Engineering Specification

SPEC, APPVL INST R SENSOR ATEX
EB-3600700
Revision: IA
Number of Pages: 41
Comments:

THIS COMPONENT MUST COMPLY WITH REGULATORY AGENCY REQUIREMENTS. NO CHANGES ARE ALLOWED WITHOUT PRIOR AUTHORIZATION FROM APPROVALS ENGINEERING.

Originator: CHB 9/13/01

Approved: MZ 10/15/01

Rev	ECN	Description	Approval	Date
C	1020407	Added MVD Solo to Model Matrix	RCS	4/11/02
D	1030272	Added Model Code Options for Aluminum Core Housing	MZ	10/9/02
E	1030955	Changed R200 Pick-Off Coil	RCS	12/18/03
F	1030912	Added 1700/2700 IIC Cover and Backlit Display Options	RCS	2/5/04
G	1031045	Added CNG to Temp Diagram	RCS	3/15/04
H	1031491	Add Dust Approval Marking	RCS	12/14/04
I	1031956	Changed R025-R100 Drive and PO Coils, Added Option Code for 800 Enhanced Core	RCS	10/31/05
IA	1038207	New format, new standards, add 2200S, add option code T, Add 1700/2700 Wireless HART Temp Diagrams, Add Wireless Output Code 4 to 1700/2700 and 5 & 6 to 2200S Transmitters, Increased Ambient Temp to +60 for Core, Correct R100 J-Box Temp Diagram T6 Ambient temperature limit	HVH/RCS	6/4/09

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Equipment type	**sensor type R*** *******Z*******
	sensor type CNG050 *******Z*****
Manufactured and submitted for examination	**Micro Motion, Inc.**
Address	**Boulder, Co. 80301, USA**
Basis for examination	**Annex II of Directive 94/9/EC**
Standard basis	EN 60079-0:2009 — General requirements EN 60079-11:2007 — Intrinsic safety ´i´ EN 61241-11: 2006 — Intrinsic safety ´iD´
Code for type of protection	**II 2G Ex ib IIB/IIC T1 – T4/T5/T6 Gb** **II 2D Ex ib IIIC T*°C Db** **IP65**
EC Type Examination Certificate	**DMT 01 ATEX E 159 X**

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1) Subject and Type

Sensor type R*** *******Z***** or CNG050 *******Z****

Instead of the *** letters and numerals will be inserted which characterize the following modifications:

```
CNG 0 5 0 * * * * * * * Z * * * *
  R * * * * * * * * * * Z * * * * *
```

- Marking without influence to the type of protection
- Letter for conduit connections
- Letter for electronic interface
  - 2 = aluminum enhanced core processor
  - 3 = stainless enhanced core processor
  - 4 = aluminum enhanced core processor with extender
  - 5 = stainless enhanced core processor with extender
  - 6 = aluminum enhanced core processor for direct host
  - 7 = stainless enhanced core processor for direct host
  - 8 = aluminum enhanced core processor with extender for direct host
  - 9 = stainless enhanced core processor with extender for direct host
  - A = local core processor
  - B = local core processor with extender
  - C = integral 1700/2700
  - F = integral 1700/2700 with extender
  - D = local core processor for direct host
  - E = local core processor with extender for direct host
  - R = with junction box for 9-wire
  - H = 9 wire junction box with extender
  - I = Integral IFT9701
  - Q = aluminum core processor
  - V = aluminum core processor with extender
  - W = aluminum core processor for direct host
  - Y = aluminum core processor with extender for direct host
  - S = 9-wire stainless junction box
  - T = 9-wire Stainless junction box with extender
  - J = integral 2200S
  - U = integral 2200S with extender
- Marking without influence to the type of protection
- Marking without influence to the type of protection
- 3 numerals for type of sensor

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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.

- When used with an integral mounted junction box, the variation gets the denomination R*** *****(S or T)******* or CNG050 ***** (S or T)****** for a SS enclosure and R*** *****(R or H)******* or CNG050 ***** (R or H)****** for an aluminum enclosure. See section 3.1.

- When used with an integral mounted signal processing device type 700, the variation gets the denomination type R*** *****(A, B, D, or E)******* or CNG050 ***** (A, B, D, or E)****** for a SS enclosure and R*** *****(Q, V, W or Y)******* or CNG050 ***** (Q, V, W, or Y)****** for an aluminum enclosure. See section 3.2.

- When used with an integral mounted enhanced signal processing device type 800, the variation gets the denomination type R*** *****(3, 5, 7 or 9)******* or CNG050 ***** (3, 5, 7, or 9)****** for a SS enclosure and R*** *****(2, 4, 6 or 8)******* or CNG050 ***** (2, 4, 6, or 8)****** for an aluminum enclosure. See section 3.2.

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When used with an integral transmitter type 2200S*********, the variation gets the denomination type R*** *****(J or U)******* or CNG050 ***** (J or U)******. See section 3.3. By mounting the sensor directly to the 2200S transmitter the use of the unit will be modified according to the following table:

	Sensor type
	R025 *****(J or U)*Z***** R025 *****(J or U)*Z***** CIC A2 R050 *****(J or U)*Z***** R050 *****(J or U)*Z***** CIC A2 R100 *****(J or U)*Z***** R100 *****(J or U)*Z***** CIC A2 R200 *****(J or U)*Z***** R200 *****(J or U)*Z***** CIC A1 CNG050 *****(J or U)*Z**** CNG050 *****(J or U)*Z**** CIC A2
Transmitter type 2200S*(H or K)*1*Z****	Ex ib IIC T1-T4 Ex ibD 21 T [3] °C
Transmitter type 2200S*(5 or 6)*1*Z****	Ex ib IIC T1-T4

[3] Max. surface temperature T for dust for types R********** and CNG********** see temperature graphs and manufacturer's instructions.

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- When used with an integral transmitter type *700********** the variation gets the denomination type R*** *****(C or F)******* or CNG050 ***** (C or F)******. See section 3.4. By mounting the sensor directly to the *700 transmitter the use of the unit will be modified according to the following table:

Sensor	R025 *****(C or F)*Z***** R025 *****(C or F)*Z***** CIC A2 R050 *****(C or F)*Z***** R050 *****(C or F)*Z***** CIC A2 R100 *****(C or F)*Z***** R100 *****(C or F)*Z***** CIC A2 R200 *****(C or F)*Z***** R200 *****(C or F)*Z***** CIC A1 CNG050 *****(C or F)*Z**** CNG050 *****(C or F)*Z**** CIC A2
Transmitter type *700*1[1)]*******	Ex ib IIB+H_2 T1-T5 Ex tD A21 IP 65 T [3)] °C
Transmitter type *700*1[2)]*******	Ex ib IIC T1-T5 Ex tD A21 IP 65 T [3)] °C
Transmitter type *700*1[1)] 4******	Ex ib IIB+H_2 T1-T4
Transmitter type *700*1[2)] 4******	Ex ib IIC T1-T4

1) At this place the numeral 1 or 2 will be inserted.
2) At this place the numeral 3, 4 or 5 will be inserted.
3) Max. surface temperature T for dust for types R********** and CNG********** see temperature graphs and manufacturer's instructions.

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- When used with an integral transmitter type IFT9703******* the variation gets the denomination type R*** *****I*Z*****. See section 3.5.

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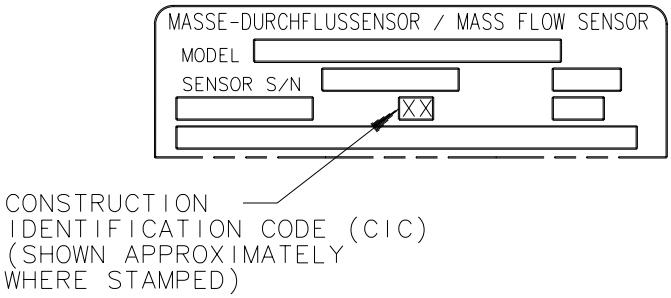
Modifications to the design which have impact on the electrical parameters are indicated by a Construction Identification Code (CIC). This code consists out of two digits, starting with an A and followed by a sequence number; for example A4. The CIC can be found on the approval label, see picture below:



Supplement 1 covers:

- The addition option code I (IFT9703).

Supplement 2 covers:

- The addition of option code D and E.

Supplement 3 covers:

- Revised Pick Off Coil parameters for the F200 Sensors. Sensors constructed using these revised coil parameters will be identified with a construction Identification Code (C.I.C.) of A1.

Supplement 4 covers:

- The addition of the Dust approval and the alternative 9-wire feed-through.

Supplement 5 covers:

- Revised Drive and Pick-Off Coil parameters for the F025-F100 Sensors. Sensors constructed using these revised coil parameters will be identified with a Construction Identification Code (C.I.C.) of A2.
- Electronic option codes 2-9 have been added to cover the 800ECP
- Option code S has been added for the 9-wire stainless junction box.
- Maximum fluid temperature has been increased to 204°C and the lower ambient/fluid temperature has been changed as well: see temperature graphs.

Supplement 6 covers:

- The addition of the 2200S.
- Option code T added for the 9-wire stainless steel junction box with extender
- New standard series EN 60079-** and EN 61241-*
- Revised electrical parameters for sensors with junction box.
- Add 1700/2700 Wireless HART Temp Diagrams
- Add Wireless Output Code 4 to 1700/2700 transmitters
- Add Wireless Output Code 5 and 6 to 2200 transmitters
- Revised Ambient Temp Limits to +60C for Sensor Electronic Interface Options for Core (2-9, A, B, D, E, Q, V, W, Y)
- Correct R100 J-Box Temp Diagram T6 Ambient temperature limit
- Corrected the drive series resistor value of the R100 CIC A2.

