Product manual | 24.06.2024

Busch-Watchdog® PRO

6851/9-xxx-500

Busch-Watchdog® 90° BT

6851/22-xxx-500

Busch-Watchdog® 220° BT

6851/22S-xxx-500

Busch-Watchdog® 220° select

Table of contents

1 Notes on the instruction manual

Please read through this manual carefully and observe the information it contains. This will assist you in preventing injuries and damage to property and ensure both reliable operation and a long service life for the device.

Please keep this manual in a safe place.

If you pass the device on, also include on this manual along with it.

ABB accepts no liability for any failure to observe the instructions in this manual.

If you require additional information or have questions about the device, please contact ABB or visit our Internet site at:

www.abb.com

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent hazards of this kind.

ABB accepts no liability for any failure to observe the safety instructions.

2.1 Information and symbols used

The following Instructions point to particular hazards involved in the use of the device or provide practical instructions:

Danger

Risk of death / serious damage to health

– The respective warning symbol in connection with the signal word "Danger" indicates an imminently threatening danger which leads to death or serious (irreversible) injuries.

Warning

Serious damage to health

– The respective warning symbol in connection with the signal word "Warning" indicates a threatening danger which can lead to death or serious (irreversible) injuries.

Caution

Damage to health

– The respective warning symbol in conjunction with the signal word "Caution" indicates a hazard that can lead to minor (reversible) injuries.

Attention

Damage to property

– This symbol in connection with the signal word "Attention" indicates a situation which could cause damage to the product itself or to objects in its surroundings.

Notice

This icon in connection with the word "Note" indicates useful tips and recommendations for the efficient handling of the product.

This icon alerts to electric voltage.

2.2 Intended use

The Busch-Watchdog® are passive infrared motion detectors that switch connected loads via a timer when heat sources move within the detection range.

The device is intended for the following:

- Operation according to the listed technical data
- Installation on walls of buildings
- Use with the connecting options available on the device

The intended use also includes adherence to all specifications in this mnaual.

Danger - Electric shock due to short-circuit!

Risk of death due to electrical voltage of 100 to 240 V during short-circuit in the low-voltage line.

– Low-voltage and 100 - 240 V lines must not be installed together in a flush-mounted box!
– Observe the spatial division during installation (> 10 mm) of SELV electric circuits to other electric circuits.
– If the minimum distance is insufficient, use electronic boxes and insulating tubes.
– Observe the correct polarity.
– Observe the relevant standards.

2.3 Improper use

Any use other than that specified in chapter 2.2 "IIntended use" on page 6 is considered improper use and can lead to personal injury and damage to property.

ABB is not liable for damages caused by use deemed contrary to the intended use of the device. The associated risk is borne exclusively by the user or operator.

The device is not intended for the following:

- Unauthorised structural changes
- Repairs
- Replacement for an alarm system.

2.4 Target group / Qualifications of personnel

2.4.1 Operation

No special qualifications are required to operate the device.

2.4.2 Installation, commissioning and maintenance

Installation, commissioning and maintenance of the device must only be carried out by trained and properly qualified electrical installers.

The electrical installer must have read and understood the manual and follow the instructions provided.

The electrical installer must adhere to the valid national regulations in his/her country governing the installation, functional test, repair and maintenance of electrical products.

The electrical installer must be familiar with and correctly apply the "five safety rules" (DIN VDE 0105, EN 50110):

1. Disconnect
2. Secure against being re-connected
3. Ensure there is no voltage
4. Connect to earth and short-circuit
5. Cover or barricade adjacent live parts

2.5 Safety instructions

Danger - Electric voltage!

Electric voltage! Risk of death and fire due to electric voltage of 100 to 240 V.

Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death Work improperly carried out on current-carrying parts can cause fires.

- Work on the 100 ... 240 V mains may only be carried out by qualified electricians.
- Disconnect the mains voltage before mounting or dismantling.
- Never use the device with damaged connecting cables.
- Do not open covers that are firmly bolted to the housing of the device.
- Use the device only if it is in a technically faultless state.
- Do not make changes to or perform repairs on the device, its components or its accessories.

Attention! – Risk of damage to the device due to external factors!

Moisture and contamination can damage the device.

– Protect the device against humidity, dirt and damage during transport, storage and operation.

3 Information on protection of the environment

3.1 Environment

Consider the protection of the environment!

Used electric and electronic devices must not be disposed of with household waste.

– The device contains valuable raw materials that can be recycled. Therefore, dispose of the device at the appropriate collecting facility.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

The products meet the legal requirements, in particular the laws governing electric and electronic devices and the REACH ordinance.

(EU Directive 2012/19/EU WEEE and 2011/65/EU RoHS and 2009/125 Ecodesign)

(EU-REACH ordinance and law for the implementation of the ordinance (EG) No.1907/2006)

4 Setup and function

4.1 Features

The Busch-Watchdog® are passive infrared motion detectors. They switch connected loads via a timer when heat sources move within the detection range.

The remote control and parameter setting is carried out via the ABB-free@home® Next App app in the respectively most current version.

The device is suitable for wall and ceiling mounting. Installation on ISO switch boxes (68 mm) is also possible.

The Busch-Watchdog® are no intrusion or attack alarms.

The following list provides an overview of the most important functions:

- Integrated twilight sensor
- Ground and back field monitoring (6851/9-xxx, 6851/22-xxx)
- Brightness-independent mode for walking test
- Automatic interference suppression
- Automatic glare protection
- Automatic range stabilisation (summer/winter operation)

Notice
Additional functions are available when using ABB-free@home® Next App. Detailed information on the individual functions can be found in the app manual for Busch-Watchdog® PRO motion detectors.

