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May 29, 2017

SCOTT ISLIP
ROUND ENGINEERING INC
10 SEGWUN RD
WATERDOWN ON L0R 2H8
CA

Service Request Type.: BPV-National BC
Service Request No.: 2051924
Your Reference No.: ROSEMOUNT R-0709A/B
Registered to.: EMERSON PROCESS MANAGEMENT, ROSEMOUNT ANALYTICAL INC

Dear SCOTT ISLIP,

Please find enclosed the original response from BC, registered under the CRN No.: 0F19160.51.

As all jurisdictional fees are handled by the Technical Standards and Safety Authority (TSSA), you do not pay any jurisdictions directly.

Should you have any questions or require further assistance, I will be happy to assist you.
For general enquiries, please contact a Customer Service Advisor at 1.877.682.TSSA (8772) or e-mail customerservices@tssa.org. When contacting TSSA regarding this file, please refer to the Service Request number provided above.

Yours truly,

Joanna Karpinski
Tel: 416-734-3377
Fax: 416-231-6183
Email: jkarpinski@tssa.org



505 - 6th Street, Suite 200
New Westminster, BC V3L 0E1

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TECHNICAL STANDARDS & SAFETY AUTHORITY
345 CARLINGVIEW DRIVE
TORONTO ON M9W 6N9

Date: April 25, 2017

Account #: 35231

Journal #: 67855

Our File #: 5614912

Attn: TANYA FRANCIS

Re: Application for Design Registration

The design, as detailed in your, TSSA SR# 2051924, for a Fitting is accepted for registration as follows:

Registered To: EMERSON PROCESS
MANAGEMENT

CRN: 0F19160.51

Drawing #: Report R-0709A/B, scope sheets

Drawing Revision: 0

Conditions Of Registration:

Registration of Low Flow Cell & Free Chlorine & Dissolved Oxygen Sensor per scope sheets (att'd 5 pgs).

This design was registered based on a technical review performed by the province of initial registration in accordance with the Association of Chief Inspectors policy on reciprocal recognition of design review.

Reviewer's Notes:

As required by CSA B51 4.2.1, this registration expires on February 10, 2027. This CRN is valid until the expiry date as long as the Manufacturer maintains a valid quality control program verified by an acceptable third-party agency until that date. Should the certification of the quality control program lapse before the expiry date, this registration shall become void.

Contact me if you have any questions. The invoice for registration will be forwarded under separate cover.

SHARON PETERS

boiler.designregistration@safetyauthority.ca
Design Administration

cc:

ROSEMOUNT

EMERSON
 Process Management

 EMERSON PROCESS MANAGEMENT ROSEMOUNT ANALYTICAL, INC.
 2400 BARRANCA PARKWAY
 IRVINE, CA
 USA, 92606

27-Jan-17

SCOPE OF CRN REGISTRATION

Item No. 1

PRODUCT DESCRIPTION		PRESSURE - TEMPERATURE RATINGS	
Description:	Low Flow Cell 24091-00, 24091-01, 24091-02	MAWP AT 158F:	90 psig
Design Standard:	ASME B31.3.	MDMT:	32F
End Connections:	Process: 1/4" FNPT, Sensor: 3/4" FNPT, 1" FNPT	NOTES:	None
Drawings:	24091-00, 24091-2, 24091-02		
CRN Report:	R-0709A		
MATERIALS OF CONSTRUCTION			
Sensor Material:	Polycarbonate, Polyester, Silicone		
Notes:	None		

Item No. 2

PRODUCT DESCRIPTION		PRESSURE - TEMPERATURE RATINGS	
Description:	Free Chlorine Sensor 499ACL Dissolved Oxygen Sensor 499ADO	MAWP AT 122F:	65 psig
Design Standard:	ASME B31.3.	MDMT:	32F
End Connections:	Sensor: 1" MNPT	NOTES:	None
Drawings:	499A-VP, 499A, 499ACL-03		
CRN Report:	R-0709B		
MATERIALS OF CONSTRUCTION			
Sensor Material:	Noryl, Viton, Silicone, Platinum, Polyethersulphone		
Notes:	None		

Note 1) See attached list of Manufacturing Locations applicable to this CRN.

