



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BVS 07.0003X

Issue No: 4

Certificate history:

Status: **Current**

[Issue No. 4 \(2018-09-20\)](#)

[Issue No. 3 \(2016-07-04\)](#)

Date of Issue: **2018-09-20**

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[Issue No. 2 \(2014-02-04\)](#)

[Issue No. 1 \(2010-08-05\)](#)

[Issue No. 0 \(2007-02-27\)](#)

Applicant: **Endress+Hauser Flowtec AG**
Kägenstrasse 7
4153 Reinach BL 1
Switzerland

Equipment: **Flow measuring system type T-mass 6*F**-* and 6*I-***

Optional accessory:

Type of Protection: **Equipment protection by flameproof enclosures "d", Equipment protection by intrinsic safety "i", Equipment with equipment protection level (EPL) Ga, Equipment dust ignition protection by enclosure "t", Equipment protection by increased safety "e"**

Marking:
See Annex

Approved for issue on behalf of the IECEx
Certification Body:

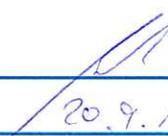
Jörg Koch

Position:

Head of Certification Body

Signature:
(for printed version)

Date:


20.9.18

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

DEKRA EXAM GmbH
Dinnendahlstrasse 9
44809 Bochum
Germany

 **DEKRA**
On the safe side.



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Manufacturer: **Endress+Hauser Flowtec AG**
Kägenstrasse 7
4153 Reinach BL 1
Switzerland

Additional Manufacturing location(s):

Endress+Hauser Flowtec AG	Endress + Hauser Flowtec (India) Co. Ltd.,	Endress+Hauser Flowtec AG Div. U.S.A.	Endress+Hauser Flowtec (Suzhou) Co. Ltd.	Endress+Hauser (Brasil) Fluxômetros Ltda.
35, rue de l'Europe 68700 Cernay France	M-171 to 176, MIDC, Waluj, Aurangabad – 431 136, Maharashtra State India	2330 Endress Place, Greenwood, Indiana 46143 United States of America	Su-Hong-Zhong-Lu No.465, China-Singapore- Suzhou Industrial Park (SIP), 215021 China	Estrada Municipal Antônio Sesti, 600 A - Recreio Costa Verde – Itatiba / SP, CEP 13254 – 085 – Brazil

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-31 : 2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7 : 2015 Edition:5.0	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

[DE/BVS/ExTR07.0003/04](#)

Quality Assessment Report:

[DE/TUN/QAR06.0004/05](#)



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Description

The Flow measuring system is designed for flow measurement. Gas flow through the sensing section passes two Pt100 RTD transducers; one is used as a temperature sensing device whilst the other is used as a heater. The temperature sensor monitors the actual process value whilst the heater is maintained at a constant differential temperature above this by varying the power consumed by the sensor. The greater the mass flow, the greater the cooling effect and power required to maintain the differential temperature. The measured heater power is therefore a measure of the gas flow rate and is evaluated as a measuring signal using the transmitter electronics.

The measuring system consists of a transmitter and a sensor which can be mounted together (compact version) or separate (remote version).

The electronic of the transmitter (type T-mass 6*) is certified under IECEx BVS 06.0006U and mounted inside the enclosure Proline G02 or G12, certified under IECEx BVS 06.0012U.

Listing of all used components

See Annex

Subject and Type

See Annex

Parameters

See Annex

SPECIFIC CONDITIONS OF USE: YES as shown below:

- 1 All equipment of the Flow measuring system shall be included in the equipotential bonding.
Along the intrinsically safe sensor circuits potential equalisation must exist.
- 2 The equipment may be employed only for those media, for which the wetted parts are known to be suitable (for EPL Ga/Gb).
- 3 For the application of the Flow measuring system in an ambient temperature of less than -20 °C suitable cables and cable entries or conduit entries certified for this condition have to be used. Entry holes which are not needed shall be closed by stopping plugs separately certified for this purpose.
- 4 Some of the dimensions of the flameproof joints exceed the permissible minimum values or go below the permissible maximum values which are given by IEC 60079-1:2014. For information concerning these dimensions contact the manufacturer.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Subject of this supplement are the following modifications:

