

(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 08ATEX0072 X** Issue Number: 1
- (4) Equipment: **Compact Electro Magnetic Flowmeter Series VersaFlow Mag 1000 C and Mag 4000 C**
- (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 2113920-3.
- (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 | EN 50284 : 1999 | |
- (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 (1) GD or II 2 GD

**EEx d [ia] IIC or EEx de [ia] IIC or
EEx dme [ia] IIC or EEx dqe [ia] IIC
T6 ... T3 or T5 ... T3
T 85 °C ... T 150 °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

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 08ATEX0072 X** Issue No. 1

(15) **Description**

The Compact Electro Magnetic Flowmeter, series VersaFlow Mag 1000 C and Mag 4000 C is used for measuring, counting and displaying the linear flow of an electrically conductive liquid. The flowmeter consists of a primary head and an aluminium or stainless steel signal converter housing, with an electronics unit and a terminal compartment.

Depending on the electronics unit used, several signal output options like a 4 - 20 mA current signal, a fieldbus connection, pulse and status signals are available.

The output signals are either intrinsically safe or non-intrinsically safe.

The terminal compartment for connection of the supply and signal circuits is in type of protection flameproof enclosure "d" or increased safety "e", depending on the type of protection of the installed cable entry device.

The type of protection for the various sizes of integral 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 electrodes are in type of protection intrinsic safety "i".

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

Process temperature range -40 °C to +150 °C.

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

Primary head in type of protection "me" (DN10-20)

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6	70 °C	60 °C	Not possible
T5	95 °C	85 °C	60 °C
T4	130 °C	130 °C	60 °C
T3	150 °C	150 (140*) °C	60 °C

* Reduced maximum temperatures for versions with stainless steel converter housing

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	80 °C	80 °C	80 (60*) °C
T5	95 °C	95 °C	80 (60*) °C
T4	130 °C	130 °C	80 (60*) °C
T3	150 °C	150 (140*) °C	80 (60*) °C

* Reduced maximum temperatures for versions with stainless steel converter housing



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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	50 °C	not possible	not possible
T4	100 °C	95 °C	80 (60*) °C
T3	150 °C	150 (140*) °C	80 (60*) °C

* Reduced maximum temperatures for versions with stainless steel converter housing

Primary head in type of protection "qe" (DN200-300) and 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	80 °C	80 °C	75 (60*) °C
T5	95 °C	95 °C	80 (60*) °C
T4	130 °C	130 °C	80 (60*) °C
T3	150 °C	150 (140*) °C	80 (60*) °C
T3**	130 °C	130 °C	80 (60*) °C

* Reduced maximum temperatures for versions with stainless steel converter housing

** 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

Power supply 100 - 230 Vac -15/+10 %, 22 VA
 (terminals L, N or L+, L-) 12 - 24 Vdc -25/+30 %, 12 W
 24 Vac -15/+10 %, 22 VA
 24 Vdc -25/+30 %, 12 W
 U_m = 253 V

Intrinsically safe I/O signal circuits

In type of protection intrinsic safety EEx ia IIC, only for connection to a certified intrinsically safe circuit, with the maximum values per circuit per table below:

Type of PCB	Type of I/O circuit (terminals)	U _o [V]	I _o [mA]	P _o [W]	C _o [nF]	L _o [mH]
Ex i IO	4 - 20 mA with HART active (C and C-)	21	90	0,5 note 1	90	2,0
					110	0,5
Ex i Option	4 - 20 mA active (A and A-)	21	90	0,5 note 1	90	2,0
					110	0,5

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Type of PCB	Type of I/O circuit (terminals)	U _i [V]	I _i [mA]	P _i [W]	C _i [nF]	L _i [μH]
Ex i IO	4 - 20 mA with HART passive (C and C-)	30	100	1,0	10	0
	pulse/status output (D and D-)					
Ex i Option	4 - 20 mA passive (A and A-)	30	100	1,0	10	0
	pulse/status output / control input (B and B-)					
Fieldbus IO note 2	Profibus-PA (C, C-, D and D-)	24	380	5,32	5	10
	Foundation Fieldbus (C, C-, D and D-)					

note 1: linear characteristic
 note 2: the fieldbus circuit complies with the FISCO model according to IEC 60079-27.

Non-intrinsically safe I/O signal circuits
 (terminals A, A-, A+, B, B-, C, C-, D and D-) $U_n \leq 32 \text{ Vdc}$, $I_n \leq 100 \text{ mA}$

Electrode circuits in type of protection intrinsic safety EEx ia IIC
 (internal circuits)

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.

With the use of conduit, a suitable certified sealing device such as a stopping box with setting compound shall be provided immediately at the entrance to the flameproof enclosure.

To avoid voltage and current addition the intrinsically safe circuits shall be separated and wired according to EN 60079-14.

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Routine tests

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.

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.

Routine tests according to EN 50018 are not required for the signal converter housing since the overpressure test has been carried out at four times the reference pressure.

Electric strength tests according to EN 50019 Clause 6.1 shall be applied during one minute without breakdown as follows:

- On each terminal compartment in type of protection increased safety "e" with 1500 V between the power supply circuit and the enclosure and with 500 V between the signal in- and output circuits and the enclosure.
- 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. 2113920-3.

(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).

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 2113920-3.