

# THREE-INPUT INTELLIGENT ANALYZER

- MULTI-PARAMETER INSTRUMENT – up to three inputs. Choose pH/ORP/ISE or Contacting Conductivity/Resistivity, in any combination.
- LARGE DISPLAY – 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.
- SMART-Enabled - compatible with SMART pH sensors
- EIGHT MENU LANGUAGES.
- FOUR ANALOG OUTPUTS.
- UL and CSA APPROVED.



## FEATURES AND APPLICATIONS

The Model 1057 analyzer offers three sensor inputs and four current outputs thus reducing the cost per loop and saving panel space. The pH signal input board supports pH, ORP, and Ion-Selective Electrode measurements. The Conductivity signal input board supports contacting conductivity, resistivity, Total Dissolved Solids, salinity and percent concentration curves for special applications. The modular design 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, 8 embedded local languages, four 4-20mA current outputs, 4 alarm relays and removable connectors for power and current outputs.

**QUICK START PROGRAMMING:** Exclusive Quick Start screens appear the first time the Model 1057 is powered. The instrument auto-recognizes each measurement board and prompts the user to configure each sensor loop in a few quick steps for immediate deployment.

**4-ELECTRODE CONDUCTIVITY:** For applications requiring wide range conductivity measurements, use Rosemount Analytical's Model 410VP **PUR-SENSE**™ 4-electrode sensor. It is not affected by fouling and is supported by the same contacting conductivity signal board as traditional 2-electrode sensors.

**THREE SENSOR INPUTS:** The Model 1057 accepts one, two or three inputs. Inputs are isolated from other signal sources and earth ground.

**FOUR CURRENT OUTPUTS:** Four 4-20 mA or 0-20 mA current outputs are electrically isolated. 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.

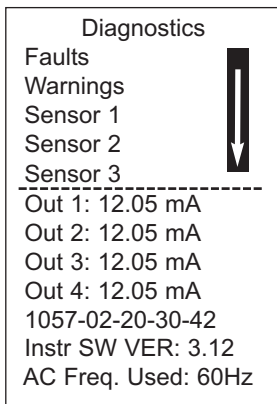
**SMART pH SENSORS:** Avoid buffer calibrations in the field. Use Rosemount Analytical SMART pH sensors to automatically calibrate the measurement loop when connected to Model 1057. Choose from a complete range of SMART pH sensors suited to most applications.

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

**ENCLOSURE:** The instrument fits standard 1/2 DIN panel cutouts. The versatile enclosure design supports panel-mount, pipe-mount, and surface/wall-mount installations.

**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 DIAG on the keypad. User help screens are displayed for most fault and warning conditions to assist in troubleshooting.

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

**LOCAL LANGUAGES :** Rosemount Analytical extends its worldwide reach by offering eight local languages – English, French, German, Italian, Spanish, Portuguese, Chinese and Russian. Every unit includes user programming menus; calibration routines; faults and warnings; and user help screens in all eight languages. The displayed language can be easily set and changed using the menus.

**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.) Minimum depth for panel mount installations 101.6 mm (4.0 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 60°C (-4 to 140°F)

**Power:** Code -02: 20 to 30 VDC. 15 W.  
Code -03: 84 to 265 VAC, 47.5 to 65.0 Hz, switching. 15 W.

Equipment protected by double insulation

**Approvals:**

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

**Hazardous Location Approvals:**

Ordering options for CSA: all except UL  
 -LR 34186 Class I, Division 2, Groups A, B, C, & D  
C US Class II, Division 2, Groups E, F, & G  
Class III T4A Tamb= 50°C

Evaluated to the ANSI/UL Standards. The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S. respectively.

**Ordinary Locations: (only with -UL ordering option)**



**POLLUTION DEGREE 2:** Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected. Altitude: for use up to 2000 meters (6562 ft.)

**Alarms relays:** Four alarm relays for process: Four alarm relays for process measurement(s) or temperature. Any relay can be configured as a fault alarm instead of a process alarm. Each relay can be configured independently and each can be programmed with interval timer settings.



