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ENGINEERING TOMORROW

Data Sheet

Temperature sensor Type **MBT 5113** and **MBT 5116**

2 stroke exhaust gas temperature sensors



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

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Product specification

Technical data

MBT 5113

Table 1: General data

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

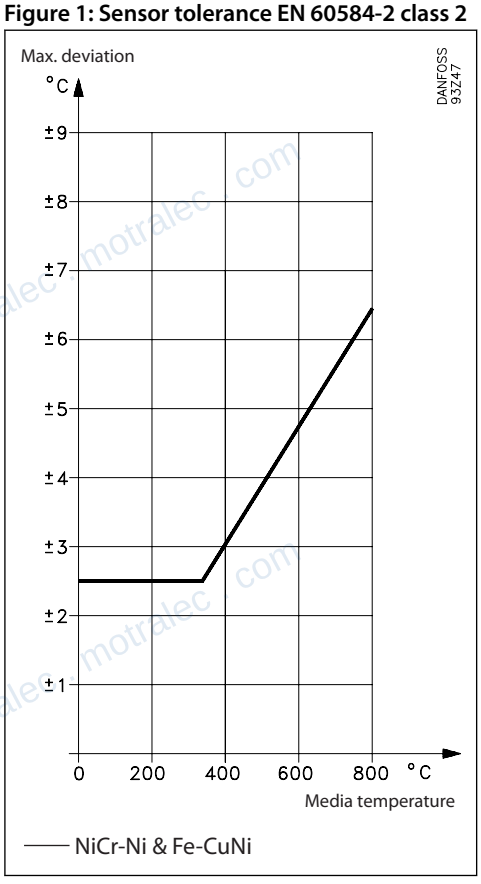
Table 2: Response times

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	700 s

Table 3: Mechanical and environmental specifications

Features	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	

Figure 1: Sensor tolerance EN 60584-2 class 2



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MBT 5116

Table 4: General data

Features	Specifications
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

Table 5: 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	150 s	450 s

Table 6: Mechanical and environmental specifications

Features	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: ±(0.3 + 0.005 × 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

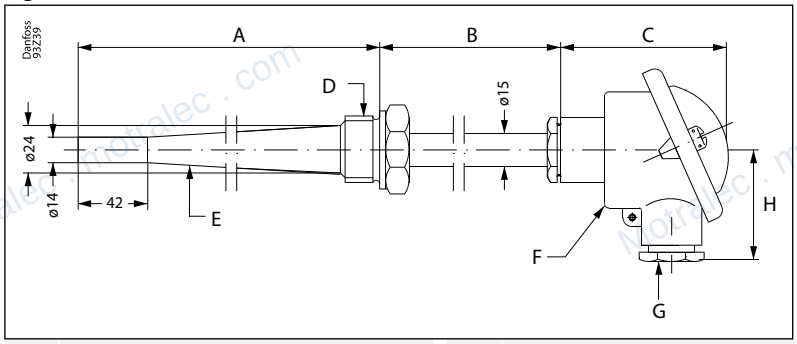
Table 7: Material

Type	Feature	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

Dimensions

MBT 5113

Figure 2: MBT 5113

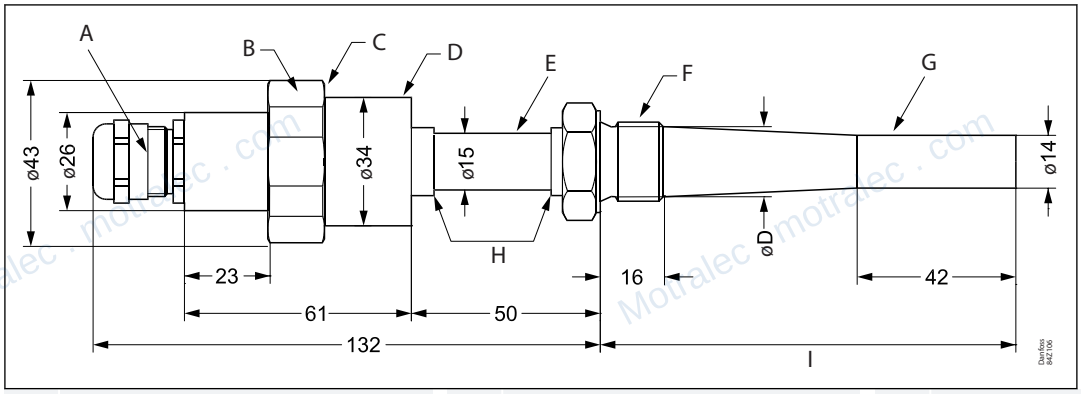


A	Insertion length	D	Process connection	G	Pg 16
B	Extension length	E	Protection tube	H	Approx. 50
C	Approx. 75	F	Connection head, type B		

