

Transmitter Trb 8300 & InPro® 8000 Sensor Series

Full range turbidity measurements

Technical Data



Trb 8300



InPro® 8050

InPro® 8200

Short description

This fiber optic measuring system is based on the backscattered light principle and consequently provides the highest possible performance from low/medium turbidities right through to high suspended particle concentrations. The system consists of a transmitter Trb 8300 and a sensor of the InPro® 8000 Series. The system is designed for reliable and accurate measurements in biotechnological, chemical and industrial wastewater applications.

Transmitter features

- Three retrievable, independently configurable parameter sets with remote access
- Manual, process and multipoint calibration procedures
- Four 0/4...20 mA galvanically isolated outputs according to NAMUR NE 43 guideline
- Two programmable limit setpoints, 1 alarm relay
- Wash contact and HOLD input
- Online help functions and full text menu guide in three languages
- RS232 interface for software updates and printing of configurations
- In compliance with EN 55011, EN50082-2, IEC 61010-1, US UL 3111-1, CAN/CSA 22.2, No. 1010.1
- Suitable for all sensors of InPro® 8000 Series

Sensor features

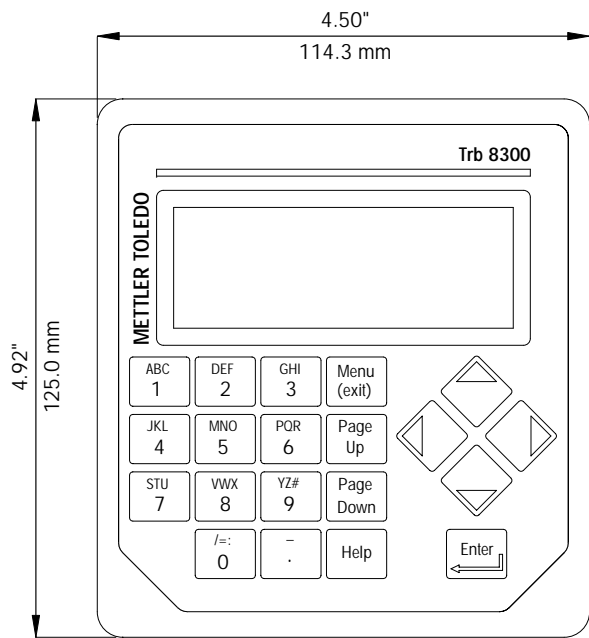
- Compact 12 mm design, single/dual optical fiber sensors made of PSU, DIN 1.4435 ss (316L) or HA-C276
- Wide measuring range from 5 FTU up to 250 g/l suspended solids
- Suitable for installation in classified areas (Ex-proof)
- Sterilizable, available in various lengths
- Fixed fiber optic cable with SMA connectors

Contents

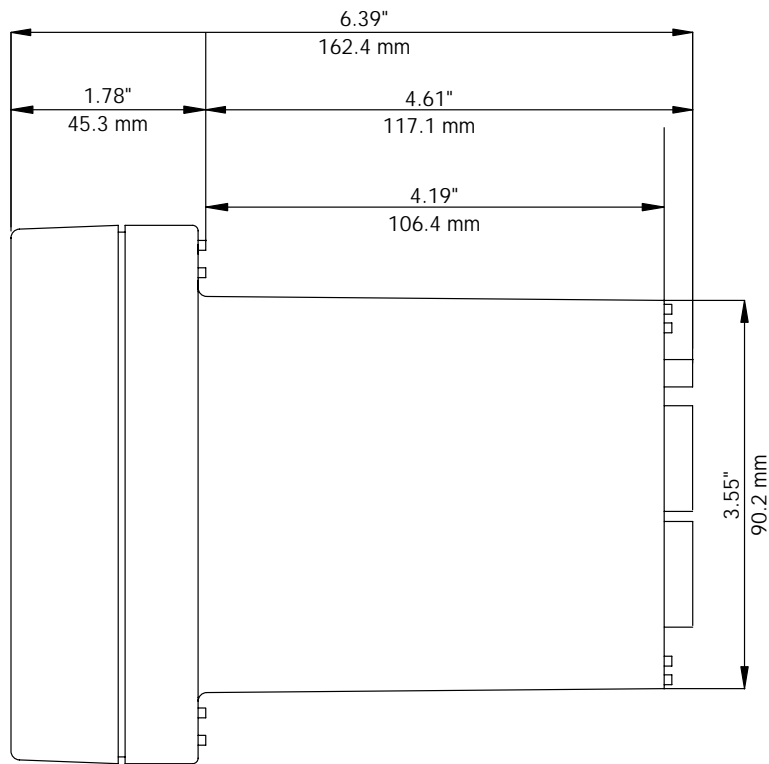
Dimensions and installation drawings: Trb 8300 transmitter	2
Technical specifications: Trb 8300 transmitter	4
Ordering information	6
Terminal assignment	7
Drawings: InPro® 8000 sensors	8
Specifications: InPro® 8000 sensors	9
Specifications: Fiber optic cable	10
Ordering information	10