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3) Parameters

3.1. Type R********(R, H, S or T)******* or CNG050 ***** (R, H, S or T)****** with J-box.

3.1.1. Drive circuit (connections 1 - 2 or wires red and brown)

Voltage	Ui	DC	11,4	V
Current	Ii		2,45	A
Power	Pi		2,54	W
Effective internal capacitance	Ci		Negligible	

Sensor type		Inductance (mH)	Coil Resistance (Ω)	Series Resistor (Ω)	Minimum Ambient/Fluid Temp (°C)
R025*****(R,H,S,T)*Z*****	(IIC)	5,83	24,1	988,8	-40°C
R025*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	569,0 568,83	-68°C -83°C
R050*****(R,H,S,T)*Z*****	(IIC)	5,83	24,1	988,8	-40°C
R050*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	569,0 568,83	-68°C -83°C
R100*****(R,H,S,T)*Z*****	(IIC)	29,9	262,1	207,7	-40°C
R100*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	74,12 74,1	-68°C -83°C
R200*****(R,H,S,T)*Z*****	(IIC)	9,4	37,4	148,3	-40°C
R200*****(R,H,S,T)*Z***** CIC A1	(IIC)	9,4	7,4 27,5 18,43	148,3 148,17 148,03	-40°C -90°C -138°C
CNG050*****(R,H,S,T)*Z****	(IIC)	5,83	24,1	988,8	-40°C
CNG050*****(R,H,S,T)*Z**** CIC A2	(IIC)	7,5	84,95 77,27	569,0 568,83	-68°C -83°C

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3.1.2 Pick-off circuit coil (Terminals 5/9 and 6/8 or wires green/white and blue/grey)

Voltage	Ui	DC	21,13	V
Current	Ii		18,05	mA
Power	Pi		45	mW
Effective internal capacitance	Ci		Negligible	

Sensor type		Inductance (mH)	Coil Resistance (Ω)	Series Resistor (Ω)	Minimum Ambient/Fluid Temp (°C)
R025*****(R,H,S,T)*Z*****	(IIC)	6,9	105	0	-40°C
R025*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	0-569 0-568,83	-68°C -83°C
R050*****(R,H,S,T)*Z*****	(IIC)	6,9	105	0	-40°C
R050*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	0-569 0-568,83	-68°C -83°C
R100*****(R,H,S,T)*Z*****	(IIC)	6,9	105	0	-40°C
R100*****(R,H,S,T)*Z***** CIC A2	(IIC)	7,5	84,95 77,27	0-569 0-568,83	-68°C -83°C
R200*****(R,H,S,T)*Z*****	(IIC)	23,8	182,5	0	-40°C
R200*****(R,H,S,T)*Z***** CIC A1	(IIC)	12,4	128,4 94,3 63,21	0-569,3 0-568,73 0-568,19	-40°C -90°C -138°C
CNG050*****(R,H,S,T)*Z****	(IIC)	6,9	105	0	-40°C
CNG050*****(R,H,S,T)*Z**** CIC A2	(IIC)	7,5	84,95 77,27	0-569 0-568,83	-68°C -83°C

3.1.3 Temperature circuit (terminals 3, 4 and 7 or wires orange, yellow and violet)

Voltage	Ui	DC	21,13	V
Current	Ii		26	mA
Power	Pi		112	mW
Effective internal capacitance	Ci		Negligible	
Effective internal inductance	Li		Negligible	

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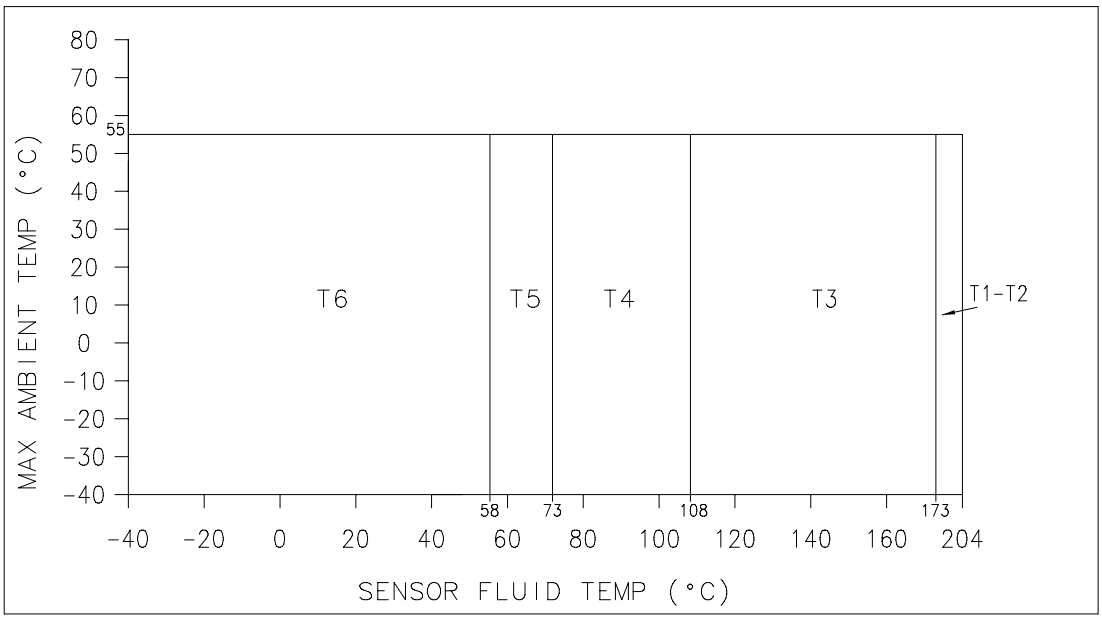
3.1.4 Temperature class/ maximum surface temperature T.
The classification into a temperature class/determination of the maximum surface temperature T depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following graphs:

3.1.4.1

Sensor type	
R025*****(R,H,S,T)*Z*****	(IIC)
R050*****(R,H,S,T)*Z*****	(IIC)
R100*****(R,H,S,T)*Z*****	(IIC)
R200*****(R,H,S,T)*Z*****	(IIC)
CNG050*****(R,H,S,T)*Z****	(IIC)



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: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 226°C.

Ambient temperature range: Ta –40°C to + 55°C

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.

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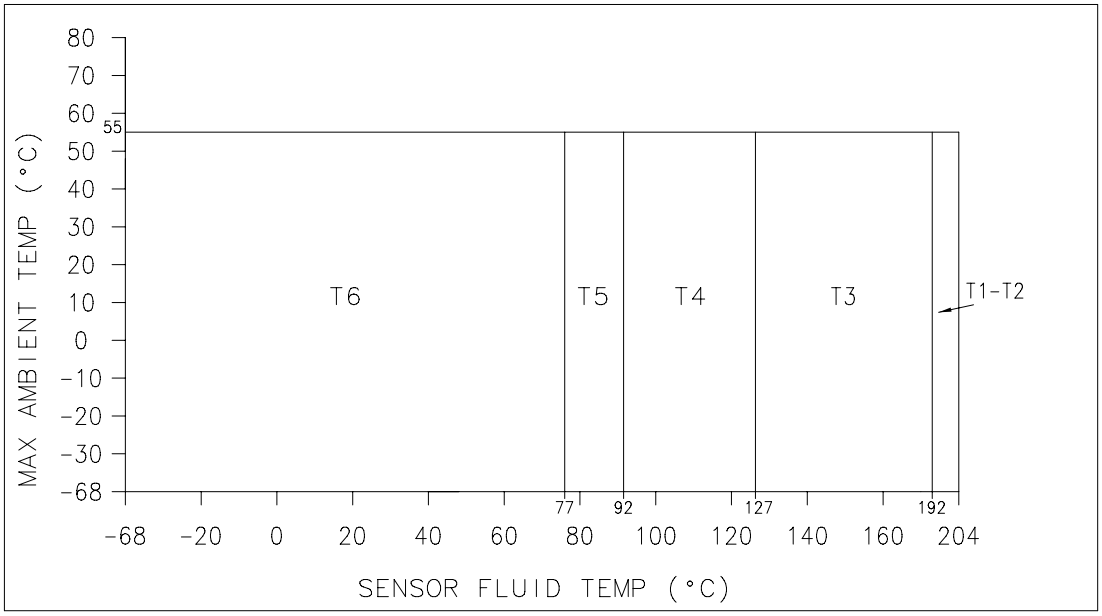
3.1.4.2

Sensor type		
R025*****(R,H,S,T)*Z***** CIC A2	(IIC)	Connected to non MVD transmitters, e.g. IFT9703, RFT9739
R050*****(R,H,S,T)*Z***** CIC A2	(IIC)	
CNG050*****(R,H,S,T)*Z**** CIC A2	(IIC)	



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: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range: Ta –68°C to + 55°C

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.

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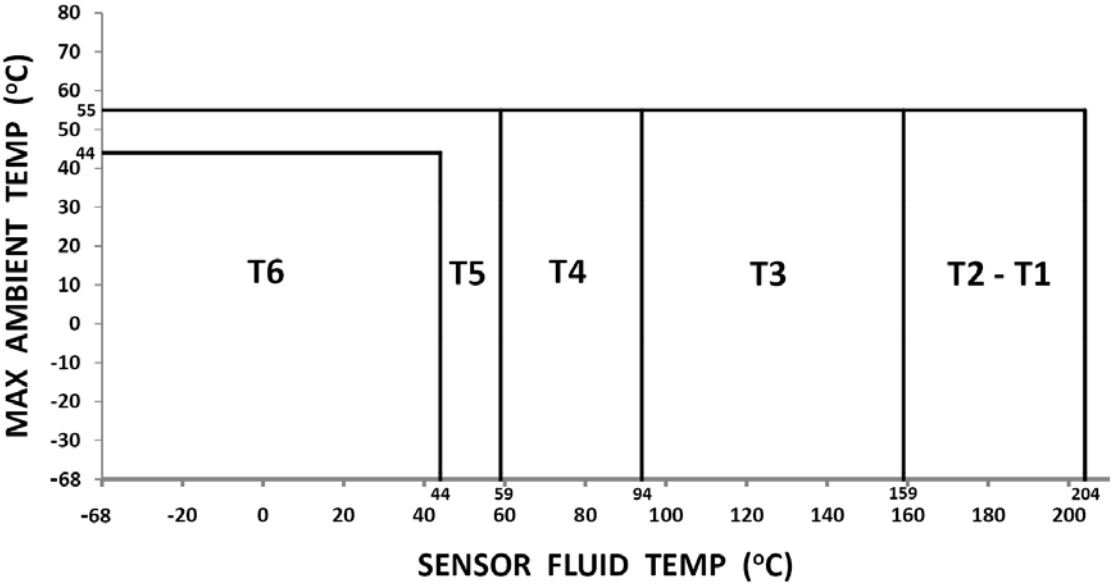
3.1.4.3

Sensor type		
R100*****(R,H,S,T)*Z***** CIC A2	(IIC)	Connected to non MVD transmitters, e.g. IFT9703, RFT9739



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: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 240°C
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range: Ta –68°C to + 55°C

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.

