제12-522호

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

Mass Flow Sensor

형식 · 모델 / 용량 · 등급 / 인증번호

형식·모델	용량 · 등급	인증번호
Type OPTIMASS x0x0x and OPTIGAS x0x0x	첨부 인증조건(12-0522) 참조	12-GA4BO-0522X
	Ex ib IIC T6...T1 Ex ib IIIC T***℃	

인 증 기 준

방호장치 의무안전인증 고시(고용노동부고시 제2010-36호)

인 증 조 건

첨부 인증조건 (12-0522) 참조

2012 년 8 월 29 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 mass flow sensors of type series OPTIMASS 1000, 100-T6, 1010C, 1010C-T6, 2000, 2010C, 3000, 3010C, 4000, 4010C, 7000, 7010C, 8000, 8010C, 9000 and 9010C as well as type series OPTIGAS 5000 and 5010C are used as part of a flow measuring system to determine the mass flow rate of flammable and non-flammable liquids and gases. The mass flow sensors are equipped with the separately certified on-site electronics Frontend & Backplane-FE as well as the p.c.b. Junction Box and they are operated via the measuring transducer, type MFC300F which is also certified separately

3. 인증범위: 본 인증서는 아래의 형식번호에 한하여 유효함
   품목 명 Mass Flow Sensor, 모델 명 Type OPTIMASS x0x0x and OPTIGAS x0x0x에 한하여 인증함.
   첨부 인증조건(12-0522) 참조.

4. 안전한 사용을 위한 조건
   1. The measuring sensors of type series OPTIMASS 1010C, 1010C-T6, 2010C, 3010C, 4010C, 7010C, 8010C, 8010kC and 9010C as well as OPTIGAS 4010C and 5010C shall be included in the equipotential bonding system of the hazardous area.
   2. For relationship between maximum permissible ambient temperature, maximum medium temperature, maximum surface temperature and temperature class for the individual types of sensors, reference is made to the tables given in the operating instructions or the tables given the annex respectively

5. 인증(변경)사항

6. 그 밖의 사항
   안전인증품의 품질관리. 확인심사 수검, 변경사항 신고 등 인증 받은 자의 의무 준수

[첨 부]

인 증 조 건(12-0522)

OPTIMASS 1000 / 1010C

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
65 ℃	T4	89 ℃	T130℃
	T3 - T1	130 ℃ (*)	T175℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS 1000 / 1010C with T6-option

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
40 ℃	T6	45 ℃	T80℃
	T5	60 ℃	T95℃
	T4	95 ℃ (*)	T130℃
	T3 - T1	130 ℃ (*)	T165℃
50 ℃	T5	60 ℃	T95℃
	T4	95 ℃ (*)	T130℃
	T3 - T1	130 ℃ (*)	T165℃
65 ℃	T4	95 ℃ (*)	T130℃
	T3 - T1	130 ℃ (*)	T165℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS 2000 / 2010C

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
40 ℃	T6	60 ℃	T80℃
	T5	75 ℃	T95℃
	T4	110 ℃	T130℃
	T3 - T1	130 ℃	T150℃
65 ℃	T5	75 ℃	T95℃
	T4	110 ℃ (*)	T130℃
	T3 - T1	130 ℃ (*)	T150℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

인 증 조 건(12-0522)

OPTIMASS 3000 / 3010C und 7000 / 7010C, non-insulated designs

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
40 ℃	T6	70 ℃	T80℃
	T5	90 ℃	T95℃
	T4	130 ℃ (*)	T130℃
	T3 - T1	150 ℃ (*)	T150℃
50 ℃	T6	70 ℃	T80℃
	T5	85 ℃	T95℃
	T4	130 ℃ (*)	T130℃
	T3 - T1	150 ℃ (*)	T150℃
65 ℃	T5	85 ℃	T95℃
	T4	125 ℃ (*)	T130℃
	T3 - T1	150 ℃ (*)	T150℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS / OPTIGAS 4000 / 4010C without heating jacket / insulation

permissible range of the ambient temperature Tamb	temperature class	permissible range of the medium temperature T_M	max. surface temperature
-40 ℃ ... + 65 ℃	T4	-40 ℃ ... + 80 ℃	T130℃
	T3	-40 ℃ ... + 145 ℃ *)	T195℃
	T2 - T1	-40 ℃ ... + 160 ℃ *)	T210℃

*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS 3000 / 3010C und 7000 / 7010C, insulated / heated designs

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
40 ℃	T6	65 ℃	T80℃
	T5	80 ℃	T95℃
	T4	115 ℃ (*)	T130℃
	T3 - T1	150 ℃ (*)	T165℃
65 ℃	T5	80 ℃	T95℃
	T4	115 ℃ (*)	T130℃
	T3 - T1	150 ℃ (*)	T165℃

(*) heat-resistant connecting cable ≥ 90 ℃ required

인 증 조 건(12-0522)

OPTIMASS 8000 / 8010C

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
65 ℃	T4	80 ℃	T130℃
	T3	145 ℃	T195℃
	T2 - T1	230 ℃ (*)	T280℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS 8000k / 8010kC with or without heating jacket / insulation
Cyrogenic applications

permissible range of the ambient temperature Tamb	temperature class	permissible range of the medium temperature T_M	max. surface temperature
-20 ℃ ... + 65 ℃	T4 - T1	-195 ℃ ... + 80 ℃	T130℃

OPTIMASS 9000 / 9010C

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M	max. surface temperature
65 ℃	T4	95 ℃	T130℃
	T3	160 ℃ (*)	T195℃
	T2	255 ℃ (*)	T290℃
	T1	350 ℃ (*)	T385℃

(*) heat-resistant connecting cable ≥ 80 ℃ required

OPTIMASS 5000 / 5010C

ambient temperature, up to Tamb	temperature class	max. medium temperature, up to T_M
65 ℃	T4	70 ℃
	T4	80 ℃ (*)
	T3 -T1	95 ℃ (*)

(*) heat-resistant connecting cable ≥ 80/90 ℃ required

The maximum permissible ambient and medium temperatures for type series OPTIMASS 1000, 1000 T6, 1010C, 1010C T6, 2000, 2010C, 3000, 3010C, 4000, 4010C, 7000, 7010C, 8000k, 8010kC, as well as OPTIGAS 4000 and 4010C of lacquered designs are:

T_{amb} = 40 ℃ T_{medium} = 110 ℃

인 증 조 건(12-0522)

Electrical data

Supply circuit terminals +, - (on p.c.b. Sencor Junction Box)	type of protection intrinsic Safety Ex ib IIC only for connection to a certified intrinsically safe circuit			
	Maximum values:			
	Ui	=	16.5	V
	Ii	=	340	mA
	Pi	=	1.3	W
	Ci	=	35	nF
	Li	=	10	μH
Data circuit terminals A, B (on p.c.b. Sencor Junction Box)	type of protection intrinsic Safety Ex ib IIC only for connection to a certified intrinsically safe circuit			
	Maximum values:			
	Ui	=	11.8	V
	Ii	=	40	mA
	Pi	=	120	mW
	Ci	=	35	nF
	Li	=	10	μH

The supply circuit and the data circuit are electrically interconnected.