AVIOTEC IP starlight 8000

FCS-8000-VFD-B

BOSCH

en Operation manual

Table of contents

1 Safety instructions

In this document, the following symbols and notations are used to draw attention to special situations:

Danger!
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

Warning!
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

Caution!
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Notice!
Indicates a situation which, if not avoided, could result in damage to the equipment or environment, or data loss.

1.1 General Safety Messages / Notices

Warning!
Do not moisten the electronic appliances inside of the lens.
It may cause fire or electric shock. In this case, shut off the power supplied to the lens immediately.

Caution!
The Low Voltage power supply unit must comply with EN/UL 60950. The power supply must be a SELV-LPS unit or a SELV - Class 2 unit (Safety Extra Low Voltage - Limited Power Source).

Caution!
Installation should only be performed by qualified service personnel in accordance with the National Electrical Code (NEC 800 CEC Section 60) or applicable local codes.

Caution!
Do not leave or store the lens under direct sunshine.
The lens may focus rays of light on a near-by object and cause fire.

Caution!
In case of unusual behavior, smoke, noise or smell coming out of the lens, shut off the power immediately and pull out the lens cable.
Notify the installer or sales agent from which you purchased the product.

Notice!
Avoid obstructions in the field of view!
Covered fires cannot be detected correctly. An unobstructed view of the detection area is necessary.

Notice!
Activating video-based fire detection sets camera settings to a specific preset.
This preset affects several camera settings as long as this mode is activated.

Notice!
No detection of moving fire.
Moving fires will not be detected by the video-based fire detection.

Notice!
Indoor use only.
This product is designed for indoor use only. Outdoor use is not allowed.

Notice!
No direct connection to fire services in EN54 compliant installations.
Authorities can allow a connection to fire services after verifying alarms in a monitoring center.

Notice!
Minimum Illumination required.
To ensure the proper functioning of the video-based fire detection algorithm, a minimal illumination of 7 lx is required.

Notice!
No existing standards.
There are no existing EN standards concerning the video-based fire detection.

Notice!
Calm wind conditions only.
Strong air currents can cause false alarms by raising dust or debris similar in appearance to fire and smoke.

Notice!
Respect data protection.
The relevant data protection and privacy rules are to be complied with.

Notice!
Avoid backlight.
Backlight can disturb the video-based fire detection algorithm.

Notice!
Optimized smoke detection.
The video-based fire detection algorithm is optimized for smoke of smoldering fires.

Notice!
Qualified personnel only.
Assembly and installation must only be performed by qualified personnel.

Notice!
Reduced detection distances at image margin area.
Due to optical distorsion of the lens, the maximum detection distances at the image margin area are reduced.

Notice!
Avoid image regions with continuous upward motion.
Continuous upward motion might lead to false alarms.

Notice!
Make sure the camera is firmly mounted.
Camera shake might lead to false alarms. Avoid vibrations of the camera and the camera environment.

2 Introduction

2.1 Disclaimer

Video Fire indication systems are video content analysis systems. They give indications for fires and are designed to supplement fire detection systems and human guards in monitoring centers.
Video Fire indication systems are confronted with a higher amount of challenges considering scenery and background compared to conventional fire detection systems. It cannot be granted that fire is detected in all scenery settings. Thus the video fire detection system shall be seen as a system that enhances the probability of early fire detection, with the restriction that it might detect false alarms. It shall not be seen as a system that ensures fire detection in all possible image scenarios.

2.2 About this manual

This manual has been compiled with great care and the information it contains has been thoroughly verified. The text was correct at the time of printing, however, the content can change without notice. Bosch Security Systems accepts no liability for damage resulting directly or indirectly from faults, incompleteness or discrepancies between this manual and the product described.
For more information please contact the nearest Bosch Security Systems location or visit www.boschsecurity.com
All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.
The operation manual provides an overview of possibilities and fields of application of the video-based fire detection. It should be a guideline for customer-specific application planning.

2.3 Conventions in this manual

Terms concerning the adjustment of the smoke and flame algorithm, such as menu options, commands or text in the user interface, are written in bold.

2.4 Definition of optical terms

The reflected light coming from the field of view arrives at the camera lens. The image sensor of the camera transforms the light into electric signals. This electrical image is the basis for further data processing. This chapter contains basic descriptions of optical terms.

2.4.1 Illumination

Illumination is an important influencing factor for sensible optical systems. Natural light shows the huge range of illumination values from direct sunlight (~100.000 lx) to full moon on a clear night (~1.0 lx). A luxmeter can be used to measure the light levels.

The following table provides an overview of typical illumination values in different application areas:

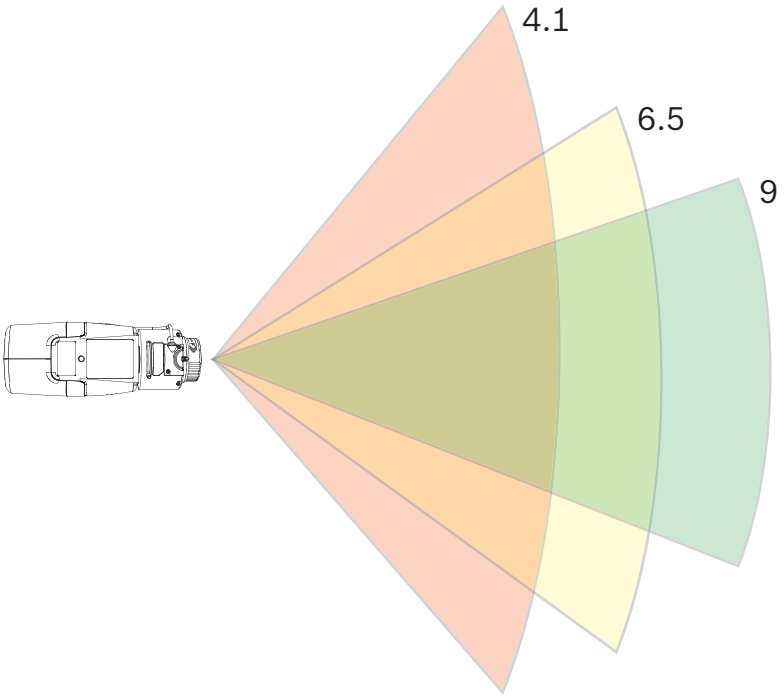
Application Area	Illumination (in lx)
Storage facility	50
Process plants	200

Sales room	300
Office space	500

In general a well illuminated monitoring area is advantageous for the video-based fire detection. Backlight should be avoided.

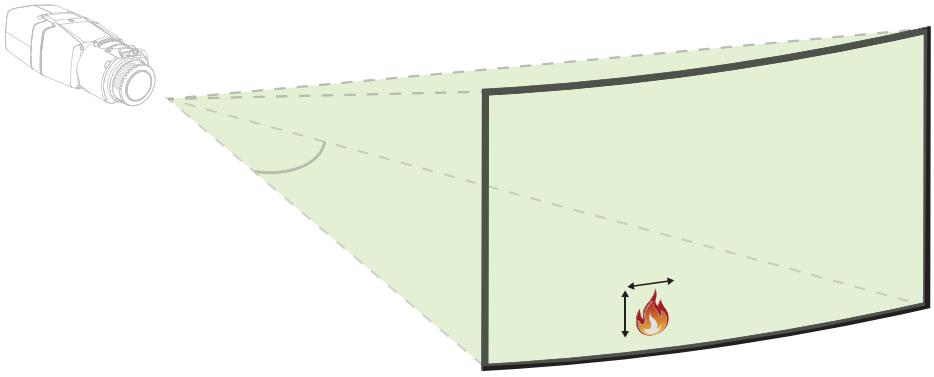
2.4.2 Focal length

The focal length of an optical system defines the distance between a light refracting lense and the focal point. Field of view, maximum distance and field angle are dependant as shown in the graphic below.



The maximum width of the field of view may be realized by the minimum focal length. This adversely affects the maximum distance to a detectable fire.
The maximum distance to a detectable fire may be reached by adjusting the largest focal length which decreases the width of the field of view to the minimum.

2.4.3 Monitoring Area



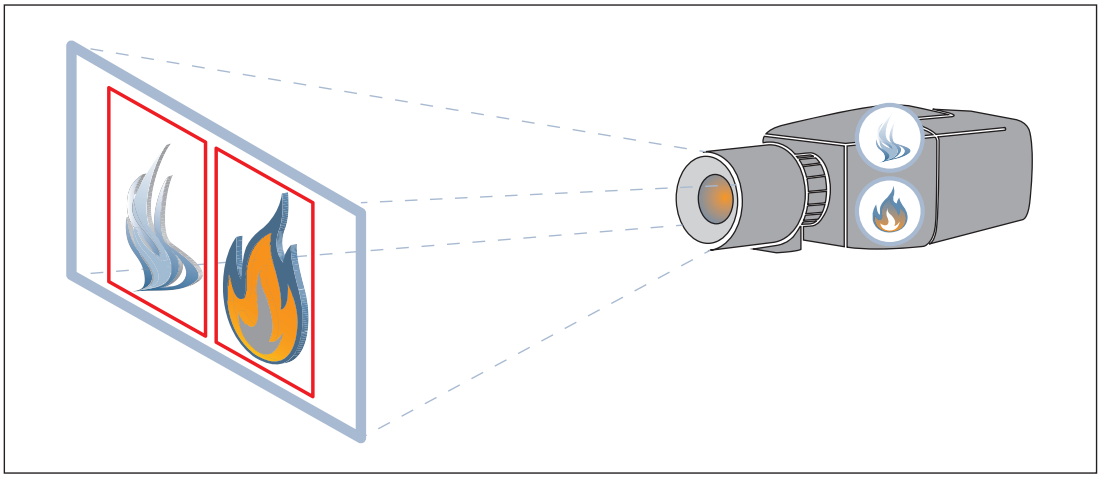
The monitoring area defines the effective space that can be observed by the video-based fire detection. It is depending on the setting of the camera lens.

See also

– *Planning, page 15*

3 System Overview

The video-based fire detection is the system of choice when reliable video motion and fire detection is needed, e.g. applications which are not subjected to construction product regulation or a supplementation to existing fire detection systems. AVIOTEC IP starlight 8000 operates as stand-alone unit and doesn't need a separate evaluation unit. Furthermore it contains all features of the Intelligent Video Analytics which allows analyzing and evaluating moving objects in parallel. Video-based fire detection and Intelligent Video Analytics operate independently from each other and are separately adjustable.



