Window and Door Technology

Roto Patio Alversa

Universal hardware for minimum effort
in Parallel Sliding and Tilt&Slide systems

Installation, maintenance and operating instructions
for aluminium profiles

1 General information

1.1 Version history

Version	Date	Changes
v0	13.02.2017	
v1	01.12.2017	Chapters added: → *1 "General information" from page 8*, → *2 "Security" from page 17*, → *3 "Information on the product" from page 23* PS Air added. Profile information and operating temperature range added. → *3.2 "Application ranges" from page 23* New colour R 04.4 added. Bottom guide block, movable, added. → *8.6.4 "Bottom guide block, movable" from page 182* Brief instructions added. → *7 "Brief instructions" from page 96* Installation of the retrofit set for PS sliding scissor stay added. → *8.5.5.2 "Preassembling the PS sliding scissor stay with retrofit set" from page 167* Installation of sliding scissor stay changed. Installation of top guide block added. → *8.5.5.1 "Inserting the KS sliding scissor stay" from page 165* → *8.5.5.3 "Inserting the PS sliding scissor stay and installing the top guide block" from page 169* Adjustment of top guide block added. → *10.6 "Top guide block, fixed" from page 209* → *10.7 "Top guide block, tiltable" from page 210* Roto Patio PS maintenance added. → *12.3.2 "Roto Patio Alversa | PS (except for PS Air Com)" from page 219* Espagnolette support set changed. SEC flush-encased gearbox set changed. Bogies changed. Now with integrated anti-jemmy device. KS scissor stays changed. PS scissor stays changed (retrofit set can be installed). Installation of connecting rod changed. → *8.4.18.2 "Connecting-rod support-block" from page 158* Installation drawings changed.

1.2 Instructions

This manual contains important information, instructions and 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 documents apply in addition to these instructions:

- Alversa catalogue
- Handles catalogue

The following guidelines also apply:

- Guideline TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Attachment of supporting fitting components for turn-only and tilt&turn fittings),
- Directive VHBE issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice for end-users),

- Directive VHBH issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice on the product and on liability),
- Instructions and information issued by profile manufacturers (e.g. manufacturers of windows and balcony doors),
- The applicable regulations, directives and national laws.

Compliance with the following guidelines is additionally recommended:

- TLE.01 by the VFF (German Window and Facade Association) Correct handling of ready-to-install windows and external doors during transport, storage and installation,
- WP.01 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales,
- WP.02 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents,
- WP.03 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement.

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 instructions use the following markings for the purpose of identification and emphasis, e.g. in figures or handling instructions:

Marking	Meaning
	Sash
	Frame
	Drill holes or screw positions
	Unaffected components Indirectly affected components
	Components that have just been described Arrows or movements
1	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.

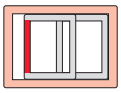
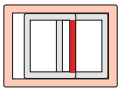
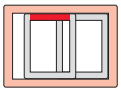
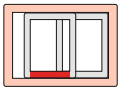
INFO
Figures are provided in the left-hand version (DIN 107).

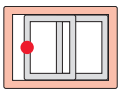
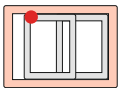
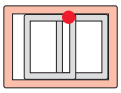
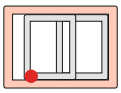
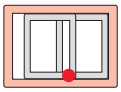
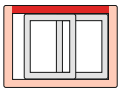
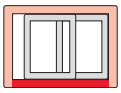
INFO
Roto Patio Alversa | PS stands for the variants:
- Roto Patio Alversa | PS without night ventilation
- Roto Patio Alversa | PS with night ventilation
- Roto Patio Alversa | PS Air
- Roto Patio Alversa | PS Air Com

1.3 Symbols

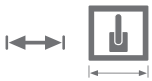
Symbol	Meaning
■	First-level list
○	Second-level list
→	(Cross-)reference
▷	Result
▶	Unnumbered step
1.	Numbered step
a.	Numbered second-level step

1.4 Pictographs

Symbol	Meaning
	Tilt&Slide system
	Parallel Sliding system
	without ventilation
	Tilt ventilation
	Night ventilation
	Comfort tilt ventilation
	Aluminium
	Left of sash
	Right of sash
	Top of sash
	Bottom of sash

Symbol	Meaning
	Sash handle height (centre-left)
	Top left of sash
	Top right of sash
	Bottom left of sash
	Bottom right of sash
	Top of frame
	Bottom of frame

1.5 Product features

Symbol	Meaning
	Description
	Colour
	Colour code
	Sash width
	Sash weight
	Sash height
	Information
	Material number
	Surface

Symbol	Meaning
	Opening type
	Frame width

1.6 Abbreviations

Abbreviation	Meaning
lock.	lockable
HA	Hardware axis
Com	Comfort
CTL	Catalogue
DIN L / R	DIN left / right
d_h	Screw head diameter
CD	Corner drive
SW	Sash width
S.kg	Sash weight
SH	Sash height
ESP	Espagnolette
IMO	Installation instructions
ISR	Hexalobular internal screw
Y	Yes
kg	Kilograms
KS	Tilt&Slide
mm	Millimetres
N	No
Nm	Torque
Not sh.	Not shown
PS	Parallel Sliding
RC	Resistance class
SEC	Security
SW	Key size

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 / 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 / individuals that purchase hardware from hardware manufac-

turers or hardware dealers and further process the hardware by integrating it in windows and balcony doors.

Building element dealers / installation companies

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

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

Builders

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

End users

The "end users" target group includes all individuals who use the installed windows and / or 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 CD-ROM 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 operating instructions
- Guideline 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 operating instructions
- Guideline 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 / the installation company

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

- 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:

- 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, 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, such as painting and varnishing 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

Protection against corrosion

Cleaning agents can corrode the surface of the components.

- 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, etc.) 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

Protection against dirt

Contamination prevents components working properly.

- Remove deposits and contaminants caused by construction materials before they bond with water, e.g. construction dust, plaster, stucco, mortar and cement.
- Keep components free of deposits and contaminants.

ATTENTION

Protection against (permanently) damp room air

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 tilt mode 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 drafts. 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.

1.12 Imprint

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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 or 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 minor 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

The hardware system described in these instructions is intended for installation in sliding sashes in windows and balcony doors. The hardware system is solely intended for further processing on windows and balcony door sashes for vertical installation made from the materials described in these

instructions. The hardware system opens sashes in windows and balcony doors and closes them tightly.

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.

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
Danger in the event of misuse
Misuse and incorrect installation of hardware can lead to hazardous situations.
- ▶ Never use hardware combinations that have not been approved by the hardware manufacturer.
- ▶ Never use non-original accessories or accessories which have not been approved by the hardware manufacturer.

2.3.2 Usage restriction

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

- Joint impermeability,
- Driving rain impermeability,
- Sound insulation,
- Thermal insulation,
- Burglary inhibition.

2.4 Stipulated use for end users

On windows or balcony doors with sliding hardware, window sashes or balcony door sashes can be moved horizontally or vertically by operating a handle.

On special structures, various sashes can additionally be brought into a turn position and / or into a tilt position restricted by the scissor stay version.

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

WARNING
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.
- ▶ 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 guided by hand throughout its entire movement range, until it has been brought into a fully closed or opened position, and that it is guided towards the frame, the opening restrictor (buffer) or other sashes at a very low speed (technical value – maximum reference speed of the closing edge $v \leq 0.2$ m/s).

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
Danger in the event of misuse
Misuse and incorrect installation of hardware can lead to hazardous situations.
- Never use hardware combinations that have not been approved by the hardware manufacturer.
- Never use non-original accessories or accessories which have not been approved by the hardware manufacturer.

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 as well as 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 in an uncontrolled manner may lead to injuries in the event of a fall or physical overexertion.

- Observe the applicable accident prevention regulations.
- Transport heavy loads with two people and / or 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 40 kg for men and 25 kg for women.

2.5.2 Use

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

Opened sashes of windows and balcony doors create a danger zone. Depending on the height of the fall, this can result in serious to life-threatening injuries.

- Take care when in the vicinity of open windows and balcony doors.
- 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 and balcony doors poses the risk of crushing injuries.

- When closing windows and balcony doors, 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 potential 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 guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position. Ensure that the sash is guided towards the frame, opening restrictor (buffer) or other sashes at a very slow speed.
- When closing a sash and locking the hardware, the gasket counter force must be overcome.

Misuse poses the potential risk of injury and property damage.

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

- Refrain from introducing obstacles into the opening area between the frame and window or balcony door sashes.
- Refrain from placing additional loads which act upon the window or balcony door sash.
- Refrain from intentionally or uncontrollably slamming or pushing the window or balcony door sash against the window reveal.

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

The windows and balcony doors, 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 in accordance with 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.

The 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 in accordance with 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 and balcony doors, a temporary buildup 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.

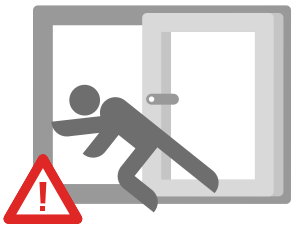
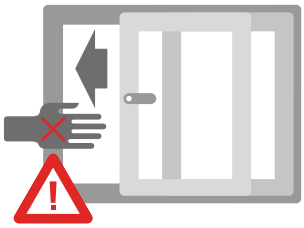
- Avoid preventing the circulation of air, e.g. due to deep reveals, curtains or unfavourable positioning of heaters or the like.
- Intensively air out the room several times per day.

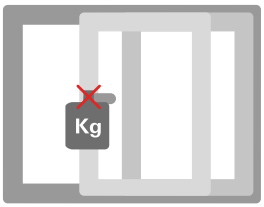
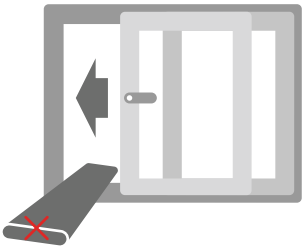
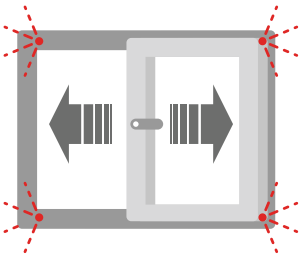
  Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- Provide adequate ventilation during holiday periods as well.
- Create a ventilation plan for construction projects if necessary.

2.6 Operation

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

Safety symbols and markings

Symbol	Meaning
	**Falls from open windows and balcony doors present an immediate danger to life and pose the risk of serious injuries.** Take care when in the vicinity of open windows and balcony doors. 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.** When closing windows and balcony doors, 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.

Symbol	Meaning
	**Placing additional loads on the sash may lead to light injuries and property damage.** Avoid placing additional loads on the sash.
	**Introducing obstacles into the opening between sash and frame may result in light injuries and property damage.** Avoid introducing obstacles into the opening between sash and frame.
	**Opening and closing the sash in an uncontrolled manner may result in light injuries and property damage.** Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or open position.

3 Information on the product

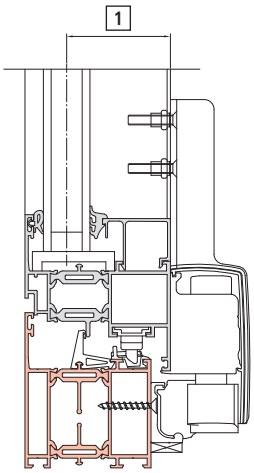
3.1 General hardware characteristics

- Modular sliding system for all profile materials.
- Universal central locking system and handle for use across all variants.
- Use of standard components from the Roto AL modular system.
- Optimised run-in and run-out characteristics on every Roto Patio Alversa | PS thanks to damping elements.
- Intuitive operation on every Roto Patio Alversa | PS thanks to the familiar Tilt&Turn operating sequence.

3.2 Application ranges

- Sash width: max. 2000 mm
- Sash height: max. 2700 mm
- Sash weight: max. 200 kg
- Rebate clearance: 11.5 – 12 mm
- 7 mm minimum overlap height
- Hardware axis: 10 mm
- Maximum retracting distance: 122 mm
- Frame groove: V.01 and V.02
- Sash groove: 15 / 20
- Compatible with RC 2/RC 2 N
- Sash arrangement according to diagrams A, C and D
- For profiles which run on the inside only
- Operating range: -20 °C to +50 °C

3.3 Application diagrams

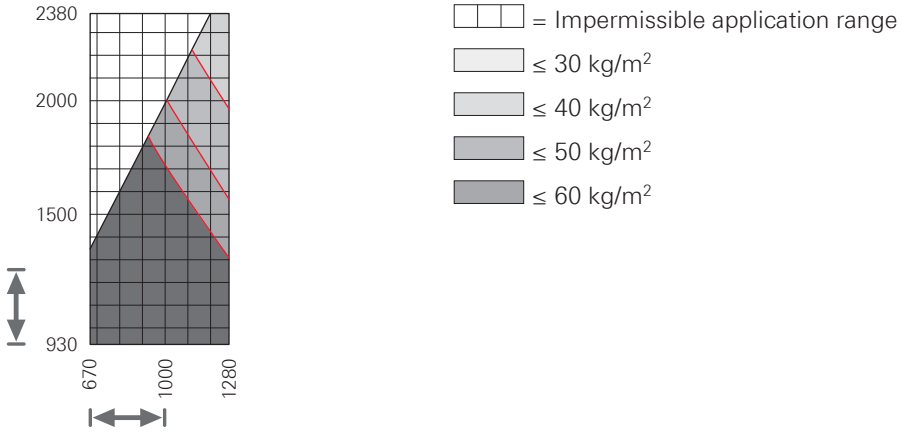


[1] Dimension M

INFO
See the following pages for the permitted product-specific dimension M. Different dimensions must be technically tested by Roto.