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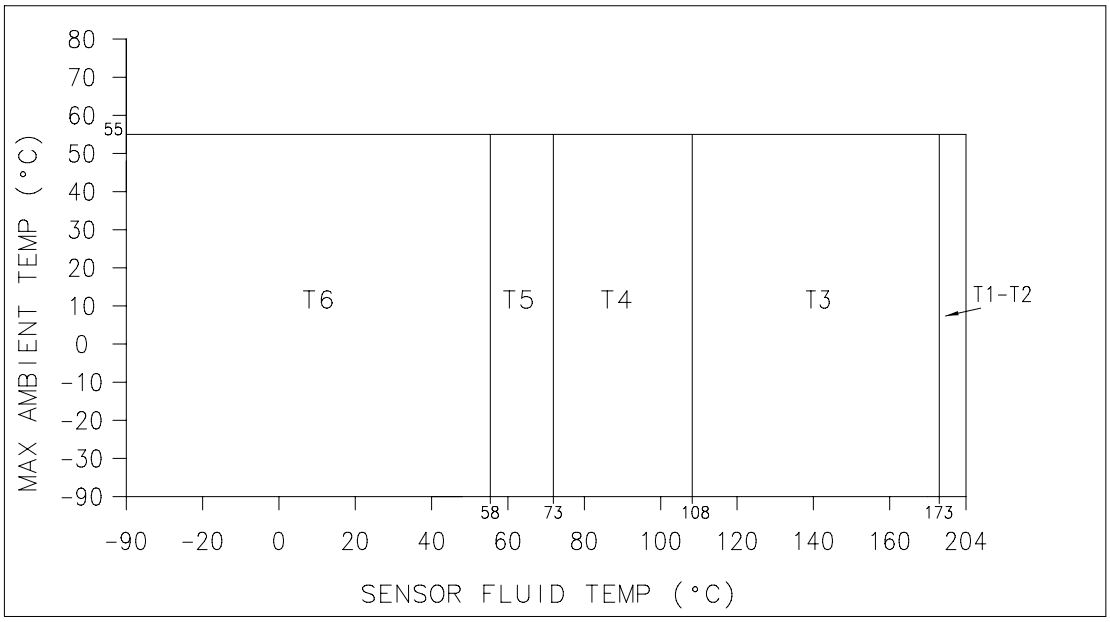
3.1.4.4

Sensor type		
R200*****(R,H,S,T)*Z***** CIC A1	(IIC)	Connected to non MVD transmitters, e.g. IFT9703, RFT9739



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: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 226°C
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range: Ta –90°C to + 55°C

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.

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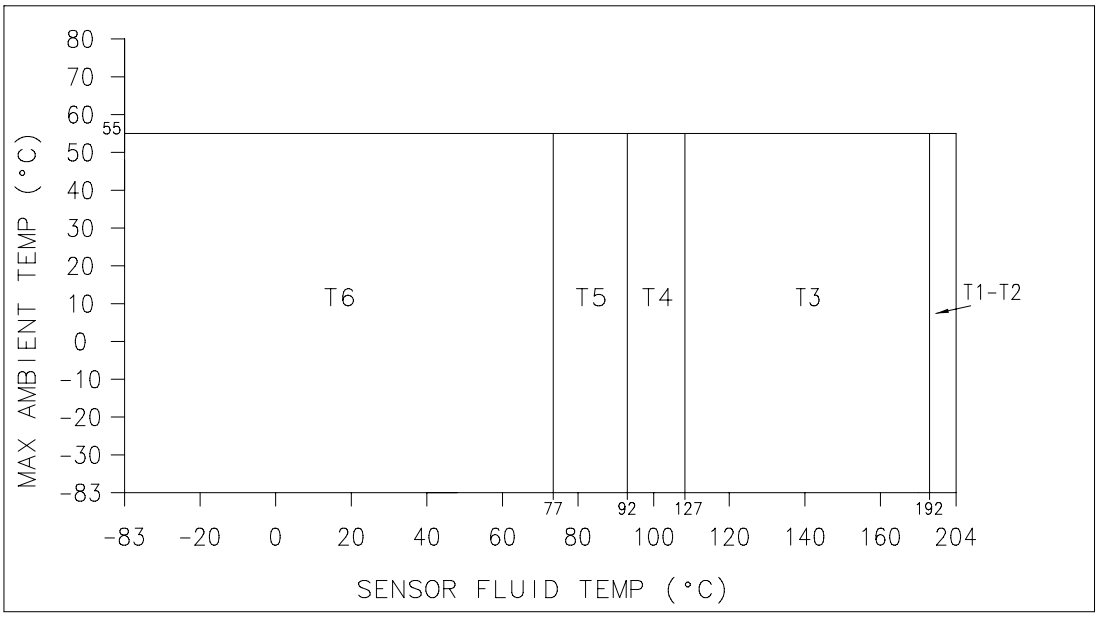
3.1.4.5

Sensor type		
R025*****(R,H,S,T)*Z***** CIC A2	(IIC)	Connected to MVD transmitters, e.g. 1000/2000/3000MVD series
R050*****(R,H,S,T)*Z***** CIC A2	(IIC)	
CNG050*****(R,H,S,T)*Z**** CIC A2	(IIC)	



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
Note 2: The maximum surface temperature T for dust is as follows: T6: 80 °C, T5: 95 °C, T4: 130 °C, T3: 195 °C, T2 and T1: 207 °C.
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40 °C.

Ambient temperature range: Ta -83 °C up to +55 °C

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.

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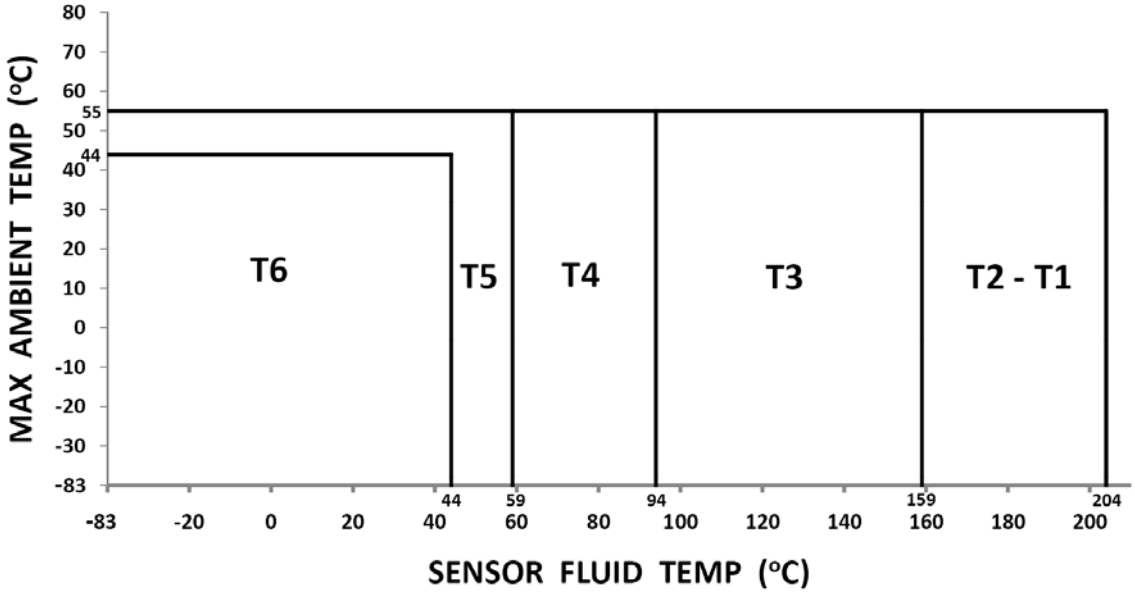
3.1.4.6

Sensor type		
R100*****(R,H,S,T)*Z***** CIC A2	(IIC)	Connected to MVD transmitters, e.g. 1000/2000/3000MVD series



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
Note 2: The maximum surface temperature T for dust is as follows: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2: to T1:T 240°C.
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range: Ta –83°C to +55°C

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.

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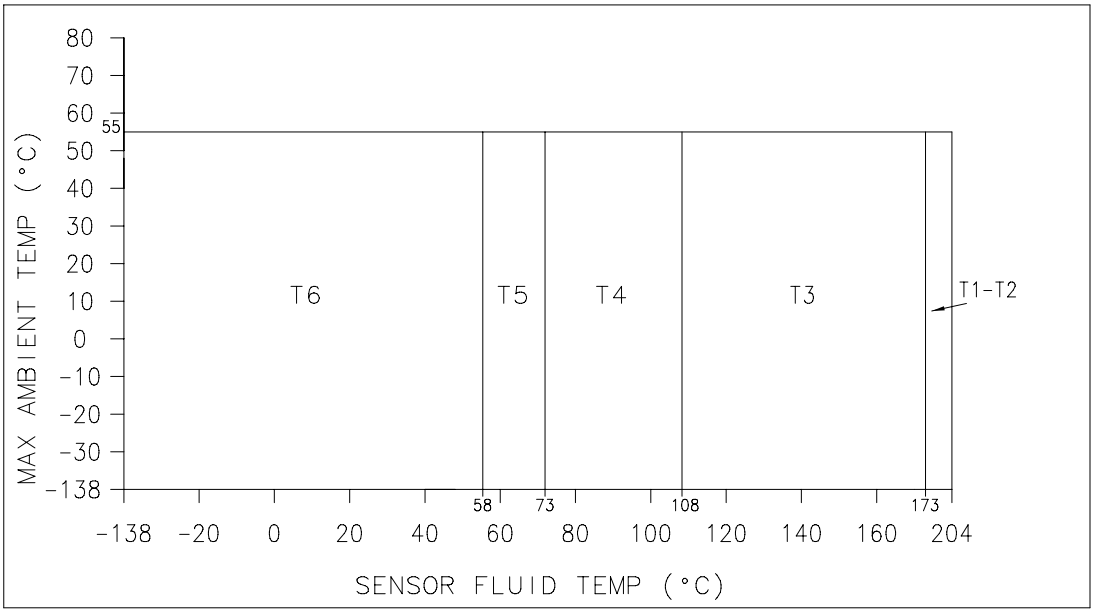
3.1.4.7

Sensor type		
R200*****(R,H,S,T)*Z***** CIC A1	(IIC)	Connected to non MVD transmitters, e.g. 1000/2000/3000MVD series



Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
Note 2: The maximum surface temperature T for dust is as follows: T6:T 80°C, T5:T 95°C, T4:T 130°C, T3:T 195°C, T2: to T1:T 226°C.
Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range: Ta –138°C to +55°C

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.

