

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*

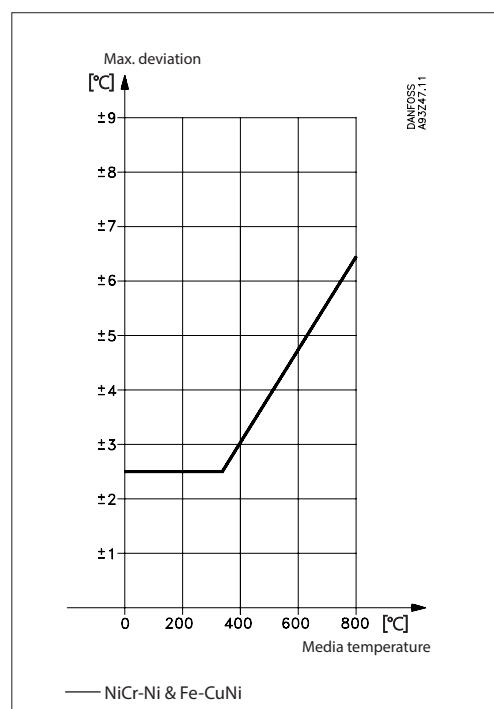
Measuring range	-50 – 800 °C
Sensing element	1 x NiCr-Ni, type K or 2 x NiCr-Ni, type K
Protection tube	ø24 / ø14, AISI 316 Ti

*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	

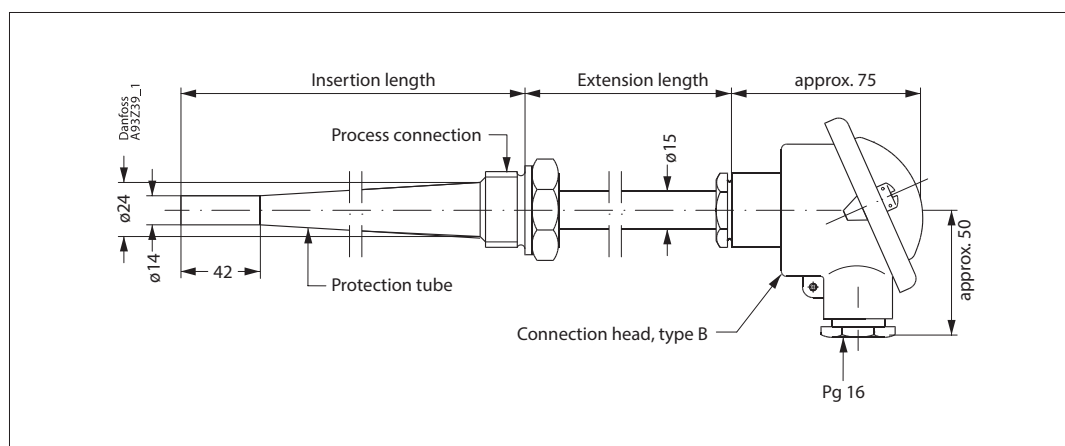
*Sensor tolerance EN 60584-2 class 2*


Ordering standard

Type MBT 5113		Sensor		Transmitter	
<b>Connection head</b>					
B-head					
<b>Resistance value</b>					
1 x NiCr-Ni, Type K (-50 – 800 °C)		0		0	0
2 x NiCr-Ni, Type K (-50 – 800 °C)		1		4	5
Other		9		5	
<b>Protection Tube, W.nr. 1.4571 (AISI 316 Ti)</b>					
Acid-proof steel, Plain hole, Tapered		0		6	60 – 600 °C
Other		9		7	
<b>Extension length</b>					
None		0		8	
50 mm		1		9	Other
100 mm		2			
Other		9			
<b>Insertion length</b>					
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		
<b>Transmitter setting, end of range</b>					
0 0 None					
4 5					
5					
6 60 – 600 °C					
7					
8					
9 9 Other					
<b>Transmitter setting, start of range</b>					
0 None					
1 0 °C					
2 -10 °C					
3 -30 °C					
4 -50 °C					
9 Other					
<b>Transmitter type</b>					
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					
<b>Tolerance</b>					
0 EN 60584-2 Class 2					
1 EN 60584-2 Class 1					
9 Other					
<b>Process connection</b>					
0 G ½A					
1 G ¾A					
2 M24x2					
9 Other					