Maximum Relay Current	
	Resistive
28 VDC	5.0 A
115 VAC	5.0 A
230 VAC	5.0 A

**Relays:** Form C, SPDT, epoxy sealed

**CAUTION**

**RISK OF ELECTRICAL SHOCK**

- Inductive load:** 1/8 HP motor (max.), 40 VAC
- Inputs:** Up to three sensor inputs-electrically isolated
- Outputs:** Four 4-20 mA or 0-20 mA isolated current outputs. Fully scalable. Max Load: 550 Ohms.
- Current Output Accuracy:** ±0.05 mA @25 °C
- Terminal Connections Rating:** Power connector (3-leads): 24-12 AWG wire size. Signal board terminal blocks: 26-16 AWG wire size. Current output connectors (4-leads): 24-16 AWG wire size. Alarm relay terminal blocks: 24-12 AWG wire size
- Weight/Shipping Weight:** (rounded up to nearest lb or nearest 0.5 kg): 3 lbs/4 lbs (1.5 kg/2.0 kg)

# CONTACTING CONDUCTIVITY (Codes -20, -30 and -40)

Measures conductivity in the range 0 to 600,000  $\mu\text{S}/\text{cm}$  (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%  $\text{H}_2\text{SO}_4$ ).

The conductivity concentration algorithms for these solutions are fully temperature compensated. Three temperature compensation options are available: manual slope ( $\text{X}/^\circ\text{C}$ ), 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 contacting conductivity sensors are used for sensor 1 and sensor 2, Model 1057 can derive an inferred pH value called pHCalc. pHCalc is calculated pH, not directly measured pH.

Note: Selected 4-electrode, high-range contacting conductivity sensors are compatible with Model 1056.

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

**Response time:** 3 seconds to 100% of final reading

**Salinity:** uses Practical Salinity Scale

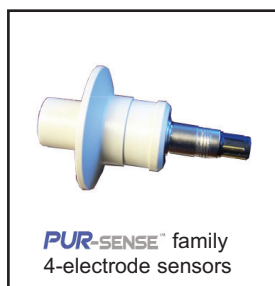
**Total Dissolved Solids:** Calculated by multiplying conductivity at 25°C by 0.65

## Temperature Specifications:

Temperature range	0-200°C
Temperature Accuracy, Pt-1000, 0-50 °C	$\pm 0.1^\circ\text{C}$
Temperature Accuracy, Pt-1000, Temp. > 50 °C	$\pm 0.5^\circ\text{C}$

## RECOMMENDED SENSORS FOR CONDUCTIVITY:

All Rosemount Analytical ENDURANCE Model 400 series conductivity sensors (Pt 1000 RTD) and **PUR-SENSE™** Model 410 sensor.



## PERFORMANCE SPECIFICATIONS

### Recommended Range – Contacting Conductivity

Cell Constant	0.01 $\mu\text{S}/\text{cm}$	0.1 $\mu\text{S}/\text{cm}$	1.0 $\mu\text{S}/\text{cm}$	10 $\mu\text{S}/\text{cm}$	100 $\mu\text{S}/\text{cm}$	1000 $\mu\text{S}/\text{cm}$	10mS/cm	100mS/cm	1000mS/cm
0.01	0.01 $\mu\text{S}/\text{cm}$ to 200 $\mu\text{S}/\text{cm}$					200 $\mu\text{S}/\text{cm}$ to 6000 $\mu\text{S}/\text{cm}$			
0.1	0.1 $\mu\text{S}/\text{cm}$ to 2000 $\mu\text{S}/\text{cm}$					2000 $\mu\text{S}/\text{cm}$ to 60mS/cm			
1.0	1 $\mu\text{S}/\text{cm}$ to 20mS/cm					20mS/cm to 600mS/cm			
4-electrode						2 $\mu\text{S}/\text{cm}$ to 300mS/cm			

### Cell Constant Linearity

	$\pm 0.6\%$ of reading in recommended range
	+2 to -10% of reading outside high recommended range
	$\pm 5\%$ of reading outside low recommended range
	$\pm 4\%$ of reading in recommended range

## pH/ORP/ISE (Codes -22, -32 and -42)

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 1057 can also derive an inferred pH value called pHCalc (calculated pH). pHCalc can be derived and displayed when two contacting conductivity sensors are used as sensor 1 and sensor 2.

### 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/ °C

**Solution temperature correction:** Pure water, dilute base and custom.

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

**Input filter:** Time constant 1 - 999 seconds, default 4 seconds.

**Response time:** 5 seconds to 100%

**Sensor Compatibility:** Model 1057 is also compatible with SMART pH sensors from Rosemount Analytical. Choose from 14 SMART sensor models for a wide array of applications and process conditions.

