Quickstart Guide

ESSER
by Honeywell

Fire Safety Design Guide

Content

Innovations

The market for fire protection is a complex and constantly changing field in which many factors are to be considered during the introduction of new technologies. For over a quarter century, ESSER has been the forerunner in the field of innovative fire detection technology - with

- products which set milestones and
- system solutions which enable more flexibility, profitability, and operational safety.

Milestones in fire detection technology at ESSER

1975 Development of the world's smallest smoke detector
1982 Diagnostic detector series 9100 with addressable detectors
1983 Intelligent display terminal (IDT), PC-based
1990 Freely programmable fire detection system 8008
1991 Multisensor technology
1992 Field bus technology for building networks
1996 IDT supervisor for Windows NT
1997 First combinable fire and intrusion alarm panel 2001
1998 Remote diagnosis downwards to sensor level with TEDIS tool
1999 Two-loop fire alarm panel 8000 C
2000 Flexible fire protection with alarm panel 8000 M for mid-size projects
2001 O^2T detector distinguishes smoke particles from disturbances like water vapor
2003 OTG detector, the multisensor detector with integrated gas sensor and individual CO parameterization
2004 IQ8Quad multicriterion detector, the world's first multifunctional fire and smoke detector with integrated alarm devices (flash, sound, speech)
2005 IQ8Quad OT^{blue}, the environmental friendly reliable smoke detector with blue light, which replaces ionization smoke detectors
2006 IQ8System, the holistic fire protection system with IQ8Control alarm panels
2007 IQ8Wireless, the all-embracing wireless fire protection concept
2008 IQ8Alarm, the wireless combined alarm and speech signalling device
2010 FlexES Control, the new FACP benchmark in fire detection and alarm technology
2013 ES Line the professional conventional panel with intelligent but non-addressable detectors ES Detect

1 Introduction

CE	
DIN EN 54	VdS 2095
DIN EN 0833	CPD

This Quickstart Guide is written for professionals who design and install fire detection systems. This manual is based on the requirements and regulations in accordance with the EN 54 Standard for Fire alarm systems. The EN54 describes fundamentally the product requirements, a general installation requirements is in work (prEN54-14). The installation described in this document follows the German installation guide line VdS 2095 and VDE 0833.

It is highly recommended to observe national regulations of the system design and commissioning.

Additional and updated Information

The features, specifications and other product specific information detailed in this manual are based on standards and information current at the time of publication (refer to the date on the rear page) and may differ due to modifications and/or amended Standards and Regulations. This guide is designed to offer an aide memoire and there is no substitute to reading the applicable standards.

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1.1 System Design

Any design should be prepared by a competent individual/ organisation, who has consulted all interested parties and created a set of drawings, a specification, a cause & effect or fire plan, a list of Variations and completed a Design certificate, detailed within VdS 2095.

If designs are undertaken without this research being carried out, the fire detection system is unlikely to comply with the legal requirements. This could result in prosecution of the parties involved, particularly those within the supply chain as well as the Owner/Occupier.

Anyone who takes on the responsibility for design will do so at their own risk and design liability insurance is advisable.

The Designer's responsibilities:

- Agree the level of protection or category with Owner/Occupier
- Justify any Variations and document reasons
- Detail the detection & alarm zones
- Prepare specification and drawings including;
- Siting of manual call points
- Siting of point type heat and smoke detectors
- Siting of beam detectors
- Siting of any other forms of detection
- Specify type of cable for each circuit
- Specify type of system and equipment
- Include detail for on/off site links with other equipment
- Take into account the risk of false alarms – use the Esser application guide at the back of this booklet
- Allow for correct level of sounders and visual alarms
- Prepare a fire plan or cause and effect chart
- Sign a design certificate

Note VdS 2095 recommends that a fire detection system is designed by a competent person, who takes responsibility for completing the design and signing off a 'Design certificate'. This should not be confused with other certificates relating to Installation and Commissioning, that are completed by the parties responsible for those parts.

Also if the contract allows, it is suggested that the Designer witness tests the completed system to ensure the original design is still appropriate – the Design certificate can then be completed after any amendments are included.

Consider the following design stages:

Design Stage 1: Pre-Design planning
Talk to the interested parties to decide on the level of protection or category and agree Variations.

The importance of pre-design planning cannot be overstated. Many parties are likely to have an interest in what the fire detection system is expected to do. Ultimately it is up to the Owner/Occupier, who is responsible by law, to make the final decision on the level of protection provided for a particular building.

In most circumstances the Owner/Occupier will appoint a competent Designer to carry out this work and take liability for the design as a whole.

The nominated Designer is expected to consult the following organisations:

- The User or Facilities Manager
- The Building Control Officer
- The Health and Safety Executive
- The Insurer
- The local Fire and Rescue Service
- A specialist fire alarm system supplier

Design Stage 2: Determination of Detection and Alarm Zones

Design Stage 3: Siting of Manual Call Points (MCP)

Design Stage 4: Selection and siting of sensors (detectors)

Design Stage 5: Choice and siting of alarm sounders and visual alarms

Design Stage 6: Determination of Control equipment and power supplies

Issues to be covered by the Designer should include:

- The Fire Risk Assessment demands
- The requirements necessary to comply with the local Fire Safety Order, any Equality Act and
- Building Regulations approved documents
- The prime purpose of the system (Property or life protection or both)
- The list of Variations identified by the interested parties

1.2 Main causes of damage and extent of damage

As shown by the loss statistics over the past few years, the level of damage remains high and the susceptibility to extensive damage continues to present problems.

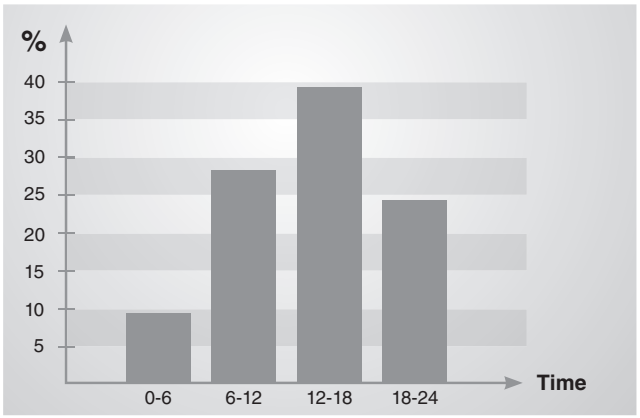
The German Institute for loss prevention & loss research (IFS) has compiled an overview of the causes and consequences of fire, which are based on newspaper reports due to a lack of comprehensive statistics. According to this overview, over 2,199 fires with 732 cases of personal injury, 63 of which resulted in deaths, were reported over a period of two months.

Conclusion: the number of fire victims in hotels, homes, hostels and private residences is 2.5 times as high as in public buildings and industrial plants. Arson is the most frequent cause of fires in hotels and homes, where smoking and defective electrical installations are significant fire hazards.

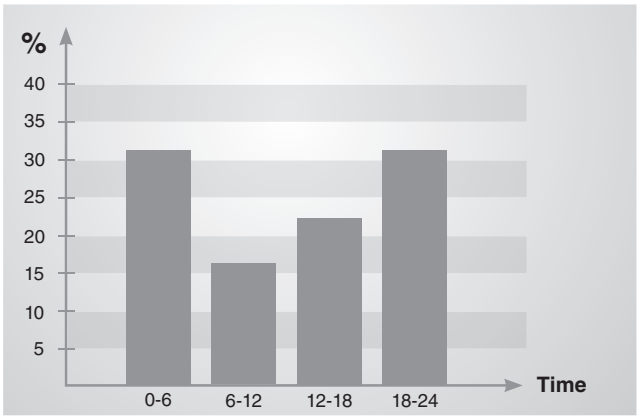
The reasons for the high fire damage can be condensed down into a few simple points:

- Constant rationalisation measures have meant that value has been increasingly concentrated in small areas
- Fire compartments have been significantly enlarged in order to maintain a favourable production flow
- The use of new materials whose fire behaviour has not been sufficiently considered has resulted in consequential damage (e.g. in the case of PVC fires) that is many times more costly than the actual fire damage
- Insufficient sealing of cable ducts, a lack of fire dampers in air conditioning/ventilation ducts
- Miscalculation of the susceptibility to fire damage
- A lack of stationary fire extinguishing equipment, such as sprinkler systems or CO_2 fire extinguishing systems
- A lack of fire alarm systems that allow fires to be detected in its early phase and which enable a rapid fire fighting response thanks to an automatic alarm transmission, e.g. to the local fire department.
- A lack of fire protection monitoring in operating rooms outside working hours is responsible for disproportionately large losses.

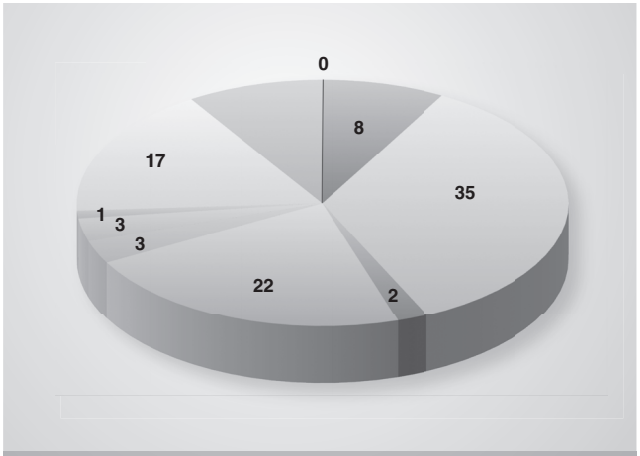
If you consider the progress of a fire and damage over 24 hours, assuming that the operating rooms are not monitored by a fire alarm system, Figure 1 shows that, for example, only 9% of fires start between midnight and 6 a.m., but these fires represent losses of 31%:
early fire detection would have been able to make a significant contribution to reducing the fire damage in these cases.



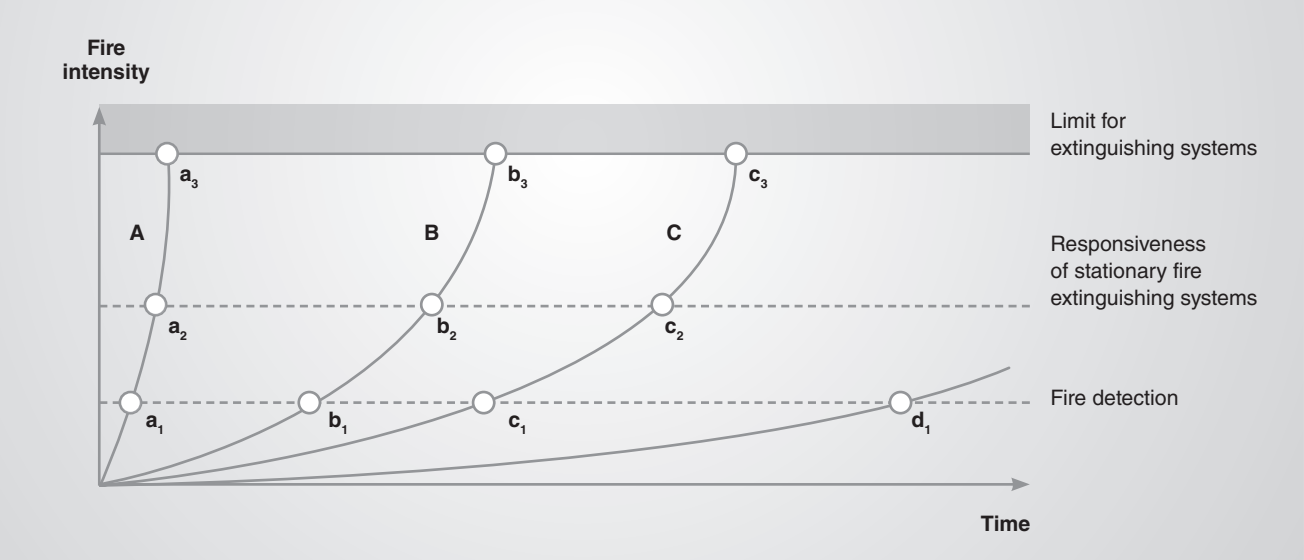
Fires over 24 hours



Fire damage over 24 hours



0 Lightning
1 Spontaneous combustion
2 Explosion
3 Open fire
3 Work representing a fire hazard
8 Arson
9 Overheating
17 Human error
22 Other and unknown
35 Electricity



Critical downtimes for electronic data processing (EDP) systems

The monitoring of EDP systems, generally operating without supervision, are a particular priority for the use of fire alarm systems.

In many operations, extensive administration tasks as well as tasks in the production areas are increasingly managed by powerful EDP systems. This obviously increases the company's dependency on the EDP system.

If the electronic machinery fails, or important data recordings are lost in a fire, this may result in significant losses for the company.

Most companies are naturally covered against property damage and loss of income by fire insurance and business interruption insurance due to fire, while potential additional losses are simply ignored.

A range of investigations conclude that a failure of an EDP system of only a few days can already be problematic for certain sectors of industry. Consequently, a failure of the EDP system in the banking sector of 2.0 days

- commercial companies of 3.3 days
- industrial companies of 4.8 days
- insurance companies of 5.6 days

can be deemed critical while downtimes beyond this are regarded as a threat to the company's existence.

Progress of the fire and assessment

Accordingly, a review must be performed in each individual case to check whether a single fire detector is sufficient or whether a fire extinguishing system needs to be controlled by the fire alarm system and, if yes, which system is the most suitable.

As shown in the figure, careful fire analysis in the planning stage is required in order to select the appropriate fire detector, as fires progress with very different phase velocities, which can range from a few milliseconds to several hours.

The top grey area represents the area in which the fire has already developed to the extent that the use of extinguishers can no longer be successful.

The individual curves A to D represent different fire progressions that are each detected by a fire alarm system from points a_1 to d_1.

The response threshold of stationary fire extinguishing systems (e.g. sprinkler systems) without activation by a fire alarm system is indicated by points b_2 and c_2.

Explosion, flash fire

The time between the detection of a fire by a fire alarm system and the time until it needs to be extinguished (a3, b3, c3) can vary dramatically. Curve A represents a rapid fire development, an explosion.

Combustible materials that form a dust/air mixture in a finely distributed form or a vapour/air mixture, in the case of liquids, can explode.

Other requirements include the presence of an explosive concentration of this dust or vapour and air mixture (the concentration must range between the top and bottom explosion thresholds) and an ignition source with sufficient energy.

Many combustible materials can explode as dusts, e.g. icing sugar, starch, flour, aluminium, magnesium and a range of carbon compounds.

A distinction is made between the following according to the different flame velocities:

- Flash fire, several cm/s
- Explosion, several m/s
- Detonation, several km/s

Highly sensitive pressure and flame detectors are used to detect the start of an explosion in the first few milliseconds and can trigger the appropriate extinguishing system.

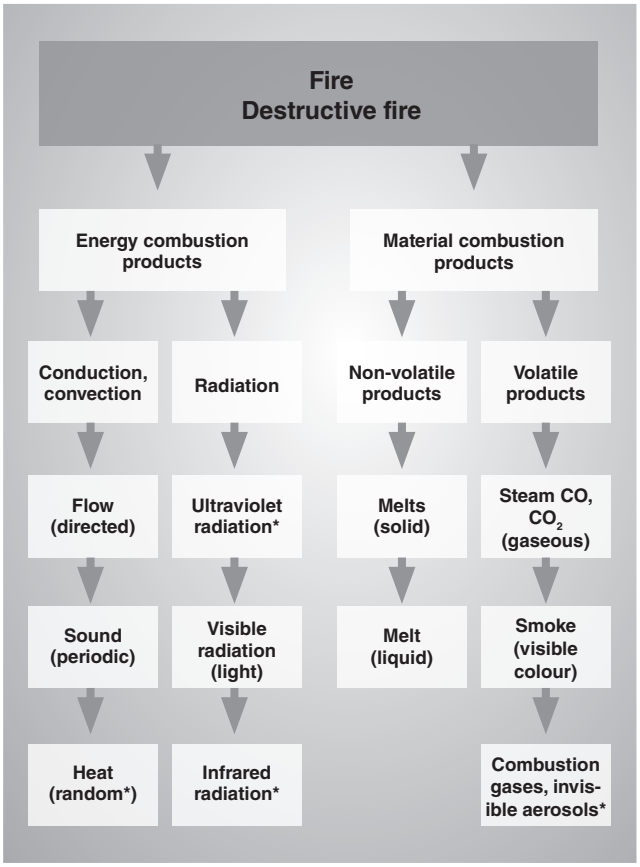
High fire load, rapid fire spread

In the area of curves B and C, fire detectors that use the temperature as the fire criterion for the transmission of an alarm can be installed due to the high fire load and the rapid increase in the fire intensity.

Thermal fire detectors which, as fixed-heat detectors, detect and sound an alarm when a certain temperature is exceeded as well as a rise in temperature in combination based on a differential evaluation, are used in this area.

Once again, the time between when the fire is detected by the fire alarm system (point b1 and c1) and the time at which it can no longer be successfully extinguished (a3, b3, c3) is relatively low.

As a result, the fire alarm system must be connected to a stationary fire extinguishing system which can automatically extinguish the fire by applying water, powder or CO_2, etc.



Smouldering fire – combustion gases, smoke

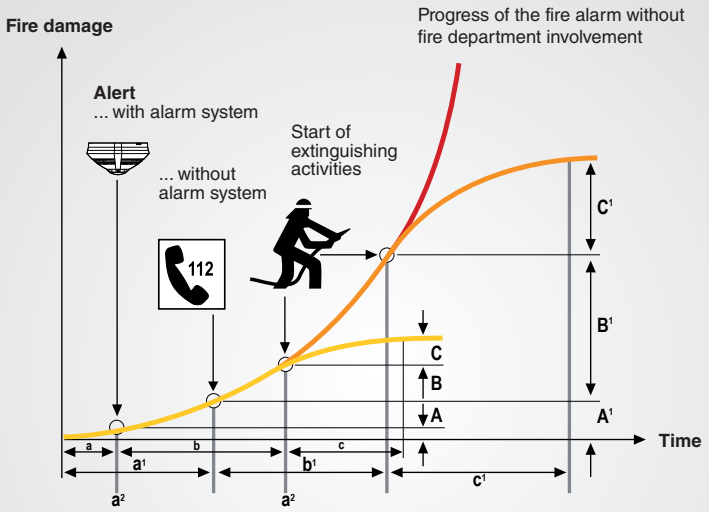
A much greater period is available from the time of fire detection (d1) until the fire intensity increases for curve D, which represents a smouldering fire.

The combustion gases and smoke accompanying a smouldering fire are identified as fire parameters by smoke detectors and are assessed as a fire alarm when they exceed a specific concentration.

Types of fire

Every combustion is connected with the conversion of energy and material. An overview of the types of fires is provided in Figure 3.

The fire parameters marked with an * are primarily used for automatic fire detectors.



a = Response time of automatic fire detectors
a' = Average response time for telephone alarms
a^1 = Time of detection of the warning device
a^2 = Time of arrival of the fire department
b = b' = Average response time by the fire department
c = Average extinguishing time for buildings with an automatic fire extinguishing system
c' = Average extinguishing time for buildings without an automatic fire extinguishing system
A = Fire damage by the time an automatic fire alarm system responds
A' = Fire damage by the time the fire department is alerted over the phone
B = Fire damage between the alarm and the start of the extinguishing activities for buildings with automatic fire alarm systems
B' = Fire damage between the alarm and the start of the extinguishing activities for buildings without automatic fire alarm systems
C = Fire damage during the extinguishing activities for buildings with automatic fire alarm systems
C' = Fire damage during the extinguishing activities for buildings without automatic fire alarm systems

Impact of the intervention time on the amount of damage

The intervention time is the time at which the fire starts until there s a response by the fire alarm system with an automatic alarm transmission to the fire department (a), the arrival time of the fire department (b^1), the time taken to localise the source of the fire (b^2) and the time required to fight and extinguish the fire. Figure 4 displays the potential progression of a fire, which is detected by a fire alarm system and transmitted to the fire department as an alarm at time a1, who arrives at the source of the fire at time a^2.

If the individual identification of the alarm warning device is not possible and it is not possible to trace the start of the fire, the source of the fire must first be located before the use of the extinguishing agent can commence.

If the individual warning device is identified at the FACP, the source of the fire can be quickly localised and the extinguishing agent can be used almost immediately. This significantly reduces the fire damage. Quicker fire detection, as is the case when using an 'intelligent' technology with an optimal fire detection quality, enables a shorter intervention time with a corresponding reduction in the amount of damage.

Minimising fire damage by using 'intelligent' fire detectors

There have been a number of new developments in fire alarm systems over the past few years, made possible by the cost-effective use of microprocessors, with the aim of further reducing false alarms. Fire alarm systems have become 'more intelligent'.

The progress in fire detection is also reflected in the specialist presentations at conventions held at the RWTH Aachen and the University of Duisburg. The 'intelligence' is structured as follows for fire alarm systems:

- Fire detection intelligence – recording signals with corresponding evaluation
- Decision-making intelligence – deciding on the presence of a fire event
- Control/monitoring intelligence – opportunity to assess the functionality of a fire alarm system and report failures and deviations
- Action intelligence – the ability to take the correct measures, such as alerting the fire department, triggering the extinguishing systems, etc.

Fire detection intelligence is extremely important for reducing false alarms, which are predominantly due to deceptive parameters, i.e. the warning device or detectors must make a correct decision regarding the presence of a fire with the greatest possible responsiveness under operational environmental influences.

Outline of a fire alarm system

An outline of a fire alarm system is provided in the figure. The fire cannot be measured directly. Rather, the fire parameters are indirectly detected and evaluated using physical or chemical interactions.

The following measuring methods are predominantly used and are based on the current level of technology:

- Scattered light measuring principle
- Temperature measuring principle
- Ultraviolet measuring principle
- Infrared measuring principle
- Gas measuring principle
- Combination of different methods

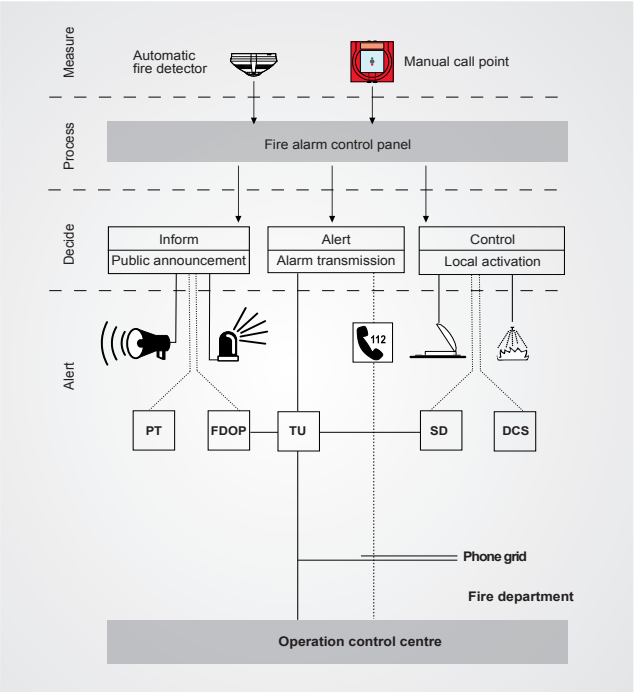
Information to the local fire department

Alerting the local fire department by a main alarm is the safest option for transmitting fire alarms. A corresponding receiver is located in the local fire department's control centre and a transmission unit (TU) is installed in the building's fire alarm control panel. This is a remote alarm to the fire department or another officially recognised extinguishing body.

The telephone grid's transmission paths monitored for wire breakage, earth faults and short-circuits, are galvanically insulated from the TU in case of a fault, whereby an electronic circuit simultaneously ensures that the alarm signals are transmitted.

Automatic telephone dialler and announcement unit (AWAG)

In many cases there is also the option of controlling an automatic telephone dialler and announcement unit (AWAG) from the fire alarm control panel, which dials preprogrammed phone numbers of participants using the local telephone grid.



A recorded announcement is then played as soon as the participant addressed confirms the receipt of the call using an installed acknowledgement unit.

In many cases the first point of contact is a security company with a constantly occupied control centre, which can initiate the necessary measures.

Automatic digital dialler and transmission unit (AWUG)

The automatic digital dialler and transmission unit (AWUG) also uses the telephone grid as the transmission path, but performs a digital check of the phone line: A corresponding receiving unit is installed at the security company site, which ensures that the line can be constantly checked.

In addition, besides a fire alarm, a range of other key operating data can be transmitted, such as the failure of the heating system and burglar alarms.

Informing, controlling, special functions

Additional information, selected according to detector zones or individual detectors, can provide the arriving fire department with valuable information, such as:

- Implementation files with overview plans regarding the location of the fire detectors, required extinguishing measures, specific hazard areas, etc.
- Plan layout annunciator panels on the building access points.

In addition to local visual and acoustic alarms, the individual detector zones can also be assigned control functions, such as:

- Closing fire protection sections such as gates, doors and flaps
- Triggering stationary fire extinguishing systems such as sprinkler, CO_2, INERGEN, argon, halon or powder extinguishing systems as well as smoke and heat extraction systems, etc.
- Shutting down machinery, ventilation systems, etc.

Special functions specifically include the fire department key store and the fire department operating panel. The fire department key store is used to ensure the safe storage of the building's master key in a key safe that has been walled-in in accordance with the provisions.

The key safe is designed so that when the fire alarm system is triggered, the fire department is alerted and the outer door to the key safe is electromagnetically unlocked. The arriving fire department is now able to open the outer door, reach the inner door and open this using the fire department's key.

The master key in the test cylinder (building key monitoring) can now be removed for unimpaired access to the building.

The fire department control panel allows the fire department to perform switching functions regardless of the fire alarm system. This prevents operating errors at the fire alarm control panel (may not be able to be operated without relevant expertise).

Alarm system with decentralised intelligence

Decentralised intelligence offers significant benefits, as the information to be transmitted and the associated error sources can be reduced to a minimum and every individual detector can be adapted to their environment.

Accordingly, the decision-making intelligence in the detector offers significant benefits and contributes to an increase in false alarm immunity. A range of detectors are used in fire alarm technology in accordance with the measuring principles previously described.

General time specification of the ESSER systems

- Information retrieval of operating state of all loop devices is conducted by the esserbus® protocol every 2s!
- Alarm transmission of a fire detector and alarm signal within 3s!
- MCP must operate an evacuation signal within 3s! 10s is allowed with a variation notice!
- Fault signal at the FACP within 100s!

2 Control equipment & power supplies

The Control panel itself should comply to EN54-2 and any power supply used should comply to EN54-4. Today all of the ESSER fire alarm control panels incorporate their own battery and charger and as long as the guidelines for loading these systems are complied with, the batteries should be sufficient to maintain the system for a period of at least 24 hours with half an hour alarm load thereafter.

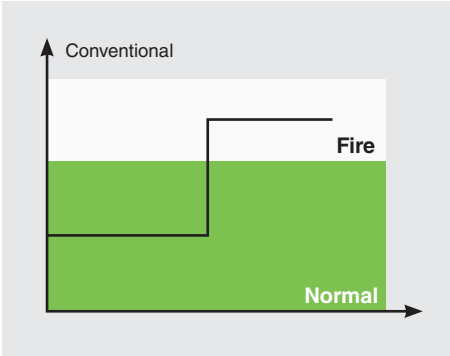
It is however recommended that a battery load calculation is carried out to verify the standby period provided by the capacity of the battery supplied.

Irrespective of the size or type of system the control panel should be sited with the following points in mind:

- In an area of relatively low fire risk
- On the ground floor entrance which the fire fighters will use
- In buildings of multiple occupancy, the panel should be sited within a communal area or if this does not exist, a location which is accessible at all times
- Where ambient light levels, ensure visibility at all times
- Fire zonal indication should be clearly displayed by LEDs or an illuminated mimic diagram – it is not acceptable to simply accept the information from an LCD or VDU display

If there are several entrances to the building, consideration should be given to the provision of repeat indicators.

3 Scope of the ES Line Fire Alarm System Conventional panel



"Conventional fire alarm systems refers to a zone with a group of detectors. Suitable for smaller installations. The system is generally more affordable than analogue addressable systems and suitable for buildings where the operator has a good overview of rooms and occupants, e.g. small stores, day care centers, retail space, etc."

The ES Line is a compact but high-performance and professional fire alarm panel for monitoring small facilities. It supports up to 8 conventional groups and has integrated detector group displays. It is programmed and operated easily via the large display. The sophisticated configuration concept is self-explanatory and enables fast commissioning without programming with a PC. Thus, the ES Line ensures high flexibility in the assignment of numerous input/output and control functions.

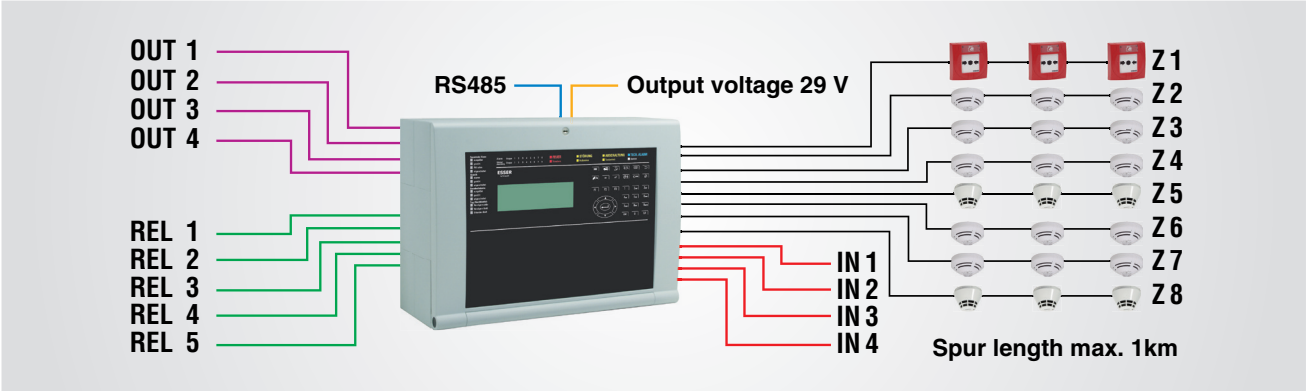
The ES Line is approved according to the relevant DIN EN 54 part 2, 4, 13 and VdS standards.

The integrated RS485 interface allows the control of peripheral fire department equipment (FBF, FAT).

Ideally suitable for facilities like kindergartens, law firms, service providers, catering firms, handicraft firms, doctors' practices, pharmacies or retail shops.

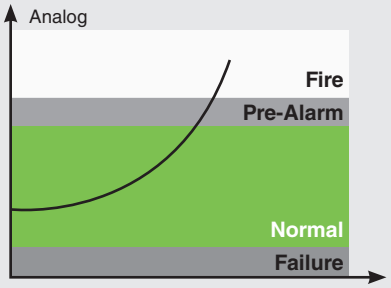
Features

- 8 sensor groups with up to 32 sensors in each sensor group
- Large LCD display with 8 rows x 40 characters
- Integrated sensor group single display
- Optimized commissioning, maintenance and operation
- Simple configuration and programming on the keypad
- Four relays, freely programmable, non-monitored, potential free, max. 30 V DC / 2 A or 60 V DC / 1 A
- 2 outputs for connecting acoustic or optical sounders according to EN 54-13 (29 V DC/ max. 500 mA)
- 1 interface to a transmission unit for fire warnings (12 V DC / max. 200 mA)
- 1 interface to a transmission unit for fault warnings (12 V DC / max. 200 mA)
- 1 standard interface extinguisher for fire control system type C according to DIN EN 54-2
- RS485 for connecting to fire department operating panel and fire department display panel
- 1 output UBext 29 V / 0.5A, for power supply of external bus users
- 72 h emergency current bridge
- "Delay of relaying" function (PM operating mode according to DIN VDE 0833-2 for preventing false alarms, delay / verify)
- "2-detection dependency" function (TM operating mode according to DIN VDE 0833-2 for preventing false alarms), alternatively programmable as intermediate alarm storage or 2-zone dependency between the detector zones
- Alarm counter for up to 10,000 trips
- Event memory for up to 10,000 events



Connection example

4 Scope of the Compact Fire Alarm System Single loop panel - Intelligent Addressable



"Diagram shows how the normal level on the detector is changed by the influence of smoke. The detector level automatically adjusts to environmental changes. Once the smoke detector is measuring particles in the optical chamber a pre-alarm is notified. With increasing signal or comparison with the stored defaults fire patterns of the detector an alarm is activated."

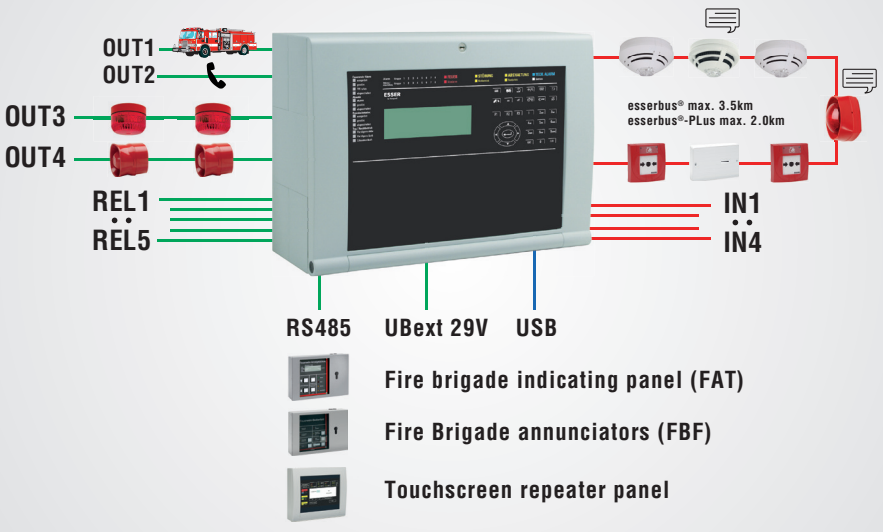
Analog Addressable Fire Alarm Control Panels provide warning and alarm messages, which refers to one or more named detectors. The system has a large degree of flexibility and a number of features that simplify use and maintenance. Addressable analog systems are used in complex buildings with a large group of occupants and where the users of the facilities are not familiar with the building and routines.

Features

- 1 loop FACP for addressable devices
- esserbus-PLus on board
- Up to 127 loop devices
- Commissioning / Configuration with tools 8000 Software
- Integrated interfaces for fire department
- 1x standard extinguishing system interface for fire control type C, complies with DIN EN 54-2
- 2x monitored relay outputs for actuation of alarm-signaling devices acc. to EN 54-13
- 4x relay outputs (unmonitored, programmable)
- Single zone indicator unit
- Up to 72 h power-failure buffering time

Restrictions

- No enhancement
- Not networkable
- No redundancy



Connection example

5 Scope of the IQ8Control Fire Alarm System Intelligent Addressable Panel

Compact housing
FACP IQ8Control C

Dimensions
(w x h x d) 450 x 320 x 185 mm

Compact housing plus
FACP IQ8Control C/M
1 x Extension housing

Dimensions
(w x h x d) 450 x 640 x 185 mm

Compact housing plus
FACP IQ8Control C/M
2 x Extension housing

Dimensions
(w x h x d) 450 x 960 x 185 mm

Fire Alarm Control Panel IQ8Control C
A stand-alone panel with two slots, up to 2 loops respectively or a networked panel.

Fire Alarm Control Panel IQ8Control M
A stand-alone panel with seven slots, up to 7 loops respectively or a networked panel for buildings with a total number of 889 fire detectors , MCPs, transponders, etc. ... (according to EN 54, VdS and DIN VDE max. 512 detectors).

The IQ8Control system is based on a modular construction providing adaptable, flexible and scalable system designs. The system is available in different housings and is suitable for use with either esserbus® or esserbus® PLus operation.

Each loop = up to 127 devices (detectors, manual call points, transponders, etc.:

- 1 loop = 127 devices
- 2 loops = 254 devices
- 3 loops = 381 devices
- 4 loops = 508 devices
- 5 loops = 635 devices
- 6 loops = 762 devices
- 7 loops = 889 devices

Part No. 786001

Part No. 786101

Human Machine Interface Module (HMI)

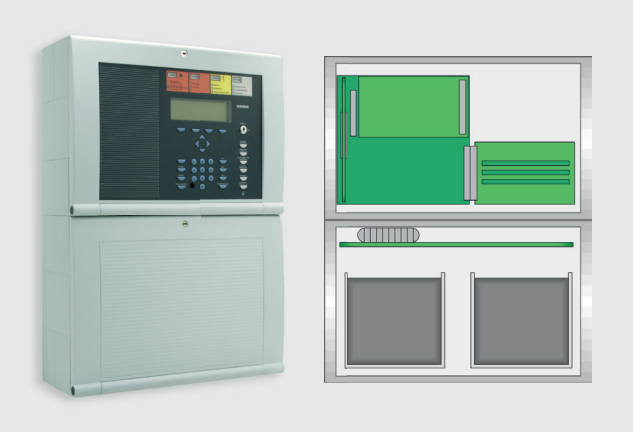
It is possible to customise the HMI of the IQ8Control to suit the installation.

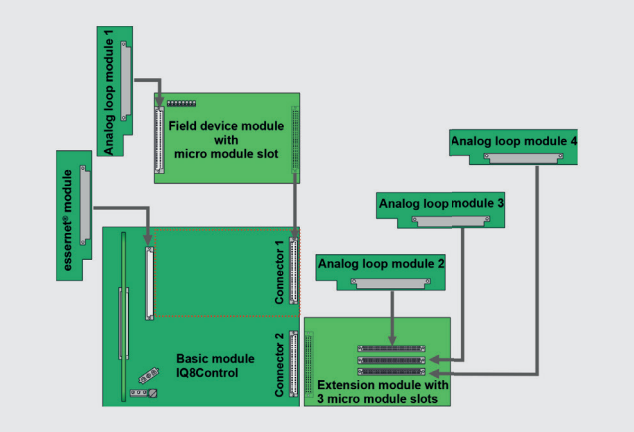
Language / Lettering
The HMI panels are supplied with different languages and the appropriate lettering to meet the national requirements (English, Arabic, German, Spanish, etc.).

The HMI is available with…

- Standard or ¼ VGA Display
- Zone indications for up to 192 zones

Configuration example IQ8Control M





Features of the FACP IQ8Control

- High performance CPU (Coldfire)-Firmware-Upgrade per PC direct on the basic module (On Board USB).
- 32 bit CPU technology.
- Decentralised intelligence.
- Operation of IQ8Quad Fire detectors with or without integrated alarm device.
- Different MMI available.
- 2x monitored inputs by default (on board).
- Serial Interface - may be configured as a TTY (20mA) or as an RS485 (polarity reversal with LED indication).
- 1x RS485 interface.
- Common trouble relay.
- Connection for two monitored batteries (max. 2 x 12 V DC / 24Ah).
- Connection for built-in printer or an external printer.
- Monitoring of 1-4 housing contacts.
- Prepared for future system extensions, e.g. ethernet, NIB connection, phone box etc..

FACP IQ8Control	esserbus®	esserbus® PLus
Fire detector series 9200	x	x
Fire alarm detector series IQ8Quad	x	x
Fire detector series IQ8Quad with integrated alarm device from series 3.02	–	x
IQ8Alarm alarm device	x	x
IQ8TAM technical alarm module	x	x
FACP esserbus® transponder	x	x

Loop specifications (esserbus® and esserbus® PLus)

- Up to than 127 zone isolators per loop.
- Up to than 127 loop devices on an loop.
- Loop may be divided into 127 individual detector zones (customer data programming).
- Max. 32 analog detectors per detector zone.
- Capability of combining loop and spur (respectively stub, transmission line) operation. No sub-spur branching allowed.
- Recommended type of cable for loop:
  - transmission cable I-Y(St)-Y 0.8 mm (diameter).
- Max. impedance of the loop incl. spur measured from terminal A+ to B+, with a cable cross section of 0.8 mm = 75Ω. This value corresponds to an overall cable length of 2000m with esserbus® PLus and 3500m with esserbus® (outgoing and return lines).
- Max. 32 esserbus® transponders on one loop.
- Max. 31 esserbus® 4 IN / 2 OUT transponders per loop.
- Max. 100 esserbus® transponders per control panel.
- Max. 8 communications transponder per loop.
- Max. 16 communications transponder per Fire Alarm Control Panel IQ8Control C/M.
- Max. 50 Smoke aspirating systems LRS compact/eb per FACP, max. 50 per loop.
- Max. 100 Smoke aspirating systems TITANUS PRO SENS® EB per FACP, max. 32 per loop.

6 Scope of the FlexES Control Fire Alarm System Intelligent Addressable Panel

FX2

FX10

FX18

- FX2 with license for 2 loops
- FX10 with license for 5 loops
- FX10 with license for 10 loops
- FX18 with license for 5 loops
- FX18 with license for 10 loops

Redundancy

FlexES Control supports standards-compliant redundant operation for the monitoring of zones with a total area of over 48,000 m² as well as the option of controlling one extinguishing zone for every loop.

User-friendly and self-explanatory HMI

The label film of the operating panel as well as the display texts of system messages are available in various languages. In addition, customer-specific texts can be programmed in one of the available languages.

During future functional expansions of the control unit, it is possible on the operating panel to switch the display between two configured languages (out of all available languages) for the system texts.

Housing variants are available for system expansion of the control unit FlexES Control for installation of 1 to 18 modules. FlexES Control can be configured as a stand-alone unit or as a network-capable control unit.

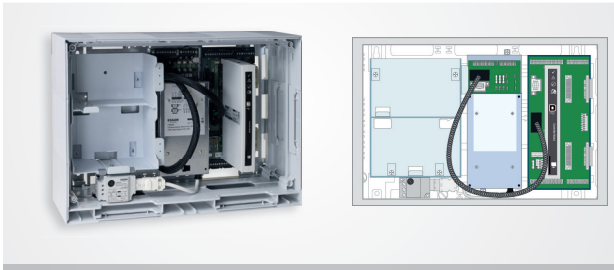
Features

- Master / Slave CPU by redundant controller module
- 24 V DC for external consumers
- Combinable loop / spur loop technology with distributed intelligence
- Freely configurable functionality of the modules used
- Increased availability thanks to emergency redundancy function for the loop modules
- Uninterruptable redundant operation with 2nd CPU module possible
- Interfaces: essernet®, USB, Ethernet, 2 x RS485, TTY (in future with FlexES com loop and 255 devices)
- Operation of bus-supplied alarm devices (visual / audible / speech) in various alarm zones esserbus®-PLus
- Max. 3 cascading energy supply modules with a total power up to 450 W (as per EN 54-4)
- Loop length up to 3.5 km (esserbus®) or 3 km (esserbus®-Plus). Electrical isolation of the loops is possible
- Operation of various input/woutput bus couplers
- Integrated interfaces for operation of the required fire department peripheral devices, such as fire department indicating panel and operating panel
- Event memory with 10,000 entries
- Operation of VdS-certified radio components with convenient field strength measurement
- Configuration and programming via USB interface
- Up to 1,000 control zones

In combination with display and operating unit

- Display and operating unit with 5.7" TFT display (colour display optional)
- Capacitive operating panel keyboard for touch-sensitive operation.
- Program-controlled night design with interactive keyboard menu

FlexES Control versions



FX2
Dimensions (w x h x d) 450 x 320 x 185 mm

Small size with maximum of 2 module slots

- Two battery bays 12V / 12 Ah
- Power supply module (PSM)
- PS connection module
- Basic module carrier

FX10
Dimensions (w x h x d) 450 x 960 x 185 mm

Medium size with maximum of 10 module slots

- Power supply module (PSM)
- PS connection module
- Basic module carrier
- Three small housings

FX18
Dimensions (w x h x d) 450 x 960 x 185 mm

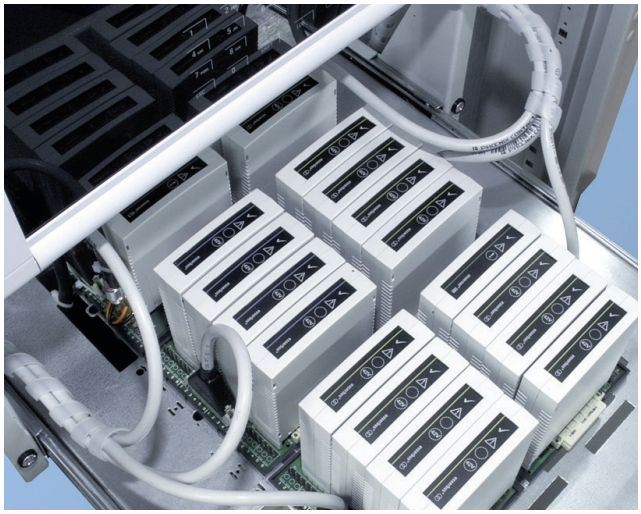
Medium size with maximum of 18 module slots

- Power supply module (PSM)
- PS connection module
- Basic module carrier
- Three small housings

Options

- Display and operating unit
- Plain front panel
- Battery expansion housing
- esserbus® module / galvanically isolated
- essernet® module 62.5 kBaud / 500 kBaud
- Extra power supply 12 Ah / 24 Ah

6.1 Upright Cabinet Installation



The installation concept allows for service-friendly installation of the FlexES Control components and required peripherals in an upright cabinet.

The individual rack mount modules for central control equipment, energy and emergency power supply as well as the operating panel can be pulled forward to make the pluggable modules freely accessible for installation and service work.

The wiring points of the upright cabinet and connection terminals of the system components are connected together via prefabricated cables.

A suitable upright cabinet with a minimum depth of 800 mm and a 19-inch mount is required for the installation.

Rack mount unit for expansion to 10 analogue loops (5HU)
Basic module card and control module for mounting up to four expansion module carriers. The control module is designed for a maximum of 10 analogue loop modules.

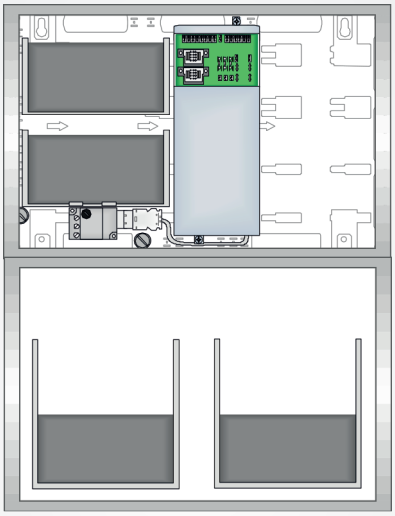
Rack mount unit for expansion to 18 analogue loops (5HU)
Basic module card and control module for mounting up to four expansion module carriers, including control module for expanding up to 18 analogue loop modules.

Rack mount unit energy supply (5HU)
For mounting an energy supply module and max. four batteries of 12 V / 24 Ah

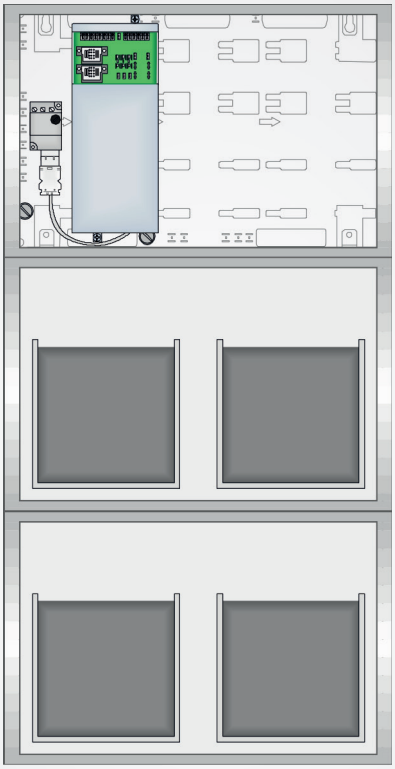
Rack mount unit with operating panel mount (7HU)
Front-side installation of the operating panel with all required display and operating elements.

1 HU (height unit) = 44.45 mm (1¾ inches)

6.2 Power Supply Unit (PSU) extension



Example: Expansion options of the 24 V / 12 Ah PSU extension



Example: Expansion options of the 24 V / 24 Ah PSU extension

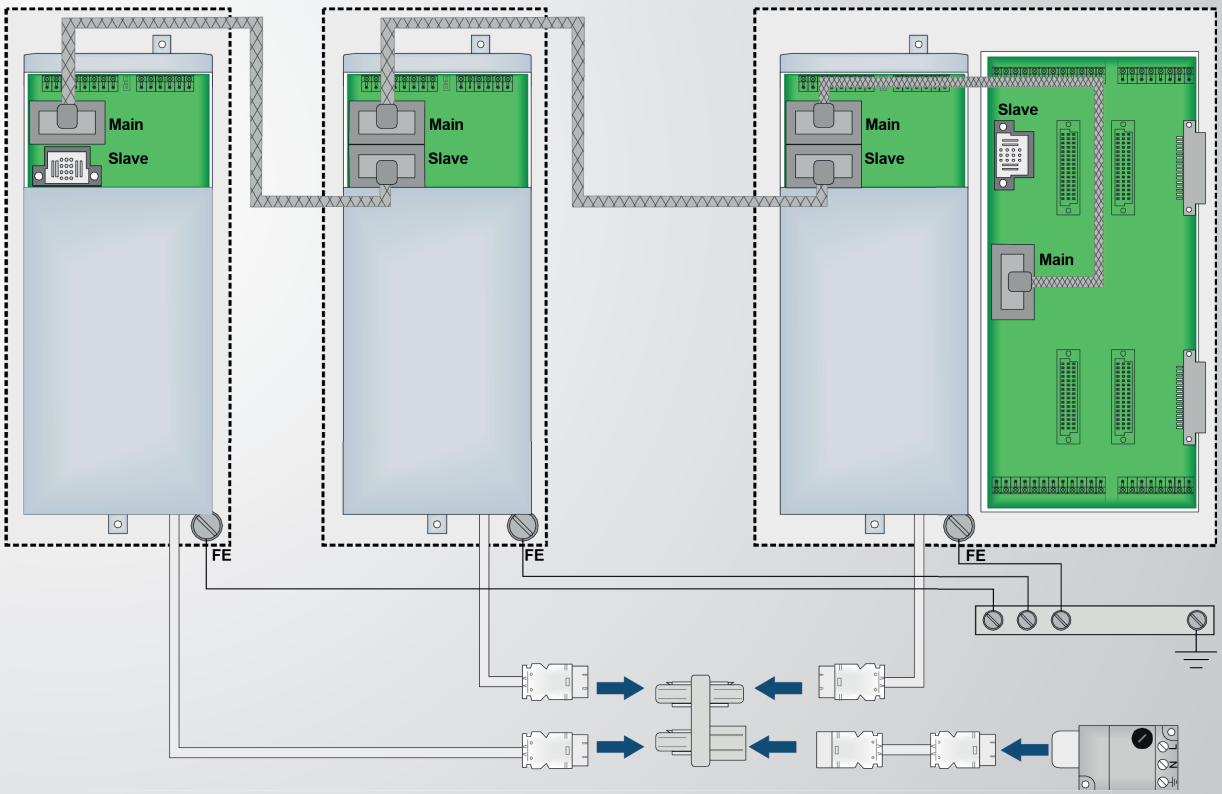
Each FACP can be fitted with up to three cascading control panel power supply units for their power supply, for which two additional power supply unit extensions are available.

