

Installation Instructions

P/N 20004425, Rev. CA

June 2009

ATEX Zone 2 and 22 Installation Drawings and Instructions

For ATEX-approved Zone 2 and 22
installations



Note: For hazardous installations in Europe, refer to standard EN 60079-14 if national standards do not apply.

Information affixed to equipment that complies with the Pressure Equipment Directive can be found on the internet at www.micromotion.com/documentation.

If you require the information given in this manual in a different language, please contact Micro Motion Customer Service.

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Model 2400 Transmitters

ATEX Installation Instructions

- For installing a Micro Motion Model 2400 transmitter

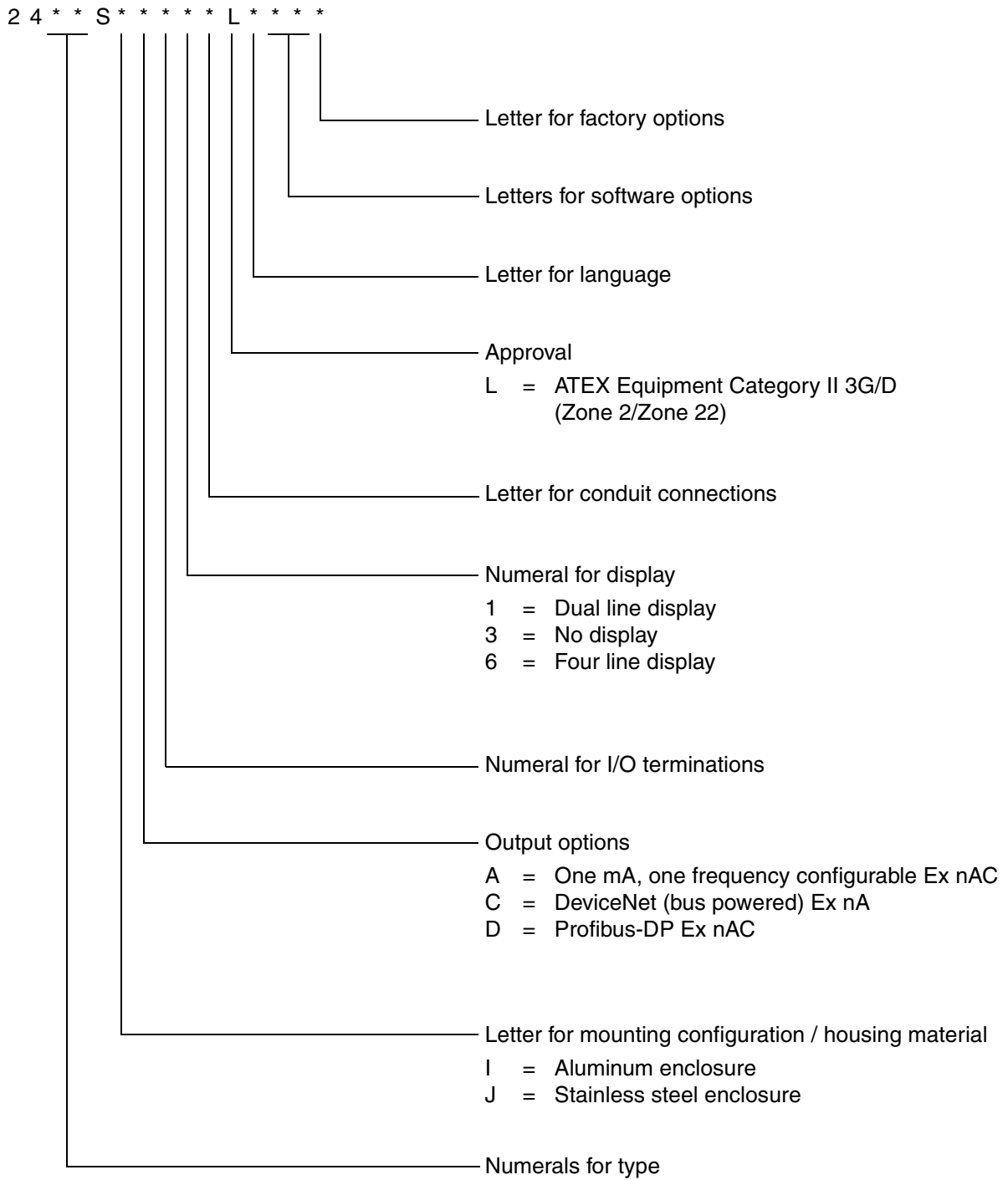


Subject: Equipment type	Transmitter type 24*****L****
Manufactured and submitted for examination	Micro Motion, Inc.
Address	Boulder, Co. 80301, USA
Standard basis	IEC 60079-15:2005 Nonsparking 'n' EN 61241-0:2006 Dust, general requirements 'D' EN 61241-1:2004 Dust by enclosure 'tD'
Code for type of protection	II 3G Ex nAC II T5 (24**S*A***L****) Analog or II 3G Ex nAC II T5 (24**S*D***L****) Profibus-DP or II 3G Ex nA II T5 (24**S*C***L****) DeviceNet II 3D Ex tD A22 IP66/67 T70 °C
Type Examination Certificate	BVS 05 E 116 X

1) **Subject and type**

Transmitter type 24*****L****

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



2) Description

The Micro Motion 24****(A, C, or D) Transmitter is integrally mounted to a Micro Motion Coriolis Meter.

The 24****(A, C, or D) integral mount transmitter system architecture consists of the following system: two circuit boards, PowerIO and BFCore, are encapsulated into a potting shell. The encapsulated device makes a 9-wire connection to the Micro Motion Coriolis Meter via a fixed 9-wire cable. Attached to the encapsulated assembly, by two mounting screws, is a User Interface (UI) that contains an optional LCD display, infrared (IR) buttons and communication, temporary service connections, and configuration switches. The configuration switches may only be operated when there is no explosive atmosphere present or when the power is switched off from the device.

The 24****A***** has two sets of screw terminals: universal power input and I/O signaling. The terminals are separated by a plastic wall. Further, the power supply terminals are under a protective cover. The I/O consists of four terminals: two are dedicated 4–20mA and two are configurable as Frequency/Pulse Output, Discrete Output, or Discrete Input.

The 24****A***** is a non-sparking device (Ex n A) containing within the encapsulation a sealed relay (Ex n C). This relay is used to software select active or passive operation of the mA output.

The 24****A***** was originally assessed using EN-60079-15:2003 and obtained the classification code EEx nA C II T5. From Supplement 2 of BVS 05 E 116 X, the assessment is based on IEC 60079-15:2005 and the classification code Ex nA C II T5.

The 24****C***** integral mount transmitter system architecture consists of the following system: two circuit boards, Power and BFCore, are encapsulated into a potting shell using Dow Corning 567. The encapsulated device makes a 9-wire connection to the Micro Motion Coriolis Meter via a fixed 9-wire cable. Attached to the encapsulated assembly, by two mounting screws, is a User Interface (UI) that contains an optional LCD display, infrared (IR) buttons and communication, temporary service connections and configuration switches. The configuration switches may only be operated when there is no explosive atmosphere present or when the power is switched off from the device.

The 24****C***** has four screw terminals: two DC Input Power (11–25 VDC) and two CAN Communications. Optionally the transmitter can be supplied with a Eurofast™ DeviceNet™ connector installed in one of the conduit openings and factory wired to the four screw terminals.

The 24****D***** integral mount transmitter system architecture consists of the following system components: two circuit boards, PowerIO and BFCore, are encapsulated into a potting shell using Dow Corning 567. The encapsulated “puck” makes a 9-wire connection to the Micro Motion Coriolis Meter via a fixed 9-wire cable. Attached to the encapsulated assembly, by two mounting screws, is a User Interface (UI) that contains an optional LCD display, infrared (IR) buttons and communication, and temporary service connections and configuration switches. The configuration switches may only be operated when there is no explosive atmosphere present or when the power is switched off from the device.

The 24****D***** has two sets of screw terminals: universal power input and I/O signaling. A plastic wall separates the terminals. Further, the power supply terminals are under a protective cover. The I/O consists of two Profibus comm. terminals. Optionally the transmitter can be supplied with a Eurofast™ Profibus™ connector installed in one of the conduit openings and factory wired to the two screw terminals.

The 24****D***** is a non-sparking device (Ex n A) containing within the encapsulation a sealed relay (Ex n C). This relay is used to software select the internal termination impedance for the Profibus-DP communication.

The housing (painted aluminum or stainless steel) has two conduit openings (M20 or 1/2" NPT) for customer wiring to power terminals and I/O signaling. A chassis ground terminal is located both inside the power terminal compartment and also external on the housing.

The 24***** was original assessed for dust using EN-50281-1-1 and obtained the classification code II 3 D IP66/IP67 T70°C. From Supplement 4 of BVS 05 E 116 X , the assessment is based on EN 61241-0 and EN 61241-1 with the classification code II 3D Ex tD A22 IP66/IP67 T70°C for the stainless steel enclosure and II 3D Ex tD A22 IP66/IP67 T70°C for the aluminum enclosure.

3) Parameters

3.1) Power supply (24****A and 24****D*****)

Rated voltage (terminals 1–2 (J1))	DC	18–100	V
	AC	85–250	V

3.2) Input/output circuits (24****A*****)

3.2.1) mA output (active or passive) (terminals 1–2 (J2))

Voltage	DC	30	V
Current		4–20	mA

3.2.2) Frequency/pulse (active or passive) frequency/pulse (terminals 1–2 (J3))

Voltage	DC	30	V
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3.2.3) Discrete output (active or passive) voltage (terminals 1–2 (J3))

Voltage	DC	30	V
Current	max	500	mA

3.2.4) Discrete input (active or passive) voltage (terminals 1–2 (J3))

Voltage	DC	30	V
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3.3) DeviceNet Supply (24****C*****)

Rated voltage (terminals 1-2 (J1)) (or pin 2–3 of Eurofast™ DeviceNet™ connector)	DC	11–25	V
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3.4) DeviceNet input/output circuits (24****C*****)













3.4.1) DeviceNet communications (terminals 1-2 (J2))

(or pin 4–5 of Eurofast™ DeviceNet™ connector) Voltage	DC	30	V
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3.5)	Profibus-DP input/output circuits (24****D*****) (or pin 1–2 of Eurofast™ Profibus™ connector)			
	Voltage	DC	30	V
3.6)	Output circuits fixed 9-wire cable to sensor (24****(A, C, or D)*****):			
3.6.1)	Drive circuit, receptacle 7–8			
	Voltage	DC	12,36	V
	Current		0,075	A
3.6.2)	Pick-off circuit, receptacle 3–4 and 5–6			
	Voltage	DC	3,3	V
	Current		27	μA
3.6.3)	Temperature circuit, receptacle 1, 2, and 9			
	Voltage	DC	2,5	V
	Current		370	μA
3.7)	Ambient temperature range			
	24****(A or C)*****	Ta	–40 °C up to +60 °C	
	24****D*****			
	Without Eurofast™ Profibus™ connector	Ta	–40 °C up to +60 °C	
	With Eurofast™ Profibus™ connector	Ta	–30 °C up to +60 °C	

