

Translation

# EU-Type Examination Certificate Supplement 3

Equipment intended for use in potentially explosive atmospheres  
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 13 ATEX E 033 X**

Product: **Liquid Density Meter type CDM100\*\*\*\*\***

Manufacturer: **Micro Motion Inc.**

Address: **7070 Winchester Circle, Boulder, Co. 80301, United States of America**

This supplementary certificate extends EU-Type Examination Certificate No. BVS 13 ATEX E 033 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

DEKRA EXAM GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential Report No. BVS PP 13.2067 EU.

The Essential Health and Safety Requirements are assured in consideration of:

<b>EN 60079-0:2012 + A11:2013</b>	<b>General requirements</b>
<b>EN 60079-1:2014</b>	<b>Flameproof enclosure "d"</b>
<b>EN 60079-11:2012</b>	<b>Intrinsic Safety "i"</b>
<b>EN 60079-31:2014</b>	<b>Protection by Enclosure "t"</b>

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

 See cl. 15.1

DEKRA EXAM GmbH  
Bochum, 2018-06-28

Signed: Jörg Koch

Certifier

Signed: Dr Michael Wittler

Approver

13 Appendix  
 14 EU-Type Examination Certificate

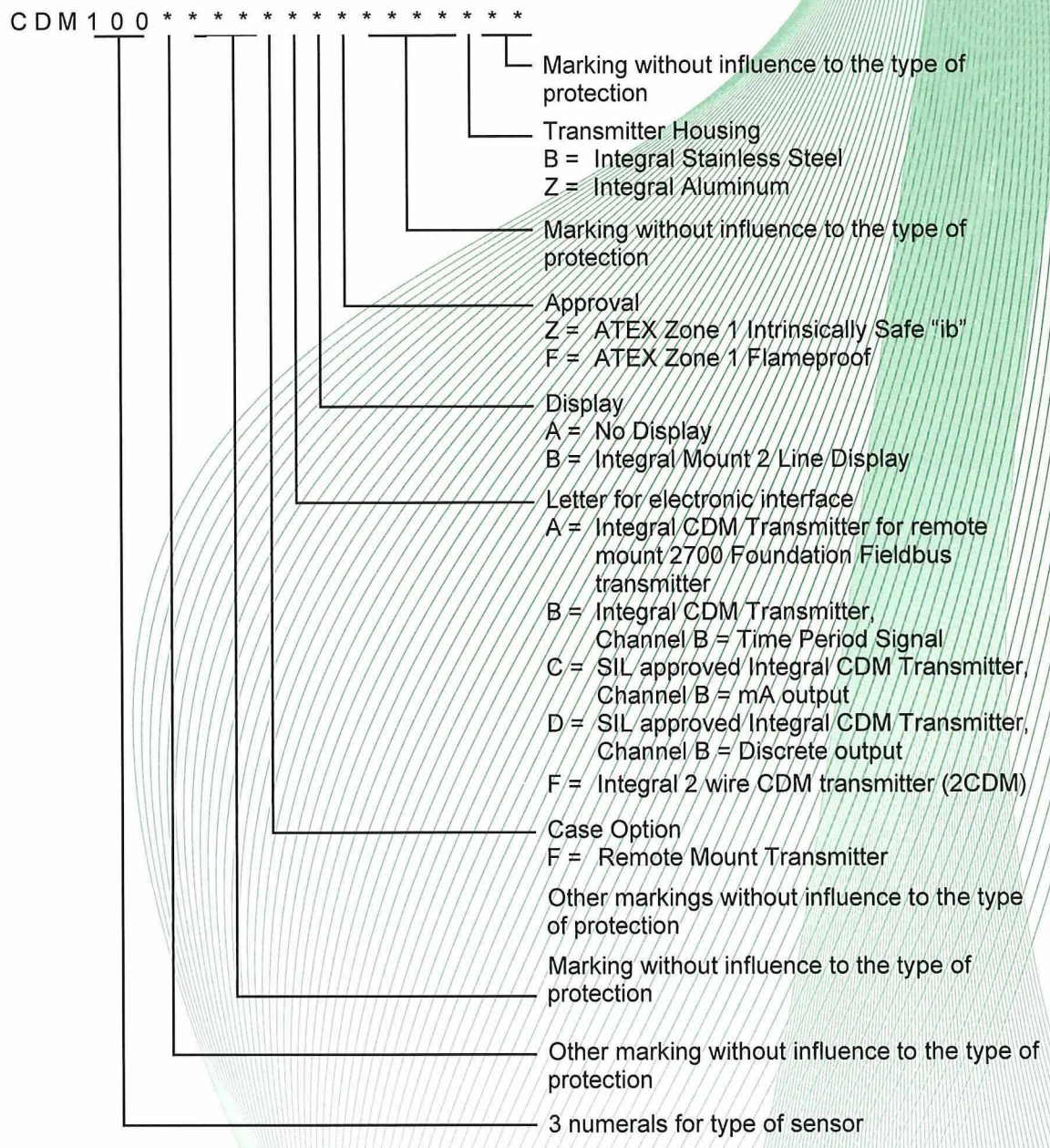
**BVS 13 ATEX E 033 X  
 Supplement 3**

15 Product description

15.1 Subject and type

Liquid Density Meter type CDM100\*\*\*\*\*

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



