



EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**



(3) EC-type-examination Certificate Number:

PTB 03 ATEX 2235

(4) Equipment: Displacement measuring chain, type DS-....., EC-....., OD-.....

(5) Manufacturer: Brüel & Kjaer Vibro GmbH

(6) Address: Leydheckerstr. 10, 64293 Darmstadt, Germany

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

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 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 the confidential report PTB Ex 03-23379 .

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

EN 50014:1997 + A1 + A2

EN 50020:2002

EN 50284:1999

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.

This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance 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.

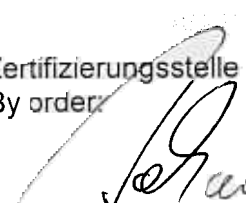
The marking of the equipment shall include the following:

 II 1/2 G EEx ia IIC T5/T4

Zertifizierungsstelle Explosionsschutz

Braunschweig, December 11, 2003

By order:


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



SCHEDULE

EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

15) Description of equipment

The displacement measuring chain, type DS-..., EC-..., OD-... consists of an eddy-current sensor, type DS-..., an extension cable, type EC-... and an oscillator, type OD-... and is intended for electrical measurements of oscillations, displacements and elongations of rotating elements (compressor shafts, centrifuges, turbines, ...).

The apparatus is installed inside the hazardous area.

Category-1/2-apparatus

The eddy-current sensor, type DS-... is installed in hazardous areas for category-1-apparatus.

The cable of the sensor, type DS-... or the extension cable, type EC-... is led through a partition separating areas where apparatus of category 2 or 1 are required.

The oscillator, type OD-... is installed in hazardous areas requiring category-2-apparatus.

Category-2-apparatus

The displacement measuring chain, type DS-... , EC-... , OD-... is installed in hazardous areas for category-2-apparatus.

For relationship between equipment category, temperature class and the permissible ranges of the ambient temperature of the sensor and the oscillator, reference is made to the following tables:

Category-1/2-Apparatus

temperature class	sensor	oscillator
T5	-20 ... +80 °C	-20 ... +80 °C
T4	-20 ... +95 °C	-20 ... +100 °C

For applications requiring category-1-apparatus, the process pressure of the media shall range from 0.8 to 1.1 bar. In case of a deviation from these operating conditions at the sensor, it is to be considered, that the temperature rise of the sensor does not exceed 3 K and that the owner is responsible for the safe operation of the system as regards pressures/temperatures of the media used.

Category-2-Apparatus

temperature class	sensor	oscillator
T5	-20 ... +80 °C	-20 ... +80 °C
T4	-20 ... +100 °C	-20 ... +100 °C

Electrical data

Voltage supply type of protection Intrinsic Safety EEx ia IIC
For connection to a certified intrinsically safe circuit only.

Maximum values:

$$U_i = 28 \text{ V}$$

$$I_i = 105 \text{ mA}$$

$$P_i = 735 \text{ mW}$$

$$C_i = 19.4 \text{ nF}$$

$$L_i = 0.6 \text{ mH}$$

(16) Test report PTB Ex 03-23379

(17) Special conditions for safe use

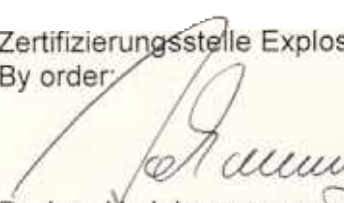
none

(18) Essential health and safety requirements

met by compliance with the standards mentioned above

Zertifizierungsstelle Explosionsschutz

By order:


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, December 11, 2003

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

(Translation)

Equipment: Displacement measuring chain, type DS-....., EC-....., OD-.....

Marking:  II 1/2 G EEx ia IIC T5/T4

Manufacturer: Brüel & Kjaer Vibro GmbH

Address: Leydheckerstr. 10, 64293 Darmstadt, Germany

Description of supplements and modifications


The displacement measuring chain, type DS-....., EC-....., OD-..... may in future also be manufactured in accordance with the test documents listed in the test report. The modifications concern the circuitry and the layout of the PCB.

The electrical data and all other specifications apply without changes also for this 1st supplement.

Test report: PTB Ex 04-24266

Zertifizierungsstelle Explosionsschutz

By order:


Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



Braunschweig, August 20, 2004

2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

(Translation)

Equipment: Displacement measuring chain, type DS-....., EC-....., OD-.....

Marking:  II 1/2 G Ex ia IIC T5/T4 or II 2 D Ex iaD 21 T100 °C

Manufacturer: Brüel & Kjaer Vibro GmbH

Address: Leydheckerstr. 10, 64293 Darmstadt, Germany

Description of supplements and modifications

In the future the displacement measuring chain, type DS-....., EC-....., OD-..... may also be manufactured according to the test documents listed in the test report.