#### Temperature Specifications:

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

### PERFORMANCE SPECIFICATIONS - ANALYZER (ORP INPUT)

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

**Accuracy:** ± 1 mV

**Temperature coefficient:** ±0.12mV / °C

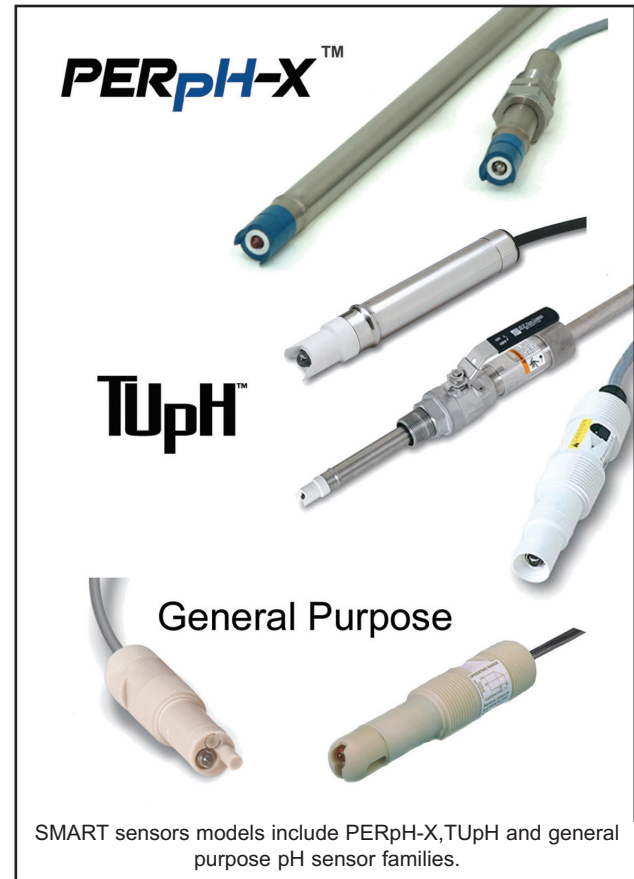
**Input filter:** Time constant 1 - 999 seconds, default 4 seconds.

**Response time:** 5 seconds to 100% of final reading

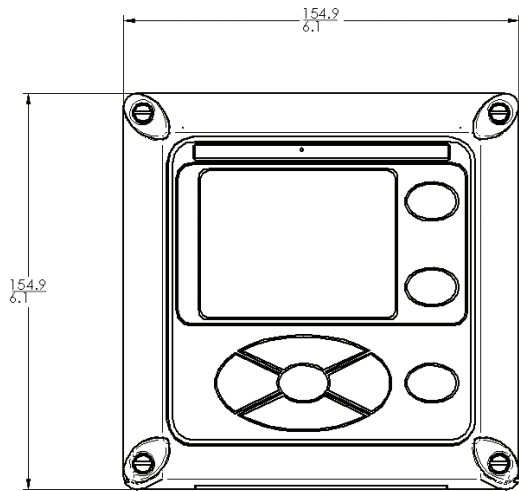
### RECOMMENDED SENSORS FOR ORP:

All standard ORP sensors.