4.2 Overview of types

Article Number	Product name	Detection range	Area of application
6851/9-xxx	90° BT	90°	Terraced houses
6851/22-xxx	220° BT	220°	Larger properties and detached houses
6851/22S-xxx	220° select BT	220° (suitable for scenarios with curtain monitoring or animal path due to selective detection area)	Larger properties and detached houses

Table 1: Overview of types

Article Number	Colour
6851/x-131	brown, RAL 8017
6851/x-133	aluminium silver, RAL 9006
6851/x-134	studio white, RAL 9016
6851/x-135	anthracite, RAL 7016
6851/x-136	Stainless steel

Tab.2: Colour variants

4.3 Device overview

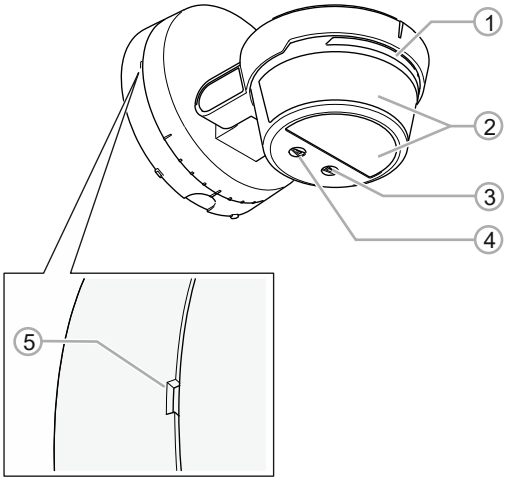


Fig. 1: Device overview 6851/9-xxx, 6851/22S-xxx and 6851/22-xxx

Pos.	Desciption
[1]	**LED**
[2]	**Lens** Note: The lens on the underside of the 6851/22S-xxx device is omitted
[3]	Follow-up time **selector switch**, short pulse / reset
[4]	Brightness limit value **selector switch**, walking test
[5]	**Groove for dismantling**

Tab. 3: Device overview

5 Technical data

Designation	Value
Nominal voltage	230 V AC ± 10 % 50 / 60 Hz
Switching capacity	2300 W/VA
Switching capacity LEDi	400 VA
Maximum power loss	< 0.3 W
Twilight sensor	Typ. 0.5 - 1000 / ∞ lux
Switch-off delay	10 seconds - 30 minutes
Short-time pulse Pulse duration ▪Break time	 ▪ 1 second ▪ 9 seconds
Operation temperature	-25 °C - 55 °C
Protection type	IP 55

Tab. 4: General technical data

Technical Technical data 6851/9-xxx

Designation	Value
Front lens	90°
Horizontal detection	90°
Maximum transmission range (if mounted 2.5 m high)	12 m at the front and 8 m at each side
Number of PIRs (can be switched off individually)	90° > 1 PIR

Table 5: Technical data 6851/9-xxx

Technical Technical data 6851/22-xxx

Designation	Value
Front lens	220°
Horizontal detection	220°
Maximum transmission range (if mounted 2.5 m high)	16 m in radius
Number of PIRs (can be switched off individually)	220° > 2 PIR

Table 6: Technical data 6851/22-xxx

Technical Technical data 6851/22S-xxx

Designation	Value
Front lens	220° select
Horizontal detection	220°
Maximum transmission range ▪for installation at a height of 2.5 m ▪for installation at a height of 1.5 m	 ▪16 m in radius ▪16 m in radius
Number of PIRs (can be switched off individually)	220° > 2 PIR

Table 7: Technical data 6851/22S-xxx

5.1 Dimensional drawings

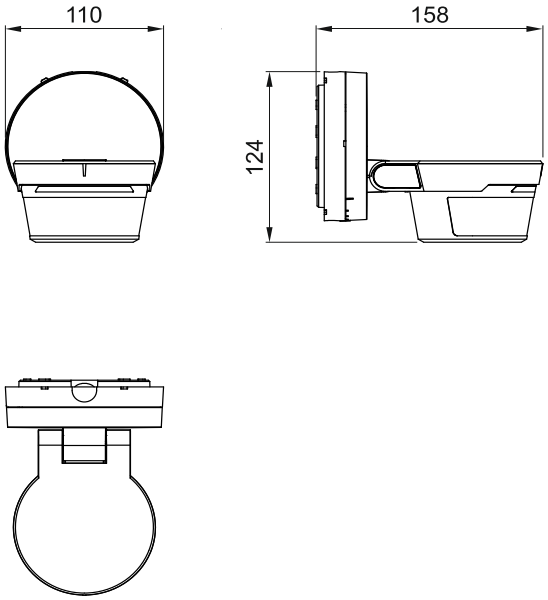


Fig. 2: Dimensions

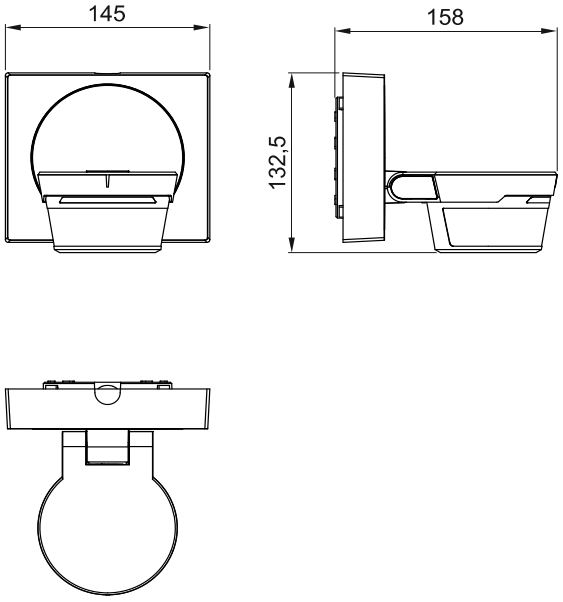


Fig. 3: Dimensions with design frame (optional)

Notice
All dimensions are in mm.