3.3.1 Roto Patio Alversa | KS

3.3.1.1 Up to 100 kg sash weight



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

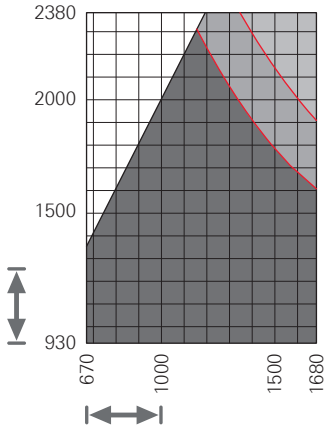
1 mm/m² glass thickness ≙ 2.5 kg

SH:SW = max. 2:1

Dimension M = max. 62 mm

		Application range
↔	Sash width (SW)	670 – 1280 mm
↕	Sash height (SH)	930 – 2380 mm
⚖	Sash weight (S.kg)	max. 100 kg
–	Glass weight	max. 60 kg/m²

3.3.1.2 Up to 160 kg sash weight



= Impermissible application range
≤ 40 kg/m²
≤ 50 kg/m²
≤ 60 kg/m²

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

1 mm/m² glass thickness ≙ 2.5 kg

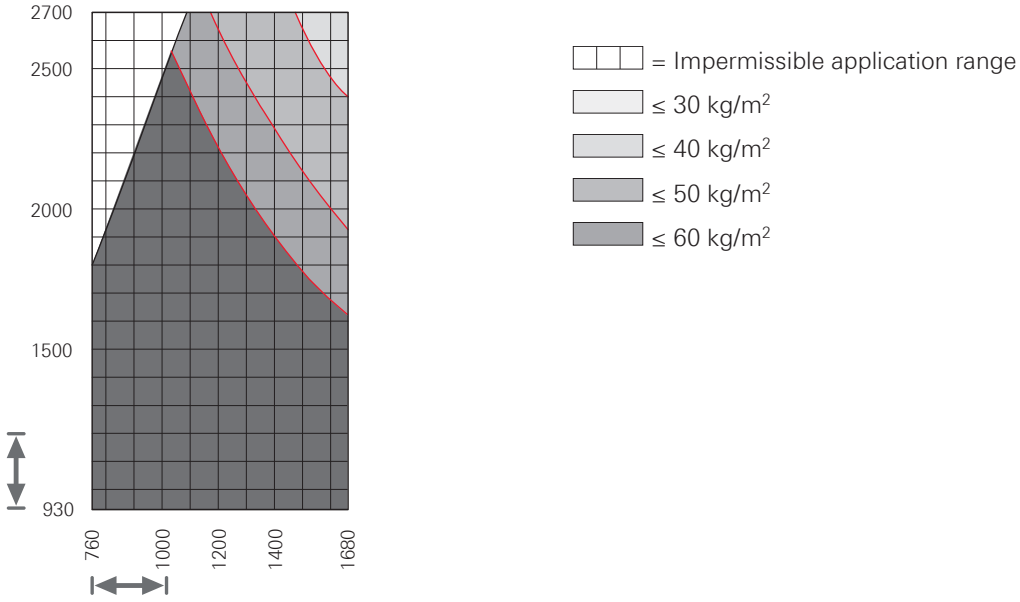
SH:SW = max. 2:1

Dimension M = max. 62 mm

		Application range
	Sash width (SW)	670 – 1680 mm
	Sash height (SH)	930 – 2380 mm
	Sash weight (S.kg)	max. 160 kg
–	Glass weight	max. 60 kg/m²

3.3.2 Roto Patio Alversa | PS without / with night ventilation

3.3.2.1 Up to 160 kg sash weight



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

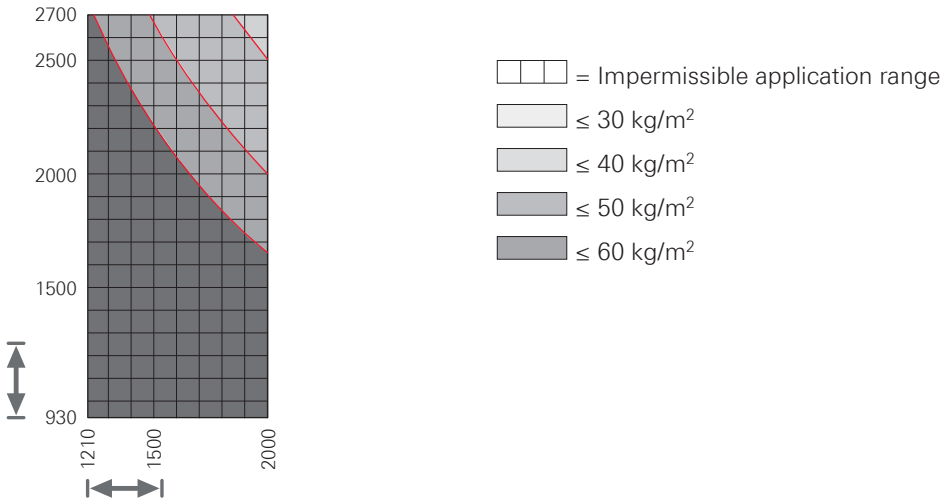
1 mm/m² glass thickness ≙ 2.5 kg

SH:SW = max. 2.5:1

Dimension M = max. 68 mm

		Application range
	Sash width (SW)	760 – 1680 mm
	Sash height (SH)	930 – 2700 mm
	Sash weight (S.kg)	max. 160 kg
–	Glass weight	max. 60 kg/m²

3.3.2.2 Up to 200 kg sash weight



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

1 mm/m² glass thickness ≙ 2.5 kg

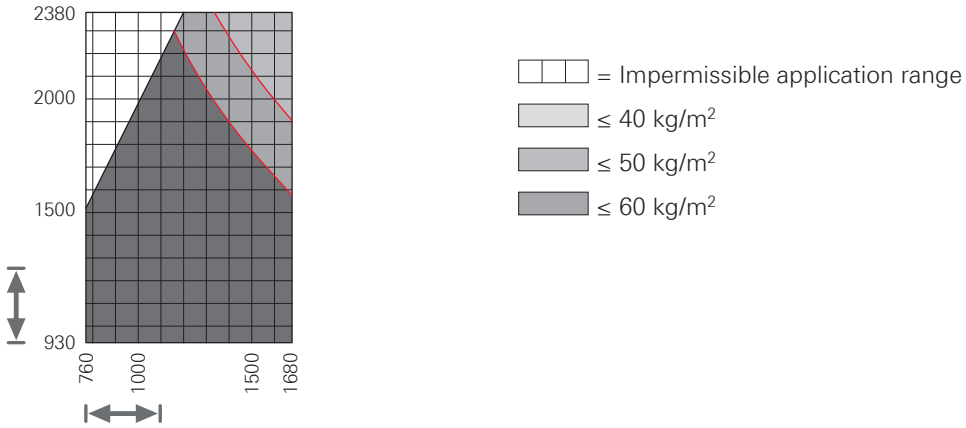
SH:SW = max. 2.5:1

Dimension M = max. 68 mm

		Application range
	Sash width (SW)	1210 – 2000 mm
	Sash height (SH)	930 – 2700 mm
	Sash weight (S.kg)	max. 200 kg
–	Glass weight	max. 60 kg/m²

3.3.3 Roto Patio Alversa | PS Air

3.3.3.1 Up to 160 kg sash weight



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

1 mm/m² glass thickness ≙ 2.5 kg

SH:SW = max. 2:1

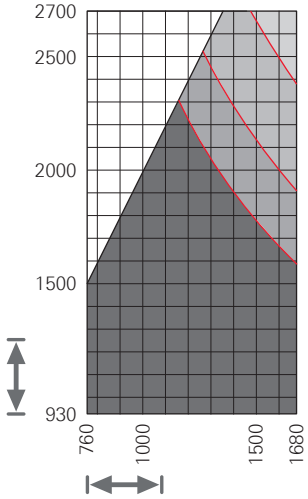
Dimension M = max. 68 mm [1]

		Application range
	Sash width (SW)	760 – 1680 mm
	Sash height (SH)	930 – 2380 mm
	Sash weight (S.kg)	max. 160 kg
–	Glass weight	max. 60 kg/m²

[1] Mandatory from dimension M 44 mm retrofit set for the lock-in position.

3.3.4 Roto Patio Alversa | PS Air Com

3.3.4.1 Up to 160 kg sash weight



= Impermissible application range
≤ 30 kg/m²
≤ 40 kg/m²
≤ 50 kg/m²
≤ 60 kg/m²

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

1 mm/m² glass thickness ≙ 2.5 kg

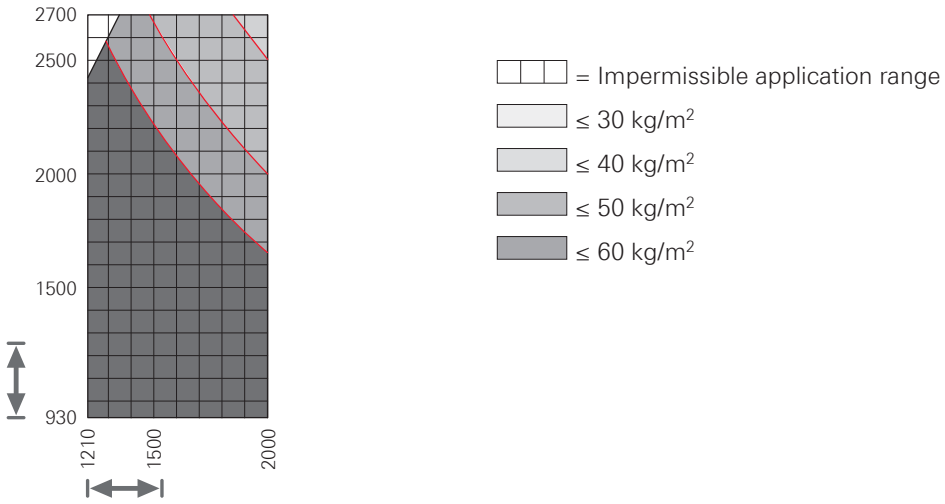
SH:SW = max. 2:1

Dimension M = max. 68 mm

		Application range
	Sash width (SW)	760 – 1680 mm
	Sash height (SH)	930 – 2700 mm
	Sash weight (S.kg)	max. 160 kg [2]
–	Glass weight	max. 60 kg/m²

[2] Mandatory from S.kg >140 kg retrofit set for tilt assistance.

3.3.4.2 Up to 200 kg sash weight



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

1 mm/m² glass thickness ≙ 2.5 kg

SH:SW = max. 2:1

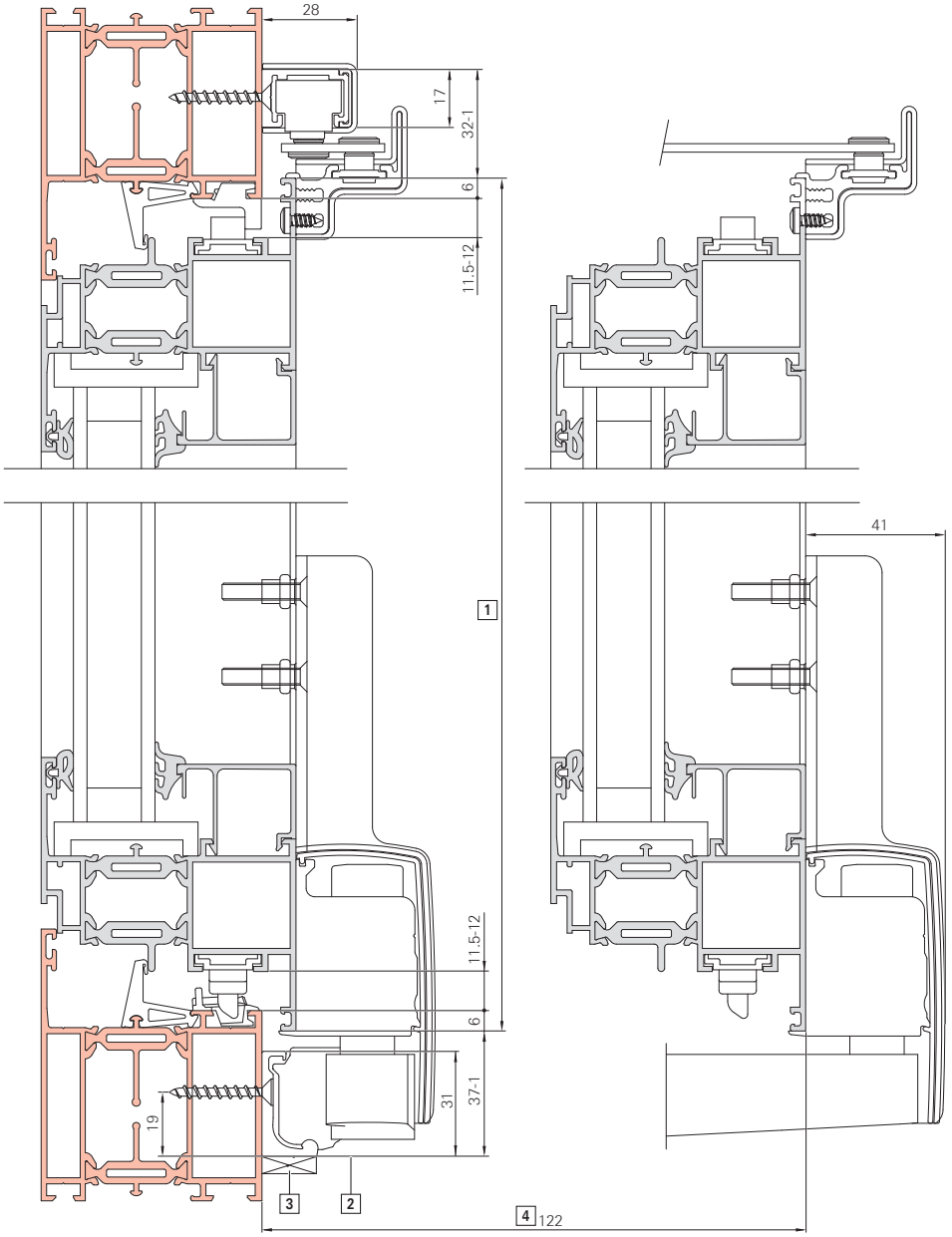
Dimension M = max. 68 mm

		Application range
	Sash width (SW)	1210 – 2000 mm
	Sash height (SH)	930 – 2700 mm
	Sash weight (S.kg)	max. 200 kg [3]
–	Glass weight	max. 60 kg/m²

[3] Mandatory from S.kg >140 kg retrofit set for tilt assistance.

3.4 Profile sections

3.4.1 Vertical cross section



Assignment	Meaning
[1]	SH
[2]	Max. top edge of finished floor
[3]	Underlay the roller track over the entire length on site in order to transfer the load.
[4]	Retracting distance

3.5 Design variants

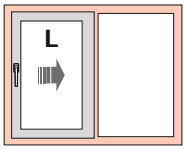
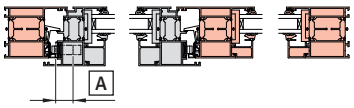
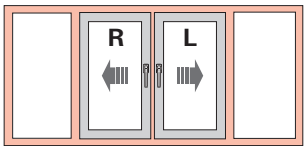
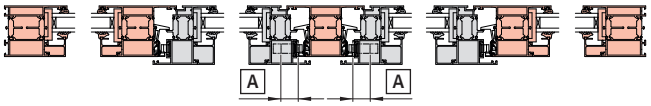
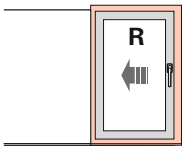
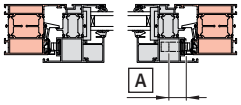
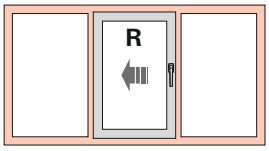
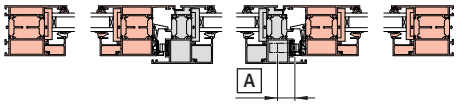
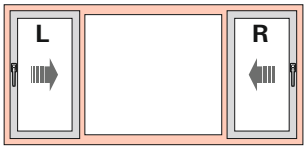
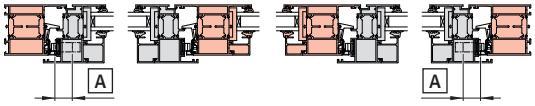
3.5.1 Note regarding the design variants

Combinations for constructing the Patio Alversa are assigned to the following diagrams.

