

## Translation

# (1) Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC
- (3) No. of Type Examination Certificate: **BVS 13 ATEX E 083 X**
- (4) Equipment: **Sensor Type CNG050\*\*\*\*\*V\*\*\*\*, F\*\*\*\*\*V\*\*\*\*, H\*\*\*\*\*V\*\*\*\*, R\*\*\*\*\*V\*\*\*\***
- (5) Manufacturer: **Micro Motion, Inc.**
- (6) Address: **7070 Winchester Circle, Boulder, Co. 80301, USA**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.
- (8) The certification body of DEKRA EXAM GmbH certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design of Category 3 equipment intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the Test and Assessment Report BVS PP 13.2165 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
- |                         |                                     |
|-------------------------|-------------------------------------|
| <b>EN 60079-0:2012</b>  | <b>General requirements</b>         |
| <b>EN 60079-15:2010</b> | <b>Type of protection 'n'</b>       |
| <b>EN 60079-31:2009</b> | <b>Protection by enclosures 't'</b> |
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.
- (11) This Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment shall include the following:

 **II 3G Ex nA IIC T1-T4/T5 Gc**  
**II 3D Ex tc IIIC T\* °C Dc**  
**IP66**

\*) see parameters

DEKRA EXAM GmbH  
Bochum, dated 2013-08-26

Signed: Migenda

\_\_\_\_\_  
Certification body

Signed: Dr. Wittler

\_\_\_\_\_  
Special services unit



- (13) Appendix to
- (14) **Type Examination Certificate**  
**BVS 13 ATEX E 083 X**
- (15) 15.1 Subject and type

Instead of the \*\*\* letters and numerals will be inserted which characterize modifications.

C	N	G	0	5	0	*	*	*	*	*	0	*	V	*	*	*	*
		F	*	*	*	*	*	*	*	*	0	*	V	*	*	*	*
		H	*	*	*	*	*	*	*	*	0	*	V	*	*	*	*
		R	*	*	*	*	*	*	*	*	0	*	V	*	*	*	*

Marking without influence to the type of protection

Letter for conduit connections

Letter for electronic interface

0 = integral 2400S

1 = integral 2400S with extender

J = integral 2200S

U = integral 2200S with extender

K = integral FMT with improved surface finish

L = integral FMT with standard surface finish

M = integrally welded FMT with standard surface finish

N = integrally welded FMT with improved surface finish

Marking without influence to the type of protection

A = High Temp. Stainless Steel Tube 350 °C

B = High Temp. HY Tube 350 °C

C = High Temp. Stainless Steel Tube 427 °C

E = High Temp. HY Tube 427 °C

Y = Standard Version Duplex Tube

Other marking without influence to the type of protection

3 numerals for type of sensor

### 15.2 Description

The flow sensor in combination with a transmitter is used for flow measurement. The flow sensor, which consists of magnetically excited oscillating tubes, contains as electrical components coils, resistors, temperature sensors and terminals and connectors.

The flow sensor is designed in connection with a suitable transmitter, e.g. type 2400S\*\*\*\*\*L\*\*\*\* in accordance with BVS 05 E 116X resp. 2200S\*\*\*\*\*L\*\*\*\* in accordance with BVS 08 ATEX E 112 X resp. FMT\*\*\*\*\*L\*\*\*\* in accordance with BVS 10 ATEX E 115 X ; only the assembly of the sensor and the transmitter guarantees the necessary degrees of protection.



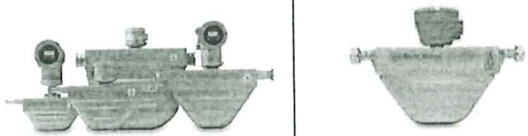
### 15.3 Parameters

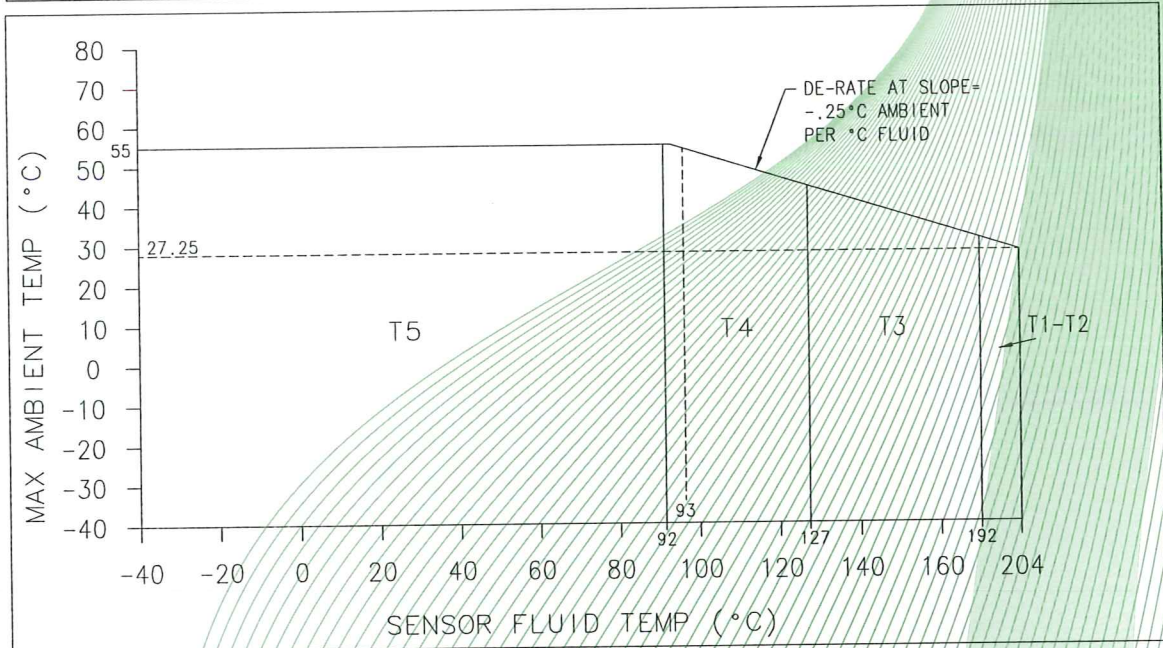
15.3.1	Drive circuit (pin connections 7-8) Voltage Current	DC	30 84	V mA
15.3.2	Pick-Off circuit (pin connections 3-4) Voltage Current	DC	30 25	V mA
15.3.3	Temperature circuit (pin connections 1, 2 and 9) Voltage Current	DC	30 25	V mA
15.3.4	Thermal data Regulation of temperature class / max. surface temperature T			