3.1 Camera

To access the features of the camera, use a web browser. The browser provides live viewing of the camera streams in the interface window, and also allows you to access and change the extensive list of settings and parameters for camera configuration. Refer to the software manual for more information on the browser interface.
The camera recording and storage functions include local alarm recording and recording to iSCSI-based systems. The camera can also use the Bosch Video Recording Manager (VRM) to control recording and storage. Integration with the many Bosch recording solutions is seamless.
The camera offers a number of flexible power and mounting options to meet your site-specific installation requirements.

3.1.1 Power supply

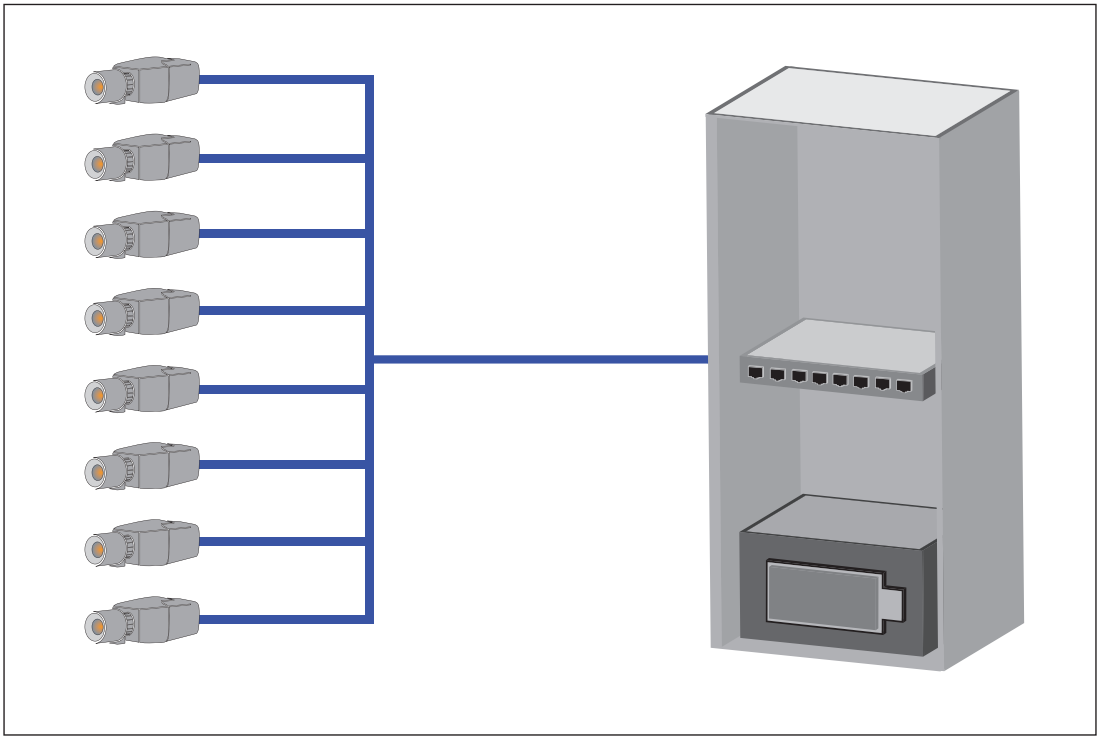
Power over Ethernet (PoE)

Notice!
Use only PoE approved devices.

Power-over-Ethernet (PoE) allows to use the Ethernet cabling for data transmission and for supplying power to the network device in the same cable. It is possible to realize long cable lengths in a PoE network system. The standard power supply for the video-based fire detection is Power-over-Ethernet. Alternatively, a 12 VDC power connector is available as accessory.
Power-over-Ethernet can be connected at the same time as a 12 VDC power supply. If auxiliary power (12 VDC) and PoE is applied simultaneously, the camera selects PoE and shuts off the auxiliary input.

3.1.2 Uninterruptible Power Supply

An uninterruptible power supply allows electronic devices to keep running for a short period of time when the primary power source is lost. In case of an electrical power outage, the video-based fire detection cameras will be supplied by the uninterruptible power supply.



3.2 Algorithm

The intelligent smoke and flame algorithm from Bosch analyzes video frames by means of characteristic and predefined patterns and variables. The fast detection algorithm is based on a real-time image processing on the camera firmware.

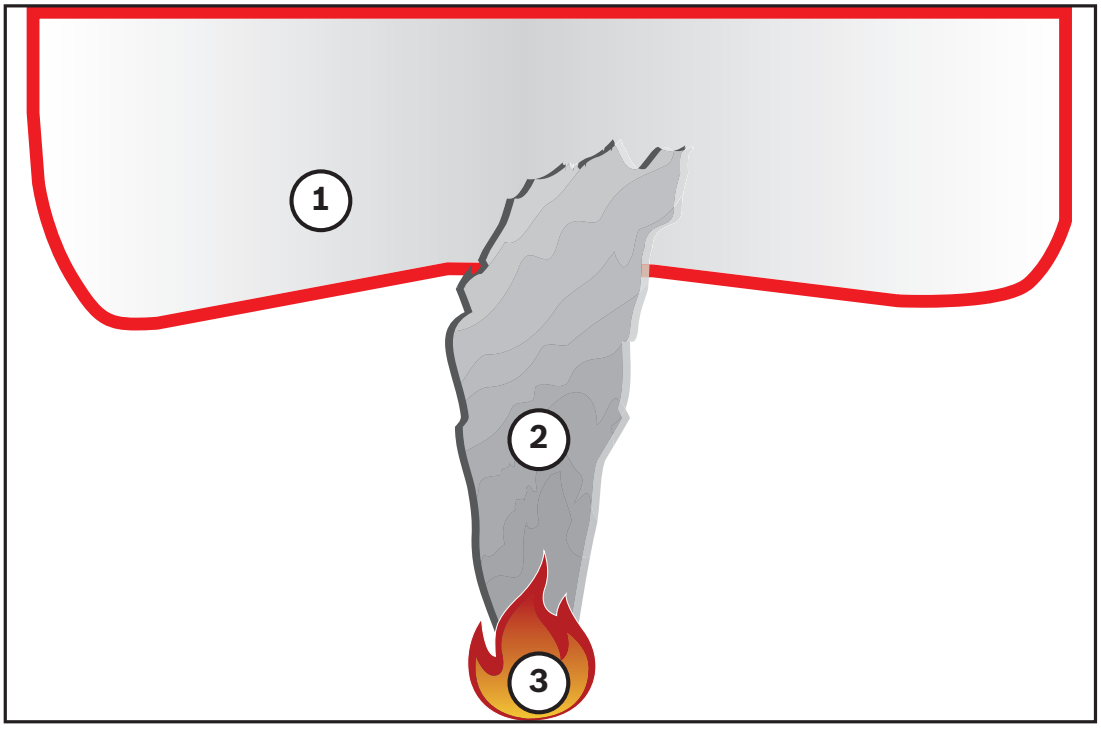
There are factors that can influence this kind of visual fire detection. It is important to avoid obstructions in the field of view. Sometimes obstructions cannot be prevented, e.g. building construction factors or huge machine parts. In this case it is necessary to analyze whether there is any need for further video-based fire detection cameras.

3.2.1 Flame detection characteristics

Flames will be analyzed by means of their flame color. White and orange are the basis colors for the algorithm to split off the video image into important and unimportant areas. Further flame colors will not be considered, for example a blue flame might not be detected.
Another algorithm characteristic to identify flames is the flickering of a flame. Objects with a similar movement pattern might cause false alarms, e.g. loose fluttering objects. The video-based fire detection offers subsequent adaption of flame detection settings for this purpose.

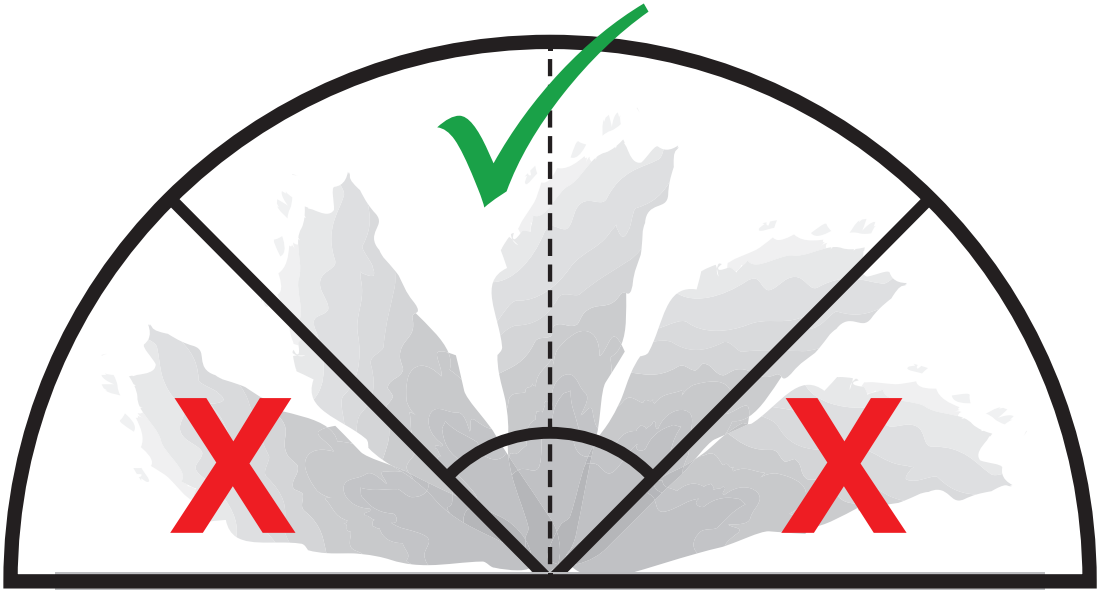
3.2.2 Smoke detection characteristics

The algorithm analyzes smoke based on physical characteristics. Typically a plume of smoke is formed in a regular upward motion of smoke at the same position. This is characterized by a thick column of smoke. This column of smoke is visible directly. Speed and angle of rising smoke may vary.
The area in which the smoke density decreases is called ambient smoke. The smoke motion is not directly visible. Ambient smoke will not be detected.



1	Ambient smoke
2	Smoke plume
3	Fire

Smoke will only be detected if the smoke plume has a maximum vertical tilt angle of 45°. The maximum detectable speed of upward motion is 4.2% of picture height per second.



The intelligent smoke detection covers a large area of application. Nevertheless, there might be some disruptive factors in the operational environment of the customer. Objects with a similar movement pattern of smoke might cause false alarms, e.g. escalators or conveyor belts.