- Update of the list of manufacturing locations
- Assessment of the Measuring system in accordance with the current standard versions
- Modified marking
- Modified drawings

Annex:

[BVS_07_0003X_Endress+Hauser_Annex_Issue4.pdf](#)



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Annex

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Marking

Compact versions

Type	Marking Standard
T-mass 6*F**-***** (B,N,U)(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9) T-mass 6*I-***** (B,N,U)(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db ia IIC T4...T1 Gb Ex tb IIIC T***°C Db
T-mass 6*F**-***** (B,N,U)(A,1)*** (F,G,R,S,T,U) T-mass 6*I-***** (B,N,U)(A,1)*** (F,G,R,S,T,U)	Ex db ia [ia Ga] IIC T4...T1 Gb Ex tb [ia Da] IIIC T***°C Db
T-mass 6*I-***** 3(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db ia IIC T4...T1 Ga/Gb Ex tb IIIC T***°C Db
T-mass 6*I-***** 3(A,1)*** (F,G,R,S,T,U)	Ex db ia [ia Ga] IIC T4...T1 Ga/Gb Ex tb [ia Da] IIIC T***°C Db
T-mass 6*F**-***** D(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9) T-mass 6*I-***** D(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db eb ia IIC T4...T1 Gb Ex tb IIIC T***°C Db
T-mass 6*F**-***** D(A,1)*** (F,G,R,S,T,U) T-mass 6*I-***** D(A,1)*** (F,G,R,S,T,U)	Ex db eb ia [ia Ga] IIC T4...T1 Gb Ex tb [ia Da] IIIC T***°C Db
T-mass 6*I-***** 5(A,1)*** (A,B,C,D,E,H,J,K,L, M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db eb ia IIC T4...T1 Ga/Gb Ex tb IIIC T***°C Db
T-mass 6*I-***** 5(A,1)*** (F,G,R,S,T,U)	Ex db eb ia [ia Ga] IIC T4...T1 Ga/Gb Ex tb [ia Da] IIIC T***°C Db

Remote versions

Transmitter

Type	Marking Standard
T-mass 6*F**-***** (B,N,U,3)(G,H,J,6,7,8)*** (F,G,R,S,T,U) T-mass 6*I-***** (B,N,U,3)(G,H,J,6,7,8)*** (F,G,R,S,T,U)	Ex db [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T85°C Db
T-mass 6*F**-***** (B,N,U,3)(G,H,J,6,7,8)*** (A,B,C,D,E, H,J,K,L,M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9) T-mass 6*I-***** (B,N,U,3)(G,H,J,6,7,8)*** (A,B,C,D,E,H, J,K,L,M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db [ia] IIC T6 Gb Ex tb IIIC T85°C Db
T-mass 6*F**-***** (D,5)(G,H,J,6,7,8)*** (F,G,R,S,T,U) T-mass 6*I-***** (D,5)(G,H,J,6,7,8)*** (F,G,R,S,T,U)	Ex db eb [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T85°C Db
T-mass 6*F**-***** (D,5)(G,H,J,6,7,8)*** (A,B,C,D,E,H, J,K,L,M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9) T-mass 6*I-***** (D,5)(G,H,J,6,7,8)*** (A,B,C,D,E,H, J,K,L,M,N,P,Q,V,W,0,2,3,4,5,6,7,8,9)	Ex db eb [ia] IIC T6 Gb Ex tb IIIC T85°C Db

Sensor

Type	Marking
T-mass 6*F**-***** (B,D,N,U)(G,H,J,6,7,8)*** T-mass 6*I-***** (B,D,N,U)(G,H,J,6,7,8)***	Ex ia IIC T4...T1 Gb Ex tb IIIC T***°C Db
T-mass 6*F**-***** (3,5)(G,H,J,6,7,8)*** T-mass 6*I-***** (3,5)(G,H,J,6,7,8)***	Ex ia IIC T4...T1 Ga/Gb Ex tb IIIC T***°C Db