4) Marking

–40 °C ≤ Ta ≤ +60 °C or –30 °C ≤ Ta ≤ +60 °C

- type	- type of protection
24***IA***L****	  II 3 G Ex nAC II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C
24***IC***L****	  II 3 G Ex nA II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C
24***ID***L****	  II 3 G Ex nAC II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C
24***JA***L****	  II 3 G Ex nAC II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C
24***JC***L****	  II 3 G Ex nA II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C
24***JD***L****	  II 3 G Ex nAC II T5 II 3 D Ex tD A22 IP66/IP67 T70 °C

5) Special conditions for safe use / Installation instructions

- 5.1) The permissible ambient temperature range for the transmitter is $-40\text{ }^{\circ}\text{C}$ up to $+60\text{ }^{\circ}\text{C}$. The use of the transmitter at an ambient temperature under $-20\text{ }^{\circ}\text{C}$ is only admissible if the cables and cable entries or conduit entries are suitable for that temperature and use.
- 5.2) The cable entries or conduit entries shall have a degree of protection of at least IP54 for use in category 3G, a degree of protection of at least IP6X for use in category 3D.
- 5.3) The user interface module must not be disconnected from the encapsulated assembly unless the unit has been de-energized or the area is known to be safe.
- 5.4) The DIP-switch SW1 and rotary switches SW 3, 4, and 5 must not be switched unless the unit has been de-energized or the area is known to be safe.
- 5.5) Special conditions for safe use for transmitters with plug sockets:
 - 5.5.1) Type 24**S*C***L****:

The plug must be suitable for the plug socket type Turck FSV57-*M/M20/CS or FSV57-*M/14.5/CS. The plug must fulfill the requirements of Category 3G respectably 3D independent of the use in Zone 2 or Zone 22.
 - 5.5.2) Type 24**S*D***L****:

The plug must be suitable for the plug socket type Turck FKW 4.5-*M/M20/CS or FKW 4.5-*M/14.5/NPT/CS. The plug must fulfill the requirements of Category 3G respectably 3D independent of the use in Zone 2 or Zone 22.
- 5.6) Type 24**S*C***L**** and Type 24**S*D***L****:

The plugs must be equipped with a connecting nut which assures a safe fixing of the plug at the plug socket.

 - 5.6.1) The plugs must assure in the plugged and screwed status the type of protection IP 67 in accordance to EN 60529 for the contacts.
 - 5.6.2) The plug must be equipped with a securing element in accordance to EN 61241-0, clause 19.1.b), which can only be removed with a tool, to prevent an unintentional disconnection.
 - 5.6.3) If the plug socket is not connected with a plug, the plug socket is to be protected against water and dust in minimum IP 67 in accordance to EN 60529. Before the plug socket will be connected to a plug it must be guaranteed that there is no dust or water in the plug and the plug socket.
 - 5.6.4) The operator shall provide external protection to prevent transient disturbances of more than 40% of the rated voltage of the plug sockets.

Model 2200 Transmitters

ATEX Installation Instructions

- For installing a Micro Motion Model 2200 transmitter

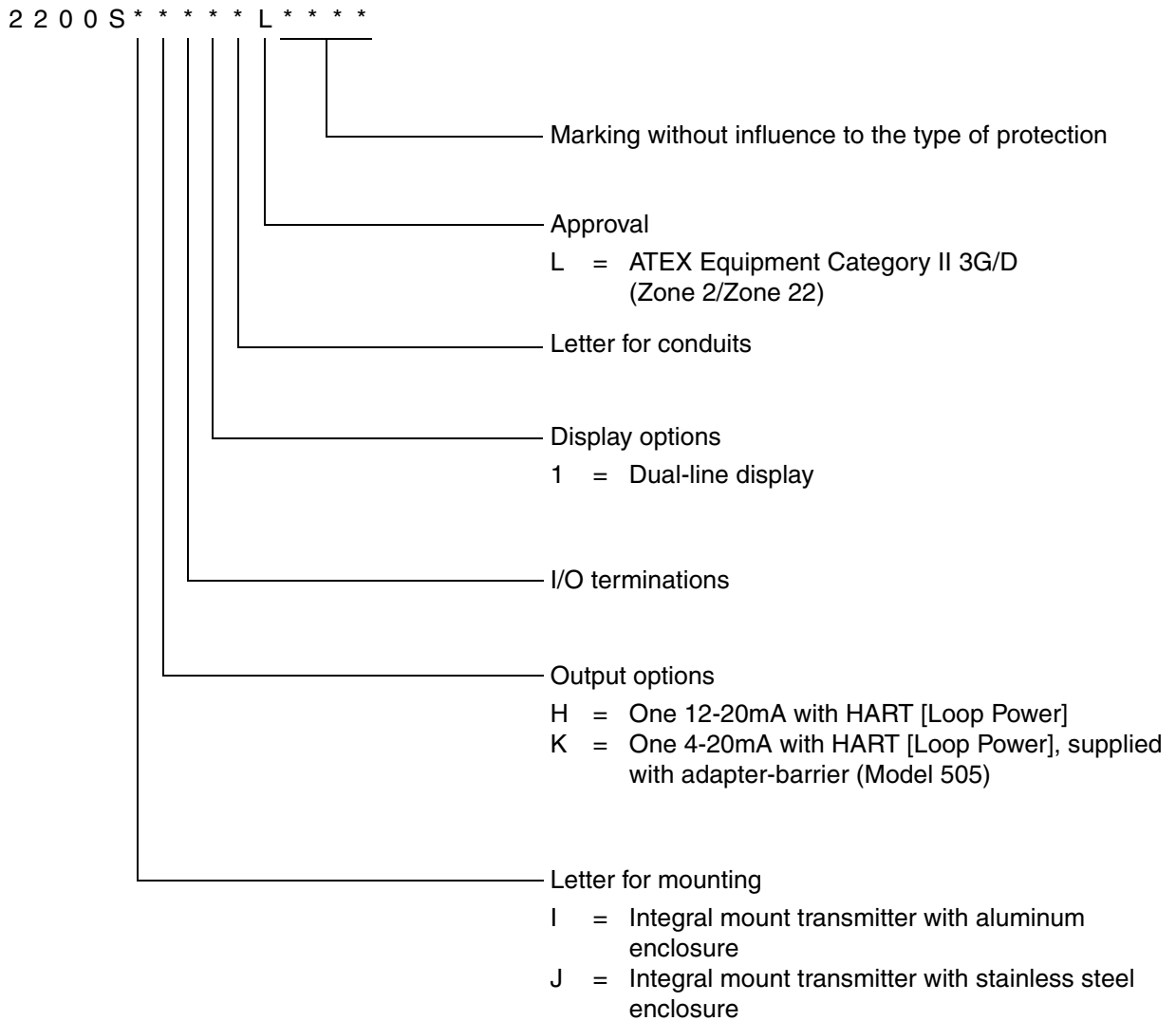


Subject: Equipment type	Transmitter type 2200S*****L****	
Manufactured and submitted for examination	Micro Motion, Inc.	
Address	Boulder, Co. 80301, USA	
Standard basis	EN 60079-15:2005	Nonsparking 'n'
	EN 61241-0:2006	Dust, general requirements 'D'
	EN 61241-1:2004	Dust by enclosure 'tD'
Code for type of protection	II 3G Ex nA II T4	
	II 3D Ex tD A22 IP66/67 T70 °C	
Type Examination Certificate	BVS 08 ATEX E 112 X	

1) **Subject and type**

Transmitter type 2200S****L****

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



2) Description

The Micro Motion model 22**S*H/K***L**** Transmitter is integrally mounted to a Micro Motion Coriolis Meter.

The model 22**S*H/K***L**** integral mount transmitter system architecture consists of two circuit boards, which are encapsulated into a potting shell. The encapsulated assembly makes a 9-wire connection to the Micro Motion Coriolis Meter via a fixed 9-wire cable. Attached to the encapsulated assembly, by two mounting screws, is a User Interface (UI) that contains an optional LCD display and temporary service connections.

The model 22**S*H/K***L**** has one sets of two screw terminals for connecting multifunctional wires providing both I/O communication and power input.

The enclosure material is either aluminum with blue paint or stainless steel.

The enclosure has two conduit openings for customer wiring to power terminals and I/O signaling however, only one conduit opening will be used and one conduit opening will be provided with an approved blanking plug. A chassis ground terminal is located both inside the power terminal compartment and also external on the housing.

3) Parameters

3.1) Input circuit (terminals 1–2)

Voltage	DC	28	V
Power in rated operation		0,56	W

3.2) Output circuits to sensor:

3.2.1) Drive circuit (J4 pins 7–8)

Voltage	DC	10,5	V
Current		80	mA

3.2.2) Pickoff circuit (J4 pins 3–6)

Voltage	DC	12,6	V
Current		4,29	mA

3.2.3) Temperature circuit, receptacle 1, 2, and 9





Voltage	DC	12,6	V
Current		3,31	mA

3.3) Ambient temperature range

22**S*H/K***L****	Ta	–40 °C up to +60 °C	
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4) Marking

-40 °C ≤ Ta ≤ +60 °C

- type	- type of protection
2200SI(H or K)*1*L**** with aluminum housing	  II 3 G Ex nA II T4 II 3 D Ex tD A22 IP66/IP67 T70 °C
2200SJ(H or K)*1*L**** with stainless steel housing	  II 3 G Ex nA II T4 II 3 D Ex tD A22 IP66/IP67 T70 °C

5) Special conditions for safe use / Installation instructions

- 5.1) The permissible ambient temperature range for the transmitter is -40 °C up to +60 °C. The use of the transmitter at an ambient temperature under -20 °C is only admissible if the cables and cable entries or conduit entries are suitable for that temperature and use.
- 5.2) The cable entries or conduit entries shall have a degree of protection of at least IP54 for use in category 3G, a degree of protection of at least IP6X for use in category 3D.
- 5.3) The user interface module must not be disconnected from the encapsulated assembly unless the unit has been de-energized or the area is known to be safe.
- 5.4) The HART and Temporary Service Port connections are not available for customer use. The terminals are covered by a plug and labeled "Factory Use Only". When the service port is utilized by service personnel for upgrade purposes, the circuits are protected from incidental damage potentially caused by non-I.S. devices temporarily connected to the port.

