

# Analytical Transmitters

**LENNTECH**  
WATER TREATMENT SOLUTIONS



## THORNTON

Leading Pure Water Analytics

### M300 ISM Transmitters

Conductivity/Resistivity

pH/ORP

Dissolved Oxygen

**ISM**



**M300 ISM Transmitters**  
for Innovative Liquid Analysis

**METTLER TOLEDO**

# M300 ISM Analytical Transmitters with plug and measure capability

**METTLER TOLEDO THORNTON M300 ISM process analytical instrumentation provides reliable, accurate measurements of conductivity/resistivity, pH/ORP and dissolved oxygen. "Intelligent Sensor Management"™ technology provides the utmost in convenience and control of sensor performance.**

## **Quick and easy installation thanks to "Plug and Measure" capabilities**

Operational errors at the transmitter are virtually eliminated since all relevant status and configuration information is automatically transferred from the sensor to the transmitter during startup.

## **Features**

- Compact ¼ DIN panel mounting with NEMA 4X, IP65 panel seal
- Robust ½ DIN wall mounting with NEMA 4X, IP65 back cover
- ISM Sensors are immediately recognized at installation
- Measurements are available within seconds of connection
- ISM capabilities communicate type, model, serial number, full calibration data plus historical data
- Used with UniCond™ conductivity sensors with ISM for exceptionally wide range measurement
- On-line sensor diagnostics assure process surveillance
- Historical calibration and exposure information improves preventive maintenance programs
- Multiple languages: English, French, German, Italian, Spanish, Portuguese, Russian, Japanese
- CE compliant, UL Listed for US and Canadian standards



**ISM**

## **Applications**

**Pure and ultrapure water treatment** for semiconductor rinsing, critical power/steam makeup and pharmaceutical waters.

**Semiconductor processing** in rinsers and wet benches with precise resistivity measurement and temperature compensation.

**Power plant cycle chemistry and stator cooling** monitoring with exceptionally accurate temperature compensation for specific and cation conductivity and pH and very low maintenance dissolved oxygen measurement.

**Pharmaceutical water monitoring** to meet USP, EP, and JP conductivity requirements including built-in tables of alarm limits.

**Reclaim, recycle and wastewater treatment** for the above industry applications for contaminant detection, diversion and neutralization.

# M300 ISM Multiparameter Transmitter

- One or two field-configurable plug & measure channels for any available measurement parameters
- ISM for Conductivity/resistivity, pH/ORP, and/or dissolved oxygen
- Reduces number of instruments and amount of panel space



## Measurement Specifications

Functional		
Conductivity/Resistivity Ranges		
0.01 Constant Sensor	0.002 to 500 µS/cm (2000 ohm-cm to 500 Mohm-cm)	
0.1 Constant Sensor	0.02 to 50,000 µS/cm (20 ohm-cm to 50 Mohm-cm)	
Readout in equivalent S/m ranges is selectable		
TDS Ranges (CaCO <sub>3</sub> and NaCl)	Cover equivalent conductivity ranges	
RO % Rejection	0-100% (computed from two conductivity measurements)	
Conductivity Resolution	Four significant digits, auto-ranged	
pH, ORP Ranges	-1.00 to 15.00 pH, -1500 to 1500 mV; resolution 0.01 pH, 1 mV	
Dissolved Oxygen Ranges	0-20,000 ppb; 0-20 ppm, 0-200% saturation; resolution 0.1 ppb	
Temperature Measurement Range	-40 to 200 °C (-40 to 392 °F); resolution 0.1 °	
Temperature Sensor Input	Digital from sensor	
Update rate	Display and outputs, once per second	
Temperature Compensation		
Conductivity/Resistivity	Selectable as: Std (standard high purity Thornton/Light), Light 84, Std referenced to 75°C, linear %°C, 50% glycol, 100% glycol, cation, ammonia, isopropyl alcohol, none	
pH	Automatic / manual for electrode output, plus adjustable solution temperature coefficient for solution ionization effects	
Dissolved Oxygen	Automatic, for membrane permeability and oxygen solubility	
Conductivity/Resistivity Calibration	1- or 2-point	
pH Calibration	1- or 2-point, with auto buffer recognition	
pH Diagnostics	Selectable continuous checking of membrane resistance and reference diaphragm/junction resistance (with solution ground sensors)	
Dissolved Oxygen Calibration	Air/comparison, zero	
Sensor maximum distance	91 m (300 ft) conductivity; 20 m (66 ft) pH, ORP, DO	
Performance		
System Accuracy		
Conductivity/Resistivity	Identical to sensor	
pH, ORP	Identical to sensor	
Dissolved Oxygen	Identical to sensor	
Outputs – see p. 4 for ratings	One Channel	Two Channel
Setpoints/Alarms	4 - high, low, outside, between, USP or EP	6 - high, low, outside, between, USP or EP
Relays	2 - SPDT, 2 SPST reed	2 SPDT, 1 SPST NO, 1 SPST NC, 2 SPST reed
Analog Output Signals	2	4
Discrete Inputs	1	2