METTLER TOLEDO

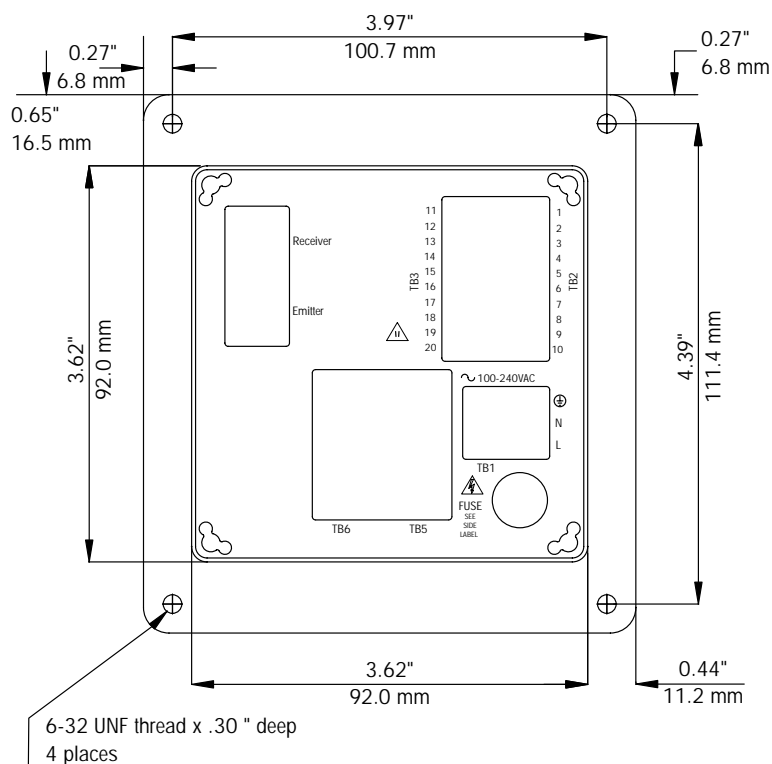
Front dimensions



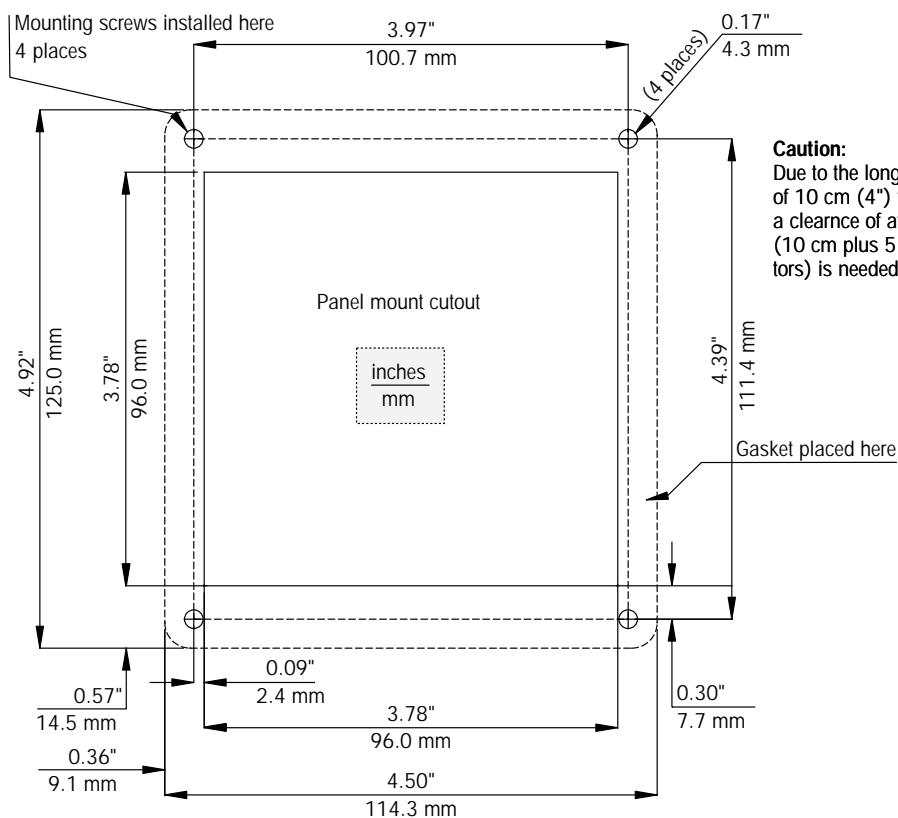
Side dimensions



Rear dimensions



Panel mount cutout



Transmitter Trb8300

Power supply	100...240VAC 25 Watts maximum, 47...63 Hz. On power loss, all stored values are retained in non-volatile memory without batteries. Clock does not run when power is off.
Light source	Light-emitting diode (LED), emitting frequency 880 nm, installed in transmitter
Measurement	Input/output for InPro® 8000 fiber optic sensor, backscattered light principle
Measurement range	5 FTU...4000 FTU (Formazin Turbidity Units) and 0...30 g/l suspended solids with InPro® 8200 10 FTU...4000 FTU and 0...250 g/l suspended solids with InPro® 8050 and InPro® 8100
Selectable measuring units	FTU NTU EBC g/l % ppm
Digital input	4 buffered digital inputs (0...5 V) – 1 digital input to HOLD the output (i.e. the 4...20 mA outputs are held or set to predefined values until the HOLD signal is removed). – 3 digital inputs to select one of three parameter sets A through C (memorized).
Parameter sets	Three different parameter sets (A through C) can be stored in memory and recalled by software menu or remote access via digital inputs.
System Calibration (operating modes)	
Manual calibration (user input):	offset and gain values for the sensor can be entered directly.
Process calibration:	single-point grab-sample calibration (offset or slope: user selectable).
Multipoint calibration:	2, 3, 4 or 5 point automatic calibration (offset and gain) for linearization of measurement curves.
