Product Data Sheet
PDS 71-1056/rev.B
February 2007

Model 1056

DUAL-INPUT INTELLIGENT ANALYZER

- MULTI-PARAMETER INSTRUMENT – single or dual input. Choose from any combination of pH/ORP/ISE, Resistivity/Conductivity, % Concentration, Chlorine (Total, Free, Monochloramine, pH independent Free Chlorine), Oxygen, Ozone and Temperature.
- LARGE DISPLAY – large easy-to-read process measurements.
- EASY TO INSTALL – modular boards; removable connectors; easy to wire power, sensors, and outputs.
- INTUITIVE MENU SCREENS with advanced diagnostics and help screens.
- SIX LANGUAGES are included with every analyzer: English, French, German, Italian, Spanish, and Portuguese.

FEATURES AND APPLICATIONS

The Model 1056 dual-input analyzer offers single or dual sensor input with an unrestricted choice of dual measurements thus reducing the cost per loop and saving panel space. This multi-parameter instrument offers a wide range of measurement choices, including differential conductivity, dual oxygen and many other combinations supporting most industrial, commercial, and municipal applications. The modular design of the instrument allows signal input boards to be field replaced making configuration changes easy. Conveniently, live process values are always displayed during programming and calibration routines. Standard features include isolated inputs, 6 embedded local languages, two 4-20mA current outputs, removable connectors for power and current outputs, four solid plugs for closure of openings, and panel mount hardware.

QUICK START PROGRAMMING: Exclusive Quick Start screens appear the first time the Model 1056 is powered. The instrument auto-recognizes each measurement board and the display prompts the user to configure each sensor in a few quick steps for immediate deployment.

MENUS: Menu screens for calibrating and programming are simple and intuitive. Plain language prompts and help screens guide the user through these procedures

DUAL SENSOR INPUT AND OUTPUT: The Model 1056 accepts single or dual sensor input. Standard 0/4-20 mA current outputs can be programmed to correspond to any measurement or temperature.

ENCLOSURE: The instrument fits standard ½ DIN panel cutouts. The versatile enclosure design supports panel-mount, pipe-mount, and surface/wall-mount installations.

ISOLATED INPUTS: Inputs are isolated from other signal sources and earth ground. This ensures clean signal inputs for single and dual input configurations. For dual input configurations, isolation allows any combination of measurements and signal inputs without cross-talk or signal interference.

TEMPERATURE: Most measurements require temperature compensation. The Model 1056 will automatically recognize Pt100, Pt1000 or 22k NTC RTDs built into the sensor.

SECURITY ACCESS CODES: Two levels of security access are available. Program one access code for routine calibration and hold of current outputs; program another access code for all menus and functions.

DIAGNOSTICS: The analyzer continuously monitors itself and the sensor(s) for problematic conditions. The display flashes Fault and/or Warning when these conditions occur. Information about each condition is quickly accessible by pressing the diagnostic button on the keypad. Help screens are displayed for most fault and warning conditions to guide the user in troubleshooting.

DISPLAY: The high-contrast LCD provides live measurement readouts in large display digits and shows up to four additional process variables or diagnostic parameters concurrently. The display is back-lit and the format can be customized to meet user requirements.

CURRENT OUTPUTS: Two 4-20 mA or 0-20 mA current outputs are electrically isolated from other signal sources and earth ground. Outputs are fully scalable and can be programmed to linear or logarithmic modes. Output dampening can be enabled with time constants from 0 to 999 seconds.

SPECIAL MEASUREMENTS: The Model 1056 offers measuring capabilities for special applications.

- **Selective Ion:** The analyzer is able to measure ammonia and fluoride using commercially available ion-selective electrodes. All analyzers with installed pH boards can be programmed to measure other selective ions with its custom ISE function.
- **pH Independent Free Chlorine:** With Rosemount Analytical's Model 498Cl-01 sensor, the analyzer is able to measure free chlorine with automatic correction for process pH without the need for an additional pH sensor.
- **Inferential pH:** The analyzer is able to derive and display inferred pH (pHCalc) using two contacting conductivity signal boards and the appropriate contacting conductivity sensors. This method will calculate the pH of condensate and boiler water from conductivity and cation conductivity measurements. The calculation assumes that the alkalizing agent is either ammonia or sodium hydroxide and the contaminant is sodium chloride.
- **Differential Conductivity:** Dual input conductivity configurations can measure differential conductivity. The analyzer can be programmed to display dual conductivity as ratio, % rejection, or % passage.

