

Total Chlorine Analyzer

The Model TCL is intended for the determination of total chlorine in water, including the determination of chlorine in seawater. The system consists of a sample conditioning unit, a sensor, and a Model 1056-24 or a Model 56-24 chlorine analyzer.

Model TCL Sample Conditioning System

- No metal wetted parts. Ideal for seawater.
- Low sample flow (about 15 mL/minute) means little waste.
- Reagent-based system measures true total chlorine.
- Five gallons of reagent lasts two months.

Model 1056-24 Chlorine Analyzer (shown)

- Four line, back-lit display with easy to use interface.
- Two independent outputs
- Optional fully programmable alarms
- Help screens for troubleshooting appear at the touch of a button

Model 56-24 Chlorine Analyzer

- Four line, full color display with easy to use interface
- Four fully programmable outputs and relays
- HART® digital communications standard
- Data logger and graphical display standard
- Information screens and troubleshooting help available at the touch of a button



Model 499ACL-02 Sensor

- Membrane-covered amperometric sensor.
- No tools required to change membrane.
- Maintenance takes only a few minutes a month.
- Variopol connector option allows the sensor to be replaced without removing and rewiring cable.

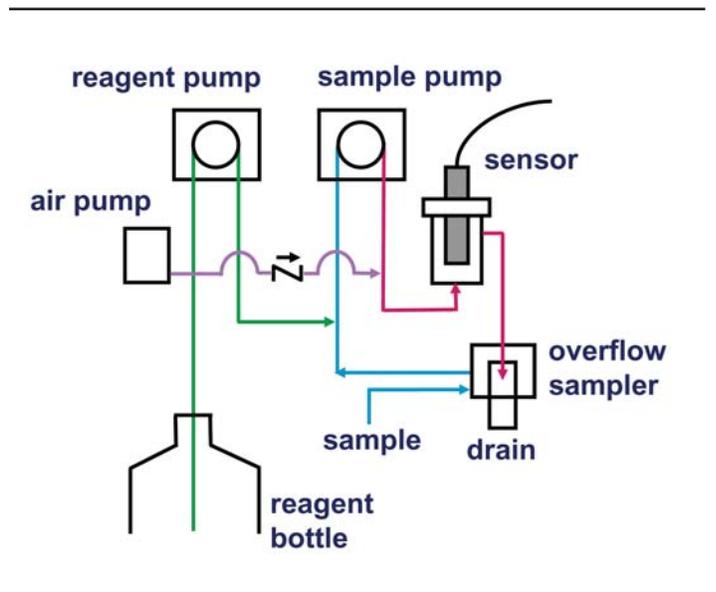
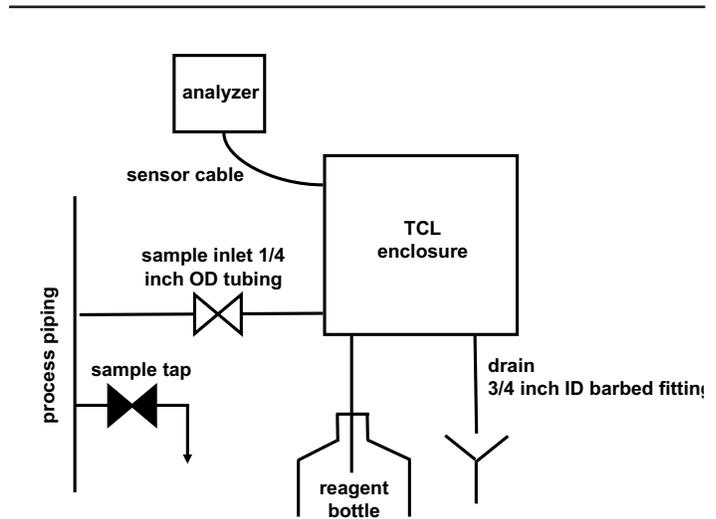
Model TCL sample conditioning system

The Model TCL is a sample conditioning system that permits a single sensor to measure total chlorine in water. The sample conditioning system continuously injects a solution of acetic acid (vinegar) and potassium iodide into the sample. The acid lowers the pH to between 3.5 and 4.5 and allows total chlorine in the sample to quantitatively react with the potassium iodide to produce iodine. The sensor measures the iodine concentration, and the analyzer displays the total oxidant concentration in ppm as Cl₂.

The Model TCL can also be used to measure chlorinated seawater. Seawater contains about 50 ppm bromide. When chlorine, as sodium hypochlorite or chlorine gas, mixes with seawater, the chlorine reacts with bromide to form a mixture of bromine oxidants, primarily hypobromous acid. In the TCL, the bromine oxidants readily convert iodide to iodine.

The figure at right is a schematic diagram of the system. The sample enters the sample conditioning enclosure and flows to an overflow sampler from which the sample pump takes suction. Excess sample drains to waste. At the same time, the reagent pump draws reagent, a solution of potassium iodide in vinegar, from the reagent carboy and injects it into the suction side of the sample pump. The sample and reagent mix as they pass through the pump, and total chlorine in the sample is converted to the chemically equivalent amount of iodine. The flow rates are 11 mL/min for the sample and 0.2 mL/min for the reagent.

The treated sample next enters the flow cell. Bubbles injected into the flow cell produce turbulence, which improves the stability of the reading. A membrane-covered amperometric sensor in the flow cell measures the concentration of iodine. The analyzer receives the raw signal from the sensor and displays the concentration of total chlorine. Display units are ppm (mg/L) chlorine as Cl₂. The treated sample leaves the flow cell and drains to waste along with the excess sample.



Model 1056-24 chlorine Analyzer

The Model 1056 analyzer is housed in a rugged NEMA 4X polycarbonate enclosure. It is suitable for panel, pipe, or wall mounting. Operation of the analyzer is through a front panel membrane keypad. The large back-lit display continuously indicates chlorine concentration and temperature, along with four user-selectable parameters, such as analog output, alarms, etc. Menu screens for calibrating and programming the analyzer are simple and intuitive. Plain language prompts in English, German, Italian, Spanish, Portuguese, French, and Chinese guide the user.

Two fully programmable 0-20 mA or 4-20 mA analog outputs are available. Outputs can be assigned to either chlorine or temperature.

Four fully programmable alarm relays are available as an option. The relays can be used to signal an out of limits condition or a sensor or analyzer fault. An interval timer feature is also available.

