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Rosemount™ 498CL

pH-Independent Free Chlorine Sensor



Reliably measure free chlorine without worrying about pH

The Rosemount™ 498CL is an amperometric sensor capable of measuring free chlorine in water without the need for pH correction. These sensors are ideal for measuring chlorine in drinking water and for monitoring dechlorination.

Overview



pH Independent Design

- Measure free chlorine without the need for pH correction.
- Sensors use a highly buffered acidic refill solution for internal pH adjustment.
- Integral Pt-100 RTFD for automatic temperature correction.

Ease of Maintenance

- Installs easily into low flow cell PN 24091-01, allowing convenient access for sensor maintenance and calibration.
- Membrane and fill solution replacement requires no special tools or fixtures and takes only a few minutes.
- Variopol (VP6) cable connection option, for quick cable-to-sensor release, eliminates cable twisting.

Contents

| | |
|--|---|
| Ordering Information | 3 |
| Specifications | 3 |
| Dimensional Drawings | 4 |
| Accessories | 5 |
| Rosemount 498CL Engineering Specifications | 5 |

Ordering Information



The Rosemount 498CL sensor is designed for measuring free chlorine in water. Sensors must be mounted in a sidestream sample with waste draining to atmosphere. These sensors are available with either a 25 ft (7.6 m) integral cable or Variopol (VP6) cable connection for use with interconnecting VP6 cables (sold separately). Three replacement membrane assemblies, three O-rings, and reagent, good enough to replace the fill slurry three times, are provided with each sensor.

Table 1. Rosemount 498CL pH-Independent Free Chlorine Sensor ordering information

| Model | Sensor type |
|--|--|
| 498CL | Free Chlorine Sensor |
| Sensor | |
| 01 | pH-Independent Free Chlorine Sensor |
| Cable | |
| - | No selection - standard 25 ft (7.6 m) integral cable |
| VP | Variopol cable connection |
| Typical Model Number: 498CL-01-VP | |

Specifications

Table 2. Rosemount 498CL pH-Independent Free Chlorine Sensor specifications

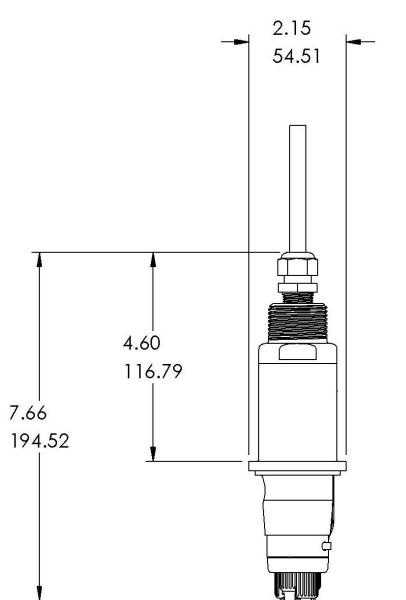
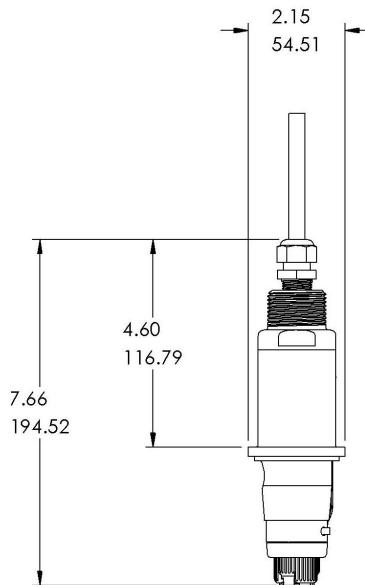
| | |
|--|---|
| Linear range | 0-20 ppm (mg/L) as Cl ₂ . For higher ranges, consult the factory. |
| Wetted materials | PVC, polyethersulfone, polyester, Viton ¹ , silicone, and 316 stainless steel |
| Cathode | Gold mesh |
| Accuracy | Accuracy depends on the accuracy of the chemical test used to calibrate the sensor. |
| Linearity between 0 and 20 ppm | 1% (per IEC 60746) |
| Linearity between 0 and 2 ppm | ±0.05 ppm following calibration at about 2 ppm |
| Sensitivity to pH | Between 6.5 and 10 sensor signal changes <4% per unit change in pH. Below pH 6.5 the change is < 1% per unit change in pH. |
| Sample conductivity | > 10 µS/cm |
| Interferences | Monochloramine, dichloramine, and permanganate |
| Response time | < 2 minutes to 90% of final value following step change at 1.2 gal/hr (75 mL/min) and 25 °C (77 °F) |
| Temperature | 0 to 50 °C (32 to 122 °F) |
| Pressure | Sample must drain to open atmosphere. No back pressure allowed. |
| Sample flow | 1.2 gal/hr (75 mL/min). Changing flow from 0.5 to 2.5 gph (30 to 160 mL/min) increases the sensor signal by about 30%. Increasing flow increases pH dependence. |
| Process connections | Sensor must be used in flow cell PN 24091-01 |
| Electrolyte life | 3 months (approx) |
| Cable length (standard integral cable) | 25 ft (7.6 m) |
| Cable length (maximum) | 300 ft (91 m) |
| Weight/shipping weight | Sensor with integral cable: 2 lb/3 lb (1.0 kg/1.5 kg) Sensor with VP connector: 1 lb/2 lb (0.5 kg/1.0 kg) <i>Note: Weights and shipping weights are rounded up to the nearest 1 lb or 0.5 kg.</i> |

¹ Viton is a registered trademark of El duPont de Nemours.

