

# METTLER TOLEDO



## Mettler Toledo pH Sensors

### Intelligent Sensor Management (ISM®)

#### Increased Data Security and Easy Handling

Our Intelligent Sensor Management (ISM®) is a sophisticated safety concept that leaves nothing to chance. With this technology, the instrument will automatically detect the connected sensor and will use the most up-to-date calibration data stored on the sensor.

### Maximized pH Accuracy Fast and Reliable Results

pH measurements must be fast, accurate and reproducible. The membrane glass of our sensors is optimized for each application.



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## InPro 3100 (i) Versatile and Robust



InPro 3100

InPro 3100i

The InPro 3100 (i) is a combined pH electrode and temperature sensor designed specially for in-line pH measurements in bio-processes where CIP and SIP are used. This rugged gel-filled electrode leads the industry for fast and precise measurements, even after repeated autoclaving or sterilization cycles at 140 °C (284 °F). The electrode utilizes METTLER TOLEDO's silver-ion trap, keeping the reference junction clear even in the presence of sulfide-bearing solutions. With the InPro 3100 (i) UD, upside-down mounting is possible.

### Specifications

pH range	0 – 14 pH
Temperature	InPro 3100 (i): 0 to 80 °C (32 to 176 °F) for operation 0 to 140 °C (32 to 284 °F) for sterilization
	InPro 3100 (i) UD: 0 to 80 °C (32 to 176 °F) for operation 0 to 130 °C (32 to 266 °F) for sterilization
Operating pressure	0 to 6 barg @ 140 °C (0 to 87 psig @ 284 °F)
Cable connection	ISM: K8S; Analog: VP
Process connection	Pg 13.5 thread
Reference system	Argenthal with silver-ion trap
Type of junction	Ceramic junction
Reference electrolyte	Gel
Lengths	120 mm, 150 mm, 225 mm, 325 mm, 425 mm
Shaft diameter	12 mm
Temperature sensor	ISM: Digital;
	Analog: Pt 100 or Pt 1000
Sterilizable	Yes
Autoclavable	Yes
pH membrane	High alkali glass (HA)

**Certificates and Approvals** METTLER TOLEDO Quality Certificate, Pressure Equipment Directive guidelines (PED) 97/23/EC, ATEX: Ex ia IIC T6/T5/T4/T3 Ga/Gb, FM: IS Cl. I, II, III, Div 1, GR ABCDEFG/T6

### Intelligent Sensor Management (ISM)

pH electrodes with integrated ISM functionality allow Plug and Measure and advanced diagnostics. ISM simplifies the installation, handling and maintenance of measurement equipment. For more information see ISM introduction pages 10–11.

### Features Overview

- Fully autoclavable or sterilizable in-situ
- Gel electrolyte reduces maintenance
- Resistant to poisoning substances
- Ehedg certified
- Pressure resistant up to 6 barg (87 psig)
- Watertight connector (IP 68)
- Integral temperature sensor permits automatic temperature compensation



Also available for upside-down installation as InPro 3100 (i) UD.

# InPro 3250 (i) Highest Performance, Highest Accuracy



InPro 3253

InPro 3250i



### Features Overview

- Fully autoclavable or sterilizable in-situ (InPro 3250(i), InPro 3253(i))
- Pressurized electrolyte reduces maintenance
- MaxCert™, including biocompatibility according to USP 26, Chapter 87

The InPro 3250(i) family is a pre-pressurized, liquid-filled, low-maintenance pH sensor and temperature sensor for in-line measurements in demanding applications. Its durable design is well suited for harsh chemical process conditions or to meet the stringent demands of sterile biotech applications where CIP and SIP are used. These rugged electrodes lead the industry for fast and precise measurements, even after repeated autoclaving or sterilization cycles at 140 °C (284 °F). The InPro 3250(i) family is available with an expanded selection of different pH-sensitive glass membranes. This guarantees the best possible measurement performance under the most diverse operating conditions, both in chemical and biotech processes. The platinum-auxiliary electrode (solution ground) which functions to eliminate ground loop problems, allows for use of advanced sensor diagnostics, or can be used as an ORP (redox) sensor. Also available with Intelligent Sensor Management (ISM) for Plug and Measure and advanced diagnostics.

