



MicroChem[®] Water Analysis System

A Versatile Multi-Parameter Instrument

Introduction

MicroChem[®] Transmitter/Controller

Specifically designed for drinking and waste water treatment plants, the MicroChem[®] Instrument is able to measure up to three of the following parameters: pH, ORP, Chlorine, Chlorine Dioxide, Ozone, Conductivity, and 4-20 mA. The MicroChem Instrument can be configured as an Analyzer/Transmitter or a Controller.

Analyzer/Transmitter - The MicroChem Instrument is capable of accepting signal(s) from up to three sensors representing a wide variety of measurements.

Controller - The MicroChem Instrument can provide control of the measured parameter using a standard PID algorithm in conjunction with the sensor input signal, or as a PID Compound Loop controller utilizing the signal from the sensor and an optional 4-20 mA process flow signal. Two outputs are available from each channel card. One control output is available both as a 4-20 mA control signal or a pulse width modulation output. A second software configurable 4-20 mA output signal is available on each configured channel.

Design Features:

- Color touch screen display provides an easy to use operator interface.
- Menu driven software design guides user through set-up and operation.
- Modularity & flexibility: Additional channels are easily added and field sensors can be changed to achieve new measurements.
- Capable of receiving inputs from up to three (3) sensors and/or 4-20 mA signals.
- Retransmits two (2) 4-20 mA signals per channel card. Up to six (6) total per instrument.
- Serial communications available via RS232/422/485 via MODBUS protocol.
- Full modem RS232 port available for connection to an external modem which allows e-mail messages to be sent from instrument. Messages provide current channel status and any alarms present.
- USB 2.0 connector to interface USB memory media to instrument. Capable of downloading data log file and instrument configuration.
- Simplicity of use is also assured by message driven menus displayed in one of the following software selectable languages: English, French, German, Spanish, Chinese and Italian.
- Up to eight (8) relay outputs available.
- On-screen Alarm and Warning messages.
- Alarms and deadband can be freely changed via software.
- Automatic temperature compensation for Chlorine and pH measurements.
- Measures and indicates the sample temperature value for all cells with temperature compensation.
- Password protected menus.
- The MicroChem Controller function utilizes specific PID algorithms for pH and Chlorine/ORP.
- Calibration is performed without opening the instrument cover via a color touch-screen display.
- Diagnostics screen available to aid in trouble shooting
- Housing suitable for outdoor installations
- (IP65/NEMA 4X protection)



Technical Data

Display:

- LCD color display resolution 480x272
- Resistive touch panel
- LED backlight control

Power Supply: (2 options available)

- Nominal 110-240 Vac 50-60 Hz 65 VA (AC version)
- 24 Vdc \pm
- 10% 3.15 A (DC version)

Enclosure Classification:

- IP65/NEMA 4X suitable for outdoor mounting.

Analog Outputs:

- Two for each installed channel card. Output 1 is configurable as either 4-20 mA or PWM output. The output is then assigned in software to represent retransmission of the measured parameter, sample temperature or PID control signal. Output 2 is a 4-20 mA signal that is software assignable to represent retransmission of the measured parameter or sample temperature.

Relay Outputs:

- Eight (8) relay outputs, 230 Vac 8A (AC versions) or 24 Vdc 2A (DC versions). Contact output status can be selected as NO or NC separately for each contact by software.

Auxiliary Input:

- One channel configurable as 4-20 mA or pulse width modulation. To be used for connection of process flow meter for select control schemes.

Digital Inputs:

- Eight (8) digital inputs available, software assignable to the installed channel cards.

Serial Communication Interconnection:

- RS232/422/485 via MODBUS protocol.

External Connections:

- All wiring connections made by removable spring type terminals
- USB 2.0 connector for connection to USB type memory media
- Full modem RS232 terminals to allow connection to an external modem

Storage Temperature Limits:

- -20°C to 70°C (-4°F to 158°F)

Operating Temperature Limits:

- -10°C to 60°C (14°F to 140°F)

Maximum Relative Humidity:

- Up to 95%

Accuracy:

- Depends upon wet end

Housing Dimensions:

- 220 mm x 250 mm x 120 mm (8.6" x 10" x 4.8")



MicroChem KC4 Analyzer

The MicroChem KC4 Analyzer forms a simple and reliable system for bufferless measuring/controlling of free residual Chlorine, Chlorine Dioxide, Ozone and temperature.