The classification into a temperature class / determination of the maximum surface temperature T depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and are shown in the following graphs:



15.3.4.1 Excluding F\*\*\*(A, B, C, E)\*\*\*\*\* $(0,1)*V$ \*\*\*\*\*.

Sensor type								
With 2400S	<table border="1"> <tr> <td>F025*****<math>(0,1)*V</math>*****</td> <td rowspan="6">CNG050***<math>(0,1)*V</math>****</td> </tr> <tr> <td>F050*****<math>(0,1)*V</math>*****</td> </tr> <tr> <td>H025*****<math>(0,1)*V</math>*****</td> </tr> <tr> <td>H050*****<math>(0,1)*V</math>*****</td> </tr> <tr> <td>R025*****<math>(0,1)*V</math>*****</td> </tr> <tr> <td>R050*****<math>(0,1)*V</math>*****</td> </tr> </table>	F025***** $(0,1)*V$ *****	CNG050*** $(0,1)*V$ ****	F050***** $(0,1)*V$ *****	H025***** $(0,1)*V$ *****	H050***** $(0,1)*V$ *****	R025***** $(0,1)*V$ *****	R050***** $(0,1)*V$ *****
F025***** $(0,1)*V$ *****	CNG050*** $(0,1)*V$ ****							
F050***** $(0,1)*V$ *****								
H025***** $(0,1)*V$ *****								
H050***** $(0,1)*V$ *****								
R025***** $(0,1)*V$ *****								
R050***** $(0,1)*V$ *****								




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

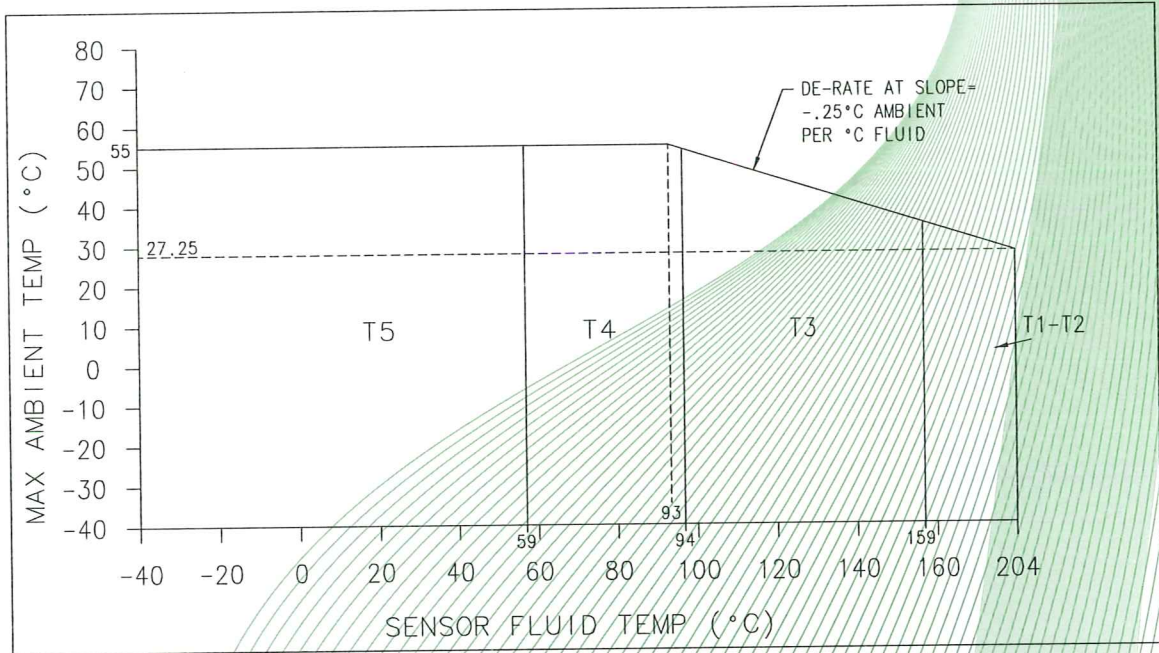
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 207 °C

Ambient temperature range:  $T_a$  -40 °C up to +55 °C



15.3.4.2 Excluding F\*\*\*(A, B, C, E)\*\*\*\*(0,1)\*V\*\*\*\*.

Sensor type	
With 2400S	F100*****(0,1)*V****
	H100*****(0,1)*V****
	R100*****(0,1)*V****



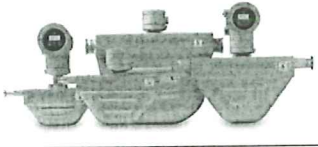
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