- PSU extension 24 V / 12 Ah (Part No. FX808363)
- PSU extension 24 V / 24 Ah (Part No. FX808364)

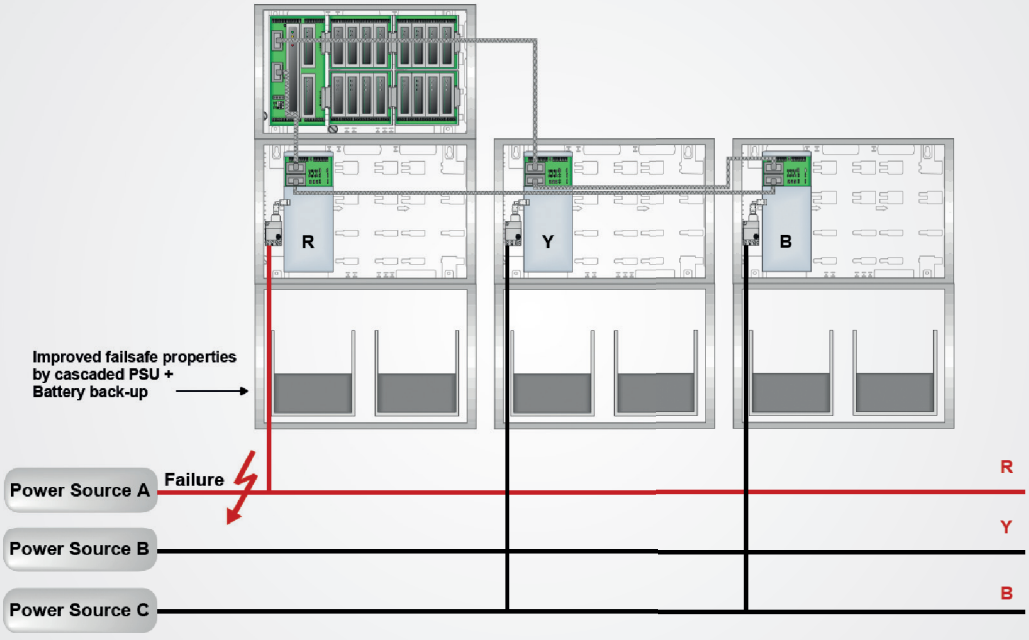
Calculation tool for required Back-up capacity

A convenient software tool is available as a planning aid for calculating the required emergency power supply based on the control unit configuration.

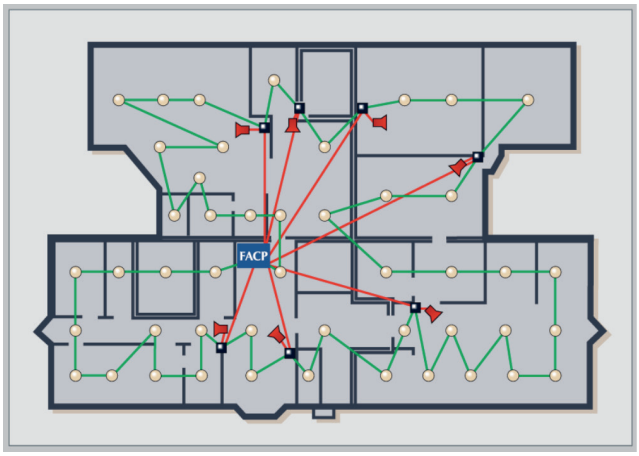
Cascading power supply modules



The individual PS modules (and basic module carrier) are connected using hybrid cables (MAIN/SLAVE).



7 Powered loop, Networked Systems and System Integration



Loop technology has been used in modern alarm systems for a long time. However, separate power sources must be provided for high-current devices, such as alarm sounders.

This means unnecessary costs are incurred for additional wiring, power supply units and longer installation times.

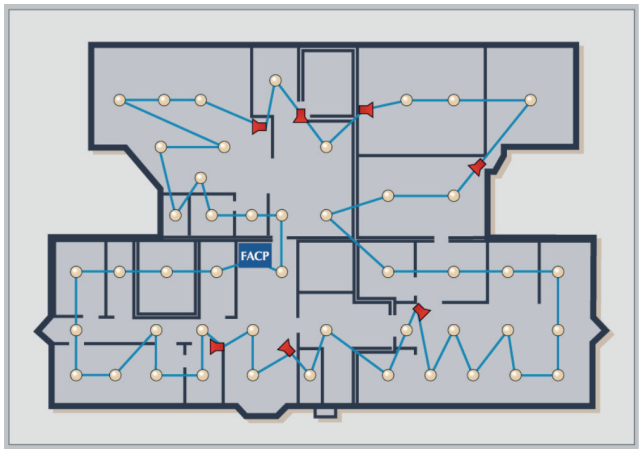
esserbus®

Depending on the control panel's structure or number of available module slots, a fire alarm system control panel can be connected to up to 18 loops with up to 127 loop devices per module. There are two different types of modules, i.e. modules with and without galvanic isolation.

The FlexEs control FACP can be fitted with up to four modules without galvanic isolation. The fifth and any further modules must have a galvanic isolation (GI)*. It is possible to use a mixture of different esserbus® loop modules, within one control panel.

Within one fire alarm control panel, each module can be individually set to one of these operating modes, which means that one fire alarm control panel can simultaneously operate both esserbus® and esserbus® PLus components.

* GI = galvanically isolated

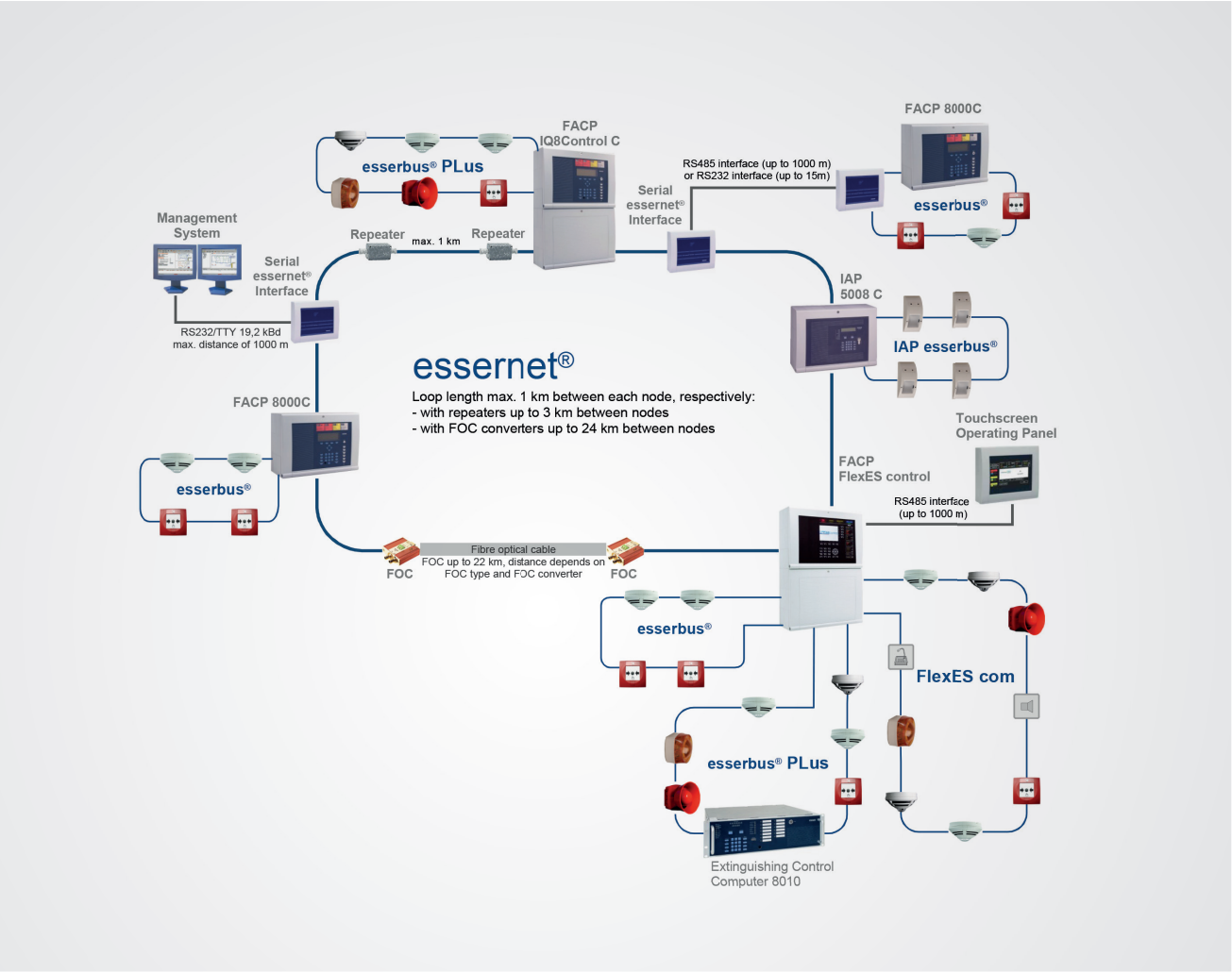


The latest in loop technology: The esserbus® PLus supplies data, signals and power, too, for the direct operation of alarm devices on only 2 wires.

esserbus® PLus (Powered loop)

The esserbus-PLus (PLus stands for Powered Loop) offers numerous advantages in terms of security and cost-effectiveness.

- Maximum planning reliability
- Permanent monitoring of the alarm device
- No detailed consideration of fire sections for alarm devices and their wiring paths is needed
- Measures to ensure continued functionality of wiring systems with alarm devices can be dispensed within most cases
- Maximum security in cases of alarm
- Savings due to lower material costs and shorter installation time
- No separate power supply units for fire compartments
- Synchronous alarm signaling



essernet®

The essernet® is the unique network for the Esser IQ8Control / FlexES Control and associated Esser systems. In accordance to the EN54 requirements it is a fault tolerant redundant network allowing the continued operation of the system whilst faults are present.

As illustrated in the drawing below if is possible to connect a number of systems directly to the essernet®.

Utilising the modular design of the IQ8Control / FlexES Control and essernet® technology it is possible to adapt the Fire Alarm System to maximise the system to produce the most cost effective system design.

Possible users in the essernet®

essernet® currently recognises the following user types:

- Fire Alarm Control Panel IQ8Control / FlexES Control.
- Fire Alarm Control Panel 8007 / 8008.
- Intruder Alarm Control Panel 5008, 5008-C.
- serial essernet® Interface (for Management System).
- Up to 16 Panels with 62.5 kBit/s.
- Up to 31 Panels with 500 kBit/s.

Transmission media and capabilities

In addition to topology, the transmission media used and their capabilities also represent important factors.

Repeater

Two control panels may be spaced apart by no more than 1km. If this is not sufficient, repeater modules can be used to increase the loop by 1km per repeater.

Requirements of cables

The cable specification is governed by the transmission rate selected for the essernet®. The essernet® itself supports the 62.5k baud and 500k baud rates.

If the 62.5k baud rate is selected, a twisted pair cable or equivalent type, e.g. I-Y (ST) Y n x 2 x 0.8mm) will suffice max. cable length 1,000m. The high transmission speed of 500 kBit/s requires the use of

a.) IBM type 1, 2, 6 or Belden 9688 Multi-Conductor - Type 1A or equivalent cable = max. 1,000m
b.) CAT3 or better e.g. CAT5 (generally STP cabling, shielded twisted pair) = max. 400m

Fibre optical cable (FOC)

Using a special fibre optics converter (single or multi mode), transmission is also possible via a fibre optics wiring.

The maximum distance relates to cable and converter specifications. Short-circuit and wire break tolerance is also maintained when using optical fibre cable.

It is, of course, also possible to run only certain sections of a system on optical fibre cable, with conventional cable (copper) of the type described above being used in the other sections.

Transmission speed

As mentioned above, the essernet® is able to operate at two different data transmission speed rates (these cannot be mixed).

Proceeding from 31 users, the maximum number possible within the essernet®, it takes an alarm signal in general no more than 10 ms to be transmitted from one user to another at the 500 kBit/s rate. At the lower baud rate of 62.5 k baud, it will take about 1 second, as the case may be with a baud rate of 62.5k baud.

The behaviour of transmissions taking place within precisely defined times is known as real time behaviour. Real-time behaviour coupled with the high transmission rate also ensures that control operations performed through the essernet®, are carried out very quickly and reliably.

Data consistency

A further practicality of the essernet® is data consistency. If a user is switched off within an active system, e.g. for servicing work, and then reactivated some time later, or if a data packet cannot be sent because of a temporary malfunction, the users within the network will not be in possession of the same information.

Data consistency makes sure that users recognise situations such as these, i.e. the inconsistency of data. Users lacking information retrieve it from those users that originally sent the information.

This procedure ensures that all users are in possession of precisely the current information they should possess.

7.1 Fibre Optics Converter

Requirements for fibre optic cable (FOC) distance between two converters

- two mono or multi-mode fibres are required per network section.
- the fibres must be connected directly to each other (not via a multiplexer).
- At least one essernet®-micro module from index “E” and one FOC converter per Fire Alarm Control Panel is required for a FOC network.
- max. 16 FOC connections per essernet®-network at a transfer rate of 62.5 KBd.
- max. 20 FOC connections per essernet®-network at a transfer rate of 500 KBd.

The FOC converter (e.g. Part No. 784763, 794764 → multi mode or 784765, 784766 → mono mode) is used to convert electrical into optical signals for reliable data communication under critical conditions e.g. where conventional copper cables are not suitable. Mixed operation of fibre optical and conventional wiring within a common network is possible. Depending on the optical cable type and the related damping, the distance between two FACPs respectively nodes may be up to 3km in multi-mode or 22km in single-mode.

The FOC converter must be mounted inside the FACP housing or in the FACP control cabinet. It is mounted directly on a C-rail or top hat rail (Part No. 788602 or 788652).

Fibre optics type	Possible range
E 10/125 (0,5 dB/km)	0 - 22 km /13 dB
G 50/125 (1,0 dB/km)	0 - 16 km /18 dB
G 62,5/125 (1,0 dB/km)	0 - 16 km /18 dB

FOC-converter ↔ conventional wiring

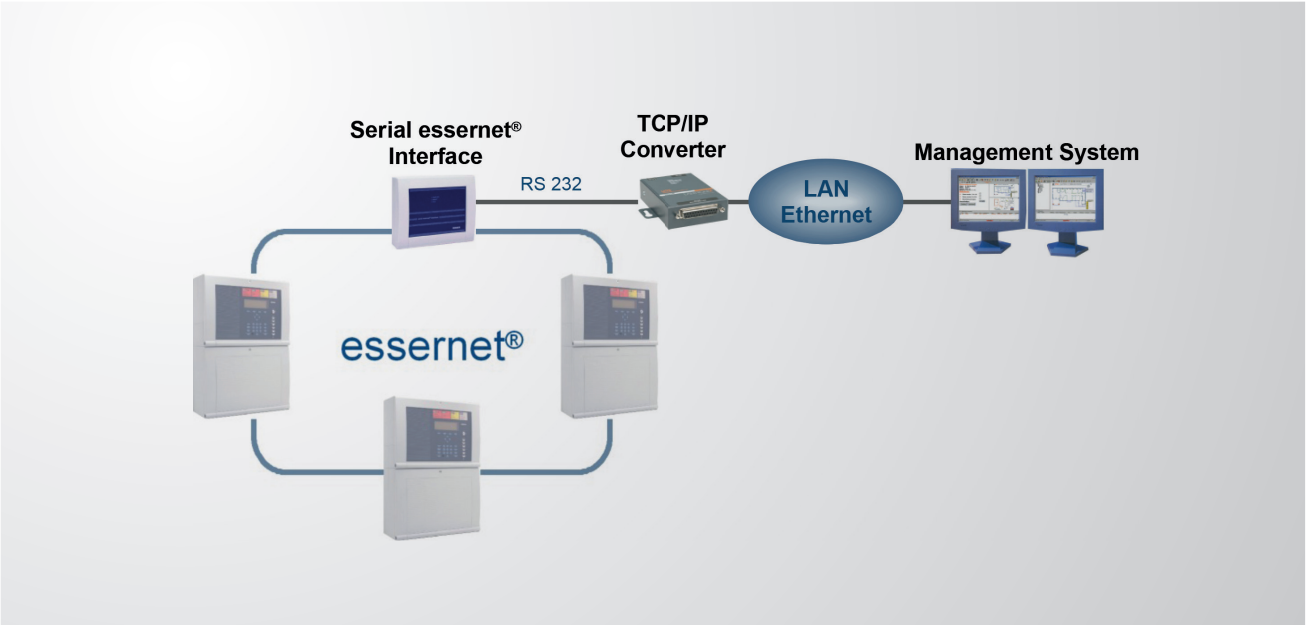
7.2 TCP/IP Converter

Features

- Serial interface: RS232, RS422 or RS485 (2-and 4-wire), configurable via software
- Transmission speed: 300 bauds to max. 230Kbaud configurable via software
- Serial connection: D-Sub 25, socket Ethernet interface: 10Base-T/100Base-TX
- Transmission speed 10/100/auto MBit, configurable via software
- Mode of transmission: half- /full-duplex or automatic, configurable via software
- Network access via RJ45 connector
- Supported protocol: ARP, UDP, TCP, ICMP, Telenet, TFTP, AutoIP, DHCP, HTTP, SNMP, TCP,UDP and Telnet, TFTP

The optional TCP/IP-Converter (Part No. 013405.10) is used for the connection of an remote essernet® via a (for example) companies-wide Ethernet LAN to a Supervising system control centre via TCP/IP.

Through this, the device is used as a protocol converter between the serial essernet® Interface (SEI) contained on the essernet® and the Supervising system available in the Ethernet LAN.



The TCP/IP Converter, Ethernet-RS232/RS485 (Type UDS 1100) changes the serial data of an RS232 interface into a TCP/IP protocol, allowing data to be transferred across large paths via an available company network or the Internet.
Using the Converter, the cable between the RS232-interface and internal devices can be extended from the 12m that it has previously been to almost any length.

7.3 Serial essernet® interface (SEI)

Dimensions (w x h x d)
270 x 221 x 71 mm

Long distances; short paths. The serial essernet® interface can connect remotely located control panels reliably via modems, facilitating convenient operation of the total system.

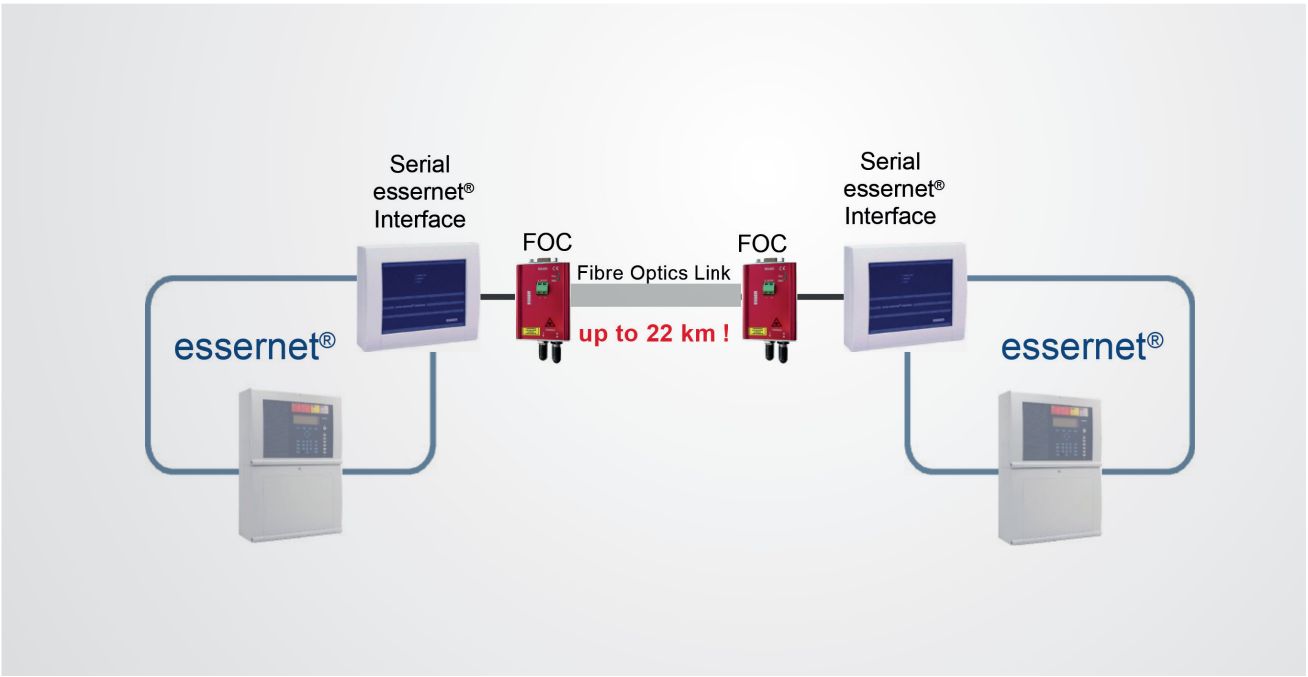
It integrates especially complex connections to the fire detector system in a technically, superior but simple manner.

The serial essernet® interface (SEI) is used to connect the IQ8Control FACPs to a security system supervisor, Multi-protocol-Gateway or other Fire Alarm Systems, e.g. series 3007/3008.
Take note, due to the RS485-interface in the FlexES Control, the panel can be connected directly to a BMS via a RS485/232 converter.

Depending on the type of the serial essernet® interface and the desired application, connection to the control panel is made via RS485, TTY or RS232 links. Systems with bi-directional data transmission include additional remote control facilities.

The essernet® micro module (option: unidirectional or bidirectional) can be installed in all versions. The serial essernet® interface may be integrated as a complete unit into an essernet® network.

Example: Connecting a remote FACP via a fibre optic cable



7.4 Repeater Indicator Panel

Dimensions (w x h x d)
206 x 177 x 48.5 mm

The Repeater Indicator Panel (Part No. 785101) for the fire systems IQ8Control C/M or FlexES Control is an universal annunciator for remote display in Fire Alarm Systems.

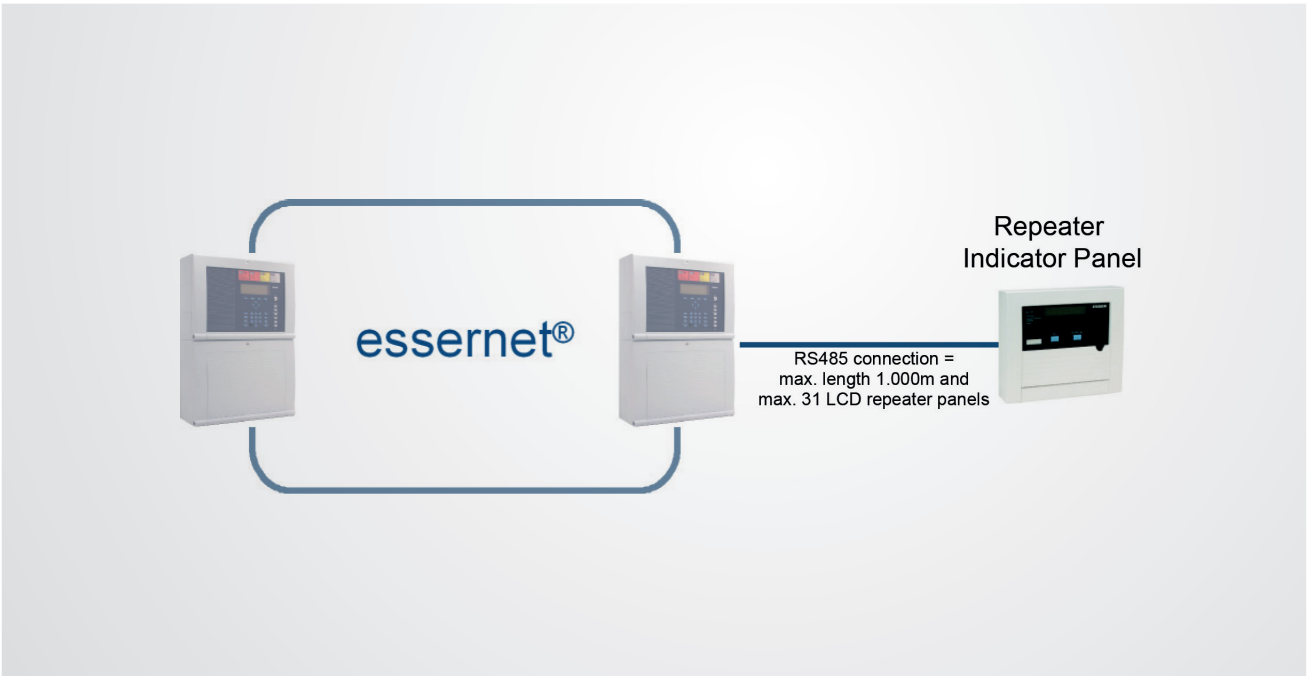
Messages about certain events are shown on the LED display and on the two line display with the associated detector/zone number as well as a programmable additional text. Each message is signalled acoustically by means of the built-in buzzer. The buzzer can be acknowledged by pushing a button.

An IQ8Control Fire Alarm System may include up to 31 LCD display panels. The panels are connected to the RS485 port of the Fire Alarm Control Panel or via the a customary Interface (RS485/RS232 or TTY) to the RS232/TTY-Interface of the FACP.

The additional text is simply edited with the programming software tools 8000.

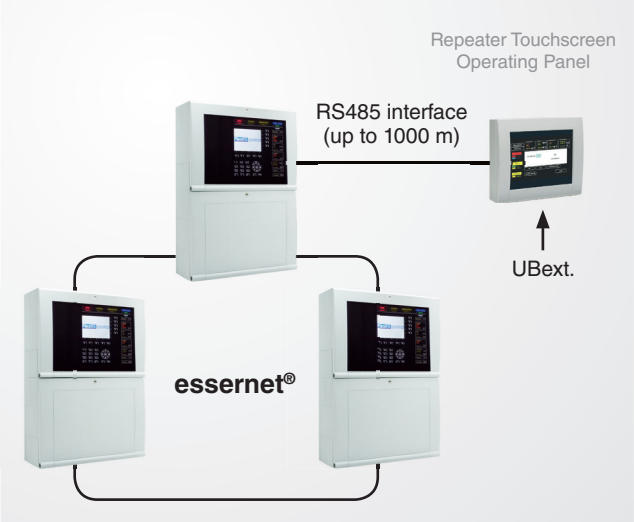
Features

- Display of zone and detector status of the FACP including additional text.
- Event log for 200 messages.
- Additional text messages programmable with up to 4000 texts with 2 x 20 characters each.
- Message retrieval via arrow keys (forward and backward).
- LED indicators for operation, fire, trouble and communication fault.
- Monitoring of the interface FACP ↔ Repeater indicator panel.
- Built-in buzzer.
- Freely accessible defeat button for the internal buzzer.
- Display test.



7.5 Repeater Touchscreen Operating Panel

Dimensions (w x h x d)
270 x 221 x 71 mm (aP)
203 x 247 x 5 mm (uP)



High-quality display and operating unit for remote operation and display of a fire alarm control unit FlexES Control. Operation of the system is dialog-based and intuitive using the touch-sensitive 7" colour screen. Individual access levels can be activated by keyboard code.

The display and operating unit is connected to the RS 485 interface of the FACP. The required 24 V DC power supply is provided by an external mains adapter or, for example, via the +Ub external connection of the fire alarm control panel.

- Flush-mounted panel (Part No. FX808460)
- Wall-mounted panel (Part No. FX808461)

Accessory: Cavity wall mounting kit for touchscreen operating unit (Part No. FX808462)

7.6 Building Management System FlexES Guard for intelligent security visualization

The newly developed FlexES Guard hazard and alarm management system is based on Java™ and thus provides an ideal basis for a platform-independent message visualization system. Any data can be accessed from any location from different mobile devices (PC, tablet, smartphone).

Integrated permission management allows customized views and functionality for different users. An additional feature enables client access via the web browser: Each user has the option to start the client either in the web browser or as a desktop program, for example if a multi-monitor view is desired. Through automatic adjustment of the software version between server and clients, all participants on the network are always using the same version.

Moreover, all functions are available to their full extent regardless of the way the program is started (browser or

desktop). The new program structure provides its various functionalities in three different software modules:

The control console: This is the application with which the user works.

The configuration module: This is where all system administration is carried out, from user and permission administration, to driver and data point management, to licensing and client administration.

The graphical editor client: This module is used to set up the application for the control console. This is where graphics and alarm points are placed, programs integrated, layers created for the different operating levels, and all the functional graphical elements set up that are needed to operate the control console.

The advantage of this organization is that both the configuration module and the editor client can not only be started in standard web browsers like Microsoft Internet Explorer or Mozilla Firefox, but also used with full functionality. A web browser, an installed Java runtime, and a TCP/IP connection are enough to use a client computer to manage the server and make changes to the application. Control of access is entirely handled by the server. It is also possible to make most changes to the application as well as carrying out administrative tasks while the FlexES Guard is online, reducing downtime and significant increasing system availability.

Interfaces

FlexES Guard offers a continually growing portfolio of proprietary interfaces for systems in the areas of fire and burglar alarm systems, voice alarm, call systems, access control, and video technology.

In addition to the OPC and ESPA standard interfaces, BACnet, Modbus, and SNMP will soon be available. This means that not only bidirectional coupling with the building services management system and process and automation technology are possible, but data exchange with communication systems will also be possible.

To integrate data provided by external databases, FlexES Guard has its own connector that permits simple, reliable access to this data.

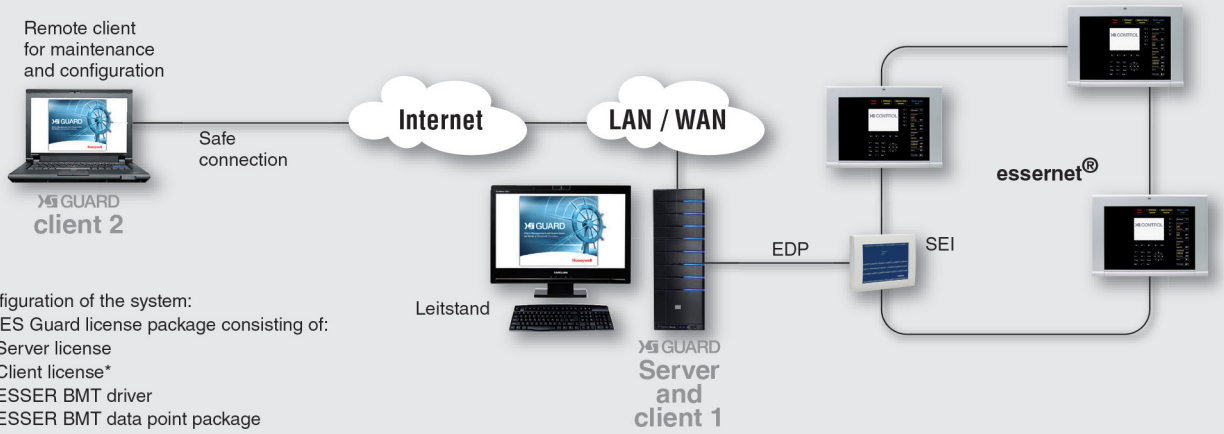
Service program

We offer an extensive service program related to FlexES Guard for installers, which in addition to a FlexES Guard project also offers appropriate support in the different phases of implementation. Services range from system presentation to customers to support in requirements definition, input of alarm points and graphics pages, as well as program support and even the training of operating personnel and support during the system handoff/acceptance. Support for maintenance and extension of existing systems completes the service program.

Features

- Separate client/server architecture with central update functionality
- Operating system-independent client function depending on drivers (plug-ins)
- Modular construction with open system architecture
- Workstation client and/or Web client
- Identical user interface for desktop and Web clients
- Separate editing modules for individual clients
- Display of system status with graphics, text, table, Web, or video view
- Multi-monitor operation with up to 9 monitors (max. 4 physical, 5 virtual)
- Alternatively: 1 physical, 8 virtual
- Server-based connection to devices
- Logging of all messages, interactions, and processes
- Initial SQL database H2, extensible to SQL Server, Oracle, DB2
- Integrated adoption of data structures and graphics from external systems
- Support for multiprocessor systems
- Multiprocessing/multithreaded architecture

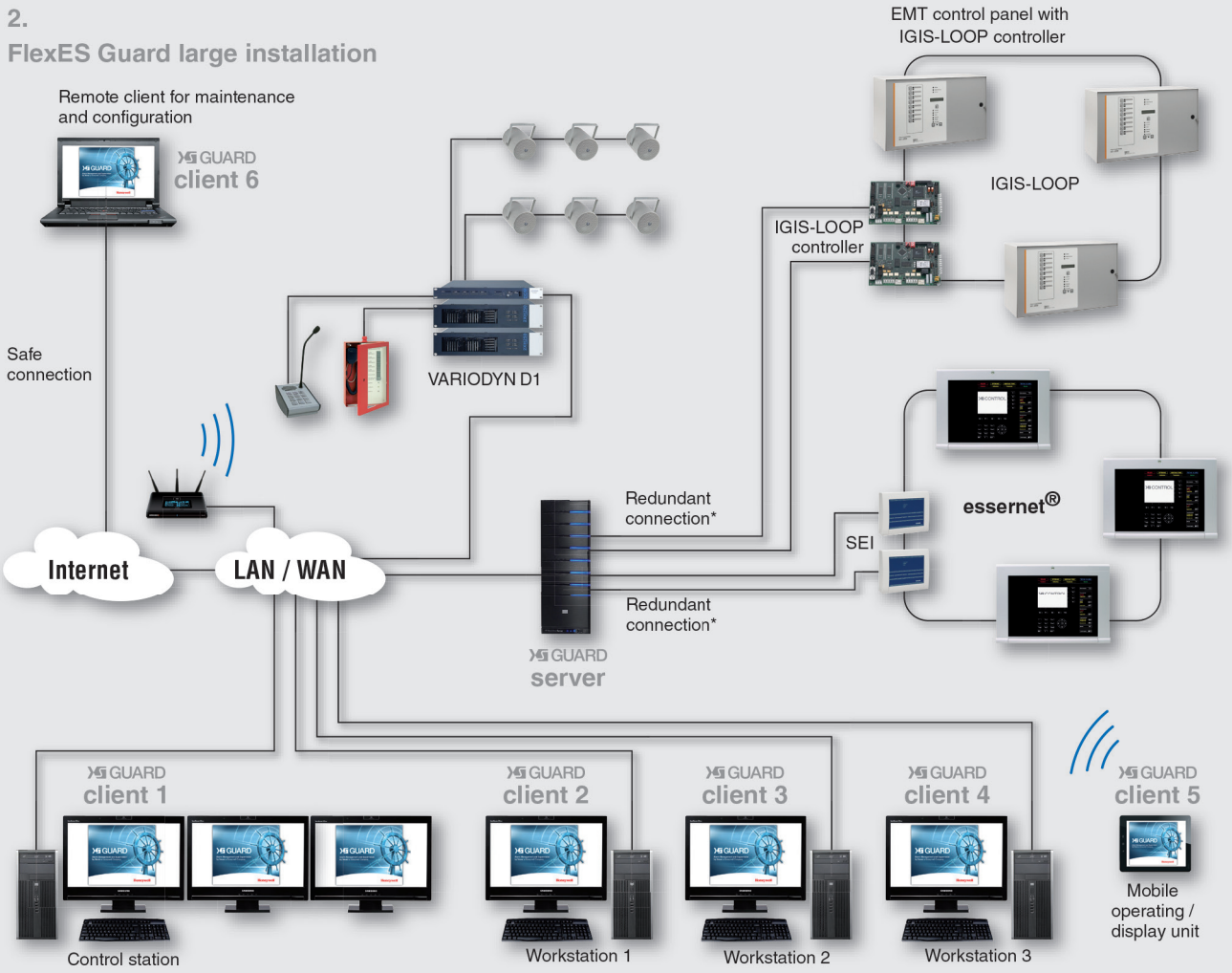
1.
FlexES Guard small installation



Configuration of the system:
FlexES Guard license package consisting of:
1 x Server license
2 x Client license*
1 x ESSER BMT driver
1 x ESSER BMT data point package

*Operation of server and client on one CPU requires server license and client license!

2.
FlexES Guard large installation



Configuration of the system:
FlexES Guard license package consisting of:
1 x Server license
1 x Client license package “5 licenses”

1 x Client license “single”
1 x Option redundant driver
1 x ESSER VAPA driver
1 x ESSER VAPA data point package

1 x ESSER fire driver
1 x ESSER fire data point package
1 x Honeywell intrusion driver
1 x Honeywell intrusion data point package

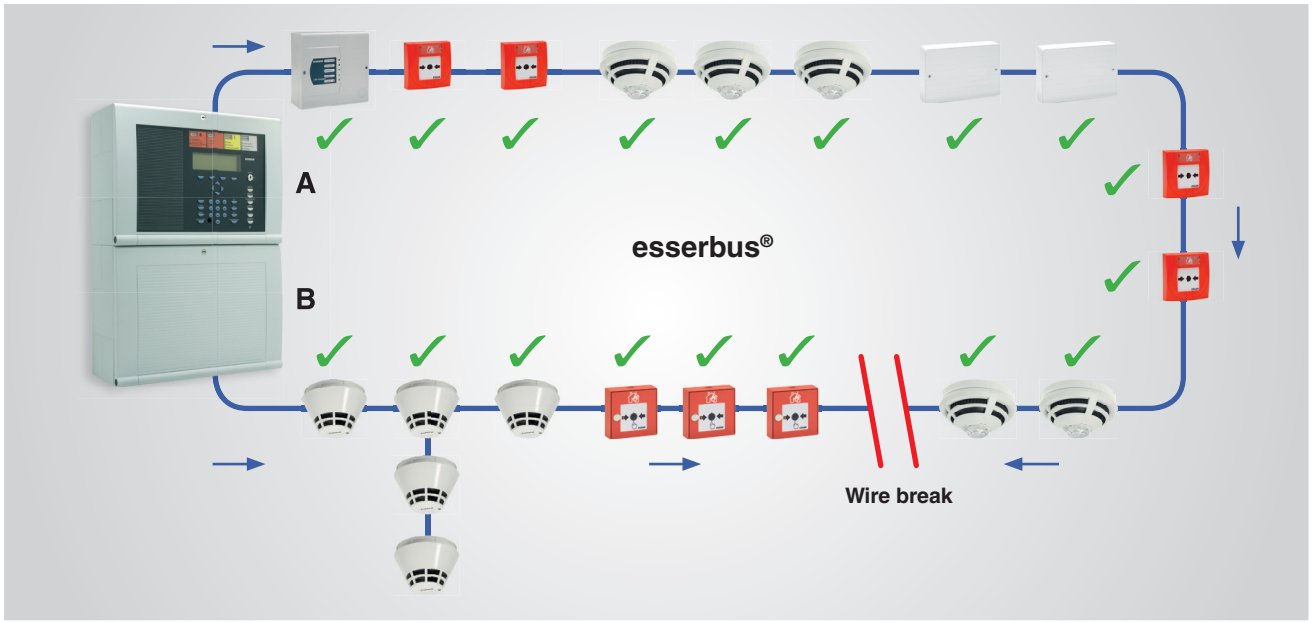
*Redundant serial driver coupling requires probably additional hardware. The distribution of the interfaces to a second PC (interface server) is also possible.

8 Loop Devices

8.1 Wire break

The esserbus® is a monitored two-wire loop fed from two sides. The last detector in both direction (of A to B v.v.) of the loop will be recognized automatically.

An integrated loop isolator is provided by the series IQ8Quad automatic fire detectors and IQ8 manual call points (MCP). All loop devices remain in operation at a single wire break.

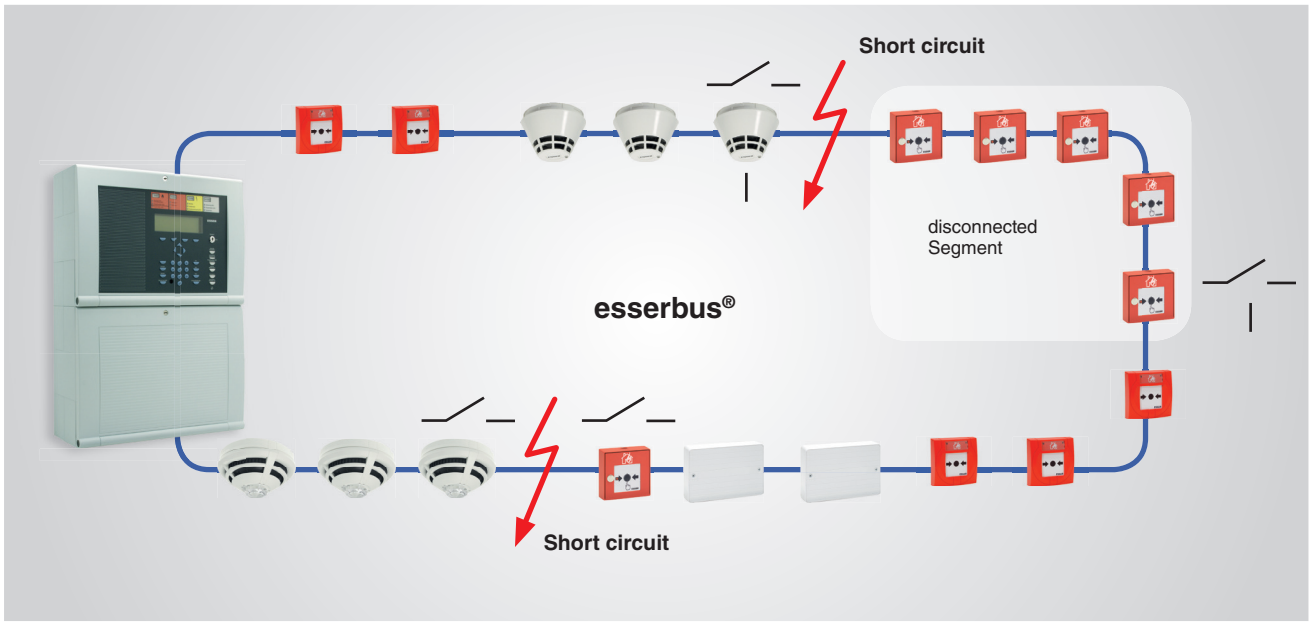


8.2 Short circuit

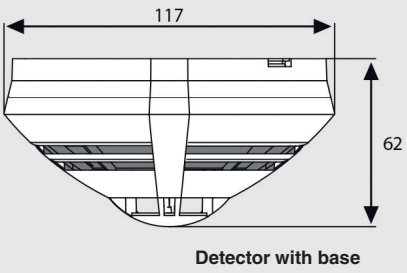
If a short circuit occurs, only the faulty element between two isolators will be disconnected. Even during this malfunction all other devices remain operational.

A short circuit on the analog loop will cause the cut-off relays to open in the relevant isolator and disconnect the faulty segment (e.g., a diagnostic fire detector) from the loop. All other devices on the loop, even the fire detectors or esserbus® transponders which isolator has been activated, will remain operational.

An integrated loop isolator is provided by the series IQ8Quad automatic fire detectors and IQ8 manual call points (MCP). All loop devices remain in operation at a single short ciruit on the loop.



8.3 Automatic Fire Detectors IQ8Quad



Detector with base

Dimensions (mm)

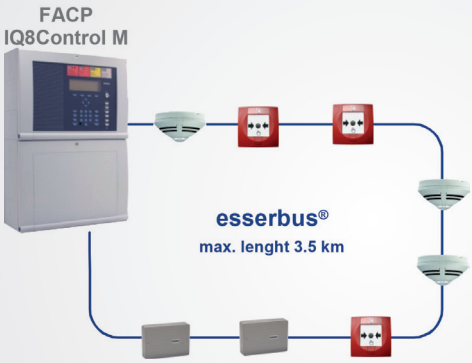
IQ8Quad - Reliable and early fire detection with patented multisensor technology.

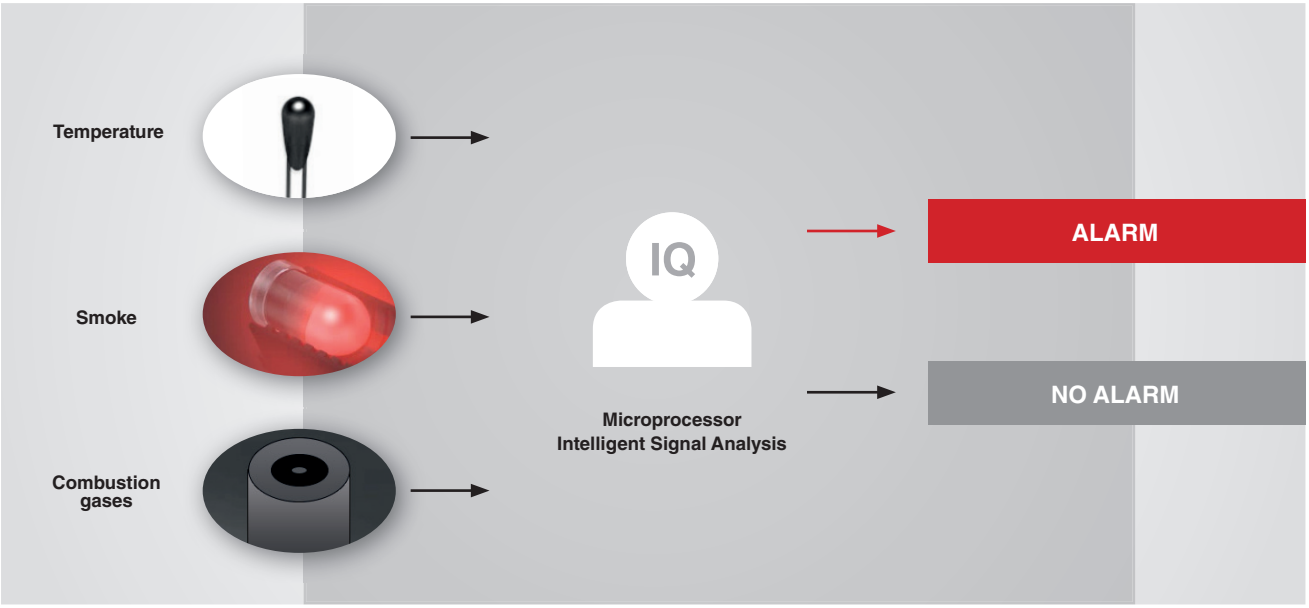
- Built-in and therefore, decentralized intelligence.
- CPU failure mode with intelligent fire message.
- Drift compensation by automatic adaptation to changing environmental conditions and monitoring of all sensors to guarantee operational capacity and correct condition.
- Short-circuit and open-circuit tolerant due to integrated loop isolators.
- Signal patterns of non-fire situations eliminated by using special filter algorithms.
- Integrated counters for fire, faults and operating time.
- Easy installation and commissioning.
- Efficient power management results in extremely low battery capacity requirement in fire alarm panels.

All system components are connected as fully addressable users on one loop instead of being spread across different spurs. This allows a short and open-circuit resilient power supply for alarm signalling devices to be taken from the 2-wire loop.

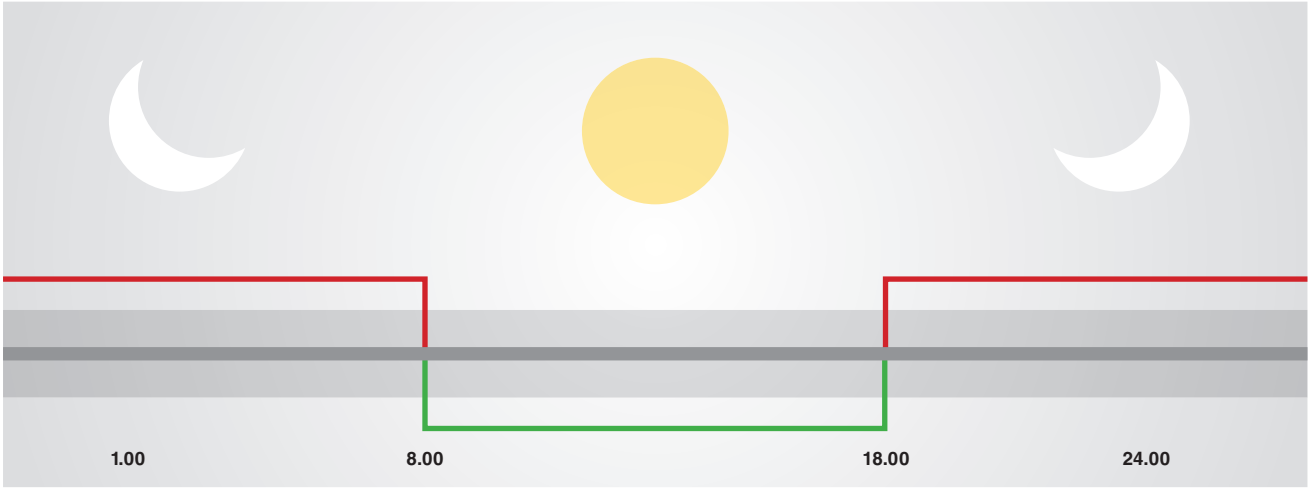
Thus, various additional circuits, transponders and power supply units become redundant whilst installation time is reduced to an absolute minimum. Up to 127 loop devices can be connected to one loop. Consequently, mixed operation between IQ8Quad and series 9200 detectors (all analog addressable) is possible.

