

Multiparameter

THORNTON

Leading Pure Water Analytics

Six Sensor Inputs:

- Conductivity/Resistivity
- pH/ORP
- Flow
- Dissolved Oxygen
- Temperature
- Pressure
- Level



770MAX

Multiparameter Analyzer Transmitter

METTLER TOLEDO

Extensive Measurement Capabilities

- 6 channels: 4 Smart Sensors, including conductivity/resistivity, temperature, flow, pH, ORP, dissolved oxygen, level and pressure, plus 2 pulse flow sensors
- Display 16 measurements on 4 line screen with auto or manual scrolling
- Metric, S.I., and English units for direct measurements; calculated values for % Rejection, % Recovery, difference, sum, ratio and DI capacity. Custom names identify all measurements

Alarm/Control and Outputs

- 16 Setpoints for high, low, USP and reset (for totalizer) alarms
- 4 SPDT relay option within the 1/4 DIN case with individual hysteresis and time delay (optional)
- 2 Discrete outputs for logic circuits
- 4 powered analog outputs (0/4-20 mA) standard, 8 optional
- RS232 serial output
- 2 discrete inputs for totalizer reset

Highest Accuracy and Easiest Calibration

- Unique 4-wire resistance measurement technique for highest installed accuracy
- Thornton's temperature compensation provides highest accuracy for UPW, cation and ammonia conductivity
- NIST-traceable automatic meter calibration system
- Direct one and two-point sensor calibration
- Smart Sensors retain factory and user calibration data
- pH automatic buffer recognition during calibration

Compact Size

- 1/4 DIN cutout, case only 12 cm deep
- Sealed panel mount standard, entire unit sealed with optional back cover
- Panel, wall, pipe mounting options

Cost Effective

- Low cost per measurement point, with 6 sensor inputs
- One panel cutout replaces 6 for single function devices
- One instrument - reduces training and spares
- Plug-in sensor connections reduce wiring time



770MAX Liquid Crystal Display option
(Vacuum Florescent Display shown on cover)

Plug-in patch cords eliminate all terminal wiring for Smart Sensors, at both ends. Gone are the possibilities for sensor wiring errors and extensive documentation. Other inputs and outputs are to pluggable terminals which snap out for ease of installation and servicing.

Unsurpassed temperature compensation algorithms to handle specific applications are user selectable. The renowned Thornton/Light ultrapure water compensation algorithm uses the best available data for the properties of pure water, while providing compensation for more conductive solutions.

Cation and ammonia/ETA compensation correct for the unique properties of cycle chemistry samples in power plants. Comprehensive temperature compensation functions for HCl, NaOH, and H₂SO₄ are used for DI regeneration. Compensation for glycol and IPA solutions meets the needs of microelectronics applications. Adjustable linear temperature compensation is also available.

Non-temperature compensated measurement is required for monitoring pharmaceutical grade waters by USP <645>. Further, Stage 1 USP conductivity limits can be alarmed by an application-specific program that also includes a user-selectable safety margin.

pH temperature compensation is provided for both the conventional Nernst effects of the sensor as well as for the effects of changing ionization in pure water, with adjustable solution temperature compensation.

Custom names allow assignment of any 6-character label to directly identify each measurement on the display. The names carry through the menu structure for clarity when making settings. Custom names can eliminate the need for special panel legends and can be changed at any time.

Analog Output Signals (4 standard, 4 more—optional) are isolated and include 0-20 or 4-20 mA ranges, with choices of linear, logarithmic, bi-linear or dual output scaling. Linear allows conventional setting of high and low limits. Other scalings allow high resolution under normal operating conditions but also keep the measurement on-scale for tracking during upsets. Logarithmic allows setting the high end and number of decades. Bi-linear provides separate scaling for the lower and upper halves of the signal range. Dual scaling switches to a second scaling range when the first range is exceeded and activates a relay for range indication.

DICap™ deionization capacity monitoring is a unique Thornton method to predict the timing of DI resin exhaustion, compensating for both flowrate and variable water composition. It measures deionizer feed flowrate and conductivity and then computes the ionic load that has entered the DI bed. The product of flowrate and TDS is integrated over time to yield this cumulative TDS as total grains or total equivalents.

Multi-level security allows separate access to calibration and to other functions. Menus may still be viewed when security prevents change.