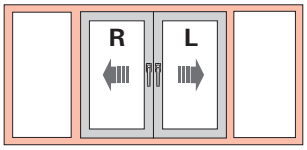
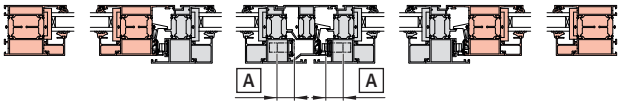
These combinations can be built in DIN L and R.

The cross sections show where the espagnolette is installed.

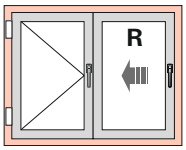
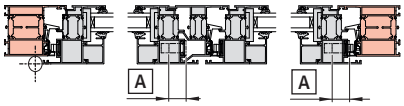
3.5.2 Diagram A

Combinations	Further description	
 1 sliding sash (L or R) 1 fixed glazing element	Diagram A	 [A] = Backset
 2 sliding sashes (L and R) with centre post 2 fixed glazing elements	Diagram C	 [A] = Backset
 1 sliding sash (L or R) 1 frame, internal, flush with the wall	Diagram B	 [A] = Backset
 1 sliding sash (L or R) 2 fixed glazing elements	Diagram G	 [A] = Backset
 2 sliding sashes (L and R) 1 fixed glazing element	Diagram K	 [A] = Backset

3.5.3 Diagram C

Combinations	Further designation	
	Diagram C	
2 sliding sashes (L and R) without centre post 2 fixed glazings		[A] = Backset

3.5.4 Diagram D

Combinations	Previous description	
	Diagram D	
1 sliding sash (L or R) 1 Turn-Only sash (L or R) Bottom guide block, movable → *8.6.4.1 "Bottom guide block, movable" from page 182*		

INFO
Turn-Only sash (diagram D) can be opened for cleaning and maintenance work.

3.6 Variant overview

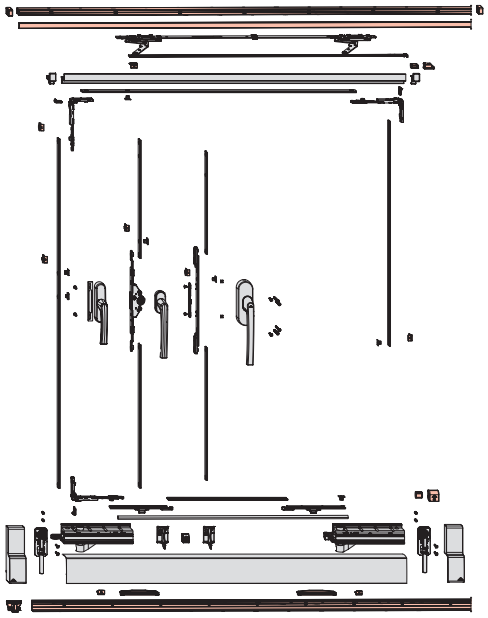
3.6.1 Notes on the variant overview

The following overviews list the components for each Patio Alversa variant.

The components for each variant are identical to the previously illustrated variant unless otherwise indicated; only additional components or those that are not present are listed again.

INFO
For more detailed information on assembling hardware, see the hardware overview chapter.

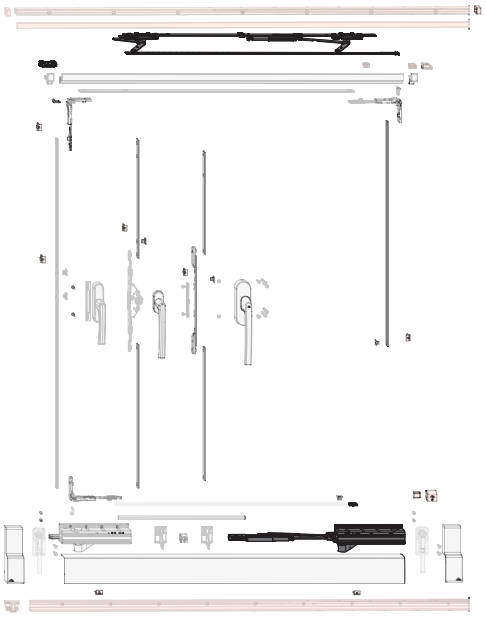
3.6.2 Roto Patio Alversa | KS

Example hardware overview	Quantity	Component	See page
	3	Corner drives	→ *from page 123*
	3	Retaining forks	→ *from page 123*
	1	Insertable connector bolt[4]	→ *from page 133*
	1	Left bullet-catch track	→ *from page 138*
	1	Right bullet-catch track	→ *from page 138*
	1	Roto Line AL geared-handle[5]	→ *from page 110*
	1	Espagnolette support	→ *from page 144*
	1	Bogies, Tilt&Slide	→ *from page 147*
	2	Reinforcement parts	→ *from page 147*
	2	Rivet nuts	→ *from page 151*
	1–2	Supporting pieces	→ *from page 156*
	1	Connecting rod	→ *from page 157*
	1	Support block	→ *from page 157*
	1	Retaining track	→ *from page 119*
	...	Strikers (depending on the sash size and resistance class)	→ *from page 161*
	...	Insertable cam (depending on the sash size and resistance class)	→ *from page 118*
	1	Guide track	→ *from page 163*
	2	Guide plates	→ *from page 161*
	1	Sliding scissor stay, Tilt&Slide	→ *from page 169*
	1	Roller track	→ *from page 172*
	2	End caps for retaining track	→ *from page 181*
	1	Guide block, bottom	→ *from page 175*
	1	Stop part, bottom	→ *from page 186*
	1	Stop part, top	→ *from page 186*
	2	Rubber buffer stop part	→ *from page 186*
	1	Bogie cover	→ *from page 187*
	2	Reinforcement part cover caps	→ *from page 188*
	1	Guide track cover profile	→ *from page 189*
	2	End caps for guide track	→ *from page 189*
	...	Connecting rods	→ *from page 126* → *from page 128* → *from page 131* → *from page 138*

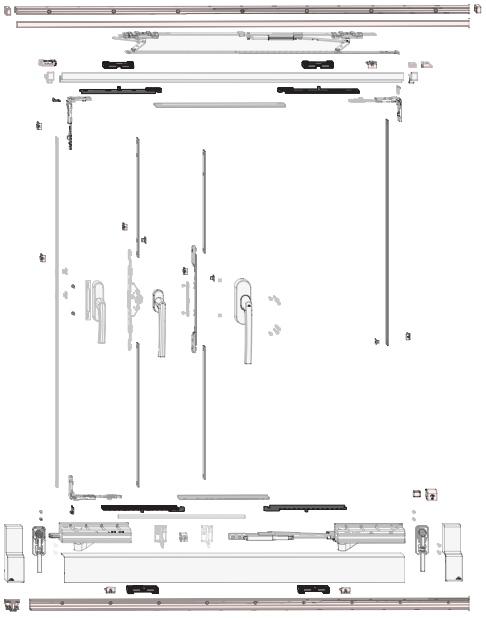
[4] Alternatively: flush-encased gearbox / flush-encased gearbox without mishandling device / adjustable centre section

[5] Alternatively: Roto Line handle / Roto Line Alversa geared-handle

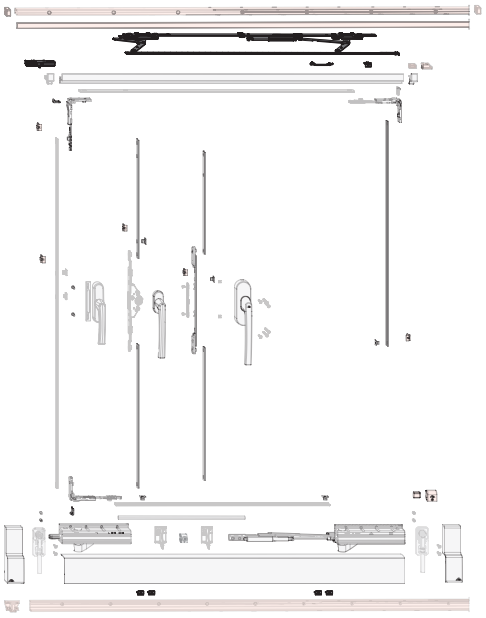
3.6.3 Roto Patio Alversa | PS without night ventilation

Example hardware overview	Quantity	Component	See page	
	1	Travel restrictor	Accessory	→ *from page 141*
	1	Sliding scissor stay, Parallel Sliding, night ventilation	Spare	→ *from page 169*
	1	Bogies, Parallel Sliding	Spare	→ *from page 147*
	1	Fixed top guide block	Accessory	→ *from page 169*
	1	Left bullet-catch track	Omitted	
	1	Right bullet-catch track	Omitted	
	2	Guide plates	Omitted	

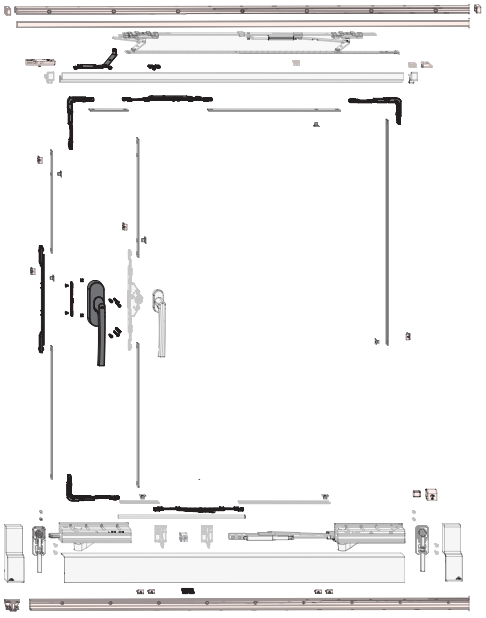
3.6.4 Roto Patio Alversa | PS with night ventilation

Example hardware overview	Quantity	Component		See page
	4	Night ventilation strikers	Spare	→ *from page 161*
	2	Night ventilation track 1	Accessory	→ *from page 138* → *from page 128*
	2	Night ventilation track 2	Accessory	→ *from page 138* → *from page 128*
	1	Travel restrictor	Omitted	

3.6.5 Roto Patio Alversa | PS Air

Example hardware overview	Quantity	Component	See page	
	...	Strikers (depending on the sash size and resistance class)	Spare	→ *from page 161*
	1	Sliding scissor stay, Parallel Sliding, tilt ventilation	Spare	→ *from page 169*
	1	Top guide block, tiltable	Spare	→ *from page 169*
	1	Retrofit set for the lock-in position (from dimension M > 44 mm)	Accessory	→ *from page 167*
	2	Tilt strikers	Accessory	→ *from page 161*
	4	Night ventilation strikers	Omitted	

3.6.6 Roto Patio Alversa | PS Air Com

Example hardware overview	Quantity	Component	See page	
	3	Reinforced corner drives	Spare	→ *from page 125*
	1–2	Comfort scissor stays	Accessory	→ *from page 128*
	1–2	Comfort scissor stay frame components	Accessory	→ *from page 161*
	1	Mishandling device	Accessory	→ *from page 138*
	1	Mishandling device frame component	Accessory	→ *from page 161*
	1	Retrofit set for tilt assistance (from S.kg > 140 kg)	Accessory	→ *from page 167*
	1	Adjustable centre section[6]	Spare	→ *from page 136*
	1	Roto Line Alversa geared-handle[7]	Spare	→ *from page 145*
	1	Insertable connector bolt	Omitted	
	1	Roto Line AL geared-handle	Omitted	
	3	Retaining forks	Omitted	
	1	Retrofit set for lock-in position	Omitted	

3.7 Space requirement for hardware

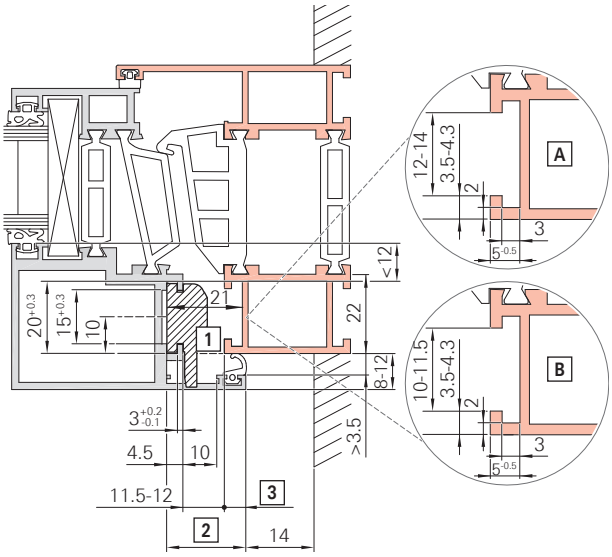
Note the following space requirement:

- ▶ Note the hatched space requirement.
  Please consult us in the event of deviating dimensions.
- ▶ Pay attention to the alignment [1] of the sash and frame.

[6] Alternatively: flush-encased gearbox

[7] Alternatively: Roto Line Patio Alversa interior handle, 200 mm

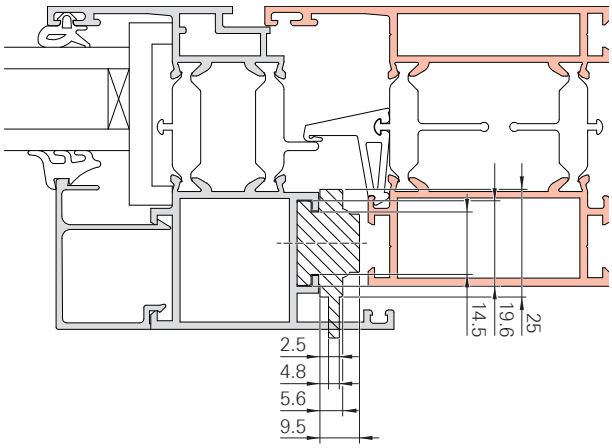
Space requirement: diagram A – Roto Line AL geared-handle



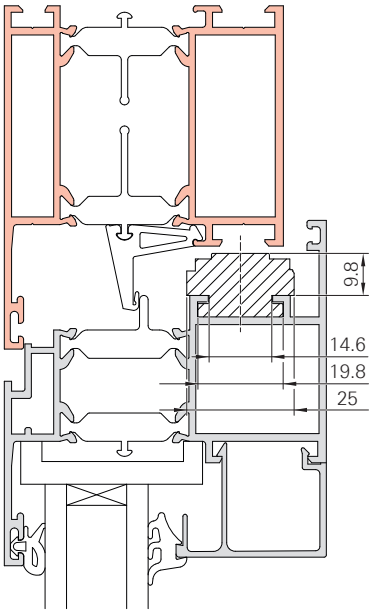
Assignment	Meaning
[1]	Alignment of the sash and frame
[2]	Overlap width (22 mm)
[3]	Coverage
[A]	Frame-groove version V.01
[B]	Frame-groove version V.02

INFO
All connecting rod dimensions refer to an overlap width of 22 mm.
If the overlap width differs from this, adapt the connecting rod dimensions accordingly.
All connecting rod dimensions T ±0.5 mm.

