

Model Q45C4

Isolated Conductivity Monitor/Analyzer System

- PEEK[®] Sensor Body Construction
- 4-Electrode Sensor Type
- Electrode Coating Rejection Diagnostic
- Universal Mounting Configurations
- Microprocessor Based System
- Loop, Line or Battery-Powered
- Data Logging Options
- Fully Isolated Output(s)
- Large High-Contrast Display
- Superior Sensor Warranty



Sensor Features

The sensor housings are constructed of PEEK[®], a high performance thermoplastic that provides outstanding mechanical strength and chemical resistance. Multiple sealing materials are used to preserve sensor integrity over a wide range of applications.

The four electrodes used in the cell are made of titanium for greater chemical resistance. Two of these electrodes are used to establish the sensor drive potential. The other two electrodes sense the flow of current between the drive electrodes and maintain the proper drive potential. The current that flows between the two drive electrodes is directly proportional to solution conductivity.

With conventional two-electrode sensors, as the process solution begins to coat the electrode surfaces, the sensor output signal begins to decrease. This produces an artificially low conductivity measurement.

The Q45C4 four-electrode system uses electrode diagnostics to compensate for the effects of fouling. As the two drive electrodes become coated by the process solution, a feedback mechanism involving the two sensing electrodes detects the decrease in drive potential and automatically re-establishes the proper drive potential. When the degree of coating reaches a limit where compensation is no longer possible, the diagnostic actuates an alarm to signal that the sensor requires cleaning.

The unique drive/control scheme of this system allows a single sensor configuration to be used reliably over a wide conductivity range. This system eliminates the requirement for multiple sensors with varying cell constants that are restricted to narrow operating ranges.

Monitor/Analyzer Features

This line of microprocessor-based instrumentation allows easy implementation of portable, loop-powered, or line-powered analyzer capability within the **same** instrument. The standard Q45C4 instrument can be rapidly converted between any of these versions with **no** requirement for software change:

- **Loop-powered (16-35 VDC) Transmitter, 4-20 mA output**
- **Line-powered (115/230 VAC) Transmitter, 4-20 mA output**
- **115/230 VAC Analyzer, dual relays, dual 4-20 mA outputs**
- **Battery-powered (9 VDC) portable version, for view-only measurement**

The large, high contrast, super-twist display provides excellent readability over a wide operating temperature range, even in low light conditions. The main display line consists of large, segmented characters with measurement units. The secondary display line utilizes easily readable dot matrix characters for clear display of calibration and diagnostic messages. Two of four measured parameters may be displayed simultaneously.

Four-button programming provides intuitive navigation through the menu-driven user interface. The 4-20 mA output(s) can be configured to represent any portion of the measurement range. Output HOLD, ALARM and SIMULATION features provide the user with complete control of the system output under any condition.

Diagnostic messages provide a clear description of system condition, which eliminates confusing error codes that must be looked up in the instruction manual.

The flexible calibration method includes stability monitors that check temperature and main parameter stability before accepting data.

