

Roto FRH Uni

Fully reversible hinges
for outward opening windows

Installation, maintenance and operation instructions
for timber, PVC and aluminium profiles



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	1	General information.....7
	1.1	Version history..... 7
	1.2	Instructions..... 7
	1.3	Symbols..... 8
	1.4	Pictographs..... 8
	1.5	Product features.....9
	1.6	Abbreviations..... 9
	1.7	Target groups.....10
	1.8	Target groups' obligation to give instructions..... 10
	1.9	Copyright protection..... 11
	1.10	Limitation of liability..... 11
	1.11	Preserving the surface finish.....12
	2	Security..... 14
	2.1	Presentation and structure of warning instructions..... 14
	2.2	Security levels of warning instructions..... 14
	2.3	Stipulated use..... 14
	2.3.1	Misuse..... 15
	2.3.2	Usage restriction..... 15
	2.4	Stipulated use for end users..... 16
	2.4.1	Misuse..... 16
	2.5	Basic safety information.....17
	2.5.1	Installation..... 17
	2.5.2	Use..... 17
	2.5.3	Ambient conditions..... 18
	2.6	Operation..... 19
	3	Information on the product..... 20
	3.1	General hardware characteristics.....20
	3.2	General information..... 20
	3.3	Difference between SRH / SRW and SH / SW..... 21
	3.4	Application diagrams..... 22
	3.4.1	80 kg..... 22
	3.5	Overview of scissor stay size..... 23

	3.6	Lock-in position and opening width.....	24
	4	Hardware overviews.....	25
	4.1	Top-Swing.....	26
	5	Emergency exit.....	29
	5.1	Requirements.....	29
	5.2	Calculation.....	29
	6	Installation.....	31
	6.1	Processing instructions.....	31
	6.2	Screw connections.....	31
	6.3	Profile dimensions.....	32
	6.3.1	Timber.....	32
	6.3.2	Timber / PVC.....	33
	6.3.3	Aluminium.....	34
	6.4	Installation space calculation	34
	6.5	Drilling and routing dimensions.....	37
	6.5.1	Drainage.....	37
	6.5.2	Fully reversible hinge.....	37
	6.5.3	Sash bearing.....	39
	6.6	Sash.....	42
	6.6.1	Top slider.....	42
	6.6.1.1	Dimensions.....	42
	6.6.1.2	Installing the topglider.....	46
	6.7	Frame.....	48
	6.7.1	Fully reversible hinge.....	48
	6.7.2	Sash bearing.....	49
	6.8	Joining the sash and frame.....	49
	6.8.1	Topglider.....	50
	6.8.2	Sash bearing.....	51
	6.9	Accessories.....	54
	6.9.1	Guide block.....	54
	6.9.2	Stop block.....	55
	6.9.3	Security component.....	57

6.9.4	Centre closer.....	60
6.9.5	Blocking device.....	61
	7 Operation.....	62
7.1	Operation information.....	62
7.1.1	Handle position.....	62
7.2	Standard version.....	63
7.2.1	Opening.....	63
7.2.1.1	Ventilation position.....	63
7.2.1.2	Cleaning position.....	64
7.2.2	Closing.....	64
7.2.2.1	Ventilation position.....	64
7.2.2.2	Cleaning position.....	65
7.3	Hotel version.....	66
7.3.1	Opening.....	66
7.3.1.1	Ventilation position.....	66
7.3.1.2	Cleaning position.....	67
7.3.2	Closing.....	68
7.3.2.1	Ventilation position.....	68
7.3.2.2	Cleaning position.....	69
7.4	Fault assistance.....	70
	8 Maintenance.....	71
8.1	Maintenance intervals.....	71
8.2	Cleaning.....	72
8.3	Care.....	72
8.3.1	Lubrication points.....	73
8.4	Performance test.....	73
8.5	Repair.....	74
	9 Dismantling.....	75
9.1	Unhinging the sash.....	75
	10 Transport.....	77
10.1	Transporting elements and hardware.....	77

	10.2	Storing the hardware.....	78
	11	Disposal.....	79
	11.1	Disposing of packaging.....	79
	11.2	Disposing of hardware.....	79
	12	Other opening types.....	80
	12.1	Explanation.....	80
	12.2	Side-Hung Projecting.....	81
	12.3	Top-Hung Projecting.....	82

1 General information

1.1 Version history

Version	Date	Changes
v0	31/01/2020	Publication
v1	20/09/2021	New item numbers for topgliders → <i>from page 26</i> New item numbers for sash bearings → <i>from page 26</i> All information with SRH instead of SH → <i>from page 21</i>
v2	11/03/2022	Sash bearing installation sequence changed → <i>from page 49</i>
v3	01/12/2022	Sash bearing item numbers changed → <i>from page 26</i>

1.2 Instructions

This manual contains important information, instructions, application diagrams (max. sash sizes and weights) and assembly instructions for the installation, maintenance and operation of hardware.

The information and instructions contained in this document refer to products belonging to the Roto hardware system named on the front page.

All steps must be completed in sequence.

The following document applies in addition to these instructions:

- Catalogue: CTL_90

The following guidelines also apply:

Locks and Hardware Association (Gütegemeinschaft Schlösser und Beschläge e. V)

- Directive TDBK: Attachment of supporting fitting components for turn-only and tilt&turn fittings
- Directive VHBE: Hardware for windows and balcony doors – Guidelines/ advice for end-users
- Directive VHBH: Hardware for windows and balcony doors – Guidelines/ advice on the product and on liability

VFF (German Window and Facade Association)

- TLE.01: Correct handling of ready-to-install windows and external doors during transport, storage and installation
- WP.01: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales
- WP.02: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents
- WP.03: Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement

Emergency exit

- The Building Regulations 2019 - Advanced Document B

Additional guidelines

- Instructions and information issued by profile manufacturers, e.g. manufacturers of windows and balcony doors
- Instructions and information issued by screw manufacturers
- The applicable regulations, directives and national laws

Storing the instructions

These instructions are an important part of the product. The instructions must be stored so that they are always to hand.

Explanation of the markings

The manual uses the following markings for emphasis (e.g. in figures or instructions):

Marking	Meaning
	Sash
	Frame
	Drill holes, routing or screw positions
	Unaffected components / indirectly affected components
	Components, arrows or movements that have just been described
	Item number
[1]	Legend
[A]	Steps



INFO

Any dimensions without a unit in the instructions are given in millimetres (mm). Other units of measurement are clearly indicated by the presence of the differing unit.

1.3 Symbols

Symbol	Meaning
■	First-level list
□	Second-level list
→	(Cross-)reference
▷	Result
►	Unnumbered step
1.	Numbered step
a.	Numbered second-level step
⇒	Requirement

1.4 Pictographs

Symbol	Meaning
	Sash rebate width
	Sash rebate height
	Sash weight
	Timber, PVC and aluminium

Symbol	Meaning
	Timber
	PVC
	Aluminium

1.5 Product features

Symbol	Meaning
	Description
	Sash rebate width
	Sash rebate height
	Sash weight
	Size
	Information
	Length
	Material
	Material number
	Minimum order quantity
	Position
	Scissor stay length
	Packaging

1.6 Abbreviations

Abbreviation	Meaning
approx.	approximately
CTL	Catalogue
SRW	Sash rebate width
S.kg	Sash weight

Abbreviation	Meaning
SRH	Sash rebate height
IMO	Installation instructions
kg	Kilograms
Max.	Maximum
Min.	Minimum
Min.	At least
mm	Millimetres
Nm	Torque in newton metres
e.g.	For example

1.7 Target groups

The information in this document is directed at the following target groups:

Hardware dealers

The “hardware dealers” target group includes all companies and individuals that purchase hardware from hardware manufacturers for resale, without modifying or further processing the hardware.

Window and balcony door manufacturers

The “window and balcony door manufacturers” target group includes all companies and individuals that purchase hardware from hardware manufacturers or hardware dealers and further process the hardware by integrating it in windows and balcony doors.

Building element dealers or installation companies

The “building element dealers or installation companies” target group includes all companies and individuals that purchase windows and balcony doors from window and balcony door manufacturers for resale and for installation in construction projects, without modifying the windows or balcony doors.

Builders

The “builders” target group includes all companies and individuals who place orders for the manufacture of windows and balcony doors for installation in their construction projects.

End users

The “end users” target group includes all individuals who use the installed windows and balcony doors.

1.8 Target groups’ obligation to give instructions



INFO

Each target group must fulfil their obligation to give instructions in full.

Unless specified otherwise in the text below, documents and information can be passed on as a printed document, on a data storage device or via the Internet.

Responsibility of hardware dealers

Hardware dealers must pass the following documents on to the window and balcony door manufacturer:

- Catalogue
- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the window and balcony door manufacturer

The window and balcony door manufacturer must pass the following documents on to building element dealers or the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions
- Directive on attachment of supporting fitting components for turn-only and tilt&turn fittings (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

They must ensure that the end users are provided with the documents and information intended for them in printed format.

Responsibility of building element dealers and the installation company

Building element dealers must pass the following documents on to the builder, even if a subcontractor (installation company) is involved:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the builder

The builder must pass the following documents on to the end user:

- Installation, maintenance and operation instructions (with a focus on hardware)
- Guidelines/advice for end-users (VHBE)

1.9 Copyright protection

The contents of this document are copyright-protected. This content can be used when working with the hardware. Any other use is not permitted without written permission of the manufacturer.

1.10 Limitation of liability

All information and instructions contained in this document have been compiled in consideration of the applicable standards and regulations, the latest developments in technology and many years of knowledge and experience.

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable directives (see the chapters entitled "Security" and "Stipulated use").

- Improper use / misuse (see the chapters entitled “Security” and “Stipulated use”).
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams (where available).
- Increased contamination.

Claims made by third parties against the hardware manufacturer on account of damage resulting from misuse or failure to comply with the obligation to give instructions on the part of hardware dealers, window, door and balcony door manufacturers and building element dealers or the builder are passed on accordingly.

The obligations agreed in the delivery contract, the general terms and conditions, the hardware manufacturer's terms and conditions of delivery and the legal provisions applicable when the contract was concluded shall apply.

The warranty only covers original Roto components.

We reserve the right to make technical changes as part of improvement to performance characteristics and further development.

1.11 Preserving the surface finish



ATTENTION

Surface treatments may cause property damage.

Surface treatments (e.g. painting and varnishing) on elements can damage components or prevent them from working properly.

- ▶ For masking, only use adhesive tape that does not damage the paint coats. Consult the manufacturer if in doubt.
- ▶ Protect components against direct contact with the surface treatment.
- ▶ Protect components against contamination.



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carbolic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.



ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

- ▶ Remove deposits and contamination caused by construction materials (e.g. plaster, gypsum).
- ▶ Keep components free of deposits and contaminants.



ATTENTION

(Permanently) damp room air may cause property damage.

Damp room air can lead to mould growth and corrosion caused by condensation.

- ▶ Provide adequate ventilation for components, particularly during the construction phase.
- ▶ Intensively air out the room several times per day by opening all elements for approximately 15 minutes. If intensive airing is not an option, place the elements in the tilt position and provide airtight masking inside the room, e.g. if there is fresh screed that cannot be walked on or must not be exposed to draughts. Discharge any humidity present in the room air to the outside using condensation dryers.
- ▶ Establish a ventilation plan for more complex construction projects if necessary.
- ▶ Provide adequate ventilation during holiday periods as well.

2 Security

This manual contains instructions relating to safety. The principal safety information in this chapter includes information and instructions relevant to the safe use or maintaining the safe condition of the product. Warning instructions that relate to handling warn of residual risks and are located before steps that are relevant to safety.

- Follow all of the instructions in order to prevent personal injury and property and environmental damage.

2.1 Presentation and structure of warning instructions

The warning instructions relate to individual actions and are structured as follows with a warning symbol:



DANGER

Nature and source of the danger.

Explanation and description of the danger and the implications.

- Measures to take to avert the danger.

2.2 Security levels of warning instructions

The warning instructions that relate to handling are identified differently according to the severity of the associated danger. The signal words and the associated warning symbols used are clarified below.



DANGER

Immediate risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



WARNING

Potential risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.



CAUTION

Risk of injuries

- Observe these warning instructions to avoid personal injuries.



ATTENTION

Reference to property or environmental damage.

- Observe these warning instructions to avoid property or environmental damage.

2.3 Stipulated use

Outward opening hardware is hardware for outward opening windows in building construction. This hardware is used to open window sashes and balcony door leaves by actuating a hand lever.

When closing a sash and locking the hardware, the gasket counter force must generally be overcome.

Stipulated use also includes compliance with all safety information and specifications contained in these instructions, the other applicable documents and the applicable regulations, directives and national laws.



Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations. The product can be used without restrictions under the warranty if the stipulated use is adhered to.

Note the following usage restriction: open window sashes and balcony door leaves, and window sashes and balcony door leaves that are unlocked or placed in ventilation positions, only have a shielding effect.



WARNING

Opening and closing sashes in an uncontrolled manner may pose a risk of death!

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ When operating the sash, do not lean too far outward.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ When pressing the restrictor, hold on to the sash with your other hand to prevent it from falling back. One hand on the restrictor, one on the handle.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ When opening the sash, watch out for obstacles on the building (e.g. window sills, protruding roller shutter boxes, etc.).
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

No claims can be made on account of damage resulting from failure to comply with the stipulated use.

2.3.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 7*.

2.3.2 Usage restriction

Open window sashes, and windows that are unlocked or placed in ventilation positions, only have a shielding effect. They do not meet the following requirements:

- Joint sealing
- Driving rain impermeability

- Sound insulation
- Thermal insulation
- Burglary inhibition

2.4 Stipulated use for end users

Outward opening hardware is hardware for outward opening windows in building construction. This hardware is used to open window sashes and balcony door leaves by actuating a hand lever.

When closing a sash and locking the hardware, the gasket counter force must generally be overcome.



WARNING

Opening and closing sashes in an uncontrolled manner may pose a risk of death!

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ Ensure that the sash does not collide with the frame, opening restrictor (buffer) or other sashes when it is moved into the fully open or closed position.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.

No claims of any kind can be made on account of damage resulting from failure to comply with the stipulated use.

2.4.1 Misuse

Any use and processing of the products that goes beyond or differs from the stipulated use is considered misuse and can lead to hazardous situations.



WARNING

Misuse may pose a risk of death!

Misuse and incorrect installation of hardware can lead to serious injuries.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Note the product-related documentation → *from page 7*.



2.5 Basic safety information

The following hazards may arise when handling the product:

2.5.1 Installation

Incorrect installation poses an immediate risk of death or serious injuries.

Incorrect installation or assembly of hardware can lead to hazardous situations or property damage. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Only use hardware combinations that have been approved by the hardware manufacturer.
- ▶ Only use original accessories or those that have been approved by the hardware manufacturer.
- ▶ Always have installation performed by a specialist company.

Heavy loads pose a risk of injury.

Lifting and carrying heavy loads may lead to injuries in the event of a fall or physical overexertion.

- ▶ Note the applicable accident prevention regulations.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).

Physical strain may cause damage to health.

Moving heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying and lifting by hand, comply with a maximum weight of 25 kg for men and 10 kg for women.
- ▶ Carry and lift even small loads with an ergonomically correct posture.

2.5.2 Use

Falls from open windows present an immediate risk of death and pose the risk of serious injuries.

Open window sashes create a danger zone. Depending on the height of the fall, this can result in serious to life-threatening injuries and glass breakage.

- ▶ Take care when in the vicinity of open windows.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Trapping body parts in the opening between sash and frame may lead to serious injuries.

Gripping between the sash and frame when closing windows poses the risk of crushing injuries.

- ▶ When closing windows, never grip between the sash and frame and always exercise caution.

- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.

Opening and closing sashes improperly poses the risk of injury and property damage.

Incorrect opening and closing of sashes can result in serious injuries and substantial property damage.

- ▶ When moving the sash, ensure that it will not slam against the frame or other sashes once fully opened or closed.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ When closing a sash and locking the hardware, the gasket counter force must be overcome.

Misuse poses a risk of injury and property damage.

Misuse can lead to hazardous situations and may destroy the hardware, frame materials or other individual parts within the windows.

- ▶ Do not introduce any obstacles in the opening area between the frame and window sashes.
- ▶ Do not place additional loads on windows.
- ▶ Refrain from intentionally or uncontrollably slamming or pushing the window sash against the window reveal.

Improper maintenance poses the potential risk of injury and property damage.

Windows, including the hardware, require expert maintenance (care, cleaning, maintenance and inspection) in order to guarantee their proper condition and safe use.

- ▶ Keep the hardware free of deposits and contaminants.
- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Always have regular maintenance, adjustment and repair work carried out by a specialist company.

2.5.3 Ambient conditions

Physical and chemical influences may result in property damage.

Hardware components can be permanently damaged to the point that they can no longer function in a saline, aggressive or corrosive environment.

- ▶ Do not use the hardware components in a saline, aggressive or corrosive environment.
- ▶ Carry out care and cleaning tasks as specified in these instructions.
- ▶ Corrosion protection must be inspected by an authorised specialist company as part of regular maintenance work.

Moisture may cause property damage.

Depending on the outside temperature, relative humidity of the room air and installation conditions for the windows, a temporary build-up of condensation may occur. This can lead to corrosion on the hardware and mould growth on the frame or wall. Ambient conditions that are too damp, particularly during the construction phase, can lead to timber elements warping.

- ▶ Avoid preventing the circulation of air (e.g. due to deep reveals, curtains and unfavourable positioning of heaters or the like).
- ▶ Intensively air out the room several times per day.



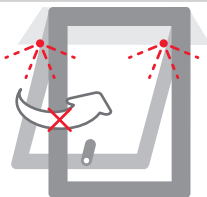
Open all windows and for approximately 15 minutes so that the air in the room can be completely replaced.

- Provide adequate ventilation during holiday periods as well.
- Create a ventilation plan for construction projects if necessary.

2.6 Operation

The safety symbols and markings and the associated warning instructions explained below apply to the safe operation of windows.

Safety symbols and markings

Symbol	Meaning
	<p>Falls from open windows present an immediate risk of death and pose the risk of serious injuries.</p> <p>Take care when in the vicinity of open windows.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Trapping body parts in the opening between sash and frame may lead to serious injuries.</p> <p>When closing windows, never grip between the sash and frame and always exercise caution.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Placing additional loads on the sash may lead to minor injuries and property damage.</p> <p>Avoid placing additional loads on the sash.</p>
	<p>The impact of wind may lead to minor injuries and property damage.</p> <p>Avoid exposing the open sash to wind.</p> <p>Close and lock the window in windy or draughty conditions.</p>
	<p>Introducing obstacles into the opening between sash and frame may result in minor injuries and property damage.</p> <p>Avoid introducing obstacles into the opening between sash and frame.</p>
	<p>Pressing the sash against the edge of an opening (reveal) may pose a risk of minor injuries and cause property damage</p> <p>Refrain from pressing the sash against the edge of an opening (reveal).</p>

3 Information on the product

3.1 General hardware characteristics

Technical features

- Can be used for timber, PVC and aluminium profiles.
- Fully reversible hinges make it possible to turn the window 170°.
- Can be used for a variety of sash formats.
- Sash weights up to max. 80 kg.
- Surface: class 5 corrosion resistance (EN 1670).
- Continuous operation: class 5 = 25,000 cycles.
- Safety in use class 1.

Advantages

- Ease of installation thanks to the fast, simple and flexible production of windows; frame and sash can be installed separately.
- Emergency exit with minimal sash heights (from scissor stay size 8).
- Different lock-in positions to lock the window in various ventilation and cleaning positions.
- Tight sealing in outward opening windows.
- The hotel version makes it possible to easily close the sash in the tilt position without pressing the restrictor.

Benefits

- Simple, reliable operation.
- Integrated cleaning position enables simple cleaning.
- Ten-year performance warranty.
- Entire room can be used because the window opens outward.

3.2 General information

Hardware functional safety

The following points must be noted in order to ensure the functional safety of the hardware at all times:

1. Correct installation of hardware components in accordance with the installation instructions.
2. Correct installation of elements during window installation.
3. The window manufacturer must pass the maintenance and operation instructions and the product liability guidelines (if applicable) on to the user.

Product liability regulations

Electrogalvanised and passivated steel fenestration screws are to be used to fasten the hardware components.

