2: Rosemount 499ACL-02 Sensor Wiring to Rosemount 5081 Transmitter

Terminal number	Letter	Wire color	Description
1	N/A	N/A	N/A
2	N/A	N/A	+0.8 V
3	A	White	RTD return

Table 3-2: Rosemount 499ACL-02 Sensor Wiring to Rosemount 5081 Transmitter *(continued)*

Terminal number	Letter	Wire color	Description
4	B	White/red	RTD sense
5	C	Red	RTD in
6	N/A	N/A	Reference guard
7	N/A	N/A	Reference in
8	D	Clear	Solution ground
9	N/A	N/A	pH guard
10	N/A	N/A	pH in
11	N/A	N/A	-5 V
12	N/A	N/A	+5 V
13	E	Gray	Anode
14	F	Orange	Cathode
15	N/A	N/A	HART®/FOUNDATION™ Fieldbus (-)
16	N/A	N/A	HART/FOUNDATION Fieldbus (+)

Figure 3-3: Rosemount 499ACL-02 Sensor Wiring to Rosemount 1066 Transmitter



Note

Connect clear shield wires to solution ground terminal on TB 2. Use wire nut and pigtail if necessary.

Table 3-3: Rosemount 499ACL-02 Wiring to Rosemount 1066 Transmitter

Letter	Color	Terminal description
A	Orange	Cathode
B	Gray	Anode
C	White	Return
D	White/red	Sense
E	Red	RTD in

Figure 3-4: Rosemount 499ACL-02-01-54-VP Sensor Pin-out Diagram (Top View of Connector End of Sensor)

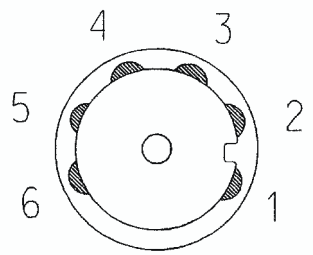


Table 3-4: Pin-out Diagram

Terminal number	Description
1	Cathode
2	N/A
3	RTD sense
4	Anode
5	RTD return
6	RTD in

When making a connection through a junction box (PN 23550-00), wire point-to-point.

NOTICE

Use a wire nut and pigtail (included) when connecting several wires to the same terminal.

4 Calibrate

4.1 Zero point calibration

The sample conditioning system converts total chlorine into iodine, which the Rosemount 499ACL-02 sensor measures. Even in the absence of iodine, the Rosemount 499ACL-02 sensor generates a small signal called the zero current. Failure to correct for the zero current can produce a bias, particularly if the total chlorine concentration is small (<0.2 ppm). Zero the sensor when it is first placed in service and every time the fill solution is changed.

To zero the sensor:

Procedure

1. Pour a cup of deionized or bottled water.
2. Place the sensor in the water.
3. Wait until the sensor current has reached a stable low value (at least two hours).
4. Follow the transmitter prompts for zeroing the sensor.

The zero current should be between -10 and +50 nA. For more information, refer to the transmitter manual.

4.2 Full scale calibration

Because stable dilute chlorine standards are not available, the sensor must be calibrated against the results of a laboratory test run on a grab sample of the process liquid.

Procedure

1. Place the sensor in the flow cell inside the TCL.
2. Start the sample and reagent flow.
3. Adjust the concentration so that it is near the upper end of the operating range.
4. Wait for the readings to stabilize.
5. Follow the transmitter prompts to complete the calibration.
6. After calibration, go to the **Diagnostics** menu and check the sensitivity.

The sensitivity should be between 900 and 1,200 nA/ppm. For more information, refer to the Rosemount TCL manual.

5 Maintenance

When used in clean water, the total chlorine sensor requires little maintenance. Generally, the sensor needs maintenance when the response becomes sluggish or noisy or when readings drift following calibration. Maintenance frequency is best determined by experience. Sensors used in dirty water require more frequent maintenance and calibration. However, if experience shows that the sensor is holding calibration and not drifting appreciably between calibration intervals, the maintenance interval can be extended.