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MBT 5116

Figure 3: MBT 5116 Slim-line



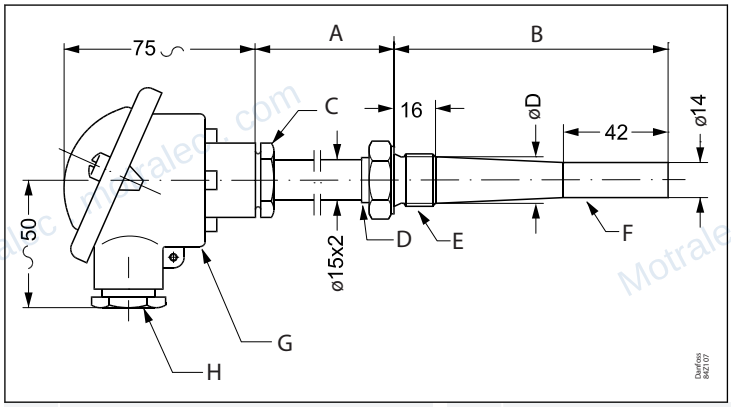
A	Pg 13.5	**D**	Housing	**G**	Protection tube
B	HEX 41	**E**	Ext. length	**H**	Welded
C	Union	**F**	Process connection	**I**	Insertion length

Table 8: Connection

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

Figure 4: MBT 5116 B-head



A	Extension length	**D**	Welded	**G**	Connection head, type B
B	Insertion length	**E**	Process connection	**H**	Pg 16
C	Union nut	**F**	Protection tube		

Table 9: Connection

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

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Net weight (kg)

MBT 5113

Table 10: Net weight - MBT 5113

Insertion length [mm]	Process connection	
	G ½"	G ¾"
80	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

MBT 5116

Table 11: Net weight - MBT 5116

Insertion length [mm]	Process connection			
	Slim-line		B-head	
	G ½"	G ¾"	G ½"	G ¾"
80	0.43	–	0.48	–
100	0.46	0.52	0.52	0.6
120	0.48	0.57	0.56	0.64
150	0.52	0.64	0.6	0.7
200	–	0.76	–	0.76
250	–	0.89	–	0.85
300	–	0.99	–	1.04

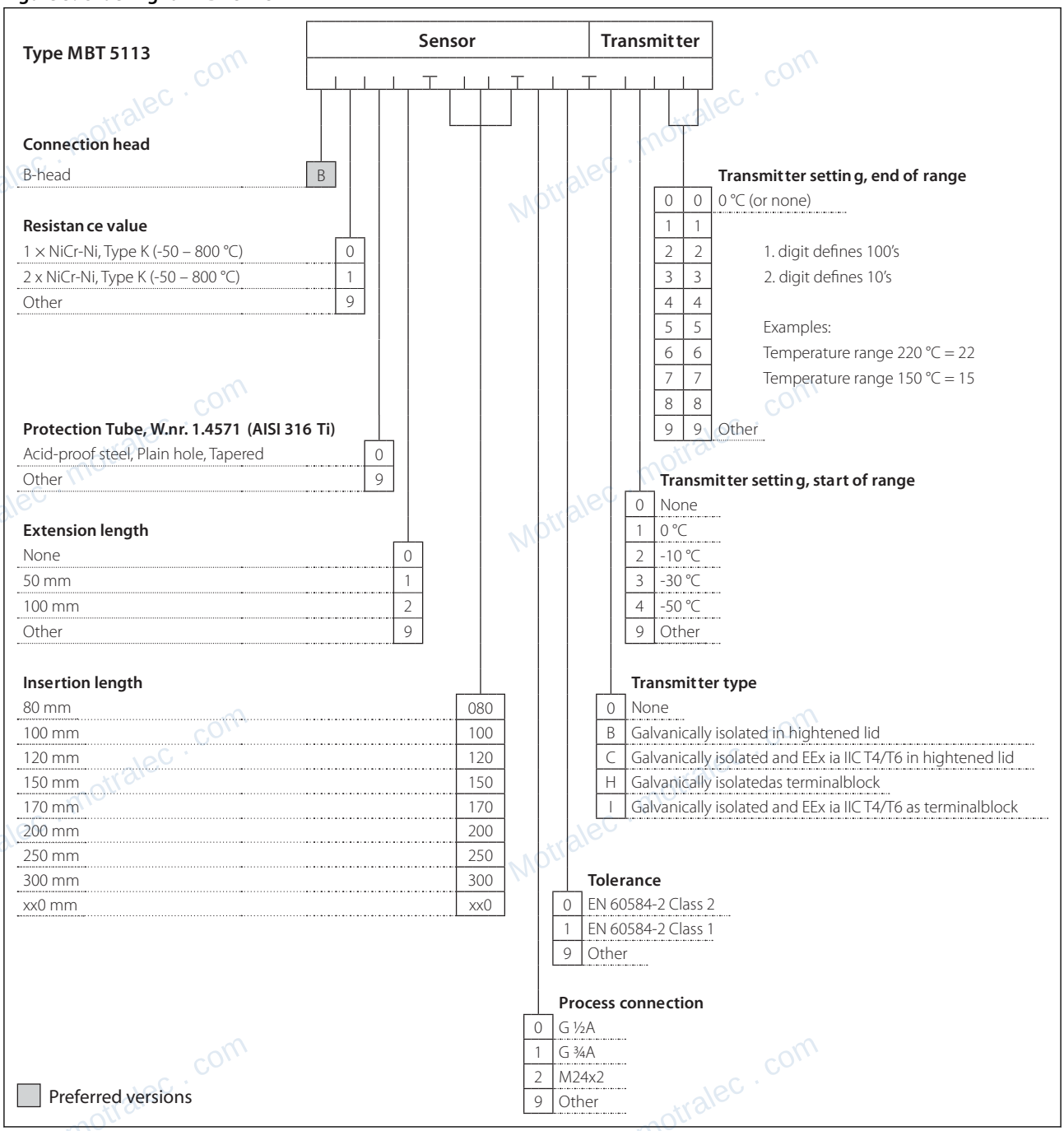
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Ordering