### Specifications

pH range	0 – 14 pH InPro 3250 (i); 0 – 12 pH InPro 3253 (i); 1 – 11 pH InPro 3251 (i), InPro 3252
Temperature	0 to 100 °C (32 to 212 °F) InPro 3250 (i), InPro 3253 (i); – 25 to 80 °C (– 13 to 176 °F) InPro 3251 (i); 0 to 80 °C (32 to 176 °F) InPro 3252
Operating pressure	0 to 4 barg (0 to 58 psig)
Cable connection	ISM: K8S; Analog: VP
Process connection	Pg 13.5 thread
Reference system	Argenthal with silver-ion trap
Type of junction	Ceramic junction
Reference electrolyte	Pre-pressurized liquid
Lengths	120 mm, 225 mm, 325 mm, 425 mm
Shaft diameter	12 mm
Temperature sensor	ISM: digital Analog: Pt 100 or Pt 1000
Sterilizable	Yes, up to 140 °C (284 °F)
Autoclavable	Yes
pH membrane	Various by applications
<b>Certificates and Approvals</b>	METTLER TOLEDO Quality Certificate, Pressure Equipment Directive guidelines (PED) 97/23/EC, ATEX: Ex ia IIC T6/T5/T4/T3 Ga/Gb, FM: IS Cl. I, II, III, Div 1, GR ABCDEFG/T6

### Intelligent Sensor Management (ISM)

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# InPro 4260 (i)/InPro 4281 i

## Reliable, Long-lasting Electrodes



InPro 4260i



InPro 4281i



The InPro 4260 (i)/InPro 4281 i is a combined pH electrode and temperature sensor family designed for highly demanding chemical applications. InPro 4260 (i)/InPro 4281 i electrodes feature Xerolyt® Extra polymer reference electrolyte for precise pH measurement and longer lifetime, even under the most difficult industrial environments. Also available with Intelligent Sensor Management (ISM) for Plug and Measure and advanced diagnostics.

### Specifications

pH range	0–14 pH InPro 4260 (i); 1–14 pH InPro 4261 (i), InPro 4281 (i)
Temperature	InPro 4260 (i), InPro 4281 i: 0 to 130 °C (32 to 266 °F) InPro 4262 (i): 0 to 80 °C (32 to 176 °F)
Operating pressure	15 barg @ 25 °C, 7 barg @ 130 °C (0 to 217 psig @ 77 °F, 101 psig @ 266 °F)
Cable connection	ISM: K8S; Analog: VP
Process connection	Pg 13.5 thread
Reference system	Argenthal
Type of junction	Open junction with direct contact to media
Reference electrolyte	Xerolyt® Extra
Lengths	120 mm, 225 mm, 425 mm
Shaft diameter	12 mm
Shaft materials	InPro 426x (i): Glass; InPro 428xi: Titanium
Temperature sensor	ISM: Digital; Analog: Pt100 or Pt1000
Sterilizable	No
Autoclavable	No
pH membrane	Various by applications
Solution ground	InPro 426x (i): Platinum; InPro 428xi: Titanium

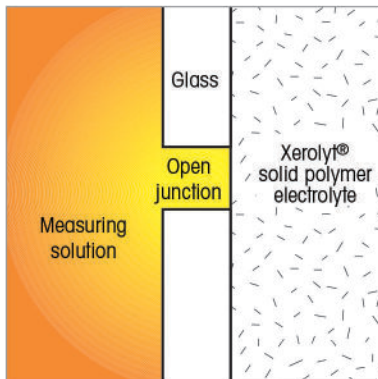
**Certificates and Approvals** METTLER TOLEDO Quality Certificate, Pressure Equipment Directive guidelines (PED) 97/23/EC, ATEX: Ex ia IIC T6/T5/T4/T3 Ga/Gb, FM: IS Cl. I, II, III, Div 1, GR ABCDEFG/T6 EN 10204-3.1 (InPro 4281 i)

### Intelligent Sensor Management (ISM)

pH electrodes with integrated ISM functionality allow Plug and Measure and advanced diagnostics. ISM simplifies the installation, handling and maintenance of measurement equipment. For more information see ISM introduction pages 10–11.

### Features Overview

- Xerolyt polymer electrolyte
- Open junction eliminates clogging
- Resistant to poisoning substances
- Expanded pH range covers 0–14 pH
- Resistant to solvents, strong acids and alkali
- Domed glass membrane impedes bubble formation for greater reliability
- Watertight connector (IP68), integral temperature sensor
- ATEX and FM certified for hazardous areas
- InPro 4281 i electrode is made with a rugged titanium shaft, providing exceptional chemical resistance and durability.
- InPro 4281i features a flat pH membrane suited for fibers and high solids samples



Open reference junction

► [www.mt.com/InPro4260](http://www.mt.com/InPro4260)

# InPro 4800 (i)/InPro 4881 i For Harsh Environments



InPro 4800i



InPro 4881 i

The InPro 4800 (i)/InPro 4881 i is the top-of-the-line combined pH and temperature electrode family designed to handle high-temperature and high-pressure dirty chemical applications. The strong resistance to oxidizing media, solvents, acid and alkali solutions make it suitable for highly demanding industrial applications including chemical processing, chlor-alkali, pulp and paper, dyes and pigments, and sugar processing.