SPECIFICATIONS - General

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

Dimensions: Overall 155 x 155 x 131mm (6.10 x 6.10 x 5.15 in.). Cutout: 1/2 DIN 139mm x 139mm (5.45 x 5.45 in.)

Conduit Openings: Accepts 1/2" or PG13.5 conduit fittings

Display: Monochromatic graphic liquid crystal display. 128 x 96 pixel display resolution. Backlit. Active display area: 58 x 78mm (2.3 x 3.0 in.).

Ambient Temperature and Humidity: 0 to 55°C, (32 to 131°F) RH 5 to 95% (non-condensing)

Storage Temperature Effect: -20 to 60ºC (-4 to 140°F)

Power: Ordering Code -01: 115/230 VAC ±15%, 50/60 Hz. 10W min. power input

RFI/EMI: EN-61326
LVD: EN-61010-1

Input: One or two isolated sensor inputs

Outputs: Two 4-20 mA or 0-20 mA isolated current outputs. Fully scalable. Max Load: 550 Ohm.

Current Output Accuracy: ±0.05 mA @25 ºC

Terminal Connections Rating: Power connector (3-leads): 24-12 AWG wire size. Signal board terminal blocks: 26-16 AWG wire size. Current output connectors (2-leads): 24-16 AWG wire size

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

SPECIFICATIONS – MEASUREMENT
pH/ORP/ISE (Codes -22 and -32)

For use with any standard pH or ORP sensor. Measurement choices are pH, ORP, Redox, ammonia, fluoride or custom ISE. The automatic buffer recognition feature uses stored buffer values and their temperature curves for the most common buffer standards available worldwide. The analyzer will recognize the value of the buffer being measured and perform a self stabilization check on the sensor before completing the calibration. Manual or automatic temperature compensation is menu selectable. Change in pH due to process temperature can be compensated using a programmable temperature coefficient. For more information concerning the use and operation of the pH or ORP sensors, refer to the product data sheets.

Model 1056 can also derive an inferred pH value called pHCalc (calculated pH). pHCalc can be derived and displayed when two contacting conductivity sensors are used. (Model 1056-01-20-30-AN)

PERFORMANCE SPECIFICATIONS - ANALYZER (pH INPUT)

Measurement Range [pH]: 0 to 14 pH

Accuracy: ±0.01 pH

Diagnostics: glass impedance, reference impedance

Temperature coefficient: ±0.002pH/ ºC

Solution temperature correction: pure water, dilute base and custom.

Buffer recognition: NIST, DIN 19266, JIS 8802, and BSI.

Input filter: time constant 1 - 999 sec, default 4 sec.

Response time: 5 seconds to 100%

Temperature Specifications:

Temperature range	0-150ºC
Temperature Accuracy, Pt-100, 0-50 ºC	± 0.5ºC
Temperature Accuracy, Temp. > 50 ºC	± 1ºC

PERFORMANCE SPECIFICATIONS - ANALYZER (ORP INPUT)

Measurement Range [ORP]: -1500 to +1500 mV

Accuracy: ± 1 mV

Temperature coefficient: ±0.12mV / ºC

Input filter: time constant 1 - 999 sec, default 4 sec.

Response time: 5 seconds to 100% of final reading

RECOMMENDED SENSORS FOR pH:

All standard pH sensors.

RECOMMENDED SENSORS FOR ORP:

All standard ORP sensors.

General purpose and high performance pH sensors
Models 396PVP, 399VP and 3300HT

CONTACTING CONDUCTIVITY (Codes -20 and -30)

Measures conductivity in the range 0 to 600,000 µS/cm (600mS/cm). Measurement choices are conductivity, resistivity, total dissolved solids, salinity, and % concentration. The % concentration selection includes the choice of five common solutions (0-12% NaOH, 0-15% HCl, 0-20% NaCl, and 0-25% or 96-99.7% H_2SO_4).

The conductivity concentration algorithms for these solutions are fully temperature compensated. Three temperature compensation options are available: manual slope (X%/°C), high purity water (dilute sodium chloride), and cation conductivity (dilute hydrochloric acid). Temperature compensation can be disabled, allowing the analyzer to display raw conductivity. For more information concerning the use and operation of the contacting conductivity sensors, refer to the product data sheets.

Note: When two contacting conductivity sensors are used, Model 1056 can derive an inferred pH value called pHCalc. pHCalc is calculated pH, not directly measured pH. (Model 1056-01-20-30-AN required)

Input filter: time constant 1 - 999 sec, default 2 sec.

