

420-0004-356		Sht. of	1 5	APP'D BY	SGA
ISSUE	EDO NO.	APP'D	DATE		
3	2-10-108	TIP	2/17/10		
4	11-11-102	JHP	11/15/11		

(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 07ATEX0068 X** Issue Number: **4**

(4) Equipment: **Radar Level Instrument**
Type DR7000***1*******
Type DR6300***1*******

(5) Manufacturer: **AMETEK Drexelbrook**

(6) Address: **205 Keith Valley Road, Horsham, PA 19044, 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 213466300/1.

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

EN 60079-0 : 2006 EN 60079-1 : 2007 EN 61241-0 : 2006 EN 61241-1 : 2004
EN 60079-11 : 2007 EN 60079-26 : 2007 EN 61241-11 : 2006 EN 60079-27 : 2008

(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 1 G or II 1/2 G or II 2 G Ex ia IIC or Ex ia IIB or Ex ia IIA T6 ... T3
 II 1 D or II 1/2 D or II 2 D Ex iaD 20 or Ex iaD 20/21 or Ex iaD 21 IP6X T70 °C ... T95 °C
 or
 II 1/2 G or II 2 G Ex d[ia] IIC or Ex d[ia] IIB or Ex d[ia] IIA T6 ... T3
 II 1/2 D or II 2 D Ex tD[iaD] A21/20 or Ex tD[iaD] A21 IP6X T70 °C ... T95 °C

This certificate is issued on October 20, 2010 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.

 C.G. van Es
 Certification Manager

Page 1/5

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(13) **SCHEDULE**

(14) to EC-Type Examination Certificate KEMA 07ATEX0068 X Issue No. 4

(15) **Description**

The Radar Level Instrument Type DR7000*****1***** and Type DR6300*****1***** are used for continuous level measurement of flammable or non-flammable liquids or solid particles, granulates or powders within storage or process tanks or in a stilling well. The distance between the antenna and the surface of the process medium is measured using frequency modulated continuous wave radar. The 2-wire Radar Level Instrument is loop powered. The output signal is a 4 - 20 mA current signal with digital communication (HART protocol).

Either the Radar Level Instrument is completely in type of protection intrinsic safety "i" or the Radar Level Instrument is provided with the power supply compartment in type of protection flameproof enclosures "d". In the latter version a zener barrier circuit board is integrated in the power supply module.

Optionally, the Radar Level Instrument may be provided with a second 4 - 20 mA current output or with a communication module, for connection of the instrument to a Fieldbus system (Profibus PA or Foundation Fieldbus), as well as with display and adjustment capabilities (HMI option).

The enclosure provides a degree of protection of at least IP6X as per EN 60529.

The ambient temperature range and the flange temperature range, depending on the equipment category, are as listed in the following table:

Equipment category	Ambient temperature range	Flange temperature range
II 1 G	-20 °C ... +60 °C	-20 °C ... +60 °C
II 1/2 G	-40 °C ... +85 °C	-20 °C ... +60 °C
II 2 G	-40 °C ... +85 °C	-40 °C ¹⁾ ... +200 °C
II 1 D, II 1/2 D, II 2 D	-40 °C ... +85 °C	-40 °C ¹⁾ ... +200 °C

¹⁾ A flange temperature ≥ -50 °C is allowed if EPDM gaskets are used.

The temperature class and the maximum surface temperature of the electronics enclosure "T", depending on the ambient temperature and the flange temperature is for the different equipment types as listed in the following tables:

Max. ambient temperature			Max. flange temperature	Surface temperature "T"
Hygienic antennas	Drop and horn antennas	Drop and horn antennas with distance piece		
60 °C			60 °C	67 °C
75 °C			75 °C	82 °C
85 °C			85 °C	92 °C
67 °C	59 °C	62 °C	150 °C	≤ 90 °C
Not allowed	Not allowed	57 °C	200 °C	

