

## **Roto Patio** Fold

Premium hardware  
for Fold&Slide systems with a large surface

Installation, maintenance and operation instructions  
for timber and PVC profiles



## **Imprint**

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This manual contains important information, instructions and application diagrams (maximum sash sizes and sash weights) as well as installation instructions regarding the further work of the hardware.

Also, this manual contains binding guidelines to ensure the duty to instruct through to the end-user.

The information and instructions in this manual refer to the products of the Roto Patio hardware system.

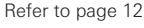
Apart from these installation, maintenance and operation instructions, the following documents apply:

- Directives TBDK of the Quality Assurance Association: Locks and Hardware (Richtlinie TBDK der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBH of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBH der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBE of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBE der Gütegemeinschaft Schlösser und Beschläge e. V.)
- RAL Installation guideline

This manual should be stored in such a manner that it can be quickly used, if needed.

### **Additional markings**

To highlight handling directives, results, lists, references and other elements, the following signs are used in this manual:

| Marking                                                                             | Explanation                                    |
|-------------------------------------------------------------------------------------|------------------------------------------------|
|  | Sash                                           |
|  | Frame                                          |
|  | Drill holes                                    |
|  | Hardware components                            |
|  | Action steps                                   |
|  | First level of the hierarchy in a list         |
|  | Unordered list (second level of the hierarchy) |
|  | (Cross) reference in tables                    |
|  | (Cross) reference in the text                  |

| Abbreviation        | Explanation                  |
|---------------------|------------------------------|
| <b>III.</b>         | Illustration                 |
| <b>AD</b>           | Coverage                     |
| <b>FRCL</b>         | Frame clearance              |
| <b>SRW</b>          | Sash rebate width            |
| <b>SRH</b>          | Sash rebate height           |
| <b>H</b>            | Timber                       |
| <b>K</b>            | PVC                          |
| <b>KBS</b>          | Enhanced threshold           |
| <b>L</b>            | DIN left (view from inside)  |
| <b>Material no.</b> | Material number              |
| <b>TEFF</b>         | Top edge of finished floor   |
| <b>R</b>            | DIN right (view from inside) |
| <b>FEW</b>          | Frame external width         |
| <b>FEH</b>          | Frame external height        |
| <b>FRW</b>          | Frame rebate width           |
| <b>FRH</b>          | Frame rebate height          |
| <b>SG</b>           | Shadow gap                   |
| <b>OH</b>           | Overlap height               |
| <b>unc.</b>         | uncoated                     |

All dimensions stated in mm.

#### Protection of copyright

The contents of this manual are protected by copyright. In the framework of the hardware manufacturing, the use of the contents is allowed. Any other or further use is not permitted without written permission of the manufacturer.

The information in this document is intended for the following target groups:

**Hardware dealers**

The “hardware dealers” target group includes all companies/persons who purchase hardware from the hardware manufacturer to resell it without the hardware being modified or subjected to further work.

**Manufacturers of windows and balcony doors**

The “manufacturers of windows and balcony doors” target group includes all companies/persons who purchase hardware from the hardware manufacturer or the hardware dealer and build it into windows and balcony doors.

**Building element dealers/Installation company**

The “building element dealers” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors in order to sell these on and to install them into a building development, without the windows or balcony doors being modified.

The “installation company” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors, or from a building element dealer, in order to sell these and to install them into a building development, without the windows or balcony doors being modified.

**Builder**

The “builder” target group includes all companies/persons who order windows and/or balcony doors for installation into their building project.

**End-users**

The “end-users” target group includes all persons who operate the installed windows and/or balcony doors.

**NOTE!**

Every target group must fully comply with its instruction obligation. Unless defined otherwise in the following, the documents and information may be transmitted e.g. as printed documents, CD-ROM, or via Internet access.

**Responsibility of the hardware dealer**

The hardware dealer must transmit the following documents to the manufacturer of windows and balcony doors:

- Installation, maintenance and operation instructions
- Directive for fixing load-bearing Turn-Only and Tilt&Turn hardware components (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

**Responsibility of the manufacturer of windows and balcony doors**

The manufacturer of windows and balcony doors must transmit the following documents to the building element dealer or to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Installation, maintenance and operation instructions
- Directive for fixing load-bearing Turn-Only and Tilt&Turn hardware components (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

He must ensure that the end-user is provided with the documents and information intended for him, in printed format.

**Responsibility of the building element dealer/installation company**

The building element dealer must transmit the following documents to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Maintenance and operating instructions (with the focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Specifications/information for end-users (VHBE)

**Responsibility of the builder**

The builder must transmit the following documents to the end-user:

- Maintenance and operating instructions (with the focus on hardware)
- Specifications/information for end-users (VHBE)

In this instructions, safety information is indicated by a symbol. The safety information is introduced by a key word that indicates the severity of the danger.

**DANGER!**

This symbol in conjunction with the signal word indicates an imminently hazardous situation, which could result in death or serious damage to health if it is not avoided.

---

**WARNING!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which could result in death or serious damage to health if it is not avoided.

---

**CAUTION!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to minor or light injuries if it is not avoided.

---

**NOTE!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to property or environmental damage if it is not avoided.

---

All details and instructions in this document were compiled taking into account the relevant standards and regulations, the state of the art, and also many years of knowledge and experience.

The hardware manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document and all product-specific documents and related applicable directives (refer to the chapters Security and Stipulated use).
- Non-stipulated use/misuse (refer to the chapters Security and Stipulated use).
- Insufficient invitation to tender, failure to adhere to the installation instructions or application drawings.
- Increased soiling.

Claims by third parties against the hardware manufacturer on the ground of damages resulting from misuse or failure to follow the instruction obligation on the part of the hardware dealer, the manufacturer of windows and balcony doors, and of the building element dealer or the builder are transferred accordingly.

The undertakings agreed in the delivery contract, the general conditions of business and the delivery conditions of the hardware manufacturer, and the legal regulations applicable at the time of concluding a contract are effective.

The warranty covers only original Roto components.

The right to technical modifications for the improvement of performance characteristics and for further development is reserved.

Turn-Only and Tilt&Turn hardware as covered by this definition is one-hand-operation hardware, Turn-Only and Tilt&Turn hardware for windows and balcony doors in building construction. This is used to enable windows and balcony-door sashes into a turning position by operating a 'hand-lever' (handle) or into a limited tilting position in the case of the scissors (sash-stay) version. Turn-Only and Tilt&Turn hardware is used on vertically installed windows and balcony doors made of aluminium. Turn-Only and Tilt&Turn hardware as covered by this definition, locks window and balcony door sashes or enables various ventilating positions. When closing, the gasket counter force must be overcome as a rule.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These installation, maintenance and operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. light metal profiles etc.)
- The relevant directives TBDK, VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- The valid national laws and directives

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.

**WARNING!****Danger from misuse!**

Misuse and incorrect installation of hardware can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
  - Never use accessories that are not original products or that have not been approved by the hardware manufacturer.
-



Sliding hardware as well as Fold&Slide hardware is hardware for sliding sashes for windows and balcony doors that are mainly used as glazed exterior structures.

In combination with the sliding sashes, fixed-glazing-units and/or further sashes can be situated in a window element.

Sliding hardware is equipped with a locking mechanism that fastens the sliding sash. Sliding hardware is equipped with rollers that are mainly located on the bottom horizontal plane of the sliding sash.

In addition, scissor stay-arms for tilting and mechanisms to lift and/or parallel-retract the sashes can be specified. By means of the hardware, the sashes are locked, brought into the ventilation position and pushed to the side.

Sliding hardware is solely used for further processing of vertically installed windows and balcony door sashes made of timber or PVC, and their corresponding material combinations.



#### **NOTE!**

Depending on the outside temperature, relative air humidity of the ambient air, as well as the application location of the sliding element, a temporary formation of condensation water on the aluminium tracks on the inside may occur. This is particularly promoted when the air circulation is hindered; for example due to deep reveals, curtains as well as unfavourable radiator positioning and the like.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These installation, maintenance and operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. PVC or light metal profiles etc.)
- The relevant directives VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- The valid national laws and directives

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.



#### **WARNING!**

##### **Danger from misuse!**

Misuse and incorrect installation of hardware can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
- Never use accessories that are not original products or that have not been approved by the hardware manufacturer.

For windows and balcony doors with Turn-Only and Tilt&Turn hardware, window and balcony door sashes can be brought into a turn position or into a limited tilting position by means of the scissor stay.

When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.

**WARNING!****Danger of injury and material damage from incorrect closing and opening the sash!**

Incorrect closing and opening of sashes can result in serious injuries and significant material damage.

Therefore:

- Ensure that when closing the sash, it does not collide with the frame or with another sash.
  - Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully closed position, and that it is brought very slowly towards the frame.
  - Ensure that the sash never slams closed or swings open in an uncontrolled manner.
- 

Any use beyond or other than the stipulated application and installation of the products is deemed to be misuse and can result in dangerous circumstances.

**WARNING!****Danger from misuse!**

Misuse of windows and balcony doors can result in dangerous circumstances.

In particular, avoid the following applications:

- insertion of obstacles in the opening area between the frame and the window or balcony door sashes,
  - the deliberate or negligent application of excessive loads on windows and balcony doors,
  - deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows or balcony doors.
- 

Claims for damages of any type whatsoever resulting of operation other than that stipulated are excluded.



On windows or balcony doors with sliding hardware the sashes can be moved horizontally or vertically by operating a 'hand-lever' (handle). On special constructions the sashes additionally can be folded by sliding (like an accordion – Fold&Slide windows). On special constructions some of the sashes additionally can be brought into a turning position and/or into a limited tilting position in the case of the scissors (sash-stay) version. When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.

**WARNING!****Danger of injury and material damage from incorrect closing and opening the sash!**

Incorrect closing and opening of sashes can result in serious injuries and significant material damage.

Therefore:

- Ensure that when opening or closing the sash, it does not collide with the frame or with another sash.
- Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position, and that it is brought very slowly towards the frame, the opening restrictor or another sash (technical value – maximum reference speed of the closing edge  $v \leq 0.2 \text{ m/s}$ ).

Any use beyond or other than the stipulated application and installation of the products is deemed to be misuse and can result in dangerous circumstances.

**WARNING!****Danger from misuse!**

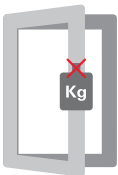
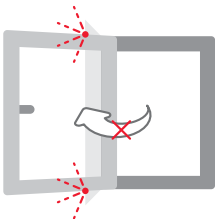
Misuse of windows and balcony doors can result in dangerous circumstances.

In particular, avoid the following applications:

- insertion of obstacles in the opening area between the frame and the window and balcony door sashes,
- the deliberate or negligent application of excessive loads on windows and balcony doors,
- deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows or balcony doors.

Claims for damages of any type whatsoever resulting of operation other than that stipulated are excluded.

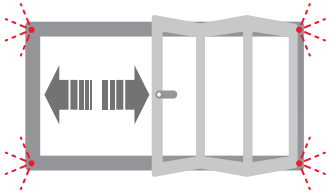
Comply with the following symbols and their meanings in order to avoid accidents, injuries and material damage.

| Symbol                                                                              | Meaning                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <p><b>DANGER!</b><br/> <b>Danger of injury from falling through open windows and balcony doors.</b></p> <ul style="list-style-type: none"> <li>Proceed cautiously in the vicinity of open windows and balcony doors.</li> <li>Please keep children and persons that cannot appreciate the danger away from the hazard area.</li> </ul>                                                       |
|    | <p><b>WARNING!</b><br/> <b>Danger of injury through trapping of body parts in the opening gap between sash and frame.</b></p> <ul style="list-style-type: none"> <li>When closing windows and balcony doors, never reach between sash and frame, and always act with care.</li> <li>Please keep children and persons that cannot appreciate the danger away from the hazard area.</li> </ul> |
|  | <p><b>WARNING!</b><br/> <b>Danger of injury and material damage from overloading the sash</b></p> <ul style="list-style-type: none"> <li>Refrain from additionally loading the sash.</li> </ul>                                                                                                                                                                                              |
|  | <p><b>CAUTION!</b><br/> <b>Danger of injury from the effect of wind</b></p> <ul style="list-style-type: none"> <li>Prevent wind from acting on the open sash.</li> <li>During wind and drafts, close and lock windows and balcony door sashes.</li> </ul>                                                                                                                                    |
|  | <p><b>CAUTION!</b><br/> <b>Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame</b></p> <ul style="list-style-type: none"> <li>Refrain from inserting obstacles in the opening gap between the sash and the frame.</li> </ul>                                                                                                     |
|  | <p><b>CAUTION!</b><br/> <b>Danger of injury and material damage from pressing the sash against the opening edge (reveal)</b></p> <ul style="list-style-type: none"> <li>Do not press the sash against the opening edge (reveal).</li> </ul>                                                                                                                                                  |



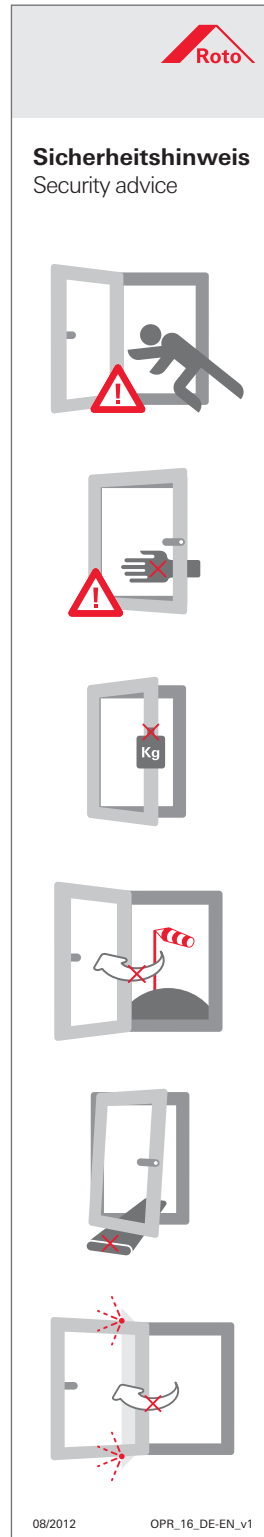
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| Symbol | Meaning                                                                                                                                                                                                                                                                                                                                                                                      |
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|        | <p><b>DANGER!</b><br/> <b>Danger of injury from falling through open windows and balcony doors.</b></p> <ul style="list-style-type: none"> <li>Proceed cautiously in the vicinity of open windows and balcony doors.</li> <li>Please keep children and persons that cannot appreciate the danger away from the hazard area.</li> </ul>                                                       |
|        | <p><b>WARNING!</b><br/> <b>Danger of injury through trapping of body parts in the opening gap between sash and frame.</b></p> <ul style="list-style-type: none"> <li>When closing windows and balcony doors, never reach between sash and frame, and always act with care.</li> <li>Please keep children and persons that cannot appreciate the danger away from the hazard area.</li> </ul> |
|        | <p><b>WARNING!</b><br/> <b>Danger of injury and material damage from overloading the sash</b></p> <ul style="list-style-type: none"> <li>Refrain from additionally loading the sash.</li> </ul>                                                                                                                                                                                              |
|        | <p><b>CAUTION!</b><br/> <b>Danger of injury from the effect of wind</b></p> <ul style="list-style-type: none"> <li>Prevent wind from acting on the open sash.</li> <li>During wind and drafts, close and lock windows and balcony door sashes.</li> </ul>                                                                                                                                    |
|        | <p><b>CAUTION!</b><br/> <b>Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame</b></p> <ul style="list-style-type: none"> <li>Refrain from inserting obstacles in the opening gap between the sash and the frame.</li> </ul>                                                                                                     |

| Symbol                                                                            | Meaning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <div><b>CAUTION!</b><br/><b>Danger of injury and material damage from pressing the sash against the opening edge (reveal) and from uncontrolled opening and closing of the sash</b><ul style="list-style-type: none"><li>▪ Do not press the sash against the opening edge (reveal).</li><li>▪ Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position.</li></ul></div> |



The following symbols can be used on windows and balcony doors to protect the end-user. Always keep these symbols in a clearly legible state. Please order stickers separately (OPR\_16\_DE-EN).



### **Maximum sash sizes and weights**

The technical data, application diagrams, and component classifications in the product-specific documentation of the hardware manufacturer give instructions on the maximum permitted sash sizes and weights. Here, the component with the smallest permitted load bearing capacity decides the maximum permitted sash weight.

- Check compliance of the technical data, application diagrams, and component classifications before the use of electronic data sets, and especially their use in fenestration programmes.
- The maximum permitted sash sizes and weights must never be exceeded. In the case of uncertainty contact the hardware manufacturer.

### **Specifications for profile manufacturers**

The manufacturer of windows and/or balcony doors must comply with all specified system-related dimensions (e.g. gasket gap dimensions or locking-point distances). Furthermore, he must check these regularly and make certain of them, especially on the first use of new hardware components, during manufacture, in an ongoing manner up to and including the window installation.

### **Specifications for fabricators**

In the area of the support brackets, cut the reinforcements to mitre and push forward into the sash edges. Do not place sashes with already fitted hardware components against or on top of each other, thereby placing stress on the projecting support brackets. Seal all the outer components on the profile-side assembly surfaces to prevent moisture from entering.



#### **NOTE!**

The hardware components are designed in such a manner, that the system-related dimensions can be adjusted, provided the hardware can have an effect on these. If a deviation from these dimensions is noticed only after the installation of the windows, the hardware manufacturer is not responsible for any possible additional work arising.

---

### **Composition of hardware**

Burglary inhibiting windows and balcony doors require hardware which fulfils particular requirements.

Windows and balcony doors for damp rooms, and those for use in environments with aggressive and corrosive air components require hardware which fulfils particular requirements.

The resistance of windows and balcony doors to wind loads when closed and locked depends on the actual designs of the windows and balcony doors. Wind loads prescribed by law and standards (e.g. as per EN 12210 – especially test pressure P3) can be dissipated by the hardware system.

The hardware combinations and installations appropriate for windows and balcony doors in the previously mentioned areas should be specifically selected and agreed with the hardware manufacturer and the profile manufacturer.



#### **NOTE!**

The guidelines of the hardware manufacturer relating to the combination of the hardware (e.g. the use of additional stay arms, the design of hardware for burglary-inhibiting sashes for windows and balcony doors, etc.) are binding.

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**DANGER!**

Danger to life from incorrectly installed and threaded hardware components!

Incorrect installation and threading of hardware components can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- For installation and especially for threaded components, observe the product-specific documentation of the hardware manufacturer, the information from the profile manufacturer, and all contents of the TBDK directive of the Gütegemeinschaft Schlösser und Beschläge e. V.
  - The window fabricator must ensure adequate fixing of the hardware components and correct load transfer.
- 

This danger note shall apply to all screwable hardware components and particularly to those safety components which are part of the RC equipment. Generally, the kind and quality of the screw fixing depends on the aluminium profile of the profile manufacturer and has to be tested before use (system check).

Do not use any acid cross-linked sealing compounds that could lead to corrosion of the hardware components. The glazing spacer-block regulations for the glazing method are to be adhered to.

### **Roto Patio Fold**

- Concealed central locking system for one-hand-operation
- Optional top or bottom running door elements
- Inward or outward opening
- Silver anodised roller tracks and guide tracks
- Coloured cover strips
- Powder-coated hinges and support brackets
- Standard colours:
  - White R07.2
  - Medium bronze R05.3
  - Silver R01.1
  - Raw (for on-site coating)
- Tilt&Turn or Turn-Only sash as the access sash
- Retro-adjustable components
- Additional possibilities:
  - Roto security components, MVS
- Area of use:
  - Sash rebate width SRW at least 450 mm – max. 1200 mm (access sash on the frame side)
  - Sash rebate width SRW at least 450 mm – max. 900 mm (folding sash)
  - Sash rebate height SRH at least 600 mm – max. 2800 mm
  - Sash weight S.kg max. 100 kg (for bottom-running version)
  - Sash weight S.kg max. 80 kg (for top-running version)
- Roller track length max. 6 m



## Explanation of the digit string in the diagrams

A mirror image of each diagram can also be implemented.

Number of sashes that open to the left  
**532**

Total number of sashes

Number of sashes that open to the right

For explanation of the letters (A-F) please refer to the dimensioned drawing on page 73.

DIAGRAM 321

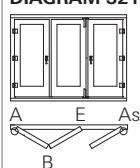


DIAGRAM 330

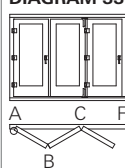


DIAGRAM 431

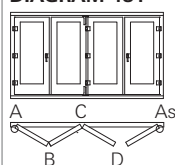


DIAGRAM 532

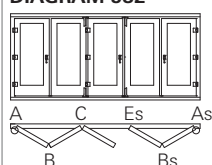


DIAGRAM 541

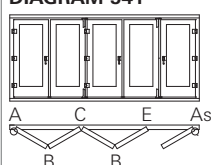


DIAGRAM 550

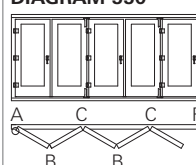


DIAGRAM 633

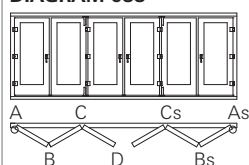


DIAGRAM 651

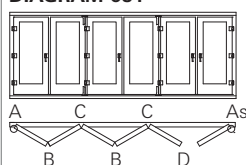


DIAGRAM 743

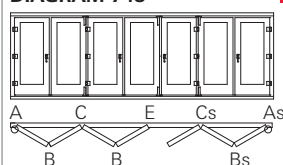


DIAGRAM 752

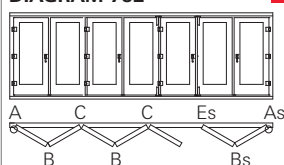


DIAGRAM 761

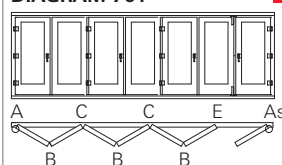


DIAGRAM 770

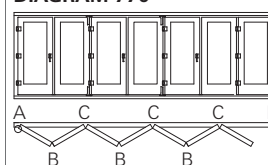
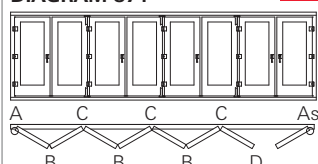
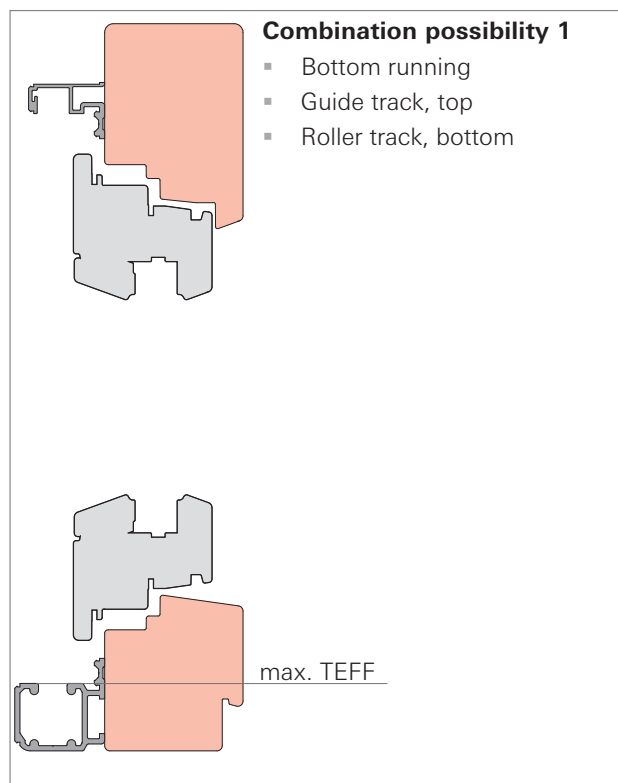


DIAGRAM 871



Possible combinations:

Bottom-running frame



**NOTE!**

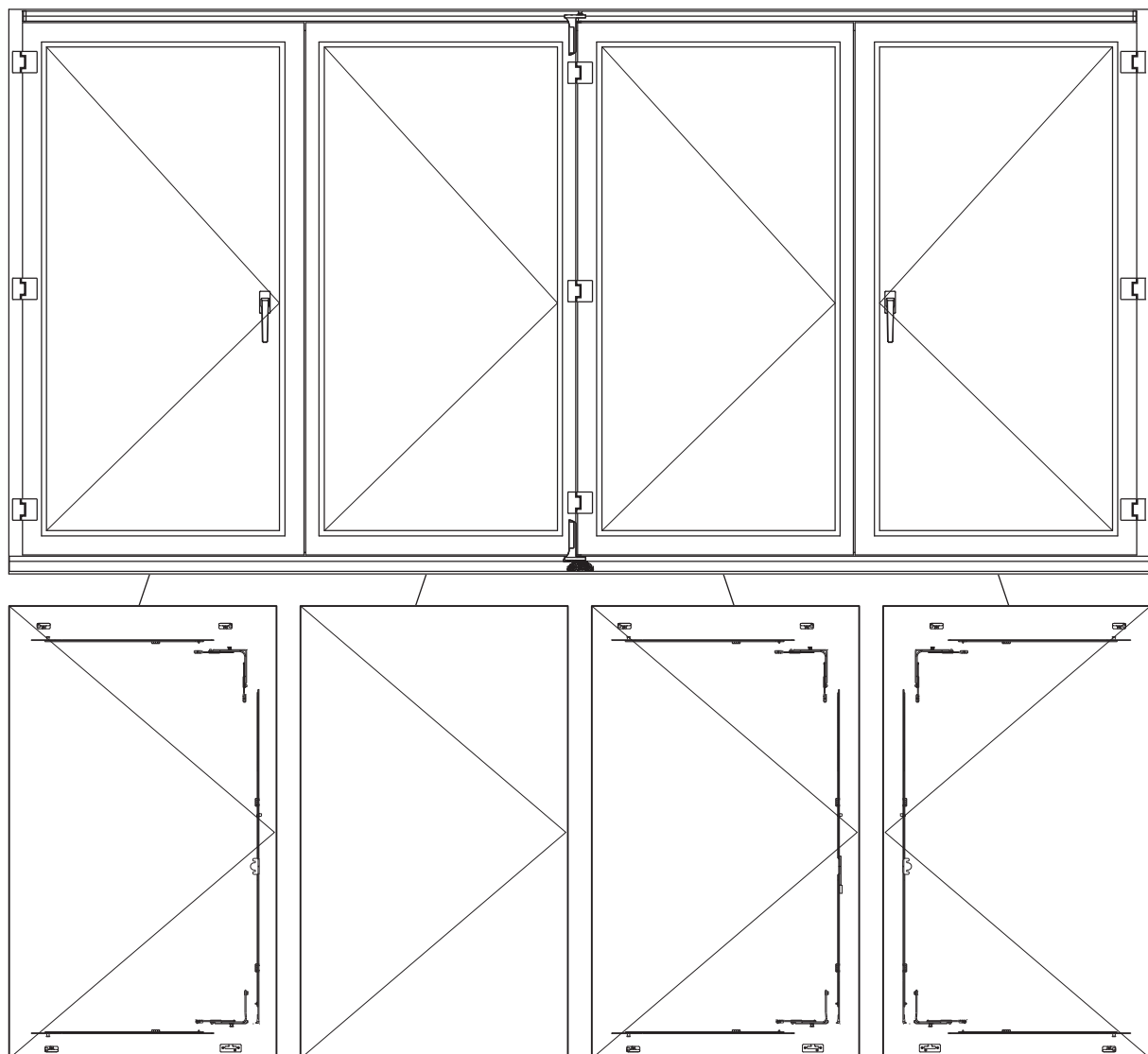
In conjunction with this document, the following installation instructions for Turn-Only and Tilt&Turn hardware apply:

