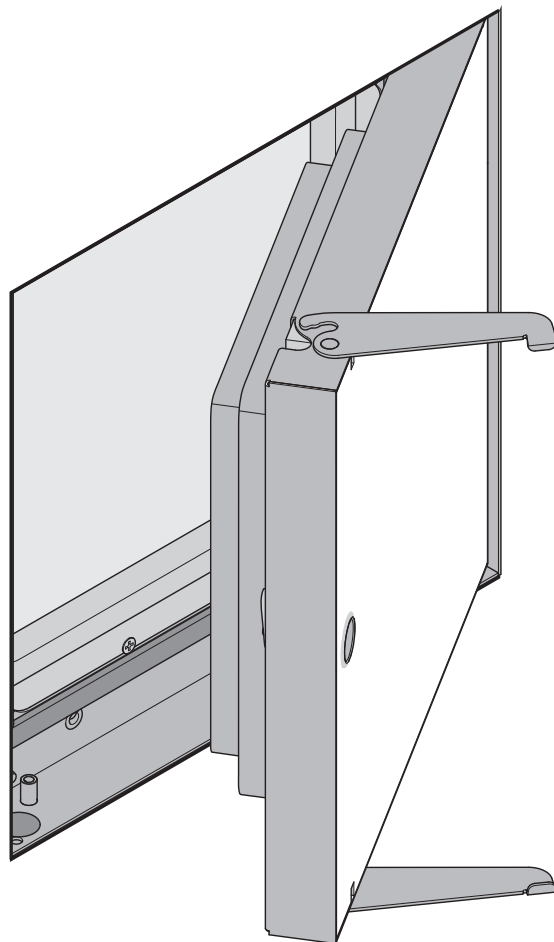




EN

Assembly and operating manual **Access panel UniSpace 60/90**

11.2021

Assembly and operating manual for the access panels:

- UniSpace 60/90 with square lock
- UniSpace 60/90 with cylinder lock

Descriptions are identical for all models listed above.

Any differences are noted separately. Show figures:

- UniSpace 60/90 with square lock
- Part of the product.
- Copyright protected.
- Duplication, reprinting and distribution only with permission.

Safety notes

WARNING!

Notes identified with the word WARNING warn of a hazardous situation that can lead to death or serious injury.

CAUTION!

Notes identified with the word CAUTION warn of a situation that can lead to minor or moderate injury.

ATTENTION!

Notes identified with the word ATTENTION warn of a situation that can lead to property or environmental damage.



Danger of crushing



Danger of falling



Danger or injuries due to sharp objects

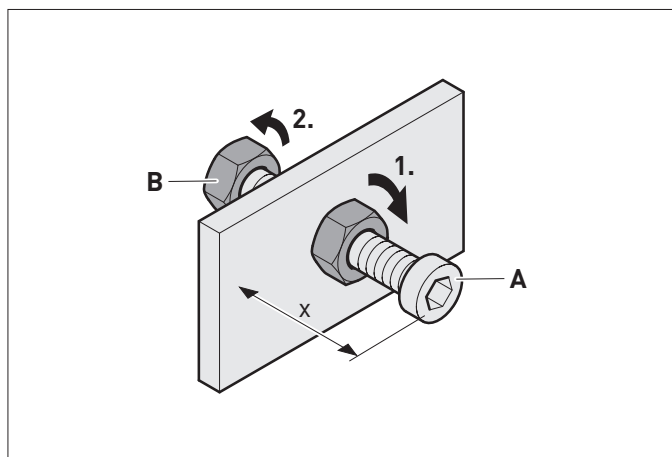


Danger of property damage

Explanation of symbols in the text

- Action required
- List
- ✓ Check
- 💡 Tip or recommendation
- ➔ Reference to other parts of this document
- 📄 Reference to other sources that must be observed

Explanation of symbols in images



- Highlights the action parts with surfaces
- A** Part designations or sizes
- x Dimensions in mm
- ↪ Arrows showing movement or direction
- 1. Sequential order of action steps

1	Action step with number
✓	Correct
✗	Incorrect
+	Optional
i	Inform
🔍	Check
🧤	Clean
🕒	Wait
⌚	Suspend

1. Safety information	6	4. Ceiling mounting	20
Intended use	6	Safety notes for ceiling mounting	20
Authorised target groups	6	Preconditions for ceiling mounting	20
Manufacturer	6	Retrospective installation	20
Developer	6	Permissible materials	20
Owner	6	Requirements for ceiling mounting	21
Specialist	6	Preparation for installation	21
User	6	Unpacking the device	22
General safety notes	7	Establishing the construction opening in ceiling systems	22
2. Product information	8	Installing a trimmer	22
Operating principle	8	Creating the construction opening	23
Variants	8	Mounting the additional hangers	23
Product overview	8	Removing the door leaf	24
Orientation	8	Mounting the device in the ceiling	24
Scope of delivery	8	Positioning the frame	24
Dimensions	8	Aligning the frame	25
Installation variants	9	Securely screwing the frame to the ceiling	26
Identification / type plate	9	Fitting the door leaf	26
Weight	9	Checking the frame	26
3. Wall mounting	10	Filling the construction connection joint	27
Safety notes for wall mounting	10	Cleaning the frame	27
Preconditions for wall mounting	10	Hardening the construction connection joint	27
Retrospective installation	10	Checking the door	27
Permissible materials	10	Checking the lock	28
Requirements for wall mounting	11	Filling the door leaf	28
Preparation for installation	11	Finishing the ceiling mounting	29
Unpacking the device	12	5. Use	30
Establishing the construction opening in wall systems and solid walls	12	Safety notes for use	30
Installing a trimmer	12	Opening the device	30
Creating the construction opening	13	Closing the device	30
Establishing the construction opening in solid walls	13	6. Cleaning	31
Removing the door leaf	14	Safety notes for cleaning	31
Mounting the device in the wall	15	Cleaning	31
Positioning the frame	15	7. Maintenance	32
Aligning the frame	16	Safety notes for maintenance	32
Securely screwing the frame to the wall	16	Maintenance intervals	32
Fitting the door leaf	16	Maintenance measures	32
Checking the frame	17	Troubleshooting	33
Filling the construction connection joint	17	8. Disassembly	34
Cleaning the frame	17	Safety notes for disassembly	34
Hardening the construction connection joint	17	Disassembling the device	34
Checking the door	18		
Checking the lock	18		
Filling the door leaf	18		
Finishing the wall mounting	19		

9. Disposal	35
Disposing of the packaging	35
Disposing of the device	35
10. Annex	36
Accessories	36
Approval	36
Standards and regulations	36
Declaration of conformity by the building authorities	37



1. Safety information



Intended use

The access panel enables access to the installations behind the wall or ceiling. In the event of fire, the closed access panel prevents fire and smoke spreading. The access panel is referred to as the device in this assembly and operating manual.

Use of the device is only permissible in the following cases:

- When technically faultless.
- After professional installation without affecting the structure and strength of the false wall or false ceiling.
- With consideration to the building regulations for the false wall or false ceiling.
- At an ambient temperature under normal circumstances of 0 C° to + 60 C°

Intended use also includes reading and observing this manual.

Any other use is improper use. The manufacturer shall not be liable for damage that arises due to improper use.

Authorised target groups

Authorised target groups are divided up into personnel groups with different rights.

Manufacturer

The manufacturer and their authorised representatives have the following task:

- Delivery of the device ready for installation.

Developer

The developer is responsible for the construction or conversion of the building in which the device is installed.

The developer has the following tasks:

- Submission of the declaration of conformity to the competent building supervisory authority.

The developer shall appoint a site manager to ensure the following:

- Satisfaction of the preconditions for wall mounting.
- Instruction of the specialist personnel.
- Compliance with the building regulations and requirements.
- Provision and observation of this manual.

Owner

The owner is responsible for the maintenance of the building in which the device is installed.

The owner has the following tasks:

- Ensure that the device is in a technically perfect condition.
- Compliance with cleaning and maintenance requirements.
- Instruction of the user.
- Provision and observation of this manual.

Specialist

Qualified specialists are responsible for assembly, commissioning, maintenance, disassembly and disposal.

Requirements applicable to qualified specialists:

- Professional experience or training in drywall construction.
- Experience in the installation and maintenance of access panels.
- Instruction by the site manager.
- Experience in the use of electrical and mechanical tools.
- Knowledge of occupational safety regulations.
- Knowledge of reading technical drawings.
- Knowledge of this manual.
- Documentation of the work carried out.
- Submission of the declaration of conformity and handover to the client.
- Provision and observation of this manual.

User

Instructed users perform work during use, cleaning and maintenance.

Requirements for instructed users:

- Instruction by the operator.
- Knowledge of this manual.



General safety notes

WARNING!

Danger due to a failure to observe the assembly and operating manual!

This manual contains important information for the safe use of the device. Special attention is drawn to possible dangers. Failure to comply may result in death or serious injury.

- ▶ Read this manual carefully.
- ▶ Follow the safety instructions in this manual.
- ▶ Keep the manual accessible.

Use of the device is prohibited in the following cases:

- Outdoors.
- In damp rooms.
- If the maximum permissible ceiling load is exceeded.
- With installations and conversions of the device (e.g. lamps).
- With remnants or residues of plaster, filler, paint, glue or other materials on the seals between the door and the frame.
- With unhooked safety rope.
- If several access panels are lined up next to each other or on top of each other.

The manufacturer accepts no liability for damage in the following cases:

- Failure to observe the assembly and operating manual.
- Change to the structure.
- Use in an area of application not described or approved.

Further safety instructions must be observed, depending on the activity. The safety instructions can be found in the corresponding chapter of this manual.

- ➔ **Safety notes for wall mounting**
- ➔ **Safety notes for ceiling mounting**
- ➔ **Safety notes for use**
- ➔ **Safety notes for cleaning**
- ➔ **Safety notes for maintenance**
- ➔ **Safety notes for disassembly**



2. Product information



Operating principle

- Inspection openings in shaft walls, partition walls, installation walls and solid walls as well as in suspended ceilings are closed by the access panel.
- When closed, fire and smoke cannot penetrate the access panel, in accordance with the approval (abZ/aBG) and the fire protection classification.

Variants

Fire resistance 60 minutes:

- UniSpace 60 with square lock
- UniSpace 60 with cylinder lock

Fire resistance 90 minutes:

- UniSpace 90 with square lock
- UniSpace 90 with cylinder lock

Product overview



- A** Threaded pin on the mounting claw
- B** Edge gap limiter
- C** Hinge mount
- D** Spring hinge
- E** Frame
- F** Mounting claw
- G** Wall bolt
- H** Sealing profile
- I** Swivel grip
- J** Cylindrical pin for fastening the mounting bracket
- K** Door leaf
- L** Rosette
- M** Locking bar
- N** Lock
- O** Pin hinge
- P** Safety rope with carabiner
- Q** Type plate
- R** QR code for contacting the manufacturer

Orientation



- A** Locating side
- B** Visible side
- C** Locking side

Scope of delivery



- A** Access panel
- B** Mounting bracket
- C** Square socket key (with UniSpace 60/90 with cylinder lock: cylindrical key)
- D** Rosette
- E** Assembly and operating manual

Dimensions



- h** Height of the device (with hinges)
 - h1** Height of the frame
 - h2** Height of the construction opening
 - $\geq h2$ Minimum height of the construction opening
 - $\leq h2$ Maximum height of the construction opening
 - h4** Height of the clear aperture
 - h5** Height of the door leaf
- b** Width of the device (with hinges)
 - b1** Width of the frame
 - b2** Width of the construction opening
 - $\geq b2$ Minimum width of the construction opening
 - $\leq b2$ Maximum width of the construction opening
 - b4** Width of the clear aperture
 - b5** Width of the door leaf
- t** Depth
- d** Clearance dimension



Installation variants

V

The device is suitable for the following installation variants:

- A** Wall mounting
- B** Ceiling mounting

Identification / type plate

The type plate is on the rear of the door leaf and contains the following information:

- Type
- Manufacturer
- Approval no.
- Third-party monitoring

Weight

b h	300 mm	350 mm	400 mm	450 mm	500 mm	550 mm	600 mm
300 mm	6	7	9	10	11	12	13
350 mm	7	9	10	11	12	14	15
400 mm	9	10	11	13	14	16	17
450 mm	10	11	13	14	16	18	19
500 mm	11	12	14	16	18	20	21
550 mm	12	14	16	18	20	21	23
600 mm	13	15	17	19	21	23	26
650 mm	14	16	18	21	23	25	28
700 mm	15	17	20	22	25	27	30
750 mm	16	19	21	24	27	29	32
800 mm	17	20	23	26	28	31	34
850 mm	18	21	24	27	30	33	36
900 mm	19	22	26	29	32	35	38
950 mm	20	24	27	30	34	37	40
1000 mm	21	25	28	32	36	39	43

Information in kg

h Height of the device (with hinges)

b Width of the device (with hinges)



3. Wall mounting



Safety notes for wall mounting

⚠ WARNING!

Danger due to a failure to observe the instructions on wall mounting!

Errors in the assembly of the device can lead to serious injuries. This chapter contains important information for installing the device safely in a wall.

- ▶ Read this chapter carefully prior to installation.
- ▶ Follow the safety instructions.
- ▶ Carry out installation as described.

The developer is responsible for fulfilling the requirements for installation.

⇒ **Developer**

Installation must be performed by qualified specialists.

⇒ **Specialist**

To avoid hazards, it is essential to comply with the following requirements:

- The device must be undamaged and in perfect condition for installation.
- From a size of 500x500 mm, the device must be installed by two people.
- During installation, the surrounding area must be protected against falling objects.
- The installation must be carried out properly and professionally according to the generally recognised rules of technology.
- Observe the occupational health and safety regulations during installation.

Preconditions for wall mounting

The building regulations applicable to the wall system must be observed (e.g. in Germany the general building authority test certificate abP).

The device can be installed in the following structures:

- Single-skinned shaft wall or partition wall, with metal substructure.
- Double-skinned shaft wall or partition wall, with metal substructure.
- Solid wall.

Retrospective installation

Retrospective installation of the device in walls that are already skinned is only permissible in the following cases:

- If the construction opening is not higher than the grid dimension of the metal substructure.
- If the construction opening is not wider than the grid dimension of the metal substructure.

The following must be ensured when retrofitting the device:

- The structural requirements are restored according to the building situation (e.g. in Germany specified in the general building inspection test certificate abP).
- The grid and matrix dimensions stipulated in the building regulations must be observed (e.g. in Germany specified in the general building inspection test certificate abP).
- The grid and matrix dimensions for a standard wall must be observed.

Permissible materials

All materials used for wall mounting must comply with the building regulations applicable to the wall system (e.g. in Germany the general building inspection test certificate abP).

Fastening materials

Skinned shaft wall or partition wall (1 and 2-skinned)	Drywall screws: DIN EN 14566 Fine thread ST 3, 9 x 25 mm
	Self-tapping screws: DIN 7981 / 7049 / 7050 ST 3, 5 x 25 mm
Solid wall	Drywall screws: DIN 7996 / 7997 6 x 80 mm

Filler

Non-flammable filler.



Requirements for wall mounting

Shaft wall or partition wall

- Single-skinned

	UniSpace 60	UniSpace 90
Wall thickness	min. 80 mm	min. 90 mm
Wall construction	min. CW 50 x 50 x 0.6 mm + single-skinned	
Nominal size	min. 300 x 300 mm max. 600 x 1000 mm	

Shaft wall or partition wall

- Double-skinned

	UniSpace 60	UniSpace 90
Wall thickness	min. 75 mm	min. 100 mm
Wall construction	min. CW 50 x 50 x 0.6 mm + double-skinned	
Nominal size	min. 300 x 300 mm max. 600 x 1000 mm	

Solid wall

	UniSpace 60	UniSpace 90
Wall thickness	min. 100 mm	
Nominal size	min. 300 x 300 mm max. 600 x 1000 mm	

With skinned shaft or partition walls the following cases require the creation of a suitable trimmer or edging:

- If the construction opening is larger than the grid dimension of the wall system.
- If the grid dimension of the wall system is larger than 625 mm (stud centre to stud centre).
- If the building approval of the wall system prescribes the creation of a trimmer.
- If a structural engineer orders the creation of a trimmer in the individual installation situation.

The following are suitable for creating the trimmer or edging:

- CW profile
- UW profile

Preparation for installation

1

- Familiarise yourself with the device, the installation situation and the associated documents:
 - Assembly and operating manual.
 - Building regulations applicable to the wall system.
 - Installation wall

2

- Put together the tools you need:
 - A** Spatula (wide)
 - B** Spatula (narrow)
 - C** 1 x screw clamp or clamp
 - D** Screwdriver size 4 x 0.6 mm
 - E** Pen
 - F** Spirit level
 - G** Measuring tool (e.g. tape measure)
 - H** Tools for producing the construction opening (e.g. hammer drill, saw, angle grinder)
 - I** Cordless screwdriver with PH2 bit

- Put together the material you need:
 - Fastening materials
 - Permissible filler
 - ➔ **Permissible materials**

3

- Assemble your personal protective equipment:
 - A** Hearing protection
 - B** Safety goggles
 - C** Mouth guard
 - D** Work gloves
- Keep the installation site free of objects that could be damaged or destroyed during installation.



Unpacking the device

4

- Check the device for completeness.
 - ➔ **Scope of delivery**

Establishing the construction opening in wall systems and solid walls

The construction opening must be created in such a way that the device can be securely fastened in the wall or ceiling with the wall anchors.

- Check whether a trimmer must be installed before mounting the device.
 - ➔ **Requirements for wall mounting**

If the installation of a trimmer is necessary:

- Create a suitable trimmer.
 - ➔ **Installing a trimmer**

If the installation of a trimmer is unnecessary:

- Continue with the installation process.
 - ➔ **Creating the construction opening**

Installing a trimmer

The trimmer must satisfy the following requirements:

- Requirements of the wall system manufacturer.
- Building regulations applicable to the wall system.

5

Overview of the possible installation situations.

5A

If the building opening is wider than the distance between the standard uprights of the wall system:

- Create a trimmer with interruption of the standard uprights.

5B

If the building opening is the same size or narrower than the distance between the standard uprights of the wall system:

- Create a trimmer with circumferential profiles.



Creating the construction opening

6

- ▶ Determine the permissible dimensions of the construction opening.
➔ **Dimensions**

7

- ▶ Mark out the building opening.
- ▶ Use spirit level and tape measure to ensure the following:
 - The marked opening is aligned horizontally and vertically.
 - The angles in the corners are 90°.
 - The diagonals are equal in length.

8

⚠ CAUTION!

Risk of injury from sharp-edged saw blade!

Contact with the saw blade can cause cuts or severe body parts.

- ▶ Carefully mark out the building opening.
- ▶ Wear suitable personal protective equipment.

- ▶ Establish the construction opening with a suitable tool.

9

- ▶ Clean the construction opening.

Establishing the construction opening in solid walls

The construction opening must be created in such a way that the device can be securely fastened in the wall with the wall anchors.

10

- ▶ Determine the permissible dimensions of the construction opening.
➔ **Dimensions**

11

- ▶ Mark out the building opening.
- ▶ Use spirit level and tape measure to ensure the following:
 - The marked opening is aligned horizontally and vertically.
 - The angles in the corners are 90°.
 - The diagonals are equal in length.

12

⚠ CAUTION!

Risk of injury from sharp-edged saw tool

Using the tool to produce the construction opening (e.g. hammer drill, hammer, chisel) can cause injuries.

- ▶ Carefully mark out the building opening.
- ▶ Wear suitable personal protective equipment.

- ▶ Create the construction opening with a suitable tool.

13

- ▶ Clean the construction opening.



Removing the door leaf

14

- ▶ Open the carabiner hook on the safety rope.
- ▶ Detach the safety rope from the door leaf.

15

- ▶ Open both swivel grips.
- ▶ Turn both swivel grips through 90°.

16

- ▶ Open the lock with the square socket key.

Only for the variant with cylinder lock:

- ▶ Open the lock with the cylindrical key.

17

- ▶ Turn the bar in the spring hinge through 90°.
- ▶ Pull the spring hinge down at the top end of the locating side.
- ▶ Hold down the spring hinge.

18

⚠ CAUTION!

Risk of injury when removing the door leaf!

Fingers can be crushed when loosening the door leaf.

- ▶ Carefully remove the door leaf from the frame.

⚠ ATTENTION!

Danger of property damage due to a broken pin hinge or bent hinge mount!

- ▶ Make sure that the pin hinge does not tilt at the bottom end of the locating side.
- ▶ Grasp the upper swivel grip.
- ▶ Carefully pull the upper edge of the door leaf out of the frame with both hands.
- ▶ Lift the door leaf to pull the pin hinge at the bottom end of the locating side out of the hinge mount.



Mounting the device in the wall

Positioning the frame

19

- ▶ Press the enclosed mounting brackets onto the cylindrical pins on the inside of the frame.

The mounting brackets serve as depth stops and ensure that the frame and the wall surface are level.

20

- ▶ Turn the side wall bolts as follows:
 - At an angle of 90° to the edge of the frame.
 - Pointing in the direction of the building opening.

21

⚠ CAUTION!

Risk of injury when inserting the frame!

Fingers can be crushed when positioning the frame.

- ▶ Carefully insert the frame into the construction opening.

- ▶ Insert the frame into the construction opening.

22

⚠ CAUTION!

Risk of injury when attaching the screw clamp or clamp!

Fingers can be pinched when attaching the screw clamp or clamp.

- ▶ Carefully attach the screw clamp or clamp.

- ▶ Secure the frame to the wall with a screw clamp or a clamp.

23

- ▶ Position the frame centrally in the construction opening.

24

- ▶ Make sure that all mounting brackets rest on the wall surface without gaps.
- ▶ Screw a mounting bracket to the wall. The three remaining mounting brackets are screwed in place in a later assembly step.

The frame is secured against falling out of the construction opening by the screwed-on mounting bracket (pre-fastening).

25

- ▶ Loosen the screw clamp or clamp.

26

- ▶ Use a screwdriver to turn the set screws in the mounting claws.

The mounting claws engage in the construction opening.

- ▶ Turn out the mounting claws until they clamp the frame firmly in the construction opening.



Aligning the frame

27

The frame is aligned in the construction opening by adjusting the four mounting claws.

- ▶ Screw the set screws in and out of the four mounting claws until the following applies:
 - The frame is plumb horizontally and vertically.
 - The distance between the diagonally opposite corners is identical ($a = b$).

28

- ▶ Check whether the following applies:
 - ✓ Horizontal and vertical edges of the frame are not warped.
 - ✓ The distance between the diagonally opposite corners of the frame is identical ($a = b$).
 - ✓ The angles in each of the four corners of the frame are 90° .

If the points are satisfied:

- ▶ Continue with the installation process.
 - ➔ **Securely screwing the frame to the wall**

29

30

If the points are not satisfied:

- ▶ Readjust the mounting claws with the screwdriver until the points are fulfilled.

Securely screwing the frame to the wall

31

- ▶ Make sure that all mounting brackets rest on the wall surface without gaps.
- ▶ Securely screw the three remaining mounting brackets to the wall.

32

- ▶ Screw the wall bolts to the metal profile with suitable fastening materials.

➔ Requirements for wall mounting

Only with installation in a solid wall:

- ▶ Screw the wall bolts to the solid wall with suitable fastening materials.

➔ Permissible materials

33

- ▶ Undo the screws in the mounting brackets.
- ▶ Pull the mounting brackets off the cylindrical pins on the inside of the frame.
- ▶ Set the mounting brackets to one side.

Fitting the door leaf

34

⚠ CAUTION!

Risk of injury when fitting the door leaf!

Fingers can be crushed when mounting the door leaf.

- ▶ Carefully insert the door leaf in the frame.

- ▶ Carefully insert the pin at the lower end of the locating side into the hinge mount in the frame.
- ▶ Pull the spring hinge down at the top end of the locating side.
- ▶ Hold down the spring hinge.
- ▶ Tilt the door leaf into the frame on the locating side.
- ▶ Release the spring hinge.

The pin of the spring hinge engages in the hinge mount in the frame.



Checking the frame

35

36

37

- ▶ Check whether the following applies:
 - ✓ The door can be closed completely without resistance.
 - ✓ The swivel grips can be completely recessed into the joint between the door and the frame.
 - ✓ The lock can be opened and closed without any problems, the locking bolt does not jam.

38

⚠ CAUTION!

Risk of injury when removing the door leaf!

Fingers can be crushed when loosening the door leaf.

- ▶ Carefully remove the door leaf from the frame.

⚠ ATTENTION!

Danger of property damage due to a broken pin hinge or bent hinge mount!

- ▶ Make sure that the pin hinge does not tilt at the bottom end of the locating side.

If the points are satisfied:

- ▶ Remove the door leaf from the frame.
- ▶ Continue with the installation process.
 - ➔ **Filling the construction connection joint (Wall)**

If the points are not satisfied:

- ▶ Remove the door leaf from the frame.
- ▶ Align the frame.
 - ➔ **Aligning the frame**

Filling the construction connection joint

39

NOTE

Non-approved or incorrectly processed filler may affect the fire resistance of the device.

- ▶ Only use permissible filler.
- ▶ Follow the manufacturer's instructions for use of the filler.
- ▶ Make sure that the edge gap limiters are firmly inserted in the frame.
- ▶ Completely fill the gap between the frame and the wall with filler.
- ▶ Smooth the joint with a spatula.

Cleaning the frame

40

- ▶ Carefully clean the hinge mounts in the frame with a screwdriver.
- ▶ Carefully clean the recess for the locking bolt in the frame with a screwdriver.

41

- ▶ Remove any dirt on the frame seals thoroughly with a damp cloth.

Hardening the construction connection joint

42

- ▶ Allow the filler to dry:
 - In accordance with the manufacturer's specifications.
 - If no specifications are provided, for 24 hours.



Checking the door

43

⚠ CAUTION!

Risk of injury when fitting the door leaf!

Fingers can be crushed when mounting the door leaf.

- ▶ Carefully insert the door leaf in the frame.

- ▶ Install the door leaf in the frame.
 - ➔ **Fitting the door leaf**

44

45

- ▶ Check whether the following applies:
 - ✓ The door can be closed completely without resistance.
 - ✓ The swivel grips can be completely recessed into the joint between the door and the frame.

If the points are satisfied:

- ▶ Continue with the installation process:
 - ➔ **Checking the lock**

46

47

If the points are not satisfied:

- ▶ Repeat the following steps without removing the door leaf.
 - ➔ **Cleaning the frame**
 - ➔ **Checking the door**
- ▶ Check the door again.

Checking the lock

48

- ▶ Completely recess the swivel grips into the joint between the door and the frame.
- ▶ Check whether the following applies:
 - ✓ The lock can be opened and closed without any problems, the locking bolt does not jam.

If the point is satisfied:

- ▶ Continue with the installation process.
 - ➔ **Filling the door leaf**

49

50

If the point is not satisfied:

- ▶ Carefully clean the recess for the locking bolt in the frame with a screwdriver.
- ▶ Check the function of the lock again.

Filling the door leaf

51

- ▶ Make sure of the following:
 - The device door is closed.
 - The swivel grips are fully recessed into the joint between the door and the frame.
- ▶ Turn the bar of the spring hinge in the recess in the door leaf.

52

NOTE

Non-approved or incorrectly processed filler may affect the fire resistance of the device.

- ▶ Only use permissible filler.
- ▶ Follow the manufacturer's instructions for use of the filler.



- ▶ Fill the following recesses and holes on the visible side of the door leaf with filler:
 - Spring hinge.
 - Pin hinge.
 - Screw holes.

53

Optional:

- ▶ Fill the entire visible side of the door leaf.

54

- ▶ Remove excess filler from the joints between the door leaf and the frame.

55

- ▶ Allow the filler to dry:
 - In accordance with the manufacturer's specifications.
 - If no specifications are provided, for 24 hours.

Finishing the wall mounting

56

- ▶ Open the device door.
- ▶ Open the carabiner hook on the safety rope.
- ▶ Hook the carabiner into the eyelet on the back of the door leaf.

The safety rope prevents the device from being accidentally opened too far.

57

- ▶ Close the device door.
- ▶ Carefully press the rosette into the hole of the lock on the visible side of the door leaf.



4. Ceiling mounting



Safety notes for ceiling mounting

⚠ WARNING!

Danger due to a failure to observe the instructions on ceiling mounting!

Errors in the assembly of the device can lead to serious injuries. This chapter contains important information for installing the device safely in a ceiling.

- ▶ Read this chapter carefully prior to installation.
- ▶ Follow the safety instructions.
- ▶ Carry out installation as described.

The developer is responsible for fulfilling the requirements for installation.

⇒ **Developer**

Installation must be performed by qualified specialists.

⇒ **Specialist**

To avoid hazards, it is essential to comply with the following requirements:

- The device must be undamaged and in perfect condition for installation.
- From a size of 500x500 mm, the device must be installed by two people.
- During installation, the surrounding area must be protected against falling objects.
- The installation must be carried out properly and professionally according to the generally recognised rules of technology.
- Observe the occupational health and safety regulations during installation.

Preconditions for ceiling mounting

The building regulations applicable to the ceiling system must be observed (e.g. in Germany the general building authority test certificate abP).

The device can be installed in the following structures:

- Suspended ceiling with metal construction, height offset, one-sided load from bottom to top and from top to bottom.
- Suspended ceiling with metal construction, level, one-sided load from bottom to top and from top to bottom.

Retrospective installation

Retrospective installation of the device in ceilings that are already skinned is only permissible in the following cases:

- If the construction opening is not higher than the grid dimension of the metal substructure.
- If the construction opening is not wider than the grid dimension of the metal substructure.

The following must be ensured when retrofitting the device:

- The structural requirements are restored according to the building situation (e.g. in Germany specified in the general building inspection test certificate abP).
- The grid and matrix dimensions stipulated in the building regulations must be observed (e.g. in Germany specified in the general building inspection test certificate abP).
- The grid and matrix dimensions for a standard ceiling must be observed.

Permissible materials

All materials used for mounting must comply with the building regulations applicable to the ceiling system (e.g. in Germany the general building inspection test certificate abP).

Fastening materials

Suspended ceiling construction	Drywall screws: DIN EN 14566 Fine thread 3.5 x 25 mm
--------------------------------	--

Filler

Non-flammable filler.



Requirements for ceiling mounting

Suspended ceiling construction

- Single-skinned.
- Level or height-offset.
- One-sided load from bottom to top and from top to bottom.

	UniSpace 90
Dimension above everything	min. 147 mm
Ceiling construction	min. CD 60 x 27 x 0.6 mm + single-skinned 2 x 20 mm + 2 x 40 mm mineral wool
Nominal size	min. 300 x 300 mm max. 600 x 600 mm
Insulation	min. 80 mm

When installing the device in a ceiling, the maximum specified ceiling load must not be exceeded.

- 📄 Building regulations applicable to the ceiling system (e.g. in Germany the general building authority test certificate abP).

The following cases require the creation of a suitable trimmer or edging:

- If the construction opening is larger than the grid dimension of the ceiling system.
- If the grid dimension of the ceiling system is larger than 625 mm (stud centre to stud centre).
- If the building approval of the ceiling system prescribes the creation of a trimmer.
- If structural calculations in the individual installation situation require the creation of a trimmer.

The following are suitable for creating the trimmer or edging:

- CD profile
- CW / UW profile

Preparation for installation

1

- Familiarise yourself with the device, the installation situation and the associated documents:
 - Assembly and operating manual.
 - Building regulations applicable to the ceiling system.
 - Installation ceiling.

2

- Put together the tools you need:
 - A** Spatula (wide)
 - B** Spatula (narrow)
 - C** 2 x screw clamp or clamp
 - D** Screwdriver size 4 x 0.6 mm
 - E** Pen
 - F** Spirit level
 - G** Measuring tool (e.g. tape measure)
 - H** Tools for producing the construction opening (e.g. hammer drill, saw, angle grinder)
 - I** Cordless screwdriver with PH2 bit
- Put together the material you need:
 - Fastening materials
 - Permissible filler
 - ➔ **Permissible materials**

3

- Assemble your personal protective equipment:
 - A** Hearing protection
 - B** Safety goggles
 - C** Mouth guard
 - D** Work gloves
- Keep the installation site free of objects that could be damaged or destroyed during installation.