Default calibration:	on reset default calibration factors are loaded into the transmitter.
Security	Password-protected menu access for different user levels (master, user 1 and 2).
System diagnostics	Light source (internal reference signal = 0).

Transmitter Trb 8300

Output 1 – 4	Four standard powered 0/4...20 mA outputs, 500 Ω load maximum, isolated from the measurement circuit; accuracy ± 0.05 mA, typical. Outputs are assignable to any parameter set with free scaling in linear, bi-linear, logarithmic or auto range format.
Alarm contact Contact ratings Contact response Alarm delay	Relay contact, mechanical SPDT, floating AC < 250 V / < 5 A DC < 30 V / < 5 A N/C (fail-safe type) 000...600 s
Wash contact Contact ratings Contact response Rinsing interval Cleaning time	Relay contact, mechanical SPDT, floating AC < 250 V / < 5 A DC < 30 V / < 5 A N/O or N/C 0.0...999.9 h (0.0 h = cleaning function switched off) 000...600 s
Limit values (2) Contact ratings Contact response Delay Switching points Hysteresis	2 relay contacts, mechanical SPDT, floating AC < 250 V / < 5 A DC < 30 V / < 5 A N/O or N/C 000...600 s hi-hi / hi-lo / lo-lo 0.0...50.0%
Digital Communications RS232 standard Baud rate Parity	For main program software updates and print outs of configurations. max. distance 15 m (45 ft) 1200, 2400, 4800, 9600, 19.2k and 38.4k odd, even or none
Display	LC display, 20 character x 4 line, backlit
Keypad	20 tactile feedback keys
Language	Software selectable: English, German, or French for menu and help texts
Diagnostic functions	Sensor mA outputs Inputs Display Keypad Meter Serial Port Relays Selftest

