

## Series Q46R ORP Monitor

ORP Monitors shall be supplied for continuous monitoring of ORP in     (Specify Application and Location)    . The ORP monitoring system shall consist of an electronic monitor housed in a NEMA 4X enclosure suitable for wall, pipe, or panel mounting, a differential-style ORP sensor, and accessories listed below. The ORP Monitoring System shall be ATI Series Q46R/Q25R as described below.

The ORP sensor shall be a 1" NPT, dual-electrode design. The reference electrode shall be fully sealed in a glass to prevent contamination of the reference element. The reference chamber of the sensor shall be fully serviceable by removal of the saltbridge and replacement of the reference chamber solution.

The sensor shall be constructed of molded PEEK (poly-ether-ether-ketone) components. These components include the saltbridge, body, all rear seal components, and all internal components. The body shall be hex shaped to facilitate quick connection to standard 1" NPT fittings.

The sensor shall include a titanium ground electrode to improve signal stability and enable electrode breakage diagnostic functions to be performed. The sensor shall include a Pt1000 RTD for high accuracy temperature measurements. The sensor shall include an integral preamplifier to provide a low impedance signal output capable of being driven 3000 feet with standard sensor cabling. The sensor preamplifier shall contain features to monitor for electrode breakage and sensor seal failure. The integral electronics shall be encapsulated into the sensor.

The sensor shall include a highly chemical resistant, cross-linked polyethylene jacketed cable. The sensor cable shall contain two foil shields for optimum electrical performance.

The sensor saltbridge shall be a high capacity, dual-junction, high capacity device. The saltbridge shall be completely replaceable.

Monitors shall be powered by either 90-260 VAC single-phase line power, or 12-24 VDC . Either version of the monitor shall provide two isolated 4-20 mA outputs as standard, with an option for a third 4-20 mA output. Outputs shall be configurable for ORP, temperature, or PID control. Analog outputs shall be both ground isolated and isolated from each other.

For alarm purposes, monitors shall contain three SPDT relays. Relay functions shall be programmable for control, alarm, or fail functions, and may be designed for either normal or failsafe operation. For monitors supplied with only 2 analog outputs, monitors shall have the option of an additional 3 low-power relays to allow for additional external alarm functions.

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

1. Provide user selectable display of ORP, 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. 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.
  3. Provide two isolated 4-20 mA outputs, with output spans programmable by the user for any segment of a display range. An optional third analog output is available, providing separate outputs for ORP and temperature.
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4. Provide output hold and output simulate functions to allow for testing or remote receiving devices or to allow maintenance without disturbing control systems.
5. The monitor shall contain calibration functions for 1-point (sample or buffer) and 2-point calibration for ORP. The user shall be able to easily override the automatic buffer recognition values and manually enter values if desired. Calibration stability monitors shall be provided to hold calibration status until stable buffer conditions have occurred
6. Provide three 6 amp SPDT relay outputs in standard unit. Software settings for relay control include setpoint, deadband, phase, delay, and failsafe. Provide an optional 3-relay card, for 0-30 V signals, to bring the total to 6 relays. Relays shall be programmable for either control or alarm function, or relays may be assigned to diagnostic functions for use in indicating trouble conditions at a remote location.
7. Provide option for digital communications. These options shall include Profibus-DP, Modbus-RTU, or Ethernet-IP.
8. 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.

AUTO-CLEAN OPTION: A complete high pressure air supply system shall be integrated into a separate enclosure. The air supply shall include as a minimum a compressor, check valve, air accumulator, and solenoid valve. Units with separate compressor systems shall be supplied with the air supply and ORP monitor mounted on a panel to reduce installation costs, with all interconnecting wiring completed at the factory so that only AC power and sensor connections are required by the installer. Systems that do not include an air accumulator to insure adequate pressure bursts are not considered "equal" to the specified unit. The cleaning function shall operate automatically at the interval determined by the operator. In addition, the cleaner may be energized at any time using the switches on the front of the monitor. In operation, the cleaner system shall delivery short, high pressure bursts of air directly across the face of the sensor. The number of air bursts during any one cleaning cycle shall be programmable by the operator to adjust for particular plant conditions.

The complete ORP Monitor shall be Series Q46R as manufactured by Analytical Technology, Inc. or approved equal.

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