Q25C Sensor Specifications

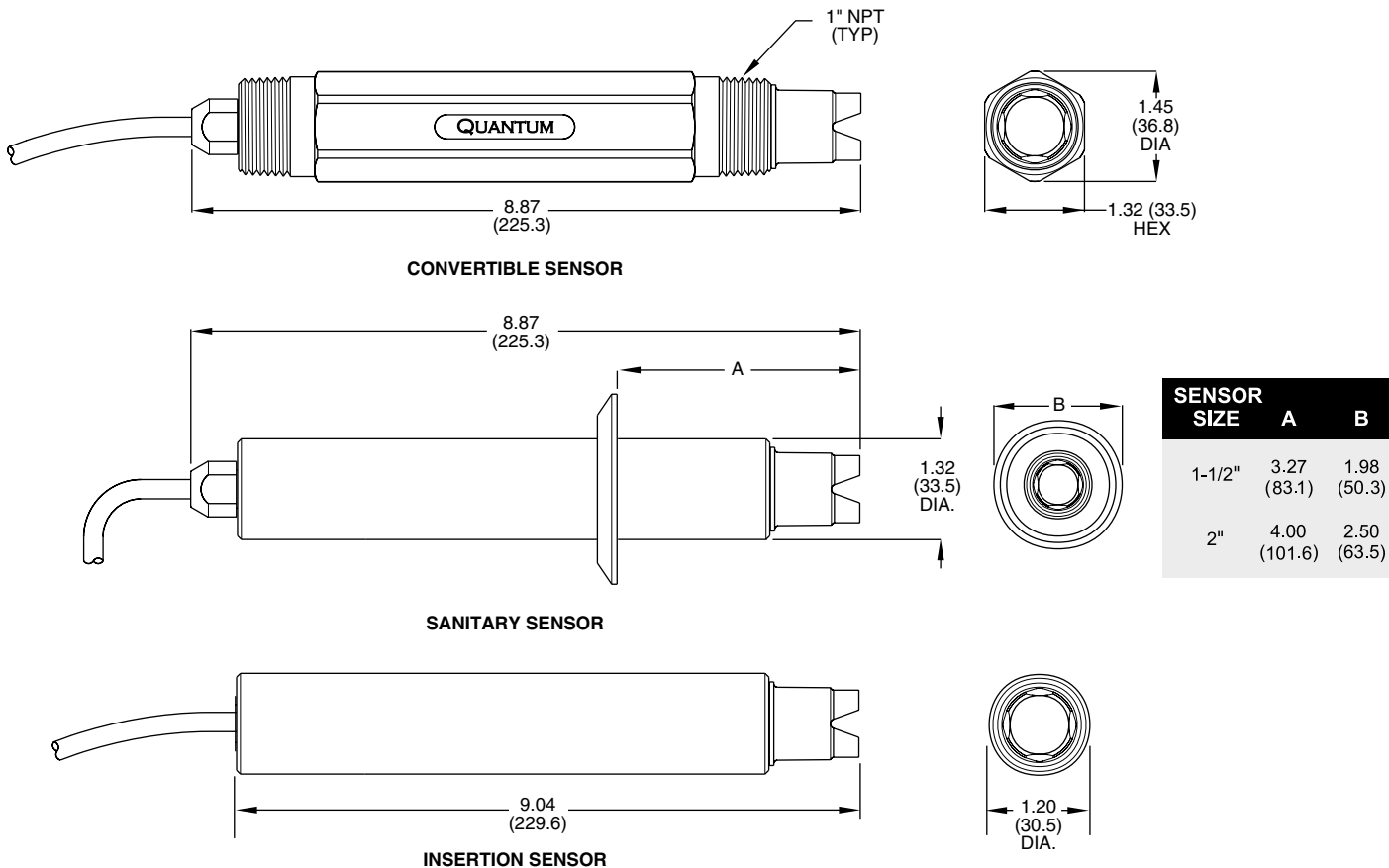
Measuring Range	0.0 to 2.000 Siemen/cm
Wetted Materials	PEEK, titanium, Viton®, EPDM (316 stainless steel with 316SS body option)
Temperature Compensation	Pt1000 RTD
Sensor Cable	6 conductor plus 2 shields, 10 feet standard
Max. Sensor to Analyzer Distance	60 feet (18.3 meters)
Temperature/Pressure Limit	See manufacturer's note below
Maximum Flow Rate	10 feet (3 meters) per second
Mounting Options	1" NPT convertible, 1 1/4" insertion, 1 1/2" or 2" sanitary style
Weight/Shipping Weight	1 pound (0.45 kilogram)

Manufacturer's Notes

CAUTION! The choice of sensor material/mounting option and hardware used to mount the sensor will determine the maximum temperature and pressure ratings. Please consult the factory for relevant temperature and pressure rating information.

Sensor Dimensions and Mounting Configurations

Dimensions: Inches (mm)



Q45C4 Instrument Specifications (NOT common to all variations)

Basic 2-Wire Transmitter:

Power	16-35 VDC (2-wire device)
DC Cable Max. Length	3000 feet (914 meters)
DC Cable Type	Belden twisted-pair, shielded
Insertion Loss	15.5 VDC

115/230 VAC Option:

Power	115/230 VAC $\pm 10\%$, 50/60 Hz 4 kV line isolation
Fuse	250 mA slow-blo on hot line, auto-reset secondary

115/230 VAC + Dual Relays Option:

Power	115/230 VAC $\pm 10\%$ 50/60 Hz
Fuse	250 mA slow-blo on hot line, auto-reset secondary
Relays	Electromechanical: Dual SPDT, 6-amp @ 250 VAC, 5 amp @ 24 VDC contacts, resistive Solid-State (AC): Dual SPST (N.O.) 0.06-2.0 amp @ 12-280 VAC, RMS Solid-State (DC): Dual SPST (N.O.) 3 amp @ 60 VDC

Software selection for setpoint, phase, delay, deadband, hi-lo alarm, and failsafe. A-B indicators on main LCD. Timer mode for auto-cleaning.

Analog Outputs

Dual 4-20 mA current loops, one for main parameter and one for temperature. Max load 500 Ohms on main and 500 Ohms on temperature.