Transmitter Trb8300

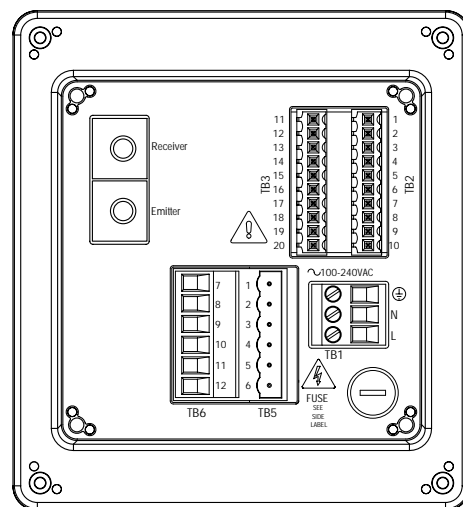
Data retention	Parameters and calibration data in non-volatile memory without batteries
CE	
Emissions:	EN 55011 / Group I / Class A ISM emissions.
Immunity:	EN 50082-2 / EMC heavy industrial generic immunity standard.
Safety:	IEC 61010-1 / safety requirements for electrical equipment for measurement, control and laboratory use
US UL	3111-1 Electrical Measuring and Test Equipment
CAN / CSA	C22.2, No. 1010.1
Nominal operating conditions	
Ambient temperature:	–10...+50 °C (14...104 °F)
Transport/storage temp:	–20...+80 °C (–4...176 °F)
Relative humidity:	0...80 % up to 31 °C (88 °F), decreasing linearly to 50 % at 40 °C (104 °F)
Altitude:	2000 m (6500 ft.)
Enclosure	
Alloy	ABS-PC, UV and chemically resistant
Assembly	Panel mounting, cutout 96 x 96 mm (3.78" x 3.78") 1/4 DIN
Dimensions	H: 125 mm, W: 114 mm, L: 162 mm (H: 4.92", W: 4.50", L: 6.39")
Rating	front panel seal, rating pending
Weight	approx. 0.9 kg (2 lbs.)

Ordering information

Item	Order no.
Transmitter Trb8300	52 800 204
10-terminal plug-in connector (TB2 and TB3)	52 800 251
6-terminal plug-in connector (TBS and TB6)	52 800 252
Fuse, 0.5 A slow blow, 5 x 20 mm (Littlefuse 215.500 or equivalent)	52 800 253
Panel mounting screws (6 – 32 x 7/16", 4 required)	52 800 254
Screws for front panel (2 required)	52 800 255
Retaining washers for front panel (2 required)	52 800 256
Liquid crystal display module (order mounting standoffs separately)	52 800 257
Display standoffs (4 required for display above)	52 800 258

Terminal assignment

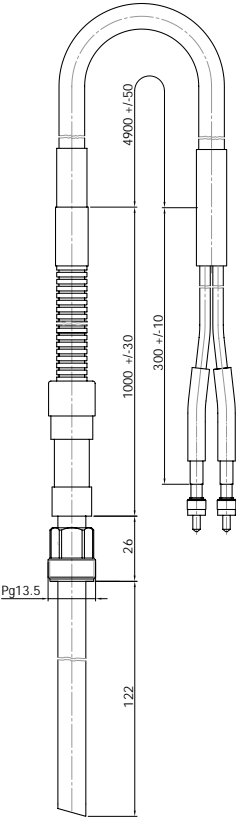
Board	Terminal	Connection
TB2	1	Do not use !
	2	Return Parameter Set A, B and HOLD
	3	Do not use !
	4	Parameter Set B
	5	Do not use !
	6	HOLD
	7	Parameter Set A
	8	RS232 ground
	9	RS232 receive
	10	RS232 transmit
TB3	11	Do not use !
	12	Return Parameter Set C
	13	Parameter set C
	14	Do not use !
	15	Analog output 4 +
	16	Analog output 3 +
	17	Analog output -
	18	Analog output -
	19	Analog output 2 +
	20	Analog output 1 +
Board	Terminal	Connection
TB5	1	Alarm, normally closed
	2	Alarm common
	3	Alarm, normally open
	4	Wash, normally closed
	5	Wash, common
	6	Wash, normally open
TB6	7	Limit 1, normally closed
	8	Limit 1, common
	9	Limit 1, normally open
	10	Limit 2, normally closed
	11	Limit 2, common
	12	Limit 2, normally open



