Product Specifications

Thermo Scientific Orion Chlorine XP

Multiple parameter water quality analyzer

From brine and wastewater to clean drinking water, the Thermo Scientific™ Orion™ Chlorine XP™ analyzer provides the ultimate accuracy and stability for the measurement of routine water quality parameters. With minimal maintenance, low cost of ownership, and multiple parameter measurement in one unit, the Orion Chlorine XP analyzer provides one of the most comprehensive water quality monitoring solution on the market.

Markets:

- Drinking Water
- Wastewater
- Food and Beverage
- Industrial

The Orion Chlorine XP analyzer measures free, total, and combined chlorine, providing accurate, objective, and fast readings of chlorine in water. It minimizes the need for periodic calibrations and is compatible with all disinfectant processes. It utilizes a DPD-based measurement technology that can be configured to use the least amount of reagents while maintaining utmost accuracy.

High Performance & Reliability

- Proven accuracy and repeatability even in harsh sample conditions (sea water, colored water, oil water)
- 0-10 ppm measurement range – in most applications
- Self zero calibration before each reading, enables “0” reading
- Wet tested for 24 hours before shipping
- 2 year warranty

Low Price & Cost of Ownership

- F&T Chlorine + pH, Temp (optional ORP, Conductivity, and Turbidity) in one analyzer – saves thousands of dollars over purchasing separate analyzers
- Low and customizable reagent consumption (default ~0.033 ml/sample) – lasts up to 2 months at 5 minutes cycle time, providing significant reagent savings compared to other manufacturers

Low Maintenance

- Light source self calibration adjustment
- Hands-free self cleansing of the photocell
- Automatic elimination of bubbling in the photocell
- Maintenance reminders and alarms (once a year on average)
- Auto buffer recognition at 4, 7, and 10

Additional Features

- Up to 6, 4-20mA isolated current outputs
- 6 x relays
- RS 485, Modbus® protocol support
- Optional Ethernet protocol to operations center

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Applications

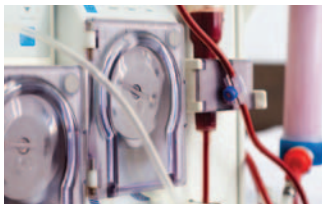
The Chlorine XP analyzer is recommended as a general purpose chlorine measurement analyzer along with other parameters- pH, temperature, ORP, and flow in water quality measurement applications.

Drinking Water Treatment - Most drinking water plants use chlorine as a preferred method of water disinfection and distribution monitoring. The Chlorine XP analyzer provides rapid feedback for chlorine additions for water disinfection and accurate checkpoint for chlorine levels during water distribution. As an EPA approved DPD method with up to two months of reagent usage, the Chlorine XP analyzer delivers significant cost savings compared to conventional one month usage systems.

Wastewater Treatment - Most wastewater plants use chlorine as a preferred method of disinfection before releasing water into the environment. The Chlorine XP analyzer accurately measures both total and free chlorine continuously in the same unit as checkpoint before the water is discharged. This combination of measurements eliminates the use of two different instruments, resulting in operating cost savings for the plant.

Power Generation - Power plants measure free and total chlorine for cooling water effluent to meet the regulatory limits for chlorine discharge. The Chlorine XP analyzer measures as low as 10 ppb for total chlorine in seawater, well below the regulatory requirement of minimum detection limits in all samples matrices.

Food & Beverage Manufacturing - Food and beverage plants need to measure chlorine before water goes through the RO process because chlorine shortens the life of the RO membrane by chemically reacting to the membrane. The Chlorine XP analyzer provides low level detection (up to 10 ppb) and a quick response time, extending life span of RO membranes which translates to low operating costs for the plant.



Dialysis Treatment - Dialysis treatment centers monitor the chlorine level in kidney dialysis machines to make sure that it doesn't come in contact with blood. Chlorine/chloramines in water used for dialysis can result in serious adverse patient reactions or death. The Chlorine XP analyzer measures less than 0.5 ppm (max. limit) total chlorine and provides quick response time, resulting in RO life extension and improving carbon filter efficiency.

