

# Orbis I.S. Optical Smoke Detector



## Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 23°C and 50% RH unless otherwise stated.

<b>Detection principle</b>	Photo-electric detection of light scattered by smoke particles over a wide range of angles.
<b>Sampling frequency</b>	Once every four seconds
<b>Operating voltage</b>	14.8 V dc to 28 V dc
<b>Supply Wiring</b>	Two wire supply, polarity sensitive
<b>Polarity reversal</b>	Not allowed
<b>Power up time</b>	< 20 seconds
<b>Minimum 'detector active' voltage</b>	12 V
<b>Power-up surge current at 24 V</b>	105 µA
<b>Average quiescent current at 24 V</b>	85 µA
<b>Alarm load</b>	325 Ω in series with a 1.0 V drop
<b>Minimum holding voltage</b>	5 V
<b>Minimum voltage to light alarm LED</b>	6 V
<b>Alarm reset voltage</b>	< 1 V
<b>Alarm reset time</b>	One second
<b>Alarm indicator</b>	Integral indicator with 360° visibility
<b>Remote output LED (-) characteristic</b>	4.7 kΩ connected to negative supply
<b>Operating and storage temperature</b>	-40°C to +70°C Operating temperature is restricted by the intrinsic safety gas classification. Class T5: -40°C to +45°C Class T4: -40°C to +60°C The detector must be protected from conditions of condensation or icing
<b>Humidity (no condensation or icing)</b>	0% to 98% RH
<b>Effect of atmospheric pressure on optical sensor</b>	Unaffected by wind
<b>Effect of wind speed</b>	Insensitive to pressure
<b>Designed to IP Rating</b>	IP23D
<b>Standards &amp; approvals</b>	EN54-7, CPD, LPCB, MED, LR, DNV-GL, BV, ABS, CCS, KRS, VdS, BOSEC, IECEX, ATEX, PESO and FG
<b>BASEEFA Cert No.</b>	BASEEFA06ATEX0007X
<b>Dimensions</b>	100 mm diameter x 42 mm height 100 mm diameter x 50 mm height in base
<b>Weight</b>	75 g detector 135 g detector with base
<b>Materials</b>	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel

## Product overview

<b>Product</b>	I.S. Optical Smoke Detector
<b>Part No.</b>	ORB-OP-52027-APO
<b>Product</b>	I.S. Optical Smoke Detector with flashing LED
<b>Part No.</b>	ORB-OP-52028-APO

## Approvals



## Product information

The sensing technology in the Orbis I.S. Optical Smoke Detector is significantly different in design from previous optical smoke detectors.

- Improved sensitivity to black smoke
- Compensation for slow changes in sensitivity
- Extra confirmation of smoke before an alarm signal is given

## Features

Optical smoke detectors have always been recognised as good detectors for general use. They are regarded as particularly suitable for smouldering fires and escape routes.

The performance of Orbis Marine optical detectors is good in black as well as in white smoke. In this respect Orbis detectors are different from traditional optical smoke detectors which perform far better in white smoke than in black.

Orbis I.S. Optical Smoke Detectors are also designed to reduce significantly the incidence of false alarms through over-sensitivity to transient phenomena.

Orbis I.S. Optical Smoke Detectors are recommended for use as general purpose smoke detectors for early warning of fires in most areas.

## Operation

Orbis I.S. Optical Smoke Detectors work on the well established light scatter principle. The remarkable optical design of the Orbis I.S. Optical Smoke Detector enables it to respond to a wide spectrum of fires.

The sensing chamber contains an optical sensor which measures back-scattered light as well as the more usual forward-scattered light. Sensitivity to black smoke is greatly improved.

The detector is calibrated so that Orbis is highly reliable in detecting fires, but is much less likely to generate false alarms.

The stability of the detector-high reliability, low false alarm rate is further increased by the use of algorithms to decide when the detector should change to the alarm state. This removes the likelihood of a detector producing an alarm as a result of smoke from smoking materials or from another non-fire source.

## Classification

Ex ia IIC T5 -40°C<Ta <+45°C (T4<60°C)Ga

## EMC Directive 2014/30/EU

The Orbis I.S. Optical Smoke Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this datasheet.

A copy of the Declaration of Conformity is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

Conformity of the Orbis I.S. Optical Smoke Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to them.

## Construction Products Regulation 305/2011/EU

The Orbis I.S. Optical Smoke Detector complies with the essential requirements of the Construction Products Regulation 305/2011/EU.

A copy of the Declaration of Performance is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk).

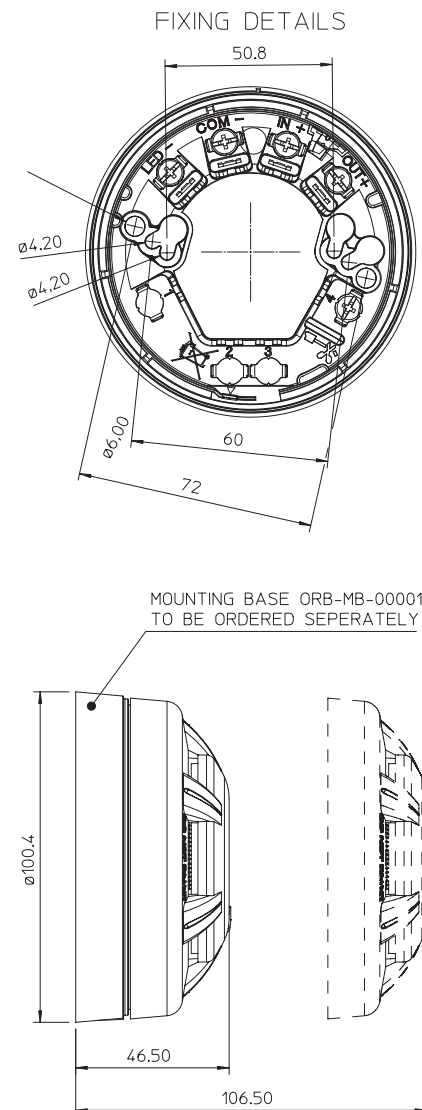
## Marine Equipment Directive 2014/90/EU

The Orbis I.S. Optical Smoke Detector complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.

## ATEX Directive 2014/34/EU

The Orbis I.S. Optical Smoke Detector complies with the essential requirements of the ATEX Directive 2014/34/EU.