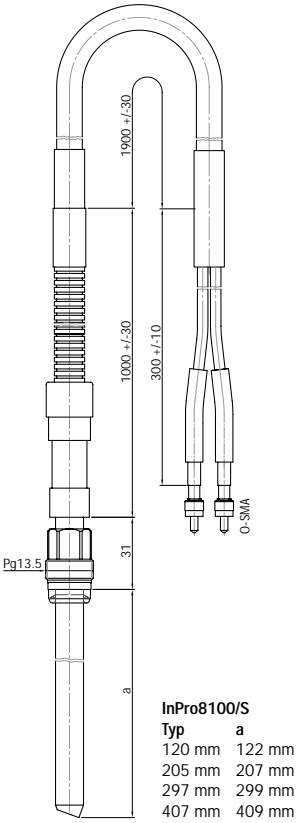
Trb 8300 rear panel view

Drawings

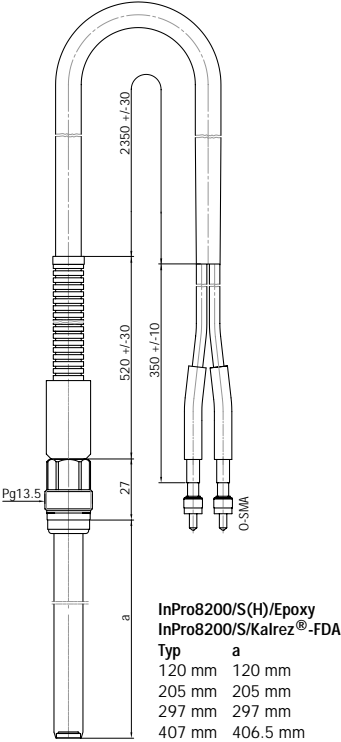
InPro® 8050



InPro® 8100



InPro® 8200



All dimensions in mm !

Specifications InPro® 8000 Sensors

	InPro® 8050	InPro® 8100	InPro® 8200
Measuring principle	backscatter, 1-fiber	backscatter, 1-fiber	backscatter, 2-fiber
Sensor material	PSU (Polysulfone)	DIN 1.4435 (316 L)	Din 1.4435 (316L) or HA-C276
Sensor diameter	12 mm	12 mm	12 mm
Insertion length	120 mm	120, 205, 297 or 407 mm	120, 205, 297 or 407 mm
Process connection	Pg 13.5	Pg 13.5	Pg 13.5
Measuring range:			
Formazin Turbidity Units	10...4000 FTU	10...4000 FTU	5...4000 FTU
Suspended Solids (Diatomaceous earth as reference)	0...250 g/l	0...250 g/l	0...30 g/l
Design:			
Cable connectors	SMA	SMA	SMA
Cable lengths	6 m (20 ft) optical	3 m (10 ft) optical	3 m (10 ft) optical
Cable type	duplex HCS fiber, fixed	duplex HCS fiber, fixed	duplex HCS fiber, fixed
Wetted parts:			
Metals	none	DIN 1.4435	DIN 1.4435 (316L) or HA-C276
Plastic	PSU	none	none
O-ring	Viton®-FDA	Viton®-FDA	Viton®-FDA
Sapphire spigot for fiber protection	yes	none	none
Sapphire window for fiber protection	none	none	Kalrez®-type: Kalrez®-FDA 6230 sealed Epoxy-type: Epoxy bonded
Working conditions:			
Pressure range	0...2 bar (0...29 psi)	0...6 bar (0...87 psi)	Epoxy-type: 0...16 bar (0...232 psi) With Swagelok® adapter: 60 bar (0...870 psi) Kalrez®-type: 0...6 bar (0...87 psi)
Measuring temperature range	0...60 °C (32...140 °F)	-30...130 °C (-22...266 °F)	Epoxy-type: -30...130 °C (-22...266 °F) Kalrez®-type: -10...130 °C (14...266 °F)
Temperature range (sterilization)	n/a	0...130 °C (32...266 °F)	Kalrez®-type: 0...130 °C (32...266 °F) Epoxy type: n/a