Micro Motion Sensors

ATEX (Zone 2 and 22) Installation Instructions

- For installing the following Micro Motion sensors with Model 2400S or Model 2200S transmitter:
 - ELITE
 - ELITE CMFS-Series
 - F-Series
 - H-Series
 - T-Series
 - R-Series
 - Model CNG050



Subject: Equipment type

Sensor type: CMF*******(0, 1, J, or U)*V******
CMFS*******(0, 1, J, or U)*V******
F*** *******(0, 1, J, or U)*V******
H*******(0, 1, J, or U)*V******
R*** *******(0, 1, J, or U)*V******
T*** *******(0, 1, J, or U)*V******
CNG050 *******(0, 1, J, or U)*V******

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 60079-0:2006	General requirements
EN 60079-15:2005	Non-sparking/limited energy 'n'
EN 61241-0:2006 and EN 61241-1:2004	Dust evaluation 'tD A'

Code for type of protection

II 3G Ex nA II T1–T4/T5
II 3D Ex tD A22 IP65 T* °C

Type Examination Certificate

BVS 06 ATEX E 093 X

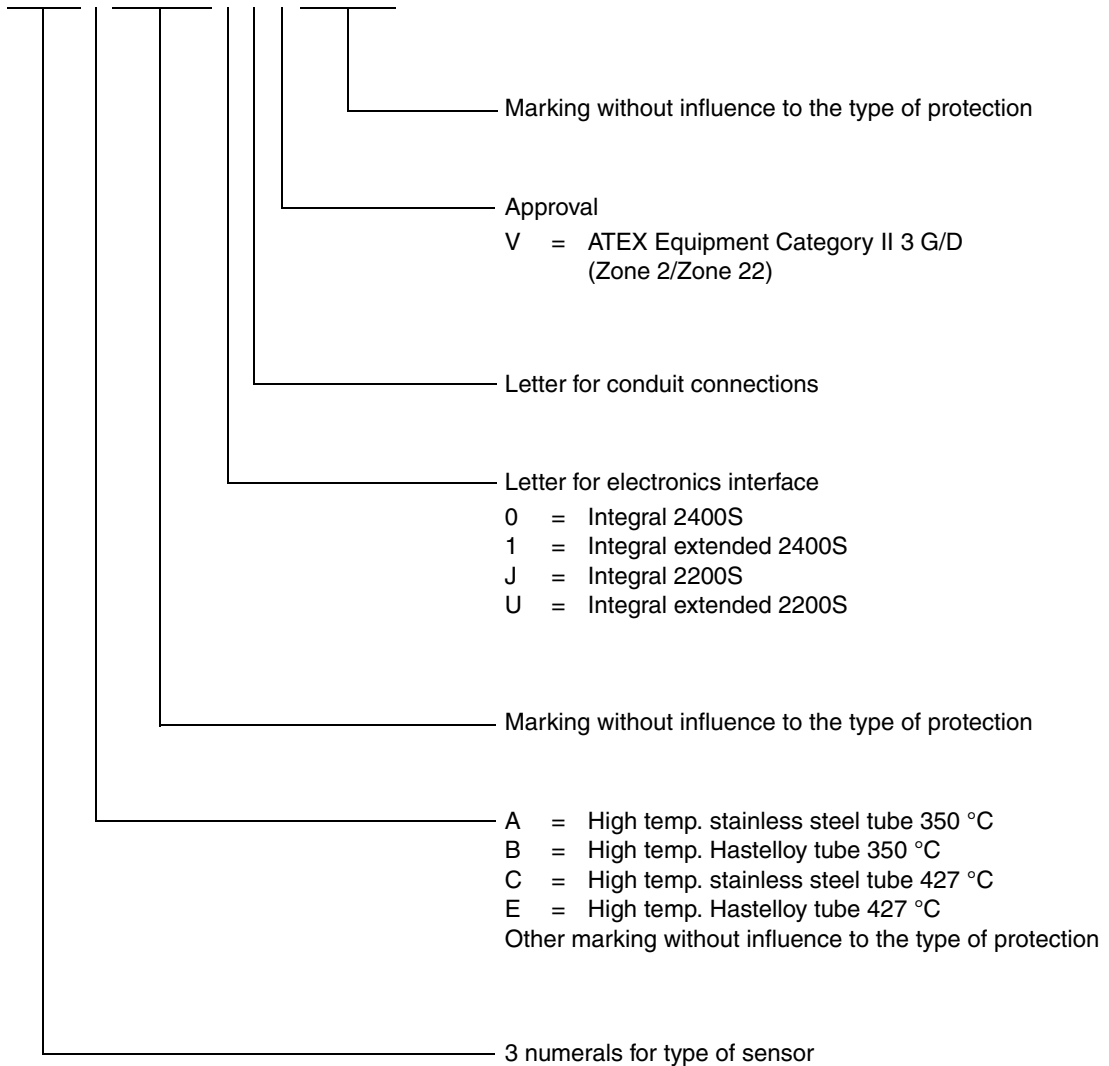


1) Subject and type

Sensor type (CMF, CMFS, F, H, R, T)*** *****V**** or CNG050*****V****

Instead of the asterisks (*), letters and numerals will be inserted which indicate the following modifications:

C M F * * * * * V * * * *
 C M F S * * * * * V * * * *
 F * * * * * V * * * *
 H * * * * * V * * * *
 R * * * * * V * * * *
 T * * * * * V * * * *
 C N G 0 5 0 * * * * * V * * * *



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.

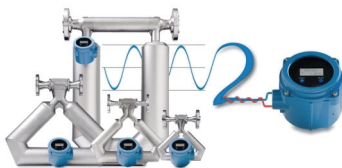
The sensor is designed for use in connection with a suitable transmitter, e.g. 24*****L**** in accordance with BVS 05 E 116 X; only the assembly of the sensor and the transmitter guarantees the necessary degrees of protection.

Alternatively a transmitter type 22*****L**** in accordance with BVS 08 ATEX E 112 X can be used; only the assembly of the sensor and the transmitter guarantees the necessary degrees of protection.

- When used with an integral transmitter type 2400S*****, the variation gets the denomination type *** ***(0 or 1)*****.



- When used with an integral transmitter type 2200S*****, the variation gets the denomination type *** ***(J or U)*****.



Supplement 1 covers:

- CMF800 and CMFHC3.
- Use of new Dust standards EN 61241-**.

Supplement 2 covers:

- Electronic Interface Codes “J” and “U” for 2200S transmitter.
- CMFHC2.
- Removed CMF800 and CMF800A, B, C and E sensors.

Supplement 3 covers:

- CMFS Sensors

3) Parameters

3.1) Type CMF*** (0 or 1)*V******

Sensor with 2400S transmitter, excluding CMF*** (A, B, C, or E) **** (0,1)*V****

3.1.1) Drive circuit
Pin connections 7–8

Voltage	30	VDC
Current	84	mA

3.1.2) Pick-off circuit (pin connections 3–4 and 5–6)

Voltage	30	VDC
Current	25	mA




3.1.3) Temperature circuit (pin connections 1, 2, and 9)

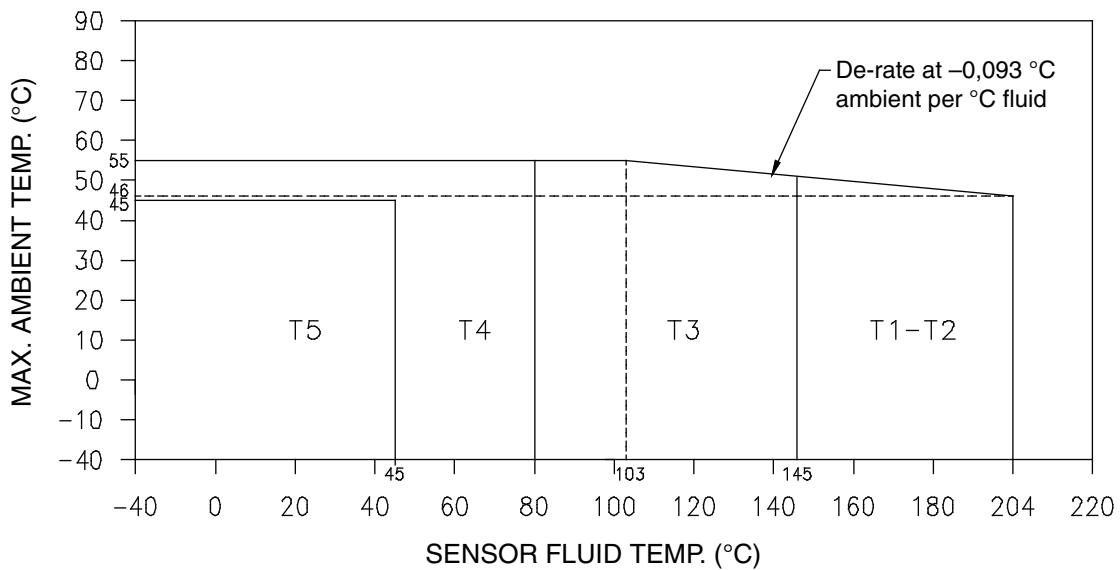
Voltage	30	VDC
Current	25	mA

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	CMF010*****(0,1)*V****	CMF025*****(0,1)*V****	CMF200*****(0,1)*V****
		CMF050*****(0,1)*V****	CMF300*****(0,1)*V****
		CMF100*****(0,1)*V****	

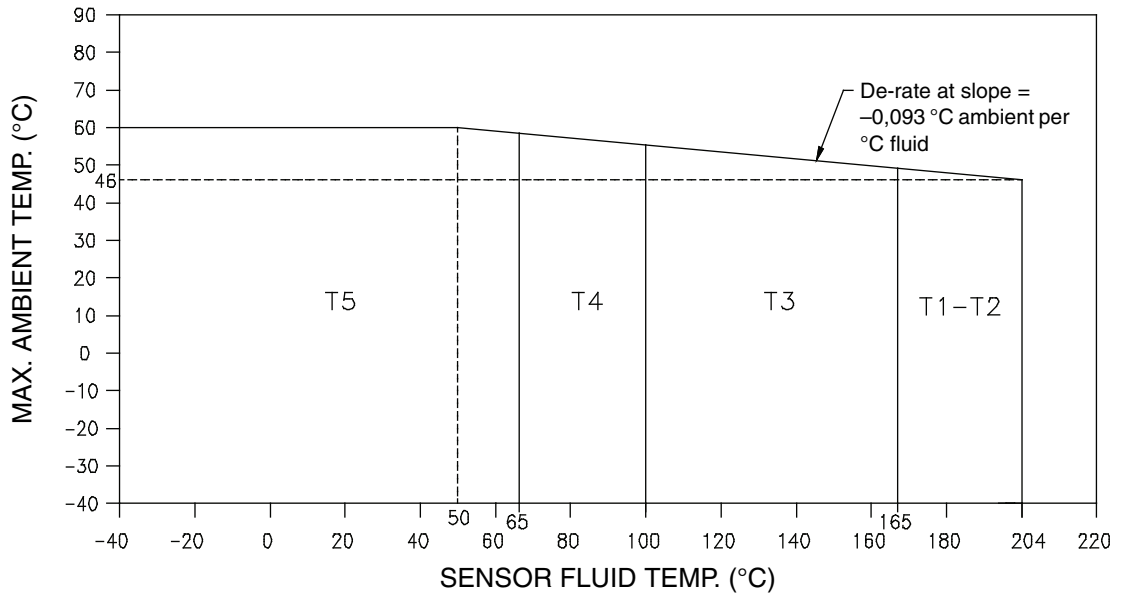


Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
 Note 2: The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 254°C.