### Orbis I.S. Optical Smoke Detector dimensional drawing



**Orbis detectors: LED status**

Feature	Description	Red LED status	Yellow LED status
StartUp™	Confirms that the detectors are wired in the correct polarity	Flashes once per second	No Flash
FasTest™	Maintenance procedure, takes just four seconds to functionally test and confirm detectors are functioning correctly	Flashes once per second	No flash
DirtAlert™	Shows that the drift compensation limit has been reached	No flash	Flashes once per second in StartUp (Stops flashing when StartUp finishes)
SensAlert™	Indicates that the sensor is not operating correctly	No flash	Flashes every four seconds (Flashes once per second in StartUp)
Normal operation	At the end of StartUp and FasTest (without flashing LED as standard)	No flash	No flash
Flashing LED version	Detectors red LED flashes in normal operation (at the end of FasTest)	Flashes every four seconds	No flash

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# Orbis

## I.S. Heat Detector



### Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 23°C and 50% RH unless otherwise stated.

<b>Detection principle</b>	Measurement of heat by means of a thermistor.
<b>Sampling frequency</b>	Once every two seconds
<b>Supply voltage</b>	14 V dc to 28 V dc
<b>Supply Wiring</b>	Two wire supply, polarity sensitive
<b>Polarity reversal</b>	Not allowed
<b>Power up time</b>	< 20 seconds
<b>Minimum 'detector active' voltage</b>	12 V
<b>Power-up surge current at 24 V</b>	105 µA
<b>Average quiescent current at 24 V</b>	80 µA
<b>Alarm load</b>	325 Ω in series with a 1.0 V drop
<b>Minimum holding voltage</b>	5 V
<b>Minimum voltage to light alarm LED</b>	6 V
<b>Alarm reset voltage</b>	< 1 V
<b>Alarm reset time</b>	One second
<b>Alarm indicator</b>	Integral indicator with 360° visibility
<b>Remote output LED (-) characteristic</b>	4.7 kΩ connected to negative supply
<b>Operating and storage temperature</b>	-40°C to +70°C Operating temperature is restricted by the intrinsic safety gas classification. Class T5: -40°C to +45°C Class T4: -40°C to +60°C The detector must be protected from conditions of condensation or icing.
<b>Humidity (no condensation or icing)</b>	0% to 98% RH
<b>Effect of atmospheric pressure on optical sensor</b>	Insensitive to pressure
<b>Effect of wind speed</b>	Unaffected by wind
<b>Designed to IP Rating</b>	IP23D
<b>Standards &amp; approvals</b>	EN54-5, CPD, LPCB, MED, LR, DNV-GL, BV, ABS, CCS, KRS, VdS, BOSEC, IECEX, ATEX, PESO, SBSC and FG
<b>BASEEFA Certification</b>	Bas06ATEX0007X
<b>Dimensions</b>	100 mm diameter x 42 mm height 100 mm diameter x 50 mm height in base
<b>Weight</b>	70 g detector 130 g detector with base
<b>Materials</b>	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel

### Product overview

Product	Orbis I.S. Heat Detector	Oris I.S. Heat Detector with flashing LED
	Part No.	Part No.
Class A1R	ORB-HT-51145-APO	ORB-HT-51146-APO
Class A1S	ORB-HT-51157-APO	ORB-HT-51158-APO
Class A2S	ORB-HT-51147-APO	ORB-HT-51148-APO
Class BR	ORB-HT-51149-APO	ORB-HT-51150-APO
Class BS	ORB-HT-51151-APO	ORB-HT-51152-APO
Class CR	ORB-HT-51153-APO	ORB-HT-51154-APO
Class CS	ORB-HT-51155-APO	ORB-HT-51156-APO

### Approvals



Note: Not all detector variants have VdS or SBSC approval. This can be checked at [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

### Product information

The Orbis Intrinsically Safe (I.S.) Heat Detector range incorporates seven heat detector classes to suit a wide variety of operating conditions in which smoke detectors are unsuitable.

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The European Standard EN 54-5 classifies heat detectors to the highest ambient temperature in which they can safely be used without risk of false alarm.

The classes are identified by the letters A to G (Class 1 is subdivided into A1 and A2). In addition to the basic classification, detectors may be identified by a suffix to show that they are rate-of-rise (suffix R) or fixed (static) temperature (suffix S) types. All heat detectors in the Orbis I.S. range are tested as static or rate-of-rise detectors and are classified as A1R, A1S, A2S, BR, BS, CR and CS.

**Operation**

Orbis I.S. Heat Detectors have an open-web casing which enables air to flow freely across a thermistor which measures the air temperature every two seconds. A microprocessor stores the temperatures and compares them with pre-set values to determine whether a fixed upper limit - the alarm level - has been reached. In the case of rate-of-rise detectors the microprocessor uses algorithms to determine how fast the temperature is increasing.

Static heat detectors respond only when a fixed temperature has been reached. Rate-of-rise detectors also have a fixed upper limit but they also measure the rate of increase in temperature. A fire might thus be detected at an earlier stage than with a static detector so that a rate-of-rise detector is to be preferred to a static heat detector unless sharp increases of heat are part of the normal environment in the area protected by the heat detector

**Where to use heat detectors**

Heat detectors are used in applications where smoke detectors are unsuitable. Smoke detectors are used whenever possible since smoke detection provides earlier warning of fire than heat detection.

Heat detectors should be used if there is a danger of nuisance alarms from smoke detectors.

**Choosing the correct class of heat detector**

Heat detectors have a wide range of response characteristics and the choice of the right type for a particular application may not always seem straightforward. It is helpful to understand the way that heat detectors are classified as explained earlier and to memorise a simple rule: use the most sensitive heat detector available consistent with avoiding false alarms.

In the case of heat detectors it may be necessary to take an heuristic approach, i.e., trial and error, until the best solution for a particular site has been found. The flowchart will help in choosing the right class of heat detector.

