



G010997

System: CCP

# Programmable Smoke & Heat Detector

## **CD-PH Ex ic**

Part no. 5101612-00

### General description

The EN-54 approved CD-PH Ex ic is an intrinsically safe addressable combined optical smoke and heat detector suitable for use in hazardous area zone 2.

The detector is equipped with two LED indicators giving clear visibility of the red local alarm indication.

The detector is connected to the detector loop via isolator module CD-GI Ex ic (5101613-00). It is not possible to connect any remote LED on the CD-PH Ex ic. See [Control drawing, page 4](#)

The CD-PH Ex ic shall be configured as a dual, smoke, or heat detector in the configuration tool.

The smoke sensor and the heat sensor are both active with the dual setup and one individual smoke and/or one individual heat alarm will be displayed in the fire central in a fire situation. With the smoke or heat setup there will be only one smoke or one heat alarm displayed.

In addition to those three settings, there are five smoke sensitivity choices, one heat assisted choice, and four heat temperature range choices that shall be configured. The default smoke sensitivity level is Normal, which is in the middle, and heat choices are the EN54-5 temperature categories: A1R, A2S, CS and CR.

### BIST (Built-In Self-Test)

Built-in self-tests are tests the unit runs on itself in order to verify the integrity of its function. The use of BIST enables longer proof test intervals.

The loop unit employs two strategies.

Continuous BIST: Readings taken from hardware interfaces are verified to be within the identified acceptable intervals before they are used, so that

the the loop unit does not act on results from broken hardware.

Periodic BIST: Some failures may not be distinguishable during normal operation. The loop unit is designed to provide means to test these conditions. These tests are performed every five minutes.

### Short Circuit Isolator (SCI)

The built-in SCI isolates short circuits on the loop-line and also has a probe function for evaluating a short circuit. The SCI ensures that the fire detection system does not lose contact with the loop units when there is one short circuit on the loop-line. The probe function makes it possible to reset the short circuit condition without restart of the loop-line.

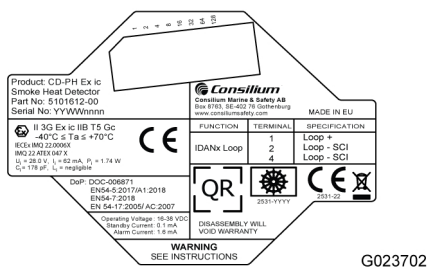
### Data for built-in Short Circuit Isolator (SCI)

Minimum switch open voltage ( $V_{SO \min}$ )	9 V DC
Maximum switch open voltage ( $V_{SO \max}$ )	11 V DC
Minimum switch close voltage ( $V_{SC \min}$ )	4 V DC
Maximum switch close voltage ( $V_{SC \max}$ )	6 V DC
Maximum line current ( $I_{C \max}$ )	500 mA
Maximum switching current ( $I_{S \max}$ )	800 mA
Maximum leakage current ( $I_{L \max}$ )	3 mA
Maximum switch resistance ( $Z_{C \max}$ )	120 m $\Omega$

## Data

Sensor method	Light Scatter and Thermistor
Operating voltage	16–38 VDC
Operating current:	
- Normal condition	100 $\mu$ A
- Alarm condition with LED activated	1.6 mA
Loop communication protocol	IDANx
Operating temperature	-40 °C to +70 °C
Storage temperature	-40 °C to +70 °C
Relative humidity	0 to 95% RH non-condensing
Addressing method	DIP switch
Ingress protection	IP22 (if used together with CD-B, 5101509-00A) IP44 (if used together with IP-BASE, 5100774-00A and IP-ADAPT, 5100775-00A)
Material	Lexan 920
Weight (w/o base)	140 g $\pm$ 5%
Colour	White, similar to RAL 9003/C
Loop cable requirement	See the Installation & Commissioning manual