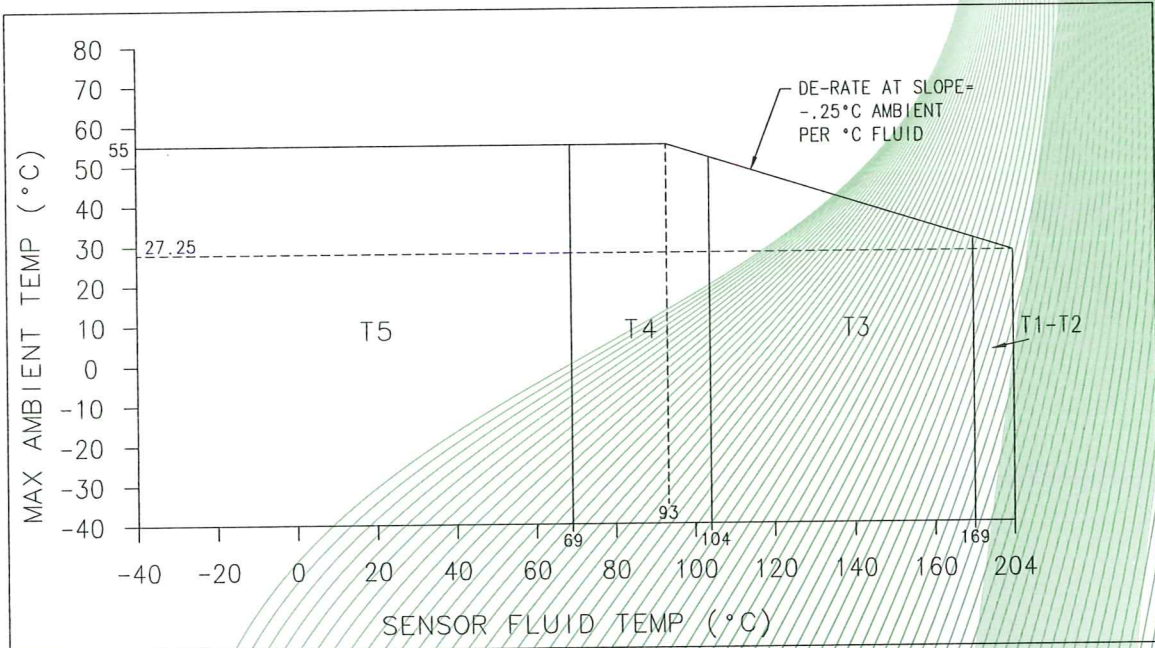
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 240 °C

Ambient temperature range:  $T_a$  -40 °C up to +55 °C



15.3.4.3 Excluding F\*\*(A, B, C, E)\*\*\*(0,1)\*V\*\*.\*

Sensor type	
With 2400S	F200***(0,1)*V**.*
	H200***(0,1)*V**.*
	R200***(0,1)*V**.*




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

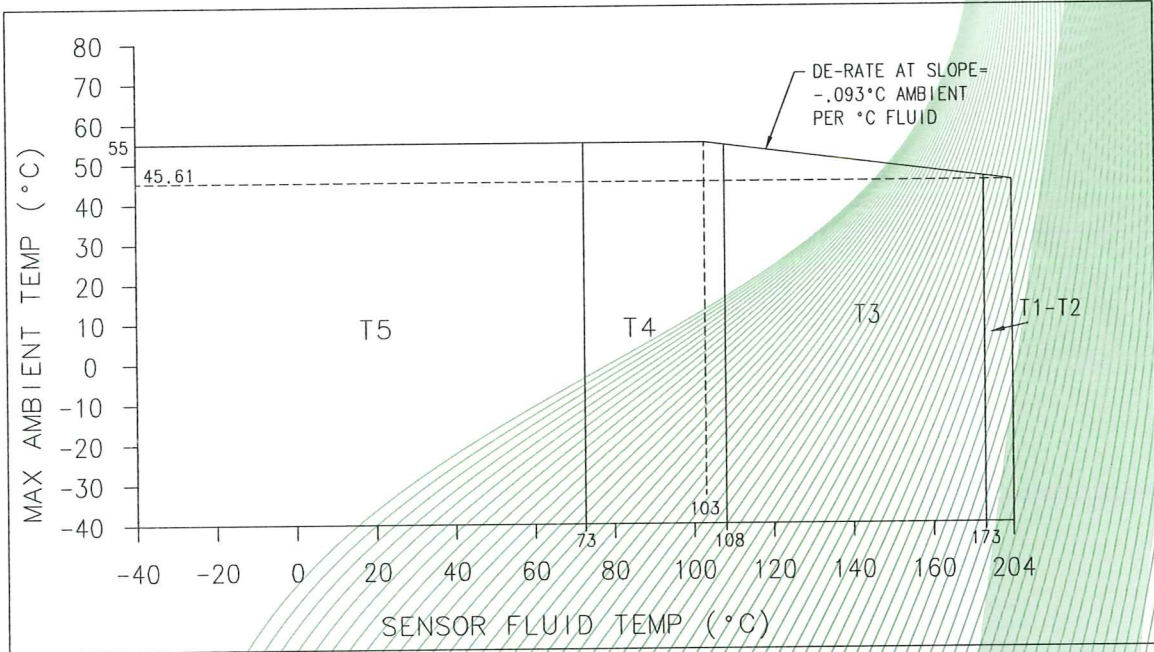
Note 2: The maximum surface temperature for dust is as follows: T5: T 95°C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 230 °C

Ambient temperature range:  $T_a$  -40 °C up to +55 °C



15.3.4.4 Excluding F\*\*(A, B, C, E)\*\*\*(0,1)\*V\*\*\*\*\*.

Sensor type	
With 2400S	F300***** (0,1)*V*****
	H300***** (0,1)*V*****




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

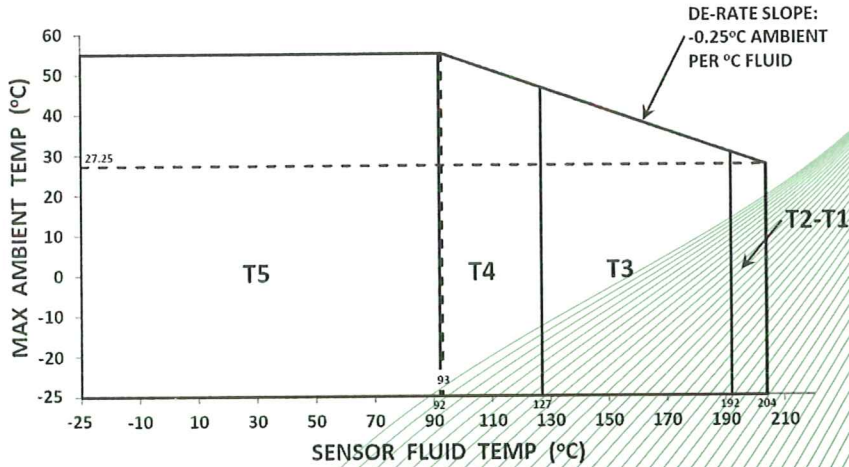
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 226 °C