Ambient temperature range T_a -40 °C to +55 °C

3.1.4.2)

	
Sensor type	CMF400*****(0,1)*V****



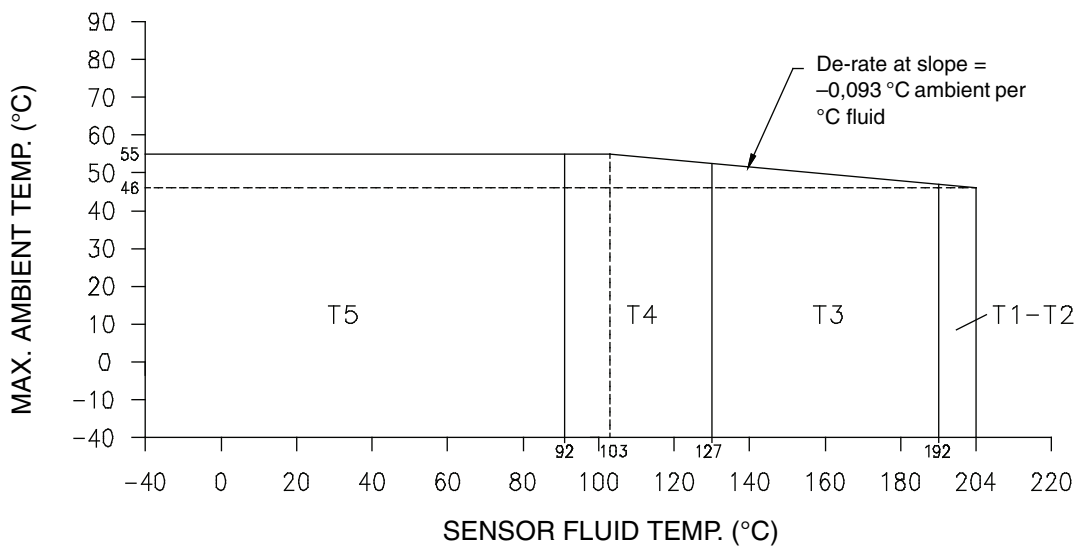
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.
 Note 2: The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 234°C.

Ambient temperature range T_a $-40\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$

3.1.4.3)



Sensor type	CMFHC2*****(0,1)*V****
	CMFHC3*****(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 $-40\text{ }^\circ\text{C}$ to $+55\text{ }^\circ\text{C}$

3.2) **Type CMF***(A, B, C, or E)****(0 or 1)*V******
 High-temperature sensor with 2400S transmitter

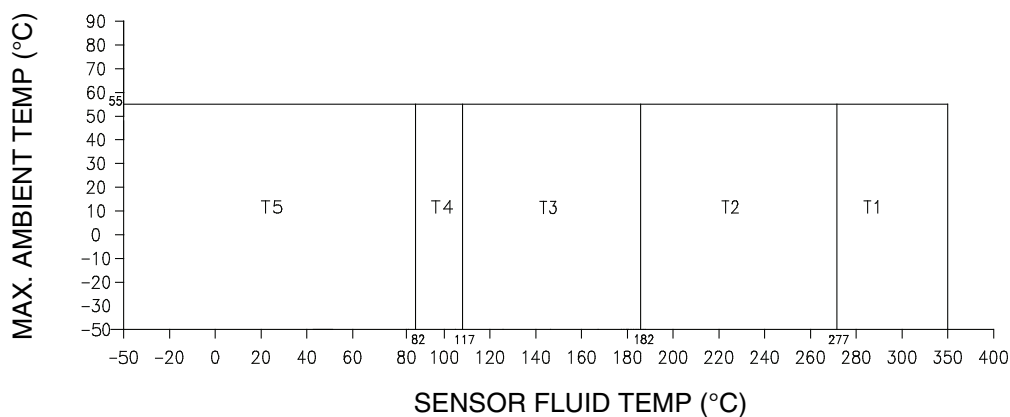
- 3.2.1) Drive circuit: See Section 3.1.1.
- 3.2.2) Pick-off circuit: See Section 3.1.2.
- 3.2.3) Temperature circuit: See Section 3.1.3.
- 3.2.4) Temperature class/maximum surface temperature T

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.

3.2.4.1)



Sensor type	CMF200(A or B)****(0,1)*V****
	CMF300(A or B)****(0,1)*V****
	CMF400(A or B)****(0,1)*V****
	CMFHC2(A or B)****(0,1)*V****
	CMFHC3(A or B)****(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:T 290°C, T1:T 363°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is $-40\text{ }^\circ\text{C}$.

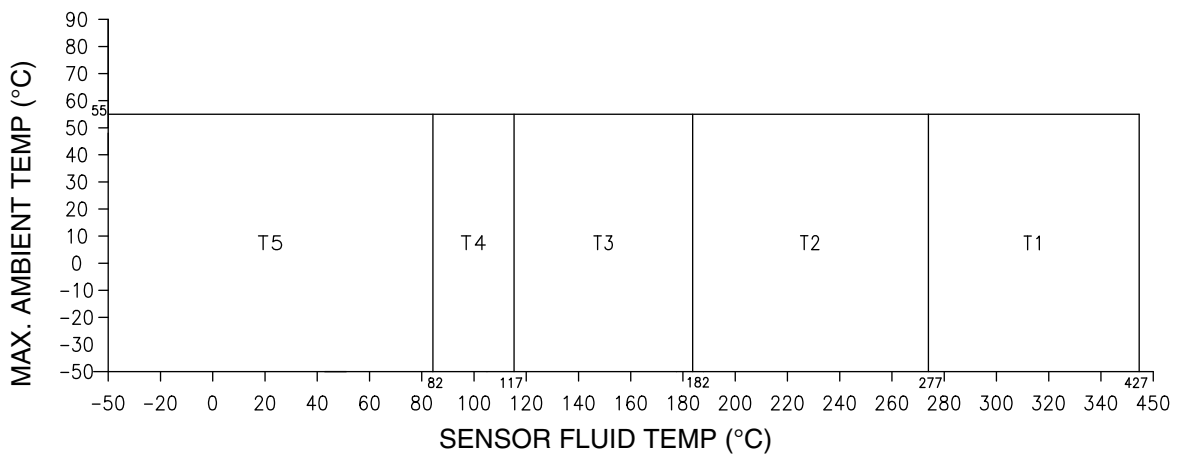
Ambient temperature range T_a $-50\text{ }^\circ\text{C}$ to $+55\text{ }^\circ\text{C}$

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.2.4.2)



Sensor type	CMF200(C or E)****(0,1)*V****
	CMF300(C or E)****(0,1)*V****
	CMF400(C or E)****(0,1)*V****
	CMFHC2(C or E)****(0,1)*V****
	CMFHC3(C or E)****(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: T 290°C, T1: T 440°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range T_a -50°C to +55°C

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.3) **Type CMF******(J or U)**V******

Sensor with 2200S transmitter, excluding CMF****(A, B, C, or E)******(J or U)**V****

3.3.1) Drive circuit: See Section 3.1.1.




3.3.2) Pick-off circuit: See Section 3.1.2.

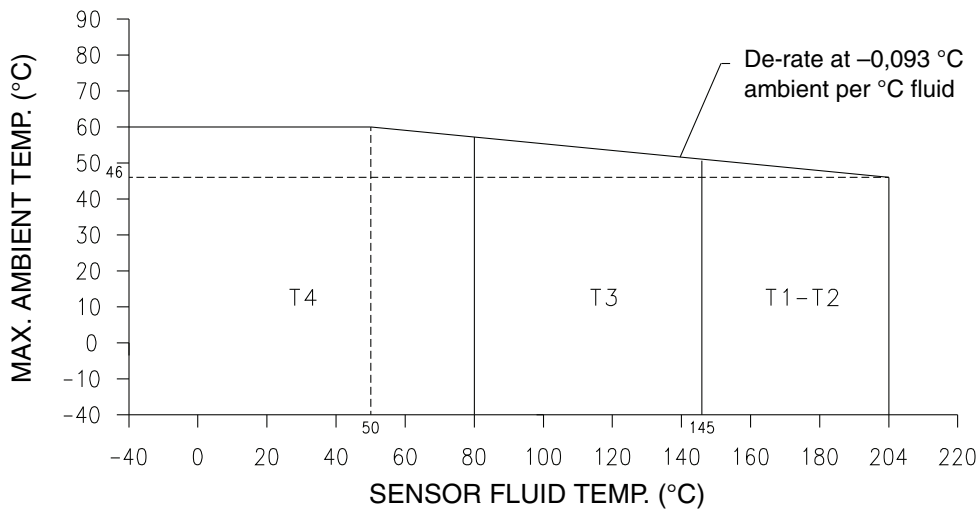
3.3.3) Temperature circuit: See Section 3.1.3.

3.3.4) 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.

3.3.4.1)

			
Sensor type	CMF010***** <i>(J,U)</i> *V****	CMF025***** <i>(J,U)</i> *V****	CMF200***** <i>(J,U)</i> *V****
		CMF050***** <i>(J,U)</i> *V****	CMF300***** <i>(J,U)</i> *V****
		CMF100***** <i>(J,U)</i> *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 254°C.