3.3 Intelligent Video Analytics

The Intelligent Video Analytics system by Bosch, is the guard-assistant system of choice when you need reliable video motion detection for indoor or outdoor use.
Intelligent Video Analytics is state-of-the-art and reliably detects, tracks, and analyzes moving objects while suppressing unwanted alarms from spurious sources in the image.
Advanced tasks like multiple line crossing, loitering, crowd density estimation, and people counting are available. Object filter based on size, speed, direction, aspect ratio, and color can be defined.
For calibrated cameras, Intelligent Video Analytics automatically distinguishes between the object types upright person, car, bike, and truck.
The software also supports geolocation, that is it outputs tracked objects in relation to camera position for subsequent visualization on maps.
It allows you to record all of the object information and change the rules even after the fact for fully configurable forensic search.

– More information is available on the Internet at: www.boschsecurity.com

3.4 Video Management System

The Bosch Video Management System is a unique enterprise IP video security solution that provides seamless management of digital video, audio, and data across any IP network. It provides the best VMS to go with Bosch CCTV devices, leveraging the unique capabilities of Bosch cameras and recording solutions. It nevertheless offers interfaces and standards to integrate AVIOTEC IP starlight 8000.

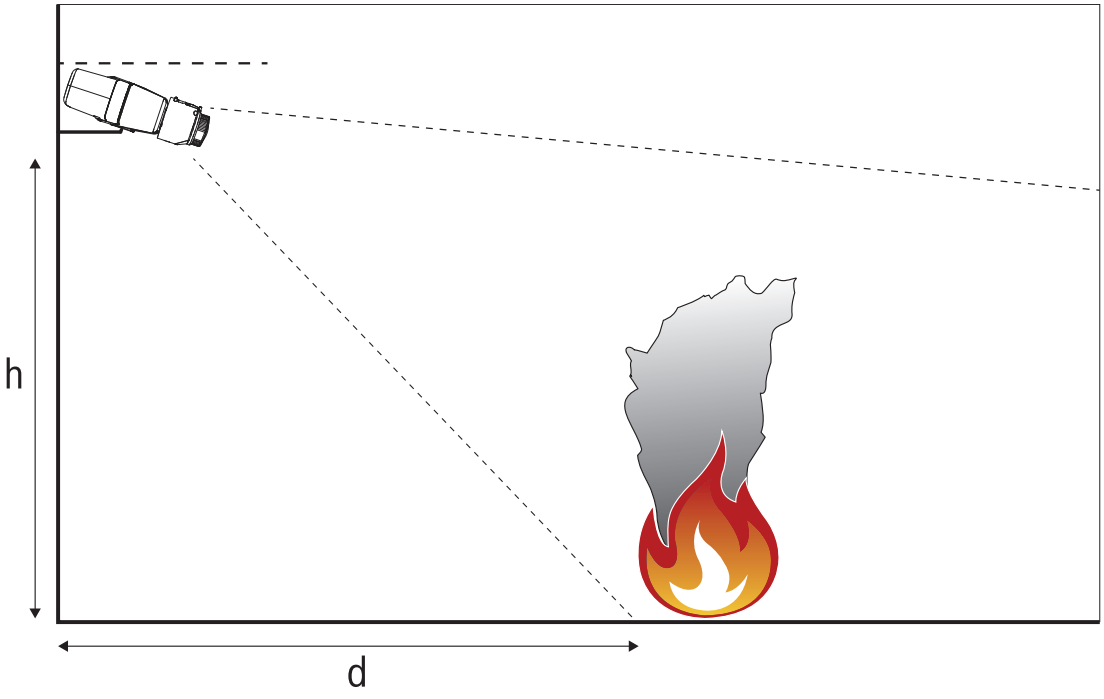
– More information is available on the Internet at: www.boschsecurity.com

4 Planning

A fire safety analysis should be performed to determine the characteristics of the area including a fire load calculation. The placement of the camera or cameras results from the application environment of the customer.

4.1 Minimum distances

The camera must be mounted according to the following graphic:



d	Minimum distance to fire
h	Installation height

The table below demonstrate exemplarily the minimum distances to fire or smoke depending on the installation height:

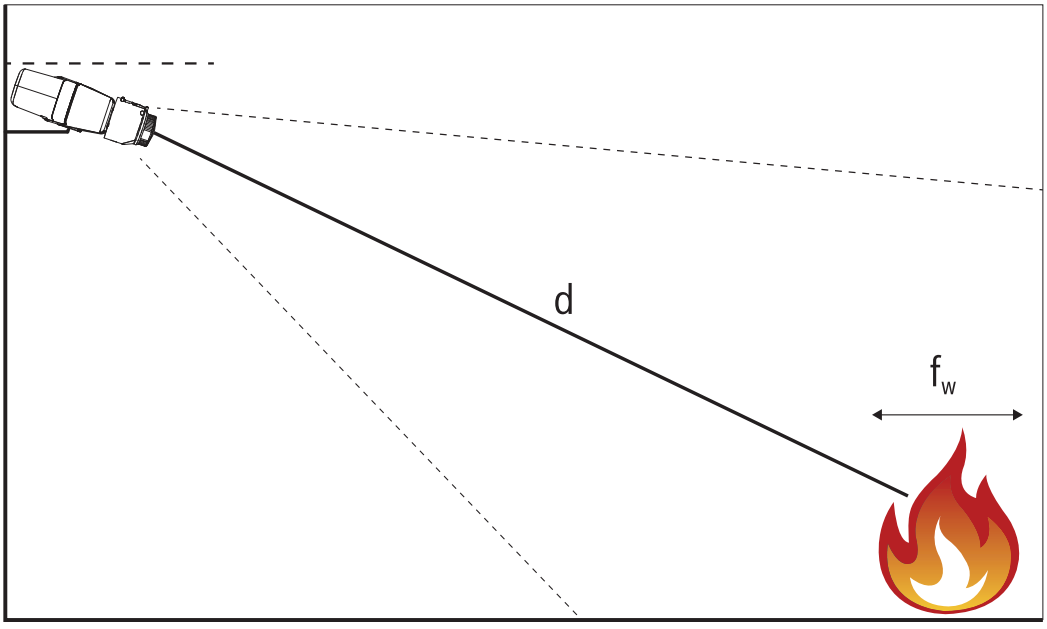
Installation height [m]	**Minimum distance to fire [m]**
2.5	4.33
3	5.20
3.5	6.06
4	6.93
4.5	7.79
5	8.66
5.5	9.53
6	10.39

6.5	11.26
7	12.12
7.5	12.99
8	13.86
8.5	14.72
9	15.59
9.5	16.45
10	17.32

Table 4.1: Minimum distance to fire

4.2 Maximum distances

Maximum distances



d	Maximum distance to fire
f_w	Fire width

The tables below demonstrate exemplarily the maximum distances to a fire depending on fire size and opening angle of the camera lens:

Maximum distance to fire in m (Flame detection)

			Opening angle [°]
	100	**60**	**45**

Fire width [m]			
0.3	12.6	19.2	25.1
0.5	21.0	32.0	41.9
1	42.1	64.1	83.9
2	84.3	128.3	167.8

Maximum distance to fire in m (Smoke detection)

			Opening angle [°]
	100	**60**	**45**
Smoke width [m]			
0.3	8.4	12.8	16.7
0.5	14.1	21.4	27.9
1	28.1	42.8	55.7
2	56.2	85.6	111.4

4.3 Image margin area

Due to the optical distorsion of the lens, there are deviating maximum detection distances at the margin area of the picture.

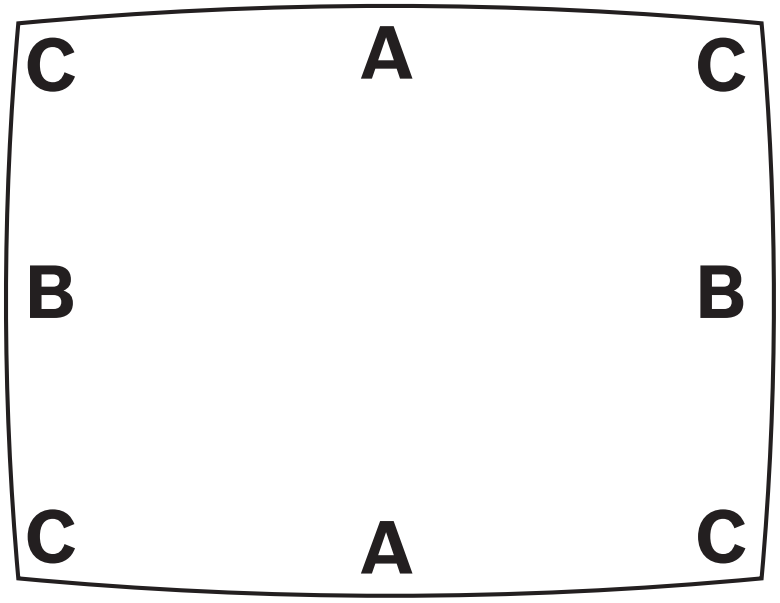


Figure 4.1: Definition of margin areas of the picture

A	Horizontal margin area
B	Vertical margin area
C	Corner area

The following table shows exemplarily the deviation in percent from the maximum detection distances at the middle of the picture:

	Margin area		
	A	**B**	**C**
Opening angle of the lens			
100°	13	40	51
90°	11	33	43
60°	5	15	20
45°	3	9	12

4.4 Immediate environment of the camera

The environment should be free from field of view disturbing elements, such as:
- Dust and humidity
- High temperature
- Steam
- Interfering influences, e.g. high radiation
- Vibrations

4.4.1 Illumination and brightness

AVIOTEC IP starlight 8000 needs a minimum illumination of 7 lx. Generally, a well illuminated monitoring area is advantageous.

	
Smoke plume and backlight	Smoke plume without backlight

Backlight should be avoided. The visibility of a smoke plume or flames decreases rapidly with increasing backlight. Try to minimize the amount of very bright background lights in your specific environment as far as it is meaningful and possible.

4.4.2 Privacy protection

Notice!
There is no fire detection in privacy defined masks created in the Intelligent Video Analytics.

To protect privacy, individual masks on the video screen can be defined to cover up areas in which privacy has to be guaranteed. Privacy defined masks remain stored after a reset of the camera, even after upgrading to a new firmware.

5 Installation

Notice!
Do not expose the image sensors to direct sunlight.
Do not obstruct the free flow of air around the camera.

Notice!
Avoid backlight.
Backlight can disturb the video-based fire detection algorithm.