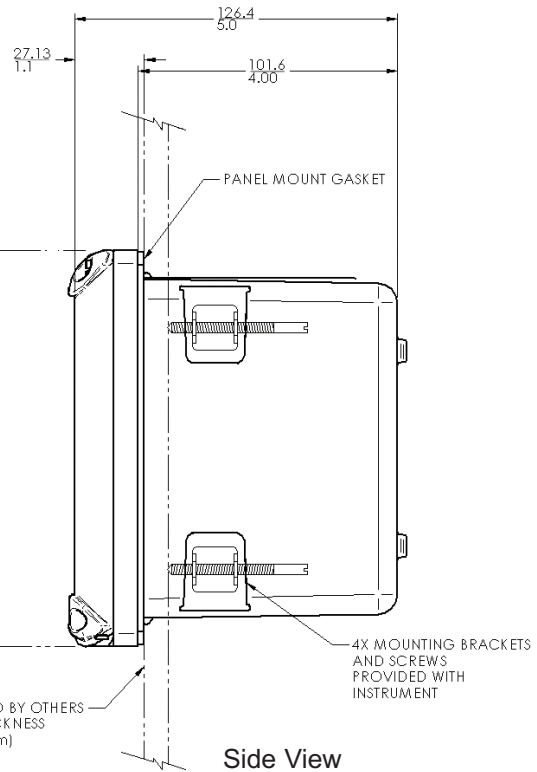
Rosemount Analytical pH Sensors



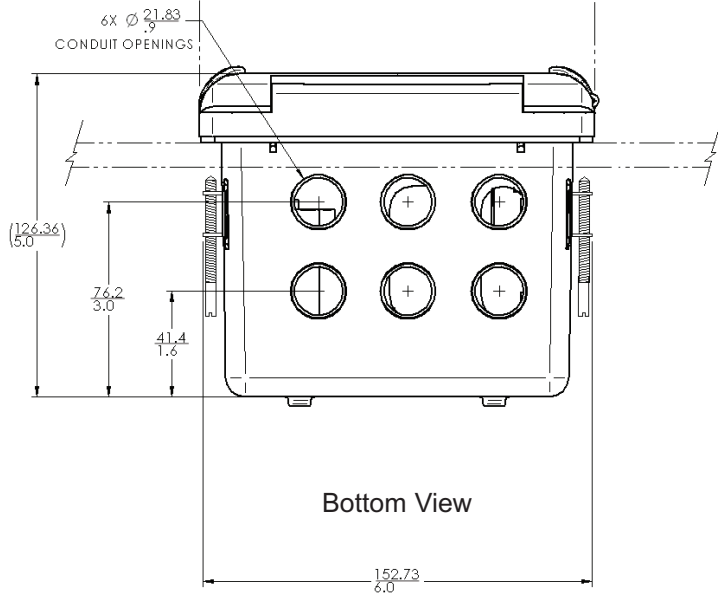
# PANEL MOUNT DIMENSIONS



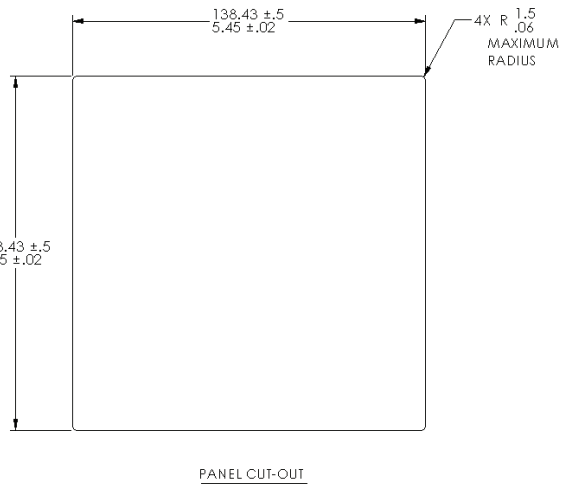
Front View



Side View



Bottom View



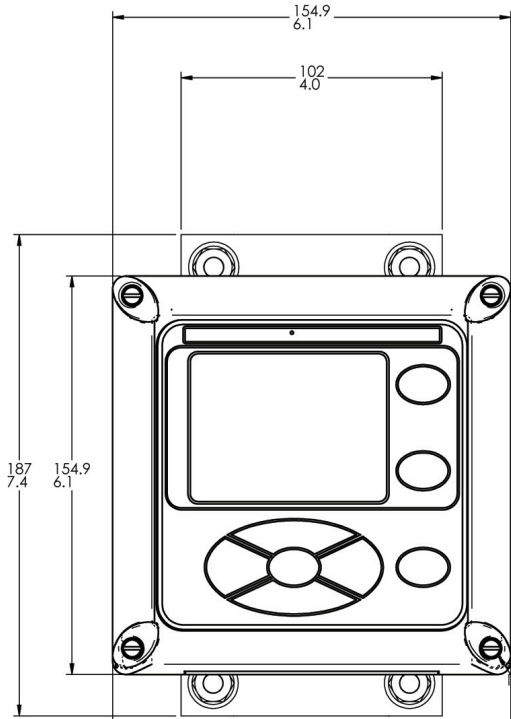
The front panel is hinged at the bottom. The panel swings down for easy access to the wiring locations. Panel mounting seal integrity (4/4X) for outdoor applications is the responsibility of the end user.