Ambient temperature range

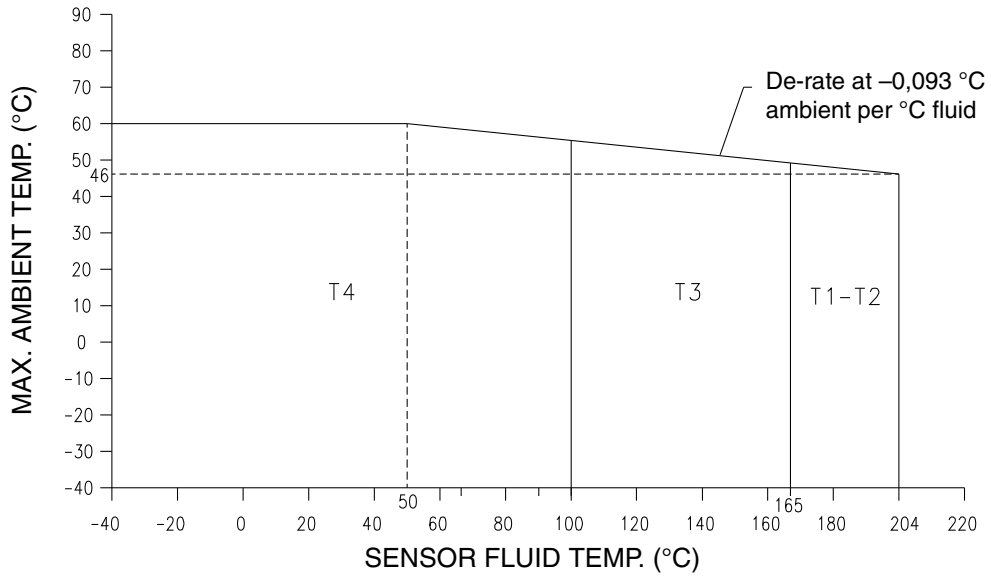
Ta

-40°C to +60°C

3.3.4.2)



Sensor type	CMF400*****(J,U)*V****
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Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

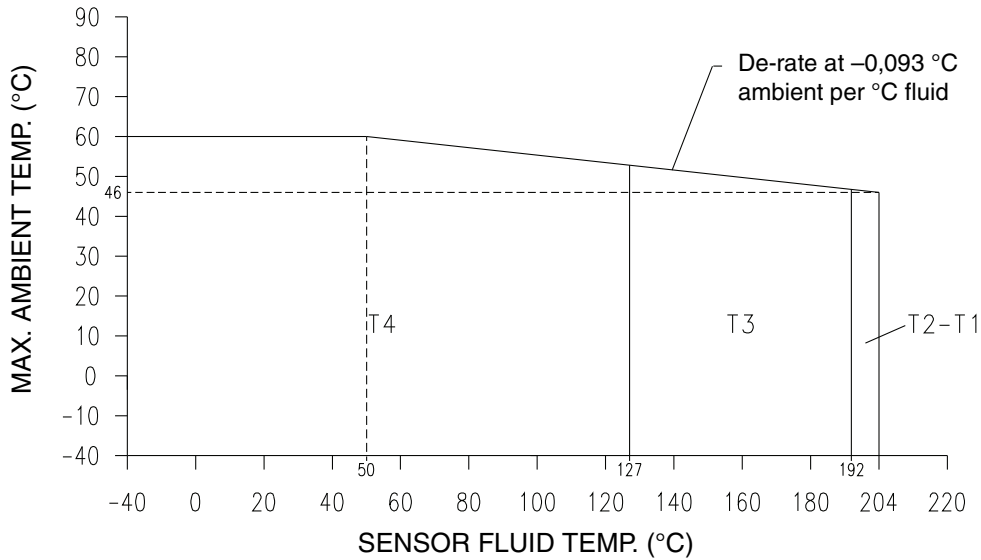
Note 2: The maximum surface temperature for dust is as follows: T4:T 130°C, T3:T 195°C, T2 to T1:T 234°C.

Ambient temperature range T_a $-40^{\circ}\text{C to } +60^{\circ}\text{C}$

3.3.4.3)



Sensor type	CMFHC2*****(J,U)*V****
	CMFHC3*****(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 T 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 to $+60^{\circ}\text{C}$

3.4) **Type CMF^{***}(A, B, C, or E)^{****}(J or U)*V^{****}**
 High-temperature sensor with 2200S transmitter

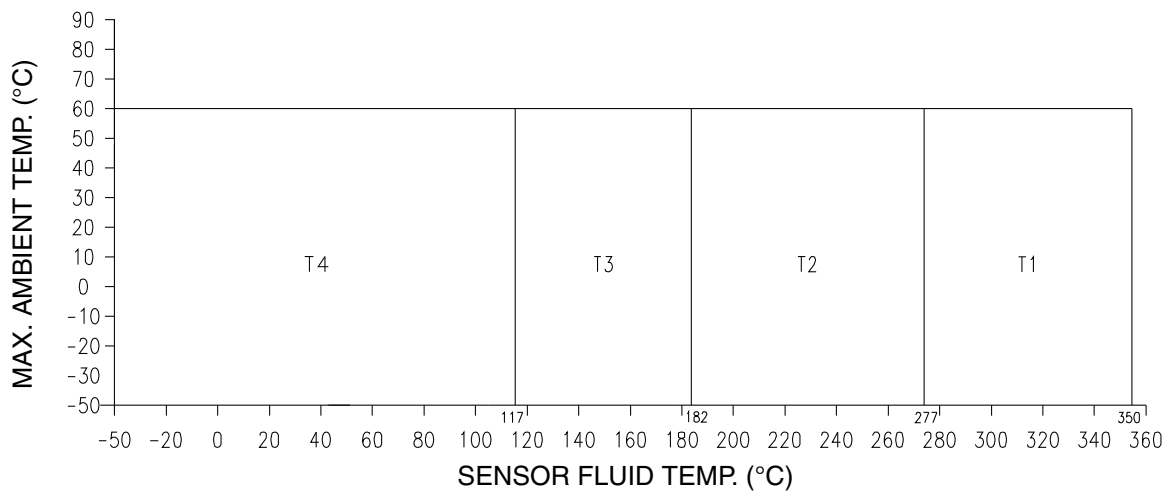
- 3.4.1) Drive circuit: See Section 3.1.1.
- 3.4.2) Pick-off circuit: See Section 3.1.2.
- 3.4.3) Temperature circuit: See Section 3.1.3.
- 3.4.4) Temperature class/maximum surface temperature T

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.

3.4.4.1)



Sensor type	CMF200(A or B)****(J,U)*V****
	CMF300(A or B)****(J,U)*V****
	CMF400(A or B)****(J,U)*V****
	CMFHC2(A or B)****(J,U)*V****
	CMFHC3(A or 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 T for dust is as follows: T4:T 130°C, T3:T 195°C, T2: T 290°C, T1:T 363°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

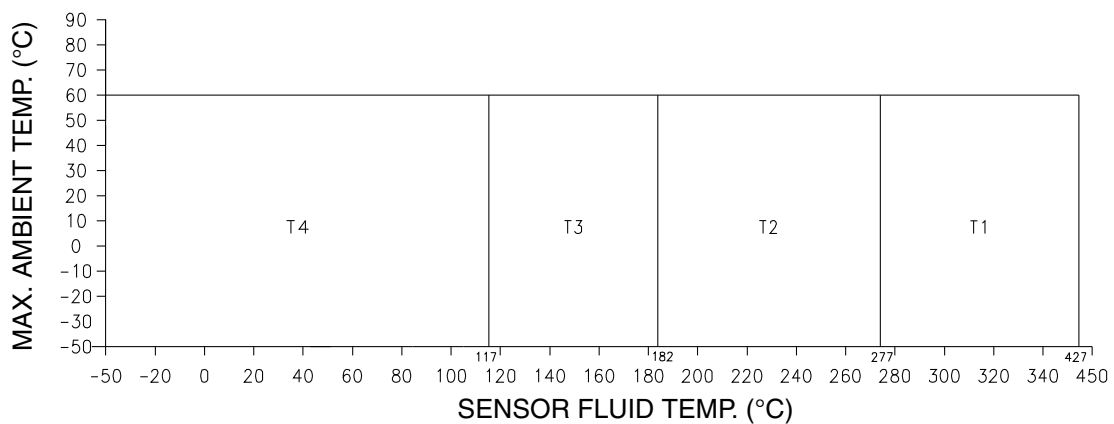
Ambient temperature range T_a -50°C to +60°C

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.4.4.2)



Sensor type	CMF200(C or E)****(J,U)*V****
	CMF300(C or E)****(J,U)*V****
	CMF400(C or E)****(J,U)*V****
	CMFHC2(C or E)****(J,U)*V****
	CMFHC3(C or 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 T for dust is as follows: T4: T 130°C, T3: T 195°C, T2: T 290°C, T1: T 440°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C .

Ambient temperature range T_a -50°C to $+60^{\circ}\text{C}$

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, the use of the sensor at an ambient temperature higher than $+55^{\circ}\text{C}$ 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.

3.5) **Type CMFS***** (0 or 1)*V******
Sensor with 2400S transmitter

3.5.1) Drive circuit: See Section 3.1.1.

3.5.2) Pick-off circuit: See Section 3.1.2.

3.5.3) Temperature circuit: See Section 3.1.3.

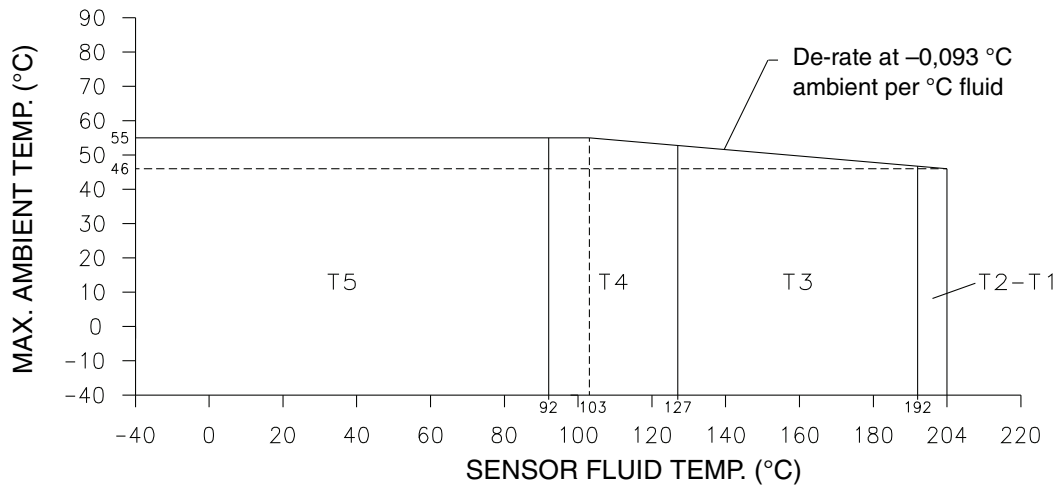
3.5.4) Temperature class/maximum surface temperature T

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.