Ambient temperature range:  $T_a$  -40 °C up to +55 °C



15.3.4.5 Excluding F\*\*\*(A, B, C, E)\*\*\*\*(K,L,M, N)\*V\*\*\*\*:

Sensor type								
With FMT	<table border="1"> <tr> <td>F025*****(K,L,M,N)*V****</td> <td rowspan="6">CNG050***(K,L,M,N)*V****</td> </tr> <tr> <td>F050*****(K,L,M,N)*V****</td> </tr> <tr> <td>H025*****(K,L,M,N)*V****</td> </tr> <tr> <td>H050*****(K,L,M,N)*V****</td> </tr> <tr> <td>R025*****(K,L,M,N)*V****</td> </tr> <tr> <td>R050*****(K,L,M,N)*V****</td> </tr> </table>	F025*****(K,L,M,N)*V****	CNG050***(K,L,M,N)*V****	F050*****(K,L,M,N)*V****	H025*****(K,L,M,N)*V****	H050*****(K,L,M,N)*V****	R025*****(K,L,M,N)*V****	R050*****(K,L,M,N)*V****
F025*****(K,L,M,N)*V****	CNG050***(K,L,M,N)*V****							
F050*****(K,L,M,N)*V****								
H025*****(K,L,M,N)*V****								
H050*****(K,L,M,N)*V****								
R025*****(K,L,M,N)*V****								
R050*****(K,L,M,N)*V****								




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

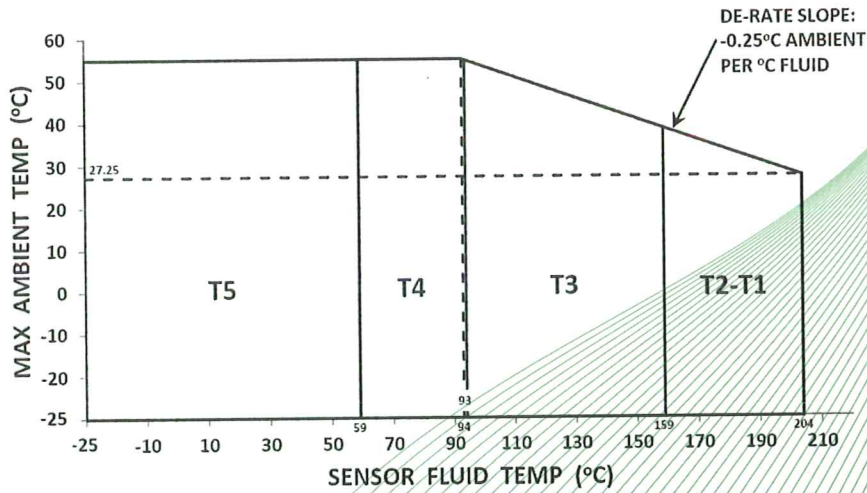
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 207 °C

Ambient temperature range:  $T_a$  -25 °C up to +55 °C



15.3.4.6 Excluding F\*\*\* (A, B, C, E)\*\*\*\* (K, L, M, N) \*V\*\*\*\*\*.

Sensor type	
With FMT	F100***** (K, L, M, N) *V*****
	H100***** (K, L, M, N) *V*****
	R100***** (K, L, M, N) *V*****




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

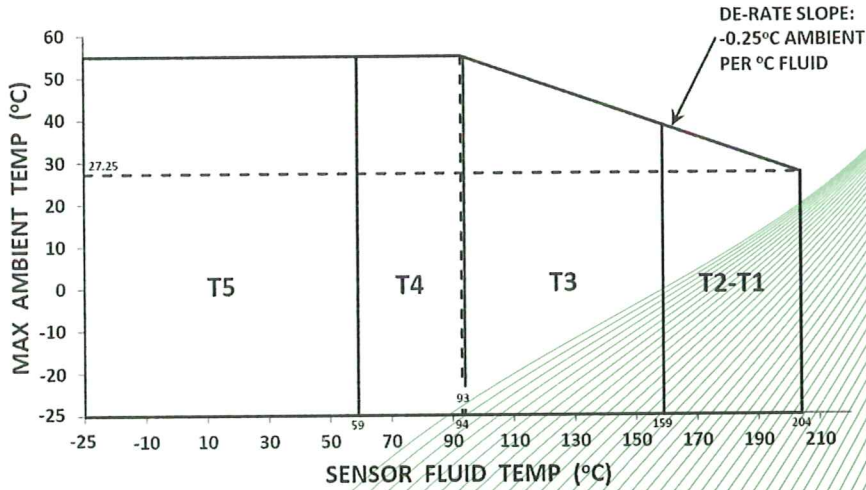
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 240 °C

Ambient temperature range:  $T_a$  -25 °C up to +55 °C



15.3.4.7 Excluding F\*\*\* (A, B, C, E)\*\*\*\*\* (K, L, M, N) \* V\*\*\*\*\*.

Sensor type	
With FMT	F200***** (K, L, M, N) * V*****
	H200***** (K, L, M, N) * V*****
	R200***** (K, L, M, N) * V*****



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

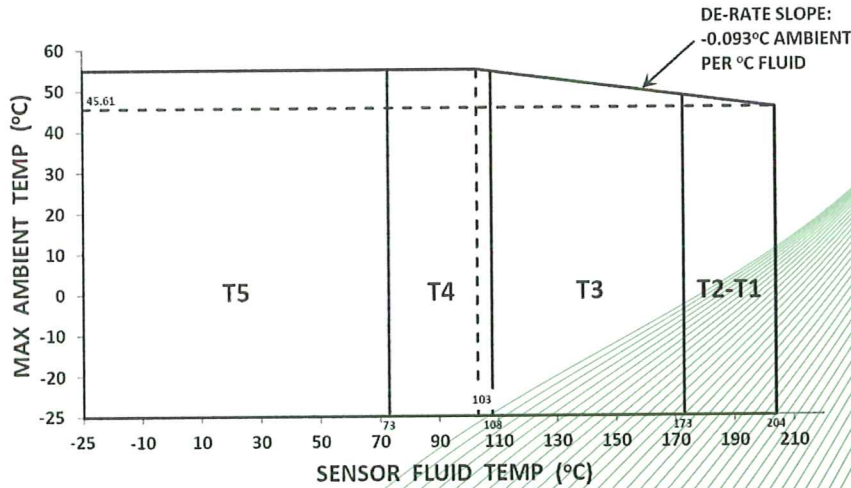
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 230 °C

