



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 KEM 06.0008 issue No.:3

Status: Current

Date of Issue: 2013-11-13

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Certificate history:

Issue No. 3 (2013-11-13)
Issue No. 2 (2012-1-11)
Issue No. 1 (2007-4-27)

Applicant: **Endress+Hauser Flowtec AG**
Kägenstrasse 7
CH-4153 Reinach
Switzerland

Electrical Apparatus: **Flowmeter Type Prowirl 72 and Type Prowirl 73**
Optional accessory:

Type of Protection: **Ex i, Ex d, Ex t**

Marking: Ex ia IIC T6 ... T1 Ga
Ex ia IIC T6 ... T1 Gb or Ex d[ia] IIC T6 ... T1 Gb
Ex ia IIC T6 ... T1 Ga/Gb or Ex d[ia] IIC T6 ... T1 Ga/Gb
Ex tb IIIC T** °C Db or Ex tb[ia] IIIC T** °C Db or Ex ia IIIC T** °C Db

Approved for issue on behalf of the IECEx
Certification Body:

T. Pijpker

Position:

Certification Manager

Signature:
(for printed version)

Date:

2013-11-13

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.

Certificate issued by:

DEKRA Certification B.V.
Meander 1051
6825 MJ Arnhem
The Netherlands





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Manufacturer: **Endress+Hauser Flowtec AG**
Kägenstrasse 7,
CH-4153 Reinach
Switzerland

Additional Manufacturing location
(s):

Endress+Hauser Flowtec AG 35, Rue de l'Europe 68700 Cernay France	Endress+Hauser Flowtec (India) Co. Ltd. M 171 to 176 MIDC Waluj Aurangabad 431136 India	Endress+Hauser Flowtec AG, Division U.S.A. 2330 Endress Place Greenwood, IN 46143 United States of America	Endress+Hauser Flowtec (China) Co. Ltd. Su-Hong-Zhong-Lu No. 465 Suzhou Industrial Park 215021 Suzhou, Province Jiangsu China	Endress+Hauser Flowtec (Brasil) Fluxômetros Ltda. Estrada Municipal Antonio Sesti, 600-A - Recreio Costa Verde CEP13254-085 - Itatiba - SP Brazil
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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 electrical 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 : 2007-04 Edition: 6	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 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure 't'

*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:
NL/KEM/ExTR06.0009/02

Quality Assessment Report:

DE/TUN/QAR06.0004/05



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The Flowmeters Type Prowirl 72...-..... and Type Prowirl 73...-..... are used to convert the flow of a gas, fluid or vapour into an electrical signal, using the Karman Vortex principle.

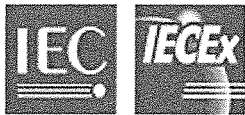
Depending on the type, the flowmeters have following variations:

- single or dual sensor;
- transmitter electronics with 4 - 20 mA current loop with HART protocol and optional pulse output or with Fieldbus connection (either Profibus PA or Fieldbus Foundation);
- sensor and transmitter electronics in compact version, or separately mounted;
- the sensor flowmeter type Prowirl 73...-..... is additionally provided with a temperature sensor.

Optionally, a display with control function may be provided.

The Flowmeters and sensors are classified as listed in Annex A.

CONDITIONS OF CERTIFICATION: NO



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EQUIPMENT(continued):

On Flowmeters Prowirl 72 F/W and Prowirl 73 with order code 7****_*****1***** with an enclosure or sensor made of aluminium, the certificate reference number on the marking plate shall be followed by an "X", or the equipment marking shall include a warning mark. The instructions shall include specific conditions of use that allow safe use of the transmitters in areas where the use of equipment of EPL Ga is required.

On Flowmeters Prowirl 72 F/W and Prowirl 73 with an enclosure or sensor made of material containing by mass more than 7,5% of magnesium, titanium and zirconium, the certificate reference number on the marking plate shall be followed by an "X", or the equipment marking shall include a warning mark. The instructions shall include specific conditions of use that allow safe use of the transmitters in an areas where the use of equipment of EPL Da, EPL Db, EPL Ga, EPL Gb is required.

