

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: **KIWA 14ATEX0016 X Issue: 1**

4 Equipment: **Vortex Flow Meter Series OPTISWIRL 4200 ... Ex**

5 Manufacturer: **KROHNE Messtechnik GmbH**

6 Address: **Ludwig-Krohne-Straße 5, 47058 Duisburg
Germany**

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

8 Kiwa Nederland B.V., notified body number 0620 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 ATEX Assessment Report No. 141100404.

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

EN 60079-0 : 2012 + A11 EN 60079-1 : 2014 EN 60079-7 : 2007
EN 60079-11 : 2012 EN 60079-31 : 2014

10 If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to specific conditions of 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. 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 G Ex db ia IIC T6...T2 Gb or
Ex db eb ia IIC T6...T2 Gb (Optiswirl 4200 C)
- II 2 G Ex db [ia] IIC T6 Gb or Ex db eb [ia] IIC T6 Gb
(VFC 200 F)
- II 2 G Ex ia IIC T6...T2 Gb (Optiswirl 4000 F)
- II 2 D Ex tb ia IIIC T70 °C...T240 °C Db (Optiswirl 4200 C)
- II 2 D Ex tb [ia] IIIC T70 °C Db (VFC 200 F)
- II 2 D Ex ia IIIC T70 °C...T240 °C Db (Optiswirl 4000 F)



Kiwa Nederland B.V.

Issue date:

First issue:

9 February 2016


Pieter van Breugel

Certification Officer

© Integral publication of this certificate in its entirety and without any change is allowed.

Kiwa Nederland B.V.
Unit Kiwa ExVision
Wilmersdorf 50
P.O. Box 137
7300 AC Apeldoorn
The Netherlands

Tel. +31 55 539 34 93
Fax +31 55 539 36 85
ExVision@kiwa.nl
www.kiwaexvision.com

13 SCHEDULE

14 to EC-Type Examination Certificate KIWA 14ATEX0016 X Issue No. 1

15.1 Description

Vortex Flow Meters model OPTISWIRL 4200 C .. Ex (compact versions with integral sensor) and model OPTISWIRL 4200 F .. Ex (versions with separate sensor assembly) are used to convert the measurement signal of a vortex sensor into an electrical signal. The different I/O options are described in 15.2, electrical data.

For EPL Gb the signal converter enclosure is in type of protection flameproof enclosures “d” with a terminal compartment in type of protection flameproof enclosures “d” or increased safety “e”, depending on the type of protection of the installed cable entry device. The sensors are in type of protection intrinsic safety “i”.

For EPL Db the signal converter enclosure is in type of protection by enclosures “t”. The flow sensors are in type of protection intrinsic safety “i”.

Flow Meters OPTISWIRL 4200 C .. Ex consist of a signal converter and an integral sensor.
Flow Meters OPTISWIRL 4200 F .. Ex consist of a signal converter model VFC 200 F .. 020 Ex and a separate sensor assembly model OPTISWIRL 4000 F.
The integral sensor and the separate sensor assemblies are available in different sizes (DN15 - DN300).

The Flow Meter can be provided with an indicator for local read-out and control.

The temperature class in relation to the maximum ambient temperature, the maximum process temperature and the sensor size, also depending on the mounting position of the transmitter or terminal enclosure with respect to the sensor, is listed in the following tables:

OPTISWIRL 4200 C .. Ex and OPTISWIRL 4000 F with transmitter enclosure respectively terminal enclosure on top of the sensor:

Temperature class	T6		T5		T4		T3			T2		
	T ambient [°C]	60	65	60	65	60	65	40	60	65	40	60
Sensor size	Maximum process temperature [°C]											
DN15-DN25	80	65	100	100	135	135)	200	200)	165)	240	200)	165)
DN40-DN 50	80	65	100	100	135	135)	200	175)	150)	240	175)	150)
DN60-DN100	80	65	100	100)	135)	130)	200	150)	130)	235)	150)	130)
DN100-DN300	75	65	100	100	135	135)	200	185)	155)	240	185)	155)

*) : Heat resistant cables and cable glands suitable for at least 80 °C shall be used.

13 **SCHEDULE**

14 **to EC-Type Examination Certificate KIWA 14ATEX0016 X Issue No. 1**

OPTISWIRL 4200 C .. Ex and OPTISWIRL 4000 F with transmitter enclosure respectively terminal enclosure at the side of or underneath the sensor:

Temperature class	T6		T5		T4		T3			T2		
Tamb [°C]	60	65	60	65	60	65	40	60	65	40	60	65
Sensor size	Maximum process temperature [°C]											
DN15-DN25	85	65	100	100	135	135	200	200	200 ^{*)}	240	240	240 ^{*)}
DN40-DN 50	80	65	100	100	135	135	200	200	200 ^{*)}	240	240	240 ^{*)}
DN60-DN100	85	65	100	100	135	135 ^{*)}	200	200 ^{*)}	200 ^{*)}	240	240 ^{*)}	240 ^{*)}
DN100-DN300	80	65	100	100	135	135	200	200	200 ^{*)}	240	240	240 ^{*)}

^{*)}: Heat resistant cables and cable glands suitable for at least 80 °C shall be used.