Functional

Sensor inputs:	4 Smart Sensor channels, 2 pulse flow channels
Cond./Resist. Ranges:	0.01 Constant 2-E Cell: 0.001 $\mu\text{S}/\text{cm}$ to 2000 $\mu\text{S}/\text{cm}$ 0.5 k $\Omega\text{-cm}$ to 1000 M $\Omega\text{-cm}$ 0.1 Constant 2-E Cell: 0.01 $\mu\text{S}/\text{cm}$ to 3000 $\mu\text{S}/\text{cm}$ 0.33 k $\Omega\text{-cm}$ to 100 M $\Omega\text{-cm}$ 10 Constant 2-E Cell: 10 $\mu\text{S}/\text{cm}$ to 200,000 $\mu\text{S}/\text{cm}$ 50 Constant 2-E Cell: 10 $\mu\text{S}/\text{cm}$ to 1.0 S/cm 4-E Cell: 10 $\mu\text{S}/\text{cm}$ to 800,000 $\mu\text{S}/\text{cm}$ Readout in S/m is selectable
	TDS: covers equivalent conductivity ranges
	Concentrations: HCl: 0-15%, NaOH: 0-13%, H ₂ SO ₄ : 0-20%, by weight
pH & ORP Ranges:	-1 to 15 pH, -1500 to +1500 mV
Temperature Ranges:	-40° to 200 °C, -40 to 392 °F with Pt1000 RTD or Pt100 RTD
Flow Ranges:	Sensor range in GPM, LPM, m ³ /hr, 0.5-4000 Hz
Pressure Ranges:	Sensor range in psi, bars, kPa, mmHg, kg/cm ² , inches, feet
Tank Level (volume):	Sensor range in gallons, m ³ , liters, % full, psi, inches, feet
Derived Meas.:	Total flow, % rejection, % recovery, sum, difference, ratio, ppm-gallons, total grains
Electrical Ranges:	Volts, Amps, based on proportional millivolt signal
Temp. Comp.:	Automatic, referenced to 25 °C for Resistivity, Conductivity, Percent Rejection and TDS. Field selectable for standard high purity (Thornton/Light), cation, ammonia/ETA (power industry), isopropyl alcohol, 50 and 100% glycol, HCl, H ₂ SO ₄ , NaOH, or Light 84 (special microelectronics applications). pH temperature compensation for Nernst electrode output effects plus adjustable solution temperature compensation for high purity water ionization effects, referenced to 25 °C.
Discrete Inputs:	Two standard, buffered TTL/CMOS level or dry (potential-free) contacts for resetting total flow or total grains measurements.

Outputs

Setpoints/Alarms:	16, set individually as high, low, reset, or USP <645> limit on any measurement. Any relay or discrete output can be programmed to operate from multiple setpoints.
Relays:	Optional, 4 SPDT potential-free relays, rated 5 amp max. resistive load up to 30 VDC or 250 VAC.
Discrete Outputs:	Two standard, buffered TTL/CMOS level.
Analog Output Signals:	Four standard plus four optional, powered 0/4-20 mA outputs, 500 ohm load maximum, isolated from input and from earth ground; accuracy ± 0.05 mA, typical. Outputs are assignable to any measurement with free scaling in linear, bi-linear, logarithmic, or dual range format. Not for use in powered circuits.
Serial Output:	RS232 standard, maximum distance 50 feet, field selectable up to 38.4 kbaud.

Performance

Resistance accuracy:	$\pm 0.3\%$ of reading, 1000 ohms to 6 Mohms; $\pm 0.5\%$ of reading, 6 M to 10 Mohms; $\pm 1\%$ of reading or ± 0.5 ohm, whichever is greater, 10 to 1000 ohms. (divide by cell constant for resistivity range)
Temp. accuracy:	± 0.2 °C
Voltage accuracy:	± 3 mV, ± 0.02 pH
Frequency accuracy:	$\pm 0.1\%$ or ± 0.001 Hz, whichever is greater
Repeatability:	$\pm 0.02\%$ of reading, 1000 to 10 Mohms; $\pm 0.8\%$ of reading, 10 to 1000 ohms for conductivity/resistivity; ± 0.05 °C; ± 0.02 pH; ± 0.3 mV
Ratings/Approvals:	Models 775-LA0 & -VA0 are CE compliant. All models are UL and cUL (CSA Standards) Recognized.

Environmental

Storage Temperature:	-20° to 80 °C (-4° to 176 °F)
Operating Temperature:	

Model	115 VAC Power	230 VAC Power
775-_A0	-10°C to 50°C (14 to 122°F)	-10° to 50°C (14 to 122°F)
775-_A1	-10°C to 50°C (14 to 122°F)	-10° to 40°C (14 to 104°F)
775-_A2	-10°C to 40°C (14 to 122°F)	-10° to 40°C (14 to 104°F)

Humidity:	0 to 95% RH (non-condensing)
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Enclosure/Power

Display/keypad:	20 character x 4 line backlit LCD or vacuum fluorescent; 20 tactile feedback keys
Material:	ABS-PC alloy, UV and chemical resistant
Rating:	NEMA 4X, panel mounting; sealed back cover also available.
Panel Cutout:	3.78" x 3.78" (96 x 96 mm) 1/4 DIN
Wall Mount:	With accessory back cover, 8.84 x 4.82" (225 x 123 mm) overall
Pipe Mount:	With accessory bracket for 2" (50.8mm) pipe
Weight:	2 lbs. (0.9 kg)
Sensor Patch Cord Length:	300 feet (91 m) maximum, 150 feet (45 m) maximum for pressure and level sensors. Reduced accuracy with 4-E sensors only at high conductivity with patch cords >50 feet (15 m).
Power:	100-240 VAC 20 Watts maximum, 47-63 Hz. On power loss all stored values are retained in non-volatile memory without batteries.

