(1) # EC-TYPE EXAMINATION CERTIFICATE

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **KEMA 08ATEX0071 X** Issue Number: **1**

(4) Equipment: **Electro Magnetic Flowmeter Primary Head Series VersaFlow Mag 1000 F and Mag 4000 F**

(5) Manufacturer: **Honeywell International, HFS**

(6) Address: **512 Virginia Drive, Fort Washington, PA 19034, USA**

(7) This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.

The examination and test results are recorded in confidential test report number 2113920-2.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 + A1, A2	**EN 50017 : 1998**	**EN 50018 : 2000 + A1**
EN 50019 : 2000	**EN 50020 : 2002**	**EN 50028 : 1987**
EN 50281-1-1 : 1998 + A1		

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 2 GD **EEx me ia IIC** or **EEx de ia IIC** or
EEx qe ia IIC or **EEx e ia IIC**
T6 ... T3 or **T5 ... T3**
T 85 °C ... T 150 °C or **T 85 °C ... T 160 °C** or
T 85 °C ... T 180 °C

This certificate is issued on June 11, 2008 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

KEMA Quality B.V.

P.T. van Nijen
Certification Manager

PRODUCTS RvA C 001

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(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 08ATEX0071 X** Issue No. **1**

(15) **Description**

The Electro Magnetic Flowmeter Primary Head, series VersaFlow Mag 1000 F and Mag 4000 F is used to convert the flow of a conducting fluid into an electrical signal. An associated flow transmitter is used to supply the field coils of the primary head and to convert the measured electrode signal into an output signal.

The type of protection for the various sizes of primary heads is as follows:
DN10 - DN20: encapsulation "m" (field coils) and increased safety "e" (field coil wiring) or
DN25 - DN150: flameproof enclosure "d" (field coils and field coil wiring) or
DN25 - DN300: powder filling "q" (field coils) and increased safety "e" (field coil wiring) or
DN200 - DN3000: increased safety "e" (field coils and field coil wiring).

The terminal compartment is in type of protection increased safety "e".

The electrodes are in type of protection intrinsic safety "i".

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

The relation between temperature class, maximum surface temperature, maximum process temperature and ambient temperature is shown in the following tables:

Primary head in type of protection "me" (DN10-20) and in type of protection "qe" (DN200-300)

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6	75 °C	70 °C	70 °C
T5	95 °C	90 °C	75 °C
T4	130 °C	115 °C	75 °C
T3	150 °C	115 °C	75 °C

Primary head in type of protection "d" (DN25-150)

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6	70 °C	70 °C	70 °C
T5	85 °C	85 °C	85 °C
T4	120 °C	120 °C	120 °C
T3	180 °C	180 °C	180 °C

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Primary head in type of protection "qe" (DN25-150)

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T5 T4 T3	60 °C 110 °C 180 °C	55 °C 105 °C 180 °C	not possible 100 °C 180 °C

Primary head in type of protection "e" (DN200-3000)

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6 T5 T4 T3 T3 *	60 °C 80 °C 115 °C 160 °C 130 °C	60 °C 75 °C 115 °C 150 °C 130 °C	60 °C 75 °C 115 °C 140 °C 130 °C

*) for some versions the process temperature for T3 is restricted to 130 °C.

The maximum surface temperature T based on a maximum ambient temperature of 60 °C is 85 °C or the process temperature whichever is higher.

The degree of protection of the apparatus enclosure is IP64 according to EN 60529.

Electrical data

Field coil circuit ..... (terminals 7, 8, 9)
U ≤ 40 V (pulsed)
I ≤ 125 mA (fuse protected)

Electrodes circuit ..... (terminals 1, 2, 20, 3, 30, 4, 40)
in type of protection intrinsic safety EEx ia IIC, only for connection to a certified intrinsically safe circuit with the following maximum values:

U_i = 20 V
I_i = 175 mA
C_i = 0 nF
L_i = 0 mH

The aforementioned intrinsically safe circuits shall, from the safety point of view, be considered to be connected to ground.

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Installation instructions

When used in a potentially explosive atmosphere, requiring the use of apparatus of equipment category 2G, certified cable entry devices shall be used that are suitable for the application and correctly installed.
When used in a potentially explosive atmosphere, requiring the use of apparatus of equipment category 2D, certified cable entry devices with a degree of protection of at least IP6X according to EN 60529 shall be used that are suitable for the application and correctly installed.
Unused openings shall be closed with suitable certified closing elements.

Routine tests

An overpressure test according to EN 50018 clause 16 must be carried out on each primary head in type of protection flameproof enclosure "d" at a test pressure of 14 bar during at least 10 seconds.

An electric strength test of the filling material of the primary heads with the field coils in type of protection powder filling "q" according to EN 50017 clause 13.2 shall be applied.

Electric strength tests according to EN 50019 Clause 6.1 shall be applied during one minute without breakdown as follows:
- On each terminal compartment with 500 V between the field coil circuit and the enclosure and with 1500 V between the field coil circuit and the intrinsically safe sensor circuit.
- On each primary head with field coil wiring in type of protection increased safety "e" (all sizes except DN25 - DN150) with 500 V between the field coils circuit and the enclosure and with 1500 V between the field coils circuit and the intrinsically safe sensor circuit.

Routine tests according to EN 50028 must be carried out on the primary heads with field coils in type of protection encapsulation "m" (sizes DN10 - DN20) as follows:
- Clause 7.1: Visual check;
- Clause 7.2: Each primary head shall withstand a test voltage of 1500 V during one minute without breakdown between the field coils circuit and the enclosure and between the field coils circuit and the intrinsically safe sensor circuit;
- Clause 7.3: Check of the electrical data.

(16) **Test Report**

KEMA No. 2113920-2.

(17) **Special conditions for safe use**

The relation between temperature class, maximum surface temperature, maximum process temperature and ambient temperature is as shown above in description (15).

A heat resistant cable with a continuous operating temperature of at least 85 °C must be used at the primary heads:
- with the field coils in type of protection powder filling "q" of sizes DN25 - DN150 or flameproof enclosure "d" when 40 °C < Ta ≤ 50 °C and process temperature ≥ 155 °C or Ta > 50 °C and process temperature ≥ 105 °C.
- with the field coils in type of protection increased safety "e" when 40 °C < Ta ≤ 50 °C and process temperature ≥ 145 °C or Ta > 50 °C and process temperature ≥ 110 °C.

The field coils in type of protection "q" and "m" must be protected by a 160 mA fuse. The breaking capacity of the fuse must be in accordance with the prospective short circuit current of the supply.

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(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 2113920-2.