## 15.2 Description

The Liquid Density Meter consists of a transmitter and a sensor and they are used for density measurement. The CDM100 flow sensor consists of magnetically excited oscillating tubes, contains as electrical components coils, resistors, temperature sensors and terminals and connectors.

The transmitter has its own certificate BVS 13 ATEX E 003 X.

The sensor has its own certificate BVS 09 ATEX E 018 X.



### Reasons for Supplement:

New Version: type CDM100\*\*\*\*F\*\*\*\*\* with Remote Mount Transmitter

## 15.3 Parameters

### 15.3.1 Type CDM100\*\*\*\*(B,C,D)\*F\*\*\*\*\* (Sensor with integral Transmitter)

#### 15.3.1.1 Non intrinsically safe main power supply (connector J1)

Nominal voltage		DC	24 V +10 %
Maximum voltage	$U_m$	AC/DC	250 V

#### 15.3.1.2 Non intrinsically safe mA passive output with HART (Channel A, connector J2):

Nominal voltage		DC	24 V +10 %
Maximum voltage	$U_m$	AC/DC	250 V

#### 15.3.1.3 Non intrinsically safe configurable passive output, mA or DO or Time Period Signal Output (Channel B, connector J3)

Nominal voltage		DC	24 V +10 %
Maximum voltage	$U_m$	AC/DC	250 V

#### 15.3.1.4 Non intrinsically safe RS485 communication port (Channel C, connector J5)

Nominal voltage		DC	24 V +10 %
Maximum voltage	$U_m$	AC/DC	250 V

#### 15.3.1.5 Internal Intrinsically Safe circuits (level of protection Ex ib):


Drive-, Left Pick-Off-, Right Pick-Off- and Temperature element circuits.

#### 15.3.1.6 Thermal data

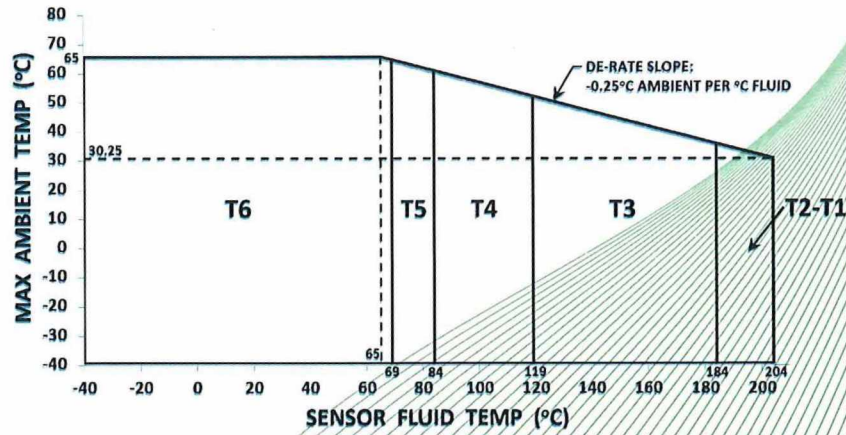
Regulation of temperature class / max. Surface temperature T