Notice!
Minimum Illumination required.
To ensure the proper functioning of the video-based fire detection algorithm, a minimal illumination of 7 lx is required.

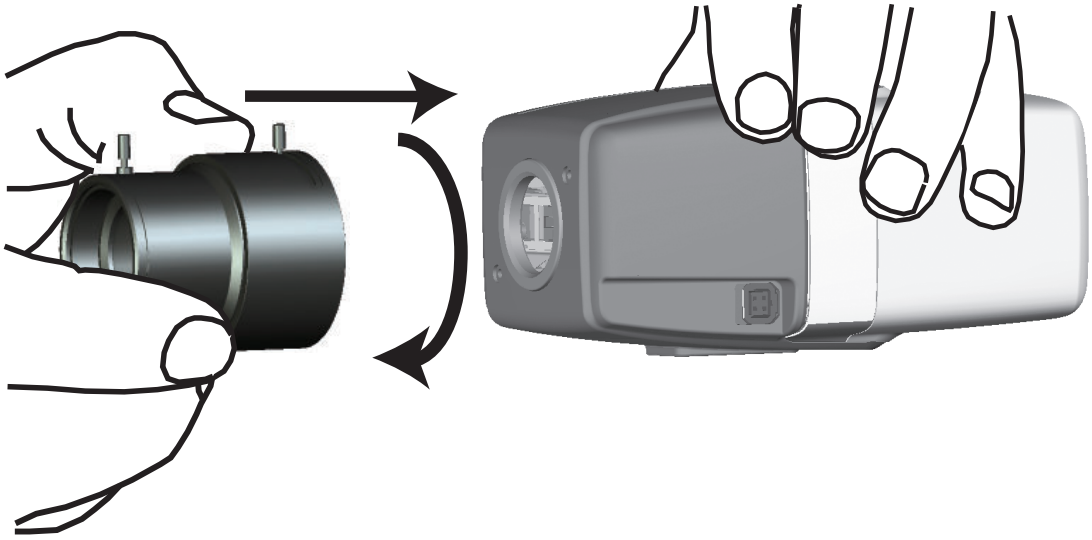
Notice!
Avoid obstructions in the field of view!
Covered fires cannot be detected correctly. An unobstructed view of the detection area is necessary.

Notice!
Avoid image regions with continuous upward motion.
Continuous upward motion might lead to false alarms.

Notice!
Make sure the camera is firmly mounted.
Camera shake might lead to false alarms. Avoid vibrations of the camera and the camera environment.

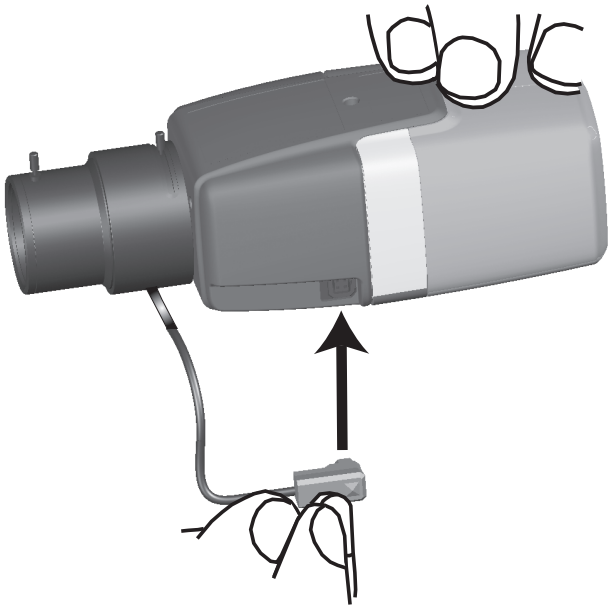
5.1 Lens mounting

Notice!
Only use the supplied lens.
Do not use other lenses. A reliable functioning of the product cannot be guaranteed with other lenses.



To attach the lens to the camera:

1. Remove the sensor protection cap from the camera.
2. Remove the protection cap from the lens.
3. Screw the lens onto the camera.



Plug the lens connector into the camera (it automatically detects the type of lens).

Pin	DC iris lens
1	Damp -
2	Damp +
3	Drive +
4	Drive -

5.2 Camera mounting

Mounting variants

Due to the provided mounting bracket, the camera can be easily mounted. There are three main mounting variants to install the camera.

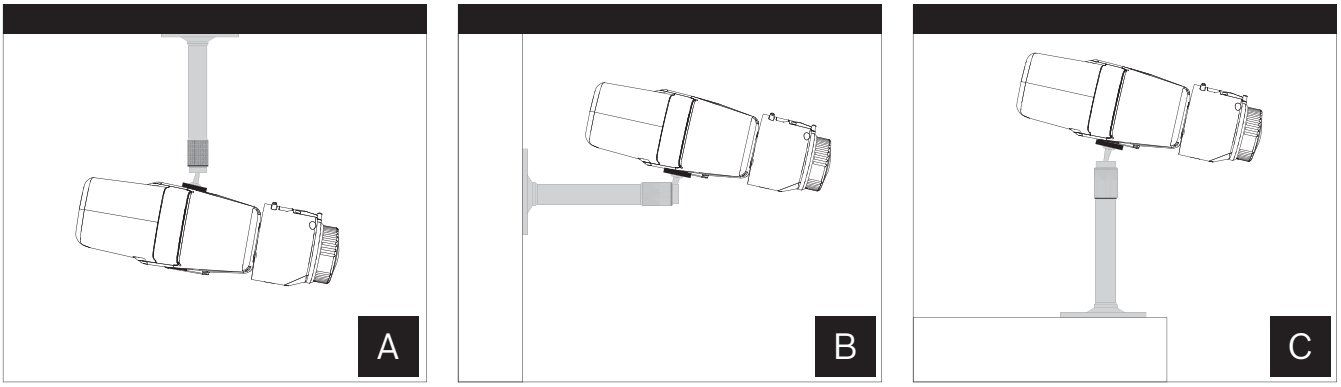


Figure 5.1: Mounting variants

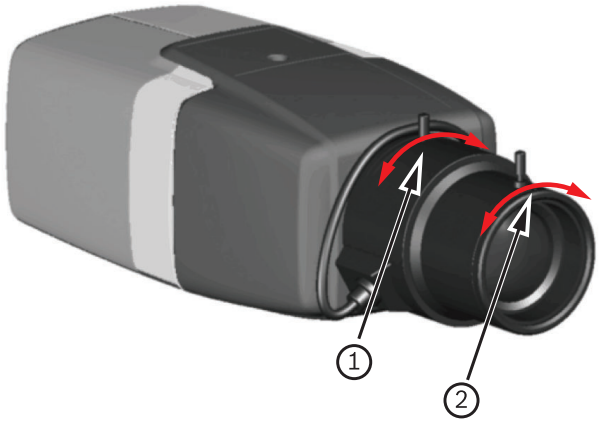
A	Ceiling mount
B	Wall mount
C	Stand mount

Chose the right mounting variant for your application and mount the device according to the following options:

1. Install the mounting bracket.
2. Attach the camera to the bracket and tighten the camera lock ring.
3. Adjust the angle of the camera to set the field of view.
4. Tighten the mounting bracket lock ring to fix the camera in the desired position.

5.3 Setting the field of view

After the camera is mounted to the surface, the field of view can be set.



1	focal length
2	focus

The field of view must be set manually according to the following steps:

1. Manually adjust the focal length on the lens to obtain the required field of view.
2. Manually adjust the focus on the lens to obtain the sharpest image possible.

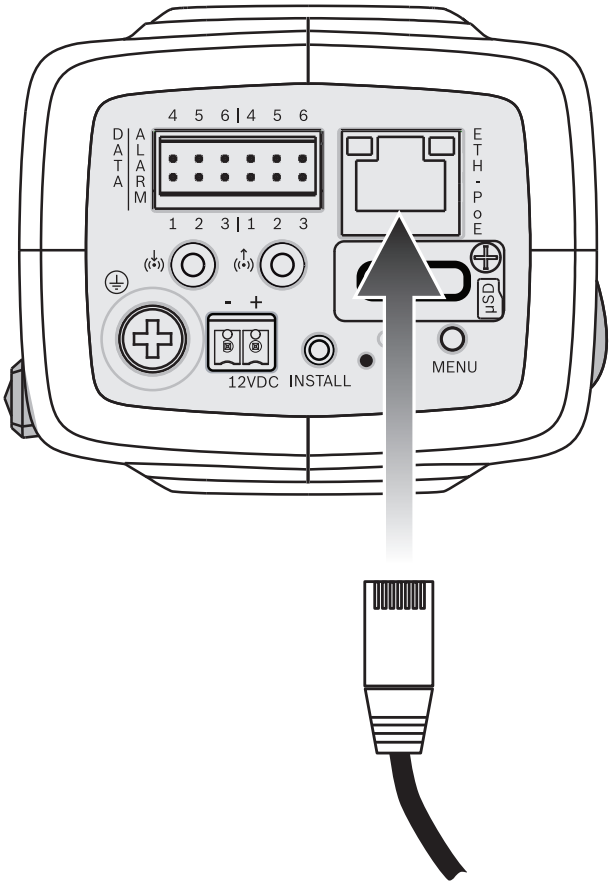
The camera lens has a motorized automatic back focus to adjust the focus at a later time via the camera menu.

5.4 Wiring of the camera

Connection to Ethernet via PoE Ethernet cable

Notice!
Use only PoE approved devices.

The camera is intended to be powered via a STP Category 5e cable in a Power-over-Ethernet (PoE) network environment . This is the default power supply.



1. Connect the camera to a 10/100 Base-T network.
2. Use STP Category 5e cable with RJ45 connectors (the camera network socket is Auto MDIX compliant).

✓ The LEDs beside the Ethernet connection indicate network connection (green lit) and IP traffic (orange flashing).

Auxilliary 12 V DC power supply

Caution!
Use **only** a +12 VDC power supply as an auxiliary power source.
The auxiliary power supply unit must be isolated from earth.