The hardware manufacturer is not liable for malfunctions or damage to the hardware, or to windows equipped with the hardware, if this has been caused by insufficient invitation to tender or failure to comply with the installation specifications and application diagrams, or if the hardware has been subjected to increased levels of dirt.

The warranty only covers original Roto components.

Product liability – liability exclusion

The hardware manufacturer is not liable for malfunctions or damage to the hardware, or to windows equipped with the hardware, if this has been caused by insufficient invitation to tender or failure to comply with the installation specifications and application diagrams, or if the hardware has been subjected to increased levels of dirt.

The warranty only covers original Roto components.

Profile classification – application ranges

The individual application diagrams must be complied with.

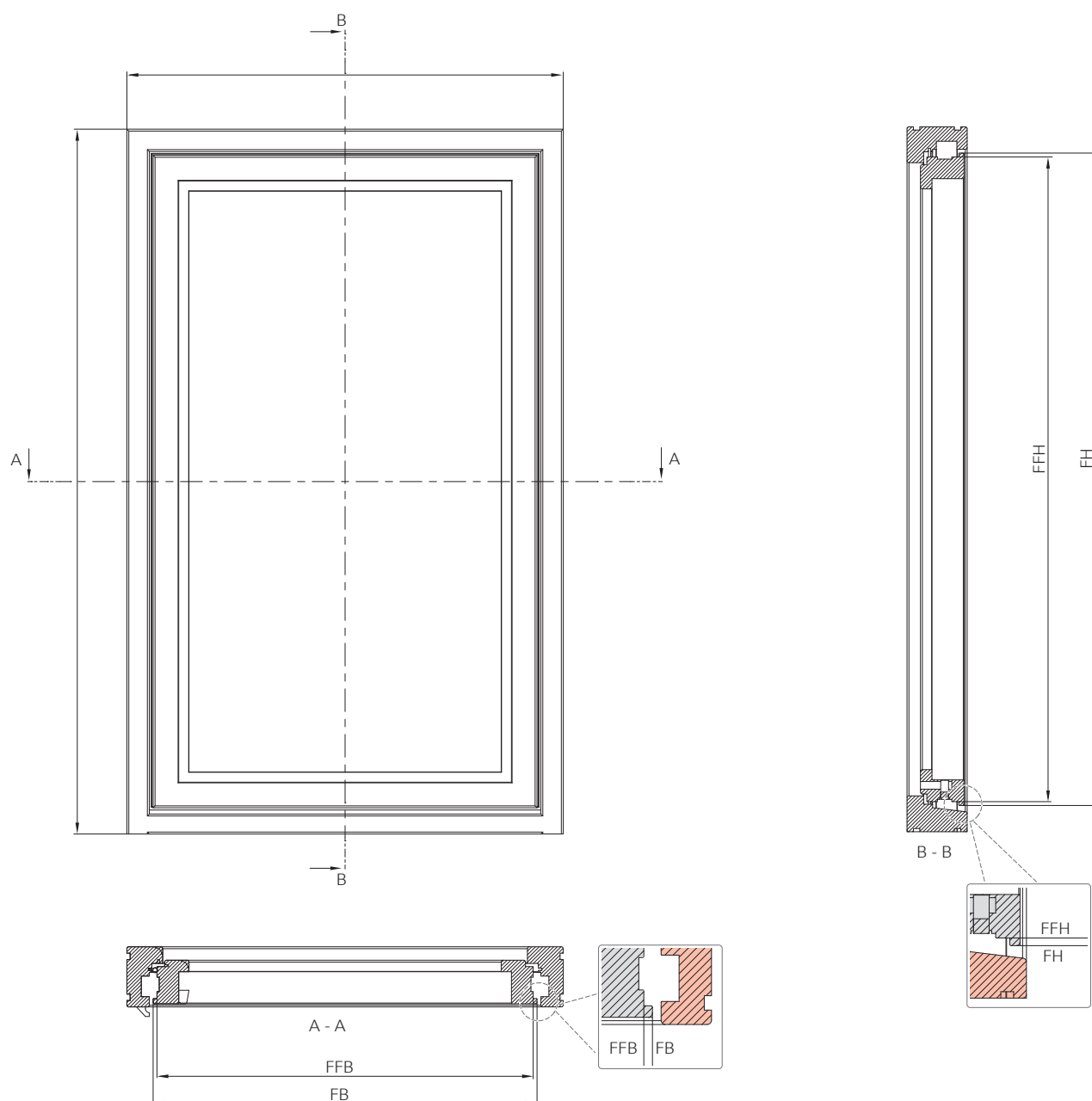
When determining the maximum permitted sash formats and sash weights, the values specified by the profile manufacturers and system owners must not be exceeded either.

3.3 Difference between SRH / SRW and SH / SW



INFO

All information in these installation instructions relates to SRH and SRW.



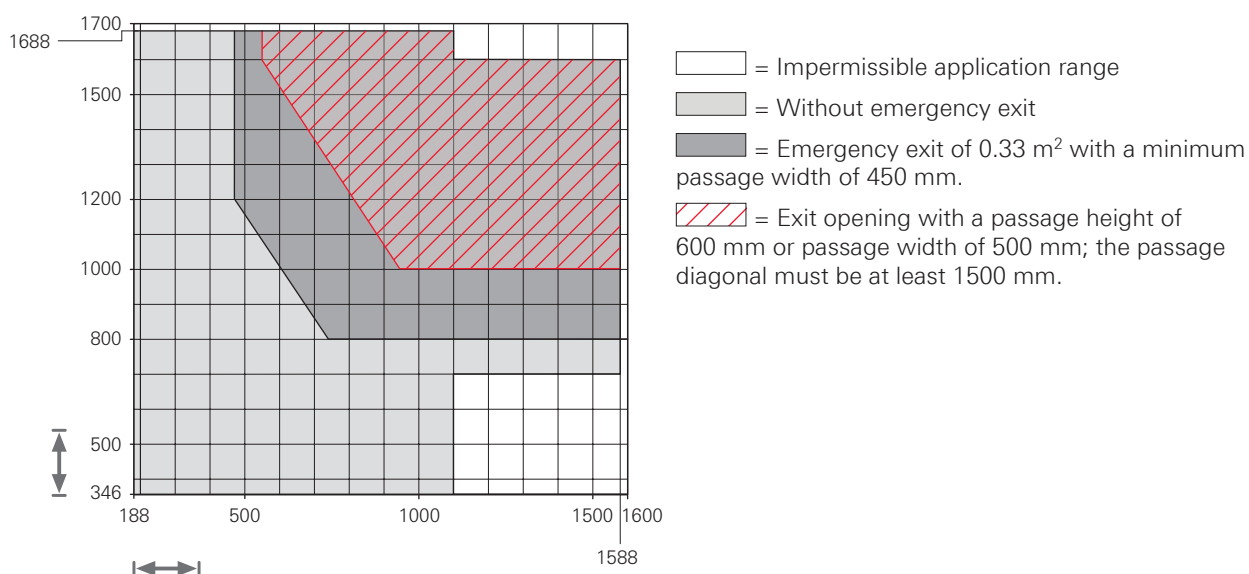
3.4 Application diagrams

3.4.1 80 kg



INFO

80 kg is only possible with fully reversible hinges M17 and M18 in combination with topgliders type 2 and type 6.



The specifications in the application diagram refer to the glass weight in kg/m².

1 mm/m² glass thickness $\approx$ 2.5 kg

Application range 60 kg

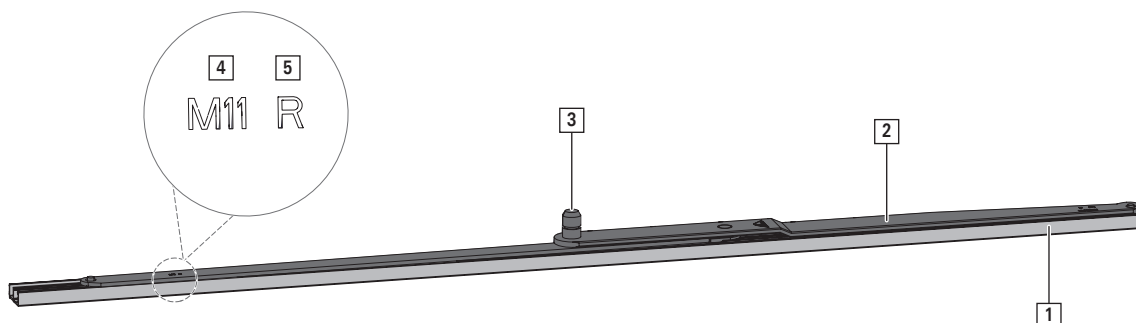
Application range		
	Sash rebate width	188 – 1588 mm
	Sash rebate height	346 – 1688 mm
	Sash weight	Max. 60 kg

Application range 80 kg

Application range		
	Sash rebate height	1547 – 1688 mm
	Sash weight	Max. 80 kg



3.5 Overview of scissor stay size



- [1] Track
- [2] Scissor stay
- [3] Bearing pin
- [4] Scissor stay size
- [5] DIN left / right

Fully reversible hinge	Length	FFH
M5	424	346 – 445
M6	524	446 – 525
M6.5	580	526 – 567
M7	624	568 – 625
M7.5	680	626 – 667
M8	724	668 – 725
M8.5	780	726 – 767
M9	824	768 – 825
M9.5	880	826 – 867
M10	924	868 – 925
M10.5	980	926 – 967
M11	1024	968 – 1025
M11.5	1080	1026 – 1067
M12	1124	1068 – 1125
M12.5	1180	1126 – 1167
M13	1224	1168 – 1225
M13.5	1280	1226 – 1267
M14	1324	1268 – 1325
M14.5	1380	1326 – 1367
M15	1424	1368 – 1425
M15.5	1480	1426 – 1467
M16	1524	1468 – 1546
M17	1624	1547 – 1646
M18	1724	1647 – 1688



INFO

Tracks can be shortened by 25 - 50 mm at the top. It is preferable for them to only be shortened by 25 mm.

Adapt dimension F accordingly (→ *from page 34*).

If fully reversible hinge M5 is shortened by 50 mm at the top, only use sash bearing 777569.



INFO

Profile: Euro-groove and SRH 346 mm

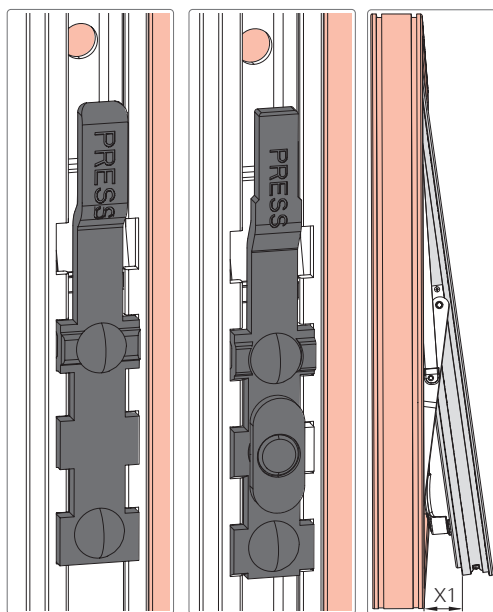
When combining fully reversible hinge M5 and topglider type 5 - 7, the cropping range is max. 38 mm.

Adapt dimension F accordingly (→ *from page 34*).

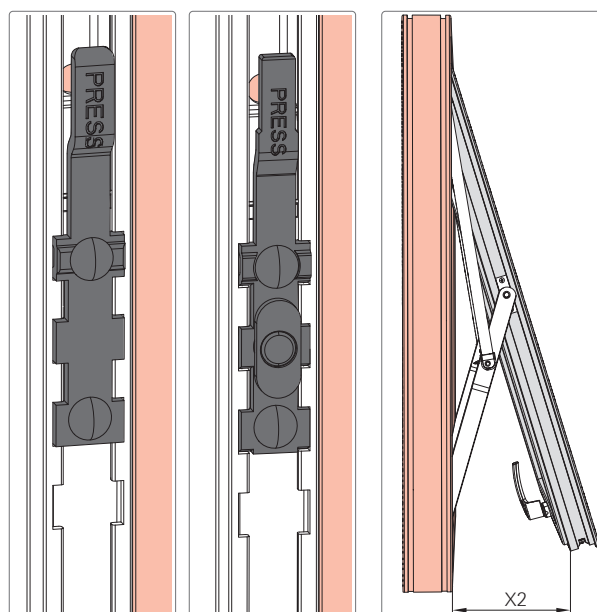
A SRH of 346 mm is not possible with topglider type 8.

3.6 Lock-in position and opening width

Lock-in position 1



Lock-in position 2



Fully reversible hinge		Lock-in position 1	Lock-in position 2
		Opening width X1	Opening width X2
M5		107	187
M6		82	177
M6.5		87	192
M7		86	194
M7.5		94	209
M8		85	211
M8.5		80	215
M9		74	214
M9.5		70	222
M10		75	224
M10.5		92	245
M11		69	239
M11.5		71	241
M12		83	246
M12.5		64	256
M13		86	261
M13.5		61	265
M14		77	267
M14.5		63	269
M15		70	288
M15.5		76	284
M16		85	277
M17		94	307
M18		97	310



4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank Fenster- und Türtechnologie GmbH.

The basic page layout in the hardware overviews chapter firstly shows examples of the combination of individual hardware components, and the associated parts list can be seen on the following pages.

Additional combinations of hardware components can be found in the catalogue.

The item numbers in the squares link the hardware overview to the parts list.

The actual composition of the hardware depends on:

- the width of the element
- the height of the element
- the weight of the element
- Profile system

Profile-related frame components and general sets are listed in additional chapters.

Recommended handles can be found in the Roto Handles catalogue (CTL_1), see the chapter entitled "Outward Opening".

Determine the quantity of required hardware components with Roto Con Orders.



INFO

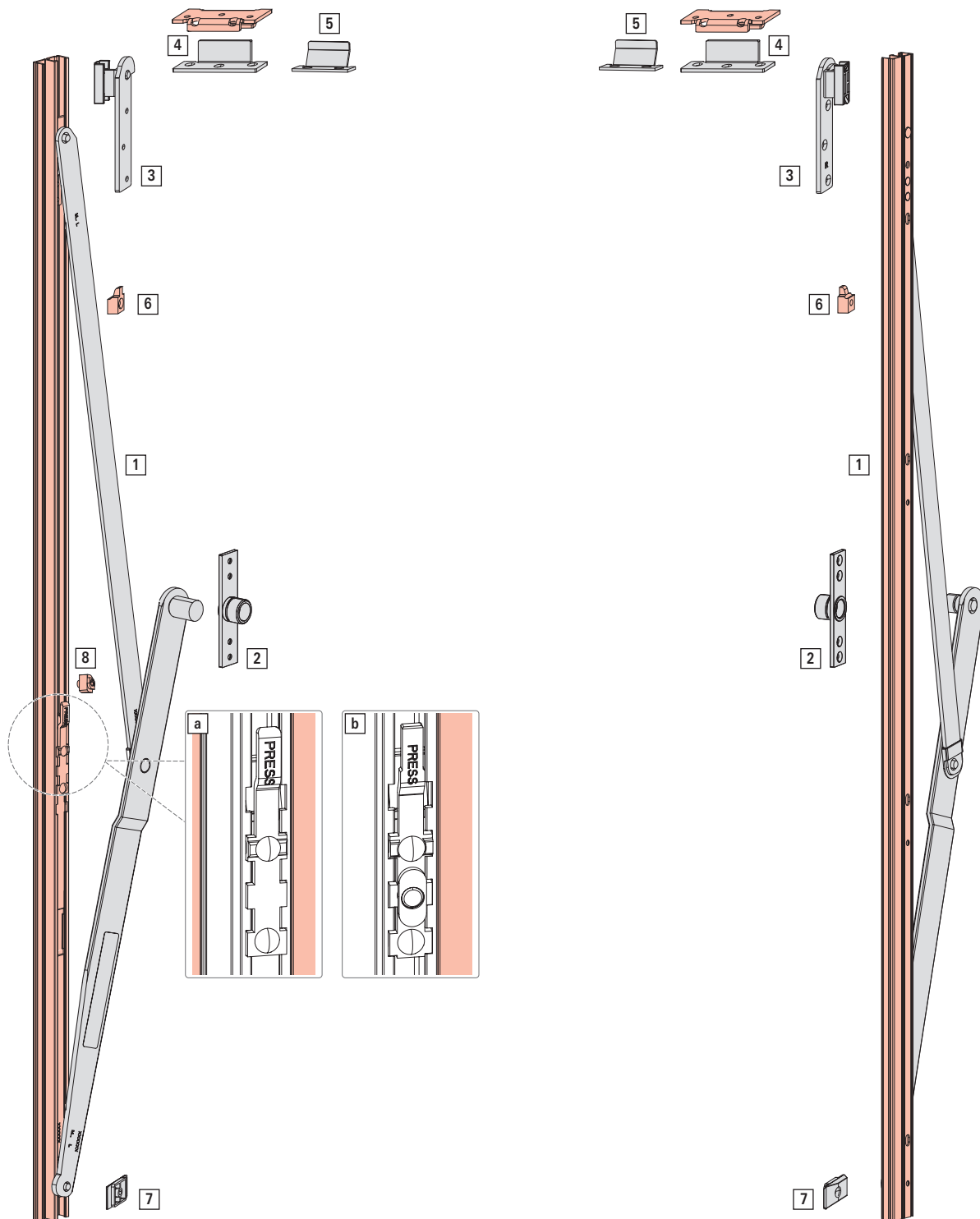
Roto Con Orders

Efficient online hardware configurator for the custom configuration of individual window and door hardware components. All conventional shapes and opening types can be automatically configured quickly and easily. Individual parts lists, including application ranges and an exemplary hardware overview, can be ordered from your responsible sales representative.



www.roto-frank.com

4.1 Top-Swing





[1a] Fully reversible hinge, standard version 5

					Nº
M5	424	60 kg	346 – 445	1 Pair(s)	777093
M6	524	60 kg	446 – 525	1 Pair(s)	777527
M6.5	580	60 kg	526 – 567	1 Pair(s)	777540
M7	624	60 kg	568 – 625	1 Pair(s)	777528
M7.5	680	60 kg	626 – 667	1 Pair(s)	777541
M8	724	60 kg	668 – 725	1 Pair(s)	777529
M8.5	780	60 kg	726 – 767	1 Pair(s)	777542
M9	824	60 kg	768 – 825	1 Pair(s)	777530
M9.5	880	60 kg	826 – 867	1 Pair(s)	777543
M10	924	60 kg	868 – 925	1 Pair(s)	777531
M10.5	980	60 kg	926 – 967	1 Pair(s)	777544
M11	1024	60 kg	968 – 1025	1 Pair(s)	777532
M11.5	1080	60 kg	1026 – 1067	1 Pair(s)	777545
M12	1124	60 kg	1068 – 1125	1 Pair(s)	777533
M12.5	1180	60 kg	1126 – 1167	1 Pair(s)	777546
M13	1224	60 kg	1168 – 1225	1 Pair(s)	777534
M13.5	1280	60 kg	1226 – 1267	1 Pair(s)	777547
M14	1324	60 kg	1268 – 1325	1 Pair(s)	777535
M14.5	1380	60 kg	1326 – 1367	1 Pair(s)	777548
M15	1424	60 kg	1368 – 1425	1 Pair(s)	777536
M15.5	1480	60 kg	1426 – 1467	1 Pair(s)	777549
M16	1524	60 kg	1468 – 1546	1 Pair(s)	777537
M17	1624	80 kg	1547 – 1646	1 Pair(s)	777538
M18	1724	80 kg	1647 – 1688	1 Pair(s)	777539

[1b] Fully reversible hinge, hotel version 5

					Nº
M5	424	60 kg	346 – 445	1 Pair(s)	777156
M6	524	60 kg	446 – 525	1 Pair(s)	777158
M6.5	580	60 kg	526 – 567	1 Pair(s)	777190
M7	624	60 kg	568 – 625	1 Pair(s)	777160
M7.5	680	60 kg	626 – 667	1 Pair(s)	777192
M8	724	60 kg	668 – 725	1 Pair(s)	777162
M8.5	780	60 kg	726 – 767	1 Pair(s)	777194
M9	824	60 kg	768 – 825	1 Pair(s)	777165
M9.5	880	60 kg	826 – 867	1 Pair(s)	777197
M10	924	60 kg	868 – 925	1 Pair(s)	777168
M10.5	980	60 kg	926 – 967	1 Pair(s)	777200
M11	1024	60 kg	968 – 1025	1 Pair(s)	777171
M11.5	1080	60 kg	1026 – 1067	1 Pair(s)	777203
M12	1124	60 kg	1068 – 1125	1 Pair(s)	777174
M12.5	1180	60 kg	1126 – 1167	1 Pair(s)	777206
M13	1224	60 kg	1168 – 1225	1 Pair(s)	777177
M13.5	1280	60 kg	1226 – 1267	1 Pair(s)	777209
M14	1324	60 kg	1268 – 1325	1 Pair(s)	777180
M14.5	1380	60 kg	1326 – 1367	1 Pair(s)	777212
M15	1424	60 kg	1368 – 1425	1 Pair(s)	777182
M15.5	1480	60 kg	1426 – 1467	1 Pair(s)	777214
M16	1524	60 kg	1468 – 1546	1 Pair(s)	777184
M17	1624	80 kg	1547 – 1646	1 Pair(s)	777186
M18	1724	80 kg	1647 – 1688	1 Pair(s)	777188

1 pair consisting of:

- 1x fully reversible hinge with restrictor, left
- 1x fully reversible hinge, right

[2] Sash bearing 100 / 200 / 200

		Nº
PVC	1 Set(s)	777131
Timber	1 Set(s)	777569
Timber PVC Aluminium	1 Set(s)	777132

1 set consisting of:

- 2x sash bearings

[3] Topglider 50

		Nº
Type 1	Timber	1 Pair(s) 777570
Type 2	Timber Aluminium	1 Pair(s) 777557
Type 3	Aluminium	1 Pair(s) 777225
Type 4	Aluminium	1 Pair(s) 777223
Type 5	PVC	1 Pair(s) 777137
Type 6	PVC	1 Pair(s) 777268
Type 7	PVC	1 Pair(s) 777272
Type 8	PVC	1 Pair(s) 777101

1 pair consisting of:

- 1x topglider, left
- 1x topglider, right

Optional

[4] Burglary protection 50

					Nº
Minimum quantity per window: 2	Sash and frame component	Top	1 Set(s)		777555

[5] Centre closer 20

					Nº
Minimum quantity per window: 2	Sash component	Top	1 Piece(s)		777524

[6] Stop block 100

				Nº
Minimum quantity per window: 2	Frame	1 Piece(s)		777554

[7] Guide block 100

				Nº
Minimum quantity per window: 2	Sash	1 Piece(s)		777525

[8] Blocking device 100

			Nº
Frame	1 Set(s)		777573

Set consisting of:

- 1x blocking device
- 1x hex key
- 1x short user guide



5 Emergency exit



INFO

All specifications of the German Construction Standards Ordinance (Baunorm-Verordnung) regarding emergency exits and escape routes must be complied with → *from page 7*.