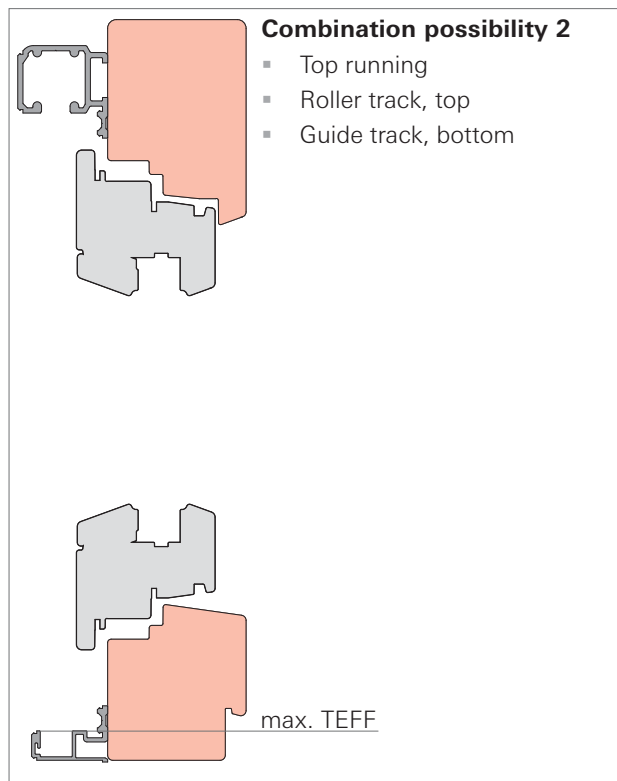
**Roto NT Timber**

- IMO\_63

**Roto NT PVC**

- IMO\_64





**NOTE!**

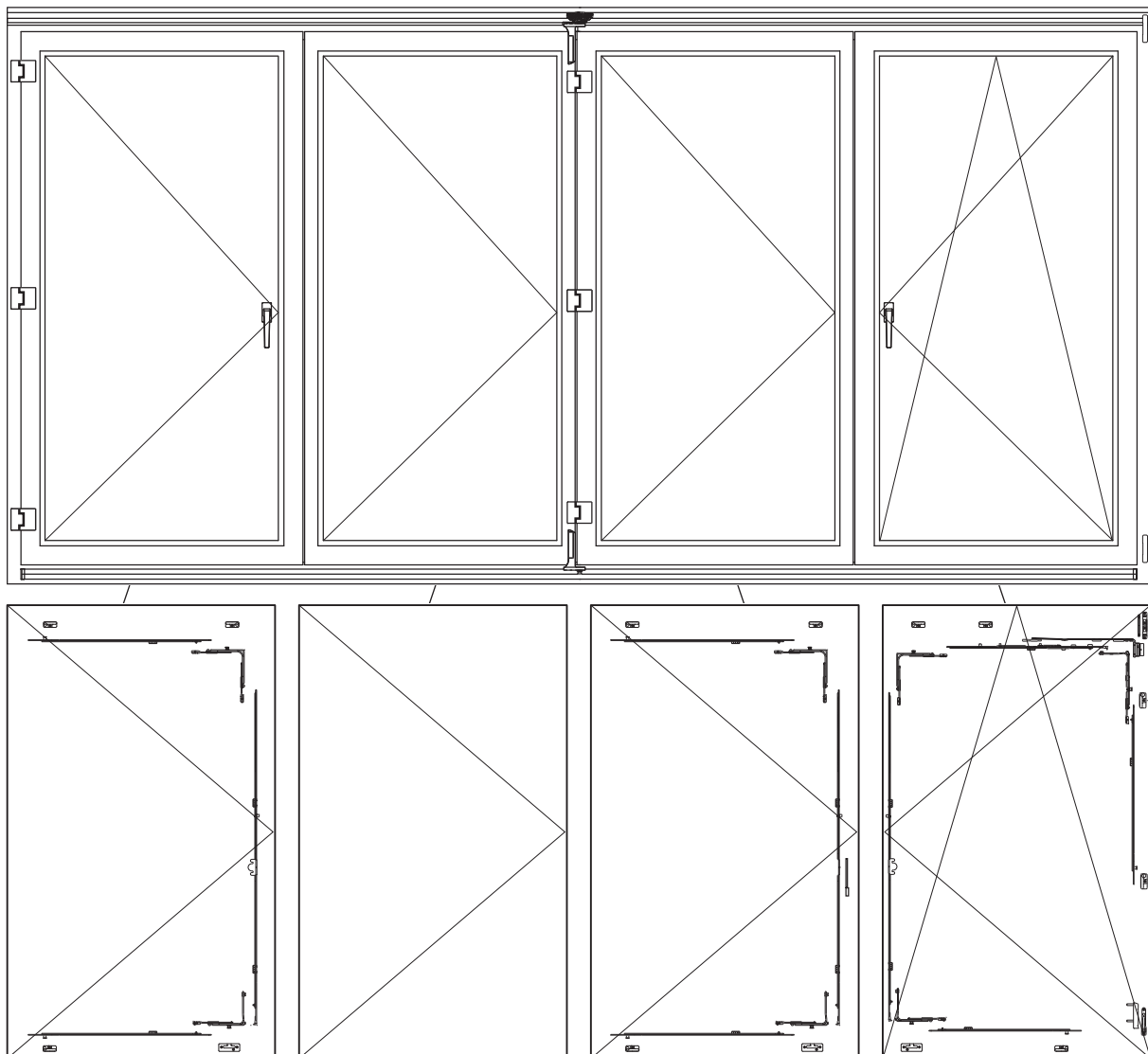
In conjunction with this document, the following installation instructions for Turn-Only and Tilt&Turn hardware apply:

**Roto NT Timber**

- IMO\_63

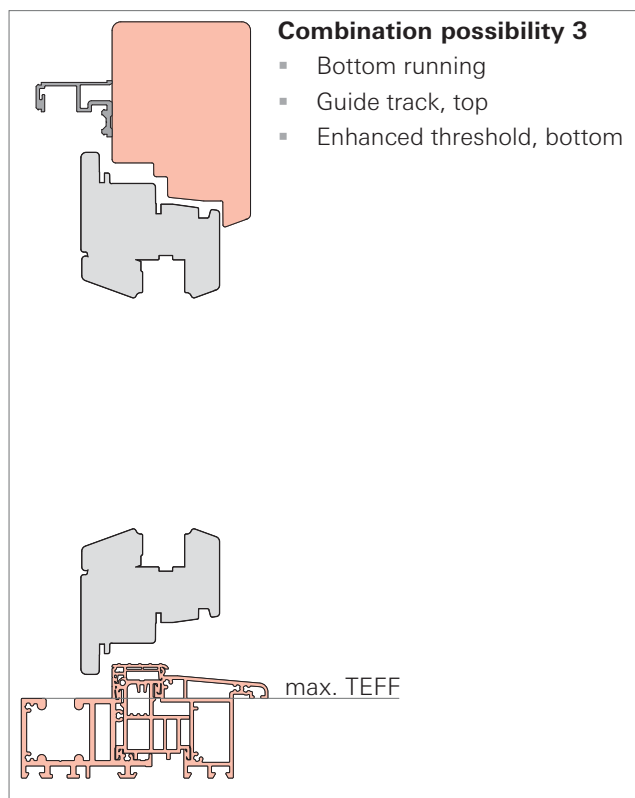
**Roto NT PVC**

- IMO\_64



Possible combinations:

Bottom-running enhanced threshold



**NOTE!**

In conjunction with this document, the following installation instructions for Turn-Only and Tilt&Turn hardware apply:

**Roto NT Timber**

- IMO\_63

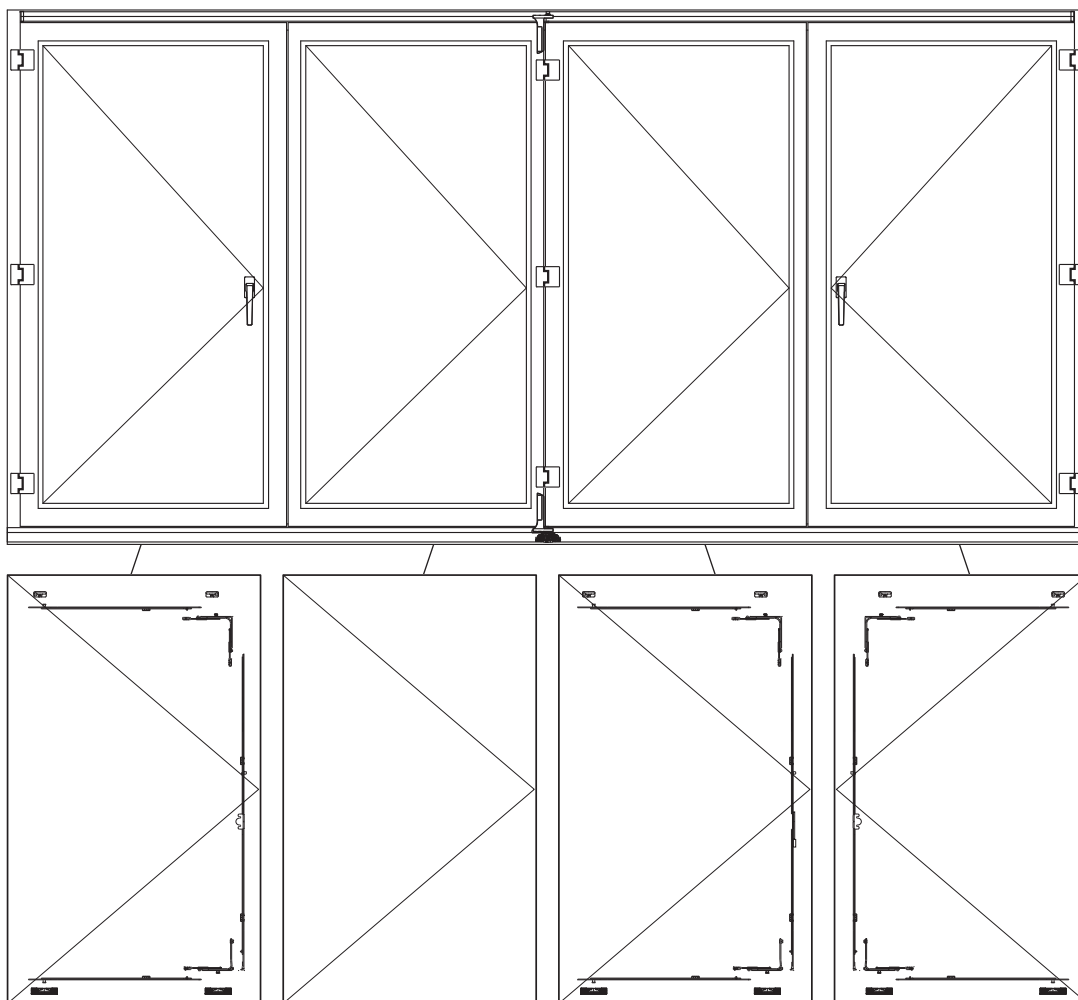
**Roto NT PVC**

- IMO\_64



**NOTE!**

The barrier-free enhanced threshold acc. to DIN 18040-1 fulfils the requirements of the Energy Saving Regulations (isothermal efficiency acc. to DIN 4108). It is only of limited suitability in driving rain conditions. The impermeability depends on the profile and must be tested individually.





### Explanation on the hardware overview chapter

The hardware overviews on the following pages are recommendations of Roto Frank AG.

The hardware overview chapter shows on the left page the single hardware components of the opening type in the overview and on the right page the respective parts list. Position numbers allow the allocation between overview and parts list.

**Hardware overview**  
Version standard roller track

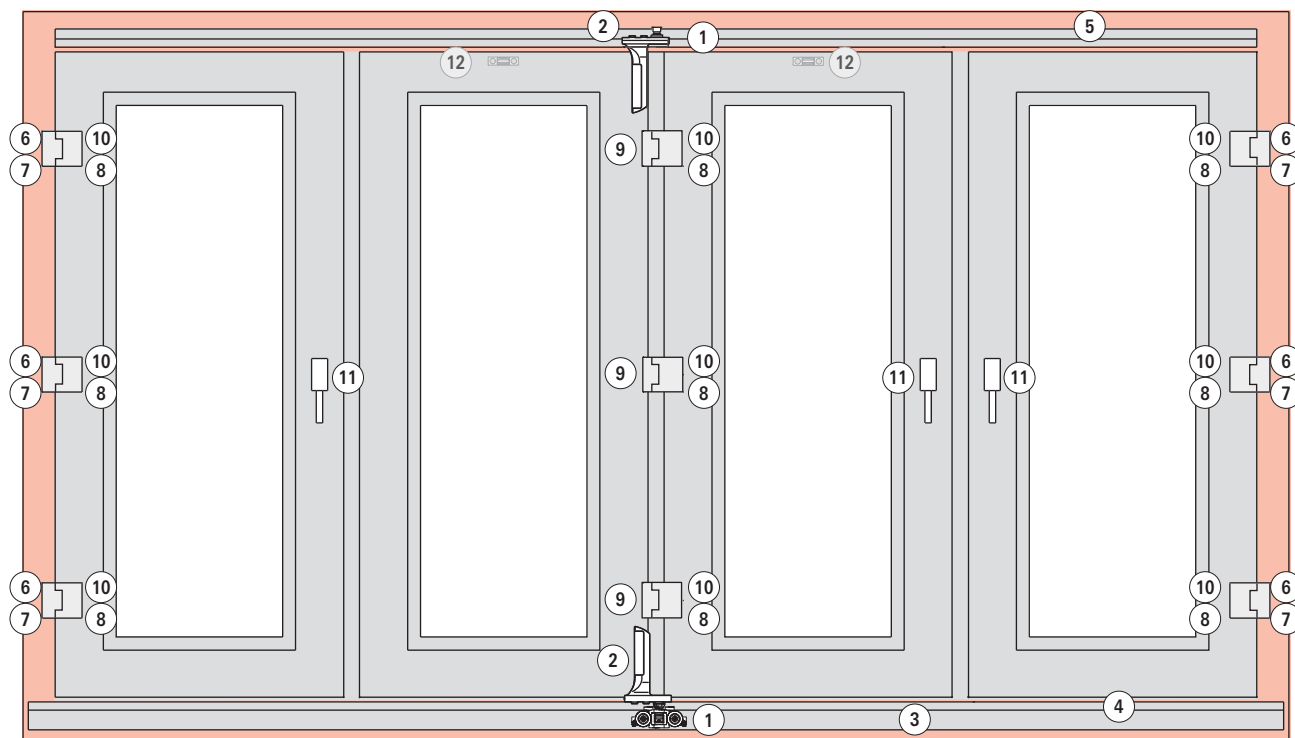
Roto Patio Fold

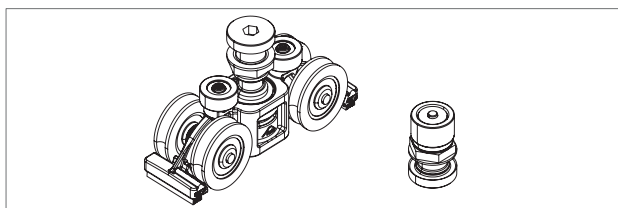
**Hardware overview**  
Parts list standard roller track

| Position | Part         | Material |
|----------|--------------|----------|
| 1        | Roller track | Al       |
| 2        | Roller track | Al       |
| 3        | Roller track | Al       |
| 4        | Roller track | Al       |
| 5        | Roller track | Al       |
| 6        | Roller track | Al       |
| 7        | Roller track | Al       |
| 8        | Roller track | Al       |
| 9        | Roller track | Al       |
| 10       | Roller track | Al       |
| 11       | Roller track | Al       |
| 12       | Roller track | Al       |
| 13       | Roller track | Al       |
| 14       | Roller track | Al       |
| 15       | Roller track | Al       |
| 16       | Roller track | Al       |
| 17       | Roller track | Al       |
| 18       | Roller track | Al       |
| 19       | Roller track | Al       |
| 20       | Roller track | Al       |
| 21       | Roller track | Al       |
| 22       | Roller track | Al       |
| 23       | Roller track | Al       |
| 24       | Roller track | Al       |
| 25       | Roller track | Al       |
| 26       | Roller track | Al       |
| 27       | Roller track | Al       |
| 28       | Roller track | Al       |
| 29       | Roller track | Al       |
| 30       | Roller track | Al       |
| 31       | Roller track | Al       |
| 32       | Roller track | Al       |
| 33       | Roller track | Al       |
| 34       | Roller track | Al       |
| 35       | Roller track | Al       |
| 36       | Roller track | Al       |
| 37       | Roller track | Al       |
| 38       | Roller track | Al       |
| 39       | Roller track | Al       |
| 40       | Roller track | Al       |
| 41       | Roller track | Al       |
| 42       | Roller track | Al       |
| 43       | Roller track | Al       |
| 44       | Roller track | Al       |
| 45       | Roller track | Al       |
| 46       | Roller track | Al       |
| 47       | Roller track | Al       |
| 48       | Roller track | Al       |
| 49       | Roller track | Al       |
| 50       | Roller track | Al       |
| 51       | Roller track | Al       |
| 52       | Roller track | Al       |
| 53       | Roller track | Al       |
| 54       | Roller track | Al       |
| 55       | Roller track | Al       |
| 56       | Roller track | Al       |
| 57       | Roller track | Al       |
| 58       | Roller track | Al       |
| 59       | Roller track | Al       |
| 60       | Roller track | Al       |
| 61       | Roller track | Al       |
| 62       | Roller track | Al       |
| 63       | Roller track | Al       |
| 64       | Roller track | Al       |
| 65       | Roller track | Al       |
| 66       | Roller track | Al       |
| 67       | Roller track | Al       |
| 68       | Roller track | Al       |
| 69       | Roller track | Al       |
| 70       | Roller track | Al       |
| 71       | Roller track | Al       |
| 72       | Roller track | Al       |
| 73       | Roller track | Al       |
| 74       | Roller track | Al       |
| 75       | Roller track | Al       |
| 76       | Roller track | Al       |
| 77       | Roller track | Al       |
| 78       | Roller track | Al       |
| 79       | Roller track | Al       |
| 80       | Roller track | Al       |
| 81       | Roller track | Al       |
| 82       | Roller track | Al       |
| 83       | Roller track | Al       |
| 84       | Roller track | Al       |
| 85       | Roller track | Al       |
| 86       | Roller track | Al       |
| 87       | Roller track | Al       |
| 88       | Roller track | Al       |
| 89       | Roller track | Al       |
| 90       | Roller track | Al       |
| 91       | Roller track | Al       |
| 92       | Roller track | Al       |
| 93       | Roller track | Al       |
| 94       | Roller track | Al       |
| 95       | Roller track | Al       |
| 96       | Roller track | Al       |
| 97       | Roller track | Al       |
| 98       | Roller track | Al       |
| 99       | Roller track | Al       |
| 100      | Roller track | Al       |

The parts list includes all profile related versions of the Roto Patio Fold hardware system as well as of the enhanced threshold Roto Fold. Technical details, special groove and clearance version information available upon request.

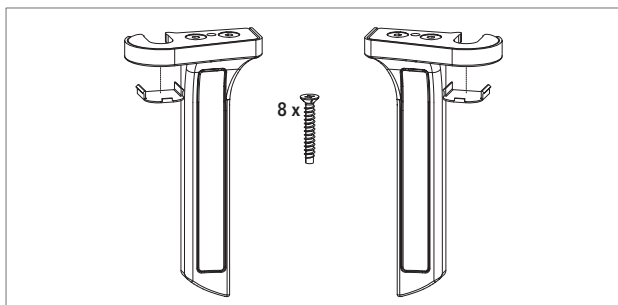
The actual scope of delivery depends on the ordered hardware configuration (height and width of the window). Handles have to be ordered separately.





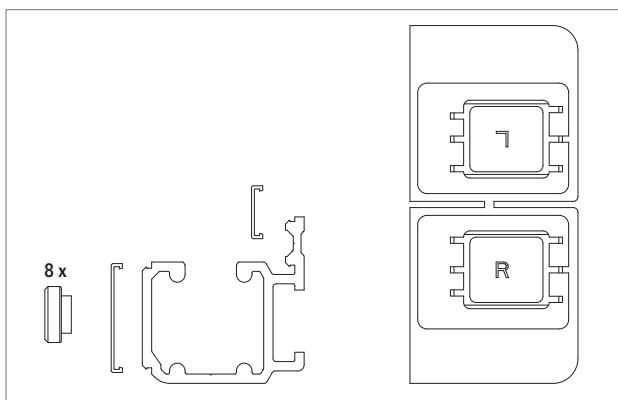
① **Bogie set**

| Description            | Colour | PQ | Material no.  |
|------------------------|--------|----|---------------|
| Bogie and guide roller | —      | 1  | <b>642422</b> |



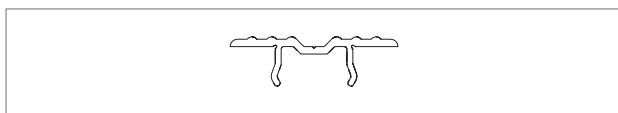
② **Support bracket incl. accessories**

| Version        | Colour              | PQ | Material no.  |
|----------------|---------------------|----|---------------|
| with pin 30 mm | White R07.2         | 1  | <b>642423</b> |
|                | Medium bronze R05.3 | 1  | <b>642424</b> |
|                | EV1 R01.1           | 1  | <b>642435</b> |
| with pin 40 mm | Unpainted unc.      | 1  | <b>643347</b> |
|                | White R07.2         | 1  | <b>643348</b> |
|                | Medium bronze R05.3 | 1  | <b>643349</b> |
|                | EV1 R01.1           | 1  | <b>643350</b> |
|                | Unpainted unc.      | 1  | <b>735307</b> |



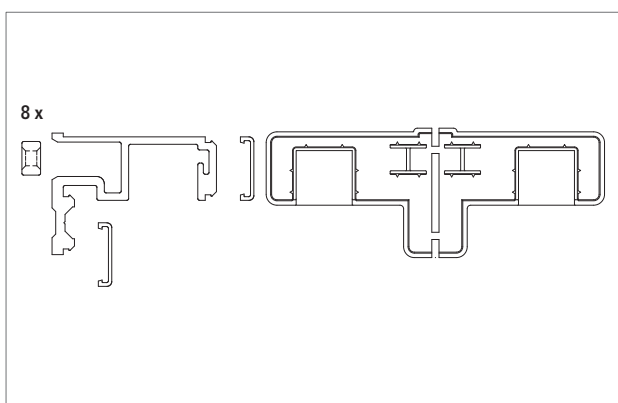
③ **Roller track incl. accessories**

| Version | Colour              | PQ | Material no.  |
|---------|---------------------|----|---------------|
| 3000 mm | White R07.2         | 1  | <b>642436</b> |
|         | Medium bronze R05.3 | 1  | <b>642440</b> |
|         | EV1 Silver R01.1    | 1  | <b>642444</b> |
| 4000 mm | White R07.2         | 1  | <b>642437</b> |
|         | Medium bronze R05.3 | 1  | <b>642441</b> |
| 5000 mm | EV1 Silver R01.1    | 1  | <b>642445</b> |
|         | White R07.2         | 1  | <b>642438</b> |
|         | Medium bronze R05.3 | 1  | <b>642442</b> |
| 6000 mm | EV1 Silver R01.1    | 1  | <b>642446</b> |
|         | White R07.2         | 1  | <b>642439</b> |
|         | Medium bronze R05.3 | 1  | <b>642443</b> |
|         | EV1 Silver R01.1    | 1  | <b>642447</b> |



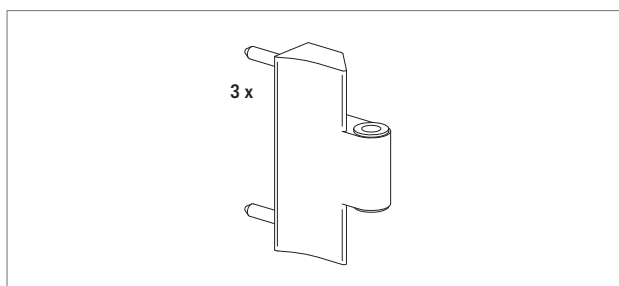
④ **Cover strip for roller track**

| Version | Colour       | PQ | Material no.  |
|---------|--------------|----|---------------|
| 1300 mm | EV1 Silver — | 1  | <b>642452</b> |



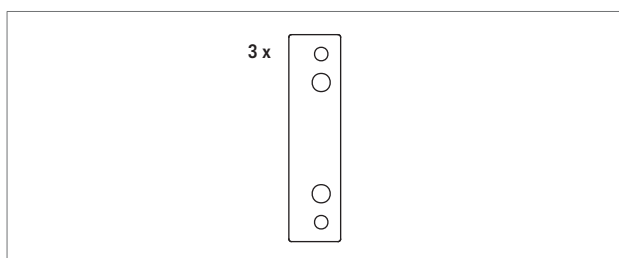
⑤ **Guide track incl. accessories**

| Version | Colour              | PQ | Material no.  |
|---------|---------------------|----|---------------|
| 3000 mm | White R07.2         | 1  | <b>312797</b> |
|         | Medium bronze R05.3 | 1  | <b>312802</b> |
|         | EV1 Silver R01.1    | 1  | <b>312807</b> |
| 4000 mm | White R07.2         | 1  | <b>312798</b> |
|         | Medium bronze R05.3 | 1  | <b>312803</b> |
|         | EV1 Silver R01.1    | 1  | <b>312808</b> |
| 5000 mm | White R07.2         | 1  | <b>312799</b> |
|         | Medium bronze R05.3 | 1  | <b>312804</b> |
|         | EV1 Silver R01.1    | 1  | <b>312809</b> |
| 6000 mm | White R07.2         | 1  | <b>312800</b> |
|         | Medium bronze R05.3 | 1  | <b>312805</b> |
|         | EV1 Silver R01.1    | 1  | <b>312810</b> |



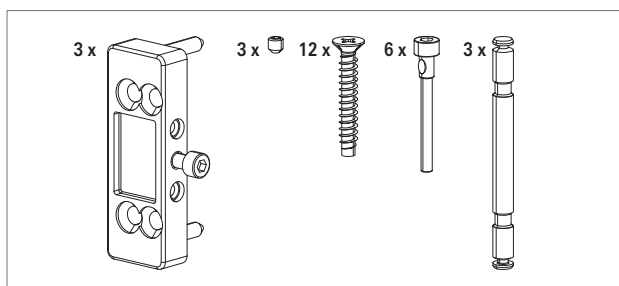
⑥ Frame hinge-bearing

| Version           | Colour        | PQ    | Material no.    |
|-------------------|---------------|-------|-----------------|
| 16 mm   pin 25 mm | White         | R07.2 | 3 <b>733375</b> |
|                   | Medium bronze | R05.3 | 3 <b>733376</b> |
|                   | Silver        | R01.1 | 3 <b>733377</b> |
|                   | Unpainted     | unc.  | 3 <b>733378</b> |
| 16 mm   pin 40 mm | White         | R07.2 | 3 <b>733379</b> |
|                   | Medium bronze | R05.3 | 3 <b>733380</b> |
|                   | Silver        | R01.1 | 3 <b>733381</b> |
|                   | Unpainted     | unc.  | 3 <b>733382</b> |
| 21 mm   pin 25 mm | White         | R07.2 | 3 <b>733383</b> |
|                   | Medium bronze | R05.3 | 3 <b>733384</b> |
|                   | Silver        | R01.1 | 3 <b>733385</b> |
|                   | Unpainted     | unc.  | 3 <b>733386</b> |
| 21 mm   pin 40 mm | White         | R07.2 | 3 <b>733387</b> |
|                   | Medium bronze | R05.3 | 3 <b>733388</b> |
|                   | Silver        | R01.1 | 3 <b>733389</b> |
|                   | Unpainted     | unc.  | 3 <b>733390</b> |



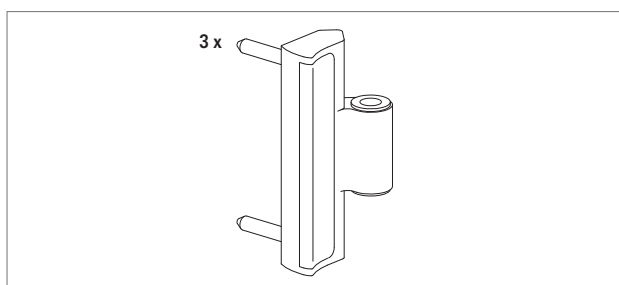
⑦ Packers frame hinge-bearing

| Version | Colour        | PQ    | Material no.    |
|---------|---------------|-------|-----------------|
| 1 mm    | White         | R07.2 | 3 <b>312831</b> |
|         | Medium bronze | R05.3 | 3 <b>312832</b> |
|         | Silver        | R01.1 | 3 <b>312833</b> |
|         | Unpainted     | unc.  | 3 <b>337802</b> |
| 2 mm    | White         | R07.2 | 3 <b>312834</b> |
|         | Medium bronze | R05.3 | 3 <b>312835</b> |
|         | Silver        | R01.1 | 3 <b>312836</b> |
|         | Unpainted     | unc.  | 3 <b>337803</b> |