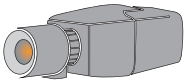
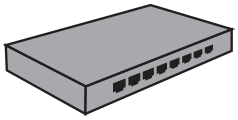
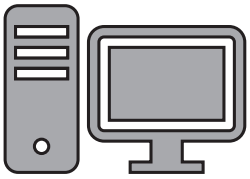
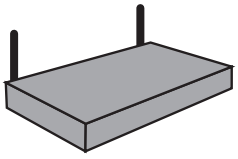
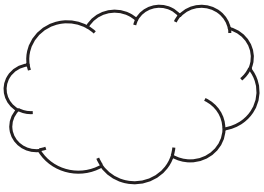
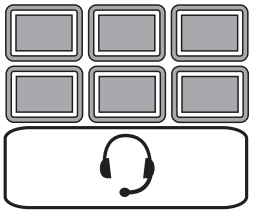
Caution!
The Low Voltage power supply unit must comply with EN/UL 60950. The power supply must be a SELV-LPS unit or a SELV - Class 2 unit (Safety Extra Low Voltage - Limited Power Source).

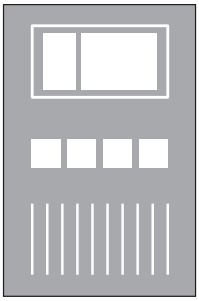
The camera can be supplied with a power supply in case of missing PoE feature of the network or for redundancy reasons.

Connect an approved power supply unit with a rated supply voltage of 12 VDC as follows:
1. Strip back 7 mm (0.28 in) of insulation on the power supply cable (must be 16-28 AWG, UL 14-30 AWG).
2. Loosen the screws of the supplied 2-pole connector and insert the stripped wires, then tighten the screws again.
3. Insert the 2-pole connector into the camera power socket.

6 Camera integration

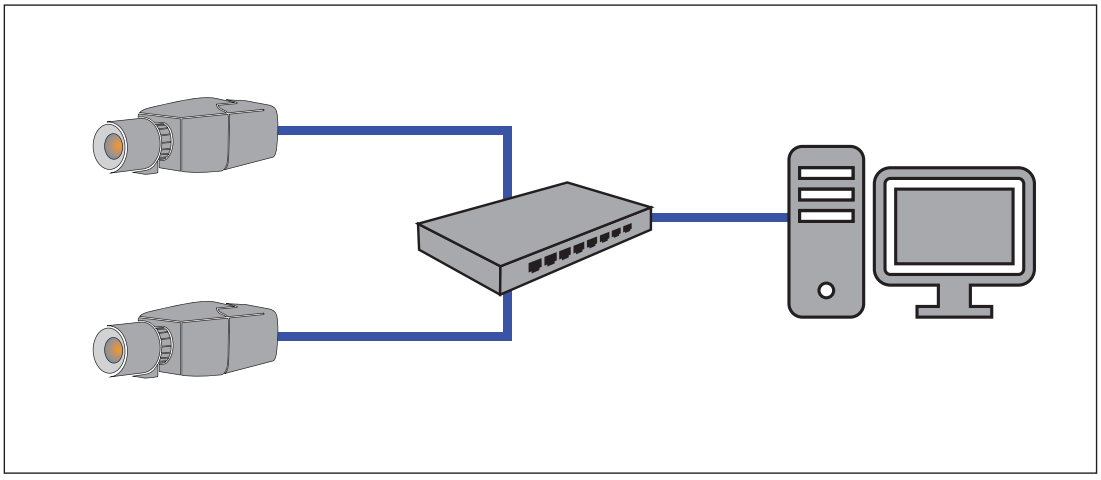
The video-based fire detection can be easily integrated into the network environment of the customer. There are several possibilities to connect the camera. Various combinations are possible. The individual customer network properties determine the performance and scalability of the system.

	Camera
	Network switch, PoE-ready
	Client PC
	Video Recording Manager (VRM)
	Router
	Internet
	Monitoring Center

	Fire alarm control panel, e.g. FPA-5000 or FPA-1200
	Mobile devices

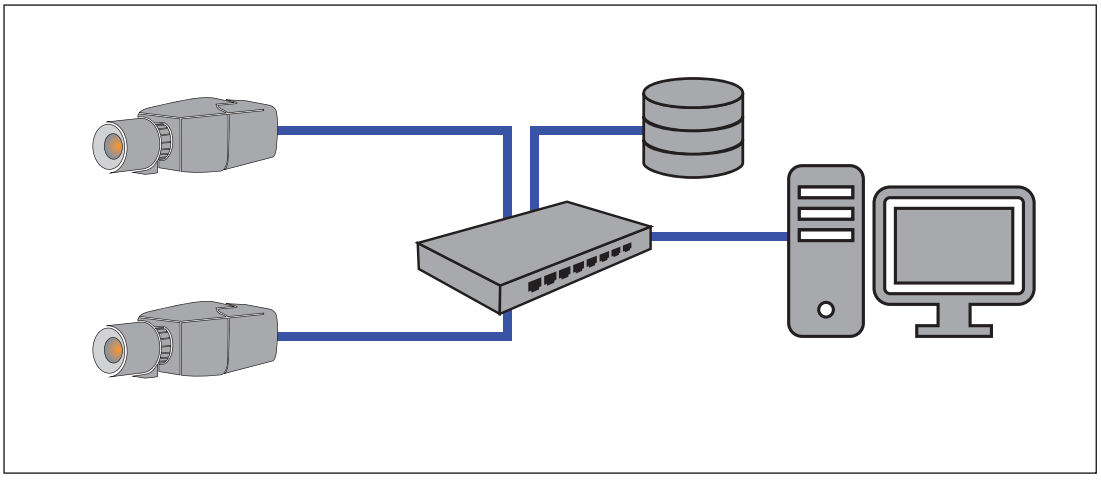
6.1 Local Area Network

Due to the IP-based camera, the integration of the video-based fire detection into the network of the customer is easy. There are a lot of opportunities regarding to scalability and enlargement of the network.



6.2 Local Area Network with recording solution

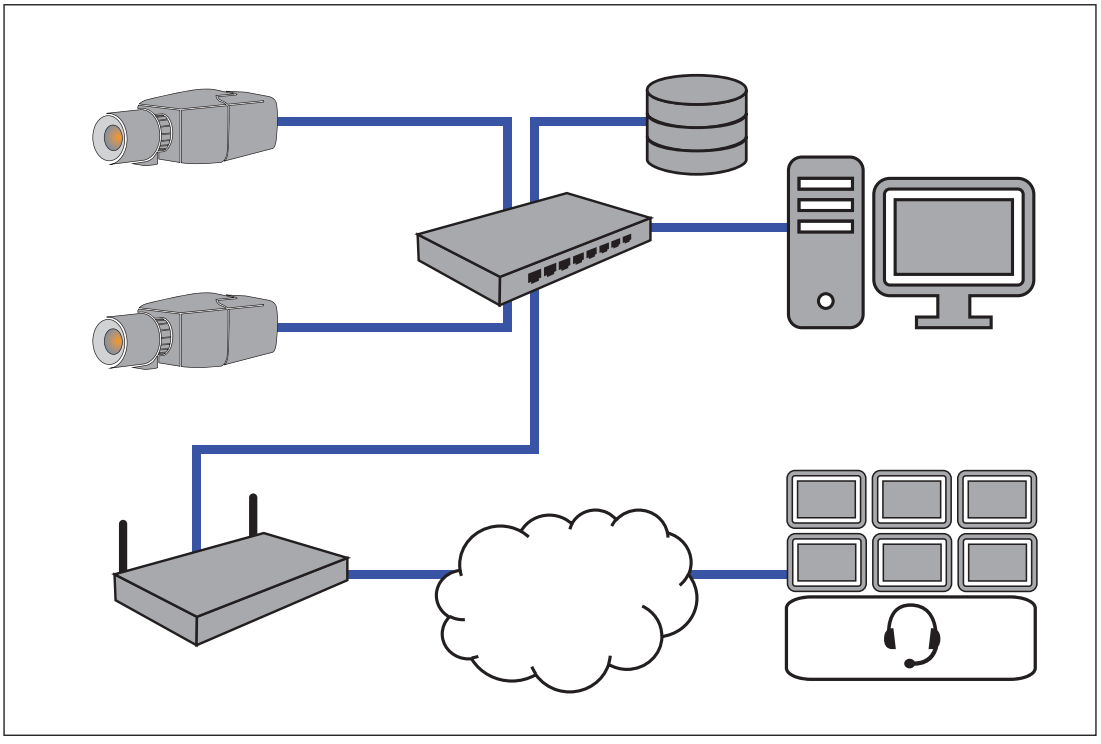
Recording and archiving functionality in the network can be realized by a video recording manager (VRM). Fire cause analysis and traceability due to legal matters are only two examples of a recording solution.



– More information is available on the Internet at: www.boschsecurity.com

6.3 Monitoring Center

In a monitoring center, alarms can be verified to call the fire brigade and to take care of additional rescue measures.

