

Translation

EU-Type Examination Certificate Supplement 8

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

EU-Type Examination Certificate Number: **DMT 01 ATEX E 149 X**

Product: **Mass flow sensor TM families**

Manufacturer: **Heinrichs Messtechnik GmbH**

Address: **Robert-Perthel-Straße 9, 50739 Köln, Germany**

This supplementary certificate extends EC-Type Examination Certificate No. DMT 01 ATEX E 149 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 Testing and Certification 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 01.2105 EU.

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

EN IEC 60079-0:2018
EN 60079-11:2012
EN 60079-26:2015

General requirements
Intrinsic Safety "i"
Equipment with equipment protection level (EPL) Ga

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:



II 1/2G Ex ia IIC T2...T6 Ga/Gb

See tables section 15 for details

DEKRA Testing and Certification GmbH
Bochum, 2021-03-05

Signed: Jörg-Timm Kilisch

Managing Director

13 **Appendix**
 14 **EU-Type Examination Certificate**

**DMT 01 ATEX E 149 X
 Supplement 8**

15 **Product description**

15.1 **Subject and type**

Mass flow sensor TM families

Type TM-ABC-DEFGHIJK-LMNO-P-Q-R-S

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V						
A	Wetted Material																										
-	Not relevant																										
	B	C	Flow-rate Range																								
	-	-	Not relevant																								
			D	E	F	G	Process connection					Installation length															
			-	-	-	-	Not relevant					Not relevant															
							H	I	J	K																	
							-	-	-	-																	
											L	Enclosure options															
											-	Not relevant															
												M	Heating / Cooling														
												-	Not relevant														
													N	Flow direction													
													-	Not relevant													
														O	Sensor Configurations (*2) (*3)												
														1	Mounted transmitter -20 °C to 100 °C												
														2	Mounted transmitter -20 °C to 150 °C												
														3	Remote transmitter (M20x1.5) (Al) -50 °C to 100 °C												
														4	Remote transmitter (M20x1.5) (Al) -50 °C to 180 °C												
														5	Remote transmitter (M20x1.5) (Al) -50 °C to 260 °C												
														6	Remote transmitter (1/2" NPT)-50 °C to 100 °C												
														7	Remote transmitter (1/2" NPT)-50 °C to 180 °C												
														8	Remote transmitter (1/2" NPT)-50 °C to 260 °C												
														S	Remote transmitter (M20x1.5) (PE) -50 °C to 100 °C												
														T	Remote transmitter (M20x1.5) (PE) -50 °C to 180 °C												
														U	Remote transmitter (M20x1.5) (PE) -50 °C to 260 °C												
															P	Approvals (*1)											
															A	ATEX / IECEx – up to Supplement 6											
															L	ATEX / IECEx – Supplement 7 onwards											
																Q	Certificates										
																-	Not relevant										
																	R	Supplementary equipment									
																	-	Not relevant									
																		S	T	U	V	Additional options					
																		-	-	-	-	Not relevant					

Type TME-ABC-DEFGHIJ-K-L-M-N

A	B	C	D	E	F	G	H	I	J	K	L	M	N		
A	Wetted Material														
-	Not relevant														
	B	C	Flow-rate Range												
	-	-	Not relevant												
			D	E	F	G	Process connection								
			-	-	-	-	Not relevant								
							H	Heating / Cooling							
							-	Not relevant							
								I	Flow direction						
								-	Not relevant						
									J	Sensor Configurations (*2) (*3)					
									1	Mounted transmitter -20 °C to 100 °C					
									2	Mounted transmitter -20 °C to 150 °C					
									3	Remote transmitter (M20x1.5) (Al) -50 °C to 100 °C					
									4	Remote transmitter (M20x1.5) (Al) -50 °C to 180 °C					
									6	Remote transmitter (1/2" NPT)-50 °C to 100 °C					
									7	Remote transmitter (1/2" NPT)-50 °C to 180 °C					
									S	Remote transmitter (M20x1.5) (PE) -50 °C to 100 °C					
									T	Remote transmitter (M20x1.5) (PE) -50 °C to 180 °C					
										K	Approvals (*1)				
										A	ATEX / IECEx – up to Supplement 6				
										L	ATEX / IECEx – Supplement 7 onwards				
											L	Certificates			
											-	Not relevant			
												M	Supplementary equipment		
												-	Not relevant		
													N	Design	
													-	Not relevant	

