

Data sheet

Exhaust gas temperature sensors

MBT 5113 and MBT 5116



Heavy-duty sensors used for measuring exhaust gas from diesel engines, turbines and compressors within stationary and marine applications.

MBT 5113 – based on thermocouple technology for media temperatures up to 800 °C.

MBT 5116 – based on a Pt 100 / Pt 1000 element technology for standardised signals, high accuracy and media temperature up to 600 °C.

Features

MBT 5113

- Up to 800 °C media temperatures
- B-head for standard installations
- Changeable inserts
- Solid drilled protection tube for high resistance to shock and vibrations
- 1 or 2 x NiCr-Ni, type K

MBT 5116

- Up to 600 °C media temperatures
- 2 or 3 wire connections
- Solid drilled protection tube for high resistance to shock and vibrations
- Available in 2 versions:
 - Slim-line for compact installations
 - B-head for standard installations
- Changeable insert
- 1 or 2 x Pt 100 / Pt 1000

Approvals

Lloyds Register of Shipping, LR
Germanischer Lloyd, GL
Det Norske Veritas, DNV
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 MBT 5113
General data MBT 5113

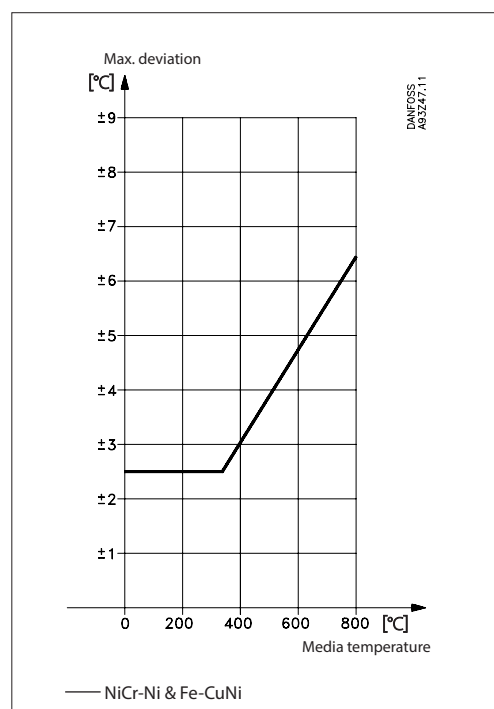
Measuring range	-50 – 800 °C
Sensing element	1 x NiCr-Ni, type K or 2 x NiCr-Ni, type K
Protection tube	ø24 / ø14, AISI 316 Ti

Response times

Protection tube	Indicative response times			
	Water 0.2 m/s		Air 1 m/s	
ø24 / ø14	$t_{0.5}$	$t_{0.9}$	$t_{0.5}$	$t_{0.9}$
		30 s	95 s	200 s

Mechanical and environmental specifications

Max. temperature	Ambient:	90 °C with 800 °C media temperature
		85 °C with transmitter
Vibration stability	Shock:	100 g/6 ms
	Vibrations:	4 g sine function, 2 – 100 Hz , measured according to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
Cable entry	Pg 16	