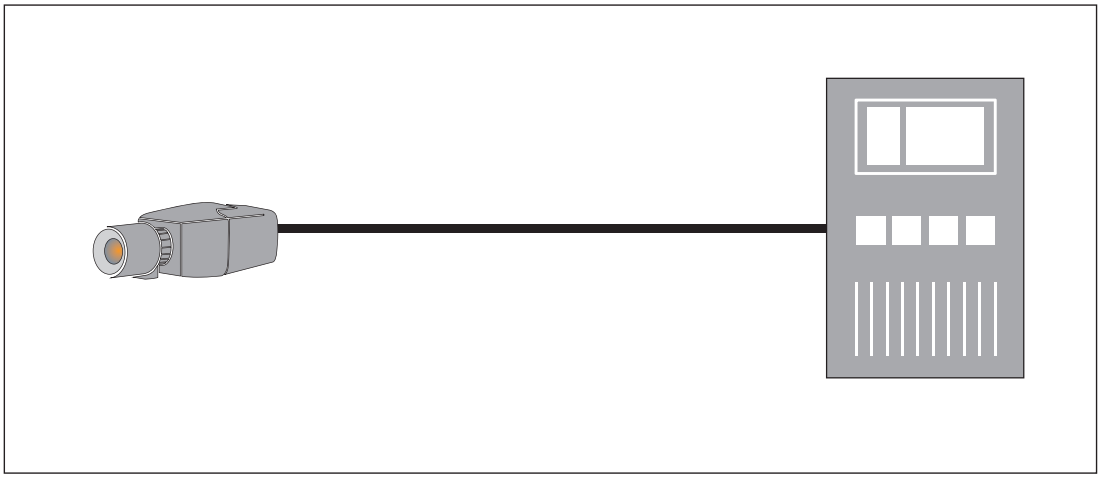


6.4 Fire Alarm Control Panel

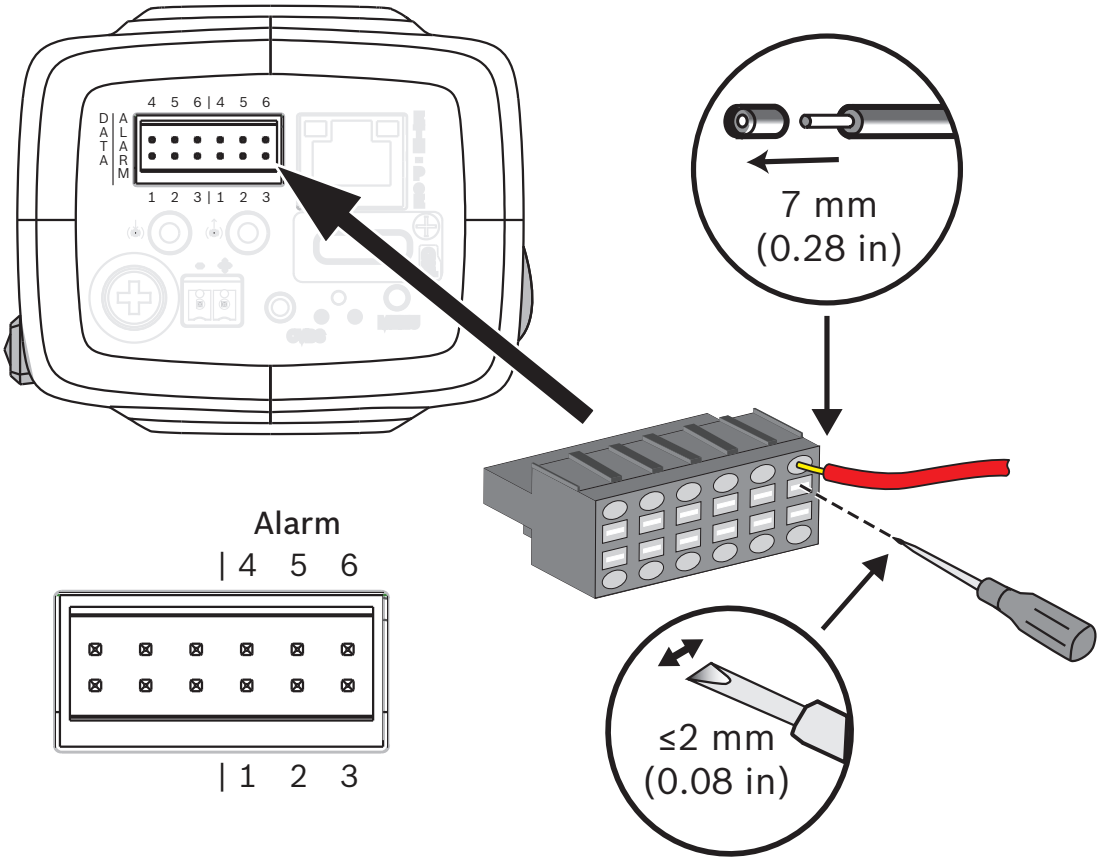
AVIOTEC IP starlight 8000 can be connected to the a fire alarm control panel. The alarm will be triggered by the relay output of the camera.

Notice!
No direct connection to fire services in EN54 compliant installations.
Authorities can allow a connection to fire services after verifying alarms in a monitoring center.

Notice!
No existing standards.
There are no existing EN standards concerning the video-based fire detection.



The alarm contact assignment is shown in the figure below:



Alarm in:
Use the alarm input to connect external alarm devices such as door contacts or sensors:

- TTL logic, +5 V nominal, +40 VDC max, DC coupled with 50 kOhm pull-up to +3.3 V.
- Configurable as active low or active high.

A zero potential make-contact or switch can be used as the actuator (use a bounce-free contact system).

Pin	Alarm socket
1	Alarm in 1
4	Ground

Pin	Alarm socket
2	Alarm in 2
5	Ground

Alarm out
Use the alarm output for switching external devices such as lamps or sirens.
Alarm output switching capability:

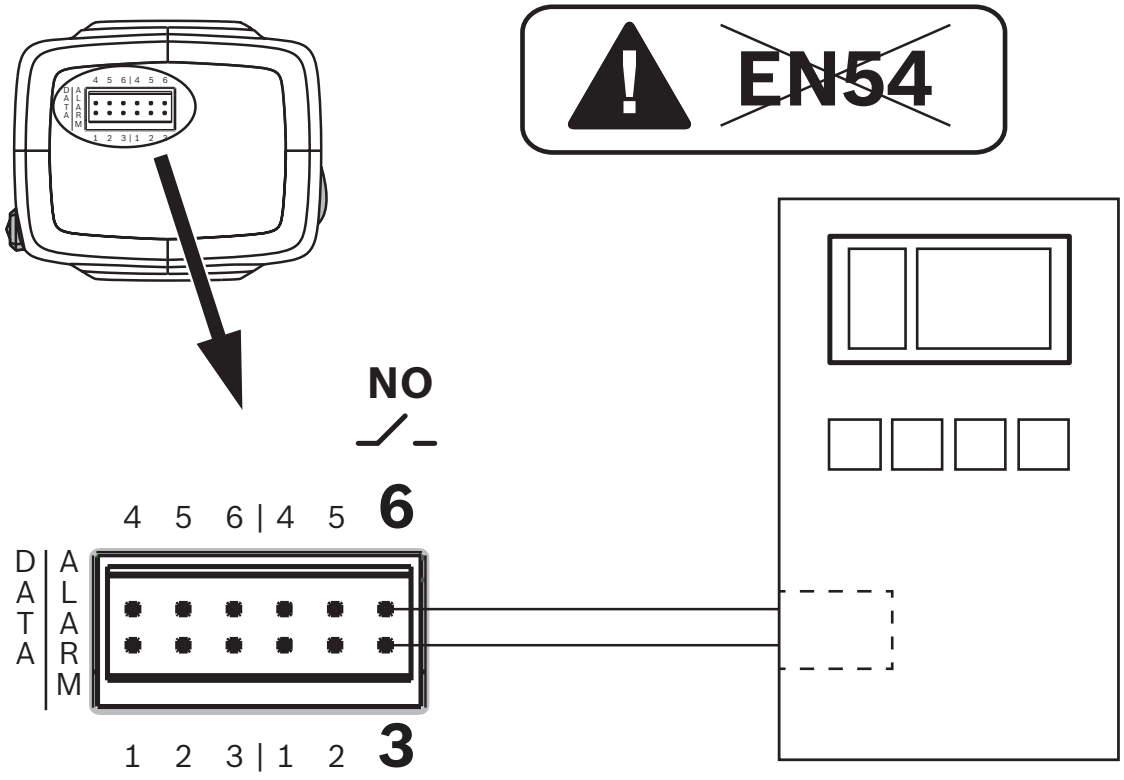
– Max. voltage 30 VAC or +40 VDC. Max. 0.5 A continuous, 10 VA.

Pin	Alarm socket
3	Alarm out
6	

The maximum wire diameter is 18-28 AWG, UL 16-28 AWG for both stranded and solid; cut back 7 mm (0.28 in) of insulation.

Connection to a fire alarm control panel
The alarm output of the camera can be connected to a fire alarm control panel, e.g. FPA-5000 or FPA-1200.

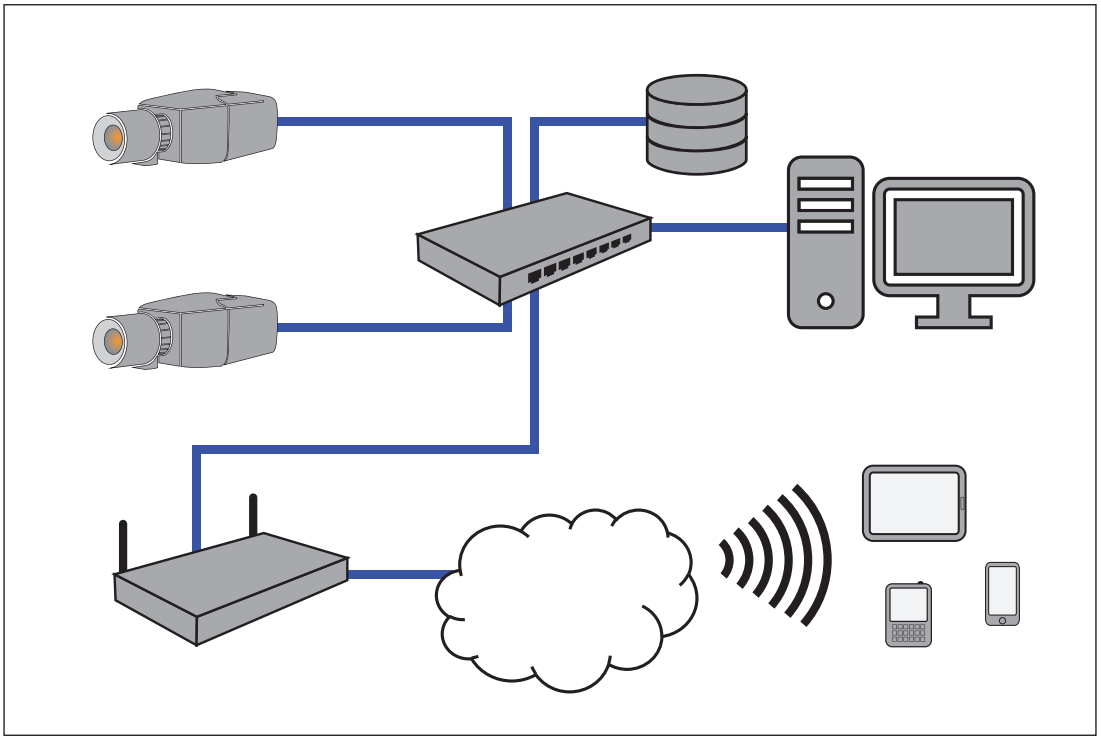
The camera alarm output is triggered by a relay that is normally open. In case of alarm the relay is closed.



See the documentation of the individual manufacturer for further information about the connection to a fire alarm control panel.

6.5 Mobile Devices

Another advantage of the network integration of the video-based fire detection is the expandability to mobile devices, such as tablets or smartphones.



7 Access via web interface

The unit must have a valid IP address and a compatible subnet mask to operate on your network.

In a network with a DHCP server the IP address will be assigned to the camera. With no DHCP server the default address is 192.168.0.1.

To view the camera in your web browser:

1. Start the Web browser.
2. Enter the IP address of the unit as the URL.
3. During initial installation, confirm any security questions that appear.