Battery Option:

Power	Generic 9 VDC alkaline battery
Auto-OFF Time	2 hours after no key press
Low Battery Indication	6.75 VDC
Battery Life	Normal use (2-4 hours per week), 4-6 months Continuous operation, 10-14 days

Analog Outputs

Dual isolated 0-2.5 VDC (1pH and 1 Temperature)

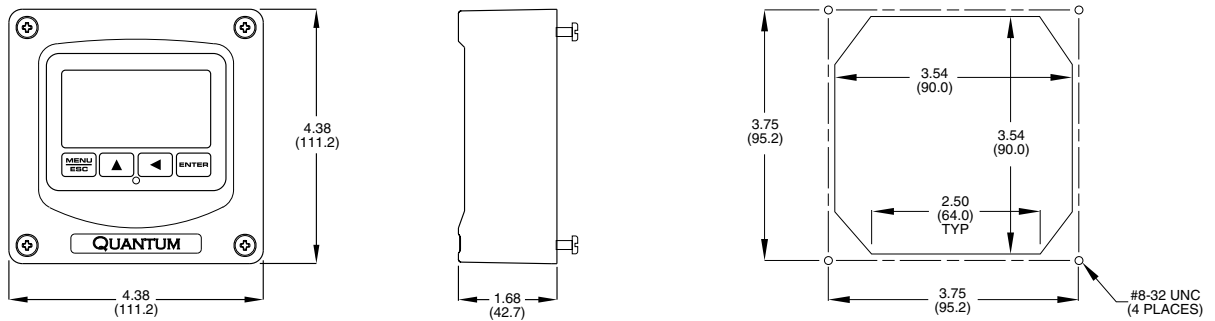
Data Logger

Optional Internal Logger, 32,000 data point capacity, programmable storage interval

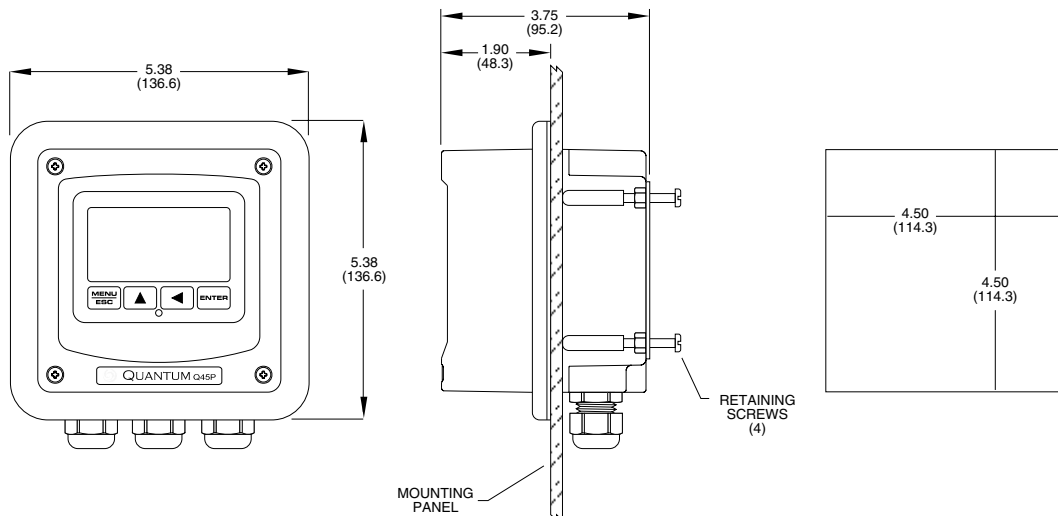
Panel Mount and Cut-Out

Dimensions: Inches (mm)

