

# InPro® 6950 / 6900 / 6800 / 6050

The O<sub>2</sub> sensor family for dissolved oxygen measurement

## Technical Data



InPro 6950/6900/6800/6050

### Short description

The InPro O<sub>2</sub> sensor family provides the means for reliable inline measurement of dissolved oxygen in a wide spectrum of processes that operate under sterile/hygienic conditions. To meet the range of respective requirements, METTLER TOLEDO offers a selection of advanced O<sub>2</sub> sensors and measuring systems for, in particular, the beverage industry and biotechnology.

Outstanding features of the O<sub>2</sub> sensors are:

- hygienic design, capable of withstanding CIP procedures
- stainless steel surfaces with highly polished finish
- steam sterilizable and autoclavable up to 140 °C
- low detection limit at high signal stability
- O-rings with FDA and USP Class VI approval
- minimal maintenance requirement
- ISM (Intelligent Sensor Management)

Measuring systems for non-hygienic applications, such as in wastewater/effluent treatment, are also available.



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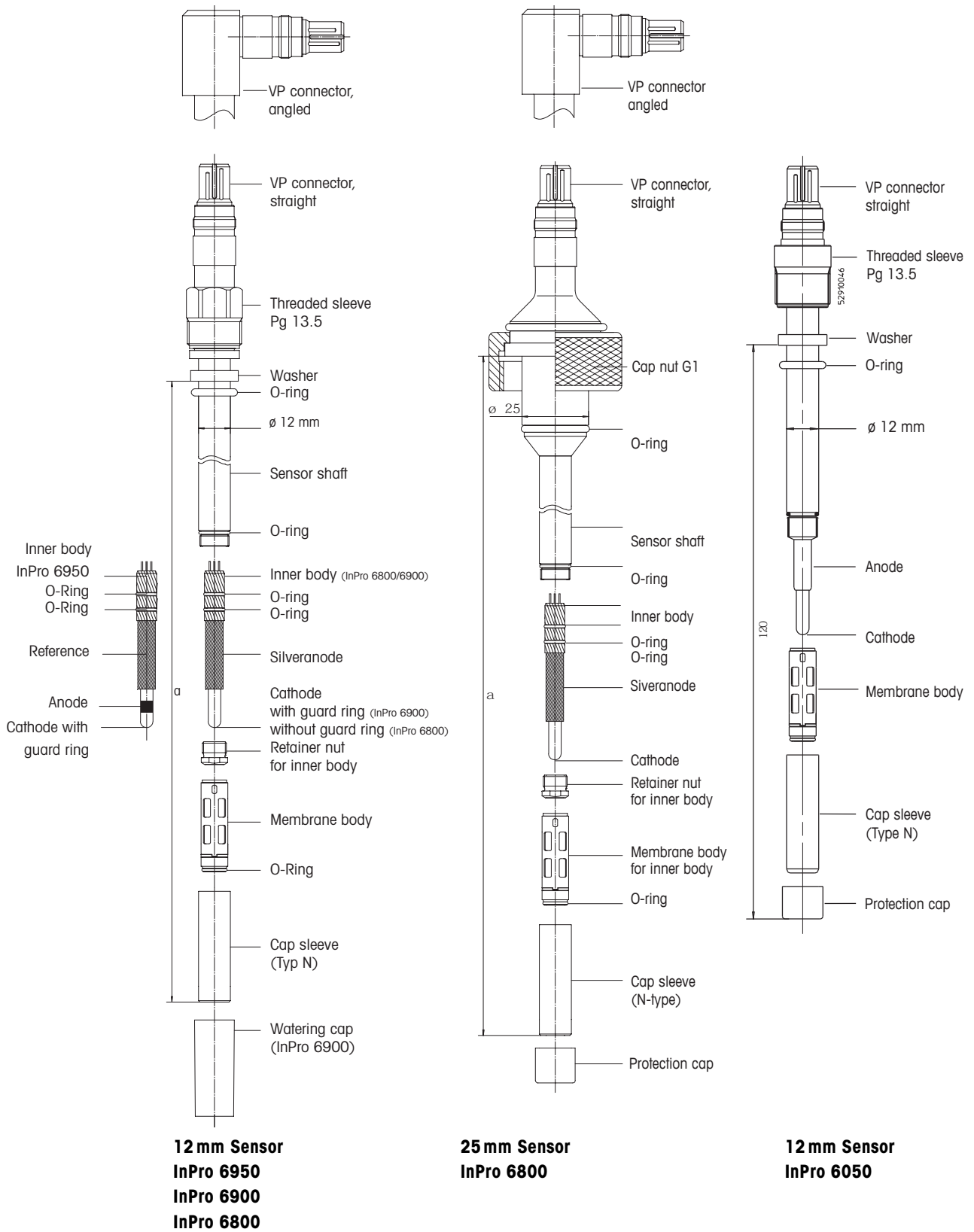
**METTLER TOLEDO**