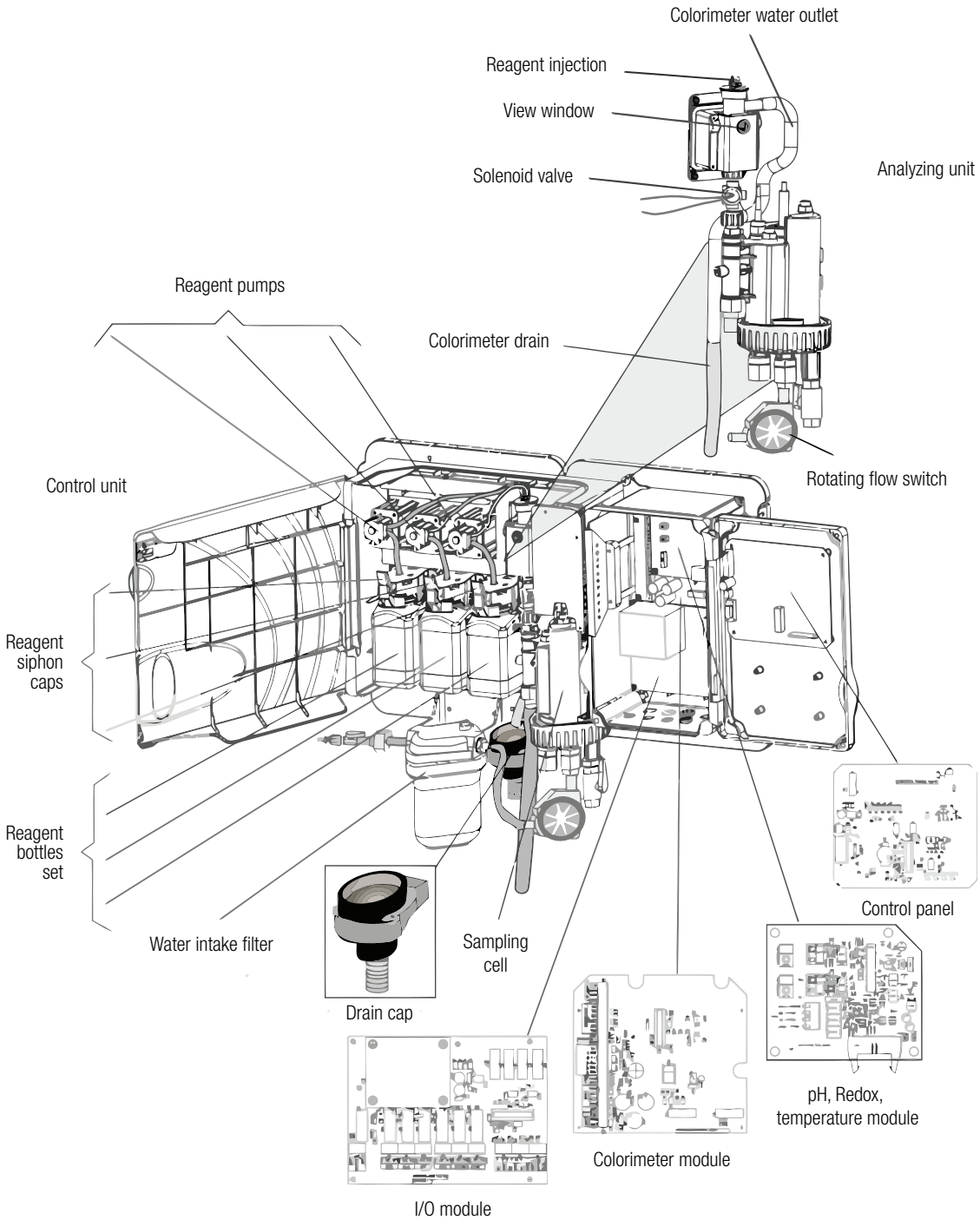
The operating system is designed to be simple and intuitive. Once installed and calibrated, the Chlorine XP analyzer automatically releases the proper quantity of chemicals depending on measurement frequency. The Chlorine XP analyzer comes standard with chlorine measurement and can be configured to measure any combination of free chlorine, total chlorine, and both free and total chlorine.