For information on the dimensions of the flameproof joints the manufacturer shall be contacted. This statement, of specific condition, is included in the instruction manual. The equipment shall include a warning mark.

If the product version contains the danger of electrostatic charges, e.g. non standard coating, a warning mark appears on the product and the instruction manual includes the specific conditions of use that allow safe use of the equipment in order to minimize the risk of electrostatic discharge.



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

Issue 3:

- Drawing changes
- Introduction of type of protection Ex ia IIC
- Addition of new enclosure materials
- Addition of considerations for thermal insulation
- Assessment of equipment to newer versions of the standards

Prowirl 72 and Prowirl 73

The Flowmeters and sensors are classified in accordance with the following table:

Compact Transmitter	Remote Transmitter	Sensor (Compact and remote)
Ex ia IIC T6 ... T1* Ga	-	Ex ia IIC T6 ... T1* Ga (compact version available only)
Ex ia IIC T6 ... T1* Gb Ex d[ia] IIC T6 – T1* Gb	Ex ia IIC T6 ... T1* Gb	Ex ia IIC T6 ... T1* Gb
Ex ia IIC T6 ... T1* Gb Ex d[ia] IIC T6 ... T1* Gb Ex tb IIIC T** °C Db Ex tb[ia] IIIC T** °C Db Ex ia IIIC T** °C Db	Ex ia IIC T6 ... T1* Gb Ex d[ia] IIC T6 ... T1* Gb Ex tb IIIC T** °C Db Ex tb[ia] IIIC T** °C Db Ex ia IIIC T** °C Db	Ex ia IIC T6 ... T1* Gb Ex tb IIIC T** °C Db Ex ia IIIC T** °C Db
Ex ia IIC T6 ... T1* Ga/Gb Ex d[ia] IIC T6 ... T1* Ga/Gb	Ex ia IIC T6 ... T1* Gb Ex d[ia] Ga] IIC T6 ... T1* Gb	Ex ia IIC T6 ... T1* Ga/Gb
Ex ia IIC T6 ... T1* Ga/Gb Ex d[ia] IIC T6 ... T1* Ga/Gb Ex tb IIIC T** °C Db Ex tb[ia] IIIC T** °C Db Ex ia IIIC T** °C Db	Ex ia IIC T6 ... T1* Gb Ex d[ia] IIC T6 ... T1* Gb Ex tb IIIC T** °C Db Ex tb[ia] IIIC T** °C Db Ex ia IIIC T** °C Db	Ex ia IIC T6 ... T1* Ga/Gb Ex tb IIIC T** °C Db Ex ia IIIC T** °C Db

- * Temperature class is T4-T1 in case of I/O-options Profibus PA and Foundation Fieldbus (for the remote sensor: T6-T1 applies).
- ** The maximum surface temperature depends on ambient and process temperature.

The interconnecting cable, between remote version transmitter to sensor, must be protected against damage in accordance with the installation rules, when the installation method for non-intrinsically safe circuits is used.

The enclosures of the compact versions of the flowmeter and of the transmitter and the sensor of the remote versions provide a degree of protection of at least IP66/IP67 in accordance with IEC 60529.

The ranges of ambient temperature and process temperature and their relation to the temperature class for the different variations is shown in the following tables:

Prowirl 72 and Prowirl 73, compact versions

For the flowmeters, transmitters and sensors, in type of protection intrinsic safety "i", or Equipment dust ignition protection by enclosure "t":

Ambient temperature range -40 °C to +70 °C, for Ex t: -20 °C to +55 °C.
Process temperature range -200 °C to +440 °C (high temperature version) or
-40 °C to +280 °C (standard version)
(process temperature range depending on type of sensor)

Temperature class	T6 *	T5 *	T4	T3	T2	T1
Max. process temperature	80 °C	95 °C	130 °C	195 °C	280 °C / 290 °C	280 °C / 440 °C
Max. ambient temperature	40 °C	60 °C	70 °C	70 °C	70 °C	70 °C

Prowirl 72 and Prowirl 73, remote versions, sensor

For sensors, in type of protection intrinsic safety "i", or dust ignition protection by enclosure "t":

Ambient temperature range -40 °C to +85 °C, for Ex t: -20 °C to +55 °C.