3.5.4.1)



Sensor type	CMFS010*****(0 or 1)*V****
	CMFS015*****(0 or 1)*V****




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

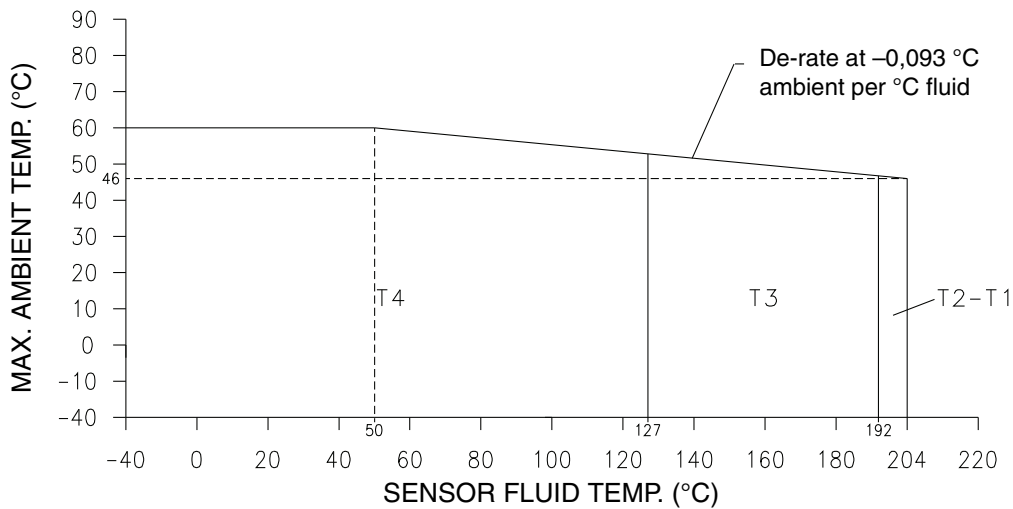
Note 2: The maximum surface temperature for dust is as follows: T5:T 95°C, T4:T 130°C, T3:T 195°C, T2 to T1:T 207°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range Ta -40°C to + 55°C

3.5.4.2)

	
Sensor type	CMFS010*****(J or U)*V****
	CMFS015*****(J or 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.
 Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.



Ambient temperature range Ta -40°C to +60°C

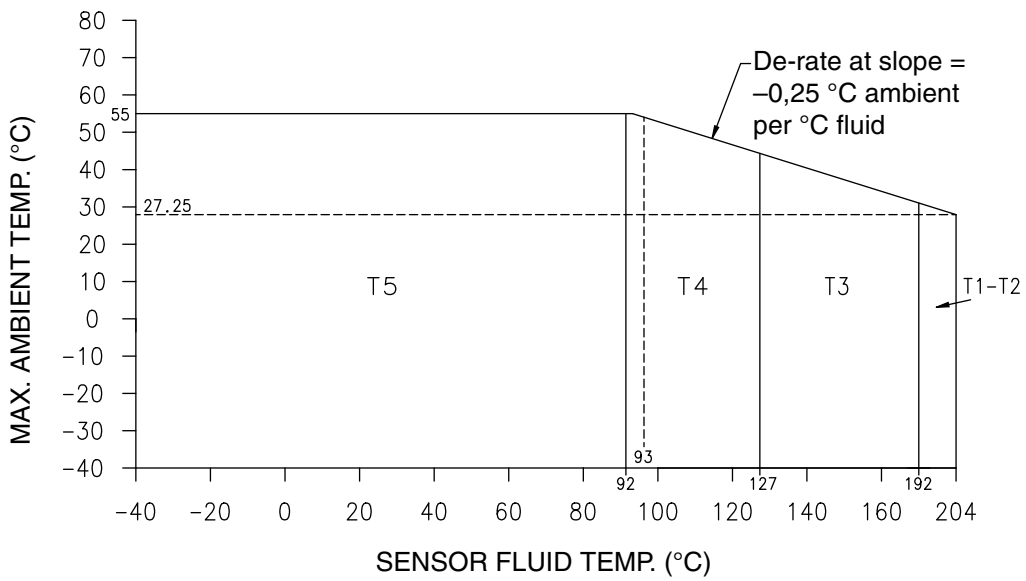
3.6) **Type F*** *****(0 or 1)*V****, H*** *****(0 or 1)*V****, R*** *****(0 or 1)*V****, and CNG050 ***(0 or 1)*V******
 Sensor with 2400S transmitter, excluding F***(A, B, C or E)*****(0 or 1)*V****

- 3.6.1) Drive circuit: See Section 3.1.1.
- 3.6.2) Pick-off circuit: See Section 3.1.2.
- 3.6.3) Temperature circuit: See Section 3.1.3.
- 3.6.4) 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.

3.6.4.1)

		
Sensor type	F025***** $(0,1)$ *V***** F050***** $(0,1)$ *V***** H025***** $(0,1)$ *V***** H050***** $(0,1)$ *V***** R025***** $(0,1)$ *V***** R050***** $(0,1)$ *V*****	CNG050*** $(0,1)$ *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

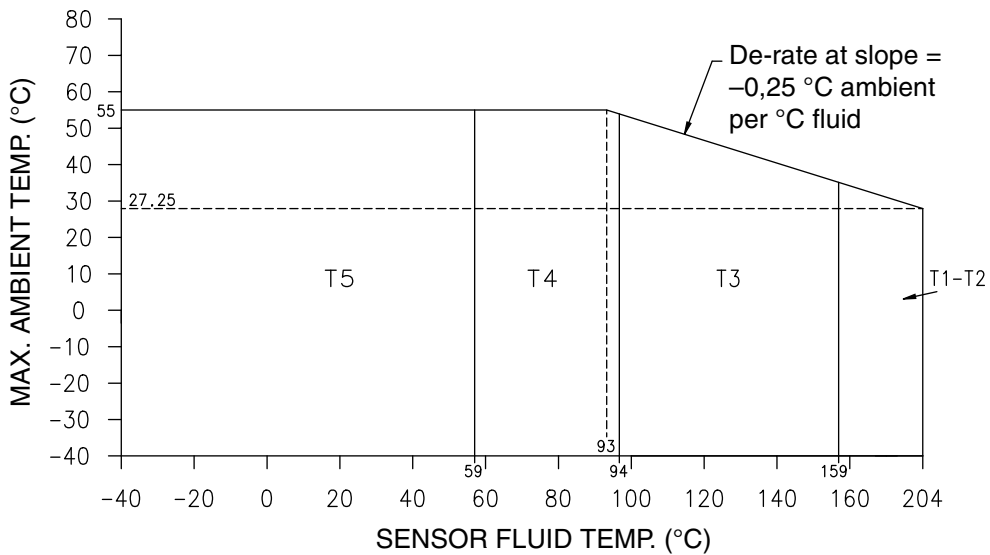
Ta

-40°C to +55°C

3.6.4.2)



Sensor type	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

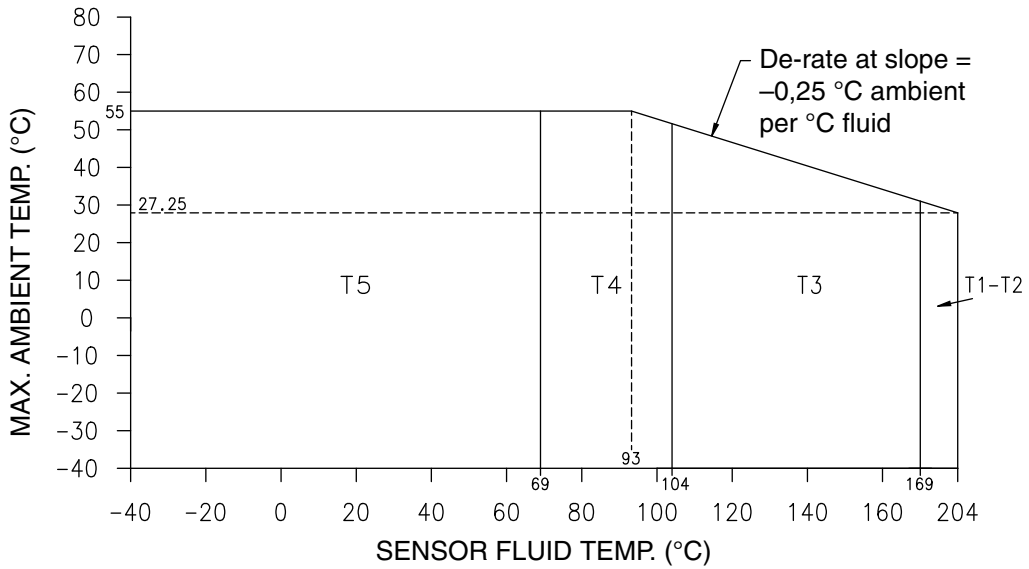
Ta

-40°C to +55°C

3.6.4.3)



Sensor type	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

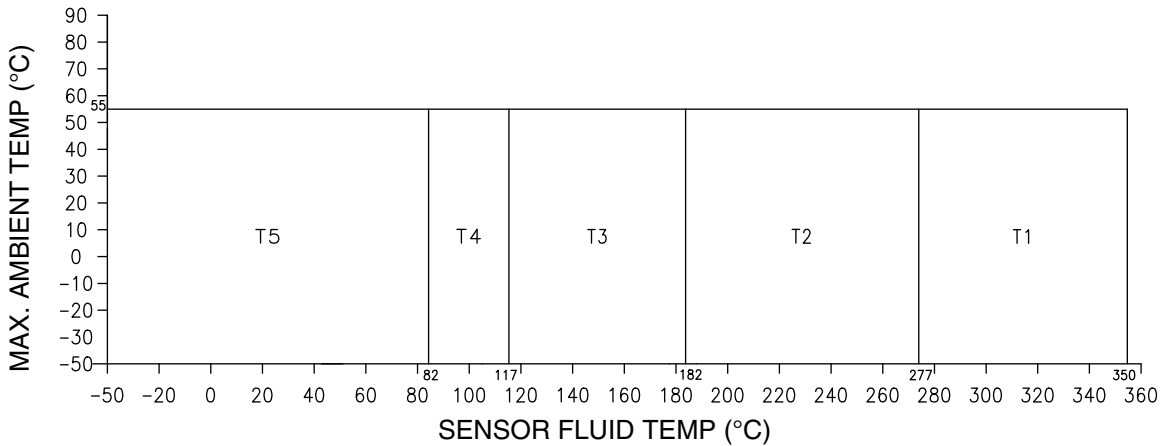
Ta

-40°C to +55°C

3.7.4.1)



Sensor type	F025(A,B)***** (0,1)*V*****
	F050(A,B)***** (0,1)*V*****
	F100(A,B)***** (0,1)*V*****
	F300(A,B)***** (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: T 290°C, T1: T 363°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