8 Adjustment of detection settings

The standard settings of the video-based fire detection will be sufficient for the most customer environments. Nevertheless, there are many ways to adapt the flame and smoke detection to the requirements of the customer. The detection settings of the fire detection can be changed in the configuration menu:

1. Go to **Configuration** and navigate to **Alarm**.
2. Select **Fire detection**.

General and special settings for **Fire detection** are selectable. Anytime you change the settings, confirm with **Set** to apply these changes.
If you want to abort, just click on another menu option, for example **Audio Alarm**.

The Intelligent Video Analytics functions and the video-based fire detection settings can be changed during operation and will immediately become effective.

8.1 General settings

Following settings change the detection algorithm generally.

Flames

The default setting of the flame size is 1.6% of the picture width. The **Min. size** can be set with a software slider. Possible settings are 1.1% to 2.0% of picture width. A red square at the bottom of the picture visualizes the actual setting in the original size.

Verification time [s] of the flame detection can be set to 4, 8, 12 or 16 seconds. The default value is 8 seconds.

Smoke

The default setting of the smoke size is 2.3% of the picture width. The **Min. size** can be set with a software slider. Possible settings are 1.6% to 3.1% of picture width. A yellow square at the bottom of the picture visualizes the actual setting in the original size.

Verification time [s] of the smoke detection can be set from 5 to 30 seconds. The default value is 15 seconds.

8.2 Adjustments of image regions

Notice!
There is no fire detection in privacy defined masks created in the Intelligent Video Analytics.

Masking

Due to the different areas of application of the camera, false alarms may be the result in individual customer environments. Algorithm disturbing elements which have an appearance similar to flames and smoke, for example ascending steam of a machine, must be excluded from the detection area.

Customized areas can be defined in the picture of the camera. These individual masks for flame and smoke detection deactivation allow individual adaption to the application of the customer. Overlapping of masks is possible.

There are several possibilities to exclude picture areas from the smoke and flame detection:

- Add masks separately for flame, smoke or both.
- Add masks with delayed smoke detection.
- Let the system automatically generate masks from the alarm memory by automasking.

Automasks support the user to adapt the system to his individual application area. Once the camera is powered, every upcoming alarm will be stored into the volatile alarm memory. Generally it is advantageous to wait a certain period of time before using the automasking feature for the first time. It depends on the special customer environment, whether there will be false alarms or not. With automasking, detection disturbing areas in the picture can automatically be masked out by the system. If there is no alarm, no automask will be generated. The user can change the size of the automasks to minimize the masked out area. The system is limited to 16 automasks (8 masks for smoke detection and 8 masks for flame detection). Changes of the flame and smoke detection settings require renewing the automasks.

Add mask

You can define individual areas in which the detection will be deactivated. These masks can easily be added to the picture area.

To add a mask, perform the following steps:

1. Click on the button **Add mask**.
   A rectangle with a crossed out flame and smoke icon will appear in the middle of the picture area.
   In **Properties** you can deselect **Mask flames** or **Mask smoke**.
2. Change the size and shape of the rectangle to your specific needs.
3. Move the mask to the desired area in the picture.
4. Select **Set** to confirm the changes.

Add smoke time region

Detection disturbing elements in the application of the customer, e.g. roller shutter, can be masked out. In this specific mask, the smoke detection will be delayed. This functionality is not applicable in masks with deactivated smoke detection.

To add this mask, perform the following steps:

1. Click on the button **Add smoke time region**.
   A rectangle with a clock icon will appear in the middle of the picture area.
2. In **Properties** select or type in the **Verification time [s]**.
   The value must be set from 5 to 120 seconds. Default value is 30 seconds.
3. Move the mask to the desired area in the picture.
4. Change shape and size to your specific needs.
5. Select **Set** to confirm the changes.

Get automatic masks

Notice!
All automasks stored in the volatile alarm memory of the camera are lost when the supply voltage is interrupted or switched off.

Notice!
If you change the settings of **Min. size** or **Verification time [s]**, it is necessary to renew the automasks.

1. Navigate to **Configuration** > **Alarm** > **Fire detection**.
2. Select **Get automatic masks**
   The system automatically generates predefined masks from the alarm memory. The automasks are illustrated as rectangles with red dashed border.
3. Adjust the automask to your specific needs.
   If it is necessary, you can add individual masks (**Add mask**).
4. Select **Set** to confirm the changes.

✓ Automasks were added to the system.

Reset user interface

Notice!
All determined masks in the user interface will be deleted! Only automasks remain stored in the alarm memory and can be regenerated.

If you want to reset the user interface to standard values:

1. Click on **Defaults**.
2. Press **OK** to confirm.

✓ The system resets the user interface for fire detection to the standard settings.

Delete Automasks

Notice!
Delete automasks if you changed the camera position, zoom, point of view or after a fire. Also delete automasks if the spatial arrangement of objects in the detection area has changed fundamentally.

To delete the automasks for Flame detection from the alarm memory:

1. Navigate to **Fire detection** > **Flames** > **Detection**.
2. Select **Off** and press **Set**.
3. Select **On** and press **Set**.

✓ Automasks for Flame were deleted.

To delete the automasks for Smoke detection from the alarm memory:

1. Navigate to **Fire detection** > **Smoke** > **Detection**.
2. Select **Off** and press **Set**.
3. Select **On** and press **Set**.

✓ Automasks for Smoke were deleted.

8.3 Relay settings

Notice!
The alarm output is only configurable for flame or smoke alarms. Forwarding alarms coming from Intelligent Video Analytics is not possible.

The camera includes a built-in relay that switches in case of a flame or a smoke alarm. The relay is switched during the alarm and returns to its initial state after the alarm.

You can configure the switching behavior of the output:
Go to **Alarm** > **Interfaces** > **Alarm Outputs**

Idle state
1. Under **Idle state** select the desired initial state of the relay.
2. Select from the following options:
   Closed: the relay is normally closed.
   Open: the relay is normally open.

Output name
An individual name can be assigned to the relay. The name is shown on the button. The **Live** page can also be configured to display this individual name.

Toggle
You can click the button to switch the alarm output manually (for example, for testing purposes). A green check mark appears to indicate that the relay switches.

Notice!
Check carefully the toggle settings before you continue.

Press **Set** to apply the settings.

9 Troubleshooting

The following issues can be solved in the detection settings (**Configuration** > **Alarm** > **Fire detection**).

9.1 Smoke and flame detection

False alarms under 4 seconds concerning the whole detection area
In this case the general settings of the fire detection have to be adjusted.

Problem	Solution
Small bounding boxes of flame detection cause false alarms.	Increase the minimum flame size. (**Flames** > **Min. size**)
Short false alarms for smoke detection.	Increase the duration of smoke detection. (**Smoke**> **Verification time [s]**)
Short false alarms for flame detection.	Increase the duration of flame detection. (**Flames** > **Verification time [s]**)

False alarms at small constant areas
Individual image areas are affected and have to be adjusted.

Problem	Solution
Objects cause flickering motion, e.g. shadow of a flag in the wind.	Mask out the disturbing image area (for flame). *Flame detection will be deactivated in this mask.*
Continuous motion in the picture causes false alarms, e.g. escalators.	Mask out the disturbing image area (for smoke). *Smoke detection will be deactivated in this mask.*
Temporary motion causes false alarms, e.g. roller shutter.	Mask out the disturbing image area (**Add smoke time region**). *Smoke detection will be delayed in this mask.*

9.2 Image quality

Interference of the camera image
Small image areas or the whole image area are affected by interferences.

Problem	Solution
Artificial light, e.g. fluorescent light, causes flickering of the camera image.	Go to **Installer Menu** > **ALC mode** and change to fluorescent mode.

9.3 Camera

If a fault cannot be resolved, please contact your supplier or system integrator, or go directly to Bosch Security Systems Customer Service.

The version numbers of the internal firmware can be viewed on a service page. Please note this information before contacting Customer Service.

1. In the address bar of your browser, after the unit IP address, enter: /version
   for example: 192.168.0.80/version
2. Write down the information or print out the page.

The camera offers a variety of configuration options. Therefore, check that it works properly after installation and configuration. This is the only way to ensure that the camera will function as intended in the event of an alarm.

Your check should include the following functions:

– Can you connect to the camera remotely
– Does the camera transmit all the data required?
– Does the camera respond as desired to alarm events?
– Is it possible to control peripheral devices, if necessary?

The camera has four LEDs on the rear panel:

– Two LEDs indicate the camera status (red for error; green for OK)
– Two LEDs (green and orange) beside the network connection indicate the LAN and PoE status

No OSD messages appear.	Bosch's Video SDK is required. Video management software from third parties does not use the SDK.

The ping command can be used to check the connection between two IP addresses. This allows testing whether a device is active in the network.

1. Open the DOS command prompt.
2. Type `ping` followed by the IP address of the device.

If the device is found, the response appears as "Reply from ... ", followed by the number of bytes sent and the transmission time in milliseconds. Otherwise, the device cannot be accessed via the network. This might be because:

– The device is not properly connected to the network. Check the cable connections in this case.
– The device is not correctly integrated into the network. Check the IP address, subnet mask, and gateway address.

10 Maintenance

10.1 Cleaning

It is generally sufficient to use a dry cloth for cleaning, but a moist lint-free cloth or leather shammy may also be used.
Do not use liquid cleaners or aerosol cleaners.
It is important to keep the lens clean to ensure optimum performance. Dust, grease, or fingerprints should be removed from the lens surface. When cleaning the lens, take extra care not to damage the special coating used to reduce light reflections.

– Remove dust with a blower-brush or grease-free soft brush.
– Wipe water drops off the lens with a clean soft lint-free cloth and dry the lens surface.
– Use special lens cleaning paper or cloth treated with lens cleaning fluid to gently wipe off any remaining dirt (wipe spirally from the lens center towards the edge).

10.2 Repair

Notice!
Never open the casing of the unit

The unit does not contain any user-serviceable parts. Refer all repairs to suitable qualified specialists.

10.3 Reset

Use the factory reset button to restore the unit to its original settings. Any changes to the settings are overwritten by the factory defaults. A reset may be necessary, for example, if the unit has invalid settings that prevent it from functioning as desired.