## Certifications



G023702

ATEX Ex ic	Certificate no: IMQ 22 ATEX 047 X Certified according to: IEC 60079-0 IEC 60079-11 II 3G
IECEX Ex ic	Certificate no: IECEX IMQ 22.0006X Certified according to: IEC 60079-0 IEC 60079-11 Ex ic IIB T5 Gc -40 °C $\leq$ Ta $\leq$ +70 °C

MED

Certified according to:  
EN 54-5:2017/A1:2018  
EN 54-7:2018  
EN 54-17:2005/AC:2007  
IEC 60092-504:2016  
IEC 60533:2015



2531/yyyy  
yyyy = year of production  
DoC no: DOC-007789

CPR

Certified according to:  
EN 54-5:2017/A1:2018  
EN 54-7:2018  
EN 54-17:2005/AC:2007



2531/yy  
yy = year of production  
DoP no: DOC-007788

## Ex parameters

Maximum voltage ( $U_i$ )	28.0 V
Maximum current ( $I_i$ )	62 mA
Internal capacitance ( $C_i$ )	178 pF
Internal inductance ( $L_i$ )	Negligible
Maximum power ( $P_i$ )	1.74 W

## Accessories

5210224-00A	UB-6 UNIVERSAL BASE Ex	Base Plate
5100774-00A	IP-BASE	Detector Base
5100775-00A	IP-ADAPT	Base Adapter
5101509-00A	CD-B	Base Plate



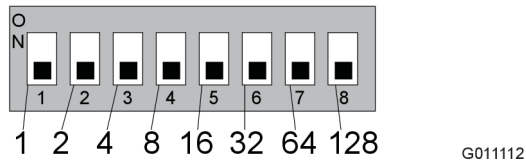
## NOTE!

Do not remove the protective cover from the detector until all paint work and polluting (dusty) activities are finished and the area has been cleaned.

After installation: Be sure to remove all covers before the fire detection system is put into operation.

## Address switch

The loop units are identified by a physical address. The address number is set on an 8 pole DIP switch located on the loop unit. To set the address, carefully loosen the sticker that protects the access hole for the DIP switch. Use a pointed tool of suitable size to set the address number, then reattach the sticker. Make sure the sticker completely covers the hole.



1–254 are valid addresses. The DIP switch value follows the binary system.

## Cleaning



### WARNING!

#### Potential electrostatic charging hazard

If the unit requires cleaning, only clean exterior with a damp cloth to avoid electrostatic charge build up.

## Compatibility

If the CD-PH Ex ic is to be used as a replacement part for the NS-AOHS IS, **config tool version 1.12.11.x and firmware version 1.12.12 is required**. It will also be necessary to redo the Ex-calculations.

## Testing & Maintenance

### Environmental compensation

The detector compensates for environmental contamination of its smoke chamber to maintain its sensitivity setting and to avoid false alarms. The detector will generate a warning if it becomes slightly contaminated (but still remains in working condition). When it gets too contaminated to fulfill its safety function it will generate a fault alarm.

### Mechanical dust protection

The detector has a finely pitched net, that blocks dust from entering the smoke chamber; in order to reduce the rate of environmental contamination.

### Test equipment

5101516-00A	EX HEAT DETECTOR TESTER	Heat Detector Tester
N1738	Solo 330	Smoke Detector Tester

### If the detector is configured for heat detection

To test heat detection use EX HEAT DETECTOR TESTER:

- Place a heated soft PCM package in the testing funnel and place this towards the detector for approx. 1 minute. This creates a warm micro climate towards the detectors thermistor and will eventually set the alarm.