Smart Sensors

Smart Sensors used with 770MAX have sensor type, calibration data and serial number factory-stored in memory for automatic configuration when connected — a great simplification at startup. Smart sensors are available for a wide variety of parameters described below. For further information see specific sensor data sheets: ML0072 for conductivity; ML0074 for pH, ORP, dissolved oxygen, flow, pressure, level & temperature; and ML0073 for sanitary sensors.

Conductivity/Resistivity

Thornton provides a full complement of Smart conductivity sensors with NPT or Tri-Clamp sanitary fittings. They include various lengths, cell constants and materials to match the application: titanium concentric electrodes for high purity water; highly polished 316L SS electrodes for pharmaceutical waters; CPVC and PEEK sensors with four flush electrodes for solutions with higher conductivity and/or suspended material; and an epoxy sensor which can also measure chemical concentration. Precise factory calibration of each cell constant and RTD is stored in sensor memory for use by the 770MAX when connected. Optimized 4-wire measuring circuitry provides exceptional rangeability and accuracy, eliminating cable effects.

pH & ORP

pH and ORP (oxidation-reduction potential) sensors utilize a compact preamplifier in the Smart module on the sensor or VP cable to prevent signal loss over long cable runs. A wide variety of Mettler-Toledo pH electrodes with VP connection can meet diverse application requirements. Smooth membrane surfaces and unique reference junction designs resist fouling in dirty samples. The high purity pH assembly uses a shielded flow chamber and flowing junction reference electrode for stable measurement and a 3-way valve for in-line calibration.

Dissolved Oxygen

Thornton provides a choice of reliable Smart dissolved oxygen sensors especially for measurement in high purity ranges. The high-performance sensor provides especially high accuracy and fast down-scale response. The long life sensor is an industry-proven design that can operate several years without any internal maintenance or replacing any parts. Sensor preamplifiers include barometric pressure measurement and correction during calibration.

Flow

Smart Sensors for flow include a variety of paddlewheel, vortex shedding, and sanitary turbine types to meet the needs of most applications. Smart flow sensors convey their precalibrated values to 770MAX for ease of installation and startup. Many Smart flow sensors have multiple calibration factors saved in memory, for linearization of response and higher accuracy.

A choice of English or metric flow units may also be totalized, with internal or external reset. Flow comparisons between two sensors include difference, ratio, and % recovery.

Pressure and Tank Level

Smart level and pressure sensors are available with sanitary and NPT connections in stainless steel and polymers to meet process requirements. The 770MAX allows very convenient calibration after installation. Level units can be % full, height or volume. A wide variety of English and metric pressure units are available.

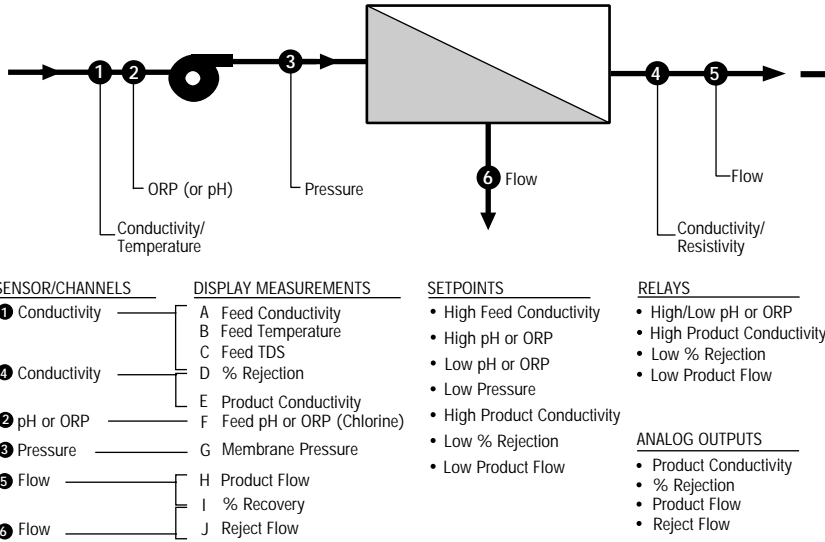
Temperature

Stand-alone Smart Temperature Sensors are available with industrial or Tri-Clamp sanitary fittings, of stainless steel.