Ambient temperature range:  $T_a$  -25 °C up to +55 °C



15.3.4.8 Excluding F\*\*\*(A, B, C, E)\*\*\*\*\* (K,L,M, N)\*V\*\*\*\*\*.

Sensor type	
With FMT	F300***** (K,L,M,N)*V*****
	H300***** (K,L,M,N)*V*****




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

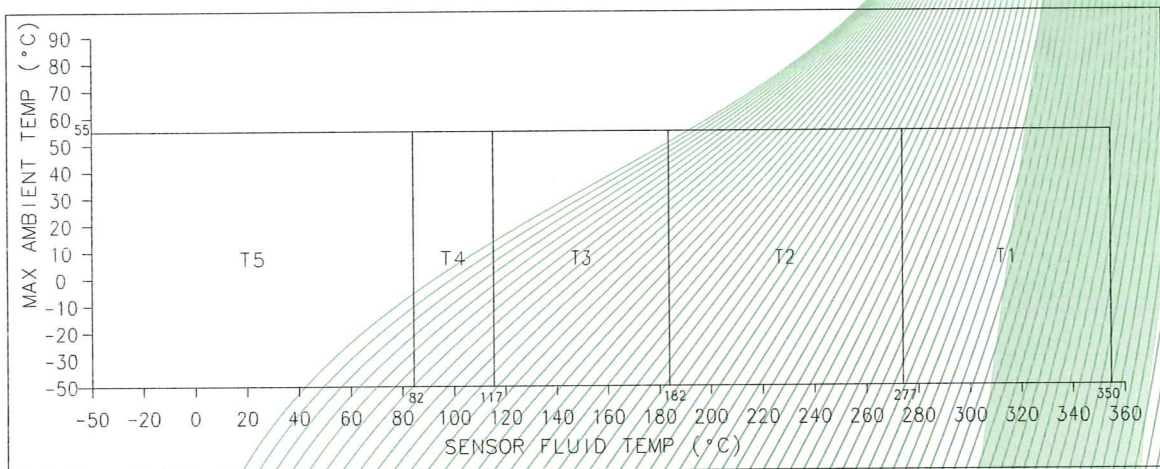
Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2 to T1: T 226 °C

Ambient temperature range:  $T_a$  -25 °C up to +55 °C



15.3.4.9

Sensor type	
With 2400S	F025(A,B)***** (0,1)*V***** F050(A,B)***** (0,1)*V***** F100(A,B)***** (0,1)*V***** F300(A,B)***** (0,1)*V*****
With FMT	F025(A,B)***** (K,L,M,N)*V***** F050(A,B)***** (K,L,M,N)*V***** F100(A,B)***** (K,L,M,N)*V***** F300(A,B)***** (K,L,M,N)*V*****



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2: 290 °C and T1: T 363 °C

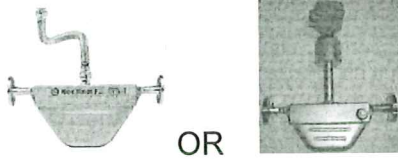
Ambient temperature range:  $T_a$  -50 °C up to +55 °C

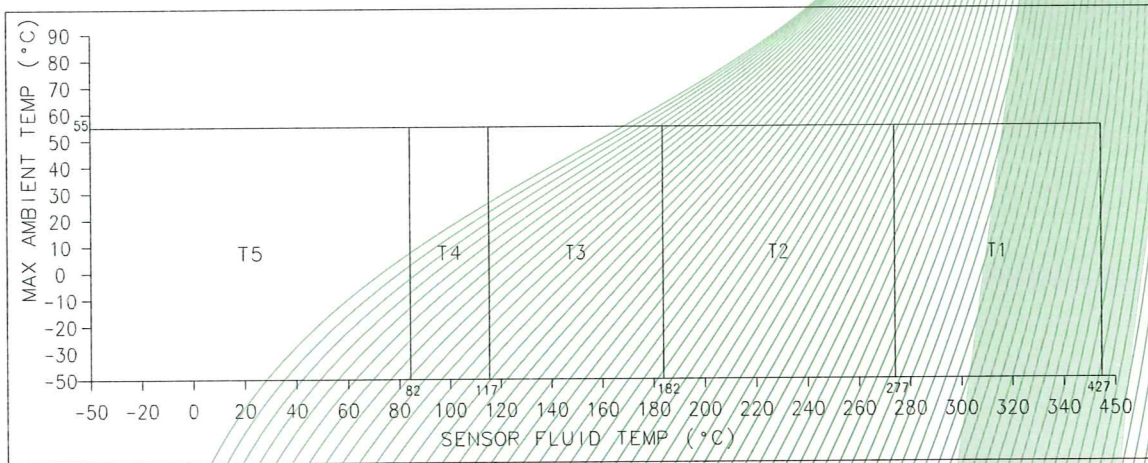
The minimum ambient and process fluid temperature for dust is -40 °C.

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, or 0.23 meter away from the sensor by means of a rigid pipe extender, the use of the sensor at an ambient temperature higher than +55 °C is possible, provided that the ambient temperature does not exceed the maximum temperature of the medium taking into account the temperature classification and the maximum operating temperature of the sensor.



