Data sheet

Temperature sensor with integrated transmitter for maritime applications, Type MBT 5560

With MBT 5560 we have combined the technology of our standard temperature sensors and the electrical connections from our MBS pressure transmitters with a new developed electronics which has resulted in a compact temperature sensor with a built-in transmitter.

The MBT 5560 is designed for use in harsh industrial environments where reliable, robust and accurate equipment is required.

Available with a wide selection of process and electrical connections. Can be delivered with a 33 mm extension length which makes it possible to measure temperatures up to 200 °C without damaging the built-in electronics.

Features

- Designed for use in harsh industrial environments where reliable, robust and accurate equipment is required
- All metal enclosure parts made of stainless steel (AISI 316)
- Output signals: 4 – 20 mA or Ratiometric 10 – 90%
- A wide selection of process and electrical connections
- Ultra compact design
- Temperature range -50 – 200 °C
- Sensor pockets available for applications where emptying the system is not an option
- Based on Pt 1000 technology

Approvals

Lloyds Register of Shipping, LR
Germanischer Lloyd, GL (not ratiometric)
Det Norske Veritas, DNV (not ratiometric)
Registro Italiano Navale, RINA
Nippon Kaiji Kyokai, NKK
American Bureau of Shipping, ABS
Korean Register of Shipping, KRS
Bureau Veritas, BV
China Classification Society, CCS

Technical data

Main specifications

Process connections	See page 3
Measuring ranges	Any combinations between -50 – 200 °C
Minimum span	25 °C
Output signals	4 – 20 mA or Ratiometric 10 – 90%
Electrical connections	See page 4

Performance

	Indicative response times			
	Water 0.2 m/s		Air 1 m/s	
ø8 mm	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
	10 s	35 s	95 s	310 s
Accuracy	< ± 0.5% FS (typ.) < ± 1.0% FS (max.)			
Max. load protection tube	100 bar			

Electrical specifications

	Nom. Output signal (short-circuit protected)	
	4 – 20 mA	**ratiometric 10 – 90% of supply voltage**
Supply voltage [U_S] polarity protected	10 – 30 V d.c.	4.75 – 8 V d.c. 5 V d.c. (Nom.)
Supply – current consumption	–	< 4 mA at 5 V d.c.
Insulation resistance	> 100 Mohm at 100 V d.c.	> 100 Mohm at 100 V d.c.
Supply voltage dependency	< ± 0.05% FS / 10 V	–
Current limitation	30 mA	–
Output impedance	–	< 25 ohm
Load [R_L]	R_L<(U_S-10) / (0.02 A) ohm	R_L> 5 kohm at 5 V d.c.

Environmental conditions

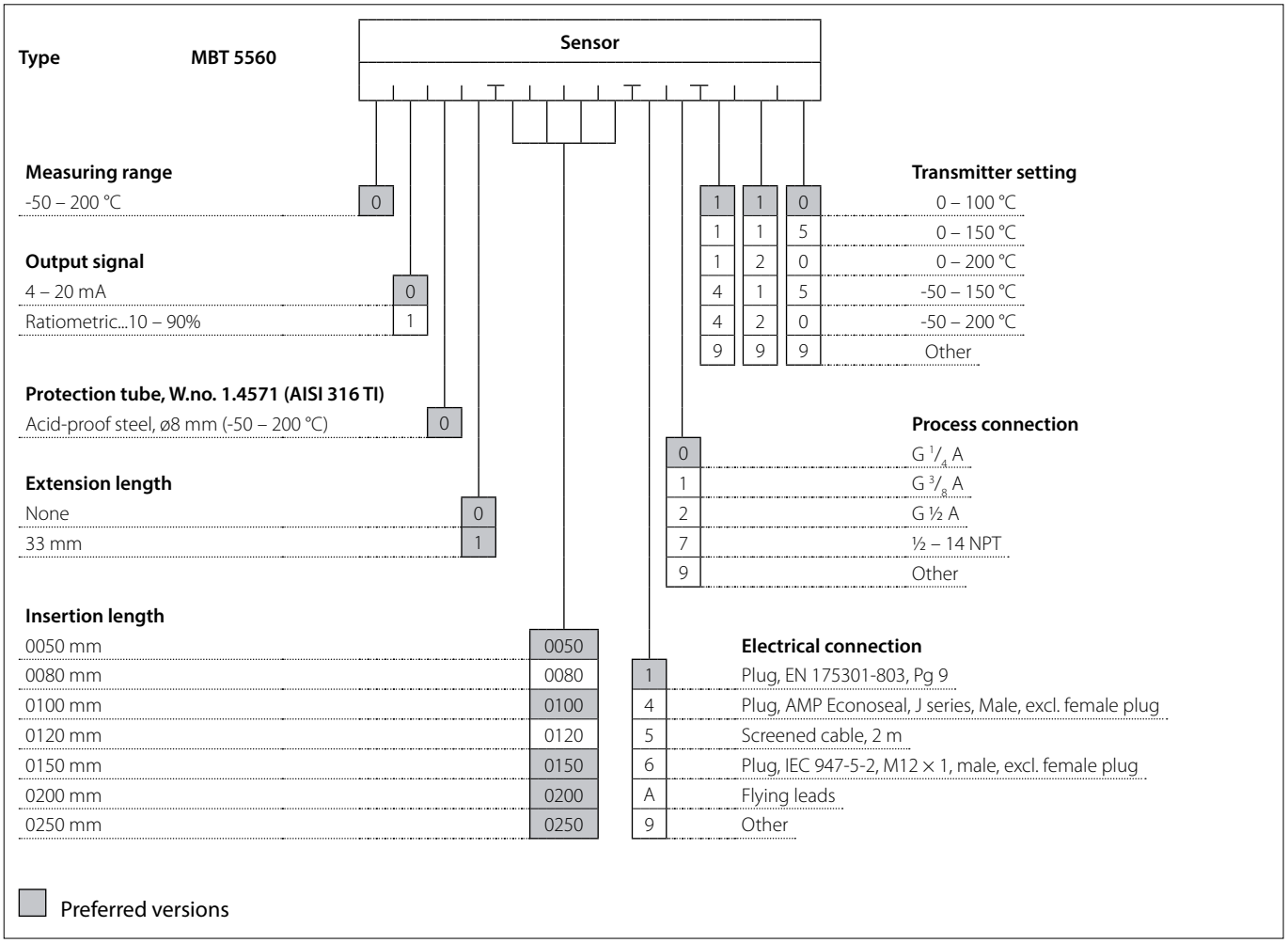
Media temperature (max. 120 °C without extension length)		-50 – 200 °C
Temperature on electronics[1)]		-40 – 85 °C
Transport temperature range		-50 – 85 °C
EMC – Emmision		EN 61000-6-3
EMC – Immunity		EN 61000-6-2
Vibration stability	Sinusoidal 15.9 mm-pp, 5 Hz – 25 Hz	
	4 g, 25 Hz – 2 kHz	IEC 60068-2-6
	Random 7.5 g_{rms}, 5 Hz – 1 kHz	IEC 600868-2-34, IEC 60068-2-36
Shock resistance	Shock 500 g / 1 ms	IEC 60068-2-27
	Free fall	IEC 60068-2-32
Enclosure (depending on electrical connections)		See page 4

