

# InPro® 8600 Sensor Series

## Transmitter Trb 8300 D

Hygienic turbidity system for the low to medium particle concentration range

### Technical data



InPro 8600



Trb 8300 D



PDA

#### Short description

The systems InPro 8600 from METTLER TOLEDO are designed for reliable measurements of turbidity in the low to medium particle concentration range. The main applications are in the food and beverage industry, mainly in breweries.

The measuring principle is based on forward and forward/sideward scattering of light. The system is intended for inline detection of undissolved (suspended) substances in liquid media.

The InPro 8600/W/3 also has a colour measurement function (with or without turbidity compensation). Absorption of blue light is measured for the colour measurement. The graduation of yellow is determined according to the directives of MEBAK. This allows to measure turbidity and graduation of yellow with one instrument.

#### Outstanding sensor features are:

- attractive prize / performance ratio
- highest accuracy
- measurement range turbidity 0 ... 400 FTU (0 ... 100 EBC)
- measurement range colour 0 ... 30 EBC
- hygienic design (EHEDG certification)
- maintenance-free optical windows due to sapphire and no O-rings
- for operation with digital turbidity transmitter Trb 8300 D or turbidity configuration tool from METTLER TOLEDO.

#### Transmitter features are:

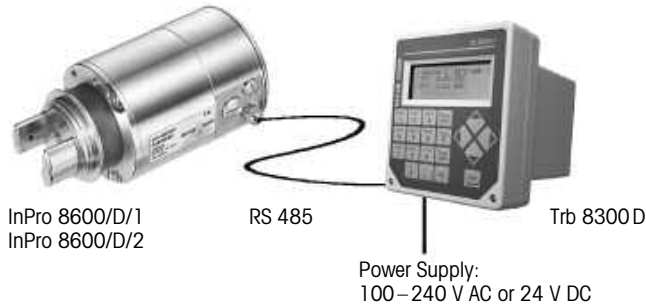
- factory-defined and process calibration routines
- full text guided menu in three languages, including online help texts
- three configurable parameter sets with remote access
- four galvanic isolated current outputs 0/4 ... 20 mA according to NAMUR NE 43 guidelines.

### Content

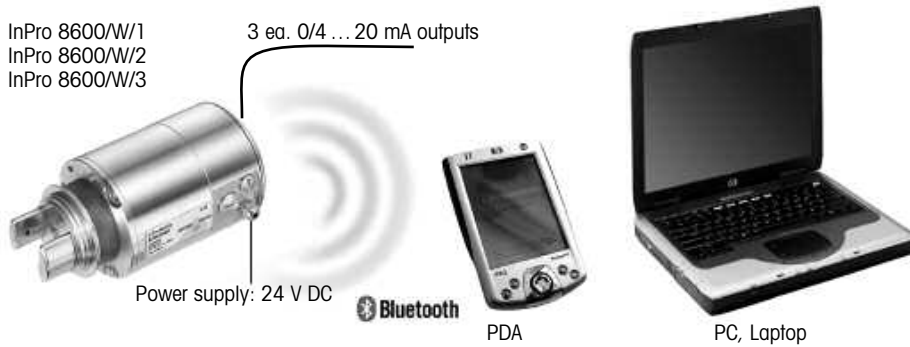
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METTLER TOLEDO

InPro 8600/D – Sensor with transmitter



InPro 8600/W – Sensor with wireless display and configuration unit



Explanation of designations

– InPro 8600/D/*:	version with digital interface
– InPro 8600/W/*:	version with wireless interface
– InPro 8600/*/1:	single-angle version
– InPro 8600/*/2:	dual-angle version
– InPro 8600/*/3:	dual-angle plus colour version

Sensor specifications InPro 8600

**Turbidity (InPro 8600/\*/\*)**

Measuring principle	Scattered light, red light 25° (single-angle version) 25° / 90° (dual-angle version)
Wavelength	650 nm (light-emitting diode [LED])
Measuring range	0 ... 400 FTU
Accuracy	0.01 FTU (measuring value < 1 FTU) 1 % of the measured value (meas. value > 1 FTU)
Repeatability	0.01 FTU
Resolution	0.01 FTU
Response time (T90)	< 2 sec
Units	FTU, NTU, EBC, ASBC, ppm SiO <sub>2</sub> , mg/L SiO <sub>2</sub>
Factory calibration	12-points-calibration over the entire measuring range, based on Formazin standards