The analyzer fully compensates chlorine readings for changes in membrane permeability caused by temperature changes.

The Model 1056-24 used for the determination of total chlorine is a single input instrument. The analyzer is also available with dual input, for example, chlorine and pH. For more information see Product Data Sheet 71-1056.

Model 56-24 Analyzer

The Model 56 analyzer is housed in a rugged NEMA 4X polycarbonate enclosure. It is suitable for panel, pipe, or wall mounting. Operation of the analyzer is through a front panel keypad. The large full-color display indicates chlorine concentration and temperature along with other six user-selectable parameters, such as analog output and relay state. Menu screens for calibrating and programming are simple and intuitive, and screens providing information about configuration, calibration, and troubleshooting are available at a touch of a button. Prompts and information screens are available in nine languages, English, German, French, Spanish, Portuguese, Italian, Polish, Russian, and Chinese.

Four fully programmable relays and HART digital communication are standard, as are four alarm relays. Seven different relay functions, included a fault alarm are available.

A data logger, storing up to 30 days of data, including diagnostic measurements as well as process variables, is standard. A dual graphical display allows the data to be shown in one hour,

one day, seven days, and one month intervals. An event logger, which holds up to 300 events, is also standard.

The analyzer fully compensates chlorine readings for changes in membrane permeability caused by temperature changes.

The Model 56-24 analyzer used for the determination of total chlorine is a single input instrument. The analyzer is also available with dual input, for example, chlorine and pH. For additional information, see Product Data Sheet 71-56.

Model 499ACL-02 sensor

The Model 499ACL-02 total chlorine sensor is really an iodine sensor. The iodine comes from the reaction between halogen oxidants in the sample and the acetic acid/potassium iodide reagent added by the TCL sample conditioning system.

The sensor consists of a gold cathode and a silver anode in an electrolyte solution. A silicone membrane, permeable to iodine, is stretched over the cathode. The analyzer applies a voltage to the cathode sufficiently negative to reduce all the iodine reaching it. Because the concentration of iodine in the sensor is always zero, a concentration gradient continuously forces iodine from the sample through the membrane into the sensor.

The reduction of iodine in the sensor generates a current directly proportional to the diffusion rate of iodine through the membrane, which is directly proportional to the concentration of iodine in the sample. Because the iodine concentration depends on the amount of total chlorine in the sample, the sensor current is ultimately proportional to the total chlorine concentration.

The permeability of the membrane is a function of temperature. A Pt100 RTD in the sensor measures temperature, and the analyzer compensates the total chlorine reading for changes in membrane permeability.

Sensor maintenance is fast and easy. Replacing the membrane requires no special tools or fixtures. Simply place the membrane assembly on the cathode and screw the retainer in place. Installing a new membrane and replenishing the electrolyte takes only a few minutes.

Specifications — Sample Conditioning System

General

Enclosure: Fiberglass reinforced polyester, NEMA 3 (IP53) suitable for marine environments

Dimensions: see drawing

Mounting: Wall

Reagent carboy: 5 gal (19L); dimensions (l x w x h) 12.5 x 9.5 x 13.5 in (318 x 233 x 343 mm)

Ambient Temperature: 32° - 122°F (0 - 50°C)

Ambient Humidity: 0 - 90% (non-condensing)

Power: 115 Vac, 6.9 W, 50/60 Hz;
230 Vac, 7.0 W, 50/60 Hz

Hazardous Location: The TCL sample conditioning system has no hazardous location approvals.

Pumps:

EN 809:1998



Weight/Shipping Weight (rounded up to the nearest lb or 0.5kg): 14 lb (6.5 kg) / 16 lb (7.5 kg)

Sample Requirements

Inlet Connection: compression fitting, accepts 1/4 in. OD tubing

Drain Connection: 3/4 in. barbed fitting (must drain to open atmosphere)

Inlet Pressure: <100 psig (791 kPa abs)

Flow: at least 0.25 gph (15 mL/min)

Temperature: 32 - 122°F (0 - 50°C)

Total Alkalinity: <300 mg/L as CaCO₃. For samples containing <50 mg/L alkalinity, consult the factory.

Sample Conditioning System

Reagent: Potassium iodide in vinegar.

Reagent Usage: 5 gallons (19L) lasts approximately 60 days.

Reagent Pump: Fixed speed peristaltic pump, about 0.2 mL/min

Sample Pump: Fixed speed peristaltic pump, about 11 mL/min

Specifications — Model 1056 Analyzer

Case: Polycarbonate NEMA 4X/CSA 4 (IP65).

Conduit openings: Accepts PG13.5 or 1/2 in. conduit fittings

Display: Monochromatic back-lit LCD. Main character height 0.6 in (15mm). Display is user-programmable

Languages: English, French, German, Italian, Spanish, Portuguese, and Chinese.

Ambient temperature and humidity: 32 to 131°F (0 to 55°C); RH 5 to 95% (con-condensing)

Storage temperature: -4 to 140°F (-20°C and 60°C)

Power: -01 option: 115/230 Vac ±15%, 50 to 60 Hz, switching, 10 W
-03 option: 84-265 Vac, 47.5 to 65.0 Hz, switching, 15 W

Equipment protected by double insulation

RFI/EMI: EN-61326



LVD: EN-61010-1

Outputs: Two 4-20 mA or 0-20 mA isolated outputs. Continuously adjustable. Linear or logarithmic. Maximum load 550 Ω. Output dampening is user-adjustable.

Alarms: Four alarm relays. Any relay can be configured as a fault alarm instead of a process alarm. Each relay can be configured independently and each can be programmed with interval timer settings.

Relays: Form C, SPDT, epoxy sealed

Relay Contact ratings:



5 A at 28 VDC or 300 VAC (resistive)

1/8 HP at 120/240 VAC.

Terminal Connections Rating: Power connector (3-leads): 18-12 AWG wire size. Current output connectors (2-leads): 24-16 AWG wire size. Alarm relay terminal blocks: 18-16 AWG wire size

Hazardous Location Approvals: For more information refer to the Model 1056 product data sheet 71-1056. Approvals apply to the analyzer only. The TCL is not suitable for use in hazardous areas.