Process temperature range -200 °C to +440 °C (high temperature version) or
-40 °C to +280 °C (standard version)

(process temperature range depending on type of sensor)

Temperature class	T6 *	T5 *	T4	T3	T2	T1
Max. process temperature	80 °C	95 °C	130 °C	195 °C	280°C / 290 °C	280°C / 440 °C
Max. ambient temperature	40 °C	60 °C	85 °C	85 °C	85 °C	85 °C

Prowirl 72 and Prowirl 73 remote versions, transmitter

For transmitters, in type of protection intrinsic safety "i", or dust ignition protection by enclosure "t":

Ambient temperature range -40 °C to +80 °C, for Ex t: -20 °C to +55 °C.

Temperature class	T6 *	T5 *	T4 - T1
Max. ambient temperature	40 °C	60 °C	80 °C

For the flowmeters, with the field wiring terminal compartment in type of protection flameproof enclosures "d", the ranges of ambient temperature and process temperature and their relation to the temperature class for the different variations is shown in the following tables:

Prowirl 72 and Prowirl 73, compact versions

For the flowmeters, transmitters and sensors, with the field wiring terminal compartment in type of protection flameproof enclosures "d":

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

Process temperature range -200 °C to +440 °C (high temperature version) or
-40 °C to +280 °C (standard version)

(process temperature range depending on type of sensor)

Temperature class	T6 *	T5 *	T4	T3	T2	T1
Max. process temperature	80 °C	95 °C	130 °C	195 °C	280°C / 290 °C	280°C / 440 °C
Max. ambient temperature	40 °C	60 °C	60 °C	60 °C	60 °C	60 °C

The relation between minimum process temperature and minimum ambient temperature is shown in the following table:

Min. process temperature	-40 °C	-80 °C	-120 °C	-170 °C	-200 °C
Min. ambient temperature	-40 °C	-36 °C	-33 °C	-29 °C	-27 °C

Prowirl 72 and Prowirl 73, remote versions, sensor

For sensors with the transmitter field wiring terminal compartment in type of protection flameproof enclosures "d":
Ambient temperature range -40 °C to +85 °C.

Process temperature range -200 °C to +440 °C (high temperature version) or
-40 °C to +280 °C (standard version)
(process temperature range depending on type of sensor)

Temperature class	T6 *	T5 *	T4	T3	T2	T1
Max. process temperature	80 °C	95 °C	130 °C	195 °C	280°C / 290 °C	280°C / 440 °C
Max. ambient temperature	40 °C	60 °C	85 °C	85 °C	85 °C	85 °C

Prowirl 72 and Prowirl 73, remote versions, transmitter

For transmitter with field wiring terminal compartment in type of protection flameproof enclosures "d":
Ambient temperature range -40 °C to +60 °C.

Temperature class	T6 *	T5 *	T4 - T1
Max. ambient temperature	40 °C	60 °C	60 °C

- * Notes:
- Temperature class T5 and T6 not applicable for all versions with Profibus PA or Fieldbus Foundation interface
 - The ambient temperature range is limited to -20 °C to +55°C for all versions of Prowirl 7****-*****G/F***** which are intended for use in an explosive dust atmosphere.

Prowirl 72 and Prowirl 73 all versions

For the flowmeters, transmitters and sensors, in type of protection dust ignition protection by enclosure "t":

Following the IEC 60079-31, the surface temperature shall not exceed 2/3 of the ignition temperature and shall be 75 K below the glow temperature of any dust.