Unpacking the device

4

- Check the device for completeness.
 - ➔ **Scope of delivery**

Establishing the construction opening in ceiling systems

The construction opening must be created in such a way that the device can be securely fastened in the ceiling with the wall anchors.

- Check whether a trimmer must be installed before mounting the device.
 - ➔ **Requirements for ceiling mounting**

If the installation of a trimmer is necessary:

- Create a suitable trimmer.
 - ➔ **Installing a trimmer**

If the installation of a trimmer is unnecessary:

- Continue with the installation process.
 - ➔ **Create a trimmer with circumferential profiles.**

Installing a trimmer

The trimmer must satisfy the following requirements:

- Requirements of the ceiling system manufacturer.
- Building regulations applicable to the ceiling system.

5

Overview of the possible installation situations.

5A

If the construction opening is wider than the grid dimension of the ceiling system:

- Create a trimmer with interruption of the grid dimension.

5B

If the construction opening is equal to or narrower than the grid dimension of the ceiling system:

- Create a trimmer with circumferential profiles.



Creating the construction opening

6

⚠ WARNING!

Risk of falling during ceiling mounting!

Using ladders or steps while mounting the device in a ceiling may cause falls. This can result in serious injuries.

- ▶ Ensure stability of the ladder or steps.
- ▶ Wear suitable footwear.
- ▶ Wear suitable personal protective equipment.

⚠ CAUTION!

Risk of injury during ceiling mounting!

During ceiling mounting, falling parts can cause injuries or damage.

- ▶ Make sure that no parts can fall during ceiling installation.
- ▶ Determine the permissible dimensions of the construction opening.
 - ➔ **Dimensions**

7

- ▶ Mark out the building opening.
- ▶ Use spirit level and tape measure to ensure the following:
 - The marked opening is aligned horizontally and vertically.
 - The angles in the corners are 90°.
 - The diagonals are equal in length.

8

⚠ CAUTION!

Risk of injury from sharp-edged saw blade!

Contact with the saw blade can cause cuts or severe body parts.

- ▶ Carefully establish the building opening.
- ▶ Wear suitable personal protective equipment.

- ▶ Establish the construction opening with a suitable tool.

9

- ▶ Clean the construction opening.

Mounting the additional hangers

10

Before mounting the device, the load-bearing capacity of the ceiling construction must be increased by installing additional hangers.

Requirements applicable to the hangers:

- Compression resistant.
- Bending resistant.

The number of hangers to be installed ($\perp$) depends on the device dimensions:

- > 400 mm side length 1 hanger per corner ($\perp$ ○).
- > 550 mm side length 1 additional hanger per side length ($\perp$ ○).

The design and installation of the hangers must meet the following specifications:

- Requirements of the ceiling system manufacturer.
- Building regulations applicable to the ceiling system.



11

- ▶ Mount 4 hangers near the corners of the building opening to the CD profiles of the ceiling construction.
- ▶ Mount additional hangers, if required, centrally on the affected sides of the construction opening to the CD profiles of the ceiling construction.

Removing the door leaf

12

- ▶ Open the carabiner hook on the safety rope.
- ▶ Detach the safety rope from the door leaf.

13

- ▶ Open both swivel grips.
- ▶ Turn both swivel grips through 90°.

14

- ▶ Open the lock with the square socket key.

Only for the variant with cylinder lock:

- ▶ Open the lock with the cylindrical key.

15

- ▶ Turn the bar in the spring hinge through 90°.
- ▶ Pull the spring hinge down at the top end of the locating side.
- ▶ Hold down the spring hinge.

16

⚠ CAUTION!

Risk of injury when removing the door leaf!

Fingers can be crushed when loosening the door leaf.

- ▶ Carefully remove the door leaf from the frame.

⚠ ATTENTION!

Danger of property damage due to a broken pin hinge or bent hinge mount!

- ▶ Make sure that the pin hinge does not tilt at the bottom end of the locating side.
- ▶ Grasp the upper swivel grip.
- ▶ Carefully pull the upper edge of the door leaf out of the frame with both hands.
- ▶ Lift the door leaf to pull the pin hinge at the bottom end of the locating side out of the hinge mount.

Mounting the device in the ceiling

Positioning the frame

17

- ▶ Press the mounting brackets onto the cylindrical pins on the inside of the frame.

The mounting brackets serve as depth stops and ensure that the frame and the underside of the ceiling are level.

18

- ▶ Turn the side wall bolts as follows:
 - At an angle of 90° to the edge of the frame.
 - Pointing in the direction of the building opening.



19

⚠ CAUTION!

Risk of injury when inserting the frame!

Fingers can be crushed when positioning the frame.

- ▶ Carefully insert the frame into the construction opening.

- ▶ Insert the frame into the construction opening.

20

⚠ CAUTION!

Risk of injury when attaching the screw clamps or clamps!

Fingers can be pinched when attaching the screw clamps or clamps.

- ▶ Carefully attach the screw clamps or clamps.

- ▶ Secure the frame to the ceiling with two screw clamps or two clamp clamps to prevent it from falling down.

21

- ▶ Position the frame centrally in the construction opening.

22

- ▶ Make sure that all mounting brackets rest on the underside of the ceiling without gaps.
- ▶ Screw a mounting bracket to the ceiling. The three remaining mounting brackets are screwed in place in a later assembly step.

The frame is secured against falling out of the construction opening by the screwed-on mounting bracket.

23

- ▶ Use a screwdriver to turn the set screws in the mounting claws.

The mounting claws engage in the construction opening.

- ▶ Turn out the mounting claws until they clamp the frame firmly in the construction opening.

Aligning the frame

24

The frame is aligned in the construction opening by adjusting the four mounting claws.

- ▶ Screw the set screws in and out of the four mounting claws until the following applies:
 - The distance between the diagonally opposite corners is identical ($a = b$).

25

- ▶ Check whether the following applies:
 - ✓ Horizontal and vertical edges of the frame are not warped.
 - ✓ The distance between the diagonally opposite corners of the frame is identical ($a = b$).
 - ✓ The angles in each of the four corners of the frame are 90° .

If the points are satisfied:

- ▶ Continue with the installation process.
 - ➔ **Securely screwing the frame to the ceiling**

26

27

If the points are not satisfied:

- ▶ Readjust the mounting claws with the screwdriver until the points are fulfilled.



Securely screwing the frame to the ceiling

28

- ▶ Make sure that all mounting brackets rest on the underside of the ceiling without gaps.
- ▶ Securely screw the three remaining mounting brackets to the ceiling.

29

- ▶ Loosen the screw clamps or clamps.

30A 30B

- ▶ Screw the wall bolts to the metal profile with suitable fastening materials.
➔ **Permissible materials**

31

- ▶ Undo the screws in the mounting brackets.
- ▶ Pull the mounting brackets off the cylindrical pins on the inside of the frame.
- ▶ Set the mounting brackets to one side.

Fitting the door leaf

32

⚠ CAUTION!

Risk of injury when fitting the door leaf!

Fingers can be crushed when mounting the door leaf.

- ▶ Carefully insert the door leaf in the frame.
-
- ▶ Carefully insert the pin at the lower end of the locating side into the hinge mount in the frame.

- ▶ Pull the spring hinge down at the top end of the locating side.
- ▶ Hold down the spring hinge.
- ▶ Tilt the door leaf into the frame on the locating side.
- ▶ Release the spring hinge.

The pin of the spring hinge engages in the hinge mount in the frame.

Checking the frame

33

34

35

- ▶ Check whether the following applies:
 - ✓ The door can be closed completely without resistance.
 - ✓ The swivel grips can be completely recessed into the joint between the door and the frame.
 - ✓ The lock can be opened and closed without any problems, the locking bolt does not jam.

36

⚠ CAUTION!

Risk of injury when removing the door leaf!

Fingers can be crushed when loosening the door leaf.

- ▶ Carefully remove the door leaf from the frame.

⚠ ATTENTION!

Danger of property damage due to a broken pin hinge or bent hinge mount!

- ▶ Make sure that the pin hinge does not tilt at the bottom end of the locating side.

If the points are satisfied:

- ▶ Remove the door leaf from the frame.
- ▶ Continue with the installation process.
 - ➔ **Filling the construction connection joint (Ceiling)**

If the points are not satisfied:

- ▶ Remove the door leaf from the frame.
- ▶ Align the frame.
 - ➔ **Aligning the frame**



Filling the construction connection joint

37

NOTE

Non-approved or incorrectly processed filler may affect the fire resistance of the device.

- ▶ Only use permissible filler.
- ▶ Follow the manufacturer's instructions for use of the filler.
- ▶ Make sure that the edge gap limiters are firmly inserted in the frame.
- ▶ Completely fill the gap between the frame and the ceiling with filler.
- ▶ Smooth the joint with a spatula.

Cleaning the frame

38

- ▶ Carefully clean the hinge mounts in the frame with a screwdriver.
- ▶ Carefully clean the recess for the locking bolt in the frame with a screwdriver.

39

- ▶ Remove any dirt on the frame seals thoroughly with a damp cloth.

Hardening the construction connection joint

40

- ▶ Allow the filler to dry:
 - In accordance with the manufacturer's specifications.
 - If no specifications are provided, for 24 hours.

Checking the door

41

⚠ CAUTION!

Risk of injury when fitting the door leaf!

Fingers can be crushed when mounting the door leaf.

- ▶ Carefully insert the door leaf in the frame.

- ▶ Install the door leaf in the frame.
 - ➔ **Fitting the door leaf**

42

43

- ▶ Check whether the following applies:
 - ✓ The door can be closed completely without resistance.
 - ✓ The swivel grips can be completely recessed into the joint between the door and the frame.

If the points are satisfied:

- ▶ Continue with the installation process:
 - ➔ **Fitting the door leaf**

44

45

If the points are not satisfied:

- ▶ Repeat the following steps without removing the door leaf.
 - ➔ **Cleaning the frame**
 - ➔ **Checking the door**
- ▶ Check the door again.



Checking the lock

46

- ▶ Completely recess the swivel grips into the joint between the door and the frame.
- ▶ Check whether the following applies:
 - ✓ The lock can be opened and closed without any problems, the locking bolt does not jam.

If the point is satisfied:

- ▶ Continue with the installation process.
 - ➔ **Filling the door leaf**

47

48

If the point is not satisfied:

- ▶ Carefully clean the recess for the locking bolt in the frame with a screwdriver.
- ▶ Check the function of the lock again.

Filling the door leaf

49

- ▶ Make sure of the following:
 - The device door is closed.
 - The swivel grips are fully recessed into the joint between the door and the frame.
- ▶ Turn the bar of the spring hinge in the recess in the door leaf.

50

NOTE

Non-approved or incorrectly processed filler may affect the fire resistance of the device.

- ▶ Only use permissible filler.
- ▶ Follow the manufacturer's instructions for use of the filler.

- ▶ Fill the following recesses and holes on the visible side of the door leaf with filler:

- Spring hinge.
- Pin hinge.
- Screw holes.

51

Optional:

- ▶ Fill the entire visible side of the door leaf.

52

Remove excess filler from the joints between the door leaf and the frame.

53

- ▶ Allow the filler to dry:
 - In accordance with the manufacturer's specifications.
 - If no specifications are provided, for 24 hours.



Finishing the ceiling mounting

54

- ▶ Open the device door.
- ▶ Cover the building opening with mineral wool from the inside.

Requirements applicable to the mineral wool:

- 2-ply
- $d = 40 \text{ mm}$
- 40 kg/m^3
- Per the approval and ceiling abP

55

- ▶ Open the device door.
- ▶ Open the carabiner hook on the safety rope.
- ▶ Hook the carabiner into the eyelet on the back of the door leaf.

The safety rope prevents the device from being accidentally opened too far.

56

- ▶ Close the device door.
- ▶ Carefully press the rosette into the hole of the lock on the visible side of the door leaf.



5. Use



Safety notes for use

WARNING!

Danger due to a failure to observe the user instructions!

Errors in the use of the device can lead to serious and even fatal injuries. This chapter contains important information for using the device safely.

- ▶ Read this chapter carefully.
- ▶ Follow the safety instructions.
- ▶ Only use the device as described here.

The device shall only be used by instructed users.
⇒ **User**

Proper fire protection is only guaranteed when the device is closed.

- ▶ Only open the device to carry out inspection work.
- ▶ Close the device immediately after completing the inspection work.
- ▶ Lock the device lock to prevent unauthorised opening.

Opening the device

1^

- ▶ Pull both swivel grips out of the joint between the door and the frame.
- ▶ Turn both swivel grips through 90°.
- ▶ Open the lock with the square socket key.

Only for the variant with cylinder lock:

- ▶ Open the lock with the cylindrical key.

2^

- ▶ Pull on the swivel grips to pull the door leaf open.

Closing the device

3^

- ▶ Close the device door.

4^

- ▶ Completely recess the swivel grips into the joint between the door and the frame.
- ▶ Lock the lock with the square socket key.

Only for the variant with cylinder lock:

- ▶ Lock the lock with the cylindrical key.



6. Cleaning



Safety notes for cleaning

ATTENTION!

Danger of property damage due to unprofessional cleaning!

Mistakes during cleaning can damage the device. This chapter contains important information on cleaning the device.

- ▶ Read this chapter carefully.
- ▶ Follow the safety instructions.
- ▶ Carry out cleaning as described.

The device shall only be cleaned by instructed users.

⇒ **User**

The device must not be cleaned with the following liquids:

- Running water.
- Chemical cleaning agents.
- Thinners (e.g. acetone, nitro thinner, universal thinner).
- Alcohol.

Cleaning

- ▶ Open the device.
- ▶ Clean all metal and plaster surfaces of the appliance with a slightly damp cloth.
- ▶ Clean the seals with a damp cloth.
- ▶ Close the device.



7. Maintenance



Safety notes for maintenance

WARNING!

Danger due to a failure to observe the maintenance instructions!

Errors during maintenance of the device can lead to serious injuries. This chapter contains important information on safely maintaining the device.

- ▶ Read this chapter carefully.
- ▶ Follow the safety instructions.
- ▶ Carry out maintenance as described.

Maintenance and repair works must be performed by qualified specialists.

⇒ **Specialist**

Troubleshooting measures are permissible by instructed users.

⇒ **User**

To avoid hazards, it is essential to comply with the following requirements:

Maintenance intervals

Device maintenance must be carried out regularly and at least once a year.

Maintenance measures

- ▶ Check the following device functions:
 - The door can be opened and closed without any problems.
 - The lock works.
 - The closed door seals fully.
- ▶ Check the following components of the device for damage or dirt:
 - Seals
(e.g. cracks, loosened adhesions, coarse soiling)
 - Intumescent
(e.g. loosened adhesions / fixings)
 - GRP door leaf
(e.g. severe damage such as breaks)
 - Frame insulation
(e.g. severe damage such as breaks)

If there is damage or soiling:

- ▶ Clean the soiled parts.
- ▶ Replace damaged or destroyed parts.
- ▶ Only use spare parts that comply with the provisions of the building authority approval.

Installation of spare parts only in accordance with these instructions.

Installation of spare parts only by qualified personnel.

⇒ **Specialist**



Troubleshooting

Possible faults are described as follows:

What is the fault?

- Cause of the fault.
 - ▶ Fault remedy.
 - ➔ Reference to corresponding chapter.
-

The door leaf does not close.

- The safety rope is clamped between the door leaf and the frame.
 - ▶ Adjust the safety rope so that it does not come between the door leaf and the frame when closing the door.
 - The sealing profile on the frame has come loose.
 - ▶ Have the sealing profile replaced by qualified personnel.
 - The sealing profile on the frame is defective.
 - ▶ Have the sealing profile replaced by qualified personnel.
-

It is not possible to close the swivel grips.

- The pin or spring hinge is bent or torn off.
 - ▶ Contact the manufacturer or a specialist company.
-

The lock does not close.

- The recess for the locking latch in the frame is dirty.
 - ▶ Clean the recess carefully with a screwdriver.
- The lock is defective.
 - ▶ Check the function of the lock with the door leaf open.

If the locking bolt does not move:

- ▶ Have the door leaf replaced by qualified personnel.
-

If a fault cannot be rectified:

- ▶ Contact the manufacturer or a specialist company.



8. Disassembly



Safety notes for disassembly

WARNING!

Danger due to a failure to observe the disassembly instructions!

Errors in the disassembly of the device can lead to serious injuries. This chapter contains important information for disassembling the device safely.

- ▶ Read this chapter carefully prior to disassembly.
- ▶ Follow the safety instructions.
- ▶ Carry out disassembly as described.

Disassembly must be performed by qualified specialists.

⇒ **Specialist**

Disassembling the device

WARNING!

Risk of falling when disassembling a device installed in a ceiling!

Using ladders or steps while disassembling the device installed in a ceiling may cause falls. This can result in serious injuries.

- ▶ Ensure stability of the ladder or steps.
- ▶ Wear suitable footwear.
- ▶ Wear suitable personal protective equipment.

WARNING!

Risk of injury when removing the door leaf from a ceiling!

The door leaf can fall down from a ceiling during removal. Injuries to the head or other parts of the body can result.

- ▶ When removing the door, make sure you always have a firm grip on the door leaf.
- ▶ Wear suitable personal protective equipment.

CAUTION!

Risk of injury when removing the door leaf!

Fingers can be crushed when loosening the door leaf.

- ▶ Carefully remove the door leaf from the frame.

CAUTION!

Danger of cuts when removing the filler

When loosening the filler on the spring hinge, sharp edges can cause injuries to the fingers.

- ▶ Carefully loosen the filler.
- ▶ Wear protective gloves.

Disassembly is carried out in reverse order to the installation of the device.



9. Disposal



Disposing of the packaging

ATTENTION!

Risk of environmental damage due to improper disposal of the packaging!

- ▶ Do not put the packaging in the normal household waste.
- ▶ Dispose of the packaging in an environmentally friendly and appropriate manner (recycling).

The packaging serves to protect against transport damage. The packaging materials are selected according to environmentally friendly aspects and are made of recyclable materials. The packaging materials can be returned to the raw material cycle after use.

- ▶ Dispose of the packaging in an environmentally friendly manner, separated according to materials.



Disposing of the device

ATTENTION!

Risk of environmental damage due to improper disposal of the device!

- ▶ Do not put the device in the normal household waste.
- ▶ Dispose of the device in an environmentally friendly and appropriate manner (recycling).

- ▶ Dispose of the device in accordance with the legal regulations via a specialist disposal company or your municipal waste disposal facility.





10. Annex



Accessories

- Assembly and operating manual
- Mounting bracket
- Square socket key or key for cylindrical lock

If required and for further information (e.g. brochures, spare parts, price lists):

- Contact the manufacturer or a specialist company.

 www.upmann.eu

Approval

General technical approval and general type approval:

UniSpace 60: Test Report No. 232000268 MPA-NRW

Test Report No. 232000252-K1 MPA-NRW

UniSpace 90: AbZ/aBG = Z-6.55-2529

Standards and regulations

Relevant regulations - without claim to completeness:

- Fire protection standard
- DIN EN 1364-1
- DIN EN 1364-2
- DIN EN 1634-3
- abZ /abG



Declaration of conformity by the building authorities

Declaration of conformity / declaration of compliance

Company:

Address:

Date of installation:

Fire resistance class F90

I hereby confirm that the fire-resistant UniSpace 90 access panel has been installed professionally and in compliance with all provisions of the general building authority approval or the general type approval Z-6.55-2529 of the German Institute for Building Technology (DIBt) dated 27.11.2020.

For the construction products or individual parts not manufactured by the signatory, this is also confirmed

- on the basis of the existing labelling of the parts in accordance with the provisions of the abP listed in the aBG,
- on the basis of internal inspection,
- in accordance with written confirmation of the manufacturers of the construction products or parts, which the signatory has added to their files.

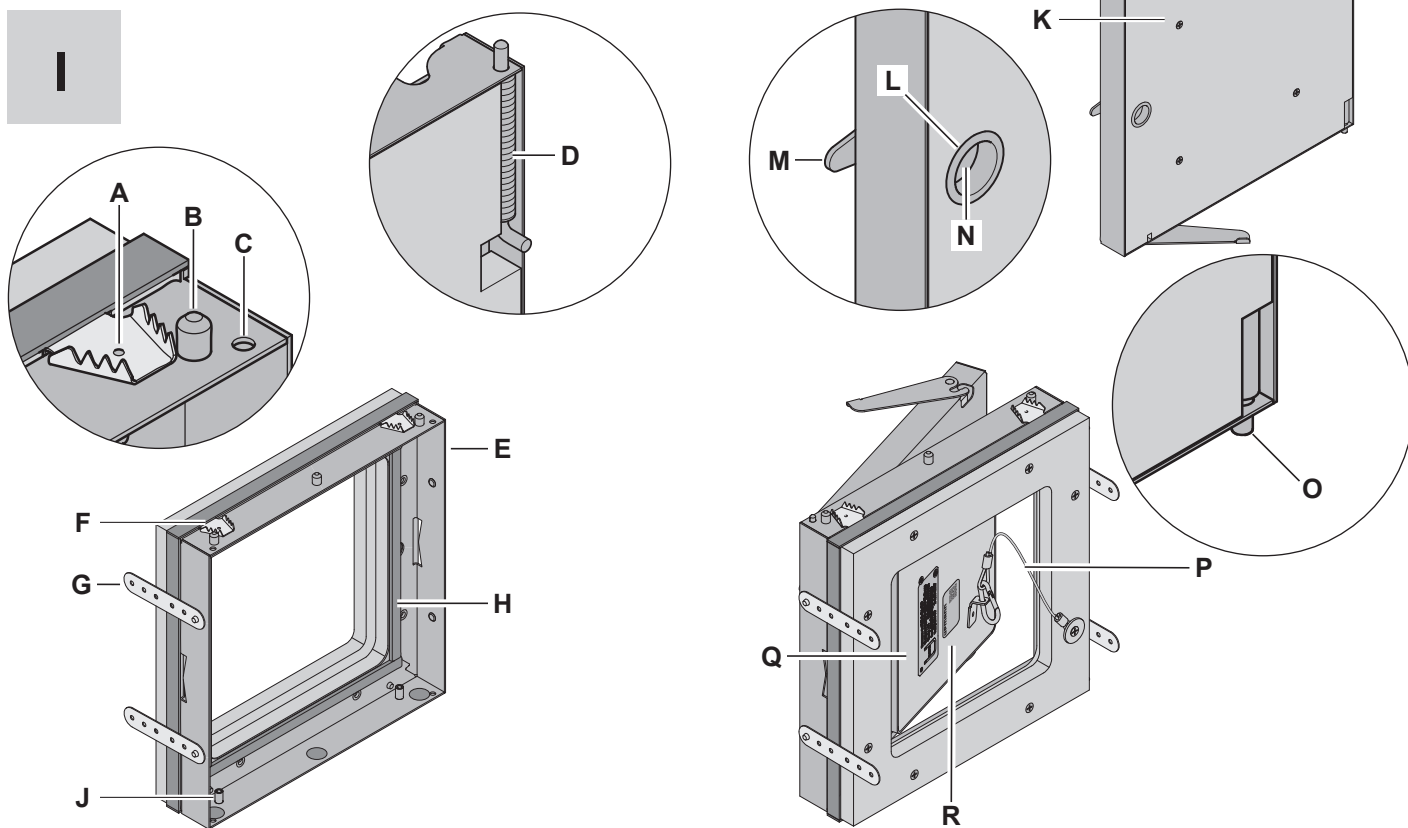
Place, date of signature/ stamp

(This certificate is to be handed over to the building owner for passing on to the responsible building supervisory authority)

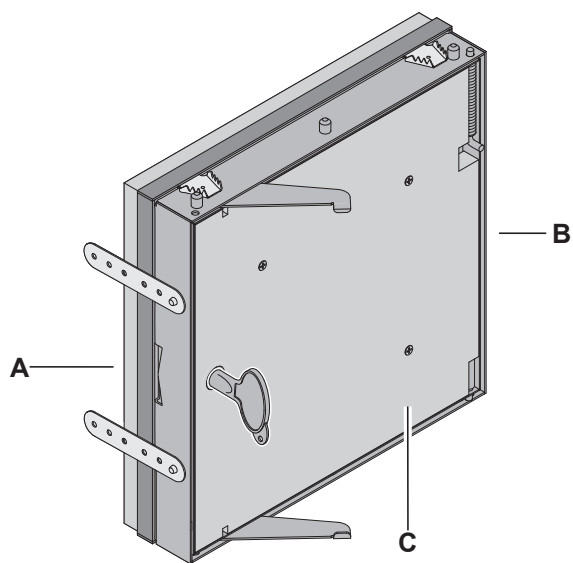




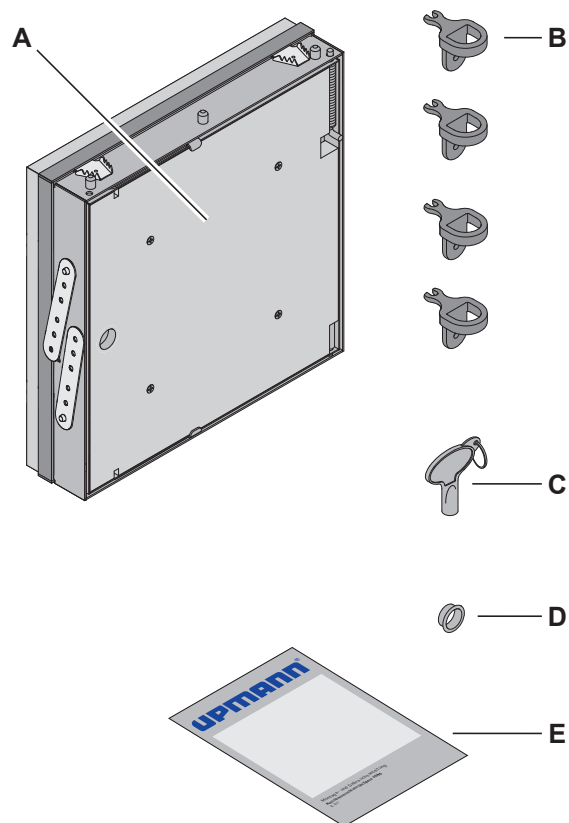
I



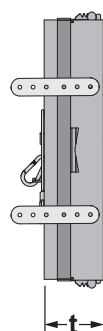
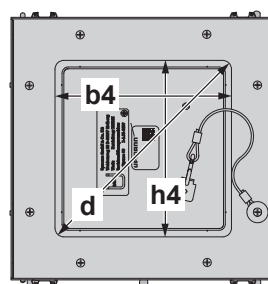
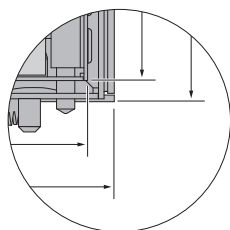
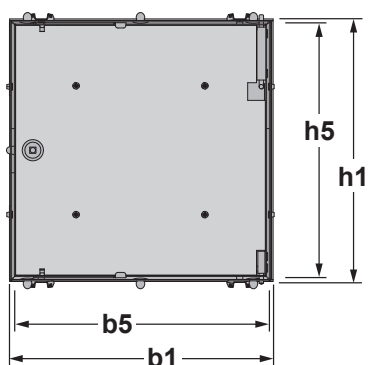
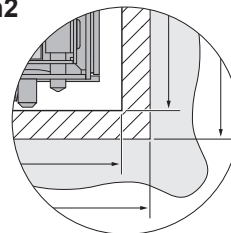
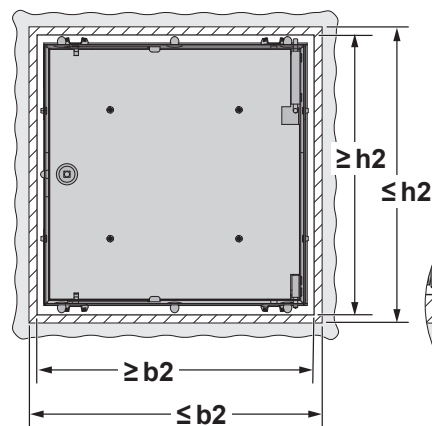
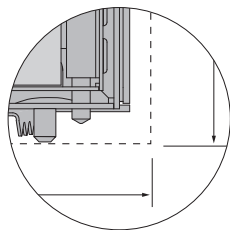
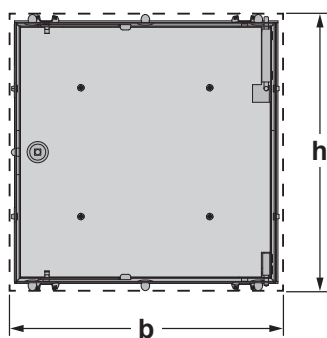
II



III



IV

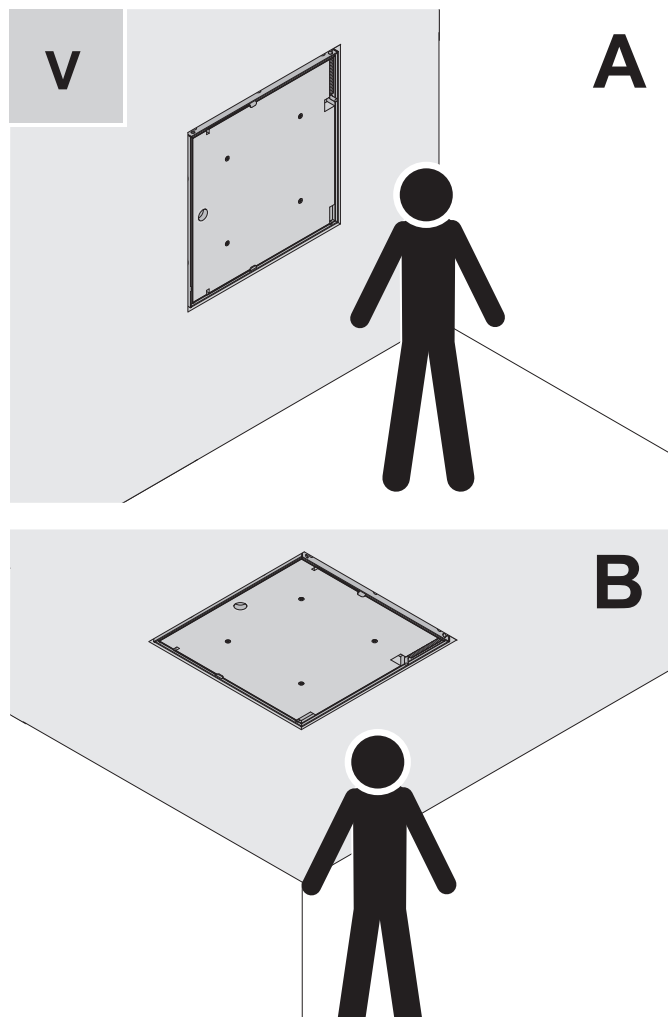


	b x h	b1 x h1	b5 x h5
1	300 x 300	295 x 295	286 x 286
2	400 x 400	395 x 395	386 x 386
3	400 x 600	395 x 595	386 x 586
4	500 x 500	495 x 495	486 x 486
5	600 x 600	595 x 595	586 x 586
6	600 x 800	595 x 795	586 x 786
7	600 x 1000	595 x 995	586 x 986

	≥b2 x h2	≤b2 x h2	b4 x h4
1	310 x 310	320 x 320	200 x 200
2	410 x 410	420 x 420	300 x 300
3	410 x 610	420 x 620	300 x 500
4	510 x 510	520 x 520	400 x 400
5	610 x 610	620 x 620	500 x 500
6	610 x 810	620 x 820	500 x 700
7	610 x 1010	620 x 1020	500 x 900