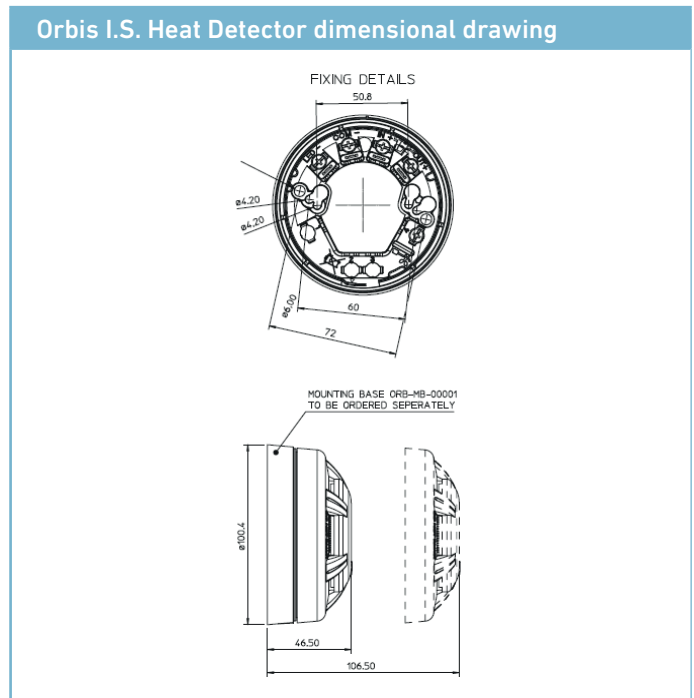
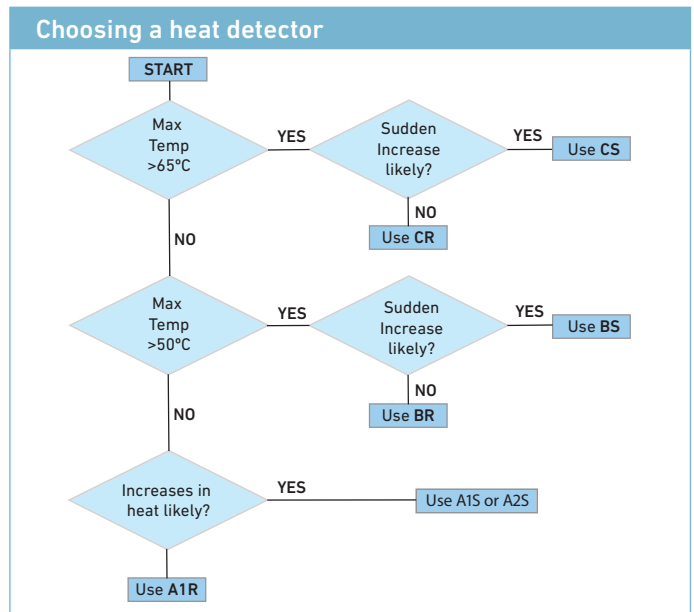
If the fire detection system is being designed to comply with BS 5839-1 heat detectors should be installed at heights of less than 12 metres with the exception of Class A1 detectors, which can be installed at heights of up to 13.5 metres.

**EMC Directive 2014/30/EU**

The Orbis I.S. Heat Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this datasheet.

A copy of the Declaration of Conformity is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

Conformity of the Orbis I.S. Heat Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to them



**Construction Products Regulation 305/2011/EU**

The Orbis I.S. Heat Detector complies with the essential requirements of the Construction Products Regulation 305/2011/ EU.

A copy of the Declaration of Performance is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

**Marine Equipment Directive 2014/90/EU**

The Orbis I.S. Heat Detector complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.

**ATEX Directive 2014/34/EU**

The Orbis I.S. Heat Detector complies with the essential requirements of the ATEX Directive 2014/34/EU.

**Orbis detectors: LED status**

Feature	Description	Red LED status	Yellow LED status
StartUp™	Confirms that the detectors are wired in the correct polarity	Flashes once per second	No Flash
FasTest™	Maintenance procedure, takes just four seconds to functionally test and confirm detectors are functioning correctly	Flashes once per second	No flash
DirtAlert™	Shows that the drift compensation limit has been reached	No flash	Flashes once per second in StartUp (Stops flashing when StartUp finishes)
SensAlert™	Indicates that the sensor is not operating correctly	No flash	Flashes every four seconds (Flashes once per second in StartUp)
Normal operation	At the end of StartUp and FasTest (without flashing LED as standard)	No flash	No flash
Flashing LED version	Detectors red LED flashes in normal operation (at the end of FasTest)	Flashes every four seconds	No flash

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# Orbis I.S.

## Optical/Heat Multisensor Detector



### Technical data

All data is supplied subject to change without notice. Specifications are typical at 24 V, 23°C and 50% RH unless otherwise stated.

<b>Detection principle</b>	Smoke: Photo-electric light scattering Heat: Temperature-sensitive resistance
<b>Chamber configuration</b>	Smoke element only: Infra-red emitter with a prism and a photo-diode at 90° to the light beam with a wide field of view
<b>Sampling frequency</b>	Once every four seconds
<b>Supply voltage</b>	14 V dc to 28 V dc
<b>Supply Wiring</b>	Two wire supply, polarity sensitive
<b>Polarity reversal</b>	Not allowed
<b>Power up time</b>	< 20 seconds
<b>Minimum 'detector active' voltage</b>	12 V
<b>Power-up surge current at 24 V</b>	105 µA
<b>Average quiescent current at 24 V</b>	85 µA
<b>Alarm load</b>	325 Ω in series with a 1 V drop
<b>Minimum holding voltage</b>	5 V
<b>Minimum voltage to light alarm LED</b>	6 V
<b>Alarm reset voltage</b>	< 1 V
<b>Alarm reset time</b>	One second
<b>Alarm indicator</b>	Integral indicator with 360° visibility
<b>Remote output LED (-) characteristic</b>	4.7 kΩ connected to negative supply
<b>Operating and storage temperature</b>	-40°C to +70°C Operating temperature is restricted by the intrinsic safety gas classification. Class T5: -40°C to +45°C Class T4: -40°C to +60°C The detector must be protected from conditions of condensation or icing.
<b>Humidity (no condensation or icing)</b>	0% to 98% RH
<b>Atmospheric pressure</b>	Insensitive to pressure
<b>Effect of wind speed</b>	None
<b>Designed to IP Rating</b>	IP23D
<b>Standards &amp; approvals</b>	EN54-7, CPD, LPCB, MED, LR, DNV-GL, BV, ABS, CCS, KRS, VdS, BOSEC, IECEX, ATEX, VNIPO, SBSC, NANIO, PESO, FG
<b>BASEEFA certification</b>	Bas06ATEX0007X
<b>Dimensions</b>	97 mm diameter x 42 mm height 100 mm diameter x 57 mm height in base
<b>Weight</b>	80 g detector 140 g detector with base
<b>Materials</b>	Housing: White flame-retardant polycarbonate Terminals: Nickel plated stainless steel

### Product overview

Product	I.S. Optical/Heat Multisensor Detector
Part No.	ORB-OH-53027-APO
Product	I.S. Optical/Heat Multisensor Detector with flashing LED
Part No.	ORB-OH-53028-APO

### Approvals



Note: Only Part No. ORB-OH-53027-APO has VdS approval.

### Product information

The Orbis Intrinsically Safe (I.S.) Optical/Heat Multisensor Detector is recognised as a good detector for general use but is additionally more sensitive to fast burning, flaming fires - including liquid fires - than optical detectors.

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**Operation**

Orbis I.S. Optical/Heat Multisensor Detectors can be readily used instead of optical detectors but should be used as the detector of choice for areas where the fire risk is likely to include heat at an early stage in the development of the fire.

The Multisensor detector has two sensors, one for smoke and one for heat with the alarm decision derived from either sensor or combination of both.

As with all the Orbis I.S. range of detectors the increased reliability of detection is combined with high immunity to false alarms.