5.2 Detection range

90° BT

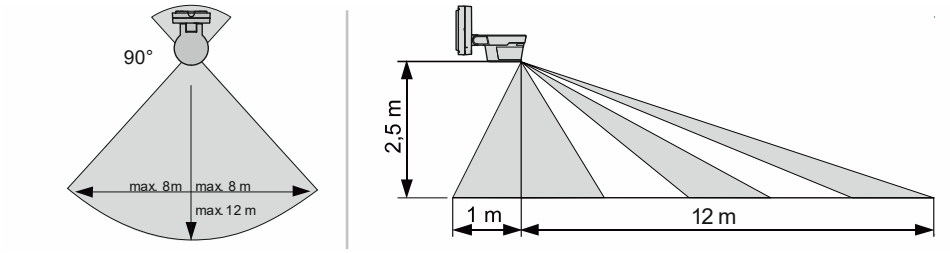


Fig. 4: Detection area 6851/9-xxx

Detection range

- The detection range is 90°.
- The maximum range is 12 m frontally and 8 m laterally.
- In addition, the motion detector has a rear field monitoring of one metre.

Wall mounting

- When mounted on a wall at a maximum height of 2.5 m, the motion detector offers optimum monitoring.

220° BT

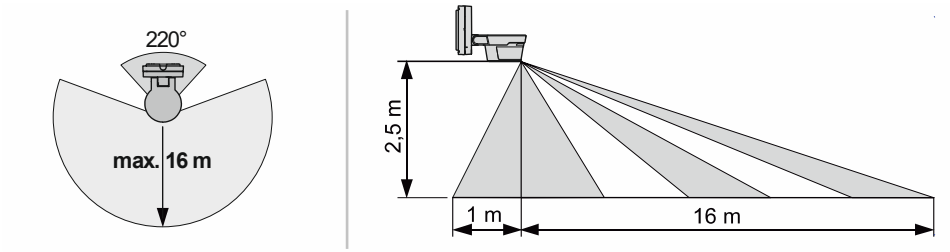


Fig. 5: Detection area 6851/22-xxx

Detection range

- The detection range is 220°.
- The maximum range is 16 m in radius.
- In addition, the motion detector has a rear field monitoring of one metre.

Wall mounting

- When mounted on a wall at a maximum height of 2.5 m, the motion detector offers optimum monitoring.

220° select BT

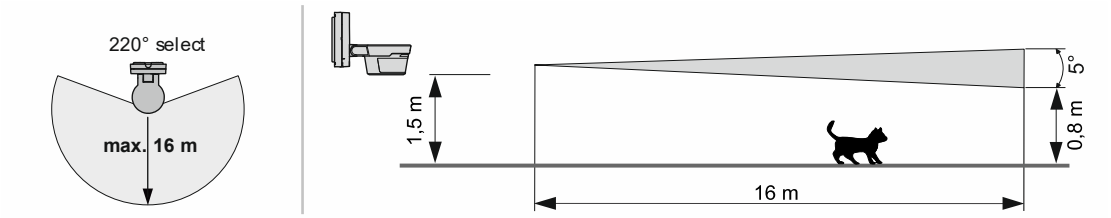


Fig. 6: Detection area 6851/22S-xxx

Detection range

- The detection range is 220°.
- The maximum range is 16 m in radius.
- The vertical aperture angle is > 5°, so detection with an animal track is possible with wall mounting.

Wall mounting

- When mounted on a wall at a maximum height of 1.5 m, the motion detector offers optimum monitoring.

6 Connection, installation / mounting

Danger - Electric voltage!

Electric voltage! Risk of death and fire due to electric voltage of 100 to 240 V.
Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death Work improperly carried out on current-carrying parts can cause fires.

- Work on the 100 ... 240 V mains may only be carried out by qualified electricians.
- Disconnect the mains voltage before mounting or dismantling.
- Never use the device with damaged connecting cables.
- Do not open covers that are firmly bolted to the housing of the device.
- Use the device only if it is in a technically faultless state.
- Do not make changes to or perform repairs on the device, its components or its accessories.

6.1 Requirement for the electrician

Danger - Electric voltage!

Install the device only if you have the necessary electrical engineering knowledge and experience.

- Incorrect installation endangers your life and that of the user of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:

- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
  1. Disconnect
  2. Secure against being re-connected
  3. Ensure there is no voltage
  4. Connect to earth and short-circuit
  5. Cover or barricade adjacent live parts.
- Use suitable personal protective equipment.
- Use only suitable tools and measuring devices.
- Check the voltage supply mains type (TN system, IT system, TT system) to guarantee the following connection conditions (classic connection to earth, protective earthing, necessary additional measures, etc.).
- Ensure correct polarity.

6.2 Electrical connection

Standard connection

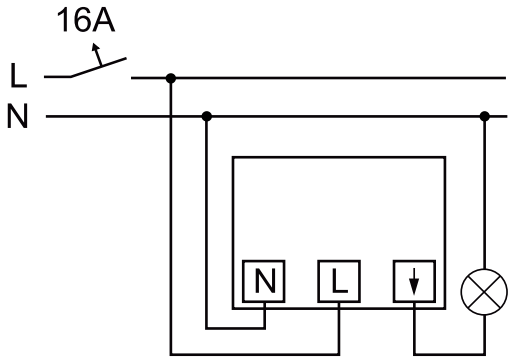


Fig. 7: Standard connection

Standard connection with NC button

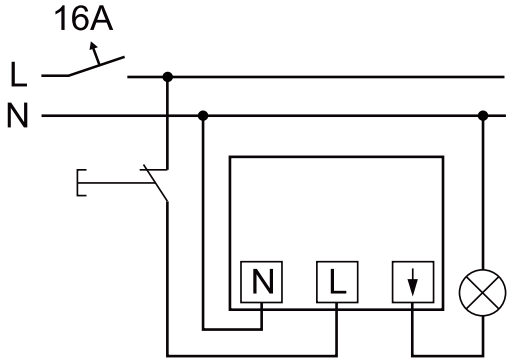


Fig. 8: Standard connection with NC button

The connected load is switched on for the duration of the set run-on time after the break contact is pressed.