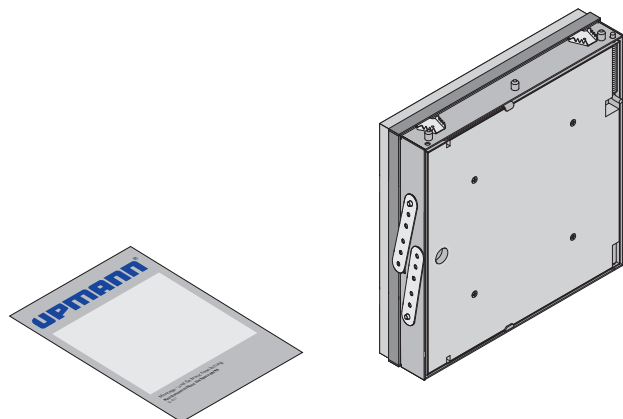
	d	t
1	274	67
2	416	67
3	575	67
4	557	67
5	699	67
6	852	67
7	1021	67

mm

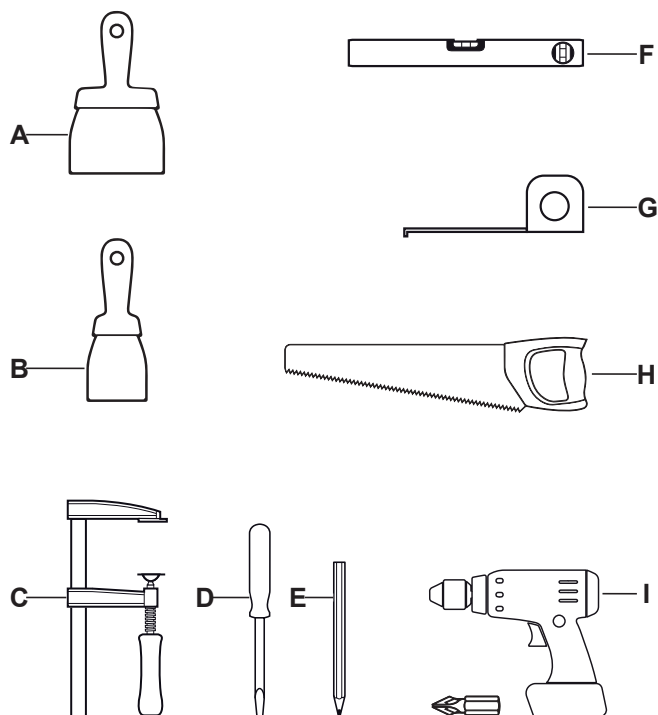




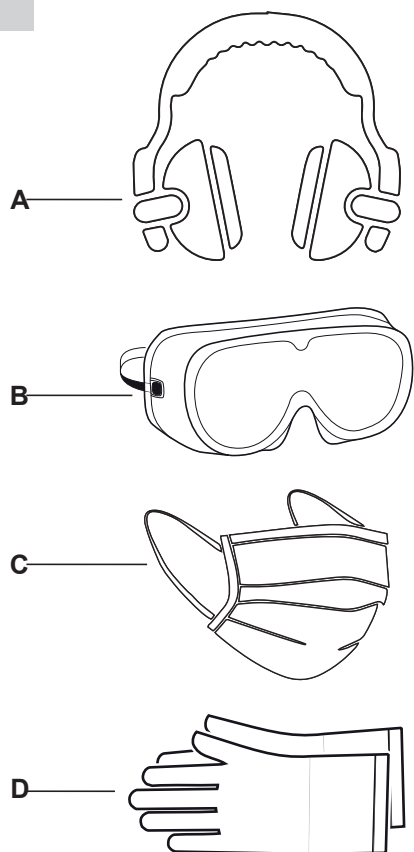
1



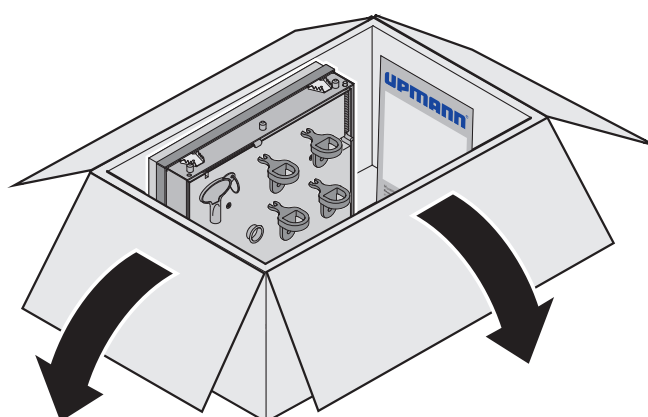
2



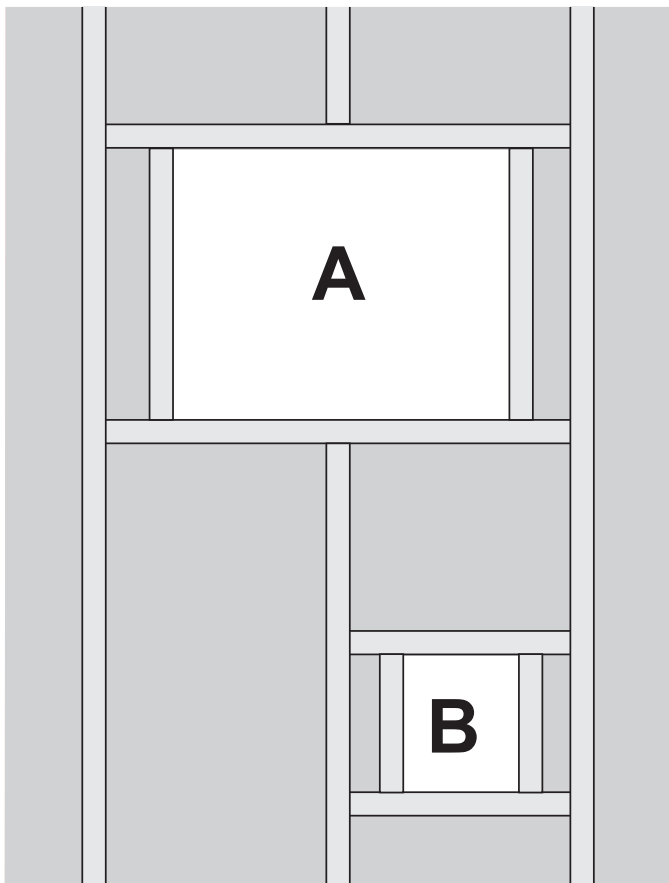
3



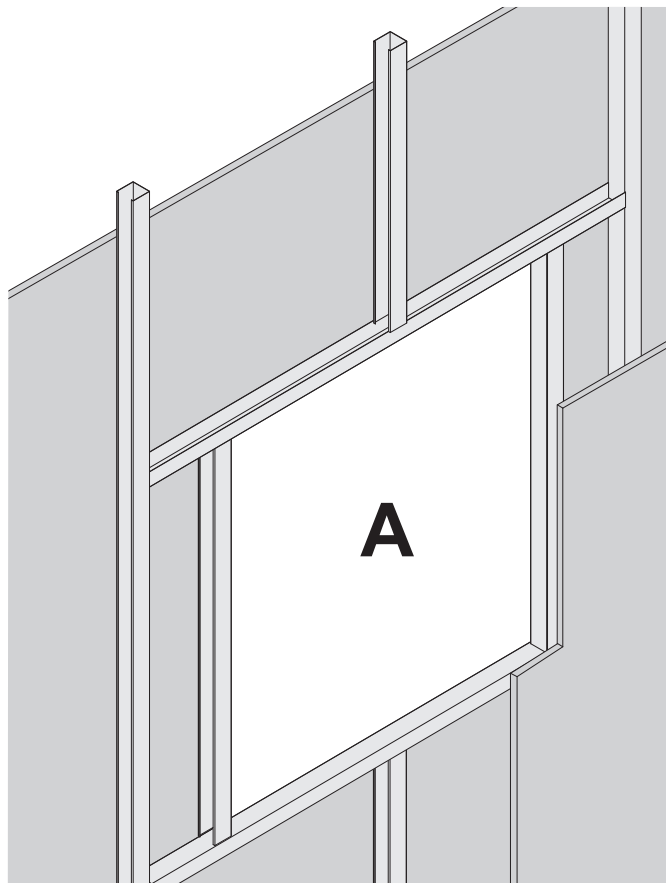
4



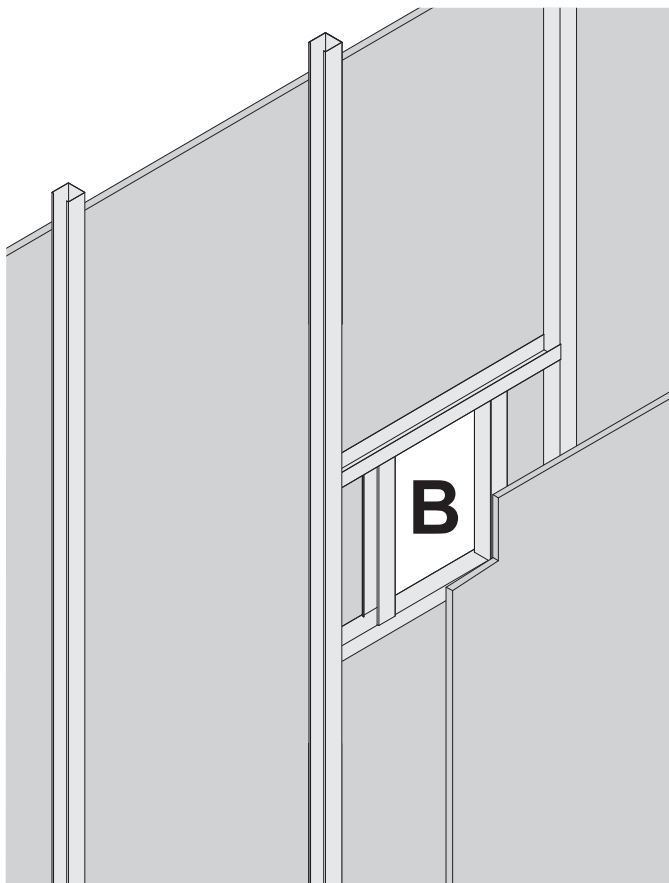
5



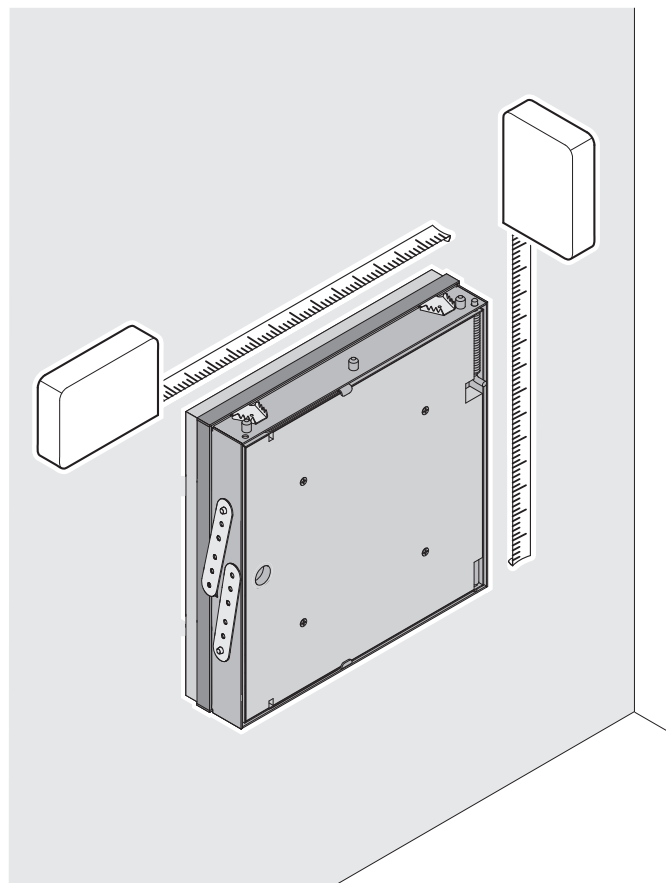
5A



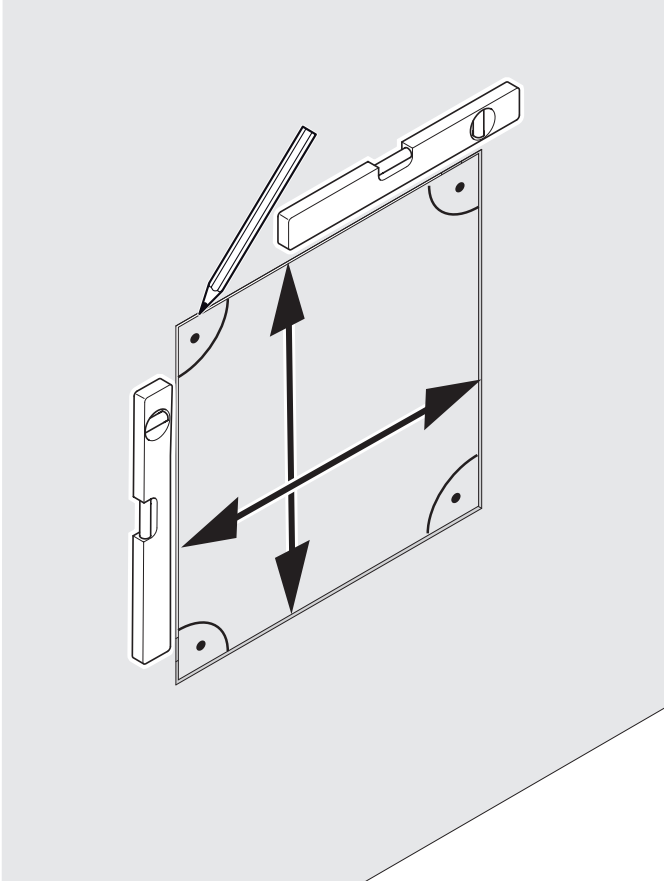
5B



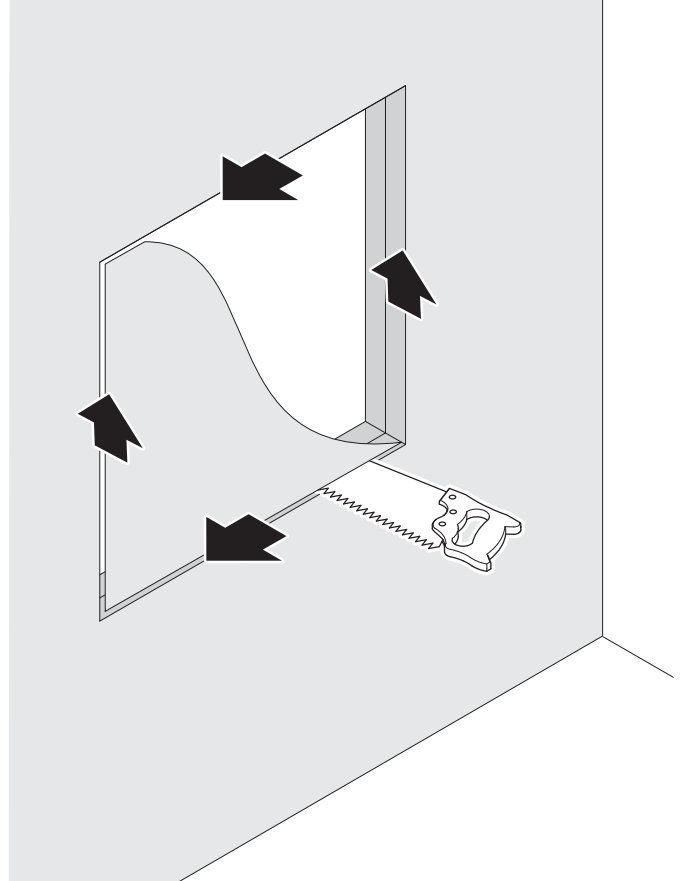
6



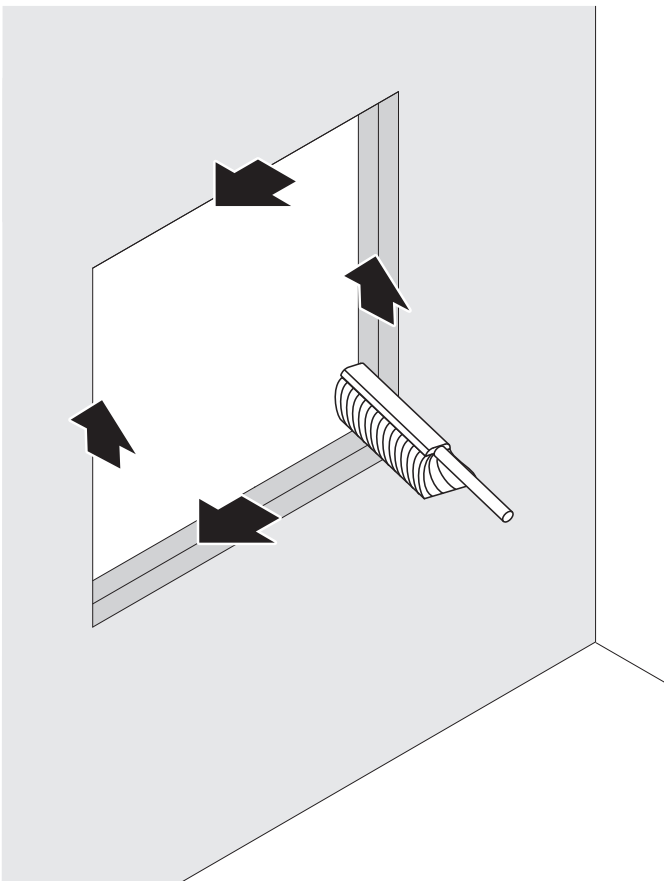
7



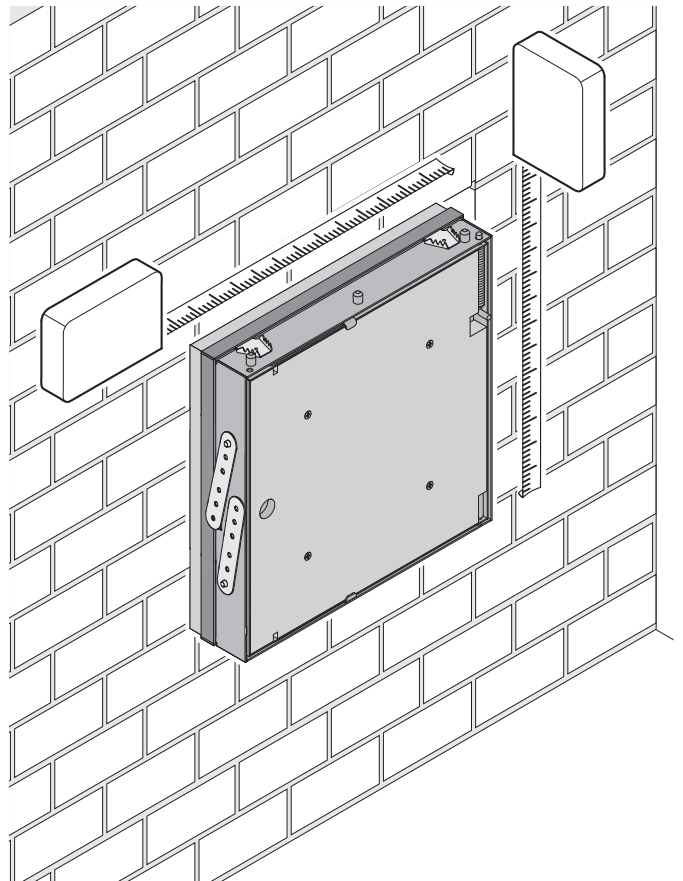
8



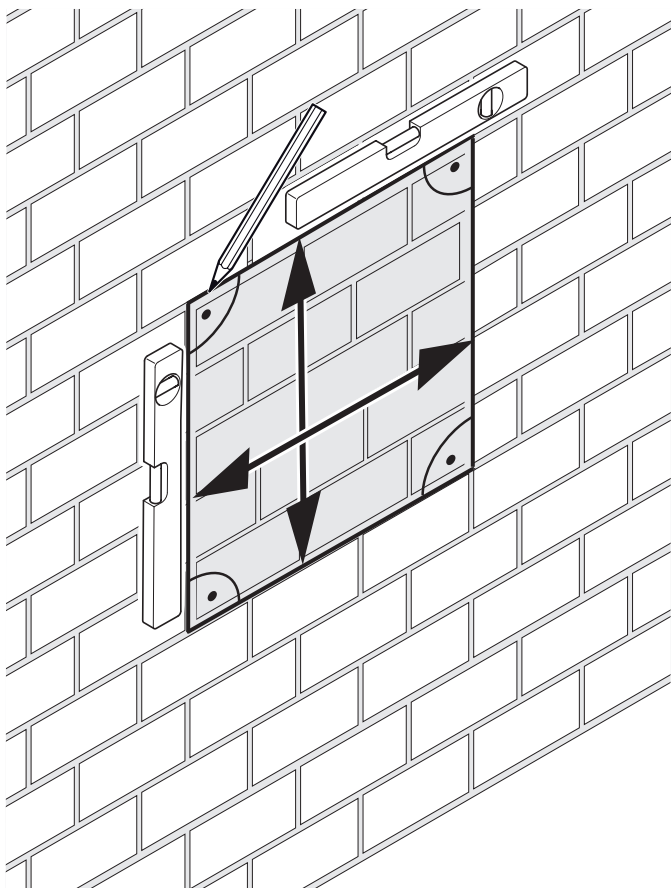
9



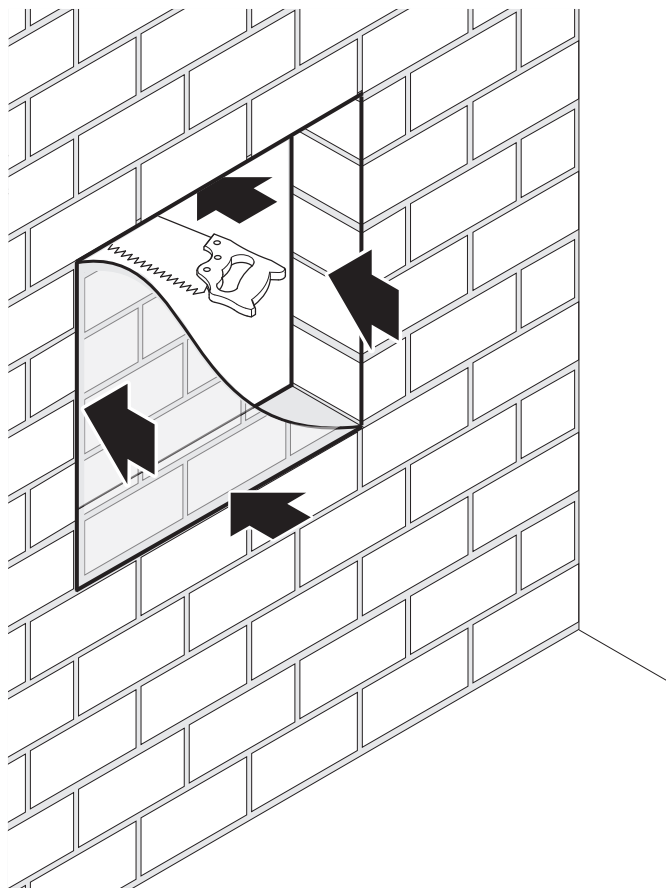
10



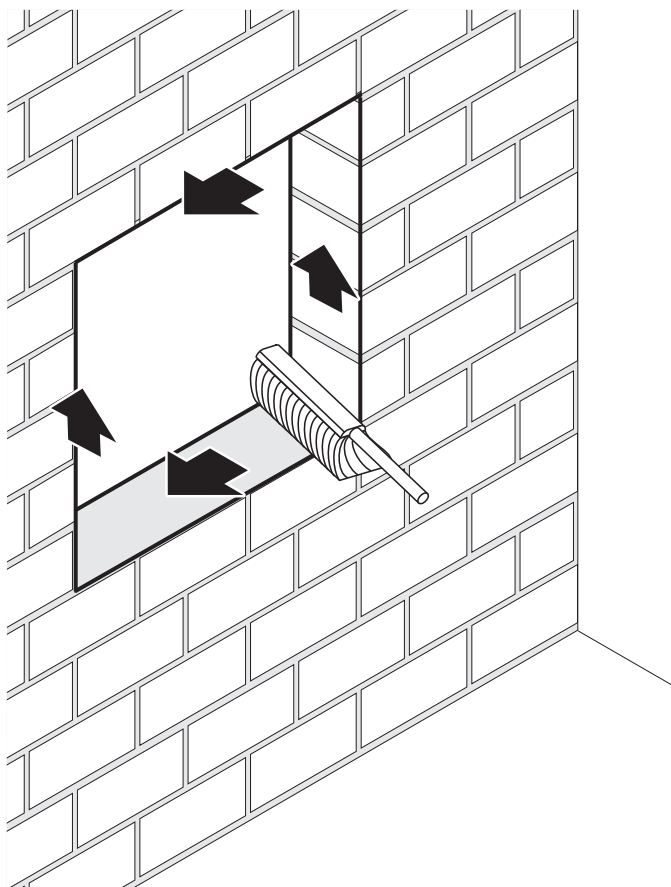
11



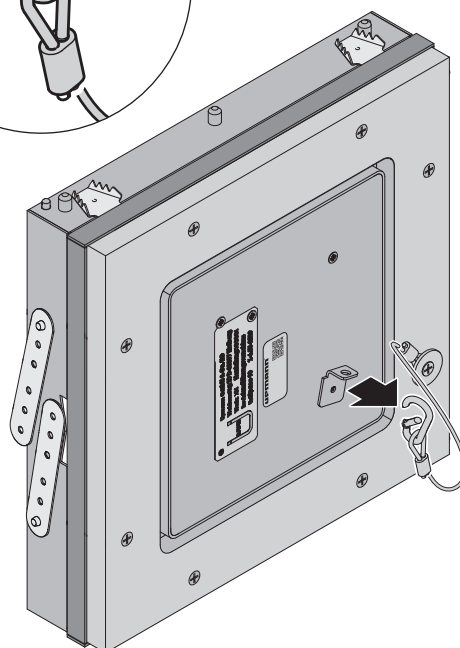
12



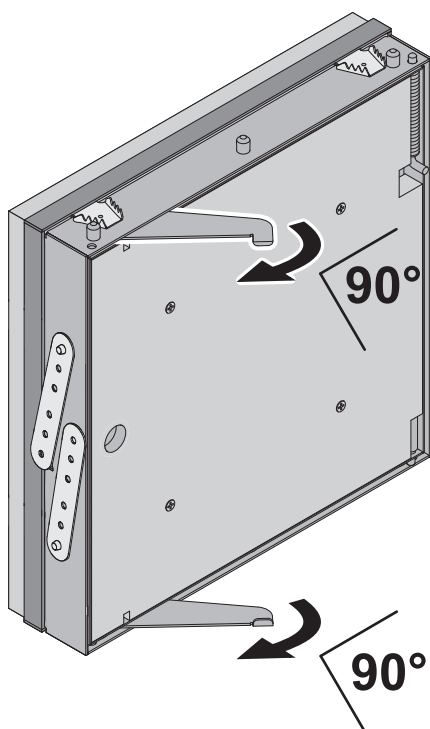
13



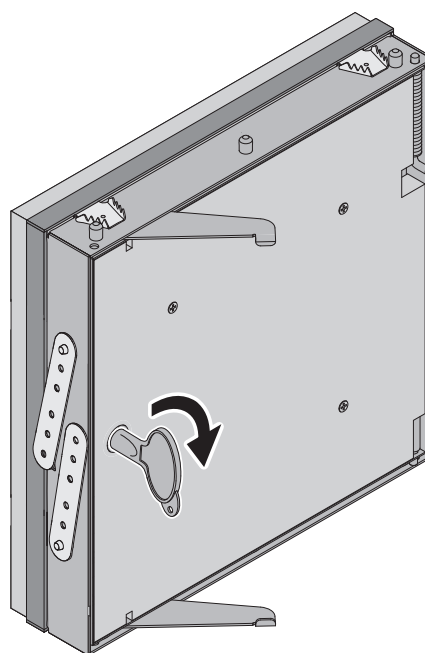
14



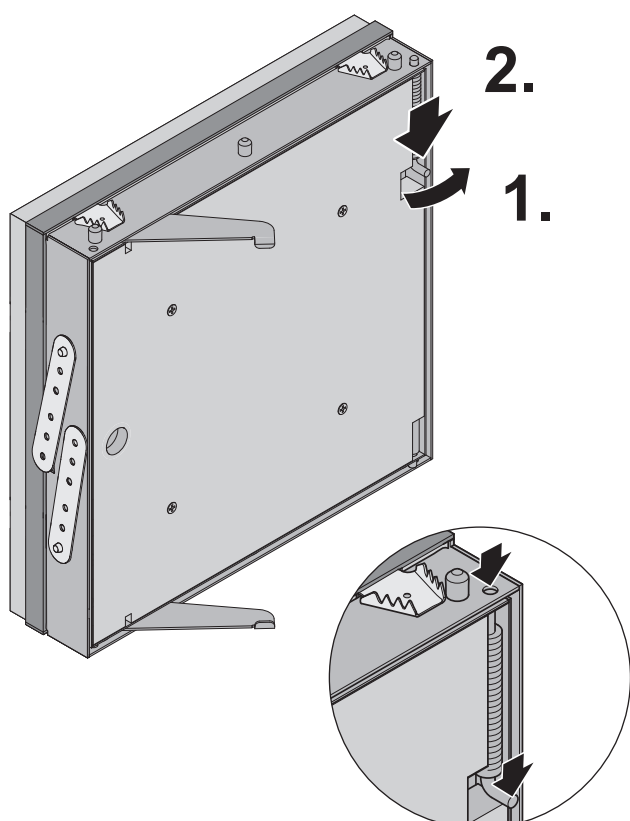
15



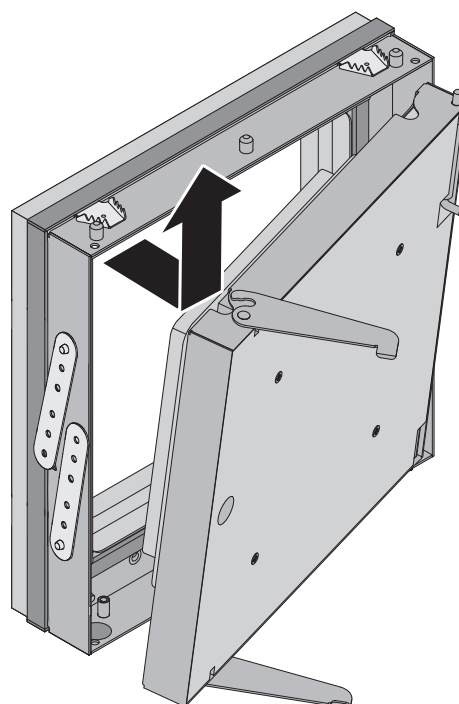
16



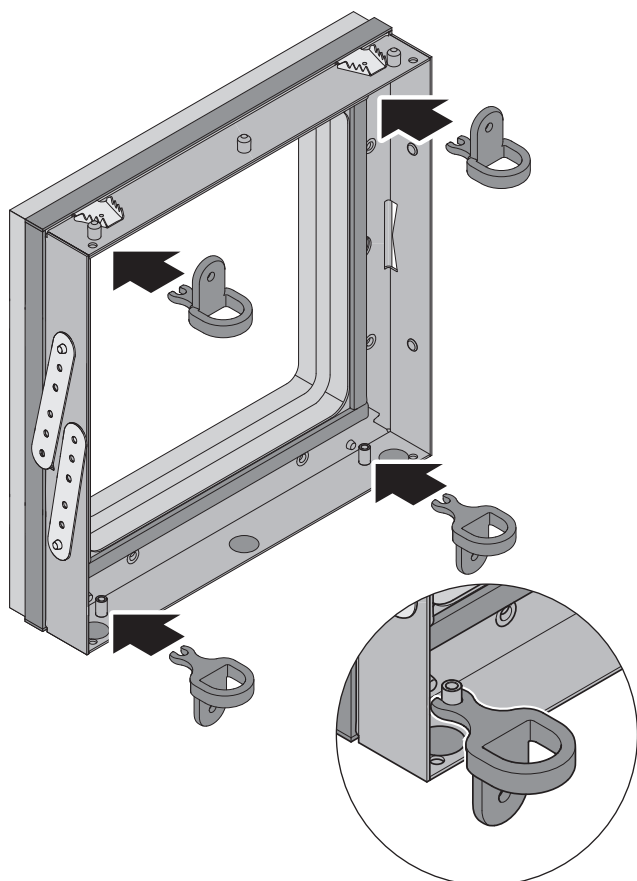
17



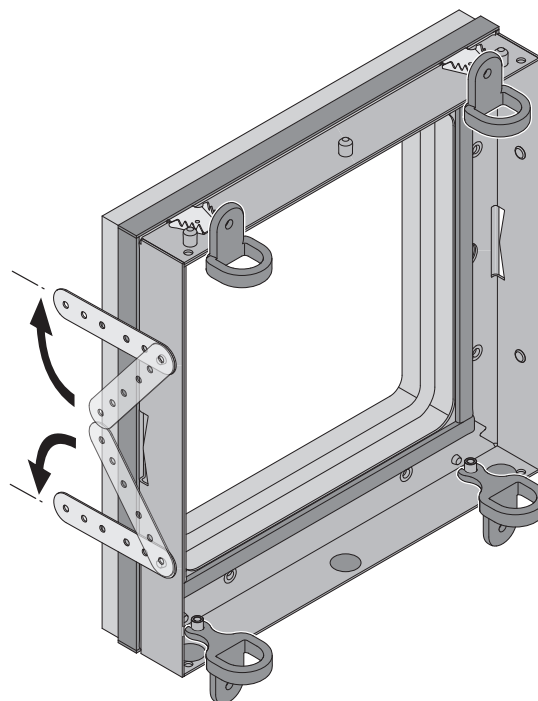
18



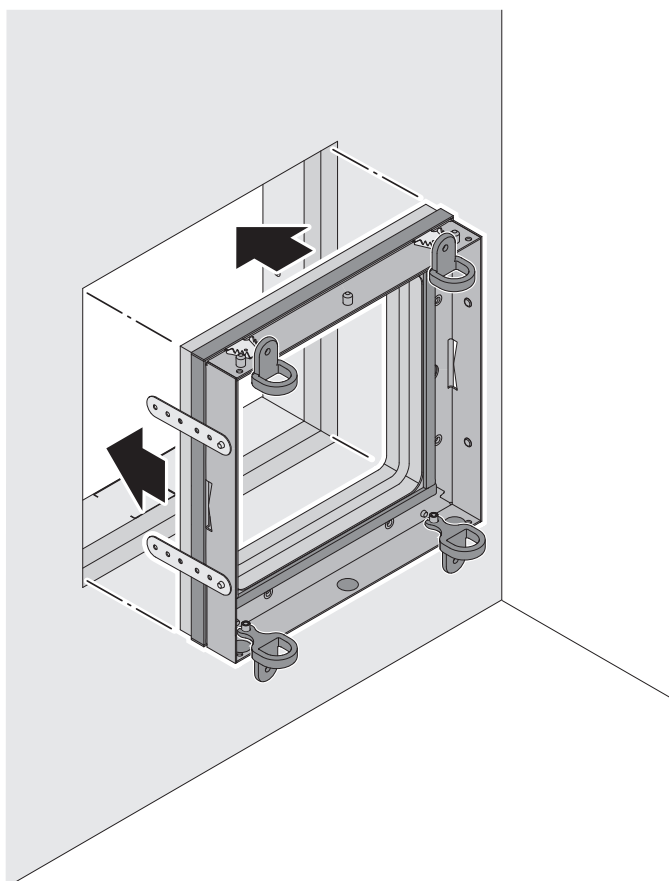
19



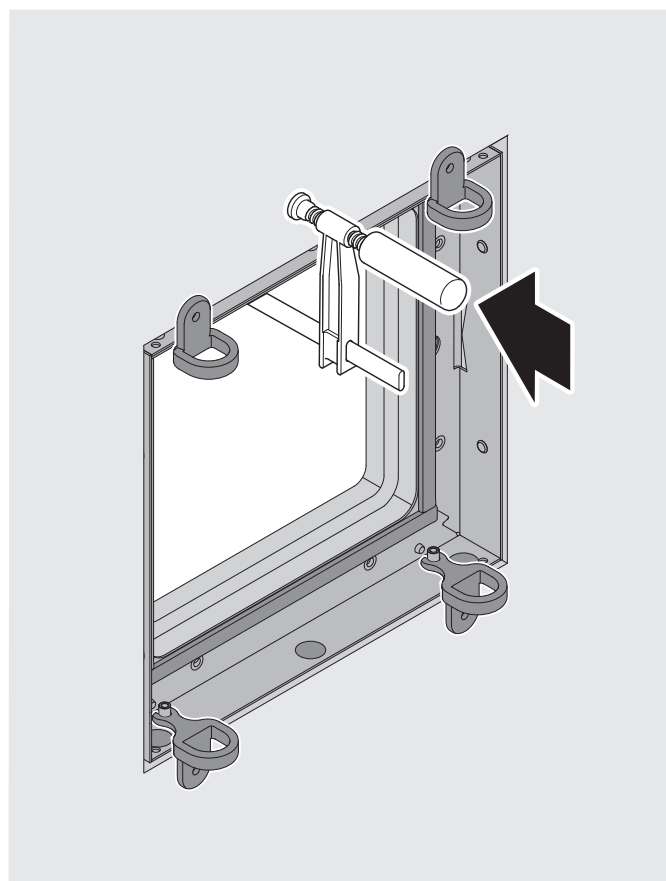
20