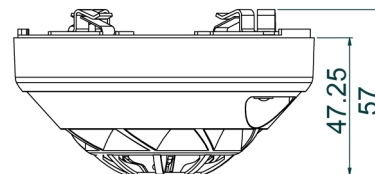
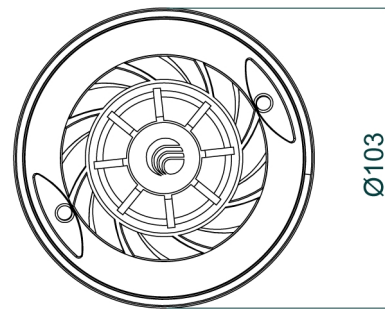
### If the detector is configured for smoke detection

To test smoke detection use Solo 330:

- Spray test gas on to the detector during 1 second. Wait 10 seconds until new gas is sprayed during 1 second.
- Repeat this procedure until the detector indicates alarm with a red indication.  
If the detector fails to alarm after three attempts the detector has to be replaced.

For further detailed instructions, please see the datasheet for the test equipment and the Service & Maintenance manual for the fire detection system.

## Dimensions (mm)



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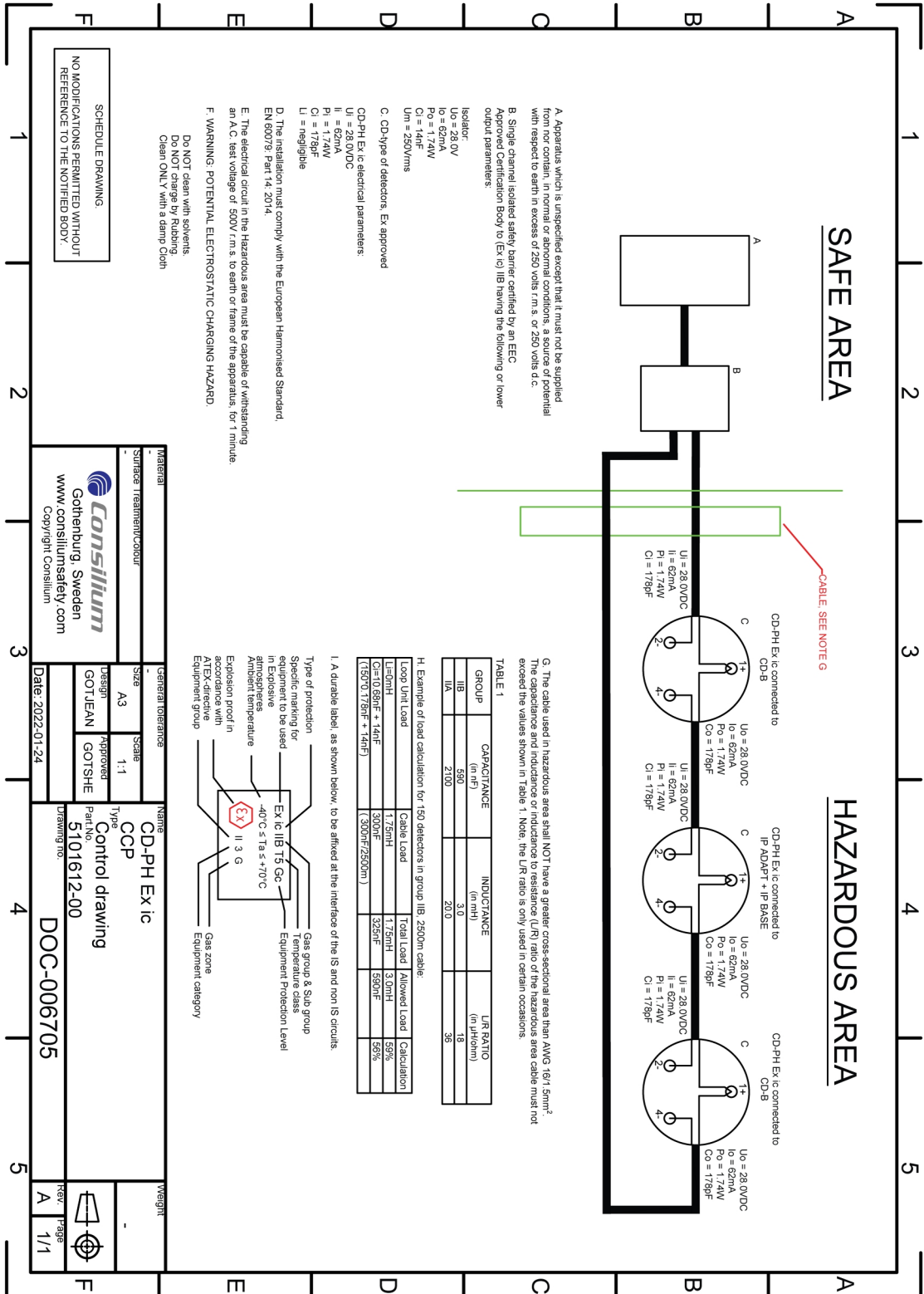
## Connection