- **O** Photoelectric (optical) fire alarm detector.
- **T** Heat (thermal-) detector for fast and slow rising temperatures. (Static heat detectors or Rate-of-Rise heat detector)
- **OT** Combined photoelectric and heat detector.
- **O²T** Combined photoelectric detector with two red LED light sources and an integrated heat sensor.
- **OTG** Combined photoelectric and heat detector with built-in gas sensor for detecting carbon monoxide.
- **OT^{blue}** Combined photoelectric and heat detector using a blue LED (short light wave) for improved performances.





Each detector features Intelligent Signal Analysis, which uses a sophisticated, high speed microprocessor to analyze signals from each sensor. A complex algorithm ensures the sensor pattern matches that of a real fire scenario to provide immunity against possible false alarm triggers, such as steam or high humidity. This advanced technology significantly reduces false alarm rates and provides more accurate fire detection, while also achieving faster recognition of different types of fires.



Life Safety First

The IQ8Quad sensor options detect combinations of smoke, heat and carbon monoxide. The optional intelligent gas sensing technology monitors the concentration of carbon monoxide in the environment for early detection of potential fire hazard and dangerous levels of gas thus increasing life safety in the workplace. Furthermore the stored messages within the sensor allow specific instructions to be conveyed to ensure a safe, controlled evacuation.

Minimises False Alarms

The sensor provides intelligent decision making to react to potential fires more quickly. As the IQ8Quad incorporates 3 separate sensing elements – heat, carbon monoxide, optical forward and backward scatter. The patented, dual angle optical forward and backward scatter allows instant identification of particles to distinguish between smoke and steam. In addition the day and night timed sensor ‘states’ can be programmed to improve the response to real fires and reduce the number of false alarms. Any of the three different sensors can be set at different sensitivity levels, depending on the application.

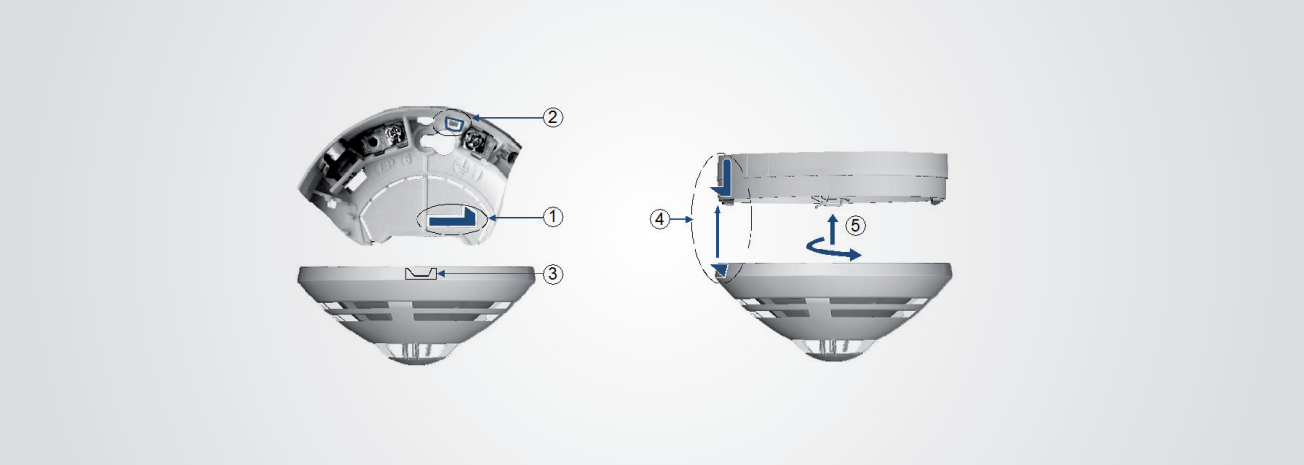
Detector base IQ8Quad

IQ8Quad detector bases for the Standard Loop / Powered Loop of the IQ8Control Fire Alarm System.

Simple installation

- Mounting adapter for easy snap-on installation.
- Optional detector lock, mounted in the detector base.
- Standard base or base with a free programmable relay output (30 V DC, 1 A).

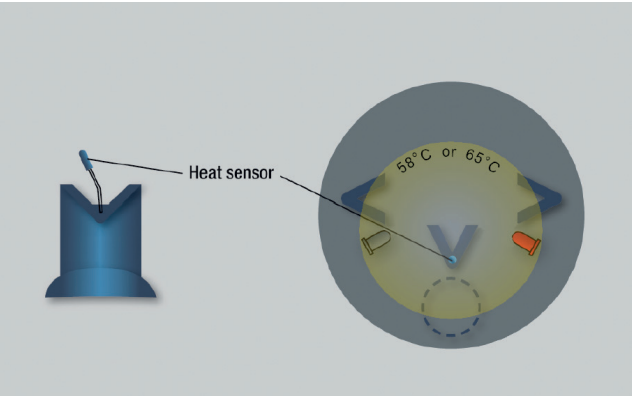
Detector lock



Protection against unauthorised detector removal for ceilings with up to H = 3 m.

Cut out the ① from plastic base and insert it in position ②. Pierce the pre-cut opening ③ in the detector cut out with a suitable knife – when the detector lock is in place the telescopic detector removal tool cannot be used.
To remove the detector push the detector lock inwards through the housing opening ④ and turn the detector carefully ⑤.

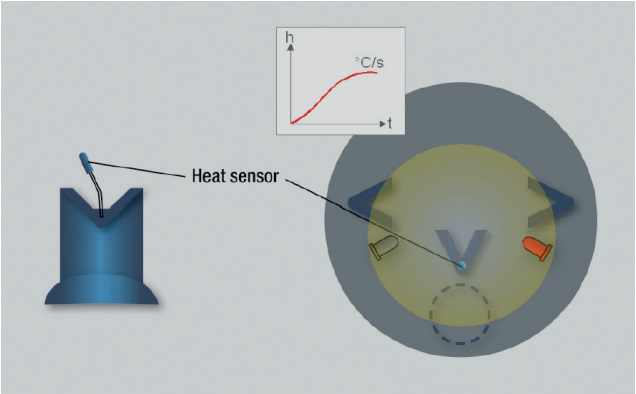
8.3.1 Heat detector



The fixed heat detector, know as static detector, is used in areas where a major change of the ambient temperature is expected and an increase over the alarm threshold temperature will cause an alarm condition.

The detector is suited as well for areas where, under normal conditions, smoke, dust or similar aerosols occur and in the case of an fire alarm a fast flame propagation must be assumed.

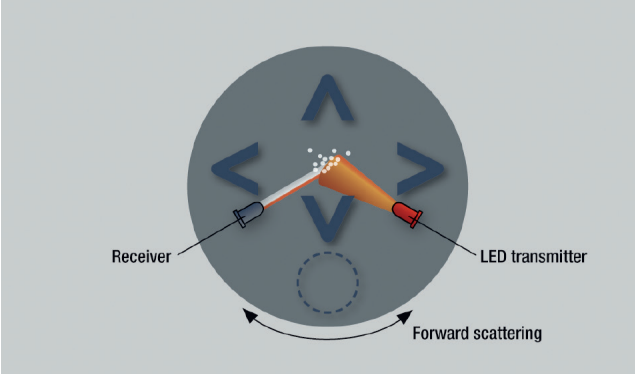
8.3.2 Rate-of-Rise heat detector



This detector is used in areas where a minor change of the ambient temperature is expected due to exceeding the threshold temperature an alarm condition will be generated and a fire condition fast rising temperature or by overstepping of the response temperature a fire alarm will be detected.

The detector is suited as well for areas where, under normal conditions, smoke, dust or similar aerosols occur and in the case of an fire alarm a fast flame propagation must be assumed.

8.3.3 Optical smoke detector

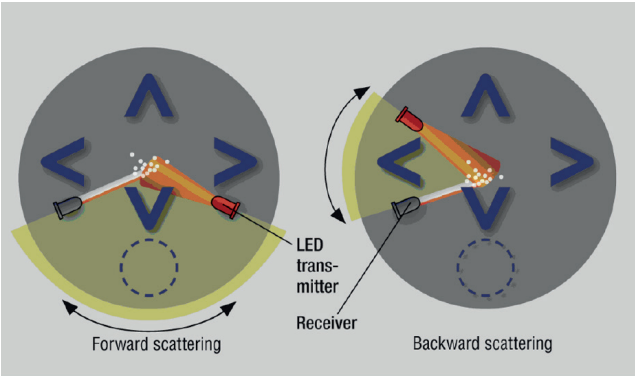


The sensor of an optical photoelectric smoke detector consists of a transmitter LED and a receiver photo-diode. These two devices are installed at a specific angle to one another and separated by a screen, so that light from the LED cannot impinge directly on the receiver diode.

The transmitter LED emits infrared light into the detection chamber. In the event of a fire visible combustion aerosol particles enter the chamber and some of the light emitted by the LED is scattered by the particles so that it impinges on the receiver diode. This naturally increases the signal level generated by the receiver, which is registered by the detector electronics, which in turn trigger an alarm signal.
It is important to understand that this type of optical sensor can only detect visible aerosol particles. This means that photoelectric sensors are not suitable for detecting fires that generate invisible aerosols such as combustion gases.

- Smoke detectors must fulfil standard DIN EN 54 Part 7.
- According to the VdS guidelines all series 9x00 and IQ8Quad smoke detectors can be installed in ceilings up to 12m high.

8.3.4 O²T multisensor detector - dual angle optical and heat sensor



New detector concept with dual-angle technology
The O²T multisensor detector eliminates the disadvantages of conventional light dispersion detectors working with one signal dispersion angle and only able to recognise particular types of smoke. This technology allows for reliable recognition of a number of different substances at constant sensitivity. The intelligent smoke detection minimises the number of false alarms.
This detector uses two measuring angles in order to sense forward (common reverse measurement) and backward (this is the particularity of this device) scattered light. The measured signals pass through a pre-filter and are then analysed by the microprocessor in comparison with stored data. This allows for clear distinction of genuine alarm conditions and spurious influences such as those caused by aerosols from the normal environmental conditions even if they are as intense as the smoke from a real fire.
Smoke detectors must comply with EN 54 Part 7.

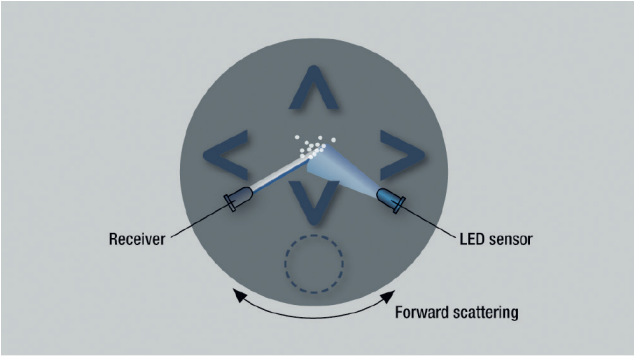
Forward scattering = ideal for bright aerosols
Backward scattering = ideal for dark aerosols

Adaptive electronics reduces false alarms

Due to their operation conventional photoelectric smoke detectors can be affected by spurious influences that could cause a false alarm conditions, e.g. water vapour from paper rolls in print shops or paper mills, showers in hotel rooms, micro-particles from air humidifiers in museums, dust in sawmills, bakeries, or other production facilities.

The O^2T detectors open up new perspectives in fire prevention. They are ideal for applications in locations with medium to high asset concentration. With their built-in intelligence and the high immunity to false alarms the O^2T detectors are especially suited for applications with strong spurious influences e.g. fumes in canteen kitchens or paper stores or dust in other production facilities. Thus, the O^2T detectors save their owners costly false alarms not to mention the related costs caused by such things as the unnecessary evacuation of a hotel.

8.3.5 OT^{blue} multisensor detector - high-sensitive optical and heat sensor



A multisensor detector with built-in optical smoke and heat sensor. The optical measurement chamber is provided with state of the art sensor technology, enabling the detection of open fires, smouldering fires and fires with high heat generation.

Especially for open fires, the classical ionisation technology implemented in ionisation detectors is superseded by this new environment-friendly detection technology. The detector is capable of identifying the TF1-TF8 test fires described in the EN 54-9 specification.

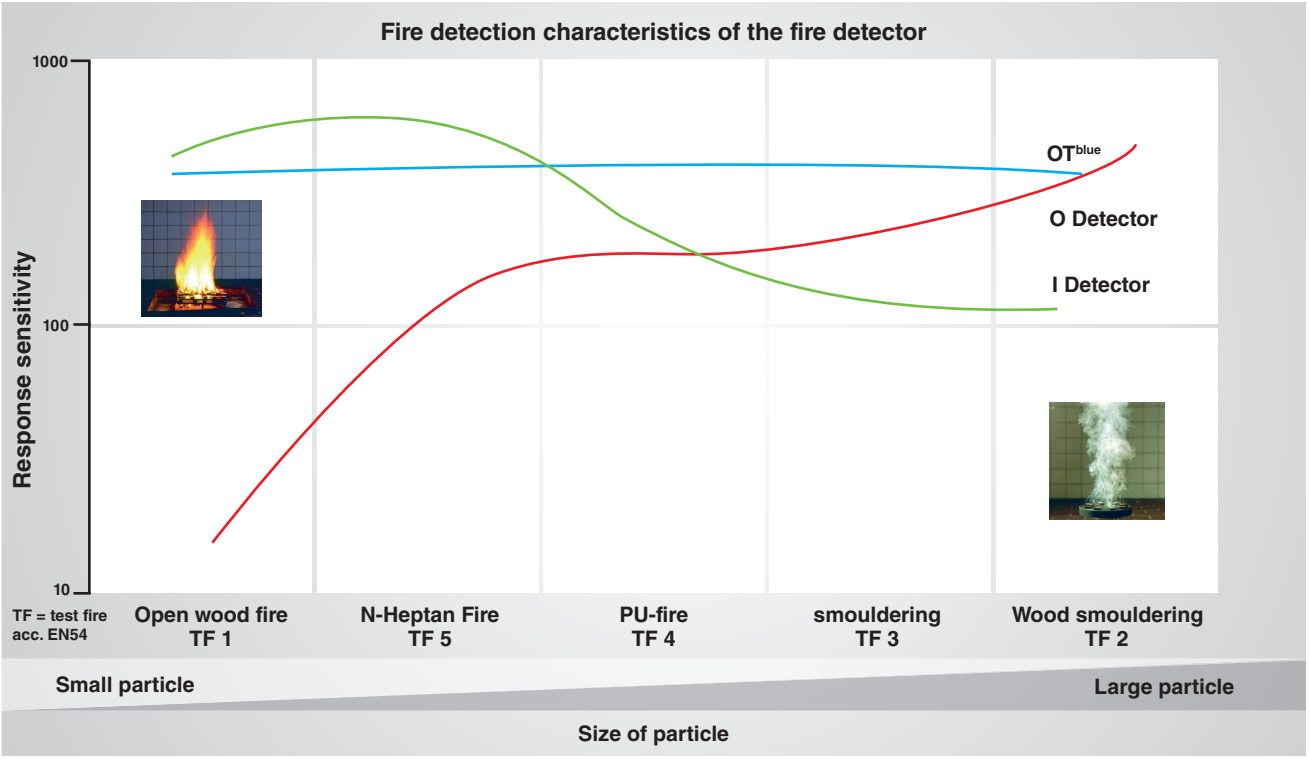
The OT^{blue} multisensor is an intelligent detector with time-related signal analysis, signal correlation of the sensor data, decentralised intelligence, automatic function self-test. CPU failure mode, automatic adaptation to environmental conditions (drift compensation), alarm and operating data memory, alarm indicator and soft-addressing.

The detector is provided with an integrated isolator and a remote LED indicator can be connected.

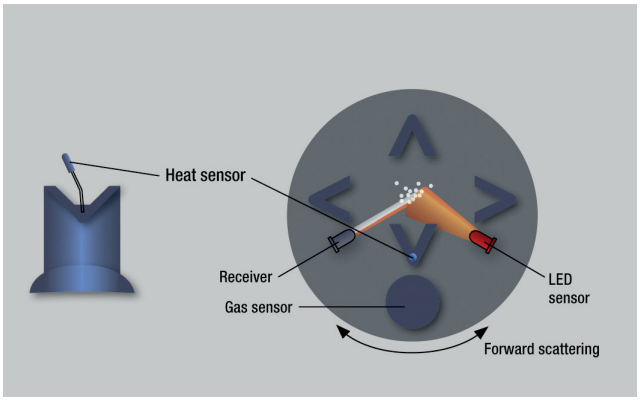
IQ8Quad OT^{blue} – Detection principle

New solution with "blue" - technology

- Using of blue light instead of infrared red light.
- Development of new detection algorithms.



8.3.6 OTG multisensor detector - optical, heat and carbon monoxide sensor



Early detection of different types of fires from smouldering fires to open fires through combined evaluation of scattered light, temperature and gas.
An alarm is triggered at carbon monoxide concentration levels that are life-threatening for humans. The detector is provided with an integrated isolator. A remote indicator can be connected.

95% of all fire victims meet their fate during the smouldering stage of a fire. This is eminently dangerous because most people choke on the smoke while sleeping at night.

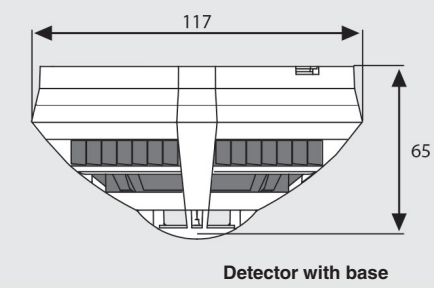
A multisensor detector with integrated optical smoke detector, heat detector and a built-in sensor to guarantee the detection of odourless carbon monoxide gas (CO) for the preventive detection of fires.

- Built-in CO sensor for very early fire detection.
- Very high security against false alarm by using the multisensor technology.

Danger caused by smoke

Body reaction		Carbon monoxide CO	Carbon dioxide CO_2
Consciousness		Uncolored, tasteless and odourless	
Effect		Lack of oxygen for the aerobe organism caused by the 250 times faster reaction of CO with the haemoglobin (erythrocyte) as the aerial oxygen Effect is respiratory paralysis	Increase of breath activity ↓ higher blood pressure respiratory paralysis Effect is suffocation
insensibility/ unconsciousness	concentration time		8 to 10 Vol. % 2 until 3 minutes
Death by suffocation	concentration time	0,1 to 0,2 Vol. % after 3 minutes	
	concentration time	0,3 to 0,5 Vol. % in a few minutes	20 Vol. % in a few minutes
Effect		**Damage to health of brain and heart**	

9 Powered loop sensor - IQ8Quad with integrated alarm devices



Detector with base

Dimensions (mm)

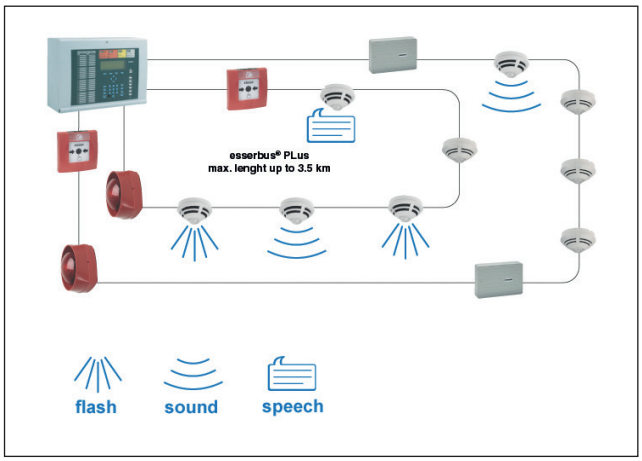
Combined sensor sounder technology with integrated sound, speech and strobe, provides a cost effective solution for alarm signalling saving on installation costs as there is no need for additional power supplies and wiring.
Synchronised messages are transmitted through the same sensor that detects the fire.

- Fire detectors designed with proven O²T technology.
- Integrated signaling device with flasher, alarm tone and speech.
- Short-circuit and open-circuit tolerant due to integrated loop isolator.
- No external Power Supply required.
- Flashing light, audible alarm and speech alarm devices can be individually controlled.
- Only one address is required despite the wide functional range.
- Automatic alarm device synchronisation.
- Adjustable sound pressure (up to 92 dB @ 1m, for DIN tone).
- Alarm and evacuation message can be combined as desired with up to four alarm signals.
- Alarm sounds as well as speech messages can be combined as signal templates.
- The alarm and evacuation message can be combined as desired with up to four alarm signals.
- 5 different speech messages for Alarm 1+2, Evacuation, Info and Test in 5 different languages. Available.
- Customer specific text messages programmable by factory settings.
- More than 20 tones, e.g. DIN tone, US-Siren, NFPA-whoop, French fire sound, BS 5839 Part 1 tone1-8, school bell etc..

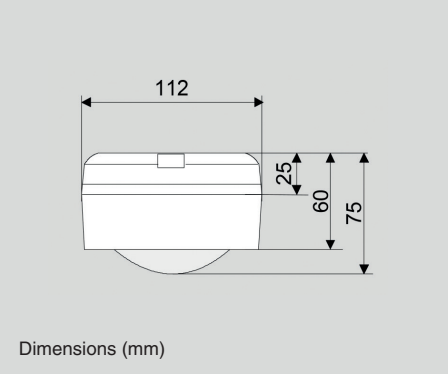
Different types of alarm devices are available:

Detector type	Alarm device type
O²T/F-Multisensor Detector	visual
O²T/So-Multisensor Detector	audible
O²T/FSp- Multisensor Detector	visual, audible + speech
O²T/Sp- Multisensor Detector	audible + speech

Design Tip
The IQ8Quad combines a sounder and strobe within a sensor which not only reduces the number of individual devices you have to install, but also provides an even cover of sound and light throughout a building.



9.1 Powered loop alarm sounder - IQ8Alarm with integrated sound, speech and strobe



Dimensions (mm)

For areas with high ambient background noise levels, the Standards recommend a sound level of 5dB(A) above the norm although it now goes on to say the maximum sound levels should not exceed 120dB(A) for health & safety reasons. Finally it is essential that at least one sounder is placed within each fire compartment and the sounder choice should be common throughout the building. You should not mix bells and electronic sounders within the same building although the ESSER IQ8Quad and IQ8Alarm, both offer bell and electronic sounders allowing a system upgrade or switch over from a bell tone to an electronic tone when required.

Sound attenuation is affected by numerous physical structures within a room, including the door, furniture, people and materials used for floor, walls etc.

General internal doors will attenuate at least 20dB(A), whilst heavier fire doors may well attenuate by up 30dB(A). To ensure 75dB(A) is achieved within a bedroom it is accepted that the sounder is mounted within the room rather than the corridor outside. Use of sensor sounders ensures an even spread of sound throughout the building without the need for separate louder sounders. Visual alarms are generally considered as supplementary rather than the only means of providing an alarm, and are used in areas where the dB(A) level exceeds 90dB(A) or where persons within the area have impaired hearing. The exception could be where sound of any description is undesirable, for example operating theatres, TV studios and places of entertainment where a discreet staff alarm system is the best option to avoid panic.

Visual alarms are also included as a requirement of the Equality Act and should be included in all sleeping accommodation where people with a hearing disability may be present. IQ8Alarm's low-current range incorporates a sounder, strobe and voice sounder in one device. Advanced loop powered technology means efficient loop powered alarm devices where a whole loop of sounders could be powered without the need for additional power supplies. The IQ8Alarm range is available in red and white housings, and the strobe colour is available in red, white, amber, blue and green. The sounders provide a high sound output and volume may be adjusted during commissioning. The powered loop sounder range is available with a number of options for ingress protection up to IP55 and all IQ8Alarm devices are compliant with EN 54 Part 3. Depending on the alarm device type a maximum of 32 IQ8Alarm can be connected to any esserbus® PLus loop of the IQ8Control Fire Alarm System.

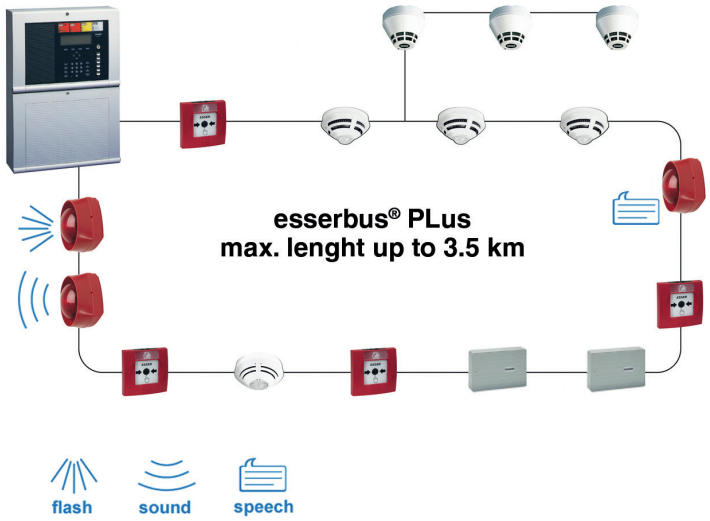
This number may be limited by the presence of other alarm devices and the loop length. The alarm is given by means of sound, flash and/or a speech message of the appropriate alarm device.

- No external Power Supply required.
- Programmable sound pressure up to 92 dB(A)/1m (with DIN tone).
- Automatic alarm device synchronisation.
- Short-circuit and open-circuit tolerant due to integrated loop isolator.
- Alarm and evacuation message can be combined as desired with up to four alarm signals.
- Alarm sounds as well as speech messages can be combined as signal templates.

- The alarm and evacuation message can be combined as desired with up to four alarm signals
- 20 multiple tones on-board, e.g. DIN tone, US-Siren, NFPA-whoop, French fire sound, BS 5830 Part 1 tone1-8, school bell etc..
- 5 different speech messages for Alarm 1+2, Evacuation, Info and Test in 5 different languages available.
- Customer specific text messages can be programmed by factory request.
- Softstart alerting, means an smooth increase of the sound level for noise-sensitive areas, e.g. nursing homes, etc.

Different types of alarm devices are available:

Alarm device type	Alarm device type
Alarm device IQ8Alarm	audible
Alarm device IQ8Alarm	visual
Alarm device IQ8Alarm	audible + visual
Alarm device IQ8Alarm	audible + speech
Alarm device IQ8Alarm	audible, visual + speech



Design Tip

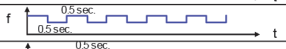
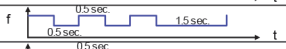
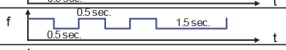
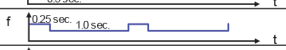
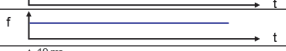
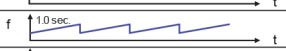
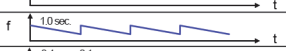
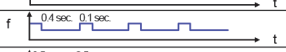
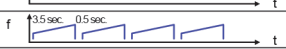
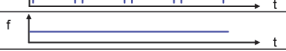
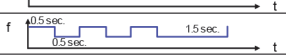
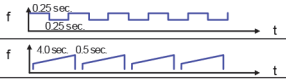
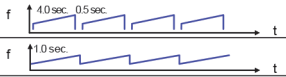
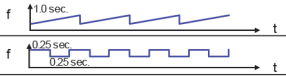
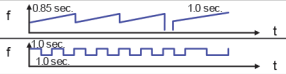
Research* over the last twenty years has proven that a voice enhanced sounder is preferred to a bell or electronic sounder as people pay more attention to a spoken message. The ESSER IQ8Quad and IQ8Alarm offer sounders that include recorded speech messages delivered in a synchronised manner to create a clear instruction to persons at risk within a building.

* Sources: Brian Piggott (The Fire Research Station) and David Canter (Surrey University)

Alarm Signaling Devices

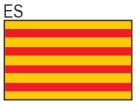
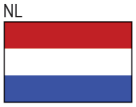
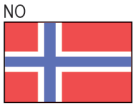
Country code acc. to ISO 3166 -Alpha-2	Language code acc. to ISO 639-1	Evacuation 1	Evacuation 2	Alarm	Test-message	All-Clear
Germany (DE)	de	Dies ist ein Feueralarm. Bitte verlassen Sie das Gebäude umgehend über die nächsten Fluchtwege. Die Feuerwehr ist alarmiert.	Achtung, Achtung! Dies ist eine Gefahrenmeldung. Bitte verlassen Sie das Gebäude über die nächsten Ausgänge.	Achtung, im Gebäude ist eine Gefahrensituation gemeldet worden. Bitte bleiben Sie ruhig, und warten Sie auf weitere Anweisungen.	Dies ist eine Testdurchsage.	Die Gefahrensituation ist jetzt behoben. Wir entschuldigen uns für jegliche Unannehmlichkeiten.
Great Britain (GB)	en	This is a fire alarm. Please leave the building immediately by the nearest available exit.	Attention please. This is an emergency. Please leave the building by the nearest available exit.	An incident has been reported in the building. Please await further instructions.	This is a test message. No action is required.	The emergency is now cancelled. We apologize for any inconvenience.
France (FR)	fr	Ceci est une alarme incendie,veuillez évacuer immédiatement les locaux par la sortie la plus proche.	Votre attention s'il vous plaît, ceci est une alarme. Veuillez évacuer les locaux par la sortie la plus proche.	Un incident est signalé dans le batiment. Merci de garder votre calme et attendez les prochaines instructions.	Ceci est un test.	L'alarme est à présent annulée. Veuillez nous excuser pour le désagrément.
Spain (ES)	es	Esto es una alarma de incendio. Abandonen por favor el edificio inmediatamente por la salida de evacuación más cercana.	Atención. Esto es una emergencia. Por favor abandonen el edificio por la salida de evacuación más cercana.	Atención, se ha reportado un incidente en el edificio. Aguarden por favor otras instrucciones.	Esto es un mensaje de prueba. No se requiere ninguna acción.	La emergencia ha sido cancelada. Pedimos disculpas por las molestias causadas.
Italy (IT)	it	Attenzione. Allarme incendio. Abbandonare l'edificio tramite l'uscita di emergenza più vicina.	Attenzione. Allarme in corso. Vi preghiamo di recarvi presso l'uscita di emergenza più vicina.	Attenzione. E' stato rilevato un allarme.Ulteriori disposizioni vi verranno comunicate appena possibile.	Attenzione. E' in corso una prova di allarme. Non è richiesta alcuna azione.	Attenzione. Cessato allarme.La situazione di normalità è stata ripristinata.

Standard speech messages of IQ8Quad detectors and IQ8Alarm

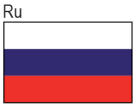
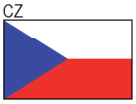
No.	Description	Frequency	Pulse rate
1	School bell	complex	complex
2	FP 1063.1 Telecoms BS 5839 Pt1	Alternating 800 / 970 Hz at 2 Hz	
3	BS 5839 Pt1	Alternating 800 / 970 Hz at 1 Hz	
4	BS 5839 Pt1	Intermittent 970 Hz at 1 Hz 0.5 sec.	
5	BS 5839 Pt1	Intermittent 2850 Hz at 1 Hz 0.5 sec.	
6	BS 5839 Pt1	Intermittent 970 Hz 1/4 sec. ON - 1 sec. OFF	
7	BS 5839 Pt1	Continuous 970 Hz	
8	BS 5839 Pt1	Sweep tone 800 Hz tp 970 Hz at 7 Hz	
9	BS 5839 Pt1	Sweep tone 800 Hz to 970 Hz at 1 Hz	
10	DIN Tone DIN 33404 Part 3	1200 - 500 Hz at 1 Hz	
11	French fire sound	554 Hz / 100 ms + 440 Hz / 400 ms + 10 %	
12	NL - Slow Whoop	500 Hz - 1200 Hz at 3.5 sec. break of 0.5 sec.	
13	US - Horn	Continuous 485 Hz	
14	US - Horn with Temporal Pattern	Intermittent 485 Hz (0,5 sec. ON; 0.5 sec. OFF; 3 times; 1.5 sec. OFF; Repeat)	
15	US - March Time	Alternating 485 Hz (0,25 sec. ON; 0.25 sec. OFF; Repeat)	
16	US - Slow Whoop	Sweep tone 500 Hz to 1200 Hz (4.0 sec. ON; 0.5 sec. OFF; Repeat)	
17	US - Siren	Sweep tone 600 Hz to 1200 Hz (1,0 sec. ON, Repeat)	
18	US - Hi/Lo	Alternating 100 Hz / 800 Hz (0.25 sec. ON; Alternate; 0.25 sec. ON; Alternate; Repeat)	
19	US - NFPA Whoop	Sweep tone 422 Hz to 775 Hz (upwards sweep 0.85 sec.; 3 times; 1 sec. OFF; Repeat)	
20	IMO GA-Signal	Intermittent 800 Hz (1,0 sec. ON; 1,0 sec. OFF: 7 times; 2.0 sec. ON: 2.0 sec. OFF; Repeat)	

IQ8Quad detectors and IQ8Alarm tone table

Alarm Signaling Devices

Country code acc. to ISO 3166 -Alpha-2	Language code acc. to ISO 639-1	Evacuation 1	Evacuation 2	Alarm	Test Message	All-Clear
SA  Arabia	ar	يرجي الإنتباه, هناك حريق, برجاء التوجه إلي أقرب مخرج طوارئ و إخلاء المبني.	تم الإبلاغ عن حالة طوارئ في المبني, يرجي الإنتظار للحصول علي الإرشادات.		هذه الرسالة لفحص النظام , نأسف للإزعاج.	تم إلغاء حالة الطوارئ الآن, نعتذر عن أي إزعاج.
BA  Bosnia	bs	Ovo je požarni alarm Molimo da odmah napustite zgradu koristeći najbliži raspoloživi izlaz.	Pažnja. Ovo je obavještenje o opasnosti. Molimo napustite zgradu koristeći najbliži raspoloživi izlaz.	U zgradi se dogodio incident. Molimo sačekajte dalja uputstva.	Ovo je poruka za ispitivanje sistema. Možete nastaviti sa vašim aktivnostimo.	Opasnost je prestala. Izvinjavamo se radi eventualnih neugodnosti.
BR  Brasil	pt	Atenção. Esta é uma emergência. Por favor, abandonem o edifício pela saída de emergência mais próxima.	Isto é um alarme de incêndio. Abandonem por favor, o edifício imediatamente pela saída de emergência mais próxima	Atenção foi reportado um incidente no edifício. Aguardem, por favor, outras instruções.	Esta é uma mensagem de teste. Não se requer nenhuma ação.	A emergência foi cancelada. Pedimos desculpas pelos problemas causados
CN  China Mandarin	zh	请注意！ 请注意！ 现在发生火警， 请保持冷静， 并尽快离开现场！	请注意！ 请注意！ 现在发生火警， 请留意厂播， 或注意现场指示！	请注意！ 现在发生紧急事故， 请等待下一步指使。	注意！ 紧急事故已经排除， 谢谢！	现在是系统测试， 请各位无需惊慌。
DK  Denmark	da	Brandalarmen er aktiveret forlad venligst bygningen, anvend nærmeste nødudgang.	Dette er en nødsituation, forlad bygningen brug de opmærkede flugtveje.	Et varsel om brand bliver undersøgt, afvent nærmer besked.	Dette er en test melding ingen tiltag nødvendig.	Normal tilstand er genoprettet, faren er overstået.
Fi  Finland	fi	Huomio, kiinteistössä on havaittu automaattinen paloilmoitus. Poistu rakennuksesta käyttäen ohjattuja reittejä. Hissien käyttö on kielletty.	Huomio, turvallisuussyistä kiinteistöstä on poistuttava välittömästi. Käytä ohjattuja reittejä.	Huomio, paloilmoitin on ilmoittanut mahdollisesta vaaratilanteesta. Tutkimme asiaa ja annamme pian lisätietoja.	Paloilmoitinjärjestelmää testataan.	Palohälytys on ohi. Tilanne on palautunut normaaliksi.
GR  Greece	el	Αυτό είναι ένα μήνυμα συναγερμού για πυρκαγιά. Παρακαλώ εγκαταλείψτε το κτίριο αμέσως από τις εξόδους κινδύνου. Η πυροσβεστική έχει δοπoιηθεί.	Προσοχή, προσοχή! Αυτό είναι ένα μήνυμα για κατάσταση κινδύνου. Παρακαλώ εγκαταλείψτε το κτίριο από τις επόμενες εξόδους.	Προσοχή στο κτίριο υπάρχει κατάσταση κινδύνου. Παρακαλώ παραμείνετε ψύχραιμοι και περιμένετε επόμενες οδηγίες.	Αυτή είναι μια δοκιμαστική ανακοίνωση.	Η κατάσταση κινδύνου έχει αρθεί. Ζητούμε συγγνώμη για τυχόν δυσάρεστες καταστάσεις που προκλήθηκαν.
ES  Catalonia	ca	Això es una alarma d´incendi. Siusplau abandonin l´edifici inmediatament per la sortida d´evacuació més propera.	Atenció. Això es una emergencia. Siusplau abandonin l´edifici per la sortida d´evacuació més propera.	Atenció. S´ha notificat un incident a l´edifici. Siusplau, esperin altres instruccions.	Això es un missatge de prova. No es requereix cap acció.	L´alarma ha estat cancel.lada. Preguem disculpin les molesties.
HR  Croatia	hr	Ovo je pozarni alarm. Molimo odmah napustite objekt koristeci najblizi izlaz za nuzdu. Vatrogasna postaja je alarmirana.	Pozor! Pozor! Ovo je priopcenje o neposrednoj opasnosti. Molimo odmah napustite objekt koristeci najblizi izlaz za nuzdu.	Pozor! U objektu je prijavljena opasnost. Molimo ostanite mirni i pricekajte daljnje upute.	Ovo je probno priopcenje. Nikakve mjere nisu neophodne.	Opasnost je prestala. Ispricavamo se radi eventualnih neugodnosti.
NL  Netherlands	nl	Attentie, er is een brandalarm. Verlaat het gebouw via de dichtstbijzijnde uitgang.	Attentie, er is een calamiteit. Verlaat het gebouw via de dichtstbijzijnde uitgang.	Attentie, er volgt een blussing, verlaat de ruimte.	Dit is een testalarm, dit is een testalarm.	Einde alarmmelding, einde alarmmelding.
NO  Norway	no	Brannalarmen er utløst, forlat bygget, bruk de oppmerkede rømningsveiene.	Dette -er en nødsituasjon, forlad bygget, bruk de oppmerkede rømnings-veiene.	Et automatisk varsel om brann blir undersøkt, avvent nærmere beskjed.	Dette er en testmelding, ingen tiltak nødvendig.	Normaltilstand er gjenopprettet, faren er over.

Alarm Signaling Devices

Country code acc. to ISO 3166 -Alpha-2	Language code acc. to ISO 639-1	Evacuation 1	Evacuation 2	Alarm	Test Message	All-Clear
PL  Poland	**pl**	Uwaga! Wystąpił alarm pożarowy. Proszę natychmiast opuścić budynek najbliższym dostępnym wyjściem ewakuacyjnym.	Proszę o uwagę! To jest komunikat alarmowy. Proszę opuścić budynek najbliższym dostępnym wyjściem ewakuacyjnym.	Uwaga. W budynku wystąpiło zdarzenie alarmowe. Proszę spokojnie oczekiwać dalszych instrukcji.	To jest komunikat testowy. Nie są wymagane żadne działania.	Stan alarmu został odwołany. Przepraszamy za wszelkie niedogodności i utrudnienia.
PT  Portugal	**pt**	Isto é um alarme de incêndio. Por favor abandonem o edifício imediatamente pela saída de evacuação mais próxima.	Atenção. Isto é uma emergência. Por favor abandonem o edifício pela saída de emergência mais próxima.	Atenção, ocorreu um incidente no edifício. Por favor aguardem mais instruções.	Atenção, isto é apenas um ensaio	O alarme foi cancelado. Queiram desculpar o inconveniente.
RO  Romania	**ro**	Atenţiune, atenţiune! S-a declanşat o alarmă de incendiu. Vă rugăm părăsiţi imediat clădirea pe cea mai apropiată cale de evacuare. Alarma a fost transmisă la pompieri.	Atenţiune! Acesta este un mesaj de urgenţă. Vă rugăm părăsiţi clădirea pe cea mai apropiată cale de ieşire.	Atenţiune. În clădire a fost semnalat un incident. Vă rugăm să vă păstraţi calmul şi să aşteptaţi noi instrucţiuni.	Situaţia de urgenţă a luat sfârşit. Ne cerem scuze pentru eventualele inconveniente.	Acesta este un mesaj de test.
RS  Serbia	**sr**	Ovo je požarni alarm! Molimo vas da odmah napustite zgradu koristeći najbliži raspoloživi izlaz.	Pažnja! Ovo je obaveštenje o opasnosti. Molimo vas da naupustite zgradu koristeći najbliži raspoloživi izlaz.	U zgradi se desio incident. Molimo vas da sečekate dalja uputsva.	Ovo je poruka za ispitivanje sistema. Možete nastaviti sa vašim aktivnostima.	Opasnost je prestala. Izvinjavamo se zbog eventualnih neugodnosti.
Ru  Russia	**ru**	Внимание. Пожарная тревога. Пожалуйста покиньте помещение через ближайшие аварийные выходы.	Внимание. Это предупреждение о пожарной опасности. Пожалуйста покиньте помещение через ближайшие выходы.	Внимание. Поступило предупреждение о пожарной опасности. Пожалуйста сохраняйте спокойствие и ждите дальнейшей информации.	Отмена пожарной тревоги. Ситуация нормализовалась. Извините за причинённые неудобства.	Тестовое сообщение. Идет проверка системы пожарной сигнализации.
Se  Sweden	**sv**	Brandlarmet är utlöst, lämna omedelbart byggnaden genom närmaste utgång.	Detta är en nödsituation, lämna omedelbart byggnadengenom närmaste utgång.	Larm om brand i byggnaden blir undersökt, invänta närmare besked.	Detta är ett testmeddelande, ingen åtgärd är nödvändig.	Normalt tillstånd är återupprättat, faran är över.
SK  Slovakia	**sk**	Toto je požiarny poplach. Opusťte prosim okamžite budovu najbližším núdzovým východom!	Pozor, hrozí nebezpečenstvo. Opusťte prosim budovu najbližším núdzovým východom!	V budove bola vyhlásená pohotovosť. Počkajte prosim na ďalšie pokyny.	Toto je testovacie hlásenie. Nie je potrebne naň reagovať.	Pohotovosť bola odvolaná. Ospravedlňujeme sa za pripadne ťažkosti.
CZ  Czech Republic	**cs**	Toto je požární poplach. Prosím, opusťte okamžitě budovu nejbližším únikovým východem.	Pozor, hrozí nebezpečí. Prosím, opusťte budovu nejbližším únikovým východem.	V budově byla vyhlášena pohotovost. Prosím, vyčkejte dalších instrukcí.	Toto je testovaci hlášení. Není třeba na něj reagovat.	Pohotovost je nyní odvolána. Omlouváme se za případné obtíže.
TR  Turkey	**tr**	Pohotovost je nyní odvolána. Omlouváme se za případné obtíže.	Acil bir durum var. Lütfen binayı en yakın çıkış noktasından terkedin.	Bu bir yangın uyarısıdır. Bu bir yangın uyarısıdır. Talimatlar için beklemede kalın. Talimatlar için beklemede kalın.	Yangın uyarısı test edilmektedir. Bir şey yapmanız gerekmiyor. Bir şey yapmanız gerekmiyor.	Tehlike geçmiştir. Tehlike geçmiştir. Bir şey yapmanız gerekmiyor.
HU  Hungary	**hu**	Tűzriadó! Kérem, azonnal hagyják el az épületet az Önökhöz legközelebb eső kijáraton!	Figyelem! Vészhelyzet! Kérem, azonnal hagyják el az épületet az Önökhöz legközelebb eső kijáraton!	Az épületben váratlan esemény történt. További utasításig kérem várjanak!	Ez egy tesztüzenet.	Vészhelyzet törölve. Az esetleges kellemetlenségekért elnézésüket kérjük.

Planning guide for powered loop installation

This is a planning guide for esserbus® PLus (powered loop) alarm devices. The alarm current of each alarm device is defined as load factor. When added up, the total load factor defines the loop length and the maximum number of alarm devices. The maximum load factor per loop of all alarm devices must not exceed 96. Without limitation for FlexES Control panel, IQ8Control M = 6 loops x 96 load factor and IQ8Control C = 2 loops x 96 load factor. Altogether up to 127 bus devices per loop can still be connected. The "Load factor" download file for easier load factor calculation is available within our customer section at http://www.esser-systems.com.

Load factors:

Part No.	Type of alarm signalling device	Load factor
802382	O/So optical smoke detector IQ8Quad	2
802383	O²T/F multisensor IQ8Quad with integr. flash	2
802384	O²T/So multisensor IQ8Quad with integr. sounder	2
802385	O²T/FSp multisensor IQ8Quad with integr. flash, sounder and speech	3
802386	O²T/SpSo multisensor IQ8Quad with integr. sounder and speech	3
807205	Sounder IQ8Alarm, Housing: white	3
807206	Sounder IQ8Alarm, Housing: red	3
807212	Optical alert device IQ8Alarm, Housing: white, lens: amber	3
807213	Optical alert device IQ8Alarm, Housing: white, lens: white, blue, green	3
807214	Optical alert device IQ8Alarm, Housing: red, lens: red	3
807224	Combi sounder IQ8Alarm, Housing: red, Lens: red	3
807322	Speech alarm unit IQ8Alarm, Housing: white	3
807332	Speech alarm unit IQ8Alarm, Housing: red	3
807372	Combi speech alarm unit IQ8Alarm, Housing: red, lens: red	3
806282	Addressable base sounder esserbus® PLus	2

Maximum loop length depending on the total load factor

Maximum powered loop length	Total load factor
up to 700 m	91 to 96
up to 800 m	85 to 90
up to 900 m	79 to 84
up to 1000 m	73 to 78
up to 1100 m	67 to 72
up to 1300 m	61 to 66

Maximum powered loop length	Total load factor
up to 1500 m	55 to 60
up to 1700 m	49 to 54
up to 2000 m	43 to 48
up to 2500 m	37 to 42
up to 3000 m	31 to 36
up to 3500 m	1 to 30

Load factor calculation

Example 1: How many IQ8Alarm alarm signalling devices with load factor 3 can be connected to one loop?

96 (max. total load factor) : 3 (load factor) = 32

As shown in the table the max. loop length is reduced to 700m for this load factor.

Example 2: Various types of alarm signalling devices are connected to one loop:

		Load factor
4 x 807205 alarm devices with load factor 3,0	= 4 x 3,0	= 12
		+
27 x O2T/So multisensor IQ8Quad (802384) with load factor 2,0	= 27 x 2,0	= 54
total load factor		**= 66**

The maximum loop length for a total load factor of 66 is 1300m (at a wire gauge 0,8mm).

Example 3: For alarm signalling with sounder, 25 x 802384 IQ8Quad O²T/So detectors are installed - each in one office. What is the maximum loop length?

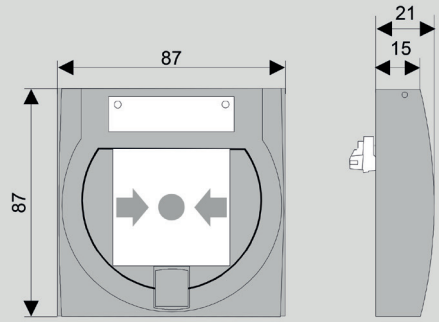
Load factor for one 802384 IQ8Quad O²T/So detector = 2 (load factor)

25 IQ8Quad O²T/So x 2 (load factor) = 50 (total load factor)

The maximum loop length is 1700 m (at a wire gauge 0,8 mm).

9.2 Manual call points (MCP)

Small Housing



Dimensions (mm)

- Manual call points for connection to the esserbus®/ esserbus® PLus fire detection of the FACP. Short-circuit and open-circuit tolerant due to integrated loop isolators.
- Conventional manual call points for universal application in systems such as Fire Alarm Systems and extinguishing panels.
- Complies with EN54 part 11 requirements.
- Electronic modules can be selected depending on the application area.
- The detector housing is available in five different colours.
- Surface mount (see Surface mount housing, available in five different colours) or flush mount installation.
- Slimline design.
- Test function, reset and opening with the standard housing key.

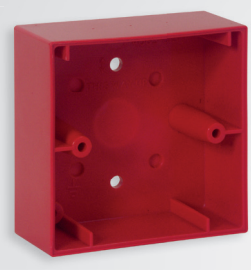
MCP type A (single action – small design)

The conventional red housing identified with a “burning house” symbol is designated for use as a call point for manually triggering fire alarms or other hazard alarms in dry workplaces not subject to explosion hazards. The call point is also available in other versions for other applications, for example in housings with different colours and with a choice of different identification labels.

To activate the MCP → Break glass or push the resettable element (for example used in kindergarten or food industry).

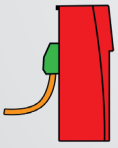
For surface mounting of the MCP the surface mount housing is required, if the cable wasn’t layed about a standard flush mount wall socket.