Typical applications	InPro 6950	InPro 6900	InPro 6800	InPro 6050
<b>Biotechnology/Pharma</b>				
Fermentation	–	–	•	–
<b>Brewery</b>				
Yeast propagation	–	–	•	–
CO <sub>2</sub> recovery	• (after recovery)	–	• (before recovery)	–
CO <sub>2</sub> conditioning	•	•	–	–
Wort aeration	–	–	•	–
Filtration	•	•	–	–
Filling	•	•	–	–
<b>Mineral water and Soft drinks</b>				
Spring water conditioning	–	–	•	–
Filling	•	•	–	–
<b>Fruit juices and concentrates</b>				
Processing	–	–	•	–
Storage	–	–	•	–
<b>Environmental processes</b>				
Wastewater treatment	–	–	–	•
<b>Fish farming</b>				
	–	–	–	•

Specifications	InPro 6950	InPro 6900	InPro 6800	InPro 6050
<b>Measurement principle</b>	Amperometric/polarographic (in accordance with the requirements of ISO 5814 and EN 25814)			
<b>Working conditions</b>				
Permissible pressure range during measuring (absolute)	0.2 ... 9 bar (2.9 ... 130 psi)	0.2 ... 6 bar (2.9 ... 87 psi) using standard membrane	0.2 ... 6 bar (2.9 ... 87 psi)	0.5 ... 2 bar (7.2 ... 29 psi)
	–	0.2 ... 9 bar (2.9 ... 130 psi) using reinforced membrane	–	–
Mech. pressure resistance (absolute)	max. 12 bar (max. 174 psi)	max. 12 bar (max. 174 psi)	max. 12 bar (max. 174 psi)	max. 2 bar (max. 29 psi)
Permissible temperature range during measuring	0 ... 80 °C (32 ... 176 °F)	0 ... 80 °C (32 ... 176 °F)	0 ... 80 °C (32 ... 176 °F)	0 ... 60 °C (32 ... 140 °F)
Mechanical	–5 ... 121 °C (23 ... 250 °F)	–5 ... 121 °C (23 ... 250 °F)	–5 ... 140 °C (23 ... 284 °F)	0 ... 60 °C (32 ... 140 °F)
Temperature resistance	(steam-sterilizable)	(steam-sterilizable)	(steam-sterilizable/ autoclavable)	–
<b>Sensor performance</b>				
Detection limit				
– in aqueous media	0.1 µg/l [0.1 ppb]	1 µg/l [1 ppb]	6 µg/l [6 ppb]	30 µg/l [30 ppb]
– in liquids containing CO <sub>2</sub>	0.25 µg/l [0.25 ppb]	3 µg/l [3 ppb]	–	–

