

InPro® 6950 / 6900 / 6800 / 6050

The O₂ sensor family for dissolved oxygen measurement

Technical Data



InPro 6950/6900/6800/6050

Short description

The InPro O₂ 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 O₂ sensors and measuring systems for, in particular, the beverage industry and biotechnology.

Outstanding features of the O₂ 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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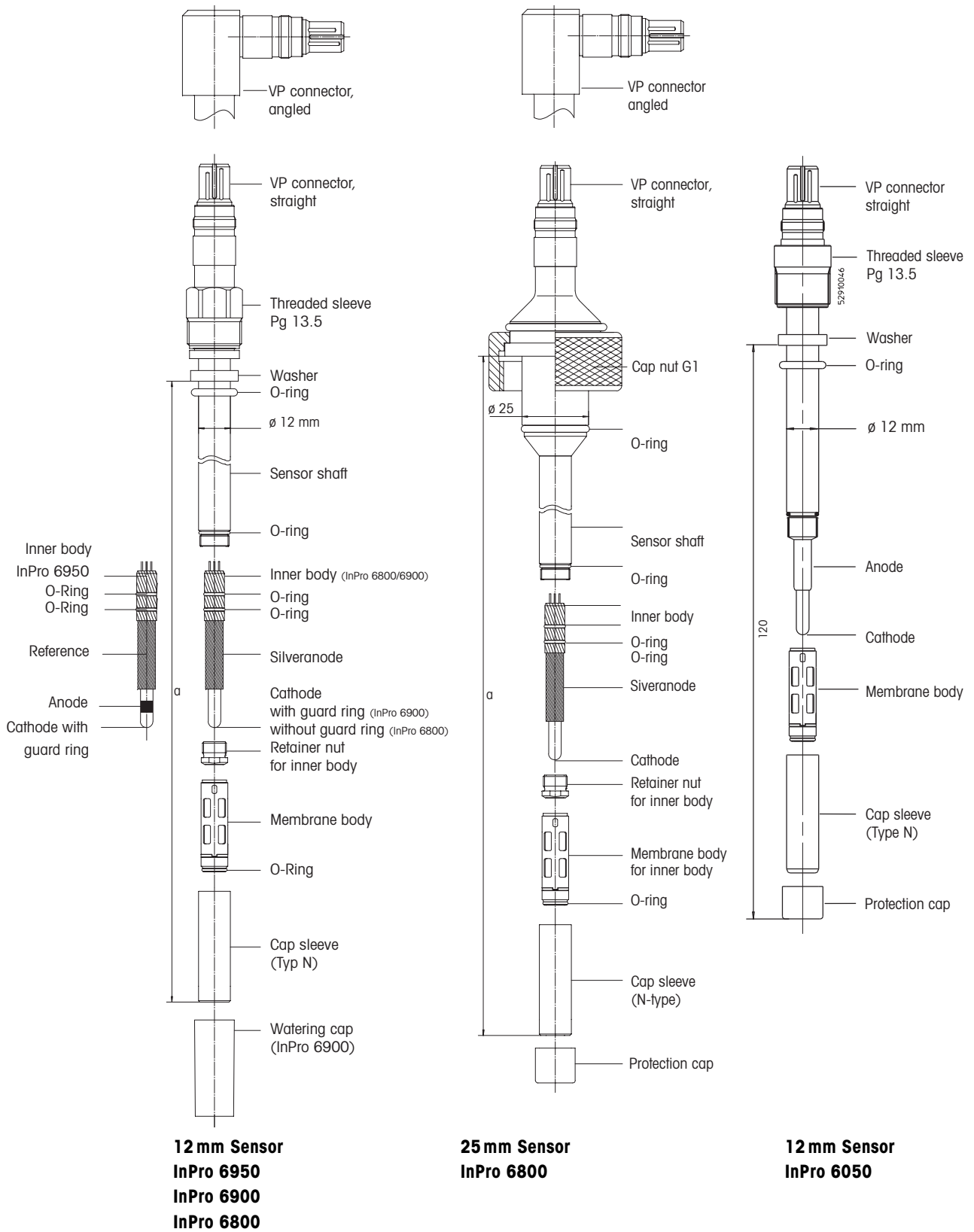
METTLER TOLEDO