The equipment has been examined with respect to the requirements of the standards cited.

The electrical data, the notes for manufacture and operation and all other specifications of the EC-type examination certificate apply without changes.

Applied standards

EN 60079-0:2006

EN 60079-11:2007

EN 60079-26:2004

EN 61241-0:2006

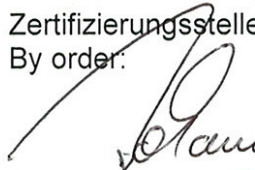
EN 61241-11:2006

Test report: PTB Ex 08-28127

Zertifizierungsstelle Explosionsschutz

By order:

Braunschweig, September 2, 2008



Dr.-Ing. U. Johannsmeyer

Direktor und Professor


Sheet 1/1

3. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

(Translation)

Equipment: Displacement measuring chain, type DS-....., EC-....., OD-.....

Marking:  II 1/2 G Ex ia IIC T6 Ga/Gb and II 2 D Ex ia IIIC T190 °C Db IP65

Manufacturer: Brüel & Kjær Vibro GmbH

Address: Leydheckerstr. 10, 64293 Darmstadt, Germany

Description of supplements and modifications

In the future the displacement measuring chain, type DS-....., EC-....., OD-..... may also be manufactured according to the test documents listed in the test report.

The modifications concern the internal and external construction as well as the thermal and electrical data. All other specifications of the EC-type examination certificate apply without changes and are represented in summary.

Category-1/2-apparatus

The displacement measuring chain, type DS-....., EC-....., OD-..... is installed in hazardous areas for category-1-apparatus.

The cable of the sensor, type DS-... or the extension cable, type EC-... is led through a partition separating areas from each other where apparatus of category 2 or 1 are required.

The oscillator, type OD-... is installed in hazardous areas requiring category-2-apparatus.

For relationship between equipment category, temperature class and the permissible ranges of the ambient temperature or surface temperature of the sensor and the oscillator, reference is made to the following table:

Normal.dotm

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

Temperature class	Permissible range of the ambient temperature Category-1/2 G-equipment		Permissible range of the surface temperature Category-2 D-equipment	
	Sensor / extension cable	Oscillator	Sensor / extension cable	Oscillator
T6	-20 ... 58 °C	-20 ... 65 °C	65 °C	85 °C
T5	-20 ... 70 °C	-20 ... 80 °C	77 °C	100 °C
T4	-20 ... 98 °C	-20 ... 85 °C	105 °C	105 °C
T3	-20 ... 150 °C	-20 ... 85 °C	160 °C	105 °C
T2, T1	-20 ... 180 °C	-20 ... 85 °C	190 °C	105 °C

For applications requiring category-1-apparatus, the process pressure of the media shall range from 0.8 to 1.1 bar. In case of a deviation from these operating conditions at the sensor, it is to be considered, that the temperature rise on the surface of the sensor (even in case of failure) does not exceed 15 K and that the operating company is responsible for the safe operation of the system as regards pressures/temperatures of the media used.

Category-2-apparatus

The displacement measuring chain, type DS-..., EC-..., OD-... is installed in hazardous areas for category-2-apparatus.

For relationship between equipment category, temperature class and the permissible ranges of the ambient temperature or surface temperature of the sensor and the oscillator, reference is made to the following table:

Temperature class	Permissible range of the ambient temperature Category-2 G-equipment		Permissible range of the surface temperature Category-2 D-equipment	
	Sensor / extension cable	Oscillator	Sensor / extension cable	Oscillator
T6	-20 ... 73 °C	-20 ... 65 °C	80 °C	85 °C
T5	-20 ... 88 °C	-20 ... 80 °C	95 °C	100 °C
T4	-20 ... 123 °C	-20 ... 85 °C	130 °C	105 °C
T3, T2, T1	-20 ... 180 °C	-20 ... 85 °C	190 °C	105 °C

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 03 ATEX 2235

Electrical data

Voltage supply type of protection Intrinsic Safety Ex ia IIC
 Only for connection to a certified intrinsically safe circuit

Maximum values:

$U_i = 28 \text{ V}$
 $I_i = 105 \text{ mA}$
 $P_i = 735 \text{ mW}$
 $L_i = 0.6 \text{ mH}$
 $C_i = 19.4 \text{ nF}$

Applied standards

EN 60079-0:2009 EN 60079-11:2007 EN 60079-26:2007 EN 61241-11:2006

Test report: PTB Ex 12-21086

Zertifizierungssektor Explosionschutz
 On behalf of PTB:

Braunschweig, March 16, 2012

U. Johannsmeyer
 Dr.-Ing. U. Johannsmeyer
 Direktor und Professor