Connection with RC-Löschglied 6899 and relay

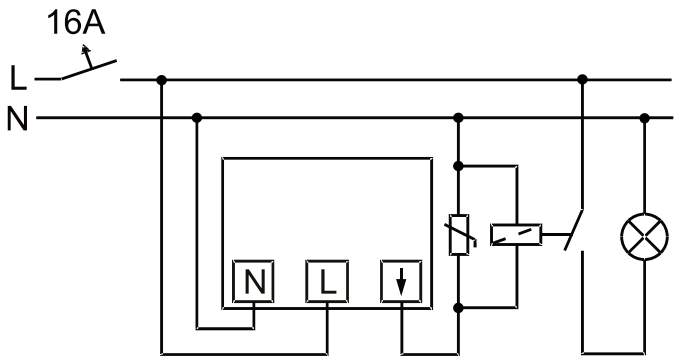


Fig. 9: Connection with RC-Löschglied 6899 and relay

Terminal assignment

[⏚] Green/yellow

[L] Brown

[N] Blue

[↓] Grey

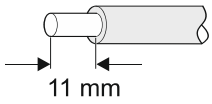


Fig. 10: Skinning length

The stripping length is 11 mm.

Attention!

Protection of the skinned lengths

– Do not remove the wire end sleeves on the device cables.

Danger - Electric shock due to short-circuit!

Risk of death due to electrical voltage of 100 to 240 V during short-circuit in the low-voltage line.

– Low-voltage and 100 - 240 V lines must not be installed together in a flush-mounted box!
– Observe the spatial division during installation (> 10 mm) of SELV electric circuits to other electric circuits.
– If the minimum distance is insufficient, use electronic boxes and insulating tubes.
– Observe the correct polarity.
– Observe the relevant standards.

6.3 Mounting

Danger - Electric voltage!

Risk of death and fire due to electric voltage of 100 to 240 V.

– Work on the 100 - 240 V supply system may only be performed by authorised and qualified electricians.
– Disconnect the mains voltage prior to mounting and dismantling.

Attention! - Damage to the appliance due to the use of hard objects!

The plastic parts of the device are sensitive.

– Pull the attachment off only with your hands.
– Do not lever parts off with screwdrivers or similar hard objects.

Attention! - Risk of damaging the device

The lens of the device is sensitive and can easily sustain damage.

– Do not press on the lens of the device!

Mounting the device

1. If the upper and lower sections are already locked in place, use a screwdriver to press in the recess for disassembly (X).

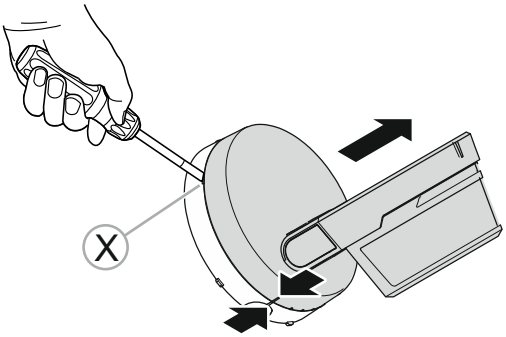


Fig. 11: Press in the recess for disassembly

2. Turn the upper part anti-clockwise.

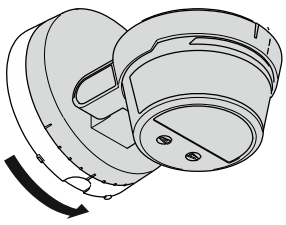


Fig. 12: Turn the upper part anti-clockwise

3. Carefully remove the upper part.

4. Fit the plinth.
   – The screw-on options [A] of the base are compatible with any existing holes in old Busch-Watchdog®.
   – Do not use countersunk screws to mount the base.
   – Use screws with a head diameter of 6.5 ... 8.5 mm.

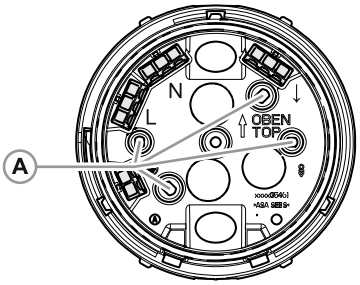


Fig. 13: Base mounting options

5. Connect the device electrically.
   – Ensure that the wiring is correct (see chapter 6.2 "Electrical connection" on page 18).

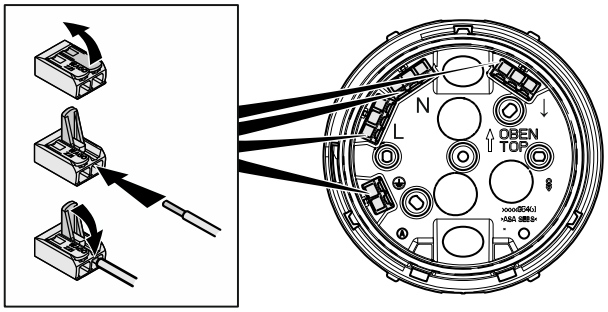


Fig. 14: Position of connection terminals on the plinth

   – When wiring, take care not to damage the ventilation hose [A] on the back of the upper section.

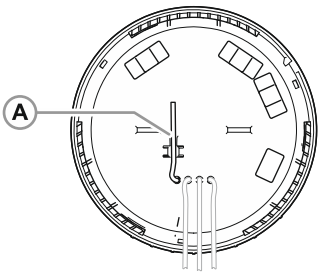


Fig. 15: Ventilation hose [A] on the upper part

6. Latch the cover of the device onto the base.

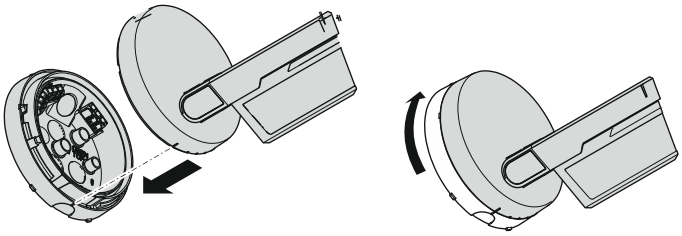


Fig. 16: Snap the front of the appliance onto the plinth

7. Attach the cover so that the markings are above each other.

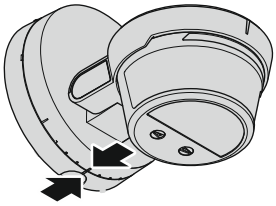


Fig. 17: Align markings

8. Turn the upper part clockwise until it engages with an audible click.

Mounting the design frame (optional)

Notice
The Busch-Watchdog® 6851/DR-xxx design frame is not included in the scope of delivery and can be ordered separately.

