Data Sheet PR53/402
Supersedes PR53/301

# Model P53 pH and ORP Analyzer


**Universal-mount 1/2 DIN Style**

Certification for Class I, Div. 2
Hazardous Area Locations

Certified Compliant to
European Community Standards

■ **Large Backlit LCD Readout.**
The large display shows measured pH (or ORP) in 1/2-inch (13 mm) high numerals. The P53 can also display the process temperature, and both analog outputs. Display screen annunciators indicate relay "on/off" status.

■ **Universal-mount 1/2 DIN Case.**
The P53 is housed in a 1/2 DIN, epoxy-coated, metal NEMA 4X case. Its hinged front panel provides easy wiring access. The supplied bracket and stainless steel hardware enable panel, surface, and pipe mounting.

■ **Electromagnetic Conformance.**
The analyzer exceeds U.S. and meets European standards for EMI and RFI.

■ **Simple Interactive Diagnostics.**
Built-in diagnostics continuously tests analyzer and sensor operation.

■ **Multiple Language Capability.**
All screens can be selected for display in English, French, German or Spanish. (Other available languages can be substituted.)

■ **"Menu-guided" Operation.**
The large display, simple keypad, and logical menu structure make the P53 easy to use. Menu screens, containing up to six text lines, guide you through setup, calibration, operation, and test/maintenance functions.

■ **Passcode-protected Access.**
For security, use the P53's passcode capability to restrict access to configuration settings and calibration to authorized personnel only.

■ **GLI Differential Sensor or Conventional Combination Electrode Compatibility.**
The Model P53 can be used with any GLI Differential Technique pH or ORP sensor, or any conventional combination electrode. The P53 accepts Pt 1000 RTD, Pt 100 RTD, or NTC 300 ohm thermistor temperature compensators.

■ **Two 0/4-20 mA Analog Outputs.**
Each of the two isolated analog outputs can be set to 0-20 mA or 4-20 mA, and assigned to represent the measured pH (or ORP) or temperature. During calibration, both outputs can be held at their present values, transferred to preset values, or remain active to respond to the measured value.

# Specifications

**Operational:**

Display ..... Graphic dot matrix LCD, 128 x 64 pixels with LED backlighting; 1/2 inch (13 mm) main character height; 1/8 inch (3 mm) auxiliary information character height; menu screens contain up to six text lines

| Measurement | Selectable Ranges |
|---|---|
| pH | -2.0 to 14.0 pH or -2.00 to 14.00 pH |
| ORP | -2100 to +2100 mV |
| Temperature | -4.0 to +392.0°F or -20.0 to +200.0°C |
| Analog Outputs (1 and 2) | 0.00-20.00 mA or 4.00-20.00 mA |

Ambient Conditions ..... Operation: -4 to +140°F (-20 to +60°C); 0 to 95% relative humidity, non-condensing
Storage: -22 to +158°F (-30 to +70°C); 0 to 95% relative humidity, non-condensing

Relays:

- Types/Outputs ..... Two or four electromechanical relays; SPDT (Form C) contacts; U.L. rated 5A 115/230 VAC, 5A @ 30 VDC resistive
- Operational Mode ..... Each relay (A, B, C, and D) can be assigned to be driven by the measured pH (or ORP) or temperature
- Function Modes: Control ..... Settings for high/low phasing, setpoint, deadband, overfeed timer, off delay, and on delay
  - Alarm ..... Settings for low alarm point, low alarm point deadband, high alarm point, high alarm point deadband, off delay, and on delay
  - Status ..... Not configurable; relay only activates when a "fail" diagnostic WARNING condition exists
  - Timer ..... Relay is activated by user-set interval and time duration to control a GLI sensor cleaning system
- Indicators ..... Relay annunciators (A, B, C, and D) indicate respective relay status

Temperature Compensation ..... Automatic from 14.0 to 230.0°F (-10.0 to +110.0°C) with selection for NTC 300 ohm thermistor (used in GLI Differential sensors), Pt 1000 ohm RTD or Pt 100 ohm RTD, or manually fixed at a user-entered temperature; additional selectable temperature correction factor available (ammonia, morpholine, or user-set pH/°C linear slope) for pure water automatic compensation from 0.0 to 50.0°C

Sensor-to-Analyzer Distance:

- GLI Differential Technique Sensor ..... 3000 ft. (914 m) maximum
- Conventional Combination Electrode with Preamplifier ..... 985 ft. (300 m) maximum
- Conventional Combination Electrode without Preamplifier ..... 100 ft. (30 m) max. with electrode cable capacitance of less than 30 pF/foot

Power Requirements ..... 90-130 VAC, 50/60 Hz. (10 VA max.) or 180-260 VAC, 50/60 Hz. (10 VA max.)

Calibration Methods:

- 2-point Buffer Method (pH only) ..... Automatic calibration and buffer recognition using two buffers from a selected buffer set*.
- 1-point Buffer Method (pH only) ..... Automatic calibration and buffer recognition using one buffer from a selected buffer set*.

