345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel.: 416.734.3300
Fax: 416.231.1626
Toll Free: 1.877.682.8772

www.tssa.org

February 10, 2017

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

Service Request Type: BPV-Fitting Registration
Service Request No.: 2019230
Your Reference No.: ROSEMOUNT R-0709A/B
Registered to: EMERSON PROCESS MANAGEMENT, ROSEMOUNT ANALYTICAL INC

Dear SCOTT ISLIP,

Technical Standards and Safety Authority (TSSA) is pleased to inform you that your submission has been reviewed and registered as follows:

CRN No.: 0F19160.5
Main Design No.: SCOPE OF REGISTRATION - LOW FLOW CELL 24091-00, 24091-01, 24091-02, & FEEE CHLORINE SENSEOR 499ACL, DISSOLVED OXYGEN SENSOR 499ADO, CATALOGUE, DESIGN REPORT, PLANT LOCATION LIST
Expiry Date: 10-Feb-2027

Please be advised that a valid quality control system must be maintained for the fitting registration to remain valid until the expiry date.

The stamped copy of the approved registration and the invoice are mailed separately. Should you have any questions or require further assistance, please contact a Customer Service Advisor at 1.877.682.TSSA (8772) or e-mail customerservices@tssa.org. We will be happy to assist you. When contacting TSSA regarding this file, please refer to the Service Request number provided above.

Yours truly,

Ruiming You, P.Eng.
Mechanical Engineer, BPV
Tel.: 416-734-3428
Fax: 416-231-6183
Email: ryou@tssa.org

TECHNICAL STANDARDS & SAFETY AUTHORITY
14th Floor, Centre Tower
3300 Bloor Street West
Toronto, Ontario
Canada M8X 2X4

Show facsimile of manufacturer's logo or trademark, as it will appear on the fitting, in the space below

ROSEMOUNT
EMERSON
Process Management

STATUTORY DECLARATION
Registration of Fittings

I, DANA CROWLEY, MANAGER OF COMPLIANCE ENGINEERING
(Name and Position, e.g. President, Plant Manager, Chief Engineer)

of EMERSON PROCESS MANAGEMENT ROSEMOUNT ANALYTICAL, INC.
(Name of Manufacturer)

Located at 2400 BARRANCA PARKWAY, IRVINE, CA, 92606, USA 949-757-8587 949-474-7250
(Plant Address) *(Telephone No.)* *(Fax No.)*

☑ do solemnly declare that the fittings listed hereunder, which are subject to the ***Technical Standards and Safety Act***, Boilers and Pressure Vessels Regulation, comply with all of the requirements of
ASME B31.1, ASME B31.3
(Title of recognized North American Standard)
which specifies the dimensions, materials of construction, pressure/temperature ratings, identification marking the fittings and service;

☐ or are not covered by the provisions of a recognized North American standard and are therefore manufactured to comply with _____ as supported by the attached data which identifies the dimensions, material of construction, pressure/temperature ratings and the basis for such ratings, the marking of the fitting for identification and service.

I further declare that the manufacture of these fittings is controlled by a quality system meeting the requirements of ISO:9001:2008 which has been verified by the following authority, DNV-GL.

The items covered by this declaration, for which I seek registration, are category CATEGORY F type fittings. In support of this application, the following information and/or test data are attached as follows:
SCOPE OF CRN, DRAWINGS, CALCULATIONS, REPORTS, WORLDWIDE LOCATIONS APPENDIX
(drawings, calculations, test reports, etc.)

Declared before me at Irvine **in the** Orange County **of** Californina

the 5th **day of** January **AD 20** 17.

Commissioner for Oaths:

Catherine Ann Stip
(Printed name)

(Signature)

(Signature of Declarer)

CATHERINE ANN STIP
Notary Public - California
Orange County
Commission # 2171376
My Comm. Expires Dec 5, 2020

FOR OFFICE USE ONLY

To the best of my knowledge and belief, the application meets the requirements of the ***Technical Standards and Safety Act***, Boilers and Pressure Vessels Regulation, and CSA Standard B51 and is accepted for registration in Category F.

CRN: OF19160.5

Registered by: RUIMING YOU

Dated: FEB 10, 2017

NOTE: This registration expires on FEB 10, 2027

Boilers and Pressure Vessels Safety Program
REGISTERED
CRN OF19160.5
Signed:
Date: Feb. 10, 2017

PV 09553 (06/04)

NOTE: SEE SCOPE OF REGISTRATION (ONE PAGE) & PLANT LIST ATTACHED TO THIS SD FORM. RM 2/10/17

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	
Description:	Low Flow Cell 24091-00, 24091-01, 24091-02
Design Standard:	ASME B31.3.
End Connections:	Process: 1/4" FNPT, Sensor: 3/4" FNPT, 1" FNPT
Drawings:	24091-00, 24091-2, 24091-02
CRN Report:	R-0709A

MATERIALS OF CONSTRUCTION	
Sensor Material:	Polycarbonate, Polyester, Silicone
Notes:	None

PRESSURE - TEMPERATURE RATINGS	
MAWP AT 158F:	90 psig
MDMT:	32F
NOTES:	None

Item No. 2

PRODUCT DESCRIPTION	
Description:	Free Chlorine Sensor 499ACL Dissolved Oxygen Sensor 499ADO
Design Standard:	ASME B31.3.
End Connections:	Sensor: 1" MNPT
Drawings:	499A-VP, 499A, 499ACL-03
CRN Report:	R-0709B

MATERIALS OF CONSTRUCTION	
Sensor Material:	Noryl, Viton, Silicone, Platinum, Polyethersulphone
Notes:	None

PRESSURE - TEMPERATURE RATINGS	
MAWP AT 122F:	65 psig
MDMT:	32F
NOTES:	None

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

THIS IS PART OF
CRN of 19160.5
Technical Standards & Safety Authority
Boilers & Pressure Vessels
Safety Program

ROSEMOUNT

EMERSON
Process Management

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

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

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 ¼ inch FPT process connections. Plastic flow cells PN 24091-00, -01, and -02 are also supplied with ¼ inch MPT to ¼ 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.

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

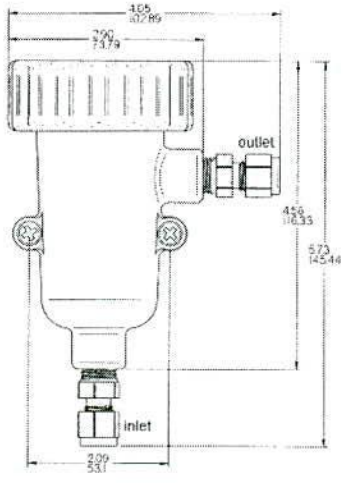

Figure 23. Low Flow Cell (PN 24091-00, 24091-01 or 24091-02) dimensions

Figure 24. PN S10290 with 400VP sensor

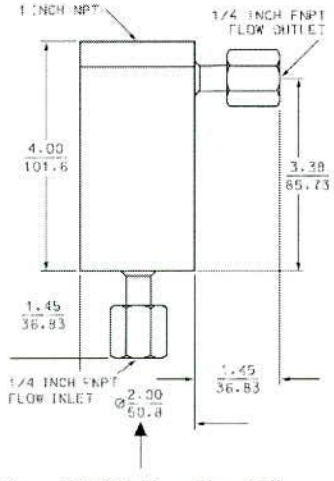

Figure 25. Metal Low Flow Cell (PN S10240 and S10290) dimensions

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

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.

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.