



G012482

System: CFD5000 T

Aspirating Smoke Detector

CS-ASP

Part no. 5210226-00A

General description

CS-ASP is a light weight addressable smoke detector of aspirating type. It is designed to comply with the standards for the rolling stock market up to Safety Integrity Level 1 (SIL 1).

The built-in fan continuously draws an air sample into the detection chamber, via an inlet sampling pipe connected to the unit. The air sample is analysed by a built-in smoke detector inside the aspirating unit, and then returned to the atmosphere via an outlet sampling pipe.

CS-ASP is very suitable for use in areas where the space is limited or where the detector may be exposed to mechanical damage or vandalised.

The airflow is supervised and generates a fault alarm in case of failure.

All connections are made with WAGO CAGE CLAMP® connectors.

The detector inside the CS-ASP can 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 of the built-in smoke detector makes it possible to make decisions locally, like evaluation of the alarm condition.

IDAxT protocol

The built-in smoke detector use the IDAxT protocol which is an extension of Consilium's communication protocol (IDA) and meets the demands on data integrity, reliability and robustness required for use in SIL 1 and SIL 2 safety functions and safety systems.

Periodic BIST

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 and the end elements. 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 smoke detector has a built-in SCI that 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

Aspirating unit

Nominal voltage	24 VDC
Operating voltage	14–30 VDC
Operating current (at 24 V)	200 mA
Operating temperature	-40 °C to +70 °C
Storage temperature	-50 °C to +70 °C
Relative humidity	≤ 95 % RH non-condensing
Ingress protection	IP31 (for the box)
Cover material	Aluminium
Weight	995 g
Colour	Aluminium
Loop cable requirement	See the Installation & Commissioning manual
Lifetime expectancy for the fan	90 000 h
Mating connector	WAGO 769-104/021-000 female plug, 4 poles
External piping	Outer diameter 12 mm Inner diameter 9 mm Legris 1025T tubing (part no: 1025P1200) is recommended
Inlet sampling pipe	Max. 5 m
Outlet sampling pipe	Max. 3 m

Detector

Sensor method	Light Scatter
Loop communication protocol	IDAxT
Addressing method	DIP switch
Approvals	EN 50155, EN 45545-2 CE
Detector CS-PYH spare part no.	5210020-00A



Functional Safety Data

Type	B
HFT	0
SFF	67 %
PFD_{avg}	$8,29 \times 10^{-3}$

PFD_{avg} is calculated for MTTR 8 h and proof test interval 1 year.
Suitable for use in SIL 1 environments.

Data for built-in Short Circuit Isolator (SCI)

Ic max (Maximum Continuous current)	500 mA
Is max (Maximum Switching current)	800 mA
Current when short circuited (IL max)	< 1 mA
Open to Close voltage	22 ± 2 VDC
Open to Close, maximum load expressed in ohms on the non-energized side	$\approx 1,2$ k Ω
Close to Open voltage	14 ± 2 VDC

Address switch

The built-in smoke detector is identified by a physical address. The address number is set on an 8 pole DIP switch located on the built-in smoke detector.



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.

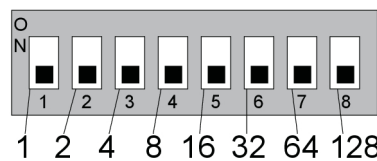
After installation: Be sure to remove all covers before the fire detection system is put into operation.

1. Unlock and remove the box cover.
2. Unscrew the detector head counterclockwise, lift it up from the base plate and turn it over.



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3. Set the address switch. (For settings use a pointed tool of suitable size.)



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1 to 150 are valid addresses. The DIP switch value follows the binary system.

4. Reinstall the detector and lock the box cover.

Testing & Maintenance

Environmental compensation

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

Mechanical dust protection

The built-in 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

5200112-00A	Testifier	Multi-stimulus Detector Tester
N1738	Solo 330	Smoke Detector Tester

To test smoke detection use either Testifier or Solo 330:

- Spray test gas in the hose air inlet during 1 second. Wait 10 seconds until new gas is sprayed during 1 second, unless the detector has indicated alarm.
- Repeat this procedure until the detector indicates alarm on the system control panel. If the detector fails to alarm after three attempts the remedy could be to check the inlet sampling pipe for obstructions or to replace the detector.

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

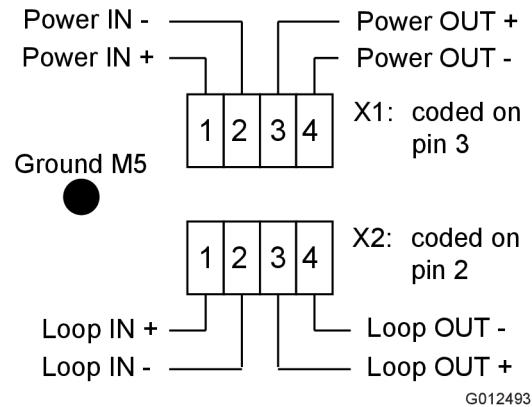
External earth connection

The external earth connection on the enclosure shall be connected to earth. For more information see the Installation & Commissioning manual.