**EMC Directive 2014/30/EU**

The Orbis I.S. Optical/Heat Multisensor Detector complies with the essential requirements of the EMC Directive 2014/30/EU, provided that it is used as described in this datasheet.

A copy of the Declaration of Conformity is available from the Apollo website: [www.apollo-fire.co.uk](http://www.apollo-fire.co.uk)

Conformity of the Orbis I.S. Optical/Heat Multisensor Detector with the EMC Directive, does not confer compliance with the directive on any apparatus or systems connected to them.

**Construction Products Regulation 305/2011/EU**

The Orbis I.S. Optical/Heat Multisensor Detector complies with the essential requirements of the Construction Products Regulation 305/2011/EU.

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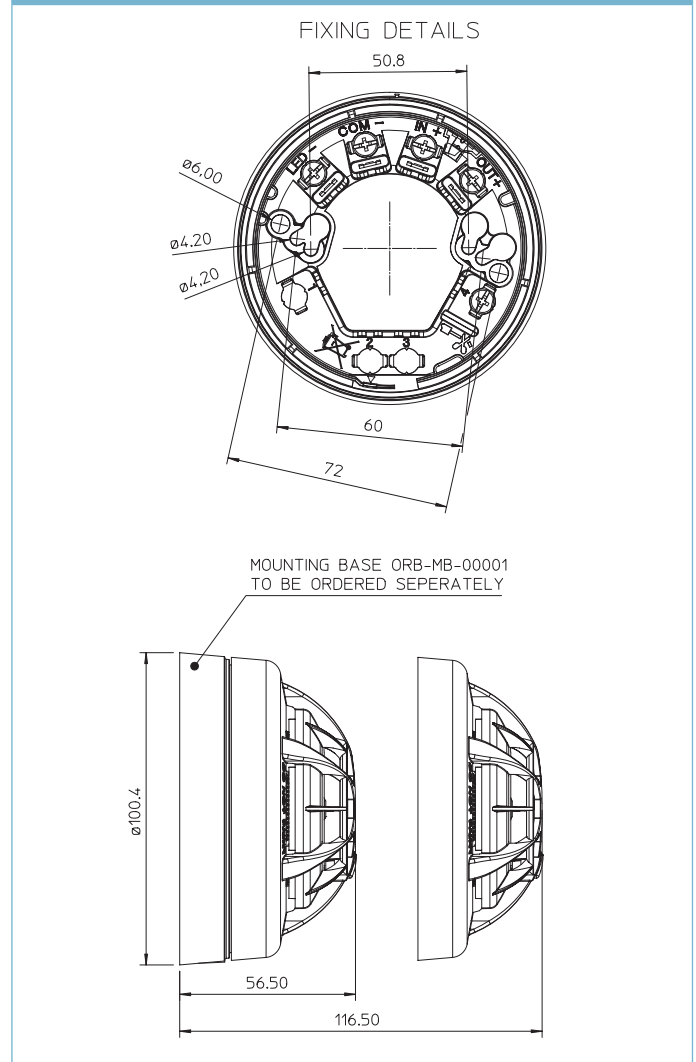
**Marine Equipment Directive 2014/90/EU**

The Orbis I.S. Optical/Heat Multisensor Detector complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.

**ATEX Directive 2014/34/EU**

The Orbis I.S. Optical/Heat Multisensor Detector complies with the essential requirements of the ATEX Directive 2014/34/EU.

Orbis I.S. Optical/Heat Multisensor Detector dimensional drawing



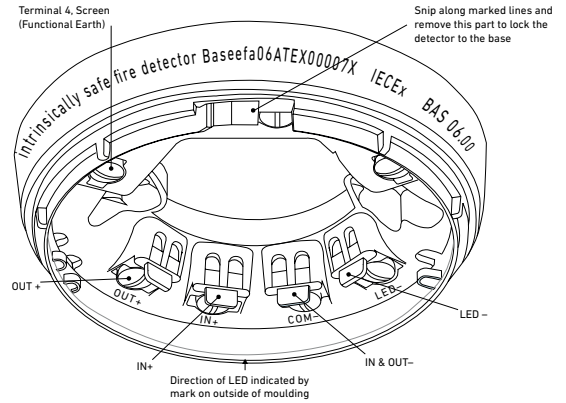
**Orbis detectors: LED status**

Feature	Description	Red LED status	Yellow LED status
StartUp™	Confirms that the detectors are wired in the correct polarity	Flashes once per second	No Flash
FasTest™	Maintenance procedure, takes just four seconds to functionally test and confirm detectors are functioning correctly	Flashes once per second	No flash
DirtAlert™	Shows that the drift compensation limit has been reached	No flash	Flashes once per second in StartUp (Stops flashing when StartUp finishes)
SensAlert™	Indicates that the sensor is not operating correctly	No flash	Flashes every four seconds (Flashes once per second in StartUp)
Normal operation	At the end of StartUp and FasTest (without flashing LED as standard)	No flash	No flash
Flashing LED version	Detectors red LED flashes in normal operation (at the end of FasTest)	Flashes every four seconds	No flash

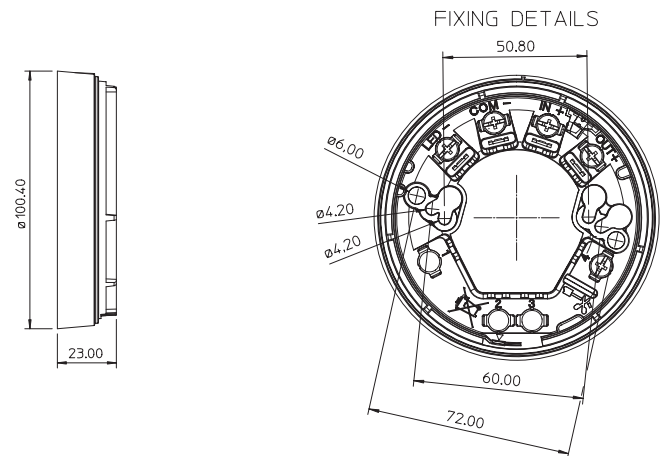
# Orbis I.S. TimeSaver® Base



## Orbis I.S. TimeSaver base terminals



## Orbis I.S. TimeSaver base dimensions



## Marine Equipment Directive 2014/90/EU

The Orbis I.S. TimeSaver Base complies with the essential requirements of the Marine Equipment Directive 2014/90/EU.

### Product overview

Product	I.S TimeSaver Base
Part No.	ORB-MB-50018-APO

### Approvals



### Product information

The Orbis Intrinsically Safe (I.S.) TimeSaver Base has been designed to make installation fast and simple.