Specifications duplex fiber optic cable

Cladding material	HCS (Hard Clad Silica)
Core diameter	600 ± 10 µm
Attenuation @ 850 nm	≤ 8 dB/km
Long-term bend radius	≥ 94 mm
Outer jacket	PVC

Ordering information

Designation code	InPro® 8100/S/xxx	S = shaft material DIN 1.4435 (316L)
	InPro® 8200/S(H)/...../xxx	H = Hastelloy C276
	 = sealing for sapphire window
		xxx = insertion length in mm

Designation	Insertion lengths	Body material	Order no.
InPro8050	120 mm (4.7")	PSU	52 800 209
InPro8100/S/120	120 mm (4.7")	DIN 1.4435 (316L)	52 800 205
InPro8100/S/205	205 mm (8.1")	DIN 1.4435 (316L)	52 800 206
InPro8100/S/297	297 mm (11.7")	DIN 1.4435 (316L)	52 800 207
InPro8100/S/407	407 mm (16.0")	DIN 1.4435 (316L)	52 800 208
InPro8200/S/Epoxy/120	120 mm (4.7")	DIN 1.4435 (316L)	52 800 216
InPro8200/S/Epoxy/205	205 mm (8.1")	DIN 1.4435 (316L)	52 800 217
InPro8200/S/Epoxy/297	297 mm (11.7")	DIN 1.4435 (316L)	52 800 218
InPro8200/S/Epoxy/407	407 mm (16.0")	DIN 1.4435 (316L)	52 800 219
InPro8200/H/Epoxy/120	120 mm (4.7")	HA-C276	52 800 220
InPro8200/H/Epoxy/205	205 mm (8.1")	HA-C276	52 800 221
InPro8200/H/Epoxy/297	297 mm (11.7")	HA-C276	52 800 222
InPro8200/H/Epoxy/407	407 mm (16.0")	HA-C276	52 800 223
InPro8200/S/Kalrez-FDA/120	120 mm (4.7")	DIN 1.4435 (316L)	52 800 224
InPro8200/S/Kalrez-FDA/205	205 mm (8.1")	DIN 1.4435 (316L)	52 800 225
InPro8200/S/Kalrez-FDA/297	297 mm (11.7")	DIN 1.4435 (316L)	52 800 226
InPro8200/S/Kalrez-FDA/407	407 mm (16.0")	DIN 1.4435 (316L)	52 800 227

Accessories

Designation	Lengths	Order no.
Fiber-Kit 3 m	3 m (10 ft)	52 800 228
Fiber-Kit 5 m	5 m (15 ft)	52 800 229
Fiber-Kit 6 m	6 m (18 ft)	52 800 230
Fiber-Kit 10 m	10 m (30 ft)	52 800 231
Fiber-Kit 15 m	15 m (45 ft)	52 800 232
Fiber-Kit 20 m	20 m (60 ft)	52 800 233
Fiber-Kit 25 m	25 m (75 ft)	52 800 234
Fiber-Kit 30 m	30 m (100 ft)	52 800 235
Fiber-Kit 40 m	40 m (130 ft)	52 800 236
Fiber-Kit 45 m	45 m (150 ft)	52 800 172
Fiber-Kit 50 m	50 m (165 ft)	52 800 237
Fiber-Kit 65 m	65 m (200 ft)	52 800 238
Fiber-Kit 75 m	75 m (230 ft)	52 800 177
Fiber-Kit 90 m	90 m (275 ft)	52 800 239
Fiber-Kit 100 m	100 m (330 ft)	52 800 154
Fiber-Kit 125 m	125 m (380 ft)	52 800 158
Fiber-Kit 170 m	170 m (520 ft)	52 800 196

Accessories (cont.)