**Colour (InPro 8600/W/3 only)**

Measuring principle	Absorption, blue light
Wavelength	460 nm (LED, light emitting diode)
Measuring range	0 – 30 EBC
Measurement accuracy	± 2% of measured value
Repeatability	0,01 EBC
Resolution	0,01 EBC
Response time (T90)	3 sec at EBC change >10
Units	EBC, E, E/m, ASBC, SRM
Factory calibration	6-points-calibration

**Process conditions**

Admissible pressure range	max. 16 bar (232 psi)
InPro 8600/*/1	0 ... 100 °C (32 ... 212 °F)
Temperature (process media):	Max. 120 °C (248 °F), short time, 1 h
InPro 8600/*/2 and InPro 8600/W/3	0 ... 80 °C (32 ... 176 °F),
Temperature (process media):	at 25 °C (77 °F) ambient temperature with air cooling 0 ... 70 °C (32 ... 158 °F), at 25 °C (77 °F) ambient temperature without air cooling Max. 120 °C (248 °F), short time, 1 h
Admissible temperature range (ambient)	0 ... 60 °C (32 ... 140 °F)

Sensor specifications InPro 8600

**Materials and dimensions**

Sensor head (wetted)	stainless steel (1.4404/316L)
Wetted measurement window	sapphire
Sensor housing	stainless steel (1.4404/316L)
O-ring (flange wetted)	EPDM
Sensor connection	in-line adaption (Varivent® or compatible Tuchenhagen N 50/40)
Surface finish	Ra ≤ 0.8 µm
Protection rating	IP 65
Cable lengths	5, 10 and 20 m (16.4, 32.8 and 65.6 ft) (RS485 communication)
Pipe diameter (process)	DN 40 ... DN 150

**InPro 8600/D/\***

Communication with Trb 8300 D	digital (RS485)
Power	24 V DC (± 2 V), reverse-polarity protected