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

15.3.1.6.1

<b>Meter type</b>		
	CDM100**** <sup>1</sup> (B,C,D)AF*****	(IIC)
	CDM100**** <sup>1</sup> (B,C,D)BF****B**	(IIC)

<sup>1</sup> Case Option F (Remote Mount Transmitter) excluded

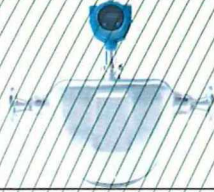


Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

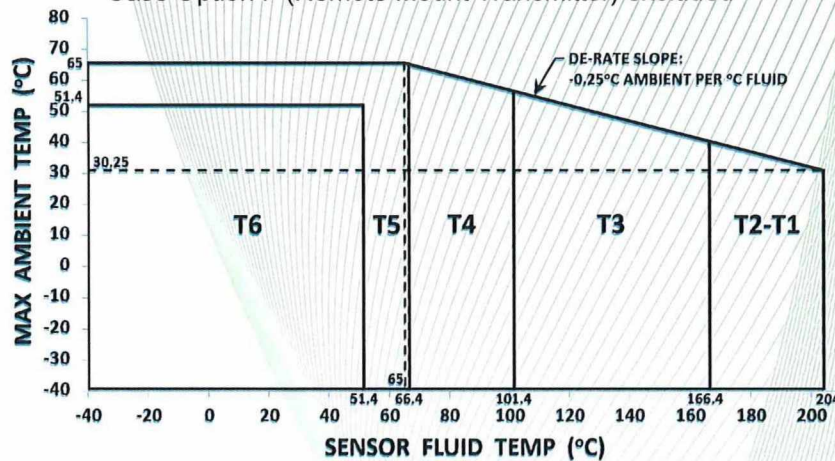
Note 2: The maximum surface temperature for dust is as follows: T6: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T215 °C.

Ambient temperature range  $T_a$  -40 °C up to +65 °C

15.3.1.6.2

<b>Meter type</b>		
	CDM100**** <sup>1</sup> (B,C,D)AF***** CIC A1	(IIC)
	CDM100**** <sup>1</sup> (B,C,D)BF****B** CIC A1	(IIC)

<sup>1</sup> Case Option F (Remote Mount Transmitter) excluded



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: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T232.6 °C

Ambient temperature range:  $T_a$  -40 °C to +65 °C

15.3.2 Type CDM100\*\*\*\*\*AAZ\*\*\*\*\* connected to Remote 2700 transmitter (DMT 01 ATEX E 082 X)

When connected to a Micro Motion 2700 Transmitter, connectors J2 and J3 are not utilized.

15.3.2.1 Intrinsically safe power supply circuit (connector J1)  
Level of protection Ex ib IIB, Ex ib IIC, Ex ib IIIC

Voltage	$U_i$	DC	17.22	V
Current	$I_i$		0.484	A
Power	$P_i$		2.05	W
Max. internal capacitance	$C_i$		negligible	
Max. internal inductance	$L_i$		negligible	

15.3.2.2 Intrinsically safe RS485 communication port (Channel C, connector J5)

Voltage	$U_i$	DC	17.22	V
Current	$I_i$		484	mA
Max. internal capacitance	$C_i$		1	nF
Max. internal inductance	$L_i$		negligible	

Level of protection Ex ib IIB, Ex ib IIC, Ex ib IIIC

Voltage	$U_o$	DC	9.51	V
Current (Instantaneous)	$I_o$		480	mA
Current (steady state)	$I$		106	mA
Power	$P_o$		786	mW
Internal resistance	$R_i$		19.8	$\Omega$

For Group IIC

Max. external capacitance	$C_o$		85	nF
Max. external inductance	$L_o$		25	$\mu H$
Max. external inductance/resistance ratio	$L_o/R_o$		31.1	$\mu H/\Omega$

For Groups IIB and IIIC

Max. external capacitance	$C_o$		660	nF
Max. external inductance	$L_o$		260	$\mu H$
Max. external inductance/resistance ratio	$L_o/R_o$		124.4	$\mu H/\Omega$