Example: For a temperature class T4 (135 °C) the Prowirl 72/73 is intended for use with any dust with an ignition temperature of $135\text{ °C} \times \frac{3}{2} = 202,5\text{ °C}$ and a glow temperature of $135\text{ °C} + 75\text{ °C} = 210\text{ °C}$, or higher.

For the transmitter of the remote version the temperature rise of the electronic has to be considered. Based on a maximum temperature rise of 7K the temperature rating for the enclosure is T90 °C for the transmitter enclosure of the remote version based on the max. ambient temperature.

Electrical data

For the flowmeters, transmitters and sensors, in type of protection intrinsic safety "i":

Prowirl 72 and Prowirl 73 with 4 ... 20 mA (HART) and (optional) pulse outputs

Supply and signal circuit (terminals 1 (L+) and 2 (L-)):

In type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values:

$U_i = 30 \text{ V}$, $I_i = 300 \text{ mA}$, $P_i = 1 \text{ W}$, $C_i = 5.28 \text{ nF}$, $L_i = 0 \text{ mH}$.

Pulse / Status output (terminals 3 (P+) and 4 (P-)):

In type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values:

$U_i = 30 \text{ V}$, $I_i = 300 \text{ mA}$, $P_i = 1 \text{ W}$, $C_i = 0 \text{ nF}$, $L_i = 0 \text{ mH}$.

Prowirl 72 and Prowirl 73 with Profibus PA or Foundation Fieldbus connection

Fieldbus circuit (terminals 1 (L+) and 2 (L-)):

In type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with following maximum values:

$U_i = 17.5 \text{ V}$, $I_i = 500 \text{ mA}$, $P_i = 5.5 \text{ W}$, or

$U_i = 24 \text{ V}$, $I_i = 250 \text{ mA}$, $P_i = 1.2 \text{ W}$; $C_i = 5 \text{ nF}$, $L_i = 10 \text{ } \mu\text{H}$.

The input circuit is suitable for connection to a fieldbus system according to the FISCO model.

Sensor circuits (compact versions), internal circuits in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC.

Sensor circuits (remote versions), in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for the connection of the remote sensor to the transmitter with a cable with a maximum length of 100 m for maximum cable inductance 1mH/km and maximum cable capacitance 1µF/km.

The sensor circuits are infallibly galvanically isolated from the supply and output circuits respectively from the fieldbus interface circuit.

For the flowmeters, transmitters and sensors, with the field wiring terminal compartment in type of protection flameproof enclosures "d", or Equipment dust ignition protection by enclosure "t":

Prowirl 72 and Prowirl 73 with 4 ... 20 mA (HART) and (optional) pulse outputs

Supply and output circuit (terminals 1 (L+) and 2 (L-)):

$U \leq 36 \text{ V}$, $U_m = 250 \text{ V}$.

Pulse output circuit (terminals 3 (P+) and 4 (P-)):

$U \leq 36 \text{ V}$, $U_m = 250 \text{ V}$.

Prowirl 72 and Prowirl 73 with Profibus PA or Foundation Fieldbus connection

Fieldbus circuit (terminals 1 (L+) and 2 (L-)):

$U \leq 36 \text{ V}$, $U_m = 250 \text{ V}$.

The intrinsically safe sensor circuits are infallibly galvanically isolated from the supply, output and fieldbus circuits up to a maximum value of the voltage of 375 V.

Prowirl 72 and Prowirl 73 all versions

All versions of the flowmeter are provided with facilities for connection of a certified intrinsically safe service tool, for example Service Interface type FXA 193.

Service interface (service connector):

In type of protection intrinsic safety Ex ia IIC, Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 7 \text{ V}$, $I_i = 1 \text{ A}$, $P_i = 2 \text{ W}$, $C_i = 25 \text{ nF}$, $L_i = 0 \text{ mH}$.