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Subject and Type

Measurement system type T-mass 6*F**-***** or 6*I-*****

With a transmitter and a sensor, specified in detail by the order code, which is marked on each apparatus. Instead of the *** in the complete denomination letters and numerals will be inserted which characterize modifications and describe the following:

T-MASS 6 * F**- * * * * *

*	*	*	*	*	*
*	*	*	*	*	*

 * * * * *

T-MASS 6 * I- * * * * *

*	*	*	*	*	*
*	*	*	*	*	*

 * * * * *

Signal outputs

non-intrinsically safe:

A, B, C, D, E, H, J, K, L, M, N, P, Q, V, W,
0, 2, 3, 4, 5, 6, 7, 8, 9

intrinsically safe:

F = Ex ia PROFIBUS PA
G = Ex ia Foundation Fieldbus
R = Ex ia HART current output, active
S = Ex ia HART current output active,
frequency output passive
T = Ex ia HART current output passive,
frequency output passive
U = Ex ia HART current output passive,
X = sensor only

Housing

A = Compact version, T_a -20 °C
1 = Compact version, T_a -40 °C
G, H, J = Remote version, T_a -20 °C
6, 7, 8 = Remote version, T_a -40 °C

Approvals (details see marking)

B = Ex db ia IIC Gb, Ex tb IIIC Db
D = Ex db eb ia IIC Gb, Ex tb IIIC Db
N = Ex db ia IIC Gb, Ex tb IIIC Db
U = Ex db ia IIC Gb, Ex tb IIIC Db
3 = Ex db ia IIC Gb, Ex tb IIIC Db
5 = Ex db eb ia IIC Gb, Ex tb IIIC Db

Not specified *** have no influence on explosion protection.

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Listing of all used components

Subject and type	Certificate	Standards
Transmitter enclosure type Proline G02 and G12	IECEx BVS 06.0012U (DE/BVS/06/2091)	IEC 60079-0:2011 ¹ IEC 60079-1:2014 IEC 60079-7:2015 IEC 60079-31:2013
Transmitter electronics type T-mass	IECEx BVS 06.0006U (DE/BVS/06/2074)	IEC 60079-0:2011 ¹ IEC 60079-11:2011

¹ No applicable technical differences

² Technical differences evaluated and found satisfactory

Parameters

- 1 Power supply (terminals no. 1 (L) and 2 (N))
 Nominal Voltage
 AC version AC 85 to 260 V
- or
- Terminals No. 1 (+) and No. 2 (-)
 Nominal Voltage
 DC version DC 16 to 62 V
 AC version AC 20 to 55 V
- Maximum voltage U_m AC 260 V

- 2 Signal circuits
 2.1 Non-intrinsically safe signal circuits

Type	Terminal No.	Safety parameters
T-MASS 6*F**_*****p T-MASS 6*I_*****p with p = A, B, C, D, E, H, J, K, L, M, N, P, Q, V, W, 0, 2, 3, 4, 5, 6, 7, 8 or 9	20 ... 27	$U_m = 260 \text{ V}$, $I_{max} = 0.5 \text{ A}$

Service connector (internal)
 Voltage U_m DC 15 V

- 2.2 Intrinsically safe signal circuits

Type	Terminal No.	Safety parameters Ex ia IIC / IIIC
T-mass 6*F**_*****F T-mass 6*I_*****G	26 and 27	$U_i = 30 \text{ V}$ $I_i = 600 \text{ mA}$ $P_i = 8.5 \text{ W}$ $C_i \leq 5 \text{ nF}$ $L_i \leq 10 \text{ } \mu\text{H}$

FISCO field device, for connection to a field bus system in accordance with FISCO