Regulations, directives and national laws of the individual countries apply.

5.1 Requirements

- It must be possible to open emergency exit windows freely.
- The emergency exit area must be at least 0.33 m² in size.
- The emergency exit area must be at least 450 mm high and 450 mm wide.
- The area to be opened should not be more than 1100 mm above ground level.

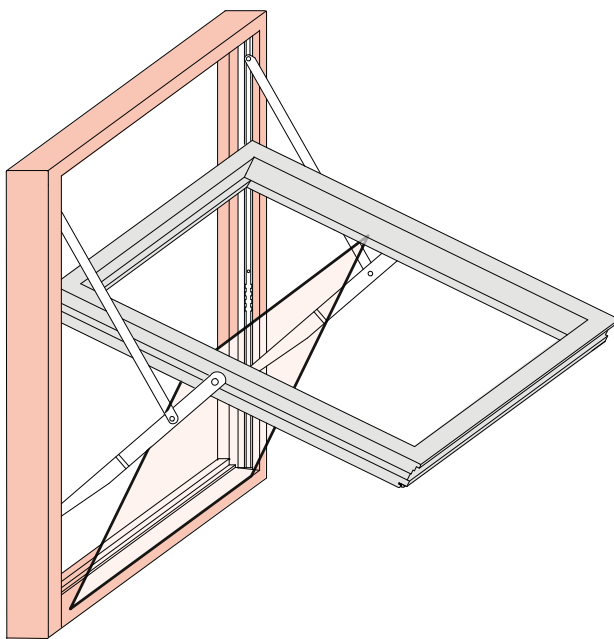


INFO

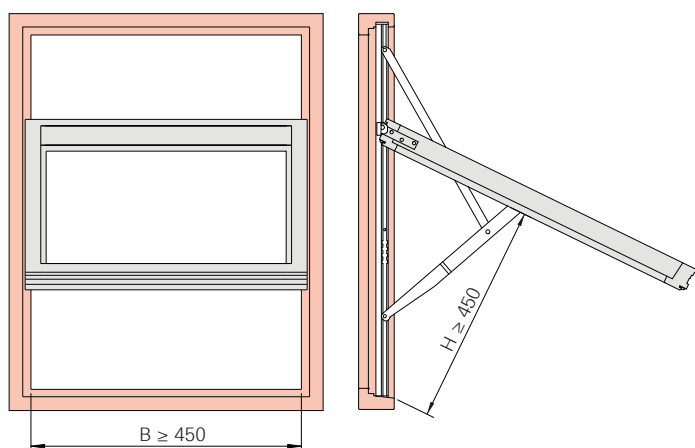
Note:

- The Building Regulations 2019 - Advanced Document B
- Regulations, directives and national laws of the individual countries.

5.2 Calculation



 Emergency exit area



INFO

The emergency exit area must be at least 0.33 m² in size.



INFO

Emergency exit possible from scissor stay size M8.

Fully reversible hinge	Length	FFH	Achievable emergency exit height [H]	Minimum sash width ^[1] [B]
M8	724	668 – 725	450 – 486	814 – 701
M8.5	780	726 – 767	460 – 525	740 – 650
M9	824	768 – 825	486 – 552	701 – 620
M9.5	880	826 – 867	524 – 590	652 – 581
M10	924	868 – 925	550 – 617	622 – 556
M10.5	980	926 – 967	587 – 654	584 – 526
M11	1024	968 – 1025	615 – 681	558 – 506
M11.5	1080	1026 – 1067	652 – 719	528 – 480
M12	1124	1068 – 1125	681 – 747	506 – 470
M12.5	1180	1126 – 1167	717 – 783	482 – 470
M13	1224	1168 – 1225	747 – 812	470
M13.5	1280	1226 – 1267	871 – 847	470
M14	1324	1268 – 1325	812 – 877	470
M14.5	1380	1326 – 1367	845 – 912	470
M15	1424	1368 – 1425	878 – 943	470
M15.5	1480	1426 – 1467	909 – 976	470
M16	1524	1468 – 1546	943 – 1008	470
M17	1624	1547 – 1646	1001 – 1068	470
M18	1724	1647 – 1688	1066 – 1095	470

Example

If B is equal to 450 mm, H must be ≥ 733 mm to achieve the emergency exit area of 0.33 m².

If H is equal to 450 mm, B must be ≥ 733 mm to achieve the emergency exit area of 0.33 m².

[1] Minimum sash width to achieve an emergency exit area of 0.33 m²



6 Installation

6.1 Processing instructions

Maximum sash sizes and weights

The specifications, application diagrams and component assignments which can be found in the hardware manufacturer's product-specific documents provide information on the maximum permitted sash sizes and weights. The component with the lowest permitted load bearing capacity determines the maximum permitted sash weight.

- Before using electronic data records and implementing them in window fabrication programs in particular, check that they match the specifications, application diagrams and component assignments.
- Never exceed the maximum permitted sash sizes and weights. If any points are unclear, contact the hardware manufacturer.

Specifications from profile manufacturers

The element manufacturer must comply with all specified system dimensions (e.g. gasket gap dimensions or locking distances).

They must continue to ensure and check this on a regular basis, especially when new hardware components are used for the first time, during production and on a continuous basis, up to and including element installation.



INFO

The hardware components are always designed in such a way that any system dimensions affected by the hardware can be adjusted. The hardware manufacturer shall not be liable for any additional expenses incurred if a deviation from these dimensions is not discovered until after the element has been installed.

Combining hardware

Burglar inhibiting elements need hardware which meets special requirements.

Elements for wet rooms and those for use in environments with aggressive, corrosive constituents in the air require hardware that meets special requirements.

Coordinate suitable hardware combinations and installation procedures in elements with the hardware manufacturer and profile manufacturer for the areas listed above, and conclude a separate agreement for them.



INFO

The hardware manufacturer's specifications on the combination of hardware (e.g. the use of additional scissor stays, the design of hardware for burglar inhibiting elements, etc.) are binding.

6.2 Screw connections



DANGER

Incorrectly installed or screwed-in hardware components present a risk of death.

Incorrectly installed and screwed-in hardware components may lead to hazardous situations and cause serious or fatal accidents.

- ▶ During installation and screwdriving work, observe the specifications provided by the profile manufacturer; contact the profile manufacturer if necessary.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.
- ▶ Ensure that the hardware components are adequately secured; contact the screw manufacturer if necessary.



ATTENTION

Using incorrect screw material may cause property damage.

Using the wrong screws may damage the components.

- ▶ Only use galvanised zinc-plated and passivated steel screws.
- ▶ Use screws with additional sealing in more challenging climatic conditions.
- ▶ Use stainless-steel screws on stainless-steel components only.
- ▶ For aluminium components, use screws made of steel (coated with zinc-nickel or zinc flakes) or stainless steel.



ATTENTION

Improper screw fixings may cause property damage.

Improper screw fixings may damage the components and the element as a whole, and stop them from working properly.

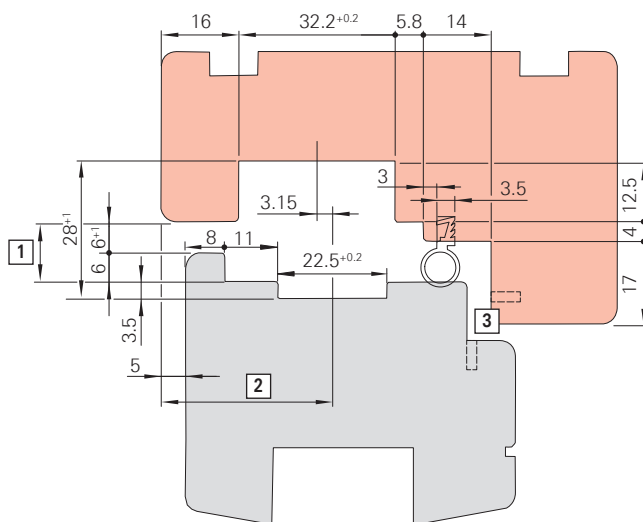
- ▶ Unless stated otherwise, turn screws in straight.
- ▶ Tighten screw heads until they are flush with the surface.
- ▶ Do not over-tighten screws. Note the torque. Choose a torque that will not deform the hardware and profile. Define profile-specific torques on the basis of the demo assembly.
- ▶ Use the recommended screws.
- ▶ Select the length of the screws according to the profiles used.

6.3 Profile dimensions

6.3.1 Timber

Uninut

Top and side



Rebate system 12/6 - 35.25

Uninut 16/32.2

12 mm rebate clearance

6 mm overlap width

35.25 mm hardware axis

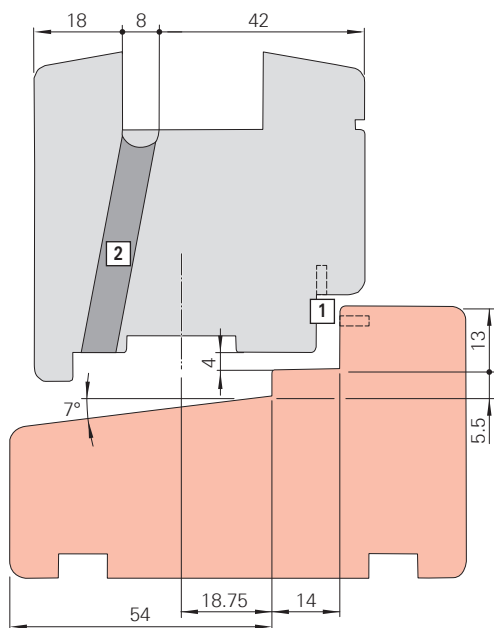
[1] Rebate clearance

[2] Hardware axis

[3] Depending on the selected gasket



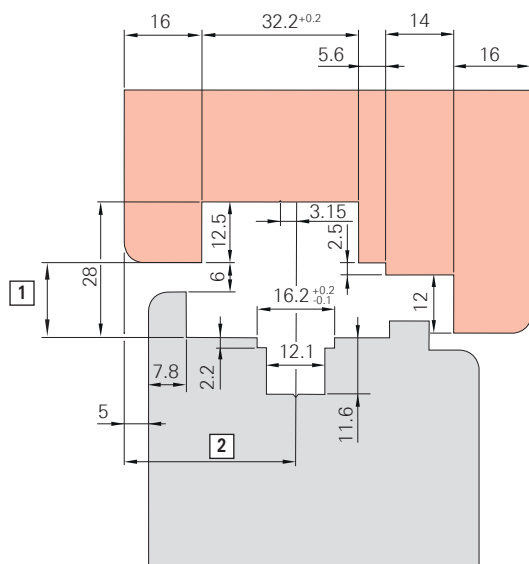
Bottom



- [1] Depending on the selected gasket
 [2] Drainage hole

6.3.2 Timber / PVC

Euro-groove



Rebate system 15.5/9.5 - 35.25

Euro-groove 16/32.2

- 15.5 mm rebate clearance
- 9.5 mm overlap width
- 35.25 mm hardware axis

[1] Rebate clearance

[2] Hardware axis



INFO

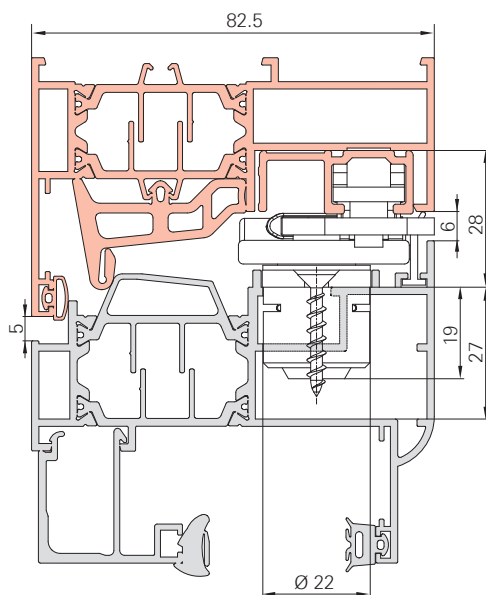
Profile: Euro-groove and SRH 346 mm

When combining fully reversible hinge M5 and topglider type 5 - 7, the cropping range is max. 38 mm.

Adapt dimension F accordingly (→ *from page 34*).

A SRH of 346 mm is not possible with topglider type 8.

6.3.3 Aluminium



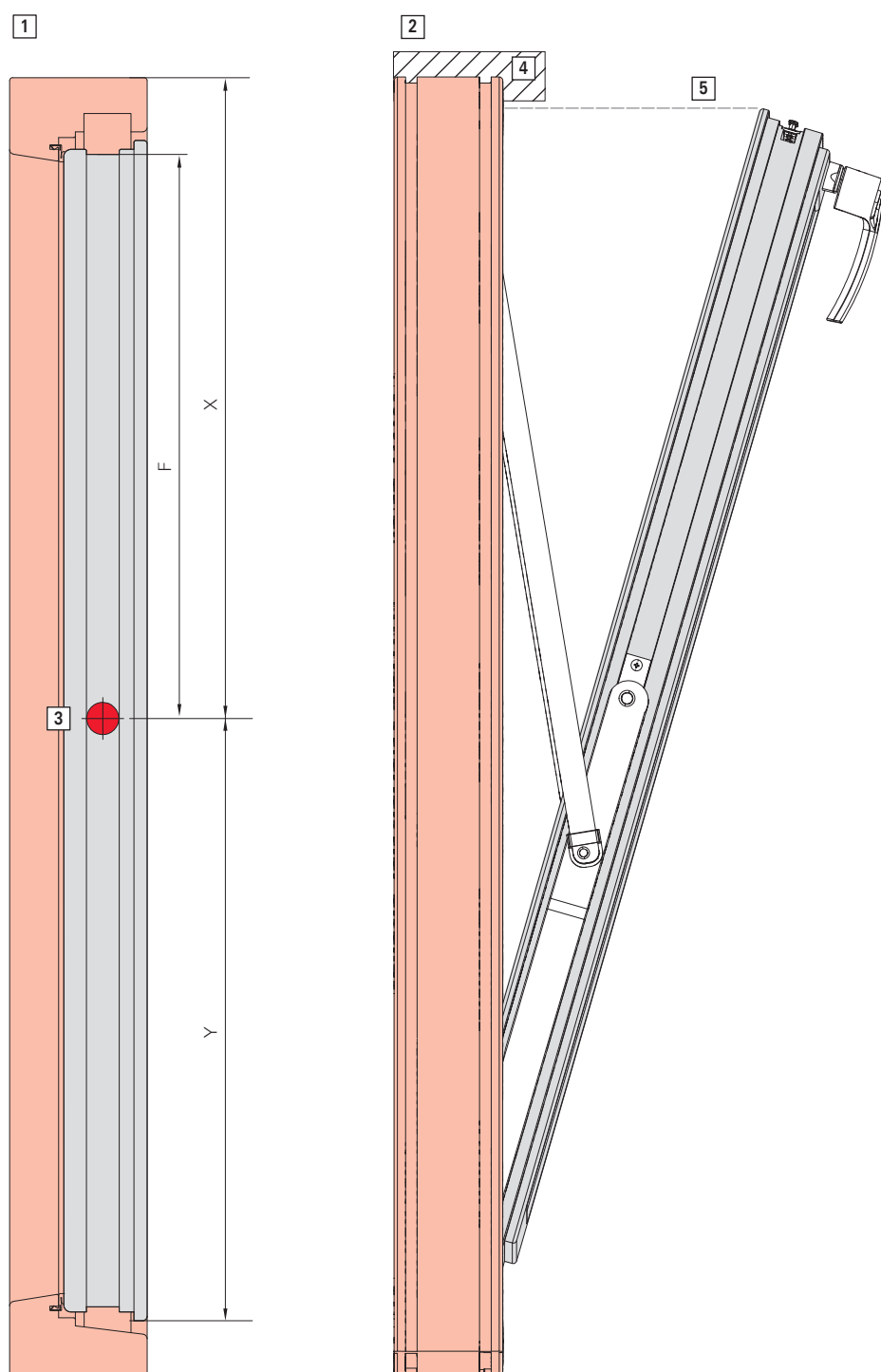
6.4 Installation space calculation



INFO

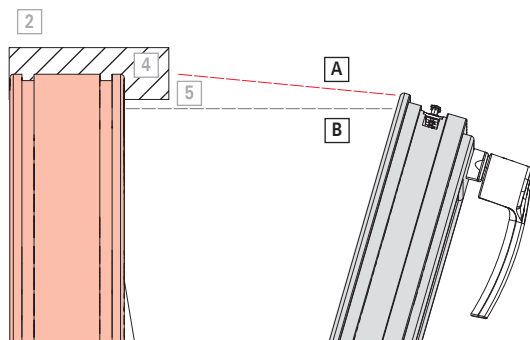
Avoid collisions, e.g. with the reveal at the top.

$X < Y$ = collision, e.g. reveal at the top



- [1] Locked position
- [2] Cleaning position
- [3] Sash bearing drill hole
- [4] e.g.: reveal

[5] Sash inlet



[A] Overshooting and collisions, e.g. with the reveal, are possible

[B] No overshooting, sash runs in without collisions.



INFO

Tracks can be shortened by 25 - 50 mm at the top. It is preferable for them to only be shortened by 25 mm.

Adapt dimension F accordingly (→ *from page 34*).

If fully reversible hinge M5 is shortened by 50 mm at the top, only use sash bearing 777569.



INFO

Profile: Euro-groove and SRH 346 mm

When combining fully reversible hinge M5 and topglider type 5 - 7, the cropping range is max. 38 mm.

Adapt dimension F accordingly (→ *from page 34*).

A SRH of 346 mm is not possible with topglider type 8.