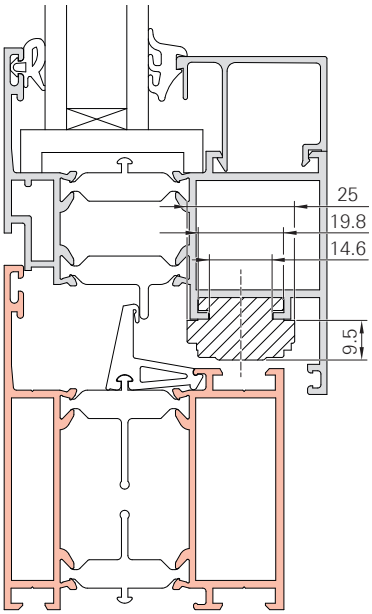
Space requirement: diagram A – Roto Line Alversa geared-handle



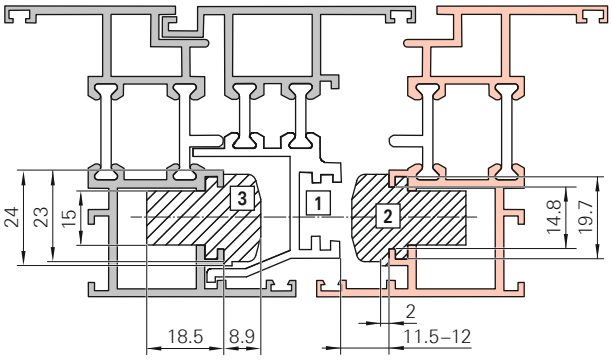
Space requirement: diagram A – Comfort scissor stay



Space requirement: diagram A – Mishandling device

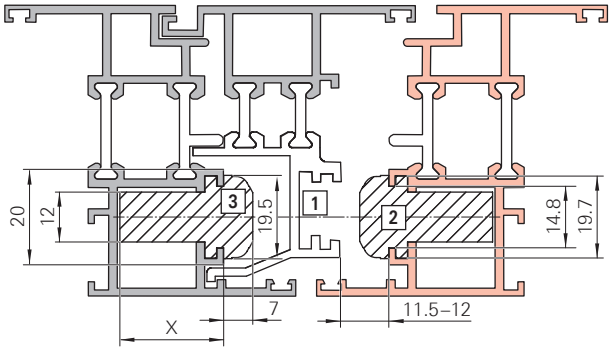


Spare requirement: diagram C – Flush-encased gearbox without mishandling device



Assignment	Meaning
[1]	Alignment of the first opening sash and the second opening sash
[2]	Connecting rod frame groove
[3]	Space requirement

Space requirement: diagram C – flush-encased gearbox BS 25, 30, 35, 40



Assignment	Meaning
[1]	Alignment of the first opening sash and the second opening sash
[2]	Connecting rod frame groove
[3]	Space requirement

	Dimension X	
Backset	without profile cylinder	with profile cylinder
25 mm	35 mm	38 mm
30 mm	40 mm	43 mm
35 mm	45 mm	48 mm
40 mm	50 mm	53 mm

4 Hardware overviews

The hardware overviews on the following pages are a recommendation on the part of Roto Frank AG.

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 height of the element
- The width of the element
- The weight of the element
- Security grade
- Profile system
- Variation

INFO
Security grades

- The RC 2 and RC 2 N security grades refer to the entire system.
- The hardware combinations shown in the hardware overviews are recommendations.
- The hardware complies with the corresponding security grades in the required system tests.
- However, the security grades are only complied with if all of the other components in the system (e.g. profile system, reinforcement, glass, etc.) are also designed for this.

INFO
Variations

- The hardware overviews in diagram C only show the second opening sash in full. The full hardware overview of the cropped, first opening sash can be found in diagram A.

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

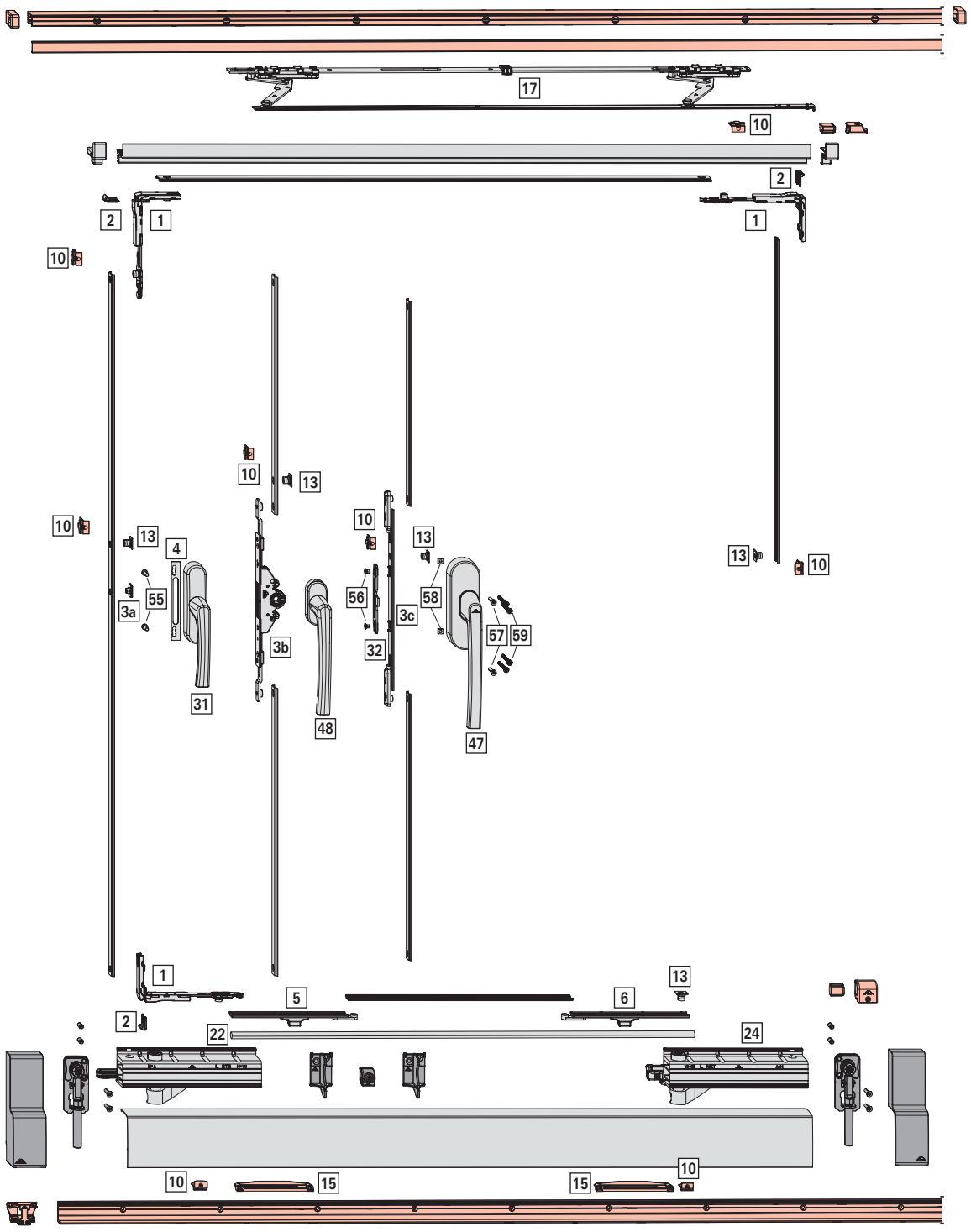
Recommended handles can be found in the handles catalogue.

Determine the required quantity of essential 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

Diagrams B, G, K, etc. correspond to diagram A (see design variants)



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300

Application range

Sash width **SW**.....670 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** ..... max. 160 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		PU	Material no.
not dep.	for Roto Line handles	10	**378338**

Bullet-catch track set 774107

Pos.		DIN	Qty.
The bullet-catch track set comprises:			
[5]	Bullet catch track	Left	1
[6]	Bullet catch track	Right	1

[17] Tilt&Slide sliding scissor stay

SW	Damping	PU	Material no.
670 – 930	No	1	**810456**
931 – 1280	No	1	**810457**
1281 – 1680	No	1	**810458**

Tilt&Slide bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies	Up to 160 kg	No	Left	1	**799896**
			Right	1	**799897**

The Tilt&Slide bogie set comprises:		Qty.
[22]	Leading bogie	1
[24]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Guide plate set

Pos.		PU	Material no.
Guide plate set V.01		1	**776011**
Guide plate set V.02		1	**776014**
The guide plate set comprises:		Qty.	
[15]	Guide plates	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Track set → *page 88*

Reinforcement part set > 100 kg → *page 87*

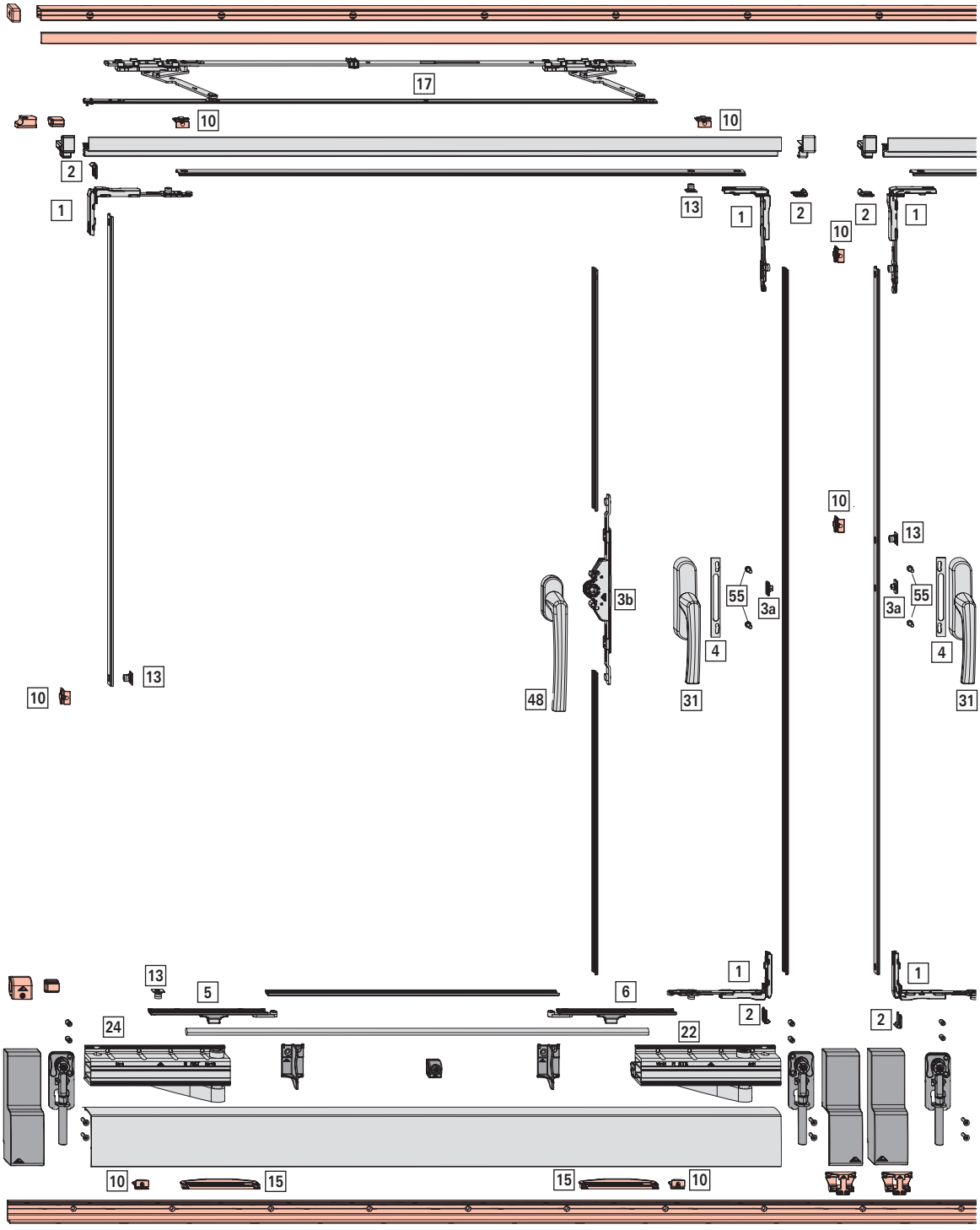
ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300; without centre post

Application range

Sash width **SW**.....670 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** ..... max. 160 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Flush-encased gearbox without mishandling device

Pos.		PU	Material no.
not dep.	for Roto Line handles	10	**378338**

Bullet-catch track set 774107

Pos.		DIN	Qty.
The bullet-catch track set comprises:			
[5]	Bullet catch track	Left	1
[6]	Bullet catch track	Right	1

[17] Tilt&Slide sliding scissor stay

SW	Damping	PU	Material no.
670 – 930	No	1	**810456**
931 – 1280	No	1	**810457**
1281 – 1680	No	1	**810458**

Tilt&Slide bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies	Up to 160 kg	No	Left	1	**799896**
			Right	1	**799897**

The Tilt&Slide bogie set comprises:		Qty.
[22]	Leading bogie	1
[24]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Guide plate set

Pos.		PU	Material no.
Guide plate set V.01		1	**776011**
Guide plate set V.02		1	**776014**
The guide plate set comprises:		Qty.	
[15]	Guide plates	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Track set → *page 88*

