(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 09ATEX0045 X** Issue Number: **1**

(4) Equipment: **Compact Electro Magnetic Flowmeter Series VersaFlow Mag 2000 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 212419200/2.

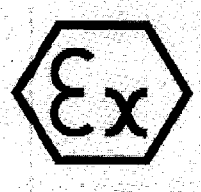
(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 + A1, A2	**EN 50018 : 2000 +A1**	**EN 50019 : 2000**
EN 50020 : 2002	**EN 50028 : 1987**	**EN 50281-1-1 : 1998 + A1**
EN 50284 : 1999	**EN 60079-0 : 2004**	**EN 60079-18 : 2004**

(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 T6...T3** or **EEx de [ia] IIC T6...T3** or **EEx dme [ia] IIC T6...T3 T85 °C ... T150 °C**	(series without flange)
II 2(1) GD or **II 2 GD**	**EEx d e [ia] mb IIC T6...T3 T85 °C ... T150 °C**	(series with flange)

This certificate is issued on June 23, 2009 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.

H.J.G. de Wild
Certification Manager

PRODUCTS RvAC 001

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(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 09ATEX0045 X** Issue No. **1**

(15) **Description**

The Compact Electro Magnetic Flowmeter, series VersaFlow Mag 2000 C is used for measuring, counting and displaying the linear flow of an electrically conductive liquid.
The flowmeter consists of a primary head and a 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 not 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 degree of protection of the apparatus housing is at least IP64 according to EN 60529.

Compact Electro Magnetic Flowmeter Series without Flange

The primary heads sizes DN2.5 - D15 are in type of protection encapsulation "m" (field coils) and increased safety "e" (field coil wiring).
The primary heads sizes DN25 - DN100 are in type of protection flameproof enclosure "d" (field coils and field coil wiring).

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

Ambient temperature range:	sizes DN2.5 - DN15:	-20 °C to +60 °C
	sizes DN25 - DN100:	-40 °C to +60 °C
Process temperature range:	sizes DN2.5 - DN15:	-20 °C to +150 °C
	sizes DN25 - DN100:	-40 °C to +150 °C

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

Temperature class	Max. process temperature		
	Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6	60 °C	55 °C	not possible
T5	75 °C	75 °C	70 °C
T4	115 °C	115 °C	75 °C
T3	150 °C	135 °C	75 °C

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

Compact Electro Magnetic Flowmeter Series with Flange

The Compact Electro Magnetic Flow Meter series VersaFlow Mag 2000 C sizes DN15, DN25, DN40, DN50, DN80 and DN100 is manufactured with stainless- or carbon steel flanges, welded to the coil housing and with ceramic tubing encased.

The type and level of protection of the flowtube for all sizes is encapsulation "mb".

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Ambient temperature range for all sizes of the VersaFlow with flanges: -40 °C to +60 °C.

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

Temperature class	Max. surface temperature	Max. process temperature		
		Ta ≤ 40 °C	40 °C < Ta ≤ 50 °C	50 °C < Ta ≤ 60 °C
T6	T85 °C	80 °C	80 °C	60 °C
T5	T100 °C	95 °C	95 °C	60 °C
T4	T135 °C	130 °C	130 °C	60 °C
T3	T150 °C	150 °C	145 °C	60 °C

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

Electrical data

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

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

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.

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

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 ingress protecton 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.

Routine tests

Compact Electro Magnetic Flowmeter Series without Flange

An overpressure test according to EN 50018 clause 16 must be carried out on each primary head in type of protection flameproof enclosure "d" (sizes DN25 - DN100) at a test pressure of 22,5 bar during at least 10 seconds.

Routine tests according to EN 50018 are not required for the signal converter housing since the

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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 leads in type of protection increased safety "e" (sizes DN2.5 - DN15) 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 DN2.5 - DN15) 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.

Compact Electro Magnetic Flowmeter Series with Flange

Electric strength tests according to EN 50019 Clause 6.1 shall be applied during at least two seconds without breakdown as follows:
- On each terminal compartment with 500 V_{rms} between the I/O signal circuit and the enclosure and with 2110 V_{rms} between the power supply circuit and the enclosure.

Alternatively dc test voltages, 1,4 times the specified ac voltage levels, may be used.

Routine tests according to EN 60079-18 must be carried out on the Compact Electromagnetic Flow Meter with field coils in type of protection encapsulation "m" as follows:
- Clause 9.1: Visual check;
- Clause 9.2: Each primary head shall withstand a test voltage of 500 V_{rms} during at least one second without breakdown between the field coils circuit and the enclosure and with a test voltage of 1500 V_{rms} during at least one minute between the field coils circuit and the intrinsically safe electrode circuit.

(16) **Test Report**

KEMA No. 212419200/2.

(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)

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 212419200/2.