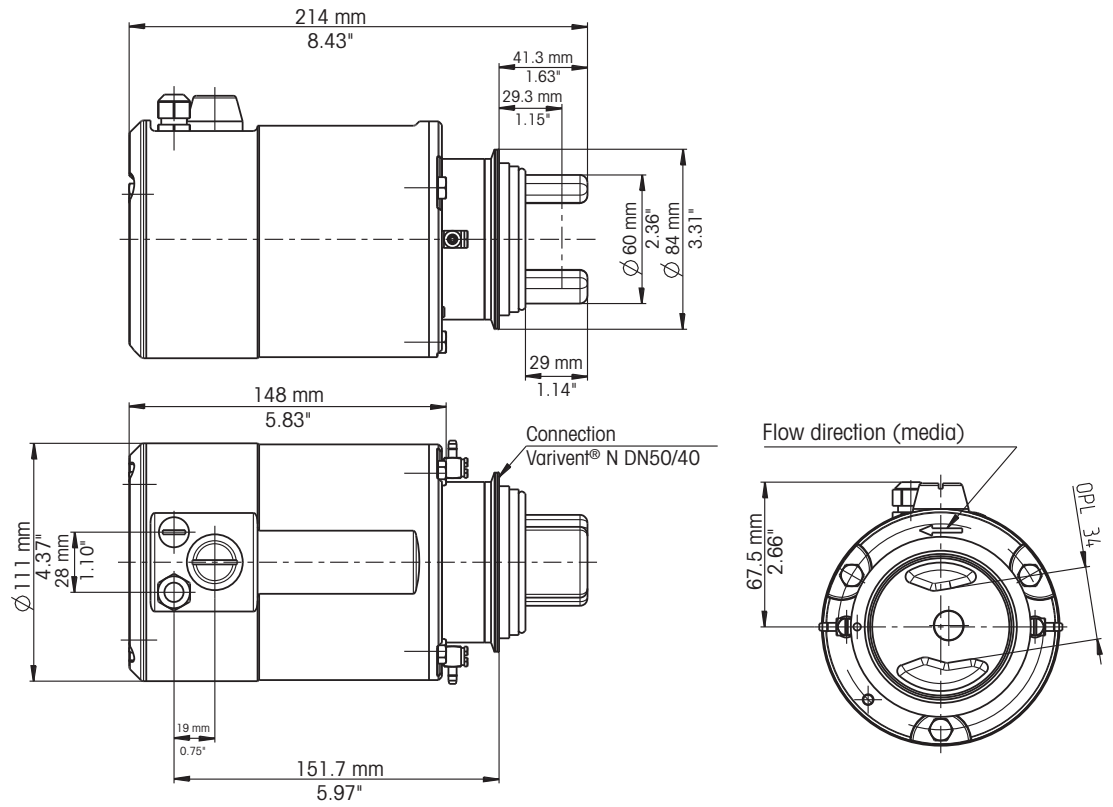
**InPro 8600/W/\***

Communication with PDA or PC	wireless (Bluetooth® V 1.2)
Power	24 V DC (± 2 V), reverse-polarity protected
Current outputs	3 ea. 0/4–20 mA, individually configurable Load: ≤ 500 Ω
Bluetooth® range	5 m (16.4 ft)

**Certificates**

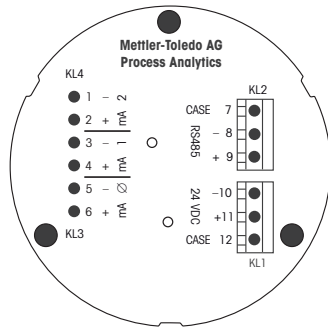
Quality control and final inspection	•
PED	•
EHEDG	•
CE	•

Dimensional drawing InPro 8600

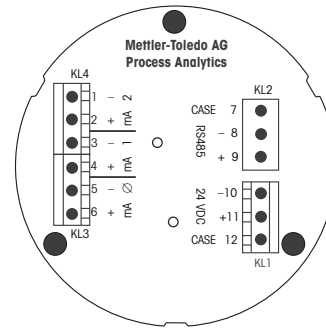


Pin assignments Sensor InPro 8600

Pin assignments



InPro 8600/D/\*



InPro 8600/W/\*

InPro 8600/D/\*

Terminal assignment	Terminal	Assignment	Cable lead
KL2	7	shield	–
	8	RS 485 –	yellow
	9	RS 485 +	green
KL1	10	24 V DC –	white
	11	24 V DC +	brown
	12	shield	green/yellow

InPro 8600/W/\*

Terminal assignment	Terminal	Assignment	Description
KL3/KL4	1	mA – (2)	current output 2
	2	mA + (2)	current output 2
	3	mA – (1)	current output 1
	4	mA + (1)	current output 1
	5	mA – (0)	current output 0
	6	mA + (0)	current output 0
KL2	7	shield	–
	8	RS 485 –	only required for service
	9	RS 485 +	only required for service
KL1	10	24 V DC –	power supply –
	11	24 V DC +	power supply +
	12	shield	–

Transmitter Trb 8300D

<b>Power requirement</b>	100 ... 240 VAC, max. 25 Watt, 47 ... 63 Hz or 20 ... 32 VDC, max. 25 Watt Data storage in non-battery supported EPROM in the event of power failure. Clock does not function without power supply.
<b>Sensor connections</b>	Digital input / output (RS 485) for turbidity sensors InPro 8600 D
<b>Units</b>	FTU, NTU, EBC, ASBL, ppm Si O <sub>2</sub> , mg/L Si O <sub>2</sub>
<b>Resolution</b>	0.01 FTU
<b>Parameter sets</b>	Three configurable parameter sets (A-C), storable and retrievable via software menu or by remote access via digital inputs.
<b>Digital inputs</b>	4 buffered digital inputs (0 ... 5 V) – 1 digital input for "HOLD" function – 3 digital inputs for activating stored parameter sets A to C
<b>System calibration (operational modes)</b>	
Factory-defined calibration	Specific factory-set sensor data.
Process calibration	Single-point calibration simultaneously with sampling (adjustment of offset or slope, user-defined).
Preset calibration parameter	Software reset restores calibration data to factory-set sensor data.
<b>Password protection</b>	Password-protected menu access for different operator levels (Master, User 1 and 2), able to be activated.
<b>Current outputs</b>	Four analog outputs 0/4 ... 20 mA. Burden max. 500 Ω. Accuracy ±0.05 mA. The outputs can be freely assigned to individual parameter sets, with choice of scaling in linear, bi-linear, logarithmic or dual-range format.
<b>Alarm contact</b>	Relay contact, SPDT, floating
Contact capacity	AC < 250 V / < 5 A DC < 30 V / < 5 A
Contact function	N/C (fail-safe type)
Alarm delay	000 ... 600 s
<b>Wash contact</b>	Relay contact, SPDT, floating
Contact capacity	AC < 250 V / < 5 A DC < 30 V / < 5 A
Contact function	N/O or N/C
Cleaning interval	0.0 ... 999.9 h (0.0 h = cleaning function switched off)
Duration of cleaning	000 ... 600 s
<b>Limit values (2)</b>	2 relay contacts, SPDT, floating
Contact capacity	AC < 250 V / < 5 A DC < 30 V / < 5 A
Contact function	N/O or N/C
Delay	000 ... 600 s
Switching point	Hi-hi / hi-lo / lo-lo
Hysteresis	0.0 ... 50.0%

