

450 Economical Two-Wire Conductivity/ TDS Loop



Benefits and Features - Transmitter*

- Transmitter operates on a two-wire 24-volt DC circuit
- Side-mounted quick connect (ISO 4400) for loop power; bottom-mounted quick connect for sensor
- Simple operation - without opening the case, users can view the sensor reading, sensor temperature, and the last calibration record
- Calibrations can be done without opening the enclosure using only the front panel keypad
- Sensor health can be examined by viewing memory of sensor cell constant when calibrated and/or a list of error codes
- Intuitive user interface with short key sequences is easy to learn – most often, no manual is required
- Convert between sensor constants on the keypad
- LCD displays conductivity, TDS, temperature, mA output and calibration status
- Sample shortcut key for quick return to sample reading
- User interface “remembers” last position within menu structure for ease of navigation
- Adjusts to wide range of standards for calibration
- Tolerates faults and issues a caution
- During calibration, output can be held
- Set the 4-20 mA output span or zero from keypad
- All user adjustments made via keypad
- Reliable, separately powered and input-output isolated circuit prevents interface problems
- Durable IP65 (NEMA 4X) housing withstands hosing down; survives acid and caustic fumes, humidity, etc.

Overview

The 50-series microprocessor-based two-wire transmitters are flexible and easy to use. They are easy to install in a surface-mounted 10x10x10 cm (4x4x4 inch) size NEMA 4X (IP 65) water-shedding and corrosion-resistant plastic case. System includes true-union conductivity sensor and insertion fitting for ease of installation.

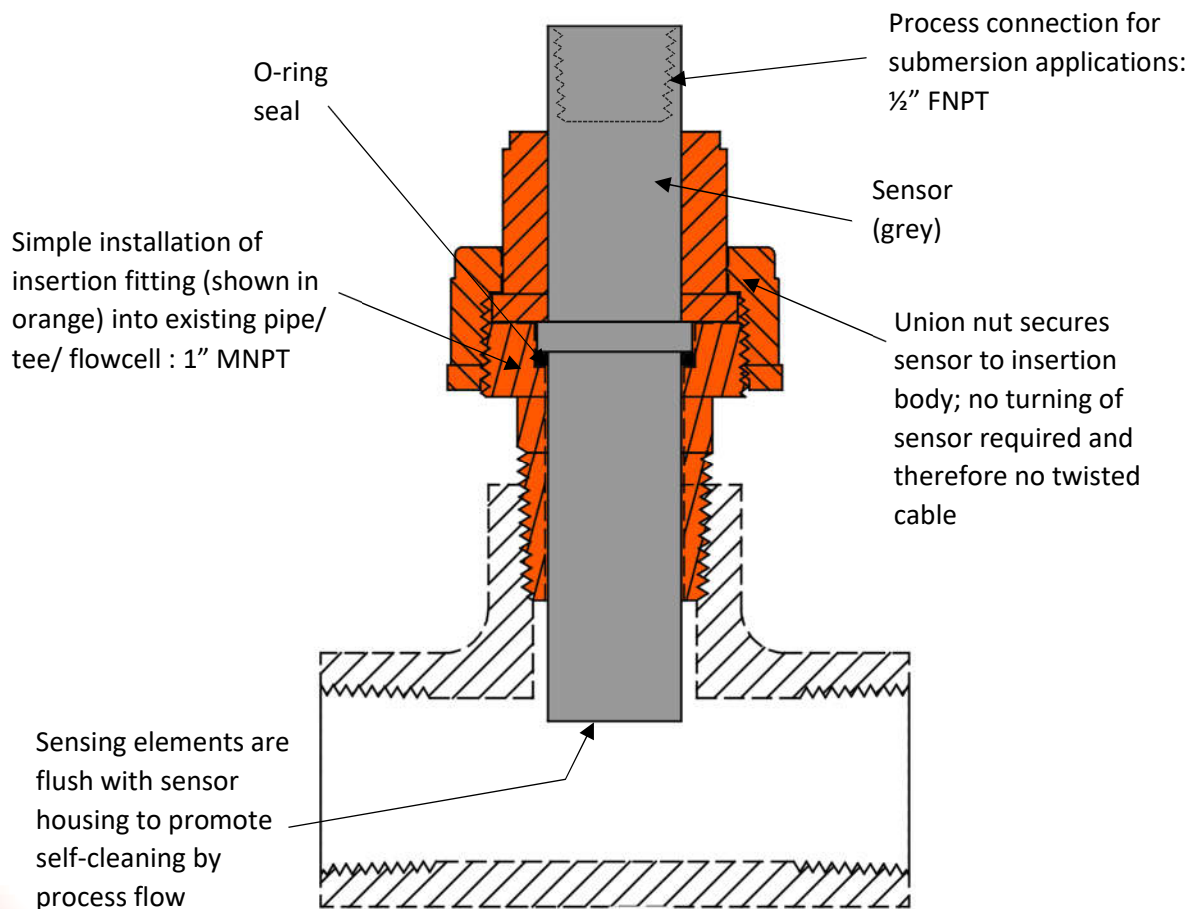
* The Model 450 is 24 VDC two-wire loop-powered and requires a source of 24 VDC power in the loop