Surface mount housing for small MCP



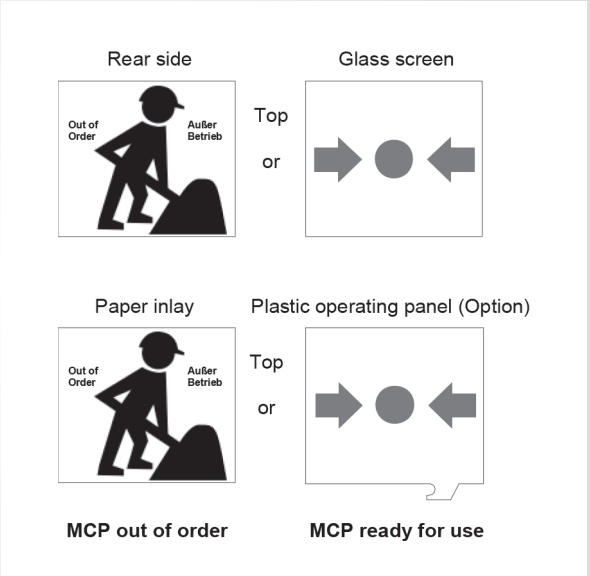
Example: red colour

Connecting terminal



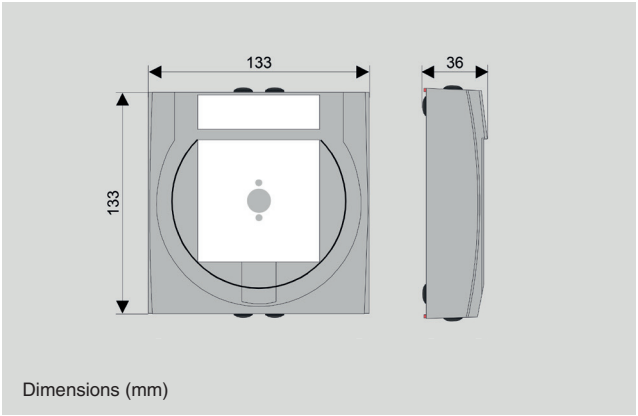
Vertical connection mode

Glass screen, paper inlay and plastic operating panel



MCP out of order **MCP ready for use**

Large Housing



Dimensions (mm)

MCP type B (double action – large design)

The conventional red housing identified with a “burning house” symbol is designated for use as a call point for manually triggering fire alarms or other hazard alarms in dry workplaces not subject to explosion hazards.

The call point is also available in other versions for other applications, for example in housings with different colours and with a choice of different identification labels.

To activate the MCP → Break glass and press button.

MCP out of order | Easy to maintain the change of condition by turning the operating foil. | MCP ready for use

Application example

10 esserbus® transponders - input and output modules

10.1 Overview

Esserbus® transponders are additional devices, which can be operated as bus devices within the multifunctional prime circuit such as the esserbus or the powered loop. With their freely programmable inputs and outputs, they can be used for controlling and monitoring external devices or for connecting standard detectors, diagnostic detectors or detectors for special application (e.g. linear detectors and Ex approved detectors for hazardous areas).

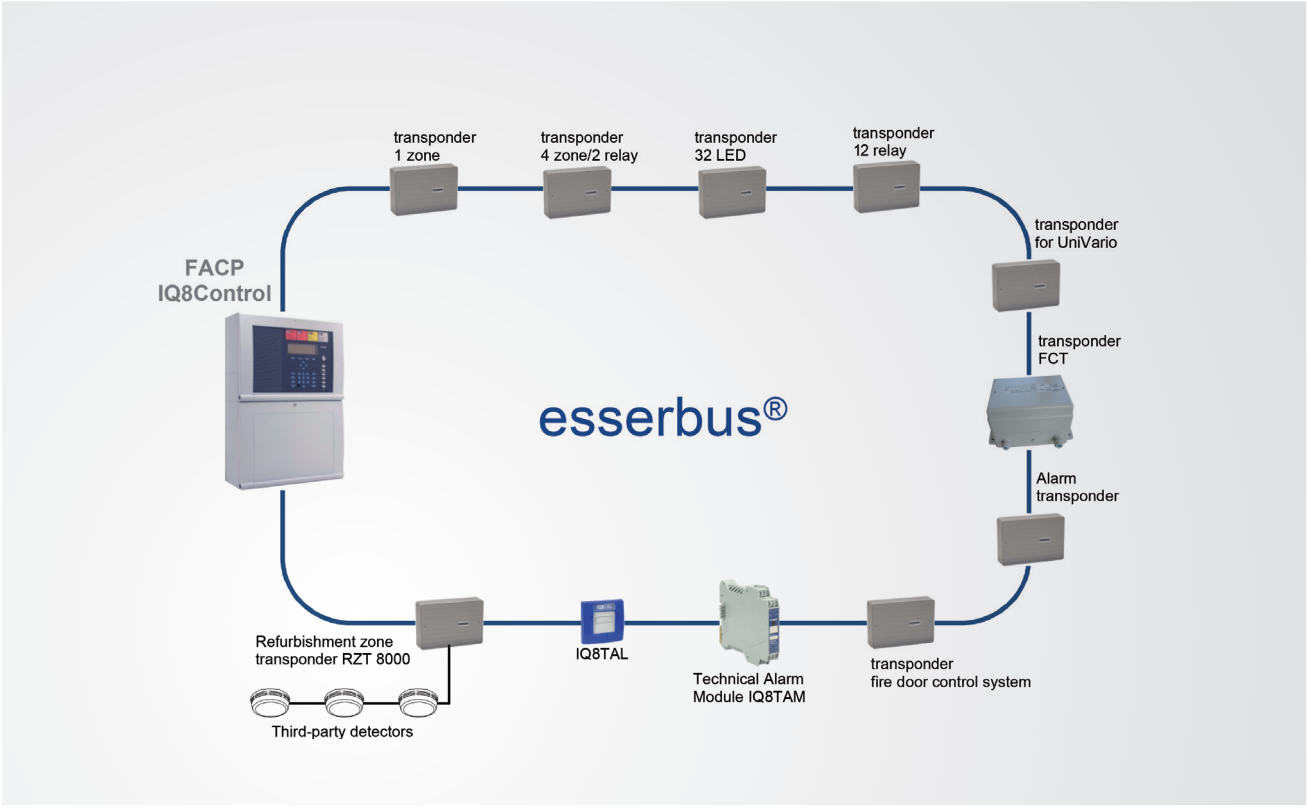
Four transponder versions and a wide range of programming options allow reliable and efficient connection of external devices for each type of application. In accordance with protection type IP 50, the esserbus interface units can be mounted to the IQ8Control fire alarm control panel as well as to external surface mount and flush mount plastic housings.

Apart from communication transponders, all transponder types require external voltage supply for operation, which can be monitored if necessary.

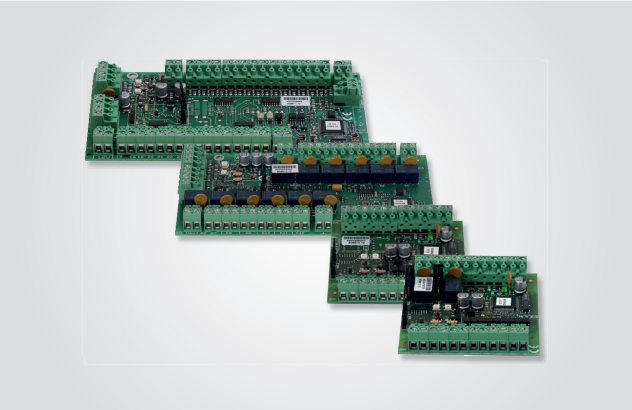
Esserbus® transponders need ONLY ONE loop address per device!

- esserbus® alarm transponder (Part No. 808623) The transponder with integrated isolator is suited exclusively for connection to the analog loop (esserbus® / esserbus® PLus) of the fire alarm control panel.
- Technical Alarm Module IQ8TAM (Part. No. 804869) Each IQ8TAM provides an integrated loop isolator which opens in case of a fault, e.g. a short circuit, to isolate the part of the loop between two loop isolators. A single wire break does not take affect to the loop and all devices remain in operation
- esserbus® transponder 12 relay (Part No. 808610.10) With the 12 x relay module, it is possible to expand the number of outputs per panel.
- esserbus® transponder 32 LED (Part No. 808611.10) This esserbus® transponder module has 32 outputs for direct LED control (e.g. indicator board).
- esserbus® transponder 1 zone (Part No. 808614.10)
  - max. 31 esserbus® transponder 1 Zone per loop
  - max. 30 standard detectors without switch-on control per zone
  - max. 10 standard detectors with switch-on control per zone
  - max. 10 MCP or Technical Alarm Modules per zone

- esserbus® transponder 4 zone / 2 relay (Part No. 808613.10) - max. 31 esserbus® transponders 4 inputs / 2 outputs per loop
- esserbus® transponder SIE (Part No. 898613.30) Standard interface EXTINGUISHING for connection of extinguishing systems to the fire detection system.
- esserbus® communication transponder (Part No. 808615) With this esserbus transponder the extinguishing relay output 8010 can be integrated on the bus of panel FACP IQ8Control or FlexES Control, thus enabling several extinguishing zones to be networked with each other. On each bus, a maximum of eight 8010 extinguishing relay outputs can be operated and networked. All indicators and controls can be activated from the fire alarm panel. The communication transponder occupies one address on the esserbus®.
- esserbus® transponder fire door control system (Part No. 808619.10) The transponder increases the number of freely programmable panel inputs and outputs. The inputs, e.g. are suited for the connection of non- addressable fire detectors and manual call points. With the fire door control functionality the transponder can be configured as a stand-alone control unit or as loop devices on a Fire alarm system. With this functionality it is possible to realise an automatic door control system and trigger fire door magnets.
- esserbus® transponder for UniVario (Part No. 808622) Input transponder with 4 monitored standard group inputs for connecting detectors of the UniVario product family. Two potential-free relay outputs are also available for control functions.
- Refurbishment zone transponder RZT 8000 (Part No. 808630.10 / 808631.10)
  The RZT 8000 third-party detector connecting module has four inputs for detector zones and two relay outputs. It may be used for connecting four additional standard detector zones with non-addressable third-party detectors to the loop. The two relay outputs are available for general control purposes.
- esserbus® transponder IQ8FCT (Part No. 804867)
  The IQ8FCT is designated for hazard alarms in dry workplaces not subject to explosion hazards. The esserbus® transponder IQ8FCT is used for general control and shutdown of roller doors, cabinets, lifts, machines, pumps, etc. and can be equipped with max. two IQ8FCT (Part No. 804981) or IQ8TAL (Part No. 804980) and connected to the loop of the fire alarm system.
- IQ8TAL Technical Alarm Module (Part No. 804868)
  The IQ8TAL Technical Alarm Module is a full-fledged loop device of the IQ8Control fire detection system and it facilitates the detection and forwarding of technical alarms.
- IQ8TAM technical alarm module for snap-on mounting (Part No. 804869)
  The technical alarm module IQ8TAM is a bus device of the fire alarm system for recognition, transmission and individual display of technical alarms.

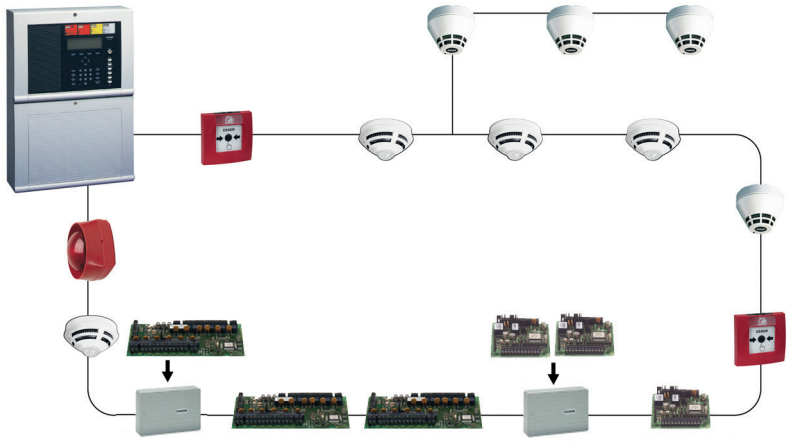


10.1.1 esserbus® transponder the input-/output module

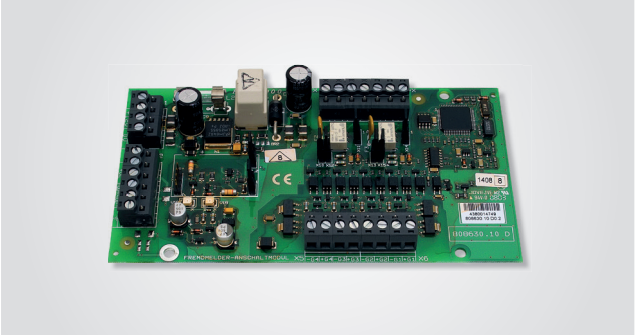


Performance data at a glance

- Simple, fast installation and start-up.
- Additional power supplied via the control panel or an external power supply.
- Transponders with a monitoring input for external voltage available.
- Excellent reliability due to proximate system element control.
- Cost-effective installation due to joint operation with fire detectors on a common loop.
- Up to 32 esserbus® transponders of the 12 relay transponder, 32-relay output transponder and single-zone transponder type on one esserbus®.
- Up to 31 esserbus® transponders of the 4 zone / 2 relay transponder type or Third-party detector connecting module RZT 8000 on one esserbus®.
- Up to 100 esserbus® transponders can be connected to a Fire Alarm Control Panel.
- Cost-saving installation due to common loop wiring.
- Convenient configuration via the programming software tools 8000.
- Maximum security through isolation of the malfunctioning segment with an optional integrated zone isolator board for increased fault tolerance.
- Dimensions (relating to type) 82 x 82 x 20 (mm) or 183 x 131 x 47 (mm).
- Housing for 1 or 2 esserbus® transponders with protection rating (IP 40) available.



10.1.2 Refurbishment zone transponder RZT 8000



The refurbishment zone transponder is a stand-alone participant on the esserbus® for Fire Alarm Systems. Individual automatic fire detectors and manual call points (conventional technology) from other manufacturers can be connected to the 4 zone inputs. The voltage of all 4 zones can be configured to 24 V via the internal DC / DC module. An additional reset module is not required to operate third party detectors.

Features

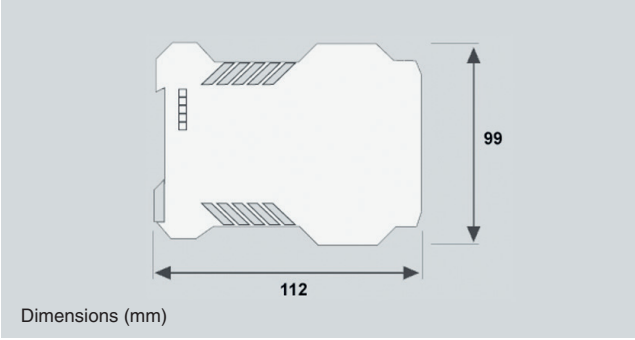
The RZT 8000 refurbishment zone transponder connecting module has four inputs for detector zones and two relay outputs. It may be used for connecting four additional standard detector zones with non-addressable third-party detectors to the loop. The two relay outputs are available for general control purposes.

- output current max. 125 mA per detector zone.
- optional use of the extended functionality of the 4 zone / 2 relays transponder. The detector states pre-alarm or detector malfunction may also be displayed.
- variable delay time for detector zone reset (0 ...15 seconds).
- The detector zones can be operated in “2-zone coincidence”.
- two relays with programmable operating modes
- programming by means of the FACP IQ8Control or FlexES Control customer data editor (requires V2.40 or higher of the FACP system and customer data software).
- programmable monitoring of the external 12 V DC power supply.

Connection of the relay outputs

- Selection of the three relay operating modes is done by means of jumpers X10 to X15 on the board of the third-party detector connecting module. In addition to this, the relay operating mode must be configured into the customer data of the IQ8Control or FlexES Control fire alarm panel.
- Different operating modes may be used for the two relay outputs. This allows for >mixed operation< of a third-party detector connecting module.
- The relay outputs are protected by an electronic protecting device (Multi-Fuse). To reset this protection disconnect the power from the module for approx. 30 seconds.

10.1.3 IQ8TAM Technical alarm module (1 contact IN)

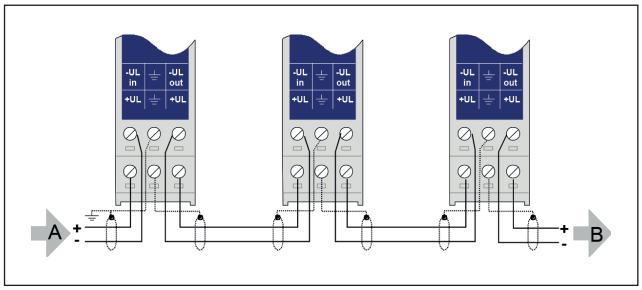


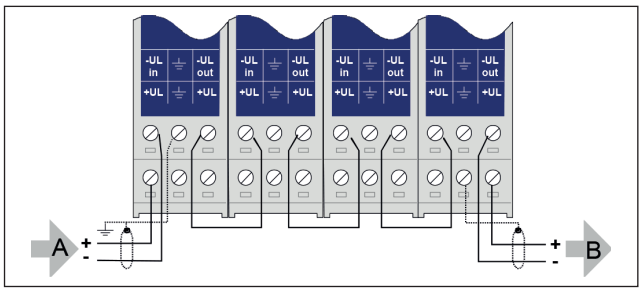
Dimensions (mm)

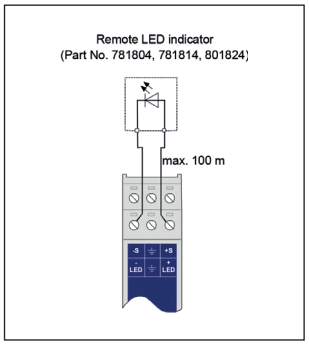
The IQ8TAM technical alarm module is connected as a BUS user to the loop of IQ8Control / FlexES comtrol Fire Alarm control Panel and allows acquisition, transmission and single indication of technical alarms.

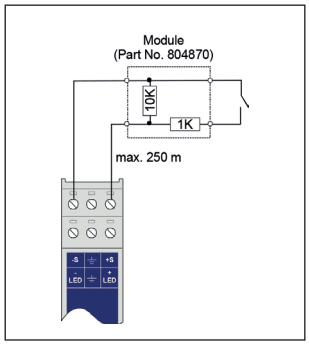
Each IQ8TAM is provided with a built-in zone isolator, which in case of trouble such as short circuits opens before and afterwards and disconnects the defective loop segment located between two isolators. During wire break, all users remain operative.

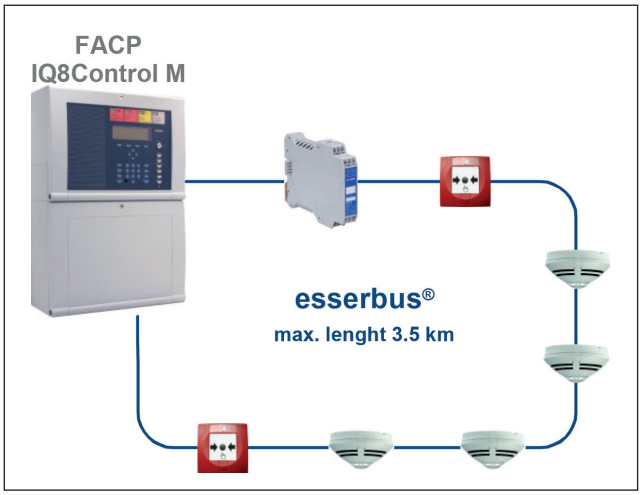
- Module for acquisition, transmission and individual indication of technical alarms.
- Suitable for connection to the loop of FACP.
- Voltage supplied via esserbus®.
- Built-in loop isolator.
- Connection of monitored external changeover contacts.
- Space-saving and wire-conserving installation through compact and cascadable design.
- Mounting on C-profile or top hat mounting.

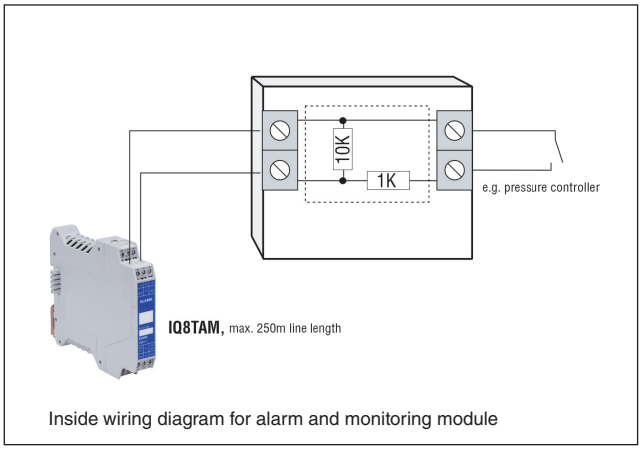












Inside wiring diagram for alarm and monitoring module

10.1.4 IQ8TAL Technical Alarm Module (1 contact IN / 1 OUT)

The IQ8TAL Technical Alarm Module is a full-fledged loop device of the fire detection system and it facilitates the detection and forwarding of technical alarms.

The IQ8TAL is equipped with an integrated loop isolator, a contact input and a relay output.

The relay can be optionally configured as a normally-closed or as a normally-open contact. The IQ8TAL does not need a separate voltage supply. In order to increase the IP protection class, the optional IP protection kit (Part No. 704965) can be used.

The functionality of the Technical Alarm Module can be tested with the included key and the alarm status can be reset directly at the IQ8TAL.

Features

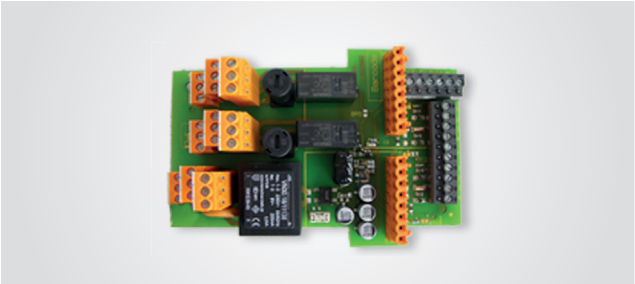
- One contact input and one floating relay output
- Voltage supply via the field bus
- Test and reset function
- Higher IP protection optional
- Programmable inverse resistance monitoring functionality (1k = normal / 10k = alarm)

10.1.5 IQ8FCT fire control transponder (1 contact IN / 1 OUT)

The IQ8FCT modules are connected to the loop of the Fire Alarm Control Panel IQ8Control or FlexES Control. The integrated zone isolators ensure that the system continues to function even if a segment of the loop circuit fails due to a short circuit. When a short circuit occurs the zone isolators before and after the short circuit open, disconnecting the section of the loop between the isolators. Simple wire breaks do not affect the functionality of the loop circuit.
The main application of this module, which has the same features as the IQ8TAL, is a monitored activation of external devices whilst the correct activation is monitored within a programmable response time from 0 – 600 seconds.
If an activated external device does not response within this time, a fault will be reported. Otherwise in case of a correct function no message is present in the system.

Maximum contact rating : 30 V DC or AC / 1 A

10.1.6 esserbus® transponder FCT 24 V / 230 V



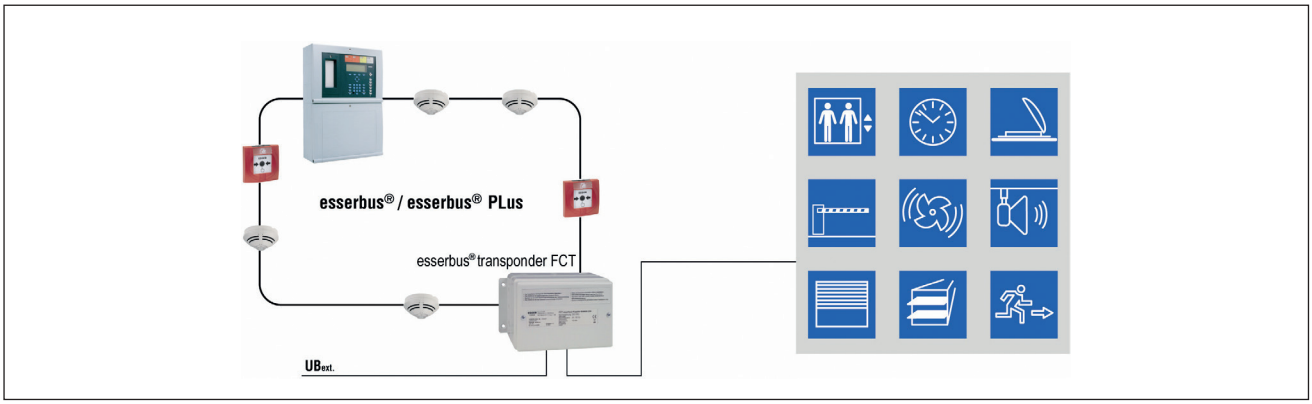
The esserbus® control transponder FCT 12-24 V DC or 230 V AC is used as a bus device connected to the fire alarm control panels IQ8Control or FlexES Control. The appropriate power supply (12 V - 24 V DC or 230 V AC) is required for operation. Commissioning of the device with the programming software tools 8000 version V1.16 or higher.
Depending on the electronic module connected (IQ8FCT or IQ8TAL), external devices such as fire dampers, roller doors, cabinets, lifts, machines, pumps or other system components can be activated/deactivated with a programmable response time range from 0 – 600 seconds.
A current of 230 V AC / 4 A per relay can be connected via the two relays on the esserbus® transponder FCT independently of the operating voltage. The esserbus® transponder FCT is operated on a loop circuit (esserbus® or esserbus® PLus). The transponder offers two open slots for the electronic modules IQ8FCT and/or IQ8TAL.

Application examples

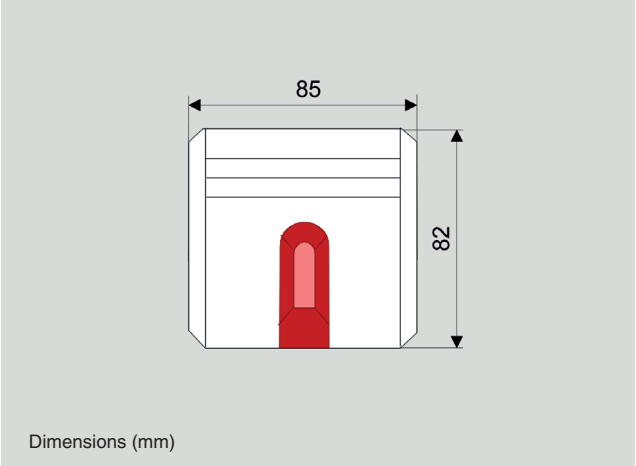
- Control of fire protection equipment (FPE), such as fire dampers (FD), smoke dampers (SD) as well as smoke and heat venting systems (HSV) and special smoke elimination dampers
- Control and deactivation of roller doors, cabinets, lifts, machines and pumps
- Activation of voice alarm systems (ON/OFF pulse)

Features

- Universal use for activation functions
- Two programmable relays (switching capacity 230 V AC / 4 A per relay)
- Monitored activation with evaluation of the response is possible via the IQ8FCT electronic module (waiting time for the response configurable from 0 to 600 seconds)
- Loop and branch operation on the esserbus® / esserbus® PLus
- Time-limited activations, activation of systems with on/off pulse possible
- Compact housing design
- IP 65 with IP base attachment (Part No. 788655)



11 Remote Indicator



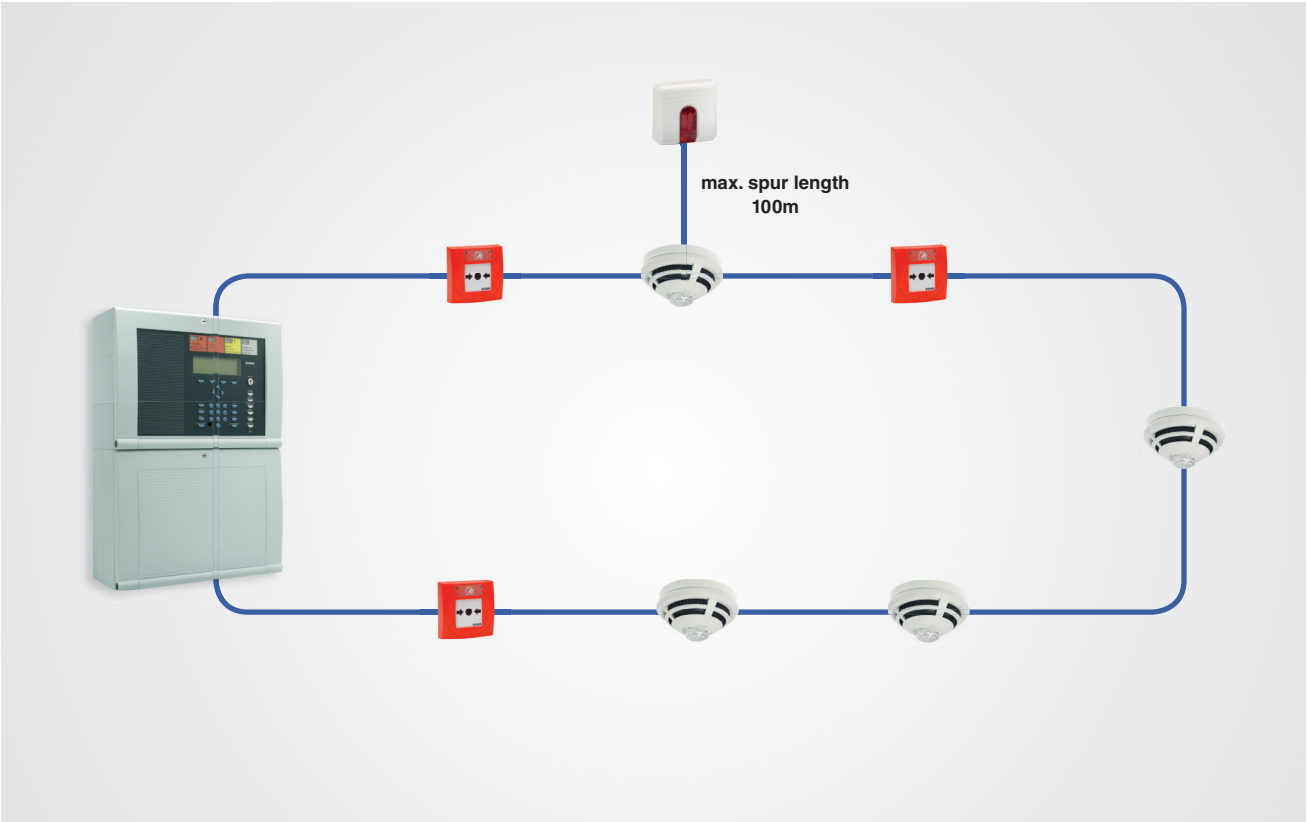
Dimensions (mm)

Fire alarm detectors installed in false floors, suspended ceilings or air ducts must be installed separately in a common detector zone.

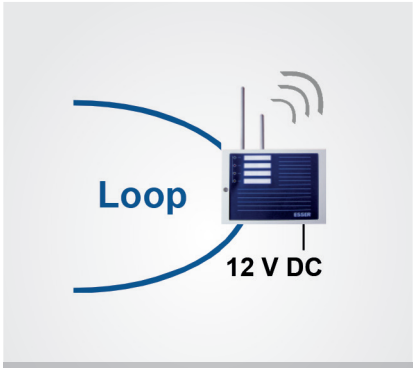
Otherwise it must be easy to identify in which part of the monitored area a detector is in alarm.

For this application optional remote indicators are well suited.

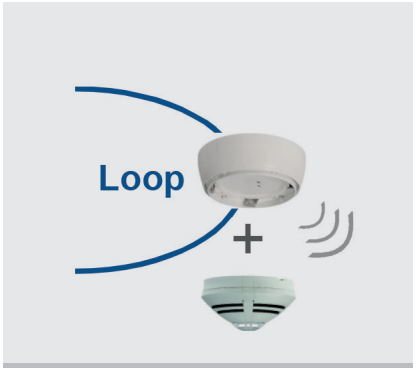
- Powered by loop or spur.
- Very low current consumption.
- High intensity flashing LEDs with an angle of 180 degrees visibility.
- Shapely, light-weight and compact design.
- Free programmable, link each device independent to the connection.
- Easy installation to a standard wall mounting box (Ø 55 mm).
- Up to 3 remote indicators type 801824 (4 pulsed LEDs) per detector IQ8Quad (max. 103 indicators per loop).
- Up to 1 remote indicator type 781814 (3 continuously or pulsed LEDs) per detector IQ8Quad or ES Detect (max. 127 indicators per loop and 30 per conventional zone).
- Cable length to detector base or voltage supply max. 100 meters.



12 IQ8Wireless devices



IQ8Wireless transponder (Part No. 805595)



IQ8Wireless gateway (Part No. 805594), Detector not included in delivery

IQ8Wireless detector base (Part No. 805593), Detector not included in delivery

The newest Fire Alarm Control Panel Series IQ8Control provides in addition to the conventional fire detection the connection of addressable wireless devices. Therefore specific wireless receiver / transmitter devices are installed on the loop.

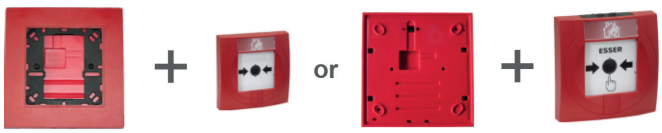
Dual band transmission

The corresponding IQ8Wireless devices for automatic or manual fire detection and signalling uses the dual-band transmission mode (433 + 868 MHz) to communicate. The IQ8Wireless technology is based on the frequency hopping procedure with up to 24 channels to ensure a maximum quality and security for the wireless fire detection. The transmitted frequency band, respectively the transmission channel alters automatically if a fault is recognized. If the whole frequency band is affected the fault will be transmitted and indicated to the Fire Alarm Control Panel IQ8Control.

The transmission range between the wireless devices may reach up to 300m (open field test site) and 30m indoor. Inside buildings the range relates to the constructional conditions, wall thickness and use of concrete.

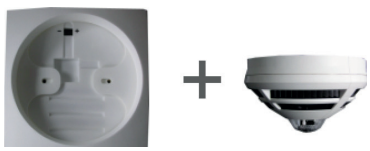
IQ8Wireless system guarantee adequate protection against electro-magnetic interference under normal ambient conditions. This module generates and uses electro-magnetic radiation and may disturb other wireless transmissions if it is not used as intended or not installed as described in the instructions. In principle, electro-magnetic influence of equipment cannot be excluded for all installations. If this module causes electro-magnetic interference on radios or televisions that cannot be rectified by switching the device on and off, the following measures can be carried out to rectify the interference:

The intended use of IQ8Wireless product series meets the standards and requirements in accordance to chapter 3 of the R&TTE-Guideline 1999/5/EG.



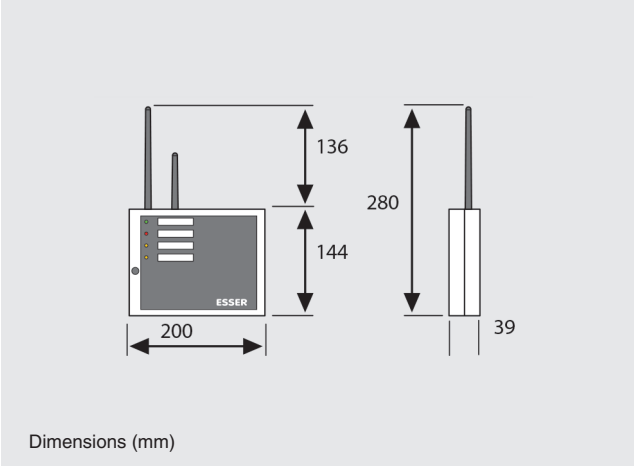
IQ8Wireless Interface (Part No. 805601, red) to adapt manual call points IQ8MCP

IQ8Wireless mounting frame (Part No. 805603) for IQ8Wireless Interface (Part No. 805601, red) to adapt IQ8Alarm devices



IQ8Wireless mounting frame (Part No. 805604) for IQ8Wireless interface (Part No.805602, white) to adapt automatic IQ8Quad fire detectors (with or without integrated alarm device)

12.1 IQ8Wireless transponder



Dimensions (mm)

General description

By virtue of the IQ8Wireless technology, IQ8Wireless bases (including automatic IQ8Quad fire detectors) or RF manual call points (MCPs) can be connected to the fire alarm system without using any wiring. Thus, already installed fire alarm systems can be extended with IQ8Wireless components or a complete fire alarm system can be realised.

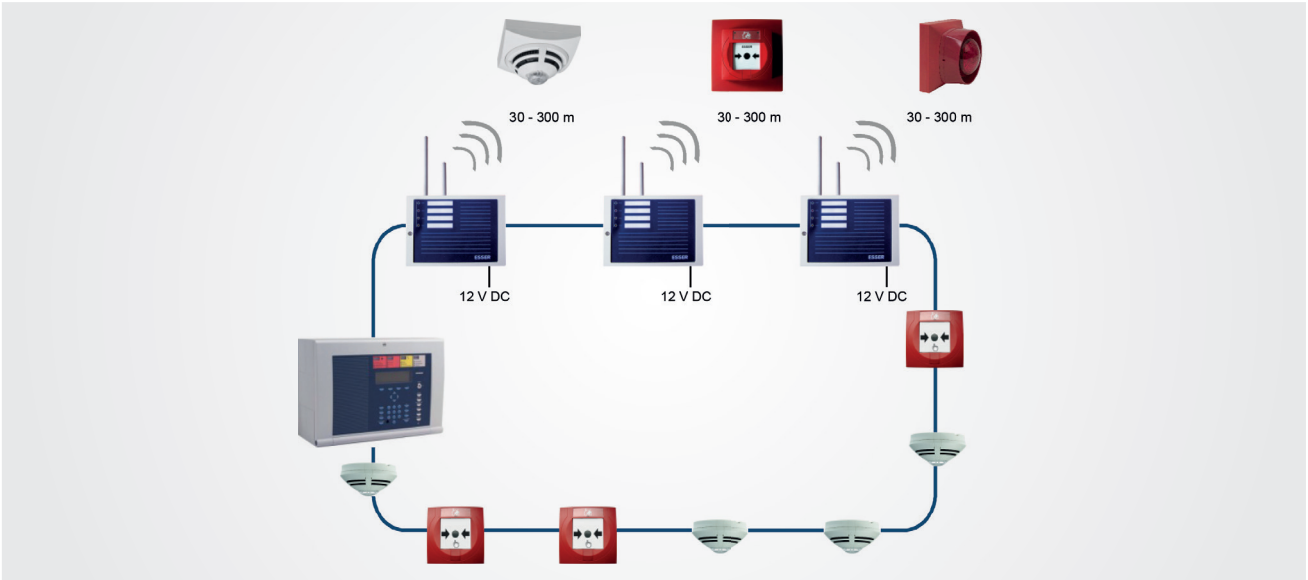
When switched to stand-alone operation mode, the IQ8Wireless transponder can be linked to intrusion alarm panels or building management systems.

Depending on the respective environmental conditions, transmission ranges of up to 300m are possible and 30m indoor. IQ8Wireless bases and interfaces (for MCPs) are assigned to an IQ8Wireless transponder or IQ8Wireless gateway via the tools 8000 programming software application.

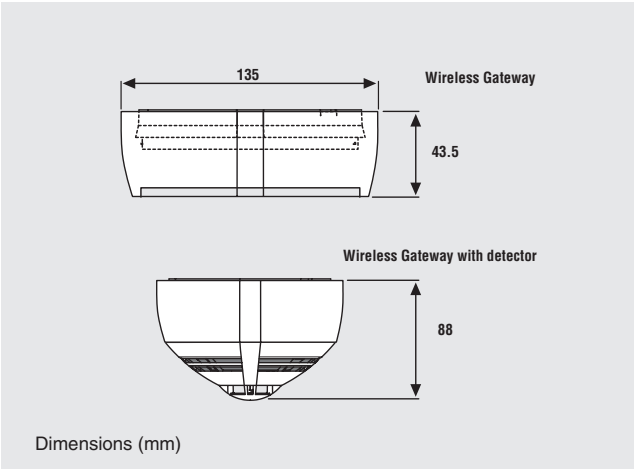
The battery state is automatically checked so that each required replacement can be indicated early as a detector fault via the RF transponder and / or the fire alarm panel. An RF transponder can be assigned RF bases and RF interfaces.

- Dual-Band transmission, frequency hopping technology (433 + 868 MHz) with 24 alternating channels
- Communication with up to 321) IQ8Wireless detectors (max. 101) IQ8Alarm devices).
- Each communication device is integrated into the esserbus® of an IQ8Control as an individual addressable participant
- Communication devices can be organised in up to 32[1)] detector zones
- Alarm and error transmission in accordance to EN54-2
- Connecting option to the esserbus®/ powered loop as well as to a conventional detector zone
- Stand-alone operation possible
- Floating outputs for common trouble and fire alarm

[1)] System limits – observe national Standards and Requirements



12.2 IQ8Wireless Gateway



Dimensions (mm)

Operation mode

Connected to the esserbus® or esserbus® PLus loop of the FACP IQ8Control

Analog loop (System limits)

- A wireless gateway may be connected to the loop and requires 1 loop address. The total number of loop devices is reduced by a single gateway about 12 loop addresses.
- Max. 9 IQ8Wireless gateway per loop.
- Max. 18 IQ8Wireless gateways per FACP IQ8Control C.
- Max. 45 IQ8Wireless gateways per FACP IQ8Control M.
- Up to 10[1)] IQ8Wireless detectors may be connected to a single gateway. Each detector may be assigned to a separate detector zone.
- Remote indicator connection per detector (gateway) possible.
- Up to 3-years battery life, depending on detector type and environmental conditions

Significance for the IQ8Wireless gateway per loop

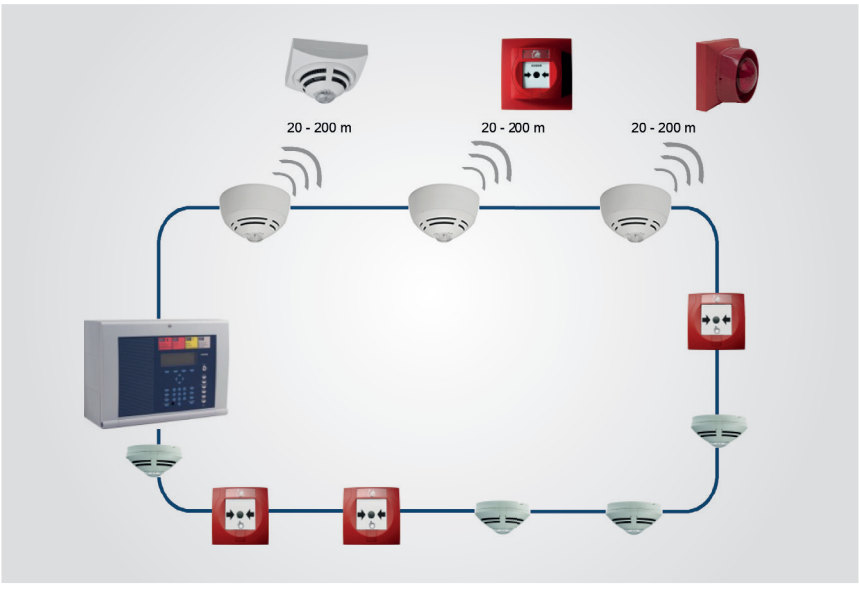
Max. 9 IQ8Wireless gateways with assigned 10[1)] IQ8Wireless devices.

- IQ8Wireless detector base (incl. IQ8Quad detector without alarm device)
- IQ8 Wireless interface (incl. IQ8Quad detector with alarm device)
- IQ8Wireless interface (incl. IQ8MCP)
- IQ8 Wireless interface (incl. IQ8Alarm device)

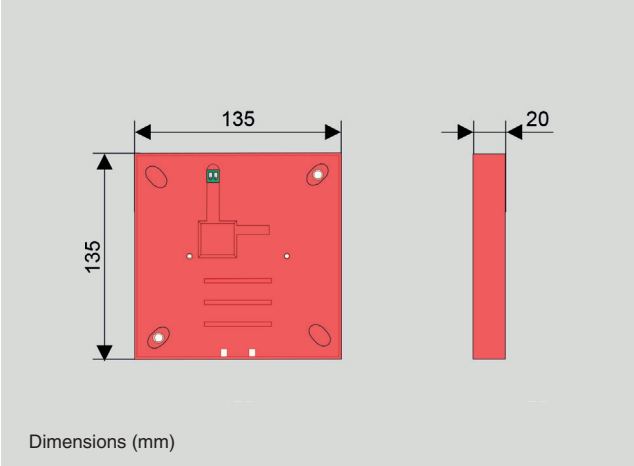
No additional loop device must be connected to the loop by using the max. number of IQ8Wireless devices. If additional loop devices are required the number of IQ8Wireless devices must be reduced accordingly.

Depending on the respective environmental conditions, transmission ranges of up to 200 m are possible and indoor 20m.

[1)] System limits – observe national Standards and Requirements



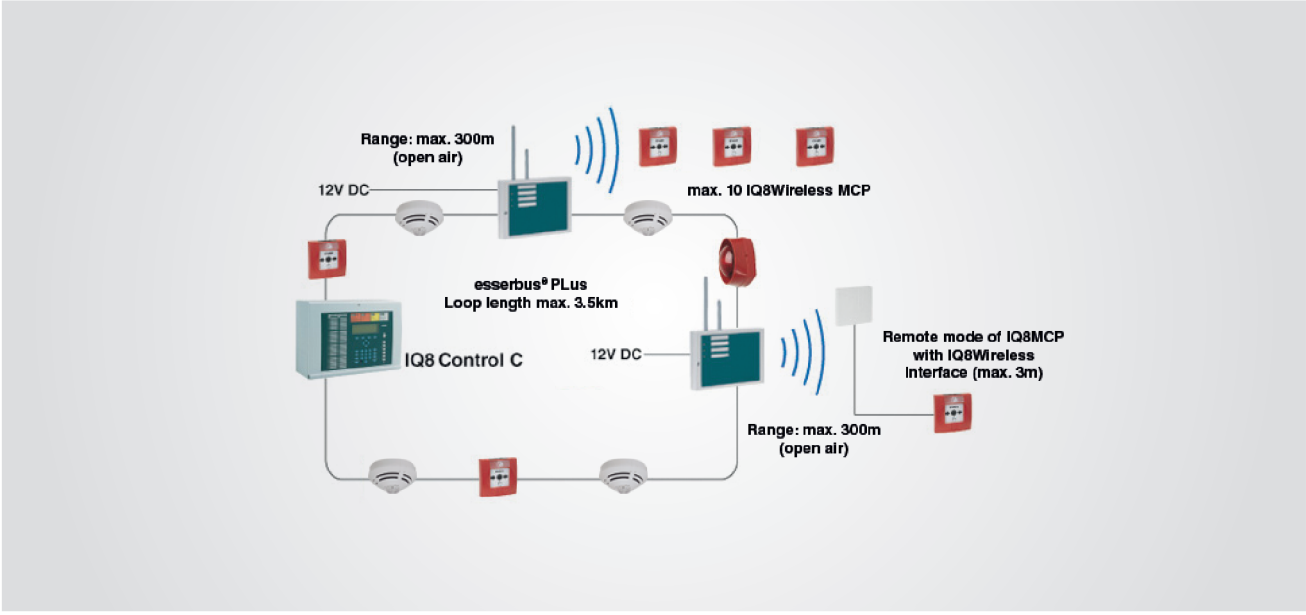
12.3 IQ8Wireless Interface



Dimensions (mm)

IQ8Wireless interface for IQ8Quad fire alarm detectors and/ or IQ8Alarm devices. The interface must be assigned to an IQ8Wireless transponder or IQ8Wireless gateway

- Dual-Band transmission, frequency hopping technology (433 + 868 MHz) with 24 alternating channels.
- Individual detector identification at the IQ8Control
- Regular device performance test
- Alarm and operation indicator on the mounted detector
- Alarm and fault transmission in accordance to EN54-2
- Easy detector or battery replacement
- Fault report when the mounted device is removed
- Permanent battery voltage monitoring by the Fire Alarm Control Panel, incl. warning message to replace battery within the next 32 days
- Up to 2-years battery life, depending on detector type and environmental conditions
- Depending on the respective environmental conditions, transmission ranges of up to 300 m are possible and in-door 30m



Application example

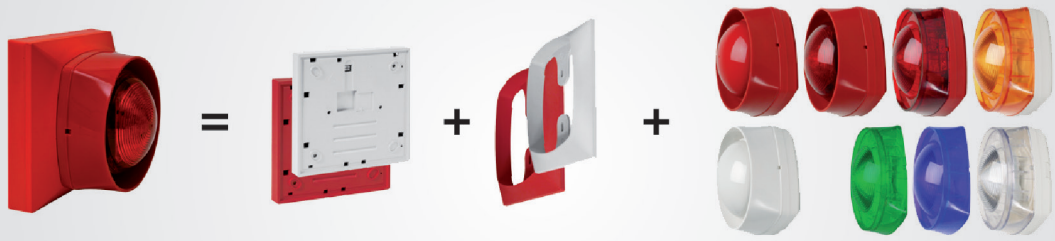
IQ8Wireless mounting with small IQ8MCP (Wall mounting)

IQ8Wireless interface + small IQ8MCP | IQ8Wireless interface | Mounting frame | Small IQ8MCP

IQ8Wireless mounting with large IQ8MCP (Wall mounting)

IQ8Wireless interface + Large MCP | IQ8Wireless interface | IQ8MCP electronic module | Plastic housing

IQ8Wireless mounting with IQ8Alarm (Wall or ceiling mounting)

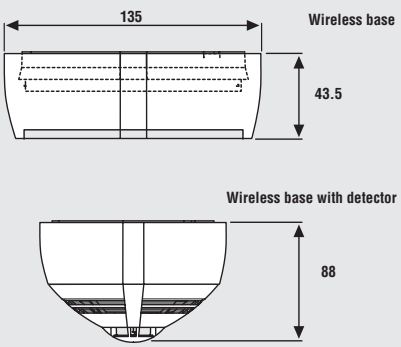


IQWireless interface + IQ8Alarm | IQWireless interface 805601 (red) or 805602 (white) | Mounting frames 805603 | IQ8Alarm devices 8072xx or 8073xx

IQ8Wireless mounting with IQ8Quad detectors (Ceiling mounting)

IQWireless interface + IQ8Quad detector with integrated alarm device | IQWireless interface 805602 | Mounting frame 805604 | Standard detector base 805590 | IQ8Quad detector with integrated alarm device 80238x

12.4 IQ8Wireless detector base

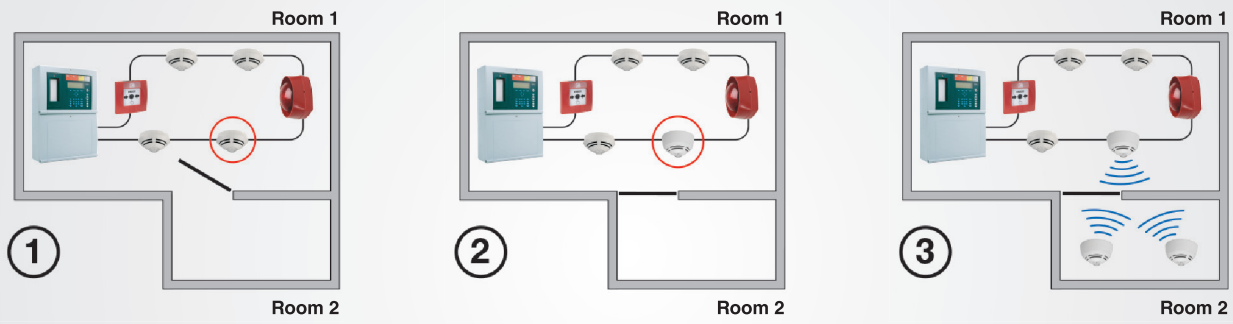


Dimensions (mm)

IQ8Wireless base for IQ8Quad fire alarm detectors. The base must be assigned to an IQ8Wireless transponder or IQ8Wireless gateway

- Dual-Band transmission, frequency hopping technology (433 + 868 MHz) with 24 alternating channels.
- Individual detector identification at the IQ8Control
- Regular detector performance test
- Alarm and operation indicator on the detector
- Alarm and fault transmission in accordance to EN54-2
- Easy detector or battery replacement by using detector removal tool
- Fault report when the mounted base or the detector is removed
- Permanent battery voltage monitoring by the Fire Alarm Control Panel, incl. warning message to replace battery within the next 32 days
- Up to 2-years battery life, depending on detector type and environmental conditions

Simply exemplary: the wireless expansion of a fire alarm system

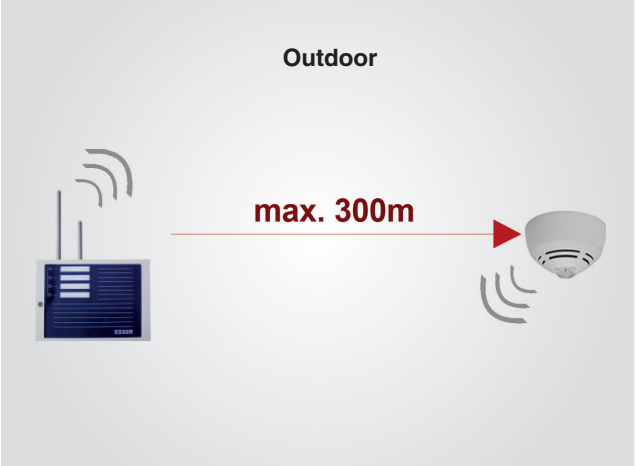


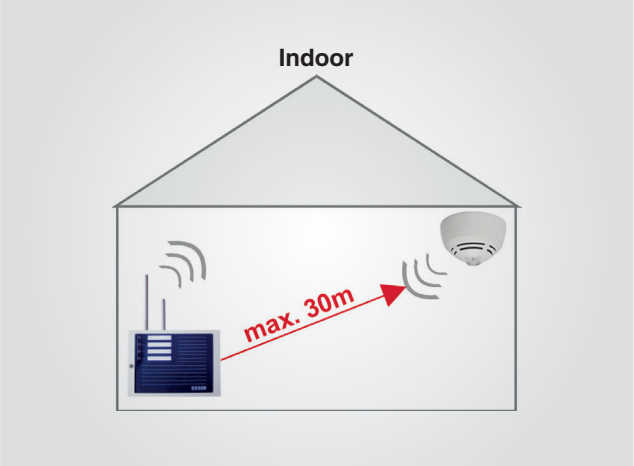
In our example, there is already a fire alarm system with serveral IQ8Quad detectors installed in room 1.