Response time: 3 seconds to 100% of final reading

Salinity: uses Practical Salinity Scale

Total Dissolved Solids: Calculated by multiplying conductivity at 25ºC by 0.65

Temperature Specifications:

Temperature range	0-150ºC
Temperature Accuracy, Pt-1000, 0-50 ºC	± 0.1ºC
Temperature Accuracy, Pt-1000, Temp. > 50 ºC	± 0.5ºC

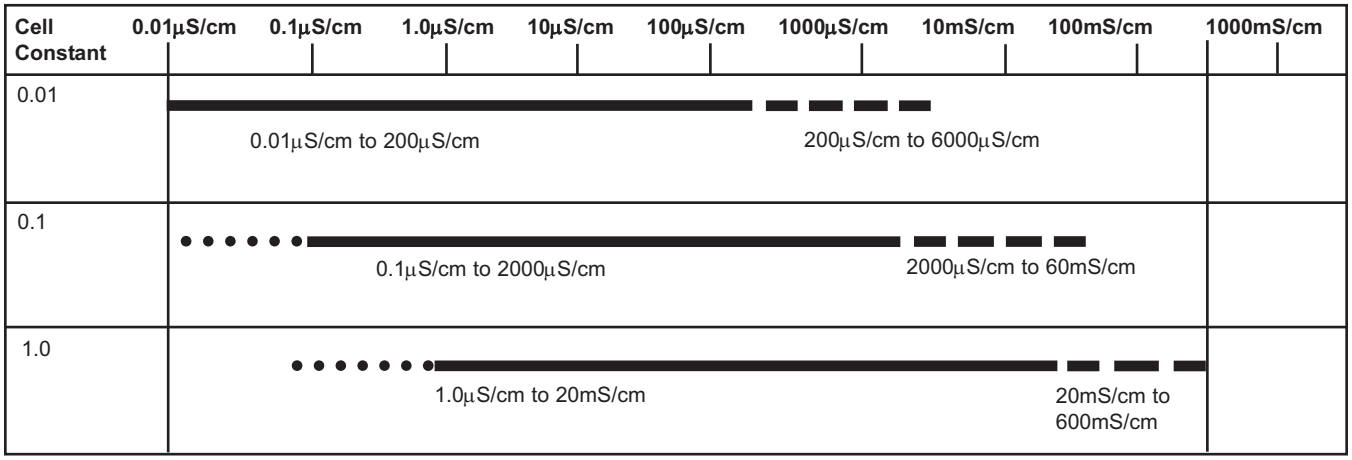
RECOMMENDED SENSORS FOR CONDUCTIVITY:

All Rosemount Analytical ENDURANCE Model 400 series conductivity sensors (Pt 1000 RTD).

ENDURANCE series of conductivity sensors

PERFORMANCE SPECIFICATIONS

Recommended Range – Contacting Conductivity



Cell Constant Linearity

- ±0.6% of reading in recommended range
- +2 to -10% of reading outside high recommended range
- ±5% of reading outside low recommended range

TOROIDAL CONDUCTIVITY (Codes -21 and -31)

Measures conductivity in the range of 1 (one) µS/cm to 2,000,000 µS/cm (2 S/cm), Measurement choices are conductivity, resistivity, total dissolved solids, salinity, and % concentration. The % concentration selection includes the choice of five common solutions (0-12% NaOH, 0-15% HCl, 0-20% NaCl, and 0-25% or 96-99.7% H_2SO_4). The conductivity concentration algorithms for these solutions are fully temperature compensated. For other solutions, a simple-to-use menu allows the customer to enter his own data. The analyzer accepts as many as five data points and fits either a linear (two points) or a quadratic function (three or more points) to the data. Two temperature compensation options are available: manual slope (X%/°C) and neutral salt (dilute sodium chloride). Temperature compensation can be disabled, allowing the analyzer to display raw conductivity. Reference temperature and linear temperature slope may also be adjusted for optimum results. For more information concerning the use and operation of the toroidal conductivity sensors, refer to the product data sheets.

Repeatability: ±0.25% ±5 µS/cm after zero cal

Input filter: time constant 1 - 999 sec, default 2 sec.