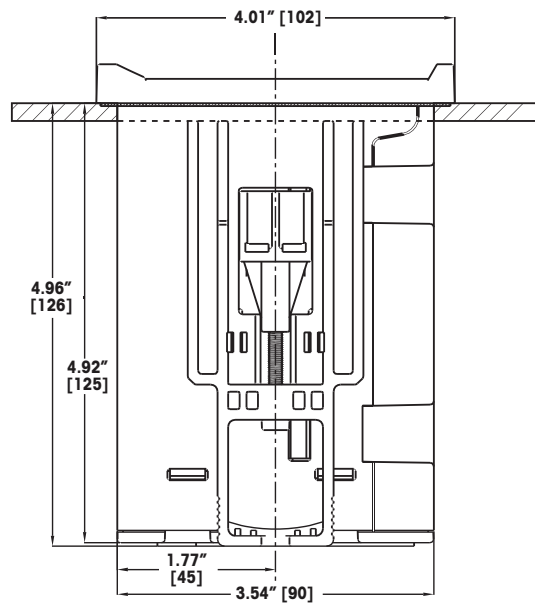
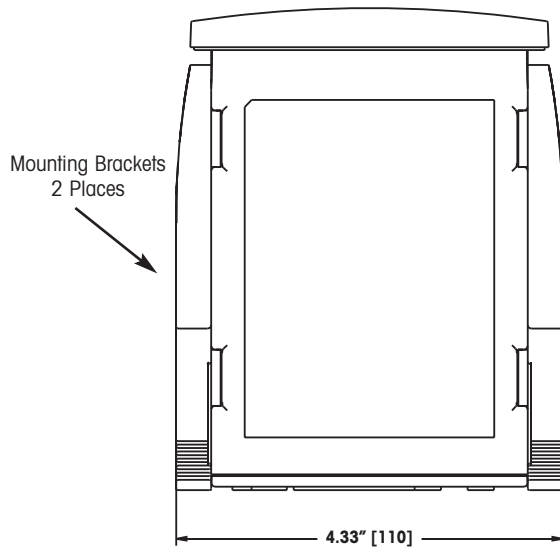
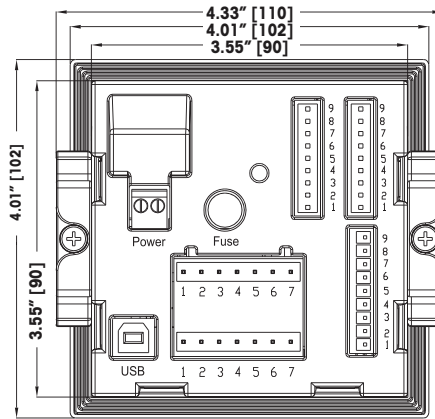
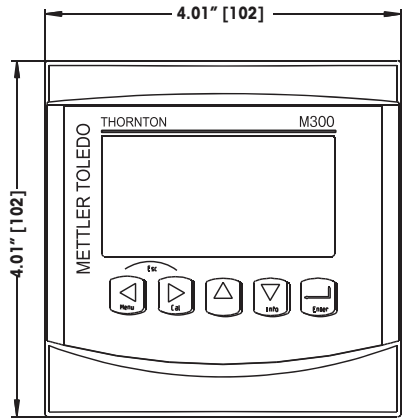
# M300 ISM Multiparameter Transmitter