Couplings (2 included in each Fiber-Kit)	52 800 240
Coupling Box IP 65/NEMA 4X	52 800 241
Swagelok Adapter NPT 1/2"	52 800 242
«CalCap» (calibration tool)	52 800 210

Complementary O-rings

Designation	Size	Order no.
Viton®-FDA	10.77 x 2.62 mm	20 302 1000
Silicon-FDA	10.77 x 2.62 mm	20 301 1136
Kalrez®	10.78 x 2.62 mm	20 304 1000
Kalrez®-FDA	10.78 x 2.62 mm	20 304 1034
EPDM-FDA	10.77 x 2.62 mm	20 303 1206

Housings for InPro® 8050 (H = immersion length)

Designation	Material	H	a	O-ring	Order no.
InFit 761-25 B PVC	PVC	70	120	Viton®-FDA	52 400 310
InFit 761-25 B PVDF	PVDF	70	120	Viton®-FDA	52 400 311
InFit 761-25 B PP	PP	70	120	Viton®-FDA	52 400 316
InDip 550/1000/PVC/Pg 13.5	PVC	1000	120	Viton®-FDA	52 400 320
InDip 550/1500/PVC/Pg 13.5	PVC	1500	120	Viton®-FDA	52 400 582
InDip 550/2000/PVC/Pg 13.5	PVC	2000	120	Viton®-FDA	52 400 588
InDip 550/2500/PVC/Pg 13.5	PVC	2500	120	Viton®-FDA	52 400 594
InDip 550/3000/PVC/Pg 13.5	PVC	3000	120	Viton®-FDA	52 400 600

Housings for InPro® 8100 and InPro® 8200 (H = immersion length)

Designation	Material	H	a	O-ring	Order no.
InFit 761-25 CP/70/4435/Vi	DIN 1.4435	70	120	Viton®	00 761 3042
InFit 761-25 CP/70/C22/Vi	Hastelloy C22	70	120	Viton®	00 761 3105
InFit 761-25 BTB/70	DIN 1.4435	70	120	Silicon-FDA	00 761 3093
InFit 761-25 CIP/70 3.1B	DIN 1.4435	70	120	Silicon-FDA	52 400 491
InFit 761-25 CIP/T 3.1B	DIN 1.4435	–	120	Silicon-FDA	52 400 493
InFit 761-25 CIP/TS 3.1B	DIN 1.4435	–	120	Silicon-FDA	52 400 502
InFit 761-25 CIP/70 TC 1.5"	DIN 1.4435	70	120	Silicon-FDA	52 400 494
InFit 761-25 CIP/70 TC 2"	DIN 1.4435	70	120	Silicon-FDA	52 400 495
InTrac 777-SL	DIN 1.4435	70	205	Kalrez®	52 401 570
InTrac 797-M	DIN 1.4435	75	297	Viton®-FDA	00 797 3012

METTLER TOLEDO Market Organizations

Sales and Service:

Australia

Mettler-Toledo Ltd.
220 Turner Street
Port Melbourne
AUS-3207 Victoria
Phone +61 39 644 57 20
Fax +61 39 645 39 35
e-mail mtausprocess@mt.com

Austria

Mettler-Toledo GmbH
Favoritner Gewerbering 17
A-1100 Wien
Phone +43 1 604 19 80
Fax +43 1 604 28 80
e-mail info@process.mt.at@mt.com

Brazil

Mettler-Toledo Ind. e Com. Ltda.
Alameda Araguaia
451 - Alphaville
BR-06455-000 Barueri/SP
Phone +55 11 4166 74 00
Fax +55 11 4166 74 01
e-mail sales@mettler.com.br
service@mettler.com.br

China

Mettler-Toledo Instruments
(Shanghai) Co. Ltd.
589 Gui Ping Road
Cao He Jing
CN-200233 Shanghai
Phone +86 21 64 85 04 35
Fax +86 21 64 85 33 51

Croatia

Mettler-Toledo d.o.o.
Mandlova 3
HR-10000 Zagreb
Phone +385 1 292 06 33
Fax +385 1 295 81 40
e-mail mt-zag@zg.tel.hr

Czech Republic

Mettler-Toledo s.r.o.
Trebohosticka 2283/2
CZ-10000 Praha 10
Phone +420 2 72 123 151
Fax +420 2 72 123 170
e-mail sales.mtcz@mt.com

Denmark

Mettler-Toledo A/S
Naverland 8
DK-2600 Glostrup
Phone +45 43 27 08 00
Fax +45 43 27 08 28
e-mail mtdk@post10.tele.dk
lsl@mts.mt.com