**Transmitter Trb 8300D**

<b>Digital interface</b>	For updating of main program software and for printing of instrument configuration.	
RS232 standard	Max. cable length 15 m	
Baud Rate	1200, 2400, 4800, 9600, 19.2k and 38.4k	
Parity	Odd, even or none	
<b>Display</b>	Liquid crystal display (LCD), 20 alphanumerical characters x 4 lines, backlit	
<b>Keypad</b>	20 keys, membrane-type keypad	
<b>Languages</b>	Selectable via software: German, English or French for menu and Help texts	
<b>Diagnostic functions</b>	Sensor mA outputs Display Keypad Instrument Serial interface Contacts Self-test	
<b>Data retention</b>	Configuration and calibration data in non-battery supported, non-volatile storage.	
<b>CE</b>		
Emission	EN 55022	Class A ISM emissions.
Immunity	EN 61326	1997 Measurement, Control and Laboratory Equipment EMC requirements – industrial use.
Safety	IEC 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
<b>US UL</b>	3111-1 Electrical Measuring and test Equipment	
<b>CAN / CSA</b>	C22.2, No. 1010.1	
<b>Nominal operating conditions</b>		
Ambient temperature	-10 ... +55 °C (14 ... 131 °F)	
Transport and storage temperature	-20 ... +80 °C (-4 ... 176 °F)	
Relative humidity	0 ... 80% at 31 °C (88 °F), linear decline to 50% at 40 °C (122 °F)	
<b>Enclosure</b>		
Composite	ABS-PC, resistant to UV and chemicals	
Cutout	For panel installation: 96 x 96 mm (3.78" x 3.78") 1/4 DIN	
Dimensions	H: 125 mm x W: 114 mm x L: 162 mm (H: 4.92" x W: 4.50" x L: 6.39")	
Protection	Sealed face, IP65	
Weight	0.9 kg (2 lbs.)	

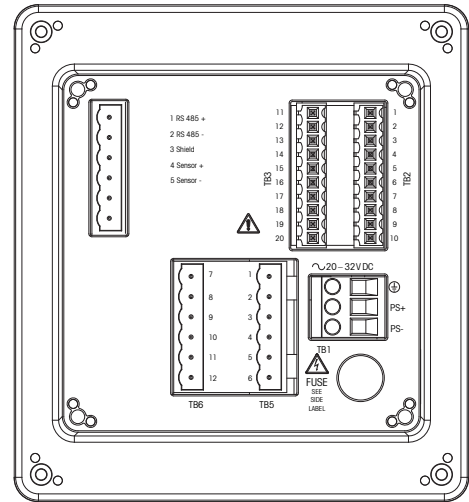
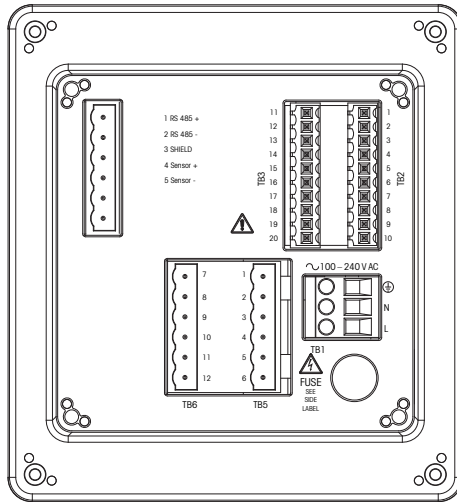
Pin assignments Transmitter Trb 8300D