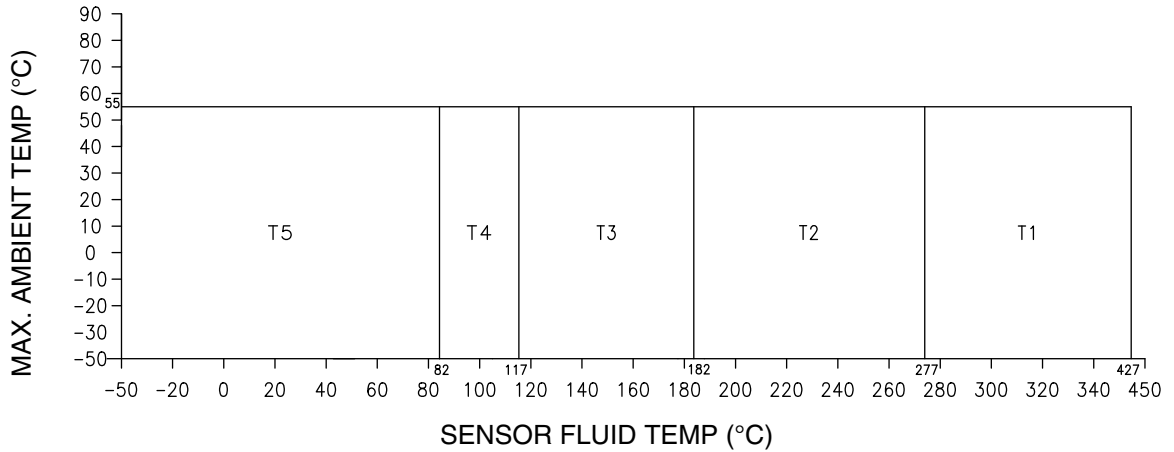
Ambient temperature range Ta -50°C to +55°C

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.7.4.2)



Sensor type	F025(C,E)***** (0,1)*V*****
	F050(C,E)***** (0,1)*V*****
	F100(C,E)***** (0,1)*V*****
	F300(C,E)***** (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: T 290°C, T1: T 440°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range T_a -50°C to +55°C

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.8) **Type F*** *****(J or U)*V*****, H*** *****(J or U)*V*****, R*** *****(J or U)*V*****, and CNG050 *** (J or U)*V*******
 Sensor with 2200S transmitter, excluding F***(A, B, C or E)***** (J or U)*V*****

3.8.1) Drive circuit: See Section 3.1.1.



3.8.2) Pick-off circuit: See Section 3.1.2.

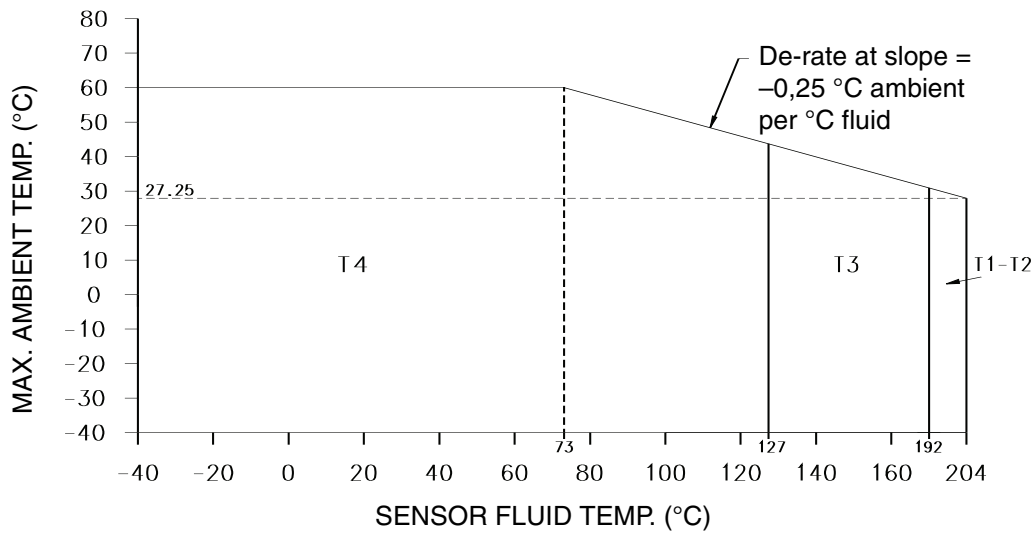
3.8.3) Temperature circuit: See Section 3.1.3.

3.8.4) 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.

3.8.4.1)

		
Sensor type	F025***** <i>(J,U)</i> *V***** F050***** <i>(J,U)</i> *V***** H025***** <i>(J,U)</i> *V***** H050***** <i>(J,U)</i> *V***** R025***** <i>(J,U)</i> *V***** R050***** <i>(J,U)</i> *V*****	CNG050*** <i>(J,U)</i> *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

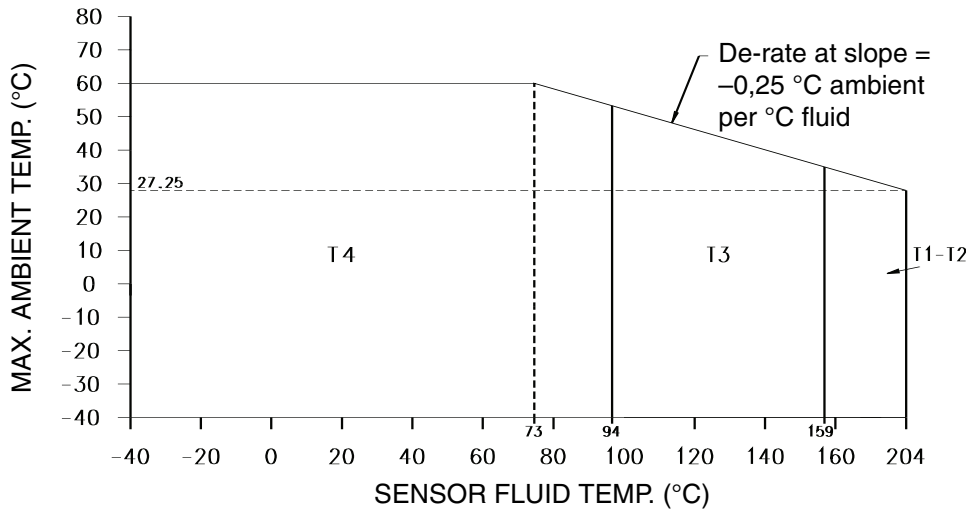
Ta

-40°C to +60°C

3.8.4.2)



Sensor type	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.

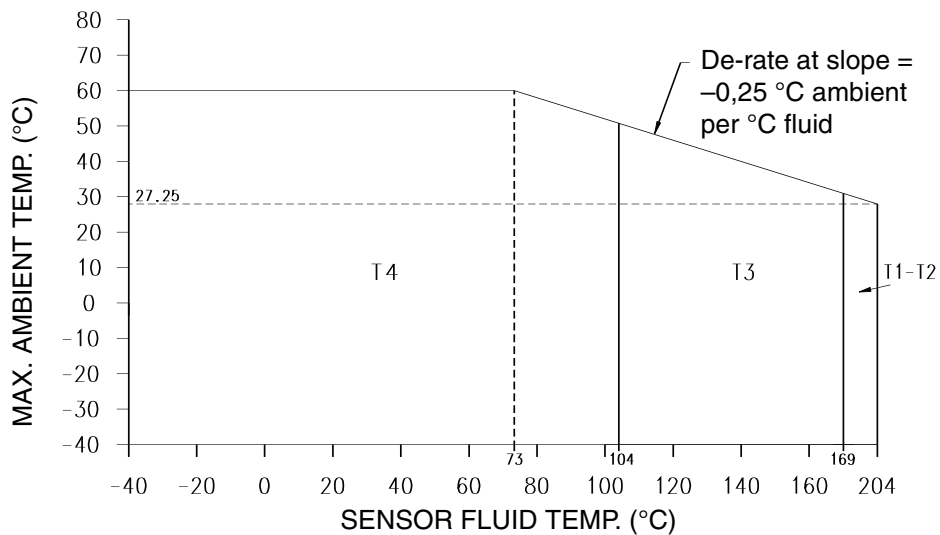
Note 2: The maximum surface temperature for dust is as follows: T4: T 130°C, T3: T 195°C, T2 to T1: T 240°C.

Ambient temperature range Ta -40°C to +60°C

3.8.4.3)



Sensor type	F200***** <i>(J,U)</i> *V*****
	H200***** <i>(J,U)</i> *V*****
	R200***** <i>(J,U)</i> *V*****



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

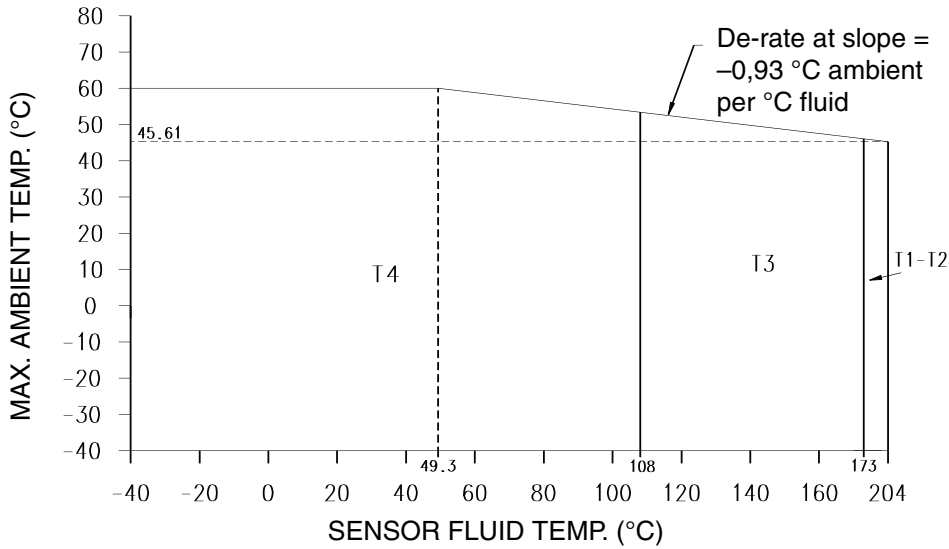
Note 2: The maximum surface temperature for dust is as follows: T4: T 130°C, T3: T 195°C, T2 to T1: T 230°C.

Ambient temperature range Ta -40°C to +60°C

3.8.4.4)



Sensor type	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 to $+60^{\circ}\text{C}$

3.9) **Type F****(A, B, C, or E)********(J or U)***V*******
High-temperature sensor with 2200S transmitter

3.9.1) Drive circuit: See Section 3.1.1.

3.9.2) Pick-off circuit: See Section 3.1.2.

3.9.3) Temperature circuit: See Section 3.1.3.