15.3.2.3 Thermal data

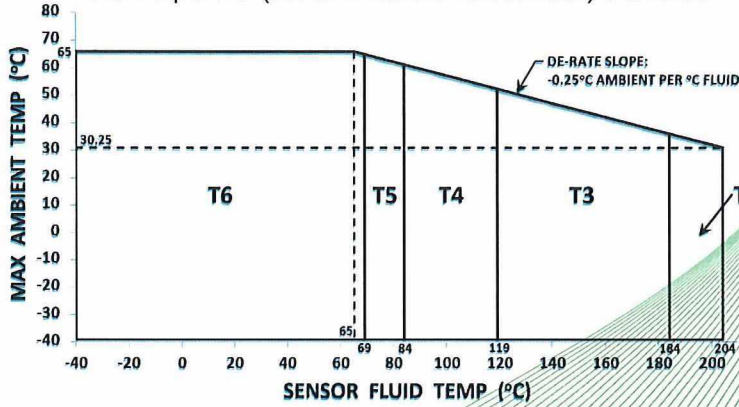
Regulation of temperature class / max. Surface temperature T

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

15.3.2.3.1

Meter type		
	CDM100****1AAZ*****	(IIC)

Case Option F (Remote Mount Transmitter) excluded



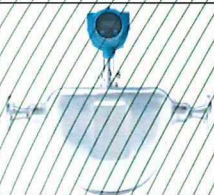
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T6: T80 °C, T5 : T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T215 °C.

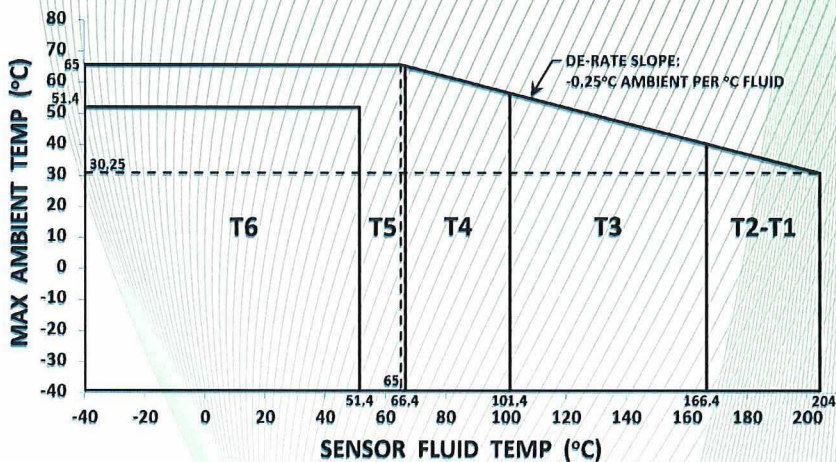
Ambient temperature range

$T_a$  -40 °C up to +65 °C

15.3.2.3.2

Meter type		
	CDM100****1AAZ***** CIC A1	(IIC)

Case Option F (Remote Mount Transmitter) excluded



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: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T232.6 °C

Ambient temperature range:  $T_a$  -40 °C to +65 °C.

15.3.3 Type CDM100\*\*\*\*\*(B,C,D)(A,B)Z\*\*\*\*\* (Sensor with integral or remote Transmitter)

15.3.3.1 Intrinsically safe power supply circuit (connector J1)

Voltage	$U_i$	DC	30	V
Current	$I_i$		0.484	A
Power	$P_i$		2.05	W
Max. internal capacitance	$C_i$		negligible	
Max. internal inductance	$L_i$		negligible	

15.3.3.2 Intrinsically safe mA output with HART (Channel A, connector J2):

Voltage	$U_i$	DC	30	V
Current	$I_i$		0.484	A
Power	$P_i$	2.05	W	
Max. internal capacitance	$C_i$		negligible	
Max. internal inductance	$L_i$		negligible	

15.3.3.3 Intrinsically safe configurable output mA or DO or Time Period Signal Output (Channel B, connector J3)

Voltage	$U_i$	DC	30	V
Current	$I_i$		0.484	A
Power	$P_i$		2.05	W
Max. internal capacitance	$C_i$		negligible	
Max. internal inductance	$L_i$		negligible	