Response time: 3 seconds to 100% of final reading

Salinity: uses Practical Salinity Scale

Total Dissolved Solids: Calculated by multiplying conductivity at 25ºC by 0.65

Temperature Specifications:

Temperature range	-25 to 210ºC (-13 to 410ºF)
Temperature Accuracy, Pt-100, -25 to 50 ºC	± 0.5ºC
Temperature Accuracy, Pt-100,. 50 to 210ºC	± 1ºC

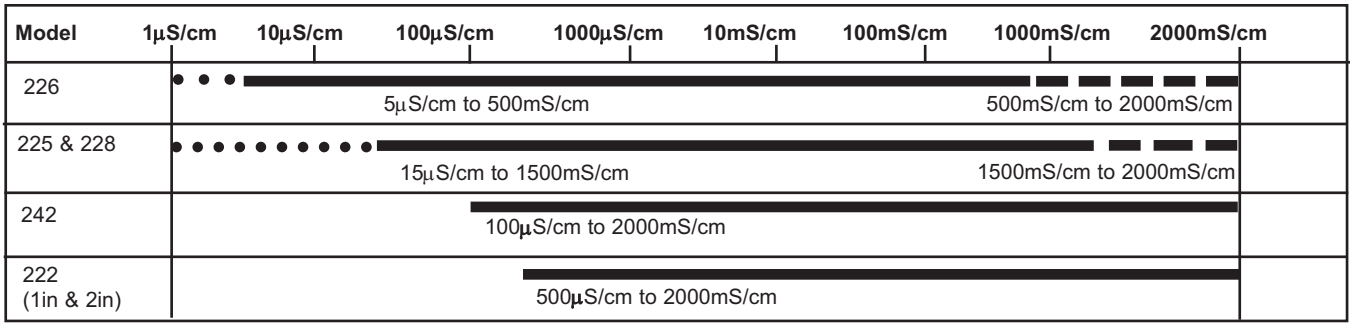
RECOMMENDED SENSORS:

All Rosemount Analytical submersion/immersion and flow-through toroidal sensors.

High performance toroidal conductivity sensors
Models 226 and 225

PERFORMANCE SPECIFICATIONS

Recommended Range - Toroidal Conductivity



LOOP PERFORMANCE (Following Calibration)

Model 226: ±1% of reading ±5µS/cm in recommended range
Models 225 &228: ±1% of reading ±10µS/cm in recommended range
Models 222,242: ±4% of reading in recommended range

Model 225, 226 & 228: ±5% of reading outside high recommended range

Model 226: ±5µS/cm outside low recommended range
Models 225 & 228: ±15µS/cm outside low recommended range

CHLORINE (Code -24 and -34)

Free and Total Chlorine

The Model 1056 is compatible with the Model 499ACL-01 free chlorine sensor and the Model 499ACL-02 total chlorine sensor. The Model 499ACL-02 sensor must be used with the Model TCL total chlorine sample conditioning system. The Model 1056 fully compensates free and total chlorine readings for changes in membrane permeability caused by temperature changes. For free chlorine measurements, both automatic and manual pH correction are available. For automatic pH correction select code -32 and an appropriate pH sensor. For more information concerning the use and operation of the amperometric chlorine sensors and the TCL measurement system, refer to the product data sheets.

PERFORMANCE SPECIFICATIONS

Resolution: 0.001 ppm or 0.01 ppm – selectable

Input Range: 0nA – 100µA

Automatic pH correction (requires Code -32): 6.0 to 10.0 pH

Temperature compensation: Automatic (via RTD) or manual (0-50°C).

Input filter: time constant 1 - 999 sec, default 5 sec.

Response time: 6 seconds to 100% of final reading

RECOMMENDED SENSORS*

Chlorine: Model 499ACL-01 Free Chlorine or Model 499ACL-02 Total Residual Chlorine

pH: The following pH sensors are recommended for automatic pH correction of free chlorine readings: Models: 399-09-62, 399-14, and 399VP-09

Monochloramine

The Model 1056 is compatible with the Model 499A CL-03 Monochloramine sensor. The Model 1056 fully compensates readings for changes in membrane permeability caused by temperature changes. Because monochloramine measurement is not affected by pH of the process, no pH sensor or correction is required. For more information concerning the use and operation of the amperometric chlorine sensors, refer to the product data sheets.

PERFORMANCE SPECIFICATIONS

Resolution: 0.001 ppm or 0.01 ppm – selectable

Input Range: 0nA – 100µA

Temperature compensation: Automatic (via RTD) or manual (0-50°C).

Input filter: time constant 1 - 999 sec, default 5 sec.

Response time: 6 seconds to 100% of final reading

RECOMMENDED SENSORS

Rosemount Analytical Model 499ACL-03 Monochloramine sensor

pH-Independent Free Chlorine

The Model 1056 is compatible with the Model 498CL-01 pH-independent free chlorine sensor. The Model 498CL-01 sensor is intended for the continuous determination of free chlorine (hypochlorous acid plus hypochlorite ion) in water. The primary application is measuring chlorine in drinking water. The sensor requires no acid pre-treatment, nor is an auxiliary pH sensor required for pH correction. The Model 1056 fully compensates free chlorine readings for changes in membrane permeability caused by temperature. For more information concerning the use and operation of the amperometric chlorine sensors, refer to the product data sheets.