# PIPE/ WALL MOUNT DIMENSIONS

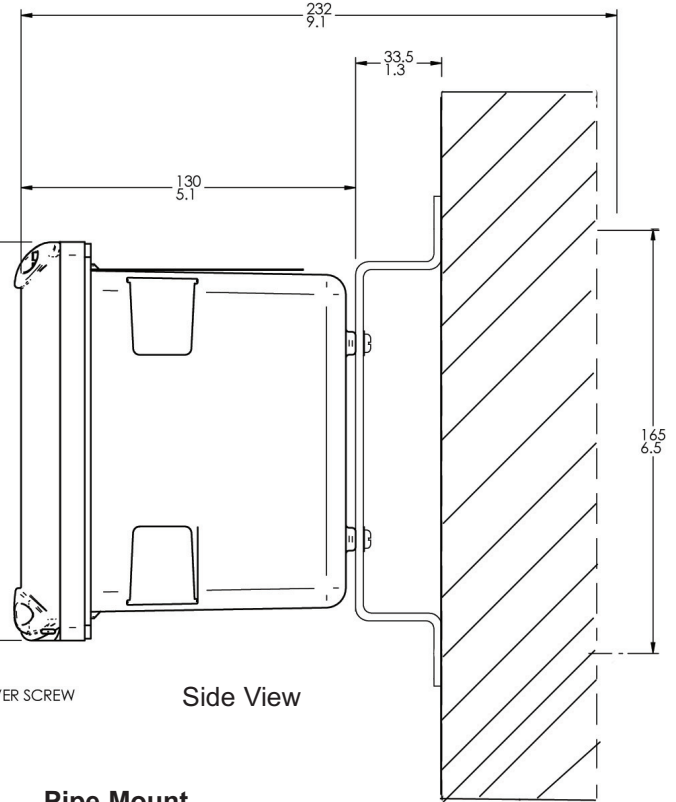
(Mounting bracket PN:23820-00)



## Wall / Surface Mount



Front View

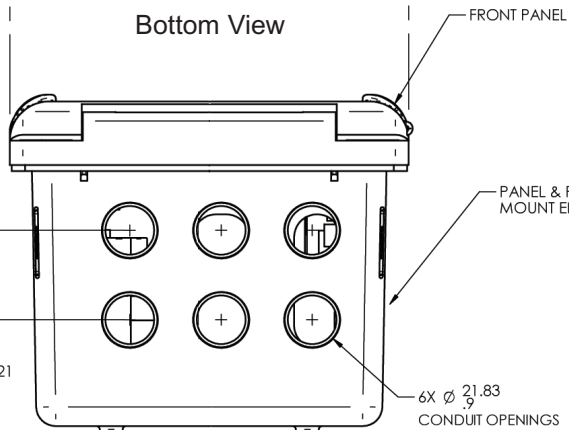


Side View

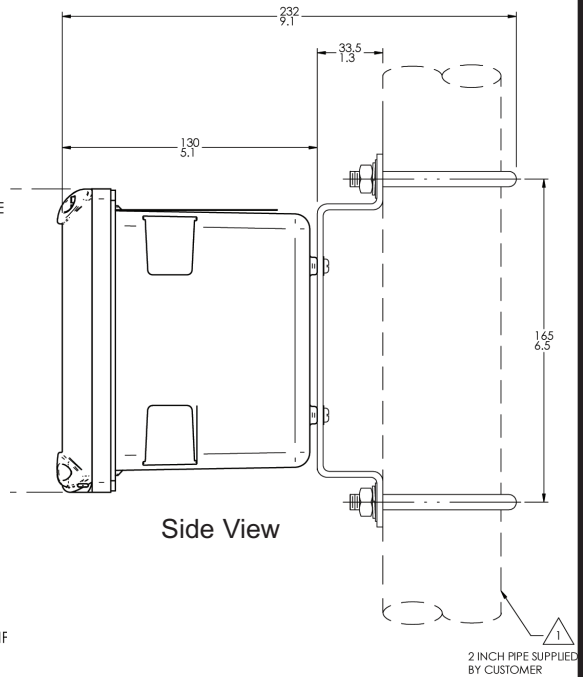
4X COVER SCREW

## Pipe Mount

Bottom View



BOTTOM VIEW



Side View

PANEL & PIPE MOUNT ENCLOSURE

6X Ø 21.83 CONDUIT OPENINGS

2 INCH PIPE MOUNT BRACKET

2X SET U-BOLTS FOR 2 INCH PIF IN KIT PN 23820-00

2 INCH PIPE SUPPLIED BY CUSTOMER

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

**Scope of Work**

The instrument shall be a line-powered analyzer for measuring pH, ORP, Contacting Conductivity, and Temperature. The device shall include three isolated inputs, four 4-20mA current outputs, eight local languages, 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**

The analyzer shall be microprocessor-based and accept all Rosemount Analytical pH, ORP, and contacting conductivity sensors. The analyzer shall be approved by UL for use in ordinary locations and shall be approved by CSA for use in Class I Division 2 hazardous areas.