INFO

If the track is shortened by the dimension X, subtract the same value from the dimension F.

$$F_{\text{New}} = F - X$$

Fully reversible hinge	F
M5	186
M6	238
M6.5	264
M7	288
M7.5	312
M8	338
M8.5	364
M9	388
M9.5	412
M10	438
M10.5	458
M11	488
M11.5	512
M12	538
M12.5	564
M13	588
M13.5	612
M14	638
M14.5	664
M15	688

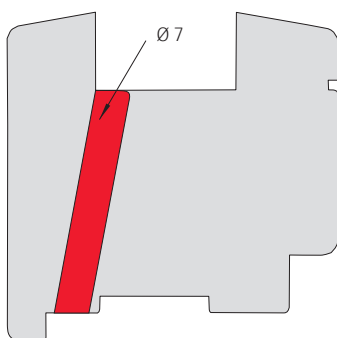


Fully reversible hinge	F
M15.5	712
M16	738
M17	778
M18	828

6.5 Drilling and routing dimensions

6.5.1 Drainage

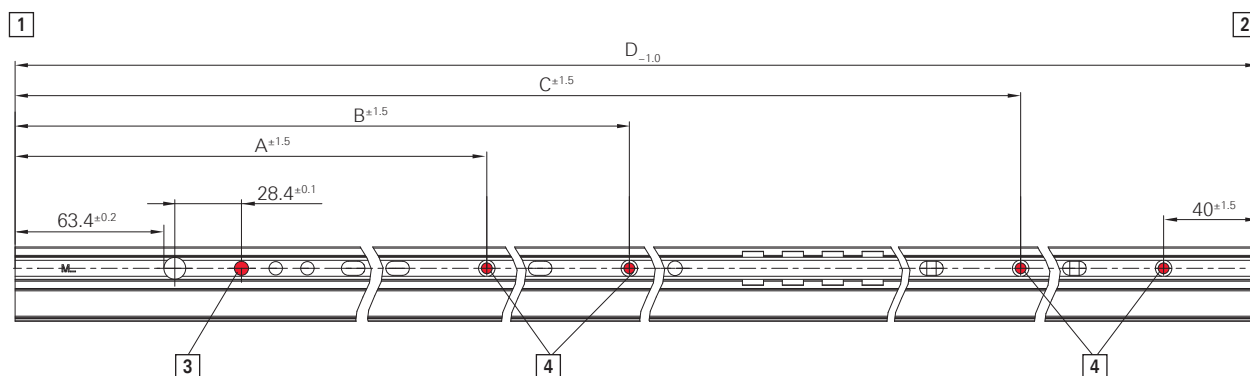
Uni-groove



Drill at least two drainage holes at the bottom of the sash.

6.5.2 Fully reversible hinge

Left

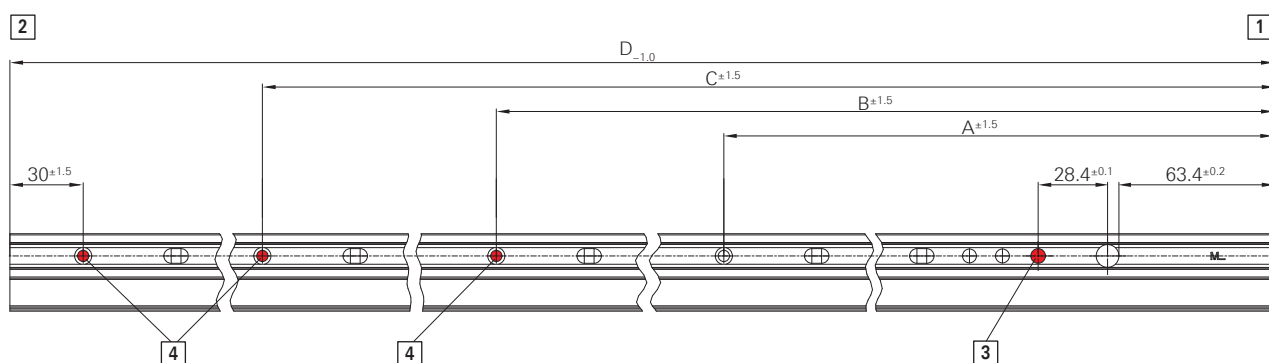


Fully reversible hinge	A	B	C	D
	Track length			
M5	–	–	–	424
M6	184	–	–	524
M6.5	184	–	–	580
M7	284	–	–	624
M7.5	284	–	–	680
M8	259	–	–	724
M8.5	284	–	–	780
M9	359	–	–	824
M9.5	359	–	–	880
M10	359	–	584	924
M10.5	359	–	684	980
M11	384	–	684	1024
M11.5	384	–	784	1080

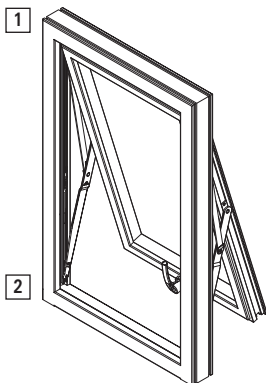
Installation
Drilling and routing dimensions
Fully reversible hinge

Fully reversible hinge	A	B	C	D Track length
M12	359	–	784	1124
M12.5	384	–	884	1180
M13	459	–	884	1224
M13.5	459	–	984	1280
M14	359	559	984	1324
M14.5	359	559	984	1380
M15	359	659	1084	1424
M15.5	359	659	1084	1480
M16	459	759	1184	1524
M17	459	859	1284	1624
M18	459	959	1384	1724

Right



Fully reversible hinge	A	B	C	D Track length
M5	–	–	–	424
M6	194	–	–	524
M6.5	194	–	–	580
M7	294	–	–	624
M7.5	294	–	–	680
M8	269	–	–	724
M8.5	294	–	–	780
M9	369	–	–	824
M9.5	369	–	–	880
M10	369	–	594	924
M10.5	369	–	694	980
M11	394	–	694	1024
M11.5	394	–	794	1080
M12	369	–	794	1124
M12.5	394	–	894	1180
M13	469	–	894	1224
M13.5	469	–	994	1280
M14	369	569	994	1324
M14.5	369	569	994	1380
M15	369	669	1094	1424
M15.5	369	669	1094	1480
M16	469	769	1194	1524
M17	469	869	1294	1624
M18	469	969	1394	1724



- [1] Top
- [2] Bottom
- [3] Drill hole Ø 6 mm
- [4] Drill hole Ø 4.7 mm

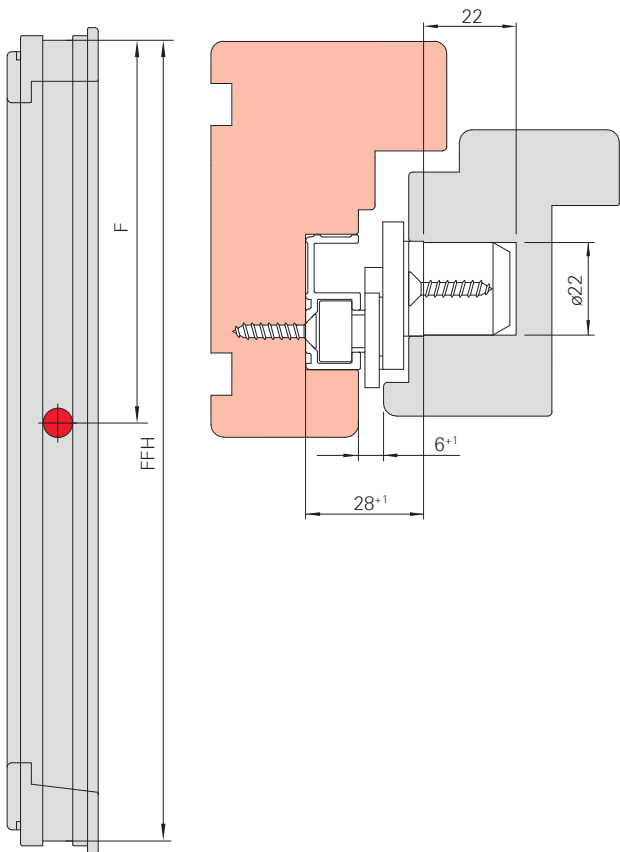
Holes do not have to be predrilled.



INFO

Slots are used to fix the fully reversible hinges in place. Once both fully reversible hinges have been aligned in parallel, drill the remaining holes and fasten the fully reversible hinges with screws.

6.5.3 Sash bearing



Fully reversible hinge	SRH	F
M5	346 – 445	186
M6	446 – 525	238
M6.5	526 – 567	264
M7	568 – 625	288
M7.5	626 – 667	312
M8	668 – 725	338
M8.5	726 – 767	364
M9	768 – 825	388

Fully reversible hinge	SRH	F
M9.5	826 – 867	412
M10	868 – 925	438
M10.5	926 – 967	458
M11	968 – 1025	488
M11.5	1026 – 1067	512
M12	1068 – 1125	538
M12.5	1126 – 1167	564
M13	1168 – 1225	588
M13.5	1226 – 1267	612
M14	1268 – 1325	638
M14.5	1326 – 1367	664
M15	1368 – 1425	688
M15.5	1426 – 1467	712
M16	1468 – 1546	738
M17	1547 – 1646	778
M18	1647 – 1688	828

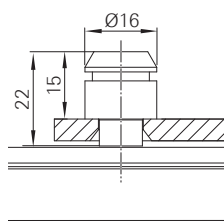


INFO

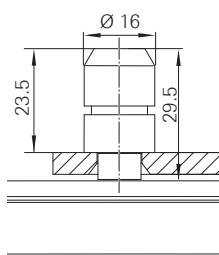
If the track is shortened by the dimension X, subtract the same value from the dimension F.

$$F_{\text{New}} = F - X$$

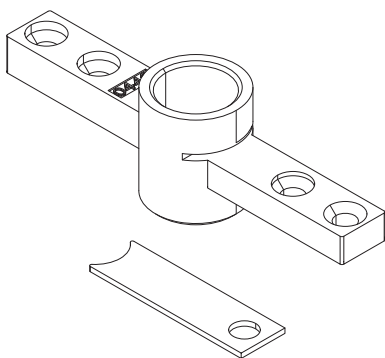
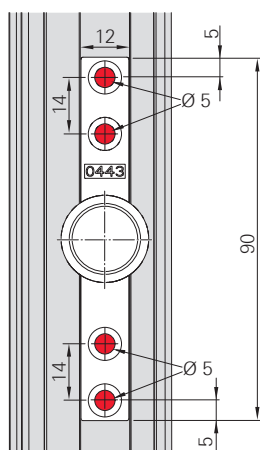
Small bearing pin for fully reversible hinges M5 to M6.5