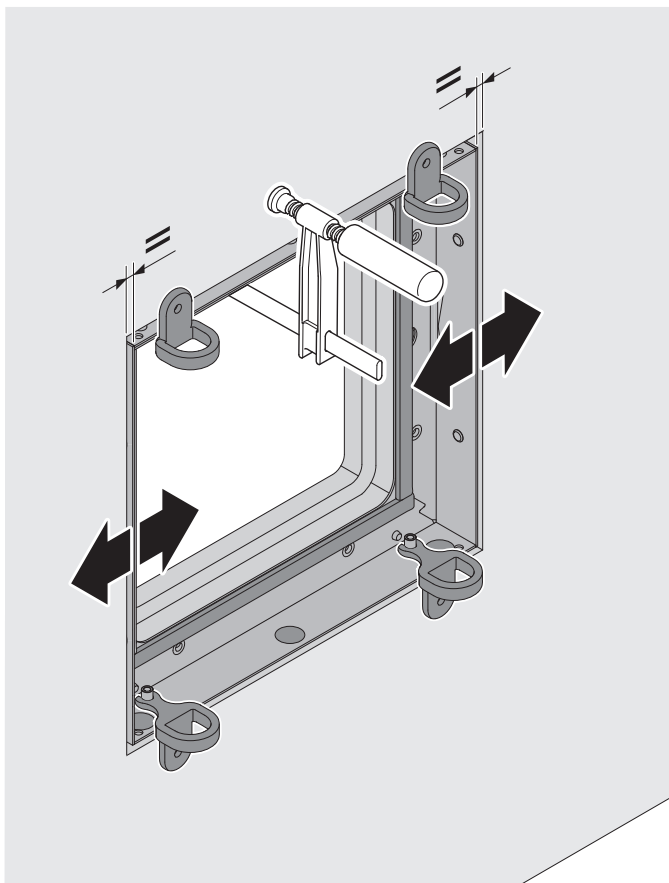
21



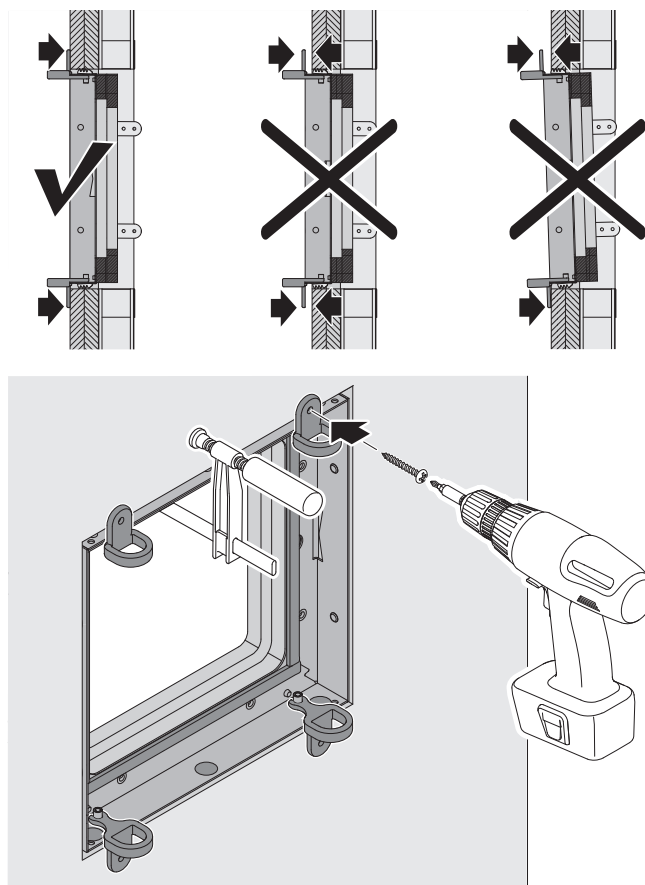
22



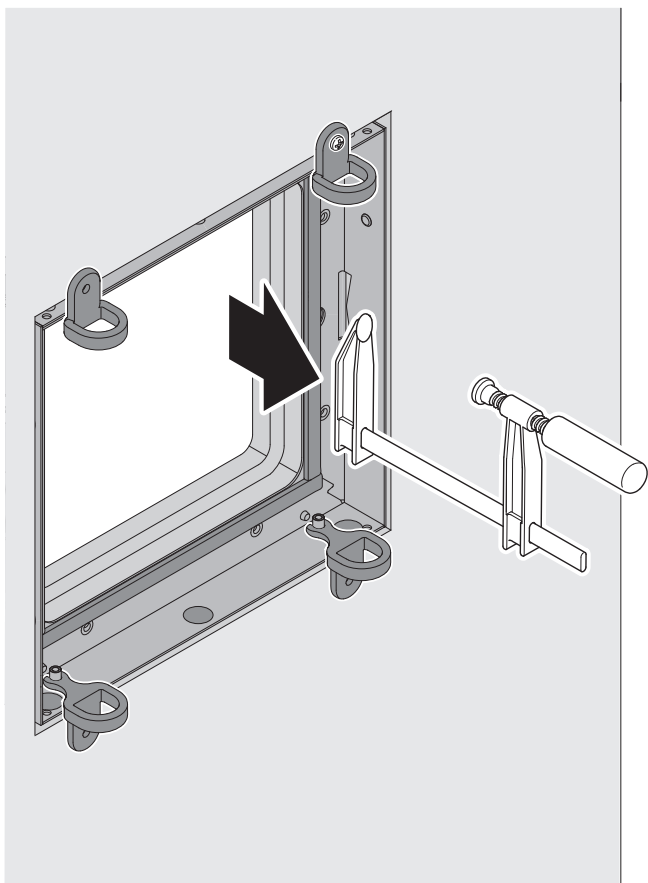
23



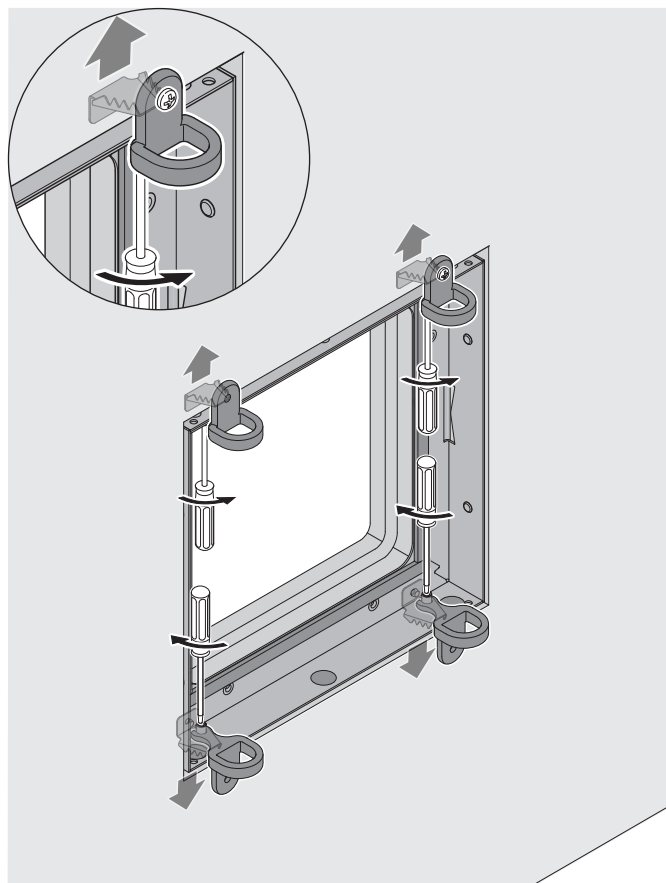
24



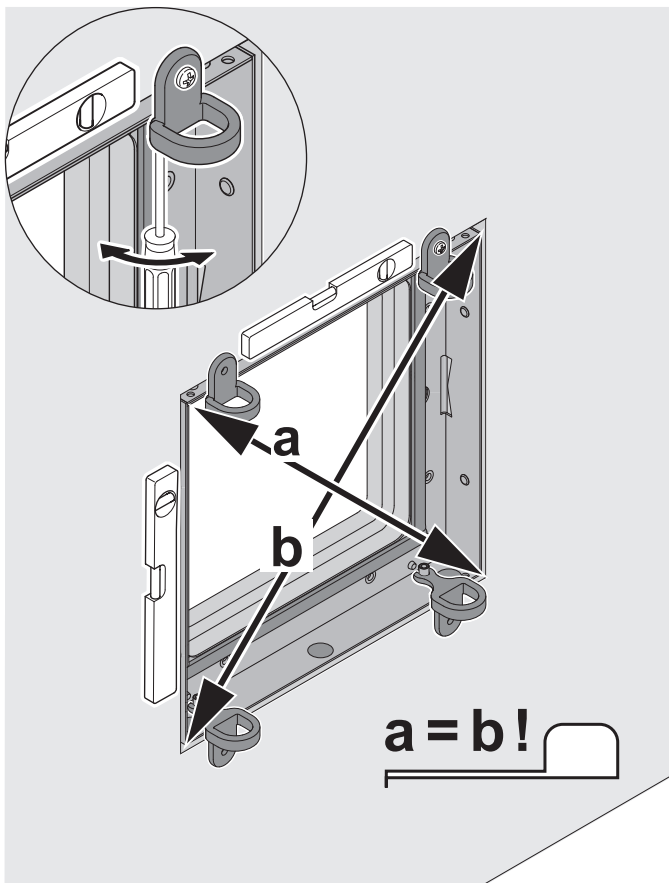
25



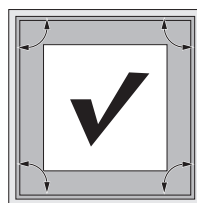
26



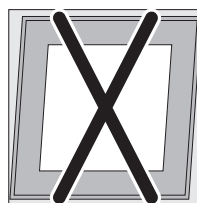
27



28



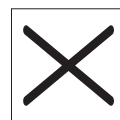
$a = b$
 $\angle = 90^\circ$



$a \neq b$
 $\angle \neq 90^\circ$

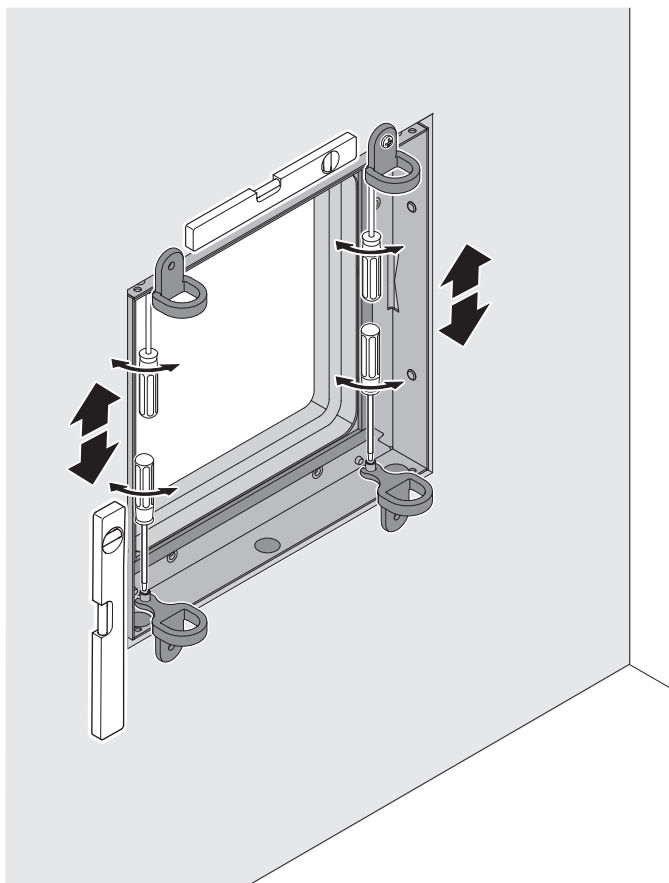


31

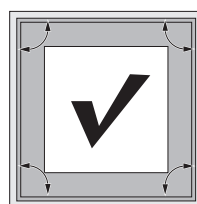


29

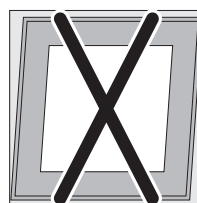
29



30



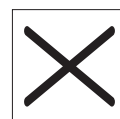
$a = b$
 $\angle = 90^\circ$



$a \neq b$
 $\angle \neq 90^\circ$

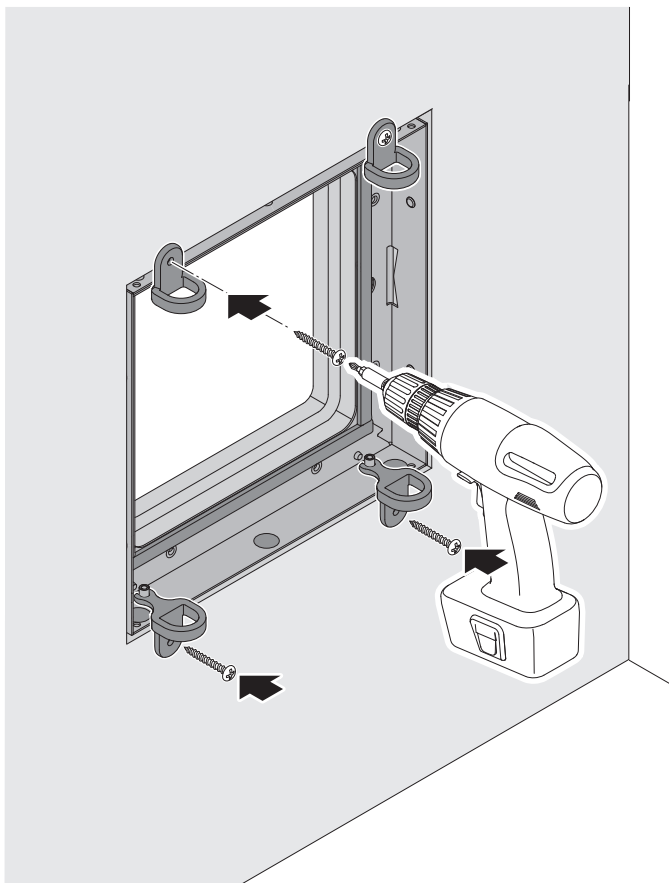


31

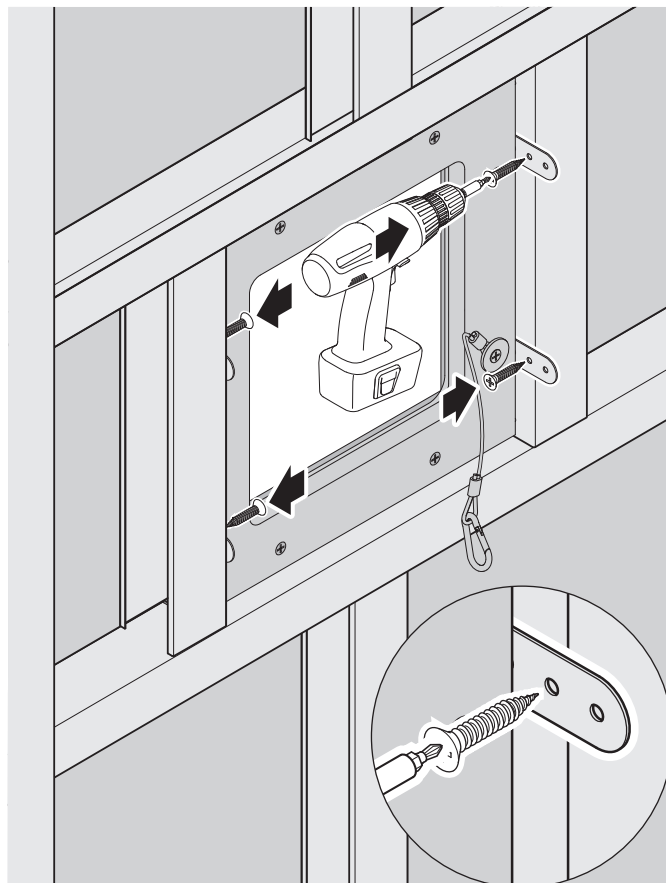


29

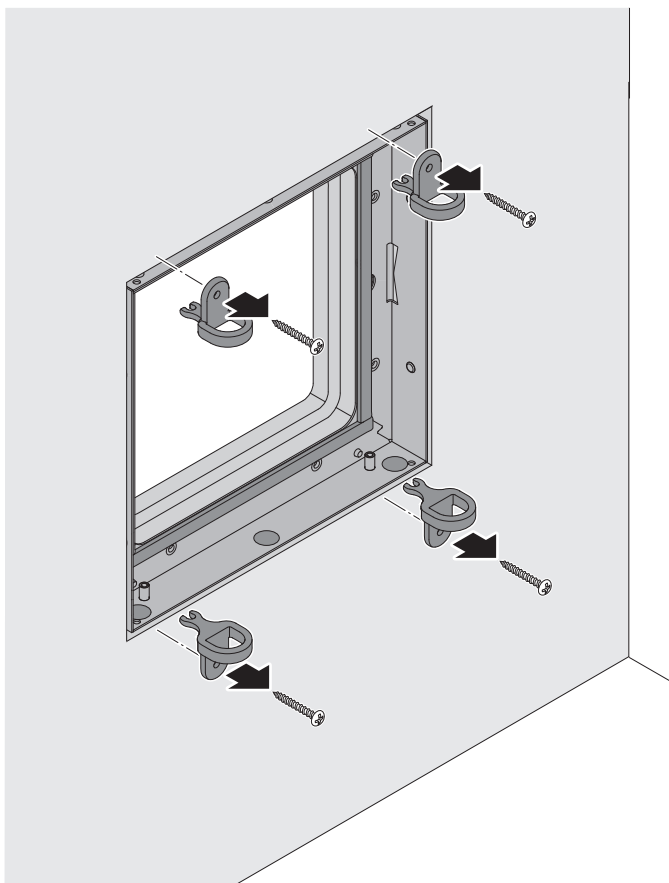
31



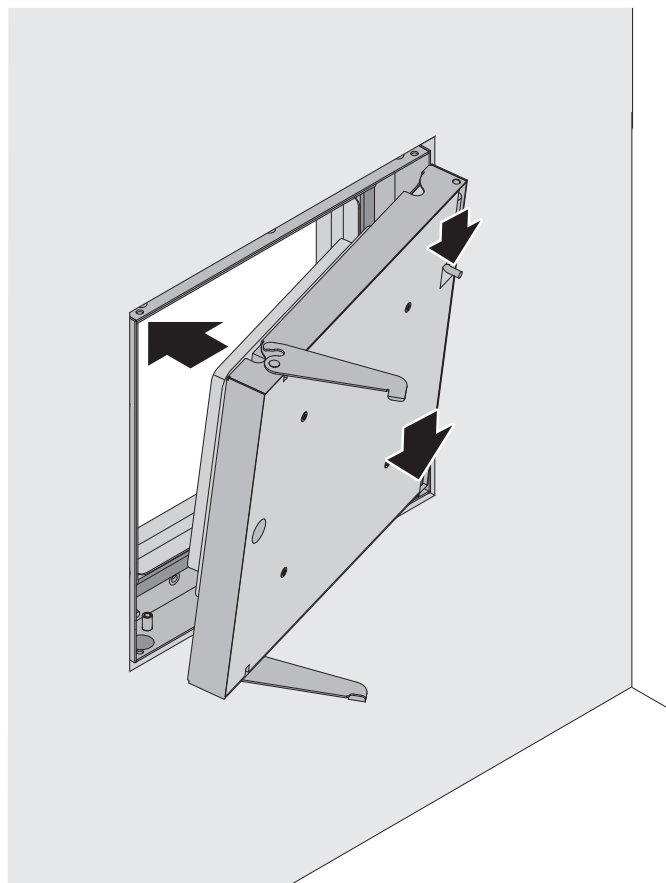
32



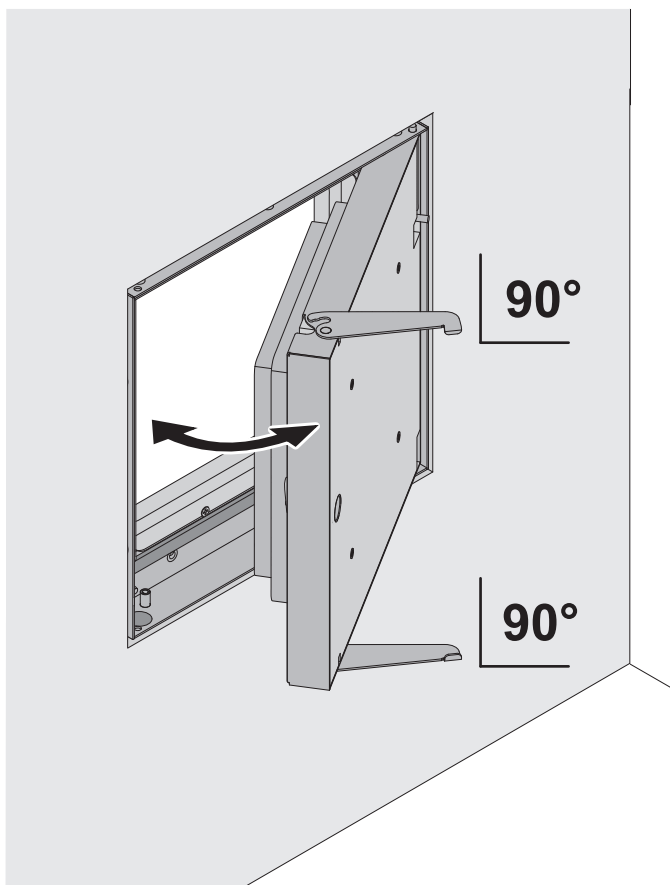
33



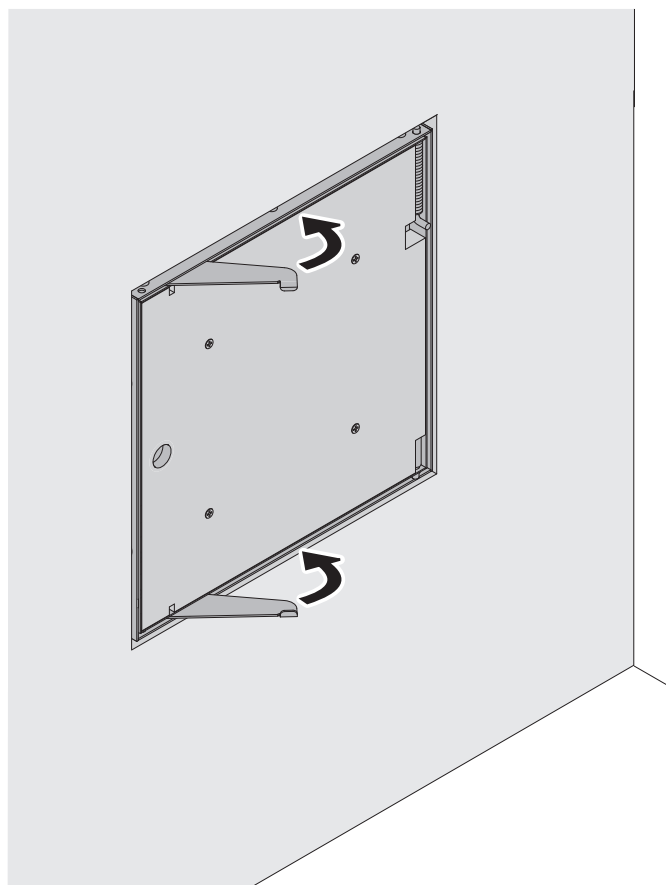
34



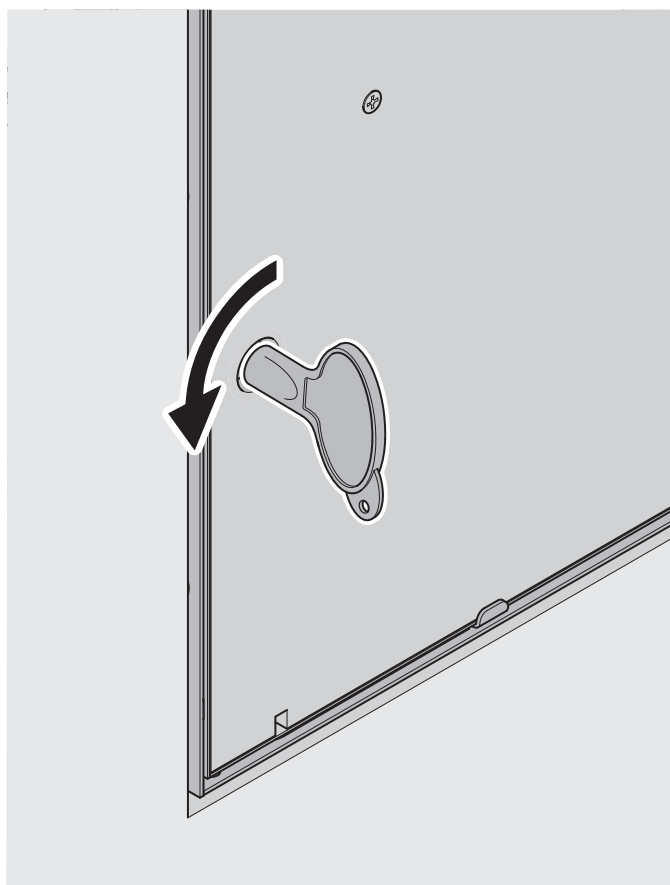
35



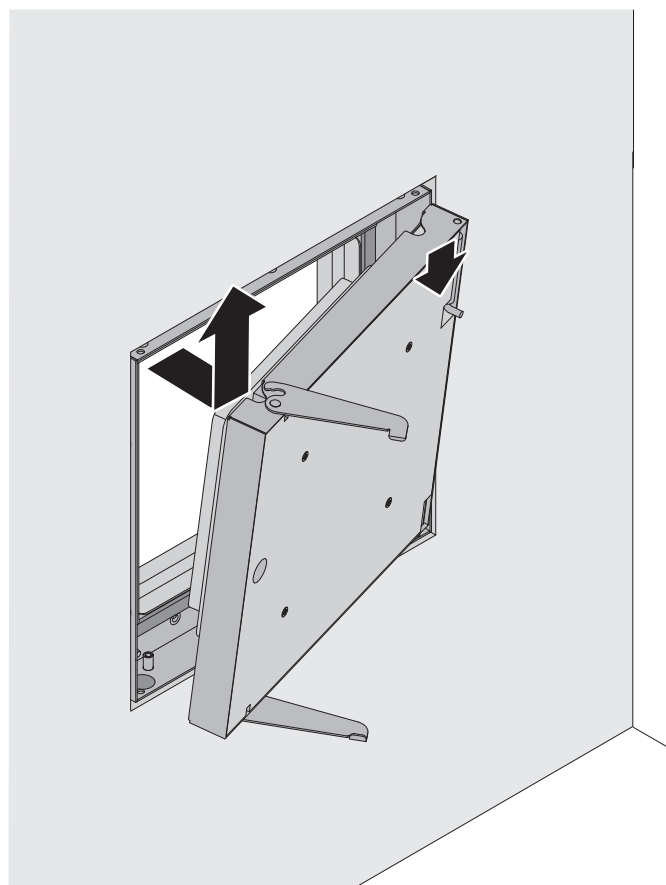
36



37



38





35

37

36



39

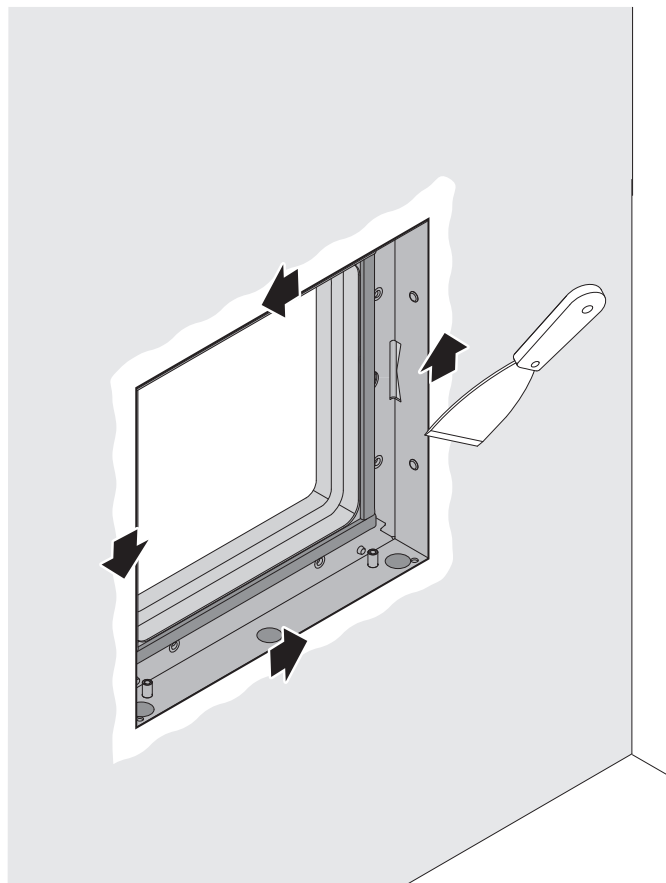


29

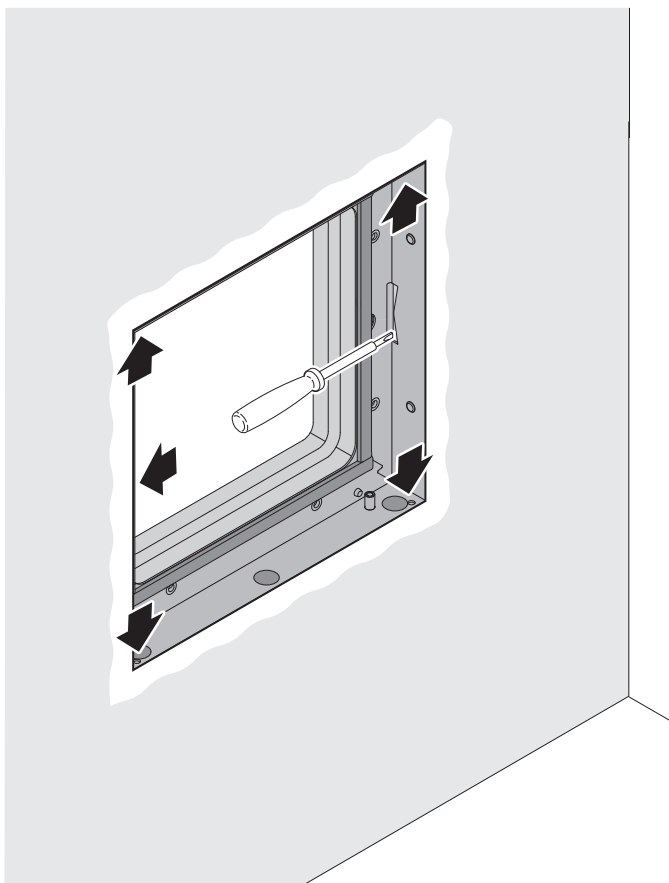
...