Type TMR-ABC-DEFGHIJK-LMNO-P-Q-R

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R		
A	Wetted Material																		
-	Not relevant																		
	B	C	Flow-rate Range																
	-	-	Not relevant																
			D	E	F	G	Process connection												
			-	-	-	-	Not relevant												
							H	I	J	K	Installation length								
							-	-	-	-	Not relevant								
											L	Enclosure options							
											-	Not relevant							
												M	Heating / Cooling						
												-	Not relevant						
													N	Flow direction					
													-	Not relevant					
														O	Sensor Configurations (*2) (*3)				
														1	Mounted transmitter -20 °C to 100 °C				
														2	Mounted transmitter -20 °C to 150 °C				
														3	Remote transmitter (M20x1.5) (Al) -50 °C to 100 °C				
														4	Remote transmitter (M20x1.5) (Al) -50 °C to 180 °C				
														5	Remote transmitter (M20x1.5) (Al) -50 °C to 260 °C				
														6	Remote transmitter (1/2" NPT)-50 °C to 100 °C				
														7	Remote transmitter (1/2" NPT)-50 °C to 180 °C				
														8	Remote transmitter (1/2" NPT)-50 °C to 260 °C				
														S	Remote transmitter (M20x1.5) (PE) -50 °C to 100 °C				
														T	Remote transmitter (M20x1.5) (PE) -50 °C to 180 °C				
														U	Remote transmitter (M20x1.5) (PE) -50 °C to 260 °C				
															P	Approvals (*1)			
															A	ATEX / IECEx – up to Supplement 6			
															L	ATEX / IECEx – Supplement 7 onwards			
																Q	Certificates		
																-	Not relevant		
																	R	Supplementary equipment	
																	-	Not relevant	

Type TM-SH-ABCD-EFGH-IJK-LM-NO-P-Q

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
-	-	Model / Range														
-	-	Not relevant														
		C	D	Wetted Material												
		-	-	Not relevant												
				E	F	G	H	Process connection								
				-	-	-	-	Not relevant								
								I	Enclosure options							
								-	Not relevant							
									J	Enclosure Filling						
									-	Not relevant						
										K	Heating / Cooling					
										-	Not relevant					
											L	Sensor Configurations				
											K	Remote transmitter -40 °C to 60 °C - connection via HAN R23 connector				
											L	Remote transmitter -40 °C to 100 °C - connection via HAN R23 connector				
											X	Customer specified - connection via HAN R23 connector				
												M	Approvals (*1)			
												A	ATEX / IECEx – up to Supplement 6			
												L	ATEX / IECEx – Supplement 7 onwards			
													N	Calibration Flow		
													-	Not relevant		
													O	Calibration Density		
													-	Not relevant		
														P	Supplementary equipment	
														-	Not relevant	
														Q	Design	
														-	Not relevant	

Type TMU-ABCD-EFGH-IJK-LM-NO-P-Q

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A	Wetted Material															
-	Not relevant															
	B	C	D	Model size												
	-	-	-	Not relevant												
				E	F	G	H	Process connection								
				-	-	-	-	Not relevant								
								I	Enclosure options							
								-	Not relevant							
									J	Heating / Cooling						
									-	Not relevant						
										K	Heating / Cooling connections					
										-	Not relevant					
											L	Sensor Configurations (*2) (*3)				
											A	Mounted transmitter -20 °C to 100 °C				
											B	Mounted transmitter -20 °C to 150 °C				
											C	Remote transmitter (1/2" NPT)-50 °C to 100 °C				
											D	Remote transmitter (1/2" NPT)-50 °C to 180 °C				
											E	Remote transmitter (1/2" NPT)-50 °C to 260 °C				
											F	Remote transmitter (M20x1.5)(Al) -50 °C to 100 °C				
											G	Remote transmitter (M20x1.5)(Al) -50 °C to 180 °C				
											H	Remote transmitter (M20x1.5)(Al) -50 °C to 260 °C				
											K	Remote transmitter -50 °C to 100 °C - connection via HAN R23 connector				
											L	Remote transmitter -50 °C to 180 °C - connection via HAN R23 connector				
											M	Remote transmitter -50 °C to 260 °C - connection via HAN R23 connector				
											S	Remote transmitter (M20x1.5)(PE) -50 °C to 100 °C				
											T	Remote transmitter (M20x1.5)(PE) -50 °C to 180 °C				
											U	Remote transmitter (M20x1.5)(PE) -50 °C to 260 °C				
											X	Customer specified				
												M	Approvals (*1)			
												A	ATEX / IECEx – up to Supplement 6			
												L	ATEX / IECEx – Supplement 7 onwards			
													N	Calibration Flow		
													-	Not relevant		
													O	Calibration Density		
													-	Not relevant		
														P	Supplementary equipment	
														-	Not relevant	
														Q	Design	
														-	Not relevant	