Large bearing pin for fully reversible hinges M7 to M18



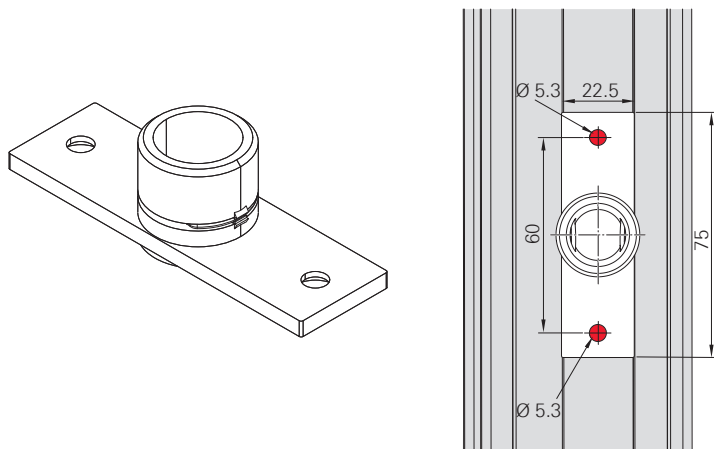
PVC



Material number: 777131

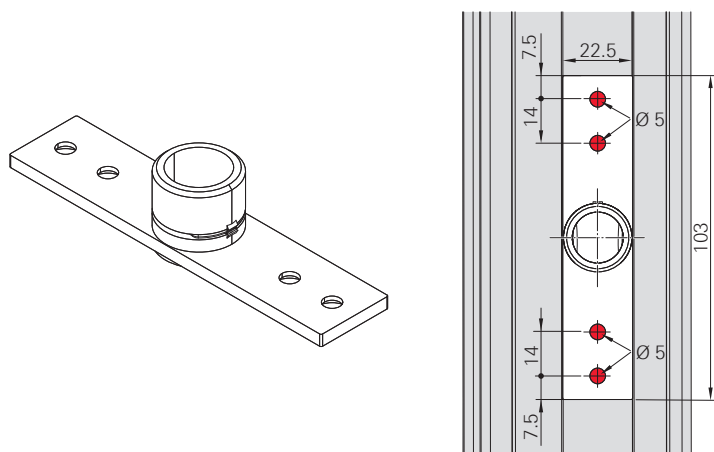


Timber Uni-groove



Material number: 777569

Timber, PVC and aluminium Uni-groove



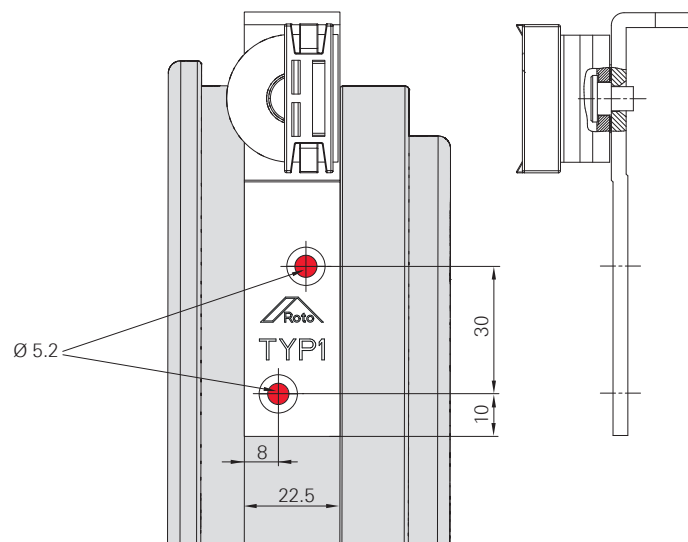
Material number: 777132

6.6 Sash

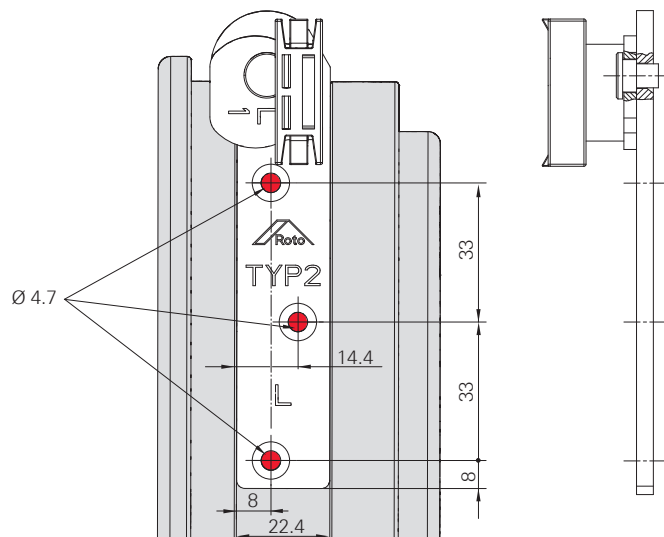
6.6.1 Top slider

6.6.1.1 Dimensions

Type 1

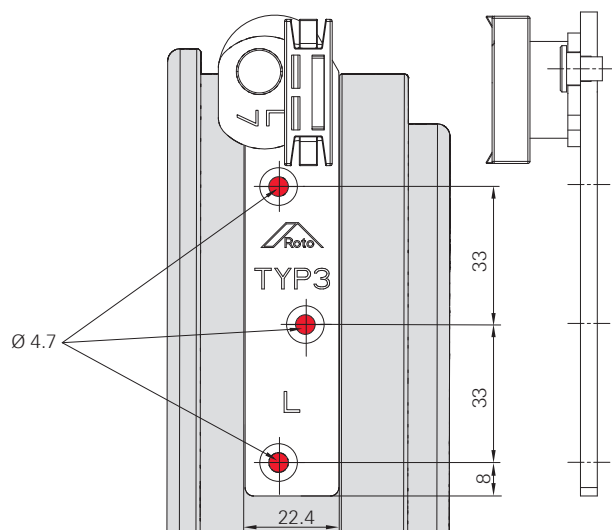


Type 2

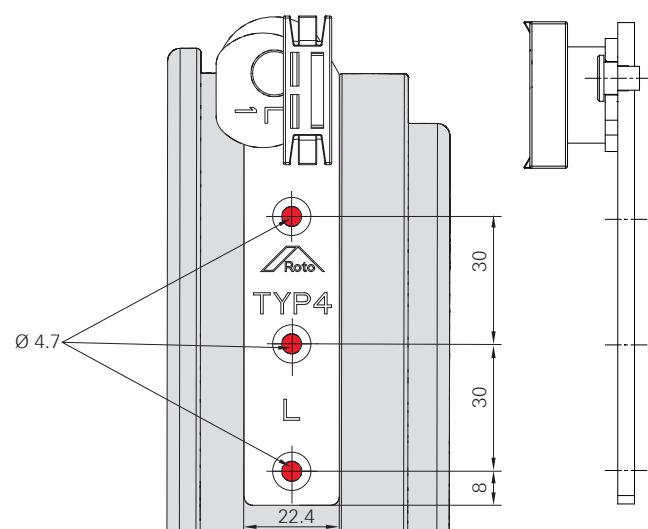




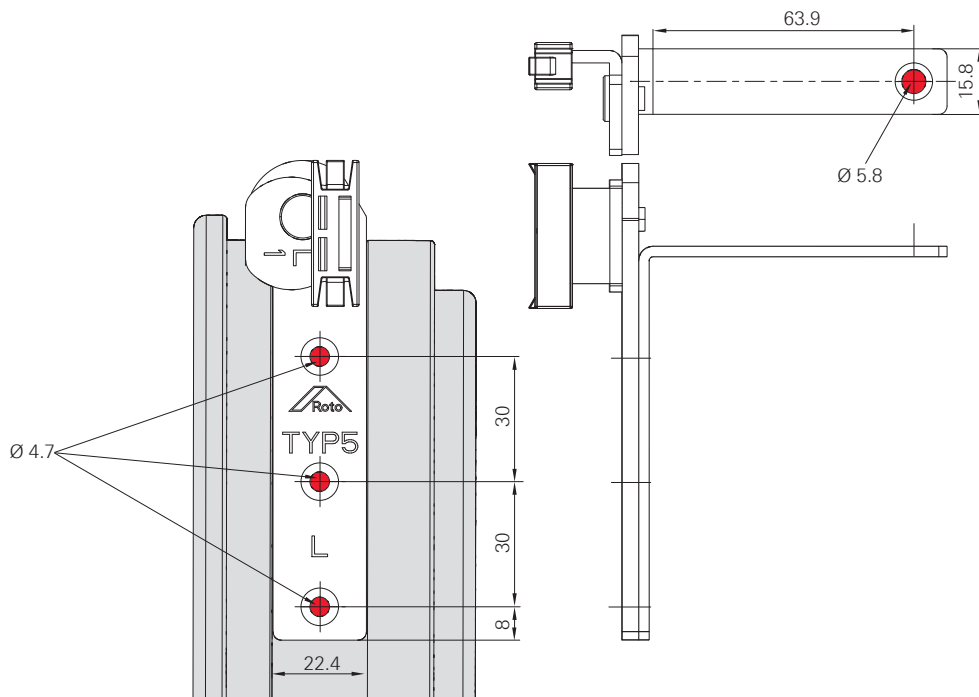
Type 3



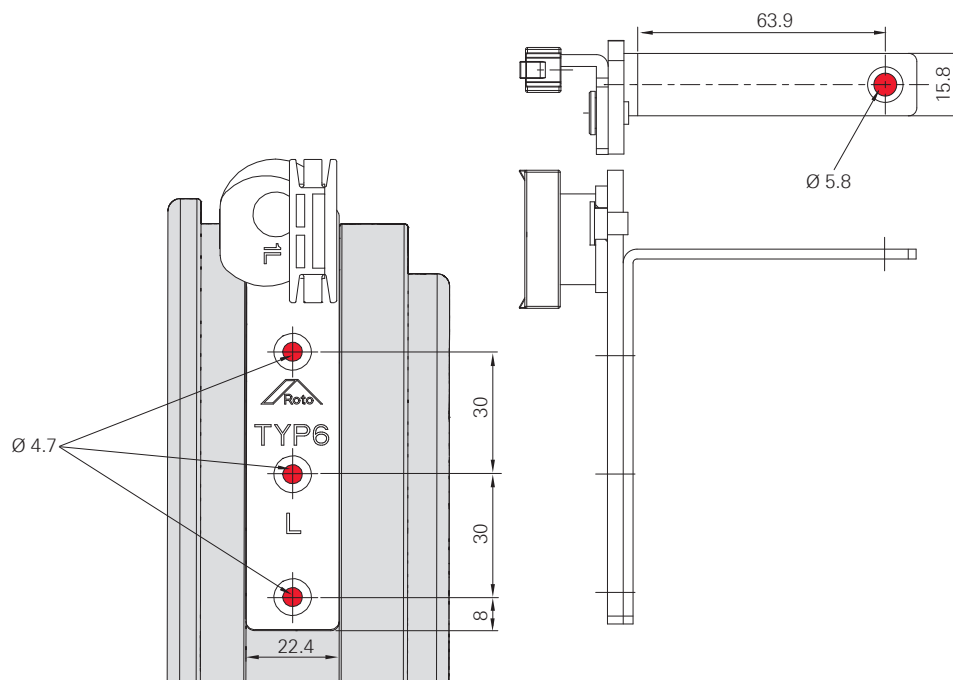
Type 4



Type 5

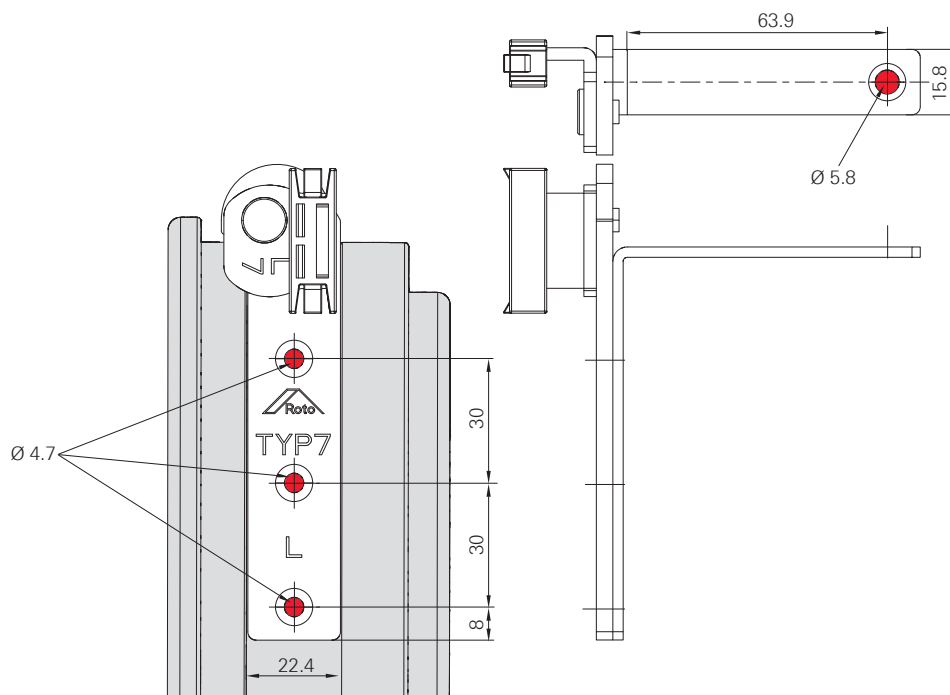


Type 6

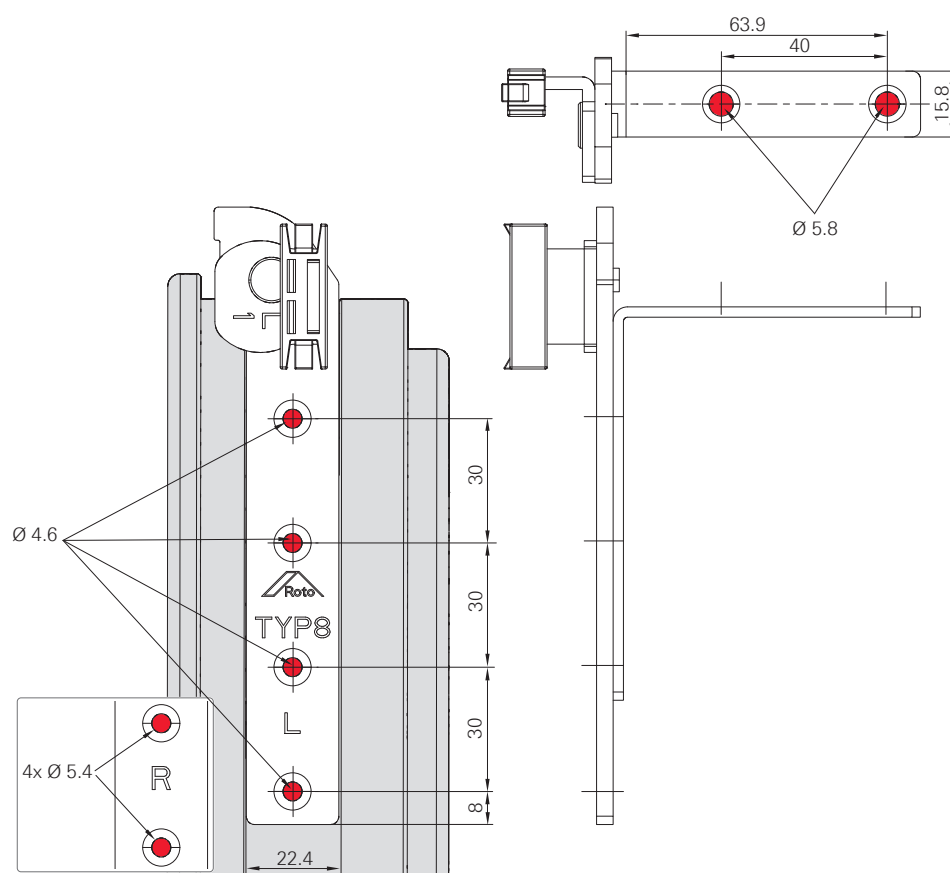




Type 7



Type 8



6.6.1.2 Installing the topglider

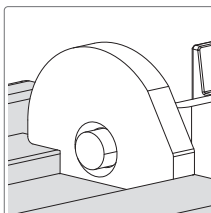
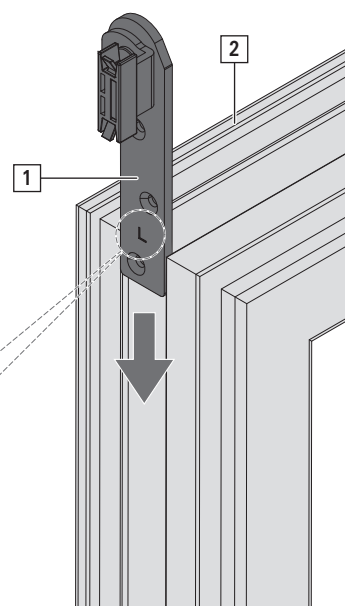
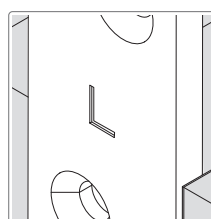
Installing type 1 - 4

1. Insert the topglider [1] into the sash [2].

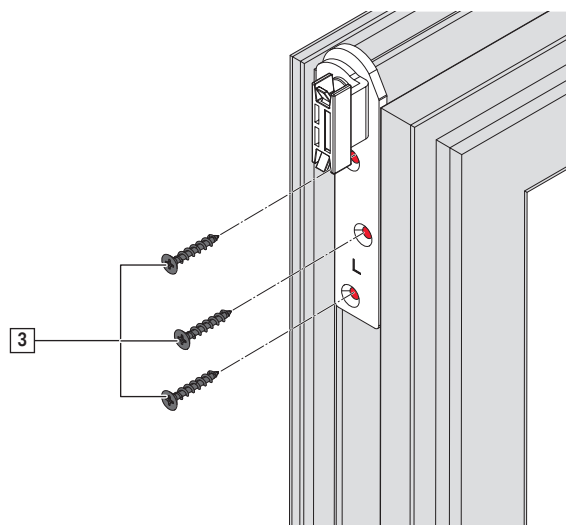


INFO

The component depends on the side.
Ensure that right and left components
are assigned correctly.



2. Fasten with three screws [3].





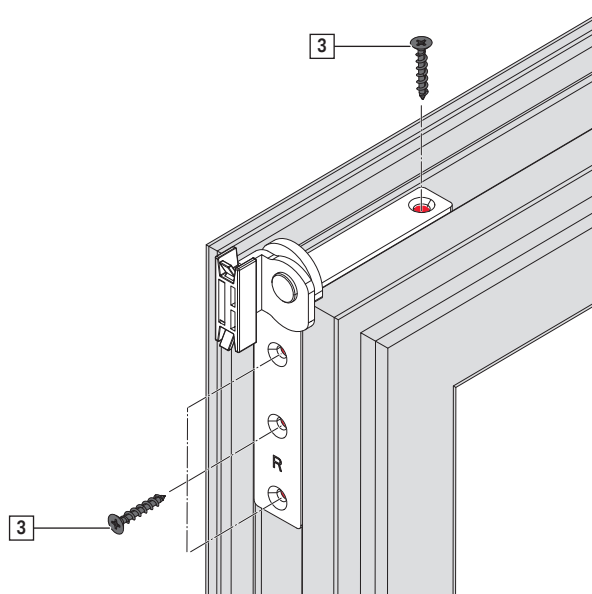
Installing type 5 - 8

1. Insert the toplider [1] into the sash [2].



INFO

The component depends on the side.
Ensure that right and left components
are assigned correctly.



2. Type 5 - 7 Fasten with four screws [3].
Type 8 Fasten with six screws.

6.7 Frame

6.7.1 Fully reversible hinge



ATTENTION

Improper installation may cause property damage.

Mechanical stress can damage the scissor stay mechanism.

- ▶ Install the fully reversible hinges so that they are exactly parallel.
- ▶ Install scissor stays that are identical in size.

1. Open the fully reversible hinge [1].

2. Position the fully reversible hinge in the open position on the frame [2].



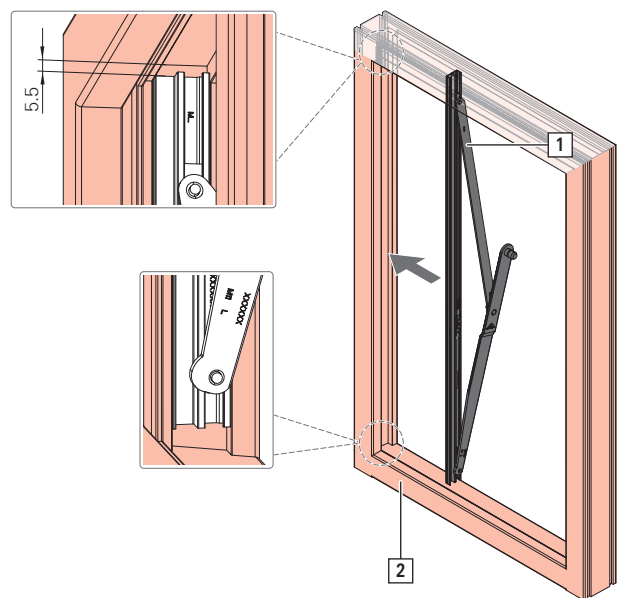
INFO

Maintain a distance of 5.5 mm at the top.



INFO

The component depends on the side. Ensure that right and left components are assigned correctly.



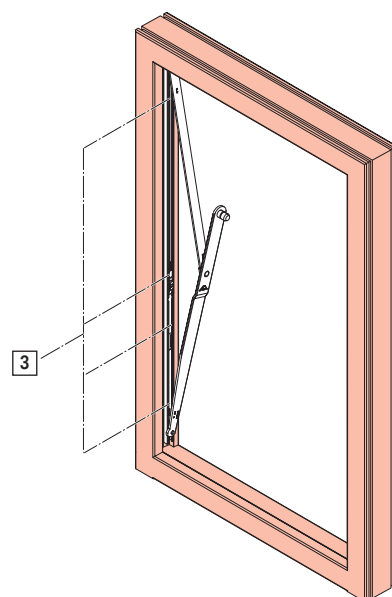
3. Fasten the track with screws [3].



INFO

Slots are used to fix the fully reversible hinge in place. Once both fully reversible hinges have been aligned in parallel, drill the remaining holes and fasten the fully reversible hinges with screws.

The quantity of screws depends on the scissor stay size → *from page 37*.





6.7.2 Sash bearing



INFO

Once a sash bearing has been installed, it cannot be removed again.



INFO

The sash bearing can also be installed at a later point → 6.8.2 "Sash bearing" from page 51.

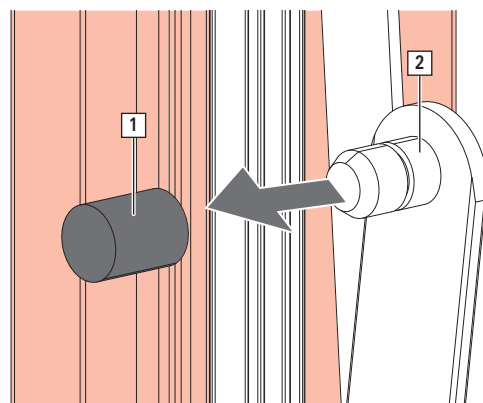
1. Remove the protective cap [1] from the bearing pin [2].

Apply an additional layer of grease if necessary.



INFO

Do not remove the layer of grease.
Once the sash bearing has been installed, it cannot be greased again.



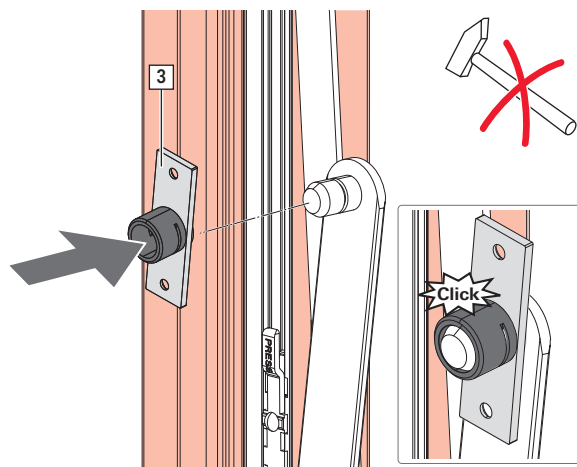
2. Fit the sash bearing [3] on the bearing pin until a "click" can be heard.



INFO

Do not hit in the sash bearing using a hammer.

Check the connection and make sure that it is secure.



3. Install the sash bearing on the sash → from page 51.

6.8 Joining the sash and frame



WARNING

Heavy loads pose the risk of injury and property damage.

Lifting and carrying heavy loads in an uncontrolled manner may lead to physical injury and property damage.

- ▶ Transport and installation must be carried out by at least two people.
- ▶ Use transportation means. → 10 "Transport" from page 77

6.8.1 Topglider

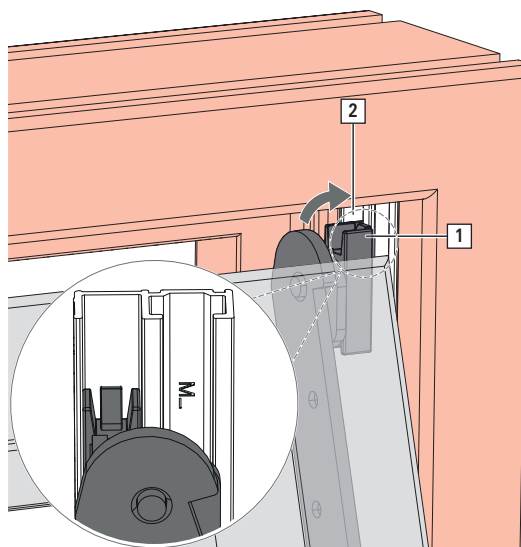
**WARNING****An unsecured sash may pose a risk of death!**

The sash may fall during installation if it is not securely connected to the frame.

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.
- ▶ The sash is secure when joined to the frame via the sash bearings.

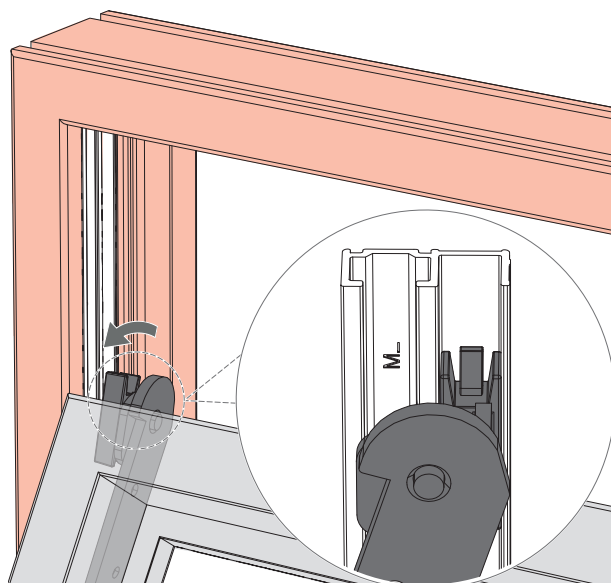
1. Mount the topglider [1] in the right-hand track [2] while holding the sash at a slight angle.

Mount the topglider in the correct groove on the track. The topglider must be able to move downwards freely.



2. Guide the mounted topglider in the track downwards and align the sash so that it is straight.

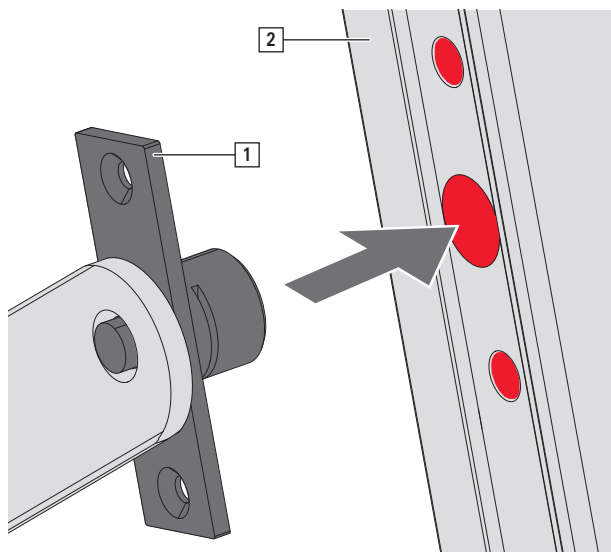
3. Mount the topglider in the left-hand track. Push the sash up until it reaches the stop.