OPTISWIRL 4200 C .. Ex and OPTISWIRL 4000 F with painted transmitter enclosure respectively painted terminal enclosure on top of the painted sensor:

Temperature class	T6		T5		T4		T3			T2		
Tamb [°C]	60	65	60	65	60	65	40	60	65	40	60	65
Sensor size	Maximum process temperature [°C]											
DN15-DN25	70	65	100	95 ^{*)}	120 ^{*)}	115 ^{*)}	120	120 ^{*)}	115 ^{*)}	120	120 ^{*)}	115 ^{*)}
DN40-DN 50	70	65	100	95 ^{*)}	115 ^{*)}	105 ^{*)}	120	115 ^{*)}	105 ^{*)}	120	115 ^{*)}	105 ^{*)}
DN60-DN100	70	65	100	90 ^{*)}	105 ^{*)}	95 ^{*)}	120	105 ^{*)}	95 ^{*)}	120	105 ^{*)}	95 ^{*)}
DN100-DN300	65	65	95	90 ^{*)}	120 ^{*)}	110 ^{*)}	120	120 ^{*)}	110 ^{*)}	120	120 ^{*)}	110 ^{*)}

^{*)}: Heat resistant cables and cable glands suitable for at least 80 °C shall be used.

OPTISWIRL 4200 C .. Ex and OPTISWIRL 4000 F with painted transmitter enclosure respectively painted terminal enclosure at the side of or underneath the painted sensor:

Temperature class	T6		T5		T4		T3			T2		
Tamb [°C]	60	65	60	65	60	65	40	60	65	40	60	65
Sensor size	Maximum process temperature [°C]											
DN15-DN25	65	65	95	90	120	120 ^{*)}	120	120	120 ^{*)}	120	120	120 ^{*)}
DN40-DN 50	65	65	85	80	120	120 ^{*)}	120	120	120 ^{*)}	120	120	120 ^{*)}
DN60-DN100	65	65	95	90 ^{*)}	120 ^{*)}	120 ^{*)}	120	120	120 ^{*)}	120	120	120 ^{*)}
DN100-DN300	65	65	85	85	120	120 ^{*)}	120	120	120 ^{*)}	120	120	120 ^{*)}

^{*)}: Heat resistant cables and cable glands suitable for at least 80 °C shall be used.

13 SCHEDULE

14 to EC-Type Examination Certificate KIWA 14ATEX0016 X Issue No. 1

The minimum ambient temperature is -40 °C; the minimum process temperature is -40 °C.

The degree of protection of the signal converter enclosure is IP66/IP67 in accordance with EN 60529.

15.2 Electrical data

OPTISWIRL 4200 C .. Ex and VFC 200 F ..020 Ex

Supply/output circuit, current 4 - 20 mA with HART communication (terminals C1 and C2):

$U_n = 12 - 32 \text{ V}$;

$I_n = 4 - 20 \text{ mA}$.

For all versions, $U_m = 250 \text{ V}$

Binary output, open collector, pnp-output (terminals M1 and M2, M4):

$U_n = 8 - 32 \text{ V}$;

$I_n \leq 100 \text{ mA}$;

or NAMUR (terminals M3 and M2, M4):

$U_n = 8 \text{ V}$;

$I_n \leq 1 \text{ or } \geq 3 \text{ mA}$.

Input circuit, current 0 - 20 mA (terminals I1 and I2):

$U_n = 9 - 32 \text{ V}$;

$I_n = 0 - 20 \text{ mA}$.

OPTISWIRL 4200 C FF Ex, OPTISWIRL 4200 C PA Ex, VFC 200 F FF020 Ex and VFC 200 F PA020 Ex

Fieldbus circuit, Fieldbus Foundation respectively Profibus PA (terminals D/D- and C/C-):

$U_n = 9 - 32 \text{ V}$;

$I_n = 20 \text{ mA}$.

OPTISWIRL 4200 C .. Ex

Sensor circuit (internal circuit):

in type of protection intrinsic safety Ex ia IIC

OPTISWIRL VFC 200 F ..020 Ex

Sensor circuit (terminals 1 to 7 (colour coded)):

in type of protection intrinsic safety Ex ia IIC, with following maximum values:

$U_o = 6,65 \text{ V}$; $I_o = 1107 \text{ mA}$; $P_o = 650 \text{ mW}$; $C_o = 2,5 \mu\text{F}$; $L_o = 73 \mu\text{H}$.

The sensor circuit is connected to earth.

OPTISWIRL 4000 F

Sensor circuit (terminals 1 to 7 (colour coded)):

in type of protection intrinsic safety Ex ia IIC, only for connection to Signal converter VFC 200 F ..020-Ex, with following maximum values:

$U_i = 7 \text{ V}$; $I_i = 1107 \text{ mA}$; $P_i = 650 \text{ mW}$; C_i and L_i are negligibly small.

13 **SCHEDULE**

14 **to EC-Type Examination Certificate KIWA 14ATEX0016 X Issue No. 1**

15.3 **Instructions**

The instructions provided with the equipment shall be followed in detail to assure safe operation.

16 **ATEX Assessment Report**

No. 141100404.

17 **Specific conditions of use**

- The flameproof joints are not intended to be repaired;
- Electrostatic discharge of the painted enclosure and sensor parts shall be prevented by suitable measures.
- For thermal and electrical data, refer to section 15.

18 **Essential Health and Safety Requirements**

All relevant Essential Health and Safety Requirements are covered by the standards listed at section 9.

19 **Test documentation**

As listed in ATEX Assessment Report No. 141100404.