Type TMS-ABCD-EFGH-IJK-LM-NO-P

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
-	Wetted Material															
-	Not relevant															
	B	C	D	Model size												
	-	-	-	Not relevant												
				E	F	G	H	Process connection								
				-	-	-	-	Not relevant								
								I	Enclosure options							
								-	Not relevant							
									J	Heating / Cooling						
									-	Not relevant						
										K	Heating / Cooling connections					
										-	Not relevant					
											L	Sensor Configurations				
											-	Remote transmitter (M20x1.5) -50 °C to 125 °C				
												M	Approvals (*4)			
												-	ATEX / IECEx			
													N	Calibration Flow		
													-	Not relevant		
														O	Calibration Density	
														-	Not relevant	
															P	Supplementary equipment
															-	Not relevant

(*1) = After implementation of ATEX supplement 7 (IECEx issue 1), sensors of supplement 6 (IECEx issue 0) with the code „A“ shall no longer be produced, and are therefore no longer available for delivery.

(*2) = The abbreviations AI and PE determine whether an aluminium terminal box or polyester terminal box with gasket out of silicon is mounted.

(*3) = The maximum process temperature of 260 °C is only permitted short-term. Refer to section 15.3 for more details

(*4) = After implementation of ATEX supplement 7 (IECEx issue 1) “A” shall remain selectable for TMS families. TMS families have not been affected by the changes of the 7th supplement.

15.2 Description

The Coriolis sensors are used in combination with a transmitter for mass-flow measurement in pipes. The mass flow sensors consisting of magnetically excited vibrating tubes, contains the electrical components, coils, resistors, temperature sensors as well as terminals and connectors for connection to the associated transmitter. The transmitter can be mounted directly on the sensor or separately connected by a cable.

The design of the sensor system is variable. The sensors can be adapted to different plant and process conditions by using a variety of materials and process connections. The Coriolis sensor can be used in applications where an explosive atmosphere can be present in the measuring tubes frequently or over a longer period of time.

The following variations of the sensor are possible:

Type TM-***-*****-****-L-**-**

Type TME-***-*****-L-**-**

Type TMU-****-****-***-L-**-**

Type TMR-***-*****-****-L-**-**

Type TM-SH-****-****-***-L-**-**

Type TMS-****-****-***-A-**-**

Reasons for the supplement:

- Update of the new EN IEC 60079-0:2018 standard
- Inclusion of a new set of PCB's for wiring the sensor coils
- New design of the TMU enclosure
- Inclusion of a plastic terminal box with a new terminal box PCB as an alternative for the aluminium box
- Extension of the model codes
- Change of the temperature range
- Other small amendments to assessed parts of the type approval

15.3 Parameters

15.3.1 Type TM-***-*****-****-L-*-*-* resp. type TME-***-*****-L-*-*-* resp. type TMU-****-*****-***-L-*-*-* resp. type TMR-***-*****-****-L-*-*-* resp. type TM-SH-****-*****-***-L-*-*-*

15.3.1.1 Exciter circuit

For exciter circuit type EC1 (terminals 9 - 10) or exciter circuit type EC1R (terminals 8 - 9)

Maximum input voltage	U_i	30	V
Maximum input current	I_i	90	mA
Maximum input power	P_i	0.4	W
Maximum internal capacitance	C_i	negligible	
Maximum internal inductance	L_i	4.38	mH

For exciter circuit type EC2 (terminals 9 - 10) or exciter circuit type EC2R (terminals 8 - 9)
For the connection of an intrinsically safe circuit type of protection Ex ia IIC with linear output characteristic and the following max. values:

Maximum output voltage	U_o	30	V
Maximum output current	I_o	90	mA
Maximum output power	P_o	0.8	W
Maximum internal capacitance	C_i	negligible	
Maximum internal inductance	L_i	negligible	

15.3.1.2 Sensor circuit (terminals 1 - 2 and 3 - 4)

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		50	mA
Maximum input power	P_i		0.3	W
Maximum internal capacitance	C_i		negligible	
Maximum internal inductance	L_i		14	mH
Maximum output voltage	U_o	AC	0.3	V

15.3.1.3 Temperature sensor circuit (terminals 5 - 8 for type EC1 or type EC2; terminals 5 - 7 for type EC1R or type EC2R)

Maximum input voltage	U_i	DC	30	V
Maximum input current	I_i		100	mA
Maximum input power	P_i		0.1	W
Maximum internal capacitance	C_i		negligible	
Maximum internal inductance	L_i		negligible	

15.3.2 Type TMS-****-*****-***-A-*-*-*

15.3.2.1 Exciter circuit (contacts 1 - 2)

Exciter circuit type EC1

Maximum input voltage	U_i	30	V
Maximum input current for Group IIC Classification	I_i	130	mA
Maximum input current for Group IIB Classification	I_i	280	mA