- Two concentric electrodes perform analysis
- Corundum sand placed in measure cell provides constant cleaning action to electrodes
- Flow regulator maintains constant flow at the inlet with no external pressure reducing valves required
- Designed for multiple simultaneous measurements

The cell body can be mounted with the following options:

- ORP electrode
- pH electrode



MicroChem CL4 Analyzer

The MicroChem CL4 Analyzer forms a simple and reliable system for measuring/controlling free residual Chlorine WITHOUT the addition of reagent.

- 3-electrode amperometric design eliminates repeated zero adjustment
- Rugged design in durable PVC and stainless steel
- Lower pH dependence; does not require pH compensation
- No moving parts on probes means less maintenance
- Air bubble formation on the membrane surface is reduced using specifically designed measure cell for improved system reliability





MicroChem 870 Analyzer

The MicroChem 870 Analyzer forms a complete system for measuring/controlling residual Chlorine. The amperometric-based two electrode measure cell is designed to continuously analyze free or total chlorine over the range of 0-20 mg/L for waste water, drinking, cooling water and other process water applications.

The analyzer comes complete with a built-in pressure reducing valve to control sample inlet pressures up to 150 psi. Reagents are fed by a gravity feed system incorporating a seven (7) day supply of reagent. Extra-large gold and copper electrodes are used for maximum signal strength making this measure cell particularly well suited for sometimes difficult wastewater applications. Water sample temperatures are measured, displayed and allow for automatic compensation of the chlorine levels.

The 870 measure cell is constructed using corrosion resistant materials. The measure cell electrodes are self-cleaning. The continuous action of PVC spheres inside the cell by a motor driven striker insures electrodes are kept clean. Maintaining clean electrodes insures reliable readings from the analyzers. Each measure cell is supplied with sample and drain tubing as well as extra connectors to make installation easy at site. A convenient wire tray is provided on the panel to organize the wire connections to the MicroChem Instrument.



MicroChem CL1 Analyzer

The MicroChem CL1 Analyzer forms a complete system for measuring/controlling residual Chlorine. The amperometric-based three electrode measure cell is designed to continuously analyze free or total chlorine over the range of 0-20 mg/L for drinking, waste water, cooling water and other process water applications.

The measure cell is panel mounted and comes complete with a built-in pressure reducing valve to control sample inlet pressures up to 150 psi. A flow switch is included to alert the user in case of sample flow failure. A third electrode is utilized in the CL1 measure cell to further bias and stabilize the chlorine readings. Reagents are fed by a peristaltic pump assembly for up to a maximum 5 week supply of reagent(s). Water sample temperatures are measured, displayed and allow for automatic compensation of the chlorine levels.

The CL1 measure cell is constructed using corrosion resistant materials. The measure cell electrodes are self-cleaning. The continuous action of PVC spheres inside the cell by a motor driven striker insures electrodes are kept clean.

Maintaining clean electrodes insures reliable readings from the analyzers. Each measure cell is supplied with sample and drain tubing as well as extra connectors to make installation easy at site. Optionally, an additional 12 mm electrode can be inserted into the sample inlet area allowing for example the capability to measure pH as well. A convenient wire tray is provided on the panel to organize the wire connections to the MicroChem Instrument.





MicroChem® Probes pH, ORP and Conductivity

Additional parameters can be measured with the MicroChem Instrument. 12 mm probes are available for use in select measure cells or in a stand-alone 12 mm flow cell. Insertion probes are available for direct tank mounting or into a 3/4" NPT pipe fitting. Consult the probe parts lists and price pages for available cable lengths and mounting options.

12 mm Probes:

The 12 mm probes can be installed in the KC4, CL4, CL1 measure cells or in a stand-alone flow cell. Most pH probes include built in temperature sensor that compensates for changes in sample temperatures. The only exception are the probes used with the KC4 that utilize the temperature sensor included with this cell. ORP probes do not utilize temperature compensation and are not provided with built in temperature sensors.