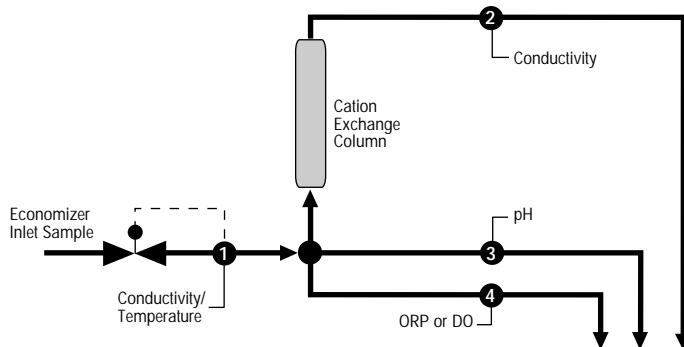
Membrane Process

A single 770MAX can handle pretreatment and all important membrane performance measurements including % rejection and % recovery.



Power Plant Cycle Chemistry Monitoring

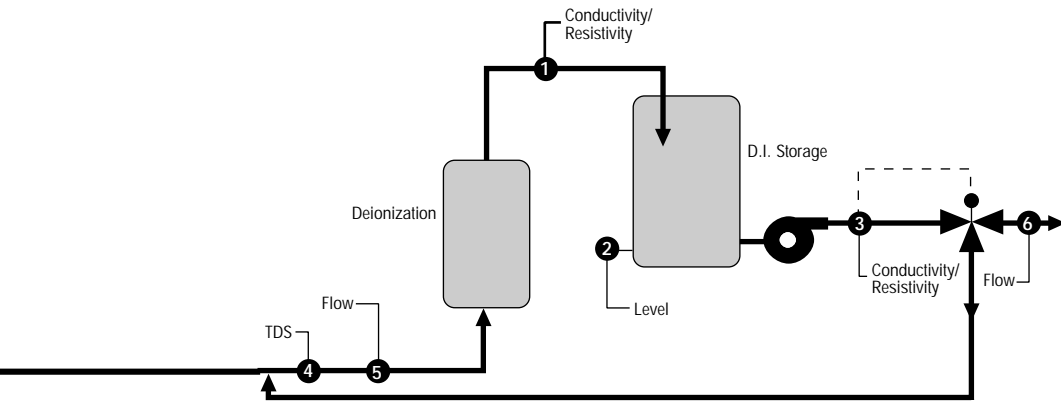
770MAX measures the common parameters of cycle chemistry samples in a single unit. Highly accurate cation conductivity temperature compensation assures close surveillance of this most important parameter.



SENSOR/CHANNELS	DISPLAY MEASUREMENTS	SETPOINTS	RELAYS
1 Conductivity	A Specific Conductivity	• High Specific Conductivity	• High/Low Specific Conductivity
	B Temperature	• Low Specific Conductivity	• High Temperature
2 Conductivity	C Cation Conductivity	• High Temperature	• High Cation Conductivity
3 pH	D pH	• High Cation Conductivity	• High/Low pH
4 ORP or DO	E ORP or Dissolved Oxygen	• Low pH	
		• High pH	ANALOG OUTPUTS
			• Specific Conductivity
			• Cation Conductivity
			• pH
			• ORP

Deionization Process

770MAX readily monitors & controls deionization process. Ionic loading on the DI resin can be tracked by Thornton's unique DICap™ deionization capacity monitoring which integrates flow and TDS to yield total grains or total equivalents.



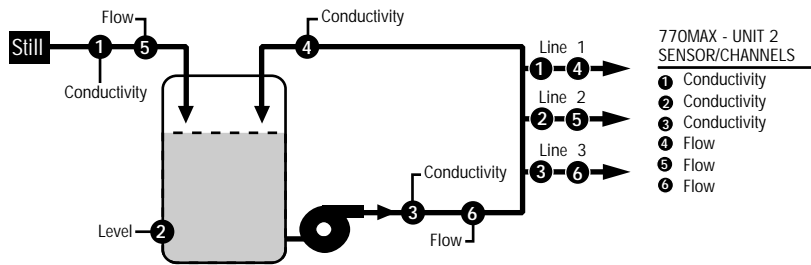
SENSOR/CHANNELS	DISPLAY MEASUREMENTS	SETPOINTS	RELAYS
1 Conductivity/Resistivity	A DI Conductivity or Resistivity	• Low DI Resistivity • High Level	• High DI Conductivity • Level Control
2 Level	B DI Level	• Low Process Resistivity • High TDS	• Recirc. Process Resistivity • High Total Grains or High TDS
3 Conductivity/Resistivity	C Process DI Resistivity	• High Total Grains • Reset Total Grains	
4 Conductivity	D Feed Temperature E Feed TDS F DICap™ Total Grains G Feed Flowrate		ANALOG OUTPUTS • DI Resistivity • Feed Flow • Feed TDS • Total Grains
5 Flow			
6 Flow		H Flowrate	

Dissolved Oxygen also available to monitor degasifier performance.

Pharmaceutical Waters

A single 770MAX monitors a still & distribution system. Additional 770MAX units can monitor conductivity & flow at each production area, to ensure compliance with USP requirements.

770MAX simultaneously measures temperature, temperature compensated and uncompensated conductivity, which can be alarmed by the limits contained in 770MAX software as specified by USP <645>.

