

## Series Q45H Chlorine Monitor

On-line Chlorine Monitors shall be provided to continuously measure (specify free or combined chlorine residual) at the \_\_\_\_\_ (Specify Locations). Each Chlorine Monitor shall consist of a direct measuring chlorine sensor, a clear constant-head flowcell, 25 feet of sensor interconnect cable with quick disconnect plug, and an electronic monitor housed in a NEMA 4X enclosure suitable for wall, pipe, or panel mounting.

The chlorine sensor shall be a direct measuring polarographic sensor utilizing a special polymeric membrane to isolate the sensing electrodes from the sample and eliminate the potential for electrode contamination. The membrane shall allow chlorine to diffuse into the sensor where it shall react with the sensing electrode, generating a signal that is linearly proportional to chlorine concentration. The sensor assembly shall also contain a precision RTD temperature sensor to continuously measure sample temperature to allow temperature compensation of the measured chlorine value. The chlorine sensor shall be constructed with a quick disconnect receptacle to allow easy sensor servicing or exchange. Chlorine sensors shall be supplied complete with at least 10 spare membranes, electrolyte, and a spare parts kit that includes all o-rings and special hardware.

The flowcell assembly supplied with the monitor shall be constructed of clear material allowing the condition of the sensor membrane to be inspected without removal of the sensor. The sensor shall slide easily into the side of the flowcell, with a double o-ring seal to prevent water leakage. Flow to the sensor shall be regulated automatically through a constant-head overflow arrangement. Hose barbs for sample inlet (1/4" I.D. tubing) and drain (1/2" I.D. tubing) shall be supplied as part of the flowcell.

OPTIONAL: The chlorine monitor shall be supplied with a pH sensor. The pH sensor shall allow free chlorine monitors to automatically correct the chlorine value for changes in sample pH to maintain measurement accuracy over wide pH swings from pH 7 to pH 9.5. The pH sensor shall fit into the inlet chamber of the chlorine sensor flowcell. The pH value shall be available for display on the second line of the monitor display.

The Chlorine Monitor electronic assembly shall be: **(select one version below)**

- A. A loop-powered 2-wire instrument providing an isolated 4-20 mA output proportional to chlorine into a maximum load of 500 ohms.
- B. A battery operated data logging monitor capable of operating from an internal battery. The monitor shall provide two 0-2.5 VDC outputs suitable for use by a data logger. The monitor shall operate for up to 4 days continuously on an alkaline battery and up to 10 days on a lithium battery.

The chlorine monitor electronic assembly shall provide a variety of functions as follows.

1. Provide user selectable display of PPM chlorine, process temperature, or PID % output on the main display. Main display variable shall be indicated with a minimum character height of 0.75" to allow easy readability up to 20 feet away.
  2. Allow selection of operating ranges of 0-200 PPB, 0-2 PPM, 0-20 PPM, or 0-200 PPM. Display ranges shall be configurable by operators, or the monitor may be configured for Auto-Ranging. The auto-ranging function shall automatically switch to the display range that provides the best resolution for any given operating level.
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3. Provide automatic pH correction of the measured free chlorine level based on input from an optional pH sensor. The pH compensation may be enabled or disabled by the user, and the pH value at which the correction factor is disabled (comp. stop value) may also be programmed by the user.
4. Provide the ability to use the 4-20 mA output for PID control. Proportional, Integral, and Derivative functions shall be user adjustable, and also provide for output hold when needed.
5. Provide output hold and output simulate functions to allow for testing or remote receiving devices or to allow maintenance without disturbing control systems.
6. Diagnostic functions shall be incorporated into the transmitter. The 4-20 mA output shall be capable of being assigned to safely rise to 20 mA, fall to 4 mA, or be left alone, during diagnostic failures. Diagnostic error messages shall be displayed in clear language; no confusing error codes shall be displayed.

The complete chlorine monitor shall be supplied with spare parts and accessories for up to 2 years of operation. A minimum of 10 replacement membranes shall be supplied for the sensor.

The complete Chlorine Monitor shall be Series Q45H-62/63 as manufactured by Analytical Technology, Inc. or approved equal.

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