Power supply: 100...240 V AC

Strip	Terminal	Connection
TB1	⊕	Ground
	N	Neutral
	L	Phase

Power supply: 20...32 V DC

Strip	Terminal	Connection
TB1	⊕	Ground
	PS+	DC plus
	PS-	DC minus



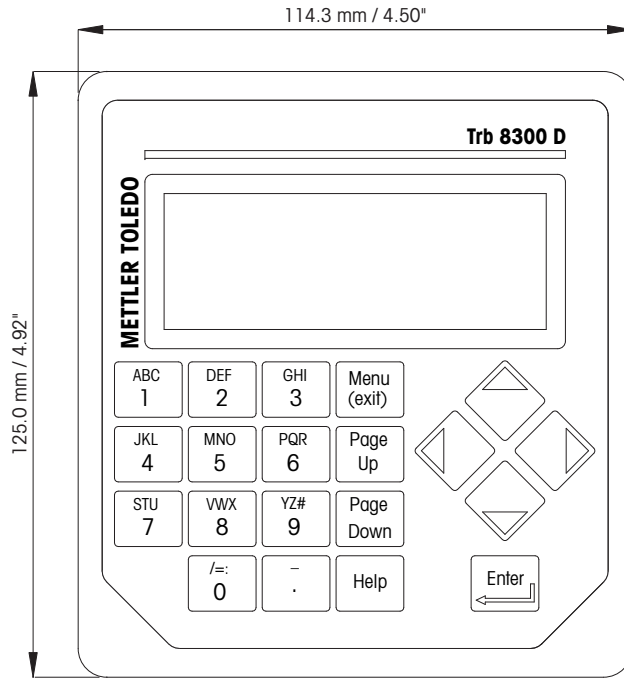
InPro 8600/D/\* sensor connections

Strip	Terminal	Connection
TB7	1	RS 485 + sensor (green)
	2	RS 485 – sensor (yellow)
	3	Shielding (green/yellow)
	4	Sensor voltage + 24 V DC (brown)
	5	Sensor voltage – 24 V DC (white)

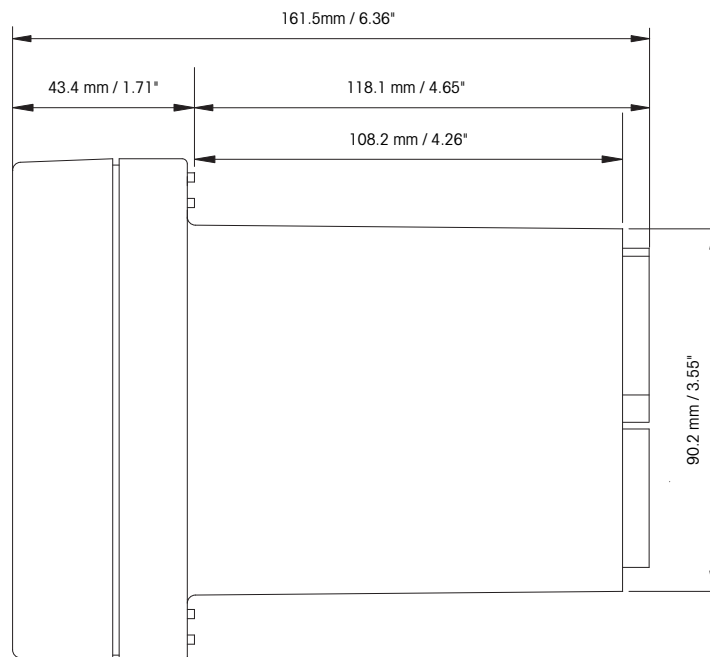
## Other connections

Strip	Terminal	Connection
TB2	1	Not to be used!
	2	Parameter sets A, B and "HOLD" (Digital 2)
	3	Not to be used!
	4	Parameter set B (Digital 1)
	5	Not to be used!
	6	"HOLD" (Digital 1)
	7	Parameter set A (Digital 1)
	8	RS 232 ground
	9	RS 232, receive
	10	RS 232, transmit
TB3	11	Not to be used!
	12	Parameter set C (Digital 2)
	13	Parameter set C (Digital 1)
	14	Not to be used!
	15	Current output 4+
	16	Current output 3+
	17	Current output –
	18	Current output –
	19	Current output 2+
	20	Current output 1+
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 value 1, normally closed
	8	Limit value 1, "Common"
	9	Limit value 1, normally open
	10	Limit value 2, normally closed
	11	Limit value 2, "Common"
	12	Limit value 2, normally open