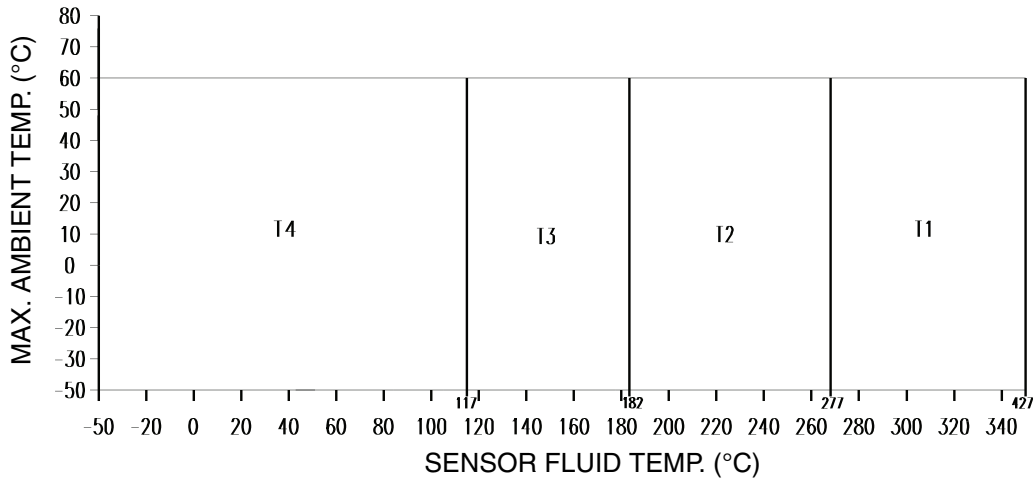
3.9.4) Temperature class/maximum surface temperature T

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.

3.9.4.2)



Sensor type	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: T 290°C, T1: T 440°C.

Note 3: The minimum ambient and process fluid temperature allowed for dust is -40°C.

Ambient temperature range T_a -50°C to +60°C

Since the electronics are mounted approx. 1 meter away from the sensor by means of a flexible stainless steel hose, 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.

3.10) **Type T*** *****(0 or 1)*V*******
Sensor with 2400S transmitter

3.10.1) Drive circuit: See Section 3.1.1.


3.10.2) Pick-off circuit: See Section 3.1.2.

3.10.3) Temperature circuit: See Section 3.1.3.

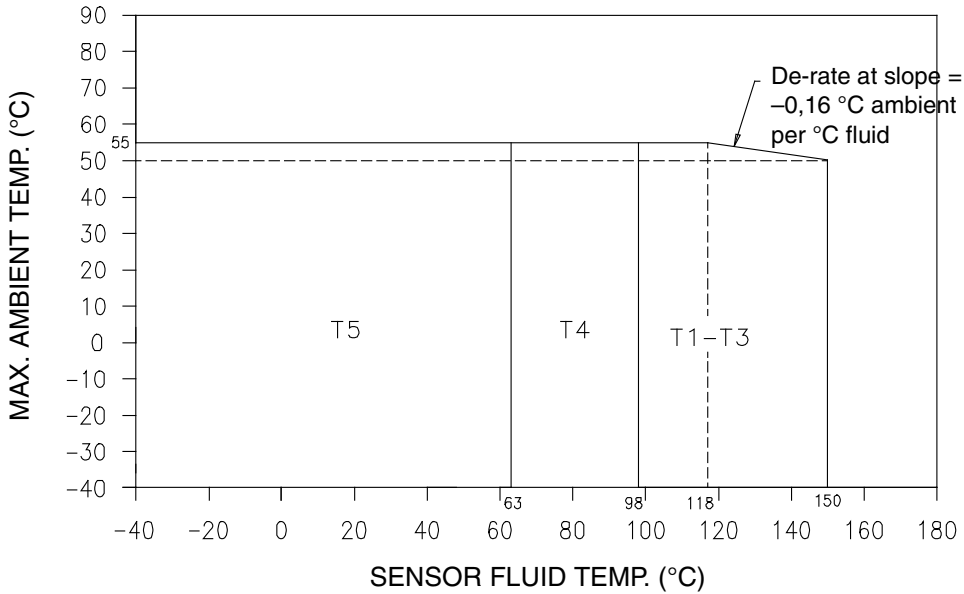
3.10.4) Temperature class/maximum surface temperature T

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.

3.10.4.1)



Sensor type	T025***** <i>(0 or 1)</i> *V*****
	T050***** <i>(0 or 1)</i> *V*****
	T100***** <i>(0 or 1)</i> *V*****
	T150***** <i>(0 or 1)</i> *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 to T1: T 182°C.

Ambient temperature range Ta -40°C to +55°C

3.11) **Type T*** ******(J or U)**V*******
 Sensor with 2200S transmitter

3.11.1) Drive circuit: See Section 3.1.1.

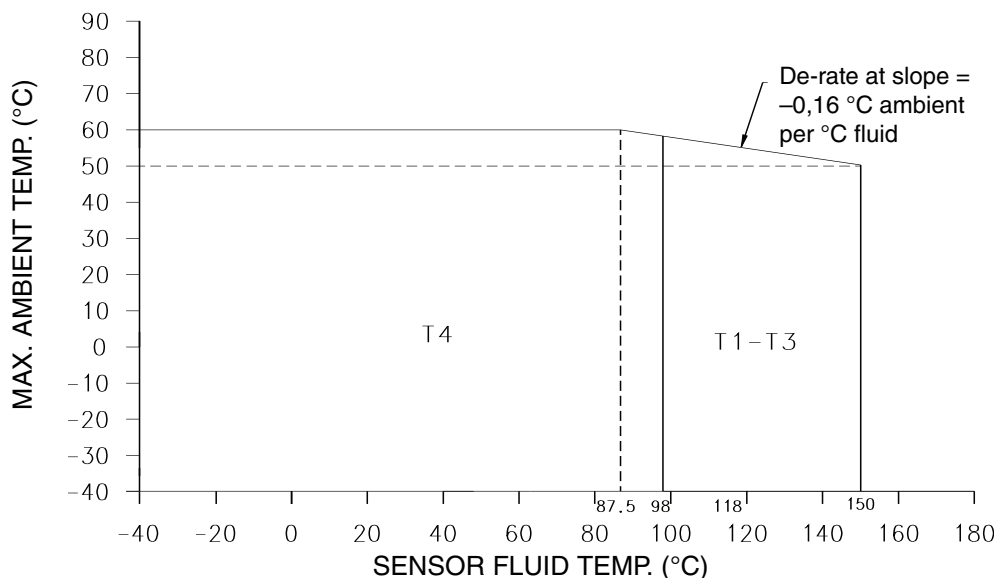
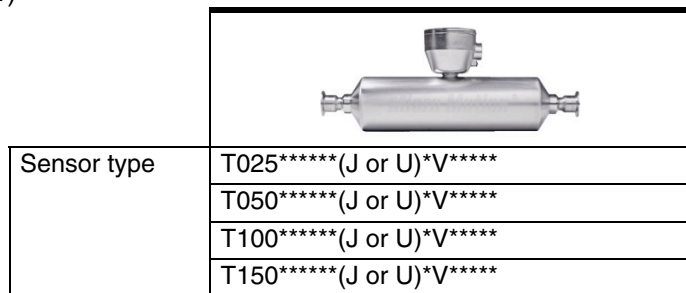
3.11.2) Pick-off circuit: See Section 3.1.2.

3.11.3) Temperature circuit: See Section 3.1.3.

3.11.4) 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.

3.11.4.1)



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 to T1: T 182°C.

Ambient temperature range T_a -40°C to $+60^{\circ}\text{C}$

4) Marking

The marking of the equipment shall include the following:

Ex II 3G with additional marking required by the standards mentioned in the following tables.
II 3D Ex tD A22 IP65 T* °C

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

Type	Type of protection	Ambient temperature range
CMF010***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMF025***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMF050***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMF100***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMF200***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMF300***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMFH2***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CMFH3***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$
CNG050***** (0 or 1)*V*****	Ex nA II T1-T5	$-40^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$

Type	Type of protection	Ambient temperature range
F025*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
F050*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
F100*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
F200*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
F300*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
H025*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
H050*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
H100*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
H200*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
H300*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
R025*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
R050*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
R100*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
R200*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
T025*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
T050*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
T075*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
T100*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
T150*****(0 or 1)*V*****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
CMF400*****(0 or 1)*V****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +60 °C
CMFS010*****(0 or 1)*V****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
CMFS015*****(0 or 1)*V****	Ex nA II T1–T5	–40°C ≤ Ta ≤ +55 °C
CMF010*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF025*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF050*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF100*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF200*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF300*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF400*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMFH2*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMFH3*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CNG050*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
F025*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
F050*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
F100*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
F200*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
F300*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
H025*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
H050*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
H100*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
H200*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
H300*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
R025*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
R050*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
R100*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
R200*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
T025*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
T050*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
T075*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
T100*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C

Type	Type of protection	Ambient temperature range
T150*****(J or U)*V*****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMFS010*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMFS015*****(J or U)*V****	Ex nA II T1–T4	–40°C ≤ Ta ≤ +60 °C
CMF200(A, B, C, or E)****(0 or 1)*V****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
CMF300(A, B, C, or E)****(0 or 1)*V****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
CMF400(A, B, C, or E)****(0 or 1)*V****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
CMFHC2(A, B, C, or E)****(0 or 1)*V****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
CMFHC3(A, B, C, or E)****(0 or 1)*V****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
CMF200(A, B, C, or E)****(J or U)*V****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
CMF300(A, B, C, or E)****(J or U)*V****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
CMF400(A, B, C, or E)****(J or U)*V****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
CMFHC2 (A, B, C, or E)****(J or U)*V****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
CMFHC3(A, B, C, or E)****(J or U)*V****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
F025(A, B, C, or E)****(0 or 1)*V*****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
F050(A, B, C, or E)****(0 or 1)*V*****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
F100(A, B, C, or E)****(0 or 1)*V*****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
F300(A, B, C, or E)****(0 or 1)*V*****	Ex nA II T1–T5	–50°C ≤ Ta ≤ +55 °C
F025(A, B, C, or E)****(J or U)*V*****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
F050(A, B, C, or E)****(J or U)*V*****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
F100(A, B, C, or E)****(J or U)*V*****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C
F300(A, B, C, or E)****(J or U)*V*****	Ex nA II T1–T4	–50°C ≤ Ta ≤ +60 °C

5) Special conditions for safe use / Installation instructions

- 5.1) The sensor is designed for use in connection with a suitable transmitter, e.g., 24*****L**** in accordance with BVS 05 E 116 X; only the assembly of the sensor and the transmitter guarantees the necessary degrees of protection.
- 5.2) The sensor is designed for use in connection with a suitable transmitter, e.g., 22*****L**** in accordance with BVS 08 ATEX E 112 X; only the assembly of the sensor and the transmitter guarantees the necessary degrees of protection.

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