PERFORMANCE SPECIFICATIONS

Resolution: 0.001 ppm or 0.01 ppm – selectable

Input Range: 0nA – 100µA

Automatic pH correction: 6.5 to 10.0 pH

Temperature compensation: Automatic (via RTD) or manual (0-50°C).

Input filter: time constant 1 - 999 sec, default 5 sec.

Response time: 6 seconds to 100% of final reading

RECOMMENDED SENSORS

Rosemount Analytical Model 498CL-01 pH independent free chlorine sensor

Chlorine sensors with Variopol connection and cable connection
Model 498CL-01

DISSOLVED OXYGEN (Codes -25 and -35)

The Model 1056 is compatible with the Model 499ADO, 499ATrDO, Hx438, and Gx438 dissolved oxygen sensors and the Model 4000 percent oxygen gas sensor. The Model 1056 displays dissolved oxygen in ppm, mg/L, ppb, µg/L, % saturation, % O_2 in gas, ppm O_2 in gas. The analyzer fully compensates oxygen readings for changes in membrane permeability caused by temperature changes. An atmospheric pressure sensor is included on all dissolved oxygen signal boards to allow automatic atmospheric pressure determination at the time of calibration. If removing the sensor from the process liquid is impractical, the analyzer can be calibrated against a standard instrument. Calibration can be corrected for process salinity. For more information on the use of amperometric oxygen sensors, refer to the product data sheets.

PERFORMANCE SPECIFICATIONS

Resolution: 0.01 ppm; 0.1 ppb for 499A TrDO sensor (when O_2 <1.00 ppm); 0.1%

Input Range: 0nA – 100µA

Temperature Compensation: Automatic (via RTD) or manual (0-50°C).

Input filter: time constant 1 - 999 sec, default 5 sec.

Response time: 6 seconds to 100% of final reading

RECOMMENDED SENSORS

Rosemount Analytical amperometric membrane and steam-sterilizable sensors listed above

Dissolved Oxygen sensor with Variopol connection
Model 499ADO

DISSOLVED OZONE (Code -26 and -36)

The Model 1056 is compatible with the Model 499AOZ sensor. The Model 1056 fully compensates ozone readings for changes in membrane permeability caused by temperature changes. For more information concerning the use and operation of the amperometric ozone sensors, refer to the product data sheets.

PERFORMANCE SPECIFICATIONS

Resolution: 0.001 ppm or 0.01 ppm – selectable

Input Range: 0nA – 100µA

Temperature Compensation: Automatic (via RTD) or manual (0-35°C)

Input filter: time constant 1 - 999 sec, default 5 sec.