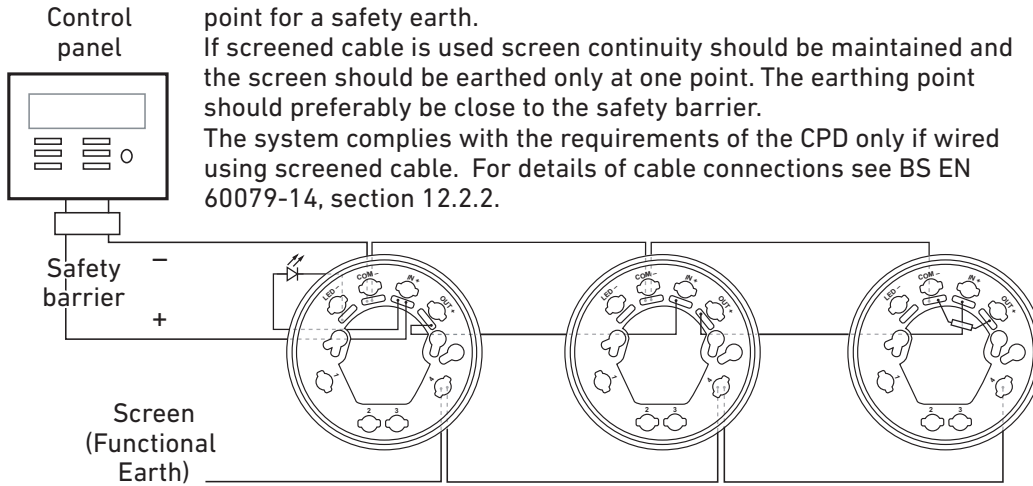
The terminal screws are captive screws and will not fall out of the terminals. The base is supplied with the screws unscrewed in order to avoid unnecessary work for the installer.

If it is required that all detectors are fitted with their LEDs facing the same direction, the bases must be fitted to the ceiling observing the marking on the exterior which indicates the position of the LED.

- Grouped terminals to make wiring easy
- Multiple fixing centres
- LED alignment mark
- Cable stripping guide

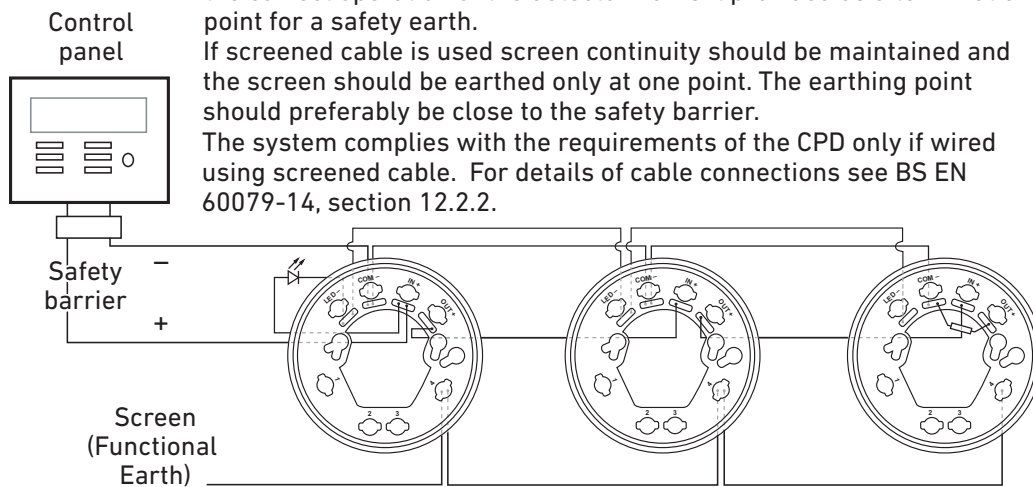
Orbis I.S. TimeSaver Base wiring diagram

Note: the earth terminal in the base is provided for convenience where continuity of a cable sheath or similar is required. It is not necessary for the correct operation of the detector nor is it provided as a termination point for a safety earth.  
 If screened cable is used screen continuity should be maintained and the screen should be earthed only at one point. The earthing point should preferably be close to the safety barrier.  
 The system complies with the requirements of the CPD only if wired using screened cable. For details of cable connections see BS EN 60079-14, section 12.2.2.



Orbis I.S. TimeSaver Base wiring diagram - three bases wired with a common LED

Note: the earth terminal in the base is provided for convenience where continuity of a cable sheath or similar is required. It is not necessary for the correct operation of the detector nor is it provided as a termination point for a safety earth.  
 If screened cable is used screen continuity should be maintained and the screen should be earthed only at one point. The earthing point should preferably be close to the safety barrier.  
 The system complies with the requirements of the CPD only if wired using screened cable. For details of cable connections see BS EN 60079-14, section 12.2.2.





# Conventional IS Manual Call Point

## FUNCTION

The Conventional IS Manual Call Point has been designed to operate on conventional intrinsically safe fire detection systems.

Designed specifically for use in atmospheres in which explosive mixtures are or may be present, certain design considerations must be observed. Full information on this to be found in PP1095.

The Manual Call Point is available in two versions, indoor and outdoor in either red or yellow.

## FEATURES

The Manual Call Point has an easily resettable element rather than a break glass. This call point is supplied with a backbox for surface mounting.

It also features a unique 'Plug and Play' installation concept designed specifically to reduce installation time. The call point utilises a terminal block, where all installation cabling is terminated.

The red Manual Call Point is approved to EN54-11 standard and complies with the requirements of the ATEX directive.

## MECHANICAL CONSTRUCTION

The component parts of the call point are moulded in polycarbonate or ABS, depending on their function.

## DIMENSIONS AND WEIGHT

Indoor	93mm x 89mm x 59.5mm	180g
Outdoor	93mm x 97.5mm x 71mm	350g



Part nos. 55100-031 (IS Indoor - Red)  
55100-032 (IS Indoor - Yellow)  
55100-033 (IS Outdoor - Red)  
55100-034 (IS Outdoor - Yellow)

## OPERATING PRINCIPLES

The Manual Call Point consists of a 470Ω resistor in series with a normally open switch contact.

The Manual Call Point helps reduce installation time as all the initial installation cabling is wired to a terminal block which connects neatly to the call point.

Once activated, the manual call point can be reset by inserting the test key into the bottom of the unit until the key clicks into position. Remove the test key and push the front cover up until it clicks home.



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### EMC DIRECTIVE 2004/108/EC

The Manual Call Point complies with the essential requirements of the EMC Directive 2004/108/EC, provided that it is used as described in this PIN sheet.

A copy of the Declaration of Conformity is available from Apollo on request.

Conformity of the Manual Call Point with the EMC Directive does not confer compliance with the directive on any apparatus or systems connected to it.