## Physical and Electrical Specifications

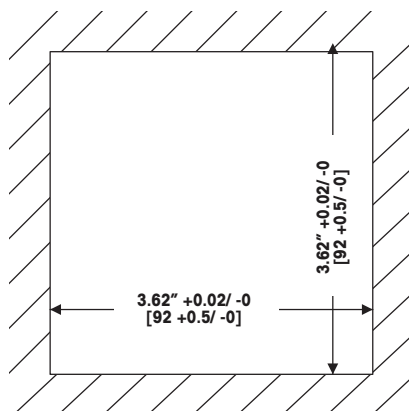
<b>Enclosure/Power</b>	
Operator interface	4 line back-lit LCD; 5-tactile keys
1/4 DIN Model Dimensions (H x W x D)	4.01 x 4.01 x 5.51 in (102 x 102 x 140 mm)
Max. Depth, - panel mounted	4.96 in (126 mm), excluding plug-in connectors
1/2 DIN Model Dimensions (H x W x D)	5.90 x 5.90 x 4.57 in (150 x 150 x 116 mm)
Max. Depth, - panel mounted	3.46 in (88 mm)
Material	Polycarbonate
Weight, 1/4 DIN Models	1.5 lb (0.7 kg)
Weight, 1/2 DIN Models	2 lb (1 kg)
UL Electrical Environment	Installation (overvoltage) Category II
Ratings/Approvals	UL listed, CE compliant; NEMA 4X, IP 65 - 1/2 DIN wall mount and 1/4 DIN panel seal
EMC Emissions	According to EN55011 Class A
Power	Universal 100-240 VAC, 50-60 Hz or 20-30 VDC; 5 W (on power loss, all settings are retained in non-volatile memory without batteries)
<b>Environmental</b>	
Storage temperature	-40 to 70 °C (-40 to 158 °F)
Ambient temperature operating range	-10 to 50 °C (14 to 122 °F)
Relative humidity	0 to 95%
<b>Outputs</b>	
Analog outputs (as specified for individual models)	Powered 0/4-20 mA, 22 mA alarm, 500 ohms maximum load; not for use with externally powered circuits
Analog output accuracy	± 0.05 mA
Analog output scaling	Linear, bi-linear, logarithmic (1,2,3 or 4 decades), auto-ranging
Relays (as specified for individual models)	All contacts are potential free, with adjustable hysteresis and time delay
SPDT, SPST NO, SPST NC	250 VAC/30 VDC, 3 A, resistive
SPST reed	300 VDC, 0.5 A, 10 W
Digital communications	USB, type B connector, for remote configuration and data acquisition
Discrete input (as specified for individual models)	Accepts dry contact closure for remote PID control auto/manual selection
<b>PID Control</b>	
Display	Auto/manual status and % output on bottom line of display
Settings	Auto/manual, setpoint, deadband, non-linear corner points, control limits, proportional gain, integral reset time (min.), derivative rate time (min.)
Manual Station	Controlled by up/down arrow keys in manual mode; remote auto/manual selection by discrete input
Control Output Types	One or two analog signals, relays—pulse frequency, or relays—pulse length

# M300 ISM Multiparameter Transmitter

Dimensions for 1/4 DIN panel-mount models

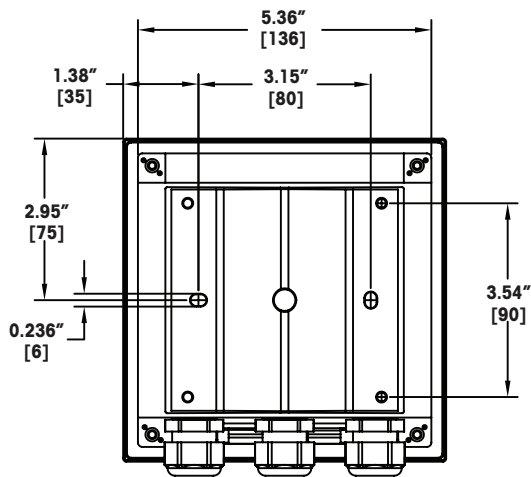
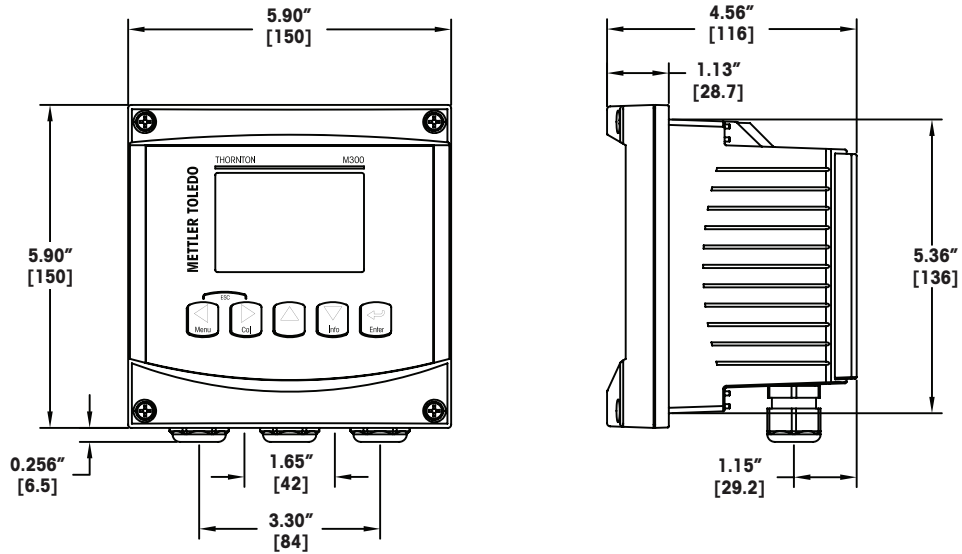