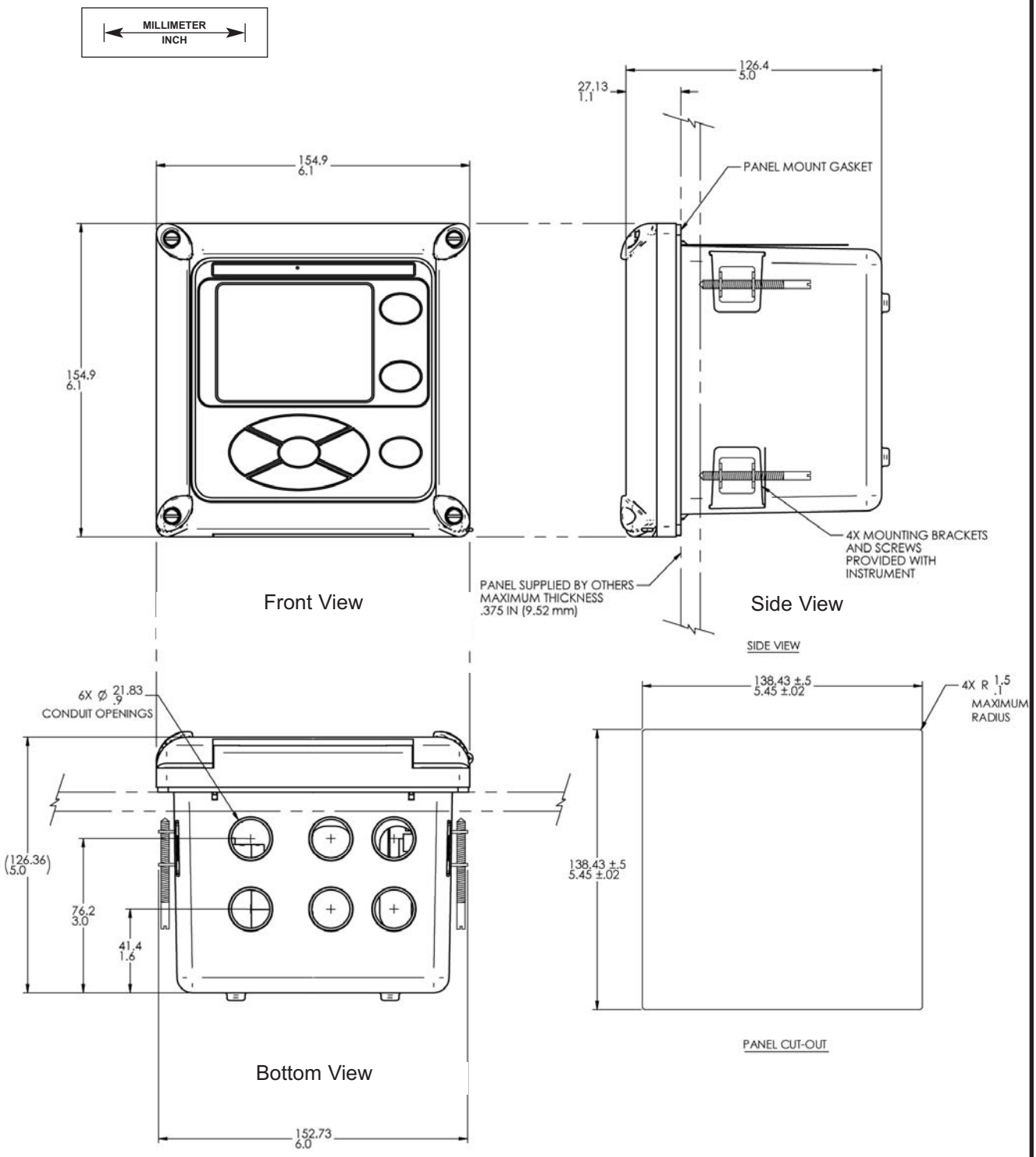
Response time: 6 seconds to 100% of final reading

RECOMMENDED SENSOR

Rosemount Analytical Model 499A OZ ozone sensor

Dissolved Ozone sensors with Polysulfone body
Variopol connection and cable connection
Model 499AOZ