15.3.3.4 Intrinsically safe RS485 communication port (Channel C, connector J5) for connection of an intrinsically safe circuit (linear) with the following values: either

Voltage	$U_i$	DC	18	V
Current	$I_i$		100	mA
Max. internal capacitance	$C_i$		1	nF
Max. internal inductance	$L_i$		negligible	

Voltage	$U_o$	DC	9.51	V
Current (Instantaneous)	$I_o$		480	mA
Current (steady state)	$I$		106	mA
Power	$P_o$		786	mW
Internal resistance	$R_i$		19.8	$\Omega$

For Group IIC

Max. external capacitance	$C_o$		85	nF
Max. external inductance	$L_o$		154	$\mu$ H
Max. external inductance/resistance ratio	$L_o/R_o$		31.1	$\mu$ H/ $\Omega$

For Groups IIB and IIIC

Max. external capacitance	$C_o$		660	nF
Max. external inductance	$L_o$		610	$\mu$ H
Max. external inductance/resistance ratio	$L_o/R_o$		124.4	$\mu$ H/ $\Omega$

or

Voltage	$U_i$	DC	17.22	V
Current	$I_i$		484	mA

Max. internal capacitance	$C_i$		1	nF
Max. internal inductance	$L_i$		negligible	
Voltage	$U_o$	DC	9.51	V
Current (instantaneous)	$I_o$		480	mA
Current (steady state)	$I$		106	mA
Power	$P_o$		786	mW
Internal resistance	$R_i$		19.8	$\Omega$
For Group IIC				
Max. external capacitance	$C_o$		85	nF
Max. external inductance	$L_o$		25	$\mu H$
Max. external inductance/resistance ratio	$L_o/R_o$		31.1	$\mu H/\Omega$
For Groups IIB and IIIC				
Max. external capacitance	$C_o$		660	nF
Max. external inductance	$L_o$		260	$\mu H$
Max. external inductance/resistance ratio	$L_o/R_o$		124.4	$\mu H/\Omega$

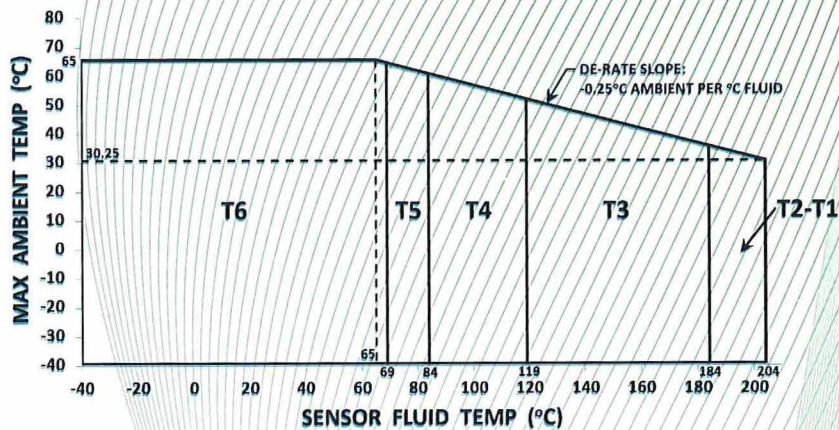
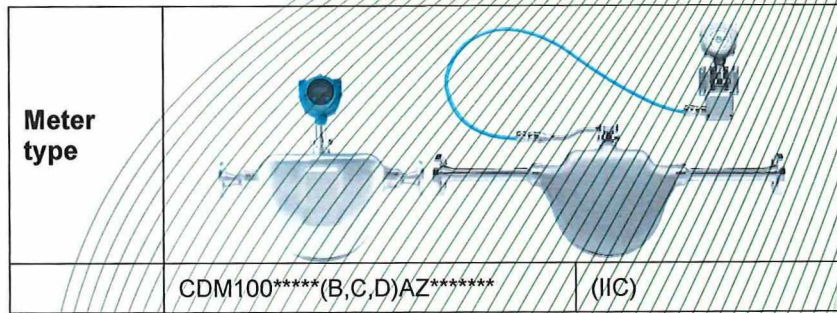
15.3.3.5