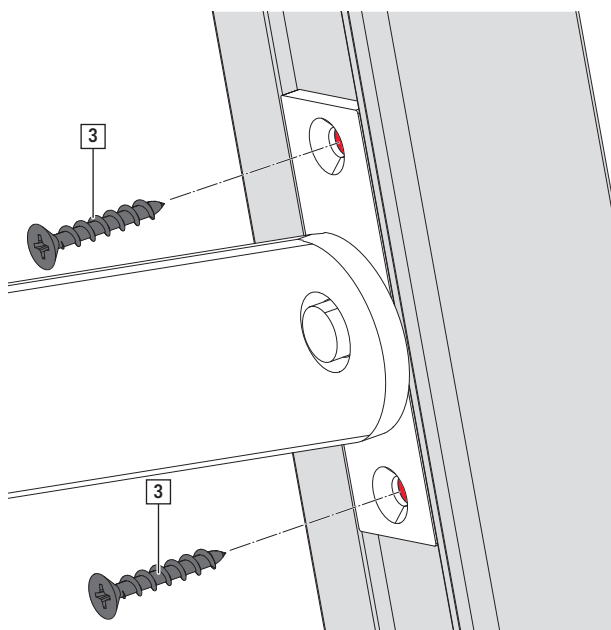


6.8.2 Sash bearing

1. Insert the sash bearing [1] into the drill hole on the sash [2]: → *from page 39*.



2. Fasten with two screws [3].

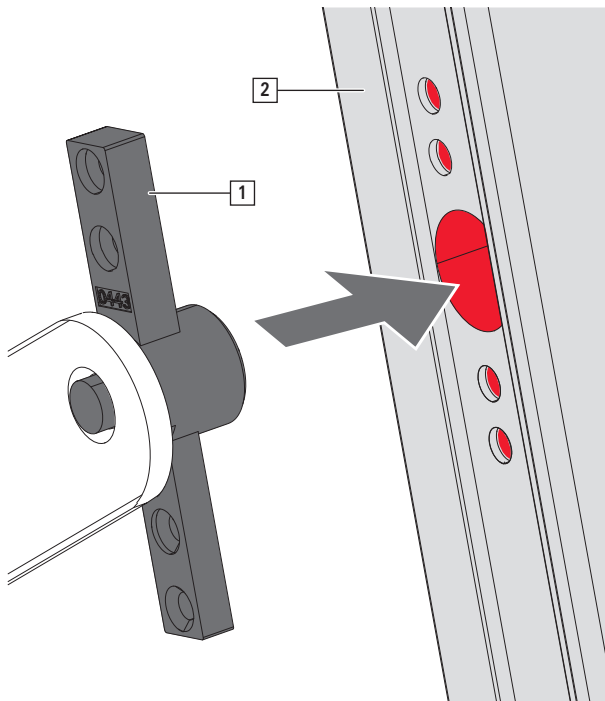


INFO

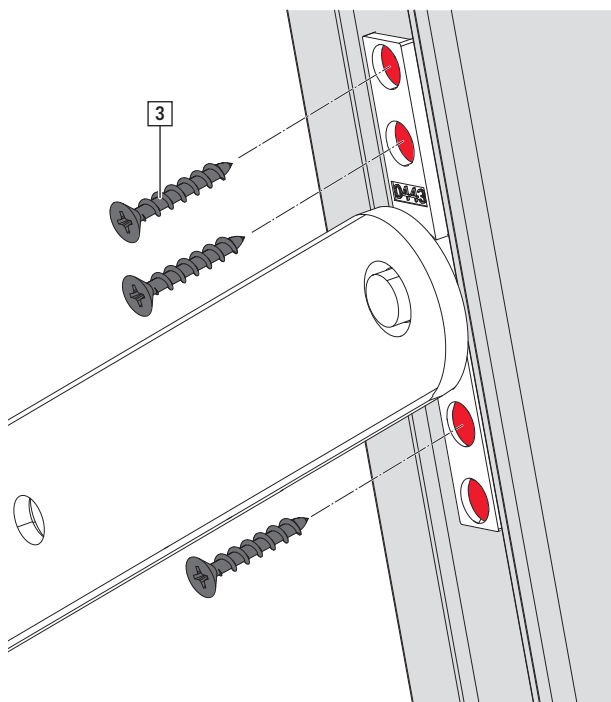
After joining the sash and the frame, lubricate all movable parts of the scissor stays and topglider → *from page 73*.

Sash bearing with separate plate (mat. no. 777131)

1. Insert the sash bearing [1] into the drill hole on the sash [2]: → *from page 39*.

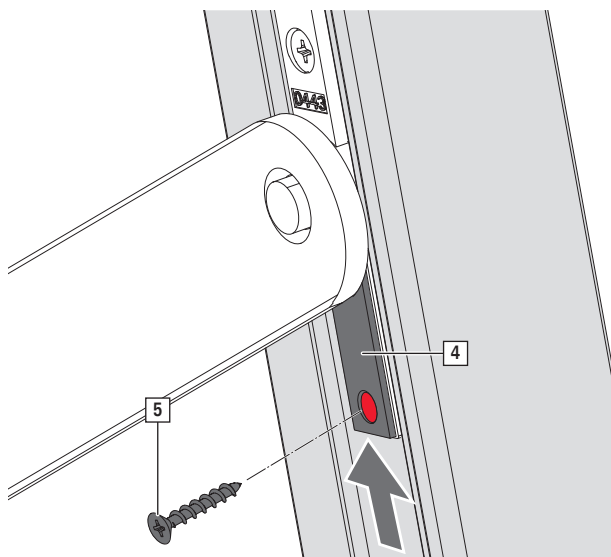


2. Fasten with three screws [3].





3. Insert the plate [4] and fasten with a screw [5].



INFO

After joining the sash and the frame, lubricate all movable parts of the scissor stays and topglider → *from page 73*.

6.9 Accessories

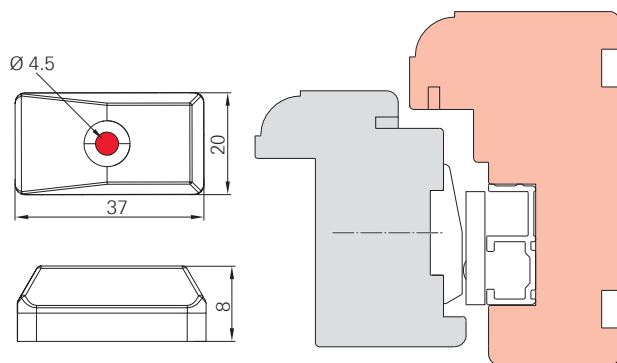
6.9.1 Guide block

				Nº
Minimum quantity per window: 2	Sash	1 Piece(s)	100 Stück	777525

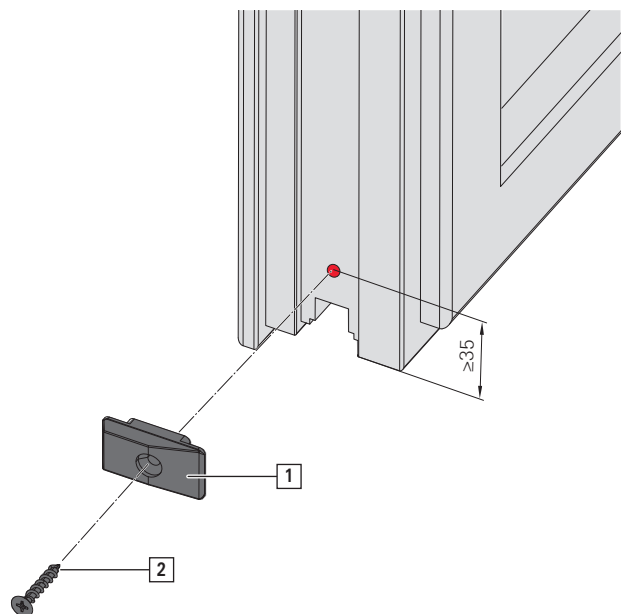


INFO

The guide block guides and keeps the sash at a right angle to the frame.



1. Position the guide block [1] on the side at the bottom of the sash.
2. Fasten with a screw [2].

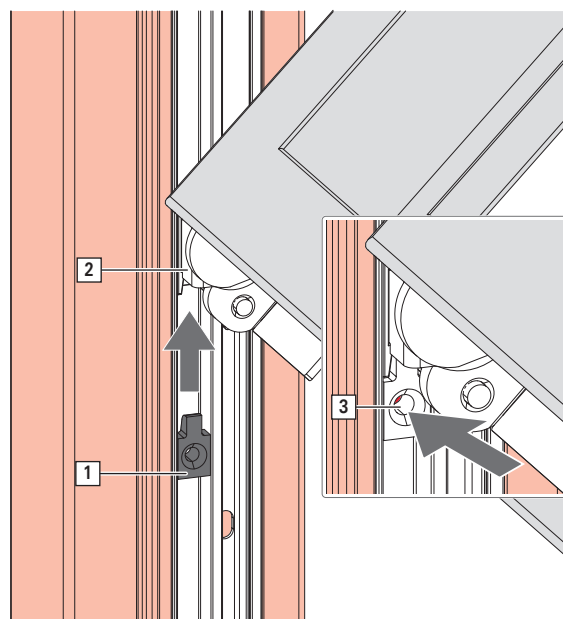




6.9.2 Stop block

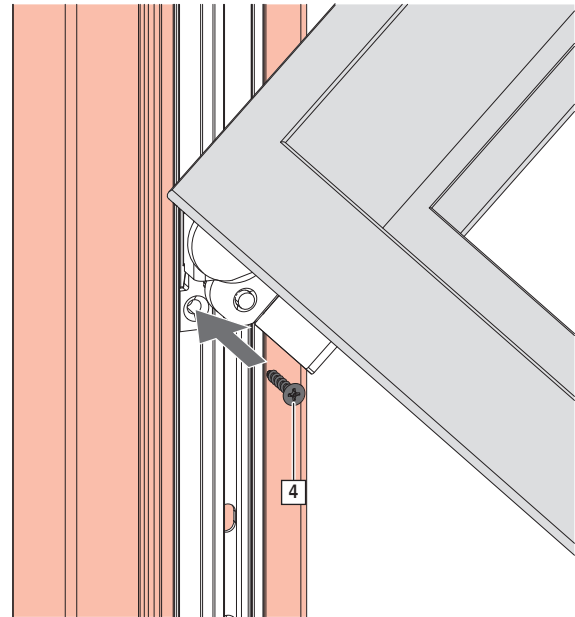
				Nº
Minimum quantity per window: 2	Frame	1 Piece(s)	100 Stück	777554

1. Move the sash to the cleaning position → *from page 67*.
 Set the required lock-in position → *from page 24*.
2. Push the stop block [1] in the track upwards and connect with the topglider [2].
 Mark the drill hole [3] on the stop block.



3. Drill a hole with Ø 2.0 mm.
4. Make the marking and drill the hole on the opposite side. Align the stop blocks so that they are parallel.

5. Fasten the stop block with a screw [4].



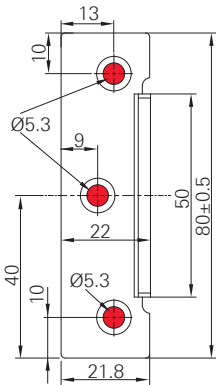


6.9.3 Security component

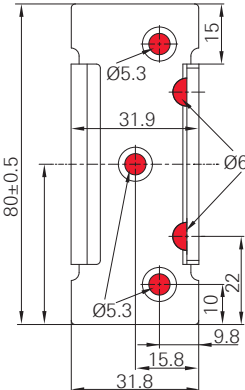
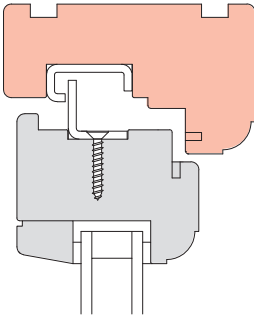
					Nº
Minimum quantity per window: 2	Sash and frame component	Top	1 Set(s)	50 Set(s)	777555

Installation dimensions

Sash component



Frame component

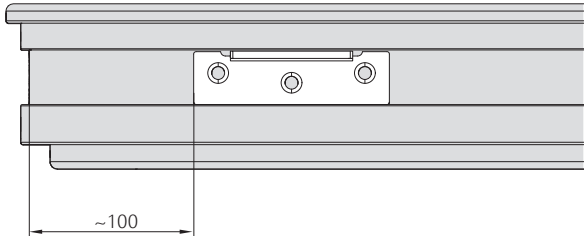


Positioning



INFO

Quantity: at least two parts per window.

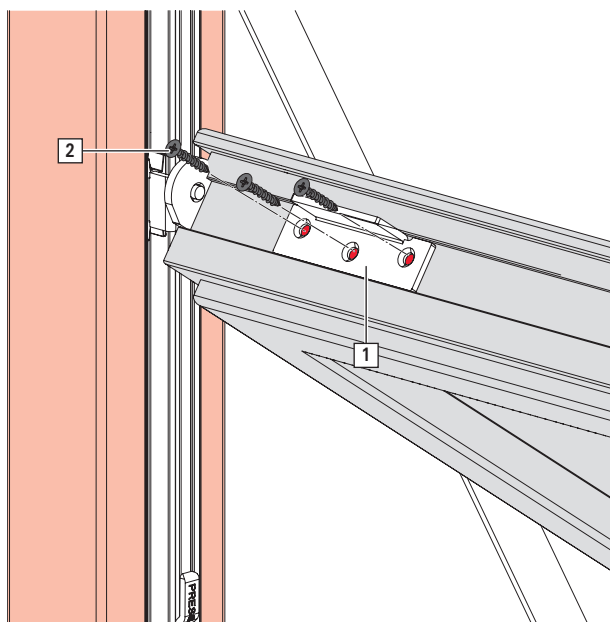


Installing the security component

Sash component

1. Open the sash in the second lock-in position.

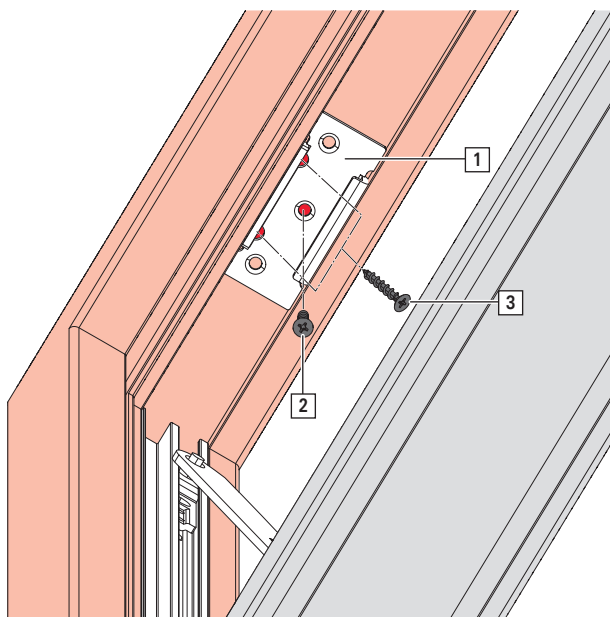
2. Position the sash security component [1] on the sash.



3. Fasten with three screws [2].

Frame component – timber

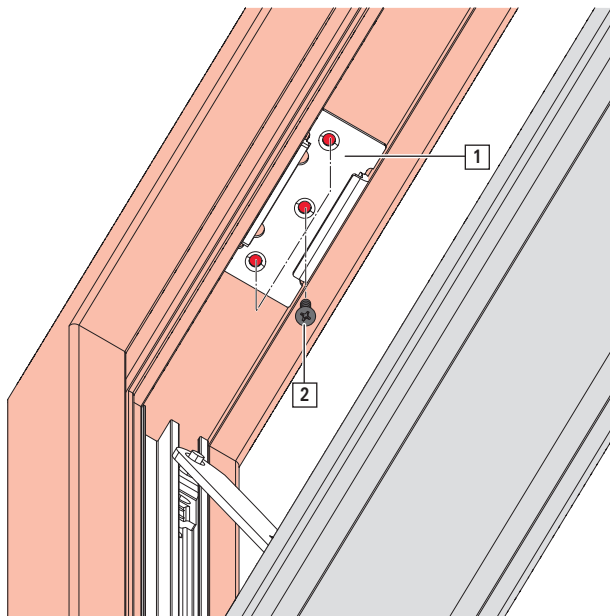
1. Fasten the frame security component [1] with three screws [2+3].
Tighten the screws [3] at an angle.





Frame component – PVC and aluminium

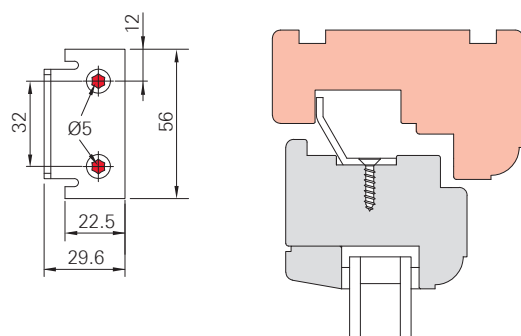
1. Fasten the frame security component [1] with three screws [2].



6.9.4 Centre closer

					Nº
Minimum quantity per window: 2	Sash component	Top	1 Piece(s)	20 Stück	777524

Installation dimensions

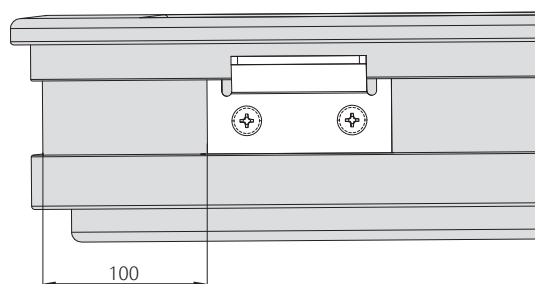


Positioning



INFO

Quantity: at least two parts per window.

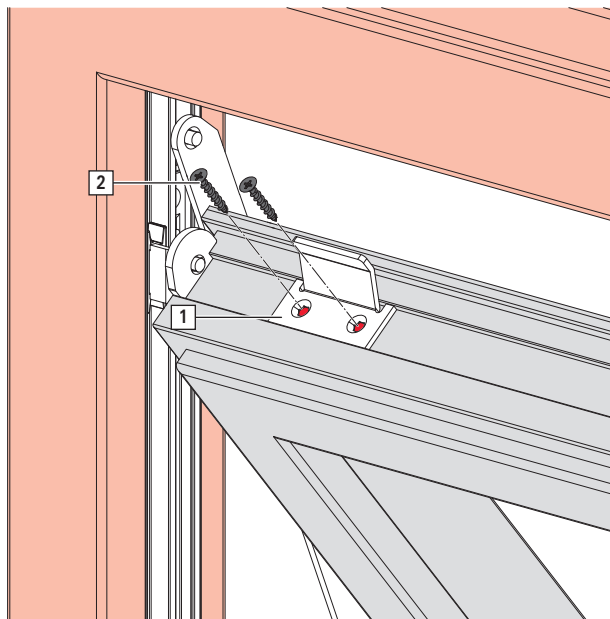


Installing centre closers

1. Open the sash in the second lock-in position.



- Position the centre closer [1] on the sash.

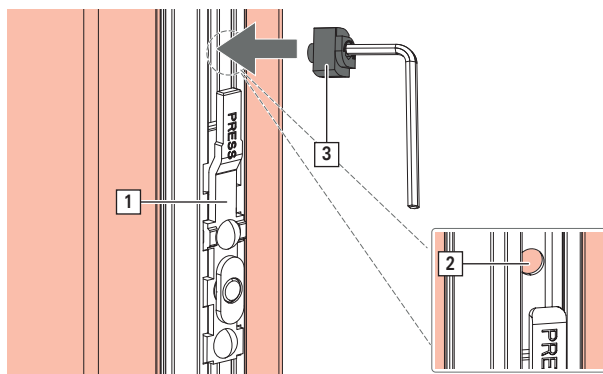


- Fasten with two screws [2].

6.9.5 Blocking device

			Nº
Frame	1 Set(s)	100 Stück	777573

- Open the sash. Position the restrictor [1] so that the round hole [2] for the blocking device [3] is not concealed.



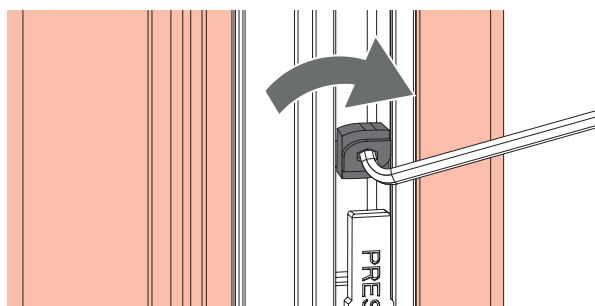
- Position the blocking device in the track using a hex key and insert it.
- Tighten the blocking device in a clockwise direction with a hex key.



INFO

The blocking device has to be removed for the cleaning position.

After cleaning the window, fit the blocking device again.



7 Operation

7.1 Operation information



WARNING

Opening and closing sashes in an uncontrolled manner may pose a risk of death!

Opening and closing the sash in an uncontrolled manner may lead to serious injuries.

- ▶ When operating the sash, do not lean too far outward.
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.
- ▶ When pressing the restrictor, hold on to the sash with your other hand to prevent it from falling back. One hand on the restrictor, one on the handle.



ATTENTION

The impact of wind on open sashes may cause property damage.

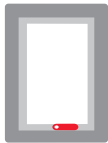
In extremely windy conditions, too much force may impact on the scissor stays.

- ▶ Keep the sash closed in extremely windy conditions.
- ▶ Do not leave open sashes unattended.

The windows are operated using a handle.

The following symbols illustrate the different handle positions and the resultant sash positions of the windows.