15.3.4.10

Sensor type	
With 2400S	F025(C,E)***** (0,1)*V***** F050(C,E)***** (0,1)*V***** F100(C,E)***** (0,1)*V***** F300(C,E)***** (0,1)*V*****
With FMT	F025(C,E)***** (K,L,M,N)*V***** F050(C,E)***** (K,L,M,N)*V***** F100(C,E)***** (K,L,M,N)*V***** F300(C,E)***** (K,L,M,N)*V*****



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T5: T 95 °C, T4: T 130 °C, T3: T 195 °C, T2: 290 °C and T1: T 440 °C



Ambient temperature range:  $T_a$  -50 °C up to +55 °C

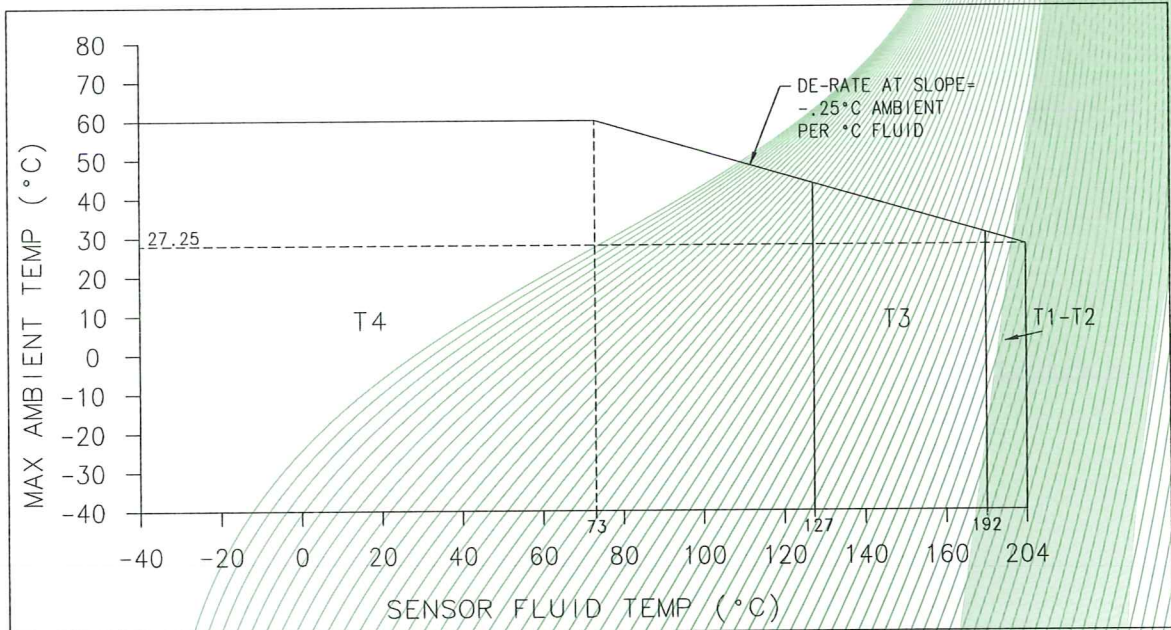
The minimum ambient and process fluid temperature for dust is -40 °C.

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, or 0.23 meter away from the sensor by means of a rigid pipe extender, the use of the sensor at an ambient temperature higher than +55 °C is possible, provided that the ambient temperature does not exceed the maximum temperature of the medium taking into account the temperature classification and the maximum operating temperature of the sensor.



15.3.4.11 Excluding F\*\*(A, B, C, E)\*\*\*(J,U)\*V\*\*:\*\*

Sensor type		
With 2200S	F025***(J,U)*V** F050***(J,U)*V** H025***(J,U)*V** H050***(J,U)*V** R025***(J,U)*V** R050***(J,U)*V**	CNG050***(J,U)*V**




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

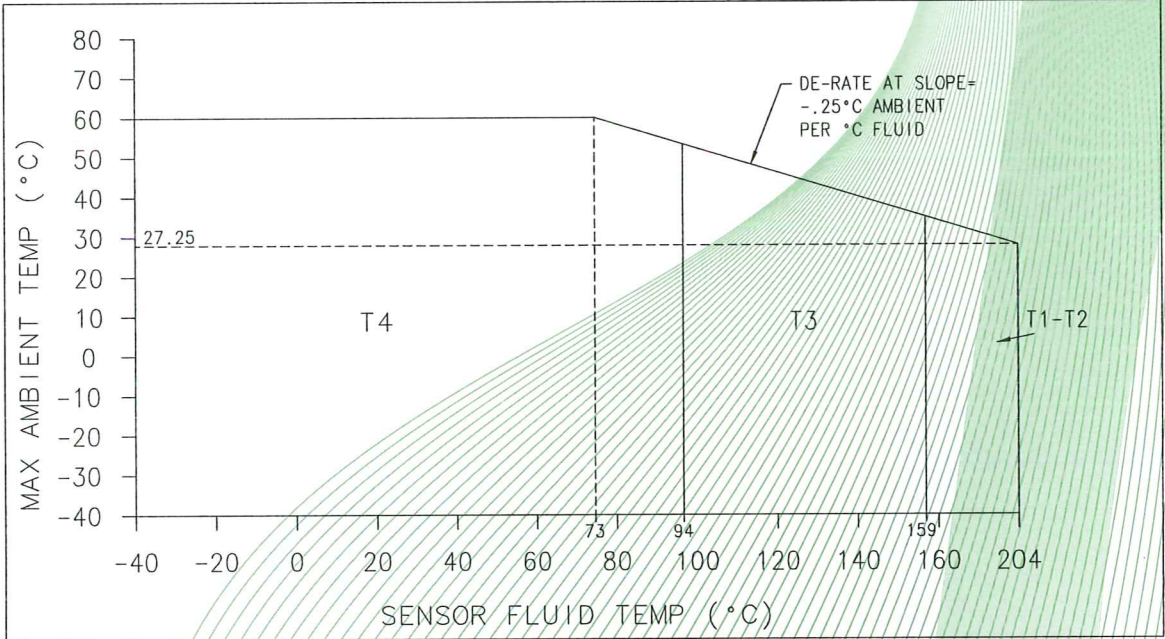
Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2 to T1: T 207 °C