Standard

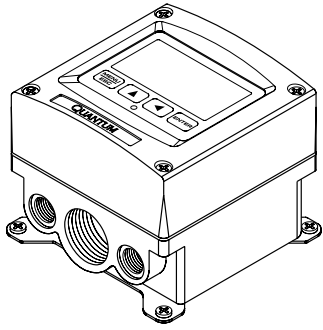


Relay Version

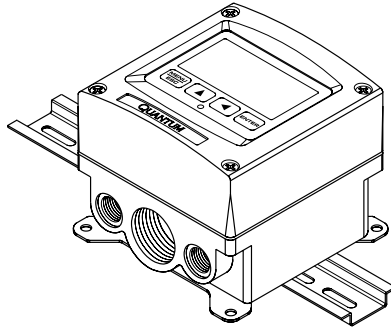


Analyzer Dimensions and Mounting Configurations

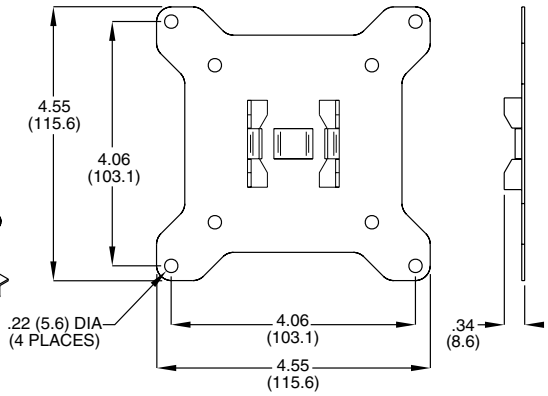
Dimensions: Inches (mm)



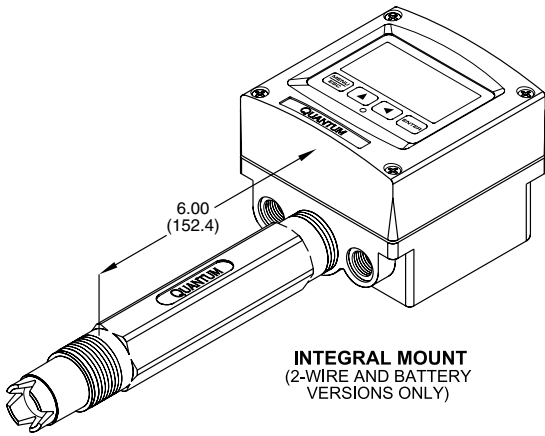
WALL MOUNT



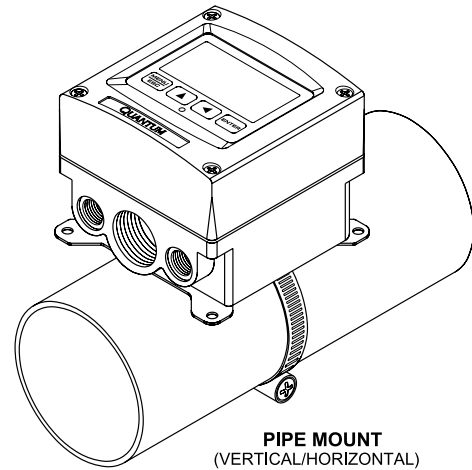
DIN RAIL MOUNT
(STANDARD 35 mm DIN)



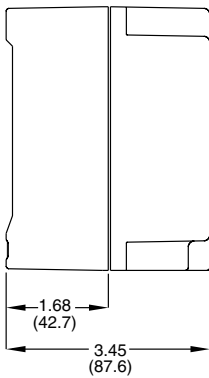
MULTI-PURPOSE BRACKET



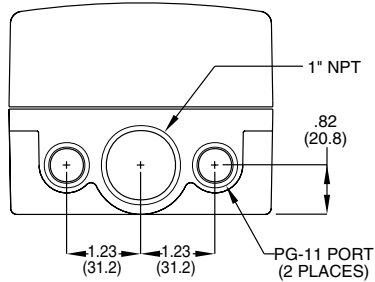
INTEGRAL MOUNT
(2-WIRE AND BATTERY VERSIONS ONLY)



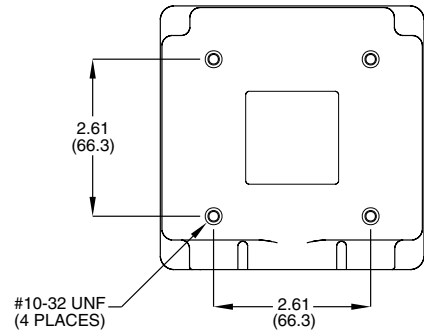
PIPE MOUNT
(VERTICAL/HORIZONTAL)



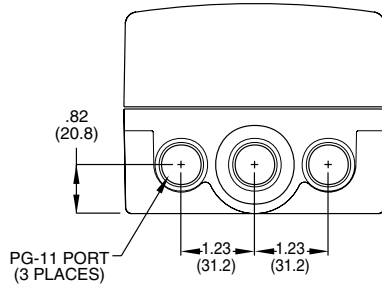
SIDE VIEW



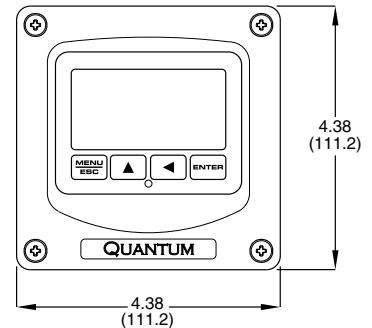
BOTTOM VIEW



BACK VIEW



BOTTOM VIEW
(RELAY VERSION)