[1)] Temperature of the electronics depends on the media temperature, extension length, ambient temperature and air velocity.

Mechanical characteristics

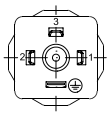
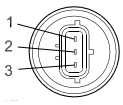
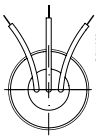
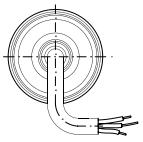
Materials:	Wetted parts Enclosure	W.no. 1.4571 (AISI 316 Ti) W.no. 1.4404 (AISI 316 L)
Measuring insert		fixed
Net weight (Depending on design)		0.1 – 0.15 kg

Ordering standard



Non-standard build up combinations may be selected. However, minimum order quantities may apply, please contact your local Danfoss office for more information

Electrical connections

EN 175301-803	AMP Econoseal J series (male)	IEC 947-5-2 M12 × 1	Flying leads	2 m screened cable
				

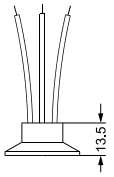
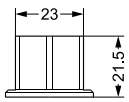
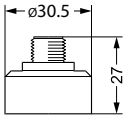
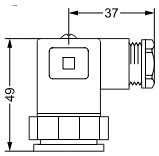
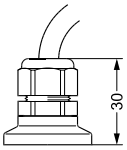
Enclosure				
IP65	IP67	IP67	IP67	IP67

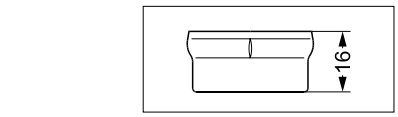
Materials				
Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	Glass filled polyamid, PA 6.6	PUR

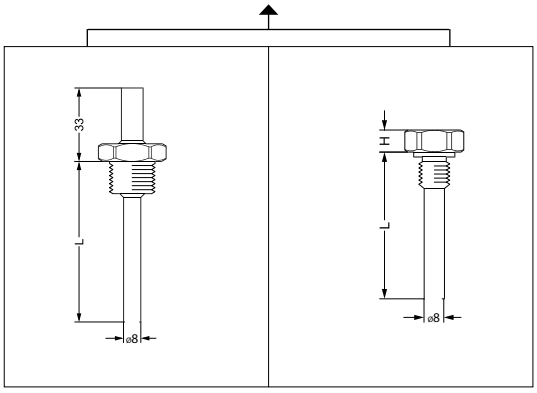
Electrical connection, 4 – 20 mA output (2 wire)				
Pin 1: +supply Pin 2: ÷supply Pin 3: Not used Earth: Not connected to MBT housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Not used	Pin 1: +supply Pin 2: Not used Pin 3: Not used Pin 4: ÷supply	Red wire: +supply Black wire: ÷supply	Red wire: +supply White wire: ÷supply Red/black wire: Not used Screen: Not connected to MBT housing

Electrical connection, Ratio metric (3-wire) 10 – 90%				
Pin 1: +supply Pin 2: ÷supply Pin 3: Output Earth: Not connected to MBT housing	Pin 1: +supply Pin 2: ÷supply Pin 3: Output	Pin 1: +supply Pin 2: not used Pin 3: Output Pin 4: ÷supply	Red wire: +supply Black wire: ÷supply Blue wire: Output	Red wire: +supply White wire: ÷supply Red/ Black wire: Output Screen: Not connected to MBT housing

Dimensions

Flying leads	AMP Econoseal J series (male)	IEC 947-5-2 M12 × 1, 4-pin	EN 175301-803, Pg 9	2 m Screened cable
				





L = Insertion length
H = 9 mm