THIS IS PART OF CRN 0F19160.5 Technical Standards & Safety Authority Boilers & Pressure Vessels Safety Program
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ROSEMOUNT[®]

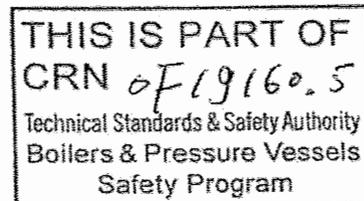


WORLDWIDE LOCATIONS APPENDIX

ROSEMOUNT MANUFACTURING LOCATIONS & CERTIFYING AUTHORITIES

(rev. January 04, 2017)

Rosemount, Inc.
6021 Innovation Boulevard
Shakopee, MN
55379, USA
ISO 9001:2008 Certified by DNV GL



Rosemount, Inc.
8200 Market Boulevard
Chanhassen, MN
55317, USA
ISO 9001:2008 Certified by DNV GL

Rosemount, Inc.
12001 Technology Drive
Eden Prairie, MN
55344, USA
ISO 9001:2008 Certified by DNV GL



Emerson Process Management Rosemount Analytical, Inc.
2400 Barranca Parkway
Irvine, CA
92606, USA
ISO 9001:2008 Certified by DNV GL

Emerson Process Management Rosemount Analytical, Inc.
Circuito Del Progreso #27, Parque Industrial Progreso,
21190, Mexicali, MX,
Mexico
ISO 9001:2008 Certified by DNV GL

LOW FLOW CELLS

Emerson offers a variety of low flow cells for sidestream applications where it is impractical to divert a large volume of sample, particularly if the sample must be sent to waste. Choose a transparent plastic or stainless steel body—both have 1/4 inch FPT process connections. Plastic flow cells PN 24091-00, -01, and -02 are also supplied with 1/4 inch MPT to 1/4 inch OD tubing fittings

and have a union connection that allows easy removal of the sensor.

Valved rotameters are also available (see page 41) to adjust and measure sample flow in sidestream installations. Accurate control of flow is especially important when measuring dissolved oxygen, chlorine, and ozone.



April 23, 2017
BOSA J# 67855

THIS IS PART OF
CRN 0619160.5

Low Flow Cells	PN 24091-00	PN 24091-01	PN 24091-02	S10240 (SQ 7716)	S10290 (SQ 7637)
Process Connection	1/4 inch 316 SST male tube connector				
Wetted Materials	Body and Nut - Polycarbonate/polyester blend; 1/4" Fittings - 316 SST; O-ring - Silicone			316 SST	
Maximum Temperature	158°F (70°C)			Consult Factory	
Maximum Pressure	90 psig (621 kPa)			Consult Factory	
Sensor Threaded Connection	1 inch	1 inch	3/4 inch	1 inch	3/4 inch
Special features	None	Bubble shedding nozzle	None	Order as a special request only	
Compatible Sensor Models*					
pH and ORP Sensors	396P, 389, 3500, 3900	-	RB-546	396P, 389, 3500, 3900	-
Conductivity Sensors	-	-	400, 400 VP	-	400, 400 VP
Dissolved Oxygen	499AtrDO, 499ADO	499ADO	-	499A DO	-
Ozone	499AOZ	-	-	-	-
Chlorine	499ACL	498CL, 499ACL	-	-	-

*Note: All sensor models noted in this graph are listed with integral cables. The sensor models with the "VP" designation can also be used.