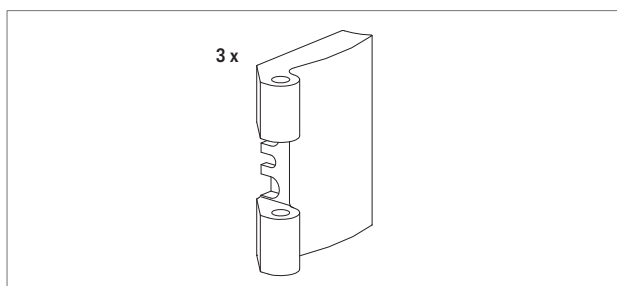
⑧ Hinge-fixing insert

| Description                                                                               | PQ | Material no.  |
|-------------------------------------------------------------------------------------------|----|---------------|
| A screwing axis 40/50 mm, 40 mm screws:                                                   |    |               |
| pin 25 mm                                                                                 | 3  | <b>733491</b> |
| pin 40 mm                                                                                 | 3  | <b>733492</b> |
| B screwing axis 44/54 mm, 50 mm screws:                                                   |    |               |
| pin 25 mm                                                                                 | 3  | <b>733493</b> |
| pin 40 mm                                                                                 | 3  | <b>733494</b> |
| C screwing axis 40/50 mm, 60 mm screws<br>incl. offset bushes 18.5 mm (timber/aluminium): |    |               |
| pin 40 mm                                                                                 | 3  | <b>734463</b> |



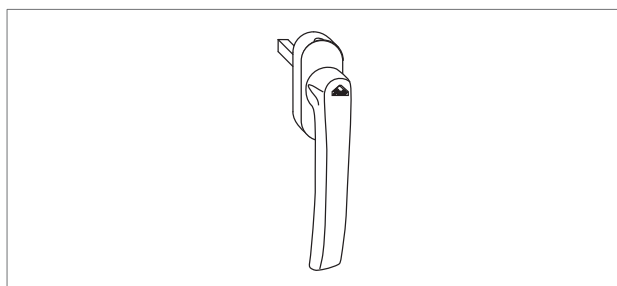
⑨ Sash hinge-bearing

| Version           | Colour        | PQ    | Material no.    |
|-------------------|---------------|-------|-----------------|
| 20 mm   pin 25 mm | White         | R07.2 | 3 <b>734361</b> |
|                   | Medium bronze | R05.3 | 3 <b>734362</b> |
|                   | Silver        | R01.1 | 3 <b>734363</b> |
|                   | Unpainted     | unc.  | 3 <b>734364</b> |
| 30 mm   pin 25 mm | White         | R07.2 | 3 <b>734365</b> |
|                   | Medium bronze | R05.3 | 3 <b>734366</b> |
|                   | Silver        | R01.1 | 3 <b>734367</b> |
|                   | Unpainted     | unc.  | 3 <b>734368</b> |
| 20 mm   pin 40 mm | White         | R07.2 | 3 <b>734369</b> |
|                   | Medium bronze | R05.3 | 3 <b>734370</b> |
|                   | Silver        | R01.1 | 3 <b>734371</b> |
|                   | Unpainted     | unc.  | 3 <b>734372</b> |
| 30 mm   pin 40 mm | White         | R07.2 | 3 <b>734373</b> |
|                   | Medium bronze | R05.3 | 3 <b>734374</b> |
|                   | Silver        | R01.1 | 3 <b>734375</b> |
|                   | Unpainted     | unc.  | 3 <b>734376</b> |



10 Hinge (PQ 3)

| Version | Colour        | PQ    | Material no.    |
|---------|---------------|-------|-----------------|
| 40 mm   | White         | R07.2 | 3 <b>733366</b> |
|         | Medium bronze | R05.3 | 3 <b>733367</b> |
|         | Silver        | R01.1 | 3 <b>733368</b> |
|         | Unpainted     | unc.  | 3 <b>733372</b> |
| 50 mm   | White         | R07.2 | 3 <b>733369</b> |
|         | Medium bronze | R05.3 | 3 <b>733370</b> |
|         | Silver        | R01.1 | 3 <b>733371</b> |
|         | Unpainted     | unc.  | 3 <b>733373</b> |



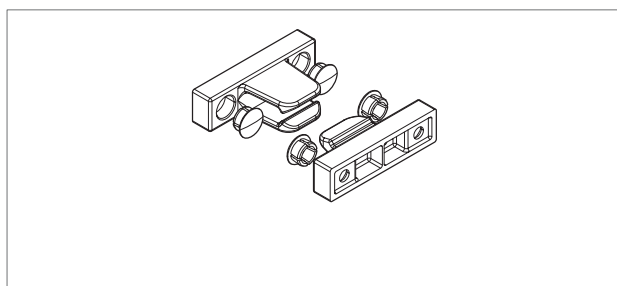
11 Roto Line flat handle, 10 mm lugs, 35 mm pin length

| Version | Colour        | PQ    | Material no.    |
|---------|---------------|-------|-----------------|
|         | White         | R07.2 | 1 <b>336110</b> |
|         | Medium bronze | R05.3 | 1 <b>336111</b> |
|         | Silver        | R01.1 | 1 <b>336112</b> |



**NOTE!**

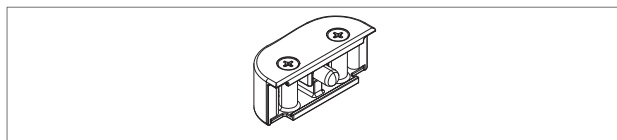
Depending on the design, further handles from the Roto range are possible.



Accessories

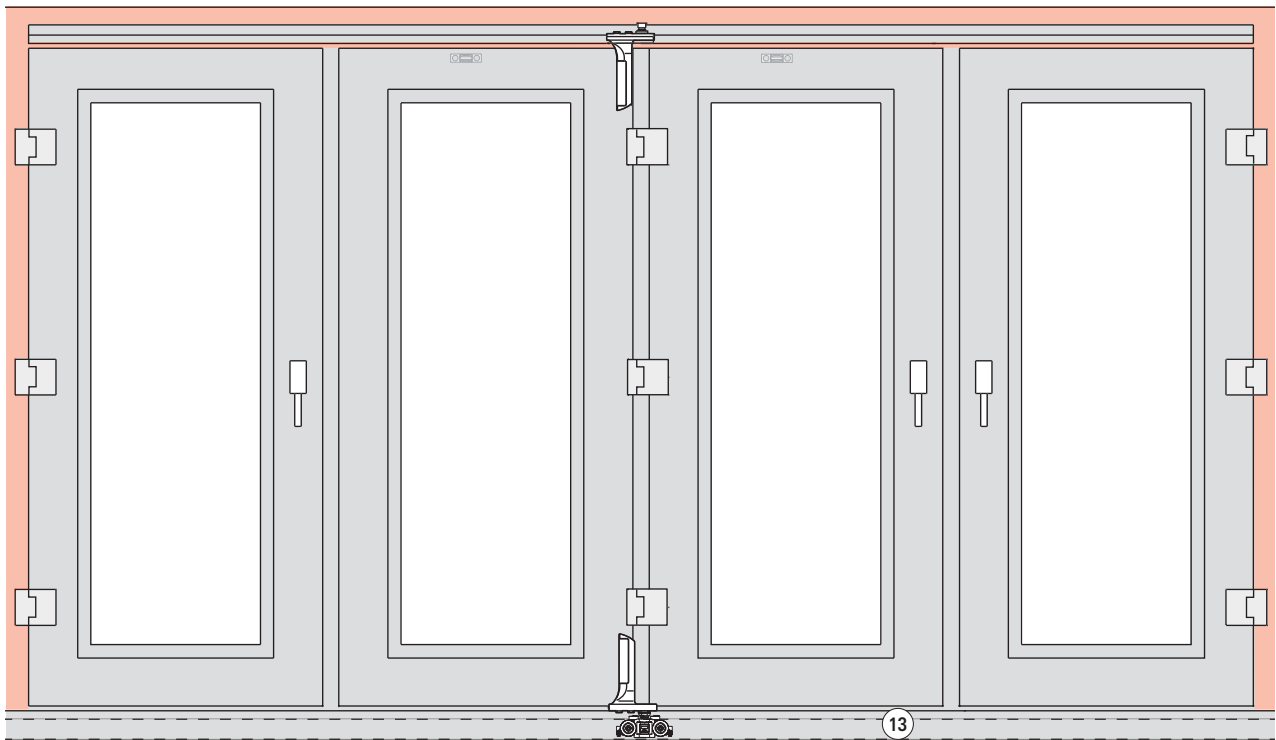
12 Set sash retaining device

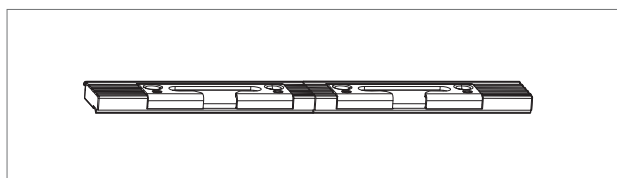
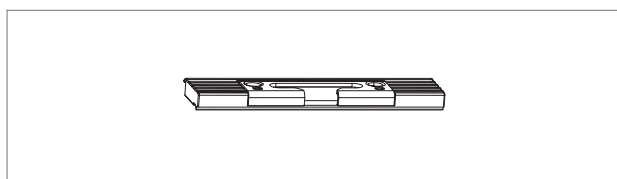
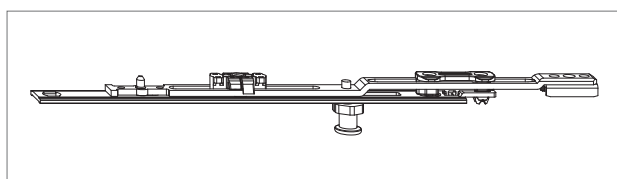
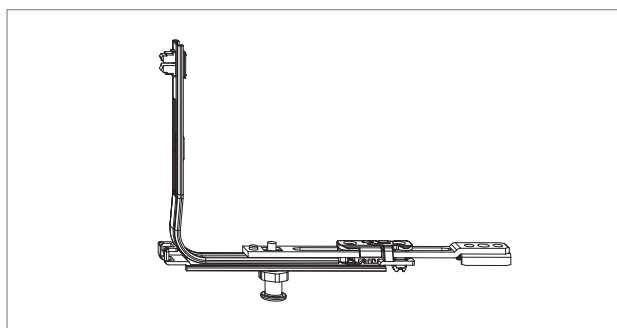
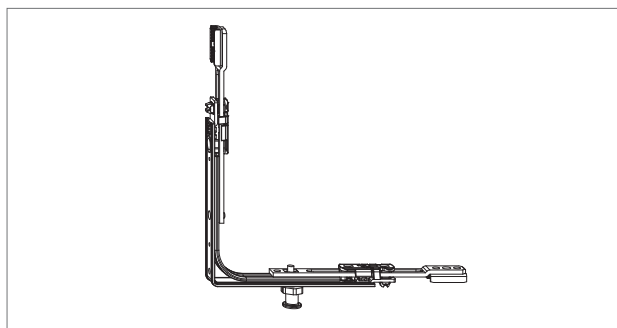
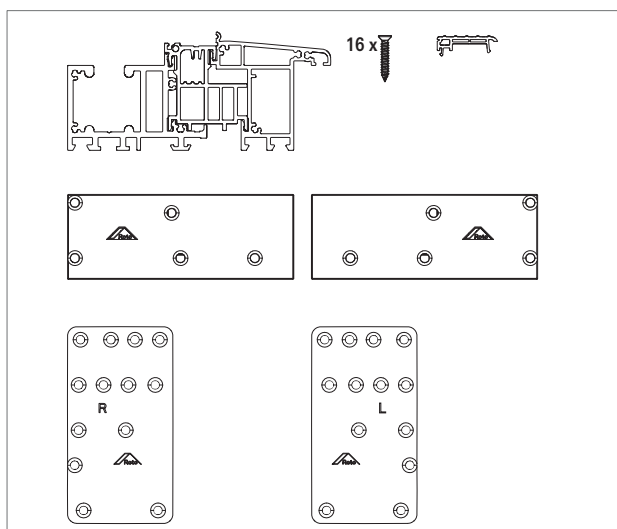
| Version | Colour | PQ    | Material no.    |
|---------|--------|-------|-----------------|
|         | White  | R07.2 | 1 <b>340208</b> |
|         | Black  | R06.2 | 1 <b>340211</b> |
|         | Silver | R01.1 | 1 <b>375241</b> |



Sash stop

| Version | Colour        | PQ    | Material no.    |
|---------|---------------|-------|-----------------|
|         | White         | R07.2 | 1 <b>444807</b> |
|         | Medium bronze | R05.3 | 1 <b>444808</b> |
|         | Silver        | R01.1 | 1 <b>444809</b> |





**13 Enhanced threshold incl. accessories**

| Version        | Colour       | PQ | Material no.  |
|----------------|--------------|----|---------------|
| <b>3000 mm</b> | EV1 Silver – | 1  | <b>642448</b> |
| <b>4000 mm</b> | EV1 Silver – | 1  | <b>642449</b> |
| <b>5000 mm</b> | EV1 Silver – | 1  | <b>642450</b> |
| <b>6000 mm</b> | EV1 Silver – | 1  | <b>642451</b> |

**Corner drive**

| Description            | Cam          | PQ | Material no.  |
|------------------------|--------------|----|---------------|
| Corner drive threshold | 1V, extended | 1  | <b>614456</b> |

**Corner drive, T&T**

| Description            | Cam          | PQ | Material no.  |
|------------------------|--------------|----|---------------|
| Corner drive threshold | 1V, extended | 1  | <b>566650</b> |

**Multipart centre lock, bottom horizontal**

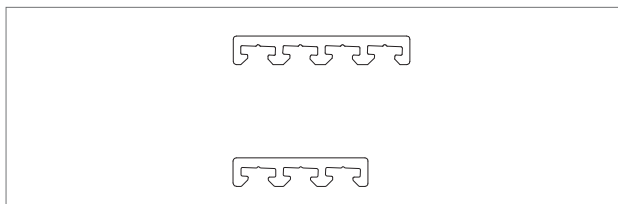
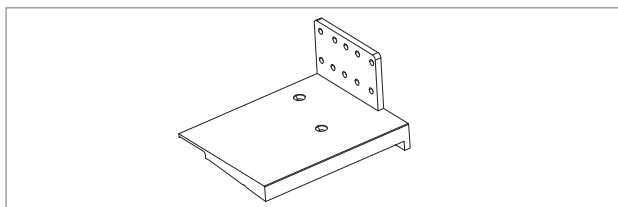
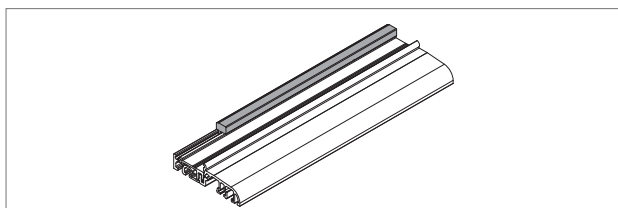
| Description                | Length | Cam          | PQ | Material no.  |
|----------------------------|--------|--------------|----|---------------|
| Centre lock 400            | 400 mm | 1V, extended | 1  | <b>566651</b> |
| Centre lock 600 coupleable | 600 mm | 1V, extended | 1  | <b>618553</b> |

**Tilt striker enhanced threshold**

| Description                  | PQ | Material no.  |
|------------------------------|----|---------------|
| Tilt striker BKV Eifel 13 mm | 1  | <b>534929</b> |
| Tilt striker BKV Eifel 9 mm  | 1  | <b>496779</b> |

**Tilt striker enhanced threshold**

| Description                  | Position                   | PQ | Material no.  |
|------------------------------|----------------------------|----|---------------|
| Tilt striker BKV Eifel 13 mm | Dummy mullion sash, centre | 1  | <b>730427</b> |



#### Adapter profile for Eifel TB

| Description        | Length | Surface-finish | PQ     | Material no.  |
|--------------------|--------|----------------|--------|---------------|
| TB adapter profile | 160 mm | Grey           | 10 pcs | <b>548528</b> |

#### Universal threshold bracket

|                | Surround frame depth | Surface-finish | PQ     | Material no.  |
|----------------|----------------------|----------------|--------|---------------|
| without radius | 70 – 80 mm           | White          | 5 pair | <b>547017</b> |
|                | 70 – 80 mm           | Black          | 5 pair | <b>547018</b> |
|                | 70 – 80 mm           | Grey           | 5 pair | <b>571778</b> |
|                | 80 – 100 mm          | White          | 5 pair | <b>547019</b> |
|                | 80 – 100 mm          | Black          | 5 pair | <b>547020</b> |
|                | 80 – 100 mm          | Grey           | 5 pair | <b>562611</b> |



#### NOTE!

When ordering profile-specific threshold brackets, pay attention to the screw positions at the corner connector of the enhanced threshold (→ page 59).

#### Brush-holder profile

| Description | Length | Surface-finish | PQ     | Material no.  |
|-------------|--------|----------------|--------|---------------|
| quadruple   | 6 m    | E6 / C-0       | 10 pcs | <b>632575</b> |
|             | 1.20 m | E6 / C-0       | 5 pcs  | <b>632576</b> |
| triple      | 60 m   | E6 / C-0       | 10 pcs | <b>640407</b> |
|             | 6 m    | E6 / C-0       | 1 pcs  | <b>640408</b> |
|             | 1.20 m | E6 / C-0       | 5 pcs  | <b>640409</b> |



#### PB 48 Fin-Seal brush seal

| Description       | Surface-finish | PQ   | Material no.  |
|-------------------|----------------|------|---------------|
| Brush seal, 10 mm | Grey           | 60 m | <b>601080</b> |
| Brush seal, 17 mm | Grey           | 40 m | <b>604872</b> |

#### Optional

##### Weather profile strip I

| Description             | Length | Surface-finish | PQ     | Material no.  |
|-------------------------|--------|----------------|--------|---------------|
| Weather profile strip I | 6 m    | E6 / C-0       | 60 m   | <b>543515</b> |
| Weather profile strip I | 1.18 m | E6 / C-0       | 25 pcs | <b>543518</b> |

##### Weather profile strip II

| Description              | Length | Surface-finish | PQ     | Material no.  |
|--------------------------|--------|----------------|--------|---------------|
| Weather profile strip II | 6 m    | E6 / C-0       | 60 m   | <b>543497</b> |
| Weather profile strip II | 1.18 m | E6 / C-0       | 25 pcs | <b>543500</b> |

##### Weather profile strip III

| Description               | Length | Surface-finish | PQ     | Material no.  |
|---------------------------|--------|----------------|--------|---------------|
| Weather profile strip III | 6 m    | E6 / C-0       | 60 m   | <b>543506</b> |
| Weather profile strip III | 1.18 m | E6 / C-0       | 25 pcs | <b>543509</b> |

##### Weather profile strip IV

| Description              | Length | Surface-finish | PQ     | Material no.  |
|--------------------------|--------|----------------|--------|---------------|
| Weather profile strip IV | 6 m    | E6 / C-0       | 60 m   | <b>543486</b> |
| Weather profile strip IV | 1.18 m | E6 / C-0       | 25 pcs | <b>543489</b> |

##### End cap for weather profile strip (pair)

| Description                       | Surface-finish | PQ    | Material no.  |
|-----------------------------------|----------------|-------|---------------|
| End cap for weather profile strip | Grey           | 50 P. | <b>540403</b> |



#### NOTE!

Further hardware parts for the enhanced threshold can be found in the Door catalogue CTL\_8\_EN.

| Profile                       | Frame hinge-bearing / Hinge |        | Sash hinge-bearing / Hinge |                    |                            |
|-------------------------------|-----------------------------|--------|----------------------------|--------------------|----------------------------|
|                               | Frame hinge-bearing / Hinge | Packer | Sash hinge outside         | Sash hinge inside  | Pin length Support bracket |
| <b>PVC</b>                    |                             |        |                            |                    |                            |
| Aluplast Ideal 2000           | 16 / 50, pin 25 mm          | 1      | 20 / 40                    | 20 / 40            | 30 mm                      |
| Aluplast Ideal 4000           | 16 / 50, pin 40 mm          | 1+2    | 20 / 40                    | 20 / 40            | 30 mm                      |
| Aluplast Ideal 5000           | 16 / 50, pin 40 mm          | 1+2    | 20 / 50                    | 20 / 50            | 30 mm                      |
| Gealan S8000                  | 16 / 50, pin 25 mm          | 1      | 20 / 40                    | 20 / 40            | 30 mm                      |
| Kömmerling Eurofutur Classic  | 16 / 50, pin 25 mm          | 2+2    | 20 / 40                    | 20 / 40            | 30 mm                      |
| Kömmerling Eurodur 3S         | 16 / 50, pin 25 mm          | –      | 20 / 40                    | 20 / 40            | 30 mm                      |
| Kömmerling Eurofutur Elegance | 16 / 50, pin 25 mm          | 2+2    | 20 / 40, pin 40 mm         | 20 / 40            | 30 mm                      |
| Rehau Brillant Design         | 16 / 50, pin 40 mm          | 2+1    | 20 / 40                    | 20 / 40            | 30 mm                      |
| Rehau Geneo                   | 21 / 50, pin 40 mm          | 2+2    | RL 16 / 50                 | 30 / 40            | 30 mm                      |
| Schüco AS 60                  | F16 / 50, pin 25 mm         | –      | 20 / 40                    | 20 / 40            | 30 mm                      |
| Schüco CT70                   | FL 20 / 50, pin 40 mm       | 16+2+2 | 20 / 50                    | 30 / 40            | 30 mm                      |
| Trocal 88                     | 21 / 50, pin 40 mm          | 2+1    | RL 21 / 50 pin 40 mm       | 30 / 50, pin 40 mm | 30 mm                      |
| WHS Halo System 10            | 21 / 50, pin 25 mm          | 2      | 30 / 50                    | 30 / 50            | 30 mm                      |
| Veka Softline 70              | 16 / 50, pin 25 mm          | 1+1    | 20 / 40                    | 20 / 40            | 30 mm                      |
| Veka Softline 82              | 16 / 54                     | 2+1    | 30 / 40                    | 30 / 40            | 30 mm                      |
| <b>Timber</b>                 |                             |        |                            |                    |                            |
| General timber                | 16 / 50                     | –      | 20 / 40                    | 20 / 40            | 30 mm                      |

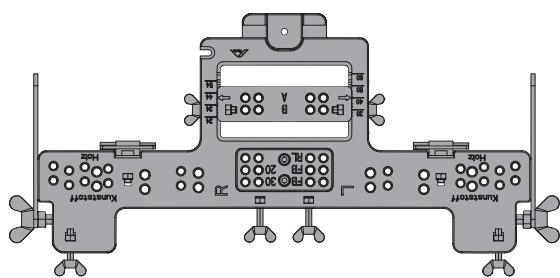


| Drawing no. | Adapter profile<br>Eifel TB (see page 34) | Universal – Threshold bracket<br>(see page 34) | Brush profile holder | Brush seal |        |
|-------------|-------------------------------------------|------------------------------------------------|----------------------|------------|--------|
|             |                                           |                                                |                      | 10 mm      | 17 mm  |
| S14A255-000 | 548528                                    | 70 - 80 mm                                     | 640408               | 601080     | 604872 |
| S14A247-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A030-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A097-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A107-001 | 548528                                    | 80 - 100 mm                                    | 632575               | 601080     | 604872 |
| S14A260-000 | 548528                                    | 70 - 80 mm                                     | 640408               | 601080     | 604872 |
| S14A342-000 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A141-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A142-001 | 548528                                    | 80 - 100 mm                                    | 632575               | 601080     | 604872 |
| S14A334-000 | 548528                                    | 70 - 80 mm                                     | 640408               | 601080     | 604872 |
| S14A104-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A314-000 | 548528                                    | 80 - 100 mm                                    | 640408               | 601080     | 604872 |
| S14A133-001 | 548528                                    | 80 - 100 mm                                    | 632575               | 601080     | 604872 |
| S14A184-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |
| S14A175-001 | 548528                                    | 70 - 80 mm                                     | 640408               | 601080     | 604872 |
| S14A032-001 | 548528                                    | 70 - 80 mm                                     | 632575               | 601080     | 604872 |



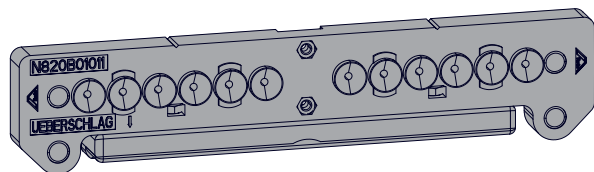
**NOTE!**

Further profile assessment upon request.



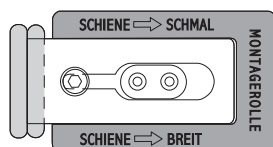
Drilling jig (hinges and support bracket)

643365



Drilling jig (stay bearing and pivot rest)

230727



Drilling jig (roller tracks and guide tracks)

314417



Drilling jig (sash stop)

469831



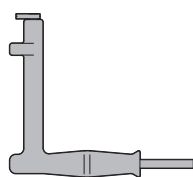
Allen key

208609



Adjusting key

258191



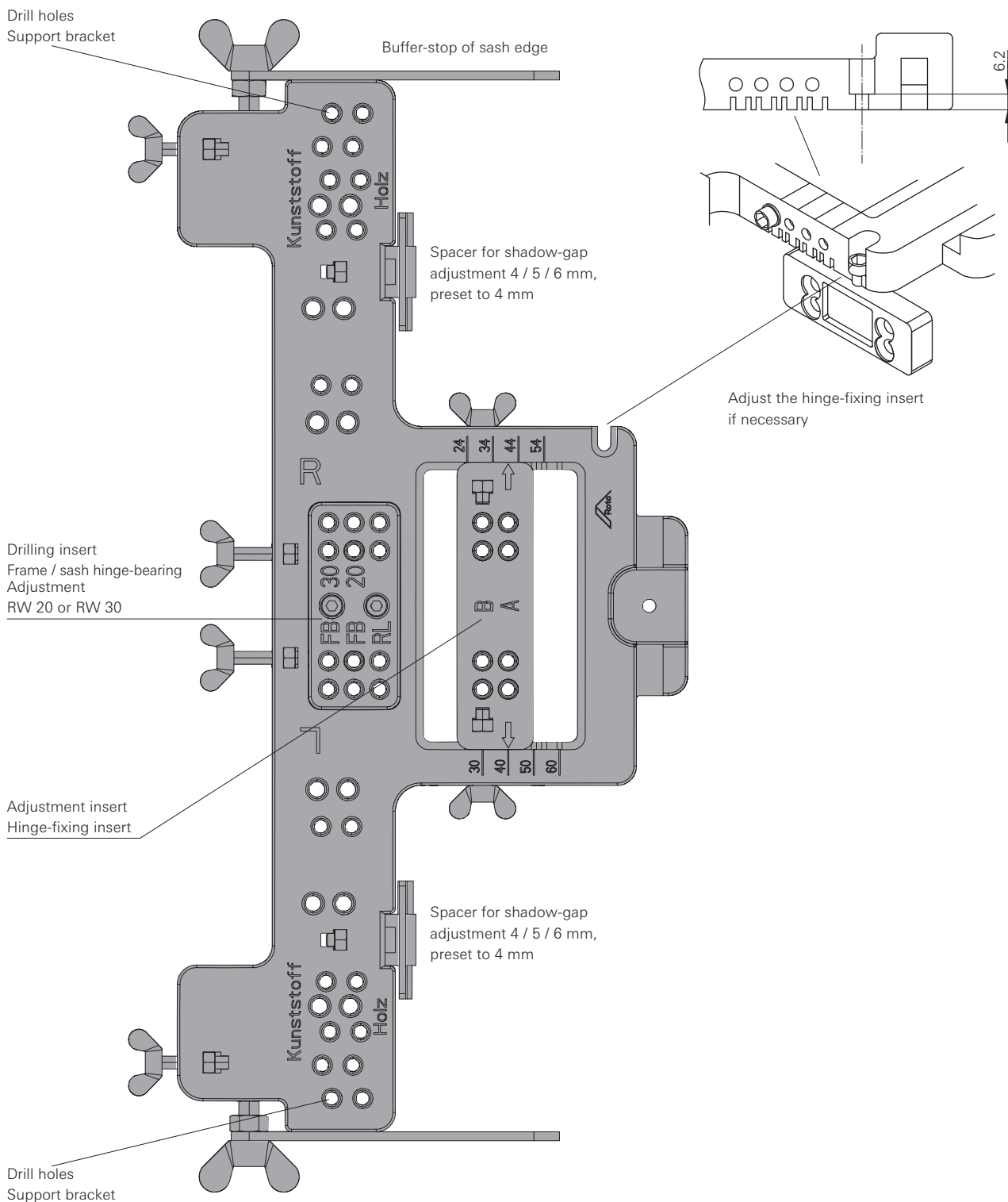
Pin extractor handle

311029

used to insert and/or remove stay-bearing pins

Replacement blade for pin extractor handle

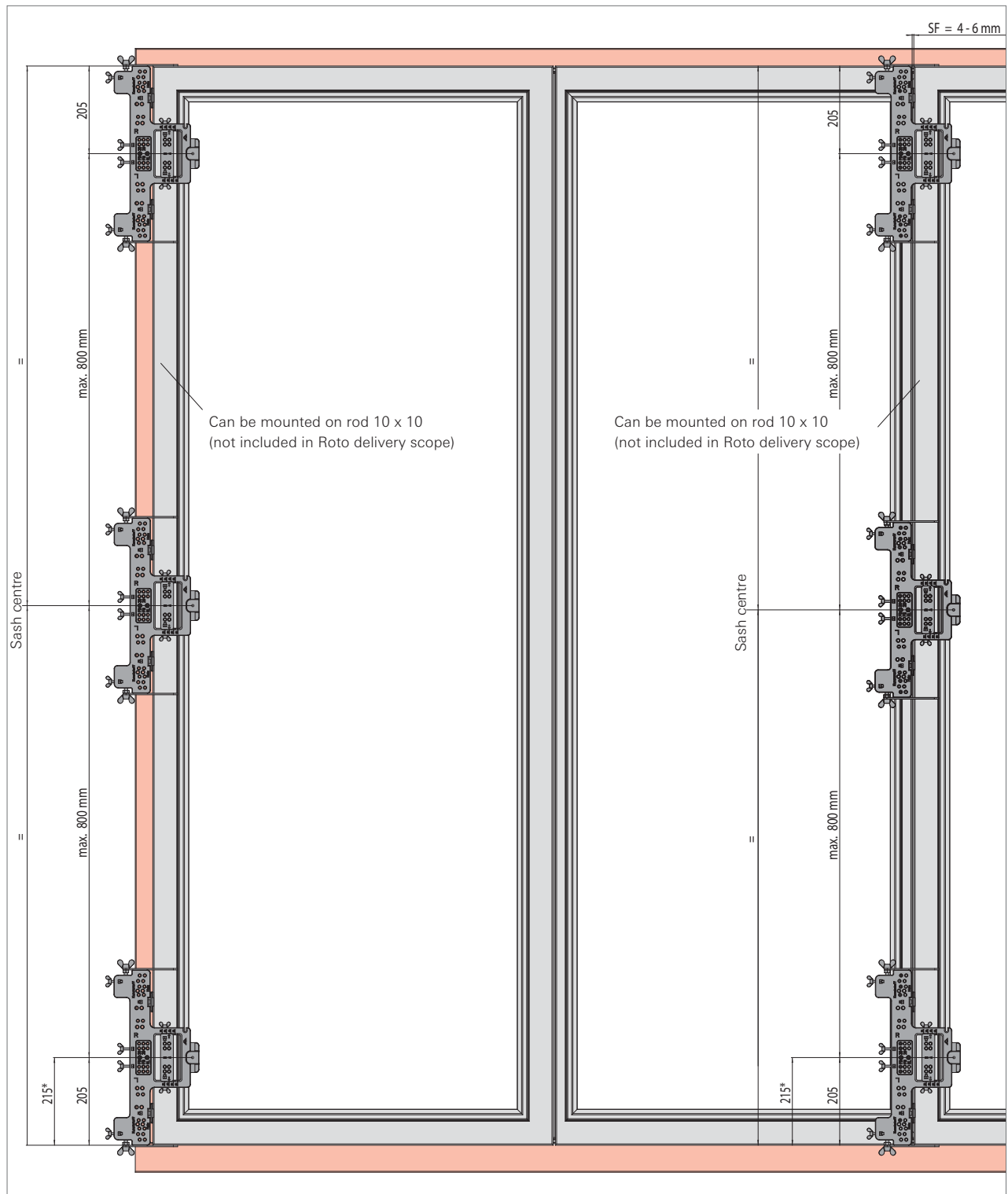
230765



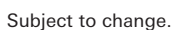


Position: Frame hinge-bearing

Position: Sash hinge-bearing



\* with enhanced threshold



Drill sash hinges and frame hinges, same procedure with timber and PVC.