Reinforcement part set > 100 kg → *page 87*

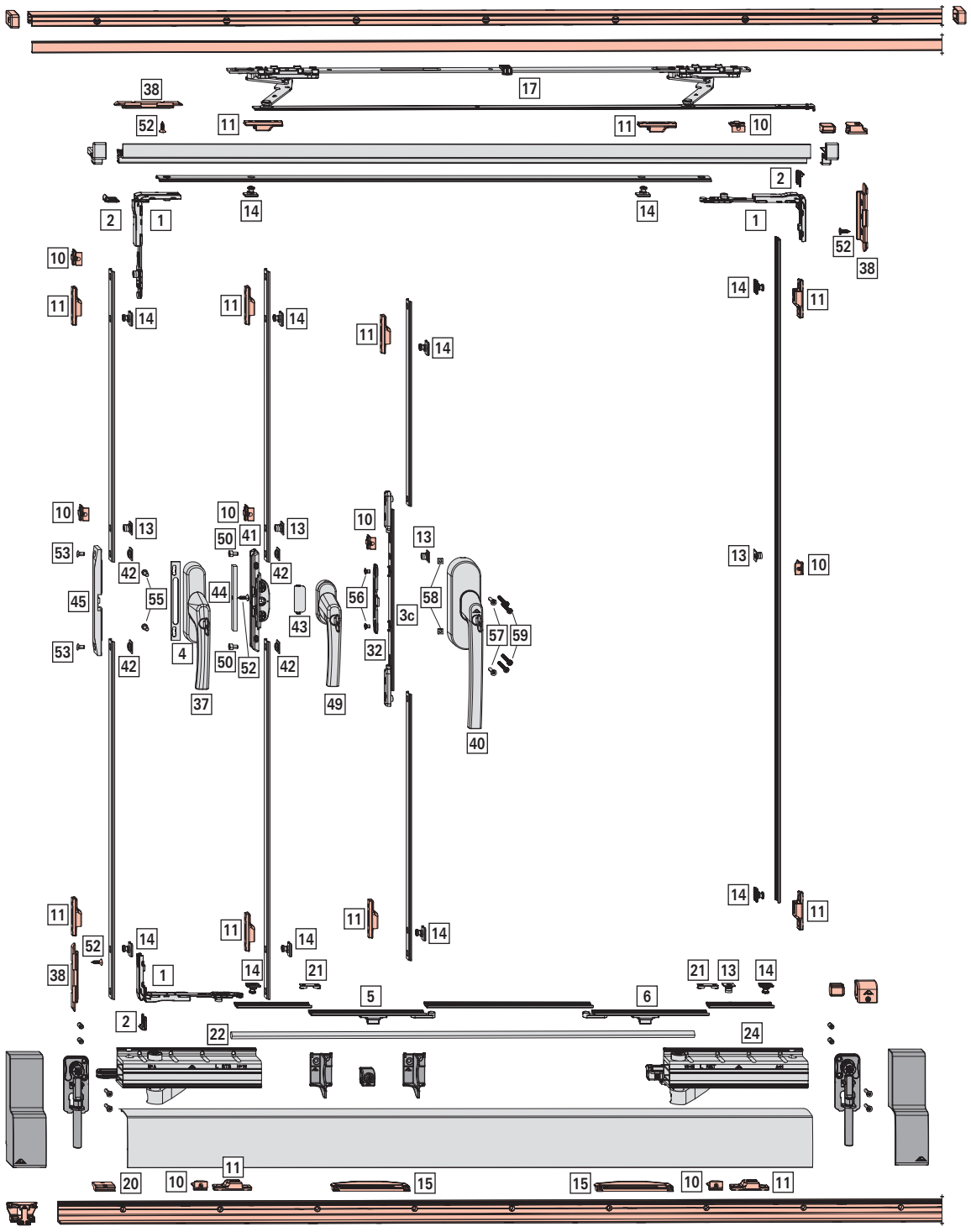
ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; RC 2 / RC 2 N; SW 1000; SH 1300

Application range

Sash width **SW**.....670 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** ..... max. 160 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

SEC rebate-clearance reduction set 728950

Pos.		Qty.
The SEC rebate-clearance reduction set comprises:		
[38]	SEC rebate-clearance reduction CD	1
[52]	Countersunk tapping-screw ST4.8 x 16	1

SEC geared-handle protection set 728952

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[45]	SEC geared-handle protection	1
[42]	SEC connector	2
[53]	Countersunk screws M5x10	2

[37] Roto Line AL lockable geared-handle

Pos.		Colour	PU	Material no.
Lock. geared-handle	Silver	R01.5	1	**786536**
	Dark bronze	R05.4	1	**786537**
	Jet black, matt	R06.2M	1	**786538**
	Traffic white	R07.2	1	**786539**
	Uncoated	Raw	1	**786540**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

[49] Lockable handle → *CTL_1*

SEC flush-encased gearbox set 728947

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[41]	SEC flush-encased gearbox without MD	1
[42]	SEC connector	2
[43]	SEC drilling protection	1
[44]	SEC rebate-clearance reduction ESP	1
[50]	Cylinder screw M5 x 8	2
[52]	Countersunk tapping-screw ST4.8 x 16	1

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa lockable geared-handle set

Pos.		Colour	PU	Material no.
200 lock. geared-handle	Silver	R01.5	1	**775921**
	Dark bronze	R05.4	1	**775922**
	Jet black	R06.2	1	**775923**
	Traffic white	R07.2	1	**775924**

The Roto Line Alversa geared-handle set comprises:		Qty.
[40]	Alversa 200 lock. geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5 x 8	2
[57]	Countersunk screws M5 x 25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Bullet-catch track set 774107

Pos.		DIN	Qty.
The bullet-catch track set comprises:			
[5]	Bullet catch track	Left	1
[6]	Bullet catch track	Right	1

SEC hardware components

Pos.		PU	Material no.
[11]	SEC strikers V.01	100	**212637**
	SEC strikers V.02	100	**212638**
[14]	SEC insertable cam	100	**447245**
[20]	Run-up block V.01	100	**684282**
	Run-up block V.02	100	**684283**
[21]	SEC coupler component	20	**348576**

[17] Tilt&Slide sliding scissor stay

SW	Damping	PU	Material no.
670 – 930	No	1	**810456**
931 – 1280	No	1	**810457**
1281 – 1680	No	1	**810458**

Tilt&Slide bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies	Up to 160 kg	No	Left	1	**799896**
			Right	1	**799897**

The Tilt&Slide bogie set comprises:		Qty.
[22]	Leading bogie	1
[24]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Guide plate set

Pos.	PU	Material no.
Guide plate set V.01	1	**776011**
Guide plate set V.02	1	**776014**

The guide plate set comprises:		Qty.
[15]	Guide plates	2
[10]	Strikers V.01 / V.02	8
[13]	Insertable cams	4

Track set → *page 88*

Reinforcement part set > 100 kg → *page 87*

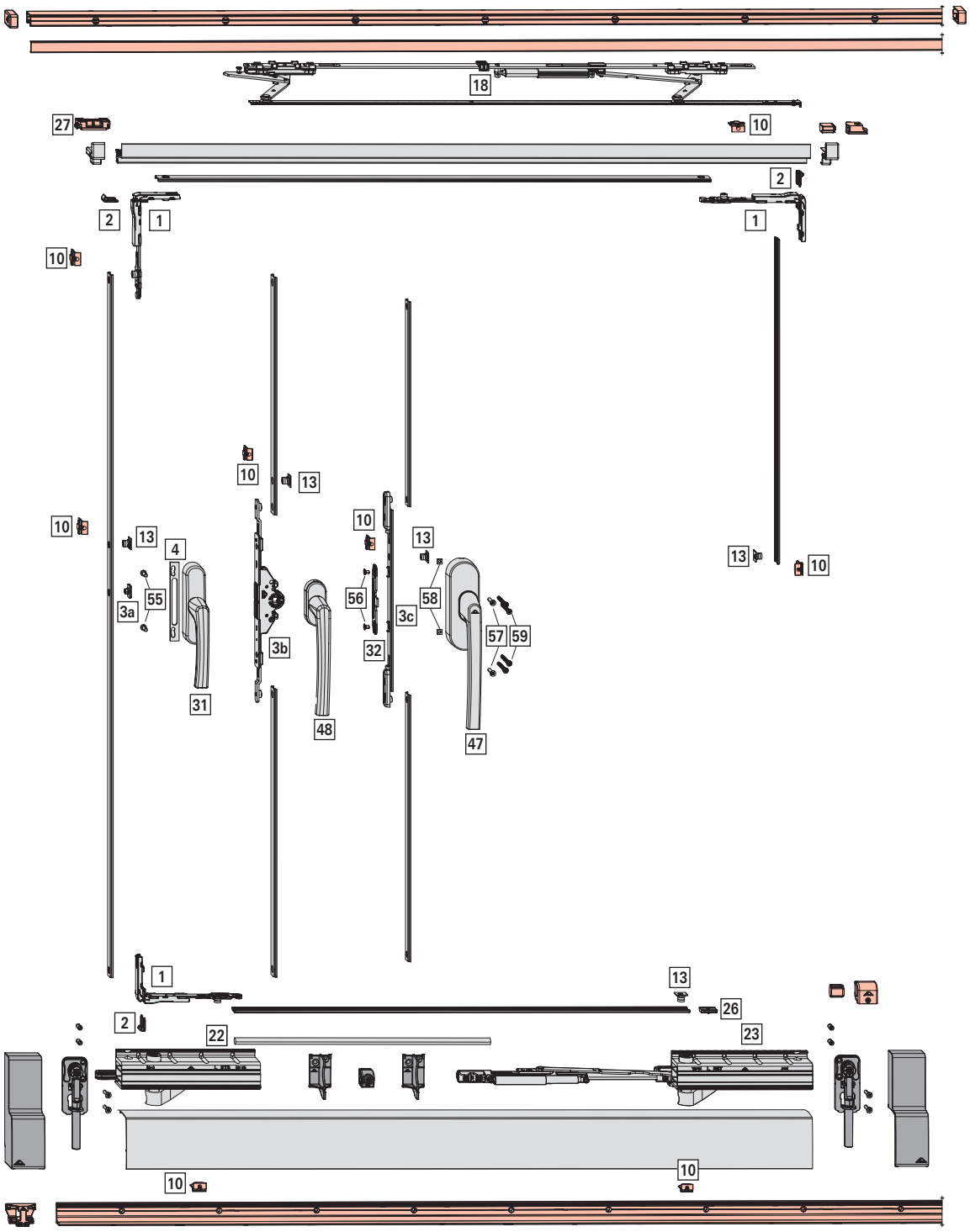
ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg**.....max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Locking set

Pos.		Qty.	Material no.
Locking set V.01			**791720**
Locking set V.02			**791721**
The locking set comprises:			
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies					
Bogies	Up to 160 kg	Yes	Left	1	**799898**
			Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Pos.	Weight	Damping	DIN	PU	Material no.
Tandem bogies					
Tandem bogies	Up to 200 kg	Yes	Left	1	**799901**
			Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

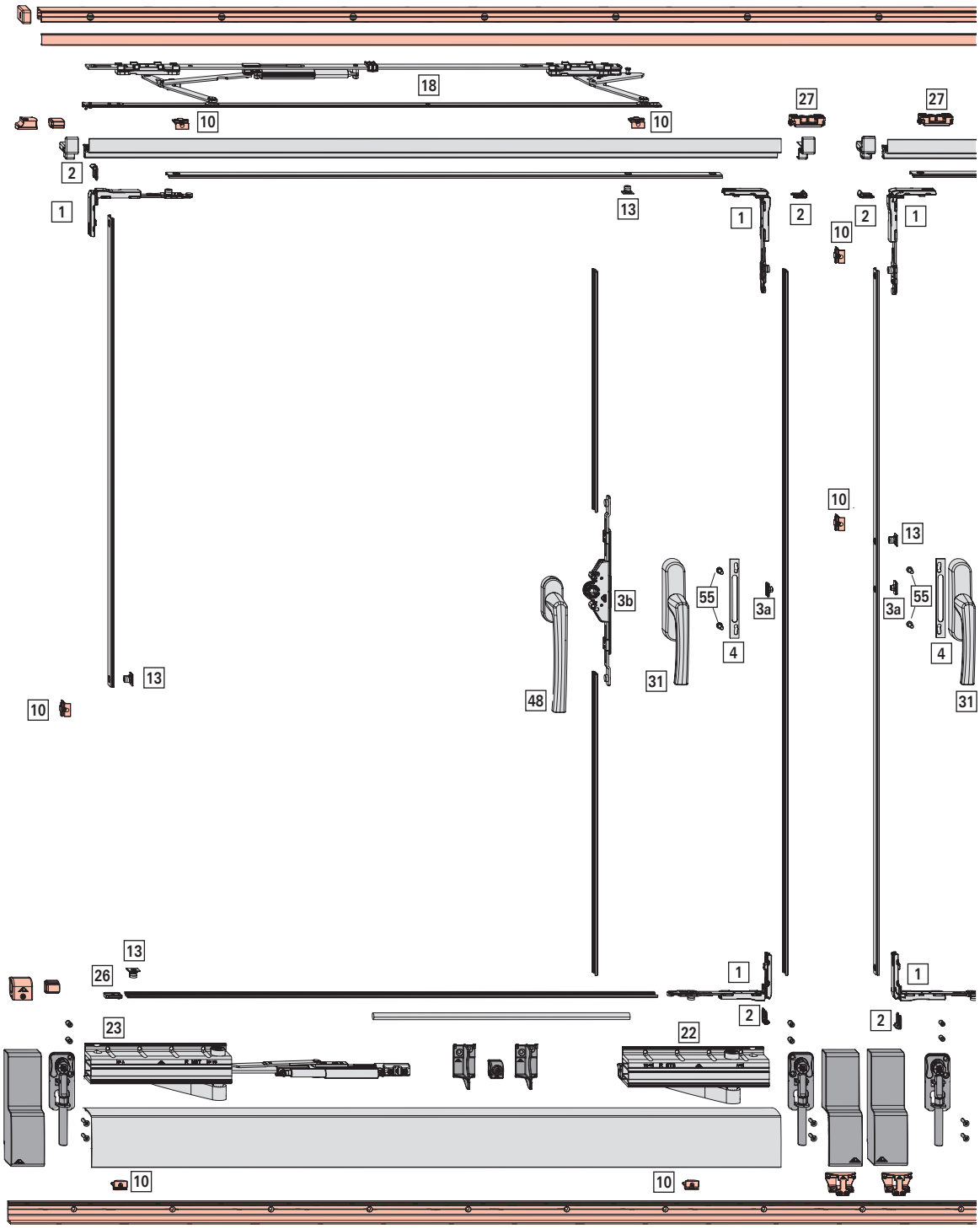
Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS without night ventilation, second opening sash – std.