FRONT VIEW

Q45C4 Performance Specifications

Displayed Parameters	Main input, 0.0 μ S to 2000 mS % Concentration Loop current, 4.00 to 20.00 mA Sensor temperature, -10° to 210° C (-40 to 410° F)
Main Parameter Ranges	Automatic or manual selection of the following: 0.0 to 20.0 μ S 0.0 to 200.0 μ S 0 to 2000 μ S 0.00 to 20.00 mS 0.0 to 200.0 mS 0 to 2000 mS
Repeatability	0.3% of span, or 0.1 μ S, whichever is greater
Sensitivity	0.05% of span, or 0.1 μ S, whichever is greater
Non-Linearity	0.3% of span, or 0.1 μ S, whichever is greater
Stability	0.1% of span per 24 hours, non-cumulative
Temperature Drift	0.03% of span/°C, span or zero
Warm-Up Time	7 seconds to rated performance
Instrument Response Time	6 seconds to 90% of step input at lowest setting
Max. Sensor-to-Analyzer Distance	60 feet (18.3 meters)
Sensor Type	Quantum 4-electrode conductivity - 6-wire input (Model Q25C4)

Q45C4 Instrument Specifications (common to all variations)

Enclosure	NEMA 4X, IP66, polycarbonate, stainless steel hardware, weatherproof and corrosion resistant, (HWD): 4.4" (112 mm) x 4.4" (112 mm) x 3.5" (89 mm)
Mounting Options	Wall, panel, pipe, DIN rail, or integral-sensor (DC only)
Conduit Openings	Standard: 2-PG-9 openings, 1-1" NPT center opening, cordgrips and plug included Relay option: 3-PG-11 openings, plugs included
Weight	DC transmitter configuration: 1 lb. (0.45 kg) Line-powered unit: 1.5 lb. (0.68 kg)
Display	Large, high-contrast, Super-Twist (STN) LCD 4-digit main display with sign, 0.75" (19.1 mm) seven-segment character 12-digit secondary display, 0.3" (7.6 mm) 5 x 7 dot matrix character
Keypad	4-key membrane type with tactile feedback, polycarbonate with UV coating, integral EMI/static shield and conductively coated window
Ambient Temperature	Service -20 to 60° C (-4 to 140° F) Storage -30 to 70° C (-22 to 158° F)
Ambient Humidity	0 to 95%, non-condensing
Location	Designed for hazardous and non-hazardous areas
EMI/RFI Influence	Designed to EN 61326-1
Output Isolation	600 V galvanic isolation
Filter	Adjustable 0-9.9 minutes additional damping to 90% step input
Temperature Input	Selectable Pt1000 or Pt100 RTD, automatic compensation

Monitor/Analyzer Ordering Information

	Parameter	Measurement Type	Control	Power	Housing	Approval	Tags
Q45	C						
	C Conductivity	4 4-Electrode	N None 2 2 Electromechanical Relays 3 2 Solid-State Relays, AC 4 2 Solid-State Relays, DC	S Loop P Portable L Portable w/ Data Logger A 115 VAC B 230 VAC	S Standard P Panel Mount, 115 x 115 mm Q Panel Mount, 1/2 DIN	N None	N None 1 316SS

Sensor Ordering Information

	Electrode Type	Electrode Material		Body Material	Mounting Style	Cable Leads	Cable Length
Q25							
	C4 4-Electrode	A Titanium		1 PEEK® S 316SS	1 Convertible 2 Insertion 3 Sanitary, 1 1/2" 4 Sanitary, 2"	1 Stripped (standard)	1 15' 2 30' 9 Special

Q25 Sensor Warranty

In addition to a standard one-year quality warranty, ATI unconditionally warrants to the ultimate purchaser **for a period of thirty months from date of shipment from our factory, that any Q25 series sensor may be replaced, FOR ANY REASON, at 50% off the current list price.** This warranty applies to normal sensor wear, as well as accidental damage.

Accessories

31-0057	Sensor interconnect cable per foot (custom, double-shielded, six-wire)
07-0100	NEMA 4X Junction Box Assembly
09-0046	Conductivity Standard – 84 microSiemens, 500 mL
09-0047	Conductivity Standard – 447 microSiemens, 500 mL
09-0048	Conductivity Standard – 1,500 microSiemens, 500 mL
09-0049	Conductivity Standard – 8,974 microSiemens, 500 mL
09-0050	Conductivity Standard – 80,000 microSiemens, 500 mL



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