MBT 5113

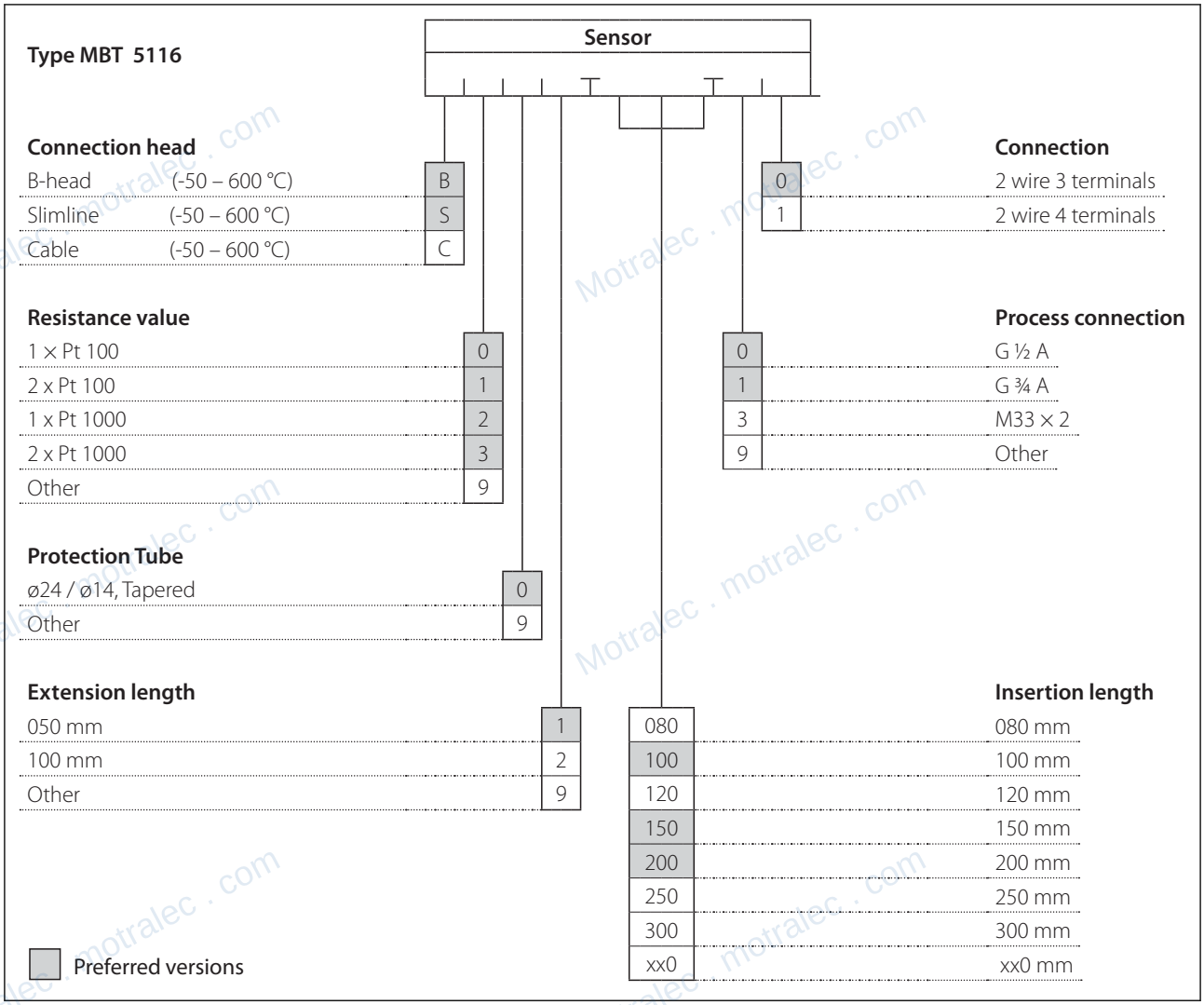
Figure 5: Ordering for MBT 5113



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MBT 5116

Figure 6: Ordering for MBT 5116



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The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 12: MBT 5113

File name	Document type	Document topic	Approval authority
CPH 04967-AE009	Marine - Safety Certificate	-	KR
ELE064120XP-001	Marine - Safety Certificate	-	RINA
16-LD1487293-PDA	Marine - Safety Certificate	-	ABS
06510-E0 BV	Marine - Safety Certificate	-	BV
GB19PTB00025	Marine - Safety Certificate	-	CCS
TAA0000130 Rev. 1	Marine - Safety Certificate	-	DNV GL
TA19235M	Marine - Safety Certificate	-	NKK
17-20082(E1)	Marine - Safety Certificate	-	LR
084R1019.01	EU Declaration	EMCD/ROHS	Danfoss
RU Д-DK.АЛ87.В.00022_19	EAC Declaration	EMC	EAC
OC.C.32.004.A 41459	Measuring - Performance Certificate	-	GOST
OC.C.32.004.A 41460	Measuring - Performance Certificate	-	GOST
084R1021.00	Manufacturers Declaration	China RoHS	Danfoss
097R0004.01	Manufacturers Declaration	RoHS	Danfoss
SMS.W.II-2179-B.0	Marine - Manufacturing Permission	-	BV
12CA69359	Explosive - Safety Certificate	ATEX	DEMKO
087R0017.00	Manufacturers Declaration	Simple apparatus	Danfoss

Table 13: MBT 5116

File name	Document type	Document topic	Approval authority