Now room 2 has to be monitored in case of fire for a certain period of time. An IQ8Quad is simply unscrewed from the existing system and a wireless gateway is inserted into the now empty standard base.

One or more IQ8Wireless detectors are then installed in room 2 and are operated as bus devices via the wireless gateway.

12.4.1 Range



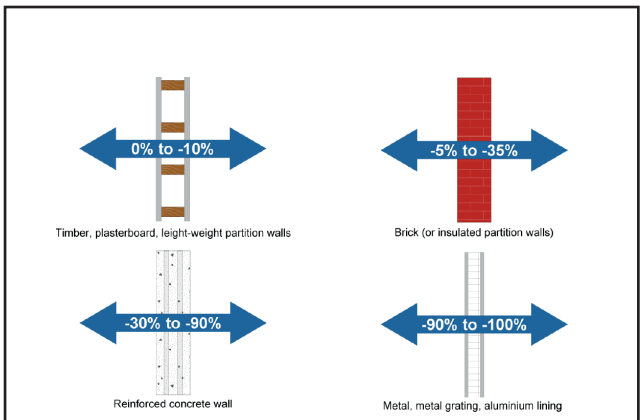


A range up to 300m may be achieved at a line of sight (open air test site) between receiver and transmitter units. The distance inside buildings is much relating to the wall thickness, reinforced concrete walls and ceilings, the ambient electromagnetic interference, other electrical devices and thus the range is down to 30m under normal conditions.

It is highly recommended to measure the signal strength separately for each wireless device directly at the mounting place.

Test range always

Requirement: tools 8000 from Version V1.09
To optimize the mounting location for the IQ8Wireless devices use programming software tools 8000.



Maximum range with line of sight between the IQ8Wireless detector base and the IQ8Wireless transponder as well as optimum technical conditions.

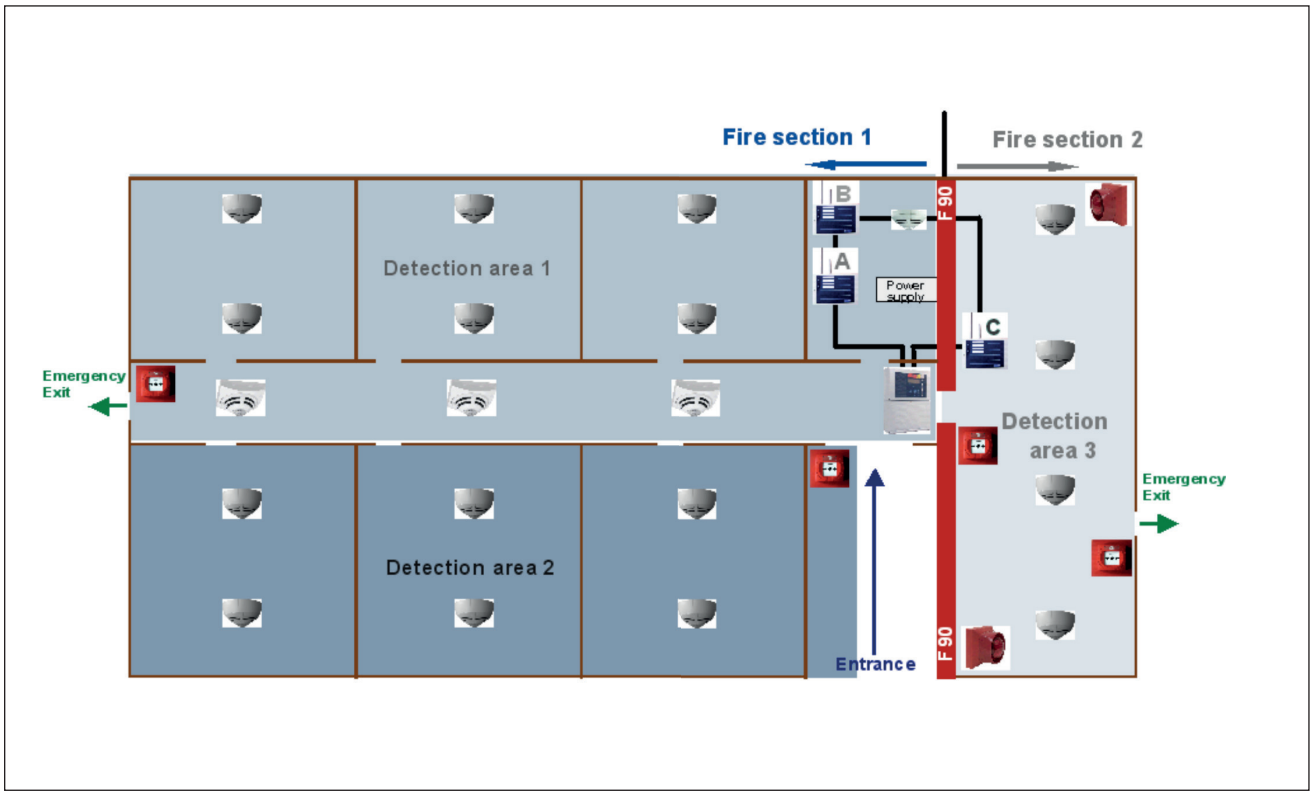
Damping characteristics of the radio signal

The mounting place of the IQ8Wireless devices should be selected for the shortest transmission path and prevented from electromagnetic interference. Improper mounting place and/or a source of interference may affect the transmission quality and range.

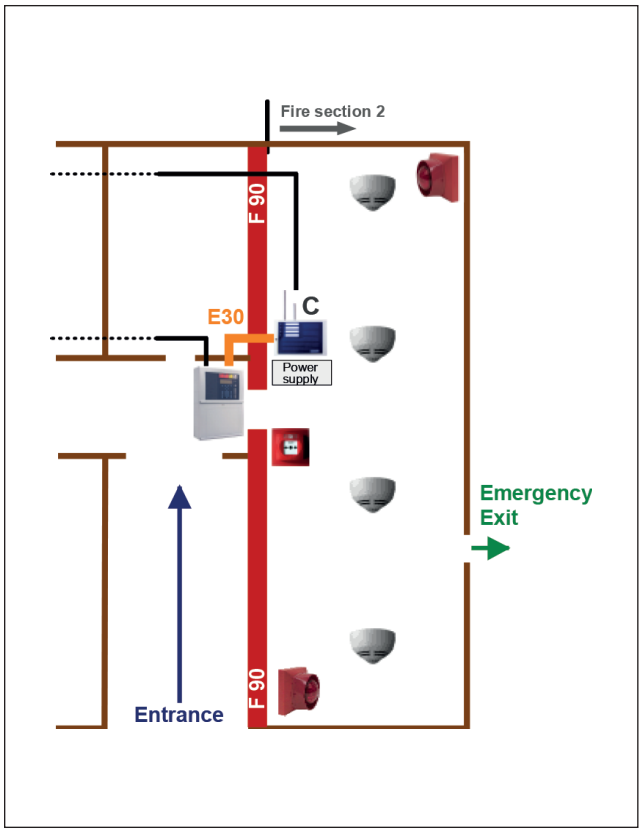
Different constructional or ambient conditions of the monitored areas may be the cause for a different damping of the radio signal.

The given range as stated below are common standard values of a radio signal which permeates a barrier in an angle of 90 degrees (lowest attenuation).

Application with 2 fire sections (Example [1])



Fire section 2 (Example [1])

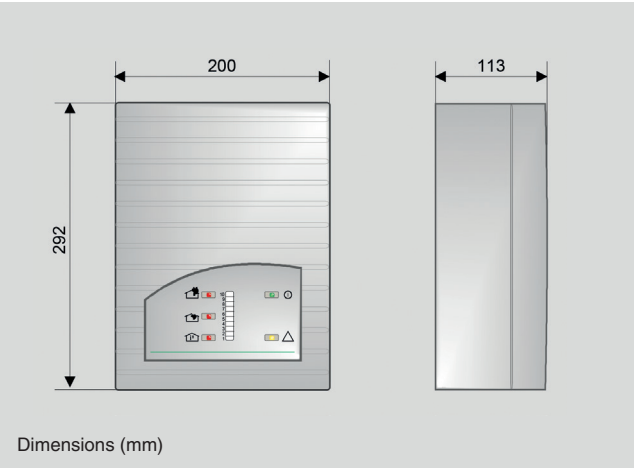


- Fire section 2 caused by the fire protection wall with F90 fire resistance.
- Fire section 2 with required E30 fire cable wiring.
- A separate power supply must be installed for the IQ8Wireless transponder in Fire section 2.

[1] System design example
Observe national Standards and Requirements

13 Various special detectors

13.1 Smoke Aspirating System Titanus EB



Dimensions (mm)

An aspirating smoke detector (ASD), consists of a central detection unit which draws air through a network of pipes to detect smoke. The sampling chamber detects the presence of smoke particles suspended in air by detecting the light scattered by them in the chamber.
Active, bus-compatible system for the earliest possible fire detection, based on an optical chamber which works with the scattered light principle.

Applications:

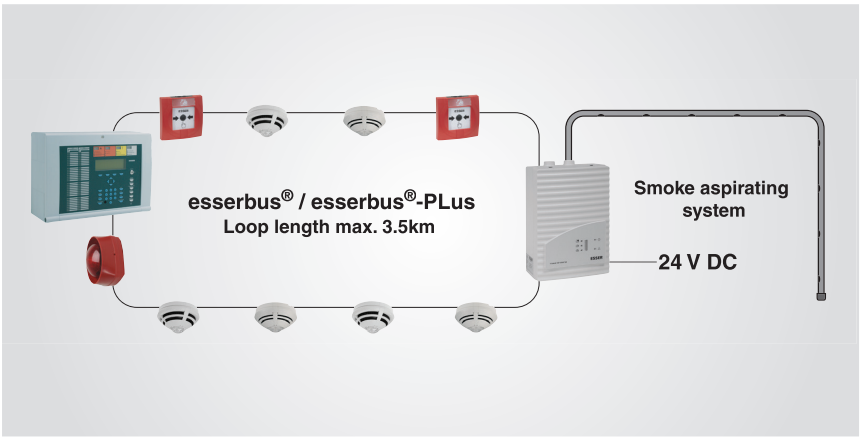
- Sensitivity range of TITANUS ASD 0.015% Obs/m to 0.5% Obs/m)
- Up to 180m duct length per duct / max. total monitoring area 2,880m², in case of single-hole monitoring the max. pipe lenght is 140m and the max. monitoring area is 1,680m²
- Up to 24 suction vents.
- Two-detector dependency can be set up incompliance with VdS guidelines.
- This very advanced system can be used in critical areas wherever widely different aspects of the highest safety requirements need to be considered.
- Minimum operational disruption through quick intervention, e.g. in telecommunications installations, server farms, clean rooms, radio and TV transmitters, high-tech production facilities, and computer centres.
- Special applications with extended evacuation periods, e.g. hospitals, theatres, airports.
- High ceilings and air speeds, e.g. in warehouses, freezer rooms, sports halls, aircraft hangars.
- Limited accessibility and inconspicuous fire detection, e.g. in prisons or cable shafts.
- Protection of priceless valuables, e.g. in museums, archives, historic buildings as well as in science and research labs.

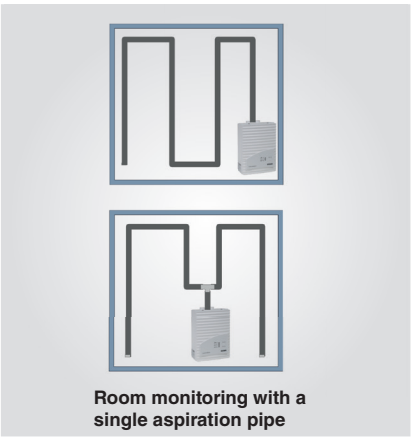
Design example

The opposite figure shows an example for a pipe design with one aspirating smoke detection system (ASD).

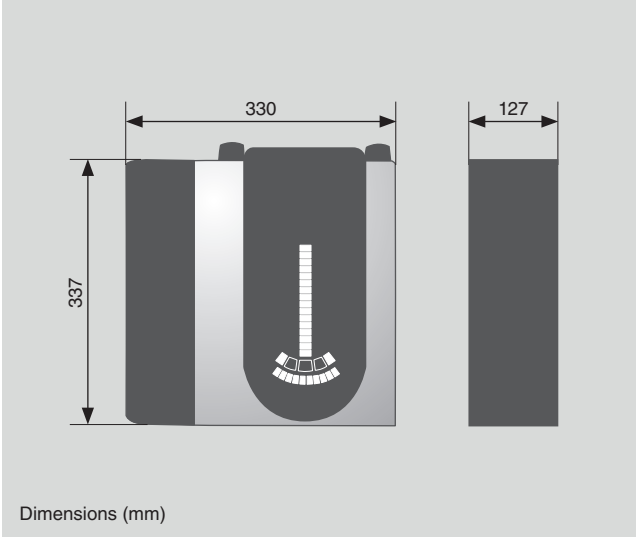
The preferred design is a meander type pipe network at the ceiling or in a suspended ceiling.

It is possible to use an ASD to monitor small and large rooms. Coverage of the protected area can be achieved through correct pipe routing and correct placement of multiple LRS units.




Room monitoring with a single aspiration pipe

13.2 Smoke Aspirating System FAAST



Dimensions (mm)

FAAST (Fire Alarm Aspiration Sensing Technology) is an aspiration solution designed to deliver highly accurate and discrete early warning fire detection. Using dual vision technology and intuitive features that allow access to data from anywhere in the world. FAAST delivers zero false alarms, zero downtime and 100% business confidence, integration into the main fire system reduces the overall cost of maintenance.

The FAAST 8100 aspirating smoke detector combines dual source (blue LED and infra-red laser) optical smoke detection with advanced algorithms to detect a wide range of fires while maintaining enhanced immunity to nuisance particulates. This enables FAAST to accurately detect incipient fire conditions as early as 30 to 60 minutes before a fire actually starts for Early Warning Fire Detection and Very Early Warning Fire Detection.

Applications:
The focus is to protect people, mission critical facilities and high value assets from the faintest traces of smoke, in a wide range of challenging environments, e.g.

Mission Critical - For these environments, there is no downtime. Every second lost, every transaction missed, any data or equipment destroyed can mean huge financial losses. FAAST alerts facility managers hours, even days before the first indication of system trouble – helping them keep their mission critical facilities up and running 24/7 and preventing unnecessary activation of suppression systems.

Discrete Detection - When aesthetics matter, such as in museums, churches or mansions, FAAST provides a discrete smoke detection solution that is nearly invisible to the public. At the same time, it provides the earliest and most accurate smoke detection available to protect high-value items from fire.

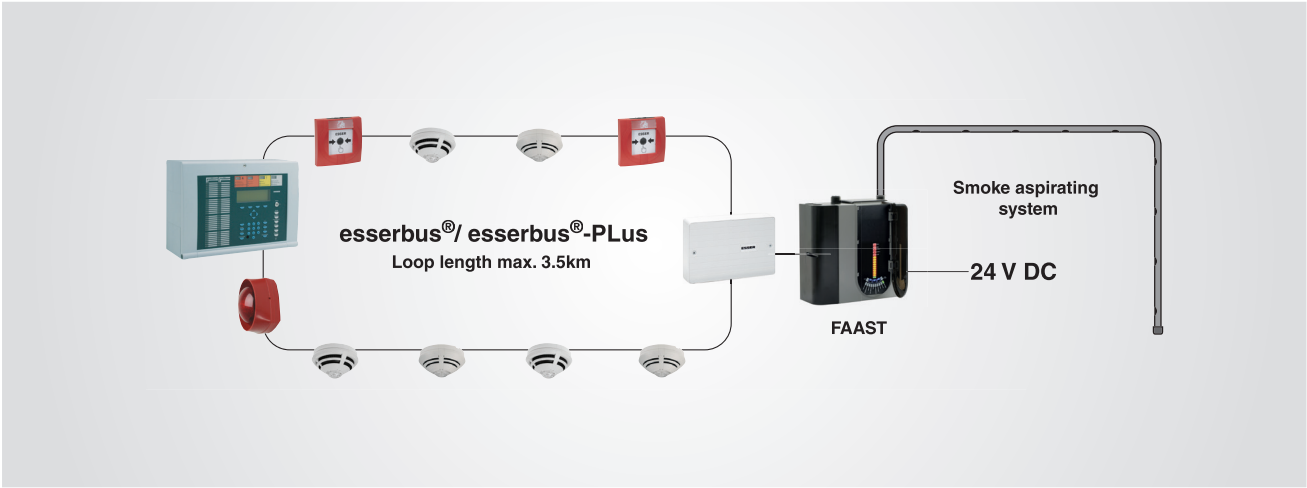
Restricted Access - Some fire systems must protect areas such as prisons and public spaces, where there is a concern for tampering. The FAAST device can be mounted in a secure area while air sampling points are located in the protected environment minimising the potential for tampering.

Public Protection - In large public areas like shopping centres, airports, or stadiums, evacuations can be difficult. FAAST provides highly accurate fire detection for these areas to avoid nuisance alarms and various alert levels to enable an appropriate and informed response to any situation.

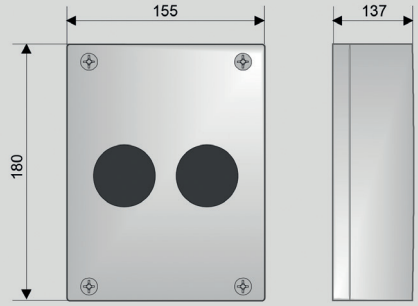
Extreme Environments - Some areas, like cold storage facilities or spaces with high-airflow, have environmental conditions outside the tolerance of typical fire detection technologies. Because the FAAST device can be mounted at a temperate, easy-to-access location while sampling points can be located in the extreme environment, it enables reliable fire detection for areas with challenging conditions.

Features

- Sensitivity Range 0.0015% obs/m – 20.5% obs/m
- Five alarm levels and two sensitivity modes provide application flexibility
- Dual flow detection including both ultrasonic and electronic sensing for pipe and chamber air flow measurement
- A single device protects up to 2000m²
- Advanced detection algorithms reject common nuisance conditions
- Patented particle separator and field-replaceable filter remove contaminants from the system
- PipeIQ™ software provides intuitive system layout, configuration and monitoring all in one package
- Integral Ethernet interface enables remote monitoring and e-mail status updates, up to 6 e-mail address alerts
- Fault indictors provide a broad spectrum of events
- Unique air flow pendulum graph verifies pipe network functionality
- Particulate graph displays subtle environmental changes for early problem indications



13.3 Linear Smoke Detector LRMX

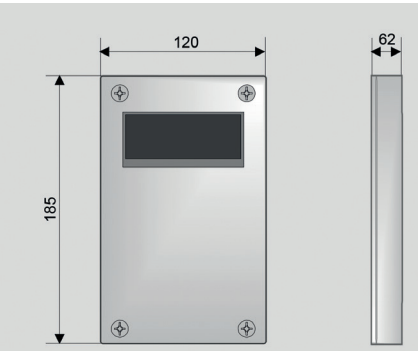


Dimensions (mm) detector

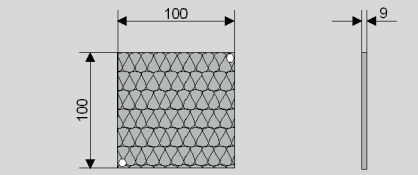
The line-type smoke detector LRMX (Part No. 761400) according to EN 54-12 comprises a detector, the operating and control unit and a prism reflector. Wiring via the esserbus® and resetting takes place via the esserbus® transponder. Use the voltage converter (Part No. 781337) to isolate DC potentials and to prevent earth faults. The smoke detector works by using a prism reflector in a range of 5 to 40 meters. For greater distances, use the range extensions (Part No. 761401 or 761402).

A remote operation of the operating and control unit and detector is possible.

Cable length → max. 60 m
Use cable I-Y (St) Y n x 2 x 0.8 mm with special designation or fire detection cable!



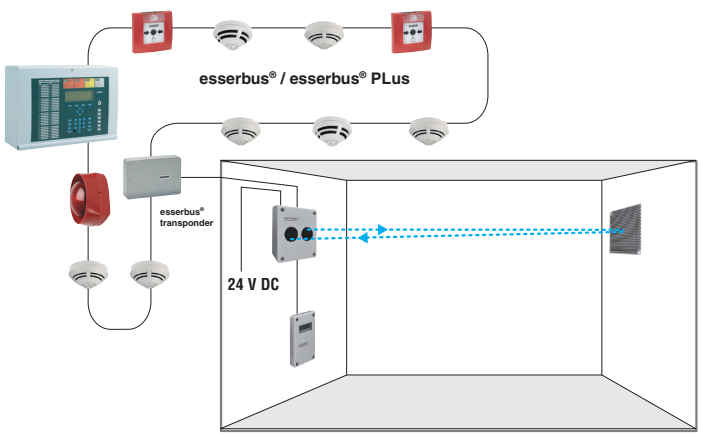
Dimensions (mm) Control unit



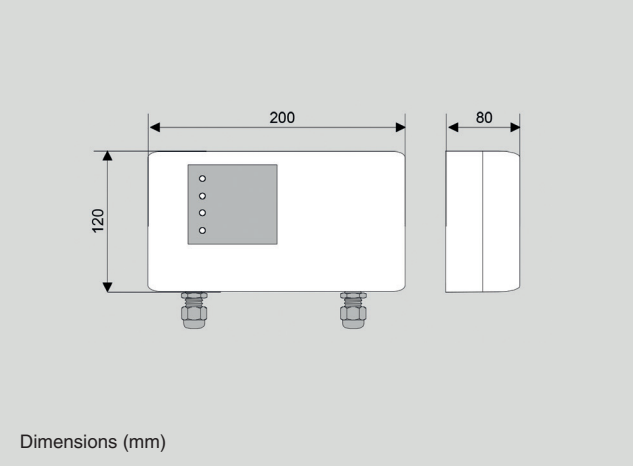
Single prism reflector

Features

- Motor-driven detector.
- User-friendly start-up with automatic self-test.
- Interference-resistant operation through automatic electro-mechanical readjustment of the detector to allow for building movement.
- Optimum operation with a recessed operating unit at eye level.
- Clear display of all statuses via a central display in the operating and control unit.
- High protection against moisture for use in difficult environments.
- Switch-on and reset via esserbus® transponder (Part No. 808623).



13.4 Line-type heat detector LWM-1



Dimensions (mm)

Line-type heat detectors like the LWM-1 system provide reliable early warnings for fires and overheating. The system can also be deployed in buildings and rooms where confined conditions make monitoring with point-type or line-type detectors difficult or impossible.

Three different sensor cables are available:

- blue type: for use in non aggressive atmosphere, but with high humiditiy
- black type: with nylon cover for protection against acids and bases
- black type with steel braiding: with stainless steel braid for extreme conditions such as chemical & biological impact.

Applications

- Floating-roof tanks in petrochemicals installations.
- Cable traces.
- Multi-storey car parks.
- Belt conveyor systems.
- Waste dumps.
- Tunnels, underground.
- Incineration plants.

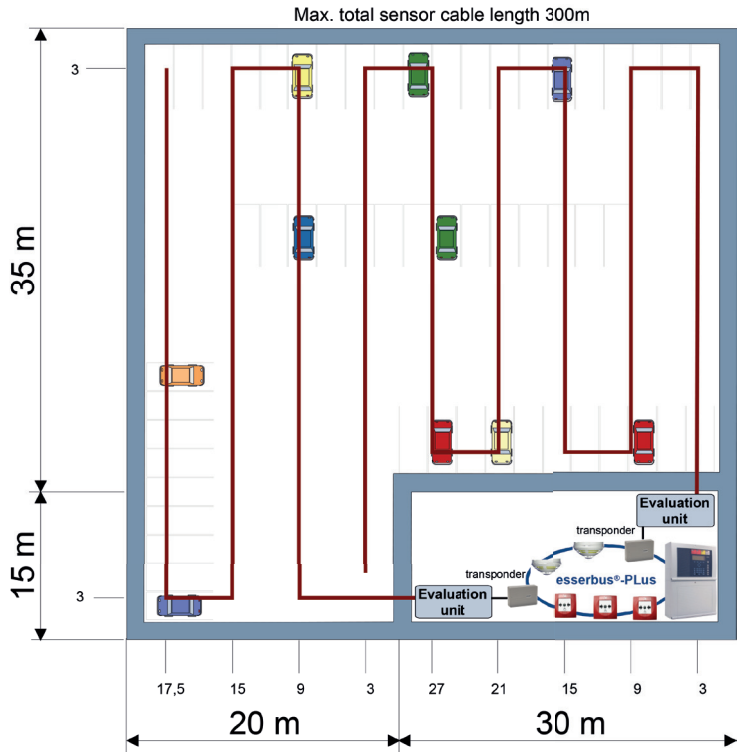
How the system works

The LWM-1 heat detector system consists of an evaluation unit and a sensor cable. The sensor cable contains four copper leads, each of which has a sheath with a negative temperature coefficient. The ends of the sensor cable leads are connected in two separate loops. Interruption of either of the loops is registered as a fault. A rise in temperature increases the electrical resistance between the two loops and when the preset temperature is exceeded the evaluation unit automatically triggers an alarm.

Features

- Line-type heat detector for medium-sized and large facilities.
- High resistance to false alarms under demanding environmental conditions.
- Resistant to mechanical and chemical influences, corrosion, humidity and dust.
- Long-range alarm capabilities (min. 10m respectively max. 300m of sensor cable can be connected and extended with max. 1200m extension cable).
- Simple installation and configuration.
- Economical, minimum maintenance requirements.

Sensor cable installation for full coverage monitoring (Underground car park)



13.5 Flame Detectors

Flame detectors

Flame detectors monitor rooms and areas for radiation, as can occur in the case of naked flames. The differing fire loads may vary the wavelengths of the resulting flame radiation. As a result, a distinction is made between IR flame detectors for the infrared range and UV flame detectors for the ultraviolet range. What is important is whether solid or liquid stores are to be monitored, as solids generally burn with a higher infrared component than liquids, which tend to display a higher UV component.

When planning flame detectors, the expected progress of the fire must be considered. Only infrared flame detectors (IRF) should be used if an initial smouldering phase is expected, as smoke absorbs any UV radiation, while infrared radiation penetrates through the smoke.

To ensure that flame detectors can detect a fire, it must be ensured that the area to be monitored is 'visible' to the flame detector.

External power supply

Most special detectors require a 24 V DC voltage for operation.

External power supply units can be used if a fire alarm system with an operating voltage of 12 V DC is used as a concentrated evaluation unit or the quiescent current consumption of one or several special detectors is too large.

The external power supply units must also have an emergency power supply whose emergency power capacity at least ensures the same bridging period as the storage batteries in the fire alarm control panel.

The power supply must be ensured via a separate fire alarm control panel supply separator; a fault in the external power supply unit must be displayed at the fire alarm control panel.

Reset

Special detectors have different reset behaviours after an alarm is triggered, whereby the reliable resetting of a fire alarm at the fire alarm control panel cannot always be guaranteed. As a result, the reset function for special detectors has been integrated into the esserbus® transponder (e.g. item no. 808623).

Combined ultraviolet / infrared flame detector

For flame detectors that only monitor one wavelength range (UV or IR), an alarm status may only lead to a fire detector and not a fire alarm. These flame detectors must always be connected or programmed in a dual group or dual detector dependency. The dependent detectors must monitor the same area from two different angles.

Flame detectors that monitor two different wavelengths using two or more sensors may trigger a direct fire alarm in the event of an AND connection.

As flame detectors can also be triggered by external influences, potential false alarms, it may be necessary to suppress these external variables by using blinds and covers.

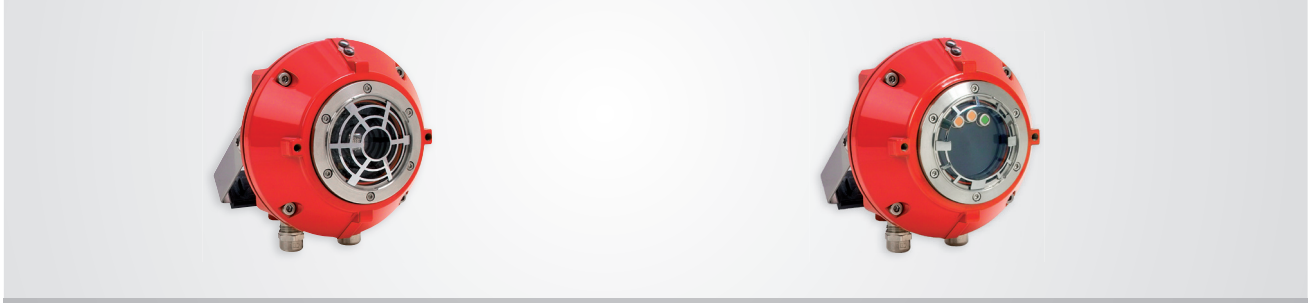
Flame detectors are ideal for use in large, high halls thanks to their relatively large monitoring range with regard to the expected progress of a fire and possible disturbance variables.

The number, installation and alignment of flame detectors must be selected so that adequate and equivalent room monitoring is ensured.

The expected number of flame detectors depends on the room volume and the conditions in the room. Flame detectors are installed in ceilings and on walls, whereby it must be ensured that the detector's beam axis is set at an angle of 45° to the floor and wall.

If the detector is installed at an angle of 45°, this provides a symmetrical angle of rotation of at least 90°, which can be used to monitor a rectangular room volume.

A flame detector classification breaks the maximum installation heights and the maximum monitoring areas into three classes.



Ultraviolet flame detector

Infrared flame detector

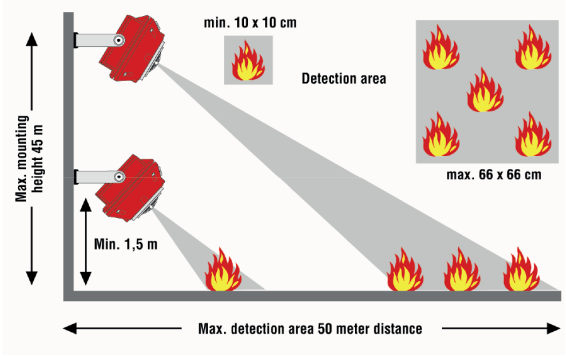
Flame detectors detect the visible and invisible radiation emitted by open flames. Two types of sensors can be used, one for each type of radiation:

- infrared flame sensors.
- ultraviolet flame sensors.

Some types of infrared detectors can also register hot combustion gases.

A flame detector registers the flickering of the radiation within a specific frequency range (light spectrum) with a wavelength of approx. 0.8 µm. An alarm is triggered when the signal intensity generated by the flame radiation reaches a preset level.

Flame detectors are used primarily for detecting fires in rooms with high ceilings (up to around 20m) in facilities where rapidly-developing open fires can be expected. In practice, flame detectors are often used in combination with other types of detectors. To reset the flame detector an optional Reset-Module (Part No. 781332/33) is required.



Flame detectors acc. DIN EN 54-10	Edge length (a, b, h)
Class 1	< 26m
Class 2	< 20m
Class 3	< 13m

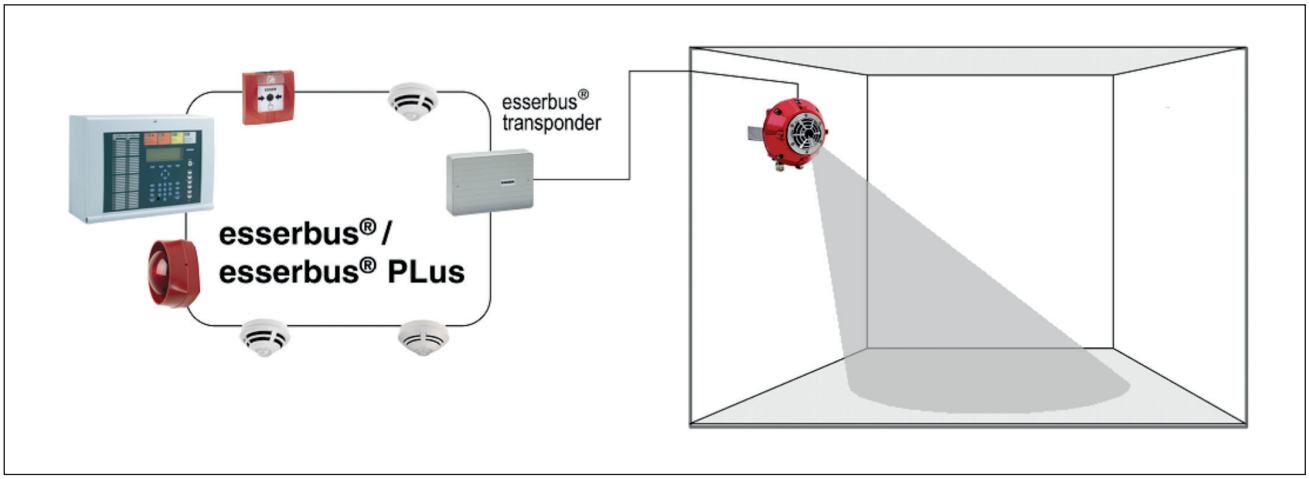
For explosion-hazard areas consider ATEX approved Ex flame detectors.

Effect of light

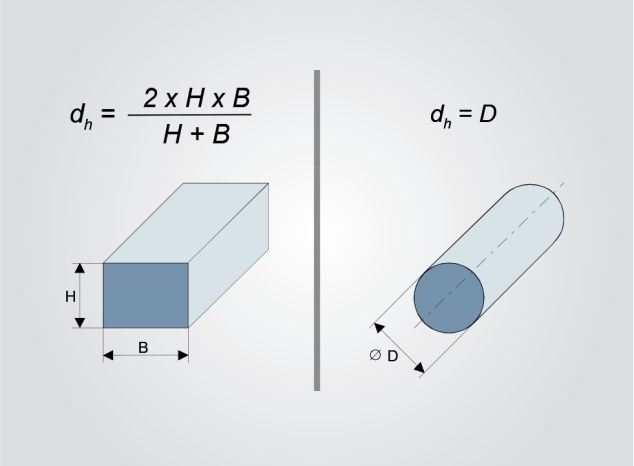
Heat detectors and point smoke detectors are not influenced by optical radiation.

Infrared flame detectors may be influenced by modulated IR radiation, e.g. moving parts of machines, flickering lamps, etc.

UV-flame detectors may be influenced by UV sources of radiation, e.g. lighting fixtures with emissions in the UV-C range (approx. 200nm), electric arcs (welding), etc.



13.6 Air duct detector



The air duct detector is mounted on the duct and the venturi tube is inserted into the duct. It is aligned in the same way as a flow meter. A flow indicator in the housing of the air duct detector shows the airflow. The built-in filter prevents excessive soiling, false alarms and malfunctions. As the detector and the housing are easily accessible outside the air duct, maintenance is simple and cost effective.

The status of the built-in detector is externally visible at all times. The air duct detector kit contains all necessary components except the detector, the detector base and the venturi tube.

The intelligent OT^{blue}-multisensor detectors combines two detection principles in one fire detector. The correlation between sensors that work on optical (with a high-sensitive blue LED), thermal principles ensures that all types of fire are reliably detected.

The air duct detector can be seamlessly integrated into a Fire Alarm System via the esserbus® and esserbus® PLus, and therefore uses all the advantages of this proven loop technology.

Housing (main unit)
Type Air duct detector based on the venturi principle:
Detector cable 0.6 mm² to max. 1.5 mm²

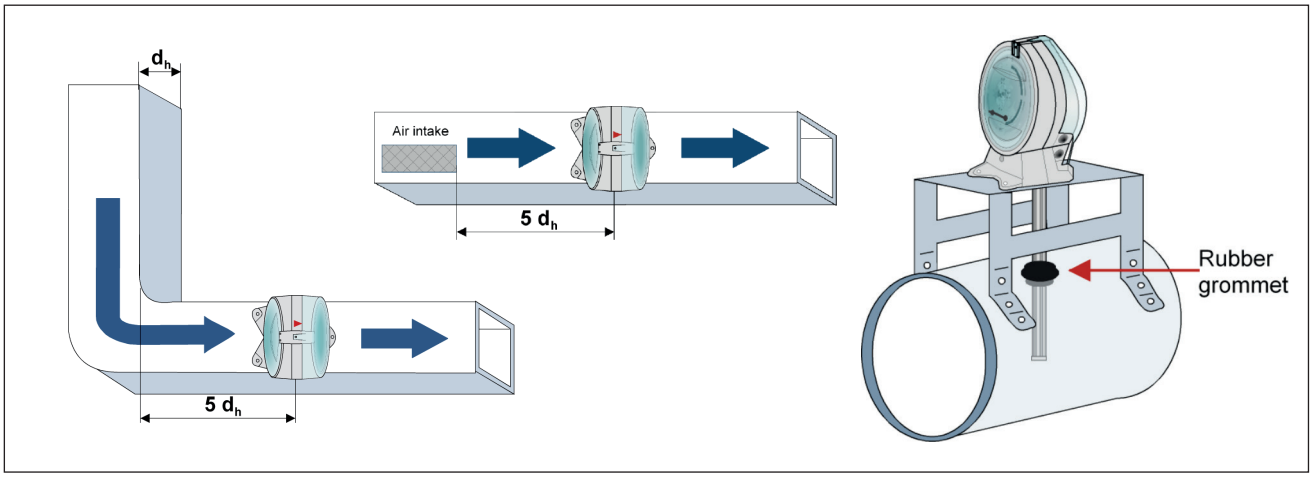
Ambient temperature:	-20 to +50 °C
Air speed:	1 - 20 m/s
Protection rating:	IP 54
Housing:	ABS plastic
Weight:	approx. 0.7 kg
Dimensions:	120 mm x 110 mm x 300 mm

Venturi tubes

Length:	0.6 m/1.5 m/2.8 m
Weight:	0.2 kg/0.6 kg/1.2 kg
Material:	Aluminium

Features

- One-pipe air sampling system, instead of two pipes for intake and outlet airflow.
- Cross-section of the venturi pipe gives an optimum venturi effect.
- Test hole on cover.
- Sensitivity flow indicator.



14 Hazardous areas

The prevention of combustible substances is still the simplest form of explosion protection. However, combustible substances are part of everyday life in the chemical and pharmaceutical industry as well as a number of other sectors. There is no way around this. Combustible gases, mists and vapours of combustible liquids as well as clouds of combustible dusts can form hazardous explosive atmospheres when combined with air. In these ex-areas, equipment, such as electronic and mechanical devices, represent a risk that must not be underestimated.

The relevant processes mean that these substances can often not be avoided, as combustible gases, mists, vapours and other circumstances, including dusts for the production process, are an essential requirement. Explosion protection in ex-areas focuses on the neutralisation of potential ignition sources in explosive atmospheres, i.e. on hot surfaces, mechanical and electrical sparks, static electricity and compensating currents.

A distinction is generally made between 3 types of explosion protection:

- primary,
- secondary and
- tertiary explosion protection.

Primary explosion protection prevents the formation of explosive atmospheres in advance. If this is not possible, which is often the case in practice, the secondary explosion protection methods can be applied. Appropriate equipment is used with the aim of disabling potential ignition sources in the hazardous areas. The third method is tertiary explosion protection, which does not prevent an explosion, but rather limits its impact, e.g. specific pressure relief using special release mechanisms.

The fire protection products that are described below, use the secondary explosion protection methods to prevent ignition sources from encountering explosive atmospheres – qualified and certified.

The areas of application of ex-products

Paint and varnish treatment, gas and liquid filling plants, plastics manufacture, energy generation, pharmaceuticals, chemistry.

Overview of ATEX

The European ATEX (French "Atmosphère explosible", means "explosive atmosphere") Directive introduced a new classification of hazardous areas in July 2003. It distinguishes between various explosive atmospheres based on their risk factor. These special requirements must correspond to the equipment installed. The classification defines the scope of the measures to be taken. Our ex-products comply with this ATEX Directive.

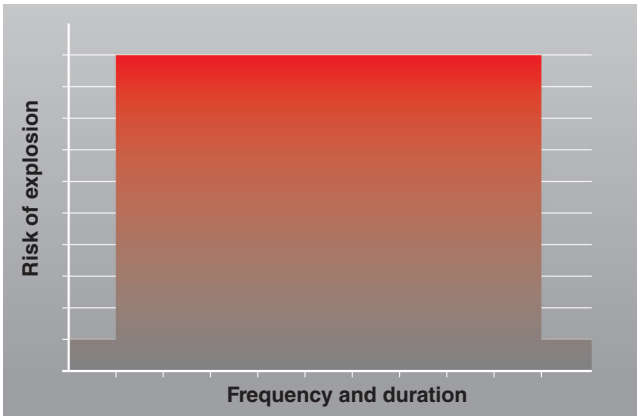
In workplaces, explosive areas are generally marked as Zone 1 and 2 as well as Zone 21 and 22. Zones 0 and 20 are the exceptions.

Explanation of ex-zones

Zone 0/20

Areas in which an explosive atmosphere is permanently or frequently present or present over long periods of time:

- As a mixture of air and combustible gases, mists and vapours (zone 0)
- In the form of a cloud consisting of combustible dust contained in the air (zone 20), e.g. inside reaction vessels



Zone 1/21

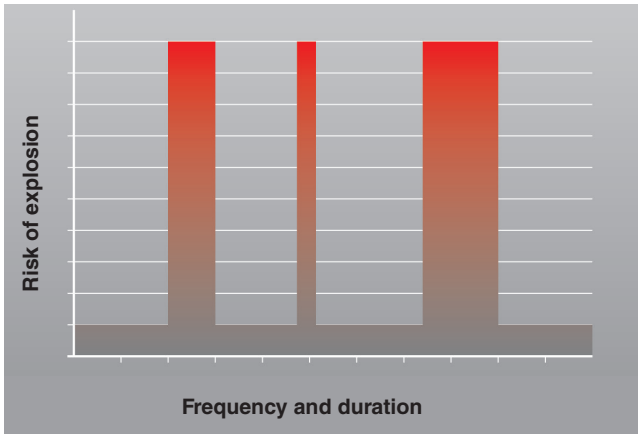
Areas in which an explosive atmosphere may occasionally form during normal operation:

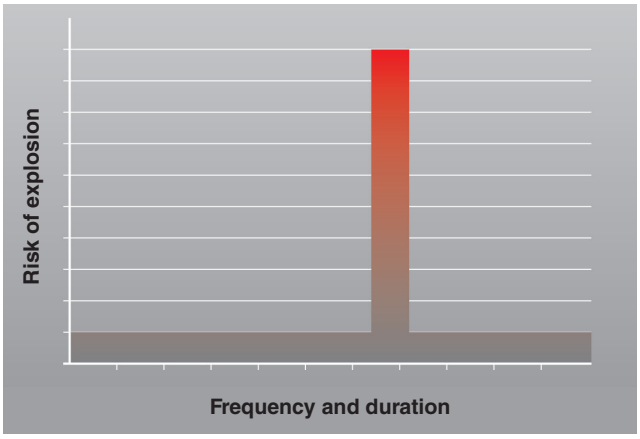
As a mixture of air and combustible gases, mists, vapours (zone 1). In the form of a cloud consisting of combustible dust contained in the air (zone 21), e.g. when mixing chemicals.

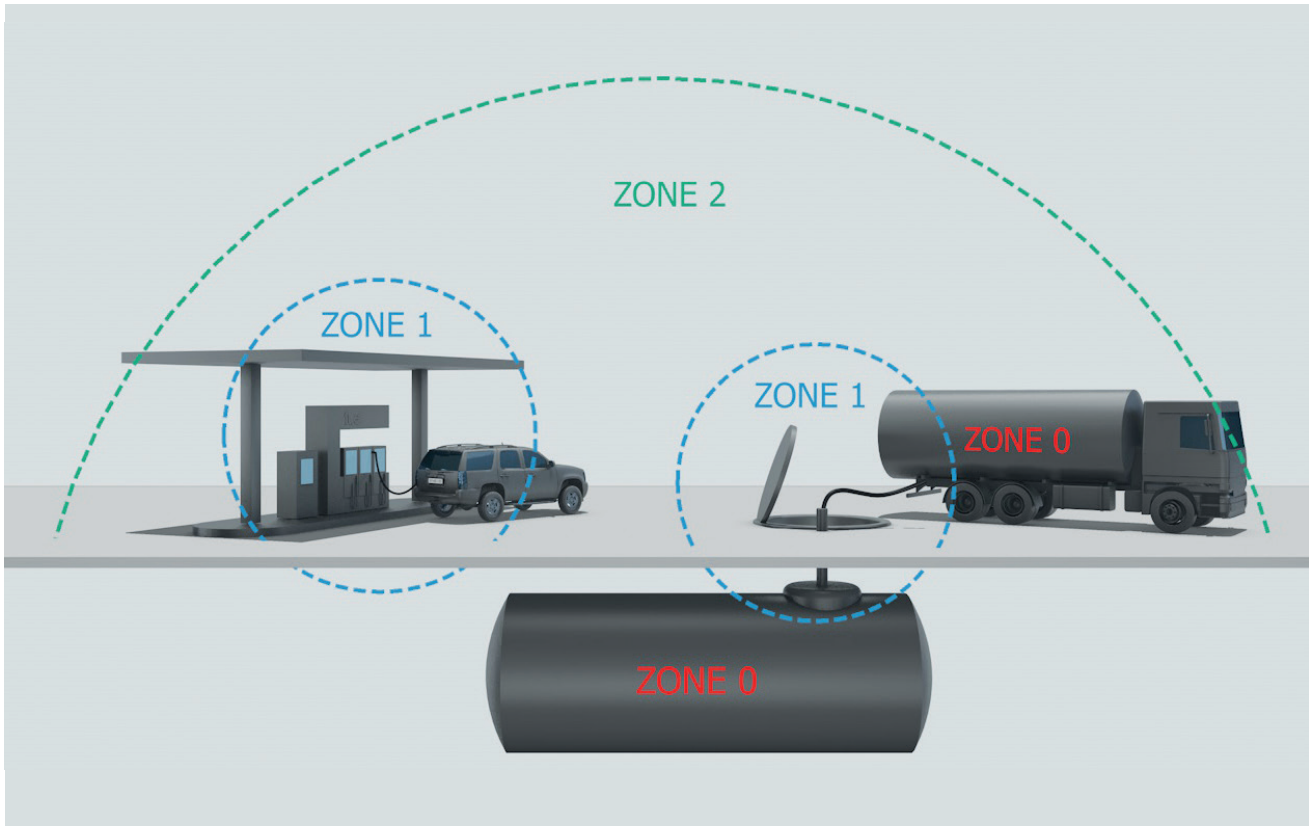
Zone 2/22

Areas in which an explosive atmosphere does not normally occur and/or only for brief periods during normal operation:

As a mixture of air and combustible gases, mists, vapours (zone 2). In the form of a cloud consisting of combustible dust contained in the air (zone 22), e.g. during storage.