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3.2 Type R*** *****(2-9, A, B, D, E, Q, V, W or Y)******* or CNG050 ***** (2-9, A, B, D, E, Q, V, W or Y)****** with integral core-processor.

3.2.1. Input circuits (terminals 1-4)

Voltage	Ui	DC	17,3	V
Current	Ii		484	mA
Power	Pi		2,1	W
Effective internal capacitance	Ci		2200	pF
Effective internal inductance	Li		30	µH

3.2.2. Temperature class/ maximum 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 graph:

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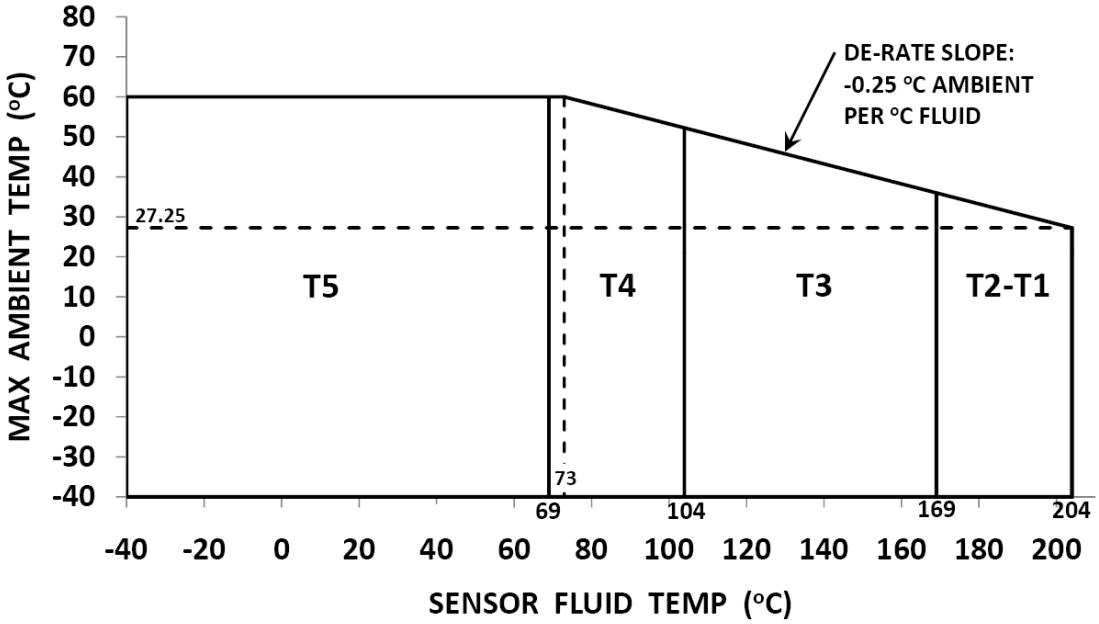
3.2.2.1

Sensor type			
R025*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z*****		(IIC)	With integral core processor
R050*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z*****		(IIC)	
R100*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z*****		(IIC)	
R200*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z*****		(IIC)	
CNG050*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z****		(IIC)	



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: Ta -40°C to +60°C

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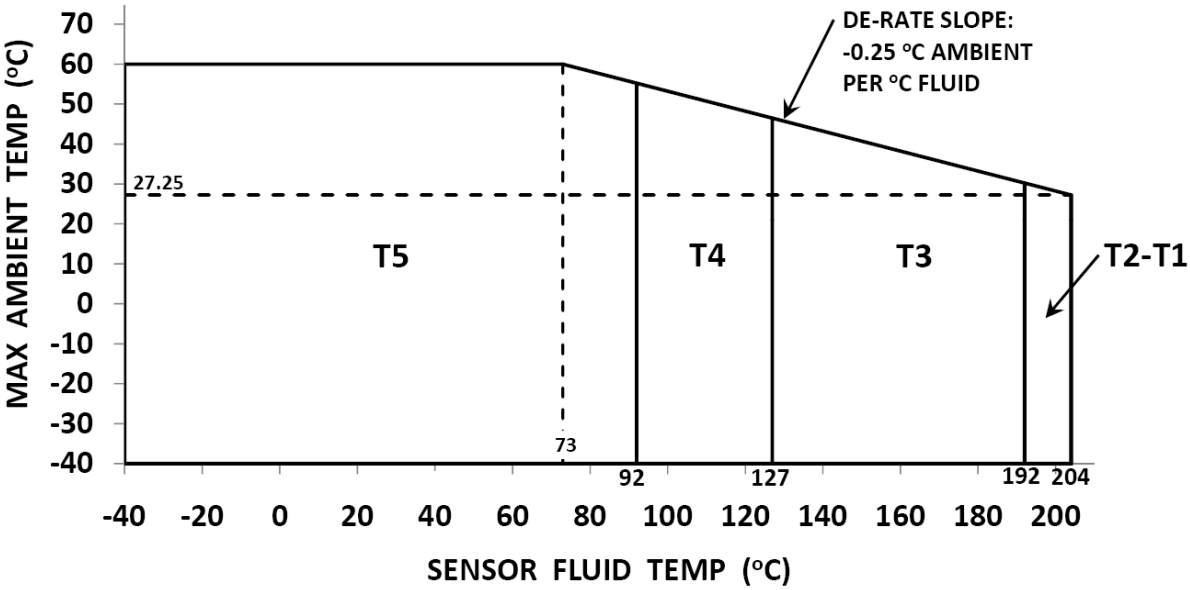
3.2.2.2.

Sensor type			
R025*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z***** CIC A2		(IIC)	With integral core processor
R050*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z***** CIC A2		(IIC)	
CNG050*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z***** CIC A2		(IIC)	



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: Ta –40°C to +60°C.

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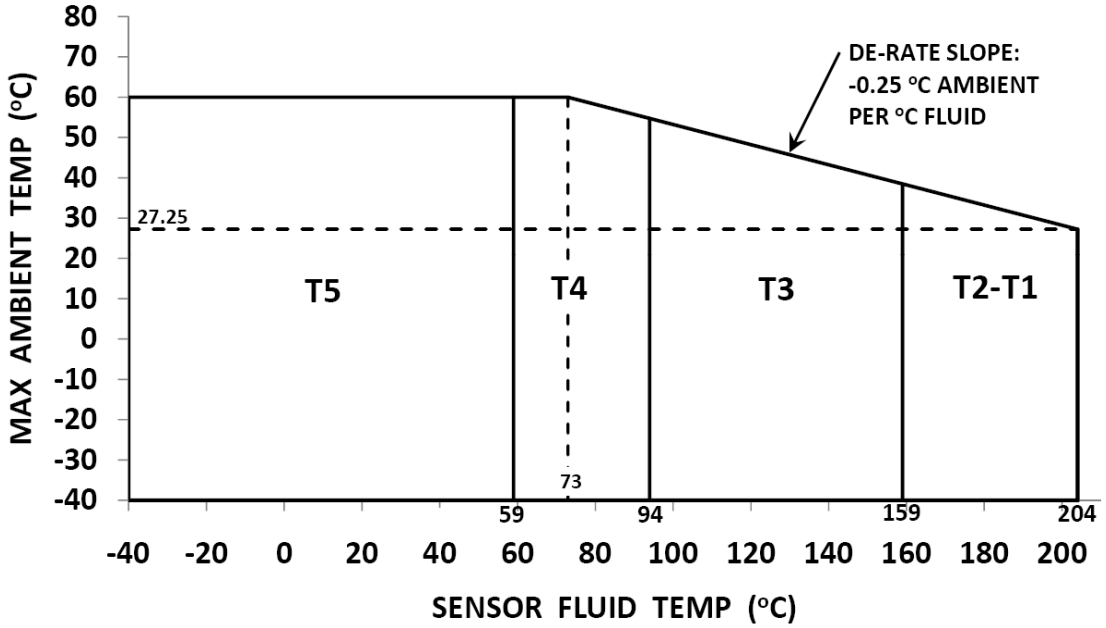
3.2.2.3.

Sensor type			
R100*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z***** CIC A2		(IIC)	With integral core processor



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: Ta –40°C to +60°C.

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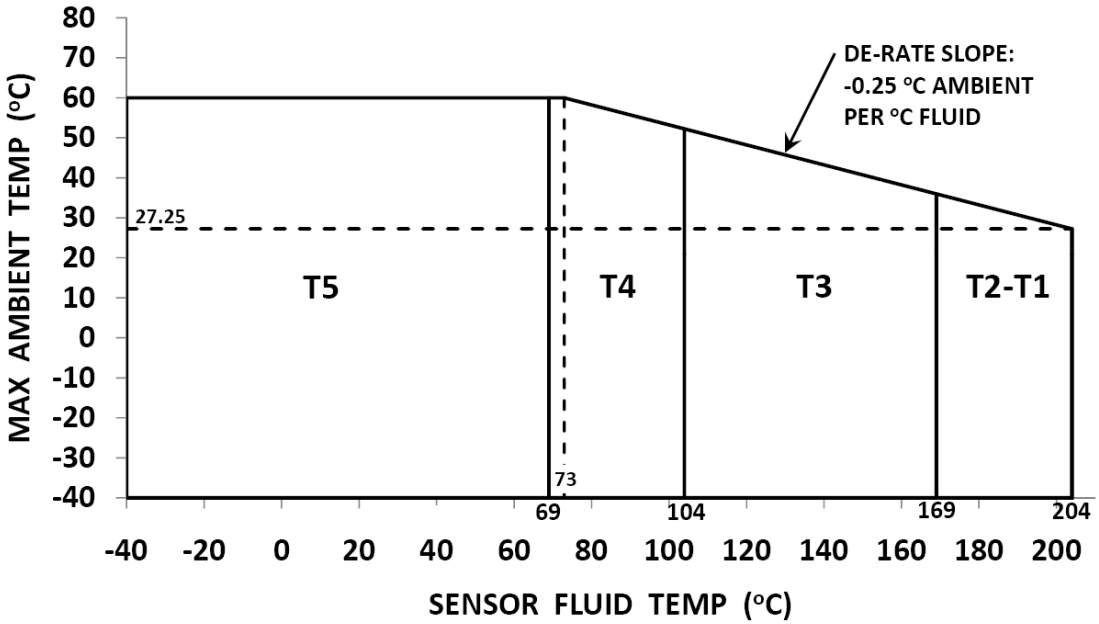
3.2.2.4.