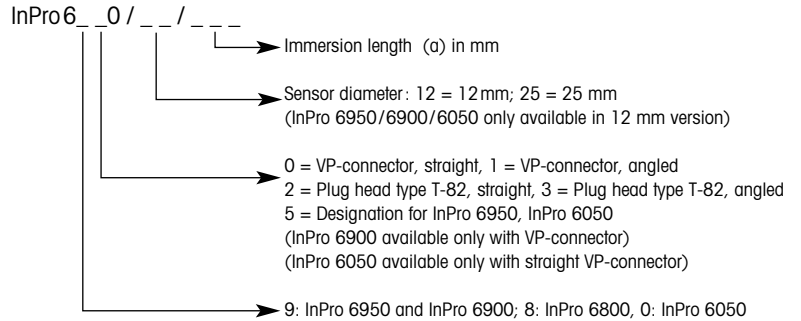
Specifications	InPro 6950	InPro 6900	InPro 6800	InPro 6050
Accuracy				
– in aqueous media	≤±[0.1 % + 1 ppb]	≤±[1 % + 1 ppb]	≤±[1 % + 6 ppb]	≤±[1 % + 30 ppb]
– in liquids containing CO <sub>2</sub>	≤±[1 % + 0.25 ppb]	≤±[1 % + 3 ppb]	–	–
Response time at 25 °C (77 °F) (air N <sub>2</sub> )	t <sub>98%</sub> < 90 s	t <sub>98%</sub> < 90 s	t <sub>98%</sub> < 90 s	t <sub>98%</sub> < 90 s
Sensor signal in ambient air at 25 °C (77 °F)	2500 ... 5000 nA	250 ... 500 nA	50 ... 110 nA	40 ... 110 nA
Residual signal in N <sub>2</sub> at 25 °C (77 °F)				
% of signal in in ambient air	≤±0.025 %	0.03 %	0.1 %	0.3 %
<b>Design features</b>				
Temperature compensation	automatic with built-in RTD			
Cable connection	VarioPin (IP 68)	VarioPin or T-82	VarioPin (IP 68)	VarioPin (IP 68)
Wetted O-rings	Silicone FDA & USP Class VI approved (other materials on request)	Silicone FDA & USP Class VI approved (other materials on request)	Silicone FDA & USP Class VI approved (other materials on request)	Silicone & Viton
O <sub>2</sub> selective membrane mat.	PTFE/Silicone (reinforced with steel mesh)			
Wetted sensor parts	S/steel 1.4404, [AISI 316L] with material certificate 3.1 (other materials on request)	S/steel 1.4404, [AISI 316L] with material certificate 3.1 (other materials on request)	S/steel 1.4404, [AISI 316L] with material certificate 3.1 (other materials on request)	Polyphenylene Sulfide (PPS)
Surface roughness of wetted s/steel parts (EN 1320: 1996)	Ra < 0.4 μm [16 μin]	Ra < 0.4 μm [16 μin]	Ra < 0.4 μm [16 μin]	–
Inner body	trace w. guard & ref. (exchangeable)	low ppb with guard (exchangeable)	standard (exchangeable)	value line (integral)
Cathode	platinum	platinum	platinum	platinum
Anode	Platinum	Ag/AgCl	Ag/AgCl	Ag/AgCl
Reference	Ag/AgCl	–	–	–
ATEX compatibility	⊕ Ex ia IIC T6/T5/ T4/T3 Ga/Gb ⊕ Ex ia IIIC T69°C/ T81°C/T109°C/ T161°C Da/Db	⊕ Ex ia IIC T6/T5/ T4/T3 Ga/Gb ⊕ Ex ia IIIC T69°C/ T81°C/T109°C/ T161°C Da/Db	⊕ Ex ia IICT6/T5/ T4/T3 Ga/Gb ⊕ Ex ia IIIC 69°C/ T81°C/T109°C/ T161°C Da/Db	
FM compatibility	IS CL I, II, III, Div 1/ABCDEFGF/T6	IS CL I, II, III, Div 1/ABCDEFGF/T6	IS CL I, II, III, Div 1/ABCDEFGF/T6	–
<b>Certificates (MaxCert™)</b>				
Quality (Final inspection Cert.)	•	•	•	•
EHEDG	• (pending)	•	•	–
FDA/USP Class VI	•	•	•	–
Material certificate 3.1	•	•	•	–
Surface finish certificate 2.1	•	•	•	–
ATEX/FM	•	•	•	–