## Installation

### Drilling and routing dimensions

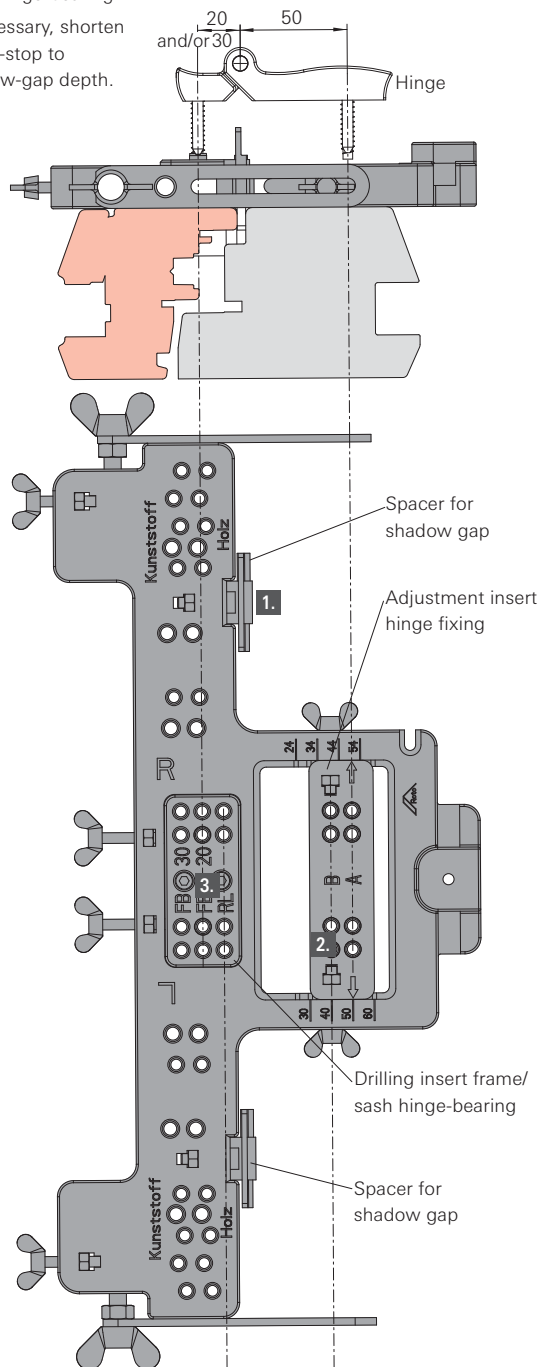
#### Predrilling sash/frame hinges



Sash hinge 20 / 50

Sash hinge-bearing

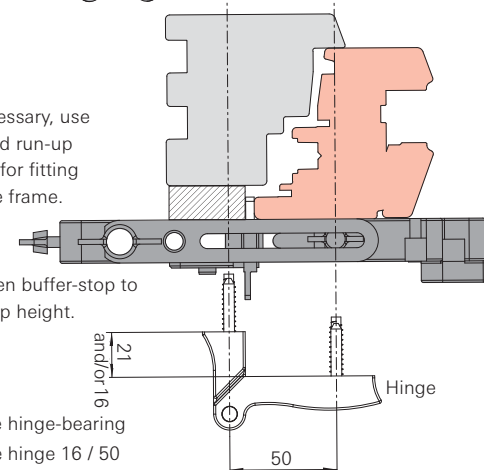
If necessary, shorten  
buffer-stop to  
shadow-gap depth.



If necessary, use  
second run-up  
block for fitting  
on the frame.

Shorten buffer-stop to  
overlap height.

Frame hinge-bearing  
Frame hinge 16 / 50  
and/or 21 / 50



#### Installation of sash hinge 20 / 50 or 30 / 50

##### Drilling-jig adjustments

1. Spacers for shadow gap
2. Adjustment insert hinge fixing
3. Drilling insert frame/sash hinge-bearing  
If necessary, use second run-up  
block for fitting on the frame.

**profile related**  
**Arrow points**  
**to 50**  
**RW 20**  
**or RW 30**

##### Drill

4. Fold together the folding sash  
according to the diagram.
5. Drill with Ø 5 mm drill
  - in adjustment insert hinge fixing **A**
  - in drilling insert frame/sash  
hinge-bearing **RW 20**  
**and/or RW 30**

#### Installation of frame hinge 16 / 50 and/or 21 / 50

##### Drilling-jig adjustments

1. Spacers for shadow gap
2. Adjustment insert hinge fixing
3. Drilling insert frame/sash hinge-bearing  
If necessary, use second run-up  
block for fitting on the frame.

**4 mm**  
**Arrow points**  
**to 50**  
**F.h-b**

##### Drill

4. Place the frame side of the folding sash on the  
frame and align (observe the chamber dimension).
5. Drill with Ø 5 mm drill
  - in adjustment insert hinge fixing **B**
  - in drilling insert frame/sash  
hinge-bearing **F.h-b**



##### NOTE!

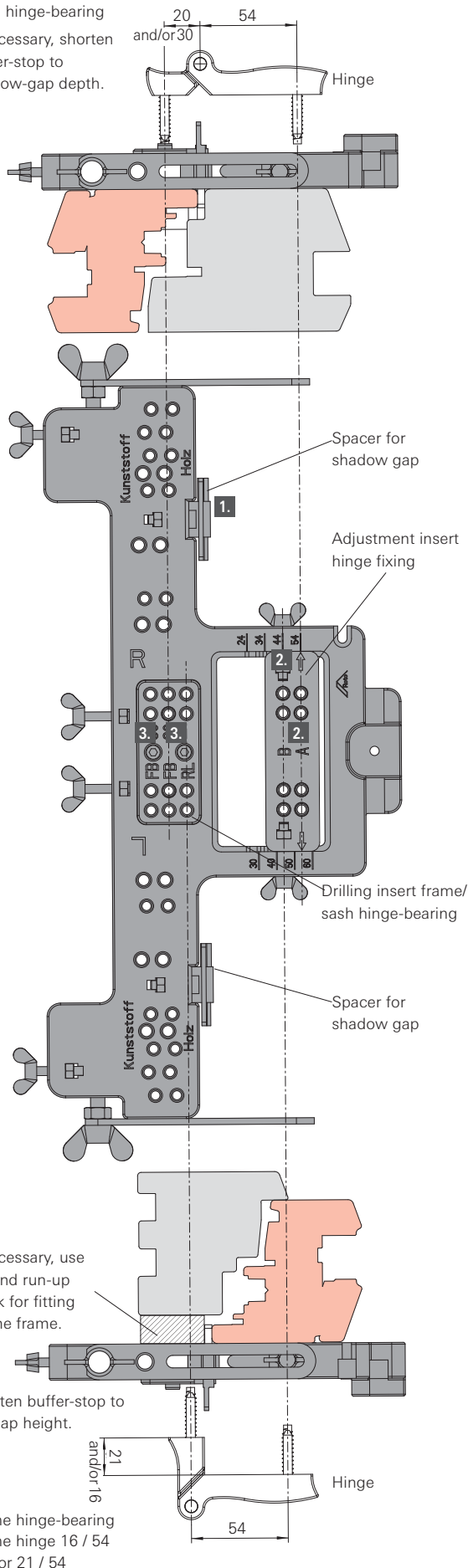
Drill sash hinges and frame hinges, same  
procedure with timber and PVC.



Sash hinge 20 / 54

Sash hinge-bearing

If necessary, shorten  
buffer-stop to  
shadow-gap depth.



## Installation of sash hinge 20 / 54 or 30 / 54



### Drilling-jig adjustments

1. Spacers for shadow gap
2. Adjustment insert hinge fixing
3. Drilling insert frame/sash hinge-bearing  
If necessary, use second run-up  
block for fitting on the frame.

profile related  
Arrow points  
to 50  
RW 20  
or RW 30

### Predrill:

4. Fold together the folding sash  
according to the diagram.

5. Drill with Ø 5 mm drill
  - in adjustment insert hinge fixing A
  - in drilling insert frame/sash  
hinge-bearing

RW 20  
and/or RW 30

## Installation of frame hinge 16 / 50 and/or 21 / 54

### Drilling-jig adjustments

1. Spacers for shadow gap
2. Adjustment insert hinge fixing
3. Drilling insert frame/sash hinge-bearing  
If necessary, use second run-up  
block for fitting on the frame.

4 mm  
Arrow points  
to 54  
RW 20

### Predrill:

4. Place the frame side of the folding sash on the frame  
and align (observe the chamber dimension).
5. Drill with Ø 5 mm drill
  - in adjustment insert hinge fixing B
  - in drilling insert frame/sash  
hinge-bearing

F.h-b



### NOTE!

Drill sash hinges and frame hinges, same  
procedure with timber and PVC.

## Installation

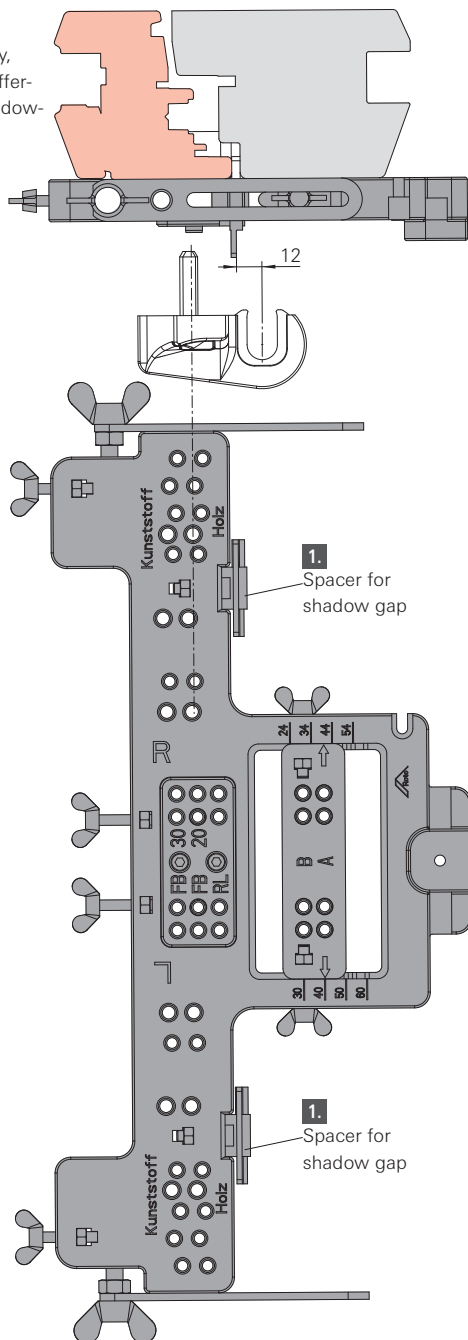
### Drilling and routing dimensions

#### Predrilling support bracket – Timber



#### 12 mm offset to shadow gap

If necessary, shorten buffer-stop to shadow-gap depth.



#### Predrilling of the support bracket

##### Drilling-jig adjustments

1. Adjust the spacers for shadow gap, shorten to shadow gap depth if necessary.

##### Predrill:

2. Predrilling of screws  $\varnothing$  5 mm, predrilling of pins  $\varnothing$  6 mm, according to the drilling-jig inscription (timber = 12 mm offset).

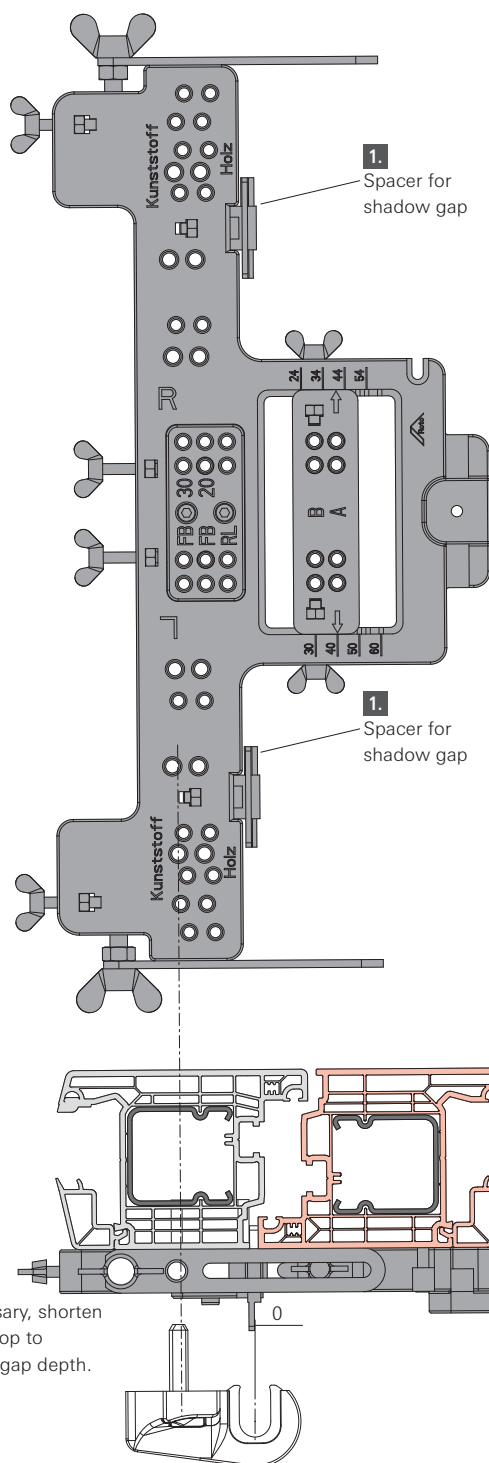


#### NOTE!

Observe the profile-specific installation instructions.



#### Centre of shadow gap



#### Predrilling of the support bracket

##### Drilling-jig adjustments

1. Adjust the spacers for shadow gap, shorten to shadow gap depth if necessary.

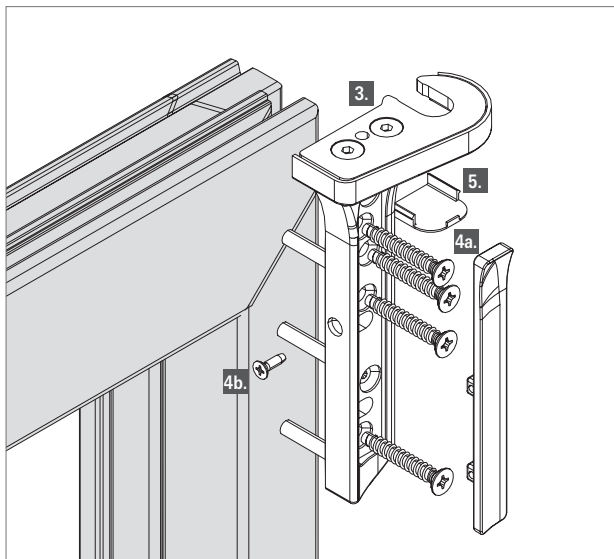
##### Predrill:

2. Predrilling of screws  $\varnothing$  5 mm, predrilling of pins  $\varnothing$  6 mm, according to the drilling-jig inscription (PVC = centre of shadow gap).



##### NOTE!

Observe the profile-specific installation instructions.

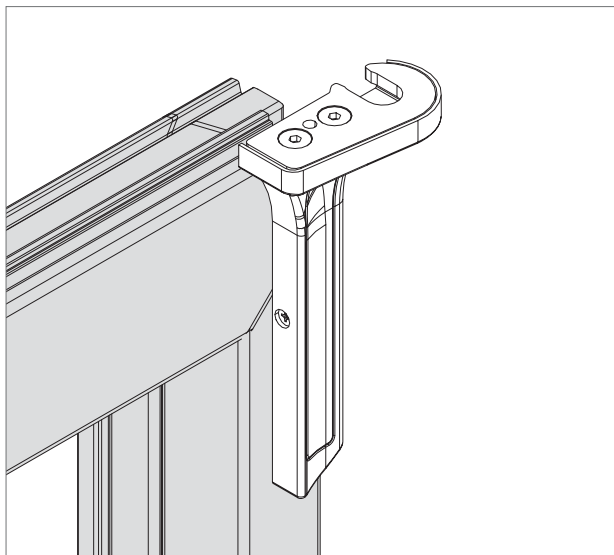


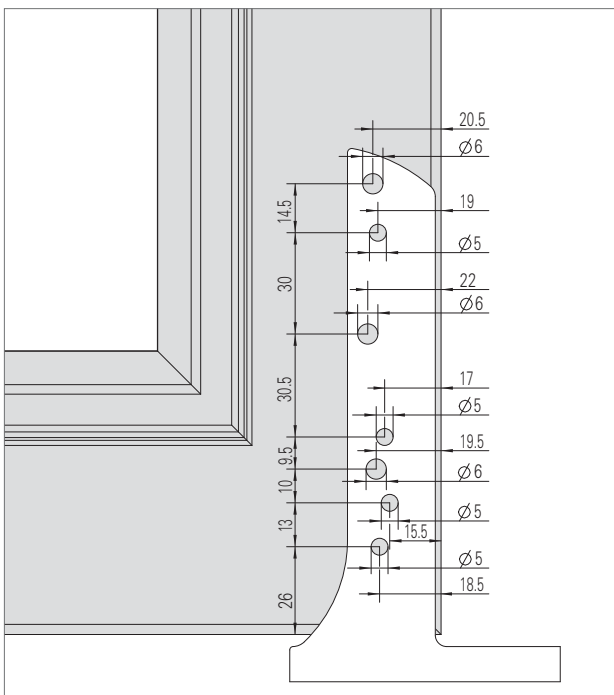
1. Move drilling jig with stop to initial position.
2. Carry out drillings with drilling jig (643365).
3. Mount the support bracket with Euro screws to the sash.
- 4a. Position the cover plate.
- 4b. Secure the cover plate with countersunk screw.
5. After installation of the bogies, clip on/insert the small cover cap.



#### NOTE!

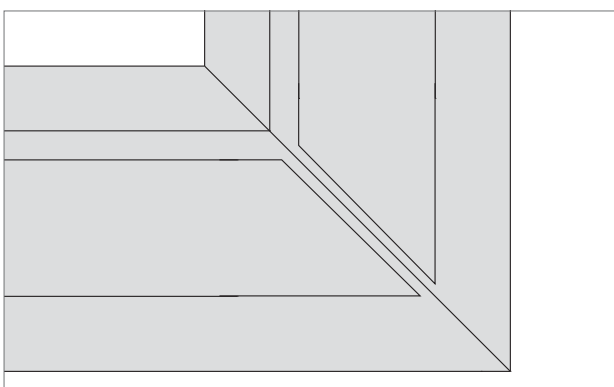
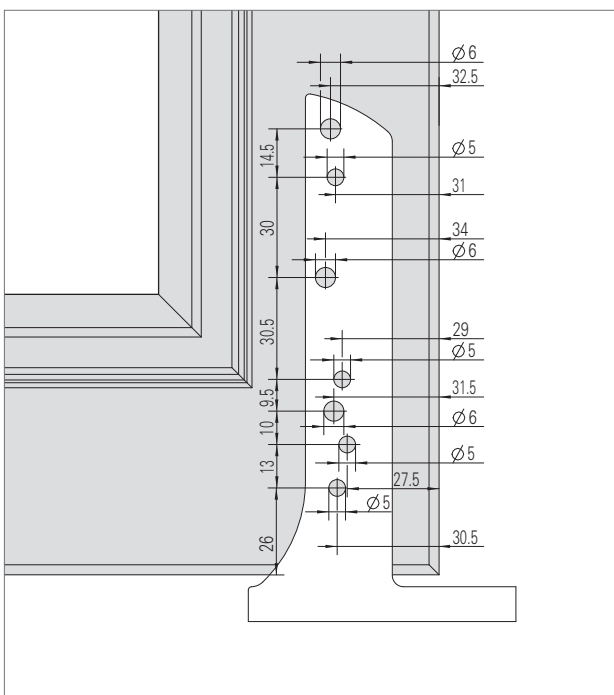
Seal the holes for the outer support brackets with suitable sealing compound to prevent the ingress of water.





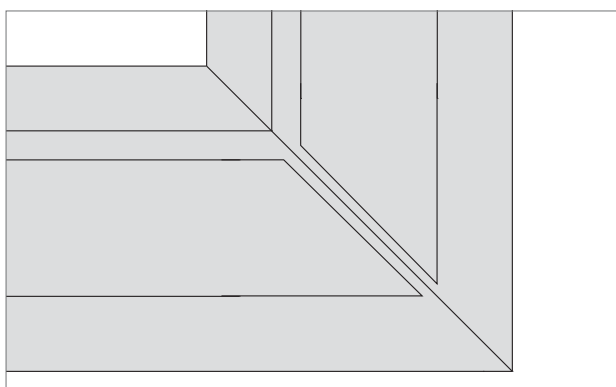
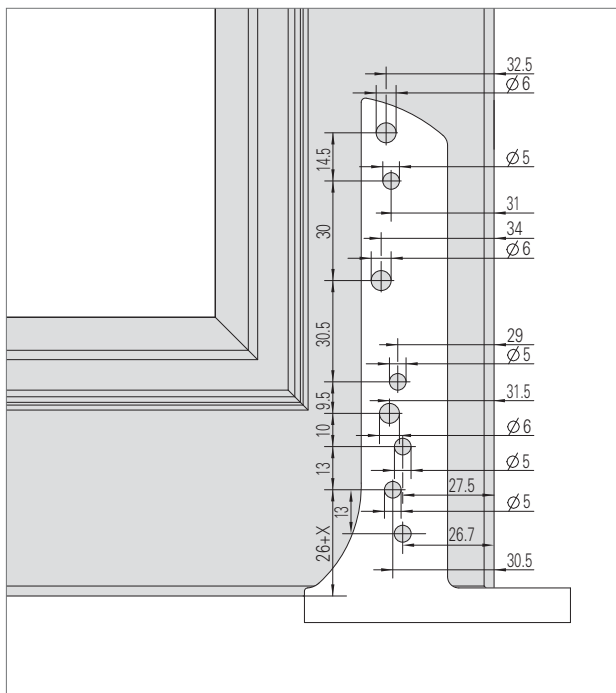
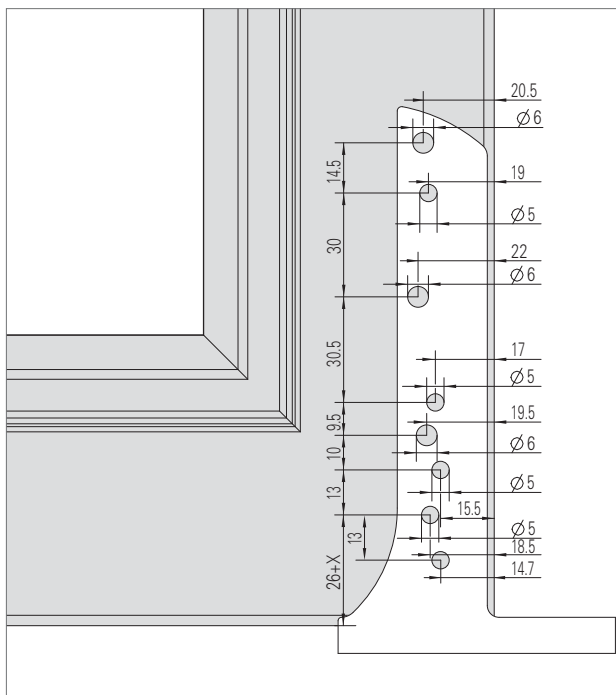
**NOTE!**

- Observe the profile-specific installation instructions, because some PVC profile systems must be drilled in timber position.
- Seal the holes for the outer support brackets with suitable sealing compound to prevent the ingress of water.



**NOTE!**

- In the area of the support brackets and/or the bogies, cut the reinforcements to mitre.



#### NOTE!

- Observe the profile-specific installation instructions, because some PVC profile systems must be drilled in timber position.
- Seal the holes for the outer support brackets with suitable sealing compound to prevent the ingress of water.
- Explanation of dimension "X", → page 49.
- Shorten the additional screw for the Euro-groove if necessary, if hardware is used in this area.



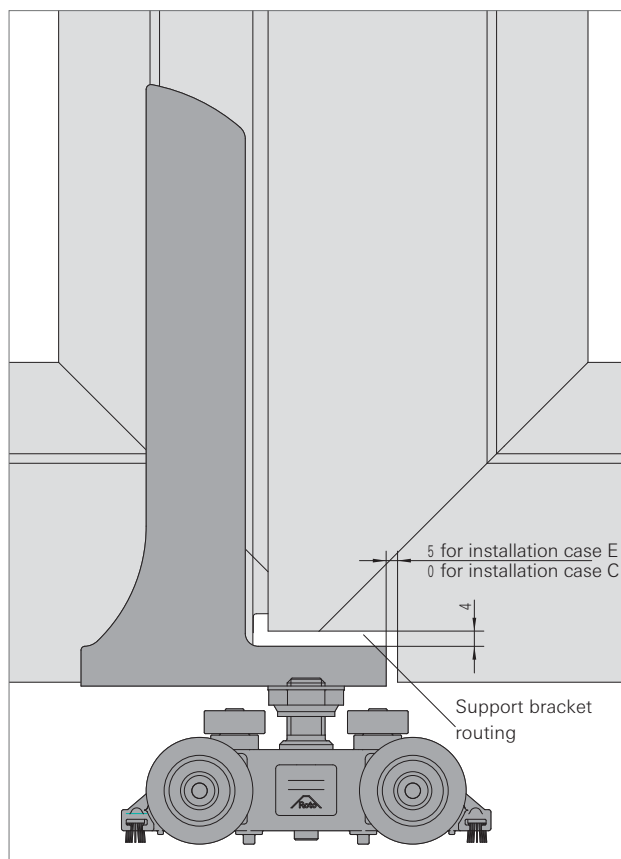
#### NOTE!