**Power and Alarms:**

20-30VDC and auto-switching 84-265VAC power supplies shall be available. These power supplies shall each include four high load 5 amp. alarm relays which can be configured independently and which include interval timer functionality. Failsafe operation shall be supported to allow programmable default states for all relays.

**Measurement Inputs**

The analyzer shall be offered in single, dual and three input configurations. Measurement inputs 1, 2 or 3 can be pH, ORP, ISE, Resistivity, Conductivity, Resistivity, % Concentration. Reconfiguration shall be possible by exchanging modular signal boards for any indicated measurement listed above. Separate signal input measurement boards shall be available to allow field reconfiguration of any Model 1057 unit.

Measurement	Range	Performance
pH	0-14pH	±0.01pH
ORP	-1500 to 1500mV	±1 mV
Contact conductivity	0.01µS/cm–600mS/cm	±0.6%

**Special measurements**

The analyzer shall measure ammonia and fluoride using commercially available ion-selective electrodes. The analyzer shall be able to derive and display pH using two contacting conductivity 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 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.

**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 wiring.

**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 four 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 128 X 96 pixel resolution and backlight. The LCD shall display large process variables (14mm [1/2"] character height) for all sensor inputs and allow the user to program the main display with user-selectable diagnostic parameters. Eight local languages shall be field selectable including English, French, German, Italian, Spanish, Portuguese, Chinese or Russian. The main display format shall be customizable to meet measurement or diagnostic 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 shall be standard. Temperature compensation is also available for high purity, dilute base, and custom applications. 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 access to prevent accidental or unwanted changes to the program settings, displays, and calibration. One access code is for calibration and hold of current outputs; the other access code is for 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.

- pH: Automatic buffer, Standardization, and Slope calibration methods
- Conductivity: Zero cal, In process cal, Meter cal, and entry of cell constant.

The analyzer shall be a Rosemount Analytical Model 1057 dual-input analyzer, Model number 1057-XX-XX-XX-XX

Engineering Specifications - Model 1057 Three Input Intelligent Analyzer

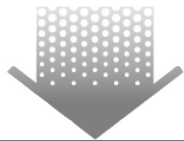
January 2010

## ORDERING INFORMATION

The Model 1057 multi-parameter analyzer supports up to three sensor inputs of pH/ORP and contacting conductivity measurements in any combination thus reducing the cost per loop and saving panel space. All configurations of the analyzer include four 4-20mA current outputs and four fully programmable alarm relays with interval timers. The instrument supports most industrial, commercial, and municipal applications and is ideal for OEMs, systems integrators and customers requiring multiple inputs and outputs. All Model 1057 units also include electrically isolated inputs, Eight (8) local languages, removable connectors for easy wiring, 4 solid plugs for closure of openings, and panel mount hardware. All configurations of Model 1057 can be ordered to meet UL approval requirements. Model 1057 is Class I, Div 2 approved for hazardous area installation by CSA.

Model 1057 Three-Input Intelligent Analyzer	
CODE	Power
02	24 VDC with four alarm relays
03	84-265 VAC switching, 50/60 Hz with four alarm relays
CODE	MEASUREMENT 1
20	Contacting Conductivity
22	pH/ORP/ISE
CODE	MEASUREMENT 2
30	Contacting Conductivity
32	pH/ORP/ISE
38	None (not available if -40 or -42 are selected)
CODE	MEASUREMENT 3
40	Contacting Conductivity
42	pH/ORP/ISE
48	None
CODE	UL OPTION
—	No Selection (non-UL units are CSA approved)
UL	UL Approval

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.
23820-01	2" Pipe Mounting Bracket, Stainless Steel
9240048-00	S.S. Tag (specify marking)



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the right answers,  
right now.*

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1-800-854-8257



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<http://www.raihome.com>

*Specifications subject to change without notice.*



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### Emerson Process Management

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