Drawings



Ordering information

Product description



InPro 6950, 12 mm Ø	Order no. straight	Order no. angled
Immersion length (a)		
70 mm (2.8")	52 206 097	52 206 101
120 mm (4.7")	52 206 098	52 206 102
220 mm (8.7")	52 206 099	52 206 103
Version with flange		
InPro 6950/12/060 V80	52 206 110	

InPro 6900, 12 mm Ø	Order no. straight	Order no. angled
Immersion length (a)		
70 mm (2.8")	52 200 944	52 200 947
120 mm (4.7")	52 200 945	52 200 948
220 mm (8.7")	52 200 946	52 200 949
Version with flange		
InPro 6900/12/060 V80	52 200 951	

InPro 6800, 12 mm Ø	VP connector		T-82 connector	
	Order no. straight	Order no. angled	Order no. straight	Order no. angled
Immersion length (a)				
70 mm (2.8")	52 200 964	52 200 969	–	–
80 mm (3.2")	–	–	–	52 201 020
120 mm (4.7")	52 200 965	52 200 970	52 201 012	52 201 016
220 mm (8.7")	52 200 966	52 200 971	52 201 013	52 201 017
320 mm (12.6")	52 200 967	52 200 972	52 201 014	52 201 018
420 mm (16.5")	52 200 968	52 200 973	52 201 015	52 201 019

InPro 6800, 25 mm Ø	VP connector		T-82 connector	
	Order no. straight	Order no. angled	Order no. straight	Order no. angled
Immersion length (a)				
80 mm (3.2")	52 200 974	52 200 978	52 201 023	–
160 mm (6.3")	52 200 975	52 200 979	52 201 021	52 201 024
260 mm (10.2")	52 200 976	52 200 980	52 201 022	52 201 025
360 mm (14.2")	52 200 977	52 200 981	–	–

InPro 6050	Order no.
InPro 6050/12/120	52 200 851

**Compatibility with METTLER TOLEDO transmitters**

Please ask your local METTLER TOLEDO representative.

	InPro 6950	InPro 6900	InPro 6800	InPro 6050
M 700	• (traces module)	• (ppb module)	•	–
M400 Type 2	–	–	•	•
M400 Type 3	–	•	•	•
M400 2H/2XH	•	•	•	•
M800 1-channel	•	•	•	•

**Compatibility with METTLER TOLEDO housings**

Please ask your local METTLER TOLEDO representative.

Static housings	12 mm Ø	25 mm Ø
INGOLD "safety weld-in socket"	–	•
InFit 761 CIP	•	–
<b>Retractable housing</b>		
InTrac 777 e	•	–
InTrac 797 e	•	–
<b>Immersion housing</b>		
InDip 550	•	–

**Accessories**



**O<sub>2</sub> Sensor Master InPro 6950/6900/6800/6050**

The sensor master serves to polarize the connected sensor in air as well as to check functioning of the sensor. Perfect operation of the sensor master can also be verified through a self-check procedure.

**O<sub>2</sub> Sensor Simulator**

The sensor simulator is used to perform a function check of transmitter and cable. It simulates the behavior of the sensor in air and in an oxygen-free medium. This device can be used to simulate all O<sub>2</sub> Sensors.

Sensor	Order. no
O <sub>2</sub> sensor master InPro 6950	52 206 113
O <sub>2</sub> sensor master InPro 6900	52 200 893
O <sub>2</sub> sensor master InPro 6800/6050	52 200 892
O <sub>2</sub> sensor simulator	52 200 891
Zeroing gel for zero-point control	30 300 435
Adapter T-82 bushing – VP connector	52 200 939
Adapter VP bushing – T-82 connector	52 200 940