Shorten the additional screw for the Euro-groove if necessary, if hardware is used in this area.



#### NOTE!

In the area of the support brackets and/or the bogies, cut the reinforcements to mitre.



#### Punching on timber profiles

Punching is normally necessary on one sash.



DIAGRAM 330

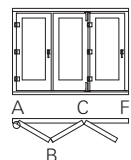
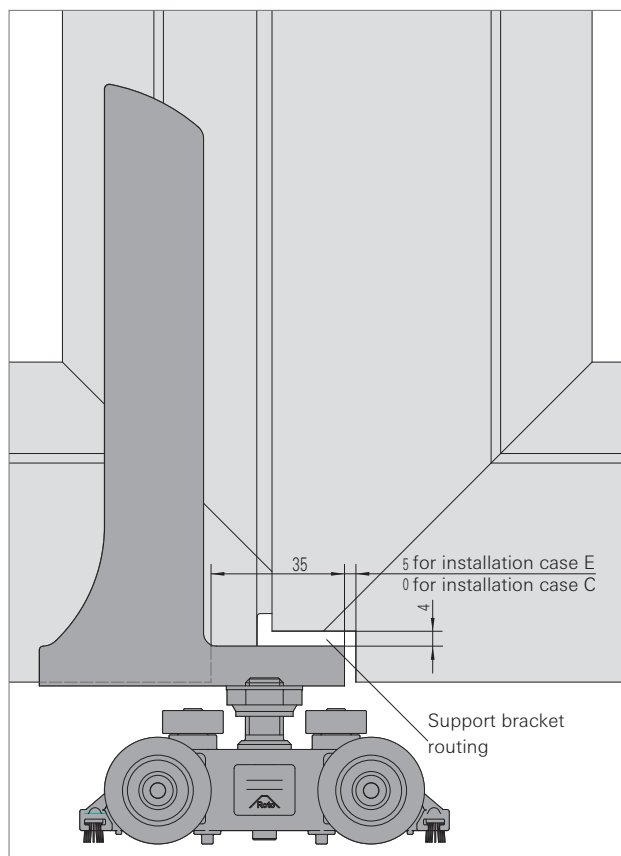
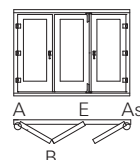


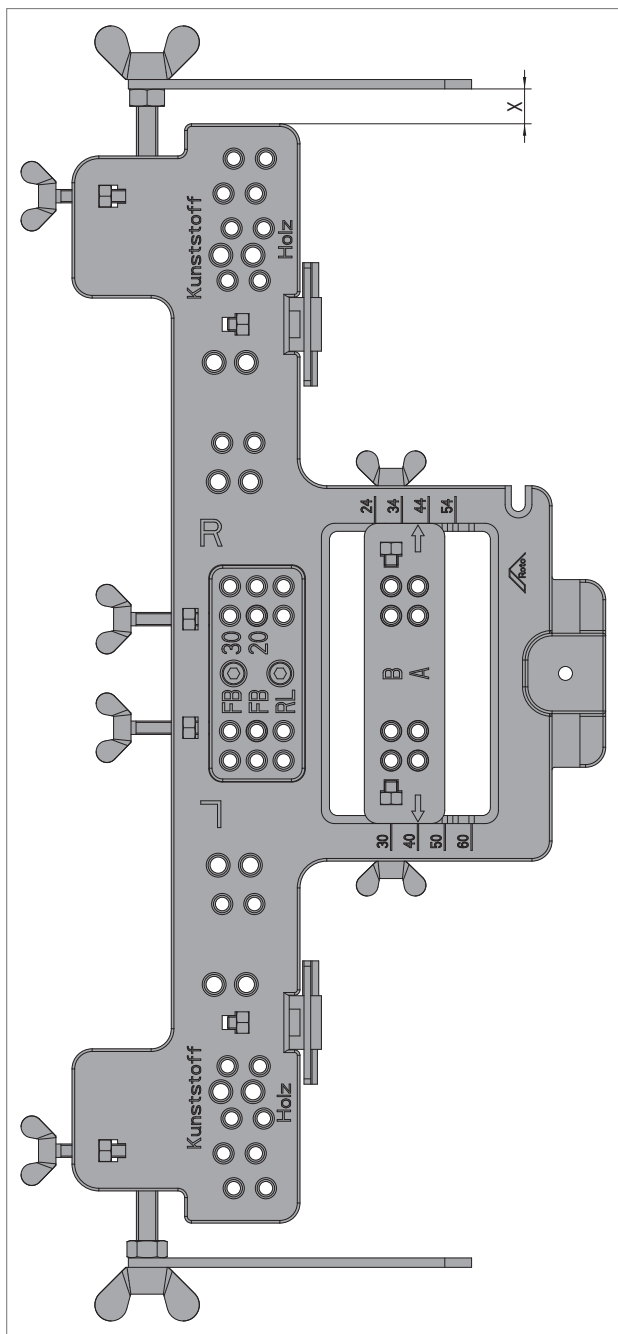
DIAGRAM 321



#### Punching on PVC profiles

Punching is normally necessary on both sashes.

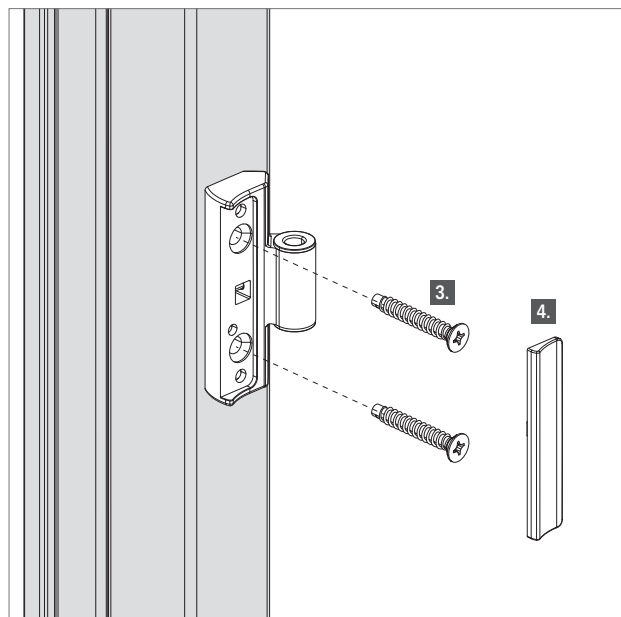




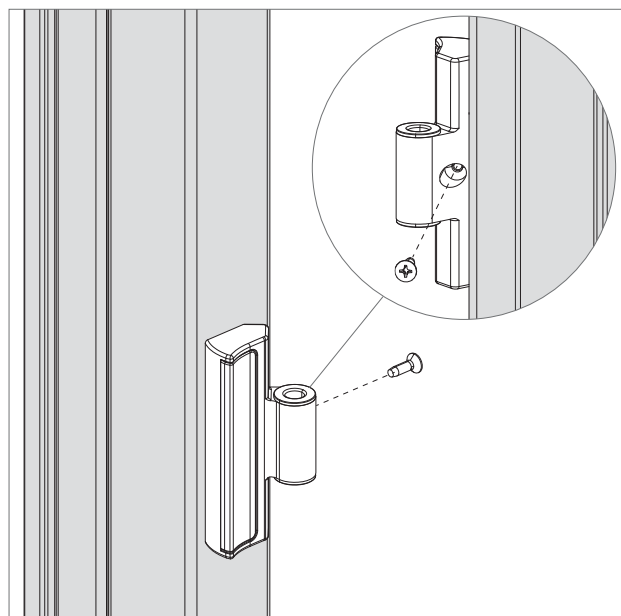
1. Determine the profile's overlap width.
2. Determine the reference dimension X  
(= overlap width - 7 mm)
3. Set the reference dimension X  
(e.g. with metre rule or slide gauge)
4. Place the drilling jig on the profile and push the stop to the sash edge. Fix the drilling jig.
5. Drills the holes.

#### Examples for dimension X with ...

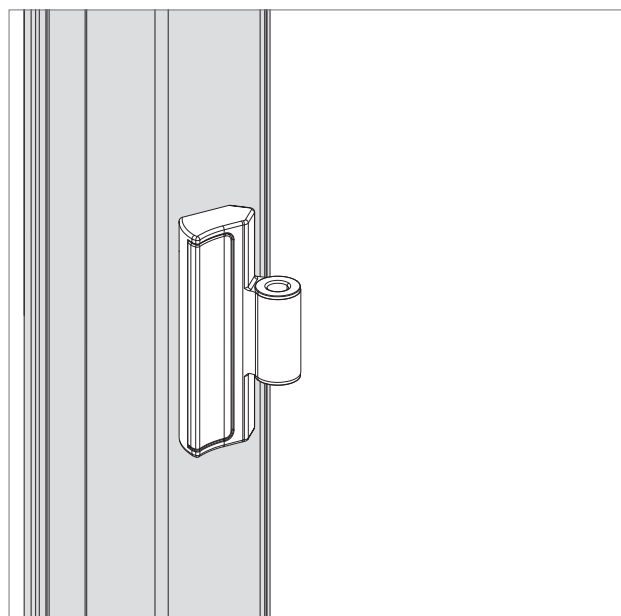
| Overlap width |   | Dimension X |
|---------------|---|-------------|
| 15            | = | 8           |
| 20            | = | 13          |
| 25            | = | 18          |



1. Fold together the folding sash according to the diagram, carry out the drillings for the sash hinge-bearing, then for the hinge-fixing insert and the support brackets with drilling jig (643365), not dep.
2. Push in the sash hinge-bearing (not dep.).
3. Screw-fix the sash hinge-bearing with Euro screws.
4. Position the cover plate.

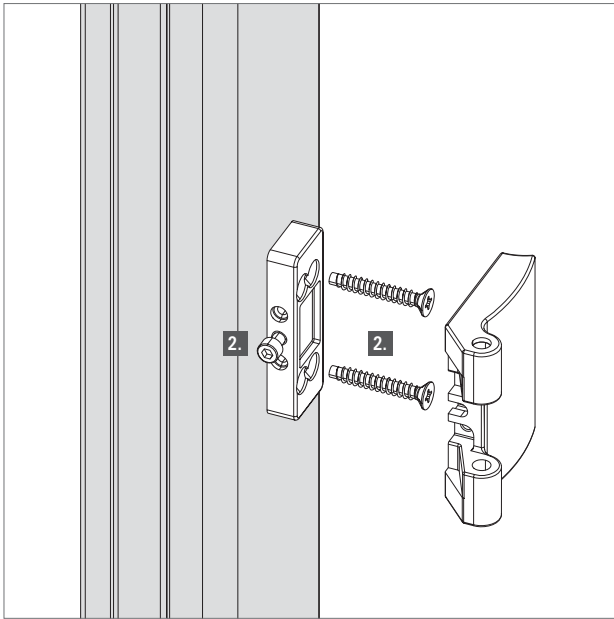


5. Secure the cover plate with countersunk screw.

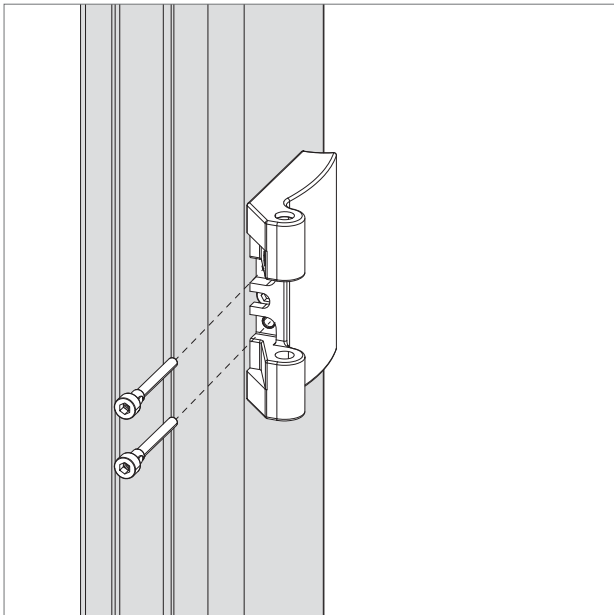


#### NOTE!

Seal the profile holes for the outer frame hinge-bearing and hinge-fixing inserts with suitable sealing compound to prevent the ingress of water.



1. Push in the hinge-fixing insert.
2. Fix with Euro screws and 4 mm cylinder screw.

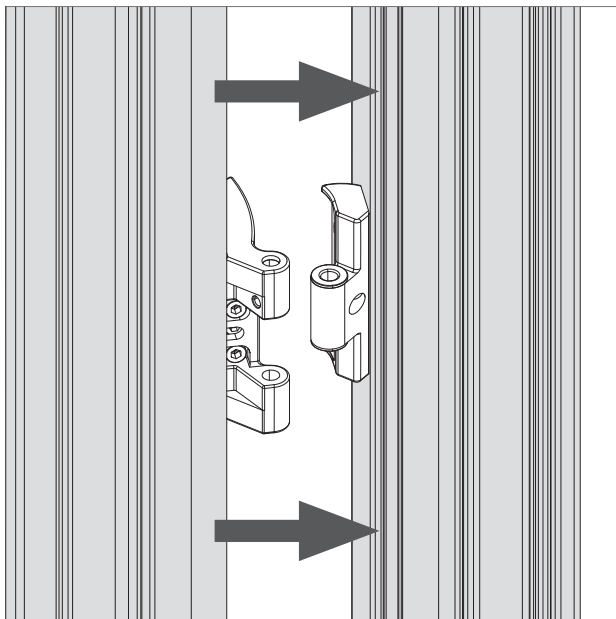


3. Put hinge 40 or hinge 50 on the hinge-fixing insert and fix with 4 mm cylinder screws.  
At the factory the hinge-fixing insert is designed with hinge 40 for 40 mm bolt axis or with hinge 50 for 50 mm bolt axis.



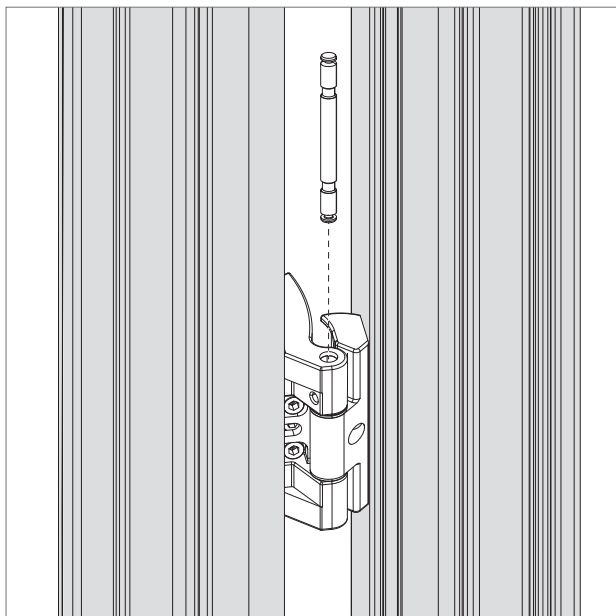
#### NOTE!

Seal the profile holes for the outer frame hinge-bearing and hinge-fixing inserts with suitable sealing compound to prevent the ingress of water.

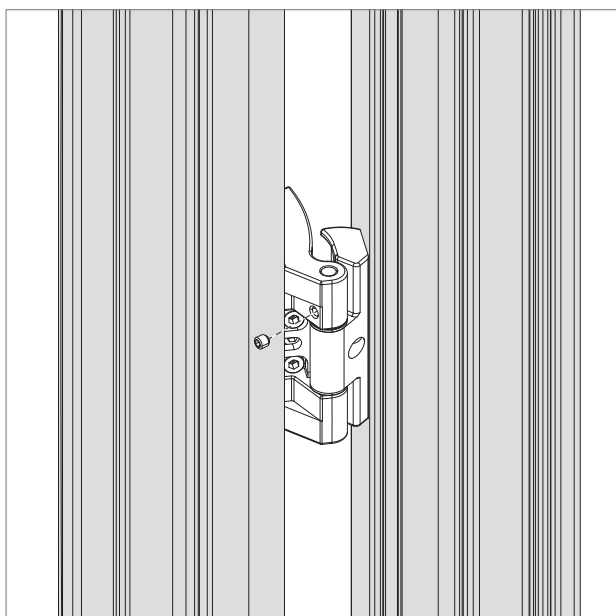


#### Installation and securing

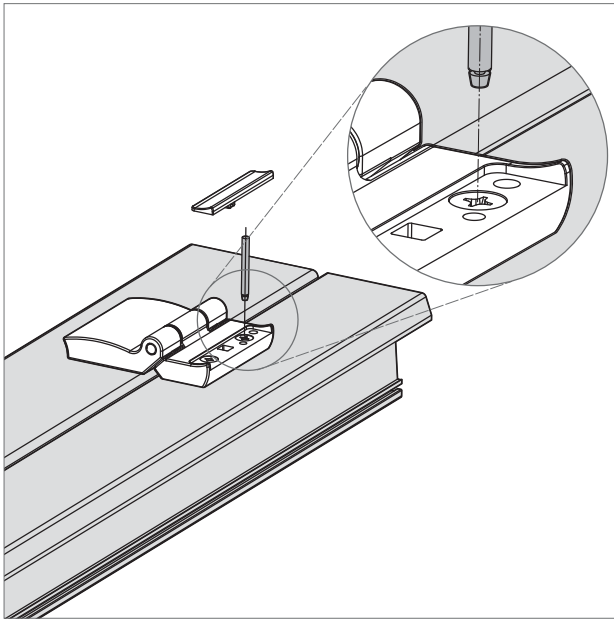
1. With the sash open, bring the hinge and bearing together.



2. Insert the cylindrical pin flush.



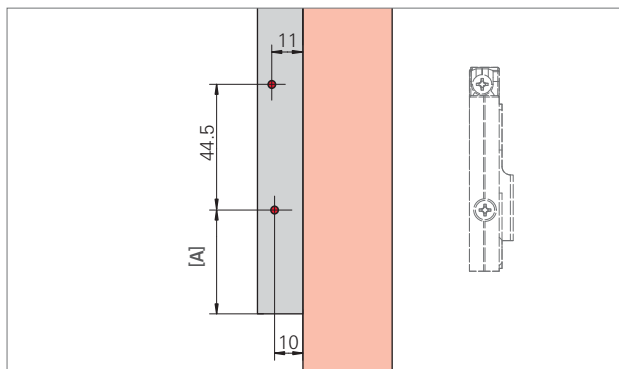
3. Secure the cylindrical pin with the size 2.5 bolt.  
Tightening torque: 5 Nm



#### Safeguarding outside

Secure the hinges in the outside area with a security pin (224749) to prevent unauthorised removal.

1. Open the sash.
2. Remove the countersunk screw and cover plate (→ page 50).
3. Close the sash.
4. Drive in the security pin into the screw head.
5. Break off the base of the pin.
6. Open the sash.
7. Position again the cover plate and screw-fix.



#### Drillings for timber rebate corner hinge

1. Drill the sash according to the illustration with  $\varnothing 3$  mm.

#### Dimensions not dep. Dimension [A]

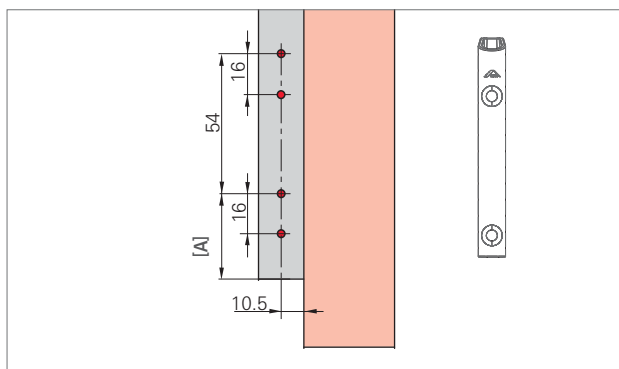
Overlap width

|    |      |
|----|------|
| 18 | 39.5 |
| 20 | 41.5 |

2. Fix the rebate corner hinge with 2 countersunk screws (A2).

#### Rebate corner hinge A – height and gasket-compression adjustable

| Version                  | Sash weight in kg | DIN | Material no.  |
|--------------------------|-------------------|-----|---------------|
| <b>12 / 18-19 groove</b> | 100               | L   | <b>447339</b> |
|                          |                   | R   | <b>447340</b> |
| <b>12 / 18-19</b>        | 100               | L   | <b>447341</b> |
|                          |                   | R   | <b>447342</b> |
| <b>12 / 18-13 groove</b> | 100               | L   | <b>447353</b> |
|                          |                   | R   | <b>447354</b> |
| <b>12 / 20-9 groove</b>  | 100               | L   | <b>447347</b> |
|                          |                   | R   | <b>447348</b> |
| <b>12 / 20-9</b>         | 100               | L   | <b>447349</b> |
|                          |                   | R   | <b>447350</b> |
| <b>12 / 20-13</b>        | 100               | L   | <b>447357</b> |
|                          |                   | R   | <b>447358</b> |



#### Drillings for PVC corner hinge – low tilting axis

1. Drill the sash according to the illustration and the table with  $\varnothing 3$  mm.

#### Dimensions not dep. Dimension [A]

Overlap width

|    |      |
|----|------|
| 18 | 40.5 |
| 20 | 42.5 |
| 21 | 43.5 |
| 22 | 44.5 |

2. Fix the corner hinge K3/100 (230343) with 2 countersunk screws (A2).



#### Bottom running

| A coverage        | Dimension Y | Dimension Y |
|-------------------|-------------|-------------|
| Overlap clearance | Bottom      | Top         |
| 6                 | 3           | 9.5         |
| 7                 | 4           | 10.5        |
| 8                 | 5           | 11.5        |
| 9                 | 6           | 12.5        |
| 10                | 7           | 13.5        |
| 11                | 8           | 14.5        |

#### Top running

| A coverage        | Dimension Y | Dimension Y |
|-------------------|-------------|-------------|
| Overlap clearance | Bottom      | Top         |
| 6                 | 9.5         | 12          |
| 7                 | 10.5        | 13          |
| 8                 | 11.5        | 14          |
| 9                 | 12.5        | 15          |
| 10                | 13.5        | 16          |
| 11                | 14.5        | 17          |

1. Carry out the frame drillings for the roll-supports (2 drillings per metre for roller track and 1 per metre for guide track), with drilling jig (314417) and screw-fix the rollers.

2. Drillings for guide track:  
Drilling jig for narrow track

Drillings for roller track:  
Drilling jig for broad track

3. Cut the bottom roller track to size:  
Size = Frame external width - 6 mm

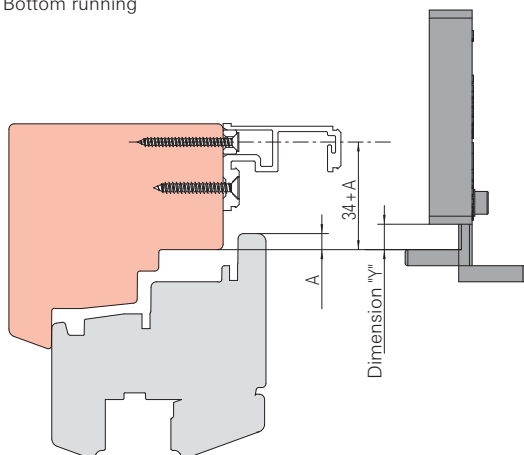
4. Cut the guide track to size:  
Size = Total width

5. Place the roller tracks on the rollers from the top and slide them in place according to the illustration.

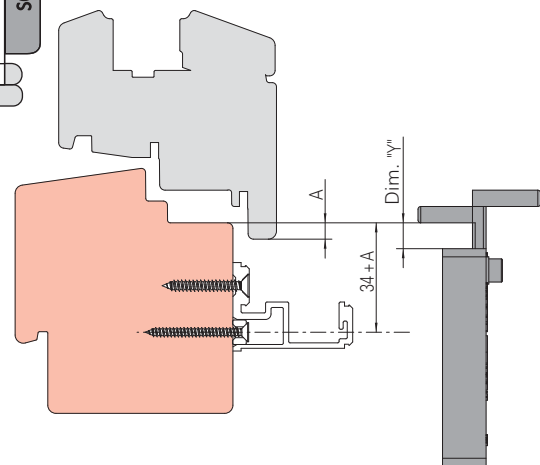
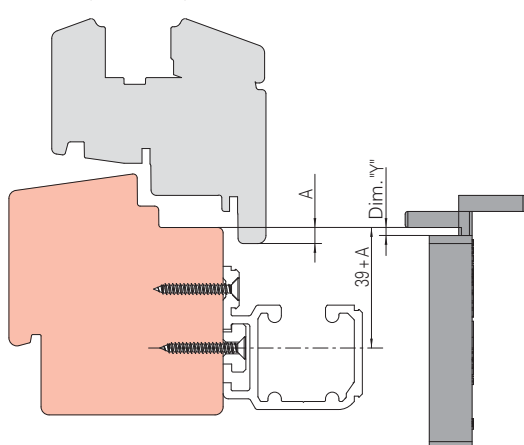
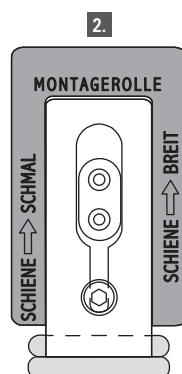
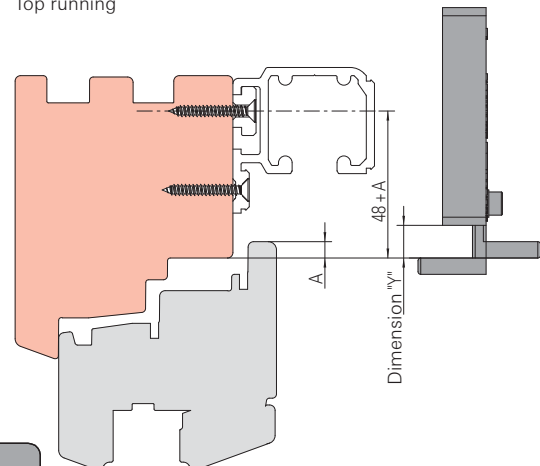
6. Predrill the mounting holes Ø 3 mm.

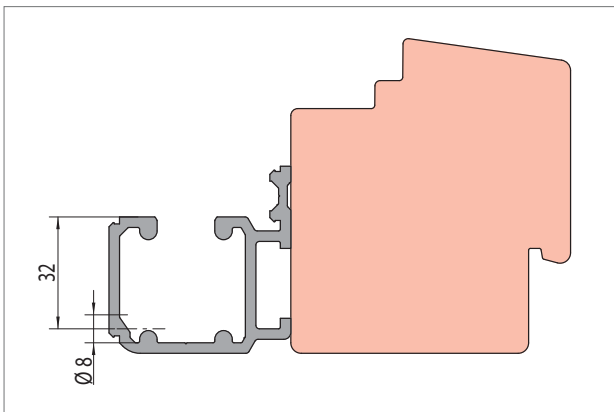
7. Screw-fix the tracks.

Bottom running



Top running



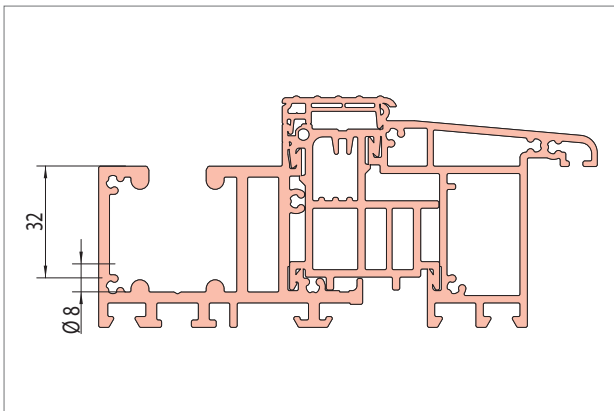


If the roller track is used outdoors, 8 mm holes must be made at 300 mm intervals in order to remove water.



#### NOTE!

Do not damage the roller track while drilling.  
Deburr the holes and clean the running surfaces of the bogie after drilling.