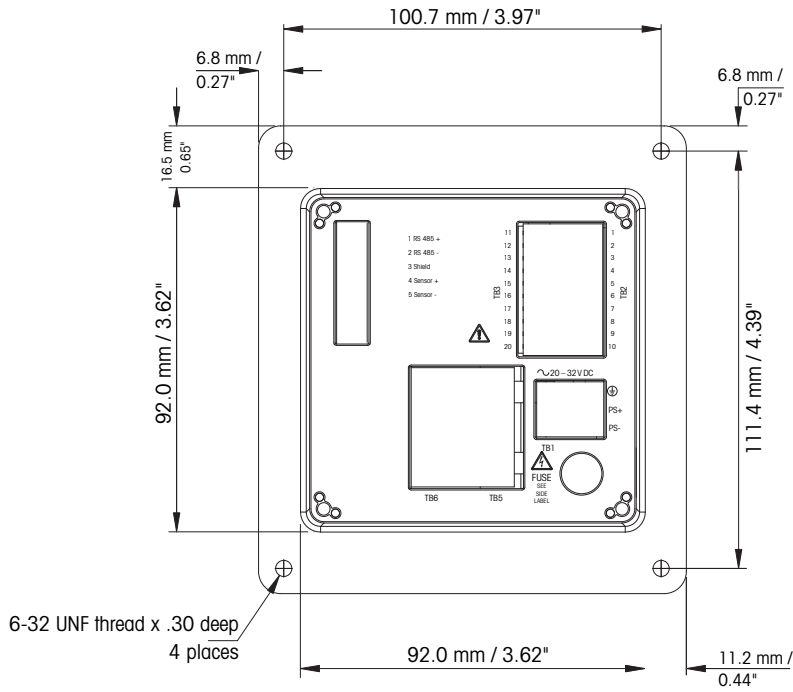
Front



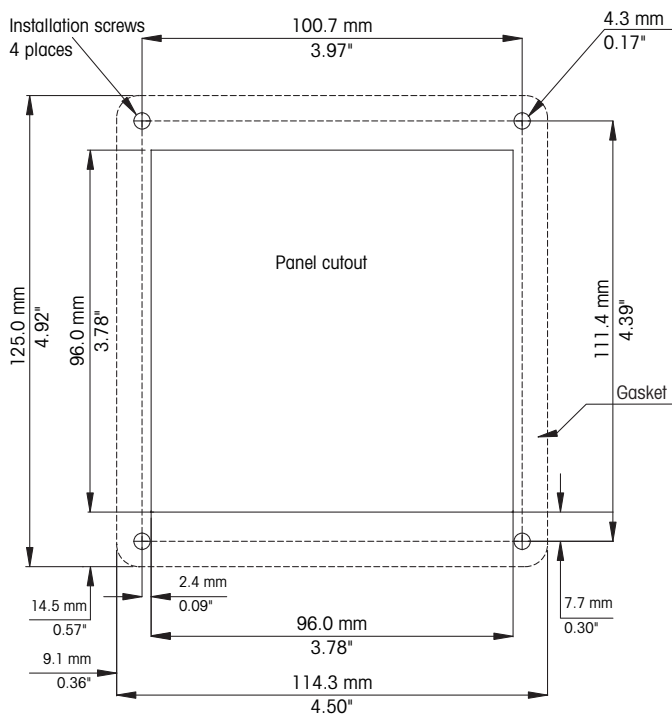
Side



Rear panel



Cutout for panel installation



## Ordering information

<b>Sensors InPro 8600/*/*</b>		<b>Order no.</b>
InPro 8600/D/1		52 801 026
InPro 8600/D/2		52 800 980
InPro 8600/W/1 (with PC configuration software)		52 801 025
InPro 8600/W/2 (with PC configuration software)		52 800 990
InPro 8600/W/3 (with PC configuration software)		52 801 101
<b>Sensors InPro 8600/*/* with inspection unit</b>		
InPro 8600/D/1 with inspection unit		52 801 062
InPro 8600/D/2 with inspection unit		52 801 060
InPro 8600/W/1 with inspection unit and PC configuration software		52 801 063
InPro 8600/W/2 with inspection unit and PC configuration software		52 801 061
InPro 8600/W/3 with inspection unit and PC configuration software		52 801 102
<b>Transmitter (for InPro 8600/D/*)</b>		
Trb 8300 D, 24 V DC		52 800 928
Trb 8300 D, 100 ... 240 V AC		52 800 927
<b>Accessories</b>		
Configuration unit (PDA with configuration software) for InPro 8600/W/*		52 800 986
Inspection unit for InPro 8600/*/*		52 800 982
Data acquisition software for Trb 8300 D (including interface cable)		52 800 929
5 m Sensor-Kabel (RS 485) for InPro 8600/D/*		52 800 979
10 m Sensor-Kabel (RS 485) for InPro 8600/D/*		52 800 981
20 m Sensor-Kabel (RS 485) for InPro 8600/D/*		52 801 005
Air purge connectors (2 pieces)		52 800 891
Stainless steel housing for wall mount		52 800 867
<b>Spare parts</b>		
O-ring EPDM for Tuchenhausen-Varivent® process connection		20 3031 210 IG
Field enclosure, IP 66 wall mounted		52 800 867
RS 232 interface cable, 10 m (32.8 ft)		58 080 111
Varivent® blanking plate, black		52 800 984





## Verkauf und Service:

### Australien

Mettler-Toledo Ltd.  
220 Turner Street  
Port Melbourne  
AUS - 3207 Melbourne/VIC  
Tel. +61 300 659 761  
Fax +61 3 9645 3935  
E-Mail info.mtaus@mt.com