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Type	Terminal No.	Safety parameters	
		Ex ia IIC	Ex ia IIB / IIIC
T-MASS 6*F**-*****R T-MASS 6*I-*****R	24 and 25 26 and 27	$U_o = 21.8 \text{ V}$ $I_o = 90 \text{ mA}$ $P_o = 491 \text{ mW}$	
		$C_o = 0.16 \mu\text{F}$ $L_o = 4.1 \text{ mH}$	$C_o = 1.16 \mu\text{F}$ $L_o = 15 \text{ mH}$
		$U_i = 30 \text{ V}$ $I_i = 10 \text{ mA}$ $P_i = 300 \text{ mW}$ $C_i \leq 6 \text{ nF}$ $L_i = \text{negligible}$	
T-MASS 6*F**-*****S T-MASS 6*I-*****S	24 and 25	$U_i = 30 \text{ V}$ $I_i = 500 \text{ mA}$ $P_i = 600 \text{ mW}$ $C_i \leq 6 \text{ nF}$ $L_i = \text{negligible}$	
	26 and 27	$U_o = 21.8 \text{ V}$ $I_o = 90 \text{ mA}$ $P_o = 491 \text{ mW}$	
		$C_o = 0.16 \mu\text{F}$ $L_o = 4.1 \text{ mH}$	$C_o = 1.16 \mu\text{F}$ $L_o = 15 \text{ mH}$
T-MASS 6*F**-*****T T-MASS 6*I-*****T	24 and 25	$U_i = 30 \text{ V}$ $I_i = 500 \text{ mA}$ $P_i = 600 \text{ mW}$ $C_i \leq 6 \text{ nF}$ $L_i = \text{negligible}$	
	26 and 27	$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1.25 \text{ W}$ $C_i \leq 6 \text{ nF}$ $L_i = \text{negligible}$	
T-MASS 6*F**-*****U T-MASS 6*I-*****U	24 and 25 26 and 27	$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1.25 \text{ W}$ $C_i \leq 6 \text{ nF}$ $L_i = \text{negligible}$	

2.3 Intrinsically safe sensor circuits

Terminals / Plugs for remote version 41, 42, 43, 44 = Sensor circuit

For the connection of the remote sensor a multicore cable with a max cable length of 100 m and the following max values has to be used:

Cable Inductance $\leq 0.9 \mu\text{H}$ per meter

Cable capacitance $\leq 1 \text{ nF}$ per meter

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3 Thermal Parameters

3.1 Medium temperature

Type	Maximum medium temperature
T-mass 6*F**-*****	100 °C
T-MASS 6*I-*****	130 °C

Gasket material	Minimum medium temperature
EPDM	-40 °C
Viton, Kalrez, Nitril	-20 °C

The permissible medium temperature range is included in the marking.

3.2 Ambient temperature range Compact version

Type	Ambient temperature range
T-Mass *****A****	$-20\text{ °C} \leq T_a \leq 60\text{ °C}$
T-Mass *****I****	$-40\text{ °C} \leq T_a \leq 60\text{ °C}$

Remote version, transmitter and sensor

Type	Ambient temperature range
T-Mass *****G/H/J****	$-20\text{ °C} \leq T_a \leq 60\text{ °C}$
T-Mass *****6/7/8****	$-40\text{ °C} \leq T_a \leq 60\text{ °C}$

3.3 The relationship between maximum ambient, medium temperature and temperature class resp. maximum surface temperature is as follows: For compact versions and sensor remote versions:

Temperature table	Max. medium temperature [°C]			
Temperature class	T4	T3	T2	T1
Max. surface temperature, Group III	135 °C	200 °C	300 °C	450 °C
T_a max = 55 °C				
T-mass 6*F**-*****	80	80	100	100
T_a max = 60 °C				
T-mass 6*F**-*****	80	80	80	80
T-mass 6*I-*****	80	80	130	130

Transmitter in remote version:
 Temperature class
 Maximum surface temperature

T6
 T85 °C