



G010997

System: CCP

Programmable Smoke & Heat Detector

CD-PH Ex ic

Part no. 5101612-00
DRAFT 2022-08-25

General description

The CD-PH Ex ic is an intrinsically safe addressable combined optical smoke and heat detector suitable for use in Zone 2 environments.

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 an Isolator module. It is not possible to connect any remote LED on the CD-PH Ex ic.

The CD-PH Ex ic detects smoke and heat in accordance with EN 54 and can be configured to detect the following:

Table 1.

Temperature category EN 54-5	A1R	A2S	CS	CR
Operating temperature	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C
Application temperature	-40 °C to +50 °C	-40 °C to +50 °C	-40 °C to +80 °C	-40 °C to +80 °C
Response temperature	+54 °C to 65 °C	+54 °C to 70 °C	+84 °C to 100 °C	+84 °C to 100 °C
Response to increasing temperature (10 °C/min), from typical application temperature	25 °C: 60 to 260 sec	No alarm response	No alarm response	55 °C: 120 to 330 sec

The CD-PH Ex ic can also detect multi-criteria heat assisted smoke according to Test fires TF2-TF5 & TF8 for temperature category A1R, CS and CR, as well as multi-criteria heat assisted smoke for temperature category A2S.

The CD-PH Ex ic can furthermore be configured to detect smoke at 5 different sensitivity levels, the default sensitivity level is 3. Normal.

Local intelligence via an integrated CPU

The integrated CPU makes it possible to make decisions locally, like evaluation of the alarm condition.

Periodic BIST (Built-In Self-Test)

The Periodic Built-In Self-Test is a central mechanism which the system uses to ensure long proof test intervals.

Countermeasures (defences) have been implemented in order to address the fault modes (threats) in the fire detection system. These countermeasures are done in order to increase the confidence in the system.

The system has two types of Built-In Self-Tests (BIST). The first BIST is made continuously; for instance when reading A/D values from hardware. This typically involves evaluation of the read value to determine if the hardware is broken; i.e. gives measurements outside an acceptable interval.

The second BIST is the Periodic Built-In Self-Test (Periodic BIST) which is made once every five minutes in order to verify the safety function by testing communication paths. All internal communication paths and all testable parts of the loop-units are included in the Periodic BIST mechanism, to verify the whole path from detection to reporting (fire) status.

The system creates a log with the results of the Periodic BIST. This log can be extracted from the system with a USB memory stick.

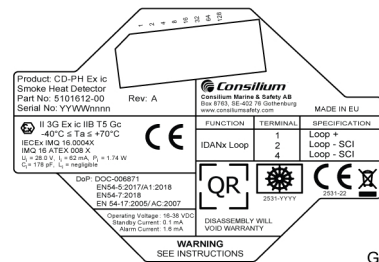
Short Circuit Isolator (SCI)

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

Sensor method	Light Scatter and Thermistor
Operating voltage	16–38 VDC
Operating current:	
- Normal condition	100 µA
- 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 ± 5%
Colour	White, similar to RAL 9003/C
Loop cable requirement	See the Installation & Commissioning manual

Certifications



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EN 54	EN 54-5:2017/A1:2018 EN 54-7:2018 EN 54-17:2005/AC:2007
ATEX Ex ic	Certificate No: IMQ 16 ATEX 008 X Certified according to: IEC 60079-0 IEC 60079-11  II 3G
IECEX Ex ic	Certificate No: IECEX IMQ 16.0004X Certified according to: IEC 60079-0 IEC 60079-11 Ex ic IIB T5 Gc -40 °C ≤ Ta ≤ +70 °C
MED	Certificate No: PENDING PENDING 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
CPR	Certificate No: PENDING 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

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.

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 Ω

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. (For settings use a pointed tool of suitable size.)



1 2 4 8 16 32 64 128

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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.

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.

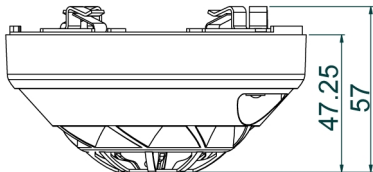
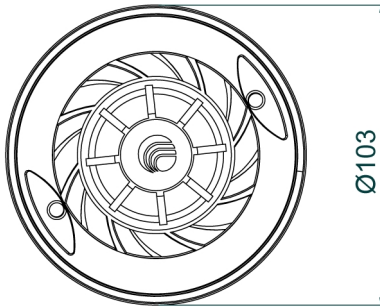
If the detector is configured for smoke detection

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).