38

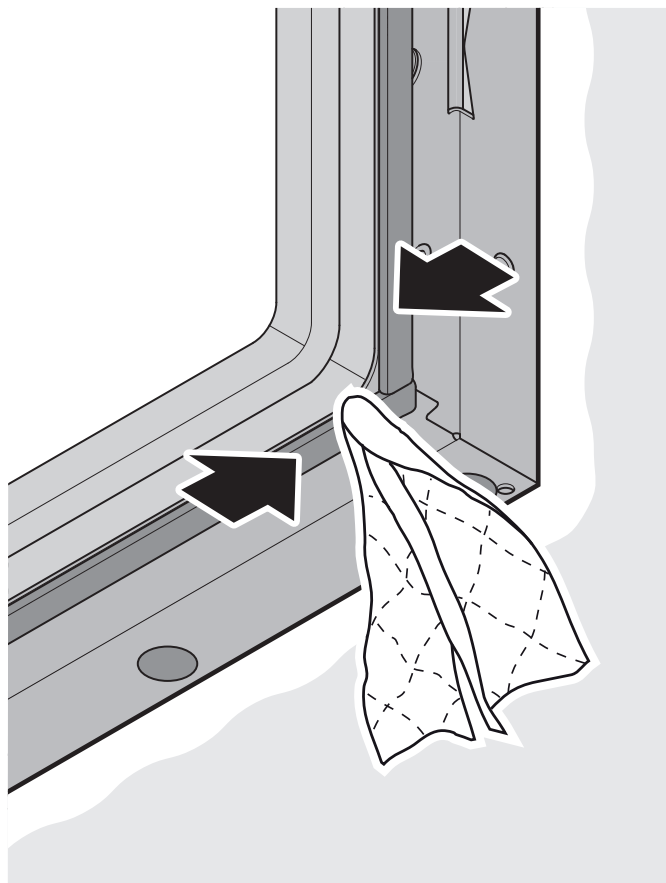
39



40



41

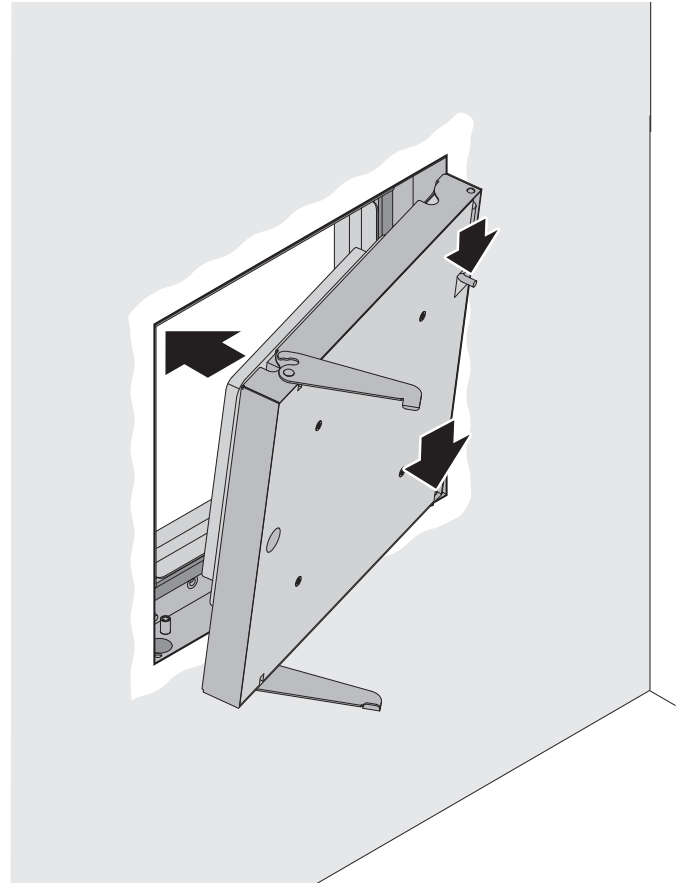


42

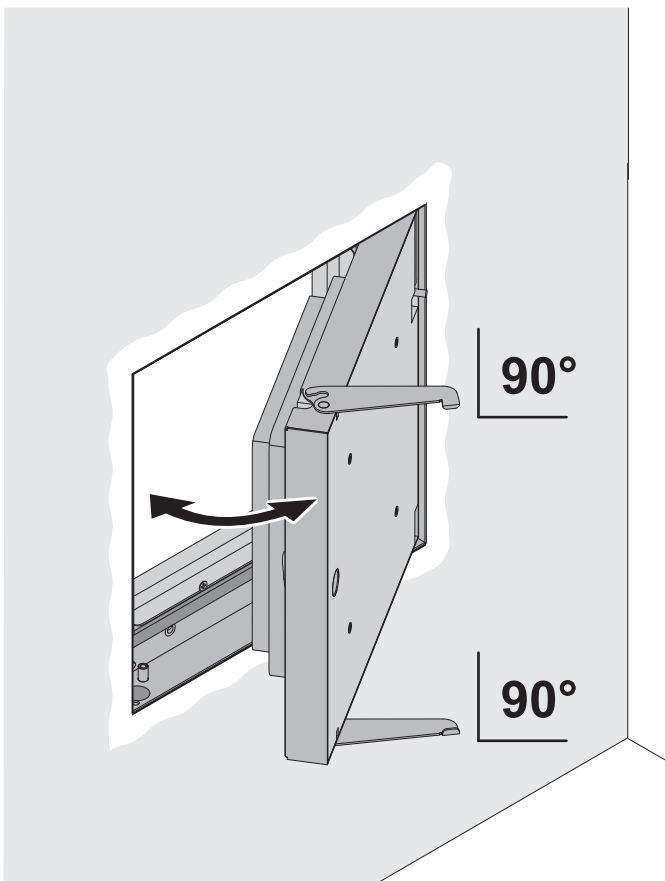


 / 24 h

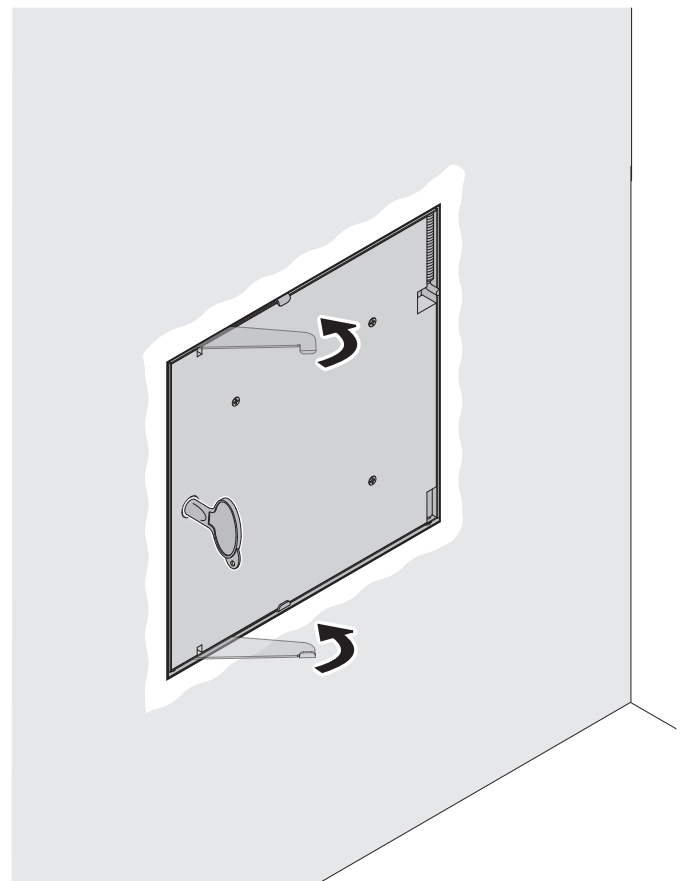
43



44



45





44

45

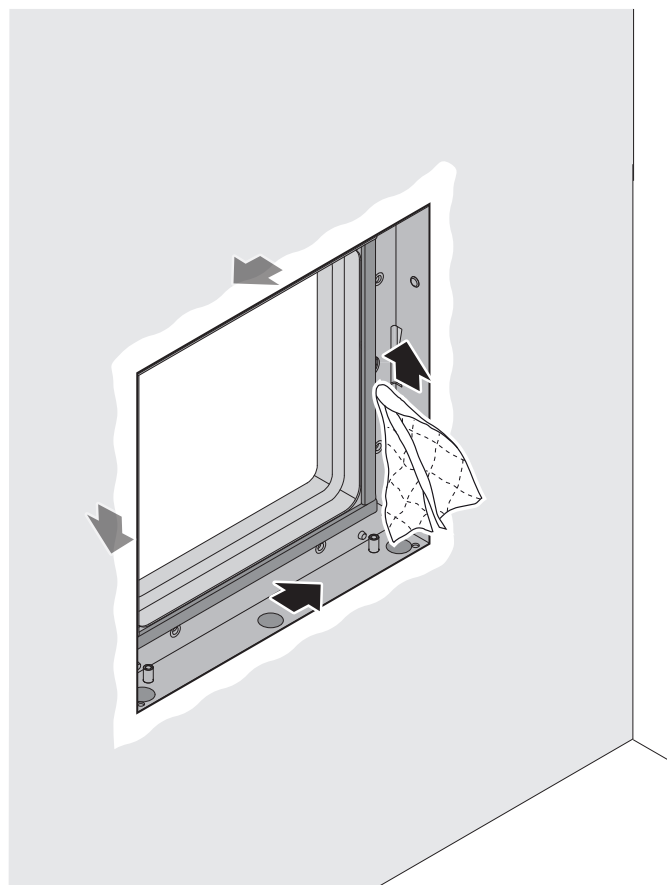


48

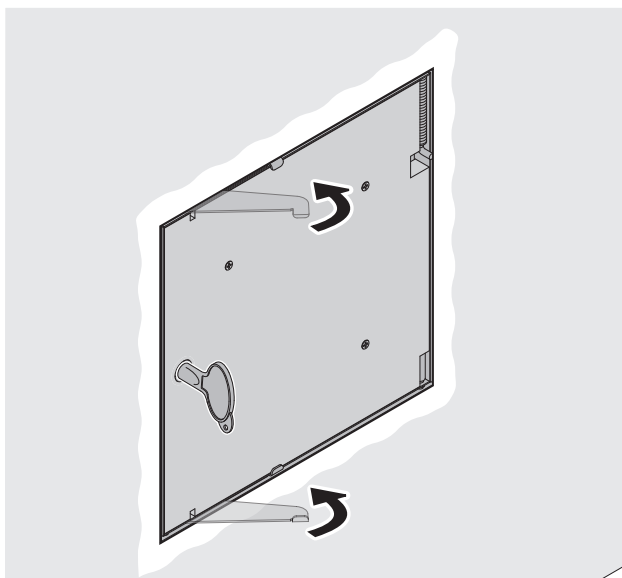


46

46



47

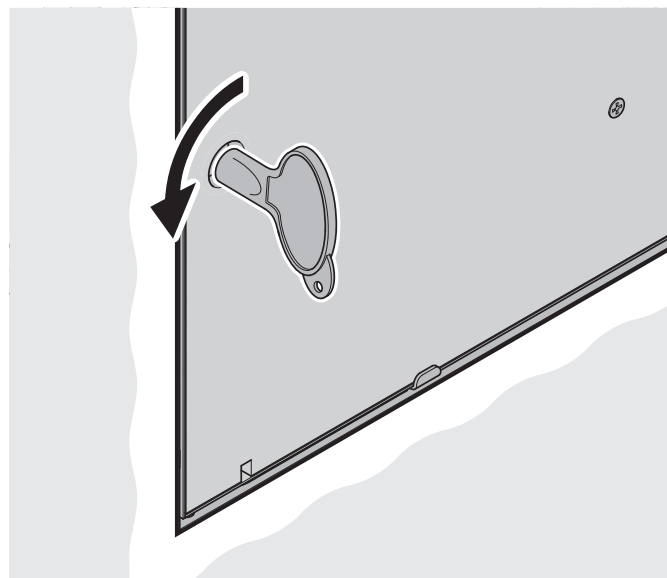


48



46

48

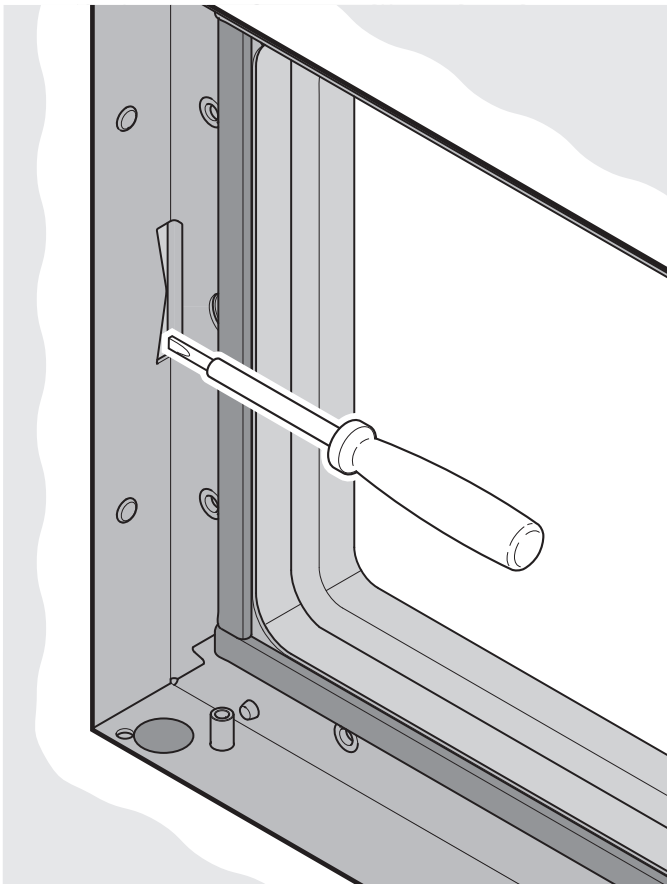


51

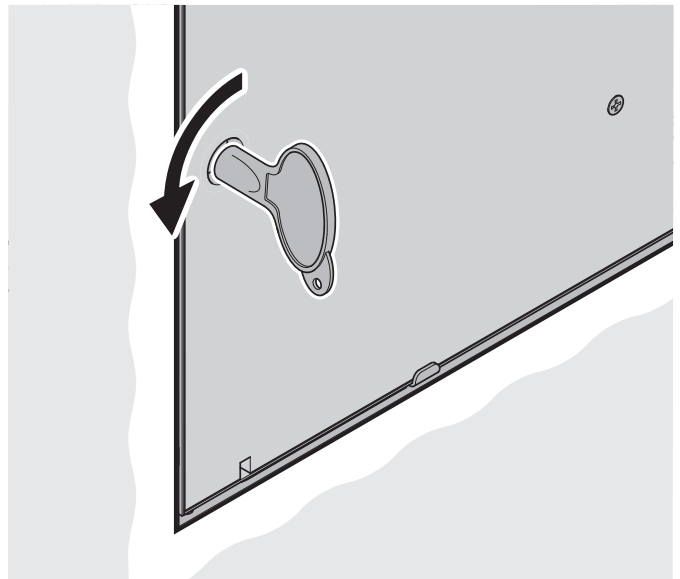


49

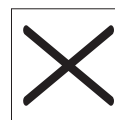
49



50

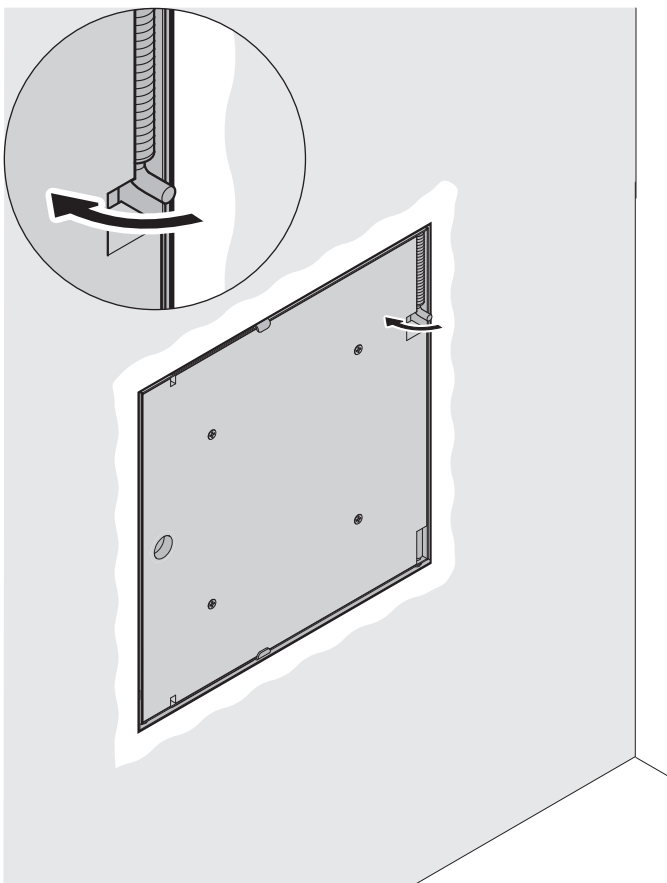


51

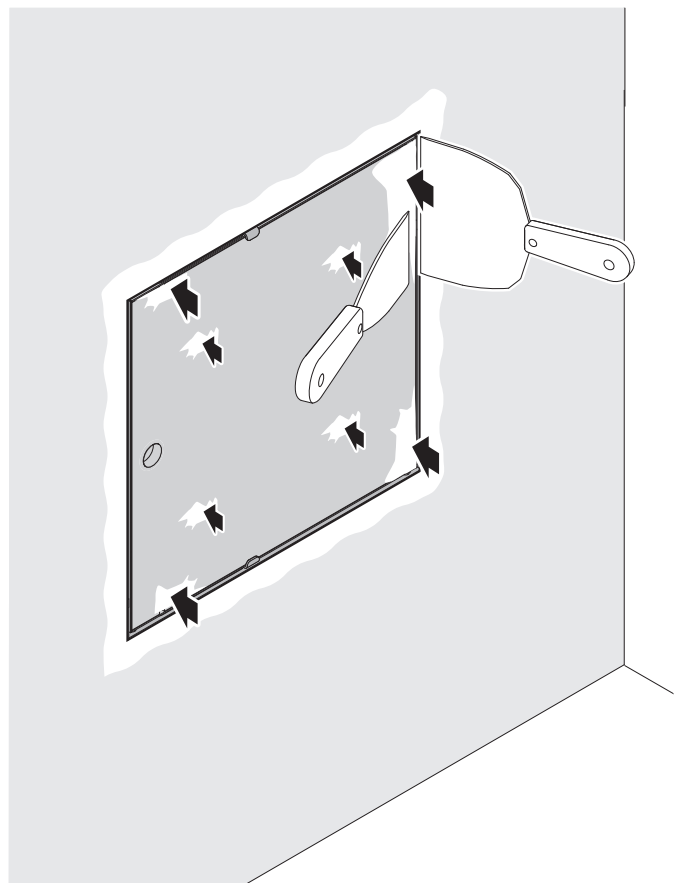


49

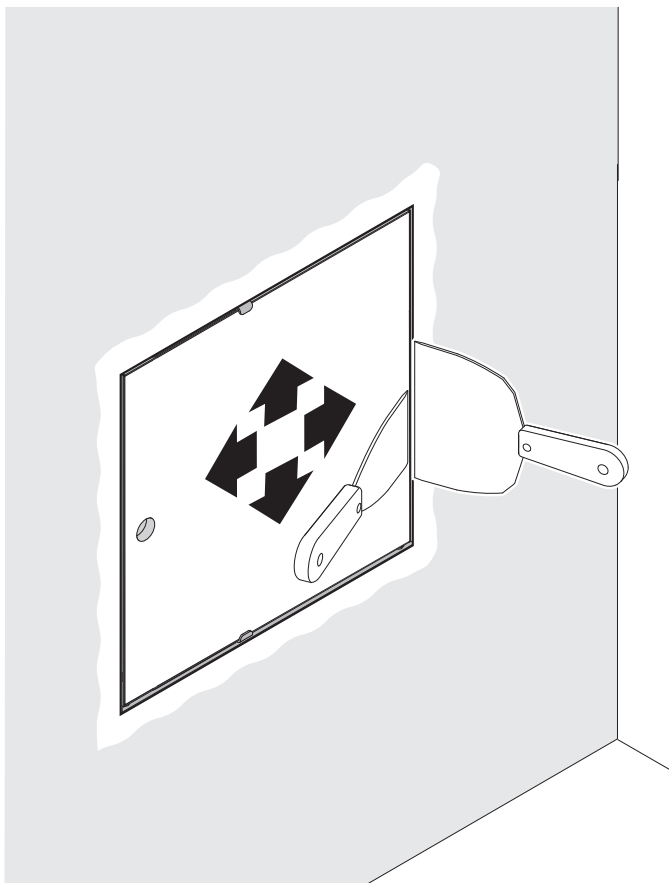
51



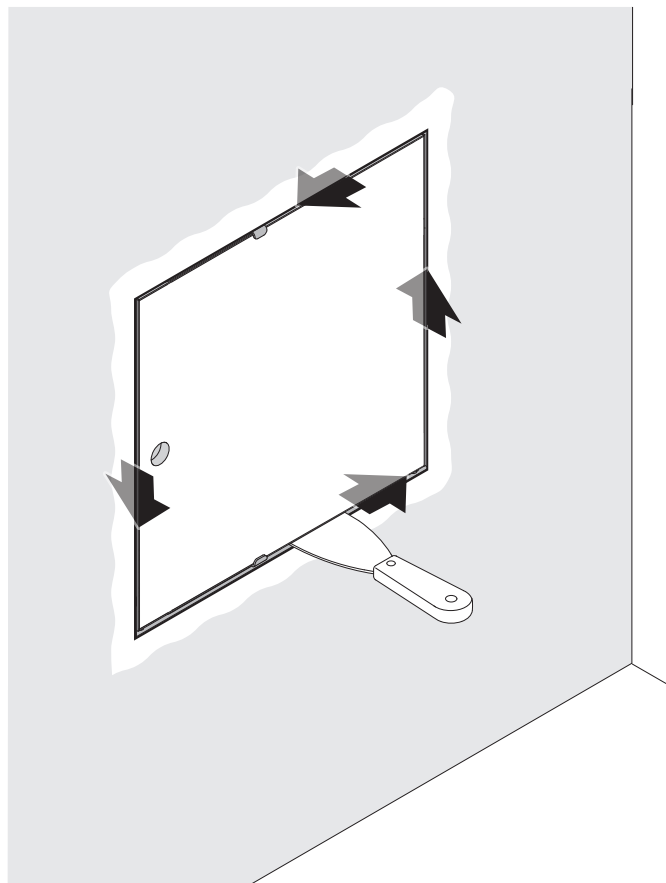
52



53



54

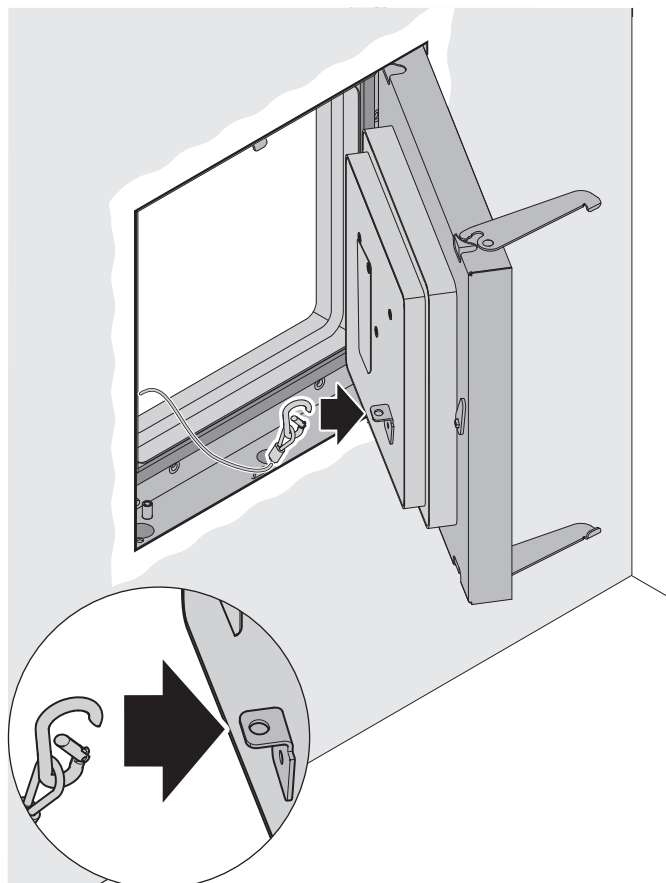


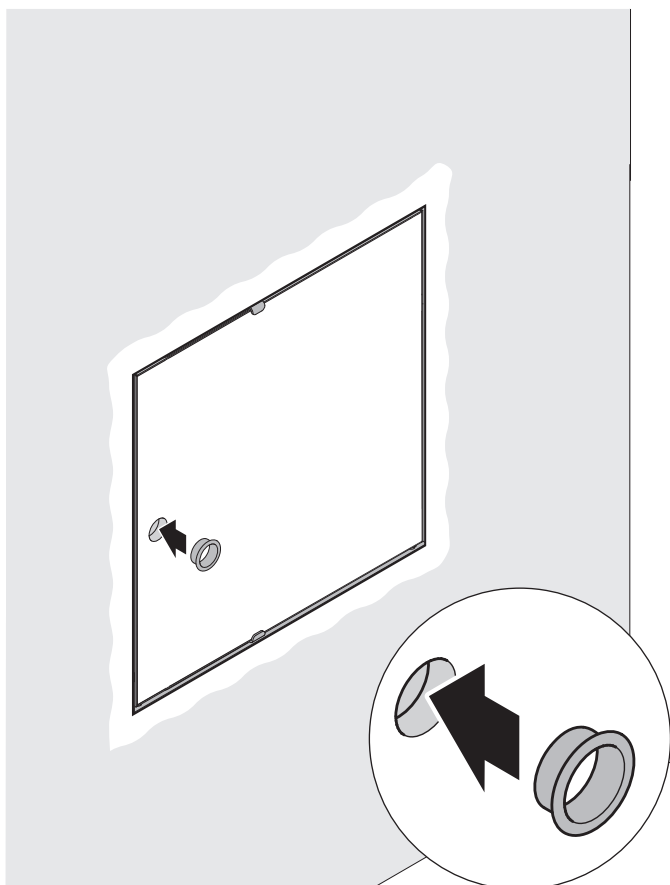
55



 / 24 h

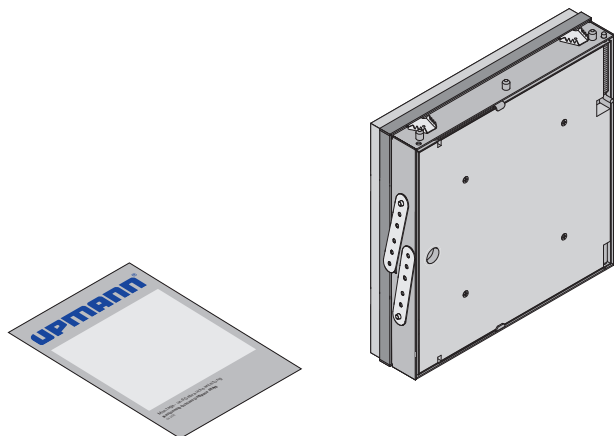
56



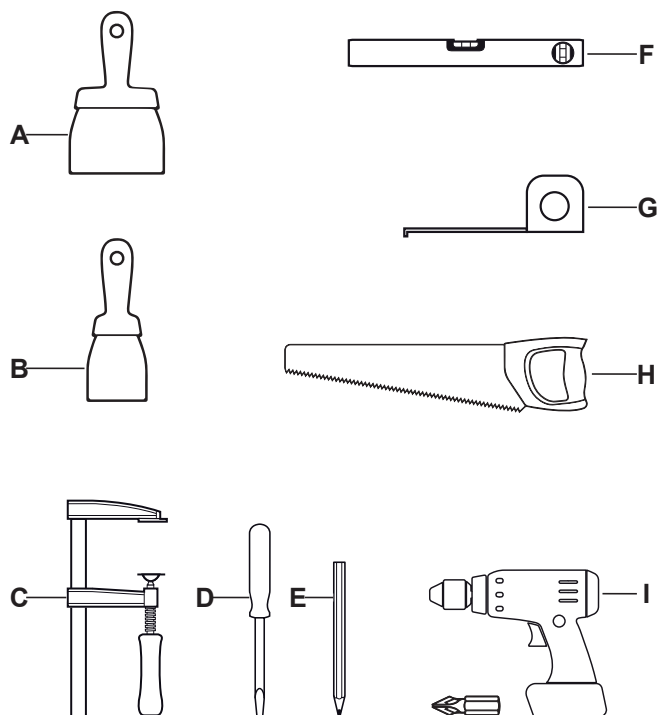




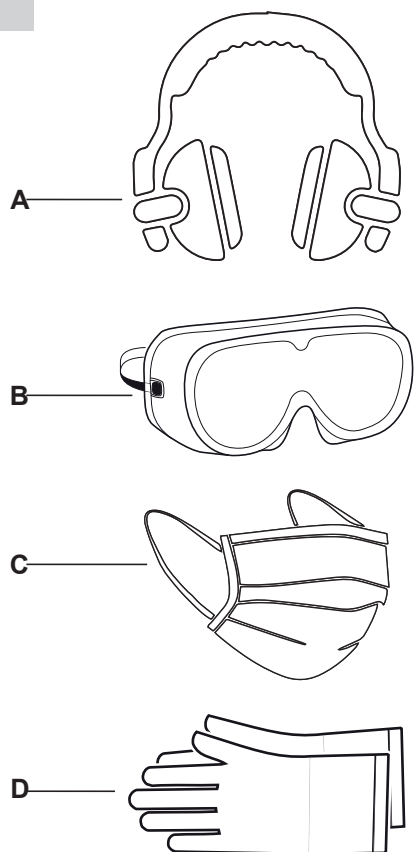
1



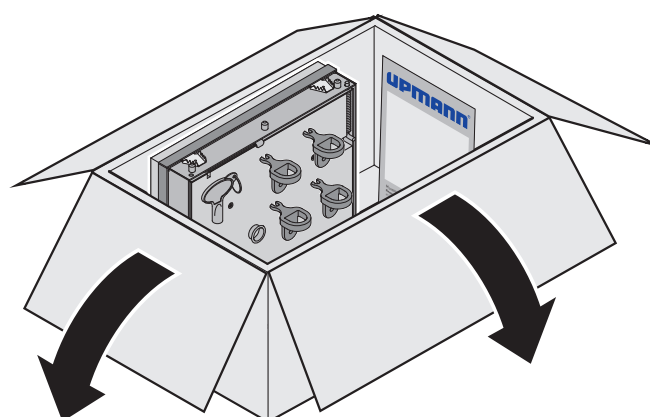
2