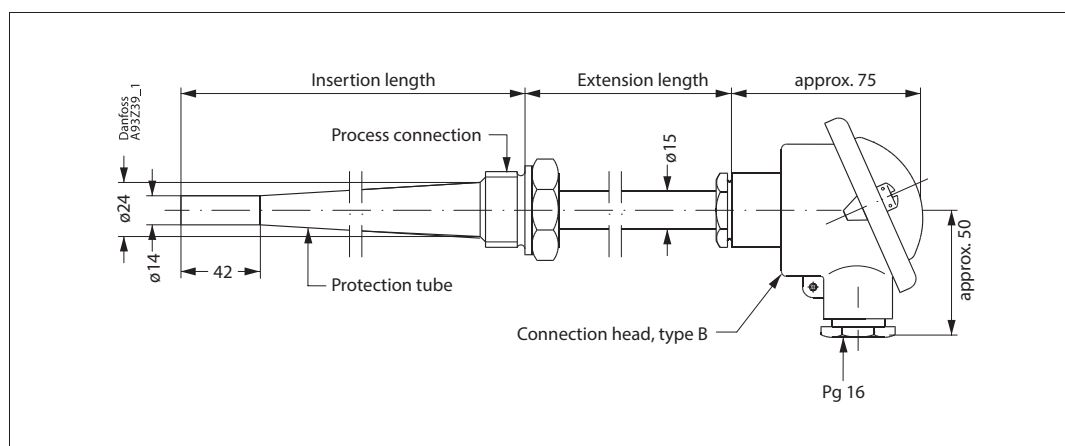
Sensor tolerance EN 60584-2 class 2


Ordering standard

Type MBT 5113		Sensor		Transmitter																													
Connection head		B-head		<table border="1"> <tr> <td>0</td> <td>0</td> <td>None</td> </tr> <tr> <td>4</td> <td>5</td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td>60 – 600 °C</td> </tr> <tr> <td>7</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>9</td> <td>Other</td> </tr> </table>		0	0	None	4	5		5			6		60 – 600 °C	7			8			9	9	Other							
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9	9	Other																															
Resistance value		<table border="1"> <tr> <td>1 x NiCr-Ni, Type K (-50 – 800 °C)</td> <td>0</td> </tr> <tr> <td>2 x NiCr-Ni, Type K (-50 – 800 °C)</td> <td>1</td> </tr> <tr> <td>Other</td> <td>9</td> </tr> </table>		1 x NiCr-Ni, Type K (-50 – 800 °C)	0	2 x NiCr-Ni, Type K (-50 – 800 °C)	1	Other	9	<table border="1"> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>1</td> <td>0 °C</td> </tr> <tr> <td>2</td> <td>-10 °C</td> </tr> <tr> <td>3</td> <td>-30 °C</td> </tr> <tr> <td>4</td> <td>-50 °C</td> </tr> <tr> <td>9</td> <td>Other</td> </tr> </table>		0	None	1	0 °C	2	-10 °C	3	-30 °C	4	-50 °C	9	Other										
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Protection Tube, W.nr. 1.4571 (AISI 316 Ti)		<table border="1"> <tr> <td>Acid-proof steel, Plain hole, Tapered</td> <td>0</td> </tr> <tr> <td>Other</td> <td>9</td> </tr> </table>		Acid-proof steel, Plain hole, Tapered	0	Other	9	Transmitter setting, start of range																									
Acid-proof steel, Plain hole, Tapered	0																																
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Extension length		<table border="1"> <tr> <td>None</td> <td>0</td> </tr> <tr> <td>50 mm</td> <td>1</td> </tr> <tr> <td>100 mm</td> <td>2</td> </tr> <tr> <td>Other</td> <td>9</td> </tr> </table>		None	0	50 mm	1	100 mm	2	Other	9	Transmitter type																					
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Insertion length		<table border="1"> <tr> <td>80 mm</td> <td>080</td> </tr> <tr> <td>100 mm</td> <td>100</td> </tr> <tr> <td>120 mm</td> <td>120</td> </tr> <tr> <td>150 mm</td> <td>150</td> </tr> <tr> <td>170 mm</td> <td>170</td> </tr> <tr> <td>200 mm</td> <td>200</td> </tr> <tr> <td>250 mm</td> <td>250</td> </tr> <tr> <td>300 mm</td> <td>300</td> </tr> <tr> <td>xx0 mm</td> <td>xx0</td> </tr> </table>		80 mm	080	100 mm	100	120 mm	120	150 mm	150	170 mm	170	200 mm	200	250 mm	250	300 mm	300	xx0 mm	xx0	<table border="1"> <tr> <td>0</td> <td>None</td> </tr> <tr> <td>B</td> <td>Galvanically isolated in hightened lid</td> </tr> <tr> <td>C</td> <td>Galvanically isolated and EEx ia IIC T4/T6 in hightened lid</td> </tr> <tr> <td>H</td> <td>Galvanically isolated as terminalblock</td> </tr> <tr> <td>I</td> <td>Galvanically isolated and EEx ia IIC T4/T6 as terminalblock</td> </tr> </table>		0	None	B	Galvanically isolated in hightened lid	C	Galvanically isolated and EEx ia IIC T4/T6 in hightened lid	H	Galvanically isolated as terminalblock	I	Galvanically isolated and EEx ia IIC T4/T6 as terminalblock
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Preferred versions

Dimensions
MBT 5113



Net weight [kg]

Insertion length [mm]	Process connection	
	G ½"	G ¾"
080	0.48	–
100	0.52	0.60
120	0.56	0.64
150	0.60	0.70
170	–	0.72
200	–	0.76
250	–	0.85
300	–	1.04

**Technical data
MBT 5116**
General data MBT 5116

Measuring range	-50 – 600 °C
Sensing element	1 or 2 x Pt 100/1 or 2 x Pt 1000
Protection tube	ø24 / ø14, AISI 316

Response times

Protection tube	Indicative response times			
	Water 0.2 m/s		Air 1 m/s	
	t _{0.5}	t _{0.9}	t _{0.5}	t _{0.9}
ø24 / ø14	30 s	95 s	150 s	450 s

Mechanical and environmental specifications

Max. ambient temperature	Slim-Line:	75 °C with 600 °C media temperature
	B-Head:	90 °C with 600 °C media temperature
Sensor tolerance	EN 60751 Class B: $\pm(0.3 + 0.005 \times t)$ t = temperature of medium, numerical value	
Insulation resistance	Minimum 0.5 M Ohm at 600 °C according to EN60751	
Vibration stability	Shock:	100 g/6 ms
	Vibrations:	4 g sine function, 2 – 200Hz, measured according to IEC 60068-2-6
Enclosure	IP65 according to IEC 60529	
Cable entry	Slim-Line	Pg 13.5
	B-Head	Pg 16