Also available with Intelligent Sensor Management (ISM) for Plug and Measure and advanced diagnostics.

### Specifications

pH range	0 – 14 pH InPro 4800 (i); 1 – 14 pH InPro 4801 (i), InPro4881 i 1 – 11 pH InPro 4802 (i)
Temperature	InPro 4800 (i), InPro 4801 (i), InPro 4881 i: – 5 to 130 °C (23 to 266 °F) InPro 4802 (i): 0 to 80 °C (32 to 176 °F)
Operating pressure	12 barg @ 130 °C (174 psig @ 266 °F)
Cable connection	ISM: K8S; Analog: VP
Process connection	Pg 13.5 thread
Reference system	Ag/AgCl system, pressure-compensated double gel-electrolyte chambers
Type of junction	Exterior: PTFE annular diaphragm Interior: Non-flow ceramic diaphragm
Reference electrolyte	Gel
Lengths	120 mm, 225 mm, 425 mm
Shaft diameter	12 mm
Shaft materials	InPro 480x (i): Glass InPro 488xi: Titanium
Temperature sensor	ISM: Digital; Analog: Pt 100 or Pt 1000
pH membrane	Various by applications
Solution ground	InPro 480x (i): Platinum InPro 488xi: Titanium
Sterilizable	No
Autoclavable	No
Solution ground	Platinum
Glass membrane	InPro 4800: Cylindrical, high alkali quality glass InPro 4801 SG, InPro 4881 i: Flat, low impedance quality glass

**Certificates and Approvals** METTLER TOLEDO Quality Certificate  
Pressure Equipment Directive guidelines (PED) 97/23/EC,  
ATEX: Ex ia IIC T6/T5/T4/T3 Ga/Gb,  
FM: IS Cl. I, II, III, Div 1, GR ABCDEFG/T6  
EN 10204-3.1 (InPro 4281 i)

### Intelligent Sensor Management (ISM)

pH electrodes with integrated ISM functionality allow Plug and Measure and advanced diagnostics. ISM simplifies the installation, handling and maintenance of measurement equipment. For more information see ISM introduction pages 10 – 11.

# InPro 4850 i

## For the Toughest Chlor-Alkali Processes



InPro 4850 i is a combination pH electrode featuring a sodium membrane glass that uses the sodium concentration in the process (brine) as a reference. The difference in electrical potential between the pH-glass and the sodium reference glass is converted into the pH value. The sodium reference system is highly resistant to chlorine and other oxidizing agents. This makes the sensor very well suited for the demanding process conditions in chlor-alkali production. Solution ground and shielding eliminate interference, and enable redox measurement. Digital signal conversion ensures 100% signal integrity and stability. Intelligent Sensor Management (ISM) technology simplifies sensor handling and reduces sensor lifecycle costs.

### Specifications

pH range	0 – 14 pH
Temperature	– 10 to 120 °C (14 to 248 °F)
Operating pressure	0 to 13 barg @120 °C (0 to 188 psig @ 248 °F)
Cable connection	ISM: K8S
Process connection	Pg 13.5 thread
Reference system	Sodium sensitive glass membrane
Type of junction	None
Lengths	120 mm, 225 mm
Shaft diameter	12 mm
Temperature sensor	Digital
Sterilizable	No
Autoclavable	No
pH membrane	High alkali resistant glass (HA)
Shaft material	Glass
Redox measurement	Yes
Min. Na <sup>+</sup> concentration	10 mg/L when pH > 7; 100 mg/L when 7 > pH > 2; 1 g/L when pH < 2
Storage solution	Storage solution buffer pH = 4.01/Na 3.9 M (P/N 52 004 103)

**Certificates and Approvals** METTLER TOLEDO Quality Certificate, Pressure Equipment Directive guidelines (PED) 97/23/EC ATEX: Ex ia IIC T6/T5/T4/T3 Ga/Gb, FM: IS Cl. I, II, III, Div 1, GR ABCDEFG/T6

### Intelligent Sensor Management (ISM)

pH electrodes with integrated ISM functionality allow Plug and Measure and advanced diagnostics. ISM simplifies the installation, handling and maintenance of measurement equipment. For more information see ISM introduction pages 10–11.

### Features Overview

- Hermetically sealed reference system resistant to any effects from poisoning substances such as chlorine.
- Very high resistance to oxidizing media, solvents, and acid or alkali solutions.
- Reliable operation in processes with particularly high pressures and high temperatures.
- Platinum solution ground (SG) electrode enables redox (ORP) measurement and advanced sensor diagnostics, as well as preventing measurement errors due to ground potentials.



### Did You Know

InPro 4850 i requires a near stable sodium concentration for the best measurement results. A 10% difference in brine concentration leads to 0.05 pH error.