Weight/Shipping Weight (rounded up to the nearest lb or 0.5 kg): 3lb (1.5 kg) / 4 lb (2.0 kg)

Specifications — Model 56 Analyzer

Case: Polycarbonate

Display: Full color LCD, 3.75 x 2.20 in. (95 x 56 mm); display can be customized by the user.

Languages: English, French, German, Italian, Spanish, Portuguese, Chinese, Russian, and Polish.

Ambient Temperature and Humidity: 14 to 140°F (-10 to 60°C); RH 5 to 95% (non-condensing). Between 23 and 131°F (-5 to 55°C) there is no visible degradation in display response or performance.

Storage temperature: -4 to 140°F (-20 to 60°C)

Power: 85 to 265 VAC, 47.5 to 65.0 Hz, 20 W

RFI/EMI: EN-61326



LVD: EN-6101-01

Outputs: Four 4-20 or 0-20 mA isolated current outputs; assignable to measurement or temperature; fully scalable; maximum load 550 Ω. HART digital signal is superimposed on output 1.

Alarms and Timers: Four relays, fully configurable as a setpoint alarm, interval timer, TPC, bleed and feed timer, delay timer, date and time timer, and fault alarm.

Relays: Form C, SPDT, epoxy sealed.

Relay Contact ratings:



5 A at 28 VDC or 300 VAC (resistive)

1/8 HP at 120/240 VAC

Control features: PID control (analog output) and time proportional control or TPC (relays) are standard.

Data logger: Data automatically stored every 30 seconds for 30 days; older data removed to make room for new data. The following data are automatically stored: date and time, ppm, temperature, raw sensor current

Event logger: Stores up to 300 events with data and time stamp: faults, warnings, calibration data, calibration results (pass or fail), power on/off cycles, and hold on/off. Alarm relay activation and deactivation can also be stored. Older events are automatically removed to make room for new events.

Data and event downloading: through USB port on front panel.

Graphical display: Dual graphical display shows measurement data on the y-axis and time on the x-axis. Y-axis is fully assignable and scalable. X-axis can be set to one hour, one day, seven days, or 30 days.

Digital communications: HART digital communications is standard.

Hazardous Location Approvals: For more information refer to the Model 56 product data sheet 71-56. Approvals apply to the analyzer only. The TCL is not suitable for use in hazardous areas.

Weight/Shipping Weight (rounded up to the nearest lb or 0.5 kg): 3lb (1.5 kg)/ 4 lb (2.0 kg)

Specifications — Model 499ACL-02 sensor

Wetted Parts: Gold, Noryl⁽¹⁾ (PPO), Viton, EPDM, Silicone

Dimensions: 1.0 x 5.6 in. (25.4 x 143 mm)

Cable: 25 ft. (7.6m) standard. (Sensor is also available with Variopol quick-disconnect fitting)

Pressure Rating: 0 to 65 psig (101 to 549 kPa)

Temperature Rating: 32 to 122°F (0 to 50°C)

Electrolyte Capacity: Approximately 25 mL

Electrolyte Life: Approximately 4 months

Weight/Shipping Weight (rounded up to the nearest 1lb or 0.5kg): 1 lb (0.5 kg)/3 lb (1.5 kg)

Specifications — Complete System

Linear Range: 0 to 20 ppm (mg/L) as Cl₂ (for higher ranges, consult factory)

Linearity (per ISO 15839): 0-10 ppm: 2%; 0-20 ppm: 3%

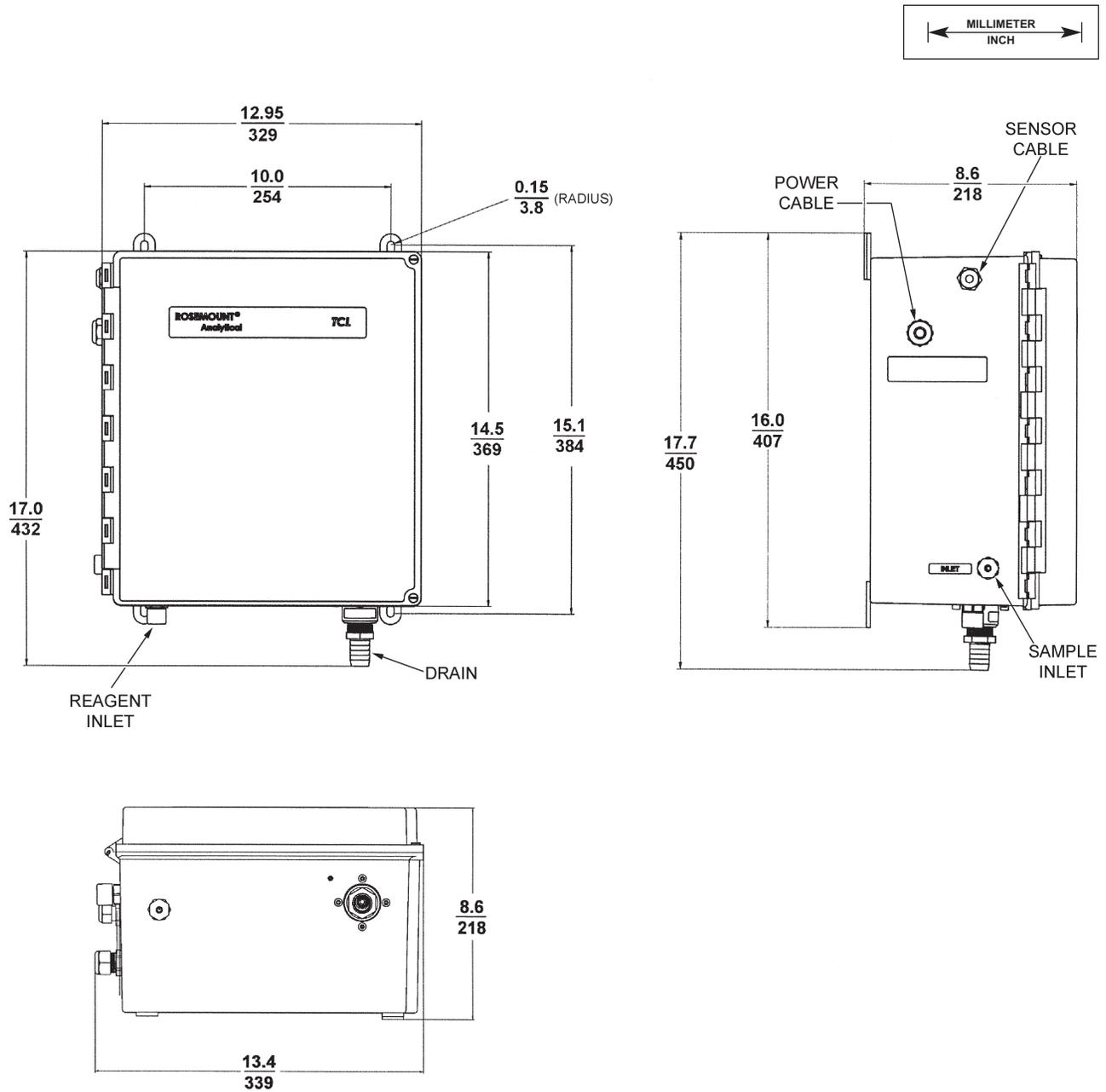
Response Time: Following a step change in concentration, the reading reaches 90% of final value within 7 minutes at 25°C.