Thermal data

Regulation of temperature class / max. Surface temperature T

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

15.3.3.5.1



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

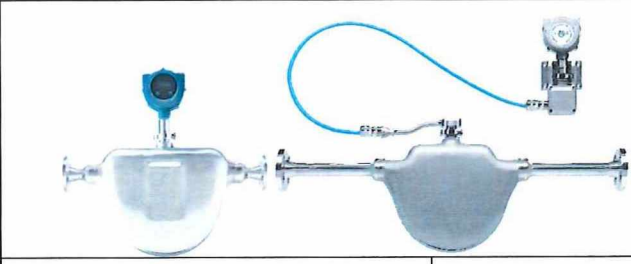
Note 2: The maximum surface temperature for dust is as follows: T6: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T215 °C.

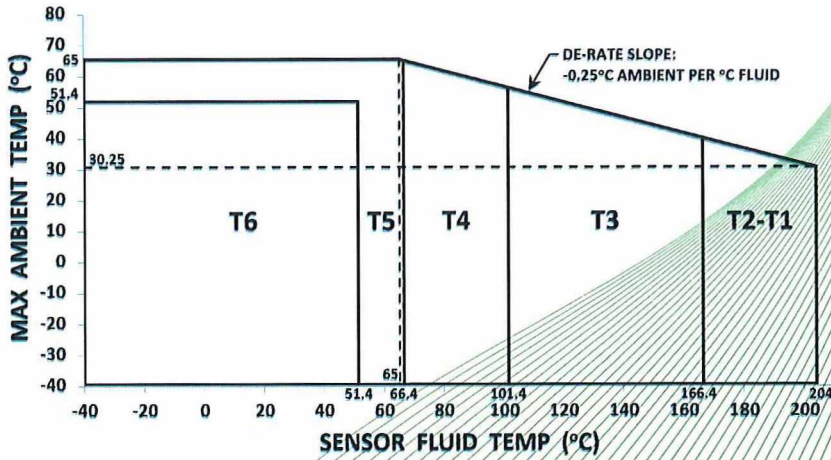
Ambient temperature range

$T_a$  -40 °C up to +65 °C



15.3.3.5.2

<b>Meter type</b>		
	CDM100*****(B,C,D)AZ*****	CIC A1 (IIC)



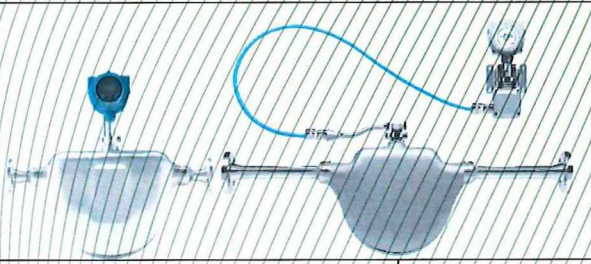
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

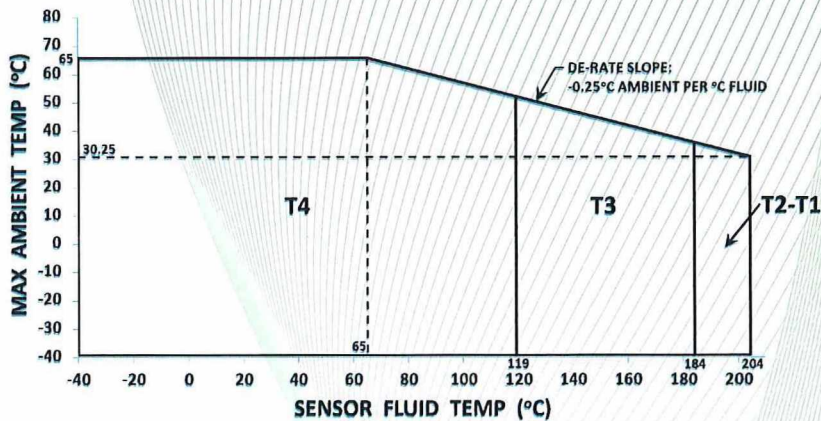
Note 2: The maximum surface temperature for dust is as follows: T6: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T 232.6 °C

Ambient temperature range:

$T_a$  -40 °C to +65 °C.