For fire detection equipment, the two most widely used classes of electrical safety design are ‘flameproof’ (sometimes known as ‘explosionproof’ and with an identification symbol Ex d) and ‘intrinsically safe’ with the symbol Ex i.

Flameproof apparatus is designed so that its enclosure is sufficiently rugged to withstand an internal explosion of flammable gas without suffering damage. This could possibly result from the accidental ignition of an explosive fuel/ air mixture inside the equipment. The dimensions of any gaps in the flameproof case or box (e.g. a flange joint) must therefore be calculated so that a flame can not propagate through to the outside atmosphere. Intrinsically safe apparatus is designed so that the maximum internal energy of the apparatus and interconnecting wiring is kept below that which would be required to cause ignition by sparking or heating effects if there was an internal fault or a fault in any connected equipment.

There are two types of intrinsic safety protection. The highest is Ex ia which is suitable for use in zone 0, 1 and 2 areas, and Ex ib which is suitable for use in zone 1 and 2 areas. Flameproof apparatus can only be used in Zone 1 or 2 areas.

Increased safety (Ex e) is a method of protection in which additional procedures are applied to give extra security to electrical apparatus. It is suitable for equipment in which no parts can produce sparking or arcs or exceed the limiting temperature in normal service. A further standard, Encapsulation (Ex m) is a means of achieving safety by the encapsulation of various components or complete circuits.

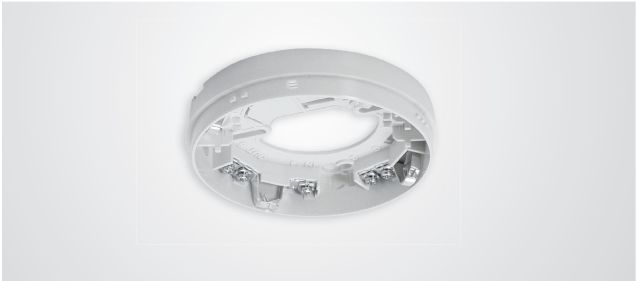
Some products now available, achieve safety certification by virtue of using a combination of safety designs for discrete parts. Eg. Ex e for terminal chambers, Ex i for circuit housings, Ex m for encapsulated electronic components and Ex d for chambers that could contain a hazardous gas.

Products for operation in ex-areas

- Detectors for ex-areas
- IQ8Quad Ex (i) series automatic, point-type fire detectors without line divider – specifically for use in ex-areas. Operation on the esserbus® or the esserbus®-Plus with individual addressing in connection with ex-barrier 804744. Operation as a standard detector on ex-barrier 764744.
- Automatic heat detector with rapid semi-conductor sensor for the reliable detection of fires with rapid temperature rises and integrated maximum value trigger for detecting fires with a slow temperature rise
- Rate of rise heat detector IQ8QuadEx(i)803271.EX scattered light-smoke detector for the reliable early detection for fires
- Optical smoke detector IQ8Quad Ex (i) 803371.EX multi-sensor detector with two integrated optical smoke sensors with various scattered light angles and additional heat detector sensor evaluation to detect smouldering fires through to open fires with an equivalent responsiveness.

O²T multi-sensor detector IQ8Quad Ex (i) 803374.EX

Detector base 805590 / 805591 for use with IQ8Quad Ex (i) series ex-detectors.



Ex-manual control point (standard) IP66 to manually trigger a fire alarm or a hazard alarm in explosive operating areas.

Type examination certificate: PTB 97 ATEX 3197

Special detectors

Flame detectors are ideal for detecting smokeless liquid and gas fires as well as open fires with intense smoke in explosive areas (zones 1 and 2 as well as zones 21 and 22), which occur when oil products, gases, wood or plastics burn for example.

They are typically used in the petrochemical industry, in turbine halls, in the automotive industry, etc.

Features

- Flame-proof enclosure approved for operation in ex-zones 1 and 2
- Status display via a tricolour LED for operation, alarms and faults
- Transmission of the statuses to the fire alarm control panel via 3 integrated relays
- Maintenance using magnets without a separate test lamp
- Reliable protection, even in difficult environmental conditions (protection class IP66)
- Microprocessor-controlled, heated optics for increased protection against moisture and ice
- Reliable immunity against interference due to the combined UV/IR evaluation

Alarm device
Ex-sound generator
Part. No.: 045040
Ex-protection:
EEx na II T4
Temp: –22 °C to +55 °C
Category: II 3 GD

The ex-sound generator is specifically designed for use in industrial environments (zone 2). Its robust die-cast aluminium housing is resistant against environmental influences and chemicals.

Ex-sound generator
Part. No.: 766253
Ex-protection:
II 2 G EEx de IIC T4
Category: II 2 G

The ex-sound generator is ideal for use in industrial areas with explosive environments (zone 1 and zone 2). The robust die-cast aluminium housing is resistant against environmental influences and chemicals.

Ex-magnetic door clamp
Part. No.: 767153
Ex-protection:
EEx me II T6
Category: II 2 G

Magnetic door clamp with flame-proof cast housing. Type examination certificate:
ATEX 1778X

Ex-barrier
Part. No.: 804744

Ex-barrier for the individually addressable operation of intrinsically safe detectors in series IQ8Quad Ex (i) in connection with detector base 805590 in zones 1 and 2.
Type examination certificate: BAS 00 ATEX 7087

Ex-barrier
Part. No.: 764744

Ex-barrier for the conventional operation of intrinsically safe detectors in series IQ8Quad Ex (i) in connection with detector base 805590 in zones 1 and 2.
Type examination certificate: BAS 01 ATEX 7005

Insulator and mounting block
Part. No.: 764745

For the insulated (floating) mounting of ex-barriers 764744 on standard C rails.

Housing
Part. No.: 764752

Housing for installing max. 10 ex-barriers for the reliable operation of intrinsically safe detector zones.

Screw glands
Part. No.: 764754

Screw glands for housing 764752.

14.1 Intrinsically safe Ex(i) detectors

Detectors with Ex-approval

Ex barrier (Part No. 804744)

Locations subject to explosion hazards are areas in which particular circumstances present the risk of an explosion. Owing to the many possible causes of explosion, these hazards often remain unrecognised at first sight, as in the case of dust explosions. Easier to understand are the potential hazards emanating from combustible liquids, such as solvents and fuels or combustible gases. These are frequently the cause of incidents, such as deflagration or, in mining, dangerous methane gas explosions (firedamp).

Intrinsically safe detectors from the series IQ8Quad may also be operated on the loop with addressing in conjunction with barriers (Part No. 804744) via esserbus® transponders. This also permits utilisation of the advantages provided by these process detectors, such as environmental adaptation and multisensor technology, in the hazardous area.

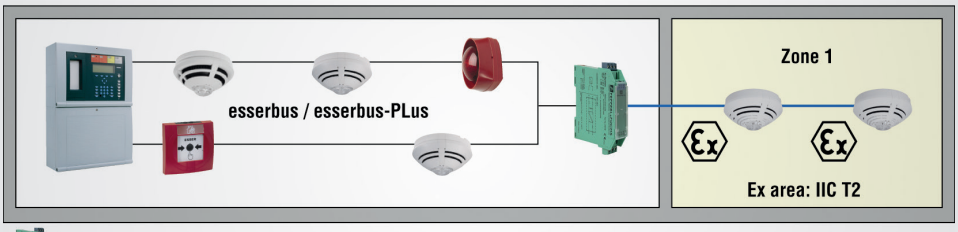
Features

- max. 4 Ex barriers per loop.
- max. 10 detectors IQ8Quad Ex (i) per barrier.
- max. 127 IQ8Quad detectors (without signaling) per loop.
- Barrier connection to the loop in spur (no transponder needed) cable length (spur) within the Ex area max. 400 m per Ex-barrier.

Total loop length (incl. spurs) < 3500m:

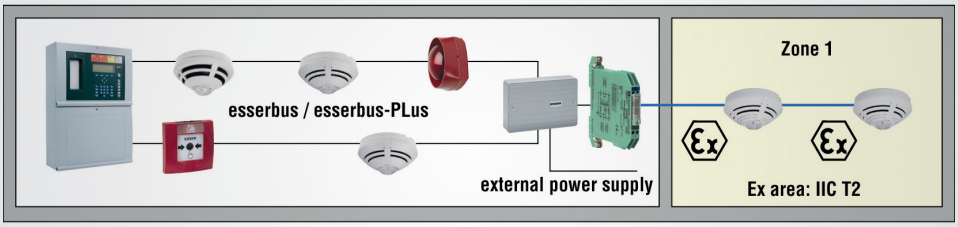
- Reduction about 300 m for each connected Ex barrier.
- Parameterization of ATEX IQ8Quad Ex (i) detectors is not supported.
- Ex barrier receives no short address.
- Load factor 3 per Ex barrier (use load factor calculation tool).
- Secure and intrinsically safe areas are electrically isolated from each other by the Ex barrier 804744.
- At least one esserbus® device with isolator must be installed between two Ex barriers.

Individual addressable operating



Ex-Barrier (Part No. 804744)

Conventional operating



Ex-Barier (Part No. 764744)

esserbus transponder 4 zone / 2 relay

15 System design in accordance to DIN EN 54

15.1 Definitions / Terminology

IQ8Control Fire Alarm Control Panel

A fault in the Fire Alarm Control Panel (FACP) may only affect a detection areas with a total space of max. 12.000 m², but not more than 512 detectors.

In case of a defective FACP affecting a detection area of more than 12.000 m² or more than 512 detectors, the detector zones must continue to function.

The fire detection state must be indicated by an optical common alarm display and by an audible signal at a constantly manned point.

In case of a fire alarm it must be possible to activate alarm signalling devices and the master box. The master box (manned centre link, autodialer) activation must also be displayed at a constantly manned point.

A fault in the FACP may only affect a detection area of up to 12.000 m², but not more than 512 detectors. If the total area exceeds 12.000 m² or the number of detectors per FACP is more than 512, then one of the following must be available:

- An additional operating module as a spare, or an indicator module with a LED indication per zone.
- A registration device, e.g. a printer in parallel operation mode.

Under the above conditions the security area may be up to 48.000 m².

Redundant system design

If the FACP has redundant signal processing (e.g. FACP IQ8Control C/M, FlexES Control), the monitored fire detection area may exceed 48.000 m².

Repeater indicator panel

FlexES Control Fire Alarm Control Panel

Touchscreen operating Panel (flush mounting)

Detection and Alarm Zones

Generally a building is broken down into smaller compartments to enable the fire fighters to locate the fire as quickly as possible. Even if the system is addressable it is still considered beneficial to have a separate 'at a glance' indication of the location of the fire. These compartments of a building are called detection zones, which need to comply with the following criteria.

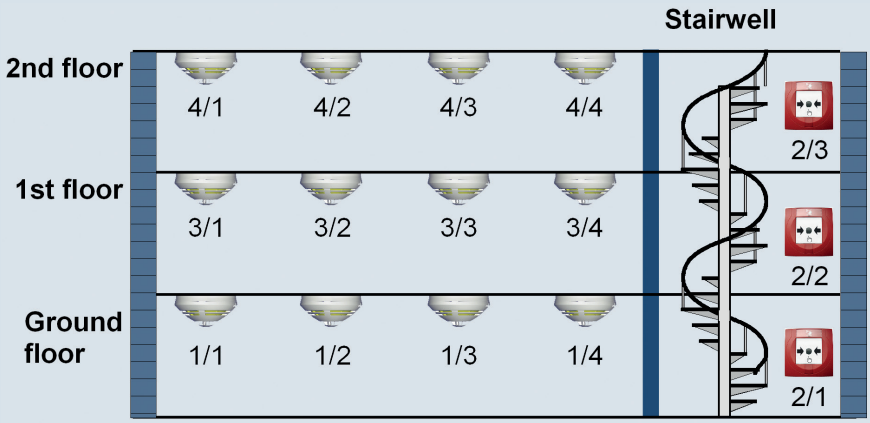
A detection zone may only cover one floor of a building. Exceptions to this are stairwells, light wells, lift shafts or tower-like constructions, which must be combined each to form a separate detection area.

A detection area may not exceed a fire section and must not be larger than 1.600m^2. Several rooms may be combined into a common detection area only if the rooms are:

- next to each other and do not exceed five and if the total area of the rooms does not exceed 400m^2.

or

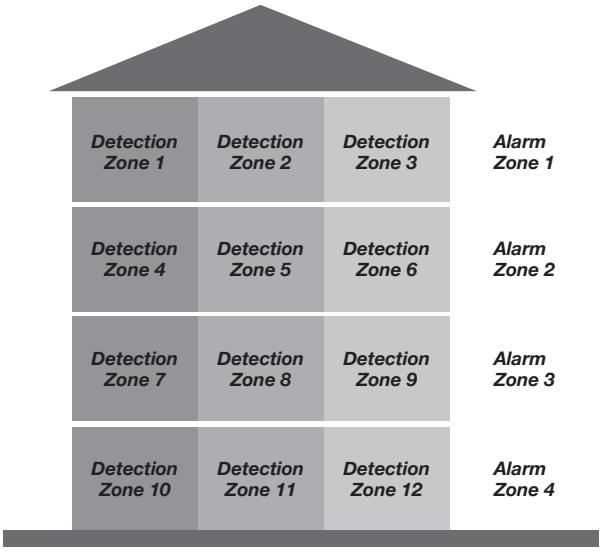
- next to each other, doors to the rooms can be easily observed, the total area does not exceed 1.000m^2 and if optical alarm indicators showing which room is affected by fire are positioned in clearly visible positions close to the doors. If possible from a constructional aspect, the optical alarm displays should be fitted to the wall above the access doors. They must be marked (e.g. according to DIN 14623). Alternatively, the rooms affected may be displayed on the FACP.



Alarm Zones

An alarm zone is clearly defined within the standard but generally is an area of the building coinciding with the fire compartment boundaries. There must be a clear break between these alarm zones to ensure alert and evacuation messages are not overheard from adjacent areas.

The only other criteria is that an alarm zone may consist of a number of detection zones but not visa versa. Alarm zones are only required when phased or staged evacuation is required. It is therefore important that care should be taken to ensure only one message is heard at any one time particularly where two alarm zones are attached.



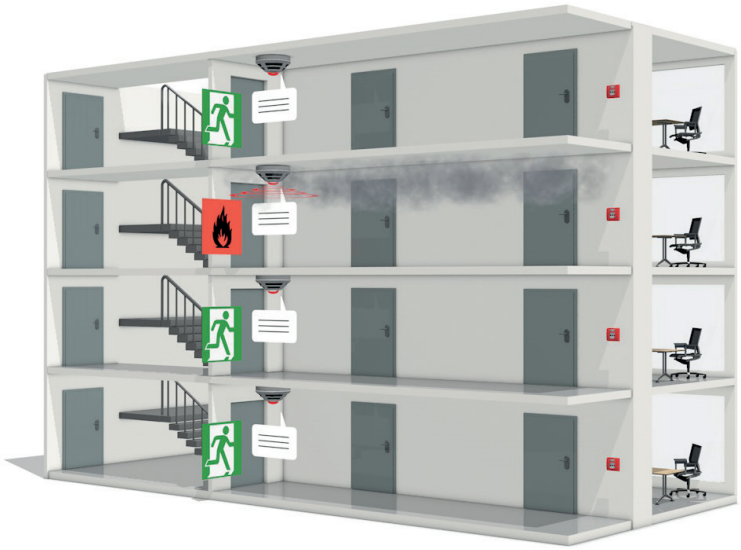
Sectors

Sectors for alarm devices are programmable in the programming software tools 8000 to match the required specifications. A different message for alarm and /or evacuation could be assigned to each sector (e.g. floor).

Due to this an individual and specific warning message for each condition is available to ensure a high effective hazard management.

Alarm and Evacuation

The VdS recommends generally to start the evacuation of building with an alert tone e.g. DIN tone, to attract first attention and then to sound the speech messages.



Attention please.This is an emergency. Please leave the building by the nearest available exit.

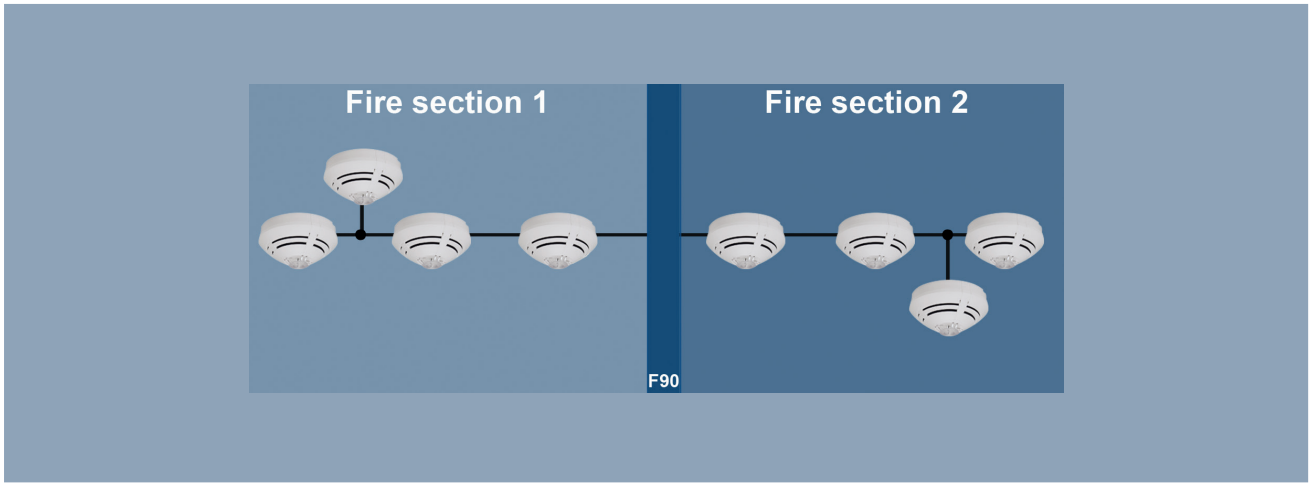
***This is a fire alarm.* Please leave the building immediately by the nearest available exit.**

Attention please.This is an emergency. Please leave the building by the nearest available exit.

Attention please.This is an emergency. Please leave the building by the nearest available exit.

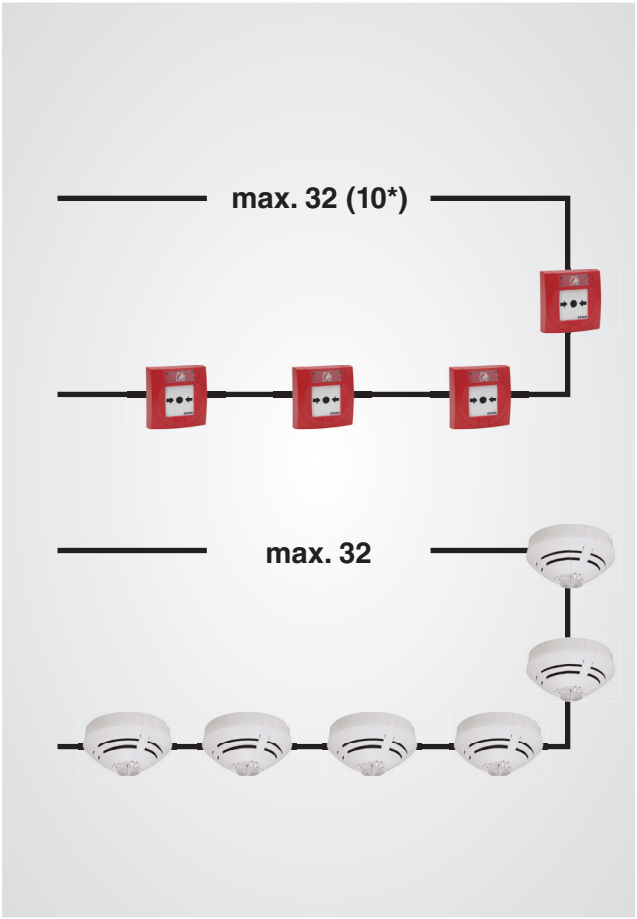
Example: Available speech messages of the IQ8Quad fire detectors with alarm device and IQ8Alarm

Compartmentalization of Fire Sectors



F90 → Fire resistant barrier for min. 90 minutes

A fire section is a sub-division of a building that is partitioned off with a view towards fire protection and which, in the event of a fire, is isolated in such a way that fire is prevented from spreading to adjacent parts of the building.



*Restriction in accordance to German regulations (VdS 2095)

Detector zone

A zone may only include detectors from one detection area.

Separate detector zones shall be provided for automatic fire detectors and manual control points. These must not contain more than 32 fire detectors.

Automatic fire detectors installed in false floors, intermediate ceilings or cable ducts must belong to separate detector zones. Otherwise, it must be very obvious in which area detectors have responded to fire, for example, by staggered detector displays.

Detectors in ventilation systems must be combined into separate detector zones.

Manual control points in stairwells with more than two basement floors must be aggregated in separate detector zones from the fire service access in the direction of the basements and also in the direction of the upper floors, although the fire service access should be allocated to the floors above.

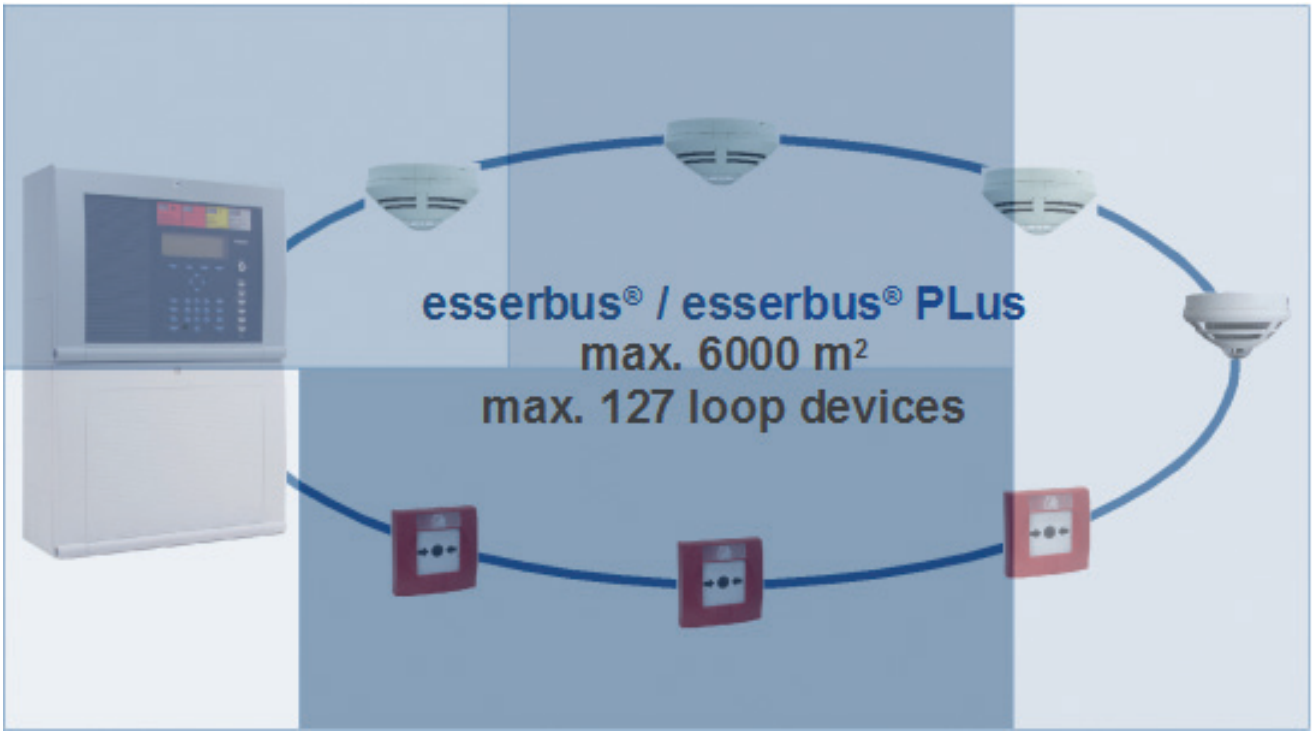
It must be possible to switch off detector zones independently of each other.

Loop technology

According to the relevant DIN standards there are extended possibilities for planning and installing loops:

- Acc. the standards up to 250 devices can be connected in one loop. Automatic and manual fire detectors may be combined in the one loop.
- Several detection areas that are assigned to one primary loop may not exceed a total area of 6000 m².
- Several fire sections may be included.
- The outward and return cables of the loop must be installed separately.

In the esserbus® loop all 127 devices may be connected, although each detector zone may be programmed with max. 32 automatic fire detectors or 10 manual control points.



15.2 Preventing false alarms via technical or manual actions

Fire alarm control panels with technical measures to prevent false alarms. These measures could include:

- verification of the alarm status such as:
  - Alarm verification
    The fire detection status is achieved if the fire parameter still exists after a maximum delay of 10 s.
  - Two-detector coincidence.
  - Two-zone coincidence.

In case of a double knock-zone or -detector the distance between two dependent detectors must not be less than 2.5 m.

A dependency of more than 2 detectors or zones to achieve fire detection status is not permitted apart from a few justified exceptions.

In the case of multiple sensors and detectors which detect different fire parameters (e.g. smoke, heat) the maximum monitoring areas of the detectors in relation to the room height and size of the room to be monitored apply. Multiple sensors are not regarded as integrated 2-detector coincidence, as there is no local separation of the different sensors.

If the room deviates from the ideal square distribution, the greatest distance (horizontal distance) between a point type automatic fire detector and any point in the ceiling must be determined for smoke detectors and heat detectors, taking account of the incline of the roof and the maximum monitored area.

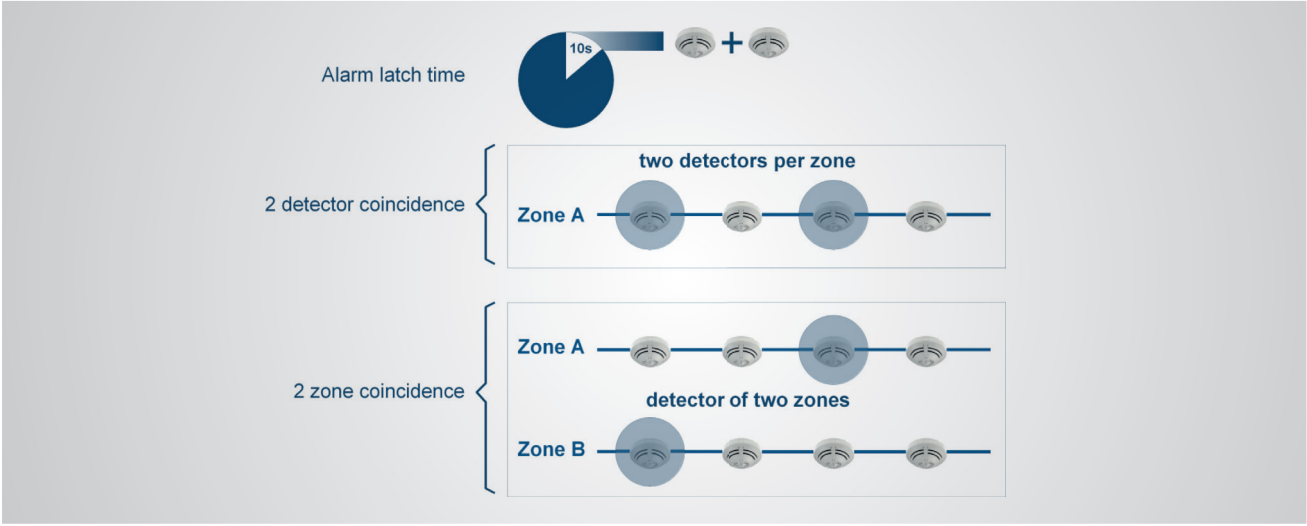
In special cases it may be necessary to define other measures to prevent false alarms.

- Complex evaluation of fire parameters such as:
  - use of multiple sensor detectors.

Fire alarm control panels with manual measures to prevent false alarms.

- If the alarm status is verified manually, routing of the fire alarm to the respective service is delayed. The following conditions must be adhered to:
- The delay may only take place when personnel are present.
- The incoming messages must be acknowledged within 30 s.
- The message must be routed further within 30 s at the latest if it is not acknowledged.
- The maximum verification time after acknowledgement is 3 min.
- If another message arrives during the verification time, the master box (autodialer) must be activated without delay.
- The routing delay must be activated manually: Deactivation must be automatic, although manual deactivation must also be possible.
- When planning 2-detector respectively 2-zone coincidence systems for the same fire parameters, the maximum number of detectors per detector zone remains unchanged.
- Individual local fire services permit automatic alarm routing to the fire service (FACP with master box) only with automatic detectors that are operated in 2-detector respectively 2-zone coincidence.

Note: These actions are not permitted for manual control points!



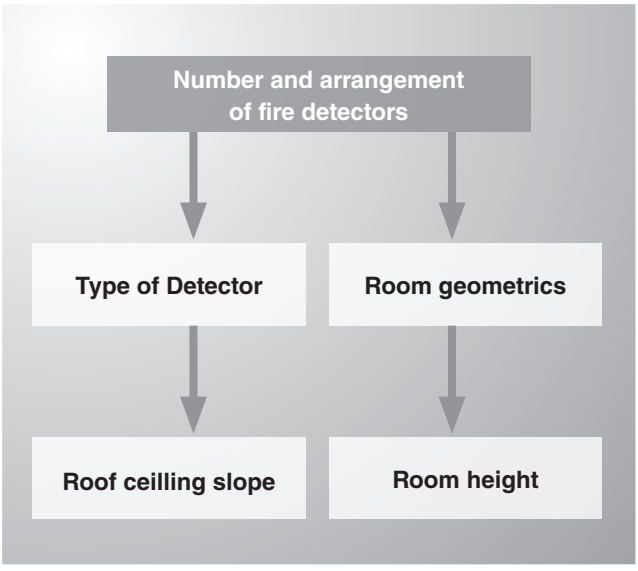
15.2.1 Arrangement of point-type detectors

Automatic fire detectors must be installed so that the fire parameters (smoke, heat, gas) can reach them without hindrance.

The number and arrangement depend on:

- room height,
- floor area,
- shape of ceiling and roof,
- maximum monitoring area per detector.

At least one automatic fire detector must be installed in each room of the protected area, apart from rooms with a low fire load or with no possibility of fire spreading. If it is expected that lives could be endangered, sub-areas where smoke can spread are also deemed to be rooms.



The minimum horizontal and vertical distance of passive smoke point detectors and heat detectors (as well other sensor points or intake ports of aspirating smoke systems) to stock or facilities is 0.5m.

In case of less distance (< 0.5m) of the a.m. devices to installations (e.g. conducts, pipes or lamps), but also if the essential space is considered larger than 0.5m to ventilation grids as needed for HAVC heating, ventilation and air conditioning systems, it must be ensured that the fire characteristics such as aerosols, smoke particles and hot air can freely reach the detectors (as well other sensor points or intake ports of aspirating smoke systems).

In rooms with forced ventilation perforated ceilings that are used for ventilation must be sealed in a 0.5 m radius around the detector.

The number of point-type smoke and heat detectors should be chosen so that the specified maximum monitoring areas are not exceeded.

When point-type smoke detectors are arranged in 2-zone or 2-detector coincidence, the maximum monitoring areas for smoke detectors should be reduced by at least 30%.

If 2-zone or 2-detector coincidence is planned for fire protection device activation, such as extinguishing systems, the maximum monitoring area for each detector should be reduced by 50%.

When point-type heat detectors are arranged in
2-zone or 2-detector coincidence, the maximum monitoring areas for heat detectors should be reduced by 50%.

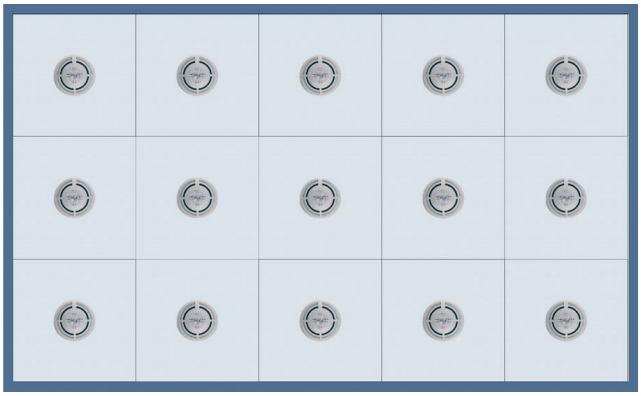
In case of 2-zone or 2-detector coincidence the distance between two dependent detectors must not be less than 2.5 m.

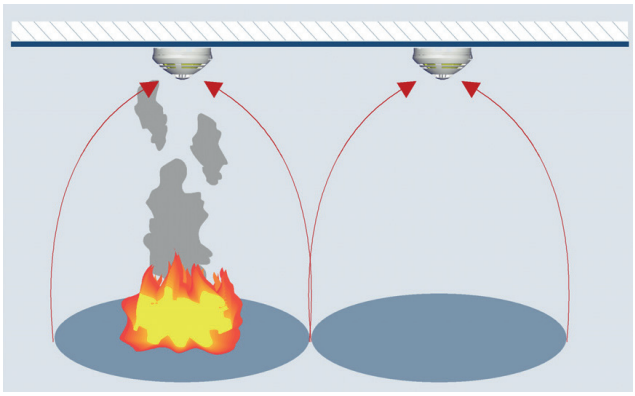
Coincidence of more than 2 detectors or zones to achieve fire detection status is not permitted apart from a few justified exceptions.

In case of multiple sensors and detectors which detect different fire parameters (e.g. smoke, heat) the maximum monitoring areas of the detectors in relation to the room height and size of the room to be monitored apply. Multiple sensors are not regarded as integrated 2-detector coincidence, as there is no local separation of the different sensors.

If the room deviates from the ideal square distribution, the greatest distance (horizontal distance) between a point-type automatic fire detector and any point in the ceiling must be determined for smoke detectors and heat detectors, taking account of the incline of the roof and the maximum monitored area.

In special cases it may be necessary to define other measures to prevent false alarms.





15.2.2 Fire detector selection relating to ambient conditions

Environmental conditions

Ambient temperature

Smoke detectors / Flame detectors		Heat detectors	
max. + 50 °C	min. - 20 °C	Fixed response temperature of the Heat sensor over the ambient temperature	
At temperature < 0 °C prevent icing		min. 10 °C	max. 35 °C
		At temperature < 0 °C use only rate-of-rise heat detectors (with integrated fixed heat sensor)	

Airflow

Smoke detectors	Heat and Flame detectors
Max. 25 m/s Spot type detectors Max. 20 m/s Air duct detectors	No restrictions
If no other requirements are given in the appropriate approval	

Vibration

Avoid this ! Apply countermeasure!

Air humidity

Max. 95 % rel. humidity! No condensation!

Smoke, Dust and similar Aerosols

Smoke detectors / Heat detectors	Flame detectors
Sources for false alarms !	No restrictions except in critical applications (e.g. damp dust)
Apply e.g. dust filter or place detector at a suited location, otherwise use OT^{blue},O^2T/OTG fire detectors or heat detectors	

Light irradation

Smoke detectors / Heat detectors	Flame detectors
No negative effect	Danger caused by false alarm sources, e.g. Sunlight, Illumination, light flashes, reflections
	Apply covers or place detector at a suited location, Change type UV/IR

15.3 Monitoring areas

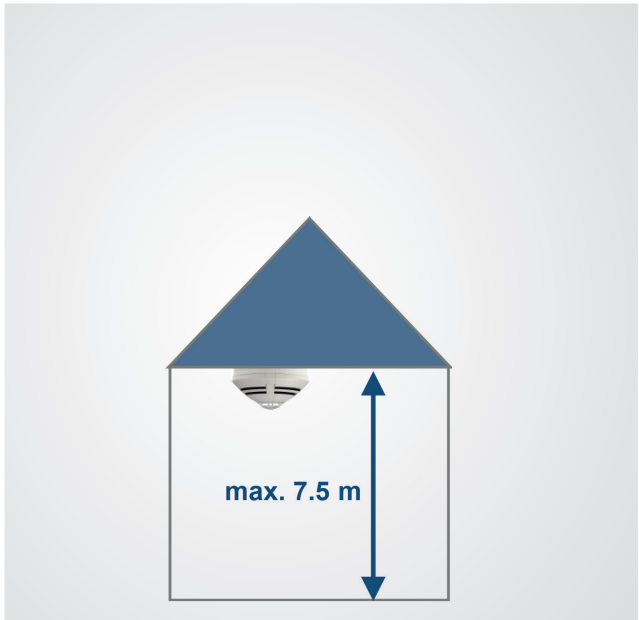
The application of different detection technology is limited by the height of the monitored room.

Areas of the ceiling whose space is less than 10% of the total ceiling space must not be considered, unless this space did not exceed the 0,6 times of the maximum monitoring area of a fire detector.

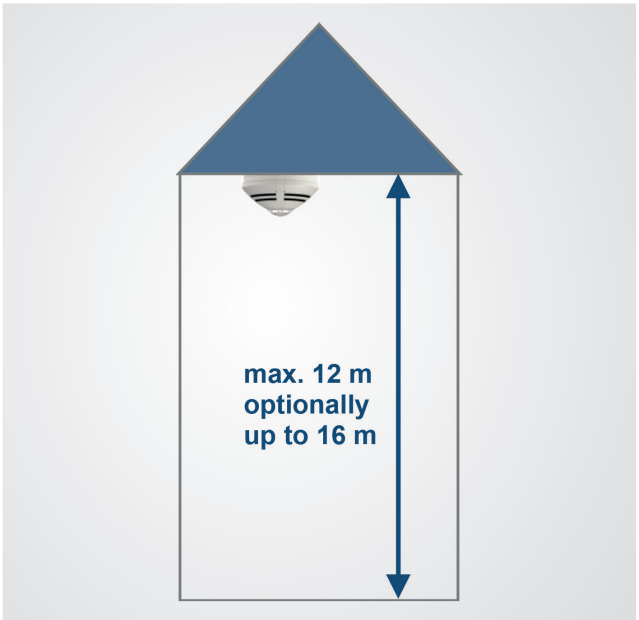
In this case the partitions with higher ceilings must be handled like separated rooms.

Room height	Single-point smoke detectors DIN EN 54-7	Line-type smoke detectors DIN EN 54-12	Aspirating smoke detectors DIN EN 54-20 class A, B and C	Single-point heat detectors DIN EN 54-5 class A1, A2, B, C, D, E, F and G [a, b]	Line-type heat detectors DIN EN 54-22 class A1 and A2	Single-point flame detectors DIN EN 54-10 class 1, 2 and 3
Up to 45 m	Not suitable	Not suitable	Not suitable	Not suitable	Not suitable	[c]
Up to 20 m	Not suitable	[d]	only class A, [d]	Not suitable	Not suitable	[c]
Up to 16 m		Suitable	only class A, B	Not suitable	Not suitable	[c]
Up to 12 m	Suitable	Suitable	Suitable	Not suitable	Not suitable	Suitable
Up to 9 m	Suitable	Suitable	Suitable	Not suitable	Suitable only class A1	Suitable
Up to 7,5 m	Suitable	Suitable	Suitable	Suitable only class A1	Suitable	Suitable
Up to 6 m	Suitable	Suitable	Suitable	Suitable	Suitable	Suitable

	Suitable depending on use and ambient conditions (e.g. rapid fire development and spread of smoke)
a	Also detectors with class index R or S
b	Class B, C, D, E, F and G only suitable for building monitoring
c	Depending on class and positioning
d	Permitted upon verification of the detection effectiveness



Heat detectors (EN 54-5)



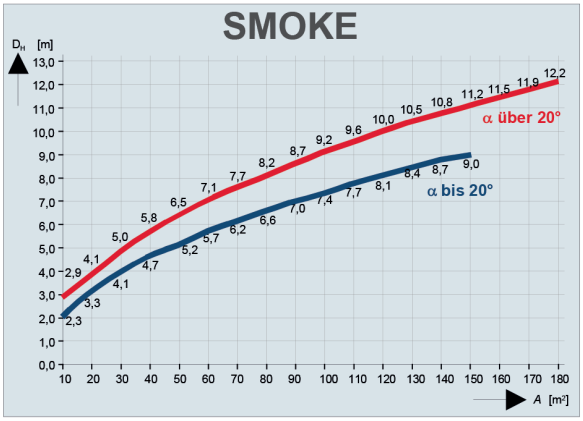
Smoke detectors (EN 54-7)

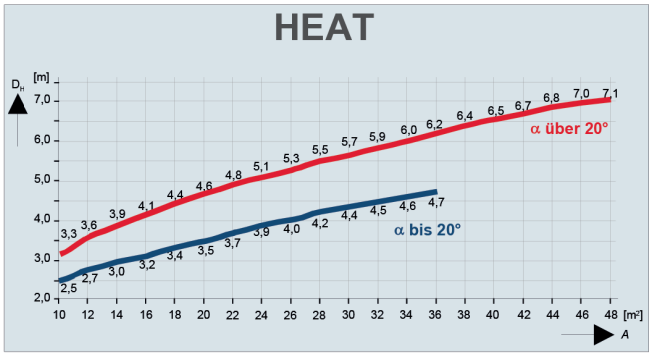
Monitored areas of point-type smoke and heat detectors

Floor space of the monitored room	Type of the autom. Fire detector	Room height	Slope roof α < 20° Δ	Slope roof α > 20° Δ
up to 80 m²	Single-point smoke detector DIN EN 54-7 Aspirating smoke detector DIN EN 54-20, class A, B and C[a]	up to 12 m	80 m²	80 m²
over 80 m²	Single-point smoke detector DIN EN 54-7 Aspirating smoke detector DIN EN 54-20, class A, B and C[a]	up to 6 m	60 m²	90 m²
		over 6 m to 12 m	80 m²	110 m²
	Single-point smoke detector DIN EN 54-7 Aspirating smoke detector DIN EN 54-20, class A and B[a]	over 12 m to 16 m	120 m²	150 m²
	Aspirating smoke detector DIN EN 54-20, class A[a]	over 16 m to 20 m	[e]	[e]
up to 30 m²	Single-point heat detector DIN EN 54-5, class A1, A2, B, C, D, E, F, and G[c] Line-type heat detector DIN EN 54-22, class A1 and A2[d]	up to 6 m	30 m²	30 m²
	Single-point heat detector DIN EN 54-5, class A1[c] Line-type heat detector DIN EN 54-22, class A1 and A2[d]	up to 7,5 m		
	Line-type heat detector DIN EN 54-22, class A1[d]	up to 9 m	15 m²	
over 30 m²	Single-point heat detector DIN EN 54-5, class A1, A2, B, C, D, E, F, and G[c] Line-type heat detector DIN EN 54-22, class A1 and A2[d]	up to 6 m	20 m²	40 m²
	Single-point heat detector DIN EN 54-5, class A1[c] Line-type heat detector DIN EN 54-22, class A1 and A2[d]	up to 7,5 m		
	Line-type heat detector DIN EN 54-22, class A1[d]	up to 9 m	15 m²	30 m²

Δ	Max. monitored area per detector
	Depending on use and ambient conditions (e.g. rapid fire development and spread of smoke)
α	Angle of the slope roof/ceiling to the horizontal line. For roof/ceiling with different slopes the smallest slope must be considered relating to the environmental conditions (e.g. fast fire propagation or smoke development)
a	Per intake opening
b	For roofs with an incline, the room height at the highest point in the room is taken into consideration
c	Also detectors with class index R or S
d	Per point of a multi-point heat detector
e	See table >Suitability of Automatic Fire Detectors Based on Room Height<; the maximum monitoring surface must be defined on a building-specific basis

Horizontal spaces in accordance to DIN EN 54-7 (smoke) and EN54-5 (heat)





A	Max. monitored area per detector
D_H	Max. horizontal space from any point of the ceiling to the next detector
α	Angle of the slope roof/ceiling to the horizontal line. For roofs/ceilings with different slopes the smallest slope must be considered.

15.4 Distance between detector and ceiling or roof

Distance between point-type smoke detectors and ceilings/roofs

Heat detectors must always be fitted directly to the ceiling.

For smoke detectors the required distance (D_L) of the detector from the ceiling or roof is dependent on the height of the rooms to be monitored, the incline of the roof and the heat buffer that is to be expected with the shape of the ceiling or roof; see the table for standard distances.

Room height R_H	Incline of roof α	
	up to 20°	more than 20°
	D_L	D_L
up to 6 m	up to 0,25 m	0,20 m up to 0,5 m
more than 6 m	up to 0,4 m	0,35 m up to 1,0 m

D_L Distance between the smoke-sensitive element and the ceiling or roof

α Angle formed by the roof/ceiling incline and the horizontal; if a roof or a ceiling has different inclines, e.g. shed roofs, the smallest incline counts depending on the use and ambient conditions (e.g. rapid fire development and spreading smoke)

Detector distances for different roof and ceiling shapes

In the case of rooms with roofs having an incline greater than 20°, e.g. pitched, gable or hip roofs, a series of detectors should be installed vertically below the ridge or the highest part of the room with suspension length D_L.

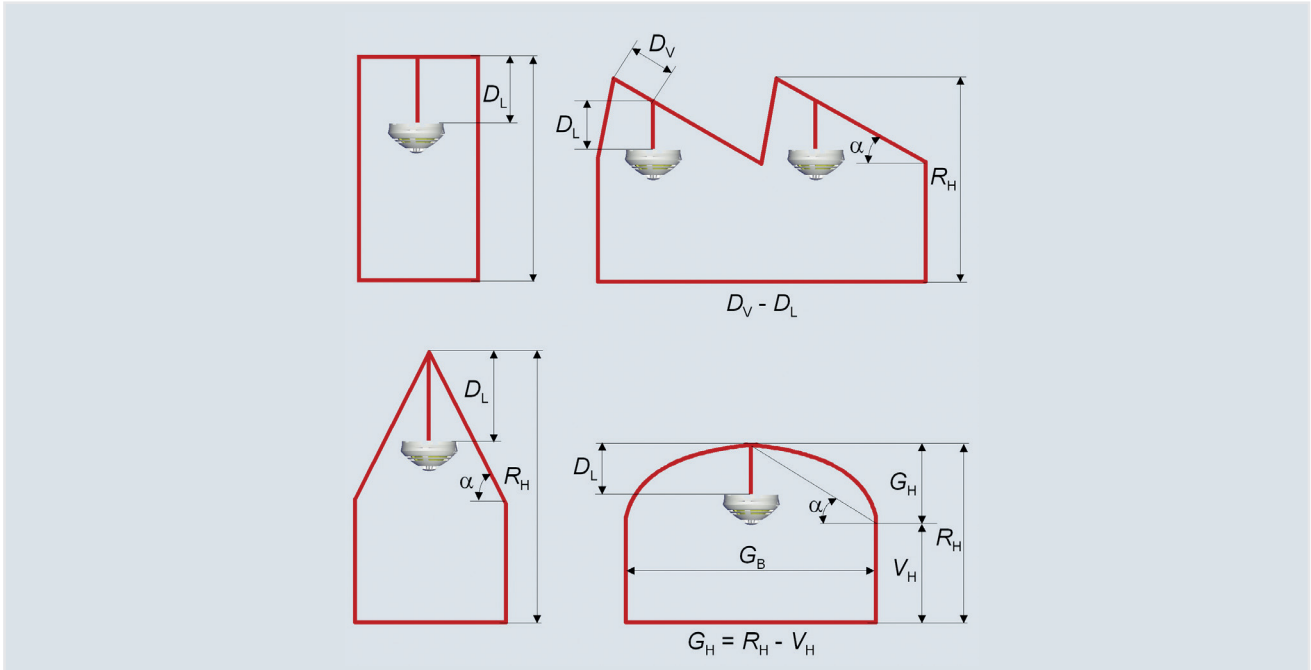
In rooms with shed roofs each shed must have a series of detectors, as shown in the diagram. The detectors must be fitted to the roof area with the lower incline at a distance of D_V from the ridge with suspension length D_L.

If other detector series are necessary, for all roof shapes the distance D_L from the roof applies for roof inclines α to 20°.

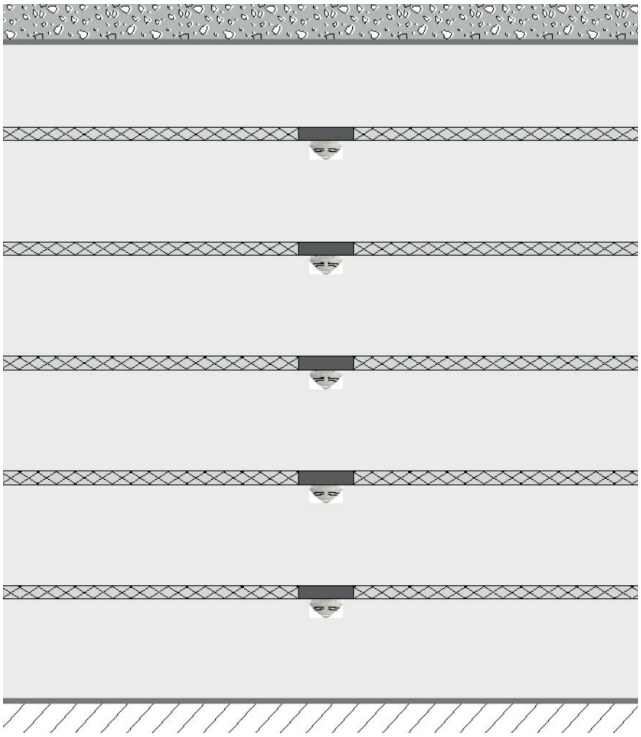
In case of arched ceilings the following simplified assumption is made to calculate the incline:

The average roof incline is smaller or equal 20° if
$G_H / G_B \leq 0.182$.
The average roof incline is greater or equal 20° if
$G_H / G_B \geq 0.182$.