Principle of Operations

The DPD (N, N-diethyl-p-phenylenediamine) method for residual chlorine was first introduced by Dr. A.T. Palin in 1957. Over the years it has become the standard method for determining free and total chlorine in water and wastewater. When DPD reacts with small amounts of chlorine at a near neutral pH, a colored dye is the principal oxidation product. The DPD dye color is measured photometrically at wavelengths ranging from 490 to 555 nanometers (nm), which results in accurate reading of both free and total chlorine concentrations in water.

Free chlorine (hypochlorous acid + hypochlorite ions) reacts with the Free Chlorine Indicator (DPD1) causing a color change in the sample from clear to red. The buffer is used to ensure reaction at a consistent pH. The more free chlorine that is present, the darker the red color that forms. The color intensity is converted to ppm employing the Beer-Lambert law.

Total chlorine is often used for monitoring combined chlorine (chloramines) levels. Combined chlorine is the difference between the total chlorine and free chlorine. When free chlorine and total chlorine need to be measured in sequence, the Total Chlorine Indicator (DPD3) is added to the sample already containing the Free Chlorine Indicator (DPD1) and buffer. The combined chlorine reacts with the Total Chlorine Indicator causing an increase in the red color. The total chlorine is determined from the color change and the combined chlorine is calculated from the difference between the total and free chlorine. When only total chlorine test is needed, the Total Chlorine Indicator (DPD4) is added to the sample causing color change and the levels of total chlorine is determined.



Product Specifications

Performance

Accuracy	3%
Repeatability	(+/- 5%)
Minimum Detection Limit	10 ppb
Zero-Point-Adjustment	Self zero before each reading
Cycle Time	2 to 10 minutes
Flow Monitoring	Rotary flow switch (see Additional Requirements section for inlet/outlet pressure)
Parameters	FC, TC, F&TC, ORP, pH, Temp.
Measuring Range	0 to 10 ppm (Cl); 0-14 (pH); PT-100 Temp.

Reliability

Warranty	2 years
Validation	Contact factory
USEPA Accepted Method	Yes
CSA Certified	Yes
ISO Certified	Yes

Operations Requirements

Maintenance	1-2 months for reagent replacement and filter cleaning
Calibration	Every 6 months (pH and ORP only)
Reagent Usage	DPD up to 2 months at 5 min. cycle time
Power Consumption	Approx. 60VA
Power Supply	100-115 VAC, 50/60Hz, 1.0A or 200-230 VAC 50/60Hz, 0.5A
Weight	24 lbs. (11kg)
Dimensions	67cm x 33cm x 14cm, 26'' x 13'' x 5.5'' (WxHxD)

Options/features

Alarms	Optional, see manual
Remote Monitoring	Not yet available
Enclosure	IP-65 rated enclosures (NEMA 4 equivalent)
Local I/O	2 standard 4 to 20 mA outputs 4 optional 4 to 20 mA outputs
Memory	256K
Lines	1000
Event Logger	Yes
Total Relay On Time	Yes
Display Type	5.5" graphic monochromatic; character LCD with background light alarms and status
Password	Operator and technician
Servicing/ Maintenance	Self-cleaning photocell (minimum service requirement)

Additional Requirements

Sample and Drain Connection	Pressurized sample inlet and gravity drain
Sample Temperature	32°F to 212°F (0°C to 100°C) Ambient Temperature: 15°F to 131°F; (-10°C to 55°C)
Inlet Pressure	5-15 psi
Sample Conditioning	Not required

Product Ordering Information

Cat. No.	Description
CXP71	**Free** Chlorine only with 2X 4/20mA outputs
CXP72	**Total** Chlorine only with 2X 4/20mA outputs
CXP73	**Free & Total** Chlorine combined, 2x4/20mA outputs
CXP71PH	**Free** Chlorine + **pH + Temp.** 2x4/20mA outputs
CXP72PH	**Total** Chlorine + **pH + Temp.** 2x4/20mA outputs
CXP73PH	**Free & Total** Chlorine **combined + pH + Temp** 2x4/20mA outputs
CXPRGDPD1F	5 Sets of DPD1 reagents for **Free** Chlorine
CXPRGDPD4T	5 Sets of DPD4 reagents for **Total** Chlorine
CXPRGDPD3T	5 sets of DPD3 reagents for **Total** Chlorine (need to be used with DPD1 for CXP73 and CXP73PH)

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