15.3.3.5.3

<b>Meter type</b>		
	CDM100*****(B,C,D)BZ*****	(IIC)



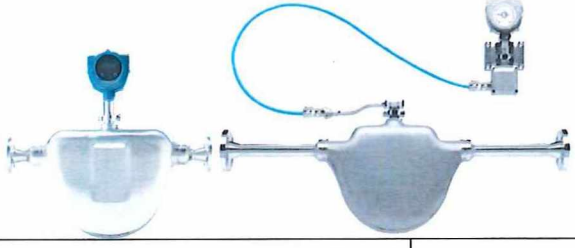
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

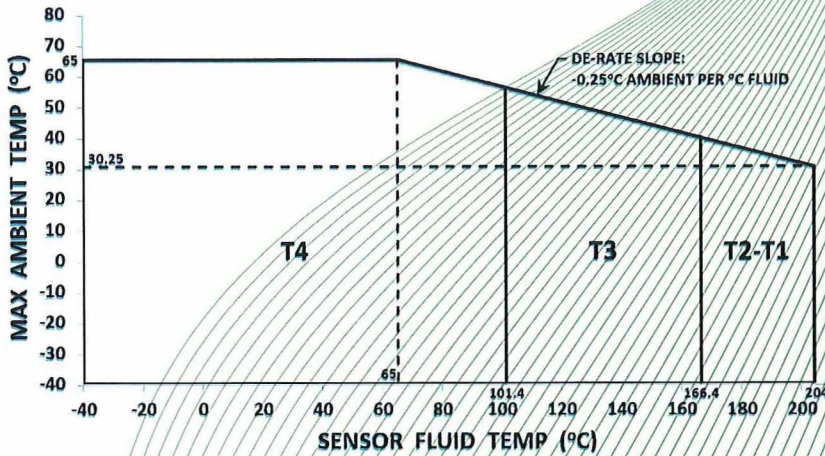
Note 2: The maximum surface temperature for dust is as follows: T4: T130 °C, T3: T195 °C, T2 to T1: T215 °C

Ambient temperature range

$T_a$  -40 °C up to +65 °C

15.3.3.5.4

<b>Meter type</b>		
	CDM100*****(B,C,D)BZ***** 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: T130 °C, T3: T195 °C, T2 to T1: T232.6 °C

Ambient temperature range:

$T_a$  -40 °C to +65 °C.

15.3.4 Type CDM100\*\*\*\*FAZ\*\*\*\*\* (Sensor with remote or integral transmitter)  
Level of protection Ex ib

15.3.4.1 Intrinsically safe main power supply (connector J4):

Voltage	$U_i$	DC	28	V
Current	$I_i$		93	mA
Power	$P_i$		0.65	W
Max. internal capacitance	$C_i$		negligible	
Max. internal inductance	$L_i$		negligible	

15.3.4.2 Internal Intrinsically Safe circuits Drive- and Left Pick-Off.

15.3.4.3 Temperature circuit (connector J1-7, J1-8 and J2-5, J2-6)

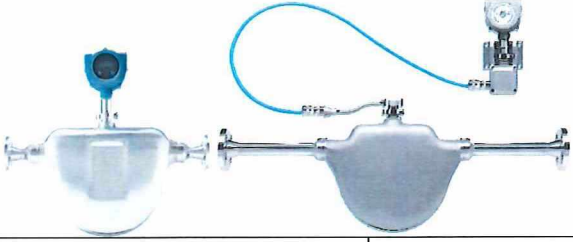
Voltage	$U_i$	DC	12	V
Current	$I_i$		12	mA
Barrier resistance	$R_i$		1	kΩ