Benefits and Features - Sensor

- Model 414 true-union conductivity sensor for ease of installation in insertion or submersion applications.
- True-union-style threaded fitting locks in the electrode for extra safety and easy removal without cable twisting (1" NPT)
- handles submersion, screw-in, and flow-through, applications
- 1.0/ cm cell constant; measurement range of 100 to 10 000 $\mu\text{S}/\text{cm}$
- TDS derived using an adjustable Solids Content Factor
- Recommended for applications where frequent removal in tough applications for calibration, cleaning or Q.C. checks, is required
- Rugged CPVC construction

Calibration Accessories

- Medium conductivity calibration kit for cell constants 0.1/cm to 5.0/cm includes:
 - 1 x 500 mL 100 $\mu\text{S}/\text{cm}$ conductivity standard
 - 2 x 500 mL 1 000 $\mu\text{S}/\text{cm}$ conductivity standard
 - 1 x 500 mL 10 000 $\mu\text{S}/\text{cm}$ conductivity standard
 - 1 x 500 mL demineralized water
 - 1 x 10 mL syringe
 - 4 x 250 mL polyethylene beakers
 - 1 sensor cleaning brush, ¼ inch
 - instruction sheet



Engineering Specifications

	PROPERTY	CHARACTERISTIC									
Transmitter - Physical	Display	Four and one half LCD digits, 1.5 cm (0.6 in) displays for conductivity, temperature, error codes, prompts and diagnostic information									
	Display Ranges	Conductivity: 0 μ S/cm to 9,999 μ S/cm and 0 mS/cm to 9,999mS/cm TDS: 0 to 9,999 ppm (parts per million) or mg/L and 0 to 9,999 ppt (parts per thousand) or g/L Temperature: -10.0 °C to 210 °C (14.0 °F to 410 °F)									
	Keypad	4 pushbutton entry keys									
	Case Dimensions	10 cm x 10 cm x 10 cm (4 in x 4 in x 4 in)									
	Surface Mounting Dimensions	Horizontal: 5.4 cm (2-1/8 in) Vertical: 11.7 cm (4-5/8 in)									
	Weight	0.9 kg (2.0 lb)									
Transmitter - Environmental	Temperature	Operational: 5.0 °C to 45 °C (41.0 °F to 113 °F) Storage: -10.0 °C to 55 °C (14.0 °F to 131 °F) Relative Humidity: 80 % maximum; non-condensing									
	Enclosure Ratings	IP65 (NEMA 4X)									
	Electrical Ratings	24 VDC (min. 17 VDC, max. 36 VDC); lift off voltage 17 VDC. 4 to 20 mA.									
	Electrical Requirements	17 VDC to 36 VDC, 24 VDC nominal. Quality ground required for microprocessor									
Transmitter - Operational	Accuracy	Conductivity: \pm 0.5 % of measured range Temperature: \pm 0.3 °C									
	Precision	Conductivity: \pm 1 digit (0.01 μ S/cm) Temperature: \pm 1 digit (0.1 °C)									
	TDS (total dissolved solids) measurement	calculated by multiplying conductivity at 25°C by solids contact factor (SCF) of 0.7; SCF adjustable within range of 0.5 to 1.1.									
	Response Time	90% within 5 s (default), function of flow and temperature. Damping adjustment: 0 s to 60 s									
	Temperature Compensation	Automatic 1000 Ω RTD Auto: -10.0 °C to 210 °C (14.0 °F to 410 °F) Manual: -10.0 °C to 210 °C (14.0 °F to 410 °F) <table border="1"> <thead> <tr> <th>Function</th> <th>Compensation Type</th> <th>Characteristic</th> </tr> </thead> <tbody> <tr> <td>Default</td> <td>Linear</td> <td>2% per °C</td> </tr> <tr> <td>Adjustable</td> <td>Linear</td> <td>0.1% to 5.0 per °C</td> </tr> </tbody> </table>	Function	Compensation Type	Characteristic	Default	Linear	2% per °C	Adjustable	Linear	0.1% to 5.0 per °C
	Function	Compensation Type	Characteristic								
	Default	Linear	2% per °C								
Adjustable	Linear	0.1% to 5.0 per °C									
Cell Constant Range	0.01/cm to 100.0/cm										
Output	One continuous, programmable 4 mA to 20 mA output; isolated, max. load 250 Ω Convertible to 1 VDC to 5 VDC										
Sensor Specifications	Measurement Range	100 μ S/cm to 10 000 μ S/cm									
	Temperature Range	0 °C to 90 °C (32 °F to 194 °F)									
	Pressure Range	0 kPa to 689 kPa (0 psi to 100 psi)									
	Sensing Element	Carbon									
	Wetted Materials	CPVC, Carbon									
	Temperature Sensor	1000 Ω PT RTD									
	Process Connections	½ in FNPT pipe mount (submersion applications) and 1 inch MNPT insertion fitting									
	Insertion Fitting Pressure & Temperature Limits	414 kPa at 90 °C (60 psi at 194 °F)									
	Electrode Dimensions	Length: 16.5 cm (6.5 in) Diameter: 2.3 cm (0.9 in)									
	Sensor Cable	4 conductor plus shield; 1.5 m (5.0 ft) in length									
Weight	0.6 kg (1.3 lb)										
Shipping	Weight	2.0 kg (4.4 lbs)									
	Package Dimensions	30 cm x 23 cm x 23 cm (12 in x 9 in x 9 in)									