Sensor type			
R200*****(2,3,4,5,6,7,8,9,A,B,D,E,Q,V,W,Y)*Z***** CIC A1		(IIC)	With integral core processor



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: Ta –40°C to +60°C.

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3.3 Type R*** *****(J or U)******* or CNG050 ***** (J or U)****** with 2200S transmitter.

3.3.1 Input circuits (terminals 1-2)

Voltage	Ui	DC	28	V
Current	Ii		120	mA
Power	Pi		0,84	W
Effective internal capacitance	Ci		2200	pF
Effective internal inductance	Li		45	µH

3.3.2 Temperature class/ maximum 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:

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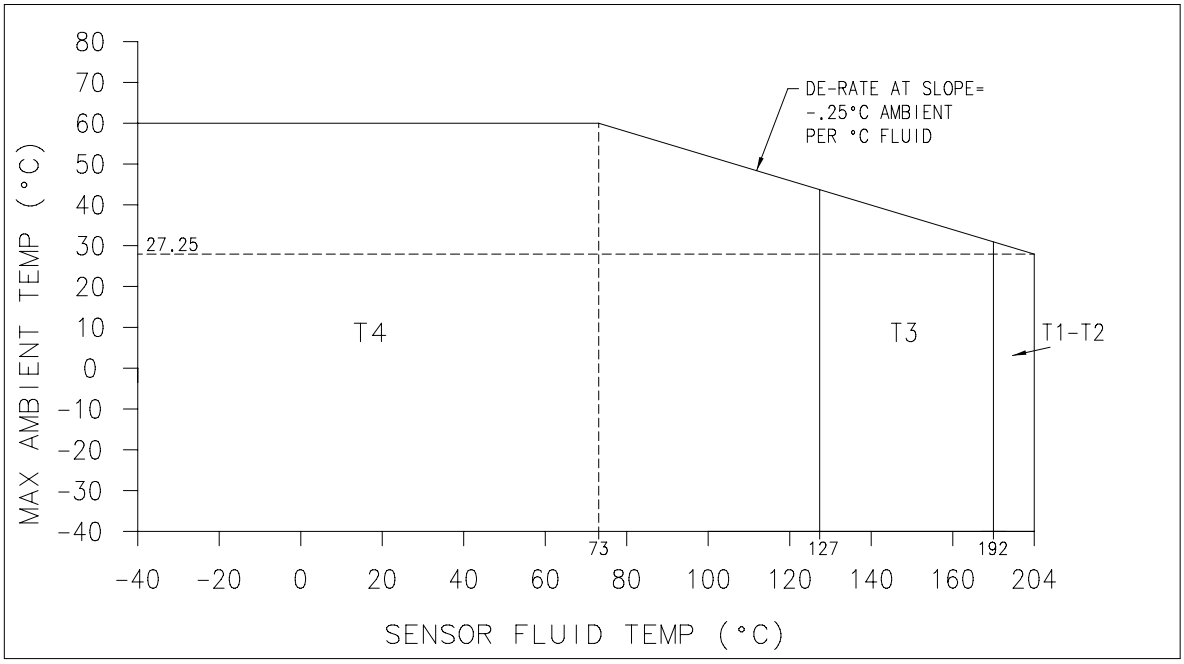
3.3.2.1

Sensor type			
R025 *****(J,U)*Z*****		(IIC)	With integral 2200S
R025 *****(J,U)*Z***** CIC A2		(IIC)	
R050 *****(J,U)*Z*****		(IIC)	
R050 *****(J,U)*Z***** CIC A2		(IIC)	
CNG050 *****(J,U)*Z****		(IIC)	
CNG050 *****(J,U)*Z**** CIC A2		(IIC)	



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: Ta -40°C to +60°C

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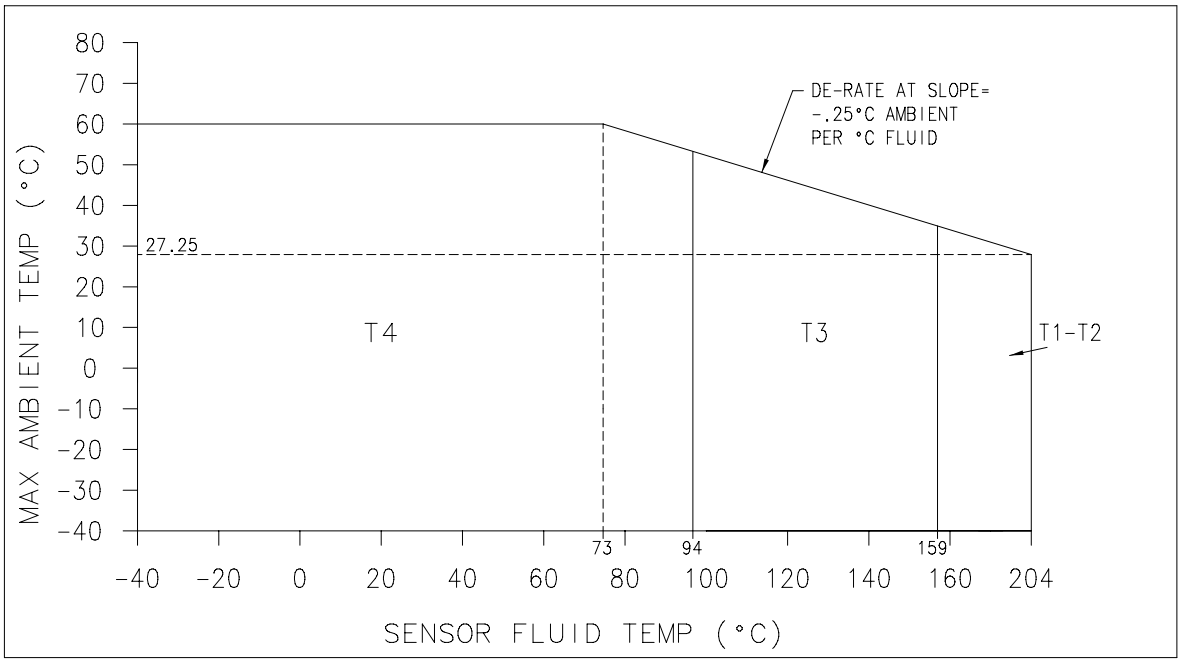
3.3.2.2

Sensor type			
R100 *****(J,U)*Z*****		(IIC)	With integral 2200S
R100 *****(J,U)*Z***** CIC A2		(IIC)	



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: Ta -40°C to +60°C

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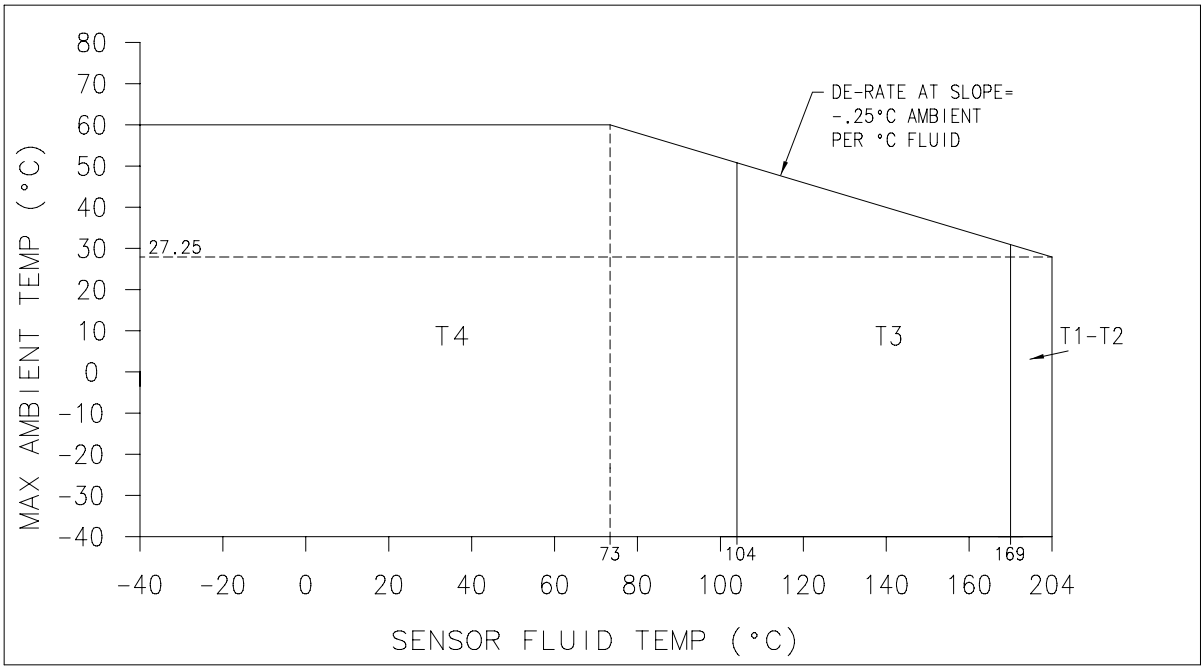
3.3.2.3

Sensor type			
R200 *****(J,U)*Z*****		(IIC)	With integral 2200S
R200 *****(J,U)*Z***** CIC A1		(IIC)	