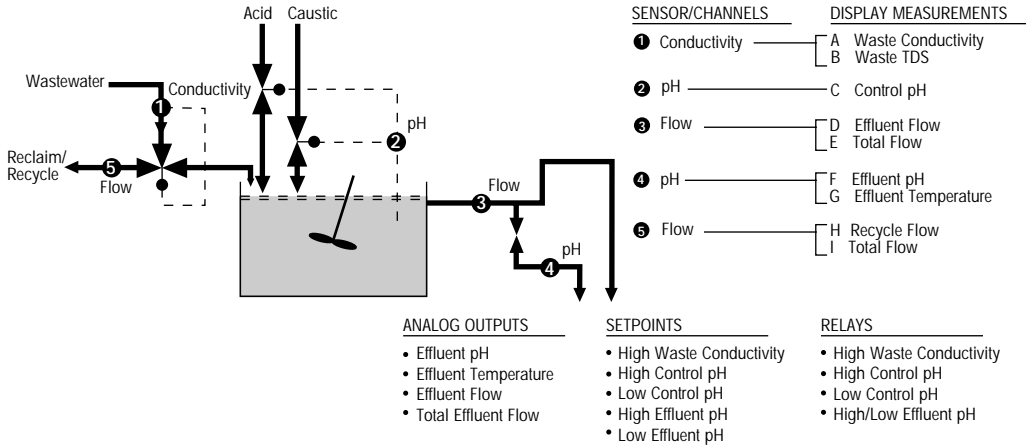


770MAX - UNIT 1 SENSOR/CHANNELS	DISPLAY MEASUREMENTS	SETPOINTS	RELAYS
1 Conductivity	A Distillate Conductivity B Distillate Conductivity U C Distillate Temperature	• USP Still Conductivity • Low Level • High Level	• High Still Conductivity • Low Level • USP Supply or Return Conductivity
2 Level	D Storage Level	• USP Supply Conductivity • USP Supply Temperature	• Low Supply or Return Temperature
3 Conductivity	E Supply Conductivity F Supply Conductivity U G Supply Temperature	• Low Return Conductivity • Low Return Temperature • Low Still Flow	ANALOG OUTPUTS • Still Flow • Supply Conductivity • Supply Flow • Return Conductivity
4 Conductivity	H Return Conductivity I Return Conductivity U J Return Temperature		
5 Flow	K Distillate Flow L Total Distillate Flow		
6 Flow	M Supply Flow		

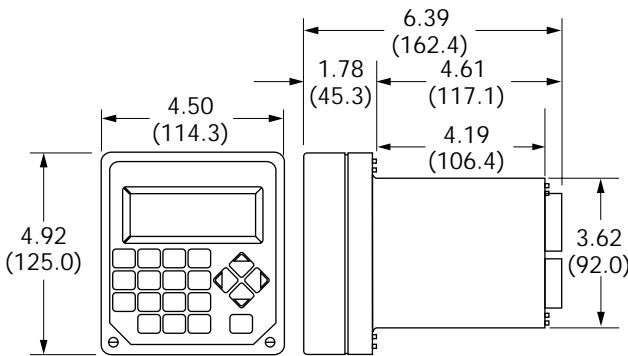
U = Non-temperature Compensated Conductivity as specified in USP <645>.

Wastewater Treatment

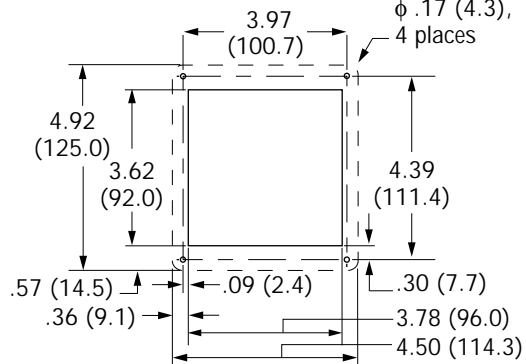
770MAX can divert reusable water before treatment. It can control neutralization and monitor effluent, to meet discharge requirements - all using the same instrument.