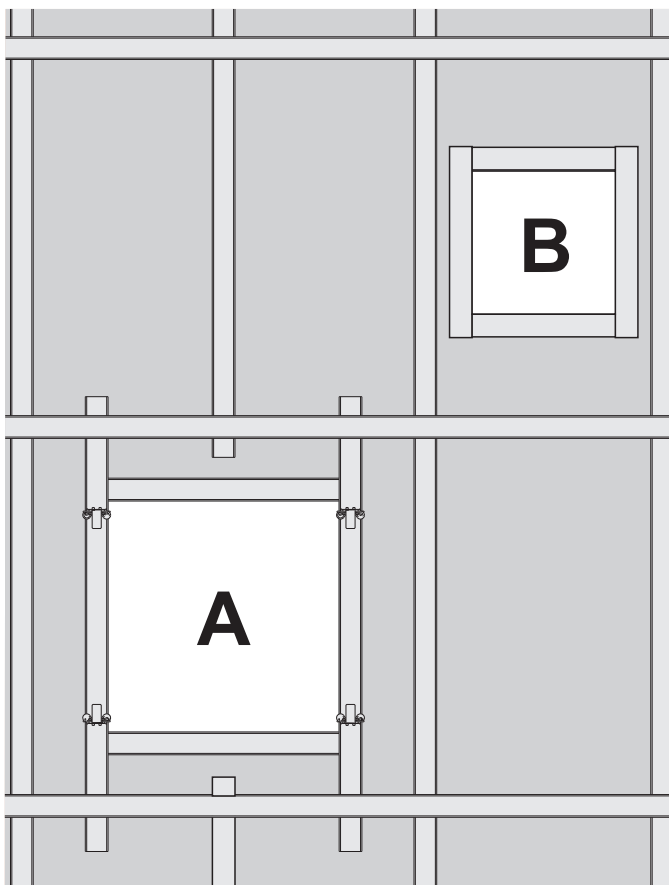
3



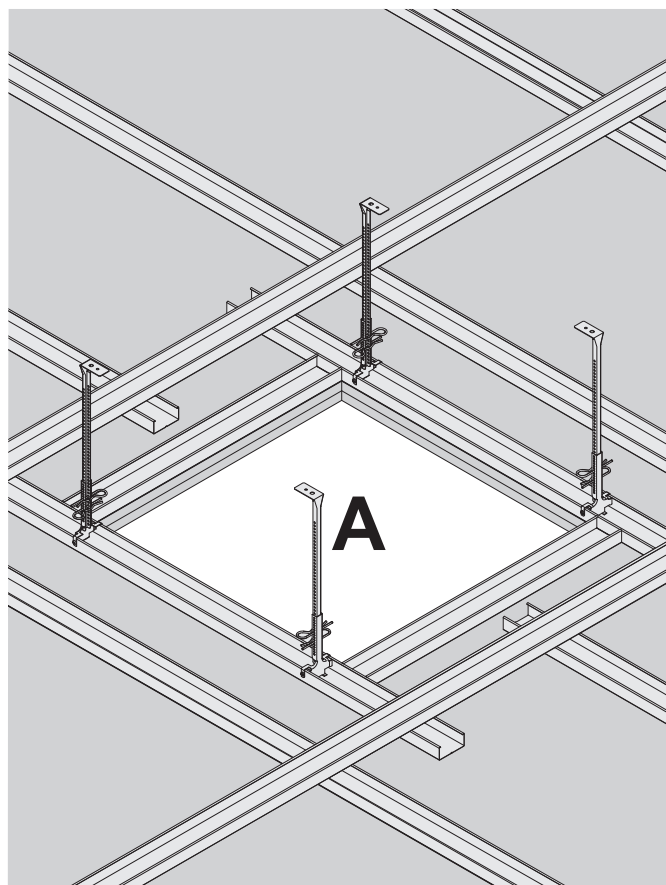
4



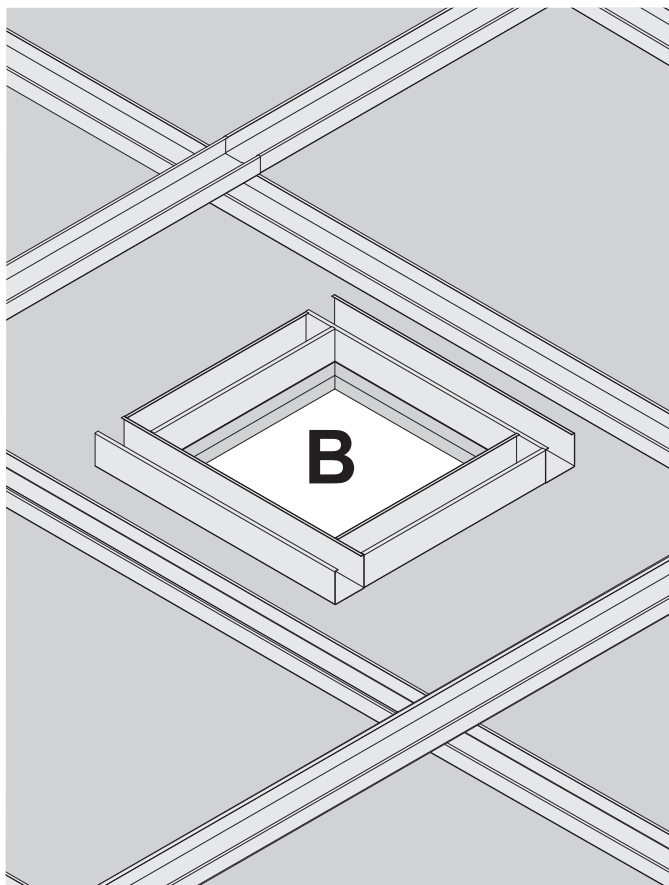
5



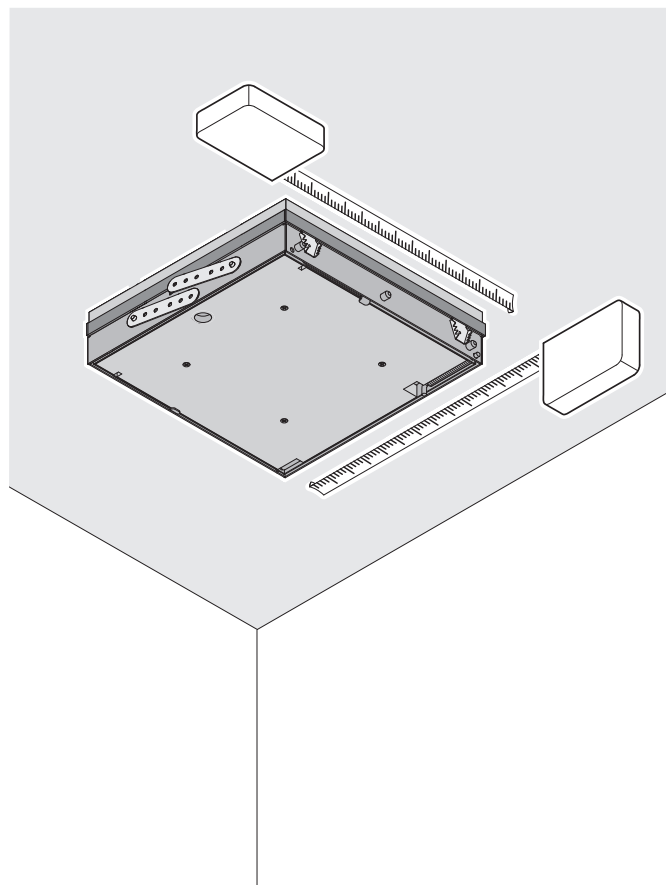
5A



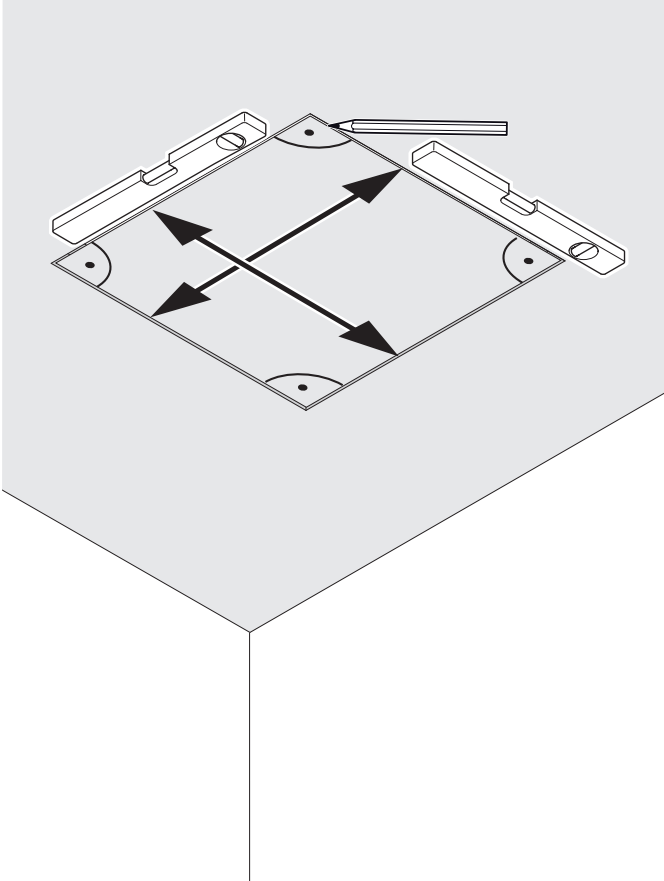
5B



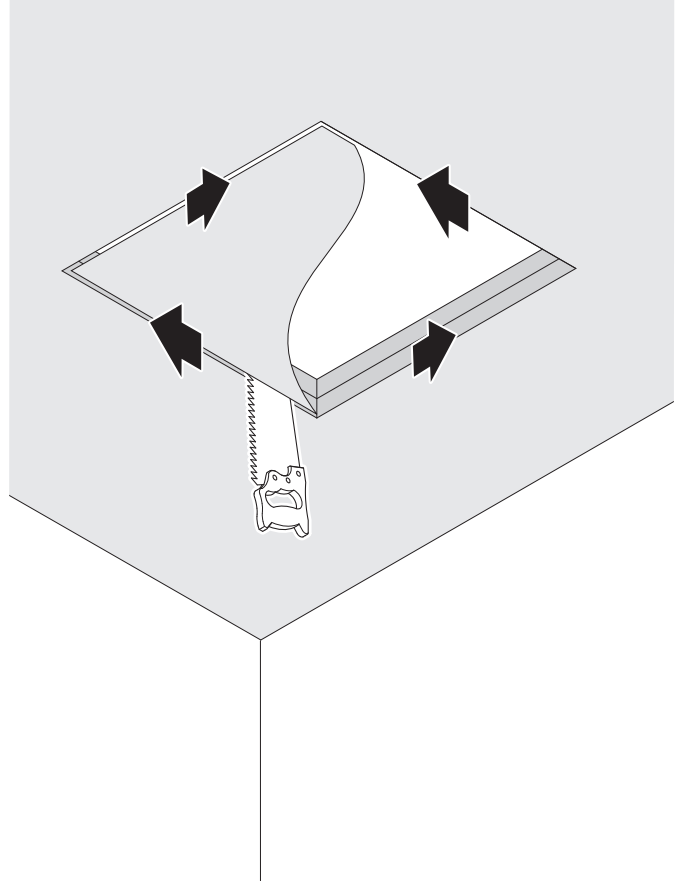
6



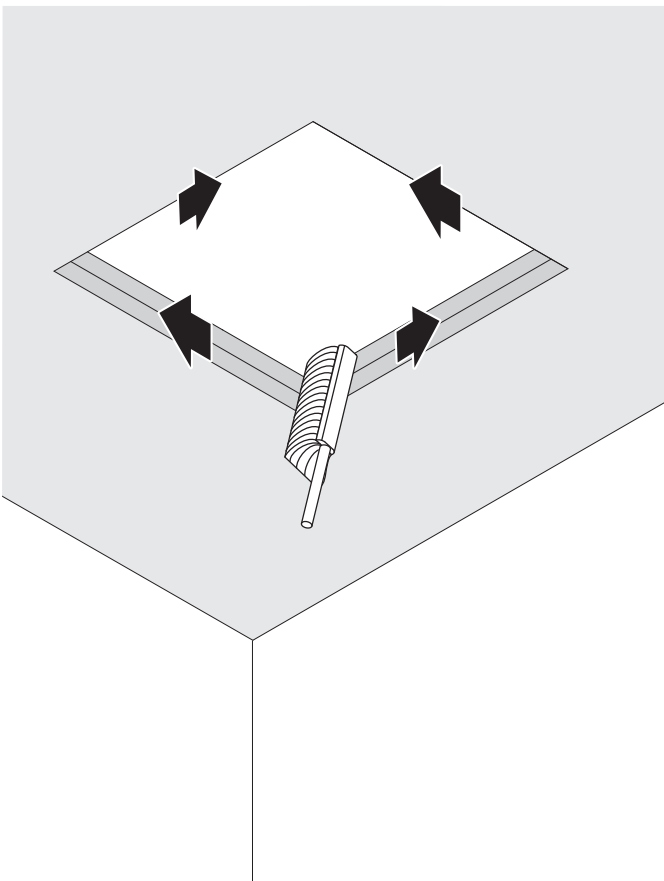
7



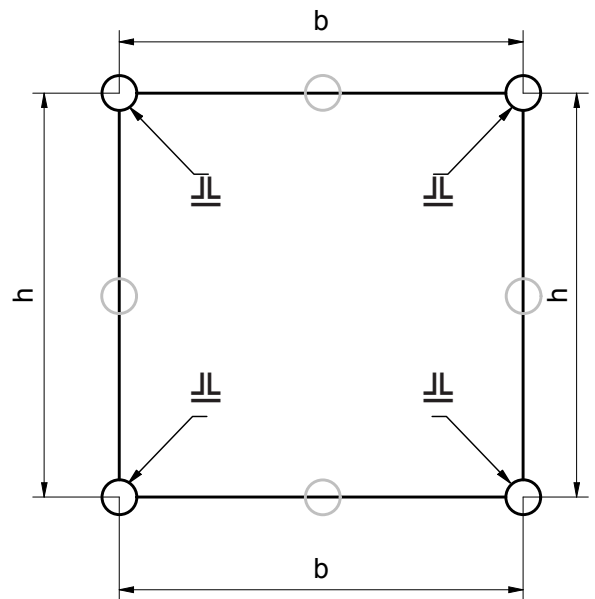
8



9

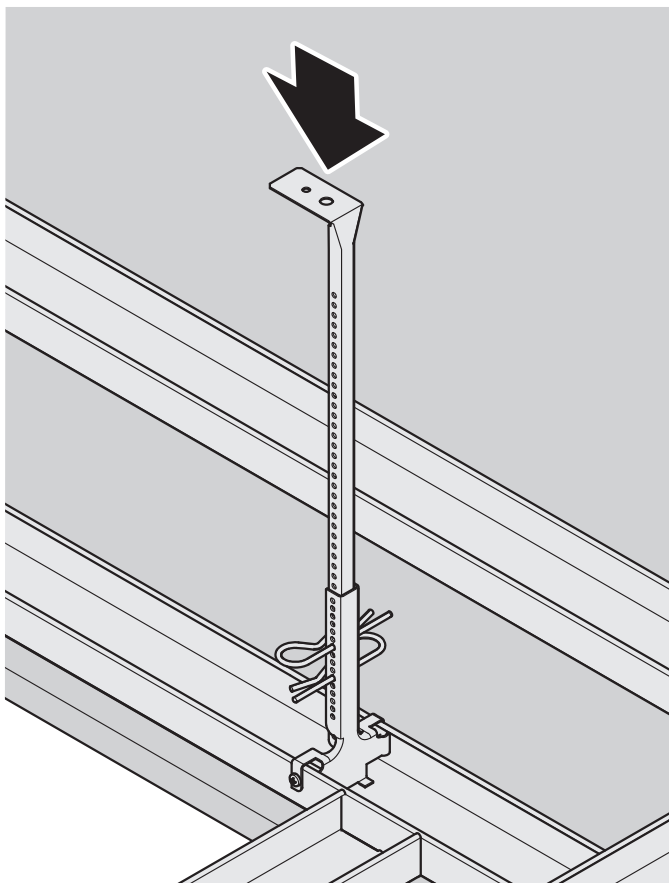


10

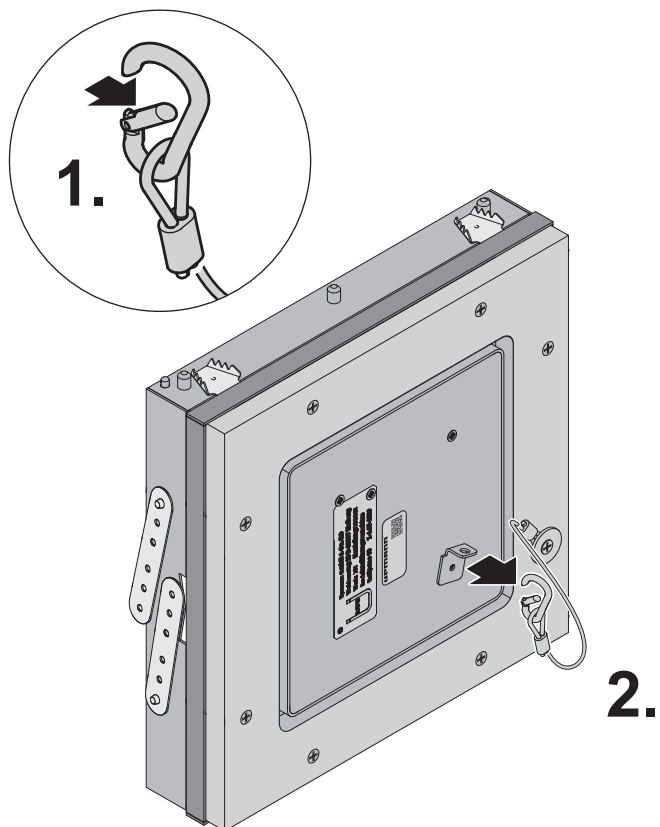


	b/h	$\perp b$	$\perp h$
1	≤ 400	-	-
2	> 400	+2	+2
3	> 500	+3	+3

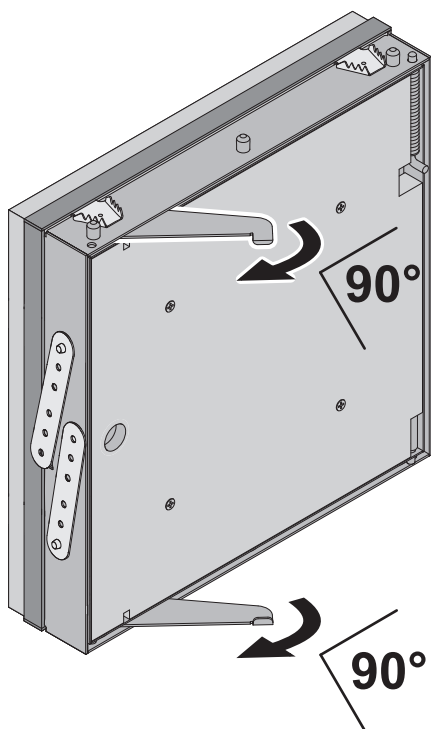
11



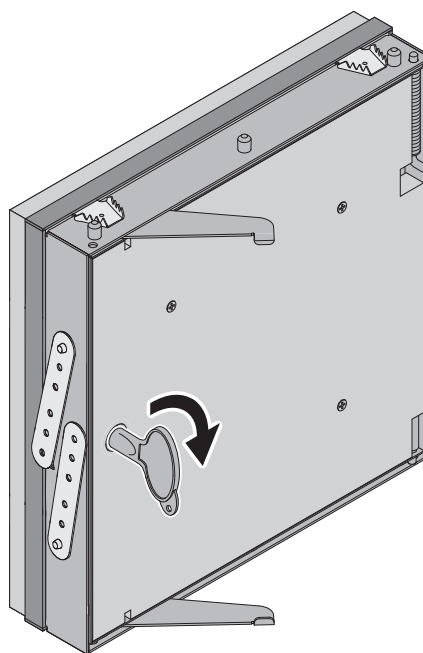
12



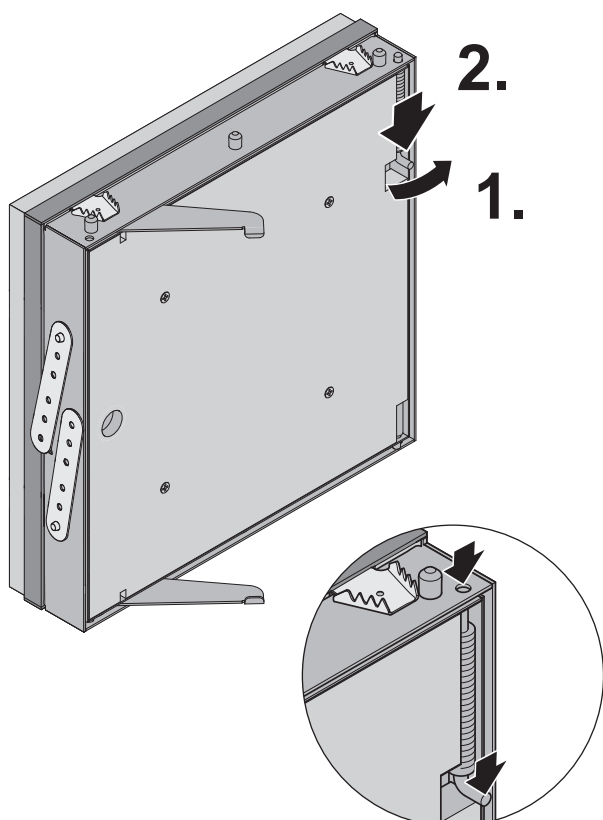
13



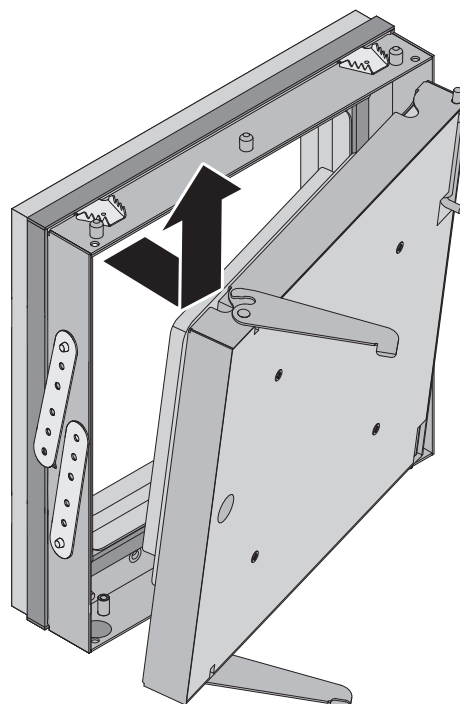
14



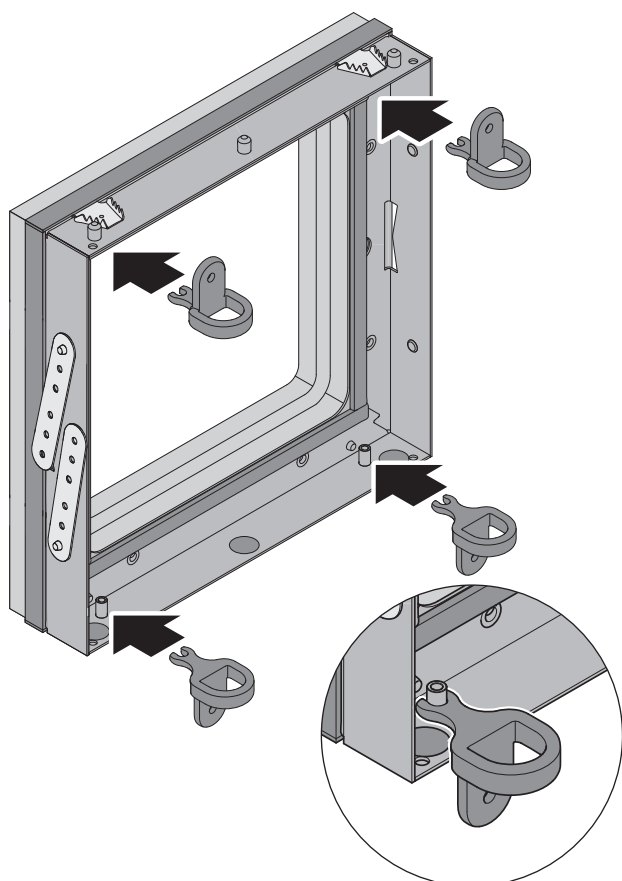
15



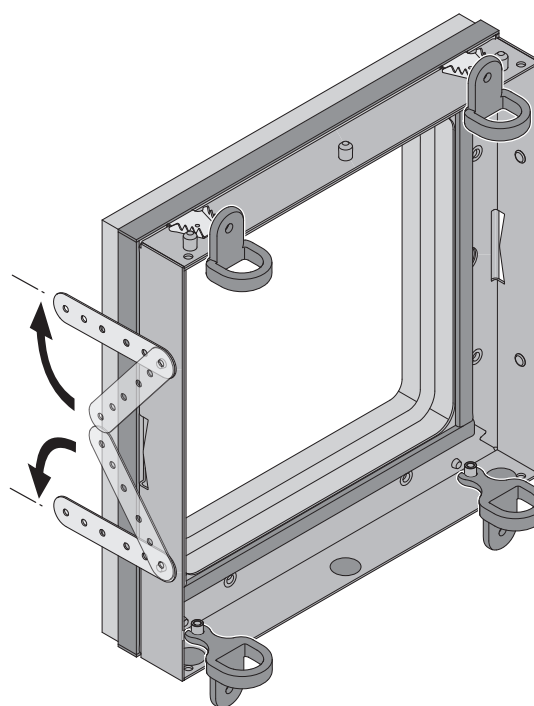
16



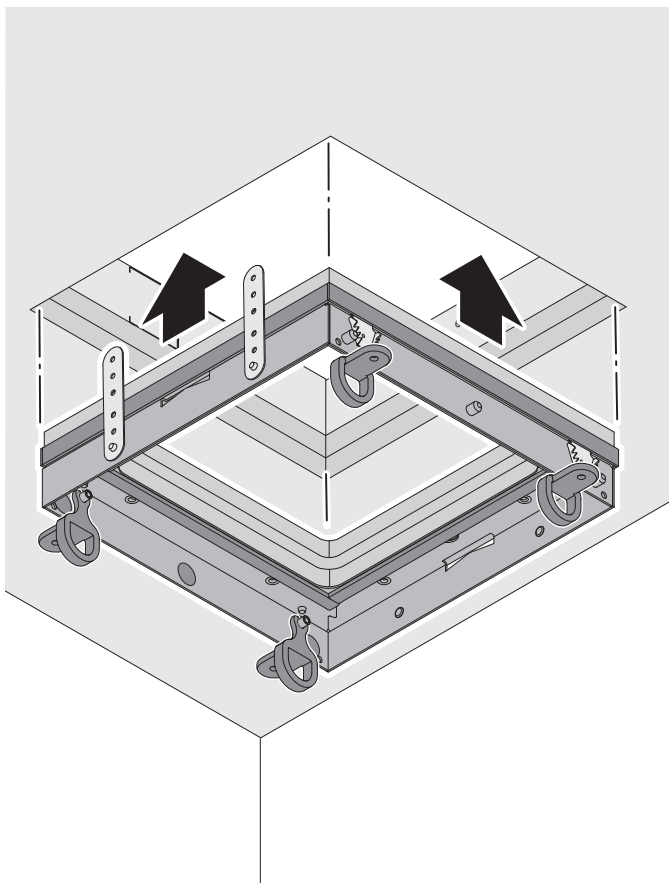
17



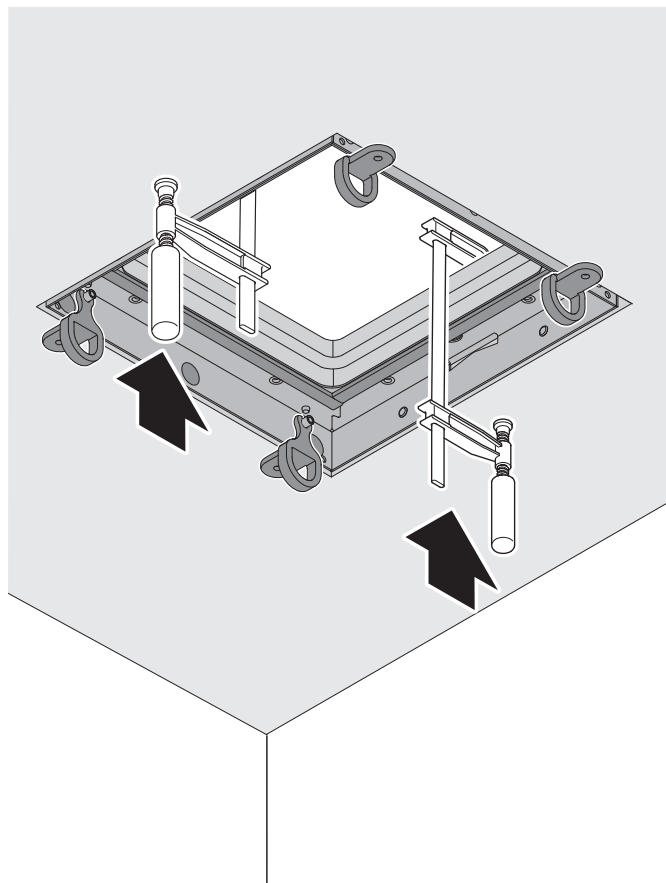
18



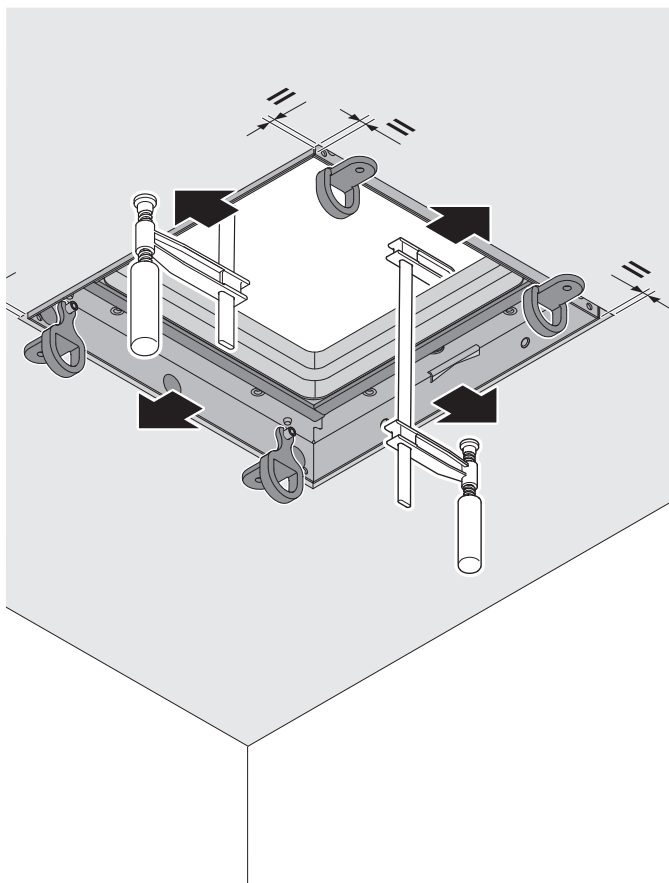
19



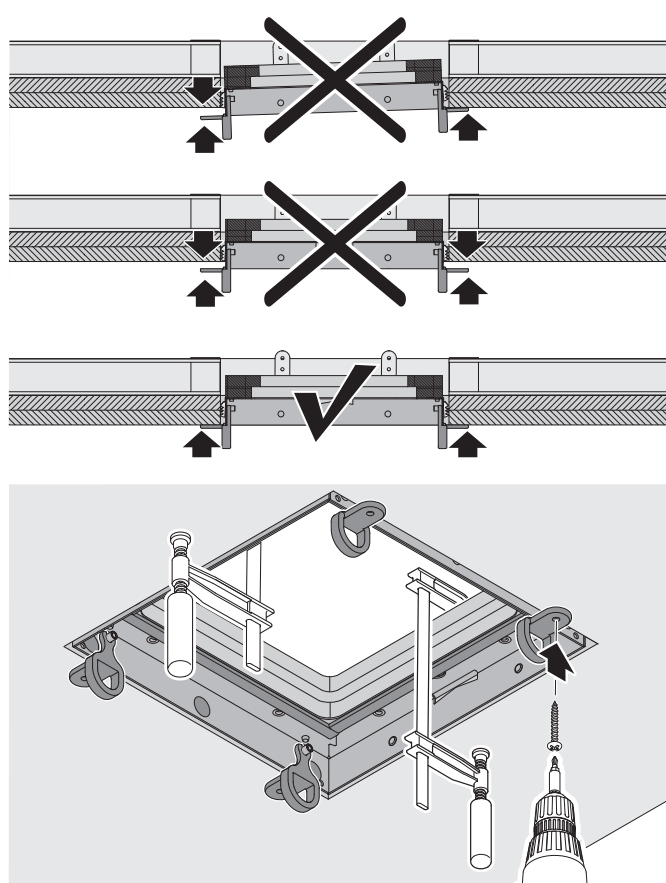
20



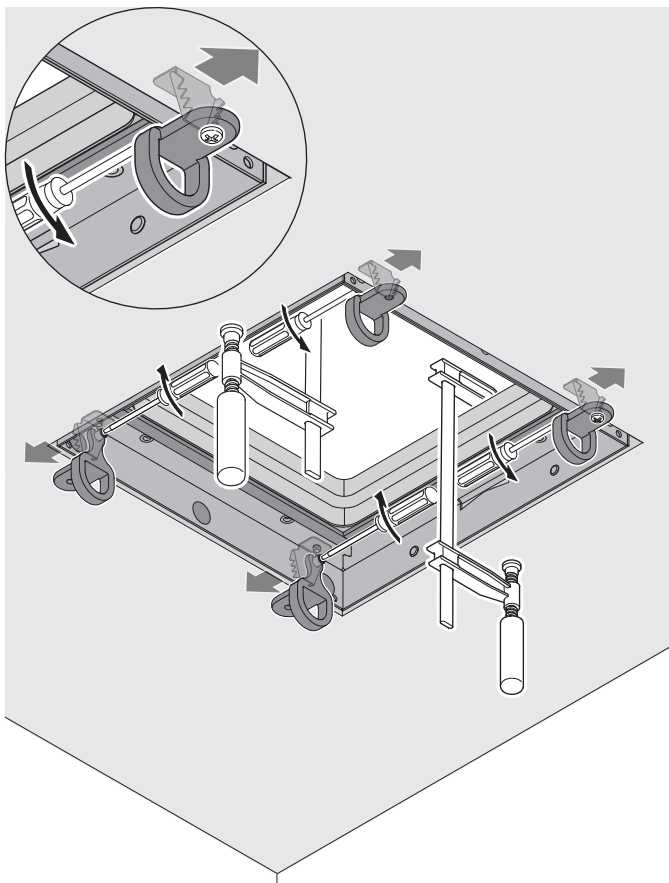
21