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: Ta -40°C to +60°C

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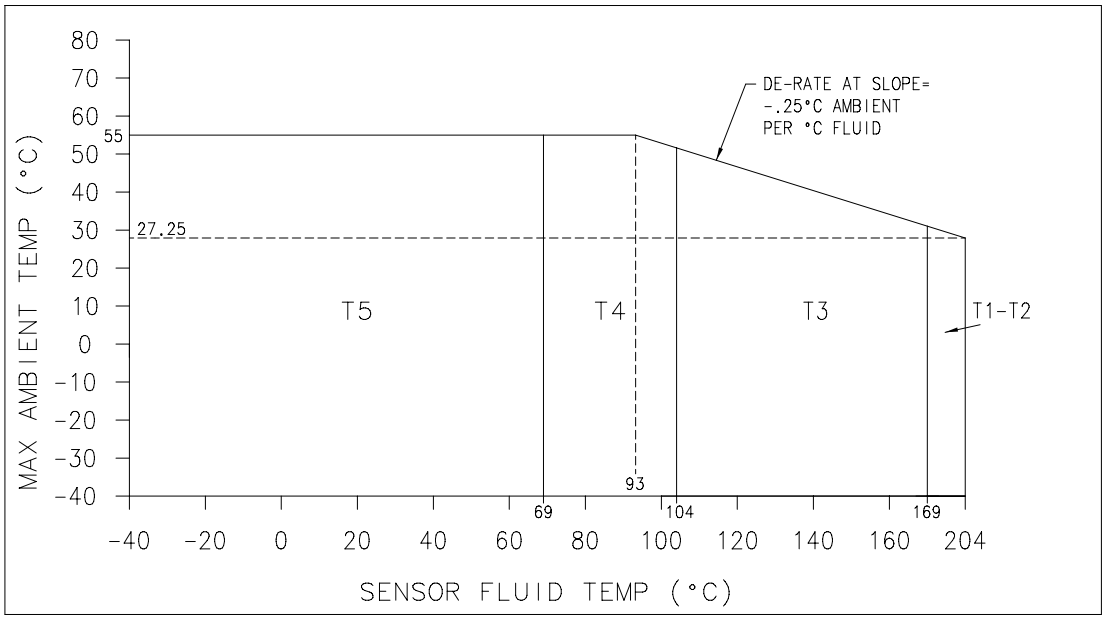
3.4 Type R*** *****(C or F)******* or CNG050 ***** (C or F)******.

3.4.1 Electrical parameters see EB-3600636 for the transmitter type *700**********

3.4.2 Temperature class/ maximum 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 is shown in the following graph:

3.4.2.1

Sensor type	
R025*****(C,F)*Z*****	(IIC)
R050*****(C,F)*Z*****	(IIC)
R100*****(C,F)*Z*****	(IIC)
R200*****(C,F)*Z*****	(IIC)
CNG050*****(C,F)*Z****	(IIC)



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: Ta –40°C to + 55°C

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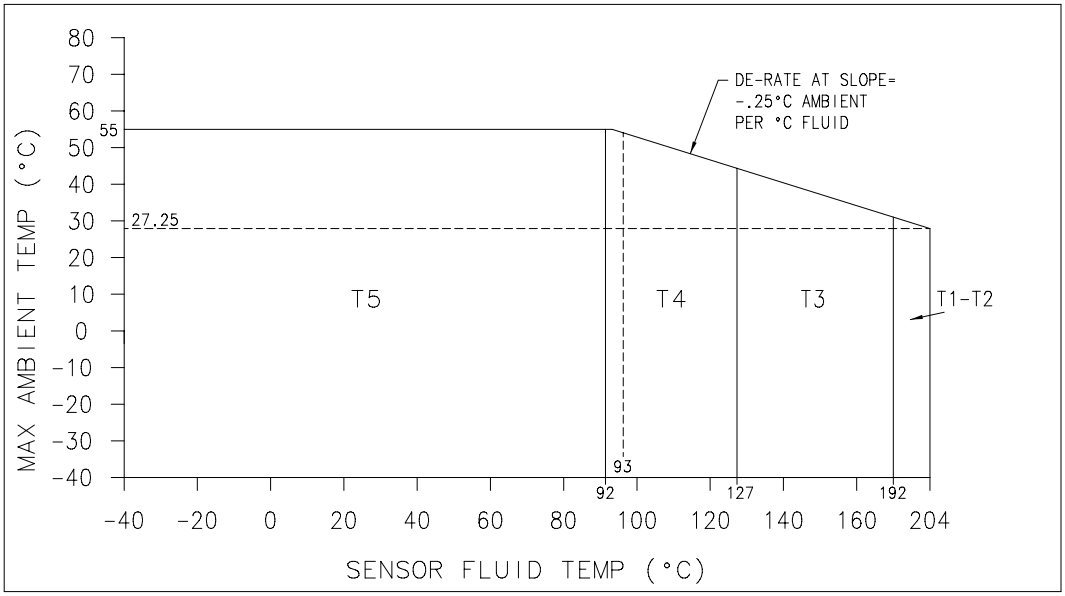
3.4.2.2

Sensor type	
R025*****(C,F)*Z***** CIC A2	(IIC)
R050*****(C,F)*Z***** CIC A2	(IIC)
CNG050*****(C,F)*Z**** CIC A2	(IIC)



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: Ta –40°C to + 55°C

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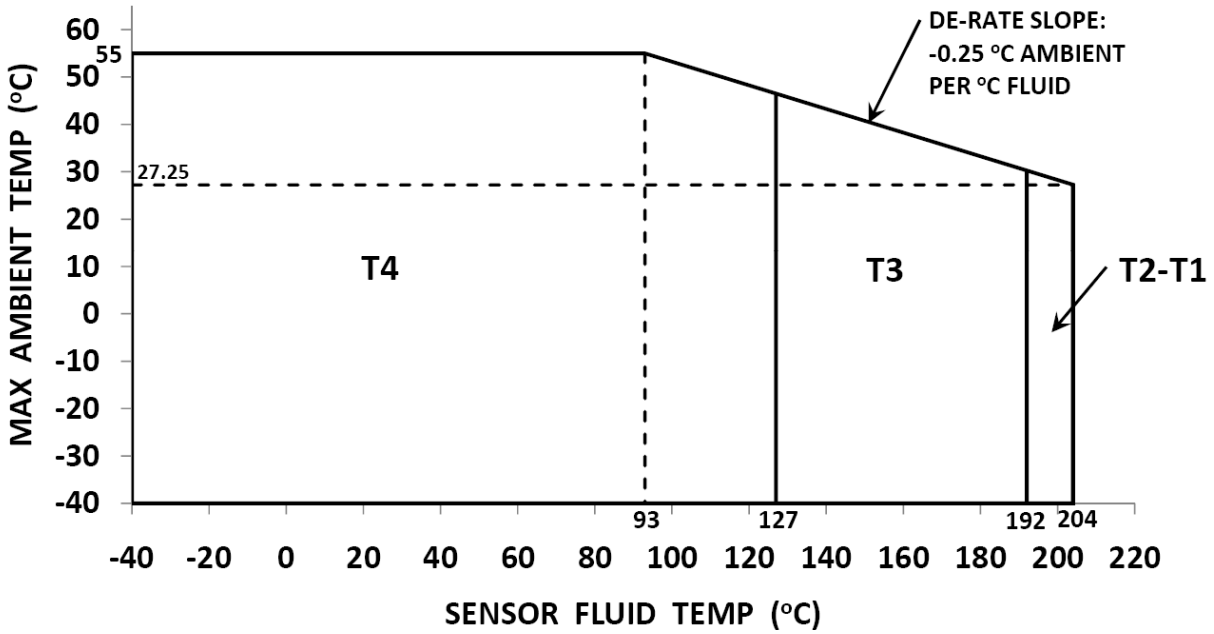
When used with 1700/2700 Transmitter with Wireless HART Output Option Code “4” (*700*1*4******):



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

Ambient temperature range: Ta –40°C to + 55°C

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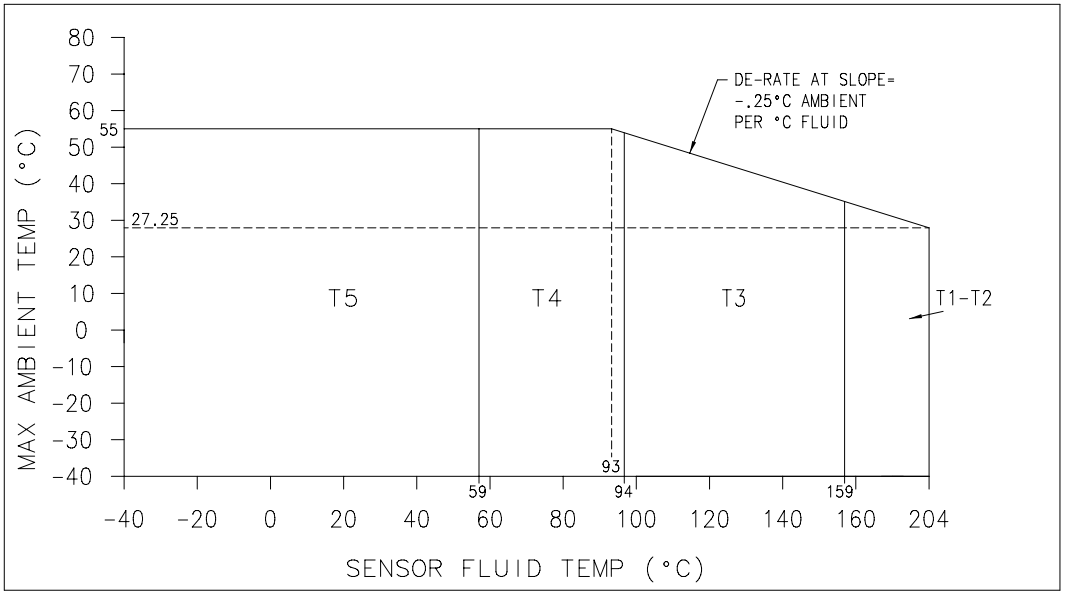
3.4.2.3

Sensor type	
R100*****(C,F)*Z***** CIC A2	(IIC)