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

Specifications	InPro 6950	InPro 6900	InPro 6800	InPro 6050
Measurement principle	Amperometric/polarographic (in accordance with the requirements of ISO 5814 and EN 25814)			
Working conditions				
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)	–
Sensor performance				
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 ₂	0.25 µg/l [0.25 ppb]	3 µg/l [3 ppb]	–	–

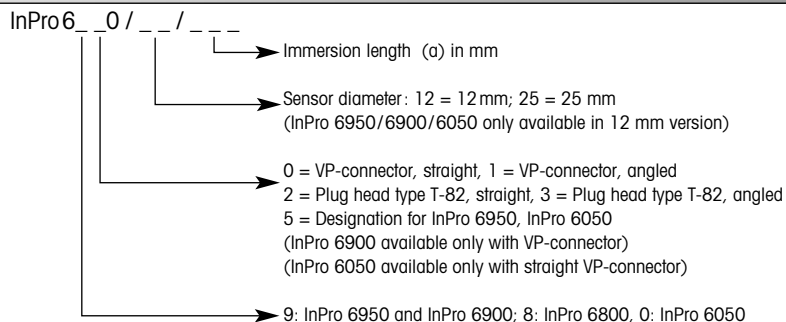
Specifications	InPro 6950	InPro 6900	InPro 6800	InPro 6050
Accuracy				
– in aqueous media	≤±[0.1 % + 1 ppb]	≤±[1 % + 1 ppb]	≤±[1 % + 6 ppb]	≤±[1 % + 30 ppb]
– in liquids containing CO ₂	≤±[1 % + 0.25 ppb]	≤±[1 % + 3 ppb]	–	–
Response time at 25 °C (77 °F) (air → N ₂)	t _{98%} < 90 s	t _{98%} < 90 s	t _{98%} < 90 s	t _{98%} < 90 s
Sensor signal in ambient air at 25 °C (77 °F)	2500 ... 6000 nA	290 ... 500 nA	50 ... 110 nA	40 ... 110 nA
Residual signal in N ₂ at 25 °C (77 °F)			–	–
% of signal in in ambient air	≤±0.025 %	0.03 %	0.1 %	0.3 %
Design features				
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 ₂ 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] PPS with material certificate 3.1 (other materials on request)	S/steel 1.4404 [AISI 316L] PPS material certificate 3.1 (other materials on request)	–
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			
Anode	Platinum	silver/silver chloride		
Reference	siver/silverchlorid	–	–	–
ATEX compatibility	–	II 1/2 Ex ia IIC T6/T5/T4	II 1/2 Ex ia IIC T6/T5/T4	–
FM compatibility	–	IS CL I, Div 1, GR ABCD	IS CL I, Div 1, GR ABCD	–
Certificates (MaxCert™)				
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)	•	–
4100/2H(X)	–	•	•	•
4100 PA, FF	–	• (limited functions)	•	–
4100 ppb	–	•	•	–
4100 e	–	–	•	•
4050 e	–	–	–	•

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	•	–
Retractable housing		
InTrac 777 e	•	–
InTrac 797 e	•	–
Immersion housing		
InDip 550	•	–

Accessories



O₂ 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.

O₂ 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 O₂ Sensors.

Sensor	Order. no
O ₂ sensor master InPro 6950	52 206 113
O ₂ sensor master InPro 6900	52 200 893
O ₂ sensor master InPro 6800/6050	52 200 892
O ₂ sensor simulator	52 200 891
Zeroing gel for zero-point control	34 100 1032
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/3m	52 300 108	VP6-HT/3m	52 300 112
VP6-ST/5m	52 300 109	VP6-HT/5m	52 300 113
VP6-ST/10m	52 300 110	VP6-HT/10m	52 300 114
VP6-ST/15m	52 300 144	VP6-HT/15m	52 300 237
VP6-ST/35m	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
Electrolyte InPro 6950 (5 ml)	52 206 111
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
Electrolyte InPro 6900 (5 ml)	52 201 005
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
Elektrolyte 25 ml	34 100 2016
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 O₂ sensor. Cap sleeves are supplied complete with material certificate.

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