Material

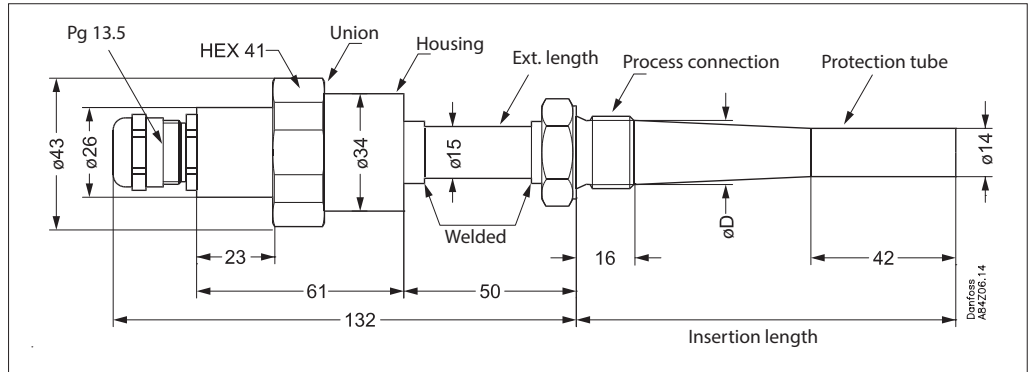
Slim-Line	Housing	Nickel plated brass
	Union	Nickel plated brass
	Cover	Nickel plated brass
	Spring (internal mounted)	W.no. 1.4568
	Extension length	AISI 316
	Protection tube in contact with media	AISI 316
B-Head	Union	Nickel plated brass
	Connection head	Die cast aluminium
	Extension length	AISI 316
	Protection tube in contact with media	AISI 316

Ordering standard

Type MBT 5116		Sensor	
Connection head			
B-head (-50 – 600 °C)	B		
Slimline (-50 – 600 °C)	S		
Cable (-50 – 600 °C)	C		
			Connection
		0	2 wire 3 terminals
		1	2 wire 4 terminals
Resistance value			Process connection
1 x Pt 100	0	0	G ½ A
2 x Pt 100	1	1	G ¾ A
1 x Pt 1000	2	3	M33 x 2
2 x Pt 1000	3	9	Other
Other	9		
Protection Tube			
ø24 / ø14, Tapered	0		
Other	9		
Extension length			Insertion length
050 mm	1	080	080 mm
100 mm	2	100	100 mm
Other	9	120	120 mm
		150	150 mm
		200	200 mm
		250	250 mm
		300	300 mm
		xx0	xx0 mm
	Preferred versions		

Dimensions

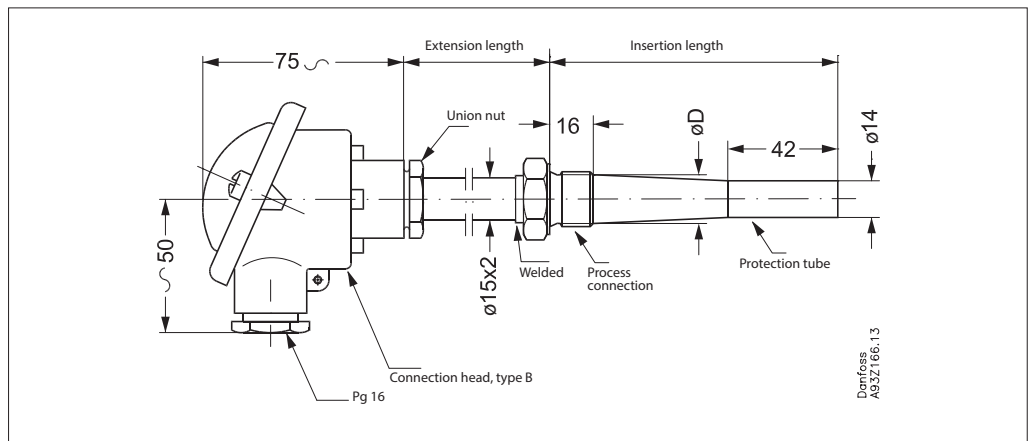
MBT 5116 Slim-line



Process connection	G ½ A	G ¾ A
Width across flats	HEX 27	HEX 32
øD	18 mm	24 mm

Note:
Tightening torque moment for the union max.: 25 Nm

MBT 5116 B-head



Process connection	G ½ A	G ¾ A
Width across flats	HEX 27	HEX 32
øD	18 mm	24 mm

Net Weight [kg]

Insertion length [mm]	Process connection			
	Slim-line		B-head	
	G ½"	G ¾"	G ½"	G ¾"
080	0.43	–	0.48	–
100	0.46	0.52	0.52	0.60
120	0.48	0.57	0.56	0.64
150	0.52	0.64	0.60	0.70
200	–	0.76	–	0.76
250	–	0.89	–	0.85
300	–	0.99	–	1.04

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