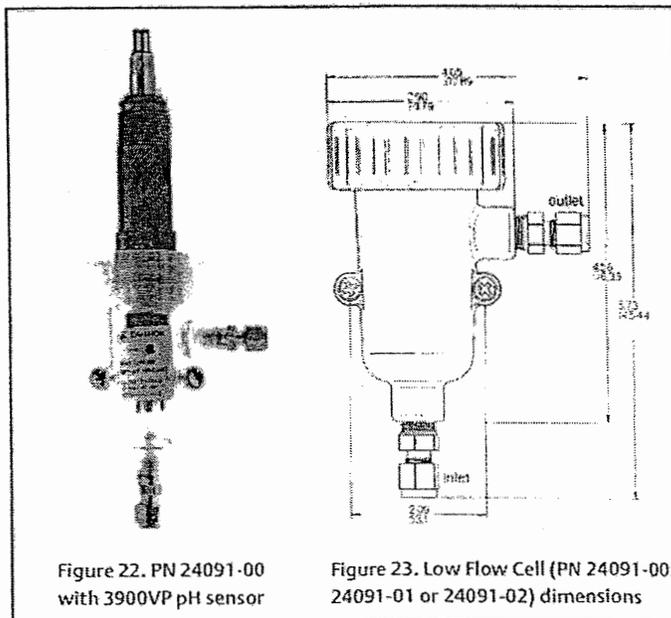


Figure 22. PN 24091-00 with 3900VP pH sensor

Figure 23. Low Flow Cell (PN 24091-00, 24091-01 or 24091-02) dimensions

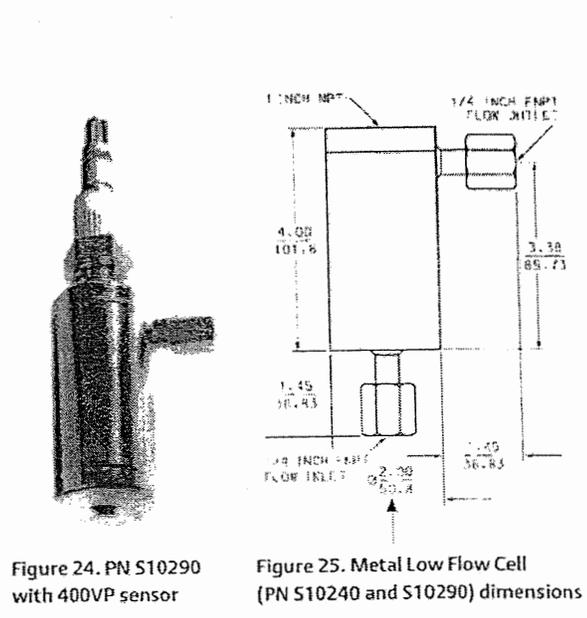


Figure 24. PN S10290 with 400VP sensor

Figure 25. Metal Low Flow Cell (PN S10240 and S10290) dimensions

499 ACL-01 Free Chlorine Sensor

The 499ACL-01 sensor is intended for the continuous determination of free chlorine (hypochlorous acid plus hypochlorite ion) in water.

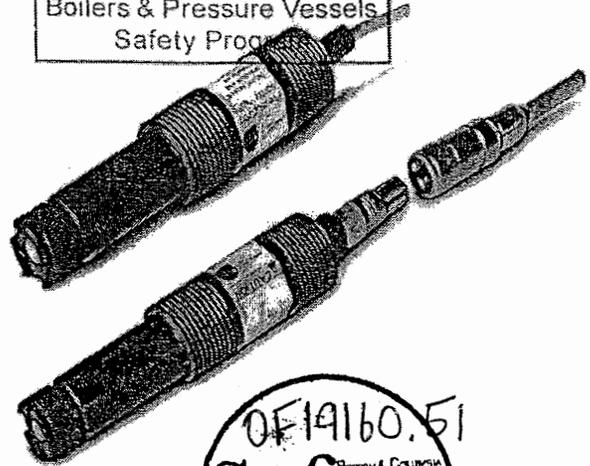
- Measure free chlorine without sample pretreatment. No messy and expensive reagents needed.
- Automatic correction to at least pH 9.5.
- Easily replaceable membrane; no special tools required.
- Automatic compensation for changes in membrane permeability with temperature.
- Automatic pressure equalization maintains correct membrane tension.
- Variopol connector option allows the sensor to be replaced without running new cable.