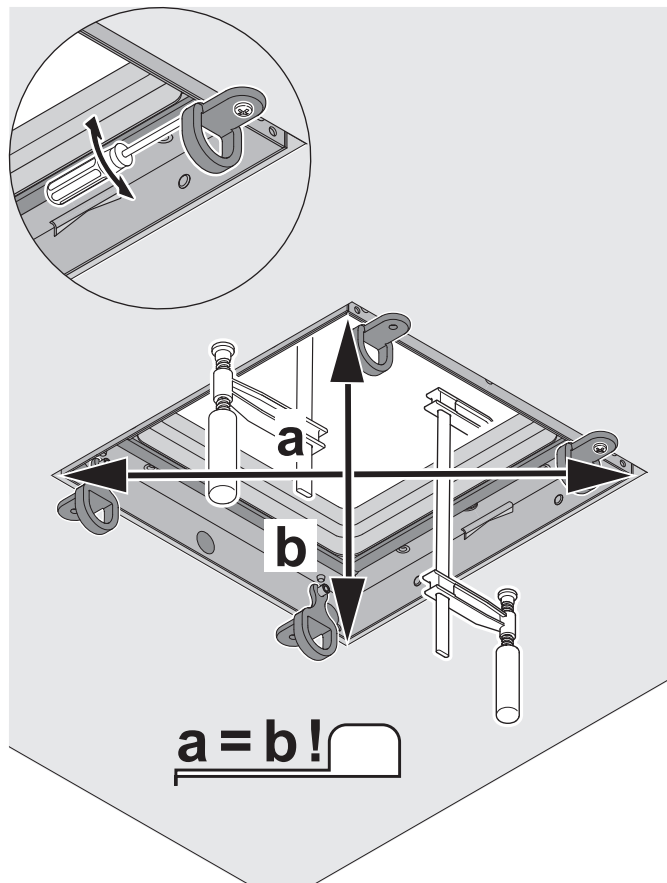
22



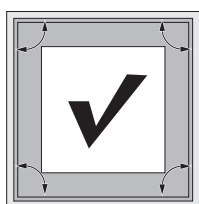
23



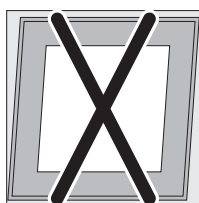
24



25

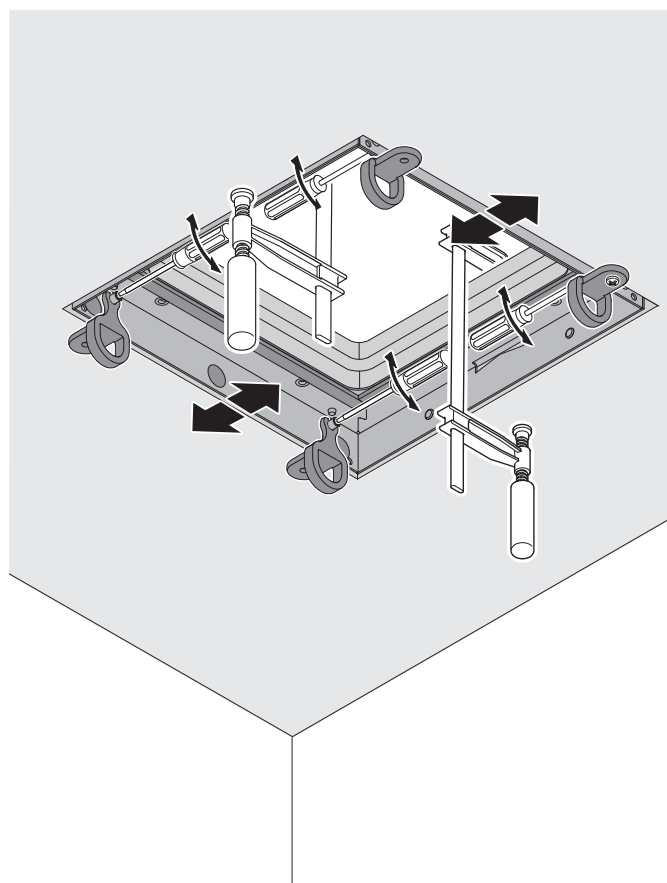


$a = b$
 $\angle = 90^\circ$



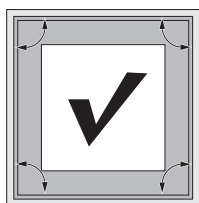
$a \neq b$
 $\angle \neq 90^\circ$

26



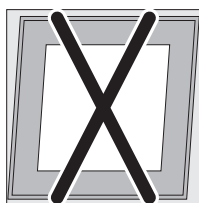
✓	➡	28
✗	➡	26

27



$$a = b$$

$$\angle = 90^\circ$$



$$a \neq b$$

$$\angle \neq 90^\circ$$

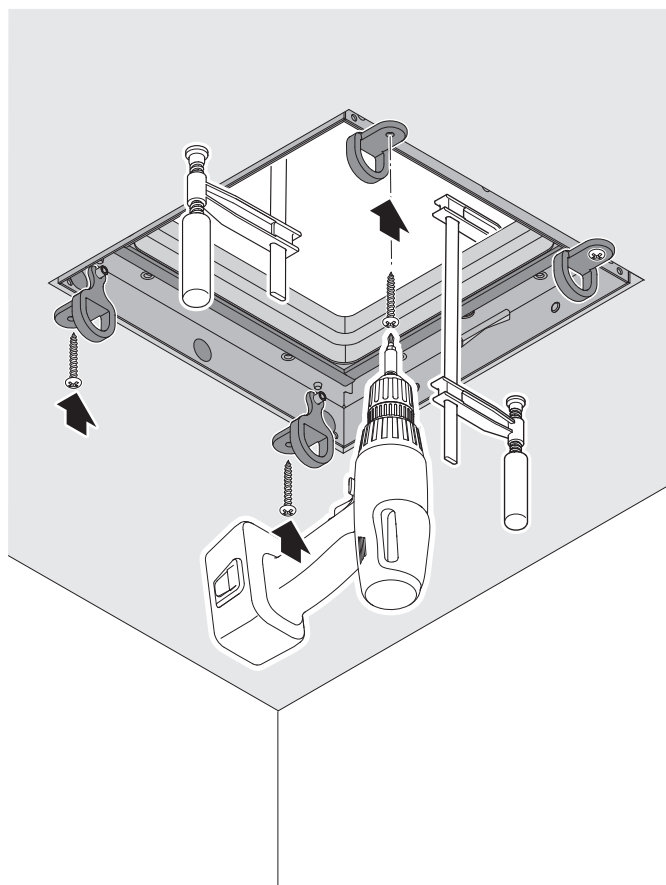


28

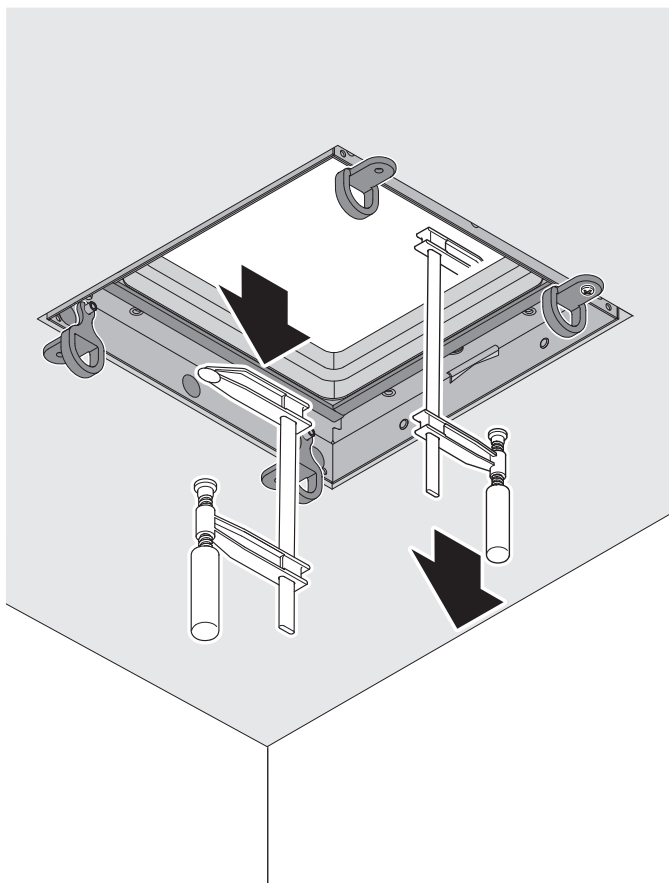


26

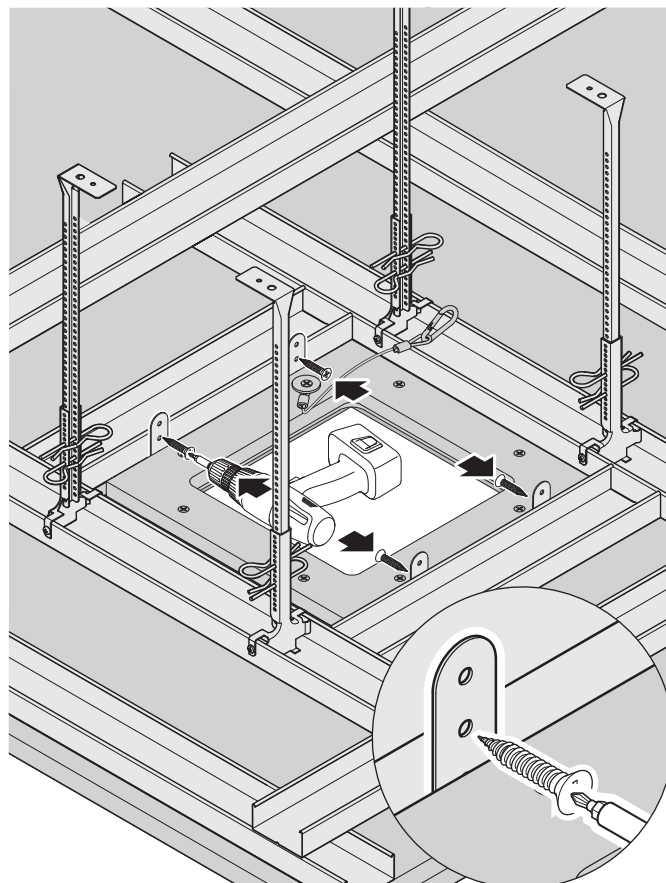
28



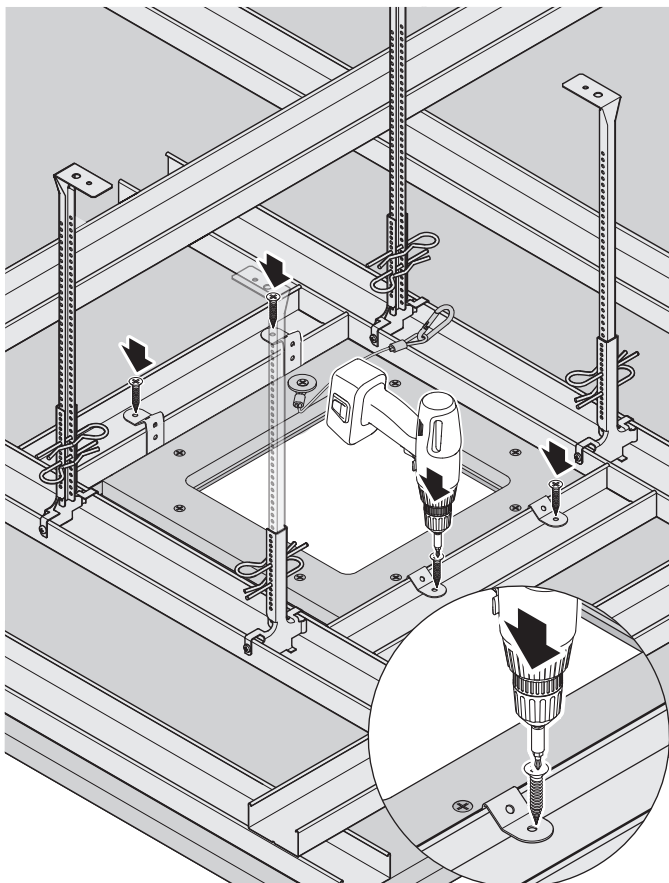
29



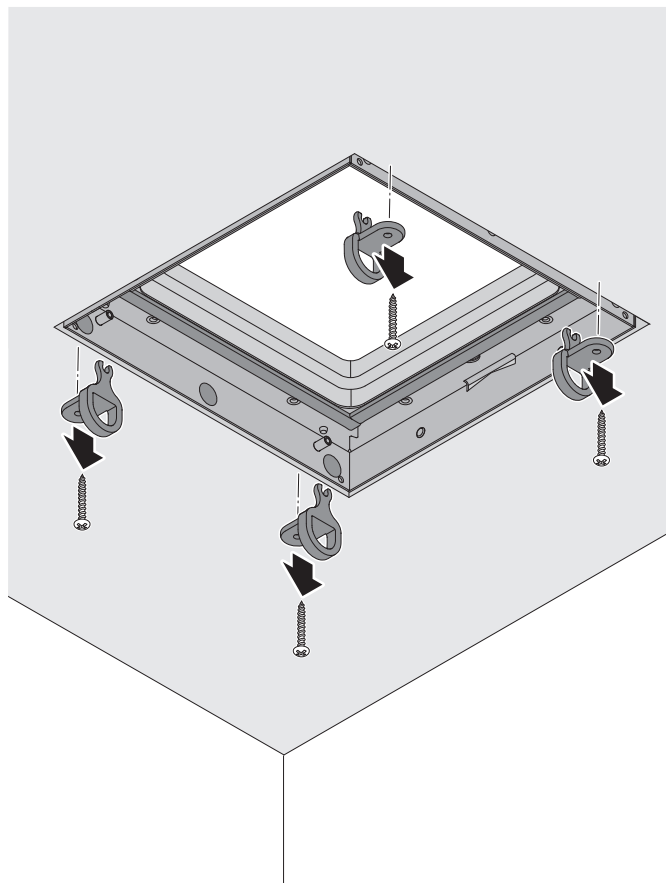
30A



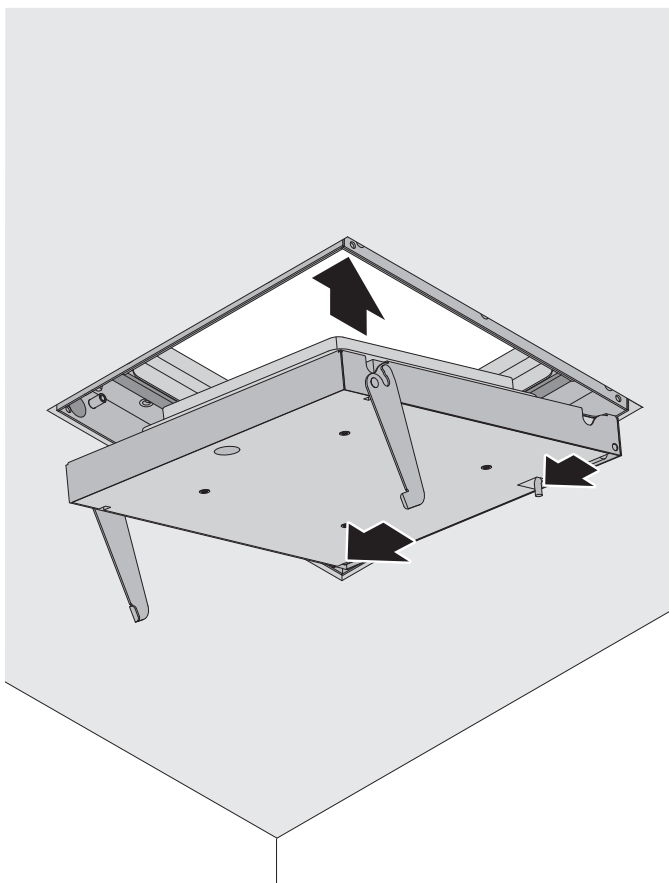
30B



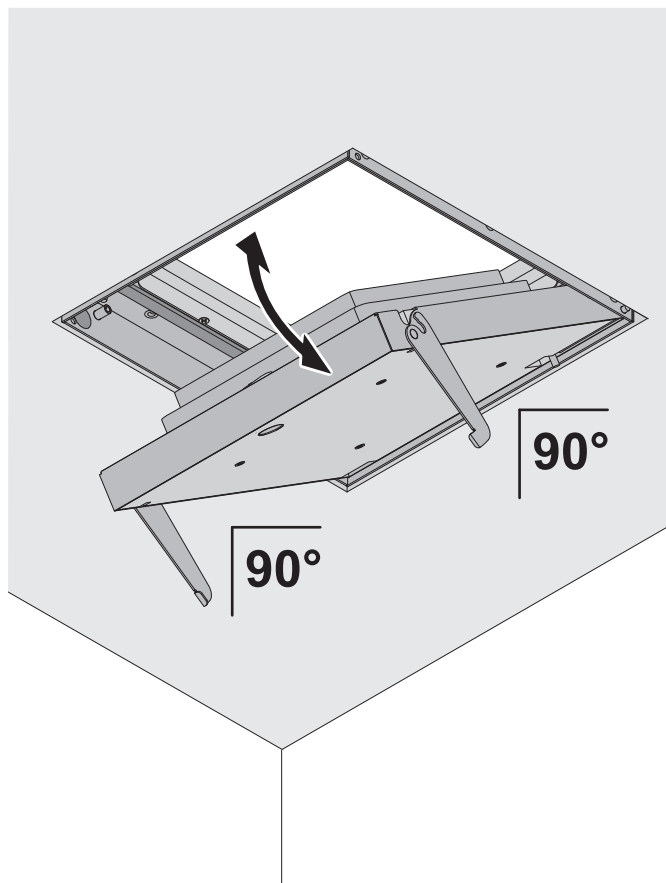
31



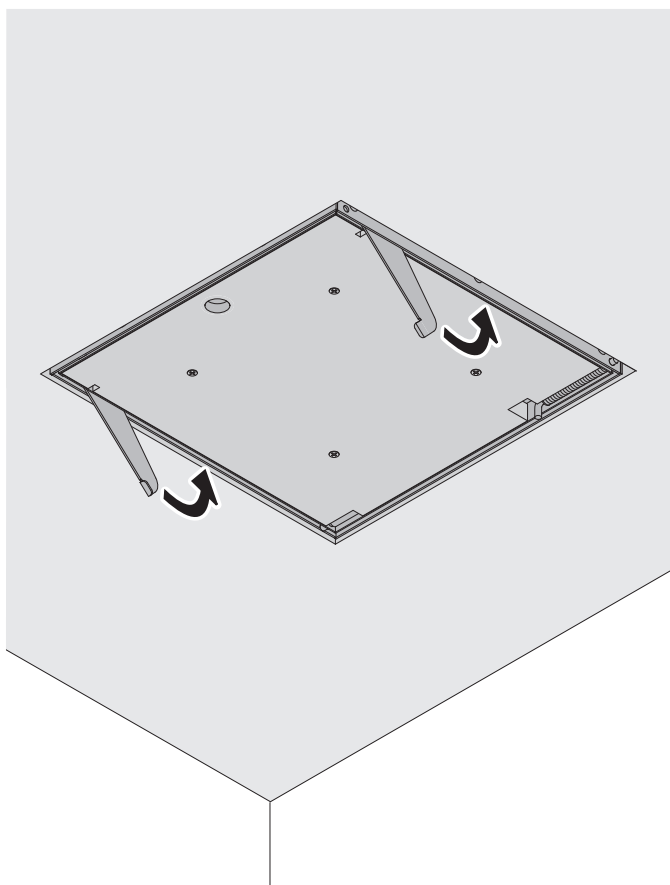
32



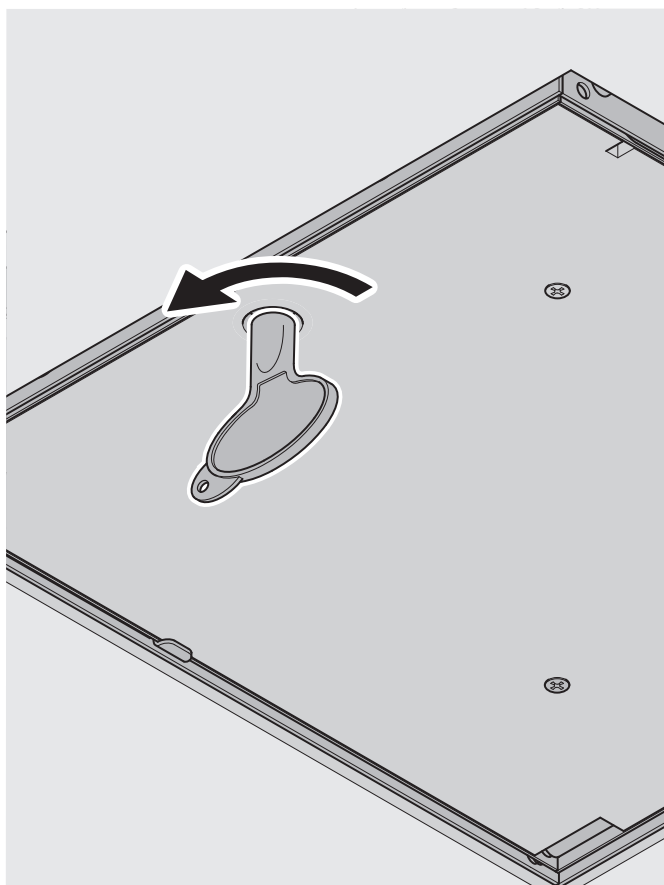
33



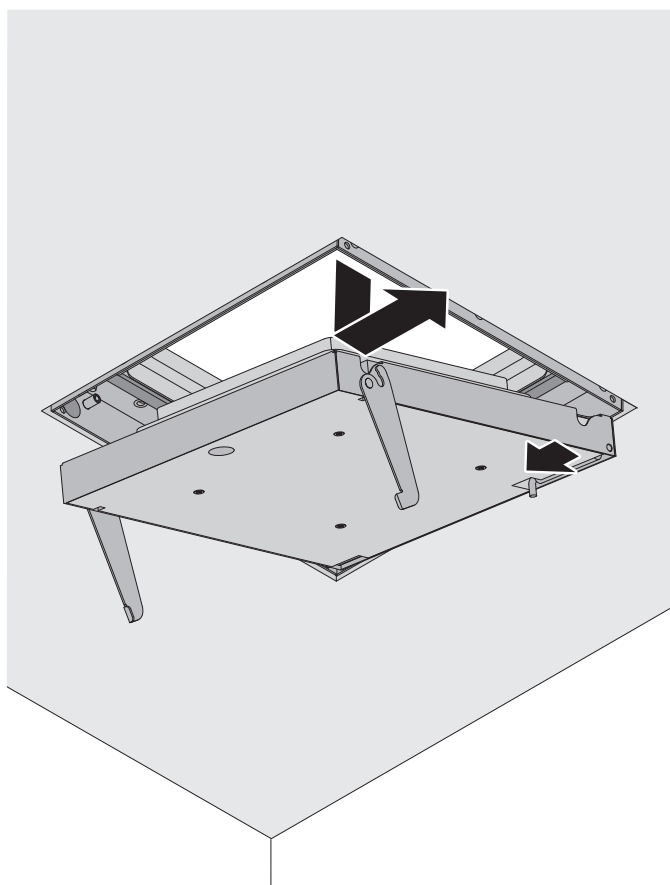
34



35



36



33

34

35

✓



37

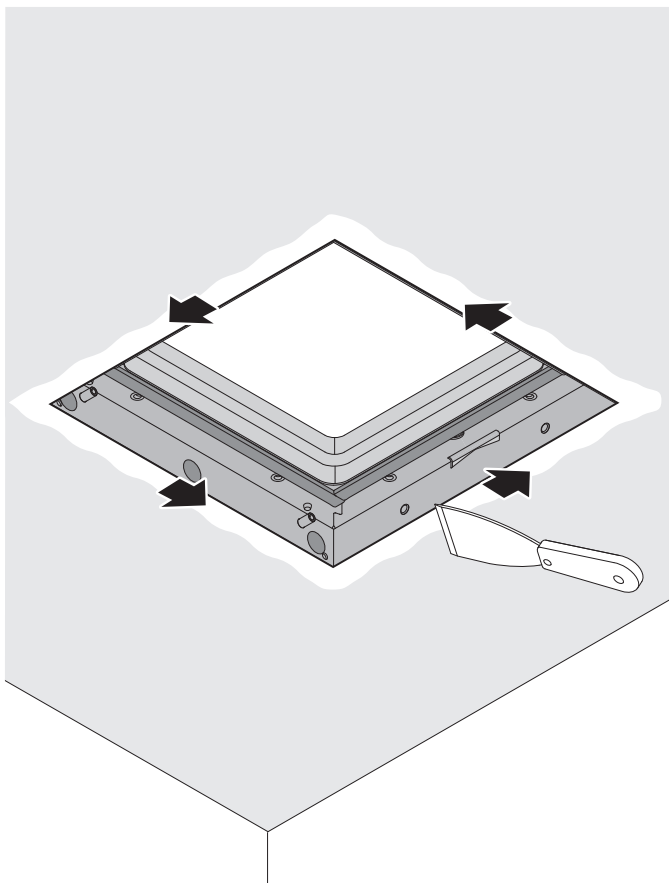


26

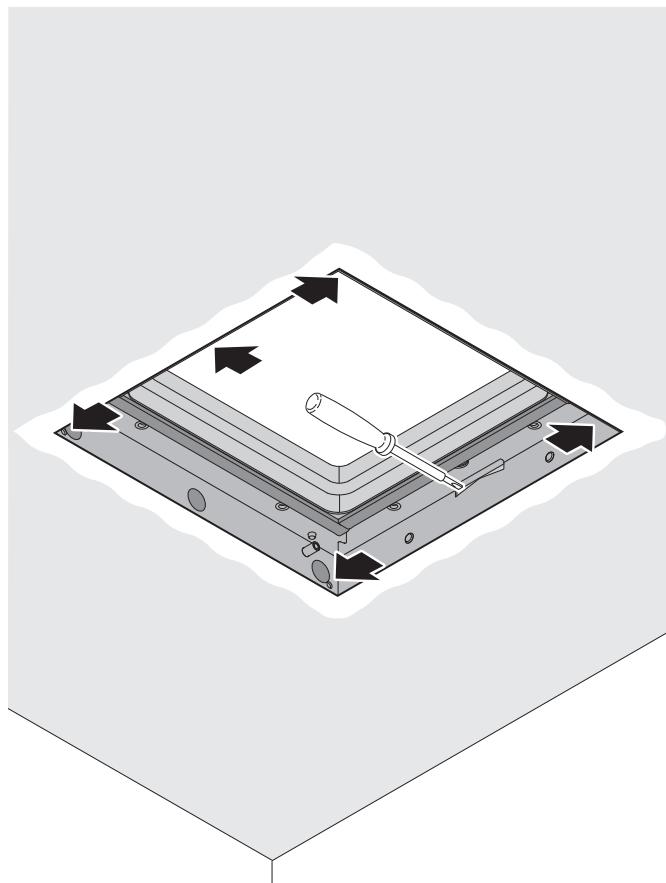
...