Drift: At about 1.5 ppm in clean water and constant temperature, drift is typically less 0.05 ppm over two weeks.

Detection Limit (per ISO 15839): 0.02 ppm (mg/L) in clean water at room temperature

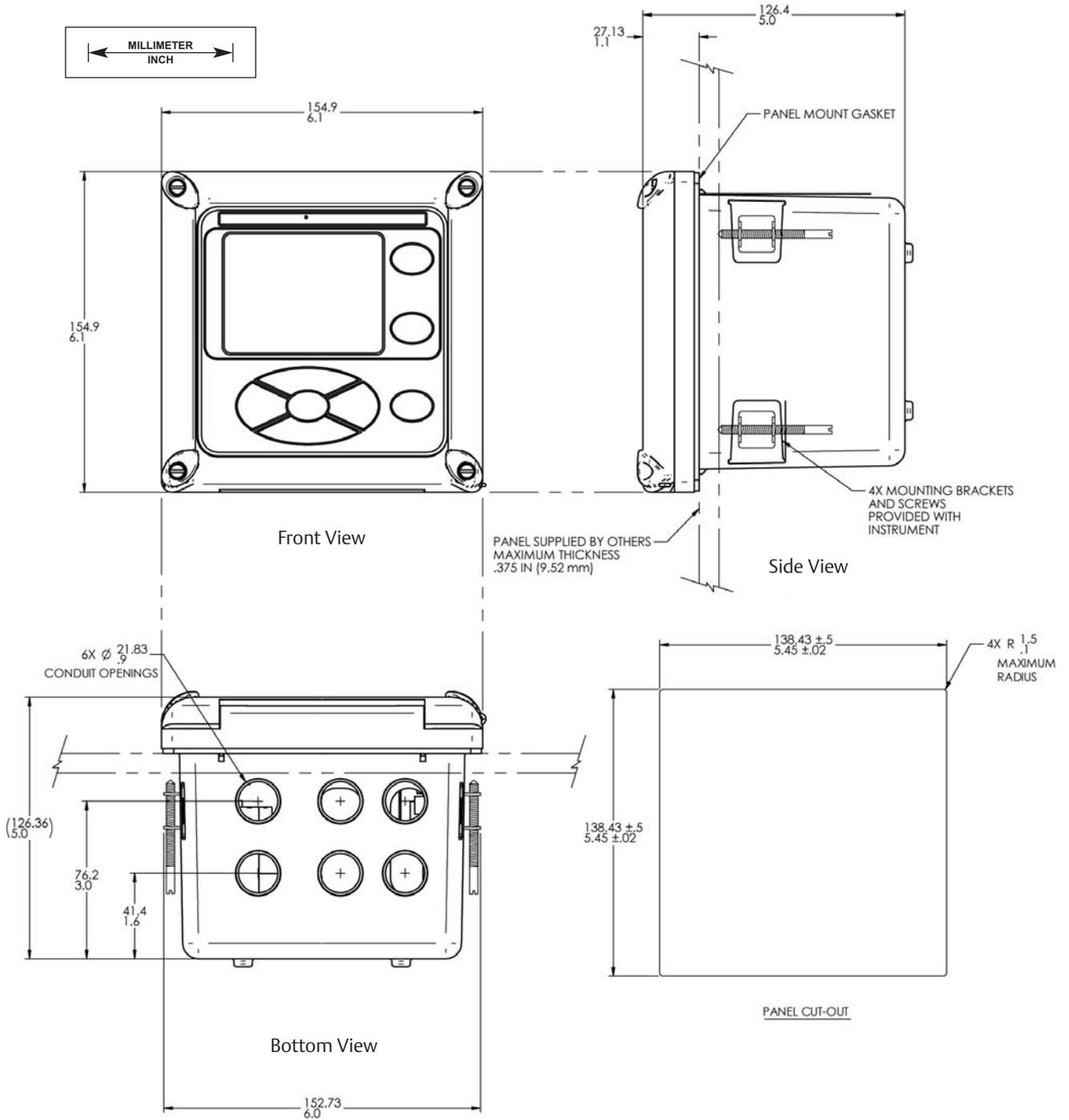
⁽¹⁾ Noryl is a registered trademark of General Electric.