Diagram C



INFO

Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300; without centre post

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg**.....max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Locking set

Pos.		Qty.	Material no.
Locking set V.01		1	**791720**
Locking set V.01		1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Tandem bogies						
Tandem bogies		Up to 200 kg	Yes	Left	1	**799901**
				Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

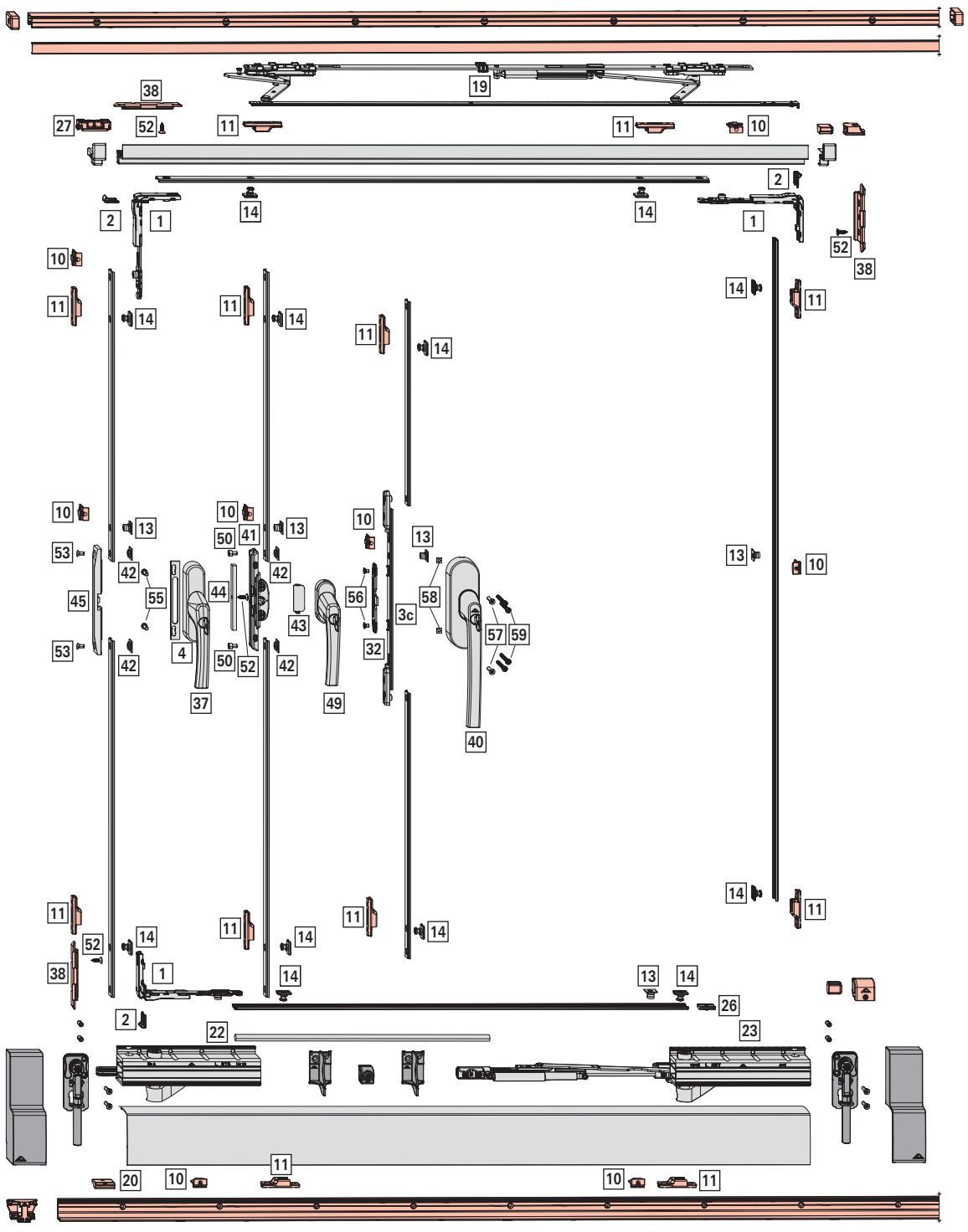
Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS without night ventilation – RC 2 / RC 2 N

Diagram A



INFO

Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; RC 2 / RC 2 N; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg** .....max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

SEC rebate-clearance reduction set 728950

Pos.		Qty.
The SEC rebate-clearance reduction set comprises:		
[38]	SEC rebate-clearance reduction CD	1
[52]	Countersunk tapping-screw ST4.8 x 16	1

Locking set

Pos.		Qty.	Material no.
	Locking set V.01	1	**791720**
	Locking set V.01	1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

SEC geared-handle protection set 728952

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[45]	SEC geared-handle protection	1
[42]	SEC connector	2
[53]	Countersunk screws M5x10	2

[37] Roto Line AL lockable geared-handle

Pos.		Colour	PU	Material no.
Lock. geared-handle	Silver	R01.5	1	**786536**
	Dark bronze	R05.4	1	**786537**
	Jet black, matt	R06.2M	1	**786538**
	Traffic white	R07.2	1	**786539**
	Uncoated	Raw	1	**786540**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

[49] Lockable handle → *CTL_1*

SEC flush-encased gearbox set 728947

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[41]	SEC flush-encased gearbox without MD	1
[42]	SEC connector	2
[43]	SEC drilling protection	1
[44]	SEC rebate-clearance reduction ESP	1
[50]	Cylinder screw M5 x 8	2
[52]	Countersunk tapping-screw ST4.8 x 16	1

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa lockable geared-handle set

Pos.		Colour	PU	Material no.
200 lock. geared-handle	Silver	R01.5	1	**775921**
	Dark bronze	R05.4	1	**775922**
	Jet black	R06.2	1	**775923**
	Traffic white	R07.2	1	**775924**

The Roto Line Alversa geared-handle set comprises:		Qty.
[40]	Alversa 200 lock. geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

SEC hardware components

Pos.		PU	Material no.
[11]	SEC strikers V.01	100	**212637**
	SEC strikers V.02	100	**212638**
[14]	SEC insertable cam	100	**447245**
[20]	Run-up block V.01	100	**684282**
	Run-up block V.02	100	**684283**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies					
Bogies	Up to 160 kg	Yes	Left	1	**799898**
			Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Tandem bogies					
Tandem bogies	Up to 200 kg	Yes	Left	1	**799901**
			Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

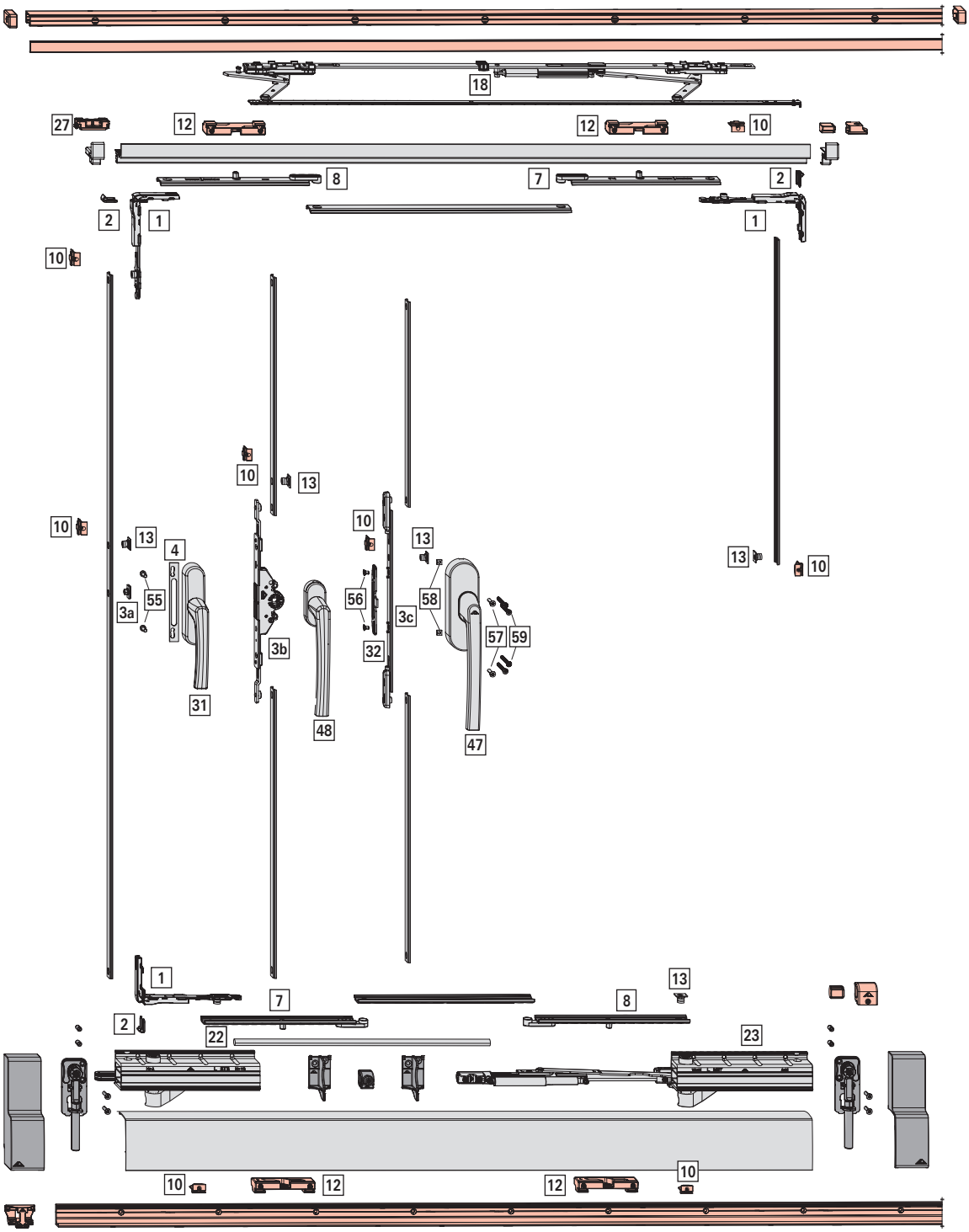
Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS without night ventilation – RC 2 / RC 2 N

Diagram A

PS with night ventilation – std.

Diagram A



INFO

Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg** ..... max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Night-vent set

Pos.		DIN	Qty.	Material no.
Night-vent set V.01		Left	1	**782305**
		Right	1	**782306**
Night-vent set V.02		Left	1	**782312**
		Right	1	**782313**
The night-vent set comprises:				
[12]	Night ventilation strikers		4	
[10]	Strikers V.01 / V.02		4	
[8]	Night ventilation tracks 1		2	
[7]	Night ventilation tracks 2		2	
[13]	Insertable cams		4	

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Tandem bogies						
Tandem bogies		Up to 200 kg	Yes	Left	1	**799901**
				Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

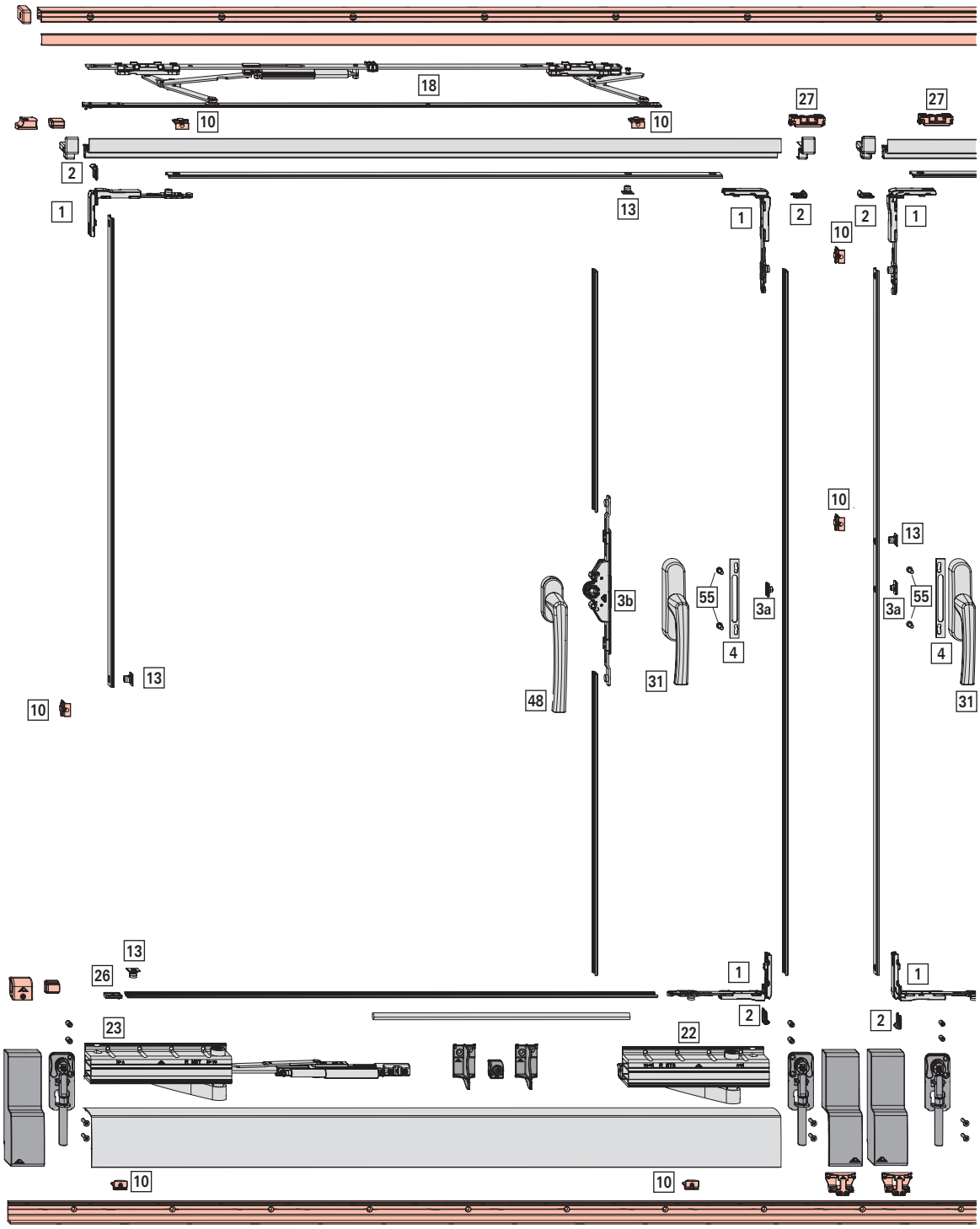
Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS with night ventilation – std.

Diagram A

PS with night ventilation, second opening sash – std.

Diagram C



INFO

- Size-dependent components can be found in the parts list.
- Diagram C:
  second opening sash such as PS without night ventilation;
  first opening sash such as diagram A PS with night ventilation.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300; without centre post

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg** ..... max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Night-vent set

Pos.		DIN	Qty.	Material no.
Night-vent set V.01		Left	1	**782305**
		Right	1	**782306**
Night-vent set V.02		Left	1	**782312**
		Right	1	**782313**
The night-vent set comprises:				
[12]	Night ventilation strikers		4	
[10]	Strikers V.01 / V.02		4	
[8]	Night ventilation tracks 1		2	
[7]	Night ventilation tracks 2		2	
[13]	Insertable cams		4	

Locking set

Pos.		Qty.	Material no.
Locking set V.01		1	**791720**
Locking set V.01		1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**
The Parallel Sliding bogie set comprises:					Qty.	
[22]	Leading bogie				1	
[23]	Trailing bogie				1	
not dep.	Countersunk tapping-screws ST4.8x50				8	
Tandem bogies						
Tandem bogies		Up to 200 kg	Yes	Left	1	**799901**
				Right	1	**799902**
The Parallel Sliding tandem bogie set comprises:					Qty.	
not dep.	Leading tandem bogie				1	
not dep.	Trailing tandem bogie				1	
not dep.	Countersunk tapping-screws ST4.8x50				16	

PS with night ventilation, second opening sash – std.