⚠ WARNING

Pressurized spray injury

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!

5.1 Cleaning the membrane

Keep the membrane clean. Clean the membrane with water sprayed from a wash bottle. Use a soft tissue to **gently** wipe the membrane.

5.2 Replacing the electrolyte solution and membrane

⚠ WARNING

Harmful substance

Fill solution may cause irritation. May be harmful if swallowed.

Read and follow the instructions.

Procedure

1. Unscrew the membrane retainer.
2. Remove the membrane assembly and O-ring.
   See Figure 1-1.
3. Hold the sensor over a container with the cathode pointing down.
4. Remove the fill plug.
5. Allow the electrolyte solution to drain out.
6. Remove the old pipe tape from the plug.
7. Wrap the plug with one or two turns of pipe tape..
8. Prepare a new membrane.

a) Hold the membrane assembly with the cup formed by the membrane and membrane holder pointing up.

b) Fill the cup with electrolyte solution.

9. Hold the sensor at about a 45 degree angle with the cathode end pointing up.
10. Add electrolyte solution through the fill hole until the liquid overflows.
11. Tap the sensor near the threads to release trapped air bubbles.
12. Add more electrolyte solution if necessary.
13. Place the fill plug in the electrolyte port and begin screwing it in.
14. After several threads have engaged, rotate the sensor so that the cathode is pointing up and continue tightening the fill plug.

    Do not overtighten.
15. Place a new O-ring in the groove around the cathode post.
16. Cover the holes at the base of the cathode stem with several drops of electrolyte solution.
17. Insert a small blunt probe, like a toothpick with the end cut off, through the pressure equalizing port.

    See Figure 1-1.

⚠ CAUTION

Equipment damage

A sharp probe may puncture the bladder and destroy the sensor.

Do not use a sharp probe.

18. Gently press the probe against the bladder several times to force liquid through the holes at the base of the cathode stem. Keep pressing the bladder until no air bubbles can be seen leaving the holes.

    Be sure the holes remain covered with electrolyte solution.
19. Place a drop of electrolyte solution on the cathode; then place the membrane assembly over the cathode.
20. Screw the membrane retainer in place.

    The sensor may require several hours operating at the polarizing voltage to equilibrate after the electrolyte solution has been replenished.

6 Accessories

Part #	Description
33523-00	Electrolyte fill plug
9550094	O-ring, Viton 2-014
33521-00	Membrane retainer
23501-02	Total chlorine membrane assembly: includes one membrane assembly and one O-ring
23502-02	Total chlorine membrane kit: includes three membrane assemblies and three O-rings
9210438	Total chlorine sensor fill solution, 4 oz (120 mL)

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GLOBAL HEADQUARTERS
6021 Innovation Blvd.
Shakopee, MN 55379
+1 866 347 3427
+1 952 949 7001
liquid.csc@emerson.com

NORTH AMERICA
Emerson Automation Solutions
8200 Market Blvd
Chanhassen, MN 55317
Toll Free +1 800 999 9307
F +1 952 949 7001
liquid.csc@emerson.com

EUROPE
Emerson Automation Solutions
Neuhofstrasse 19a PO Box 1046
CH-6340 Baar
Switzerland
+41 (0) 41 768 6111
+41 (0) 41 768 6300
liquid.csc@emerson.com

MIDDLE EAST AND AFRICA
Emerson Automation Solutions
Emerson FZE
Jebel Ali Free Zone
Dubai, United Arab Emirates, P.O. Box 17033
+971 4 811 8100
+971 4 886 5465
liquid.csc@emerson.com

ASIA-PACIFIC
Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
Republic of Singapore
+65 6 777 8211
+65 6 777 0947
liquid.csc@emerson.com

Linkedin.com/company/Emerson-Automation-Solutions
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