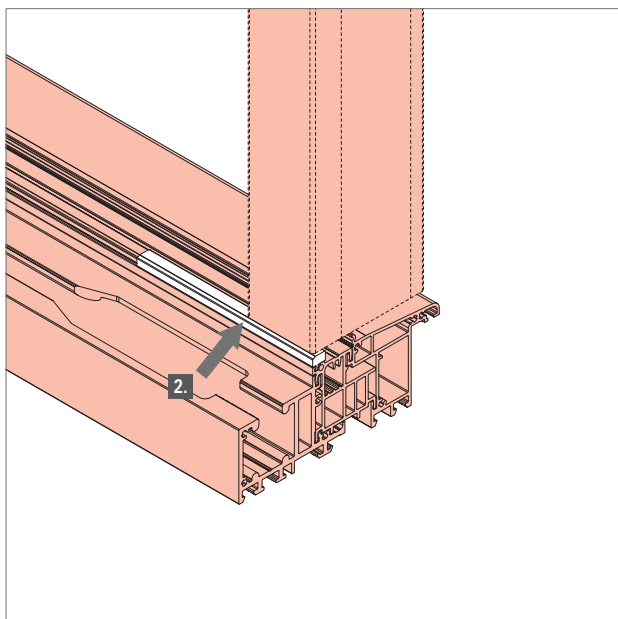


If the enhanced threshold is used outdoors, 8 mm holes must be made at 300 mm intervals in order to remove water.



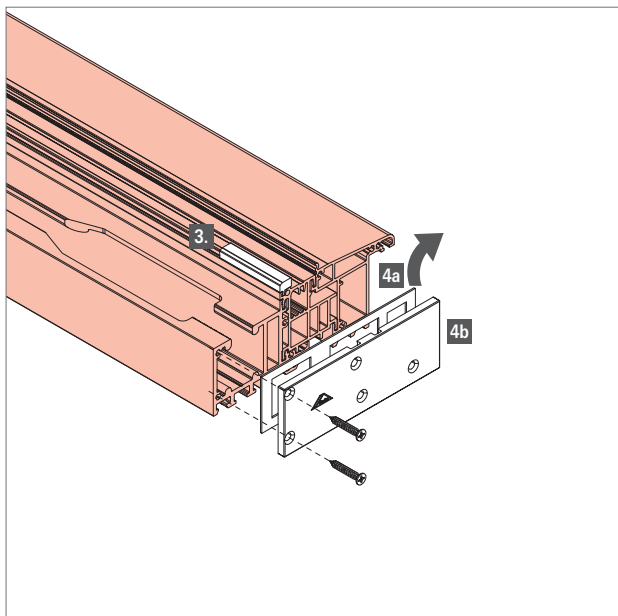
#### NOTE!

Do not damage the roller track while drilling.  
Deburr the holes and clean the running surfaces of the bogie after drilling.



1. Cut the enhanced threshold to the required length, making sure that the cut edge is clean.

2. Cut the TB adapter profile (548528) to the width of the profile.



3. Insert the cut TB adapter profile (548528).

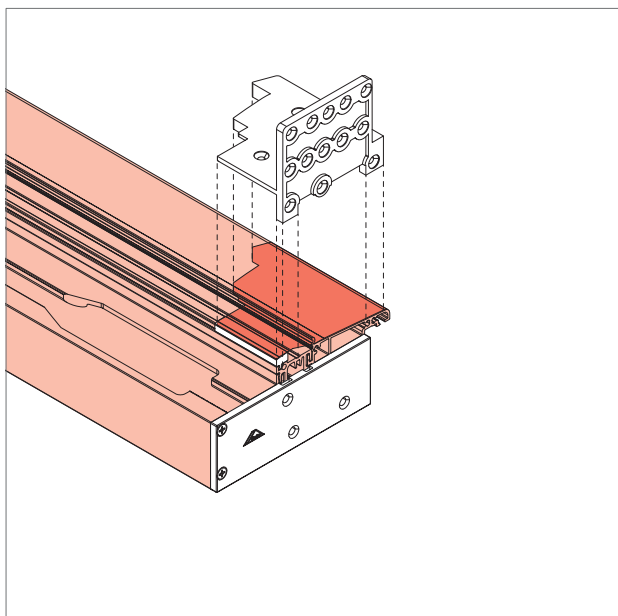
4a Pull off the adhesive film on the cover cap before placing it onto the threshold.

4b Secure the cover cap.

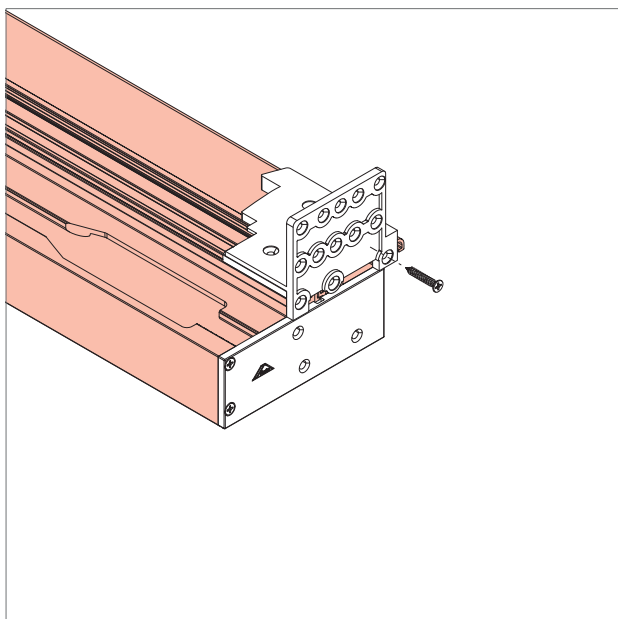


#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.



5. Seal the surface on the threshold before installing the threshold bracket with a suitable sealing compound to prevent the ingress of water.

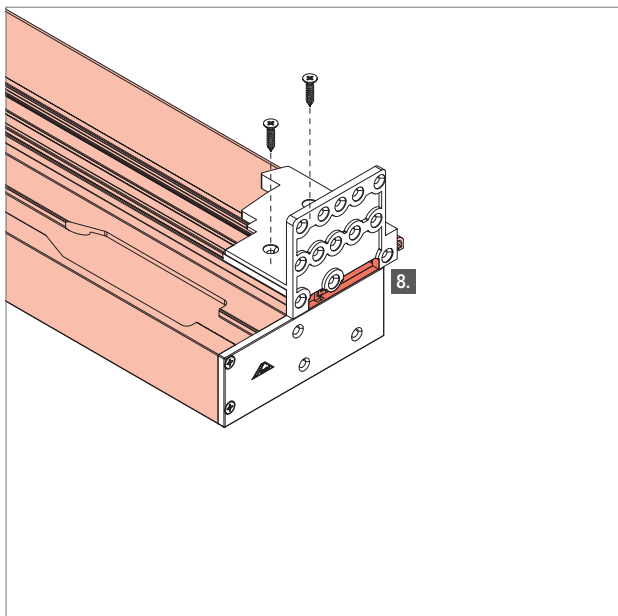


6. Secure the threshold bracket.



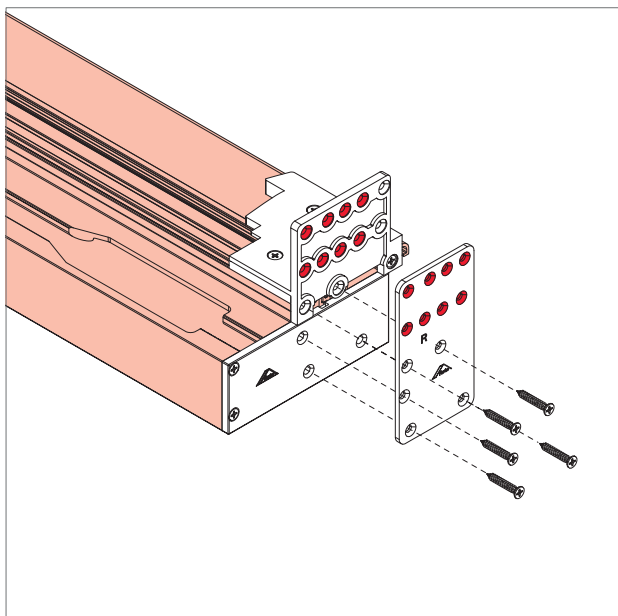
#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.



7. Recommendation: Self-tapping screws (choice on site) ISO 7050 – ST 4.2 x ... – C – Z, stainless steel A2

8. Seal the gap between the threshold bracket and cover cap with a suitable sealing compound to prevent the ingress of water.



9. Fix the threshold bracket with self-tapping screws 4.2 x 25.



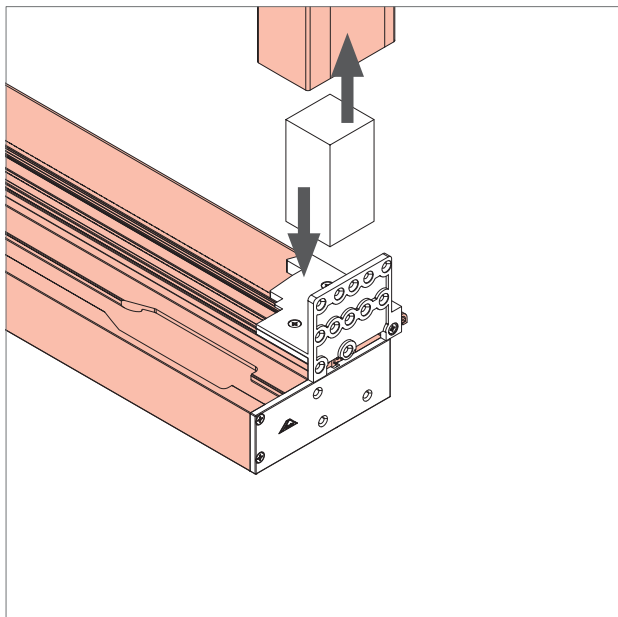
#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.



#### NOTE!

When ordering profile-specific threshold brackets, pay attention to the screw positions (see red identifier) to the corner connector of the enhanced threshold.

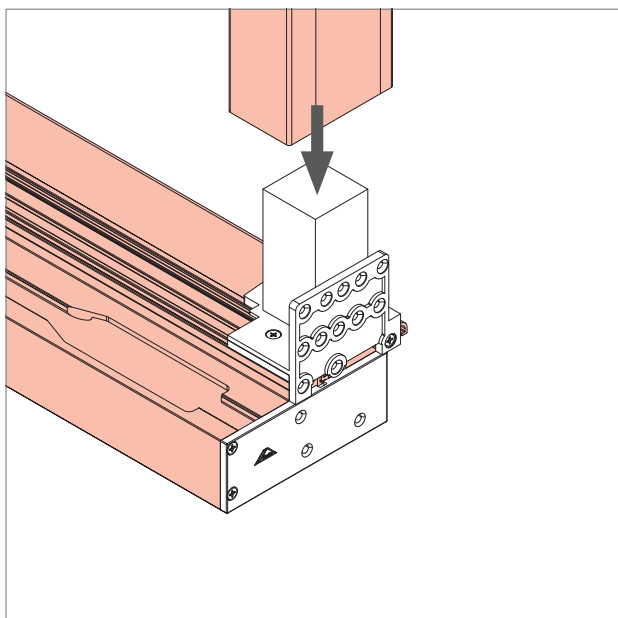


10. Cut the profile stabiliser (e.g. made of solid PVC) to match the frame profile.



#### NOTE!

Profile stabiliser only required with PVC profiles.



11. Insert profile stabiliser and screw it securely to the enhanced threshold.



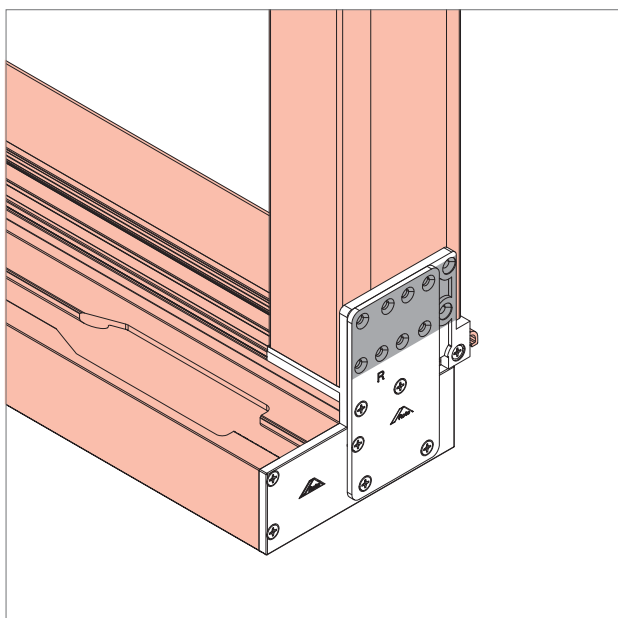
#### NOTE!

Profile stabiliser only required with PVC profiles.



#### NOTE!

Coordinate the length of the screws to the on-site conditions.

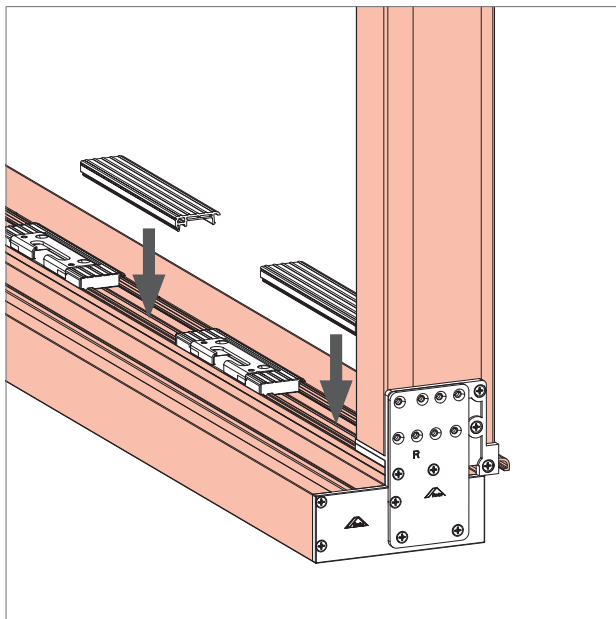


12. Secure the frame.  
Recommendation: Self-tapping screws (choice on site)  
ISO 7050 – ST 4.2 x ... – C – Z, stainless steel A2



#### NOTE!

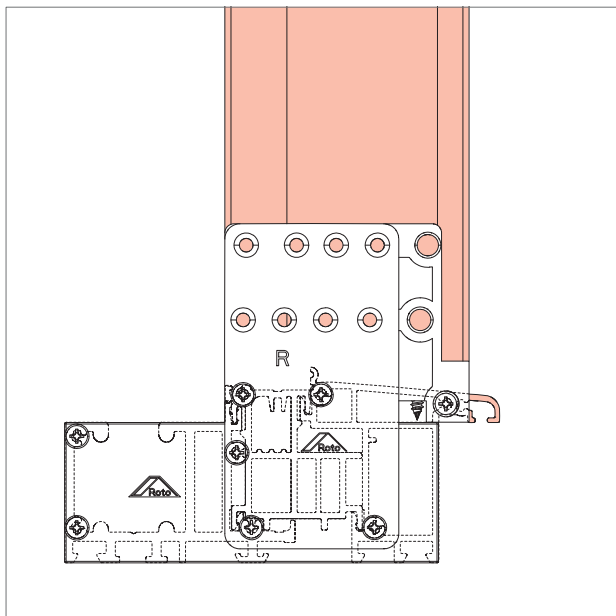
Coordinate the length of the screws to the on-site conditions.  
Generally, screw into the reinforcement.



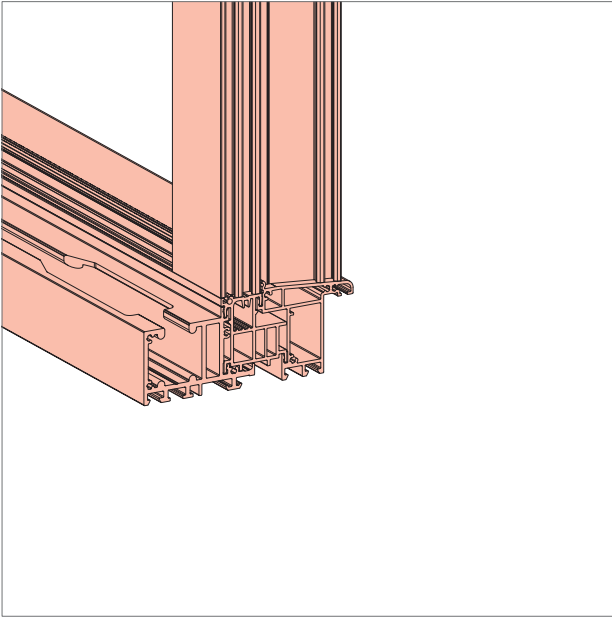
13. Position and secure the strikers according to the locking cams of central locking system.



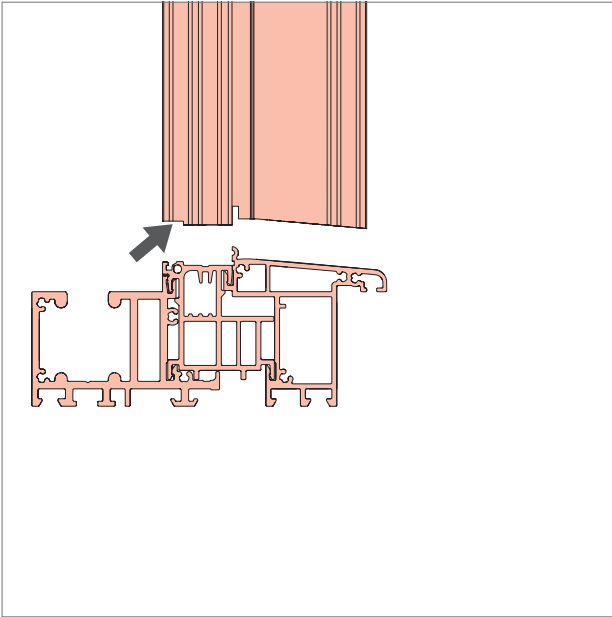
14. Cut the profile cover to size and clip it into place.



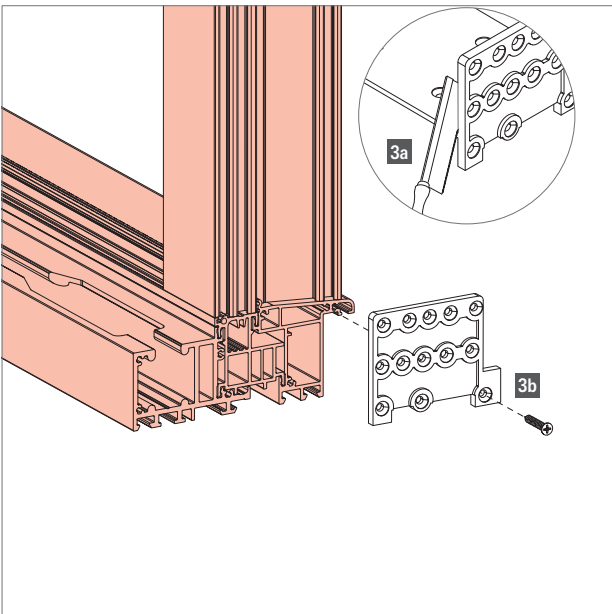
Ensure installation flush with the edge.



1. Cut the enhanced threshold to the required length, making sure that the cut edge is clean.



2. Frame counter-rotated, adapted to the enhanced threshold BKV Eifel TB

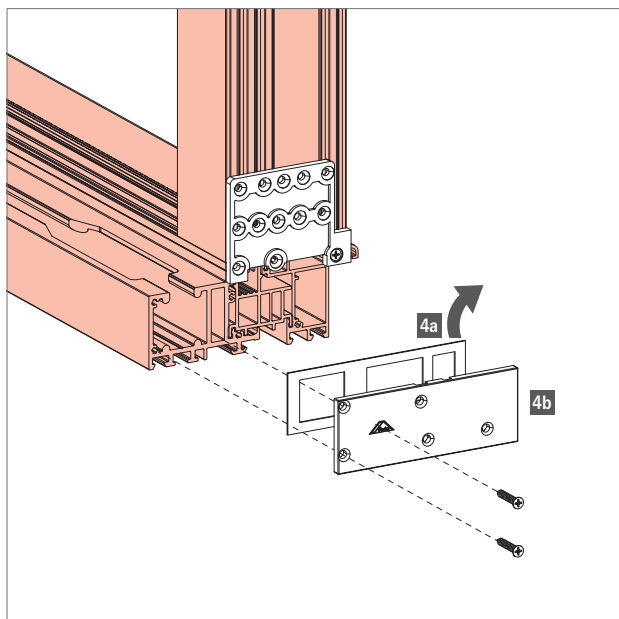


- 3a Cut the base plate of the threshold bracket to length.
- 3b Secure the shortened threshold bracket as a spacer.



#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.



- 4a** Pull off the adhesive film on the cover cap before placing it onto the threshold.

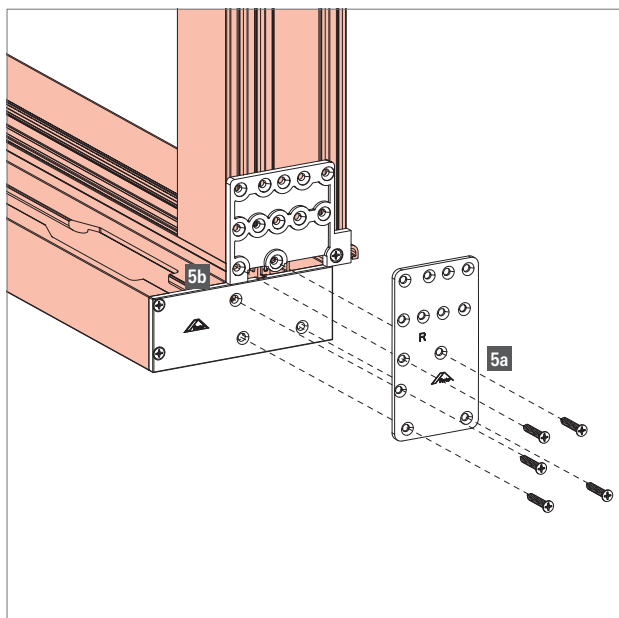


- 4b** Secure the cover cap.



#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.



- 5a** Secure the threshold bracket with self-tapping screws.

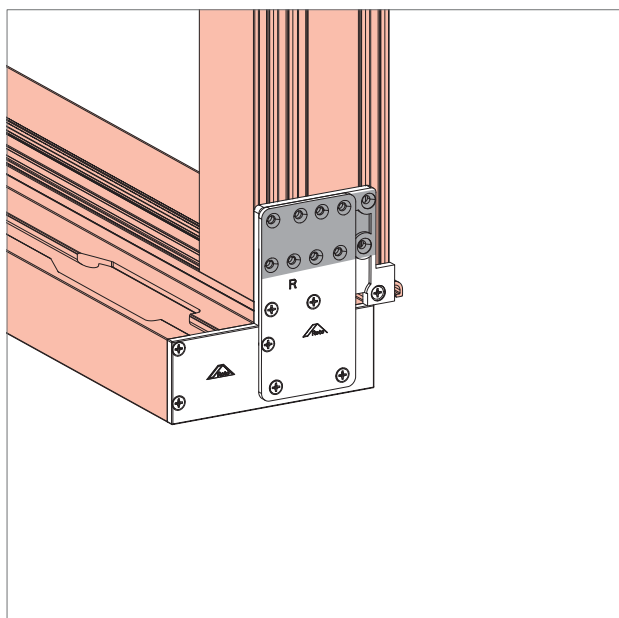


#### NOTE!

The screws shown are in the misc. small components pack of the enhanced threshold.

- 5b**

Seal the relevant surfaces.



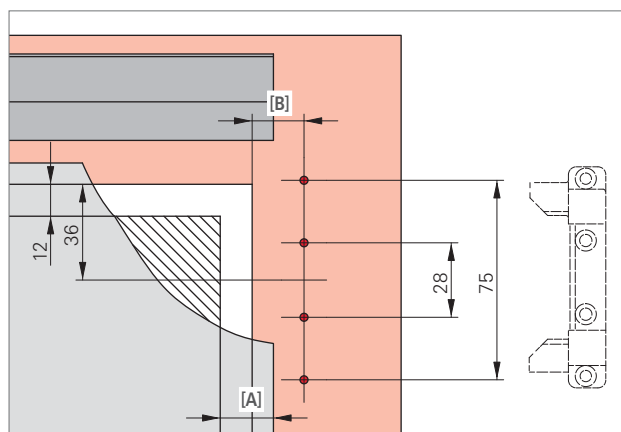
- 6.** Secure the frame.

Recommendation: Self-tapping screws (choice on site)  
ISO 7050 – ST 4.2 x ... – C – Z, stainless steel A2



#### NOTE!

Harmonise the length of the screws to the conditions at the installation site.  
Generally, screw into the reinforcement.



#### Drillings for timber stay bearing

1. Drill the frame according to the illustration and the table.

| Dimension [A] | Dimension [B] |
|---------------|---------------|
| Overlap width |               |
| 18            | 17.5          |
| 20            | 19.5          |



#### NOTE!

Use of stay bearing A in this context only up to a sash weight of max. 100 kg.

2. Fix the stay bearing with 4 countersunk screws (A2).

#### Stay bearing A

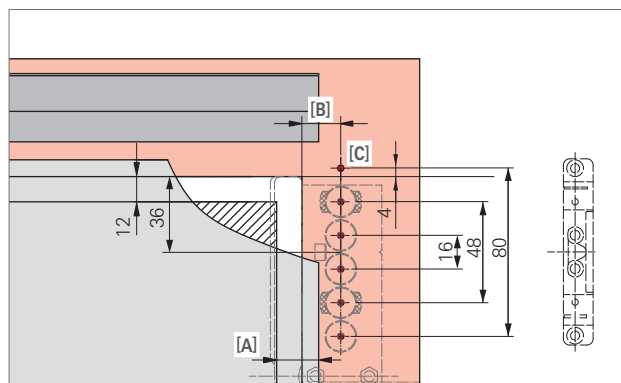
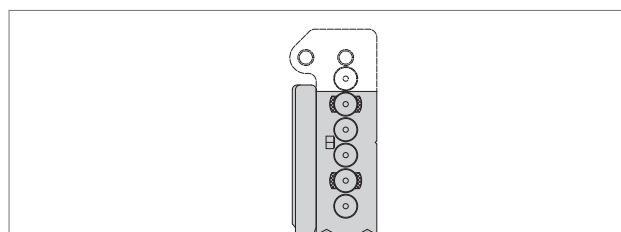
| Version    | Sash weight in kg | DIN   | Material no. |
|------------|-------------------|-------|--------------|
| 12 / 18-9  | 100               | L / R | 245709       |
| 12 / 20-9  | 100               | L / R | 245714       |
| 12 / 18-13 | 100               | L / R | 245709       |
| 12 / 20-13 | 100               | L / R | 245714       |

#### Drillings for PVC stay bearing

#### Jig for stay bearing and pivot rest

230727

1. Cut the drilling jig on top to the same height as the stop according to the illustration.



2. Position the drilling jig and drill the frame according to the illustration and the table with Ø 3 mm.

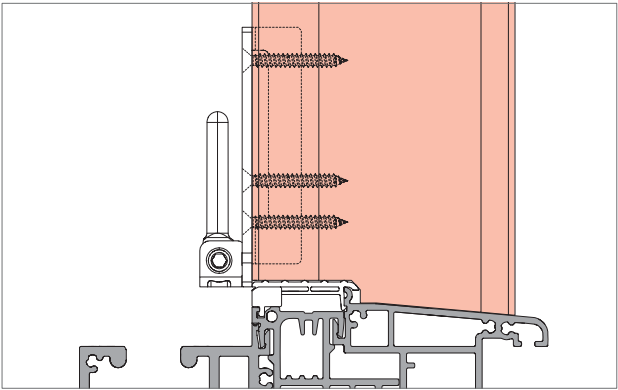
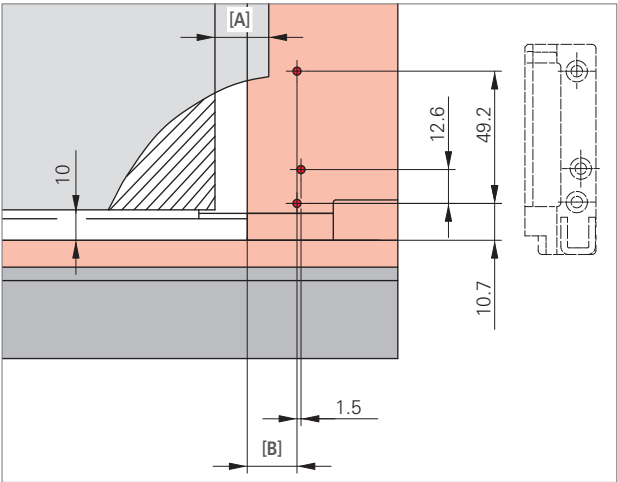
| Dimension [A] | Dimension [B] |
|---------------|---------------|
| Overlap width |               |
| 18            | 16.5          |
| 20            | 18.5          |
| 21            | 19.5          |
| 22            | 20.5          |



#### NOTE!

5 drillings using the drilling jig, 1 drilling [C] by hand.