Notice
The Busch-Watchdog® 6851/DR-xxx design frame is suitable for wall and ceiling mounting, but not for corner mounting.

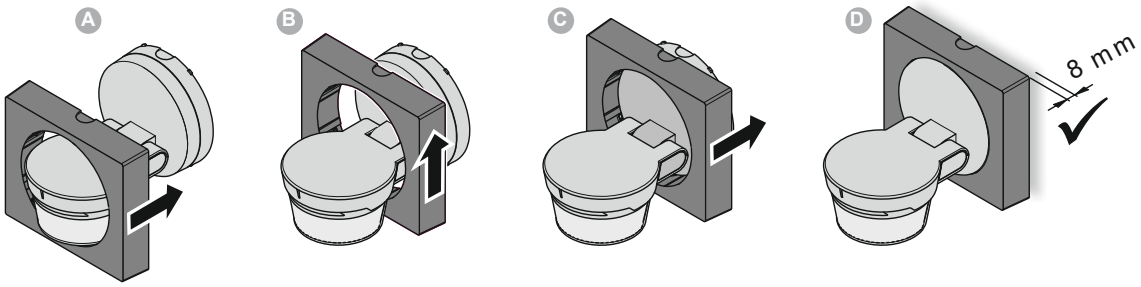


Fig. 18: Mounting the design frame (optional)

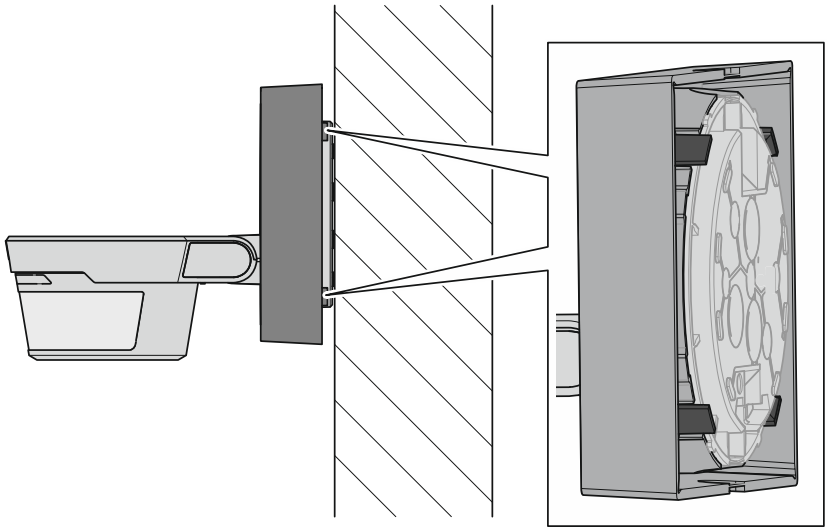


Fig. 19: Design frame detail view

Mounting the corner adapter (optional)

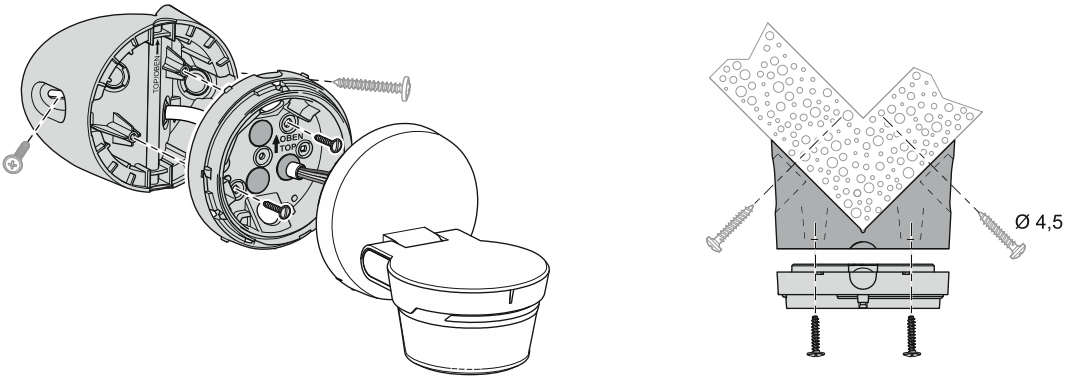


Fig. 20: Mounting the corner adapter (optional)

Notice

The corner adapter (not included in the scope of delivery) can be used for corner mounting of 6851/22-xxx and 6851/22S-xxx.

6.4 Mounting situation

There are different types of installation for Busch-Watchdog® 6851/9-xxx, 6851/22-xxx and 6851/22S-xxx.