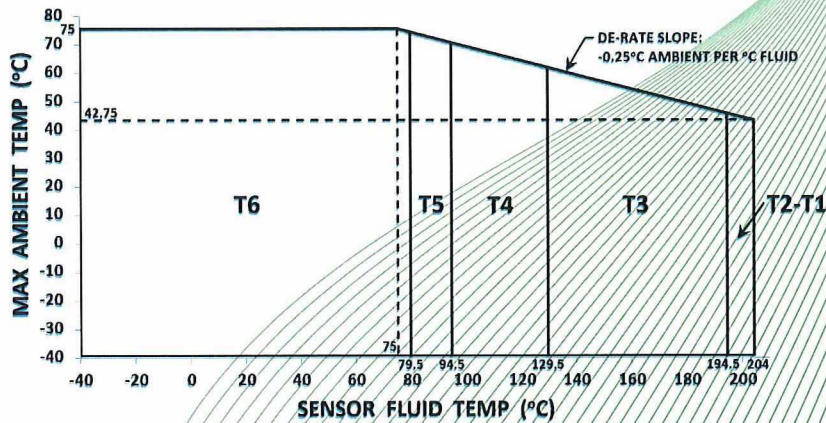
15.3.4.4

Thermal data

Regulation of temperature class / determination of the 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:

15.3.4.4.1

<b>Meter type</b>		
	CDM100****FAZ*****	(IIC)

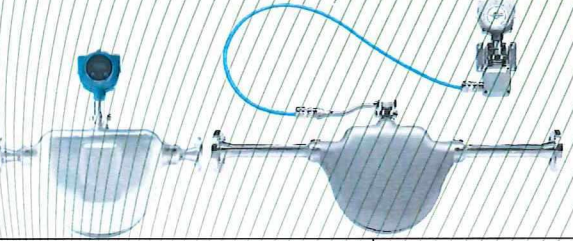


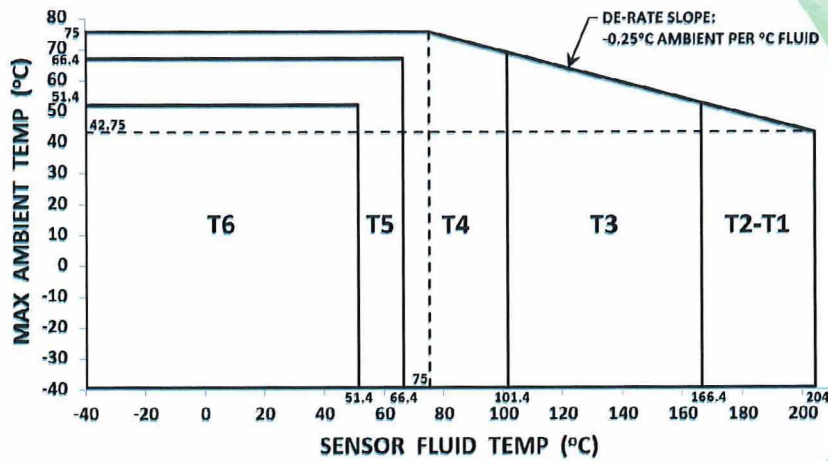
Note 1: Use the above graph to determine the temperature class for a given fluid and ambient temperature.

Note 2: The maximum surface temperature for dust is as follows: T6: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T204.5 °C

Ambient temperature range  $T_a$  -40 °C to +75 °C

15.3.4.4.2

<b>Meter type</b>		
	CDM100****FAZ***** 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: T6: T80 °C, T5: T95 °C, T4: T130 °C, T3: T195 °C, T2 to T1: T232.6 °C

Ambient temperature range

$T_a$  -40 °C to +75 °C

16 **Report Number**

BVS PP 13.2067, as of 2018-06-28

17 **Special Conditions for Use**

- 17.1 For the application of the Liquid Density Meter in an ambient temperature of less than -20 °C suitable cable and cable entries or conduit entries certified for this condition shall be used.
- 17.2 If certified conduit entries are used for the connection of the transmitter enclosure, the associated stopping boxes shall be installed immediately at the enclosure.
- 17.3 The dimensions of the flameproof joints are in parts other than the relevant minimum or maximum values of EN 60079-1:2014. For information on the dimensions of the flameproof joints contact the manufacturer.

18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 **Drawings and Documents**

Drawings and documents are listed in the confidential report.

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  
Bochum, dated 2018-06-28  
BVS-Ben/Pz/Mu A 20180180

\_\_\_\_\_  
Certifier

\_\_\_\_\_  
Approver