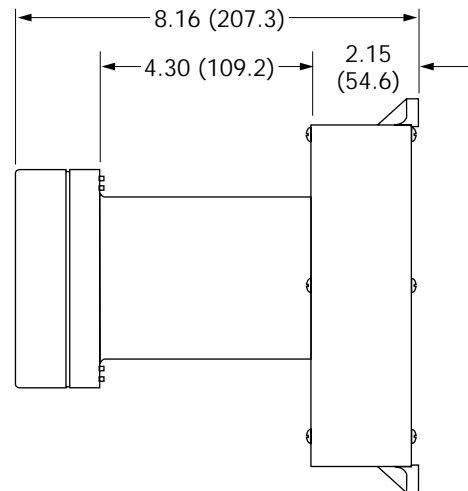
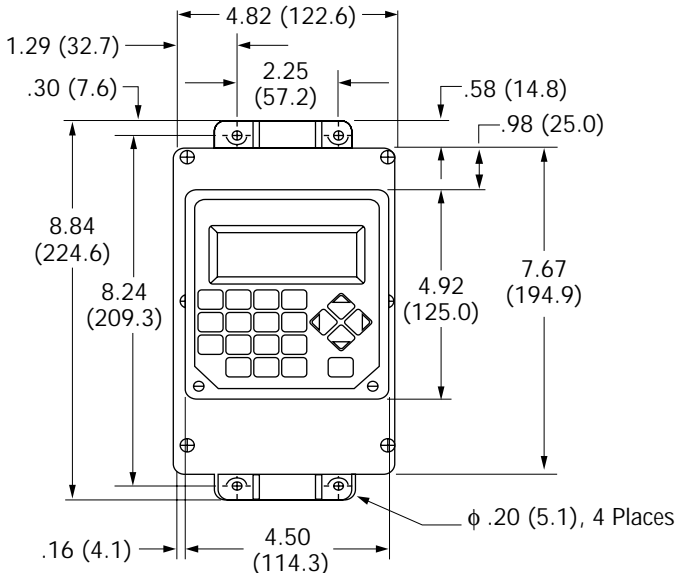
770MAX Dimensions



Panel Cutout

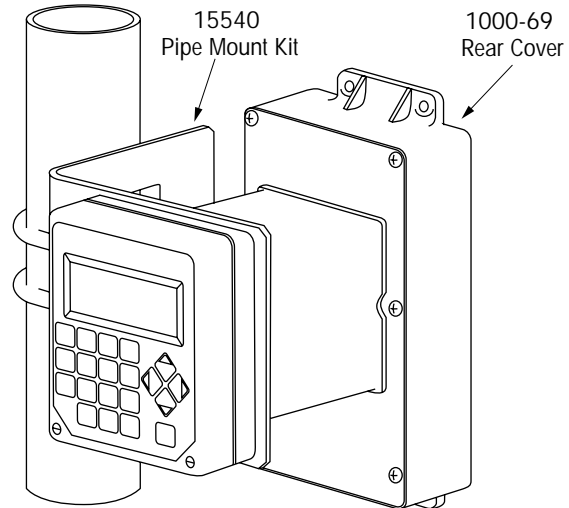
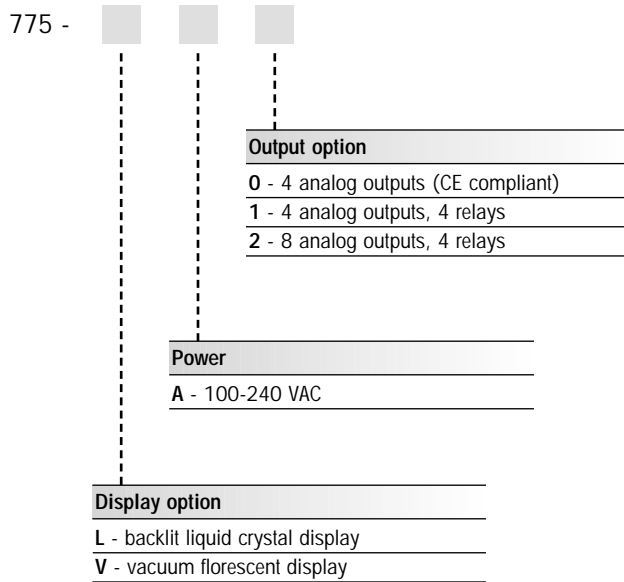


770MAX with Sealed Rear Cover



Dimensions: inches (mm)

Model numbers (e.g. model 775-LA0 has a liquid crystal display, AC power and 4 analog outputs)



Sensor Patch Cords

Length	Standard Part No.
1 ft (0.3 m)	1001-79
5 ft (1.5 m)	1005-79
10 ft (3 m)	1010-79
15 ft (4.5 m)	1015-79
25 ft (7.6 m)	1025-79
50 ft (15.2 m)	1050-79
100 ft (30.5 m)	1110-79
150 ft (45.7 m)	1115-79
200 ft (61 m)	1120-79
300 ft (91 m)	1130-79

Patch cord with connector at both ends, for 770MAX and Smart Sensors.
Not used with pulse input flow sensors.
Observe length limitations of some sensors.

Accessories

Description	Part No.
Rear cover for wall mounting and rear seal (requires Cable Grip Kit, 1000-80, or conduit)	1000-69
Cable Grip Kit – One kit seals two cables into the rear cover above, with fittings large enough to accept patch cord connector or other cable 0.546 (13.8 mm) maximum diameter.	1000-80
Pipe Mounting Bracket for 2" (50 mm) pipe	15540
Automatic Smart Calibrator Kit (for 770MAX)	1875
Portable Conductivity/Resistivity Calibration System (for system including sensor)	1885

For 770MAX Sensors, see datasheets:

- Conductivity/Resistivity Sensors	ML0072
- pH, ORP, dissolved oxygen, flow, pressure, level, temperature	ML0074
- Sanitary Tri-Clamp sensors	ML0073

1875 Automatic Smart Calibrator

At the push of a button, the 1875 calibrator automatically steps through NIST-traceable reference resistances, voltages and frequencies to calibrate and verify all ranges of the 770MAX to meet QA requirements and ensure highest accuracy performance. Digital communication conveys precise calibration values to the instrument and confirms that verification values are measured within tolerance.* Results of sequential 770MAX calibrations are retained in the calibrator's memory with a real time clock to allow subsequent downloading to a PC for printout of calibration certificates. Software and cables are included.

