제12-539호

안 전 인 증 서

Krohne Ltd.

Rutheford Drive, Park Farm industrial Estate, Wellingborough, Northants NN8 6AE, United Kingdom

위 사업장에서 제조하는 아래의 품목이 「산업안전보건법」 제34조 및 같은 법 시행규칙 제58조의4제4항에 따른 안전인증 심사 결과 안전·보건기준에 적합하므로 안전인증표시의 사용을 인증합니다.

품 목

Measuring transducer

형식 · 모델 / 용량 · 등급 / 인증번호

형식·모델	용량 · 등급	인증번호
Type MFC300F	첨부 인증조건(12-0539) 참조	12-GA4BO-0539X
	Ex d e [ia/ib] IIC T6/T4...T1 Ex tD [ia/ib] IIIC T***℃	

인 증 기 준

방호장치 의무안전인증 고시(고용노동부고시 제2010-36호)

인 증 조 건

첨부 인증조건 (12-0539) 참조

2012 년 9 월 5 일

한국가스안전공사 사장

인 증 조 건

1. 제조공장:

Rutheford Drive, Park Farm industrial Estate, Wellingborough, Northants NN8 6AE, United Kingdom에 위치한 Krohne Ltd. 공장에서 생산한 제품 중 아래 인증범위의 제품에 한함.

2. 제품개요

The measuring transducer, type MFC300F is used for the determination and display of the mass flow rate of flammable and non-flammable liquids and gases. It consists of the separately certified electronic assembly which is mounted into an enclosure certified for type of protection Flameproof Enclosure "d". The measuring transducer is designed as associated apparatus and may be installed in the hazardous area. All connections to the sensor unit comply with type of protection Intrinsic Safety.

3. 인증범위: 본 인증서는 아래의 형식번호에 한하여 유효함

품목 명 Mass Flow Meter, 모델 명 Type OPTIMASS X300XC and OPTIGAS 5300C에 한하여 인증함. 첨부 인증조건(12-0539) 참조.

4. 안전한 사용을 위한 조건

1) The measuring transducer, type MFC300F / MFC300F T6 shall be included in the equipotential bonding system of the hazardous area.
2) Opening the enclosure inside the hazardous area is only permissible in a de-energized state and with keeping a subsequent waiting time (warning label !)
   This waiting time is :
   35 minutes for temperature class T6 and 10 minutes for temperature class T5
   The waiting time may be omitted for temperature classes T4 ... T1.
3) Only certified cable glands may be applied as cable entries. Non-used openings shall be sealed by means of certified blind plugs.

5. 인증(변경)사항

6. 그 밖의 사항

안전인증품의 품질관리. 확인심사 수검, 변경사항 신고 등 인증 받은 자의 의무 준수

[첨 부]

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The permissible range of the ambient temperature depends on the material of the enclosure as follows.

Aluminium enclosure:	-40 ℃ ... +65 ℃	for all variants listed in the table given in the operating instructions
	-40 ℃ ... +60 ℃	for non-listed variants
Stainless steel enclosure:	-40 ℃ ... +55 ℃	

The range of the permissible ambient temperature for the variant with optionally lacquered enclosure (aluminium or stainless steel) teads:

T_{amb}: -40 ℃ ... +40 ℃

Electrical data

Auxiliary power (non-intricsically safe)

depending on variant (terminals L (L+), N (L-))	U_N = 12 ... 24 V DC, +30 % / -10 % (short-time - 25%) approx. 12 W internal fusing $I_N \leq$ 2 A U_m = 253 V for connection to protective extra low voltage with safe isolation (PELV) or U_N = 24 V AC/DC, +10 % / -15 %, 50/60 Hz, approx. 22 VA/ 12W 24 V DC, +30 % / -25 % internal fusing $I_N \leq$ 2 A U_m = 253 V for connection to protective extra low voltage with safe isolation (PELV) or U_N = 100 ... 230 V AC, +10 % / -15 %, 50/60 Hz, approx. 22 VA internal fusing $I_N \leq$ 1.6 A

In/Output circuits (non-intrinsically safe)

	Nominal voltage:	$U_N \leq$ 32 V DC U_m = 253 V

Printed circuit board:

Basic IO		
(terminals C, C-	status output, passive	I_{max} = 100 mA
B, B-	status output, passive	I_{max} = 100 mA
	or control input	U_{max} = 32 V
D, D-	pulse output, passive	I_{max} = 100 mA
A, A-, A+)	current output, active/passive	HART