Where Arch height $G_H = R_H - V_H$
Arch width G_B



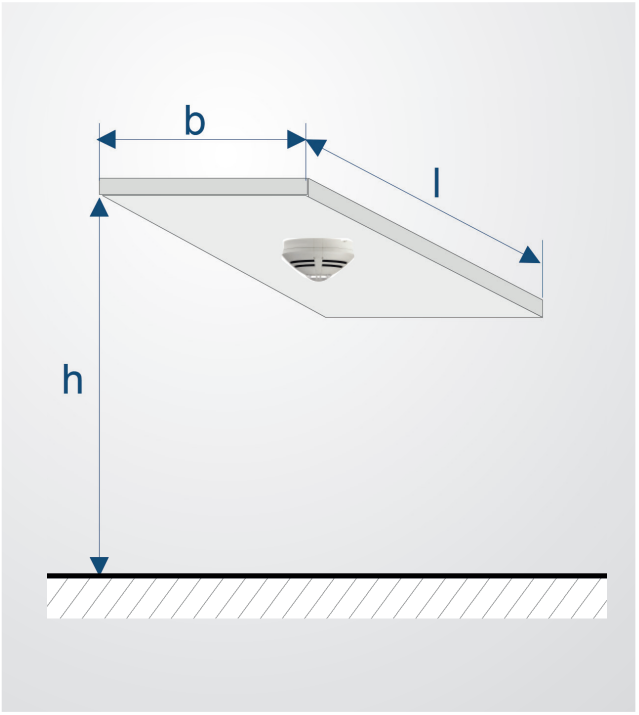
15.5 Installing detectors below platforms, gratings or similar



If a room is split up vertically by solid or grating-type platforms, additional smoke or heat detectors must be installed below them if all three impacting factors (length, width and area of the platform) exceed the limiting values for *l*, w and A shown in the diagram – in relation to the detector installation height *h*.

Grating should be treated as an enclosed platform as it may be filled with various installations.

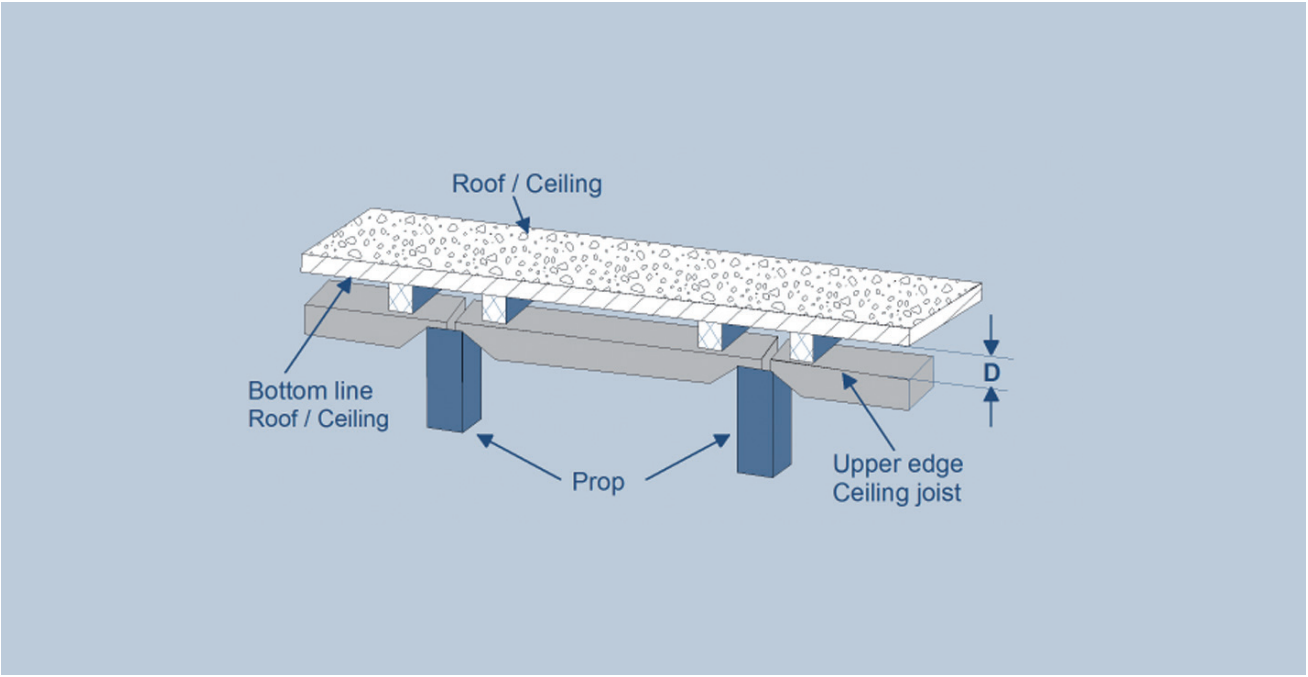
In case of several platforms above each other, only the lowest level should be fitted with point-type smoke or heat detectors if there is a low fire load between the platform levels above.



Arrangement of point-type smoke and heat detectors

Type of automatic fire detector	Height *h*	Stage-length *l*	Stage-width *b*	Stage-area *F*
Heat detectors DIN EN 54-5	< 7,5 m	> 2 m	> 2 m	> 9 m²
Smoke detectors DIN EN 54-7	< 6 m	> 2 m	> 2 m	> 16 m²
	< 6 m to 12 m	> 3,5 m	> 3,5 m	> 31,5 m²

15.6 Detector arrangement on ceilings with beams



Beams, ventilation ducts and other sub-divisions in the ceiling that are more than 3% of the height of the room, but only have a minimum height of 0.2 m, must be considered as if they are attached to the ceiling. The height D of the subdivision is determined vertically to the surface of the roof.

If subdivisions on the ceiling do not have to be considered, point-type smoke detectors may be fitted to them.

If spacers with height D have are greater than 3% of the room height, but at least 0.25 m high are installed between the subdivisions and the ceiling and if the open space is more than 75% of the total area between the sub-divisions and the ceiling, the subdivisions do not have to be considered, regardless of the height, if the spacers themselves do not subdivide the ceiling. These should then be treated as described above.

If ceiling areas which have to be considered due to subdivisions are smaller or equal to 0.6 times the maximum monitoring area of the point-type, automatic smoke or heat detectors, one detector may only monitor several ceiling areas up to 1.2 times the specified maximum monitoring area if the associated horizontal distance for smoke detectors and heat detectors is not exceeded. If the individual subdivided ceiling area is greater than 0.6*A*, each ceiling area must be equipped with detectors.

If the subdivisions are more than 0.8 m high, point-type smoke or heat detectors must be fitted to the individual ceiling areas.

If a ceiling area is more than 1.2 times the monitoring area A, this ceiling area must be treated as an individual room.

- Subdivisions from 0.2 m or 3% of the room height are treated as beams.
- If the ceiling areas are less than 0.6 times the monitoring area A, one detector may monitor several ceiling areas not exceeding 1.2 times the monitoring area.
- D_h must be adhered to.
- If the individual ceiling area is larger than 0.6 A, each ceiling area must be equipped with detectors.
- From a beam height of 0.8 m each ceiling area must be equipped with detectors.
- If the ceiling area is larger than 1.2 A, it must be treated as a separate room.

15.7 In narrow corridors and ceiling areas

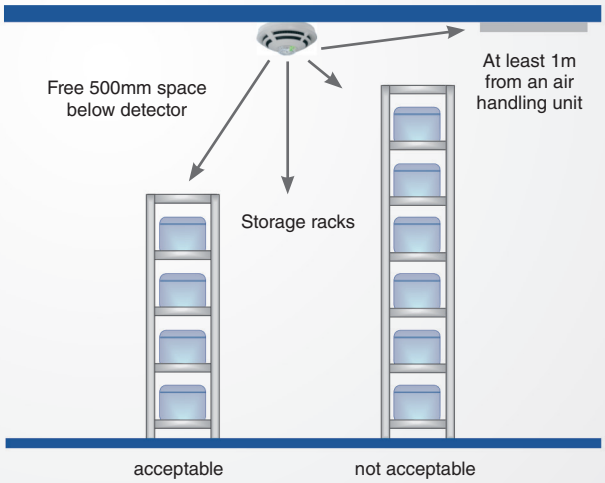
- The distance between heat detectors may be up to 10 m or 5 m in case of 2-detector or 2-zone dependency.
- The distance between smoke detectors may be up to 15 m, or 11 m in case of 2-detector or 2-zone dependency, or 7.5 m if fire protection systems, such as extinguishing systems are activated.
- The monitoring areas of the detectors must be adhered to.
- The distance between the detector and the front of the corridor or ceiling area may not exceed half the above distances.
- A detector should be fitted in areas where corridors cross and merge and at corners.

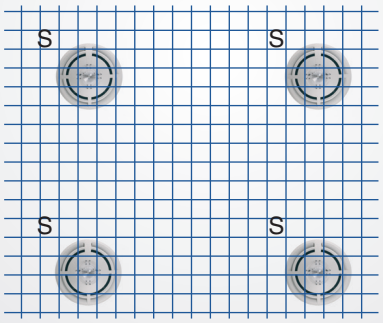
15.8 Distance between walls

- The distance may not be less than 0.5 m to the wall.
- The only exception is for corridors and similar less than 1 m wide.
- If the room has subdivisions which are less than 0.25 m from the ceiling, the detector must also be 0.5 m from these.

15.9 Ceilings with other obstructions or Air Handling units etc.

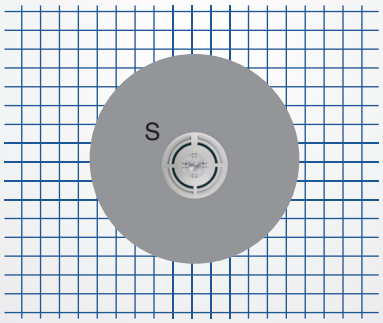
- The horizontal distance between detectors and stored goods and storage facilities must not be less than 0.5 m at any point.
- One of the most common mistakes is to mount a smoke sensor adjacent to the air conditioning intake or outlet grill. The minimum distance between the two should be at least 1 metre and further if possible. This is due to the fact that smoke may have difficulty penetrating the sensor when the air conditioning is switched on. Also there is a greater risk of the sensor becoming contaminated and giving rise to false alarms.





Detectors above ceilings with perforations can protect the area below subject to the following conditions:

- The perforations are uniform
- The minimum perforation is > 10mm
- The thickness is < than 3 times the minimum dimension of the perforation



Where air is forced through a perforated ceiling, the detector should be mounted on a solid baffle with a minimum diameter of 1,000 mm

16 Arrangement of Manual Call Points (MCP)

Siting of Manual Call Points

Manual call points should be fixed at a height of 1.4m above finished floor level, at easily accessible, well-illuminated and conspicuous positions free from potential obstruction. If an emergency light is present it must illuminate the MCP. They should be sited against a contrasting background to assist in easy recognition. A lower mounting height is acceptable in circumstances where there is a high likelihood that the first person to raise an alarm of fire will be a wheelchair user.

All manual call points, whatever the system, should comply to EN54-11 and should be located as follows:

- On all storey exits and all exits to open air irrespective of whether they are designated fire exits
- Nobody should travel more than 50 metres to reach one, except if the exit routes are in critical environments in which case the direct line distance should not exceed 30 metres
- The above distances to be reduced to 25 and 16 metres respectively, if there are persons with limited mobility or there is a likelihood of rapid fire development
- In all areas with potential high fire risk such as kitchens etc
- Where phased evacuation is planned, call points will need to be sited on all exits from a particular zone
- 1.4 metres + or – 0.2m above the floor
- Call points fitted with protective hinged covers for whatever reason should be listed as a variation

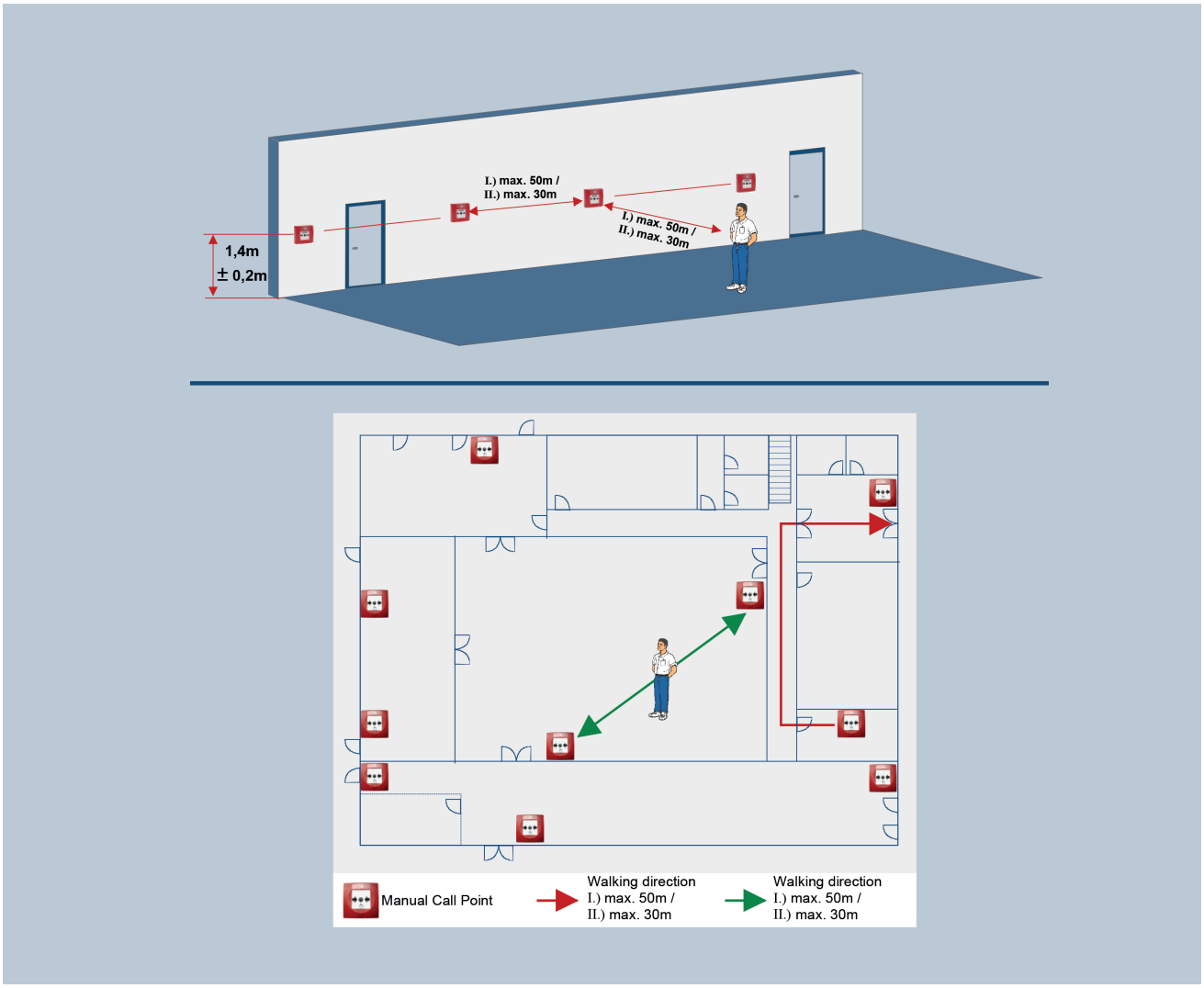
Manual call points must be:

- if required labelled with an additional plate in accordance to standard DIN 4066.

Each disabled MCP must be appropriate labelled, e.g. >out of order<.

I.) In low risk fire locations or systems the spacing of two MCPs must not exceed 50m.

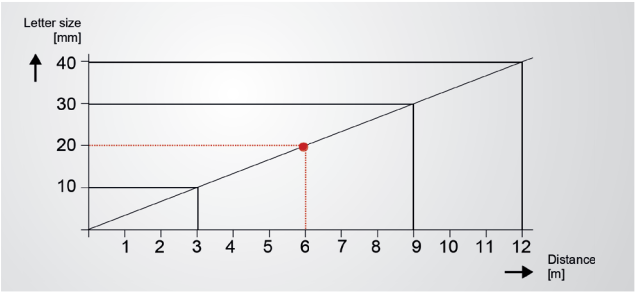
II.) In critical environments e.g. explosive areas / areas with high potential fire sources or depending on the buildings properties, the spacing of MCPs should not exceed 30m. The arrangement and number must ensure that the way for a person to the next MCP is below 30m.



16.1 Detector identification

Visibility

Schematic to determine the letter size:



For example:

If the distance is 6m, then the detector should be labelled with text 20mm in height.

- Label with detector and zone number.
- Indicator label must be installed in a close nearby to the detector, e.g. on the detector base.
- Observe the requirements of the local fire brigade.

- In accordance to DIN 1450, assuming a good visibility, the letter size can be calculated by the formula:

Formula

Letter size (mm) = distance (m): 0.3

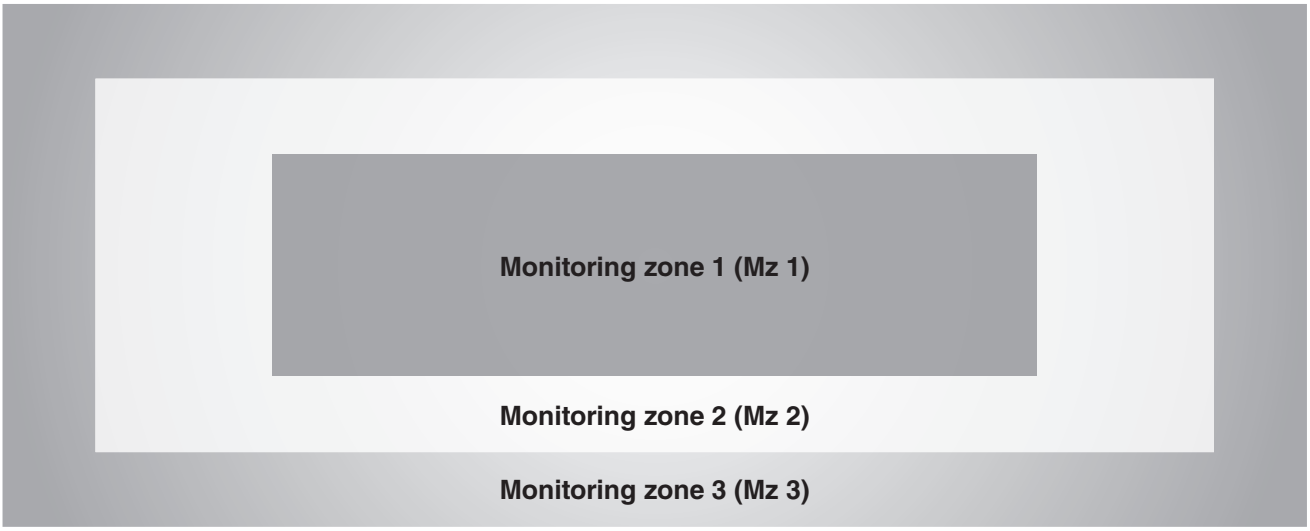
- The label of manual call points should be place behind the screen.

Detector zone No. 16, Detector number 4

Detector zone No. 15, Detector number 3

17 Fire alarm systems for data processing rooms

Monitoring zones (Mz)



Because of the nature of computer rooms the value of the area or risk may vary between the rooms being monitored. Data storage areas are typically considered to be high value areas whereas ancillary rooms may contain equipment/information of a lower value.

This diversity means that the Fire Alarm System must be planned to suit the local conditions. In these application, the construction of the building and zonal separations play a very important role.

The constructional separation between the monitoring zones determines the design of the Fire Alarm System.

The monitoring zones Mz 1 to Mz 3 in the figure determine the monitoring area for each detector and the size of the monitoring area.

Mz 1: Computer room, data medium archive, including false floors and intermediate ceilings (analogous to this, central telephone office, control and monitoring rooms).

Mz 2: Rooms next to Mz 1, related to the IT area (including false floors and intermediate ceilings) for work preparation, peripherals etc. If these areas are separated from Mz 1 by partition walls with a fire resistance of less than 30 min, the FACP should be designed like that in Mz 1.

Mz 3: Other rooms next to Mz 2 that are not part of the IT area.

Detection areas

The monitoring zones must form separate detection areas. Rooms, false floors and intermediate ceilings must each form a separate detection area. Detection areas in the individual monitoring zones may not exceed 500 m^2 in Mz 1, 800 m^2 in Mz 2 and 1600 m^2 in Mz 3.

Choosing the fire detector type

As mainly smouldering fires are expected in Mz 1, only smoke detectors should be installed. (Consideration should be given to high sensitivity smoke sensors to provide the minimum detection time.) In Mz 2 and Mz 3 smoke detectors are also the preferred choice.

Number and arrangement of point-type smoke detectors

Maximum monitoring area A per detector			
	Mz 1	Mz 2[1)]	Mz 3[2)]
Suspended ceiling	40 m²	60 m²	Monitoring according to chapter **Arrangement of point-type fire detectors** (DIN VDE 0833)
Room	25 m²	40 m²	
False floor	40 m²	60 m²	

Mz	Monitoring zone
1)	constructional separation between Mz 1 and Mz 2 at least F 30-A otherwise A like Mz 1
2)	constructional separation between Mz 2 and Mz 3 at least F90

The number of fire detectors should be chosen so that the maximum monitoring areas (A), shown in the table (monitoring areas of point-type smoke detectors), are not exceeded. In case of 2-zone or 2-detector dependency the monitoring areas stated for each smoke detector must be reduced by at least 30%.

If 2-zone or 2-detector dependency is planned for activation of fire protection facilities, such as automatic extinguishing systems, the monitoring areas stated in the table should be reduced by around 50% for each detector.

A ventilation system should be integrated into the monitoring so that both incoming and outgoing air is monitored. A separate detector zone should be planned for the ventilation system.

Response of hidden detectors, e.g. in ventilation ducts, must be displayed optically in the entrance area of the monitoring zone.

17.1 Fire alarm systems for rooms with electrical and electronic systems

General

Rooms with electrical and electrical systems include rooms and ancillary rooms for

- data processing systems,
- energy supply and distribution systems, including uninterruptible power supply (UPS),
- measuring and control systems,
- switching centres and PBXs,
- air conditioning systems and cabinets,
- CNC machines,
- CAD/CAM systems.

Room monitoring

The design of the FACP is determined by the type and use of the room. A distinction is made between

- rooms with electrical systems and equipment; planning must consider additional equipment monitoring.
- rooms with electronic data processing systems (data centres). Planning should take account of additional requirements (see Fig. Monitoring zones) and additional equipment monitoring.

Equipment monitoring

Equipment monitoring, which is possible only in combination with room monitoring, is limited to direct monitoring of the equipment. This allows developing fires in the equipment to be detected and reported at an early stage.

Planning, implementation and maintenance of the equipment monitoring and equipment protection system must be coordinated between the equipment manufacturer, the operator, the planner and the Fire Alarm System and extinguishing system installers. Essentially, the complete fire protection concept, including equipment protection, depends on the following impacting factors, which should be determined in the course of a risk analysis.

- Internal and external fire hazards,
- Person protection,
- Economic value,
- System interruption,
- Replacement time,
- Size of the building, position, constructional separation and technical equipment,
- Size and configuration of the system,
- Serviced or un-serviced operation,
- Existing protective measures.

To ensure end-to-end fire protection all facilities serviced by an air conditioning system should be integrated into the monitoring scope.

The protection limits can be defined with the help of these impacting factors in combination with the individual need for safety and protection.

Planning

The equipment monitoring system should be chosen and adapted to take account of the operating conditions. The following criteria should be considered:

- Operating and ambient conditions (e.g. temperature, moisture, dust, aerosols, vapours, radiation),
- Type of operation (e.g. serviced and un-serviced areas, equipment accessibility, short-term or long-term operation),
- Type of cooling (naturally ventilated, externally ventilated and liquid-cooled equipment),
- Electromagnetic influences.

In case of equipment protection systems a maximum 5 neighbouring devices with associated functions may be assigned to one extinguishing area. If the devices are more than 5m apart or if they do not have associated functions, they must be assigned a separate extinguishing area. As smoke occurs with most fires, smoke detectors are the preferred choice. If equipment is cooled with liquid media, special adaptations may be required for the detector systems depending on the design of the device.

Detector arrangement

If aspirating smoke detectors are used, they must record the main cooling air flows. In general, this is achieved if the aspirating device is installed very close to the air outlet of the monitored equipment. Aspirating smoke detectors may not affect the cooling air flow of the respective device. It should be ensured that the operating safety of the protected device is not reduced. It must be possible to maintain the device without hindrance. The arrangement of aspirating smoke detectors should be coordinated with the respective equipment manufacturer.

If point-type fire detectors, preferably smoke detectors, are installed in equipment, the volume to be monitored may not exceed 2.5 m^2 per detector. At least one detector should be used for each device. If installations in the device hinder the detector response, more detectors must be installed.

For equipment monitoring of individual devices point-type fire detectors may also be installed outside the equipment, taking account of the flow conditions in the room, if:

- the detector can be installed in the air flow,
- the distance between the detector and the air outlet of the device is less than 1m,
- the air exchange rate and air speeds in the room are normally negligible.

Detector zones

The detectors for room and equipment monitoring must be connected in separate detector zones in a Fire Alarm Control System. Several detectors on one equipment unit or equipment group with associated functions may be aggregated into one joint detector zone.

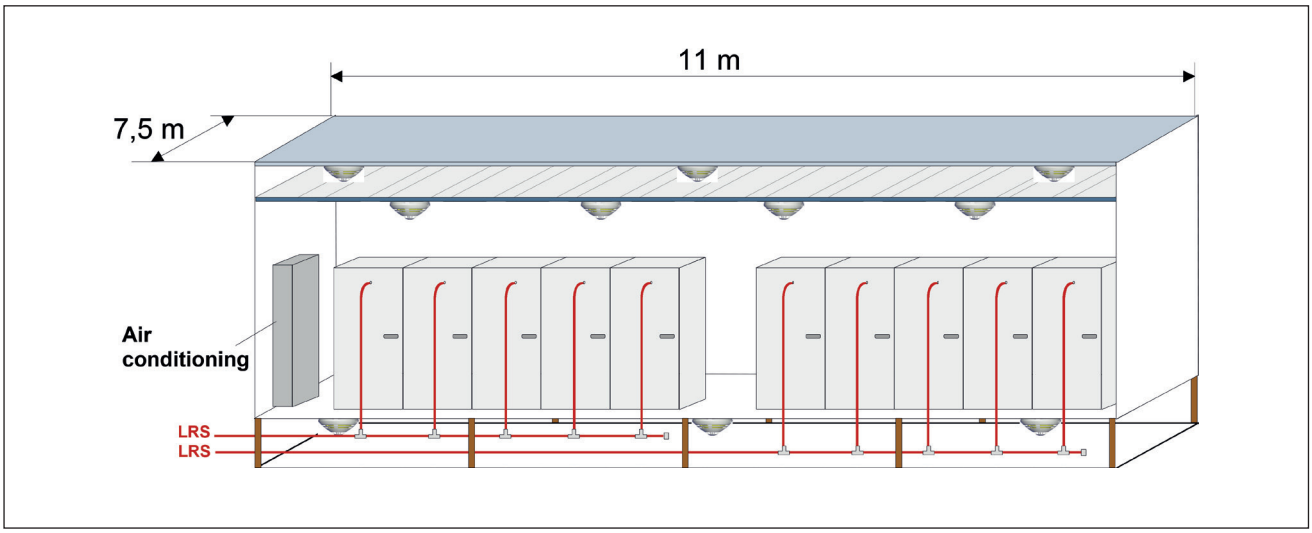
If point-type fire detectors are used, a detector zone should be limited to 5 devices with similar functions.

No more than 5 devices with associated functions may be monitored by one aspirating smoke detector so that the fire is detected quickly, reliably and selectively. It may be necessary to reduce this number further.

- due to the number and type of air outlets on the device, where they are not directly next to each other.

If the devices are more than 5m apart or if they do not have associated functions, separate suction smoke detectors must be installed.

Planning example for data processing rooms (DP)



DP-room with a complete monitoring of location and objects in the cabinets.

Suspended ceilings and floor of the DP-room:
7,5m x 11m = 82,5m²
max. monitoring area 40m²

DP-room Zone 1:
7,5m x 11m = 82,5m²
max. monitoring area 25m²
82,5m² : 25m² = 4 detectors

Air duct system: 1 air duct detector

Object monitoring:
One detection area are max 5 monitored objects

Objects:
10 DP-cabinets = 2 detection area with a smoke aspirating system per area

Fire detection with beam detectors

- General rules apply as for point detectors
- 600mm from the highest point
- Avoid beams close to walls (500mm) or where temporary obstructions may occur
- Mount transmitter & receivers on a solid surface not affected by wind or natural temperature changes
- Additional units may be included in atria to detect at lower levels, to counter stratification effect

Room height R_H	D_H	A	Roof slope α	
			< 20° D_L	> 20° D_L
< 6m	6m	1200m²	< 0.3m to 0.5m	0.3m to 0.5m
> 6m to 12m	6.5m	1300m²	0.4m to 0.7m	0.4m to 0.9m
> 12m to 16m*	7m	1500m²	0.6m to 0.9m	0.8m to 1.2m

D_H	Max. horizontal distance from any point to of the ceiling to the next detector beam
A	Max. monitoring area per detector = max permitted horizontal space DH multiplied with the max. space between transmitter and receiver, for a transmitter/receiver unit and reflector (the value must be doubled)
D_L	Distance between detector to the ceiling or roof
α	Angle formed by the roof/ceiling incline and the horizontal; if a roof or a ceiling has different inclines, e.g. shed roofs, the smallest incline should be used in calculations.
	Depending on the use and ambient conditions (e.g. rapid fire development and spreading smoke)
*	For room heights over 12m it is recommended to provide a second monitoring area. Detectors of the lower area should be mounted displaced to the detectors of the upper area.

High bay warehouse systems-excerpt from DIN VDE 0833-2:

High bay warehouse systems are rack storage systems where the storage height (base to top of the stored materials) exceeds 7.5m. If aspirating fire detectors are used to detect fire, the aspirating tubes must be fitted to the outside of the racks or, in case of double racks, preferably in the middle shaft.

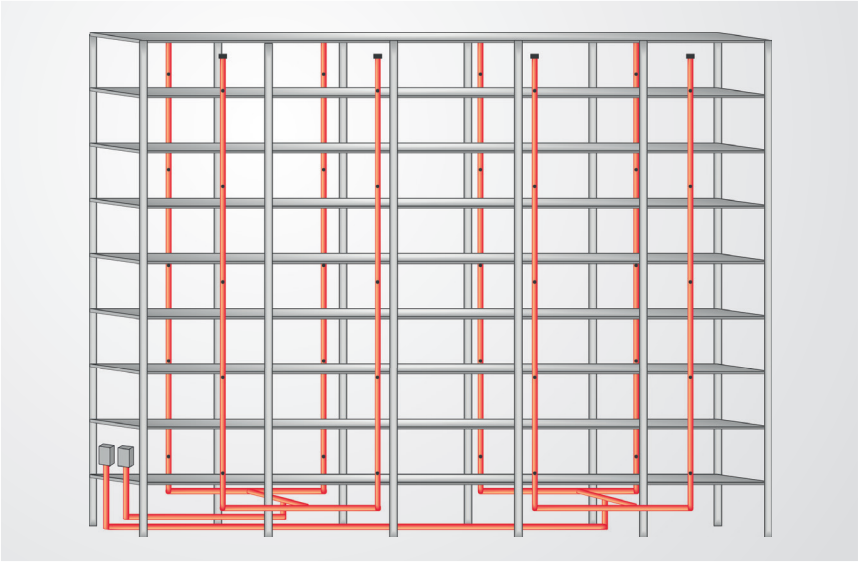
The top of the aspirating inlet for rack monitoring may not be more than 6m from the ceiling.

With a vertical distance of max. 6 m, each detection level should have one aspirating inlet. The maximum horizontal distance between the aspirating pipes may not exceed 6 m. The first and last vertical row of the aspirating inlets should be no more than 3 m from the end of a rack.

The maximum distance between smoke suction inlet and the outside of the rack may not exceed 3 m.

These distances apply also in case of 2-detector and 2-zone dependency.

Each suction smoke detector should be assigned to a separate detector zone. One detector zone may not contain more than 20 aspirating inlets.



18 Extinguishing Systems

18.1 Extinguishing Control Computer 8010 Series 04 Wall Mounting

The different extinguishing systems can be controlled in compliance with the standard using extinguishing agent control system 8010 (LMST). The microprocessor-controlled unit rovides all the relevant control and monitoring options.

Two types of operation are used to directly control the different extinguishing systems (i.e. not via the extinguish interface pursuant to the VdS):

1. Extinguishing agent control system
2. Aquasafe (pulsed control of mist water extinguishing systems)

The extinguishing system requires an 'electrical control unit' if VdS-compliant control is to be implemented. This unit provides monitored dual wire lines in order to control a VdS-compliant extinguishing area. On the fire alarm system side, the 'electrical control unit' can be implemented by the SIE micromodule or an esserbus® transponder. A FACP with redundant CPU card is required for normative reasons if additional extinguishing areas are to be controlled.

If existing fire extinguishing systems are to be upgraded or expanded, control units are often no longer available for the outdated extinguishing system or an investment is no longer appropriate for reasons of cost.

In this case the LMST 8010 can take over the control function for the extinguishing system.

However, this kind of direct valve control is not VdS-approved. A FACP IQ8Control or FlexES Control can operate a maximum of 16 extinguishing agent control systems 8010. However, a maximum of 8 extinguishing agent control systems can be used for each loop.

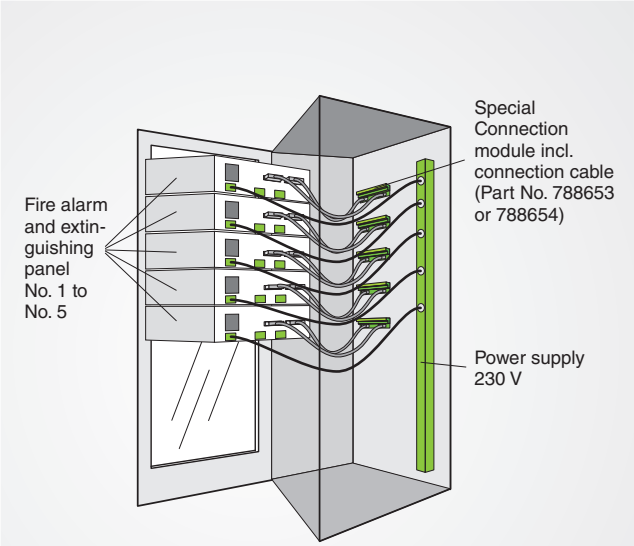
As the extinguishing agent control system 8010 units operate independently, a maximum of one extinguishing area can fail at a time. However, this mode of operation is not VdS-compliant, as collective system recognition does not generally exist for these extinguishing systems.

The extinguishing agent control system 8010 can be used as follows:

1. as an electrical control system for an extinguishing system. As an individual unit, the extinguishing agent control system 8010 provides a total of 8 detector and 13 control groups as inputs and outputs to fulfil the VdS requirements (Directive 2095 and 2496) for electrical control systems for extinguishing systems. This directive defines how a fire alarm system communicates with an extinguishing system (regardless of the extinguishing agent). Additional standards and directives also apply.
2. as an electrical control system for a fire detection/fire alarm system.

To cost-effectively control several extinguishing areas independently and in compliance with the VdS, it is possible to operate up to 8 extinguishing agent control systems 8010 on one IQ8Control or FlexES Control FACP. Every extinguishing area is monitored by a separate extinguishing computer.
The (decentrally) installed extinguishing computers are then connected to the multi-functional FACP primary line to save on wiring and can also be operated as an integral component of the overall system. As the monitoring and triggering is only performed by the extinguishing agent control system 8010, several extinguishing agent control systems can be operated on any FACP in compliance with the relevant standard.
IQ8Quad, max. 30 units per zone, can be connected to the 8 automatic detector zones using the spur wiring technique. (max. 25 units/zone for dual detector dependency) esserbus® transponders, 32 optocouplers (item no. 808611.10) and 12 relays (item no. 808610.10), can be connected in order to expand the number of controllable outputs (control groups).
These esserbus® transponders cannot be operated in a mixed group with loop detectors.

18.2 Extinguishing Control Computer 8010 Series 04 19-Inch Design



Installation of multiple extinguishing panels in one upright cabinet

Extinguishing panel as per EN 12094-1 for extinguishing zone control in compliance with VdS 2496, with integrated fire detection unit and optional convenient operating and indicating panel.

The slide-in concept enables space-saving, ergonomic integration into a 19-inch housing for installation heights of only 3 height units (13.34 cm). Peripherals are connected at the back of the housing via plug-in cable connections to accessible connection terminals, allowing convenient installation within the housing before the insert is integrated. With the communication transponder (Part No. 808615), a maximum of eight extinguishing control panels can be networked on one esserbus® or powered loop in FACP IQ8Control or FlexES Control. Via the programming interface plugged to the front, the extinguishing panel settings can be adjusted to the specific requirements and information can be transferred for visualising to the master fire alarm system via the loop.

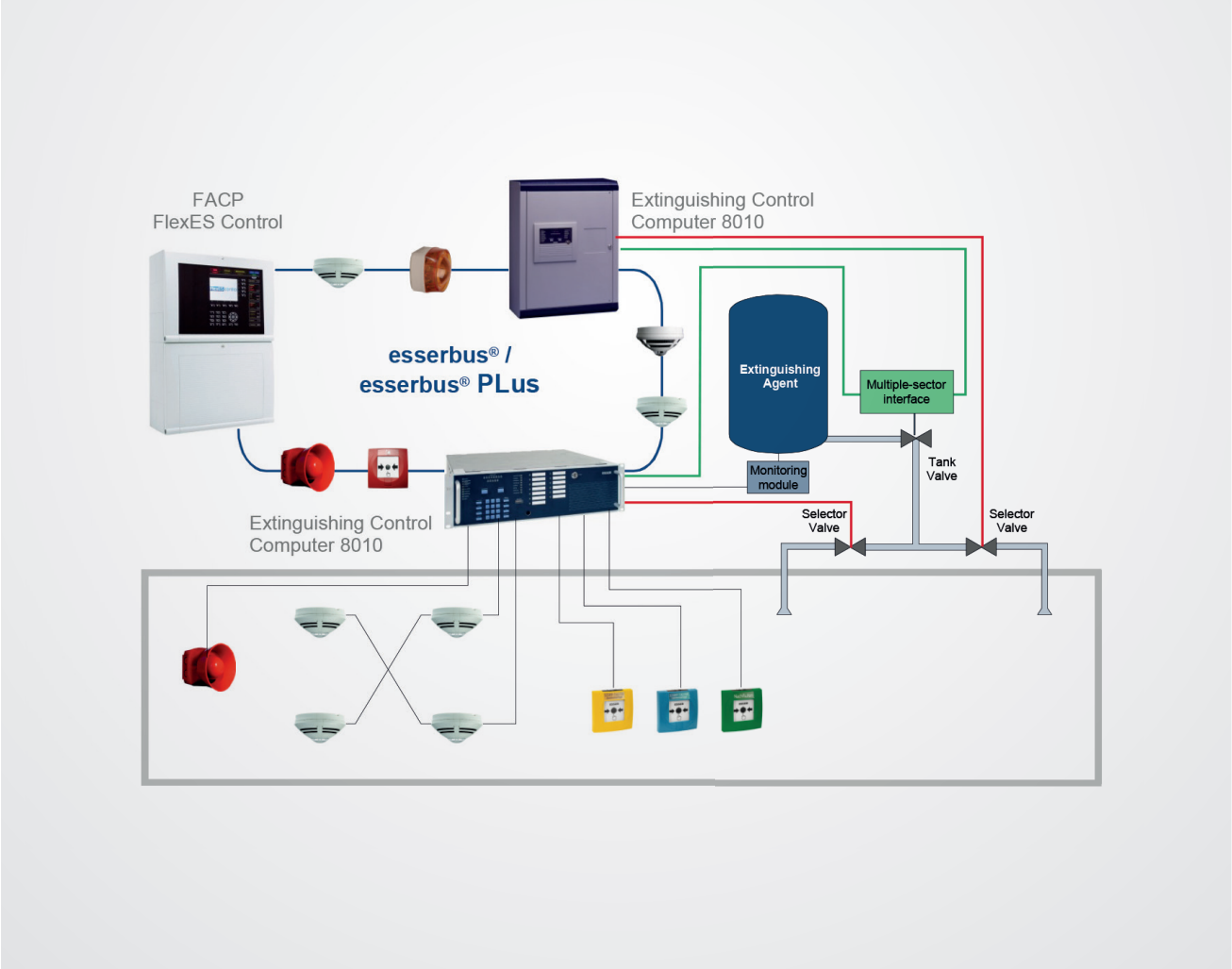
Features

Extinguishing Computer 8010 Series 04

- 8 detector zones for up to 30 Series 9200 or IQ8Quad automatic fire detectors per detector zone (max. 25 detectors in two-detector coincidence)
- 1 detector zone manual alarm
- 1 detector zone emergency stop
- 1 detector zone post flooding
- 1 detector zone blocked extinguishing system
- 1 control input buzzer off
- 1 control input reset control panel
- 8 monitorable relays 30V DC /2A
- 3 floating relays 30V DC /2A
- 2 relays for mains voltage 230V (connection at the back)
- Each output is protected by fuses
- Electronically controlled exhauster control

Operating unit:

- 13 LED-indication with inscription fields for indicating activated outputs
- Mechanical alarm counter
- LED display to indicate the detector zone status
- LED common status indicator
- Keypad can be intuitively handled
- Key operated switch for keypad activation
- Emergency current supply 2 batteries 12V/12Ah (not supplied as standard)



Application example

18.3 Planning guide for extinguishing systems

This planning guide provides an overview of the conceptual structure of extinguishing systems in consideration of national standards and the state of our technology. The applicable knowledge of device documentation, standards and directives cannot replace this planning guide. It represents a guide for planning and modifying current and older extinguishing systems.

Older systems: LMST 3010, 4908, FACP 3007, 3008, 8000, 8007, 8008
Current systems: LMST 8010 series 4, FACP IQ8 Control and FlexES Control

General information

In principle, a distinction is made between extinguishing systems that do and do not present a risk to personnel. The requirements for a compromise between personnel protection and property protection have been elaborated in various standards committees (professional association, VDE, DIN through to the VdS Directives). Extinguishing systems differ based on the extinguishing agent (water, powder, foam, gas). All non-water extinguishing systems are considered to be extinguishing systems with a risk to individuals and require additional personnel protection measures.

This also applies for gas systems that use INERGEN, argon, FM200 or Novec 1310, etc., as the extinguishing agent.

Personnel protection measures

An adequate evacuation time pursuant to VdS is appropriate in this case, which is determined by the installer of the extinguishing system and the activation of two alarm devices from two energy sources and separate control paths (e.g. gas horn, monitored electronic siren, water-activated gong).

An emergency stop function for operator interaction is permitted, but not required pursuant to the VdS.

Redundancy requirement/ failure limitation

In Directive 2496, the VdS requires that not more than one extinguishing area fails or is triggered in case of a fault if a central processing node fails. This applies for all extinguishing systems, regardless of the extinguishing agent. For example, these processing nodes are microprocessors on esserbus® transponders, loops or essernet® modules as well as the central processor. This naturally results in several requirements when designing a system with multi-area extinguishing agent controls.

Several extinguishing areas may not be controlled via a loop module using the extinguish standard interface.

1. Several extinguishing areas of a FACP IQ8Control C/M or FlexES control may not be controlled via the extinguish standard interface.
2. Each extinguishing area must be controlled by a separate loop via the extinguish standard interface and a redundant FACP must be used.
3. A stand-alone control (separate FACP or LMST 8010) can be used for every extinguishing area.

System recognitions

The company Kidde-Deugra, Ratingen, has system recognitions for their FM2000, Novec1230 and LMST 8010 (S 304007, S 300001) systems.

The company G+S Brandschutz, Mogendorf, also has a system recognition (S 398006) for their CO_2 extinguishing systems and the LMST 8010. The extinguish standard interface is not required for these configurations.

What does ‘exempt’ mean for structural and technical systems?

Problems frequently occur in existing buildings when defining the necessary scope of the conversion and extension measures. It is unclear whether components and systems can remain in their current condition from a legal or official perspective, or whether an upgrade is required. It generally does not take long for the term ‘exempt’ to arise. However, confusion regarding the scope also frequently exists in this case.
The ‘Safety Officer’ has researched this topic and the results are provided in the following article.

Quote:
The word Bestandsschutz (exempt) is not included in any standard. It originates from Article 14 of the Constitution, the right of ownership. The protection of ownership includes the protection of structural and/or technical systems that have been lawfully installed or operated. This means that, in principle, a system cannot be unlawful if the standards applicable at the time of installation and/or operation were considered. This justifies the ‘exemption’.
However: the State Building Codes define circumstances under which adjustments to the current regulations are required. This, in turn, means that ‘exemption’ applies to scenarios that have not been described.
Extract: Safety Officer, Issue 19/2005

Loss of exemption

As we already know from fire alarm systems, the applicable standards and directives must be applied at the time of installation and commissioning.
Only these provisions are applicable for the system as long as it retains its original function through maintenance, inspection and repair.

For the precise definition see:
DIN 14675, Chapter 12:
'Changing and extending existing FACP' Examples to support decision-making relating to 'exemptions'. Series IQ8 detectors without isolators can be used to maintain functionality using older detector models (e.g. 1-1051). However, if structural changes result in new monitoring areas that require new detector zones, this is considered to be an extension/ upgrade. Replacing the entire LMST and its scope of protection is also considered to be an upgrade.

Building-specific VdS approval

The approval (initial inspection) of a newly installed fire protection system is subject to a stringent and extensive inspection. As building supervision experts, engineers from the technical testing centre are also able to assess and approve the quality of the system in terms of the relevant building requirements. This also applies for fire alarm systems that must be inspected for compliance with the generally accepted technological standards prior to initial commissioning. Likewise, technical testing centre specialists are also employed as accredited experts wherever property as well as personnel protection is required, for example, in order to examine extinguishing systems with gaseous extinguishing agents.

Contact partners can be located at your local technical testing centre branch.

You can find further information at: www.vds.de

Standard Interface Extinguishing (SIE)

The VdS defines the following communication option when combining a fire alarm system with an extinguishing system:

The transmitter of the information activates a floating contact and issues an alarm to a monitored detector zone. This straightforward design aims to prevent incompatibilities.

This type of coupling does not require a separate VdS inspection.

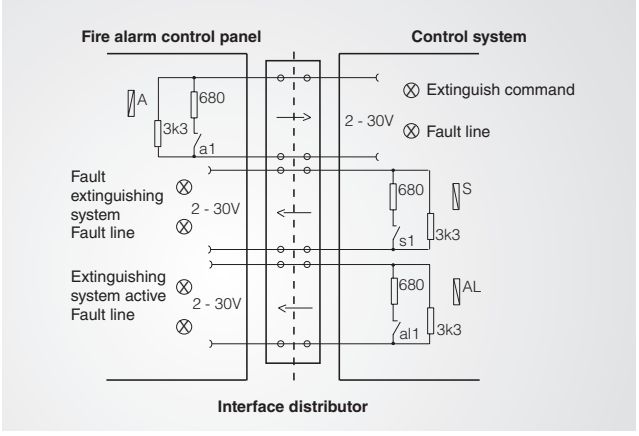
The resistances are set and match the thresholds of the ESSER standard detector zones.

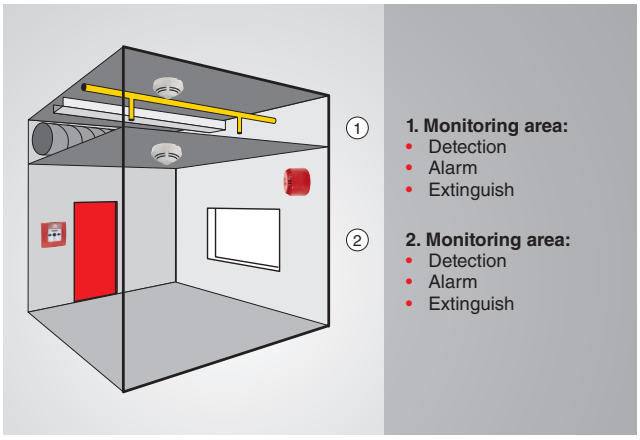
The esserbus® transponder 808613.10 can be used to implement this interface.

Control concept for various extinguishing systems

As explained above, a distinction is made between extinguishing systems that do and do not present a risk to personnel. Furthermore, the selection must also be made in consideration of the VdS directives. Four different approaches are defined: The selection can be made based on the information provided by the planning expert or operator. If the selection can be made 'without VdS consideration', the 'SIE' is generally not included and the extinguishing system is directly controlled by the fire detection section (fire alarm control panel, extinguishing agent control).