Ceiling mounting

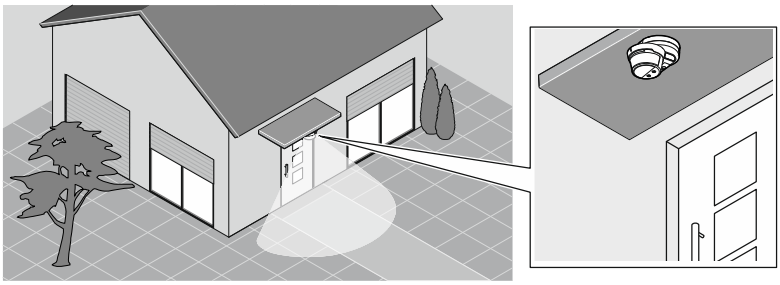


Fig. 21: Ceiling installation, example canopy

Wall mounting 6851/9-xxx

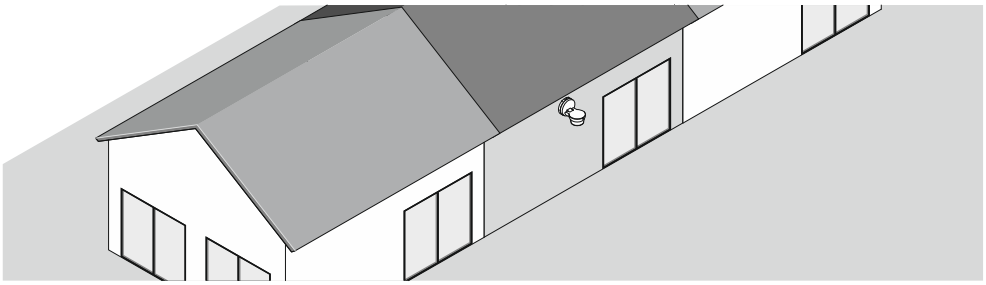


Fig. 22: Wall mounting on centre-row house 6851/9-xxx

Fig. 23: Wall mounting on centre-row house for limited detection radius 6851/9-xxx

Wall mounting 6851/22-xxx

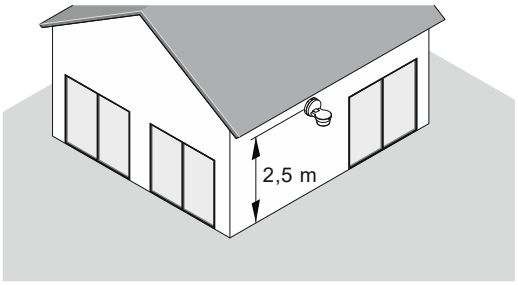


Fig. 24: Wall mounting on a detached single-family house 6851/22-xxx

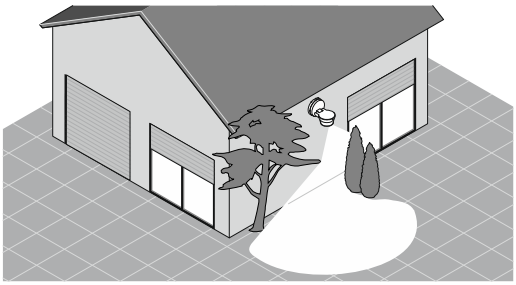


Fig. 25: Wall mounting on detached single-family house with floor lens 6851/22-xxx

Wall mounting on a slope 6851/22-xxx

Wall mounting on a slope is recommended, for example, for a building on a hill or with a gradient. This allows the detection ranged to be used effectively.

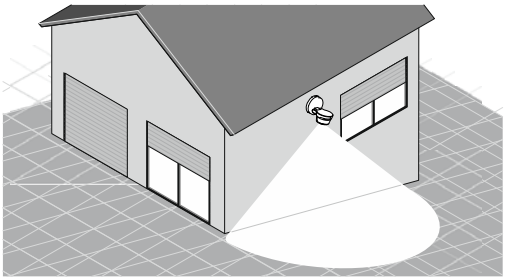


Fig. 26: Wall mounting on a slope 6851/22-xxx

Wall mounting 6851/22S-xxx

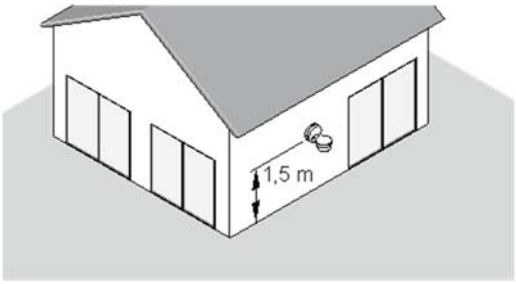


Fig. 27: Wall mounting on a detached single-family house 6851/22S-xxx

Fig. 28: Wall mounting on detached single-family house without floor lens 6851/22S-xxx

Installation for curtain monitoring 6851/22S-xxx

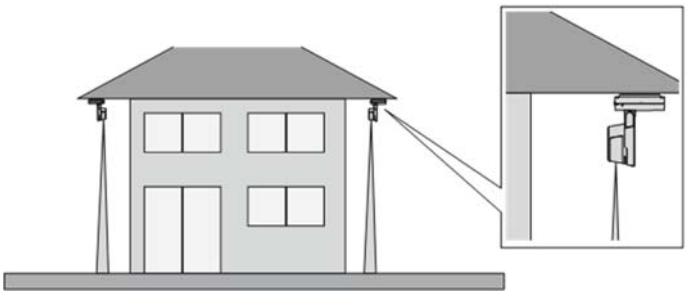


Fig. 29: Installation for curtain monitoring 6851/22S-xxx

Animal corridor 6851/22S-xxx

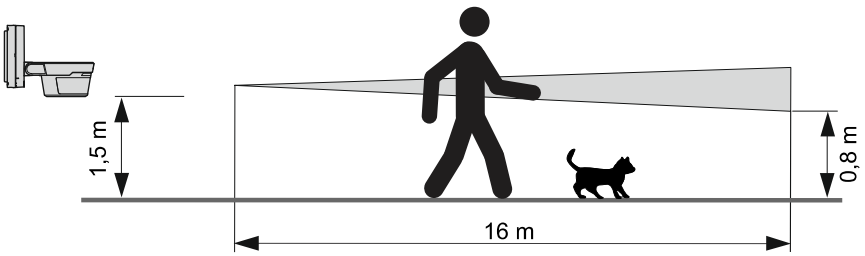


Fig. 30: Animal corridor 6851/22S-xxx

6.5 Changing the range

Change the range as follows:

1. Change the range by raising or lowering the device head (at least 6 metres).

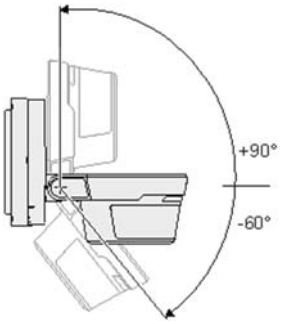


Fig. 31: Coverage

6.6 Installation site

- Ceiling mounting is not recommended in confined spaces.
- The mounting height of the appliance must be between 1.5 m (6851/22S-xxx) and 2.5 m (6851/9-xxx and 6851/22-xxx).
- The motion detector should be at least 1.5 m away from light and heat sources.
- The ideal mounting position for the motion detector is slightly offset to the walking direction.