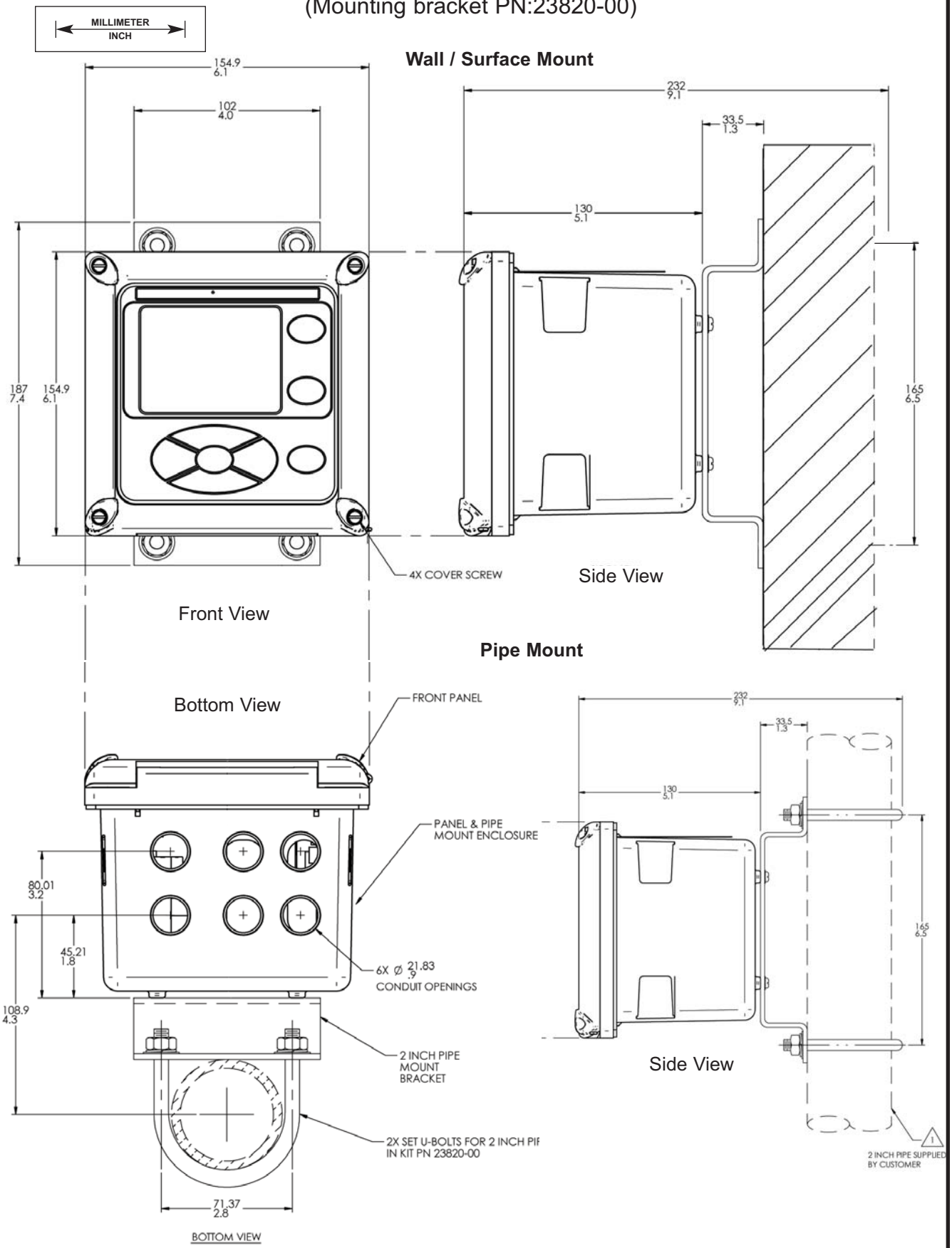
PANEL MOUNT DIMENSIONS



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

PIPE/ WALL MOUNT DIMENSIONS

(Mounting bracket PN:23820-00)



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

ORDERING INFORMATION

The Model 1056 dual-input analyzer offers single or dual sensor input with an unrestricted choice of dual measurements thus reducing the cost per loop and saving panel space. This multi-parameter instrument offers a wide range of measurement choices supporting most industrial, commercial, and municipal applications. Standard features include two isolated inputs, 6 embedded languages, two 4-20mA current outputs, removable connectors for AC power and current outputs, 4 solid plugs for closure of openings, and panel mount hardware.

MODEL 1056 DUAL-INPUT INTELLIGENT ANALYZER	
CODE	**POWER**
01	115/230 Vac, 50/60 Hz

CODE	MEASUREMENT 1
20	Contacting Conductivity
21	Toroidal Conductivity
22	pH, ORP, Redox, ISE
24	Chlorine (Free, Total, Monochloramine)
25	Dissolved Oxygen
26	Ozone

CODE	MEASUREMENT 2
30	Contacting Conductivity
31	Toroidal Conductivity
32	pH, ORP, Redox, ISE
34	Chlorine (Free, Total, Monochloramine)
35	Dissolved Oxygen
36	Ozone
38	None

CODE	COMMUNICATIONS
AN	Analog: 0-20mA or 4-20mA - 2 current outputs

ACCESSORIES	
PART #	**DESCRIPTION**
23554-00	Cable Gland Kit - Qty 5 per pack
23820-00	2" Pipe Mounting Bracket includes U-bolts, mounting bracket, nuts, washers, and screws (complete). Also accommodates wall / surface mounting.
240048-00	S.S. Tag (specify marking)

Engineering Specifications - Model 1056 Dual Input Intelligent Analyzer

December 2006

Scope of Work

The instrument shall be a micro-processor based, line-powered analyzer for measuring pH, ORP, Conductivity, Chlorine, Dissolved and Gaseous Oxygen, Dissolved Ozone, or Temperature. The device shall include two isolated inputs, six embedded local languages, two 4-20mA current outputs, removable connectors for power and current outputs, four solid plugs for closure of openings, and panel mount hardware. Accessories and services shall be available from the manufacturer of the device to support this instrument and its installation.

The analyzer shall be manufactured by Rosemount Analytical Inc., 2400 Barranca Parkway, Irvine, CA 92606-5018 USA (800) 854-8257 www. http://www.raihome.com, or as approved equal.

General and Power

The analyzer shall be microprocessor based and accept all Rosemount Analytical sensors. Power requirement shall be 115 or 230 VAC, 50/60 Hz.