An interconnect cable is supplied to connect the calibrator to the instrument. The 770MAX 4-wire resistance measuring technique eliminates patch cord resistance effects.

* US Patent No. 5,248,933

- Resistance Accuracy:** ±0.05% except ±0.075% for 1-10 Mohm
- Temperature Accuracy:** ±0.1 °C
- Frequency Accuracy:** ±0.03%
- Voltage Accuracy:** ±0.5 mV
- NIST traceability:** documented on certificate of calibration for calibrator
- Ambient temperature:** 20-40°C for rated accuracy
- Memory capacity:** 20 channels of calibration and/or verification (770MAX has 4 smart channels per instrument)
- Power Supply rating:** 90-264 V, 47-63 Hz; CE compliant, CSA rated, UL listed
- Dimensions:** 7.7 x 4.0 x 1.6" (195 x 100 x 40 mm)



The 1875 Kit includes:

- Smart Automatic Calibrator with certificate of calibration
- Calibrator-to-MAX Cable, connects to smart channel input, 5 ft (1.5 m)
- RS232 DB9 cable for connection to computer port
- MAX Certificate Management Program for Windows 95 or higher on 3.5" disk (approx. 0.5 MB)
- Modular power supply and cable, used when Calibrator is not connected to a 770MAX, during download to the computer.

770MAX
*** Certificate of Recalibration ***

Thornton Inc., an ISO9001 certified company, hereby certifies that the item below will meet or exceed all published measurement specifications when calibrated in accordance with the referenced procedure as indicated by Pass/Fail Below. The calibration procedures for the Smart Calibrator comply with ISO 10012. The standards used are traceable to the National Institute of Standards and Technology (NIST).

DATE OF CAL: _____
 MODEL NUMBER: _____ CAL. REFERENCE PER: Factory Procedure TP97201
 SERIAL NUMBER: _____ or User Manual 84386
 MEASUREMENT CHANNEL: 1

*** Calibration Standards ***

MAKE: Thornton Inc. 1875 Smart Calibrator V1.04

SERIAL#	0-1Mohm		>1Mohm		VOLTAGE	FREQUENCY	DUE DATE
	RES/TEMP	ACCURACY	RES/TEMP	ACCURACY			
387053	+/- 0.050%		+/- 0.075%		+/- 0.5mV	+/- 0.03%	08-Apr-02

RANGE: (Ohms)	INPUT VALUE	DEVIATION		MEASURED		LIMIT	P/F
		BEFORE	P/F	AFTER VALUE	AFTER		
1	3976154.0	0.00%	PASS	3976154.0	0.00%	+/- 0.30%	PASS
2	157574.0	0.04%	PASS	157574.0	0.00%	+/- 0.30%	PASS
3	6958.3	0.00%	PASS	6958.3	0.00%	+/- 0.30%	PASS
4	9.993	0.09%	PASS	9.993	0.00%	+/- 0.30%	PASS
TEMP: (Ohms)	1001.1	0.01%	PASS	1001.1	0.00%	+/- 0.20%	PASS
VOLTAGE: (Volts)	1.3350	0.1mV	PASS	1.3350	0.0mV	+/- 2.00mV	PASS
FREQUENCY: (Hz)	99.992	0.00%	PASS	99.992	0.00%	+/- 0.03%	PASS

RANGE: (Ohms)	INPUT VALUE	DEVIATION		MEASURED		LIMIT	P/F
		BEFORE	P/F	AFTER VALUE	AFTER		
1	157574.0	-0.00%	PASS	157574.0	0.00%	+/- 0.30%	PASS
2	6958.3	-0.01%	PASS	6958.3	0.00%	+/- 0.30%	PASS
3	498.6	-0.01%	PASS	498.6	0.00%	+/- 0.30%	PASS
4	498.6	-0.31%	FAIL*	498.6	0.00%	+/- 0.30%	PASS
TEMP: (Ohms)	1391.5	0.00%	PASS	1391.5	0.00%	+/- 0.20%	PASS
VOLTAGE: (Volts)	-1.3337	-0.0mV	PASS	-1.3337	0.0mV	+/- 2.00mV	PASS
FREQUENCY: (Hz)	1001.7	0.00%	PASS	1001.7	0.00%	+/- 0.03%	PASS