Ambient temperature range:  $T_a$  -40 °C up to +60 °C



15.3.4.12 Excluding F\*\*(A, B, C, E)\*\*\*(J,U)\*V\*\*:

Sensor type	
With 2200S	F100***(J,U)*V**
	H100***(J,U)*V**
	R100***(J,U)*V**




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

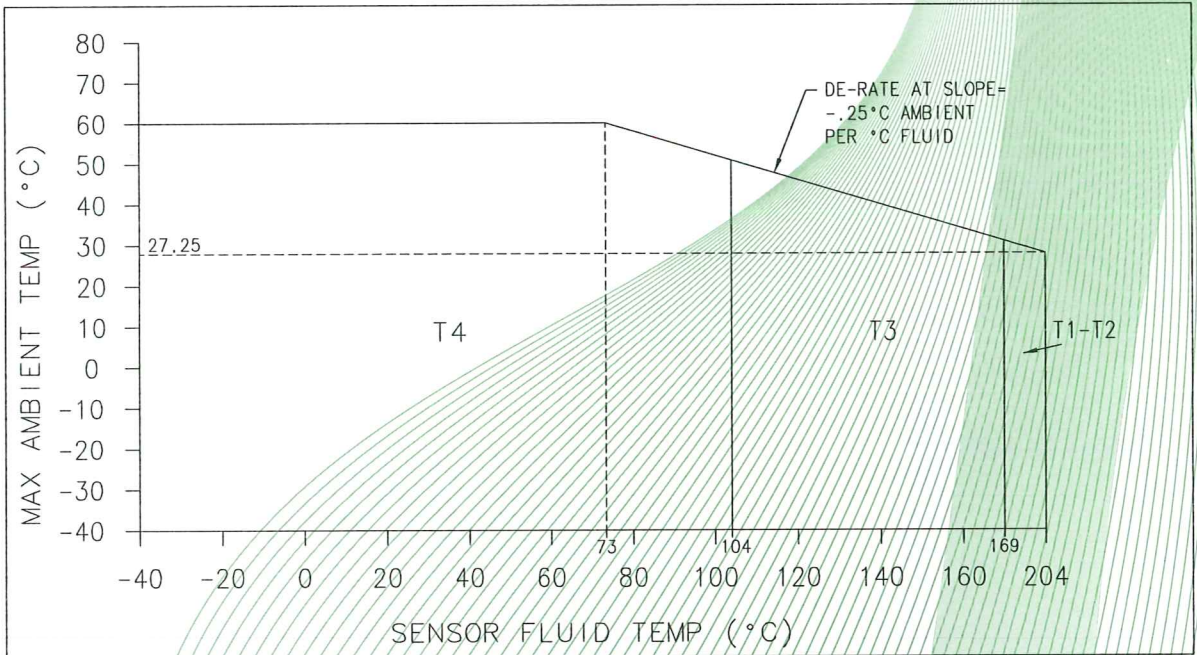
Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2 to T1: T 240 °C

Ambient temperature range:  $T_a$  -40 °C up to +60 °C



15.3.4.13 Excluding F\*\*\* (A, B, C, E)\*\*\*\* (J,U)\*V\*\*\*\*\*:

Sensor type	
With 2200S	F200*****(J,U)*V*****
	H200*****(J,U)*V*****
	R200*****(J,U)*V*****




Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

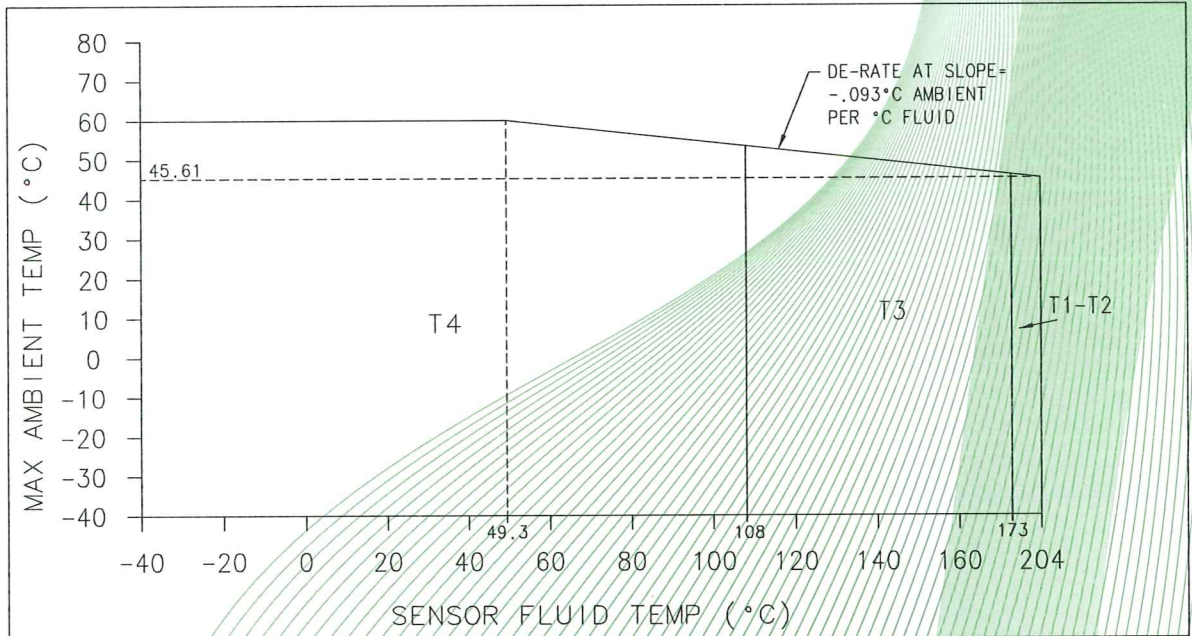
Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2 to T1: T 230 °C

Ambient temperature range:  $T_a$  -40 °C up to +60 °C



15.3.4.14 Excluding F\*\*(A, B, C, E)\*\*\*(J,U)\*V\*\*:

Sensor type	
With 2200S	F300***(J,U)*V**
	H300***(J,U)*V**



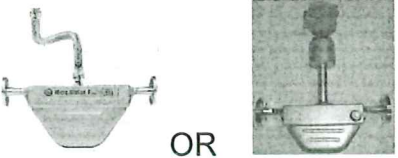
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