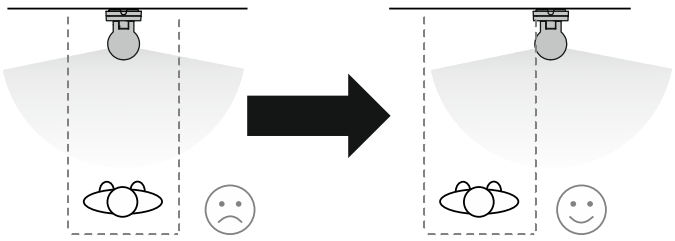


Fig. 32: Mounting position

7 Commissioning

7.1 Reduction of the detection range

The detection area can be reduced using the film supplied or via the app.

The detection angle can be specifically limited by gluing on the enclosed foil.

The detection range of the Busch-Watchdog® is 90° or 220° horizontally. The detection range can be limited in case of special local circumstances. To do this, proceed as follows:

1. Cut the enclosed masking film to the desired length.
2. Stick the shortened masking film from the front in front of the lens of your Busch-Watchdog® on the area where the detection is to be faded out.

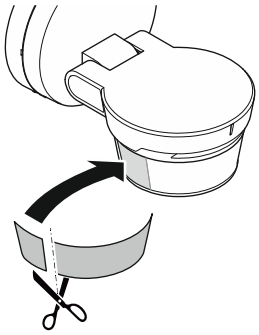


Fig. 33: Masking the detection area

Notice
The floor lens can also be masked with the enclosed films as described above.

7.2 Changing the lateral detection area

Change the lateral detection area as follows:

1. Adjust the lateral detection range by turning the head of the device.

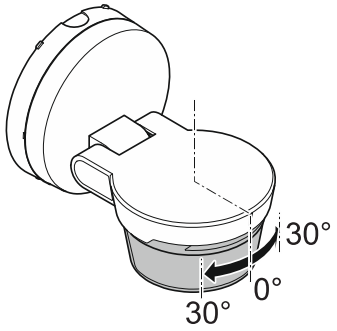


Fig. 34: Lateral detection area

7.3 Adaptation to slopes

To adjust the detection area to the slope, proceed as follows:

1. Change the level of the detection area by turning the upper part of the device on the base.

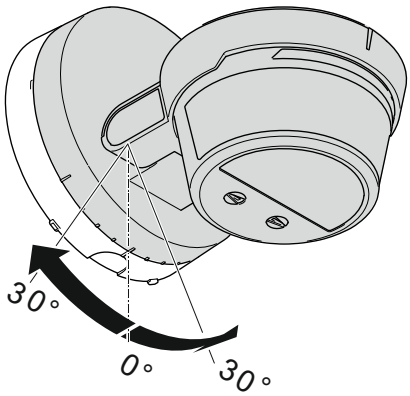


Fig. 35: Adapt the detection area to the slope

7.4 Commissioning the device via the app

Notice
Detailed information on the setting options and operation via ABB-free@home® Next App can be found in the app manual for Busch-Watchdog® PRO motion detectors.

7.5 Walking test

The walking test is used to check the detection range by pacing. A run-on time of two seconds is activated during the walking test; the device operates independently of brightness.

Notice
The detection area can be reduced by sticking on a film or via the app (see chapter 7.1 "Reduction of the detection range" on page 29).

Activating the walking test

The device is in the walking test for 10 minutes (red status LED flashes quickly at 5 Hz):

- After an interruption in the operating voltage supply lasting longer than 15 seconds.
- When the selector switch is briefly set to "Test".
  - After activating the walking test, set the selector switch to the desired brightness value.

Selector switch

6851/9-xxx

Selector switch

6851/22-xxx

6851/22S-xxx

Fig. 36: Activation test

Carrying out the walking test

1. Walk through the detection area.
   - Each detection is indicated by the status LED flashing quickly.
2. If necessary, adjust the detection area and test the adjustments by walking through it again.

Completing the walking test

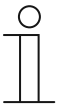
The device terminates the "Walk test" function under the following conditions:

- Automatically 10 minutes after the start of the walking test if the selector switch has been set to any brightness value.

Manual termination of the walking test:

– Turn the selector switch to any brightness value and then briefly to the "Test" position.

– Now set the desired brightness value.



Notice

The device deactivates if the selector switch is left in the "Test" position:

– at the end of the ten-minute walking test

– after approx. 5 s if the device is not in "walking test" mode

To activate the device, turn the selector switch from the "Test" position.

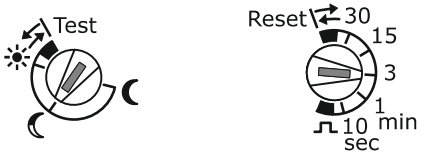
8 Operation

8.1 Operating modes for on-site operation

Standard function

Lighting during advancing twilight remains switched on for 3 minutes after the last detection.

Selector switch
6851/9-xxx



Selector switch
6851/22-xxx
6851/22S-xxx

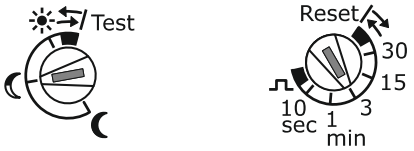


Fig. 37: Standard operation

Notice
After switching on the mains voltage, the device is in "Walk test" mode for 10 minutes (see chapter 7.5 "Walking test " on page 31).