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: Ta –40°C to + 55°C

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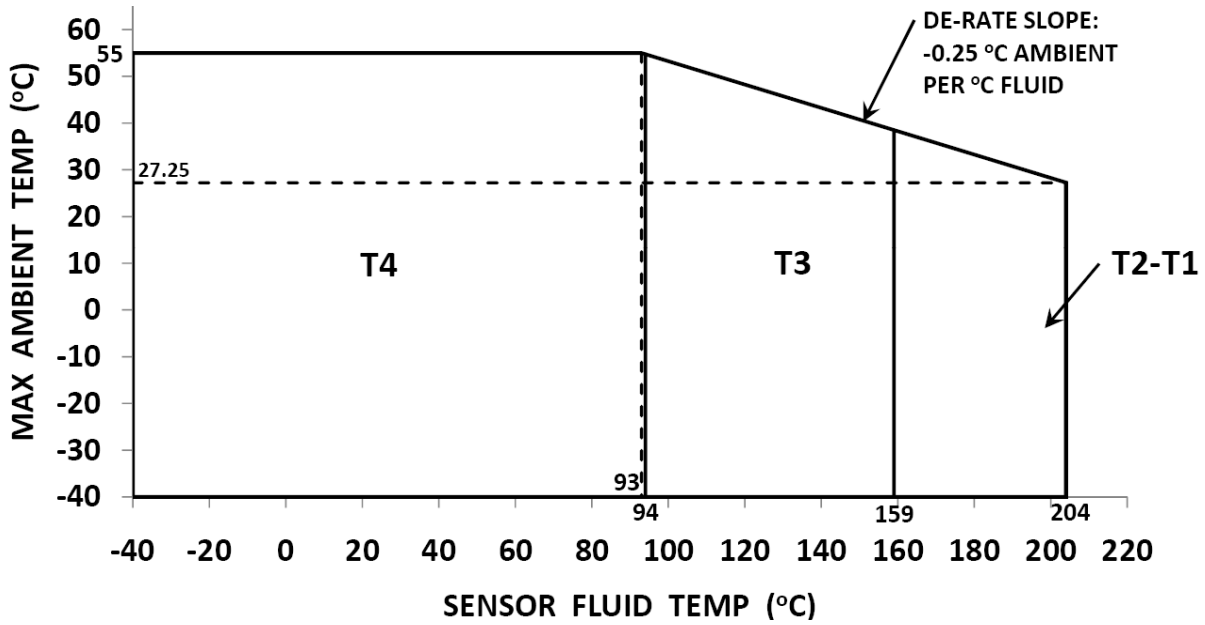
When used with 1700/2700 Transmitter with Wireless HART Output Option Code “4” (*700*1*4******):



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

Ambient temperature range: Ta –40°C to + 55°C

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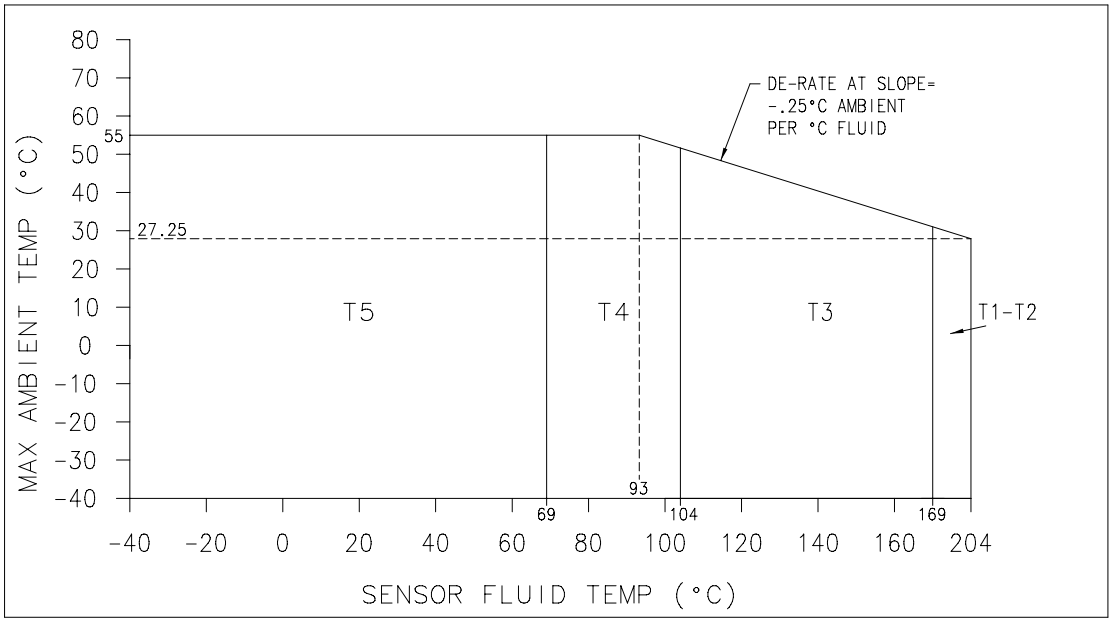
3.4.2.4

Sensor type	
R200*****(C,F)*Z***** CIC A1	(IIC)



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: Ta –40°C to + 55°C

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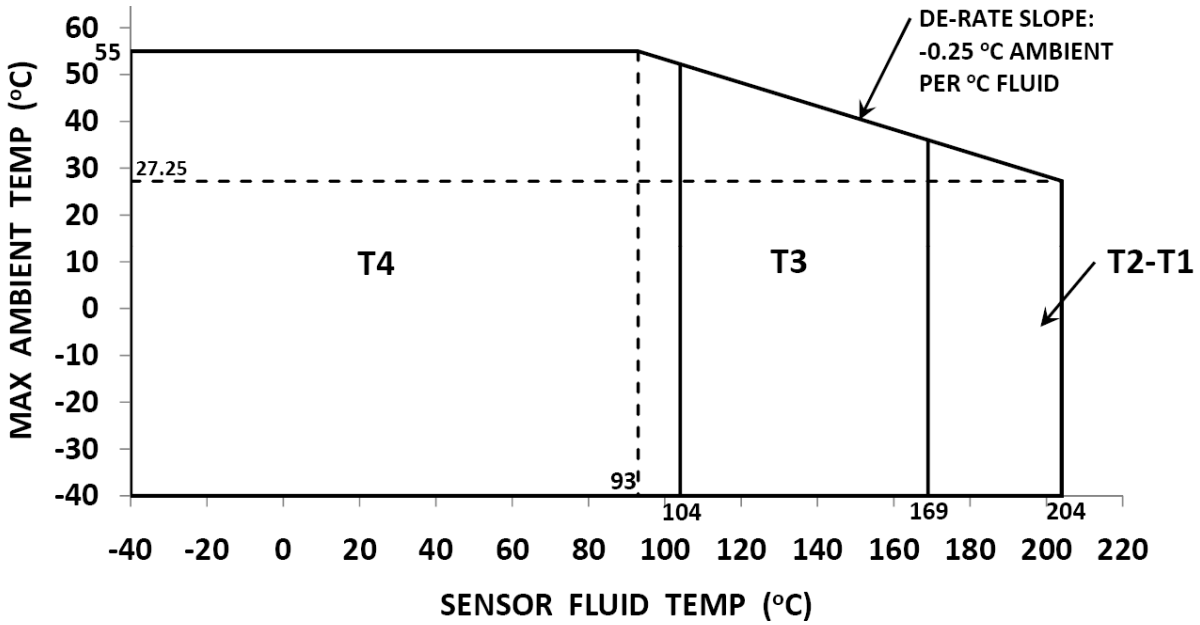
When used with 1700/2700 Transmitter with Wireless HART Output Option Code “4” (*700*1*4******):



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

Ambient temperature range: Ta –40°C to + 55°C

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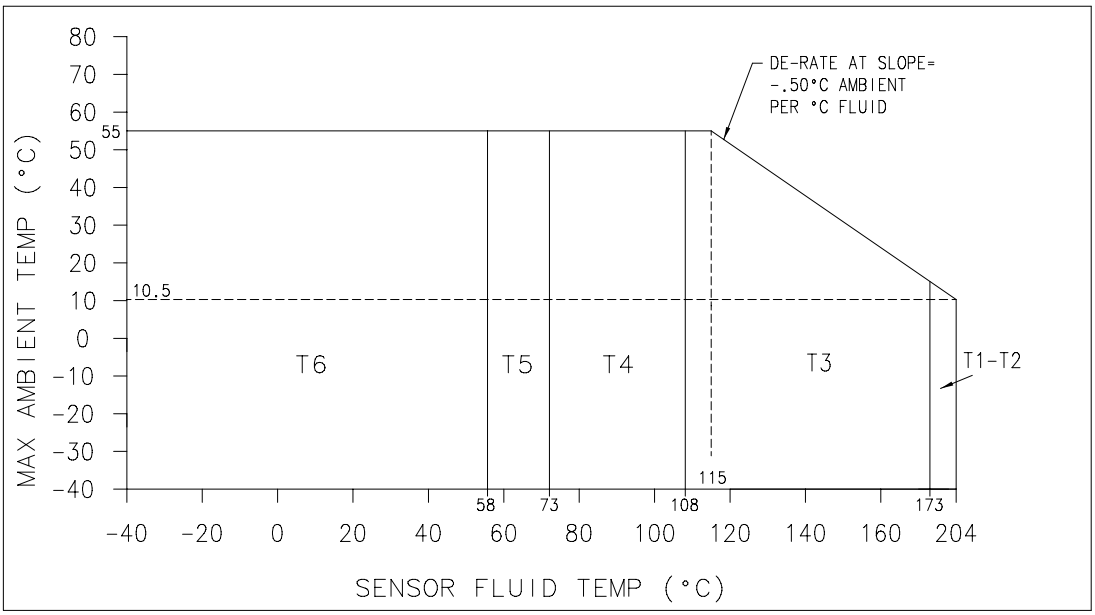
3.5 Type R*** *****I******* or CNG050 ***** I******.