### Brasilien

Mettler-Toledo Ind. e Com. Ltda.  
Alameda Araguaia, 451  
Alphaville  
BR - 06455-000 Barueri/SP  
Tel. +55 11 4166 7444  
Fax +55 11 4166 7401  
E-Mail mettler@mettler.com.br  
service@mettler.com.br

### China

Mettler-Toledo Instruments  
(Shanghai) Co. Ltd.  
589 Gui Ping Road  
Cao He Jing  
CN - 200233 Shanghai  
Tel. +86 21 64 85 04 35  
Fax +86 21 64 85 33 51  
E-Mail mtcs@public.sta.net.cn

### Dänemark

Mettler-Toledo A/S  
Naverland 8  
DK - 2600 Glostrup  
Tel. +45 43 27 08 00  
Fax +45 43 27 08 28  
E-Mail info.mtdk@mt.com

### Deutschland

Mettler-Toledo GmbH  
Prozeßanalytik  
Ockerweg 3  
D - 35396 Gießen  
Tel. +49 641 507 333  
Fax +49 641 507 397  
E-Mail prozess@mt.com

### Frankreich

Mettler-Toledo  
Analyse Industrielle S.A.S.  
30, Boulevard de Douaumont  
BP 949  
F - 75829 Paris Cedex 17  
Tel. +33 1 47 37 06 00  
Fax +33 1 47 37 46 26  
E-Mail mtpro-f@mt.com

### Grossbritannien

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

### Indien

Mettler-Toledo India Private Limited  
Amar Hill, Saki Vihar Road  
Powai  
IN - 400 072 Mumbai  
Tel. +91 22 2803 1111  
Fax +91 22 2857 5071  
E-Mail sales.mfin@mt.com

### Italien

Mettler-Toledo S.p.A.  
Via Vialba 42  
I - 20026 Novate Milanese  
Tel. +39 02 333 321  
Fax +39 02 356 2973  
E-Mail customercare.italia@mt.com

### Japan

Mettler-Toledo K.K.  
Process Division  
4F Izumikan Sanbancho Bldg.  
3-8 Sanbancho  
Chiyoda-ku  
JP - 102-0075 Tokyo  
Tel. +81 3 3222 7103  
Fax +81 3 3222 7118  
E-Mail helpdesk.ing.jp@mt.com

### Kroatien

Mettler-Toledo d.o.o.  
Mandlova 3  
HR - 10000 Zagreb  
Tel. +385 1 292 06 33  
Fax +385 1 295 81 40  
E-Mail mt.zagreb@mt.com

### Malaysia

Mettler-Toledo (M) Sdn Bhd  
Bangunan Electroscop Holding, U1-01  
Lot 8 Jalan Astaka U8/84  
Seksyen U8, Bukit Jelutong  
MY - 40150 Shah Alam Selangor  
Tel. +60 3 78 44 58 88  
Fax +60 3 78 45 87 73  
E-Mail MT-MY.CustomerSupport@mt.com