Normal operation (time and brightness-dependent)

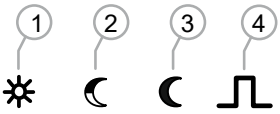
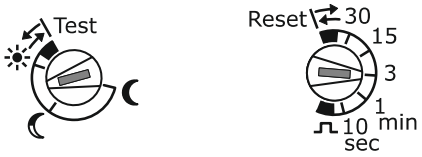


Fig. 38: Icons

[1] Switching during all brightness levels
[2] Switching during advancing twilight
[3] Switching during darkness
[4] Short-time pulse

Selector switch
6851/9-xxx



Selector switch
6851/22-xxx
6851/22S-xxx

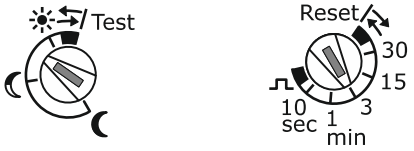


Fig. 39: Standard operation

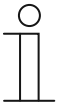
1. Set the values for the brightness limit value and the switch-off delay (ON period of the light after the last detection).
   – Short-time pulse for activating the staircase light timer switches or door bells.

Notice

Local operation can be disabled via ABB-free@home® Next App. In this case, both operation and the master reset via the selector switch on the device are deactivated.

The lock can only be cancelled via the app.

8.2 Operating modes for operation via the app



Notice

Detailed information on the setting options and operation via ABB-free@home® Next App can be found in the app manual for Busch-Watchdog® PRO motion detectors.

8.3 LED status display

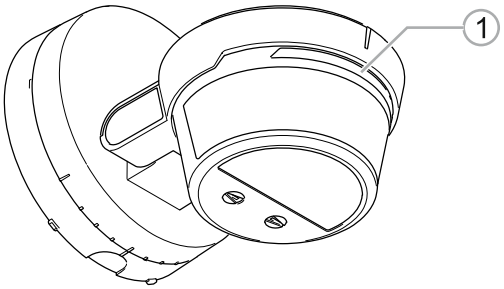


Fig. 40: LED position

[1] LED

Indication	Function
▪ Blue LED - flashes twice (1 Hz)	Starting the device after the return of voltage, when the device is in factory status and has not been connected with the app
▪ Red LED - flashes twice (1 Hz)	Starting the device after the return of voltage, when the device has already been read into the system or has been connected with the app
▪ Blue LED pulsates (1 Hz)	During the connection with the app
▪ Blue LED flashes quickly fo r20 seconds (5 Hz)	Device identification via app
▪ Red LED - flashes fast (5 Hz)	Motion detection in "Walk test" mode
▪ Red LED - flashes three times (1 Hz) and then pauses for 10 s	Movement detection during standard operation
▪ Red LED - lights up permanently	"Lock to brightness" function activated (via the app)
▪ Red LED - flashes (1 Hz)	Master reset phase 1, first 5 seconds (via selector switch)
▪ Red LED - flashes (2 Hz)	Master reset phase 2, following 5 seconds (via selector switch)
▪ Purple LED - flashes (1 Hz) during the entire update	Firmware update

Table 8: LED status display

8.4 RESET (Resetting the device)

There are two ways to reset the device to the factory settings:

– Master reset via selector switch directly on the device
– Master reset via app

Notice
Local operation can be disabled via ABB-free@home® Next App. In this case, both operation and the master reset via the selector switch on the device are deactivated.
The lock can only be cancelled via the app.

Master reset via selector switch

1. Switch off the power supply to the device for 10 seconds.
2. Switch the voltage back on.
   – A master reset can be carried out within the next 5 minutes.
3. Set the selector switch to the "Reset" position.
   – After 10 seconds, the red LED starts to flash slowly for 5 seconds (1 Hz, flash code master reset phase 1).
   – The red LED then starts to flash faster for 5 seconds (2 Hz, flash code master reset phase 2).
   – Then the LED goes out.
   – The master reset was performed.
4. Now turn the selector switch back out of the "Reset" position.

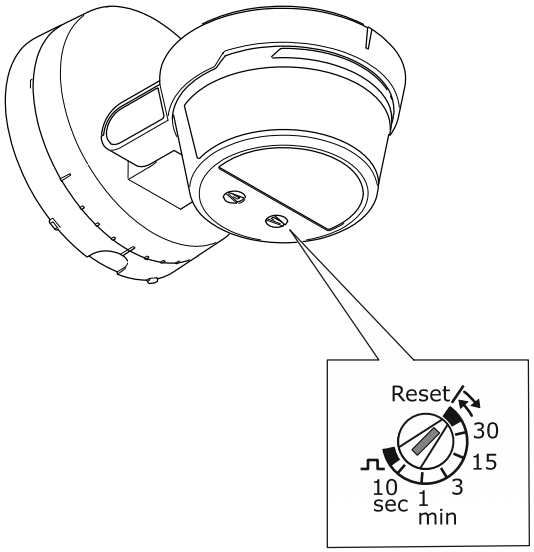


Fig. 41: Reset selector switch

Master reset via app

Notice

Detailed information on the setting options and operation via ABB-free@home® Next App can be found in the app manual for Busch-Watchdog® PRO motion detectors.

9 Maintain

9.1 Maintenance-free device

The unit is maintenance-free. In case of damage, e.g. during transport or storage, do not perform repairs. Once the device is opened, the warranty is void.

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

9.2 Cleaning

Attention! - Risk of damaging the device!

- Spraying cleaning agents can cause them to penetrate the appliance through gaps.
  - Do not spray cleaning agents directly onto the device.
- Aggressive cleaning agents may damage the surface of the appliance.
  - Do not use corrosive agents, abrasive agents or solvents.

Clean dirty devices with a soft dry cloth.

– If this is insufficient, the cloth can be moistening slightly with a soap solution.

10 Notes

11 Index

Busch-Jaeger Elektro GmbH
A member of the ABB Group

Freisenbergstraße 2
D-58513 Lüdenscheid, Germany

https://new.abb.com/en

Customer service:
Tel.: +49 2351 956-1600

2CKA001473B5790