3.5.1 Electrical parameters see EB-20000373 for the transmitter type IFT9703*******

3.5.2 The classification into a temperature class depends on the temperature of the medium taking into account the maximum operating temperature of the sensor and is shown in the following graph:

3.5.2.1

Sensor type	
R025*****I*Z*****	(IIC)
R050*****I*Z*****	(IIC)
R100*****I*Z*****	(IIC)
R200*****I*Z*****	(IIC)
R200*****I*Z***** CIC A1	(IIC)
CNG050*****I*Z****	(IIC)



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

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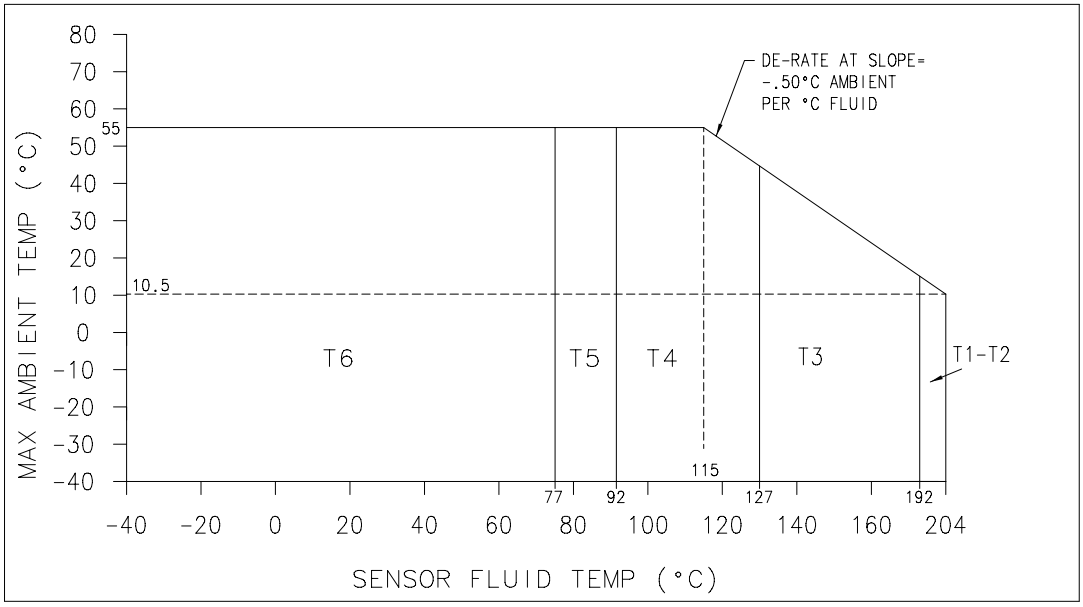
3.5.2.2

Sensor type	
R025*****I*Z***** CIC A2	(IIC)
R050*****I*Z***** CIC A2	(IIC)
CNG050*****I*Z**** CIC A2	(IIC)



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

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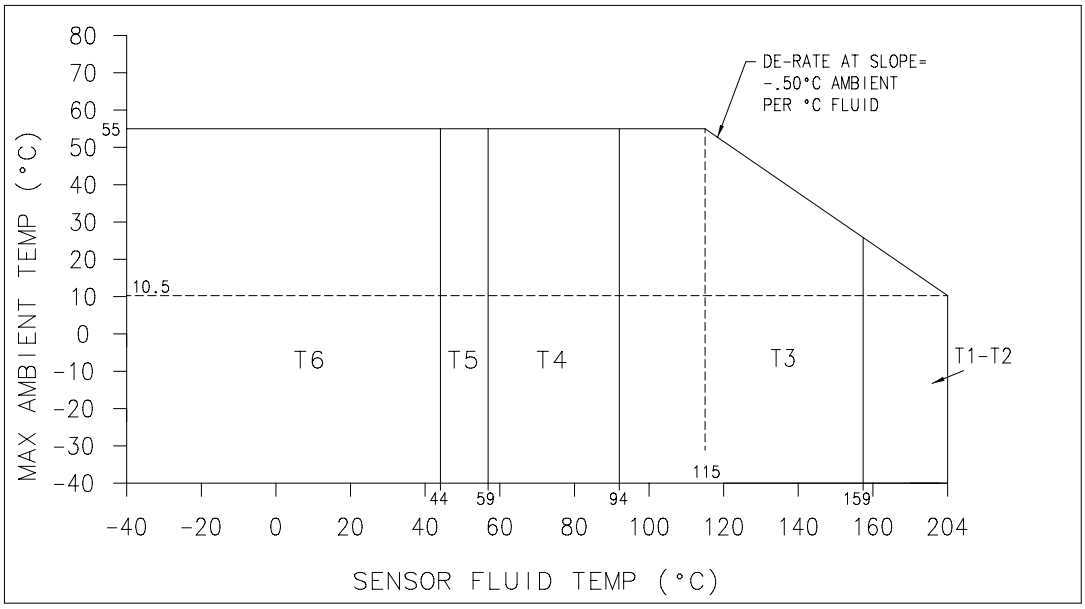
3.5.2.3

Sensor type	
R100*****I*Z***** CIC A2	(IIC)



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

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4) Marking

The marking of the equipment shall include the following:

II 2G
II 2D with additional marking required by the standards mentioned in the following tables:

Type	Type of protection gas	type of protection dust
R025*****[1)]*Z*****	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
R050*****[1)]*Z*****	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
R100*****[1)]*Z*****	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
R200*****[1)]*Z*****	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
R200*****[1)]*Z***** C.I.C. A1	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
CNG050*****[1)]*Z****	Ex ib IIC T1-T6 Gb	Ex ib IIIC T[3]°C Db IP65
R025 *****I*Z*****	Ex ib IIC T1-T6 Gb	
R025 *****I*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	
R050 *****I*Z*****	Ex ib IIC T1-T6 Gb	
R050 *****I*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	
R100 *****I*Z*****	Ex ib IIC T1-T6 Gb	
R100 *****I*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	
R200 *****I*Z*****	Ex ib IIC T1-T6 Gb	
R200 *****I*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	
CNG050 *****I*Z****	Ex ib IIC T1-T6 Gb	
CNG050 *****I*Z**** C.I.C. A2	Ex ib IIC T1-T6 Gb	
R025*****[2)]*Z*****	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R025*****[2)]*Z***** C.I.C. A2	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R050*****[2)]*Z*****	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R050*****[2)]*Z***** C.I.C. A2	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R100*****[2)]*Z*****	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R100*****[2)]*Z***** C.I.C. A2	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R200*****[2)]*Z*****	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
R200*****[2)]*Z***** C.I.C. A1	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
CNG050*****[2)]*Z****	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65
CNG050*****[2)]*Z**** C.I.C. A2	Ex ib IIC T1-T5 Gb	Ex ib IIIC T[3]°C Db IP65

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For sensors with J-box connected to non-MVD transmitters (i. e. 9703) is valid:

Type	Type of protection gas	Min. ambient/fluid temp. gas	Type of protection dust
R025*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-68 °C	Ex ib IIIC T[3)]°C Db IP65
R050*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-68 °C	Ex ib IIIC T[3)]°C Db IP65
R100*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-68 °C	Ex ib IIIC T[3)]°C Db IP65
R200*****[1)]*Z***** C.I.C. A1	Ex ib IIC T1-T6 Gb	-90 °C	Ex ib IIIC T[3)]°C Db IP65
CNG050*****[1)]*Z**** C.I.C. A2	Ex ib IIC T1-T6 Gb	-68 °C	Ex ib IIIC T[3)]°C Db IP65

For sensors with J-box connected to MVD transmitters (i. e.1700/2700) is valid:

Type	Type of protection gas	Min. ambient/fluid temp. gas	Type of protection dust
R025*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-83 °C	Ex ib IIIC T[3)]°C Db IP65
R050*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-83 °C	Ex ib IIIC T[3)]°C Db IP65
R100*****[1)]*Z***** C.I.C. A2	Ex ib IIC T1-T6 Gb	-83 °C	Ex ib IIIC T[3)]°C Db IP65
R200*****[1)]*Z***** C.I.C. A1	Ex ib IIC T1-T6 Gb	-138 °C	Ex ib IIIC T[3)]°C Db IP65
CNG050*****[1)]*Z**** C.I.C. A2	Ex ib IIC T1-T6 Gb	-83 °C	Ex ib IIIC T[3)]°C Db IP65

1) At this place the letter R, H, S or T will be inserted.

2) At this place the numeral 2, 3, 4, 5, 6, 7, 8 or 9 or the letter A, B, D, E, Q, V, W or Y will be inserted.

3) Maximum surface temperature T for dust, see temperature graphs and the manufacturer's instructions. Minimum ambient and process temperature for dust is -40 °C.

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5) Special conditions for safe use / Installation instructions

- By mounting the sensor directly to the 2200S transmitter the use of the unit will be modified according to the following table:

	Sensor type
	R025 *****(J or U)*Z***** R025 *****(J or U)*Z***** CIC A2 R050 *****(J or U)*Z***** R050 *****(J or U)*Z***** CIC A2 R100 *****(J or U)*Z***** R100 *****(J or U)*Z***** CIC A2 R200 *****(J or U)*Z***** R200 *****(J or U)*Z***** CIC A1 CNG050 *****(J or U)*Z**** CNG050 *****(J or U)*Z**** CIC A2
Transmitter type 2200S*(H or K)*1******	Ex ib IIC T1-T4 Ex ibD 21 T [3] °C
Transmitter type 2200S*(5 or 6)*1******	Ex ib IIC T1-T4

[3] Max. surface temperature T for dust for types R********** and CNG********** see temperature graphs and manufacturer's instructions.

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- By mounting the sensor directly to the *700 transmitter the use of the unit will be modified according to the following table:

Sensor	R025 *****(C or F)*Z***** R025 *****(C or F)*Z***** CIC A2 R050 *****(C or F)*Z***** R050 *****(C or F)*Z***** CIC A2 R100 *****(C or F)*Z***** R100 *****(C or F)*Z***** CIC A2 R200 *****(C or F)*Z***** R200 *****(C or F)*Z***** CIC A1 CNG050 *****(C or F)*Z**** CNG050 *****(C or F)*Z**** CIC A2
Transmitter type *700*1[1)]*******	Ex ib IIB+H_2 T1-T5 Ex tD A21 IP 65 T [3)] °C
Transmitter type *700*1[2)]*******	Ex ib IIC T1-T5 Ex tD A21 IP 65 T [3)] °C
Transmitter type *700*1[1)] 4******	Ex ib IIB+H_2 T1-T4
Transmitter type *700*1[2)] 4******	Ex ib IIC T1-T4

1) At this place the numeral 1 or 2 will be inserted.
2) At this place the numeral 3, 4 or 5 will be inserted.
3) Max. surface temperature T for dust for types R********** and CNG********** see temperature graphs and manufacturer's instructions.

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1. When the application requires that IIB certified sensors are to be used in IIC hazardous areas, these sensors can be modified by adding an infallible series resistor in the drive coil circuitry done by the manufacturer or his representative. In this case, the modified sensor can be marked with IIC and must be marked with an identification code (so-called ETO number). Furthermore the manufacturer or his representative must issue a Manufacturing Declaration which shows how the calculations have been done, what resistor value is to be added and what the identification code is.
2. The above is also applicable when IIB or IIC certified sensors are going to be used at lower fluid temperatures than indicated in the EC Type Examination Certificate.
3. A combination of point 1 and 2 is also allowed.

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