(13) **SCHEDULE**

(14) to EC-Type Examination Certificate KEMA 07ATEX0068 X Issue No. 4

Equip. category	Max. ambient temperature ¹⁾						Max. flange temp. ²⁾	Temp. class
	Hygienic antennas		Drop and horn antennas		Drop and horn antennas with distance piece			
	4-20mA	PA-FF	4-20mA	PA-FF	4-20mA	PA-FF		
II 1 G	57 °C	50 °C	57 °C	50 °C	57 °C	50 °C	60 °C	T6
II 1/2 G	57 °C	50 °C	57 °C	50 °C	57 °C	50 °C	60 °C	T6
	72 °C		72 °C		72 °C		60 °C	T5
	80 °C		80 °C		80 °C		60 °C	T4
II 2 G	57 °C	50 °C	57 °C	50 °C	57 °C	50 °C	60 °C	T6
	50 °C	45 °C	47 °C	42 °C	51 °C	45 °C	85 °C	
	72 °C		72 °C		72 °C		75 °C	T5
	65 °C		62 °C		66 °C		100 °C	
	80 °C		80 °C		80 °C		85 °C	
	76 °C		74 °C		79 °C		100 °C	T4
	73 °C		70 °C		74 °C		110 °C	
	66 °C		60 °C		68 °C		135 °C	
	62 °C		54 °C		64 °C		150 °C	T3
	Not allowed		Not allowed		57 °C		180 °C	
Not allowed		Not allowed		52 °C		200 °C		

¹⁾ Permitted temperature range of the antenna must be observed (see instructions).

²⁾ Permitted core and gasket temperature ranges must be observed (see instructions).

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 07ATEX0068 X** Issue No. 4

Electrical data

Apparatus in type of protection intrinsic safety "i" for the 4-20 mA version

Supply and output circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
 $U_i = 30 \text{ V}$; $I_i = 300 \text{ mA}$; $P_i = 1 \text{ W}$; $C_i = 30 \text{ nF}$; $L_i = 200 \text{ }\mu\text{H}$.

Output circuit (terminals output 2, + and -):
in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
 $U_i = 30 \text{ V}$; $I_i = 300 \text{ mA}$; $P_i = 1 \text{ W}$; $C_i = 30 \text{ nF}$; $L_i = 200 \text{ }\mu\text{H}$.

The optional second current output circuit is infallibly galvanically isolated from the supply and output circuit and from the earthed parts of the transmitter

Apparatus in type of protection intrinsic safety "i" with Fieldbus connection (PA/FF)

Supply circuit (terminals output 1, + and -):
in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
 $U_i = 30 \text{ V}$; $I_i = 300 \text{ mA}$; $P_i = 1 \text{ W}$; $C_i = 1,6 \text{ nF}$; $L_i = 0 \text{ }\mu\text{H}$.

Supply circuit (terminals output 2, + and -):
in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit or a circuit in accordance with FISCO, with the following maximum values:
 $U_i = 17,5 \text{ V}$; $I_i = 380 \text{ mA}$; $P_i = 5,32 \text{ W}$; $C_i = 3,8 \text{ nF}$; $L_i = 2,2 \text{ }\mu\text{H}$.

Apparatus in type of protection flameproof enclosures "d" for the 4-20 mA version

Supply circuit (terminals output 1, + and -):
Power supply max. 36 Vdc
Output 4 - 20 mA
Intrinsically safe circuits $U_m = 253 \text{ V}$

Supply circuit (terminals output 2, + and -):
Power supply max. 30 Vdc
Output 4 - 20 mA
Intrinsically safe circuits $U_m = 253 \text{ V}$

(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate KEMA 07ATEX0068 X** Issue No. 4

Installation instructions

Apparatus in type of protection intrinsic safety "i"

When the Radar Level Instrument is used in explosive atmospheres caused by air/dust mixtures, cable entry devices shall be used that provide a degree of protection of at least IP6X, that are suitable for the application and are correctly installed.

Apparatus in type of protection flameproof enclosures "d"

When used in a potentially explosive atmosphere, requiring the use of apparatus of equipment category 2 G, flameproof certified cable entry devices shall be used that are suitable for the application and correctly installed. 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.

When used in a potentially explosive atmosphere, requiring the use of apparatus of equipment category 2 D, certified cable entry devices shall be used that provide a degree of protection of at least IP6X, that are suitable for the application and are correctly installed.

Unused openings shall be closed with suitable certified blanking elements.

When the ambient temperature exceeds 70 °C, the cables, cable entry devices and blanking elements shall be suitable for at least 80 °C.

Routine tests

Routine tests according to Clause 16 of EN 60079-1 are not required since the type test has been made at a static pressure of four times the reference pressure.

(16) **Test Report**

KEMA No. 213466300/1.

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

For versions with an enclosure made of aluminium alloy, when used in a potentially explosive atmosphere requiring the use of apparatus of equipment category 1 G, the apparatus must be installed so, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.

The flamepath dimensions of the bushing are better than the values specified in EN 60079-1 (minimum length is 14,5 mm, maximum gap is 0,118 mm).

Also, see description and installation instructions above.

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 213466300/1.