VP cable	Order. no	Order. no	
Temp. range –30 ... 80 °C (–22 ... 176 °F)		Temp. range –30 ... 130 °C (–22 ... 266 °F)	
VP6-ST/1 m	52 300 107	VP6-HT/1 m	52 300 111
VP6-ST/3 m	52 300 108	VP6-HT/3 m	52 300 112
VP6-ST/5 m	52 300 109	VP6-HT/5 m	52 300 113
VP6-ST/10 m	52 300 110	VP6-HT/10 m	52 300 114
VP6-ST/15 m	52 300 144	VP6-HT/15 m	52 300 237
VP6-ST/35 m	52 300 184		

## Spare parts

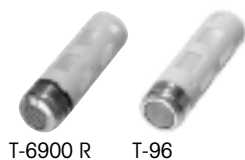
InPro 6950	Order. no
Membrane body InPro 6950 (singly)	52 206 105
Membrane kit InPro 6950 (4 membrane bodies, 1 O-ring set, 2 × 5 ml electrolyte)	52 206 106
InPro 6950 electrolyte pack (3 × 5 ml)	30 298 426
Inner body InPro 6950 (exchangeable)	52 206 112
InPro 6900	
Membrane body T-6900 (singly)	52 201 049
Membrane kit T-6900 (4 membrane bodies, 1 O-ring set, 2 × 5 ml electrolyte)	52 201 003
Membrane body T-6900 (16 pcs)	52 202 116
Reinforced membrane body T-6900 R (singly)	52 201 108
Membran-kit T-6900 R (4 reinforced membrane bodies, 1 O-ring set, 2 × 5 ml electrolyte)	52 201 109
InPro 6900 electrolyte pack (3 × 5 ml)	30 298 425
Inner body InPro 6900 (exchangeable)	52 200 943
Conversion kit InPro 6800 to InPro 6900 (Inner body, membrane body, instruction manual)	52 201 004
InPro 6950/6900/6800	
Cap sleeve N, s/steel 1.4404 (AISI 316L)	52 200 037
Cap sleeve N, s/steel 1.4435 (AISI 316L)	52 201 153
Cap sleeve P, s/steel 1.4404 (AISI 316L)	52 200 038
Cap sleeve P, s/steel 1.4435 (AISI 316L)	52 201 154
InPro 6800/6050	
Membrane body T-96 (singly)	52 200 071
Membran-kit T-96 (4 membrane bodies, 1 O-ring set, 25 ml electrolyte)	52 200 024
Membrane body S-96 (singly)	52 200 072
Membran-kit S-96 (4 membrane bodies, 1 O-ring set, 25 ml electrolyte)	52 200 025
Membrane body T-96 (16 pcs)	52 206 114
Membrane body S-96 (16 pcs)	52 206 115
O <sub>2</sub> electrolyte pack (3 × 25 ml)	30 298 424
Inner body InPro 6800 (exchangeable)	52 200 899



InPro 6950    InPro 6800

**Inner body**

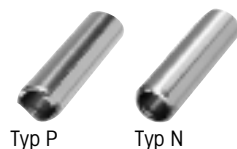
The inner body is the virtual heart of an oxygen sensor. Over and above that of the standard InPro 6800 version, the inner body of the InPro 6900 sensor is equipped with an ancillary annular protective cathode to provide increased signal stability. This makes it possible to achieve detection limits of 1 ppb. Occurrence of the "Stop-of-Flow Effect" often experienced during the bottling of beverages is thereby drastically reduced.



T-6900 R    T-96

**Membrane body**

The annular, stainless steel reinforcement of the membrane body T-6900 R enables operation at pressures of up to 9 bar. Both the T-96 and T-6900 membrane bodies are PTFE-coated, and therefore optimally protected against the aggressive influences of CIP and SIP cleaning cycles. On the other hand, the membrane bodies S-96 are coated with a layer of silicone, which is thinner than a PTFE layer. This reduces the response time  $t_{98\%}$  from 90 sec. to 60 sec. All membrane bodies are supplied complete with material certificate.



Typ P    Typ N

**Cap sleeve**

In contrast to the cap sleeve Type N, the P version is equipped additionally with a protective cage and 3 stand-offs to provide increased protection for the sensitive measuring tip of the O<sub>2</sub> sensor. Cap sleeves are supplied complete with material certificate.