7.1.1 Handle position

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in opening position.



7.2 Standard version

7.2.1 Opening

7.2.1.1 Ventilation position



INFO

Overview of lock-in position and opening width → *from page 24.*

1. Move the handle [1] to the opening position.
2. Push the sash outward by the handle with one hand until the first lock-in position.
For the second lock-in position, press the restrictor [2] and push the sash outward by the handle with one hand.

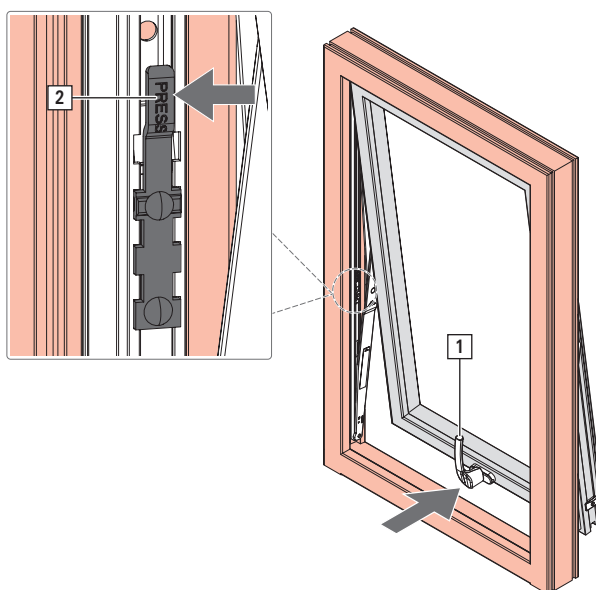


WARNING

Trapped limbs may result in injuries.

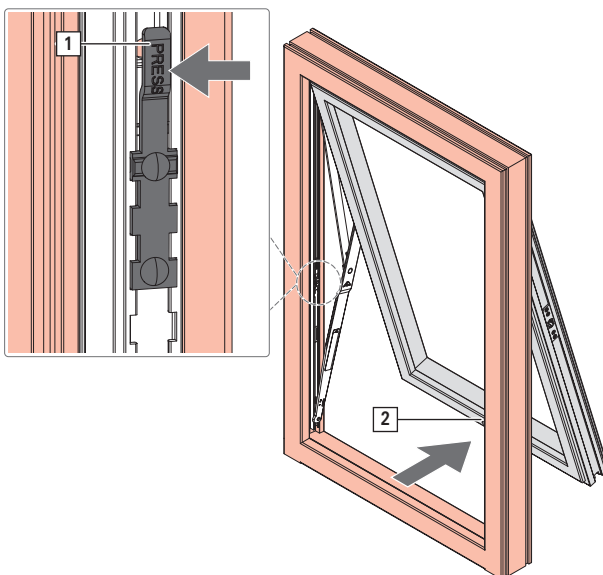
Wind and draughts can move the sash in an uncontrolled manner. This can result in limbs being trapped and seriously injured.

- ▶ Avoid exposing the open sash to wind.
- ▶ Close and lock the window in windy or draughty conditions.



7.2.1.2 Cleaning position

1. Open the sash as far as the second lock-in opening.
2. Press the restrictor [1], overcoming resistance while doing so, and push the sash outward by the handle [2] with your free hand.



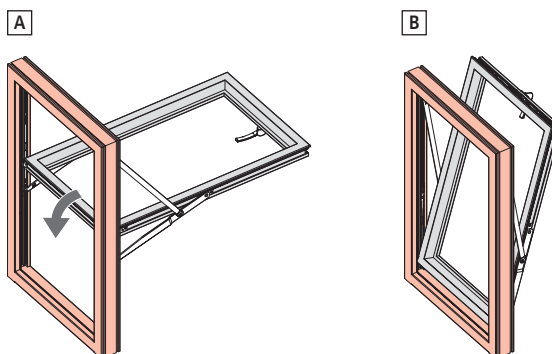
3. Push the top edge of the sash slowly down [A] with both hands, until the restrictor engages [B].



WARNING
Trapped limbs may result in injuries.

Wind and draughts can move the sash in an uncontrolled manner. This can result in limbs being trapped and seriously injured.

- ▶ Avoid exposing the open sash to wind.
- ▶ Close and lock the window in windy or draughty conditions.



7.2.2 Closing

7.2.2.1 Ventilation position



INFO

Closing is performed in reverse order to opening.

1. Press the restrictor and pull the sash by the handle.
2. Move the handle to the locked position.



7.2.2.2 Cleaning position



INFO

Closing is performed in reverse order to opening.

1. Press the restrictor, overcoming resistance while doing so, and pull the sash towards you with your free hand.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ When opening the sash, watch out for obstacles on the building (e.g. window sills, protruding roller shutter boxes, etc.).
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

2. Slowly push the sash up with both hands.
3. Pull the sash by the handle.
Press the restrictor twice.
4. Close the window.
5. Move the handle to the locked position.

7.3 Hotel version

7.3.1 Opening

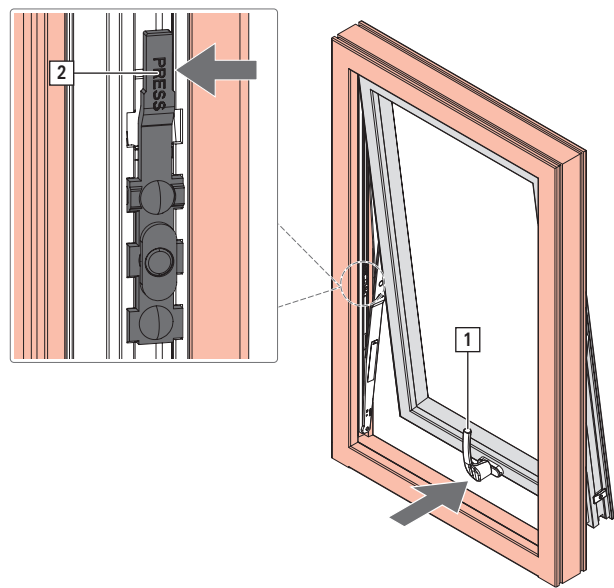
7.3.1.1 Ventilation position



INFO

Overview of lock-in position and opening width → *from page 24.*

1. Move the handle [1] to the opening position.
2. Push the sash outward by the handle with one hand until the first lock-in position.
For the second lock-in position, press the restrictor [2] and push the sash outward by the handle with one hand.



3. Secure the sash in the open position: turn the turn lock [3] 90°.

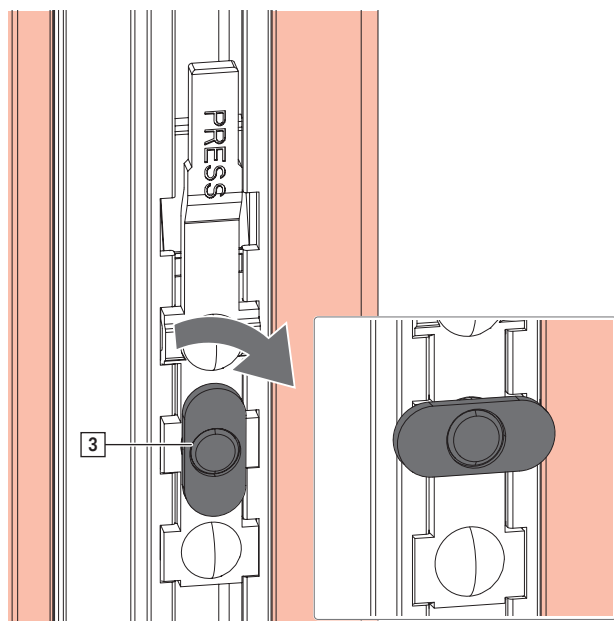


WARNING

Trapped limbs may result in injuries.

Wind and draughts can move the sash in an uncontrolled manner. This can result in limbs being trapped and seriously injured.

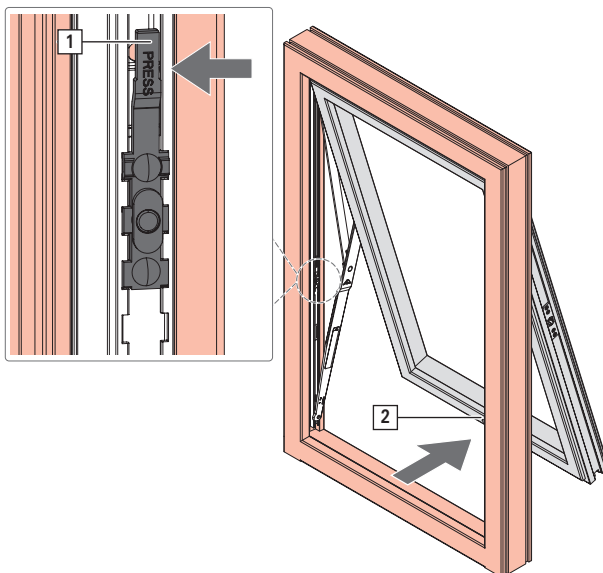
- ▶ Avoid exposing the open sash to wind.
- ▶ Close and lock the window in windy or draughty conditions.
- ▶ Secure open sashes with the turn lock.



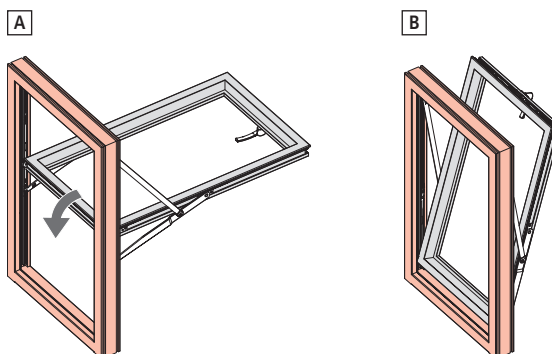


7.3.1.2 Cleaning position

1. Open the sash as far as the second lock-in opening.
2. Press the restrictor [1], overcoming resistance while doing so, and push the sash outward by the handle [2] with your free hand.



3. Push the top edge of the sash slowly down [A] with both hands, until the restrictor engages [B].



- Secure the sash in the open position: turn the turn lock [3] 90°.

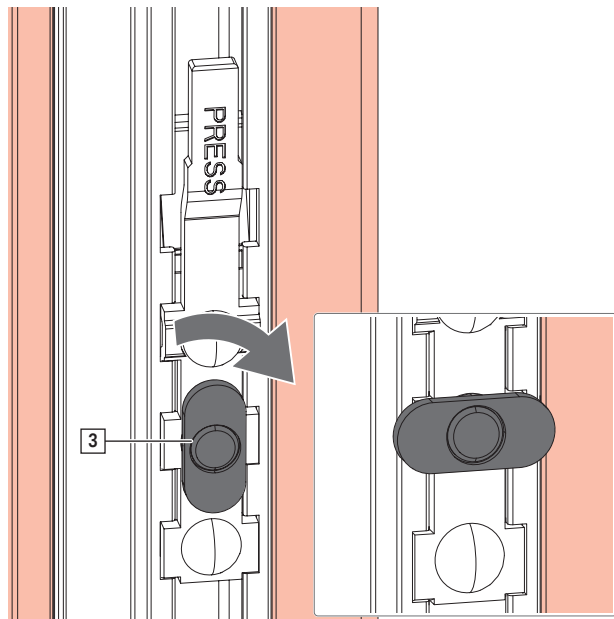


WARNING

Trapped limbs may result in injuries.

Wind and draughts can move the sash in an uncontrolled manner. This can result in limbs being trapped and seriously injured.

- ▶ Avoid exposing the open sash to wind.
- ▶ Close and lock the window in windy or draughty conditions.
- ▶ Secure open sashes with the turn lock.



7.3.2 Closing

7.3.2.1 Ventilation position

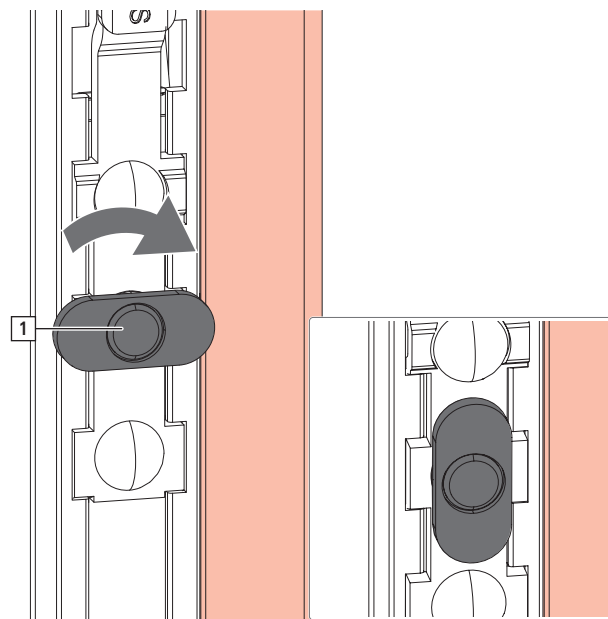


INFO

Closing is performed in reverse order to opening.

With the hotel version, it is not necessary to press the restrictor. The sash moves into the closed position automatically when shut.

- Turn the turn restrictor [1] to the vertical position.



- Pull the sash by the handle.
- Move the handle to the locked position.



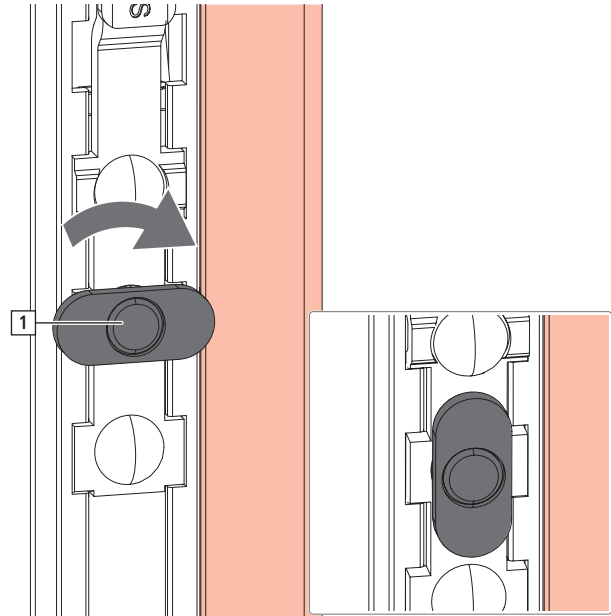
7.3.2.2 Cleaning position



INFO

Closing is performed in reverse order to opening.

1. Turn the turn restrictor to the vertical position.



2. Overcome the resistance, and pull the sash towards you with your free hand.



ATTENTION

Opening and closing sashes in an uncontrolled manner may result in property damage.

Opening and closing the sash in an uncontrolled manner may cause the element to malfunction.

- ▶ When opening the sash, watch out for obstacles on the building (e.g. window sills, protruding roller shutter boxes, etc.).
- ▶ Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

3. Slowly push the sash up with both hands.
4. Pull the sash by the handle.
5. Close the window.
6. Move the handle to the locked position.

7.4 Fault assistance

Fault	Cause	Corrective action	To be carried out by
Window is difficult to open / close.	Incorrect sash alignment.	Correct the sash alignment.	■
	Incorrect scissor stay size.	Install scissor stays that are identical in size.	■
	Obstacle in the opening between frame and sash.	Remove the obstacle.	□
	Obstacle between the scissor stay arms.	Remove the obstacle.	□
	Deposits or dirt on the hardware components.	Clean and lubricate the hardware components.	□
	Scissor stay is faulty.	Replace the fully reversible hinge.	■
	Scissor stay arm not secured to frame.	Secure the scissor stay arm to the frame.	■
No grip between open and closed position.	Fully reversible hinge is faulty.	Replace the fully reversible hinge.	■
	Restrictor is faulty.	Replace the restrictor.	■
Window is not closed tightly.	Window gasket is faulty.	Replace the window gasket.	■
	Gasket compression setting is incorrect.	Adjust the gasket compression.	■
	Fully reversible hinge not adequately secured.	Tighten fixing screws; replace them if necessary.	■
Window cannot be opened.	Fully reversible hinge is faulty.	Replace the fully reversible hinge.	■

□ = May be carried out by a specialist company or the end user.

■ = **Must** be carried out by a specialist company.



8 Maintenance



CAUTION

Performing maintenance work incorrectly can lead to injuries.

Performing maintenance incorrectly can lead to injuries.

- ▶ Ensure that there is sufficient space for installation before starting work.
- ▶ Ensure that the installation site is clean and tidy.
- ▶ Always have hardware adjustment and replacement work performed by a specialist company.
- ▶ Secure the sash against unintentionally opening or closing.
- ▶ Do not unhinge the sash for maintenance.



ATTENTION

Incorrect or improper testing may cause property damage.

Incorrect or improper testing of the hardware may cause the element to malfunction.

- ▶ Have the hardware checked by a specialist company when installed.
- ▶ If defects need to be remedied, have the element unhinged and remounted by a specialist company.



INFO

The manufacturer must draw the attention of builders and end consumers to these maintenance instructions.

Roto Frank Fenster- und Türtechnologie GmbH recommends the manufacturer conclude a maintenance agreement with their end users.

No legal claims can be derived from the following recommendations; their application is to be based on the specific individual case.

	Responsibility	
Maintenance interval	☐	→ from page 71
Cleaning		→ from page 72
Clean hardware	☐	
Care		→ from page 72
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		→ from page 73
Check that hardware components are fitted securely	☐	
Inspect hardware components for wear	☐	
Check that movable parts work properly	☐	
Check that locking points work properly	☐	
Check ease of movement	■	
Repair		→ from page 74
Retighten screws	■	
Replace damaged components	■	

☐ = May be carried out by a specialist company or the end user

■ = **Must** be carried out by a specialist company

8.1 Maintenance intervals



ATTENTION

Failure to adhere to maintenance intervals may cause property damage.

The maintenance interval for all tasks relating to the hardware components is **annually** at the least. In hospitals, schools and hotels, the maintenance interval is **six-monthly**.

Regular maintenance is necessary in order to maintain the proper and smooth-running operation of the hardware and to prevent premature wear or even defects.

- ▶ Determine and adhere to the appropriate maintenance interval in accordance with the ambient conditions.

8.2 Cleaning



ATTENTION

Using incorrect cleaning agents and sealing compounds may cause property damage.

Cleaning agents and sealing compounds may damage the surfaces of components and gaskets.

- ▶ Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- ▶ Only use mild, pH-neutral cleaning agents that have been diluted.
- ▶ Apply a thin protective film to the components, for example using a cloth soaked in oil.
- ▶ Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carboic acid, chlorine, tannic acid) around the element.
- ▶ Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can corrode the surface of the components.

Cleaning the hardware

- ▶ Clean deposits and contaminants off the hardware using a soft cloth.
- ▶ Lubricate movable parts and locking points after cleaning. → 8.3 "Care" from page 72
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

8.3 Care



ATTENTION

Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

- ▶ Use high-quality lubricants.
- ▶ Only use resin-free and acid-free lubricants.
- ▶ Use appropriate lubricant in more challenging climatic conditions. Note the manufacturer specifications.



ATTENTION

Cleaning agents and lubricants may pollute the environment.

Leaking or excess cleaning agents and lubricants may pollute the environment.

- ▶ Remove any leaking or excess cleaning agents and lubricants.
- ▶ Dispose of cleaning agents and lubricants separately and properly.
- ▶ Observe the applicable directives and national laws.

Ease of movement can be improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated on a regular basis.