### Mexiko

Mettler-Toledo S.A. de C.V.  
Pino No. 350, Col. Sta.  
MA. Insurgentes, Col Atlampa  
MX - 06430 México D.F.  
Tel. +52 55 55 47 57 00  
Fax +52 55 55 41 22 28  
E-Mail mt.mexico@mt.com

### Polen

Mettler-Toledo (Poland) Sp.z.o.o.  
ul. Poleczki 21  
PL - 02-822 Warszawa  
Tel. +48 22 545 06 80  
Fax +48 22 545 06 88  
E-Mail polska@mt.com

### Österreich

Mettler-Toledo Ges.m.b.H.  
Südrandstraße 17  
A - 1230 Wien  
Tel. +43 1 607 43 56  
Fax +43 1 604 28 80  
E-Mail infoprocess.mtat@mt.com

### Russland

Mettler-Toledo Vostok ZAO  
Sretenskij Bulvar 6/1  
Office 6  
RU - 101000 Moscow  
Tel. +7 495 651 98 86  
Fax +7 495 621 63 53  
+7 495 621 78 68  
E-Mail inforus@mt.com

### Schweden

Mettler-Toledo AB  
Virkesvägen 10  
Box 92161  
SE - 12008 Stockholm  
Tel. +46 8 702 50 00  
Fax +46 8 642 45 62  
E-Mail info.se@mt.com

### Schweiz

Mettler-Toledo (Schweiz) GmbH  
Im Langacher  
Postfach  
CH - 8606 Greifensee  
Tel. +41 44 944 45 45  
Fax +41 44 944 45 10  
E-Mail salesola.ch@mt.com

### Singapur

Mettler-Toledo (S) Pte. Ltd.  
Block 28  
Ayer Rajah Crescent #05-01  
SG - 139959 Singapore  
Tel. +65 6890 00 11  
Fax +65 6890 00 12  
+65 6890 00 13  
E-Mail precision@mt.com

### Slowakei

Mettler-Toledo s.r.o.  
Hattalova 12/A  
SK - 831 03 Bratislava  
Tel. +421 2 4444 12 20-2  
Fax +421 2 4444 12 23  
E-Mail predaj@mt.com

### Slowenien

Mettler-Toledo d.o.o.  
Peske 12  
SI - 1236 Trzin  
Tel. +386 1 530 80 50  
Fax +386 1 562 17 89  
E-Mail keith.racman@mt.com

### Spanien

Mettler-Toledo S.A.E.  
C/Miguel Hernández, 69-71  
ES - 08908 L'Hospitalet de Llobregat  
(Barcelona)  
Tel. +34 93 223 76 00  
Fax +34 93 223 76 01  
E-Mail bcn.centralita@mt.com

### Südkorea

Mettler-Toledo (Korea) Ltd.  
Yeil Building 1 & 2 F  
124-5, YangJe-Dong  
SeCho-Ku  
KR - 137-130 Seoul  
Tel. +82 2 3498 3500  
Fax +82 2 3498 3555  
E-Mail Sales\_MTKR@mt.com

### Tschechische Republik

Mettler-Toledo s.r.o.  
Trebohosticka 2283/2  
CZ - 100 00 Praha 10  
Tel. +420 2 72 123 150  
Fax +420 2 72 123 170  
E-Mail sales.mtcz@mt.com

### Thailand

Mettler-Toledo (Thailand) Ltd.  
272 Soi Soonvijai 4  
Rama 9 Rd., Bangkapi  
Huay Kwang  
TH - 10320 Bangkok  
Tel. +66 2 723 03 00  
Fax +66 2 719 64 79  
E-Mail MT-TH.CustomerSupport@mt.com

### Ungarn

Mettler-Toledo Kereskedelmi KFT  
Teve u. 41  
HU - 1139 Budapest  
Tel. +36 1 288 40 40  
Fax +36 1 288 40 50  
E-Mail mthuh@t-online.hu

### USA/Kanada

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 mtprous@mt.com  
ingold@mt.com



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Mettler-Toledo AG, Process Analytics  
Industrie Nord, CH - 8902 Urdorf, Switzerland  
Tel. +41 44 729 62 11, Fax +41 44 729 66 36

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