Diagram C

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

Additional components, size-dependent

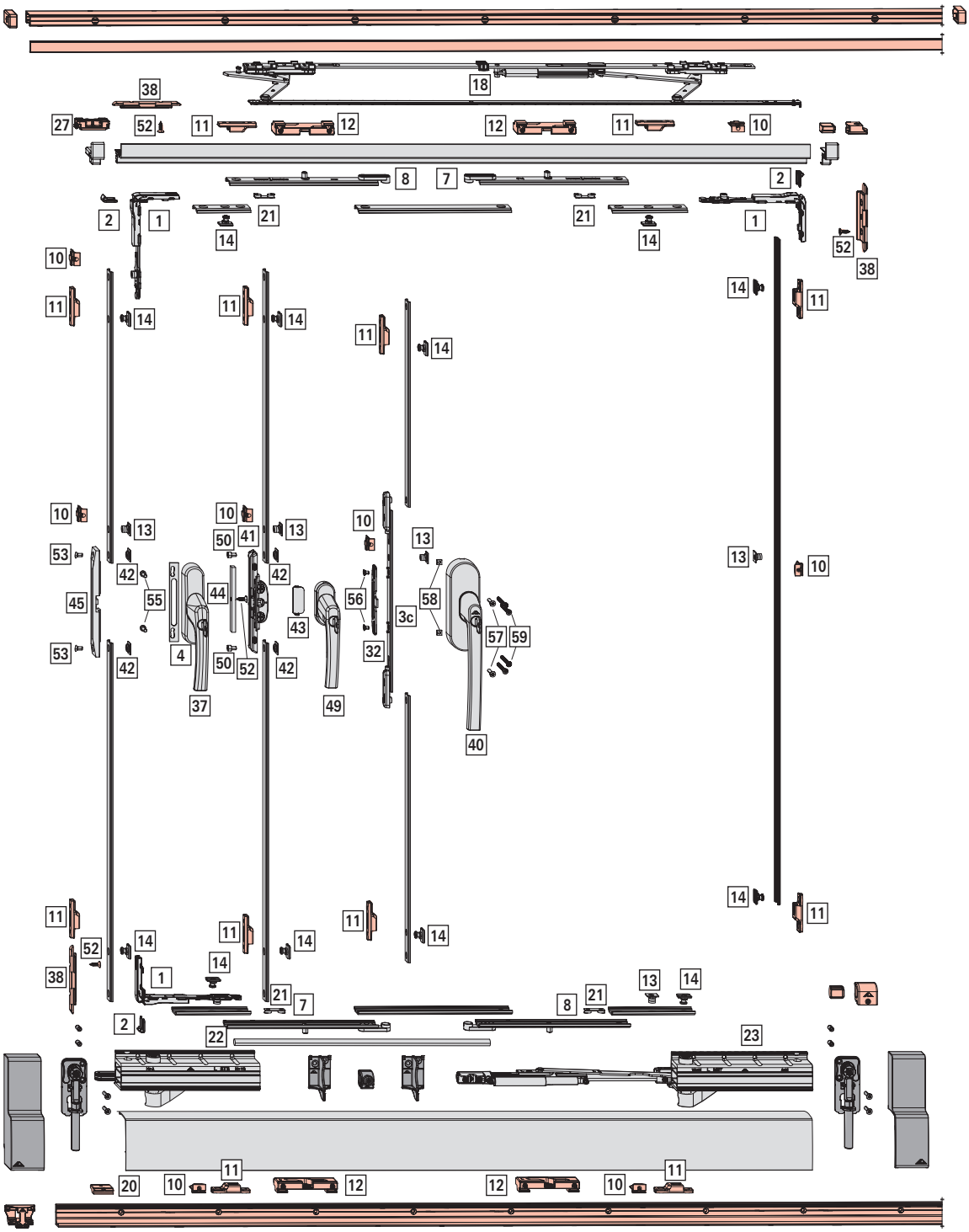
Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS with night ventilation, second opening sash – std.

Diagram C

PS with night ventilation – RC 2 / RC 2 N

Diagram A



INFO

Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; RC 2 / RC 2 N; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg** ..... max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Night-vent set

Pos.		DIN	Qty.	Material no.
Night-vent set V.01		Left	1	**782305**
		Right	1	**782306**
Night-vent set V.02		Left	1	**782312**
		Right	1	**782313**
The night-vent set comprises:				
[12]	Night ventilation strikers		4	
[10]	Strikers V.01 / V.02		4	
[8]	Night ventilation tracks 1		2	
[7]	Night ventilation tracks 2		2	
[13]	Insertable cams		4	

SEC rebate-clearance reduction set 728950

Pos.		Qty.
The SEC rebate-clearance reduction set comprises:		
[38]	SEC rebate-clearance reduction CD	1
[52]	Countersunk tapping-screw ST4.8 x 16	1

Locking set

Pos.		Qty.	Material no.
Locking set V.01		1	**791720**
Locking set V.01		1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

SEC geared-handle protection set 728952

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[45]	SEC geared-handle protection	1
[42]	SEC connector	2
[53]	Countersunk screws M5x10	2

[37] Roto Line AL lockable geared-handle

Pos.		Colour	PU	Material no.
Lock. geared-handle	Silver	R01.5	1	**786536**
	Dark bronze	R05.4	1	**786537**
	Jet black, matt	R06.2M	1	**786538**
	Traffic white	R07.2	1	**786539**
	Uncoated	Raw	1	**786540**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

[49] Lockable handle → *CTL_1*

SEC flush-encased gearbox set 728947

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[41]	SEC flush-encased gearbox without MD	1
[42]	SEC connector	2
[43]	SEC drilling protection	1
[44]	SEC rebate-clearance reduction ESP	1
[50]	Cylinder screw M5 x 8	2
[52]	Countersunk tapping-screw ST4.8 x 16	1

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa lockable geared-handle set

Pos.		Colour	PU	Material no.
200 lock. geared-handle	Silver	R01.5	1	**775921**
	Dark bronze	R05.4	1	**775922**
	Jet black	R06.2	1	**775923**
	Traffic white	R07.2	1	**775924**

The Roto Line Alversa geared-handle set comprises:		Qty.
[40]	Alversa 200 lock. geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

SEC hardware components

Pos.		PU	Material no.
[11]	SEC strikers V.01	100	**212637**
	SEC strikers V.02	100	**212638**
[14]	SEC insertable cam	100	**447245**
[20]	Run-up block V.01	100	**684282**
	Run-up block V.02	100	**684283**
[21]	SEC coupler component	20	**348576**

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**
The Parallel Sliding bogie set comprises:					Qty.	
[22]	Leading bogie				1	
[23]	Trailing bogie				1	
not dep.	Countersunk tapping-screws ST4.8x50				8	
Tandem bogies						
Tandem bogies		Up to 200 kg	Yes	Left	1	**799901**
				Right	1	**799902**
The Parallel Sliding tandem bogie set comprises:					Qty.	
not dep.	Leading tandem bogie				1	
not dep.	Trailing tandem bogie				1	
not dep.	Countersunk tapping-screws ST4.8x50				16	

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

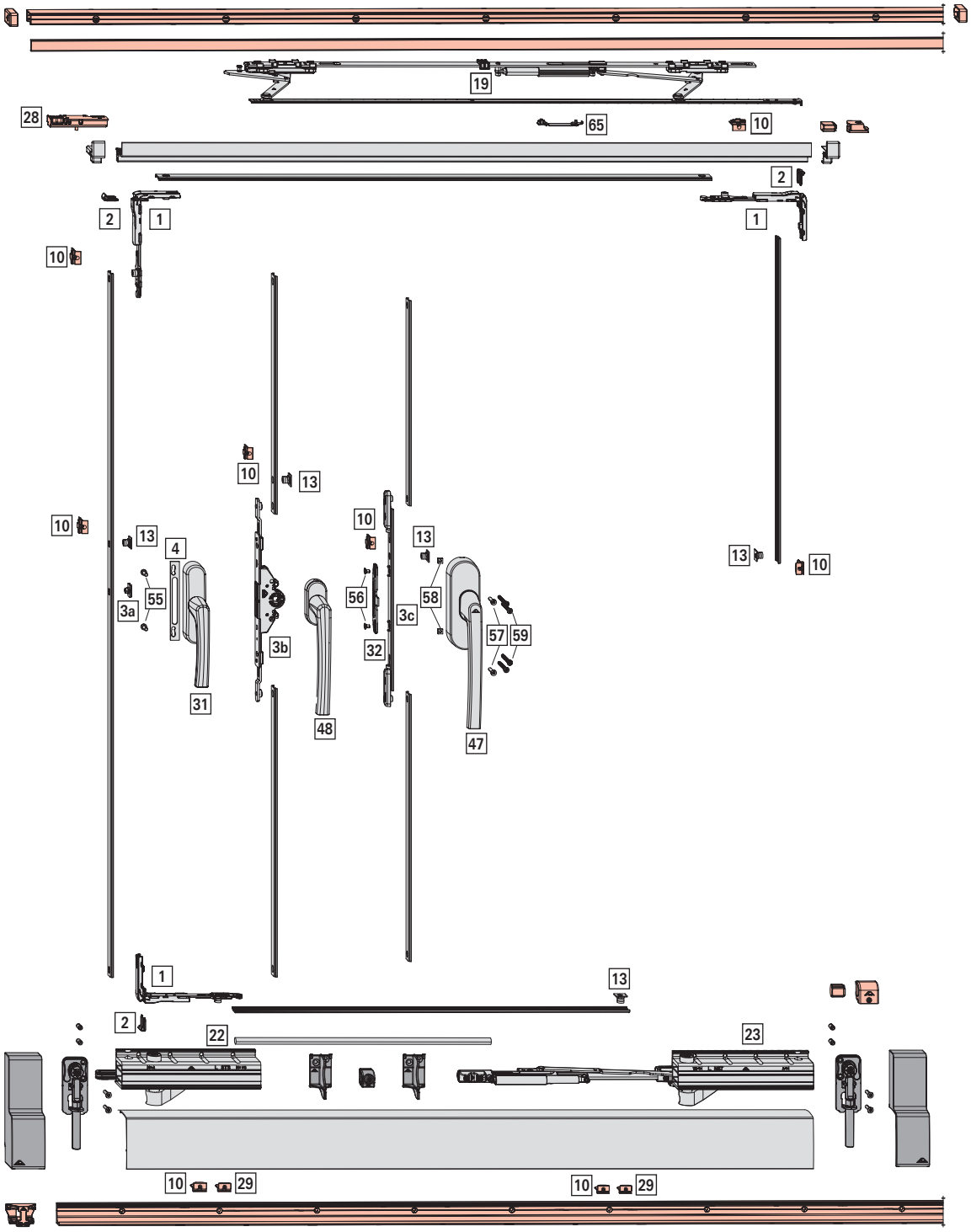
Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS with night ventilation – RC 2 / RC 2 N

Diagram A



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** ..... max. 160 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Tilt striker set

Pos.		PU	Material no.
	Tilt striker set V.01	1	**779421**
	Tilt striker set V.02	1	**779422**
The tilt striker set comprises:		Qty.	
[29]	Tilt strikers V.01 / V.02	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5x12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

[65] Retrofit set for lock-in position*

	PU	Material no.
For sliding scissor stay, Parallel Sliding, tilt ventilation: to assist the lock-in function	1	**807166**

Parallel Sliding sliding scissor stay set, tilt ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**808816**
				Right	1	**808827**
	931	– 1280	Yes	Left	1	**808824**
				Right	1	**808828**
	1281	– 1680	Yes	Left	1	**808825**
				Right	1	**808829**

The Parallel Sliding sliding scissor stay set, tilt ventilation comprises:		Qty.
[19]	Parallel Sliding sliding scissor stay	1
[28]	Tiltable top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

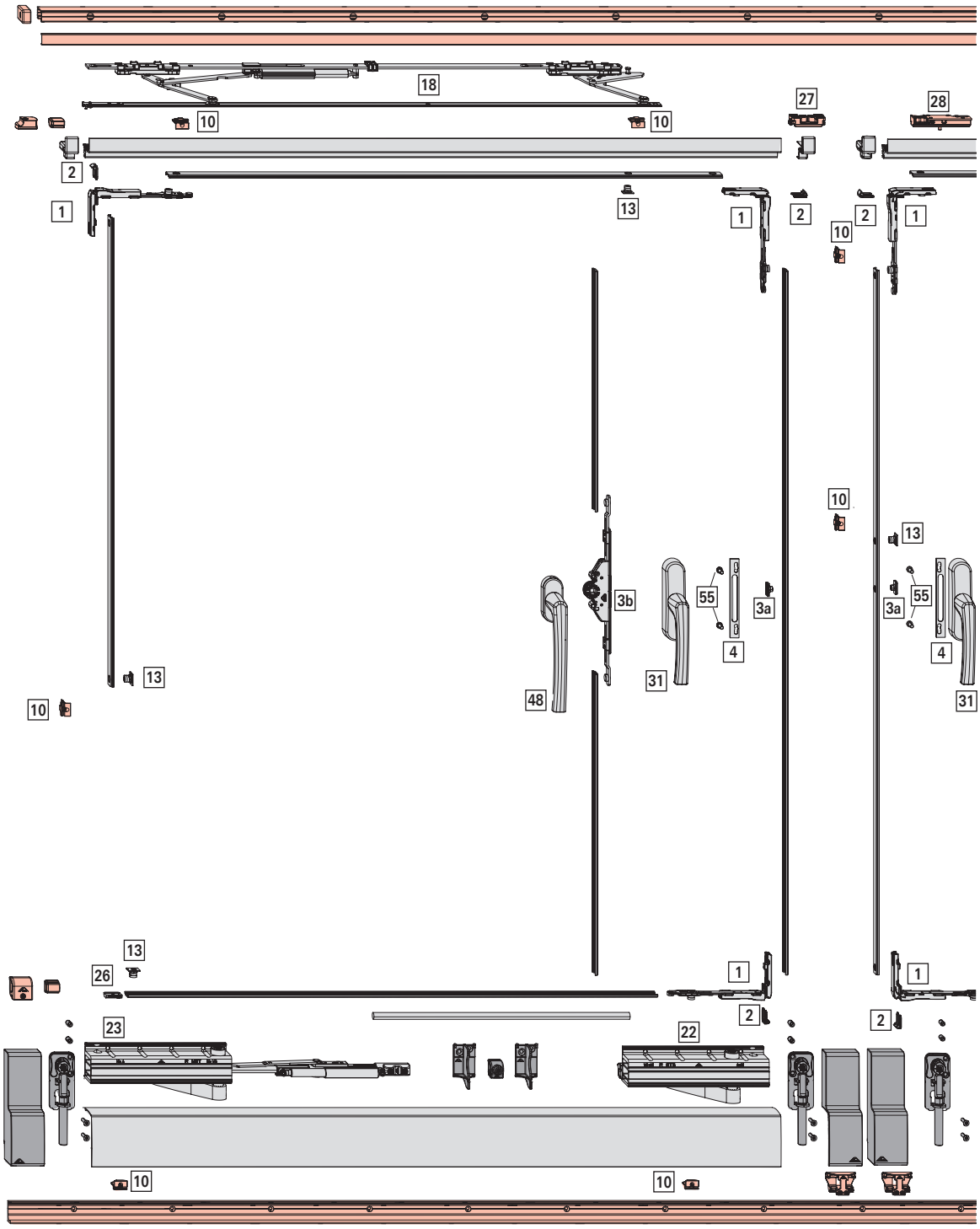
Additional components, size-dependent

Pos.		PU	Material no.
	Striker set V.01	1	**786321**
	Striker set V.02	1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

* With dimension M > 44 mm

PS Air second opening sash – std.

Diagram C



INFO

- Size-dependent components can be found in the parts list.
- Diagram C:
  second opening sash such as PS without night ventilation;
  first opening sash such as diagram A PS Air.