*Buffer Sets: 4.00, 7.00, and 10.00 - or - DIN 19267 Standard (1.09, 4.65, 6.79, 9.23, and 12.75)

***NOTE:*** *When using buffers that are not included in either analyzer buffer set, calibrate using only the Sample Method (2 or 1-point).*

- 2-point Sample Method (pH only) ..... Enter known values of two samples (determined by laboratory analysis or comparison reading) or two pH buffers.
- 1-point Sample Method (pH or ORP) ..... Enter known value of one sample (determined by laboratory analysis or comparison reading), one pH buffer or, for ORP measurement, one reference solution.

Analog Outputs ..... Two isolated 0/4-20 mA outputs; each with 0.004 mA (12-bit) resolution and capability to drive up to 600 ohm loads

***NOTE:*** *Each output can be assigned to represent the measured pH (or ORP) or temperature. Parameter values can be entered to define the endpoints at which the minimum and maximum mA output values are desired (range expand). During calibration, both outputs can be selected to hold their present values, transfer to preset values to operate control elements by an amount corresponding to those values, or remain active to respond to the measured value.*

Communication: RS-232 ..... Enables configuration and retrieval of measured data for one analyzer using IBM-compatible PC and GLI optional software tool kit

HART Protocol ..... Enables configuration and retrieval of measured data for multiple analyzers over a communication link using appropriate hand-held terminal or data system with HART software

Memory Backup (non-volatile) ..... All user settings are retained indefinitely in memory (EEPROM)

Certifications:

- European Community EMC ..... Certified CE compliant for conducted and radiated emissions (EN 50081-2) and immunity (EN 61000-6-2)
- General Purpose ..... CSA/$CSA_{NRTL}$ and FM (UL pending)
- Class I, Div. 2 (Groups A, B, C, and D) ..... CSA/$CSA_{NRTL}$ and FM (UL pending)

# Specifications (continued)

**Analyzer Performance**
**(Electrical, Analog Outputs):**

| | |
|---|---|
| Accuracy | 0.1% of span |
| Stability | 0.05% of span per 24 hrs., non-cumulative |
| Repeatability | 0.1% of span or better |
| Temperature Drift | Zero: less than 0.03% of span per °C<br>Span: less than 0.03% of span per °C |

**Mechanical:**

| | |
|---|---|
| Enclosure | NEMA 4X; polycarbonate face panel, epoxy-coated high-quality cast aluminum door and case with four 1/2 inch (13 mm) conduit holes, nylon mounting bracket, and stainless steel hardware |
| Mounting Configurations | Panel, surface, and pipe (horizontal and vertical) mounting |
| Net Weight | 3.5 lbs. (1.6 kg) approximately |

# Ordering Information

**MODEL NUMBER**
**P53** pH analyzer (also measures ORP) in 1/2 DIN, NEMA 4X enclosure with hardware for panel, surface or pipe mounting.