3. Fix the stay bearing K3/100 (230177) with 4 countersunk screws (A2).



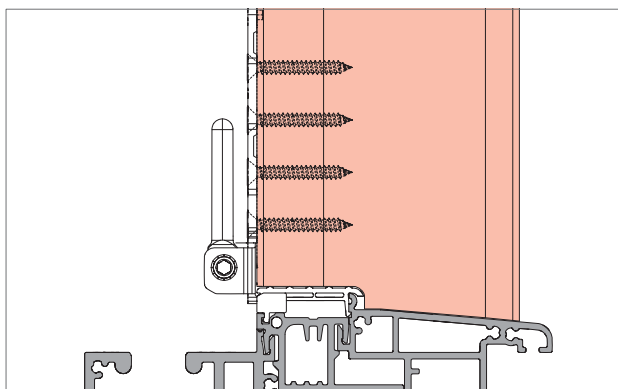
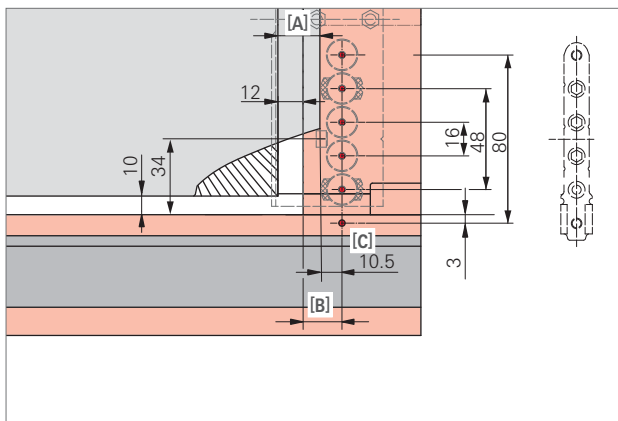
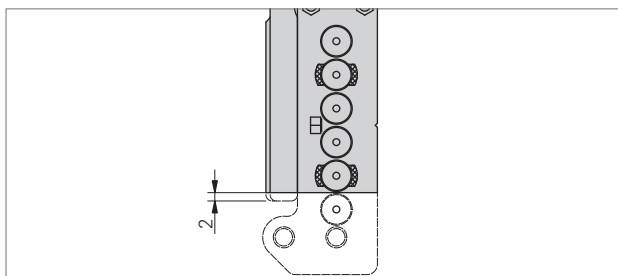
Drillings for timber pivot rest

1. Drill the frame according to the illustration and the table.

| Dimension [A] | Dimension [B] |
|---------------|---------------|
| Overlap width |               |
| 18            | 17.5          |
| 20            | 19.5          |

2. Fix the pivot rest with 3 countersunk screws (A2).

| Pivot rest A |                   |     |              |
|--------------|-------------------|-----|--------------|
| Version      | Sash weight in kg | DIN | Material no. |
| 12 / 18-9    | 100               | L   | 261910       |
|              | 100               | R   | 261911       |
| 12 / 20-9    | 100               | L   | 262004       |
|              | 100               | R   | 262005       |
| 12 / 18-13   | 100               | L   | 261910       |
|              | 100               | R   | 261911       |
| 12 / 20-13   | 100               | L   | 262004       |
|              | 100               | R   | 262005       |



#### Drillings for PVC pivot rest – low tilting axis

#### Jig for stay bearing and pivot rest

230727

1. Cut the drilling jig on the bottom to the same height as the stop according to the illustration.



#### NOTE!

Shorten the stop by 2 mm, since the bottom clearance is 10 mm.

2. Position the drilling jig and drill the frame according to the illustration and the table with Ø 3 mm.

#### Dimension [A] Dimension [B]

Overlap width

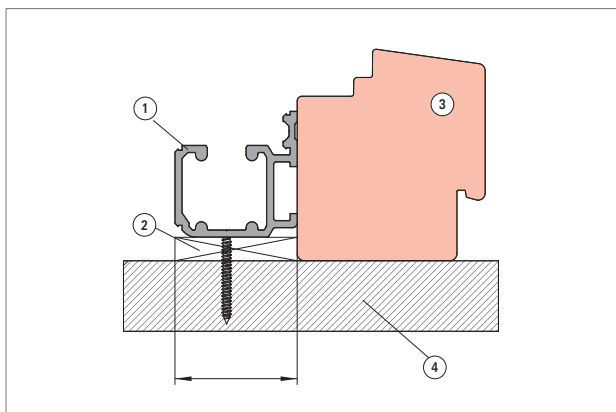
| Dimension [A] | Dimension [B] |
|---------------|---------------|
| 18            | 16.5          |
| 20            | 18.5          |
| 21            | 19.5          |
| 22            | 20.5          |



#### NOTE!

5 drillings using the drilling jig, 1 drilling [C] by hand.

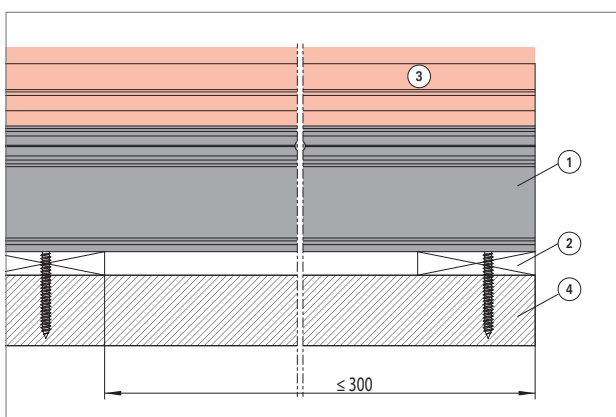
3. Fix the pivot rest K3/100 (306662) with 4 counter-sunk screws (A2).



Put down a pressure-resistant packer over the complete width of the roller track.



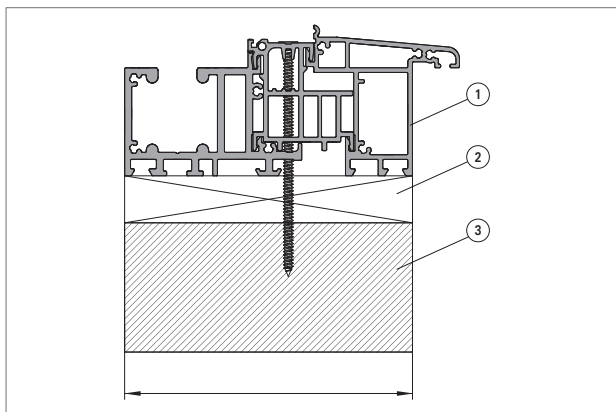
- ① Roller track
- ② Packer
- ③ Frame
- ④ Floor



Packer along the complete length of the roller track, but at least every 300 mm out from the corner.

Screw the roller track onto the floor through the packer at least every 300 mm.

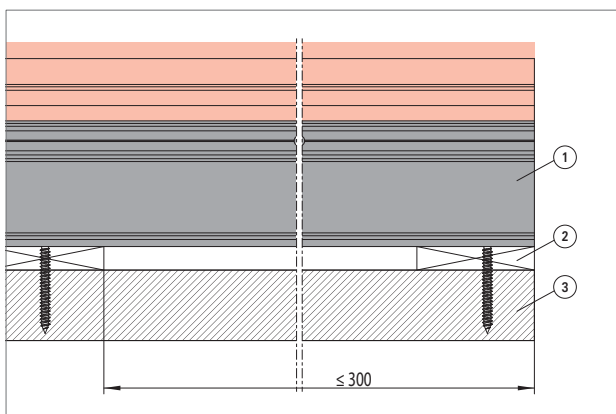
- ① Roller track
- ② Packer
- ③ Frame
- ④ Floor



Put down a pressure-resistant packer over the complete width of the enhanced threshold.

Pre-drill the screw position / rawlplug position with max. Ø 10 mm. Coordinate the screw length and screw diameter at the installation site.

- ① Enhanced threshold
- ② Packer
- ③ Floor



Packer along the complete length of the enhanced threshold, but at least every 300 mm out from the corner.

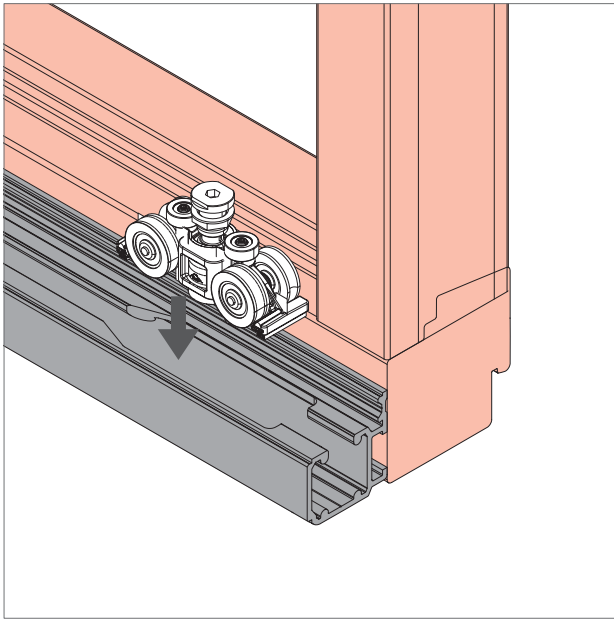
Screw the enhanced threshold onto the floor through the packer at least every 300 mm.

- ① Enhanced threshold
- ② Packer
- ③ Floor



#### NOTE!

Maximum permitted unevenness of the entire enhanced threshold  $\pm 1$  mm.

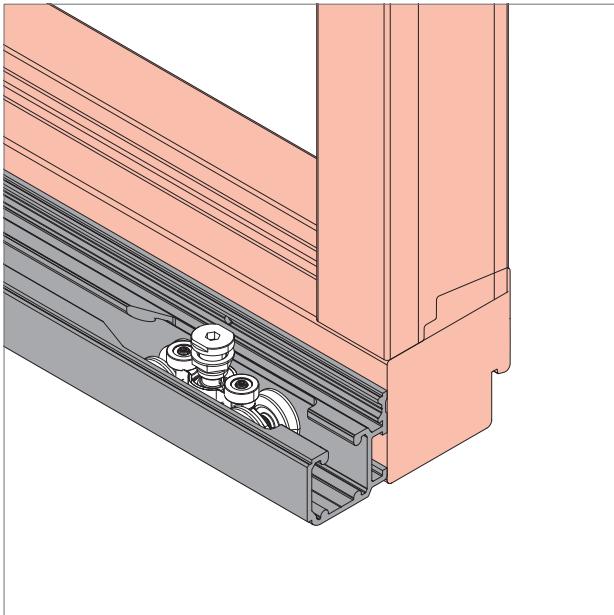


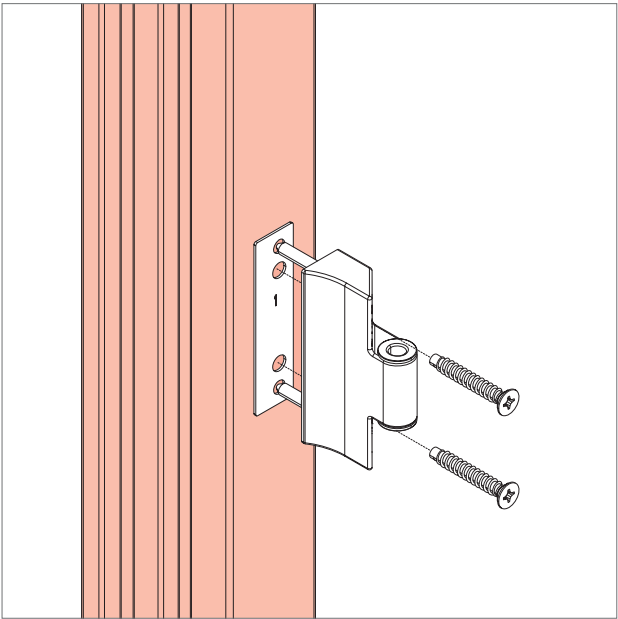
1. Insert bogie into the opening provided in the roller track.



#### NOTE!

The procedure with the bogie for the enhanced threshold is identical.





**Installing the frame hinge-bearing**

1. Place the frame side of the folding sash on the frame and align (observe the chamber dimension) and carry out the drillings for the frame hinge with drilling jig (643365) (not dep.)
2. Define the number of required spacers for the frame hinge-bearing according to the table.



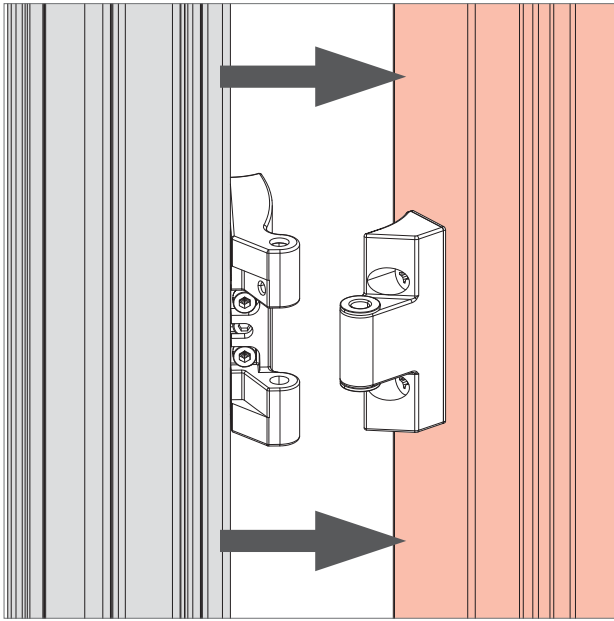
**Quantity of spacers required**

| Frame hinge | Overlap height OH | Number of spacers |      |
|-------------|-------------------|-------------------|------|
|             |                   | 1 mm              | 2 mm |
| 16          | 16                | –                 | –    |
|             | 17                | 1                 | –    |
|             | 18                | –                 | 1    |
|             | 19                | 1                 | 1    |
|             | 20                | –                 | 2    |
| 21          | 21                | –                 | –    |
|             | 22                | 1                 | –    |
|             | 23                | –                 | 1    |
|             | 24                | 1                 | 1    |
|             | 25                | –                 | 2    |

## Installation

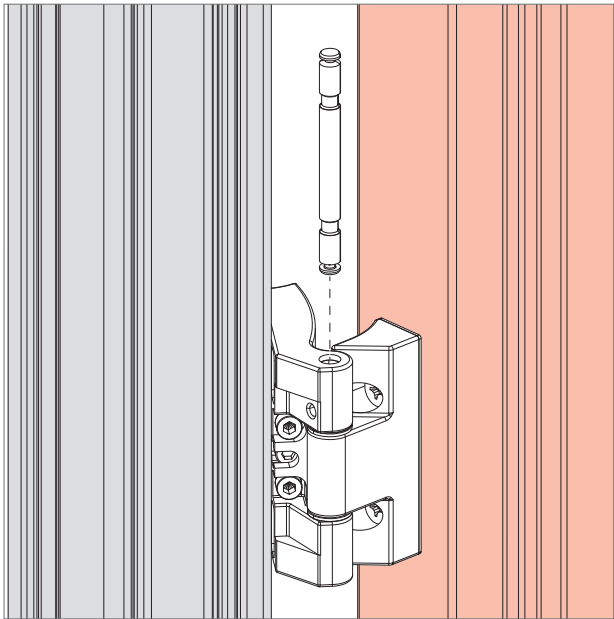
### Connecting sash and frame

#### Hinging the sash

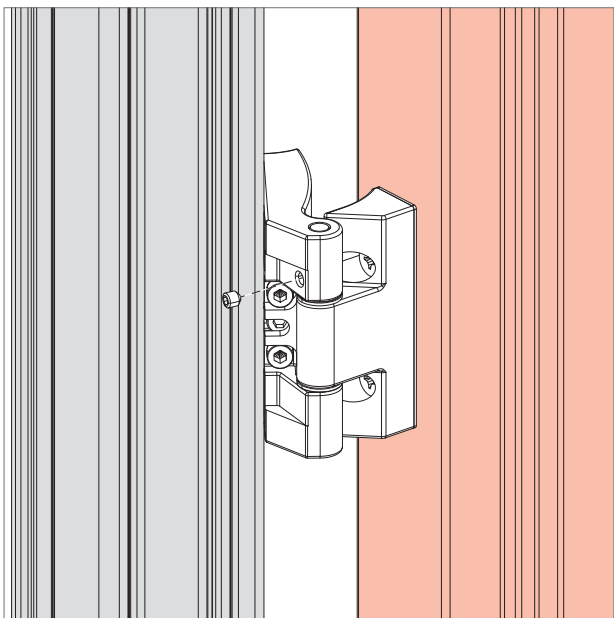


#### Installation and securing

1. With the sash open, bring the hinge and bearing together.



2. Insert the cylindrical pin flush.

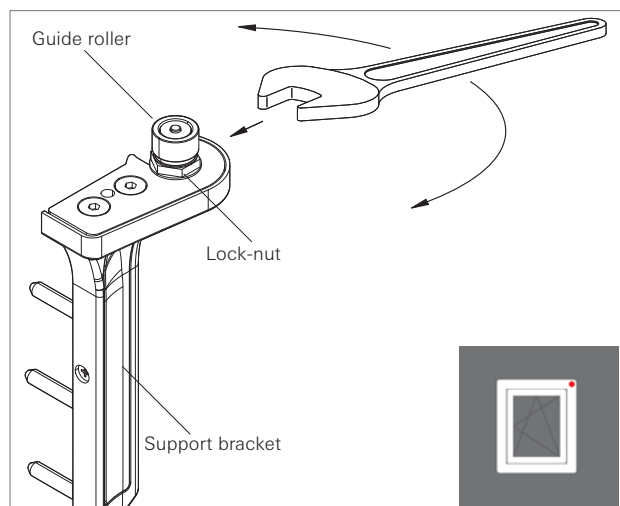


3. Secure the cylindrical pin with the size 2.5 bolt.  
Tightening torque: 5 Nm

## Installation

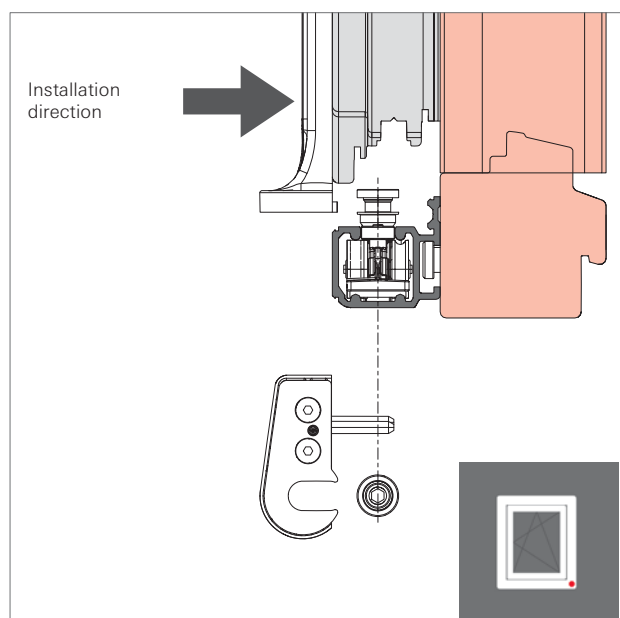
### Connecting sash and frame

#### Hinging the sash



1. Insert the sash with the guide roller into the rail at the top and swing in the sash.

2. Screw-fix the lock-nut with open-end spanner size 17.  
Tightening torque: 22 Nm  $\pm$  2 Nm



3. Connect the bogie and the support bracket:  
Tightening torque: 22 Nm  $\pm$  2 Nm



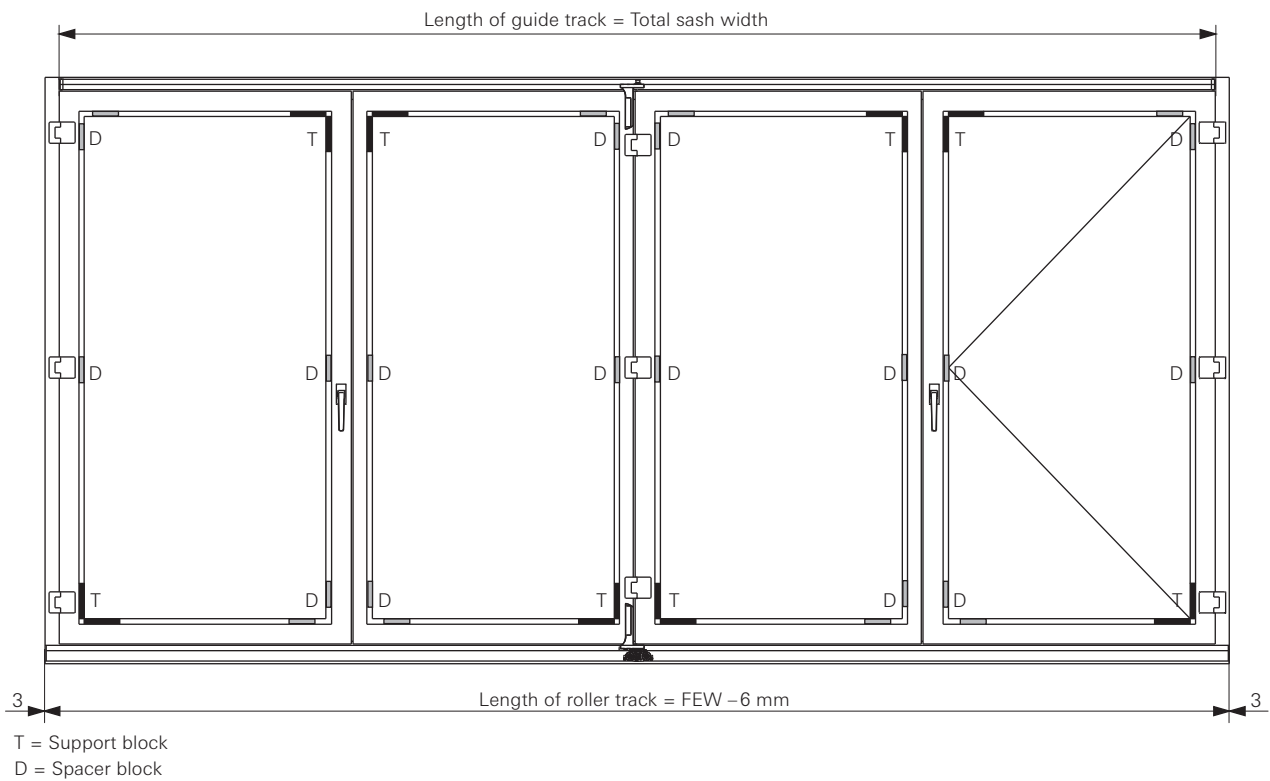
#### NOTE!

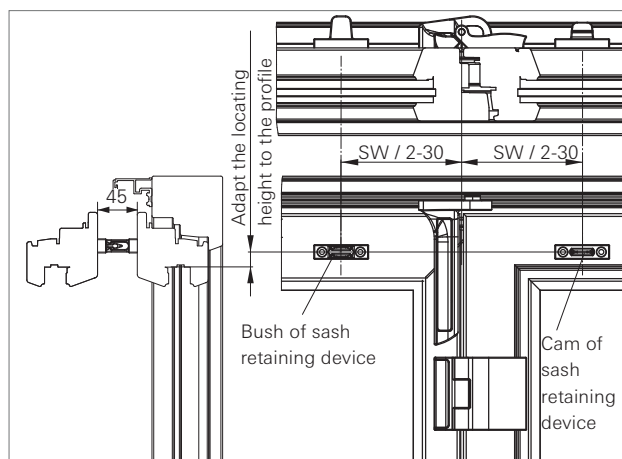
Pay attention to the installation direction.

## Installation

### Advice on the use of glazing packers

#### Frontal view support bracket





1. Determine the position according to the drawing.
2. Predrill  $\varnothing 3.5$  mm.
3. Screw-fix the sash retaining device with countersunk screws  $\varnothing 5$  mm.



DIAGRAM 321

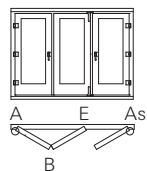


DIAGRAM 330

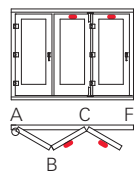


DIAGRAM 431

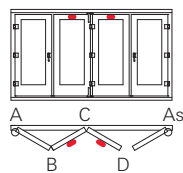


DIAGRAM 532

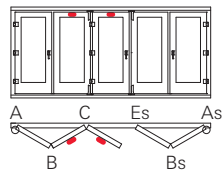


DIAGRAM 541

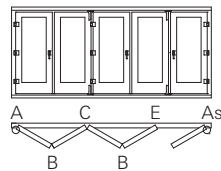


DIAGRAM 550

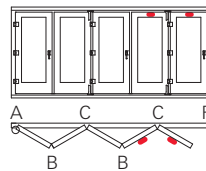


DIAGRAM 633

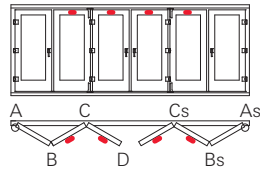


DIAGRAM 651

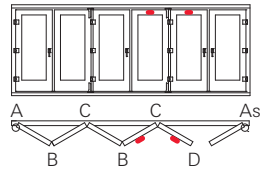


DIAGRAM 743

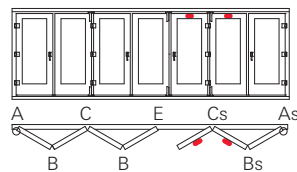


DIAGRAM 752

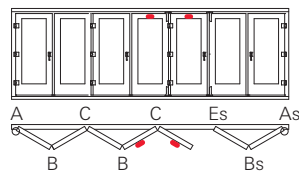


DIAGRAM 761

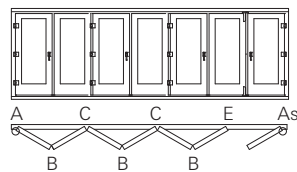


DIAGRAM 770

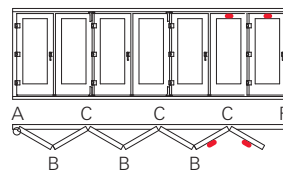
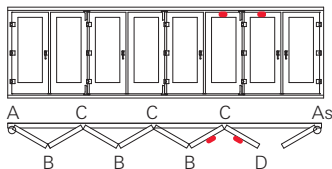
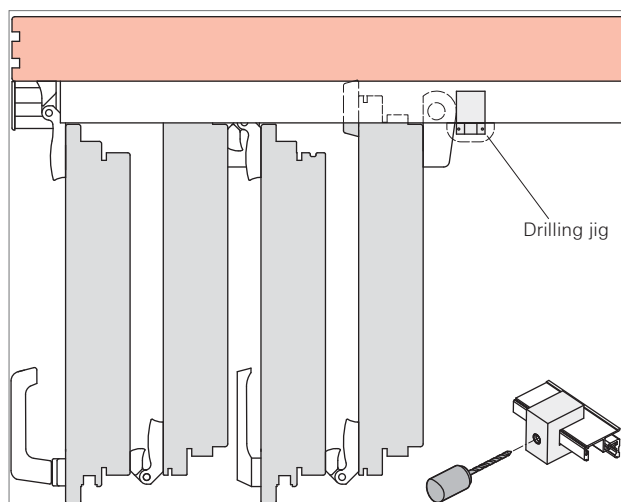
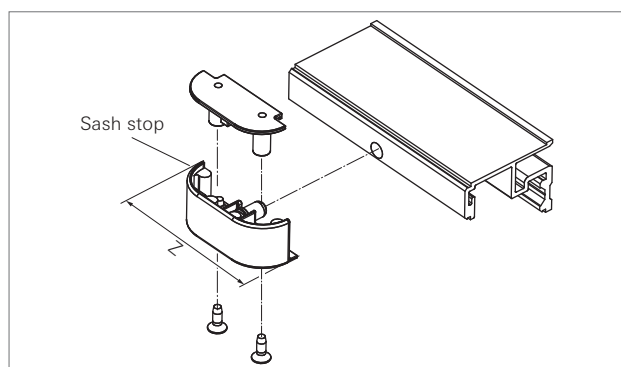
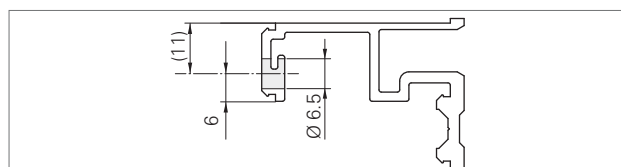
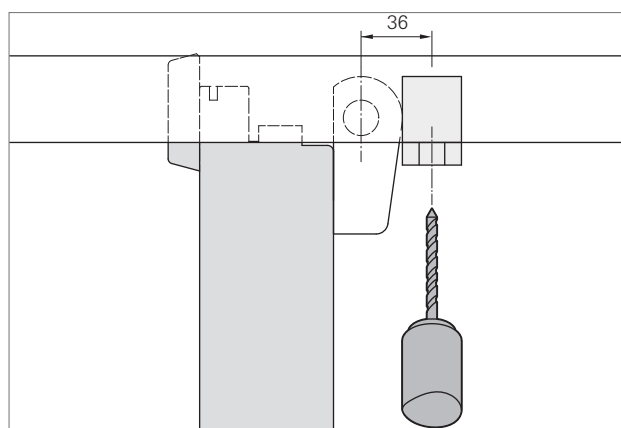


DIAGRAM 871

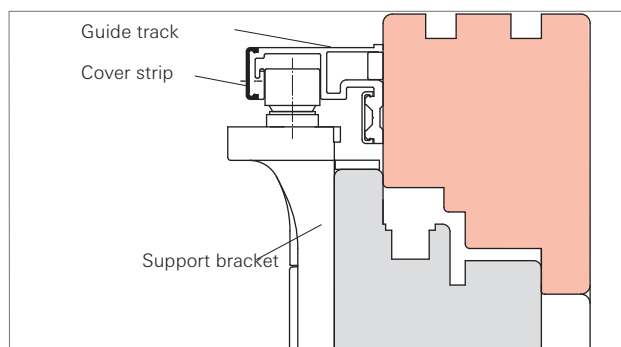




1. Open the door and fold together the sashes.
2. Determine the sash stop's position when the sashes are pushed together.
3. Carry out the drilling in the guide track with drilling jig (mat. no. 469831).