## Sales and Service:

### Australia

Mettler-Toledo Limited  
220 Turner Street  
Port Melbourne, VIC 3207  
Australia  
Phone +61 1300 659 761  
e-mail info.mtaus@mt.com

### Austria

Mettler-Toledo Ges.m.b.H.  
Laxenburger Str. 252/2  
AT-1230 Wien  
Phone +43 1 607 4356  
e-mail prozess@mt.com

### Brazil

Mettler-Toledo Ind. e Com. Ltda.  
Avenida Tamboré, 418  
Tamboré  
BR-06460-000 Barueri/SP  
Phone +55 11 4166 7400  
e-mail metfler@metfler.com.br  
service@metfler.com.br

### Canada

Mettler-Toledo Inc.  
2915 Argentia Rd #6  
CA-ON L5N 8G6 Mississauga  
Phone +1 800 638 8537  
e-mail Proinsidesales@mt.com

### China

Mettler-Toledo International Trading  
(Shanghai) Co. Ltd.  
589 Gui Ping Road  
Cao He Jing  
CN-200233 Shanghai  
Phone +86 21 64 85 04 35  
e-mail ad@mt.com

### Croatia

Mettler-Toledo d.o.o.  
Mandlova 3  
HR-10000 Zagreb  
Phone +385 1 292 06 33  
e-mail mt.zagreb@mt.com

### Czech Republic

Mettler-Toledo s.r.o.  
Trebohosticka 2283/2  
CZ-100 00 Praha 10  
Phone +420 2 72 123 150  
e-mail sales.mtcz@mt.com

### Denmark

Mettler-Toledo A/S  
Naverland 8  
DK - 2600 Glostrup  
Phone +45 43 27 08 00  
e-mail info.mtdk@mt.com

### France

Mettler-Toledo  
Analyse Industrielle S.A.S.  
30, Boulevard de Douaumont  
FR-75017 Paris  
Phone +33 1 47 37 06 00  
e-mail mtpro-f@mt.com

### Germany

Mettler-Toledo GmbH  
Prozeßanalytik  
Ockerweg 3  
DE-35396 Gießen  
Phone +49 641 507 444  
e-mail prozess@mt.com

### Great Britain

Mettler-Toledo LTD  
64 Boston Road, Beaumont Leys  
GB - Leicester LE4 1AW  
Phone +44 116 235 7070  
e-mail enquire.mtuk@mt.com

### Hungary

Mettler-Toledo Kereskedelmi KFT  
Teve u. 41  
HU-1139 Budapest  
Phone +36 1 288 40 40  
e-mail mthu@axelero.hu

### India

Mettler-Toledo India Private Limited  
Amar Hill, Saki Vihar Road  
Powai  
IN-400 072 Mumbai  
Phone +91 22 2857 0808  
e-mail sales.mtin@mt.com

### Indonesia

PT. Mettler-Toledo Indonesia  
GRHA PERSADA 3rd Floor  
Jl. KH. Noer Ali No.3A,  
Kayuringin Jaya  
Kalimalang, Bekasi 17144, ID  
Phone +62 21 294 53919  
e-mail  
mt-id.customersupport@mt.com

### Italy

Mettler-Toledo S.p.A.  
Via Vialba 42  
IT-20026 Novate Milanese  
Phone +39 02 333 321  
e-mail  
customercare.italia@mt.com

### Japan

Mettler-Toledo K.K.  
Process Division  
6F Ikenohata Nisshoku Bldg.  
2-9-7, Ikenohata  
Taifo-ku  
JP-110-0008 Tokyo  
Phone +81 3 5815 5606  
e-mail helpdesk.ing.jp@mt.com

### Malaysia

Mettler-Toledo (M) Sdn Bhd  
Bangunan Electrocon Holding, U 1-01  
Lot 8 Jalan Astaka U8/84  
Seksyen U8, Bukit Jelutong  
MY-40150 Shah Alam Selangor  
Phone +60 3 78 44 58 88  
e-mail  
MT-MY.CustomerSupport@mt.com