Immersion Probes:

Immersion probes are mounted inside a robust Ryton housing. Immersion probes can be mounted directly to a 3/4" NPT pipe connection or submerged into a tank. The probes have flat surface electrodes that provide a self-cleaning action as the fluid sample passes over the element. pH and Conductivity probes include a built in temperature sensor to allow compensation of the measurement as the sample temperature changes. ORP probes do not utilize temperature compensation and are not provided with built in temperature sensors.



MicroChem Remote Mounted Measure Cells

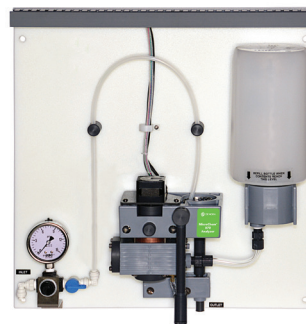
MicroChem Analyzers are modular, allowing additional measure cells to be added to the system. Up to three measurements are possible by installing additional channel cards to the instrument.



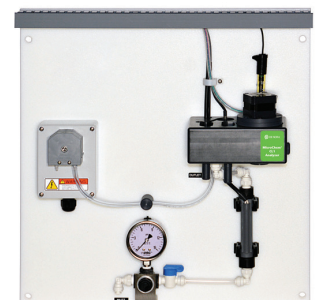
KC4 Cell



C4 Cell



870 Cell



C1 Cell

Specifications:

Series	KC4 Analyzer or Measure Cell	CL4 Analyzer Measure Cell & Probe	870 Analyzer or Measure Cell	CL1 Analyzer or Measure Cell	pH or ORP Probes
Measurement Type	Free Chlorine, Chlorine Dioxide and Ozone	Free Chlorine	Free/Total Chlorine	Free/Total Chlorine	pH or ORP
Electrodes	Two: Gold (working), Copper (counter)	Three: Gold (working), Stainless Steel (counter), Silver/Silver Chloride (reference)	Two: Gold (working), Copper (counter)	Three: Gold (working), Copper (counter), Silver/Silver Chloride (reference)	
Range	0 - 10 ppm	0.01 - 2.0 ppm 0.01 - 5.0 ppm 0.01 - 10.0 ppm	0 - 20 ppm	0 - 20 ppm	0 - 14pH units (0 - 12pH w/o Na = error) 1500 to 1500 mV ORP
Accuracy	Chlorine, Chlorine Dioxide or Ozone ± 5% of f.s.	± 5% of range	± 1% of range	± 1% of range	± 0.2 pH units. Accuracy decreases above 12 pH (sodium ion error occurs)
Applications	Drinking/clean water where reagent-free measurements are required & pH of the sample is <7.5	Drinking/clean water where bufferless measurement is desired at up to 9.0 pH	Waste/Drinking/Process water with elevated or unstable pH levels	Drinking/Waste/Process water where three electrode measurements are required	All conventional applications
Sample Inlet Pressure	0.5 - 4 bar (7.5 - 60 psi)	2 - 15 psi, sufficient to produce 0.5 L/min sample flow. Pressure up to 150 psi possible with optionally available pressure regulating valve	0.3 bar min to 10.4 bar (5 psi min up to 150 psi)	0.3 bar min to 10.4 bar (5 psi min up to 150 psi)	Immersion Probe: 0 - 4.8 bar (0 - 70 psi) 12mm Probe: 0 - 1 bar (0 - 14.7 psi)
Sample Temperature	Temperature compensation from 2°C to 50°C (36°F to 122°F)	0°C to 45°C (32°F to <113°F)	0°C to 50°C (32°F to 122°F)	0°C to 50°C (32°F to 122°F)	0°C to 70°C (32°F to 158°F)
Sample Flow	50 L/h (13.2 g/h)	30 L/h (8 g/h)	9 L/h (2.4 g/h)	9 L/h (2.4 g/h)	
Sample Inlet	3/8" O.D. Tube	1/4" O.D. Tube	1/4" O.D. Tube	1/4" O.D. Tube	1/4" O.D. Tube
Sample Drain	3/8" Tube	1/2" Tube	1/2" Tube	1/2" Tube	

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