36

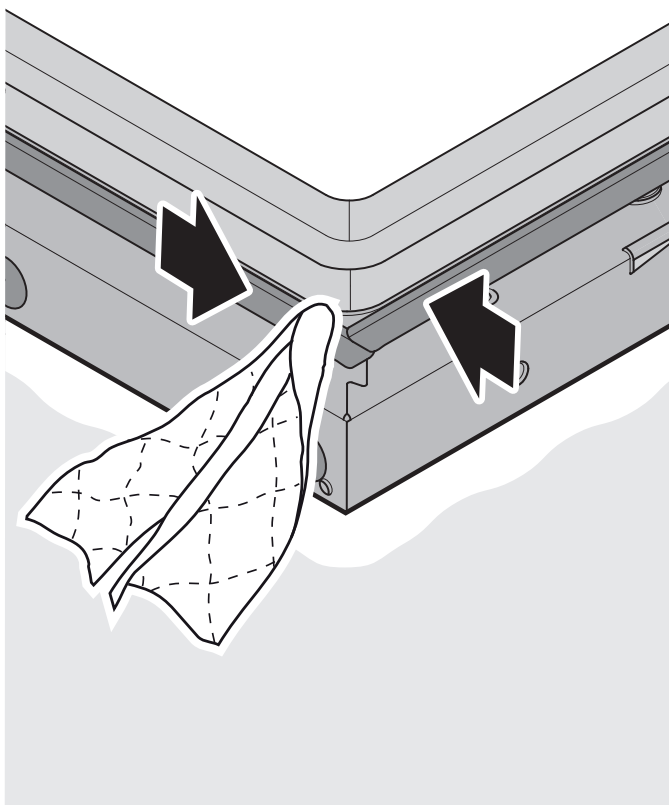
37



38



39

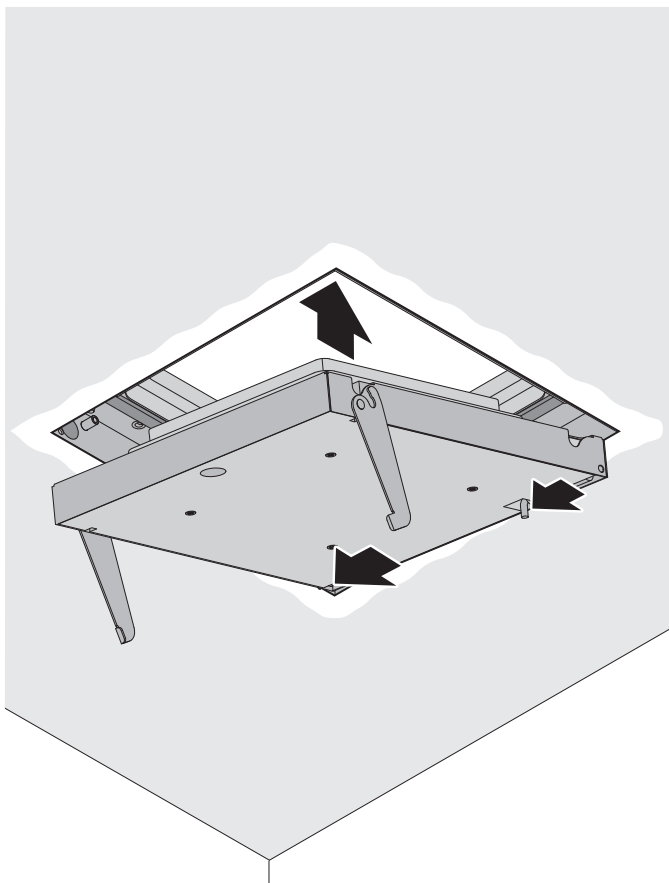


40

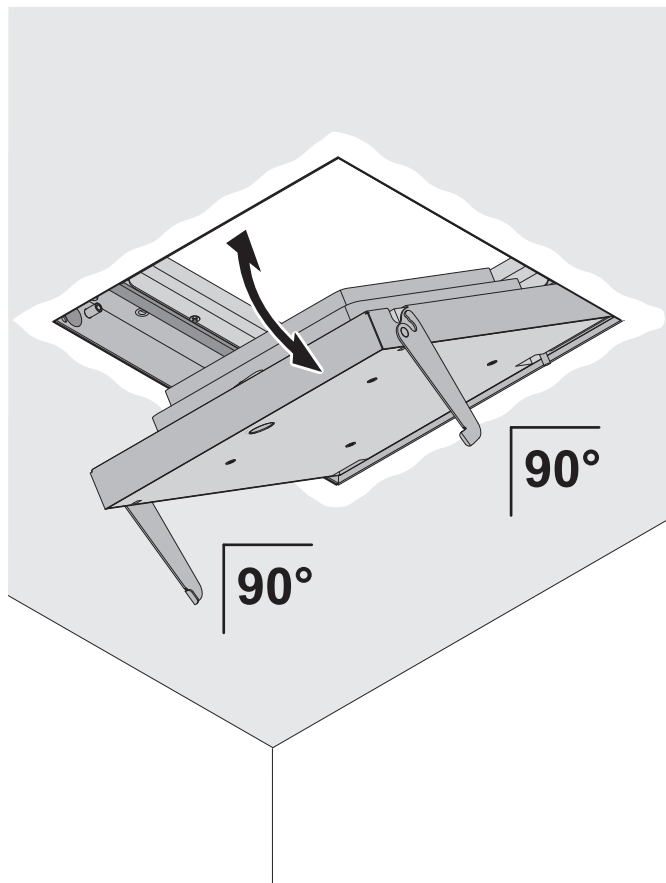


 / 24 h

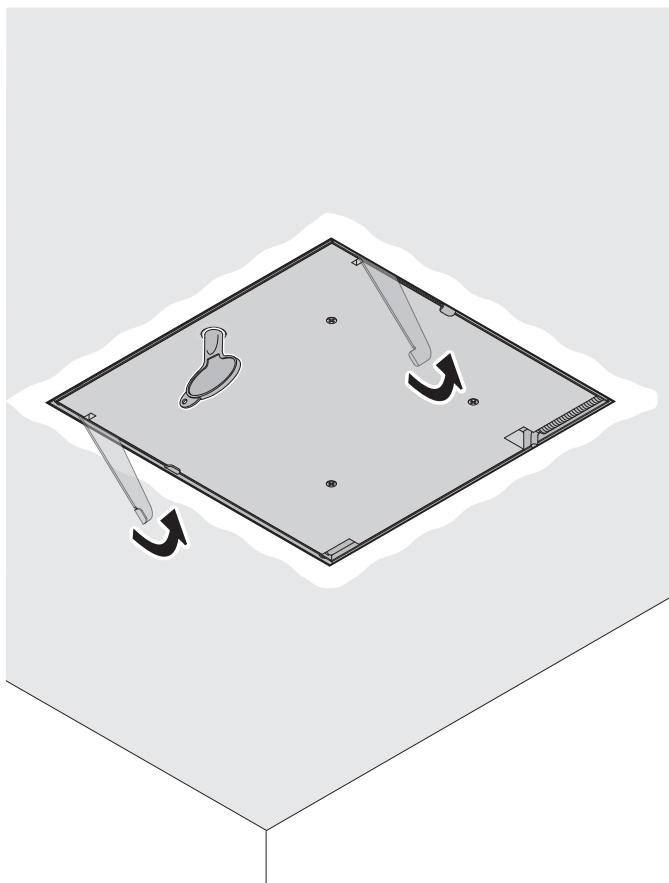
41



42



43



42

43

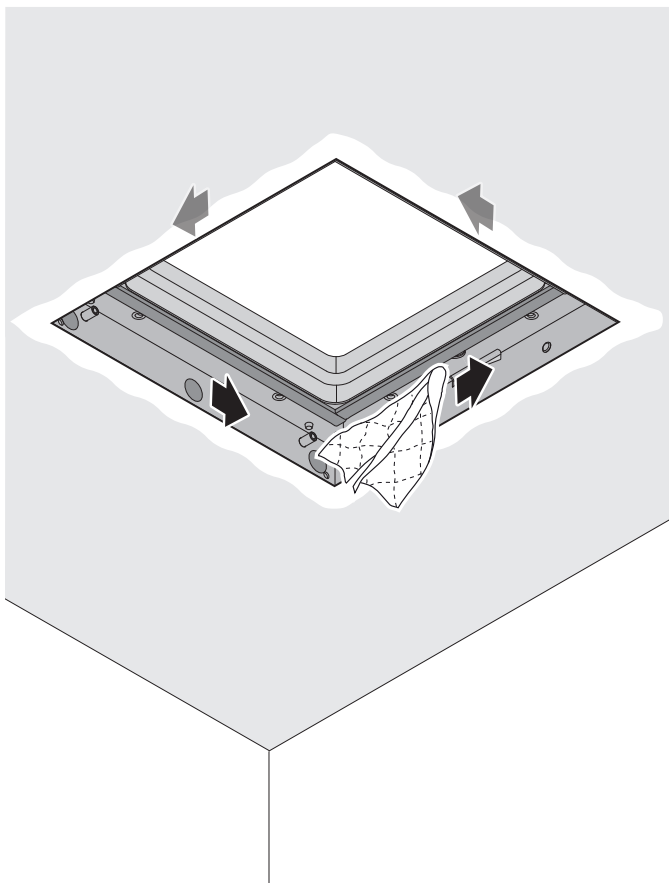


45

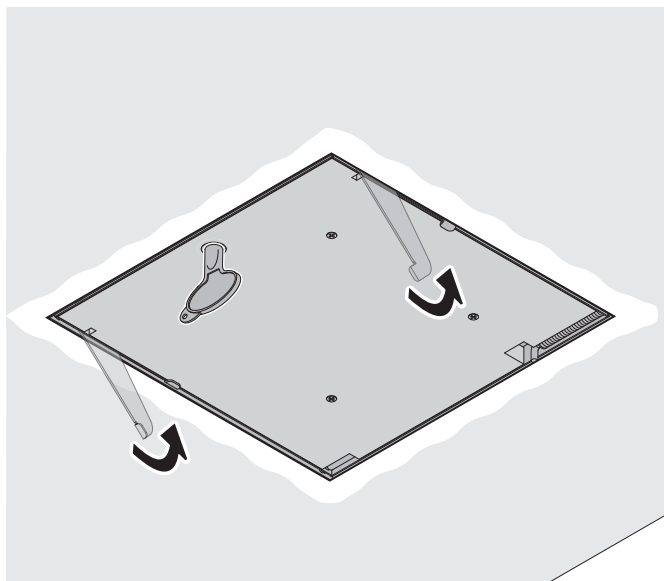


44

44



45

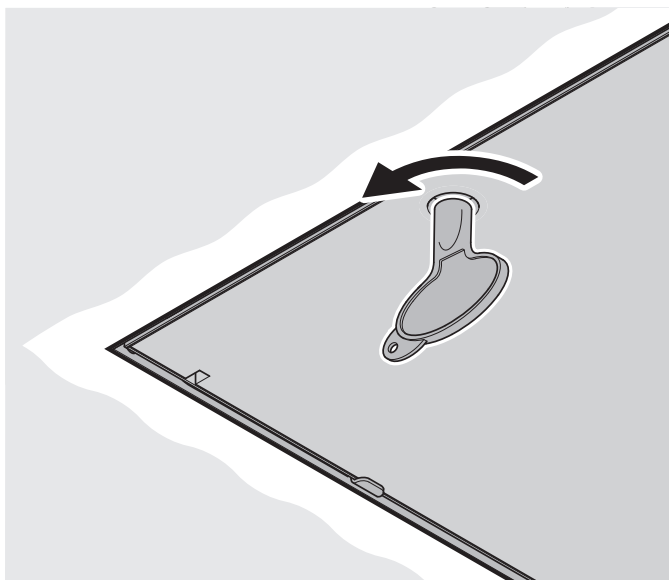


49



44

46

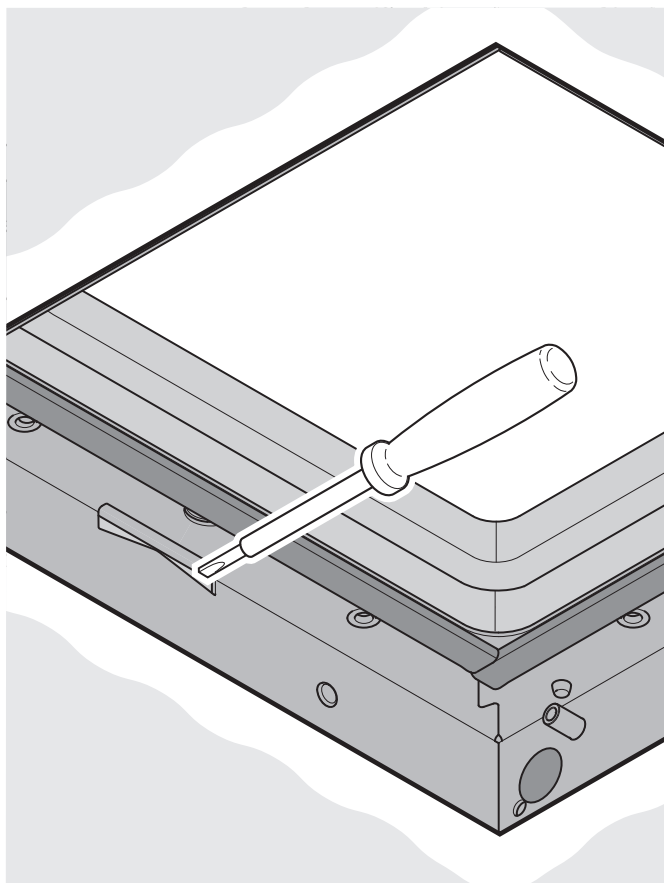


48

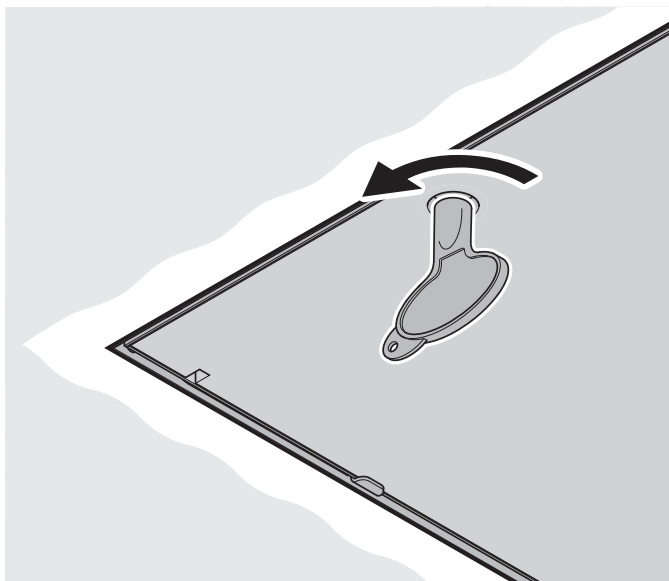


47

47



48

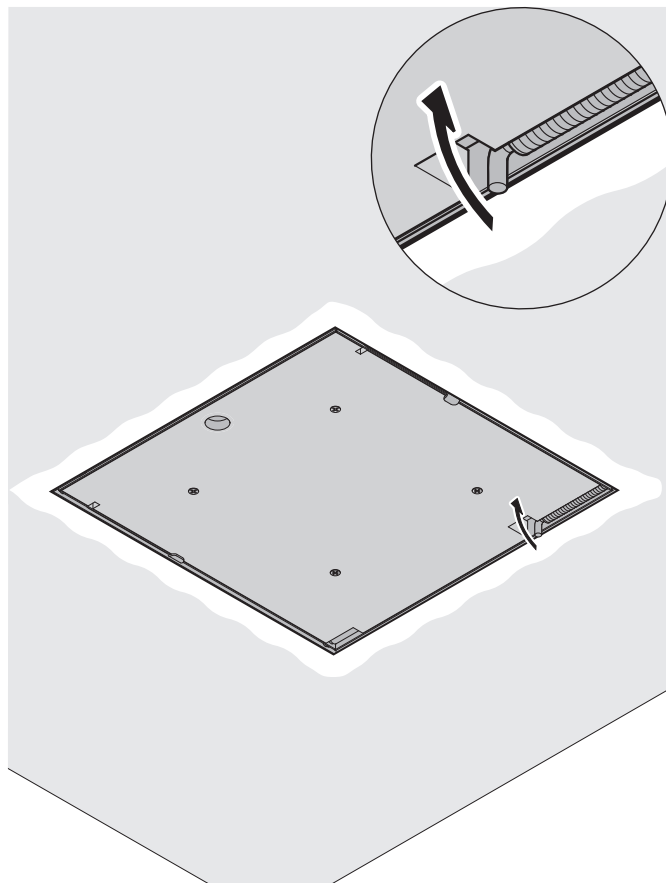


49

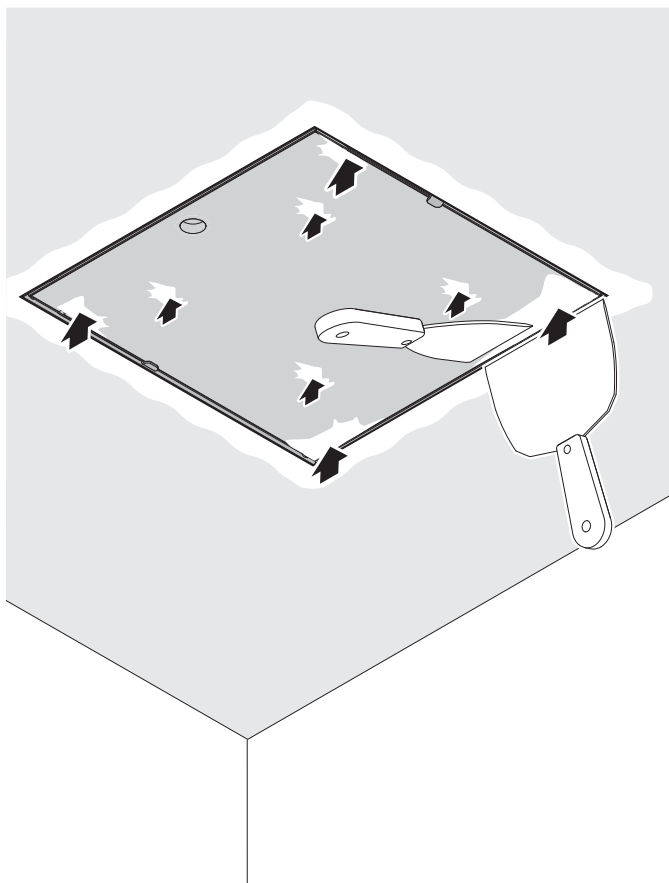


47

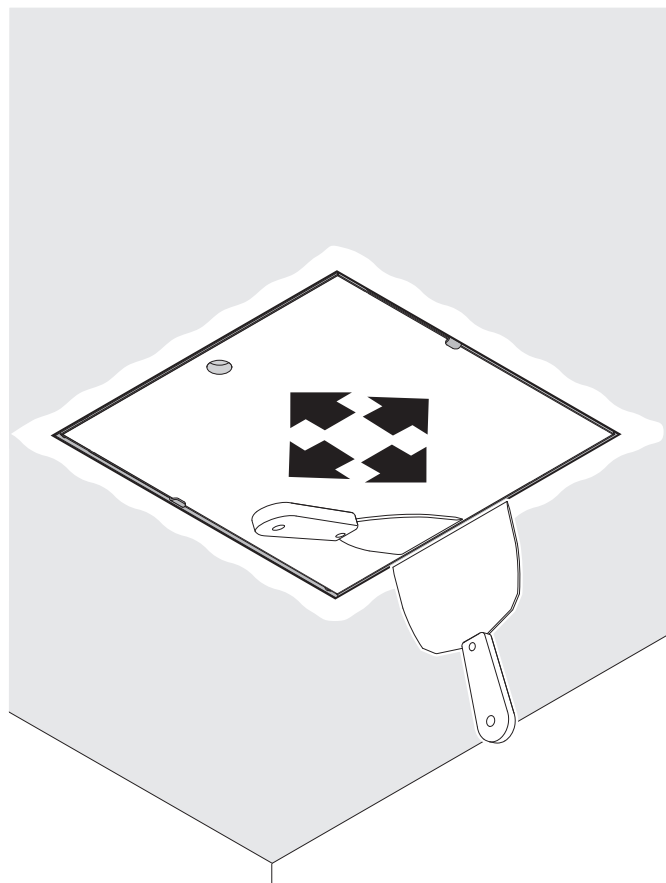
49



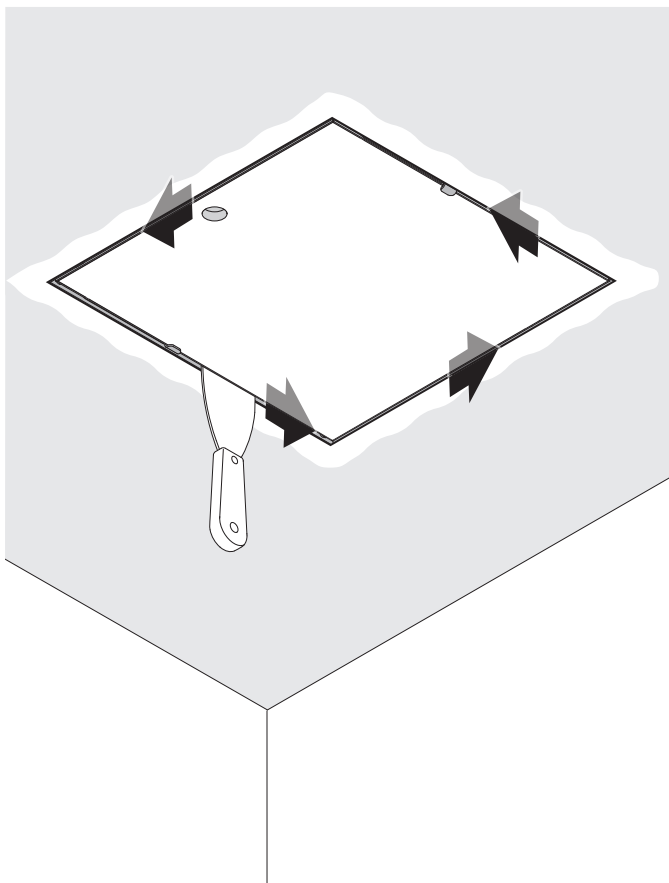
50



51



52

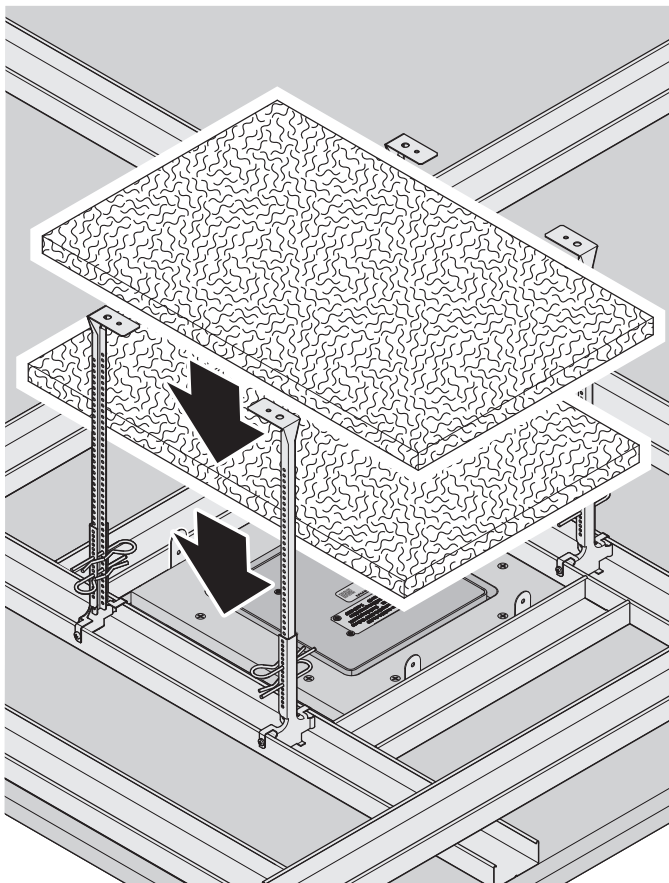


53

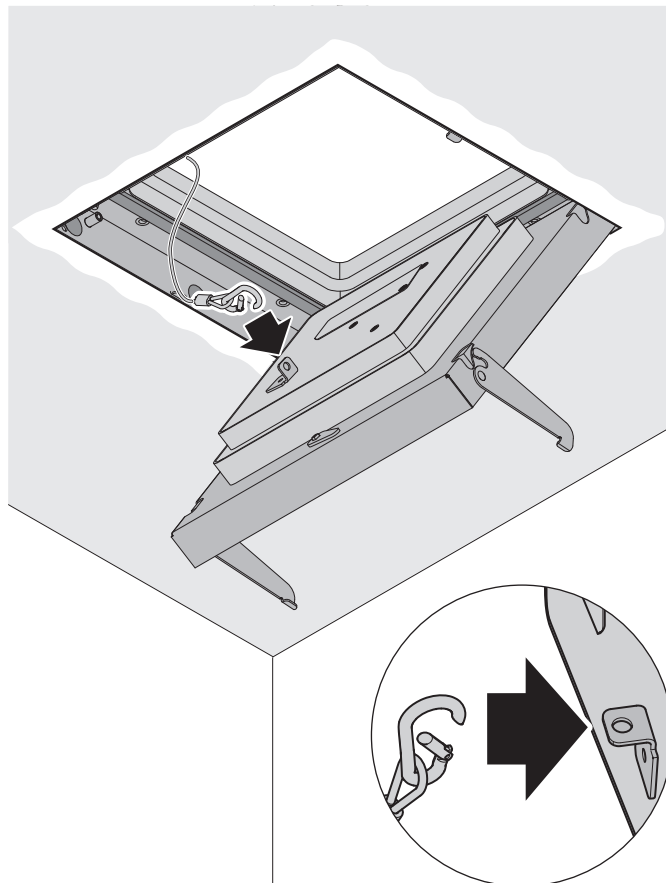


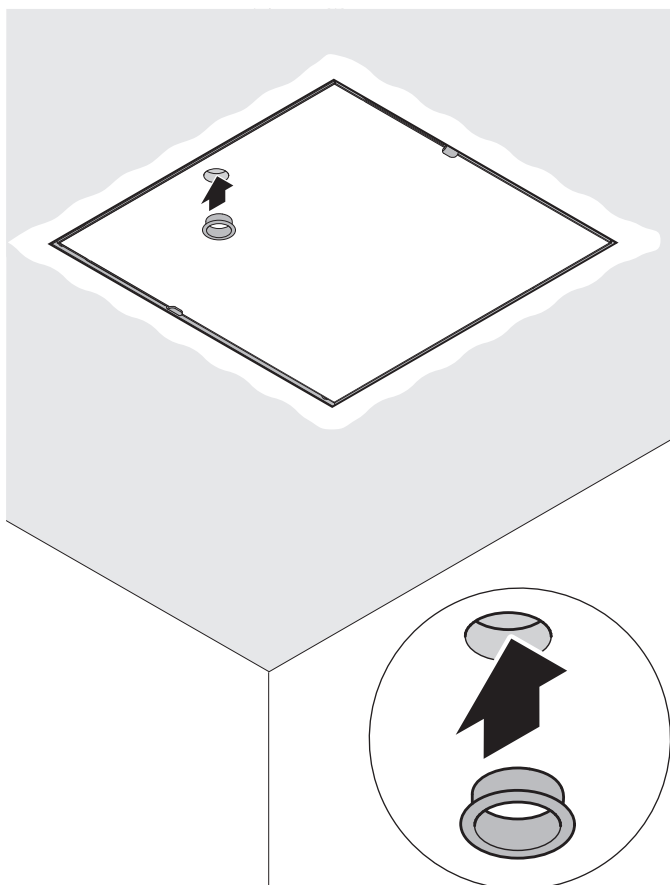
 / 24 h

54



55

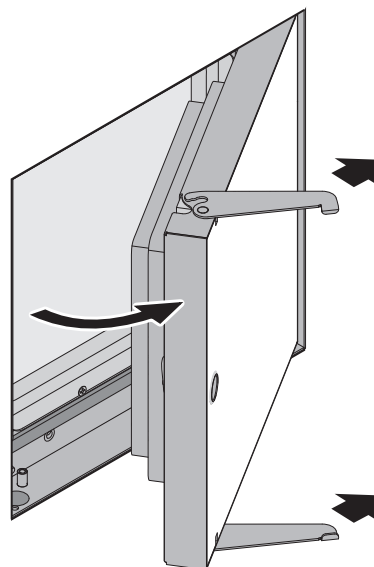
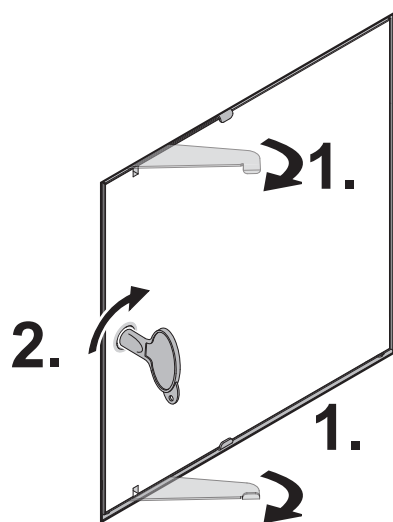






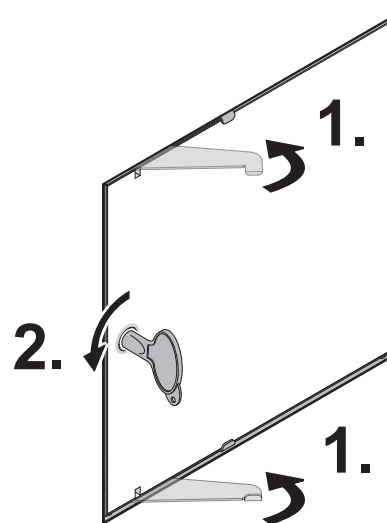
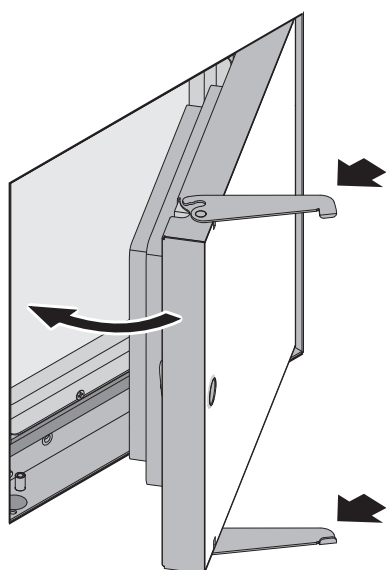
2^

1^



3^

4^



UPMANN®



UPMANN GmbH & Co.KG
Weidenweg 20
33397 Rietberg
Tel (05244) 985 -0
Fax (05244) 985 110
upmann@upmann.eu
www.upmann.eu