Dimensions of TCL Case



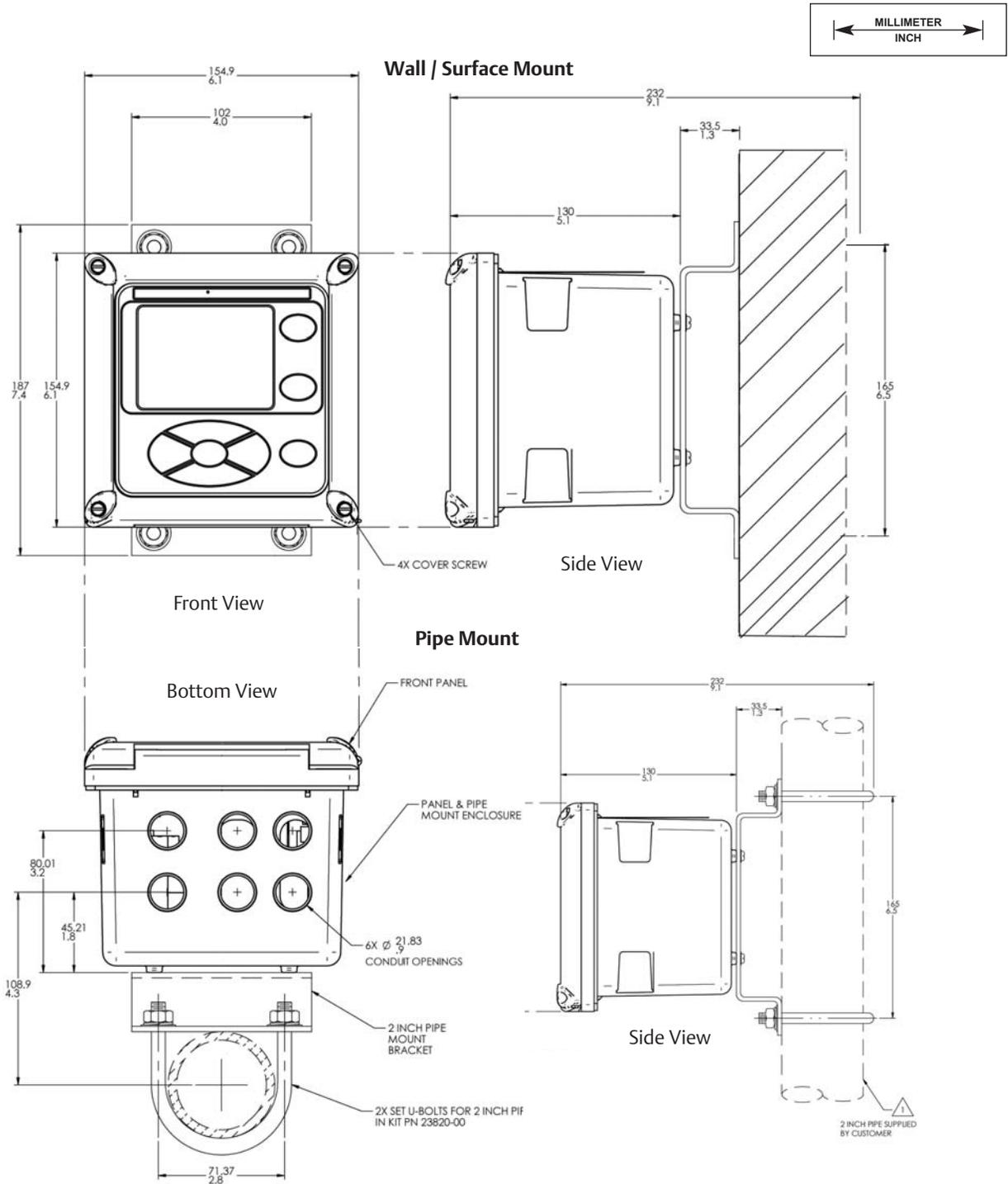
1056-24 Panel Mount Installation

The front panel is hinged at the bottom. The panel swings down for easy access to wiring terminals.



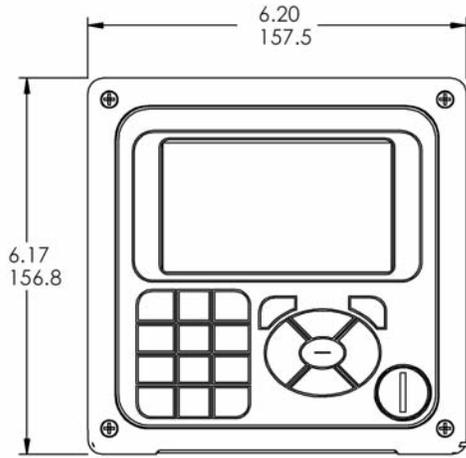
1056-24 Pipe/Wall Mount Installation

The front panel is hinged at the bottom. The panel swings down for easy access to wiring terminals.

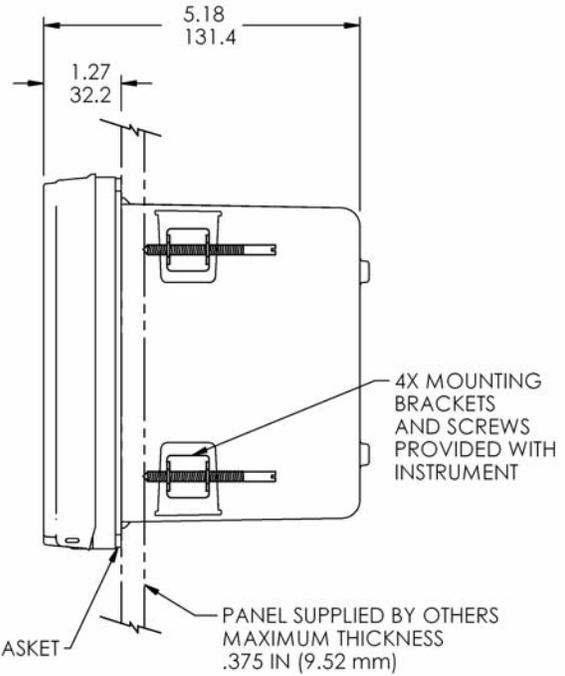


56-24 Panel Mount Installation

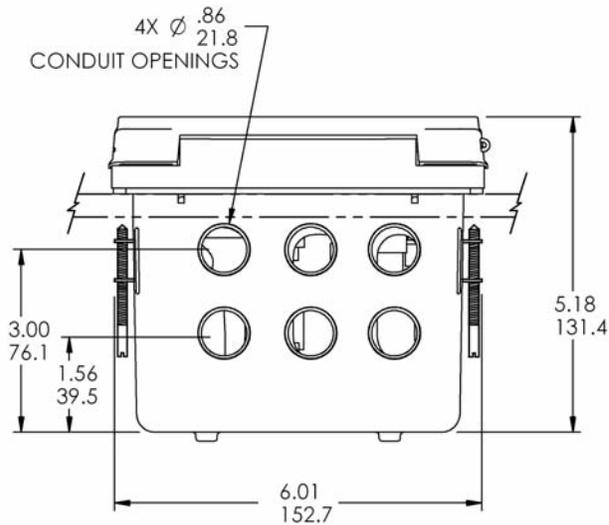
The front panel is hinged at the bottom. The panel swings down for easy access to wiring terminals.