11 Technical data

Environmental	
Operating Temperature	-20°C to +50°C (-4°F to 122°F)
Storage Temperature	-30°C to +70°C (-22°F to +158°F)
Operating Humidity	20% to 93% RH
Storage Humidity	up to 98% RH

Input/output	
Analog video out	SMB connector, CVBS (PAL/NTSC), 1 Vpp, 75 Ohm
Audio line in	1 Vrms max, 18 kOhm typical,
Audio line out	0.85 Vrms at 1.5 kOhm typical,
Audio connectors	3.5 mm mono jack
Alarm input	2 inputs
Alarm input activation	+5 VDC nominal; +40 VDC max. (DC-coupled with 50 kOhm pull-up resistor to +3.3 VDC) (< 0.5 V is low; > 1.4 V is high)
Alarm output	1 output
Alarm output voltage	30 VAC or +40 VDC max. Maximum 0.5 A continuous, 10VA (resistive load only)
Ethernet	RJ45
Data port	RS-232/422/485

Local storage	
Internal RAM	10 s pre-alarm recording
Memory card slot	Supports up to 32 GB microSDHC / 2 TB microSDXC card. (An SD card of Class 6 or higher is recommended for HD recording)
Recording	Continuous recording, ring recording. alarm/events/schedule recording

Mechanical	
Dimensions (W x H x L)	78 x 66 x140 mm (3.07 x 2.6 x 5.52 inch) without lens
Weight	855 g (1.88 lb) without lens
Color	RAL 9006 Metallic Titanium
Tripod Mount	Bottom and top 1/4-inch 20 UNC

Network	
Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, Telnet, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication
Encryption	TLS 1.0, SSL, DES, 3DES
Ethernet	10/100 Base-T, auto-sensing, half/full duplex
Connectivity	ONVIF Profile S , Auto-MDIX

12 Appendices

12.1 Maximum detection distances for margin areas

Due to the optical distorsion of the lens, there are deviating maximum detection distances at the margin area of the picture.

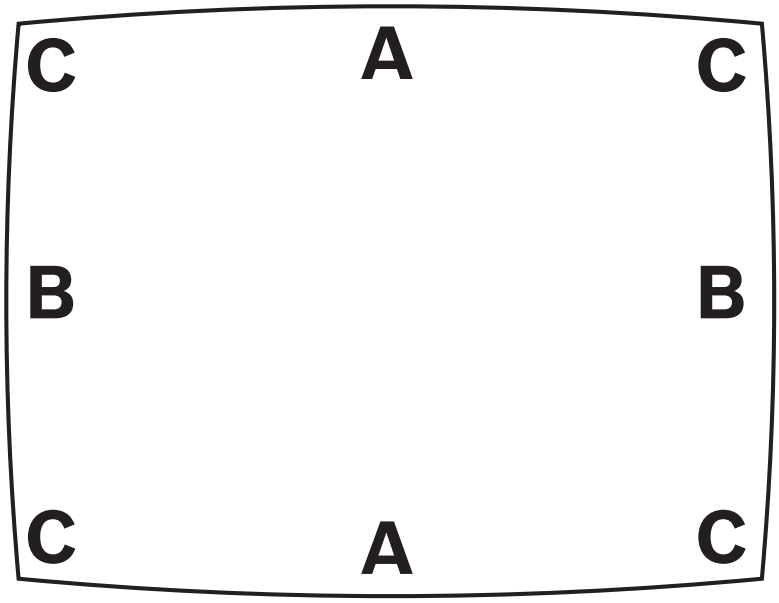


Figure 12.1: Definition of margin areas of the picture

A	Horizontal margin area
B	Vertical margin area
C	Corner area

12.1.1 Flame detection

Opening angle 100°

Fire width (m)	A	B	C
0.3	11.01 m	7.59 m	6.19 m
0.4	14.68 m	10.12 m	8.26 m
0.5	18.34 m	12.65 m	10.32m
0.6	22.01 m	15.18 m	12.39 m
0.7	25.68 m	17.71 m	14.45 m
0.8	29.35 m	20.24 m	16.52 m
0.9	33.02 m	22.77 m	18.58 m
1	36.69 m	25.30 m	20.65 m
1.25	45.86 m	31.63 m	25.81 m
1.5	55.03 m	37.95 m	30.97 m
1.75	64.20 m	44.28 m	36.13 m
2	73.38 m	50.60 m	41.29 m
2.25	82.55 m	56.93 m	46.45 m
2.5	91.72 m	63.25 m	51.61 m
2.75	100.89 m	69.58 m	56.78 m
3	110.06 m	75.91 m	61.94 m

Opening angle 90°

Fire width (m)	A	B	C
0.3	12.29 m	9.25 m	7.91 m
0.4	16.39 m	12.34 m	10.55 m
0.5	20.49 m	15.42 m	13.19 m
0.6	24.59 m	18.51 m	15.83 m
0.7	28.68 m	21.59 m	18.46 m
0.8	32.78 m	24.68 m	21.10 m
0.9	36.88 m	27.76 m	23.74 m
1	40.98 m	30.85 m	26.38 m
1.25	51.22 m	38.56 m	32.97 m
1.5	61.46 m	46.27 m	39.57 m
1.75	71.71 m	53.98 m	46.16 m
2	81.95 m	61.69 m	52.75 m
2.25	92.20 m	69.41 m	59.35 m

2.5	102.44 m	77.12 m	65.94 m
2.75	112.68 m	84.83 m	72.54 m
3	122.93 m	92.54 m	79.13 m

Opening angle 60°

Flame width (m)	A	B	C
0.3	18.29 m	16.36 m	15.44 m
0.4	24.39 m	21.82 m	20.59 m
0.5	30.48 m	27.27 m	25.74 m
0.6	36.58 m	32.73 m	30.88 m
0.7	42.67 m	38.18 m	36.03 m
0.8	48.77 m	43.64 m	41.18 m
0.9	54.87 m	49.09 m	46.32 m
1	60.96 m	54.55 m	51.47 m
1.25	76.20 m	68.18 m	64.34 m
1.5	91.44 m	81.82 m	77.21 m
1.75	106.68 m	95.45 m	90.07 m
2	121.93 m	109.09 m	102.94 m
2.25	137.17 m	122.73 m	115.81 m
2.5	152.41 m	136.36 m	128.68 m
2.75	167.65 m	150.00 m	141.54 m
3	182.89 m	163.64 m	154.41 m

Opening angle 45°

Flame width (m)	A	B	C
0.3	24.42 m	22.91 m	22.16 m
0.4	32.57 m	30.55 m	29.54 m
0.5	40.71 m	38.19 m	36.93 m
0.6	48.85 m	45.83 m	44.32 m
0.7	56.99 m	53.46 m	51.70 m
0.8	65.13 m	61.10 m	59.09 m
0.9	73.27 m	68.74 m	66.47 m
1	81.41 m	76.38 m	73.86 m
1.25	101.77 m	95.47 m	92.33 m
1.5	122.12 m	114.57 m	110.79 m
1.75	142.47 m	133.66 m	129.26 m

2	162.83 m	152.76 m	147.72 m
2.25	183.18 m	171.85 m	166.19 m
2.5	203.53 m	190.95 m	184.65 m
2.75	223.89 m	210.04 m	203.12 m
3	244.24 m	229.13 m	221.58 m

12.1.2 Smoke detection

Opening angle 100°

Smoke width (m)	A	B	C
0.3	7.34 m	5.06 m	4.13 m
0.4	9.78 m	6.75 m	5.51 m
0.5	12.23 m	8.43 m	6.88 m
0.6	14.68 m	10.12 m	8.26 m
0.7	17.12 m	11.81 m	9.63 m
0.8	19.57 m	13.49 m	11.01 m
0.9	22.01 m	15.18 m	12.39 m
1	24.46 m	16.87 m	13.76 m
1.25	30.57 m	21.08 m	17.20 m
1.5	36.69 m	25.30 m	20.65 m
1.75	42.80 m	29.52 m	24.09 m
2	48.92 m	33.74 m	27.53 m
2.25	55.03 m	37.95 m	30.97 m
2.5	61.15 m	42.17 m	34.41 m
2.75	67.26 m	46.39 m	37.85 m
3	73.38 m	50.60 m	41.29 m

Opening angle 90°

Smoke width (m)	A	B	C
0.3	8.20 m	6.17 m	5.28 m
0.4	10.93 m	8.23 m	7.03 m
0.5	13.66 m	10.28 m	8.79 m
0.6	16.39 m	12.34 m	10.55 m
0.7	19.12 m	14.40 m	12.31 m
0.8	21.85 m	16.45 m	14.07 m
0.9	24.59 m	18.51 m	15.83 m
1	27.32 m	20.56 m	17.58 m

1.25	34.15 m	25.71 m	21.98 m
1.5	40.98 m	30.85 m	26.38 m
1.75	47.81 m	35.99 m	30.77 m
2	54.63 m	41.13 m	35.17 m
2.25	61.46 m	46.27 m	39.57 m
2.5	68.29 m	51.41 m	43.96 m
2.75	75.12 m	56.55 m	48.36 m
3	81.95 m	61.69 m	52.75 m

Opening angle 60°

Smoke width (m)	A	B	C
0.3	12.19 m	10.91 m	10.29 m
0.4	16.26 m	14.55 m	13.73 m
0.5	20.32 m	18.18 m	17.16 m
0.6	24.39 m	21.82 m	20.59 m
0.7	28.45 m	25.45 m	24.02 m
0.8	32.51 m	29.09 m	27.45 m
0.9	36.58 m	32.73 m	30.88 m
1	40.64 m	36.36 m	34.31 m
1.25	50.80 m	45.45 m	42.89 m
1.5	60.96 m	54.55 m	51.47 m
1.75	71.12 m	63.64 m	60.05 m
2	81.28 m	72.73 m	68.63 m
2.25	91.44 m	81.82 m	77.21 m
2.5	101.60 m	90.91 m	85.78 m
2.75	111.76 m	100.00 m	94.36 m
3	121.93 m	109.09 m	102.94 m

Opening angle 45°

Smoke width (m)	A	B	C
0.3	16.21 m	15.21 m	14.71 m
0.4	21.61 m	20.28 m	19.61 m
0.5	27.02 m	25.35 m	24.51 m
0.6	32.42 m	30.42 m	29.41 m
0.7	37.83 m	35.49 m	34.32 m
0.8	43.23 m	40.55 m	39.22 m

0.9	48.63 m	45.62 m	44.12 m
1	54.04 m	50.69 m	49.02 m
1.25	67.54 m	63.37 m	61.28 m
1.5	81.05 m	76.04 m	73.53 m
1.75	94.56 m	88.71 m	85.79 m
2	108.07 m	101.39 m	98.04 m
2.25	121.58 m	114.06 m	110.30 m
2.5	135.09 m	126.73 m	122.56 m
2.75	148.60 m	139.41 m	134.81 m
3	162.11 m	152.08 m	147.07 m

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