### Mexico

Mettler-Toledo S.A. de C.V.  
Ejército Nacional #340  
Polanco V Sección  
C.P. 11560  
MX-México D.F.  
Phone +52 55 1946 0900  
e-mail mt.mexico@mt.com

### Norway

Mettler-Toledo AS  
Ulvenveien 92B  
NO-0581 Oslo Norway  
Phone +47 22 30 44 90  
e-mail info.mtn@mt.com

### Poland

Mettler-Toledo (Poland) Sp.z.o.o.  
ul. Poleczki 21  
PL-02-822 Warszawa  
Phone +48 22 545 06 80  
e-mail polska@mt.com

### Russia

Mettler-Toledo Vostok ZAO  
Sretenskij Bulvar 6/1  
Office 6  
RU-101000 Moscow  
Phone +7 495 621 56 66  
e-mail inforus@mt.com

### Singapore

Mettler-Toledo (S) Pte. Ltd.  
Block 28  
Ayer Rajah Crescent #05-01  
SG-139959 Singapore  
Phone +65 6890 00 11  
e-mail  
mt.sg.customersupport@mt.com

### Slovakia

Mettler-Toledo s.r.o.  
Hattalova 12/A  
SK-831 03 Bratislava  
Phone +421 2 4444 12 20-2  
e-mail predaj@mt.com

### Slovenia

Mettler-Toledo d.o.o.  
Pot heroja Trtnika 26  
SI-1261 Ljubljana-Dobrunje  
Phone +386 1 530 80 50  
e-mail keith.racman@mt.com

### South Korea

Mettler-Toledo (Korea) Ltd.  
1 & 4F, Yeil Building 21  
Yangjaecheon-ro 19-gil  
Seocho-Gu  
Seoul 06753 Korea  
Phone +82 2 3498 3500  
e-mail Sales\_MTKR@mt.com

### Spain

Mettler-Toledo S.A.E.  
C/Miguel Hernández, 69-71  
ES-08908 L'Hospitalet de Llobregat  
(Barcelona)  
Phone +34 902 32 00 23  
e-mail mtemkt@mt.com

### Sweden

Mettler-Toledo AB  
Virkesvägen 10  
Box 92161  
SE-12008 Stockholm  
Phone +46 8 702 50 00  
e-mail sales.mts@mt.com

### Switzerland

Mettler-Toledo (Schweiz) GmbH  
Im Langacher, Postfach  
CH-8606 Greifensee  
Phone +41 44 944 47 60  
e-mail ProSupport.ch@mt.com

### Thailand

Mettler-Toledo (Thailand) Ltd.  
272 Soi Soonvijai 4  
Rama 9 Rd., Bangkok  
Huay Kwang  
TH-10320 Bangkok  
Phone +66 2 723 03 00  
e-mail  
MT-TH.CustomerSupport@mt.com

### Turkey

Mettler-Toledo Türkiye  
Haluk Türksöy Sokak No: 6 Zemin ve 1.  
Bodrum Kat 34662 Üsküdar -Istanbul, TR  
Phone +90 216 400 20 20  
e-mail sales.mtr@mt.com

### USA

METTLER TOLEDO  
Process Analytics  
900 Middlesex Turnpike, Bld. 8  
Billerica, MA 01821, USA  
Phone +1 781 301 8800  
Freephone +1 800 352 8763  
e-mail mtprous@mt.com

### Vietnam

Mettler-Toledo (Vietnam) LLC  
29A Hoang Hoa Tham Street, Ward 6  
Binh Thanh District  
Ho Chi Minh City, Vietnam  
Phone +84 8 35515924  
e-mail  
MT-VN.CustomerSupport@mt.com



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Mettler-Toledo GmbH, Process Analytics  
Im Hackacker 15, CH-8902 Urdorf  
Phone +41 44 729 62 11, Fax +41 44 729 66 36

[www.mt.com/pro](http://www.mt.com/pro)