### TECHNICAL DATA

Maximum Supply voltage	30VDC
Switch Rating	2A

Operating temperature	
Indoor	-10°C to +55°C
Outdoor	-25°C to +70°C

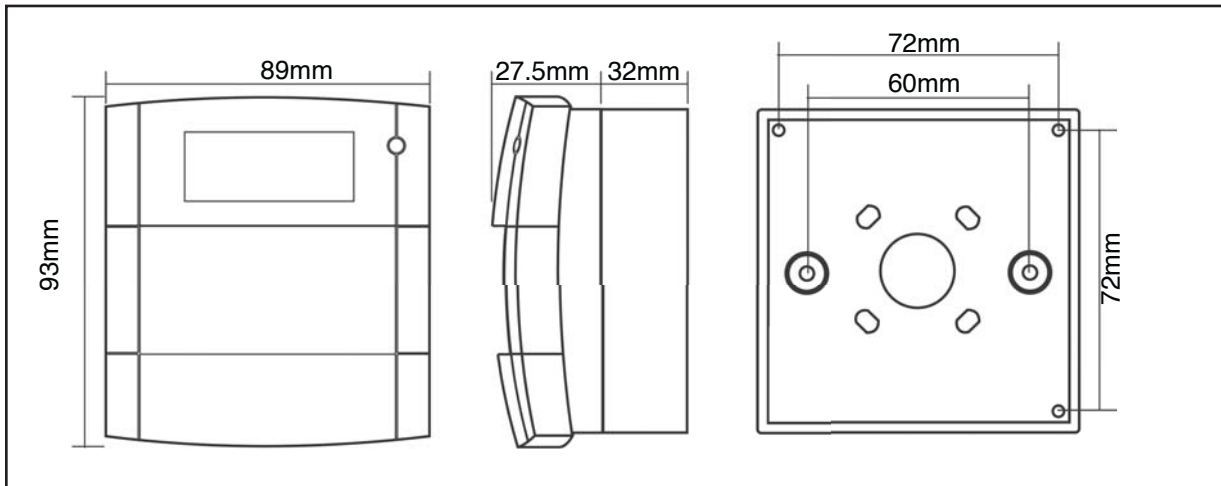
Humidity (no condensation) 0-93 ±3%(Ind/Out)

IP rating	
Indoor	24D
Outdoor	67

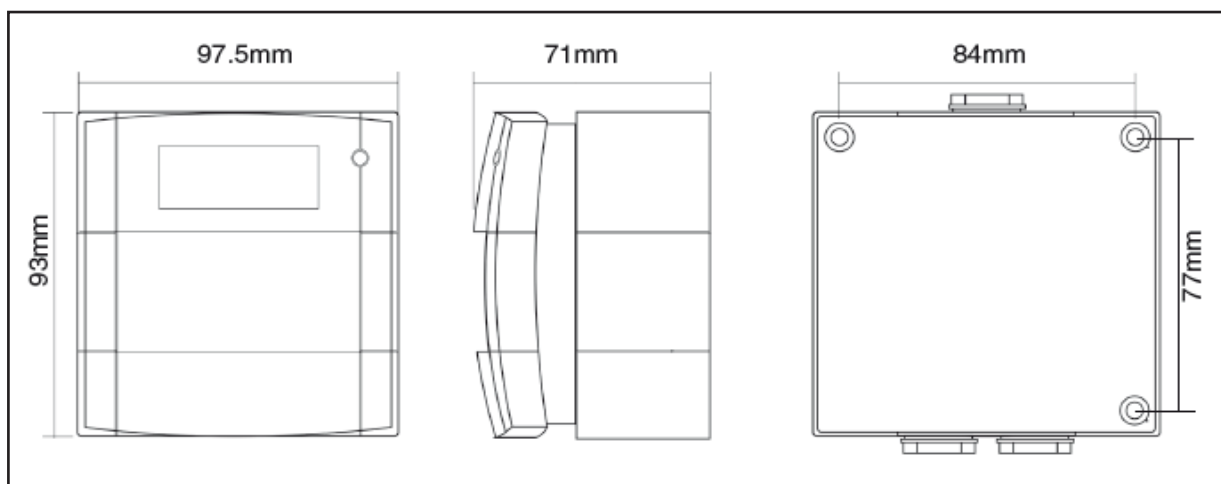
Complies with EMC Directive 2004/108/EC  
Complies with EN54-11:2001  
Complies with ATEX Directive 94/9/EC

### DIMENSIONAL DRAWING

#### INDOOR



#### OUTDOOR



**Features**

- 1-channel isolated barrier
- 24 V DC supply (loop powered)
- Current input/output 0 mA ... 40 mA
- I/P or transmitter power supply
- Accuracy 1 %
- Reverse polarity protection
- Up to SIL2 acc. to IEC 61508

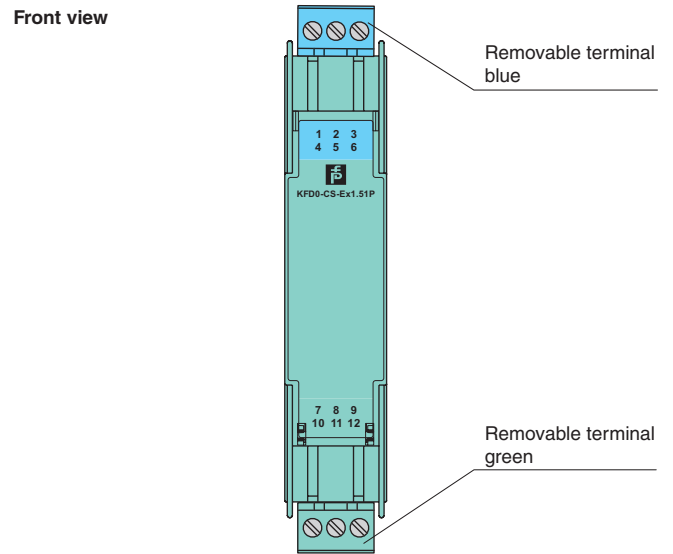
**Function**

This isolated barrier is used for intrinsic safety applications. It transfers DC signals from fire alarms, smoke alarms, and temperature sensors in hazardous areas. It can also be used to control I/P converters, power solenoids, LEDs, and audible alarms.