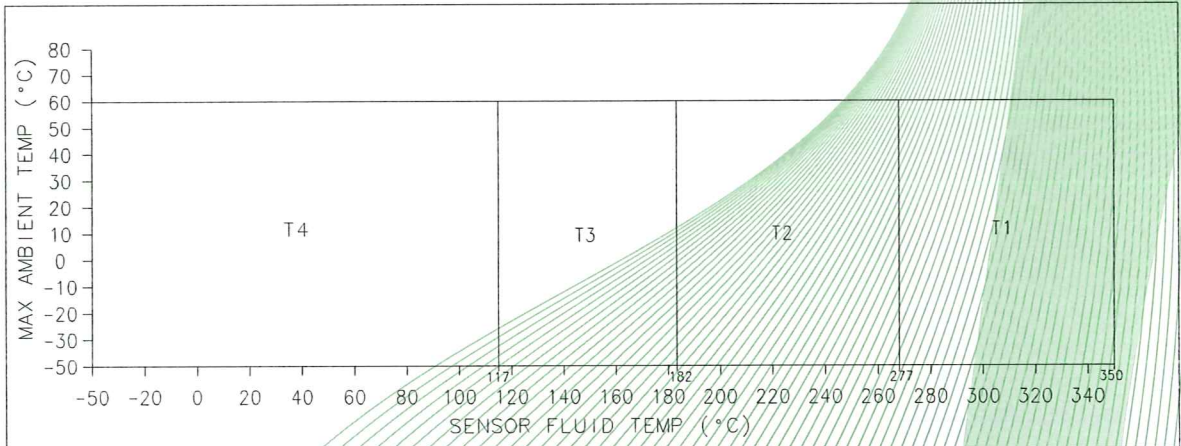
Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2 to T1: T 226 °C

Ambient temperature range:  $T_a$  -40 °C up to +60 °C



15.3.4.15

Sensor type	
With 2200S	F025(A,B)*****(J,U)*V*****
	F050(A,B)*****(J,U)*V*****
	F100(A,B)*****(J,U)*V*****
	F300(A,B)*****(J,U)*V*****



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2: 290 °C and T1: T 363 °C

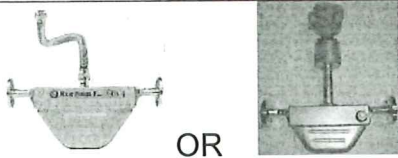
Ambient temperature range:  $T_a$  -50 °C up to 60 °C

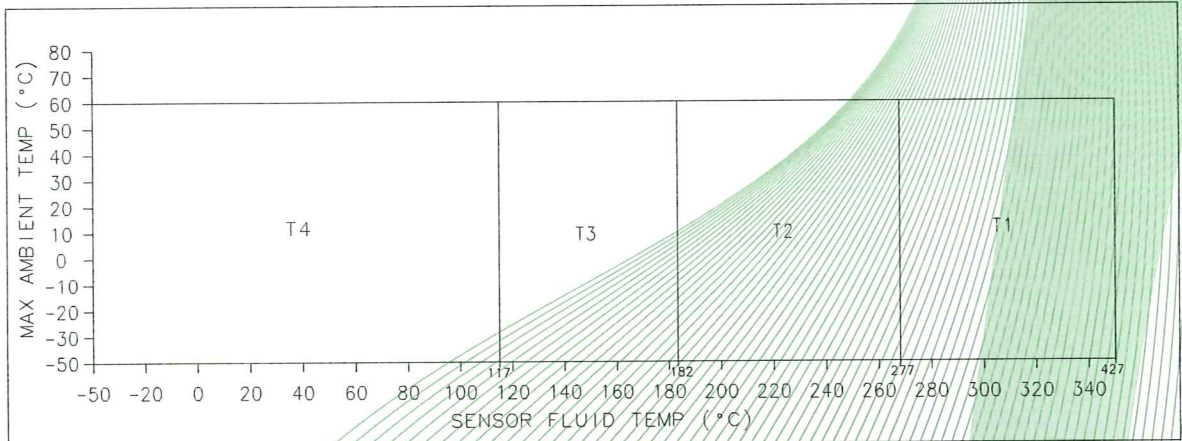
The minimum ambient and process fluid temperature for dust is -40 °C.

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, or 0.23 meter away from the sensor by means of a rigid pipe extender, the use of the sensor at an ambient temperature higher than +60 °C is possible, provided that the ambient temperature does not exceed the maximum temperature of the medium taking into account the temperature classification and the maximum operating temperature of the sensor.



15.3.4.16

Sensor type	
With 2200S	F025(C,E)***** (J,U)*V***** F050(C,E)***** (J,U)*V***** F100(C,E)***** (J,U)*V***** F300(C,E)***** (J,U)*V*****



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T4: T 130 °C, T3: T 195 °C, T2: 290 °C and T1: T 440 °C

Ambient temperature range:

$T_a$  -50 °C up to +60 °C

The minimum ambient and process fluid temperature for dust is -40 °C.

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, or 0.23 meter away from the sensor by means of a rigid pipe extender, the use of the sensor at an ambient temperature higher than +60 °C is possible, provided that the ambient temperature does not exceed the maximum temperature of the medium taking into account the temperature classification and the maximum operating temperature of the sensor.



(16) Test and assessment report

BVS PP 13.2165 EG as of 26.08.2013

(17) Special conditions for safe use

The sensor is designed for use in connection with a suitable transmitter, e. g. type 2400S\*\*\*\*\*L\*\*\*\* in accordance with BVS 05 E 116 X resp. type 2200S\*\*\*\*\*L\*\*\*\* in accordance with BVS 08 ATEX E 112 X resp. type FMT\*\*\*\*\*L\*\*\*\* in accordance with BVS 10 ATEX E 115 X; only the assemblage of the sensor and the transmitter guarantees the necessary degrees of protection.

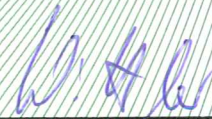
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We confirm the correctness of the translation from the German original.  
In the case of arbitration only the German wording shall be valid and binding.

DEKRA EXAM GmbH  
44809 Bochum, 2013-08-26  
BVS-Yil/Mu A 20130585



Certification body



Special services unit