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Modular IO			
(terminals C, C-		current output, active/passive	HART
	D, D-	status/pulse output, active	I_{max} = 20 mA
		status/pulse output, passive	I_{max} = 100 mA
Modular Carrier + IO Module		(depending on module)	
(terminals B, B-, A, A-)		current output, active/passive	0(4) - 20 mA
		status/puls output, active	I_{max} = 20 mA
		status/pulse output, passive	I_{max} = 100 mA
		control input, active/passive	U_{max} = 32 V
		current input, active/passive	0(4) - 20 mA
			U_{max} = 32 V

Fieldbus IO
(terminals D, D-, C, C-) depending on function
Profibus-PA, passive
Foundation Fieldbus, passive

Profibus DP IO
(terminals D, D-, C, C-,B, B-) depending on function
Profibus RS 485, active, up to 12 Mbit/s

Modbus IO
(terminals D, D-, C, C-) RS 485 Modbus, active

In/Output circuits (Intrinsically safe)
(depending on p.c.b. and I/O-function)

<u>Printed circuit board:</u>

Exi-IO
Current output, passive
HART communication
(terminals C, C-)

type of protection Intrinsic Safety Ex ia IIC
or Ex ib IIC
only for connection to a certified intrinsically safe circuit
Maximum values:

U_i	=	30 V
I_i	=	100 mA
P_i	=	1.0 W
C_i	=	10 nF
L_i		negligibly low

or

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Currnent output, active HART communication (terminals C, C-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

Maximum values:

U_o = 21 V

I_o = 90 mA

P_o = 0.5 W

linear characteristic

C_o	90 nF	110 nF
L_o	2.0 mH	0.5 mH

and

Puls/Status output, passive (terminals D, D-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 30 V

I_i = 100 mA

P_i = 1.0 W

C_i = 10 nF

L_i negligibly low

Exi-Option
Exi-Option 2

Current output, passive (terminals A, A-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 30 V

I_i = 100 mA

P_i = 1.0 W

C_i = 10 nF

L_i negligibly low

or

Currnent input, active (terminals A, A-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

Maximum values:

U_o = 24.1 V

I_o = 99 mA

P_o = 0.6 W

linear characteristic

C_o = 75 nF

L_o = 0.5 mH

or

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Currnent output, active (terminals A, A-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

Maximum values:

U_o = 21 V

I_o = 90 mA

P_o = 0.5 W

linear characteristic

C_o	90 nF	110 nF
L_o	2.0 mH	0.5 mH

and

Puls/Status output
Control input, passive (terminals B, B-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC

only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 30 V

I_i = 100 mA

P_i = 1.0 W

C_i = 10 nF

L_i negligibly low

Fieldbus IO

Profibus-PA
Foundation Fielsbus
(terminals D, D-, C, C-)

type of protection Intrinsic Safety Ex ia IIC or Ex ib IIC/IIB

only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 24 V

I_i = 380 mA

P_i = 5.32 W

C_i = 5 nF

L_i = 10 µH

suitable for connection to an intrinsically safe fieldbus in accordance with the FISCO-model

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Data circuit (terminals A, B)	type of protection Intrinsic Safety		Ex ib IIC
	Maximum values:		
	U_o	=	6 V
	I_o	=	33 mA
	P_o	=	120 mW
	trapezoidal characteristic		
	C_o	=	1.9 µF
	L_o	=	2 mH

Measuring transducer, type MFC300F

Supply circuit (terminals +,-)	type of protection Intrinsic Safety		Ex ib IIC
	Maximum values:		
	U_o	=	16.5 V
	I_o	=	305 mA
	P_o	=	1.25 W
	linear characteristic		
	C_o	=	230 nF
	L_o	=	320 µH

Measuring transducer, type MFC300F T6

Supply circuit (terminals +,-)	type of protection Intrinsic Safety		Ex ib IIC
	Maximum values:		
	U_o	=	16.5 V
	I_o	=	262 mA
	P_o	=	1.07 W
	linear characteristic		
	C_o	=	240 nF
	L_o	=	450 µH

The intrinsically safe circuts are safely electrically isolated from all non-intrinsically safe circuits up to a peak value of the nominal voltage of 375 V.