Features and Applications

The primary application is measuring chlorine in drinking water. The sensor requires no acid pretreatment and can measure free chlorine in samples having pH as high as 9.5. In some cases, samples having pH as great as 10.0 can be measured. For high pH applications, consult the factory. The linear range of the sensor is 0 to 10 ppm. For determination of higher levels of chlorine, consult the factory.

The 499ACL-01 is a membrane-covered amperometric sensor. The sensor consists of a hydrophilic membrane stretched tightly over a platinum cathode. A silver anode and an electrolyte solution complete the internal circuit. During operation, chlorine diffuses from the sample through the membrane. A polarizing voltage applied to the cathode completely reduces chlorine to chloride. The reduction produces a current, which the analyzer measures. The current is directly proportional to the rate at which chlorine diffuses through the membrane, which is ultimately proportional to the concentration of chlorine in the sample

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The 499ACL-01 sensor needs no pretreatment. Instead, the analyzer automatically applies a pH correction factor to the chlorine reading. If the sample pH varies more than 0.2 pH (peak-to-peak), an auxiliary pH sensor is required to provide the continuous pH correction.

Because the rate of diffusion of free chlorine through the membrane depends on temperature, sensor response must be corrected for temperature changes. A Pt 100 RTD in the sensor measures the temperature, and the analyzer automatically performs the correction.

Stable, dilute chlorine standards do not exist, so the sensor must be calibrated against the results of a laboratory test run on a grab sample of the process liquid. Portable test kits are available from other manufacturers.

All amperometric free chlorine sensors respond to changes in pH. Although free chlorine is a mixture of hypochlorous acid and

499ADO Dissolved Oxygen Sensor

- Installs in aeration basins or sidestream samples.
- Rugged construction.
- Easily replaceable membrane; no special tools required.
- Automatic compensation for changes in membrane permeability with temperature.
- Automatic pressure equalization maintains correct membrane tension.
- Variopol connector option allows the sensor to be replaced without running new cable.

Features and Applications

The 499ADO sensor is intended for the continuous determination of dissolved oxygen between 0-20 ppm. The primary application is aeration basins in municipal and industrial wastewater treatment plants.

The 499ADO is a membrane-covered amperometric sensor. The sensor consists of a gas-permeable membrane stretched tightly over a gold cathode. A silver anode and an electrolyte solution complete the internal circuit. During operation, oxygen diffuses from the sample through the membrane to the cathode. A polarizing voltage applied to the cathode reduces the oxygen to hydroxide. The reaction produces a current, which the analyzer measures. The current is directly proportional to the rate at which oxygen reaches the cathode, which is ultimately proportional to the concentration of oxygen in the sample.

Because the rate of diffusion of oxygen through the membrane depends on temperature, sensor response must be corrected for temperature changes. A Pt 100 RTD in the sensor measures the temperature, and the analyzer automatically performs the correction.

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Calibration is easy. Simply expose the sensor to water-saturated air and press a button on the analyzer. The analyzer measures the barometric pressure and calculates the equilibrium solubility of atmospheric oxygen at the prevailing temperature and pressure. (5081-A, and 1066 analyzers require the user to manually enter the barometric pressure.)

Maintenance is fast and easy. Replacing the membrane requires no special tools or fixtures. Simply place a few drops of electrolyte solution in the membrane assembly, place it on the cathode, and screw the retainer in place. To replenish the electrolyte solution, unscrew the fill plug, add the reagent from a squeeze bottle, and replace the plug.

Pressure changes have little influence on sensor response. A flexible bladder in the sensor prevents distortion of the membrane by keeping the pressure inside the sensor equal to the sample pressure.

Several mounting configurations are possible. For aeration basins and tanks, use the handrail mounting. For measuring oxygen in pipes, use a sidestream sample and install the sensor in either the flow tee or the low flow cell.