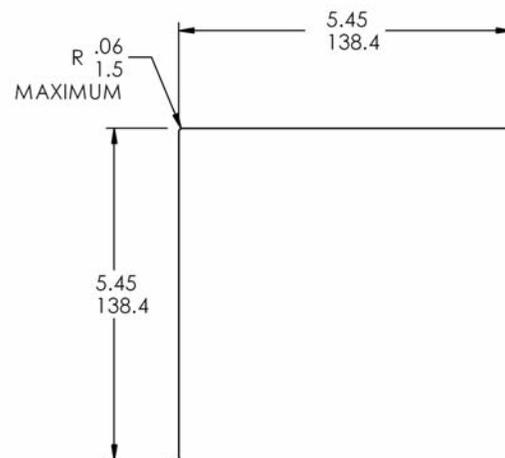
Front View



Side View



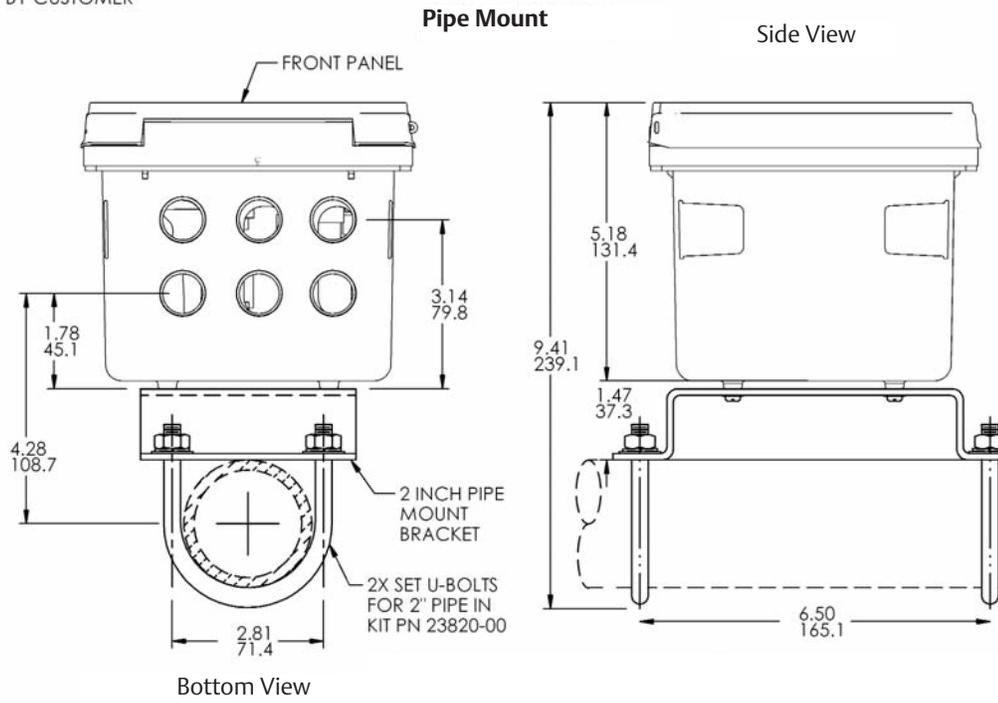
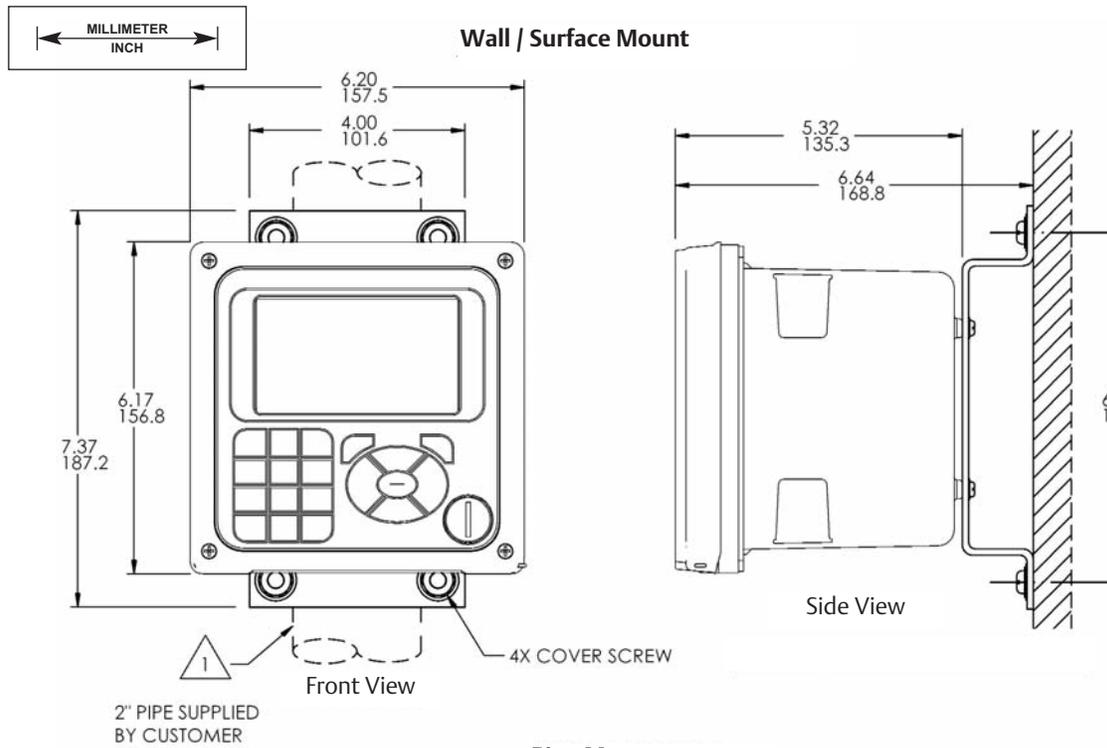
Bottom View



Panel Cut-Out

56-24 Pipe/Wall Mount Installation

The front panel is hinged at the bottom. The panel swings down for easy access to wiring terminals.