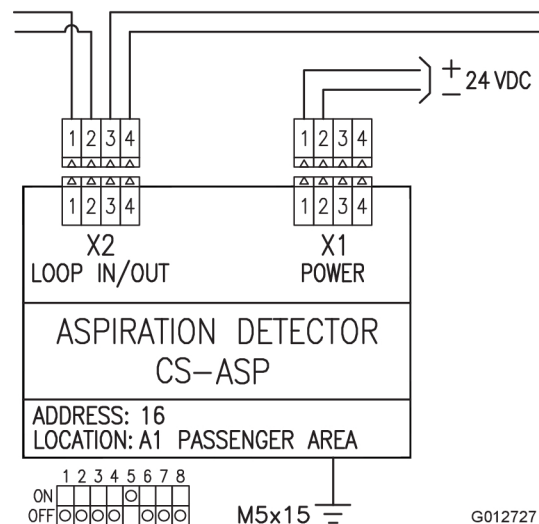
Figure 1. The M5 external earth connection

Connection



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Connection example



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CS-ASP Assembly

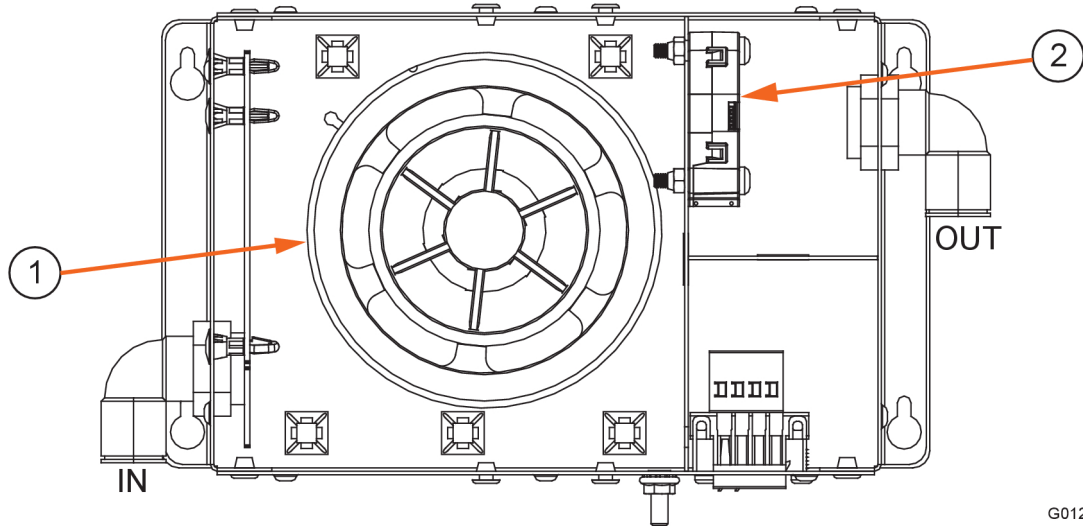
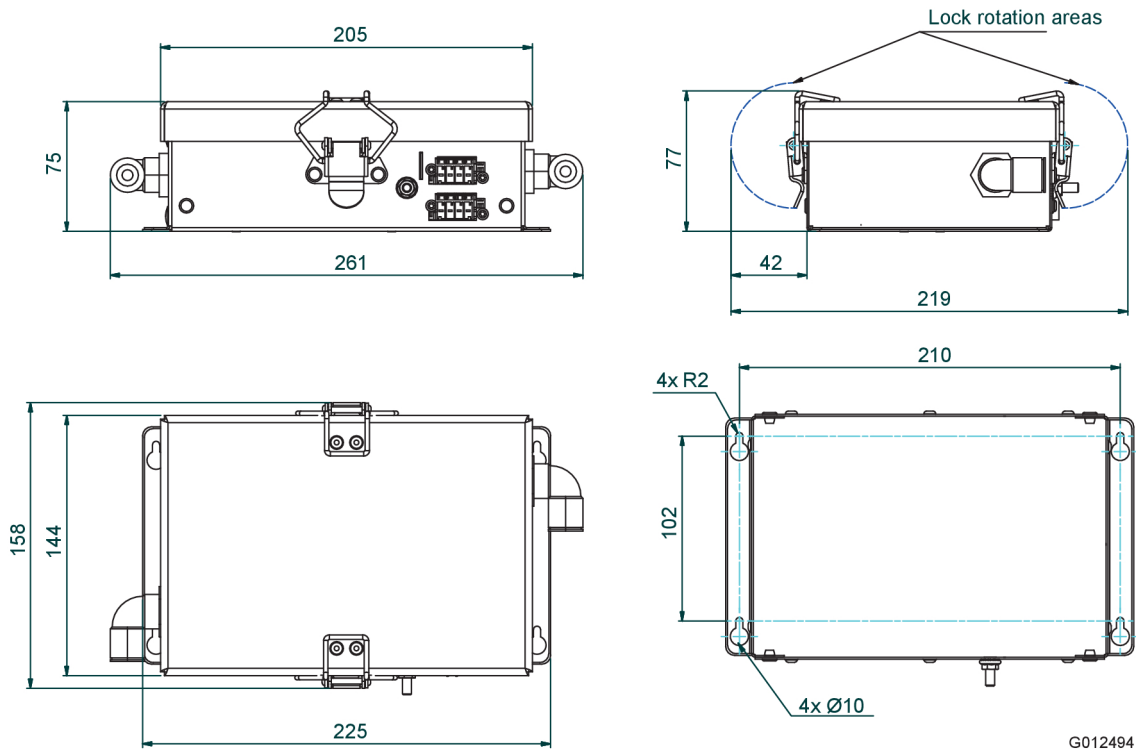


Figure 2. Location of (1) the smoke detector and (2) the radial fan

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Dimensions (mm)



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Mounting holes (x4): Max screw thread Ø4.