### Hint!

For connection, please refer to the data sheet for IP-ADAPT (5100775-00A) and also for CD-B (5101509-00A).

# Control drawing



**SAFE AREA**

**HAZARDOUS AREA**

CABLE: SEE NOTE G

A. Apparatus which is unspecified except that it must not be supplied from a hazardous area shall NOT have a greater cross-sectional area than AVG - 16/1 5mm<sup>2</sup> with respect to earth in excess of 250 volts r.m.s. or 250 volts d.c.  
 B. Single channel isolated safety barrier certified by an EEC Approved Certification Body to Ex (c) IIB having the following or lower output parameters:  
 Isolator:  
 Uo = 280V  
 Io = 62mA  
 Po = 1,74W  
 Ci = 14nF  
 Um = 250Vrms  
 C. CD-type of detectors, Ex approved  
 CD-PH Ex ic electrical parameters:  
 Uo = 280V DC  
 Io = 62mA  
 Po = 1,74W  
 Ci = 178pF  
 Li = negligible  
 D. The installation must comply with the European Harmonised Standard, EN 60079 Part 14, 2014.  
 E. The electrical circuit in the Hazardous area must be capable of withstanding an A.C. test voltage of 500V r.m.s. to earth or frame of the apparatus; for 1 minute  
 F. WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD

Do NOT clean with solvents.  
 Do NOT charge by rubbing.  
 Clean ONLY with a damp cloth

SCHEDULE DRAWING.  
 NO MODIFICATIONS PERMITTED WITHOUT REFERENCE TO THE NOTIFIED BODY.

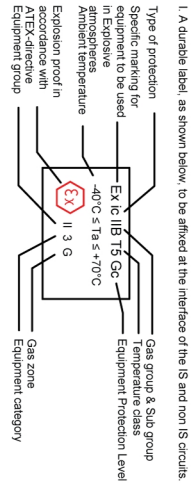
G. The cable used in hazardous area shall NOT have a greater cross-sectional area than AVG - 16/1 5mm<sup>2</sup>. The cable used in hazardous area shall NOT have a greater cross-sectional area than AVG - 16/1 5mm<sup>2</sup> exceeded the values shown in Table 1. Note: the I/R ratio is only used in certain occasions.

TABLE 1

GROUP	CAPACITANCE (in nF)	INDUCTANCE (in mH)	I/R RATIO (in μH/ohm)
IIB	590	3.0	18
IA	2100	20.0	36

H. Example of load calculation for 150 detectors in group IIB, 2500m cable:

Loop Unit Load	Cable Load	Total Load	Allowed Load	Calculation
Uo=280V Io=62mA Po=1,74W Ci=178pF + 14nF	1,75mH 3,00nF	1,75mH 3,25nF	3,0mH 590nF	55% 55%
(150*0,178nF + 14nF)	(300mH/2500m)			



Material	Surface Treatment/Colour	General tolerance	Name	Weight
		Size	CD-PH Ex ic	
		Scale	CCP	
		Design	Control drawing	
		Approved	Part No. 5101612-00	
		Signature	Doc-006705	
		Date: 2022-01-24		
		Revision	1/1	

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