17-20082(E1)	Marine - Safety Certificate	-	LR
GB19PTB00025	Marine - Safety Certificate	-	CCS
06509-F0 BV	Marine - Safety Certificate	-	BV
TAA0000065 Rev. 1	Marine - Safety Certificate	-	DNV GL
CPH 04967-AE009	Marine - Safety Certificate	-	KR
ELE064120XP-001	Marine - Safety Certificate	-	RINA
16-LD1487293-PDA	Marine - Safety Certificate	-	ABS
TA19235M	Marine - Safety Certificate	-	NKK
084R1019.01	EU Declaration	EMCD/ROHS	Danfoss
OC.C.32.004.A 41460	Measuring - Performance Certificate	-	GOST
OC.C.32.004.A 41461	Measuring - Performance Certificate	-	GOST
084R1022.01	Manufacturers Declaration	China RoHS	Danfoss
097R0004.01	Manufacturers Declaration	RoHS	Danfoss
SMS.W.II-2179-B.0	Marine - Manufacturing Permission	-	BV
12CA69359	Explosive - Safety Certificate	ATEX	DEMKO
087R0017.00	Manufacturers Declaration	Simple apparatus	Danfoss

Table 14: MBT 5116 - Slim-line

File name	Document type	Document topic	Approval authority
CPH 04967-AE009	Marine - Safety Certificate	-	KR
ELE064120XP-001	Marine - Safety Certificate	-	RINA
06509-F0 BV	Marine - Safety Certificate	-	BV
GB19PTB00025	Marine - Safety Certificate	-	CCS
17-20082(E1)	Marine - Safety Certificate	-	LR
TA19235M	Marine - Safety Certificate	-	NKK
SMS.W.II-2179-B.0	Marine - Manufacturing Permission	-	BV

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