RANGE: (Ohms)	INPUT VALUE	DEVIATION		MEASURED		LIMIT	P/F
		BEFORE	P/F	AFTER VALUE	AFTER		
1	1805661.0	0.00%	PASS	1805645.0	0.00%	+/- 0.30%	PASS
2	24924.9	0.00%	PASS	24923.9	-0.00%	+/- 0.30%	PASS
3	1391.5	-0.00%	PASS	1391.5	0.00%	+/- 0.30%	PASS
4	199.9	0.03%	PASS	199.6	-0.02%	+/- 0.30%	PASS
TEMP: (Ohms)	1097.1	0.00%	PASS	1097.0	-0.00%	+/- 0.20%	PASS
VOLTAGE: (Volts)	0.6679	0.3mV	PASS	0.6681	0.2mV	+/- 2.00mV	PASS
FREQUENCY: (Hz)	500.3	0.00%	PASS	500.3	0.00%	+/- 0.03%	PASS

Note:
Measurement certification consists of one page per channel

1885 Portable Conductivity/Resistivity Calibration System

The 1885 Portable Conductivity/Resistivity Calibration System enables verification of in-line sensors, without shutting down the process.

Principal of Operation

It is a standard practice to determine the cell constant of a sensor by comparing the reading of that sensor to the reading of a sensor with a known, certified cell constant. This procedure is described in ASTM D5391 and USP <645>. A key reason that this method is used by these standards organizations is the lack of accurate and stable liquid standards in the pure and ultrapure water ranges (less than 100 $\mu\text{S}/\text{cm}$).

The 1885 Calibration System includes the 230-211 Smart Sensor™ as the reference conductivity sensor, with a certified and traceable cell constant of $\pm 1\%$ and a temperature detector of $\pm 0.1\text{ }^\circ\text{C}$ at $25\text{ }^\circ\text{C}$. This reference sensor, mounted in a sealed flow chamber and connected to a Thornton 770MAX Instrument, measures a side-stream sample, delivered through user-supplied tubing. The 770MAX compensates and displays the sensor signal. The 770MAX would have been previously calibrated using the 1875 Smart Calibrator™ which has $\pm 0.075\%$ or better conductivity accuracy.

Thornton Factory Calibration

Thornton has an extensive ISO 9001 controlled QC procedure for certifying reference conductivity sensors and temperature compensators. First, cell constants for Thornton's transfer standard sensors are determined by using ASTM D1125 standard solutions C and D at $25\text{ }^\circ\text{C}$. Then, these cell constants are verified in a flowing high purity water loop at three precisely measured temperatures (15 , 25 and $40\text{ }^\circ\text{C}$), which are effectively three different

high purity standards. While in the loop, the RTDs in the transfer standard cells are calibrated at $25\text{ }^\circ\text{C}$, based on NIST-traceable temperature sensors.

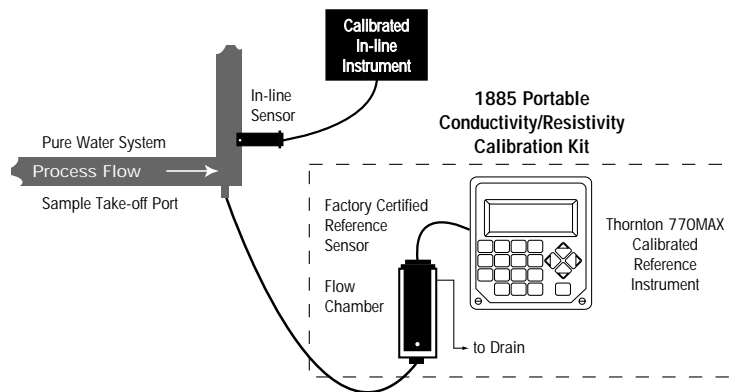
Next, production conductivity sensors are installed into the high purity loop, where temperature is controlled to $25\text{ }^\circ\text{C}$, along side the standard transfer sensors. Each production sensor cell constant is determined. The production sensor RTD is calibrated in the same manner. To complete the calibration process, a dedicated computer logs the readings, calculates the calibration cell constants, and generates a certificate of accuracy.

1885 components are then factory calibrated as a system, resulting in a typical total system accuracy of $\pm 1\%$ of reading near $25\text{ }^\circ\text{C}$. For additional information see 770MAX Instrument and 1875 Calibrator specifications and conductivity sensor datasheet MLO072.

The **1885 Kit** includes:

- 775-VA0: 770MAX with line cord
- 230-211: Smart Conductivity Sensor
- 1000-30: Stainless Steel Flow Chamber with 1/8" NPTF ports
- 1005-79: (2) Patch Cords 5 ft. (1.6 m)
- 1875: Automatic Smart Calibrator
- 13339: Carrying Case
- CAL-40: System Calibration, with report

The user supplies appropriate fittings and tubing between the flow chamber and the process take-off port. The length should be as short as possible, less than 3 ft. (1 m).





For the most current product information visit:

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