Recommended lubricants

- Roto NX / NT grease

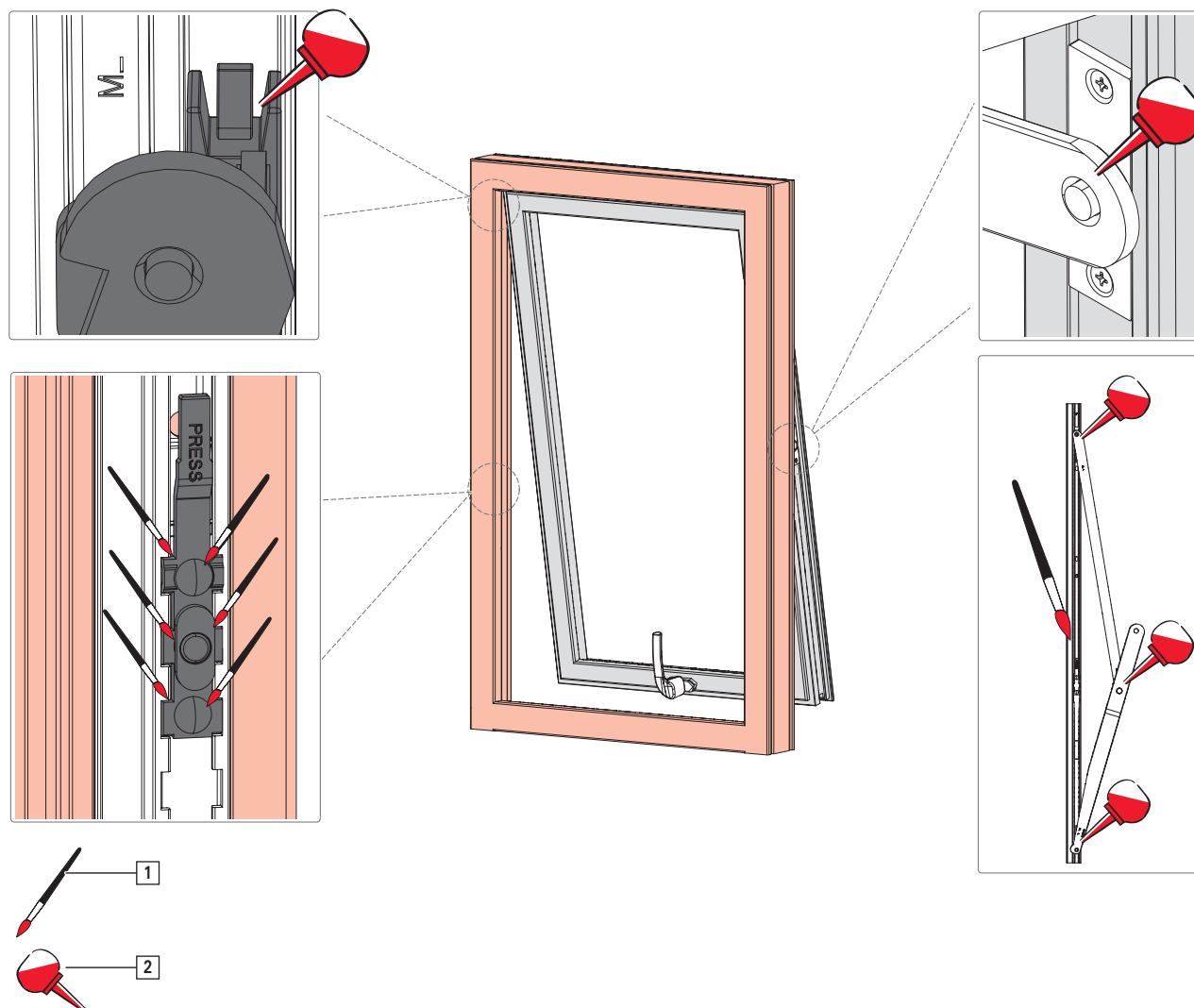


INFO

The figure displays the positioning of potential lubrication points. The figure does not necessarily match the installed hardware. The quantity of lubrication points varies depending on the size and design of the element.



8.3.1 Lubrication points



- [1] Grease
 [2] Oil

8.4 Performance test



WARNING

Improper repair work may pose a risk of death!

Improper maintenance may prevent the element from working properly and make it less safe to use.
 ▶ Always have repairs performed by a specialist company.

Check for proper operation:

- ▶ Inspect hardware components for damage, deformation and a firm fit.
- ▶ Check that windows run smoothly by opening and closing them.
- ▶ Check the window gaskets for elasticity and fit.
- ▶ Check closed windows to ensure that they are leakproof.
- ▶ Locking and unlocking torque max. 10 Nm. The test can be performed on the handle.

Have malfunctions remedied by a specialist company.

8.5 Repair



WARNING

Improper repair work may pose a risk of death!

Improper maintenance may prevent the element from working properly and make it less safe to use.

- ▶ Always have repairs performed by a specialist company.



ATTENTION

Improper screw fixings may cause property damage.

Loose or faulty screws can prevent the hardware from working properly.

- ▶ Check that the individual screws are secure and seated correctly.
- ▶ Tighten or replace loose or faulty screws.
- ▶ Use only the suggested screws.

Repair work includes replacing and repairing components and is only necessary if components have become damaged after wear or as a result of external circumstances. The hardware must be secured reliably in order to ensure that the element works properly and is safe to use.

The following tasks must only be performed by a specialist company:

- All adjustment work on the hardware,
- Replacing hardware or hardware components,
- Installing and removing windows.

The specialist company must observe the following:

- Perform the necessary repair work properly, according to generally recognised engineering practice and in accordance with the applicable regulations.
- Do not perform makeshift repairs on worn or damaged components.
- Only use original or approved spare parts for repairs.



9 Dismantling



WARNING

Improper dismantling may pose a risk of death!

The sash may fall during dismantling.

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.
- ▶ Always have dismantling work performed by a specialist company.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.



INFO

Unless otherwise stated, dismantling is performed in reverse order to installation.

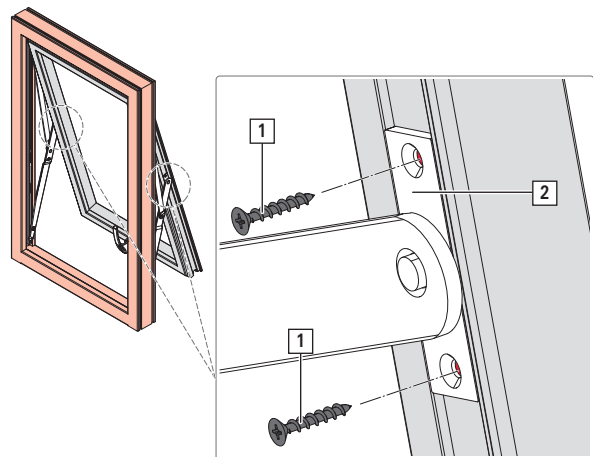
9.1 Unhinging the sash



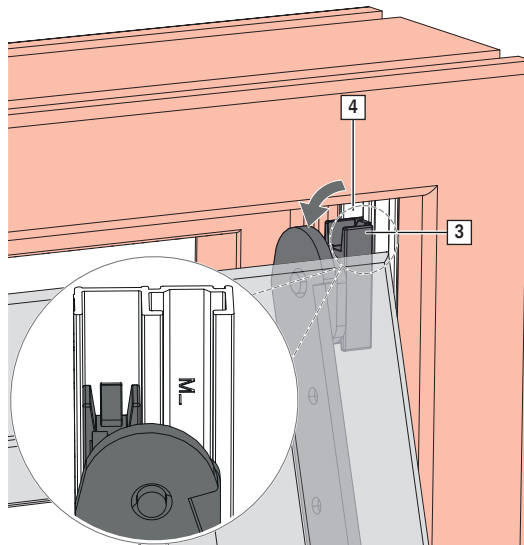
INFO

The sash bearing and fully reversible hinge must be removed together.

1. Remove all screws [1] from the sash bearing [2].



2. Unhinge the topglider [3] from the track [4].



3. Remove the sash.



WARNING
**Improper dismantling may pose
a risk of death!**

Improper dismantling of the sash can lead to serious injuries.

- ▶ Depending on the access, dismantling is performed from outside using suitable aids, such as a crane.
- ▶ Secure the sash to prevent it from falling, e.g. by using two people.
- ▶ Always have dismantling work performed by a specialist company.



10 Transport

10.1 Transporting elements and hardware



DANGER

Improper transport poses a risk of death!

Improper procedures for transporting, loading or unloading elements may cause serious injuries and glass breakage as a result of the elements swinging open, falling or becoming overloaded.

- ▶ Note the applicable accident prevention regulations.
- ▶ Note force application points and reaction forces.
- ▶ Prevent the sash from opening uncontrollably.
- ▶ Avoid jerky movements.
- ▶ Use suitable transportation means and protective devices.
- ▶ Watch out for protruding components.
- ▶ Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).



CAUTION

Trapped limbs may result in injuries.

The transported goods can skid, open, close or fall during transportation tasks. This can result in limbs being trapped and seriously injured.

- ▶ Never reach near the scissor stays.
- ▶ Close the sash after installation and secure it in place for transport.
- ▶ Wear safety gloves and protective footwear.



CAUTION

Physical strain may cause injury and damage to health.

Carrying and lifting heavy loads for extended periods leads to physical injury in the long term.

- ▶ When carrying or lifting loads, maintain an ergonomically correct posture. The maximum permissible load is 25 kg for men and 10 kg for women.

Hardware is supplied to the specialist company as complete sets. The components are packaged accordingly for each scope of delivery. The instructions for safely transporting the hardware are described below.

Observe the following basic instructions when transporting hardware:

- ▶ Transport larger scopes of delivery using appropriate transportation means (such as industrial trucks).
- ▶ Note the transport weight in order to select appropriate transportation means.
- ▶ Ensure that the transport process is careful and appropriate for the material and that components are protected against dirt during transport.
- ▶ Immediately check the delivery for completeness and transport damage on receipt.



INFO

Submit a complaint about any defects as soon as they are identified. Claims for damages may only be made within the reclamation period.

Use the following transportation means for support when transporting, loading and unloading larger scopes of delivery:

- Industrial trucks, e.g. forklifts, telescopic handlers, pallet trucks
- Lifting equipment, e.g. transport nets, carry straps, round slings
- Protective devices, e.g. edge protection, spacer blocks



INFO

Industrial trucks and lifting devices may only be operated by qualified persons.



INFO

Lifting equipment and protective devices may only be used if they are in full working order.

10.2 Storing the hardware

Store all hardware components as follows until they are installed:

- Dry and protected
- On a level surface
- Protected against sunlight



11 Disposal



ATTENTION

Incorrect disposal may pollute the environment.

Pieces of hardware are raw materials.

- ▶ Dispose of hardware for environmentally friendly material reutilisation as mixed scrap.

11.1 Disposing of packaging

The hardware is supplied as complete sets together with the packaging. Once unpacked, the installation company or builder is responsible for disposing of the packaging properly. The packaging materials are produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of packaging:

- ▶ Do not dispose of packaging in household waste.
- ▶ Hand over packaging at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.

11.2 Disposing of hardware

Once the hardware is finished with, the end user or builder is responsible for properly disposing of the windows and the hardware, including any accessories. Hardware is produced in accordance with current environmental protection standards. The materials can be recycled separately.

Follow the basic instructions below for the proper disposal of hardware:

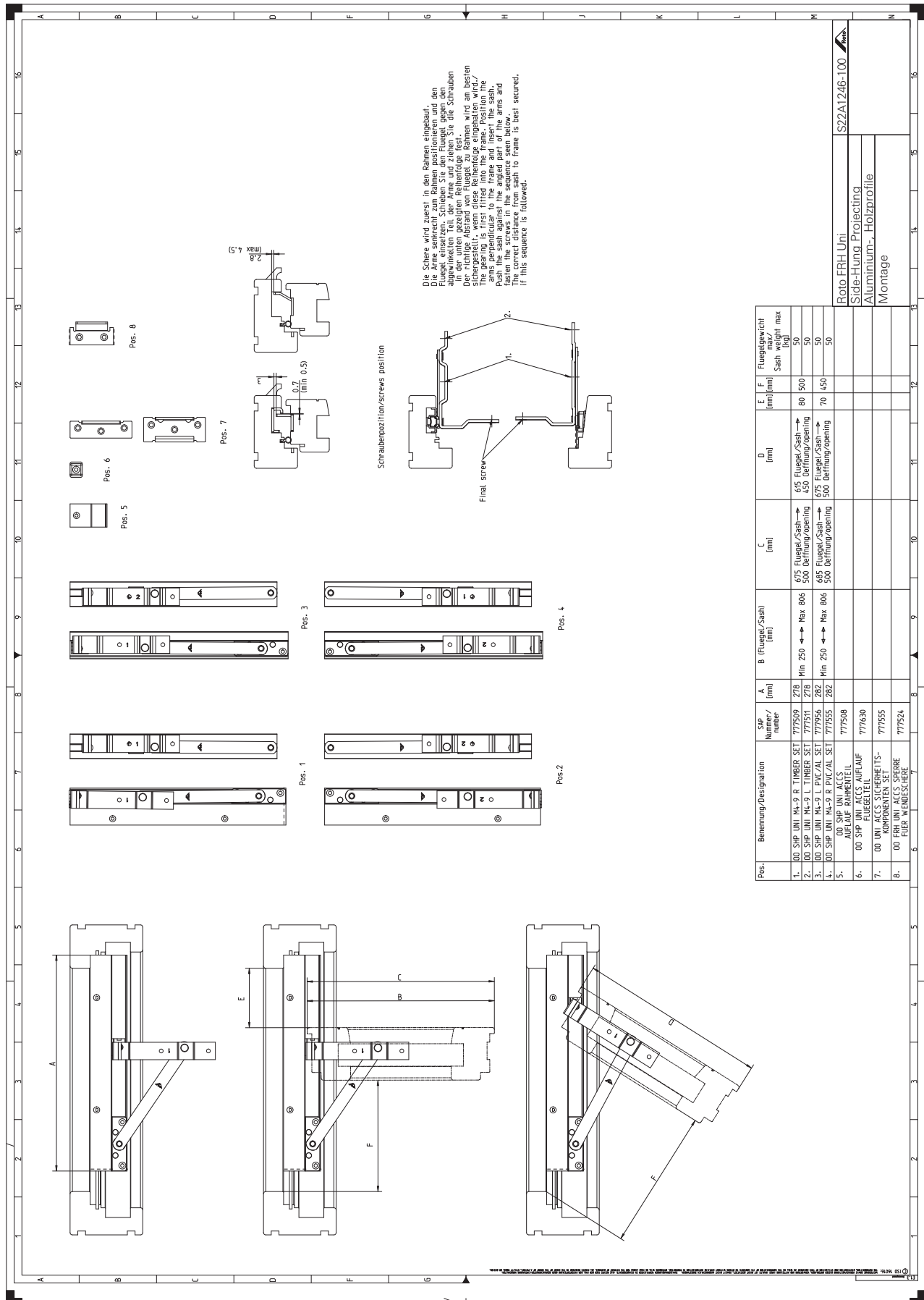
- ▶ Observe the information and specifications for disposal contained in the other applicable documents.
- ▶ Window hardware components
- ▶ Do not dispose of hardware in household waste.
- ▶ Hand over hardware at local waste collection points or recycling centres.
- ▶ Observe the national regulations on the disposal of recyclable materials.
- ▶ Contact the local authorities if necessary.

12 Other opening types

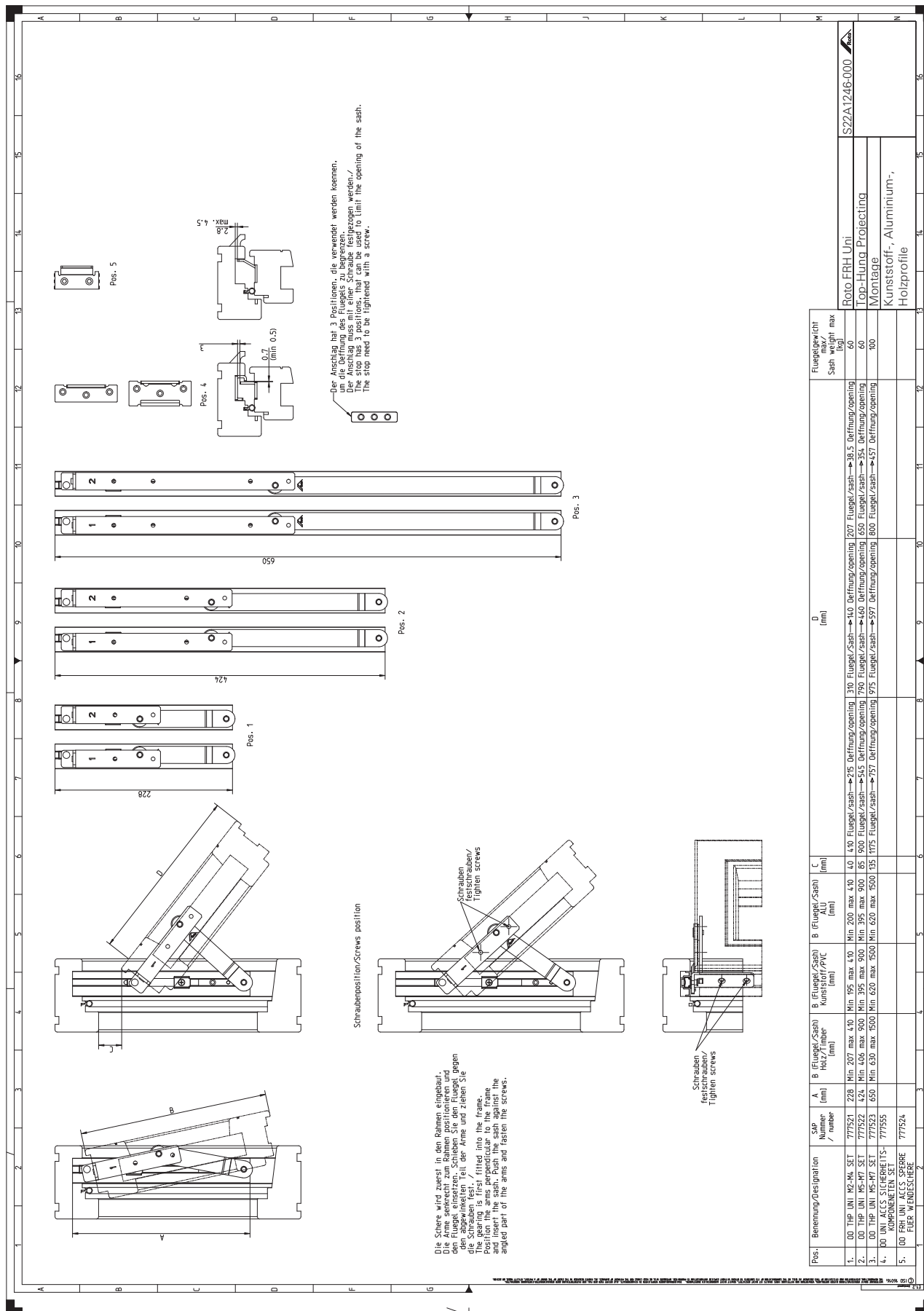
12.1 Explanation

The following markings are used in the installation drawings to emphasise references and other elements:

Marking	Translation
ALU	Aluminium
AUFLAUF FLUEGELTEIL	Run-up block sash component
AUFLAUF RAHMENTEIL	Run-up block frame component
Benennung	Name
Der Anschlag hat 3 Positionen, die verwendet werden koennen, um die Oeffnung des Fluegels zu begrenzen.	The stop has three positions which can be used to limit the opening of the sash.
Die Schere wird zuerst in den Rahmen eingebaut. Die Arme senkrecht zum Rahmen positionieren und den Fluegel einsetzen. Schieben Sie den Fluegel gegen den abgewinkelten Teil der Arme und ziehen Sie die Schrauben fest.	First, the scissor stay is installed in the frame. Position the arms so that they are vertical to the frame and insert the sash. Push the sash against the angled part of the arms and tighten the screws.
Die Schere wird zuerst in den Rahmen eingebaut. Die Arme senkrecht zum Rahmen positionieren und den Fluegel einsetzen. Schieben Sie den Fluegel gegen den abgewinkelten Teil der Arme und ziehen Sie die Schrauben in der unten gezeigten Reihenfolge fest. Der richtige Abstand von Fluegel zu Rahmen wird am besten sichergestellt, wenn diese Reihenfolge eingehalten wird.	First, the scissor stay is installed in the frame. Position the arms so that they are vertical to the frame and insert the sash. Push the sash against the angled part of the arms and tighten the screws in the order shown below. Adhering to this order is the best way to ensure the correct distance between sash and frame.
Fluegel	Sash
Fluegelgewicht	Sash weight
Holz	Timber
Pos.	Item
Kunststoff	PVC
max.	Maximum
min.	Minimum
Oeffnung	Opening
Rahmen	Frame
SAP Nummer	SAP number
Schrauben festschrauben	Tighten screws
Schraubenposition	Screw position
SICHERHEITSKOMPONENTEN	Security components
SPERRE FUER WENDESCHERE	Blocking device for fully reversible hinge



12.3 Top-Hung Projecting





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