Model TCL Engineering Specification Using Model 1056 Analyzer

1. The system shall be suitable for the determination of total chlorine in water. The system shall consist of an analyzer, sensor, reagent carboy, and sample conditioning system.
2. The system shall be suitable for use in a marine environment. All wetted materials must be plastic.
3. To ensure the determination of total chlorine, the system must be reagent-based. The reagents shall consist of a solution of potassium iodide in vinegar (acetic acid). Total chlorine analyzers in which the acid and potassium iodide are stored in separate containers are not acceptable. Total chlorine analyzers that do not use vinegar are not acceptable.
4. Five gallons (19 L) of reagent shall last about two months.
5. The system shall be able to measure total chlorine in samples containing as much as 300 ppm total alkalinity (as CaCO_3).
6. To avoid wasting water, the required sample flow shall be no more than about 0.25 gallons per hour (15 mL/min). A sample overflow cup shall be used to divert excess sample to waste.
7. The linear range of the system shall be 0 – 20 ppm (mg/L) total chlorine as Cl_2 . Between 0 and 10 ppm the linearity shall be at least 2%; between 0 and 20 ppm the linearity shall be at least 3%. One sensor shall be able to cover the entire range.
8. The sensor shall be a membrane-covered, two-electrode amperometric device, having a gold cathode, silver/silver chloride anode, and a silicone membrane.
9. Expected sensor electrolyte life shall be about four months.
10. No special tools shall be required to change the membrane or to perform routine maintenance.
11. The sensor shall be available with a quick disconnect fitting to permit it to be replaced without removing and rewiring the cable.
12. The analyzer shall receive the raw signal from the sensor and automatically correct it for temperature effects. Results shall be displayed as ppm Cl_2 . A dual input analyzer shall also be available if the user wishes to use a single analyzer to measure two parameters, for example, total chlorine and pH.
13. The analyzer shall require single point calibration. A correction for the sensor zero current shall also be available.
14. The analyzer shall have a four line, back lit display. The display shall show ppm chlorine and temperature on one screen. The user shall be able to program the display to show additional information such as raw sensor current.
15. The analyzer shall be capable of operating between 32 and 131°F (0 and 55°C) and between 5 and 95% relative humidity (non-condensing).
16. The analyzer shall have dual 0/4-20 mA isolated outputs. Outputs shall be fully scalable and assignable independently to chlorine or temperature.
17. Digital communication using either HART or Profibus DP shall be available as options.
18. The analyzer shall have four (optional) alarm relays fully programmable for logic (high or low operation), dead band, and set point. Relays shall also be configurable to energize when the analyzer detects a fault with the sensor or itself.
19. All analyzer programming shall be through a front panel membrane keypad. The language (English, Spanish, Italian, Portuguese, German, French, or Chinese) used in the menu screens shall be selectable by the user.
20. The analyzer shall have a security feature to prevent unauthorized tampering with calibration and configuration settings.
21. The analyzer shall be Rosemount Analytical Model TCL with Model 1056 analyzer and 499ACL-02 total chlorine sensor or approved equal.

Model TCL Engineering Specification Using Model 56 Analyzer

1. The system shall be suitable for the determination of total chlorine in water. The system shall consist of an analyzer, sensor, and sample conditioning system.
2. The system shall be suitable for use in a marine environment. All wetted materials must be plastic.
3. To ensure the determination of total chlorine, the system must be reagent-based. The reagents shall consist of a solution of potassium iodide in vinegar (acetic acid). Total chlorine analyzers in which the acid and potassium iodide are stored in separate containers are not acceptable. Total chlorine analyzers that do not use vinegar are not acceptable.
4. Five gallons (19 L) of reagent shall last about two months.
5. The system shall be able to measure total chlorine in samples containing 300 ppm total alkalinity (as CaCO_3).
6. To avoid wasting water, the required sample flow shall be no more than about 0.25 gal/hr (15 mL/min). A sample overflow cup shall be used to divert excess sample to waste.
7. The linear range of the system shall be 0 – 20 ppm (mg/L) total chlorine as Cl_2 . Between 0 and 2 ppm the linearity shall be at least 2%; between 0 and 20 ppm the linearity shall be at least 3%. One sensor shall be able to cover the entire range.
8. The sensor shall be a membrane-covered, two-electrode amperometric device, having a gold cathode, silver/silver chloride anode, and a silicone membrane.
9. Sensor electrolyte life shall be about four months.
10. No special tools shall be required to change the membrane or to perform routine maintenance.
11. The sensor shall be available with a quick disconnect fitting to permit it to be replaced without removing and rewiring the cable.
12. The analyzer shall receive the raw signal from the sensor and automatically correct it for temperature effects. Results shall be displayed as ppm Cl_2 . A dual input analyzer shall also be available if the user wishes to use a single analyzer to measure two parameters, for example, total chlorine and pH.
13. The analyzer shall require single point calibration. A correction for the sensor zero current shall also be available.
14. The analyzer shall have a four line, full color display. The display shall show ppm chlorine and temperature on one screen. The display shall be programmable to show additional information such as raw sensor current.
15. The analyzer shall have four 0/4-20 mA isolated outputs and HART digital communications as a standard feature. Outputs shall be fully scalable and assignable independently to chlorine or temperature. PID control shall be available as a standard feature. Profibus DP digital communications shall be optional.
16. The analyzer shall have four alarm relays fully programmable as a high/low alarm with adjustable deadband or as a timer. Timer functions shall include an interval timer, bleed and feed timer, delay timer, and date and time timer. Time-proportional control shall also be available. In addition, relays shall be configurable to energize when the analyzer detects a fault with itself or the sensor.
17. All analyzer programming shall be through a front panel membrane keypad. The language (English, Spanish, Italian, Portuguese, German, French, Russian, Polish, or Chinese) shall be selectable by the user.
18. The analyzer shall have a data logger that automatically stores data every thirty seconds for thirty days, with older data being discarded to make room for newer data. In addition to storing date and time, chlorine concentration and temperature, the analyzer shall store raw sensor current (chlorine sensor). Stored data shall be downloadable through a USB port.
19. The analyzer shall have a dual graphical display that allows stored data to be viewed over one hour, one day, seven days, and one month intervals.
20. The analyzer shall have a data logger that stores up to 300 events.
21. The analyzer shall have help screens, available at the touch of a button, that provide information about configuration, calibration, and troubleshooting.
22. The analyzer shall have a security feature to prevent unauthorized tampering with calibration and configuration settings.
23. The analyzer shall be Rosemount Analytical Model TCL-11(or-12)-280 (analog/HART) or TCL-11(or-12)-281 (Profibus DP) or approved equal.