France

Mettler-Toledo
Analyse Industrielle Sarl.
30, Boulevard Douaumont
BP 949
F-75829 Paris Cedex 17
Phone +33 1 47 37 06 00
Fax +33 1 47 37 46 26
e-mail mtpro-f@mt.com

Germany

Mettler-Toledo GmbH
Prozeßanalytik
Ockerweg 3
D-35396 Gießen
Phone +49 641 507 333
Fax +49 641 507 397
e-mail prozess@mt.com

Great Britain

Mettler-Toledo LTD
64 Boston Road Beaumont Leys
GB-LE4 1AW Leicester
Phone +44 116 235 7070
Fax +44 116 236 5500
e-mail enquire.mtuk@mt.com

Hungary

Mettler-Toledo Kereskedelmi KFT
Teve u. 41
HU-1139 Budapest
Phone +36 1 288 40 40
Fax +36 1 288 40 50

Italy

Mettler-Toledo S.p.A.
Via Vialba 42
I-20026 Novate Milanese
Phone +39 02 333 321
Fax +39 02 356 2973
e-mail mettler.toledo@interbusiness.it

Japan

Mettler-Toledo K.K.
5F Tokyo Ryutsu Center Annex B
6-1-1 Heiwajima, Ohta-ku
JP-143-0006 Tokyo
Phone +81 3 5762 07 06
Fax +81 3 5762 09 71

Mexico

Mettler-Toledo S.A. de C.V.
Pino No. 350, Col. Sta.
Col Atlampa
MX-06450 México D.F.
Phone +52 5 541 33 00
Fax +52 5 541 04 02
e-mail mario.roca@mt.com

Poland

Mettler-Toledo (Poland) Sp.z.o.o.
ul. Iwonicka 39
PL-02-924 Warszawa
Phone +48 22 651 92 32
Fax +48 22 651 71 72

Russia

Mettler-Toledo ZAO
Sretenskij Bulvar 6/1
Office 6
RU-101000 Moscow
Phone +7 095 921 92 11
Fax +7 095 921 63 53
+7 095 921 78 68

Singapore

Mettler-Toledo (S) Pte. Ltd.
Block 28
Ayer Rajah Crescent #05-01
SG-139959 Singapore
Phone +65 890 00 11
Fax +65 890 00 12
+65 890 00 13

Slovakia

Mettler-Toledo SERV s.r.o.
Bulharska 61
SK-82104 Bratislava
Phone +421 743 42 74 96
Fax +421 743 33 71 90

Slovenia

Mettler-Toledo d.o.o.
IOC Trzin, Peske 12
SI-1236 Trzin
Phone +386 61 162 18 01
Fax +386 61 162 17 89
e-mail cipot@mtslo.mt.com
racman@mettler-toledo.si

Sweden

Mettler-Toledo AB
Virkesvägen 10
Box 92161
SE-12008 Stockholm
Phone +46 8 702 50 00
Fax +46 8 642 45 62
e-mail sales.mts@mt.com

Switzerland

Mettler-Toledo (Schweiz) AG
Im Langacher
Postfach
CH-8606 Greifensee
Phone +41 1 944 45 45
Fax +41 1 944 45 10
e-mail info.ch@mt.com

Thailand

Mettler-Toledo Thailand
1. Floor, 272 Block A3
Raintree Office Garden
Rama 9 Rd. Kuay Kwang
TH-10310 Bangkok
Phone +66 2 723 03 00
Fax +66 2 719 64 79

USA

Mettler-Toledo
Ingold, Inc.
36 Middlesex Turnpike
Bedford, MA 01730, USA
Tel. +1 781 301 8800
Zollfrei +1 800 352 8763
Fax +1 781 271 0681
e-mail mtprou@mt.com



Management System
certified according to
ISO 9001 / ISO 14001



INTERNET

<http://www.mtpro.com>

Subject to technical changes.
© Mettler-Toledo GmbH, Process Analytics
07/02 Printed in Switzerland. 52 800 246

Mettler-Toledo GmbH, Process Analytics
Industrie Nord, CH-8902 Urdorf
Tel. +41 1 736 22 11, Fax +41 1 736 26 36