Dimensions for 1/4 DIN panel cutout

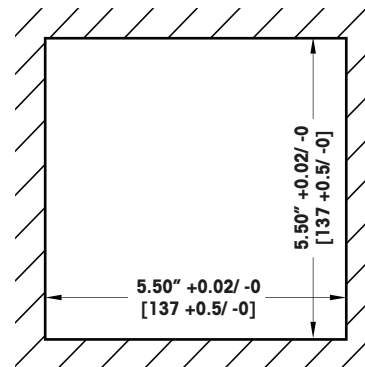


Dimensions in inches [mm]

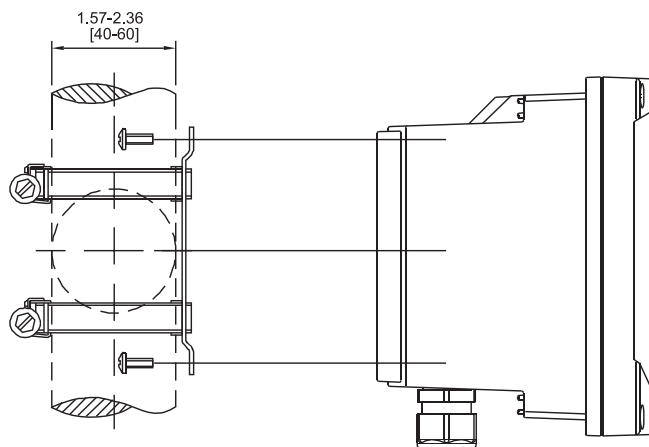
Dimensions for 1/2 DIN wall/panel-mount models



Panel Cutout Dimensions



Dimensions for 1/2 DIN pipe mount kit



Dimensions in inches [mm]

# Ordering Information

## M300 ISM Transmitters

Description		Part Number
<b>1/4 DIN enclosure – panel mounting kit included</b>		
M300 ISM	1-channel Multiparameter	<b>58 000 301</b>
M300 ISM	2-channel Multiparameter	<b>58 000 302</b>
<b>1/2 DIN enclosure – panel/wall/pipe mount*</b>		
M300 ISM	1-channel Multiparameter	<b>58 000 311</b>
M300 ISM	2-channel Multiparameter	<b>58 000 312</b>

\* Panel and pipe mounting require kits, listed below, ordered separately.

## Accessories

Description	Part Number
Panel Mount Kit for 1/2 DIN models	<b>52 500 213</b>
Pipe Mount Kit for 1/2 DIN models	<b>52 500 212</b>
ISM Conductivity Calibration Module	<b>58 082 305</b>
Adapter Panel - M300 to 200/2000 cutout	<b>58 083 305</b>

## M300 ISM Sensor Cables

Thornton Conductivity	Part Number
1 ft (0.3 m)	<b>58 080 270</b>
5 ft (1.5 m)	<b>58 080 271</b>
10 ft (3.0 m)	<b>58 080 272</b>
15 ft (4.5 m)	<b>58 080 273</b>
25 ft (7.6 m)	<b>58 080 274</b>
50 ft (15.2 m)	<b>58 080 275</b>
100 ft (30.5 m)	<b>58 080 276</b>
150 ft (45.7 m)	<b>58 080 277</b>
200 ft (61.0 m)	<b>58 080 278</b>
300 ft (91.4 m)	<b>58 080 279</b>

pH/ORP/DO	Part Number
3 ft (1 m)	<b>(10 000 0102) 59 902 167</b>
10 ft (3 m)	<b>(10 000 0302) 59 902 193</b>
16 ft (5 m)	<b>(10 000 0502) 59 902 213</b>
33 ft (10 m)	<b>(10 000 1002) 59 902 230</b>

# UniCond™ Conductivity Sensor Calibration Module

- Includes resistances for all ranges of conductivity/resistivity and temperature
- Connects between UniCond™ conductivity sensor and M300 ISM transmitter
- With NIST-traceable certificate of calibration
- Enables efficient QA program

Description	Accuracy	Part No.
ISM Conductivity Calibration Module	± 0.08%	<b>58 082 305</b>



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CE Compliant



UL listed  
Meets Canadian Standards