Ordering Information and Accessories

Model TCL Reagent-Based Chlorine System. The TCL is used for the continuous determination of total chlorine in water. The TCL consists of a sample conditioning system, a reagent carboy, a sensor, and an analyzer. **Reagents must be ordered separately. Reagent kits for 0-5 ppm and 0-10 ppm chlorine are available. For higher ranges, consult the factory. See ACCESSORIES - Sample Conditioning System.**

Model TCL	Reagent-based Chlorine System
CODE	POWER (required selection)
11	115 V 50/60 Hz
12	230 V 50/60 Hz

CODE	ANALYZER (optional selection)
270	1056-01-24-38-AN, no alarm relays, analog output
271	1056-01-24-38-HT, no alarm relays, HART
272	1056-01-24-38-DP, no alarm relays, Profibus DP
273	1056-03-24-38-AN, with alarm relays, analog output
274	1056-03-24-38-HT, with alarm relays, HART
275	1056-03-24-38-DP, with alarm relays, Profibus DP
280	56-03-24-38-HT, relays, analog HART
281	56-03-24-38-DP, relay, Profibus DP

CODE	SENSOR (optional selection)
30	499ACL-02-54 sensor with standard cable
31	499ACL-02-54-60 sensor with optimum EMI/RFI cable
32	499ACL-02-54-VP sensor with Variopol 6 fitting (interconnecting cable must be ordered separately)

Accessories— Sample Conditioning System

PN	Description	Weight*	Ship Weight*
24134-00	Air pump, 115 Vac, 50/60 Hz	1 lb (0.5 kg)	1 lb (0.5 kg)
24134-01	Air pump, 230 Vac, 50/60 Hz	1 lb (0.5 kg)	1 lb (0.5 kg)
9160578	Air pump repair kit	1 lb (0.5 kg)	1 lb (0.5 kg)
9322052	Check valve for air injection line	1 lb (0.5 kg)	1 lb (0.5 kg)
24153-00	Carboy for reagent, 5 gal/19 L, includes cap	4 lb (1.5 kg)	5 lb (2.0 kg)
9100204	Fuse, 0.25 A, 250 V, 3AG, slow blow for option -11 (115 Vac)	1 lb (0.5 kg)	1 lb (0.5 kg)
9100132	Fuse, 0.125 A, 250 V, 3AG, slow blow for option -12 (230 Vac)	1 lb (0.5 kg)	1 lb (0.5 kg)
9380094	Reagent pump, 115 Vac, 50/60 Hz	1 lb (0.5 kg)	2 lb (1 kg)
9380095	Reagent pump, 230 Vac, 50/60 Hz	1 lb (0.5 kg)	2 lb (1 kg)
9380091	Reagent pump replacement tubing	1 lb (0.5 kg)	2 lb (1 kg)
24151-00	Reagent tubing replacement kit	1 lb (0.5 kg)	2 lb (1 kg)
24135-00	Reagent uptake tubing, 6 ft (1.8 m), includes weight	1 lb (0.5 kg)	2 lb (1 kg)
9380090	Sample pump, 115 Vac, 50/60 Hz	1 lb (0.5 kg)	2 lb (1 kg)
9380093	Sample pump, 230 Vac, 50/60 Hz	1 lb (0.5 kg)	2 lb (1 kg)
9380092	Sample pump replacement tubing	1 lb (0.5 kg)	2 lb (1 kg)
24152-00	Sample tubing replacement kit	1 lb (0.5 kg)	2 lb (1 kg)
24164-00	Potassium iodide, 25 g, sufficient for 5 gallons (19 L) of vinegar (0-5 ppm total chlorine)	1 lb (0.5 kg)	1 lb (0.5 kg)
24164-01	Potassium iodide, 50 g, sufficient for 5 gallons (19 L) of vinegar (0-10 ppm total chlorine)	1 lb (0.5 kg)	1 lb (0.5 kg)
24165-00	Acetic acid, 2 x 2.5 gal (9.5 L) bottles/case, with 25 g potassium iodide (0-5 ppm total chlorine)	45 lb (20.5 kg)	48 lb (22.0 kg)
24165-01	Acetic acid, 2 x 2.5 gal (9.5 L) bottles/case, with 50 g potassium iodide(0-10 ppm total chlorine)	45 lb (20.5 kg)	48 lb (22.0 kg)

*Weights are rounded up to the nearest whole pound or 0.5 kg.

Accessories — Model 1056-24 and 56-24 Analyzers

PN	Description	Weight*	Ship Weight*
23554-00	Cable glands (Qty 5 of PG 13.5)	1 lb (0.5 kg)	1 lb (0.5 kg)
23820-00	Wall and two-inch pipe mounting kit	2 lb (1.0 kg)	3 lb (1.5 kg)
240048-00	Stainless steel tag (specify marking)	1 lb (0.5 kg)	1 lb (0.5 kg)

Accessories — Sensor

PN	Description	Weight*	Ship Weight*
23501-02	Total Chlorine Membrane, includes one membrane assembly and one O-ring	1 lb (0.5 kg)	1 lb (0.5 kg)
23502-02	Total Chlorine Membrane Kit, includes 3 membrane assemblies and three O-rings	1 lb (0.5 kg)	1 lb (0.5 kg)
9210438	Total Chlorine Sensor Fill Solution, 4 oz (120 mL)	1 lb (0.5 kg)	2 lb (1.0 kg)

For First Time Variopool Installations

PN	DESCRIPTION
23747-06	Interconnecting cable, VP 6, 2.5 ft (0.8 m)
23747-04	Interconnecting cable, VP 6, 4 ft (1.2m)
23747-02	Interconnecting cable, VP 6, 10 ft (3.0 m)
23747-07	Interconnecting cable, VP 6, 15 ft (4.6 m)
23747-08	Interconnecting cable, VP 6, 20 ft (6.1 m)
23747-09	Interconnecting cable, VP 6, 25 ft (7.6 m)
23747-10	Interconnecting cable, VP 6, 30 ft (9.1 m)
23747-03	Interconnecting cable, VP 6, 50 ft (15.2 m)
23747-11	Interconnecting cable, VP 6, 100 ft (30.5 m)

*Weights are rounded up to the nearest whole pound or 0.5 kg.

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Emerson Process Management

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