Maximum input power	P_i	0.5 W
Maximum internal capacitance	C_i	negligible
Maximum internal inductance	L_i	2 mH

Exciter circuit type EC2 (the transmitter is mounted separately)

For the connection of an intrinsically safe circuit level of protection Ex ia with the following maximum values:

Maximum output voltage	U_o	30 V
Maximum output current for Group IIC Classification	I_o	130 mA
Maximum output current for Group IIB Classification	I_o	280 mA
Maximum output power	P_o	0.5 W

15.3.2.2 Sensor circuit (contacts 5 - 6 and 7 - 8)

Maximum input voltage	U_i	DC	30 V
Maximum input current for Group IIC Classification	I_i		50 mA
Maximum input current for Group IIB Classification	I_i		100 mA
Maximum input power	P_i		0.4 W
Maximum internal capacitance	C_i		negligible
Maximum internal inductance	L_i		14 mH
Maximum output voltage	U_o	AC	0.3 V

15.3.2.3 Temperature sensor circuit (contacts 3 - 4)

Maximum input voltage	U_i	DC	30 V
Maximum input current	I_i		100 mA
Maximum input power	P_i		0.1 W

15.3.3 Ambient temperature range

T_a
depending on the type of electrical connection, the installation, the process temperature and the temperature class:

15.3.3.1 For Type TMU-****-****-***-*_L-**-**-* resp. Type TM-SH-****-****-***-*_L-**-**-*

Mounted separately with a HAN R23 connector

Neck extension element	Process temperature -50 °C up to (°C)*	Ambient temperature range (°C)*	Temperature class
without	40	-40 up to +40	T6
without	60	-40 up to +60	T5
without	100	-40 up to +60	T4
60 mm	100	-40 up to +80	T4
160 mm	120	-40 up to +80	T4
160 mm	180	-40 up to +80	T3
260 mm	220 / 260 **	-40 up to +80	T2

* TM-SH sensors are restricted to $T_{Amb} = 60 \text{ °C}$ and $T_{Process} = -40 \text{ °C}$ to 100 °C

** The maximum process temperature of 260 °C only permitted for periods of maximum 1 hour.

15.3.3.2 For Type TM-***-*****-****-L-*-* resp. Type TME-***-*****-L-*-* resp. Type TMU-****-****-***-L-*-* resp. Type TMR-***-*****-****-L-*-*

Mounted separately with a junction box

Neck extension element	Process temperature -50 °C up to (°C)*	Ambient temperature range (°C)	Temperature class
without	40	-40 up to +40	T6
without	60	-40 up to +60	T5
without	100	-40 up to +80	T4
100 mm	120	-40 up to +80	T4
100 mm	180	-40 up to +80	T3
200 mm	220 / 260 **	-40 up to +80	T2

* TME-* sensors are restricted to $T_{Process} = 180 \text{ °C}$.

** The maximum process temperature of 260 °C only permitted for periods of maximum 1 hour.

The process temperature 220 / 260 °C is only applicable for TM, TMU and TMR sensors.

15.3.3.3 For Type TM-***-*****-****-L-*-* resp. Type TME-***-*****-L-*-* resp. Type TMU-****-****-***-L-*-* resp. Type TMR-***-*****-****-L-*-*

Mounted to the transmitter

Neck extension element	Process temperature (°C) -50 °C up to (°C)*	Max. ambient temperature (°C)	Temperature class
without	40	-40 up to +40	T6
without	60	-40 up to +55	T5
without	100	-40 up to +50	T4
100 mm	120	-40 up to +50	T4
100 mm	150	-40 up to +50	T3

The values for ambient temperature mentioned in the certificate of the transformer have to be regarded.

15.3.3.4 For type TMS-****-****-***-A-*-*

Process temperature -50 °C up to (°C)	Ambient temperature range (°C)	Temperature class
125	-40 up to +60	T4
70	-40 up to +60	T5

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17 Special Conditions for Use

- 17.1 If the sensor is mounted separately from the transmitter, equipotential bonding between the transmitter and the sensor must be guaranteed.
- 17.2 For the application of the sensor in an ambient temperature of less than -20 °C and higher than +60 °C cables and cable entries suitable for this condition shall be used.
- 17.3 The measuring tubes built of corrosion-resistant steel may have a thickness of < 1 mm. During installation and operation it must be ensured that risks e.g. by the medium or by mechanical damages are excluded.
- 17.4 For ambient temperature range / process temperature range see parameters.

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 Testing and Certification GmbH
Bochum, 2021-03-05
BVS-Fro/MGR A20201215

Managing Director