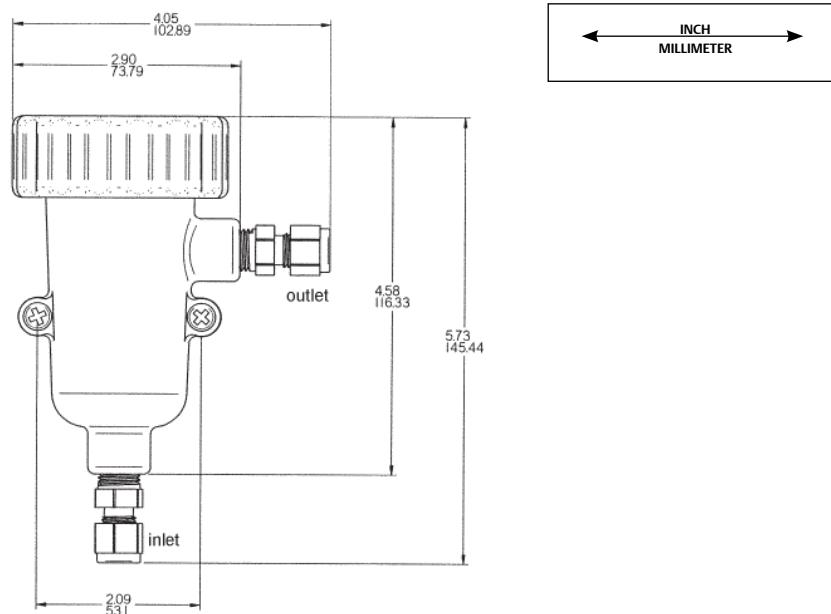
Table 3. Flow cell specifications

| | |
|------------------------|---|
| Part number | 24091-01 (low flow cell with bubble sweeping nozzle) |
| Wetted materials | Polycarbonate, polyester, 316 stainless steel, and silicone |
| Maximum inlet pressure | 65 psig (549 kPa abs) |
| Process connections | 1/4 in. OD tubing compression fitting or 1/4 in. FNPT |

Dimensional Drawings

Figure 1. Rosemount 498CL-01 Sensor dimensions**Figure 2. Rosemount 498CL-01-VP Sensor dimensions****Figure 3. Low flow cell (PN 24091-01)**

The union nut holds the sensor in place in the flow cell.



Accessories

Table 4. Rosemount 498CL pH-Independent Free Chlorine Sensor accessories

| Part number | Description |
|-------------|---|
| 24150-01 | Variopol 6.0 interconnecting cable , 10 ft (3 m) |
| 24150-02 | Variopol 6.0 interconnecting cable, 50 ft (15 m) |
| 242091-01 | Cell, low flow, 1/4 in. inlet and outlet, with bubble shedding nozzle |
| 33970-00 | Fill plug |
| 33521-03 | Membrane retainer cap |
| 23501-10 | pH-independent free chlorine membrane assembly, includes one membrane assembly and one O-ring |
| 23502-10 | pH-independent free chlorine membrane assembly, includes three membrane assemblies and three O-rings |
| 24146-00 | pH-independent free chlorine sensor electrolyte kit, includes three bottles of saturated succinic acid solution and three bottles of succinic acid crystals |

Rosemount 498CL Engineering Specifications

1. The sensor shall be suitable for the determination of free chlorine in water without the use of sample conditioning reagents or an auxiliary pH sensor. Sensors that use sample conditioning or require an auxiliary pH sensor are not acceptable.
2. The sensor shall be a three-electrode membrane-covered sensor with a silver/silver chloride reference, gold mesh cathode, and external stainless steel auxiliary electrode. The fill solution shall be saturated succinic acid.
3. The sensor shall contain a Pt 100 RTD to measure temperature for correcting the raw signal for changes in membrane permeability.
4. The change in chlorine signal shall be less than 4% per unit change in pH between pH 6.5 and 10.
5. The linearity of the sensor shall be 1% between 0 and 20 ppm (IEC 60746)
6. The recommended sample flow shall be about 1.2 gph (75 mL/min).
7. The response time to a step change in free chlorine concentration shall be <2 minutes to 90% of final value at 1.2 gph (75 mL/min).
8. Sensor maintenance shall require no special tools or fixtures.
9. The life of the fill solution shall be approximately three months.
10. The sensor shall be available with either integral cable or VP 6.0 quick disconnect fittings. Sensors without a quick disconnect fitting are not acceptable.
11. A flow cell designed for use with the sensor shall be available.
12. The sensor shall be Rosemount 498CL-01 or 498CL-01-VP or approved equivalent.

Notes

Notes



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