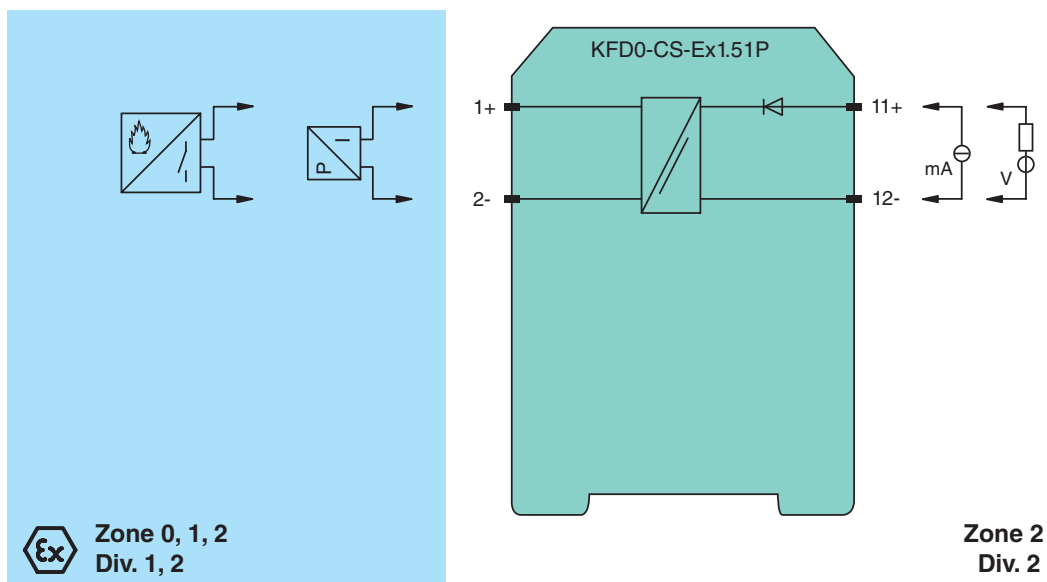
Reverse polarity protection prevents damage to the isolator caused by faulty wiring.

Since this isolator is loop powered, use the technical data to verify that proper voltage is available to the field devices.

**Assembly**



**Connection**



Release date 2012-02-27 13:50 Date of issue 2012-02-27 072147\_eng.xml

<b>General specifications</b>	
Signal type	Analog output
<b>Supply</b>	
Rated voltage	loop powered
<b>Control circuit</b>	
Connection	terminals 12-, 11+
Voltage	4 ... 35 V DC
Current	0 ... 40 mA
Power loss	at 40 mA and $U_{in} < 22$ V: 700 mW per channel at 40 mA and $U_{in} > 22$ V: 1.2 W per channel
<b>Field circuit</b>	
Connection	terminals 1+, 2-
Voltage	for $4 \text{ V} < U_{in} < 24 \text{ V}$ : $\geq U_{in} - (0.37 \times \text{current in mA}) - 1.0$ for $U_{in} > 24 \text{ V}$ : $\geq 21 \text{ V} - (0.36 \times \text{current in mA})$
Short-circuit current	at $U_{in} > 24 \text{ V}$ : $\leq 65 \text{ mA}$
Transfer current	$\leq 40 \text{ mA}$
<b>Transfer characteristics</b>	
Deviation	
After calibration	$\leq \pm 200 \mu\text{A}$ ; incl. calibration, linearity, hysteresis and load fluctuations at the output up to a load of 1 k $\Omega$ and current $\leq 20 \text{ mA}$ at 20 °C (68 °F)
Influence of ambient temperature	$\leq \pm 2 \mu\text{A/K}$ at $U_{in} \leq 20 \text{ V}$ ; $\leq \pm 5 \mu\text{A/K}$ at $U_{in} > 20 \text{ V}$
Rise time	$\leq 5 \text{ ms}$ at 4 ... 20 mA step and $U_{in} < 24 \text{ V}$
<b>Electrical isolation</b>	
Field circuit/control circuit	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
<b>Directive conformity</b>	
Electromagnetic compatibility	
Directive 2004/108/EC	EN 61326-1:2006
<b>Conformity</b>	
Electromagnetic compatibility	
NE 21:2006	
Protection degree	
IEC 60529	
Protection against electric shock	
UL 61010-1	
<b>Ambient conditions</b>	
Ambient temperature	
-20 ... 60 °C (-4 ... 140 °F)	
<b>Mechanical specifications</b>	
Protection degree	
IP20	
Mass	
approx. 100 g	
Dimensions	
20 x 107 x 115 mm (0.8 x 4.2 x 4.5 in) , housing type B1	
Mounting	
on 35 mm DIN mounting rail acc. to DIN EN 60715	
<b>Data for application in connection with Ex-areas</b>	
EC-Type Examination Certificate	
BAS 98 ATEX 7343 , for additional certificates see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>	
Group, category, type of protection	
$\text{Ex}$ II (1)G [Ex ia Ga] IIC, II (1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I (-20 °C $\leq$ T <sub>amb</sub> $\leq$ 60 °C)	
Voltage	$U_o$ 25.2 V
Current	$I_o$ 93 mA
Power	$P_o$ 585 mW
Control circuit	
Maximum safe voltage	$U_m$ 250 V <sub>eff</sub> (Attention! The rated voltage can be lower.)
Field circuit	
Maximum safe voltage	$U_m$ 250 V <sub>eff</sub> (Attention! The rated voltage can be lower.)
Statement of conformity	
TÜV 99 ATEX 1499 X , observe statement of conformity	
Group, category, type of protection, temperature class	
$\text{Ex}$ II 3G Ex nA II T4 [device in zone 2]	
Electrical isolation	
Field circuit/control circuit	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity	
Directive 94/9/EC	EN 60079-0:2009, EN 60079-11:2007, EN60079-15:2005
<b>International approvals</b>	
FM approval	
Control drawing	116-0129
UL approval	
Control drawing	116-0173 (cULus)
<b>General information</b>	
Supplementary information	
EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .	

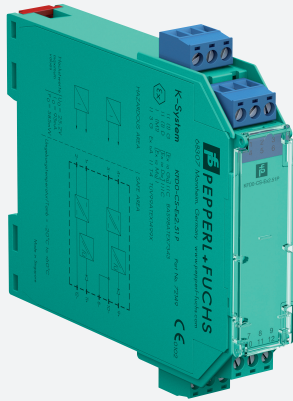
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## Application

The device is used for isolation of power loops for the control of positioner, I/P converters etc. A current source is connected to the safe area terminals.

The device is used for isolation of a current signal from fire detectors or similar sensors. In this case, a voltage source can be connected to the safe area terminals. A specific measurement current across a passive sensor can be measured in the safe area with a series resistor (min. 50  $\Omega$ ). When a voltage supply is used, the measuring resistor can also provide current limitations.