4. Mount the sash stop and screw-fix with enclosed countersunk screws.
5. Check for ease of movement.

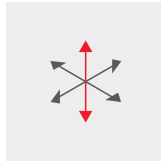


6. Cut the cover strip to size acc. do dimension Z and mount it.

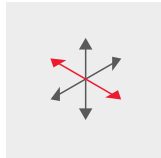


#### Symbols for the sash adjustment when installed

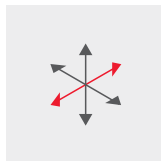
These symbols facilitate the orientation while adjusting the window sashes after installation with the following steps.



**Height adjustment**



**Lateral adjustment**

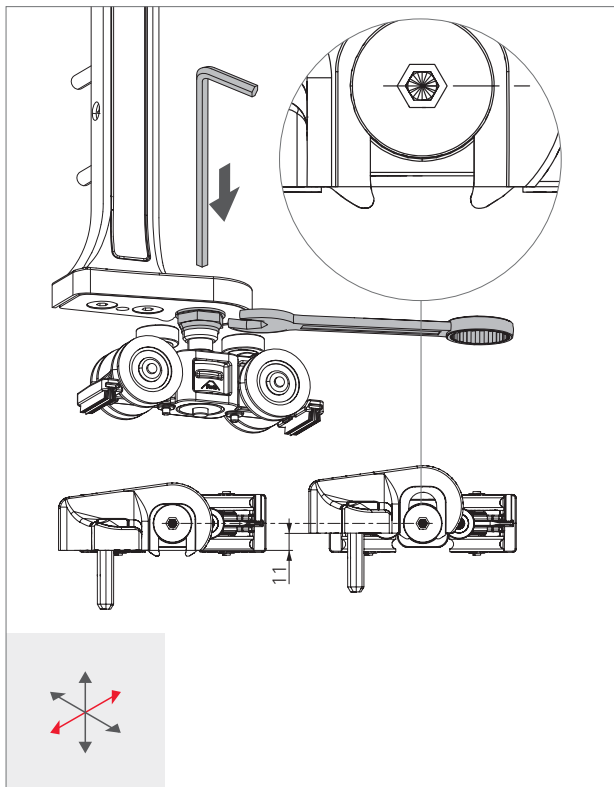


**Gasket-compression adjustment**



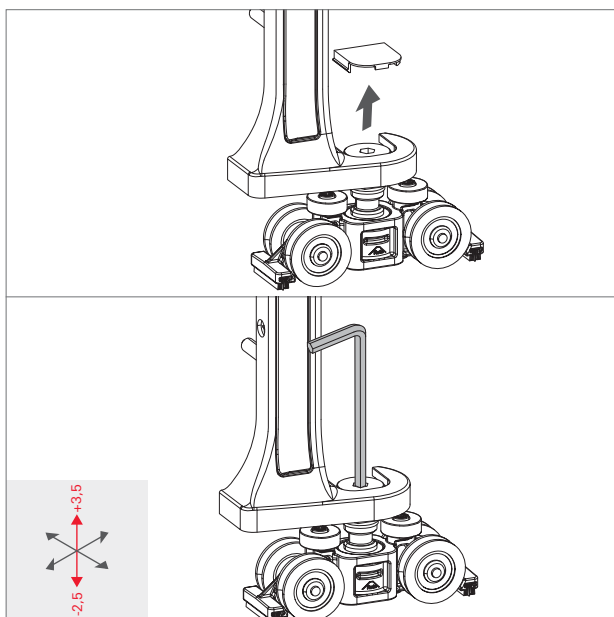
#### **NOTE!**

Adjusting Roto hardware components may only be carried out by authorised and qualified personnel.



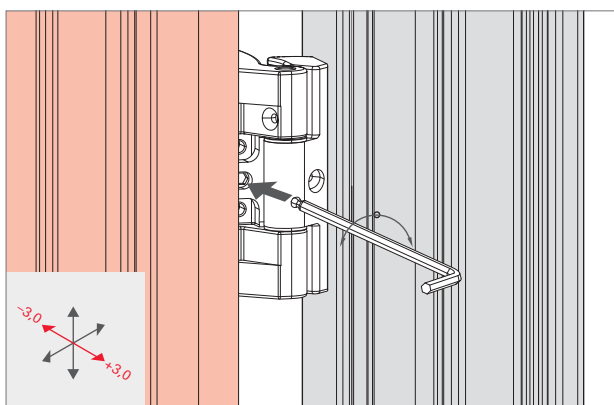
#### Gasket-compression adjustment of the sashes via bogie

1. Remove the cover cap.
2. Release the support bracket on the threaded bolt.  
Allen key size 6 and  
open-end spanner size 17.
3. Set the gasket compression.
4. Tighten the screws.



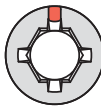
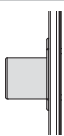
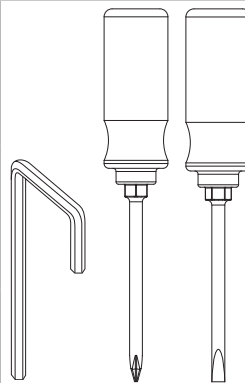
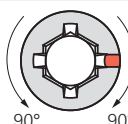
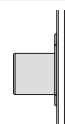
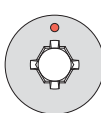
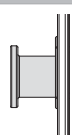
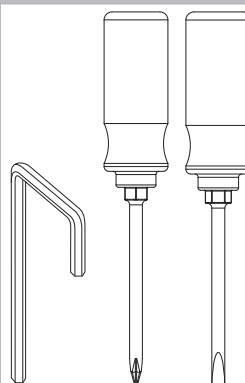
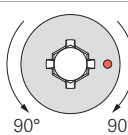
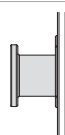
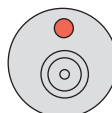
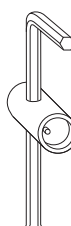
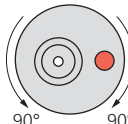
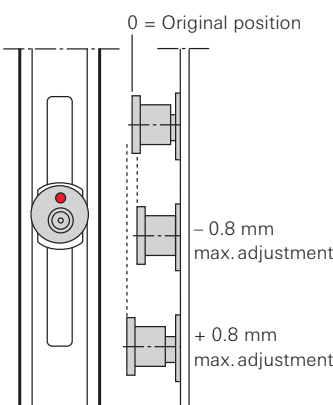
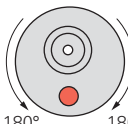
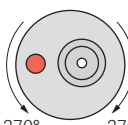
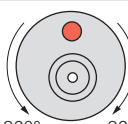
#### Height adjustment of the sashes via bogie

1. Remove the cover cap.
2. Adjust the bogie height by turning the threaded bolt with the 4 mm Allen key.



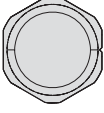
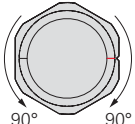
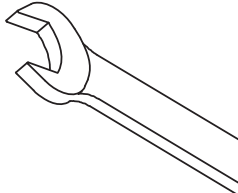
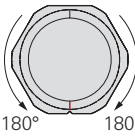
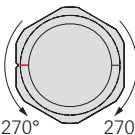
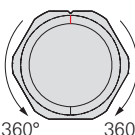
#### Lateral adjustment of the shadow gap via the hinge

1. Open the sash resp. element.
2. Turn the cylinder screw in the middle with a 4 mm Allen key for adjusting the hinge.  
4 mm Allen key  
Turning 180° = 0.5 mm  
Turning 360° = 1.0 mm

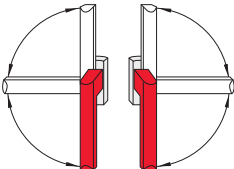
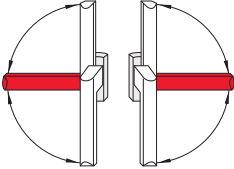
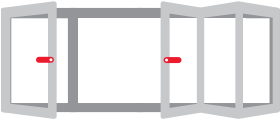
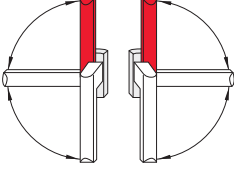
| Locking cam adjustment instructions                                                 |                  |                                    |                        |                                                                                      |  |                                                                                       |
|-------------------------------------------------------------------------------------|------------------|------------------------------------|------------------------|--------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------|
| Cam type                                                                            | Adjustment range | Gasket-compression adjustment / mm | Height adjustment / mm | Side view / top view                                                                 |  | Tools                                                                                 |
| <b>E cam</b>                                                                        |                  |                                    |                        |                                                                                      |  |                                                                                       |
|    |                  |                                    |                        |     |  |    |
|    | ±0.8             |                                    |                        |   |  |                                                                                       |
|                                                                                     |                  |                                    |                        |                                                                                      |  |                                                                                       |
| <b>P cam</b>                                                                        |                  |                                    |                        |                                                                                      |  |                                                                                       |
|    |                  |                                    |                        |     |  |   |
|   | ±0.8             |                                    |                        |  |  |                                                                                       |
|                                                                                     |                  |                                    |                        |                                                                                      |  |                                                                                       |
| <b>V cam</b>                                                                        |                  |                                    |                        |                                                                                      |  |                                                                                       |
| Cam type                                                                            | Adjustment range | Gasket-compression adjustment / mm | Height adjustment / mm | Side view / top view                                                                 |  | Tools                                                                                 |
|  |                  |                                    |                        |                                                                                      |  |  |
|  | ±0.8             |                                    | ±0.2                   |  |  |                                                                                       |
|  | —                |                                    | ±0.4                   |                                                                                      |  |                                                                                       |
|  | ±0.8             |                                    | ±0.6                   |                                                                                      |  |                                                                                       |
|  | —                |                                    | ±0.8                   |                                                                                      |  |                                                                                       |
|                                                                                     |                  |                                    |                        |                                                                                      |  |                                                                                       |



**V cam, extended (10 mm clearance)**

| Cam type                                                                           | Adjustment range | Gasket-compression adjustment / mm | Height adjustment / mm                                                            | Side view / top view                                                                                                                                                           | Tools                                                                               |
|------------------------------------------------------------------------------------|------------------|------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|   |                  |                                    |  |                                                                                                                                                                                |                                                                                     |
|   | 90° 90°          | ±0.8                               | ±0.2                                                                              |  <p>0 = Original position</p> <p>- 0.8 mm max. adjustment</p> <p>+ 0.8 mm max. adjustment</p> |  |
|   | 180° 180°        | -                                  | ±0.4                                                                              |                                                                                                                                                                                |                                                                                     |
|   | 270° 270°        | ±0.8                               | ±0.6                                                                              |                                                                                                                                                                                |                                                                                     |
|  | 360° 360°        | -                                  | ±0.8                                                                              |                                                                                                                                                                                |                                                                                     |

The following symbols show the different handle positions and the resulting sash positions of windows and balcony doors.

| Handle position                                                                     | Sash position                                                                       | Symbol                                                                              | Meaning                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------|
|    |    |    | Closed position of the sash        |
|    |    |    | Turn and fold position of the sash |
|  |  |  | Opened tilt position of the sash   |
|                                                                                     |  |  | Malpositioning of the sash         |



## Maintenance



### WARNING!

**Danger of injury through incorrectly conducted maintenance work!**

**Incorrect maintenance can result in serious personal injury or material damage.**

- Before starting work, ensure that there is sufficient installation room.
- Maintain order and cleanliness at the installation location.
- Ensure that the window or balcony door is prevented from suddenly slamming during maintenance work.
- Get a specialist company to carry out adjustment work on hardware – especially of pivot rests and scissor stays – as well as replacement of parts and hinging and unhinging of sashes.
- Do not un hinge the sash for maintenance work.

### At least annually, every six months for school and hotel buildings:

|                                                                                                | Specialist company | End-users |
|------------------------------------------------------------------------------------------------|--------------------|-----------|
| If necessary, tighten fixing screws.                                                           | ■                  | –         |
| Replace damaged screws.                                                                        | ■                  | –         |
| If necessary, replace components.                                                              | ■                  | –         |
| Lubricate all moving components with acid free and non resinous oil from a specialised dealer. | □                  | □         |
| Lubricate steel strikers with acid free and non resinous grease from a specialised dealer.     | □                  | □         |

■ = To be carried out **only** by a specialist company.

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

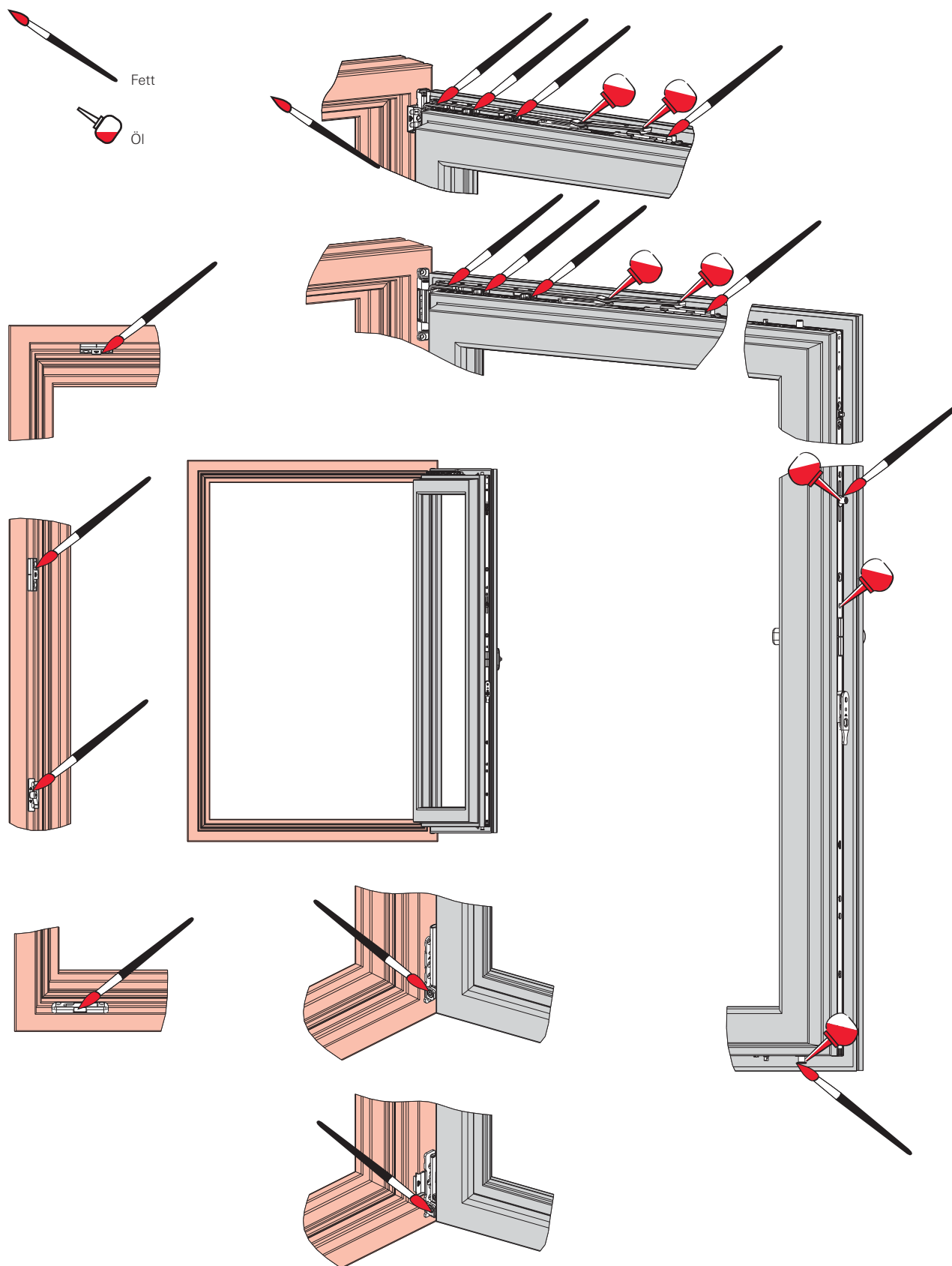
□ = To be carried out either by a specialist company or by the end-user.



### NOTE!

**Observe the following environmental protection notes during maintenance work:**

- Remove emerging or residual grease at the lubricating points and dispose of in accordance with the valid local regulations.
- Collect exchanged oil in suitable containers and dispose of in accordance with the environmental regulations.





## Inspection

At least annually, every six months for school and hotel buildings:

|                                                                                      | Specialist company       | End-users                |
|--------------------------------------------------------------------------------------|--------------------------|--------------------------|
| Check that safety-relevant hardware components are mounted securely.                 | <input type="checkbox"/> | <input type="checkbox"/> |
| Examine safety-relevant hardware components for wear and tear.                       | <input type="checkbox"/> | <input type="checkbox"/> |
| All movable parts are to be operation-tested.                                        | <input type="checkbox"/> | <input type="checkbox"/> |
| All locking points are to be operation-tested.                                       | <input type="checkbox"/> | <input type="checkbox"/> |
| The hardware's smooth operation can be checked by means of moving the window handle. |                          |                          |
| ▪ In accordance with DIN 18055, the locking and unlocking moment is max. 10 Nm.      | ■                        | –                        |
| ▪ It can be checked using a torque wrench.                                           | ■                        | –                        |
| ▪ The smooth operation can be improved by greasing/oiling or adjusting the hardware. | ■                        | –                        |

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

## Care

|                                                                         | Specialist company       | End-users                |
|-------------------------------------------------------------------------|--------------------------|--------------------------|
| Keep the hardware free from deposits and soiling.                       | <input type="checkbox"/> | <input type="checkbox"/> |
| Never use aggressive, acidiferous cleaners or abrasive cleaning agents. | <input type="checkbox"/> | <input type="checkbox"/> |
| Only use mild, pH-neutral cleaning agents in diluted form.              | <input type="checkbox"/> | <input type="checkbox"/> |
| Only use a soft cloth for cleaning.                                     | <input type="checkbox"/> | <input type="checkbox"/> |

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

No legal claims can be derived from these recommendations, the application is to be conveyed for each concrete individual case. The window and balcony door manufacturer must draw builders and end-user's particular attention to these maintenance instructions. Roto Frank AG recommends window-fabricators to make maintenance agreements with their end-users.

### Protection against corrosion

|                                                                                                                                                                                                                           | Specialist company | End-users |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
| Aggressive vapours (e.g. by means of formic acid or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid etc.) in the vicinity of the windows must be absolutely avoided.          | ■                  | —         |
| Never use acetic acid or crosslinked acidic sealing compounds or those with the above mentioned contents, since both the direct contact with the sealing compound and its vaporisation can attack the hardware's surface. | ■                  | —         |
| Due to the risk of salt deposits on the hardware, shorter maintenance and lubrication intervals are necessary in coastal areas (every three months).                                                                      | ■                  | —         |

■ = To be carried out only by a specialist company

— = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

### Protection against dirt

|                                                                                                                                          | Specialist company | End-users |
|------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
| Remove deposits and dirt from building materials (building dust, plaster, cement, etc.) or similar materials with water before it cures. | □                  | □         |
| Keep the hardware and the threshold free from deposits and soiling.                                                                      | □                  | □         |
| Never use aggressive, acidiferous cleaners or abrasive cleaning agents.                                                                  | □                  | □         |
| Only use mild, pH-neutral cleaning agents in diluted form.                                                                               | □                  | □         |
| Only use a soft cloth for cleaning.                                                                                                      | □                  | □         |

■ = To be carried out only by a specialist company

— = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.



### Protection against (permanent) moist interior air

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Specialist company       | End-users                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| Ventilate the hardware and the rebate areas – especially in the construction phase – so that they are neither exposed to direct contact with water nor to formation of condensation water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> | <input type="checkbox"/> |
| <p>Ensure that (permanently) damp spatial air cannot condense in the hinge and rebate areas:</p> <ul style="list-style-type: none"> <li>Force ventilate several times each day (open all windows for approx. 15 minutes).</li> <li>Also ventilate during holidays and absences.</li> <li>For more complex construction projects, develop a ventilation plan if necessary.</li> </ul> <p>If described systematic ventilation is not possible, e.g. because fresh screed must not be traversed, or it cannot take draughts, put the windows into the tilted position and make them airtight by taping on the indoor side. Divert the moisture present in the room air to the outside by means of condensation dryers.</p> | <input type="checkbox"/> | <input type="checkbox"/> |

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

### Protection against damages due to renovation work

|                                                                                                                                               | Specialist company       | End-users                |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| When applying surface treatments of the windows, exclude all hardware components from this treatment, and thus protect against contamination. | <input type="checkbox"/> | <input type="checkbox"/> |
| Use only adhesive tapes which do not damage the varnish layers. In the case of doubt, ask the window fabricator.                              | <input type="checkbox"/> | <input type="checkbox"/> |

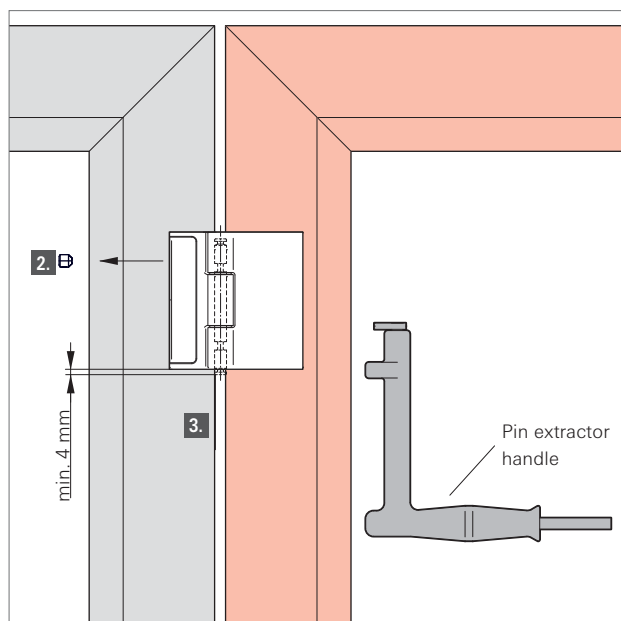
■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

## Dismantling

### Unhinging the sash



1. Open the sash/element and secure it from falling out.
2. Remove the bolt (2.5 mm Allen key).
3. Tap out the cylindrical pin min. 4 mm and pull out downwards with the pin extractor handle.
4. Carefully lift out the sash.



## Transport / handling of the window elements



### **DANGER!**

#### **Danger to life from incorrect handling and transport!**

Incorrect handling and unsuitable transport of window elements can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- During loading and unloading, select force application points which exclusively create reaction forces appropriate to the designed layout of the hardware components for the intended installation location.
- During handling and transport, ensure that hardware is in the locked position, so as to prevent an uncontrolled opening of the window. During transport, additionally use suitable means of securing, e.g. tensioning belts.
- Use only transport protections designed for the respective clearance.
- Wherever possible, undertake transport in the intended installation position – transport windows upright and glazed.
- Prevent diagonal moving and slipping of the sash with respect to the frame (e.g. by using spacers).
- If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the frame to which it belongs.



### **NOTE!**

The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise. Especially when using auxiliaries such as suckers, transport nets, forklifts, or cranes, reaction forces may arise which result in damage or overloading to the installed hardware.

Therefore observe the following during all transport, loading, and unloading:

- Always choose the force application points so that the resulting reaction forces are dissipated appropriate to the designed layout of the hardware components for the intended installation location. This applies particularly for the hinge positions.

Check the delivery on receipt immediately for completeness and transport damage.



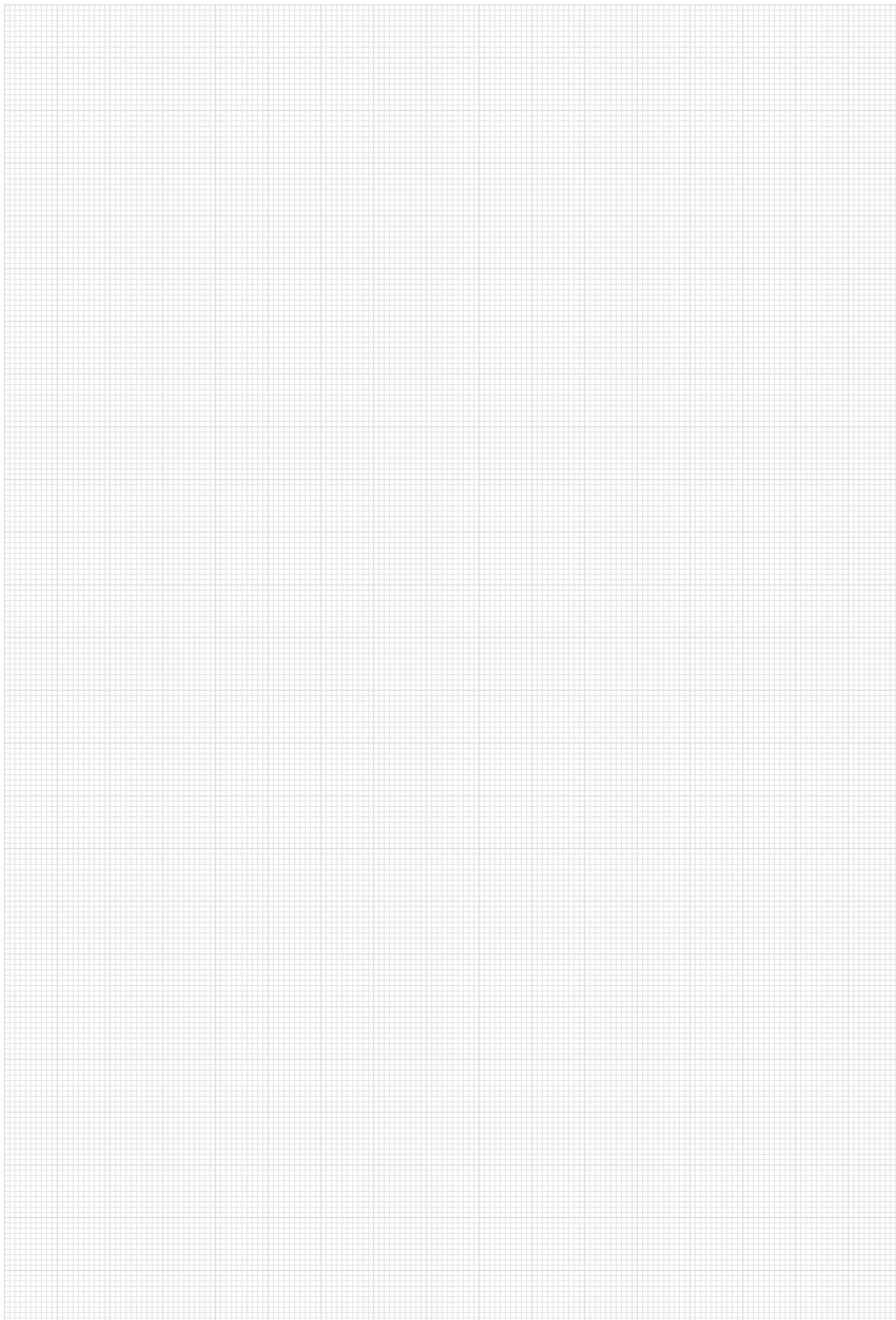
**NOTE!**

Claim any damage as soon as it is detected. Claims for damage can only be invoked within the statutory reclamation period.

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Separate the hardware components from the window and dispose of as metal scrap.





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