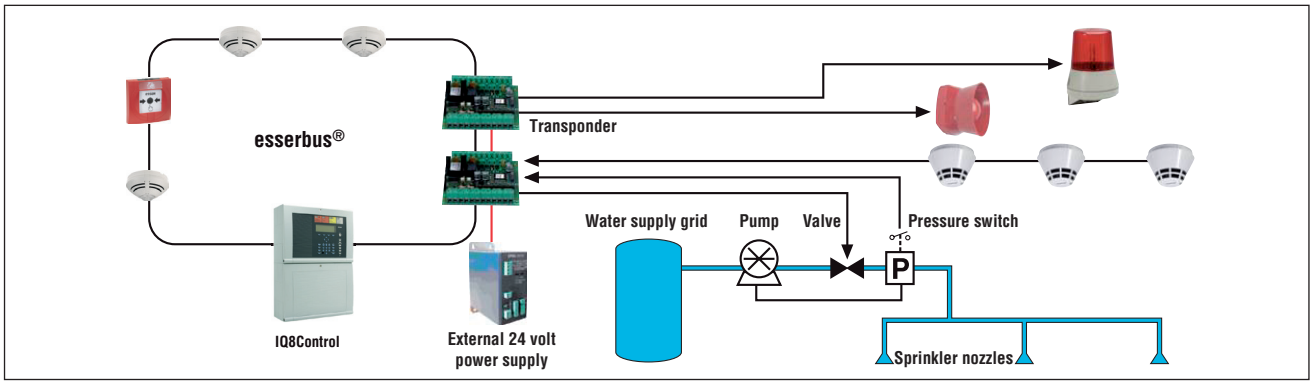
An evacuation period (clearance time) may be avoided for water sprinkler systems, so that extinguishing can commence as soon as the alarm is detected. An evacuation period is required for all other types of extinguishing systems. This may take place electrically or electrically/pneumatically based on requirements 1 to 4. Extinguish standard interface (extract: VdS 2095)



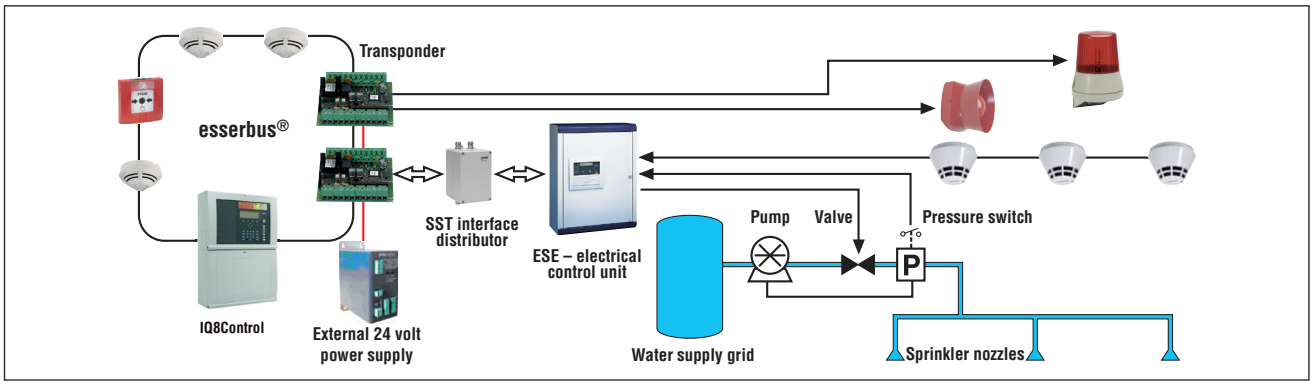


The manufacturers of the extinguishing systems use different types of valves. Both the control voltage (12 V/24 V) as well as the mechanical characteristics (closed/open when not connected to power) differ, so the control concept generally has to be adapted.

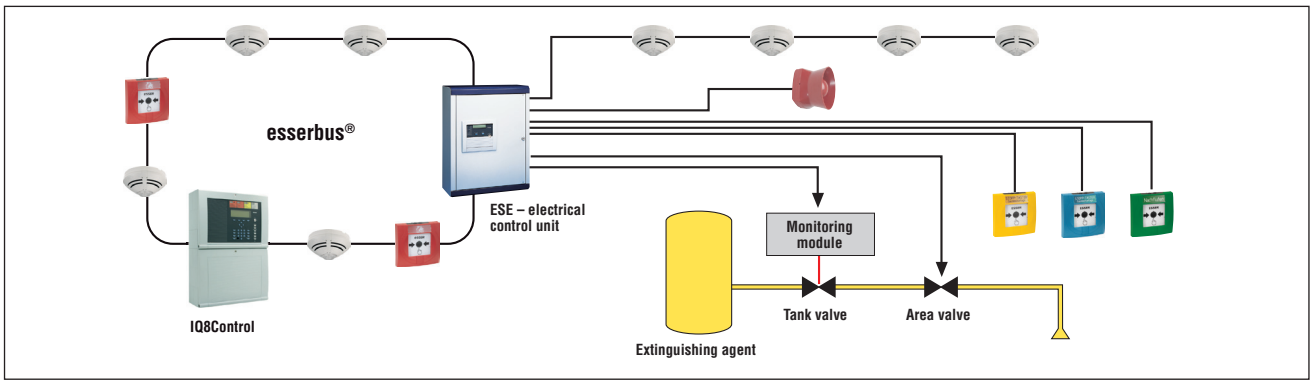
Note: the following figures display a LMST 8010 as an electrical control unit for an extinguishing system. For example, this extinguishing agent control system is used by the company Kidde-Deugra. All available group and relay connections can be used to implement a SIE.



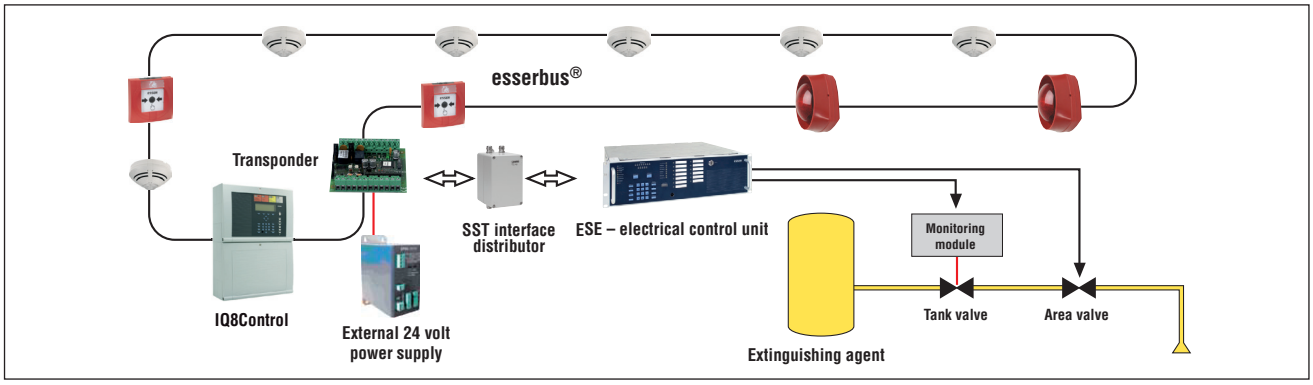
Sprinkler system without SST



Sprinkler system with SST



Gas extinguishing system without SST



Gas extinguishing system with SST

18.4 Alarm Zones

An alarm zone is clearly defined within the standard' but generally it is an area of the building coinciding with the fire compartment boundaries. There must be a clear break between these alarm zones to ensure alert and evacuation messages are not overheard from adjacent areas.

The only other criteria is that an alarm zone may consist of a number of detection zones but not vice versa.

Alarm zones are only required when phased or staged evacuation is required. Therefore it is important that care should be taken to ensure only one message is heard at any one time particularly where two alarm zones are attached.

Requirements for audible alarm devices in Fire Alarm Systems

- The ambient sound pressure levels of the environment must be measured.
- The volume of the alarm device must be at least 65 dB and at all locations must be 10dB higher than the measured ambient sound pressure level. If necessary, several alarm devices may have to be planned.
- The sound pressure level of the signal tone (e.g. DIN tone) that will subsequently be used for the alarm in this area must be measured.
- The signal tone must be clearly audible above the ambient noise. In case of similar frequencies a different signal tone must be chosen and/or the alarm must be signalled with an additional visual alarm device.

In accordance to the requirements of DIN 33404, an alarm signal or signal template for alarms (e.g. comprising signal tone + speech output) must always begin with the DIN tone. Then a speech message may be output.

Alarm range

An alarm range is generally taken to mean a "section of a property with allocated internal alarm devices".

In practical terms this is a single floor or fire section of a building.

As an orientation aid, alarm areas are classified according to statutory building requirements:

If not specified:
An alarm area could also include several fire sections or an entire building. No more detailed definition for the alarm area is currently available in the German standards.

If specified:
The alarm area should comply with structural fire prevention limitations. This is, for example, a fire section or a floor of the building. The installation must fulfil the requirements E30 (to ensure a min. operation time of 30 minutes in a fire).

According to DIN 54-3 (draft)

In case of incidents that require immediate action the transmission sequence of tone and message must be within the parameters stated in the table. For other messages it is permissible to extend the duration between sending and repeating the message.

Warning signal – duration 4s to 10s
Then
Short pause – duration 1s to 2s
Then
Send the message
Then
Pause – duration 2s to 5s

Comment 1	The time between the start of each repeated message may not exceed 30s.
Comment 2	In certain circumstances the length of the pause may be longer than stated - for example in rooms with long reverberation times - but the time between the start of each repetition should still not exceed 30s.

18.4.1 Planning audible alarm devices

Calculating the maximum number of alarm devices

The permissible number of bus-enabled alarm devices on the loop depends on the type of alarm device and the length of the loop. The individual load factors of the bus devices must be added together (see specific detector data). To prevent overloading, he maximum permissible total load factor of a single loop is 96.

Commissioning/maintenance

IQ8Quad fire detectors with integrated alarm device and separate audible alarm devices e.g. IQ8Alarm must only be commissioned and maintained by qualified technicians who are familiar with the Fire Alarm System IQ8Control. If unauthorised work is carried out on the fire detectors, this invalidates all guarantee and warranty claims.

The fire detector and the integrated alarm device are configured in the customer data programming of the IQ8Control Fire Alarm System. All functions and the status of the fire detector are checked cyclically inside the detector and transmitted to the panel during test operation of the system, where they are displayed in case of a fault.

Definition of the sound pressure level

The effective sound pressure is the change in pressure which is generated by vibrating air molecules and which is subjectively perceived as volume.

The human ear can hear within an effective sound pressure range of 0 to 120dB at a frequency of 1000 Hz. This corresponds to a change in sound pressure of 20N/m^2 (= Pa) or a factor of 1: 1,000,000 for the sound pressure level.

For the sake of simplification and to make the mathematical calculation easier the logarithmic ratio of quantities decibel (dB) was introduced to describe the sound pressure level. The table below shows the expected sound pressure levels in certain environments.

Environment	Sound pressure level (dB) [1]
Living area at night	< 30
Individual offices	50
Open-plan offices	55-60
Warehouses with electric fork lift trucks	65-70
Warehouses with diesel fork lift trucks	70-75
Production halls with machines or very intense traffic noise	> 80
Jack hammer at a distance of 10m	100
Police, ambulance or fire siren at a distance of 10m	110
Hammer blows from a smithy's shop at a distance of 1m	130-150

[1] Examples – the actual sound pressure levels may differ considerably from these values.

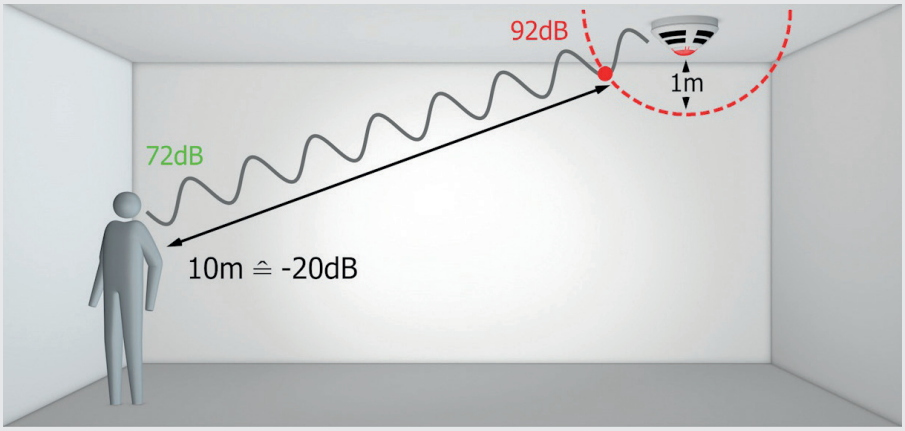
In practice the following applies: Change in sound pressure level with distance

The sound pressure level emitted from audible alarm devices is given for a distance of 1m from the source of the noise.

Every time the distance to the noise source doubles the sound pressure level is attenuated by 6 dB (free-field measurement).

The 6 dB attenuation corresponds to a 50% reduction in the sound pressure level.

- Each time the distance to the noise source doubles this reduces the sound pressure level by 50% (-6dB).
- At a distance of 10m to the noise source, for example, the sound pressure level is reduced by -20 dB.
- A +10 dB increase in the sound pressure level is perceived as a doubling of the volume (and vice versa).
- Differences of 3dB are clearly heard – smaller differences in the sound pressure level are hardly noticed or only in a direct comparison.



Calculating the level variation (L) for sound pressure for audible alarm devices:

ΔL (in dB) = 20 x log (r2 [m] / r1 [m])

Example:
r1 = 1m distance to the noise source
r2 = 20m distance to the noise source

Height/m	Acoustical alarm device with 92 dB(A) / 1m											
1	92											
2	86	85	83	81	79	77	76	75	74	73	72	70
3	82	82	81	79	78	77	75	74	73	72	72	70
4	80	80	79	78	77	76	75	73	73	72	71	70
5	78	78	77	77	76	75	74	73	73	72	71	70
6	76	76	76	75	75	74	73	73	72	71	71	69
7	75	75	75	74	74	73	73	72	71	71	70	69
8	74	74	74	73	73	73	72	71	71	70	70	69
9	73	73	73	72	72	72	71	71	70	70	69	68
10	72	72	72	72	71	71	71	70	70	69	69	68
11	71	71	71	71	71	70	70	70	69	69	69	68
12	70	70	70	70	70	70	69	69	68	68	68	67
0	1	2	3	4	5	6	7	8	9	11	12	
Distance/m												

Leads (db), rounded

19 Installers' Responsibility

Required Prior to Commissioning

The following information is required prior to commissioning being carried out to ensure that the system is set up and tested in accordance with the customers requirements and specification:

- As fitted drawings detailing all devices installed and the sequence they are connected on each loop
- Copy of design specification with variations
- Label schedule per loop detailing address details for each device that have been agreed with the building user and cross referenced to as fitted drawings
- Cause and effect schedule. The system will need to be set up to a predetermined cause and effect, this needs to be confirmed in writing or in the form of cause and effect matrix

System installation

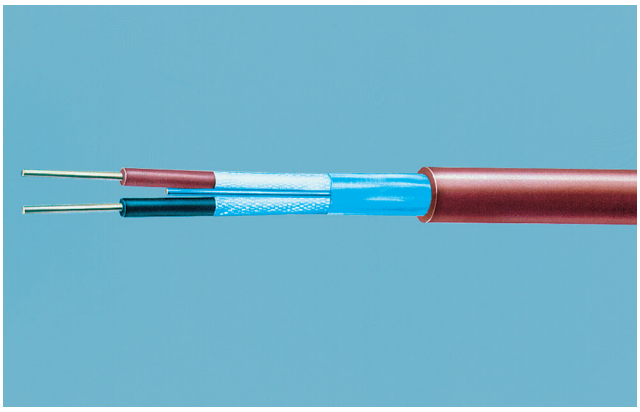
- Install all equipment in accordance with the standards.
- Use correct type of cable.
- Test the cables, continuity and earth, and provide certificates.
- To flag up any Variations that affect the Design
- Produce a set of >as fitted< drawings.
- Sign off an appropriate installation certificate.

Requirements of cables

Description of the cable specification:
E → Operation without functional deficiency
XX → fire resistance (in minutes)

Example:
E30 → Sure operation for 30 minutes in a fire condition

- Check the requirements for standard or enhance fire resistant cable, pls. employ only twisted and shielded cable.
- Core size not less than 0,8 mm (diameter), e.g. type I-Y (St) Yn x 2 x 0,8 mm.
- Where exposed cable are below 2 m, additional mechanical protection should be considered.
- The colour of the outer sheath should be preferably be red although other colours are permitted as long as it is common throughout the building and does not clash with any other electrical services.
- Fire cables should be segregated from all other services, not share the same conduit, use a separate compartment if common trunking is used, avoid running adjacent to lightning conductor or alongside power lines and avoid electromagnetic interference.



Main power supply

- For reasons of electrical safety, the mains supply to the system should be via a separate circuit breaker, taken from the load side of the buildings main isolating device.
- This circuit breaker can incorporate a switch if necessary but in either event should be labelled "FIRE ALARMS – DO NOT SWITCH OFF" this supply should be use for the sole purpose of the Fire Alarm System.
- The power supply must be monitored an any malfunction displayed at the FACP as a fault message.

Commissioning

- Functional testing of all equipment.
- Confirm fire plan or cause & effect is correct as per design.
- Check for any incorrect positioning of all detectors or other devices - snag them or list them as variations.
- Carry out staff training.

Documentation

On completion of commissioning and user training all documentation will have to be collected and handed to the client or their representative. This will include;

- Design, Installation and Commissioning certificates
- Cable and insulation resistance test records
- "As fitted" drawings of the final installation, including cable run details
- Product manuals and user instructions
- System log book e.g. 798655.GB0 and product manuals
- A copy of the fire plan documentation against which the commissioning engineer programmed the system
- The designer's specification and a written list of agreed Variations

Inspection and testing of the entire system

At this stage the entire system should be inspected and tested, in particular:

- Every Manual Call Point, automatic fire detector, sounder, transponder and indicator.
- Check that all devices are correctly labelled and display the correct information on the control panel (FACP).
- All sound pressure levels should be measured and recorded.
- Record the transmission of all wireless components and document the installation of the wireless devices in the building design and photographically.
- Any transmission of signals to remote centres or equipment should be proven.
- A suitable zone plan is mounted adjacent to the FACP.
- No changes of the building have affected the siting of equipment or the effectiveness of the system, e.g. an additional partition requiring additional detectors.
- Mains and Stand-by power supplies are adequate and designed to support the system for a specific period, e.g. 24, 48 or 72 hours.
- As far as reasonable, ascertain that the installation complies with the standard and certificates are provided by the installer.
- Ensure that there are no obvious shortcomings with the system as a whole and that all the documentation is correct.

It is also highly recommended that the system is soak tested for up to a week, dependant on the system size, so that any teething problems are identified without giving rise to any false alarms.

Servicing and Maintenance

In order to limit false and unwanted alarms, servicing and maintenance of the system should be carried out by a competent company.

Generally, a contract for periodic servicing and emergency call out should be set up before the system becomes operational.

Table 1 - Sensor Application Guide

This guide is aimed at providing advice on the most suitable type of sensor for specific applications. Obviously conditions may vary depending on the particular application and if there are any doubts we suggest you consult one of our field sales advisors.

General Application for Sensor	Preferred Option	Option 2	Option 3	Additional notes
Air extraction ducts	Duct detectors	Aspirating		
Air Handling Unit (AHU) rooms/ plant rooms and lift motor rooms	Aspirating			
Airport terminals	O^2T	OTG	Video	
Animal houses, stables, zoo's etc.	Aspirating	T		
Areas of high electrical fields	Aspirating			
Areas of high risk like historic houses	Aspirating	OTG	Radio detection	Suggest time out feature, used when reduced sensitivity is required
Atrium	Beam	Aspirating vertically		
Bakery	O^2T	OTG		
Battery re-charge rooms	Ex (IS) O^2T	Ex-Flame		
Bedroom	OTG	O^2T		
Bedroom - Smoking	OTG			
Bedroom with adjacent Bathroom	O^2T F/So (p)	OTG (p)		Options dependent on severity of steam leakage into bedroom
Bedroom with bath or kitchen attached	O^2T F/So (p)	OTG (p)		Options dependent on severity of steam leakage into bedroom
Boiler room with coal or coke	O^2T	OTG		
Boiler room clean with gas/oil/ electrical source	T class B	O^2T		
Cable duct ways, cable funnel	Linear heat	Aspirating	Beam	Watch out for obstructions for Option 2
Car park (enclosed), Underground garage	T	OTG (p)	O^2T (p)	
Changing rooms alongside with showers etc.	O^2T	T		
Church's or Cathedrals with open high ceilings	Beam/Aspirating	O^2T		
Clean data processing room	OT^{blue} (p)	Aspirating		Watch for rapid air changes
Cleanrooms	OT^{blue}	Aspirating		
Cold storage	Aspirating	T		Avoid fitting of heat detector near open doors
Conference rooms, smokers' office	O^2T			
Corridors, stairwells or internal passageways	O^2T	OT		
Data centers / Server rooms	OT^{blue}	Aspirating	OTG	
Disco	OTG	O^2T		

General Application for Sensor	Preferred Option	Option 2	Option 3	Additional notes
Electrical enclosures, switch cabinets or plant rooms	OT^{blue}	O^2T		
Enclosures open to air	Ex-Heat	Ex-Flame		
Event locations	OTG	O^2T		
Exhibition halls	OT^{blue}	T		
Factory, Workshop	O^2T	OT^{blue}	OTG	
Flour Mills	O^2T	OTG		
Garage work areas, multi-storey parking lot, underground parking lot	T	O^2T (p)	OTG	
Hazardous areas, areas with a potentially explosive atmosphere (ATEX approval)	O^2T Ex (i)/ O Ex (i)/ T Ex (i)			All devices intrinsically safe
Heritage building e.g. Historic house	Aspirating	O^2T		
Hospitals	OTG	O^2T/OT		
Hotel rooms	O^2T F/So (p)	OTG (p)		
Humid environmental condition	O^2T			
Intermediate ceilings, false floors	OT^{blue}	Aspirating		
Kitchen large commercial	O^2T (p)	T class B		
Kitchen small domestic	O^2T (p)	T class B		
Laboratories	OTG	O^2T	OT^{blue}	Wide variation dependent on use, contact engineer
Laundry rooms large, high ceiling	Beam	T class B	Flame	Consider linear heat around machinery
Laundry rooms small, low ceiling	O^2T	T class B		
Laundry storage	O^2T	T class B		
Libraries	OT^{blue}	OTG	Aspirating	
Manufacturing - Heavy industrial with strobes, welding and forging	O^2T	OTG		
Manufacturing - High technology/ Scientific Laboratories	OTG			
Multi-functional halls	OTG	O^2T	OT^{blue}	
Museums and Art Galleries	O^2T F/So	OTG	OT^{blue}	
Normal office or working area	O	O^2T	OT^{blue}	
Offices or working areas	O /So	O^2T / FSo	OTG	
Open high ceilings in Churches or Cathedrals	Aspirating	Beam	Flame	Watch number of candles lit for Option 3
Paint shops, spray booth and car body repair shop	Flame	T	Linear heat	Watch out for hazardous requirement
Power Plant	O^2T	OTG		
Printing plants, paper stocks	O^2T	OTG	OT^{blue}	

General Application for Sensor	Preferred Option	Option 2	Option 3	Additional notes
Prisons / secure accommodations	OTG	O^2T	O/Aspirating	
Production workshops with high dust accumulation	O^2T	OT^{blue}		
Pubs, Bars, Restaurants	O^2T	OTG		
Radioactive areas	T / O / O^2T / OT^{blue}/ OT^{blue}-LKM / O^2T Ex (i)/ O Ex (i)/ T Ex (i)			All devices P/N "*.NU"!
Restaurant area	O^2T	T		
Refineries	OT^{blue} (p)	O^2T	OTG	
Retail shop	O^2T	OT	OTG	
Retail shops high ceilings	Beam	Aspirating		
Retail shops normal ceiling height	O^2T	OTG		
Retail storerooms	O^2T	OTG		
Retirement homes	OTG	O^2T F/So	OT^{blue}	
Room with open wood or coal fire	O^2T	T class B		
Rooms with gas fire	OTG	OT^{blue}		
Shopping centers	O/So	O^2T/FSo	OT^{blue}	
Spray booths, spray shops	Flame			
Steam rooms, sauna or shower areas	O^2T	OT^{blue}		
Store rooms, production depots with low dust accumulation	O^2T	OT^{blue}		Subject to material in store
Telecommunication	OT^{blue}	O^2T	OTG	
Theaters, Operas and Nightclubs	OTG	O^2T		
Tunnels	Linear heat	Flame		
Unheated spaces - Attics pump houses, service intake rooms, etc.	O^2T			
Ventilation ducts	OT^{blue}-LKM			Consider the Venturi air duct module
Warehouse loading bay	T	Flame	O^2T	
Warehouse with inflammable contents	OT^{blue}	O^2T (p)	Flame	
Warehouse with low and high dust accumulation	Beam/Aspirating	OT^{blue}/O^2T		Option 1 watch out for fork lifts, trucks and cranes
X-ray or other high EMC areas	Aspiration	OTG		

T = Heat detector
TD = Rate-of-Rise heat detector
O = Optical smoke detector
F/So = integrated Flasher & Sounder
(p) = parametrized
OT = Multisensor detector (smoke/heat)
OTG = Multisensor detector (smoke/heat/carbon monoxide)
EX… = for hazardous areas (IS = intrinsically safe)
So = Sounder

Table 2 - Choice and siting of automatic sensors

Specific risk	Preferred solution	Alternative	Advise
Aerosol	OTG (p)	O^2T	If possible use Timezone disablement on O^2
Aerosol (excessive chemicals)	Flame	OTG	OTG may be suitable depending on aerosol
Burning toast/food	OTG (p)	T	
Cigarette smoke (excessive)	O^2T (p)	T	This is a FIRE therefore manage with techniques such as Timezone disablement on O^2
Cooking fumes	O^2T (p)	T	
Dry Ice (CO^2)	OTG		
Dust (temporary e.g. Builders clear up periode)	O^2T		
Dust or lint (excessive)	OTG (p)		
Fork lift trucks & cranes	O^2T		
Fumes from hot oil based machines (suds etc.)	O^2T (p)	T class B	
Heating – Wood, coal, coke or flame effect gas	O^2T	T class B	Dark or invisible smoke
High humidity (up to 95% RH)	O^2T		
High powered electro-magnetic equipment (X-ray, machines, scanners etc.)	O^2T		T, if interference very strong
Insect & harvest flies or small spiders/mites	O^2T		
Low humidity (less than 15% RH)	All types		OTG could have reduced live time
Rapid air changes	All types		
Soldering	O^2T		Light smoke
Steam or water vapour (excessive/constant)	O^2T		
Storage of different material	OT^{blue}	T class B	Detection of different smoke
Temperature - high ambient	O^2T	T class B	
Temperature - low (permanently below 0°C)	All types		
Temperature - rapidly changing			TD not suitable
Vehicle exhausts	O^2T	OTG	
Welding or brazing	O^2T		

T = Heat detector
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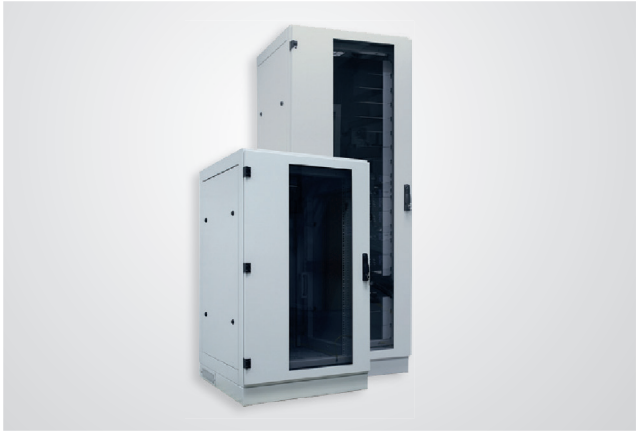
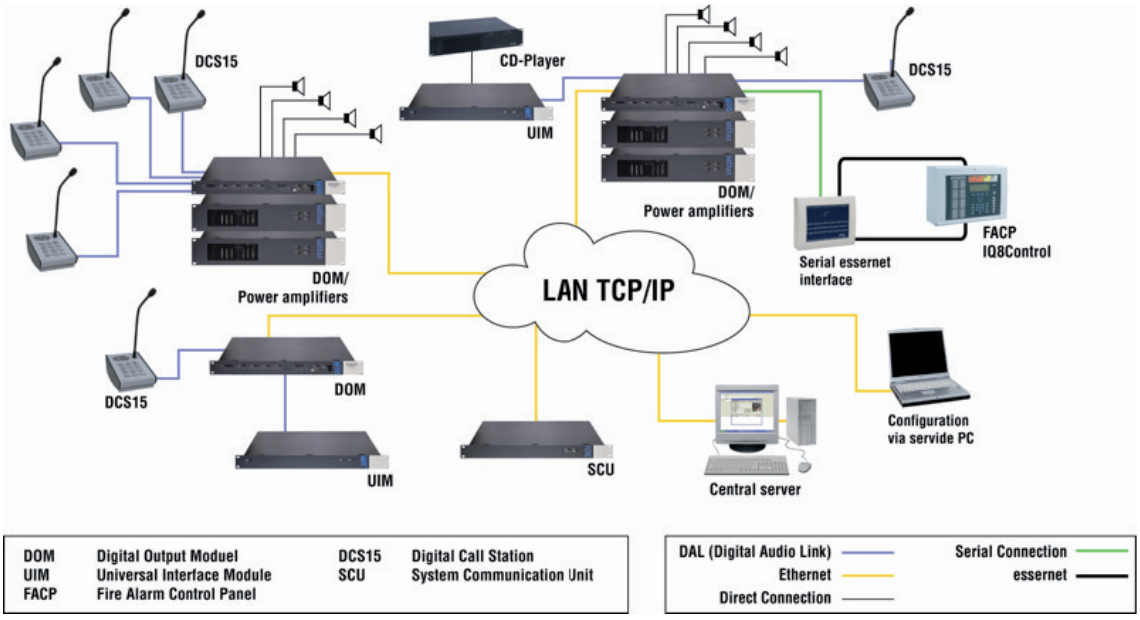
20 Voice alarm and public address system

A voice alarm system and public adress can be used for issuing alarms anywhere that hazards to people can be expected. Voice alarms are particularly effective in buildings and rooms frequented by visitors or other people who are not trained how to act in an emergency or where visual signal devices cannot always be clearly recognised. An especially high level of risk exists in the case of people who are dependent on external help in an emergency, such when evacuation of the building is necessary. This may include people who are ill, the elderly and children.



The voice alarm system is mainly used in combination with a fire alarm control panel for emitting alarms. In practice, the voice alarm system is also used for tasks outside of this area of application. Typical examples of this include spoken messages such as advertising or calling people in airports, announcements at train stations or playing background music. Different requirements are placed on the voice alarm system depending on this combined use as an alarm and as a general public address system. For example, external loudspeakers which can generate a high volume level are required for voice alarms. At the same time, however, it should be possible to transmit a high-quality music signal in other areas and ideally also to control the volume for individual areas.

The requirements for the areas of safety, comfort and flexibility demand a high level of specialised skill for the planning and implementation of a system as well as very good knowledge of individual product components.



21 Lightning and surge protection

764730
Local equipotential bonding Surge arrester

764732
Local equipotential bonding Surge arrester

General

In a dangerous situation, hazard alert systems (fire alarm systems or burglar alarm systems) shall signal actively, and remain passive in safe situations. Malfunctions of these systems (no response in case of danger, or alarm signal in case of no danger) are undesirable and expensive. False alarms sent by hazard alert systems result in expenses, which, in the industrial countries, amount to several hundred million Euro per year. Another aspect of malfunctions is the possible direct or indirect danger to human lives.

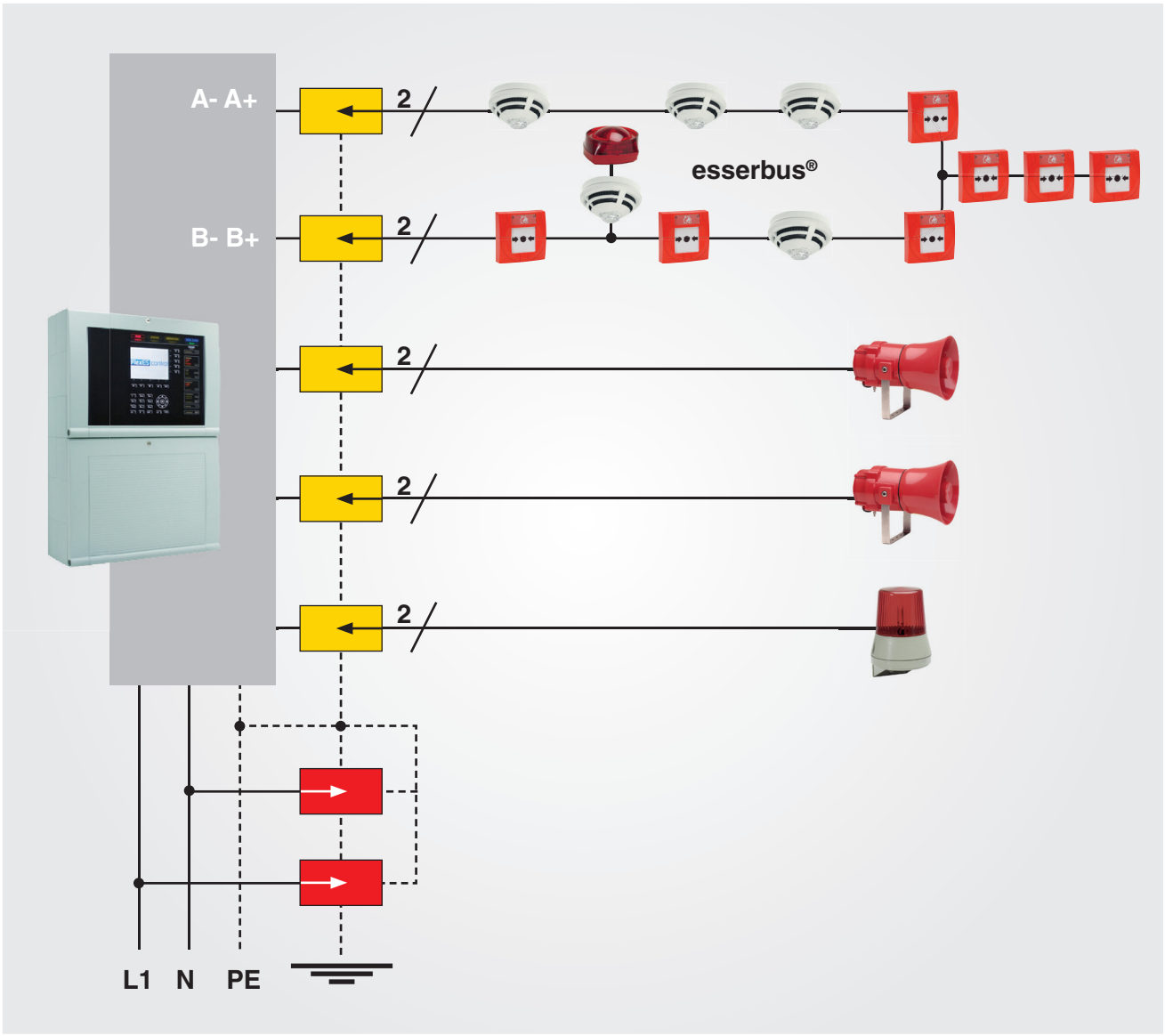
For alarm systems, which are certified by the German Insurance Association, (systems recognised by VdS), the manufacturer of the alarm system should be contacted. The installations as well as the lightning and surge protection equipment have to be set up in accordance with VdS 2095, VdS 2311 or VdS 2833.

The surge protection of the power supply is important, too. It is recommended to use modular surge protective devices here.

A distinct increase of the operational reliability of these systems can be reached with specific lightning and surge protection of hazard alert systems.

On the one hand, this refers to the prevention of false alarms when no danger exists, and on the other, costs eventually arising from this, can be prevented. This again, allows an effective damage limitation by informing the auxiliary personnel reliably. This counteracts a possible formation of catastrophic conditions (e.g. danger to human lives, pollution of the environment, etc.). Notice that in case of injuries to persons or environmental damage, the operator of a plant is liable first. This comprehensive responsibility for security can normally be expected from managers or executives of a company. However, in the legal sense, an operator of a plant is a technical layman, who is not able to estimate, if threats can arise from a technical solution. Therefore, skilled persons as suppliers of technical solutions must ensure in each individual case, that the solutions offered also correspond to the actual requirements. Retreating to the accepted rules of technology is not sufficient, if the state of the art already describes a higher quality solution. This may entitle a technical layman (plant operator) to claim recourses.

Regardless of the fact, whether fire alarm systems are VdS-approved systems or not, they should be furnished with a surge protection.




Local equipotential bonding
Surge arrester


Local equipotential bonding
Surge arrester

As an example, the enclosed diagrams contain a proposal for surge protection of fire alarm control and indication units, which are operated on the principle of d.c. line technology or pulse engineering.

If the fire alarm post and the control unit shall be integrated into a lightning protection system, then all lines entering the building shall be connected with lightning current arresters or combined lightning current and surge arresters.

22 Compatibility list

	System components VdS S294050 / S209207	Part No.	VdS Approval	FlexES Control	IQ8Control C/M esserbus®	IQ8Control C/M esserbus® PLus	ES-Line	Compact	FACP 8000C/M esserbus®	FACP 8000C/M esserbus®-PLus	FACP 80	FACP 800	FACP 8007 / 8008
	Approvals			G209207	G205129	G205129	G212165	n.N.	G299044	G299044	G202050	-----	G296046
Alarm devices	IQ8Alarm Sounder red & white	807205 & 807206	G206001	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Speech red & white	807322 & 807332	G206001	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Sounder & Flasher red	807224	G206003	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Speech & Flasher red	807372	G206003	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Flasher amber	807212	G206002	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Flasher red	807214	G206002	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Alarm Flasher blue & green & white	807213	G206002	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Quad O²T/ F with Flasher	802383	G205111	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Quad O²T/ So with Sounder	802384	G205111	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Quad O²T/FSp with Speech & Flasher	802385	G205111	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Quad O²T/Sp with Speech	802386	G205111	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Quad O/So optical with sounder	802382	G206090	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Alarm devices	IQ8Lumivox	806205 - 806214	obsolete	✓	✗	✓	✗	✗	✗	✓	✗	✗	✗
Alarm devices	Systemsounder	806280 - 806284	obsolete	✓	✗	✓	✗	✗	✗	✓	✗	✗	✗
Alarm devices	Basesounder	806282	G202046	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗
Automatic fire detectors	IQ8Quad Fixed heat detector	802171	G204058	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Fixed heat detector class B	802177	G208057	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Rate-of-rise heat detector (ROR)	802271	G204059	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Optical detector	802371	G204060	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓
Automatic fire detectors	IQ8Quad Optical detector w/o isolator	803371	G204060	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Optical detector BLUE LED technology	802375	G205071	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Optical Heat detector	802373	G205070	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	IQ8Quad Dual Angel Optical Heat detector	802374	G204061	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓
Automatic fire detectors	IQ8Quad Dual Angel Optical Heat detector w/o isolator	803374	G204061	✓	✓	✓	✓	✓	✗	✗	✗	✓	✓
Automatic fire detectors	IQ8Quad Optical Heat & CO detector	802473	G205072	✓	✓	✓	✗	✓	✓	✓	✗	✗	✓
Automatic fire detectors	IQ8Quad Rate-of-rise heat detector w/o isolator	803271	G204059	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓
Automatic fire detectors	Detector series 9200	801071 - 801973	G201007 - G201011	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
Automatic fire detectors	Detector series 9000 w/o switch-on control	761162; 761262; 761362	G294003; G29126; G29226	o	o	o	✓	o	o	o	✓	✓	o
Automatic fire detectors	ES Detect Fixed heat detector	800171; 800177	G213068	o	o	o	✓	o	o	o	✗	✗	o
Automatic fire detectors	ES Detect Rate-of-rise heat detector (ROR)	800271	G213069	o	o	o	✓	o	o	o	✗	✓	o
Automatic fire detectors	ES Detect Optical detector	800371	G213066	o	o	o	✓	o	o	o	✓	✗	o
Automatic fire detectors	ES Detect Optical Heat detector BLUE LED technology	800375	G213065	o	o	o	✓	o	o	o	✗	✓	o
Automatic fire detectors	ES Detect Dual Angel Optical Heat detector	800374	G213070	o	o	o	✓	o	o	o	✓	✗	o

	System components VdS S294050 / S209207	Part No.	VdS Approval	FlexES Control	IQ8Control C/M esserbus®	IQ8Control C/M esserbus® PLus	ES-Line	Compact	FACP 8000C/M esserbus®	FACP 8000C/M esserbus®-PLus	FACP 80	FACP 800	FACP 8007 / 8008
	Approvals			G209207	G205129	G205129	G212165	n.N.	G299044	G299044	G202050	-----	G296046
Special detectors	UV flame detector UniVario	782311	G208131	o	o	o	✗	o	o	o	✗	✓	o
	Triple IR flame detector UniVario	782315	G211041	o	o	o	✗	o	o	o	✗	✓	o
	Heat detector UniVario	782310;782302-04	G211039; G211040	o	o	o	✗	o	o	o	✗	✓	o
	IR flame detector (ex) X 9800	761347	G203084	o	o	o	✗	o	o	o	✗	✓	o
	UV-IR flame detector (ex) X 9800	761349	G203085	o	o	o	✓	o	o	o	✗	✗	o
	Venturi air duct module for IQ8Quad OTblue-LKM (802379)	781443	G207128	✓	✓	✓	✗	✓	✓	✓	✗	✗	✗
	Linear Heat Detector LWM-1	761290	G205066	o	o	o	✓	o	o	o	✗	✗	o
	Linear Smoke Detector LRMX beam	761400.10	G2906056	o	o	o	✓	o	o	o	✗	✗	o
	Fireray 50RV &100RV Linear Smoke Detector Fireray beams	761315; 761316	G203070	o	o	o	✓	o	o	o	✗	✗	o
	Fireray 2000 Linear Smoke Detector Fireray beam	761321	G297058	o	o	o	✓	o	o	o	✗	✗	o
	Aspirating Smoke System Laser FOCUS	761519	G205060	o	o	o	✓	o	o	o	✗	✗	o
	Aspirating Smoke System LRS 100	761500	G298024	o	o	o	✓	o	o	o	✗	✗	o
	Aspirating Smoke System LRS-S 700	761502	G298024	o	o	o	✓	o	o	o	✗	✗	o
	Aspirating Smoke System LRS compact	761515	G298024	o	o	o	✓	o	o	o	✗	✗	o
	Aspirating Smoke System LRS compact/net	761516	G298024	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens EB Aspirating Smoke System Compact unit	801515.10	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens EB Aspirating Smoke System	801521.10	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens EB Aspirating Smoke System w. silent fan	801521.10.SL	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens 2 EB Aspirating Smoke System	801522.10	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens 2 EB Aspirating Smoke System w. silent fan	801522.10.SL	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens EB Aspirating Smoke System	801531.10	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens 2 EB Aspirating Smoke System w. silent fan	781531.10.SL	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TITANUS Pro Sens 2 EB Aspirating Smoke System	801532.10	G206118	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	FAAST 8100E Conventional Aspirating Smoke System	8100E	G212002	o	o	o	✓	o	o	o	✓	✗	o
	FAAST LT 1-1: Aspirating Smoke System 1 chanal & 1 detector	801711	-----	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	FAAST LT2: Aspirating Smoke System 2 chanals & 2 detectors	801722	-----	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	Linear Smoke Detector OSID beam	7613xx	G211072	o	o	o	✓	o	o	o	✓	✗	o
Wireless	IQ8Wireless Wireless transponder for loop installation	805595/.10	G205113	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗
	IQ8Wireless Wireless transponder with relay connection	805595/.10	G205113	o	o	o	✓	o	o	o	✓	✗	o
	IQ8Wireless Wireless gateway	805594/.10	G206091	✓	✓	✓	✗	✗	✓	✓	✗	✗	✗

	System components VdS S294050 / S209207	Part No.	VdS Approval	FlexES Control	IQ8Control C/M esserbus®	IQ8Control C/M esserbus® PLus	ES-Line	Compact	FACP 8000C/M esserbus®	FACP 8000C/M esserbus®-PLus	FACP 80	FACP 800	FACP 8007 / 8008
	Approvals			G209207	G205129	G205129	G212165	n.N.	G299044	G299044	G202050	-----	G296046
Manual call points	IQ8MCP Manual call point (small design)	804955-56; 804971-73	G205132	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Conventional MCP (small design)	804950-51, 804970	G205131	✗	✗	✗	✓	o	✗	✗	✓	✗	✗
	IQ8MCP Manual Call Point (large design)	804905-06	G205002	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Conventional MCP compact (small) IP66/67	804960	G205131	✗	✗	✗	✓	o	✗	✗	✓	✗	✗
	Manual call point compact (small design) IP66/67	804961	G205002	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Manual call point compact (small design) IP66/67	804963.F0	G205002	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Conventional MCP (large design)	804900-02	G205001	✓	✓	✓	✓	o	✓	✓	✓	✓	✓
Transponder	12-Relay transponder	808610.10	G206044	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	32-Output transponder	808611.10	G206044	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	4In/2Out- transponder	808613.10	G206042	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	4IN/2OUT transponder acc.EN54-13 with EOL-Z	808613.20	G206042	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Transponder SST for 1 extinguishing area	808613.30	G206042	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓
	1-Zone transponder	808614.10	G206042	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Communication transponder	808615	----	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Control transponder for fire doors	808619.10	G206042	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	Transponder for UniVario flame detector	808622	G206042	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	Refurbishment zone transponder for 3rd party devices 24V	808630.10	G207098	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓
	Refurbishment zone transponder for 3rd party devices 12V	808631.10	G207098	✓	✓	✓	✗	✗	✓	✓	✗	✓	✓
	IQ8TAL Technical Alarm Device	804868	G209138	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	IQ8TAM Technical Alarm Module	804869	G206031	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	IQ8TAL Technical Alarm Device module	804980	G210091	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	IQ8FCT Fire Control Transponder	804981	G210091	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	TAL optoc. input with isolator	805863	-----	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	TAL optoc. input with relay output	805864	-----	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	IQ8FCT Fire Control Transponder 230V package	808600.230	G210091	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	IQ8FCT Fire Control Transponder 12-24V package	808600.24	G210091	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	esserbus® Transponder for UniVario flame detector	8008623.10	G210020	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
	Fire Alarm Transponder	808623	G210020	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
ATEX	IQ8Ex Ex-barrier	804744	G210047	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	IQ8Quad Ex (i) Dual Angel Optical Heat detector w/o isolator	803374.EX	G209225	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	IQ8Quad Ex (i) Optical detector w/o isolator	803371.EX	G209224	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓
	IQ8Quad Ex (i) ROR heat detector w/o isolator	803271.EX	G209223	✓	✓	✓	✗	✓	✓	✓	✗	✓	✓

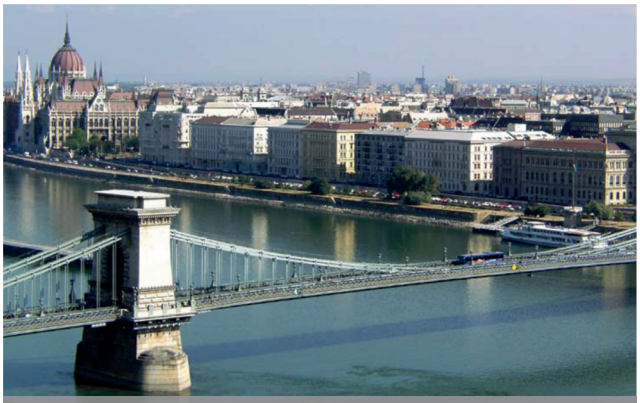
	System components VdS S294050 / S209207	Part No.	VdS Approval	FlexES Control	IQ8Control C/M esserbus®	IQ8Control C/M esserbus® PLus	ES-Line	Compact	FACP 8000C/M esserbus®	FACP 8000C/M esserbus®-PLus	FACP 80	FACP 800	FACP 8007 / 8008
	Approvals			G209207	G205129	G205129	G212165	n.N.	G299044	G299044	G202050	-----	G296046
ATEX	Conventional MCP Ex IP55 (large design)	804920.EX	-----	o	o	o	(not EN54-13)	o	o	o	✓	o	o
ATEX	IQ8MCP Ex IP55 (large design)	804924.EX	-----	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗
ATEX	Conventional MCP compact EX IP66/67 (small design)	804960.EX	-----	o	o	o	(not EN54-13)	o	o	o	✓	o	o
ATEX	IQ8MCP compact Ex IP66/67 (small design)	804961.EX	-----	✓	✓	✓	✗	✓	✗	✗	✗	✓	✓
ATEX	IQ8MCP compact Ex IP66/67 (small design)	804963.EX.F0	-----	✓	✓	✓	✗	✓	✗	✗	✗	✗	✗

Legend:

✗ non-compatible
✓ compatible
o only with transponder

Reference application

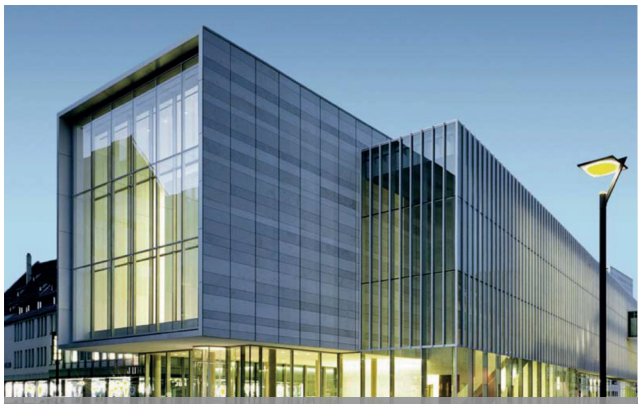
University of Munich Clinic



State Health Center of the Hungarian Ministry of Defense

Prague Subway

City Hall Römer, Frankfurt



Art Museum Kunsthalle Weishaupt, Ulm

International Maritime Museum Hamburg

Steiff-Gruppe, Giengen

Rohde & Schwarz Munich

For additional references refer to: https://www.esser-systems.com/en/applications.html

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