Measurement	Range	Performance
pH	0-14pH	±0.01pH
ORP	-1500 to 1500mV	±1 mV
Contact conductivity	0.01µS/cm–600mS/cm	±0.6%
Toroidal conductivity	1µS -2000mS/cm	±1%
Free Chlorine	0-20 ppm	±1%
Total Chlorine	0-20 ppm	±1%
Monochloramine	0-20 ppm	±1%
Dissolved oxygen	0-20 ppm	±1%
Dissolved ozone	0-10 ppm	±1%

Measurement Inputs

The analyzer shall be offered in single and dual input configurations, and shall allow an unrestricted choice of dual measurement combinations. Measurement inputs 1 or 2 can be pH, ORP, ISE, Resistivity, Conductivity, Resistivity, % Concentration, Chlorine, Oxygen, Ozone, or Temperature. Reconfiguration of the unit shall be possible by exchanging modular signal boards for any indicated measurement listed above on either or both input measurements.

Special measurements

The analyzer shall measure ammonia and fluoride using commercially available ion-selective electrodes. When the proper chlorine sensor is used, the analyzer shall be capable of measuring free chlorine with automatic correction for pH without the need for an additional pH sensor. The analyzer shall able to derive and display pH using two contacting conductivity measurement boards and the appropriate contacting conductivity sensors. With a dual input conductivity configuration, the analyzer shall be capable of measuring differential conductivity and displaying the measurement value as ratio, % rejection, or % passage.

Enclosure and Installation

The analyzer enclosure shall be constructed of polycarbonate material and designed to meet NEMA 4X/CSA 4 (IP65) requirements. The instrument fits standard ½ DIN panel cutouts. One enclosure design shall support panel-mount, pipe-mount, and surface/wall-mount installations. The enclosure material shall be highly resistant to discoloration effects from exposure to direct sunlight.

Wiring

The instrument shall ship with removable connectors for power and current outputs. Individual wiring lead designations for each input board shall be labeled to facilitate easy wiring. Further, each signal board shall slide out fully or partially to aid in ease of wring.

Start-up

Quick Start screens shall appear the first time the instrument is powered up, The instrument shall automatically recognize each measurement board upon power-up.

Outputs

The analyzer shall include two 4-20 mA or 0-20 mA isolated outputs, continuously adjusted, with output dampening and linear or logarithmic output. The outputs shall be independently programmed to correspond to the selected measurement(s) or temperature.

Display and Languages

The analyzer shall have a 58 x 78mm display with 128X96 pixel resolution and backlight. The LCD shall display large process variables (14mm [1/2”] character height) for both sensor inputs and allow the user to program the main display with user-selectable diagnostic parameters. All operation and descriptive messages shall be field selected for English, French, German, Italian, Spanish, or Portuguese. The main display format shall be customizable to meet measurement display requirements.

Automatic Buffer Recognition

For pH measurement, the analyzer shall include an automatic buffer recognition feature, using stored buffer values and their temperature curves for the most common buffer standards available worldwide. The analyzer shall automatically recognize the value of the buffer being measured and perform a self stabilization check on the sensor before completing the calibration.

Temperature

Manual or automatic temperature compensation shall be menu selectable. Changes in the measurement due to process temperatures shall be compensated using a programmable temperature coefficient. For pH, temperature compensations available shall be standard, high purity, dilute base, and custom. The analyzer shall automatically recognize either a Pt100 RTD or a Pt1000 RTD, normally built into the sensor. The display of temperature shall be in °C or °F.

Security and Hold

The analyzer shall have two levels of password protection to prevent accidental or unwanted changes to the program settings, displays, and calibration. One access code is for routine calibration and hold of current outputs; the other access code is for accessing all menus and functions. During hold, the outputs and alarms shall remain at the last value.

Diagnostics

The instrument shall have a dedicated DIAGNOSTIC button and the analyzer shall continuously monitor itself and the sensor for faults, and display fault and/or warning messages. Faults and warnings shall be quickly accessible via the dedicated Diagnostic button and help screens shall be displayed to assist in troubleshooting.

Calibration

Depending on the selected measurement, the analyzer shall have several calibration methods.

a) pH: Automatic buffer, Standardization, and Slope calibration methods
b) Amperometric: Air cal, Zero cal, In process cal, and Sensitivity/slope entry
c) Conductivity: Zero cal, In process cal, Meter cal, and entry of cell constant.

The analyzer shall be a Rosemount Analytical Model 1056 dual-input analyzer, Model number 1056-XX-XX-XX

The right people,
the right answers,
right now.

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