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 <sub>0.5</sub>	t <sub>0.9</sub>	t <sub>0.5</sub>	t <sub>0.9</sub>
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*

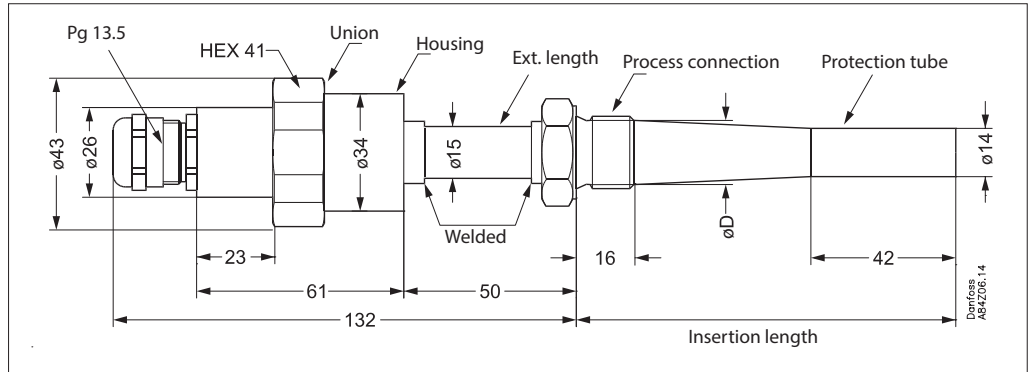
Slim-Line	Housing	Nickel plated brass
	Union	Nickel plated brass
	Cover	Nickel plated brass
	Spring (internal mounted)	W.no. 1.4568
	Extension length	AISI 316
	Protection tube in contact with media	AISI 316
B-Head	Union	Nickel plated brass
	Connection head	Die cast aluminium
	Extension length	AISI 316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

Ordering standard

Type MBT 5116		Sensor	
<b>Connection head</b>			
B-head (-50 – 600 °C)	B		
Slimline (-50 – 600 °C)	S		
Cable (-50 – 600 °C)	C		
			<b>Connection</b>
		0	2 wire 3 terminals
		1	2 wire 4 terminals
<b>Resistance value</b>			<b>Process connection</b>
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		
<b>Protection Tube</b>			
ø24 / ø14, Tapered	0		
Other	9		
<b>Extension length</b>			<b>Insertion length</b>
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**

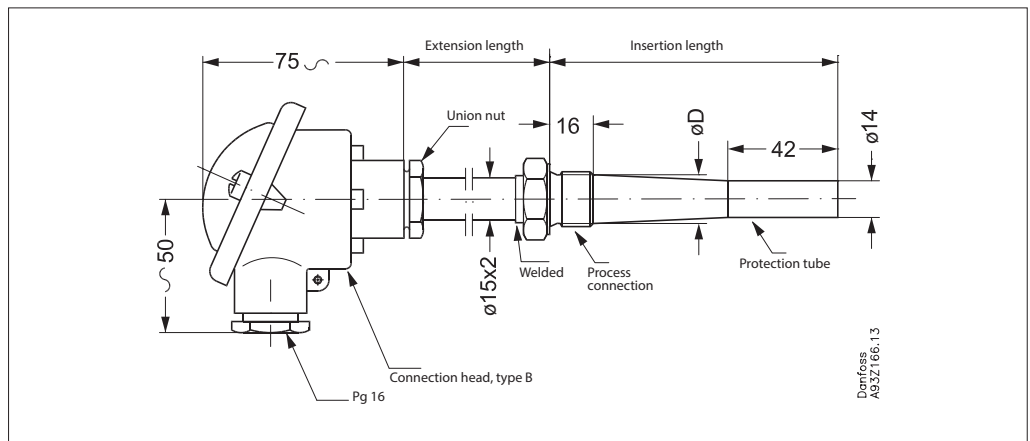
*MBT 5116 Slim-line*



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

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.