# Current Driver/Repeater KFD0-CS-Ex2.51P

**SIL 2**

- 2-channel isolated barrier
- 24 V DC supply (loop powered)
- Current input/output 0 mA ... 40 mA
- I/P or transmitter power supply
- Accuracy 1 %
- Reverse polarity protection
- Up to SIL 2 acc. to IEC 61508

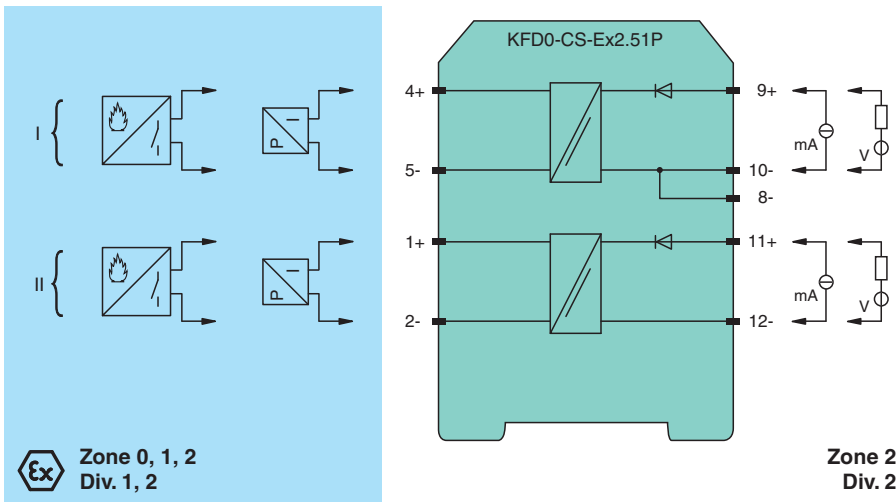
2-channel



## Function

This isolated barrier is used for intrinsic safety applications. The device transfers DC signals of fire alarms and smoke alarms from the hazardous area to the non-hazardous area. The device can also be used to control I/P converters, valves, indicators, and audible alarms. A reverse polarity protection prevents damage to the device caused by faulty wiring. The device is loop powered. From the control side no additional power supply has to be connected. Use the technical data to verify that proper voltage is available to the field devices.

## Connection



## Technical Data

### General specifications

Signal type Analog input/analog output

### Functional safety related parameters

Safety Integrity Level (SIL) SIL 2

### Supply

Rated voltage  $U_r$  loop powered

### Control circuit

Connection terminals 12-, 11+; 8-, 10-, 9+

Voltage 4 ... 35 V DC

Current 0 ... 40 mA

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## Technical Data

Power dissipation		at 40 mA and $U_{in} < 22$ V: 700 mW per channel at 40 mA and $U_{in} > 22$ V: 1.2 W per channel
<b>Field circuit</b>		
Connection		terminals 1+, 2-; 4+, 5-
Voltage		for $4$ V $< U_{in} < 24$ V: $\geq U_{in} - (0.37 \times \text{current in mA}) - 1.0$ for $U_{in} > 24$ V: $\geq 21$ V - $(0.36 \times \text{current in mA})$
Short-circuit current		at $U_{in} > 24$ V: $\leq 65$ mA
Transfer current		$\leq 40$ mA
<b>Transfer characteristics</b>		
Accuracy		1 %
Deviation		
After calibration		$\leq \pm 200$ $\mu$ A; incl. calibration, linearity, hysteresis and load fluctuations at the field side up to a load of 1 k $\Omega$ and current $\leq 20$ mA at 20 °C (68 °F)
Influence of ambient temperature		$\leq \pm 2$ $\mu$ A/K at $U_{in} \leq 20$ V; $\leq \pm 5$ $\mu$ A/K at $U_{in} > 20$ V
Rise time		$\leq 5$ ms at bounce from 4 ... 20 mA and $U_{in} < 24$ V
<b>Galvanic isolation</b>		
Field circuit/control circuit		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
<b>Indicators/settings</b>		
Labeling		space for labeling at the front
<b>Directive conformity</b>		
Electromagnetic compatibility		
Directive 2014/30/EU		EN 61326-1:2013 (industrial locations)
<b>Conformity</b>		
Electromagnetic compatibility		
		NE 21:2012 EN 61326-3-2:2008
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1:2012
<b>Ambient conditions</b>		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
<b>Mechanical specifications</b>		
Degree of protection		IP20
Connection		screw terminals
Mass		approx. 100 g
Dimensions		20 x 107 x 115 mm (0.8 x 4.2 x 4.5 inch) , housing type B1
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
<b>Data for application in connection with hazardous areas</b>		
EU-type examination certificate		BAS 98 ATEX 7343 X
Marking		Ⓔ II (1)G [Ex ia Ga] IIC, II (1)D [Ex ia Da] IIIC, I (M1) [Ex ia Ma] I (-20 °C $\leq T_{amb} \leq 60$ °C)
Voltage	$U_o$	25.2 V
Current	$I_o$	93 mA
Power	$P_o$	585 mW
Control circuit		
Maximum safe voltage	$U_m$	250 V <sub>eff</sub> (Attention! The rated voltage can be lower.)
Field circuit		
Maximum safe voltage	$U_m$	250 V <sub>eff</sub> (Attention! The rated voltage can be lower.)
Certificate		
Marking		Ⓔ II 3G Ex nA II T4 [device in zone 2]
Galvanic isolation		
Field circuit/control circuit		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 2014/34/EU		EN 60079-0:2012+A11:2013 , EN 60079-11:2012 , EN 60079-15:2010
<b>International approvals</b>		
FM approval		
Control drawing		116-0437

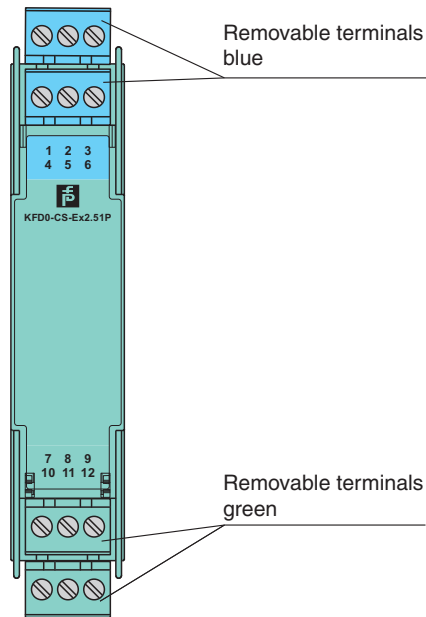
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**Technical Data**

UL approval	
Control drawing	116-0438 (cULus)
IECEX approval	
IECEX certificate	IECEX BAS 05.0004X IECEX CML 19.0040X
IECEX marking	[Ex ia Ga] IIC , [Ex ia Da] IIIC , [Ex ia Ma] I Ex ec IIC T4 Gc
<b>General information</b>	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a> .

**Assembly**

Front view



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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

## Application

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The device is used for isolation of a current signal from fire detectors or similar sensors. In this case, a voltage source can be connected to the safe area terminals. A specific measurement current across a passive sensor can be measured in the safe area with a series resistor (min. 50  $\Omega$ ). When a voltage supply is used, the measuring resistor can also provide current limitations.