**RELAYS**
**A2** Two electromechanical relays
**A4** Four electromechanical relays

**COMMUNICATIONS OUTPUT**
**A** None
**B** HART Protocol

**RESERVED CATEGORY**

**EQUIPMENT TAGGING** (specify tag data)
**N** None
**P** Paper
**S** Stainless steel

| P53 | 1 | **Product Number** |
|---|---|---|

**Choose one from each category.**

### Accessories (ordered separately):

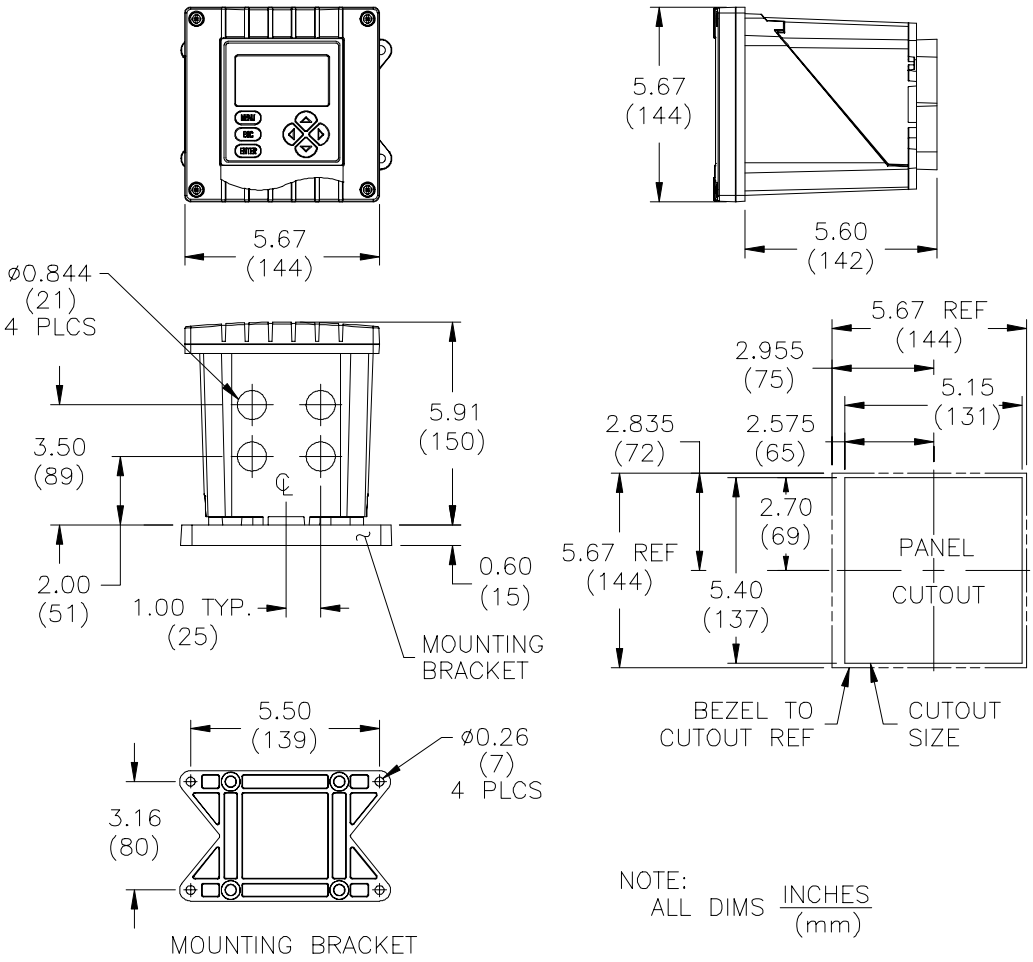
- **Sensors:** Refer to data sheets PD, LRE, PC, and RP6300M.
- **Software Tool Kit 1000G3311:** The kit is for use with an IBM-compatible PC. The software can create and download multiple sets of analyzer configuration values. The kit includes a GLI software CD-ROM and ten-foot cable terminated with an RS-232 connector and stripped/tinned wires for connection to the analyzer.
- **Sun Shield 1000G3088-001:** Aluminum shield provides additional protection from harmful effects of direct sunlight.

# Engineering Specification

1. The microprocessor-based analyzer shall accept any GLI Differential Technique pH or ORP sensor, or any conventional combination electrode. The analyzer shall accept NTC 300 ohm thermistor, Pt 1000 RTD, and Pt 100 RTD temperature compensators.
2. The analyzer shall be menu selectable to measure pH or ORP, and operate in multiple languages.
3. The analyzer shall have a graphical dot matrix LCD display with 128 x 64 pixels and LED backlighting. The main display character height shall be 1/2 inch (13 mm). Auxiliary information character height shall be 1/8 inch (3 mm). Menu screens shall contain up to six text lines.
4. The analyzer shall have these calibration methods:
   a) 2-point Buffer Method (pH only): Automatic calibration and buffer recognition using two buffers from a selected buffer set
   b) 1-point Buffer Method (pH only): Automatic calibration and buffer recognition using one buffer from a selected buffer set
   c) 2-point Sample Method (pH only): Enter known values of two samples (determined by laboratory analysis or comparison reading) or two pH buffers.
   d) 1-point Sample Method (pH and ORP): Enter known value of one sample (determined by laboratory analysis or comparison reading), one pH buffer or, for ORP measurement, one reference solution.
5. The analyzer shall have a passcode to restrict access to configuration settings and calibration to authorized personnel only.
6. The analyzer shall have user-test diagnostics for outputs, relays, and alarm annunciators without requiring special test equipment.
7. The analyzer shall be configurable using its RS-232 port and optional GLI software tool kit, or through HART protocol.
8. The analyzer shall have two isolated 0/4-20 mA analog outputs. Each output can be assigned to represent the measured pH (or ORP) or temperature. Parameter values can be entered to define the endpoints at which the minimum and maximum mA output values are desired. During calibration, both outputs can be selected to hold their present values, transfer to preset values to operate control elements by an amount corresponding to those values, or remain active to respond to the measured value.
9. The analyzer shall be GLI International, Inc. Model P53.

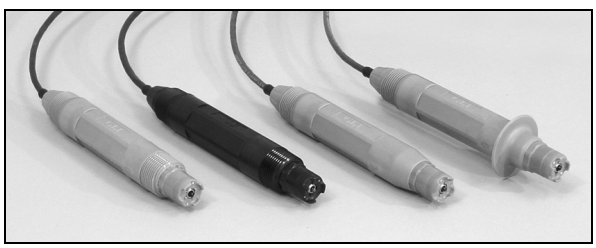
# Dimensions

**Inches (mm)**




### GLI pHD™ Differential pH and ORP Sensors

(available in convertible (PEEK or Ryton), insertion, and sanitary mounting styles



For complete details and specifications, refer to Data Sheet PD.

### GLI 3/4-inch Combination pH and ORP Sensors

(flow-through, immersion, insertion, and sanitary mounting styles in various materials)

For complete details and specifications, refer to Data Sheet PC.