Application range

Sash width **SW**.....760 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** ..... max. 160 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Tilt striker set

Pos.		PU	Material no.
Tilt striker set V.01		1	**779421**
Tilt striker set V.02		1	**779422**
The tilt striker set comprises:		Qty.	
[29]	Tilt strikers V.01 / V.02	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Locking set

Pos.		Qty.	Material no.
Locking set V.01		1	**791720**
Locking set V.01		1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

Insertable connector bolt

Pos.		PU	Material no.
[3a]	for Roto Line AL geared-handle	1	**254601**

[31] Roto Line AL geared-handle

Pos.		Colour	Qty.	Material no.
Geared-handle	Silver	R01.5	1	**786522**
	Dark bronze	R05.4	1	**786523**
	Jet black, matt	R06.2M	1	**786524**
	Traffic white	R07.2	1	**786535**
	Uncoated	Raw	1	**786541**

Espagnolette support set 728853

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5 x 8	2
[57]	Countersunk screws M5 x 25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Flush-encased gearbox without mishandling device

Pos.		Qty.	Material no.
not dep.	for Roto Line handles	10	**378338**

[65] Retrofit set for lock-in position*

	PU	Material no.
For sliding scissor stay, Parallel Sliding, tilt ventilation: to assist the lock-in function	1	**807166**

Parallel Sliding sliding scissor stay set, tilt ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**808816**
				Right	1	**808827**
	931	– 1280	Yes	Left	1	**808824**
				Right	1	**808828**
	1281	– 1680	Yes	Left	1	**808825**
				Right	1	**808829**

The Parallel Sliding sliding scissor stay set, tilt ventilation comprises:		Qty.
[19]	Parallel Sliding sliding scissor stay	1
[28]	Tiltable top guide block	1

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.		Weight	Damping	DIN	PU	Material no.
Bogies						
Bogies		Up to 160 kg	Yes	Left	1	**799898**
				Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

* With dimension M > 44 mm

PS Air second opening sash – std.

Diagram C

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

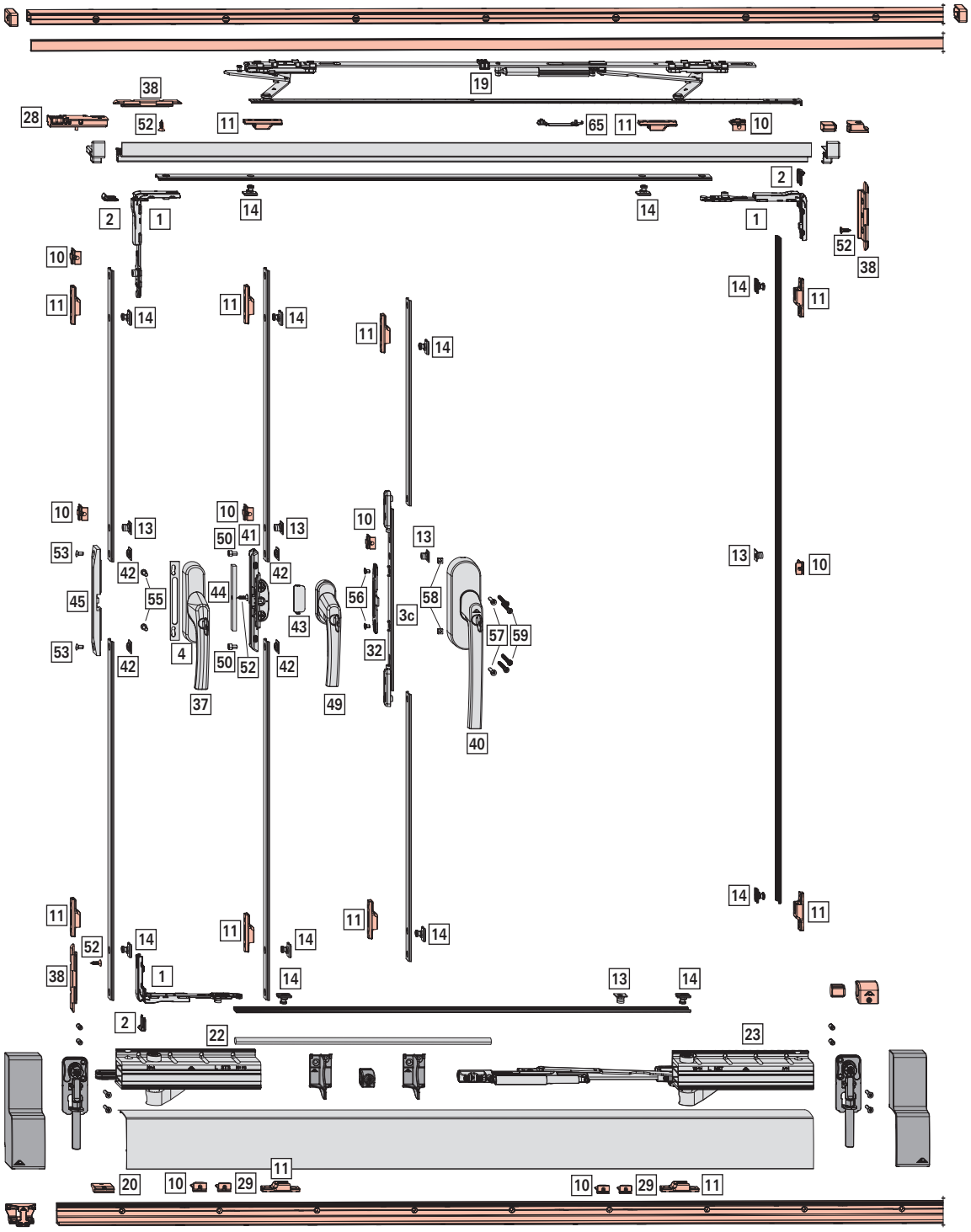
Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS Air second opening sash – std.

Diagram C



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; RC 2 / RC 2 N; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 1680 mm

Sash height **SH**.....930 – 2380 mm

Sash weight **S.kg** max. 160 kg

Corner drive set **626523**

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

SEC rebate-clearance reduction set **728950**

Pos.		Qty.
The SEC rebate-clearance reduction set comprises:		
[38]	SEC rebate-clearance reduction CD	1
[52]	Countersunk tapping-screw ST4.8 x 16	1

Tilt striker set

Pos.		PU	Material no.
Tilt striker set V.01		1	**779421**
Tilt striker set V.02		1	**779422**
The tilt striker set comprises:		Qty.	
[29]	Tilt strikers V.01 / V.02	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

SEC geared-handle protection set **728952**

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[45]	SEC geared-handle protection	1
[42]	SEC connector	2
[53]	Countersunk screws M5x10	2

[37] Roto Line Alversa geared-handle set – security

Pos.		Colour	PU	Material no.
Lock. geared-handle	Silver	R01.5	1	**786536**
	Dark bronze	R05.4	1	**786537**
	Jet black, matt	R06.2M	1	**786538**
	Traffic white	R07.2	1	**786539**
	Uncoated	Raw	1	**786540**

Espagnolette support set **728853**

Pos.		Qty.	Material no.
The espagnolette support set comprises:			
[4]	Espagnolette support	1	
[55]	Flat-headed screws M5 x 12	2	

[49] Lockable handle → *CTL_1*

SEC flush-encased gearbox set **728947**

Pos.		Qty.
The SEC geared-handle protection set comprises:		
[41]	SEC flush-encased gearbox without MD	1
[42]	SEC connector	2
[43]	SEC drilling protection	1
[44]	SEC rebate-clearance reduction ESP	1
[50]	Cylinder screw M5 x 8	2
[52]	Countersunk tapping-screw ST4.8 x 16	1

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa lockable geared-handle set

Pos.		Colour	PU	Material no.
200 lock. geared-handle	Silver	R01.5	1	**775921**
	Dark bronze	R05.4	1	**775922**
	Jet black	R06.2	1	**775923**
	Traffic white	R07.2	1	**775924**

The Roto Line Alversa geared-handle set comprises:		Qty.
[40]	Alversa 200 lock. geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4
[59]	Countersunk tapping-screws ST4.8x50	4

SEC hardware components

Pos.		PU	Material no.
[11]	SEC strikers V.01	100	**212637**
	SEC strikers V.02	100	**212638**
[14]	SEC insertable cam	100	**447245**
[20]	Run-up block V.01	100	**684282**
	Run-up block V.02	100	**684283**

[65] Retrofit set for lock-in position*

	PU	Material no.
For sliding scissor stay, Parallel Sliding, tilt ventilation: to assist the lock-in function	1	**807166**

Parallel Sliding sliding scissor stay set, tilt ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**808816**
				Right	1	**808827**
	931	– 1280	Yes	Left	1	**808824**
				Right	1	**808828**
	1281	– 1680	Yes	Left	1	**808825**
				Right	1	**808829**

The Parallel Sliding sliding scissor stay set, tilt ventilation comprises:		Qty.
[19]	Parallel Sliding sliding scissor stay	1
[28]	Tiltable top guide block	1

Parallel Sliding bogie set

Pos.	Weight	Damping	DIN	Qty.	Material no.
Bogies	Up to 160 kg	Yes	Left		**799898**
			Right		**799900**

The Parallel Sliding bogie set comprises:			
[22]	Leading bogie	1	
[23]	Trailing bogie	1	
not dep.	Countersunk tapping-screws ST4.8x50	8	

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

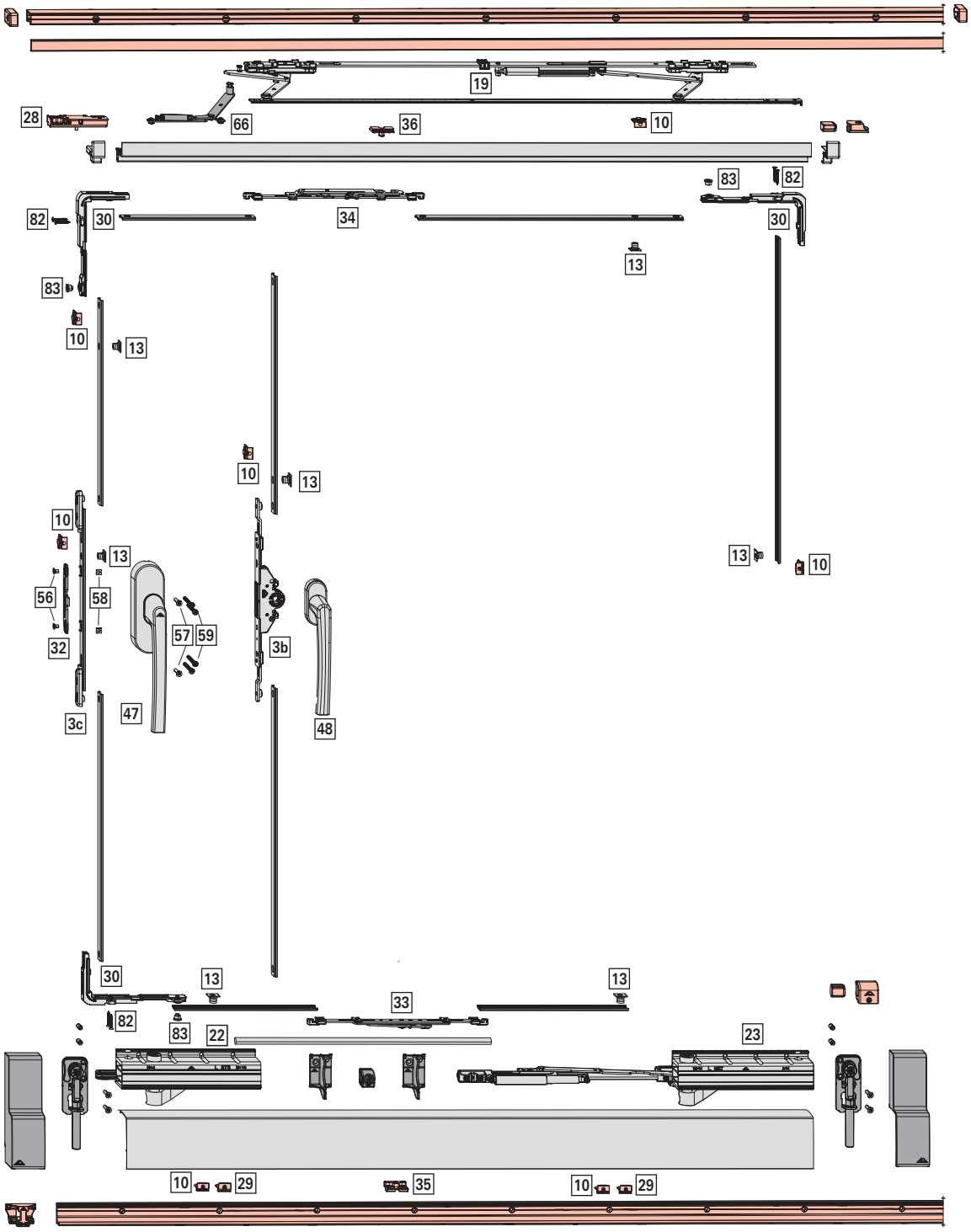
Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

* With dimension M > 44 mm

Optional

Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	



INFO
Size-dependent components can be found in the parts list.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg** .....max. 200 kg

Comfort set

Pos.	SW		DIN	PU	Material no.
	760	– 1400	Left	1	**772315**
			Right	1	**772316**
	1401	– 2000	Left	1	**786062**
			Right	1	**786063**

The comfort set comprises:		Qty.
[34]	Comfort scissor stays	1–2
[13]	Insertable cams	4
[33]	Mishandling device	1
[30]	Reinforced corner drives	3
[82]	Countersunk tapping-screw ST3.9 x 25	12
[83]	Special screws M6 x 10	3

Comfort scissor stay frame component*

Pos.			PU	Material no.
[36]	for comfort scissor stay from comfort set	V.01	2	**772684**
		V.02	2	**786361**

Mishandling device frame component

Pos.			PU	Material no.
[35]	for mishandling device from comfort set	V.01	1	**786328**
		V.02	1	**786329**

Tilt striker set

Pos.		PU	Material no.
Tilt striker set V.01		1	**779421**
Tilt striker set V.02		1	**779422**

The tilt striker set comprises:		Qty.
[29]	Tilt strikers V.01 / V.02	2
[10]	Strikers V.01 / V.02	8
[13]	Insertable cams	4

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

INFO
Only use handles with a length of 200 mm for Patio Alversa | PS Air Com.

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Retrofit set for tilt assistance**

Pos.		DIN	PU	Material no.
[66]	for Parallel Sliding sliding scissor stay, tilt ventilation	Left	1	**808699**
		Right	1	**808732**

Parallel Sliding sliding scissor stay set, tilt ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**808816**
				Right	1	**808827**
	931	– 1280	Yes	Left	1	**808824**
				Right	1	**808828**
	1281	– 1680	Yes	Left	1	**808825**
				Right	1	**808829**
	1681	– 2000	Yes	Left		**808826**
				Right		**808830**

The Parallel Sliding sliding scissor stay set, tilt ventilation comprises:		Qty.
[19]	Parallel Sliding sliding scissor stay	1
[28]	Tiltable top guide block	1

Parallel Sliding bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies					
Bogies	Up to 160 kg	Yes	Left	1	**799898**
			Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Tandem bogies					
Tandem bogies	Up to 200 kg	Yes	Left	1	**799901**
			Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

* 2 comfort scissor stay frame components are required for a SW of 1401–2000
** When S.kg > 140 kg

ECC connecting rod C-groove			
Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

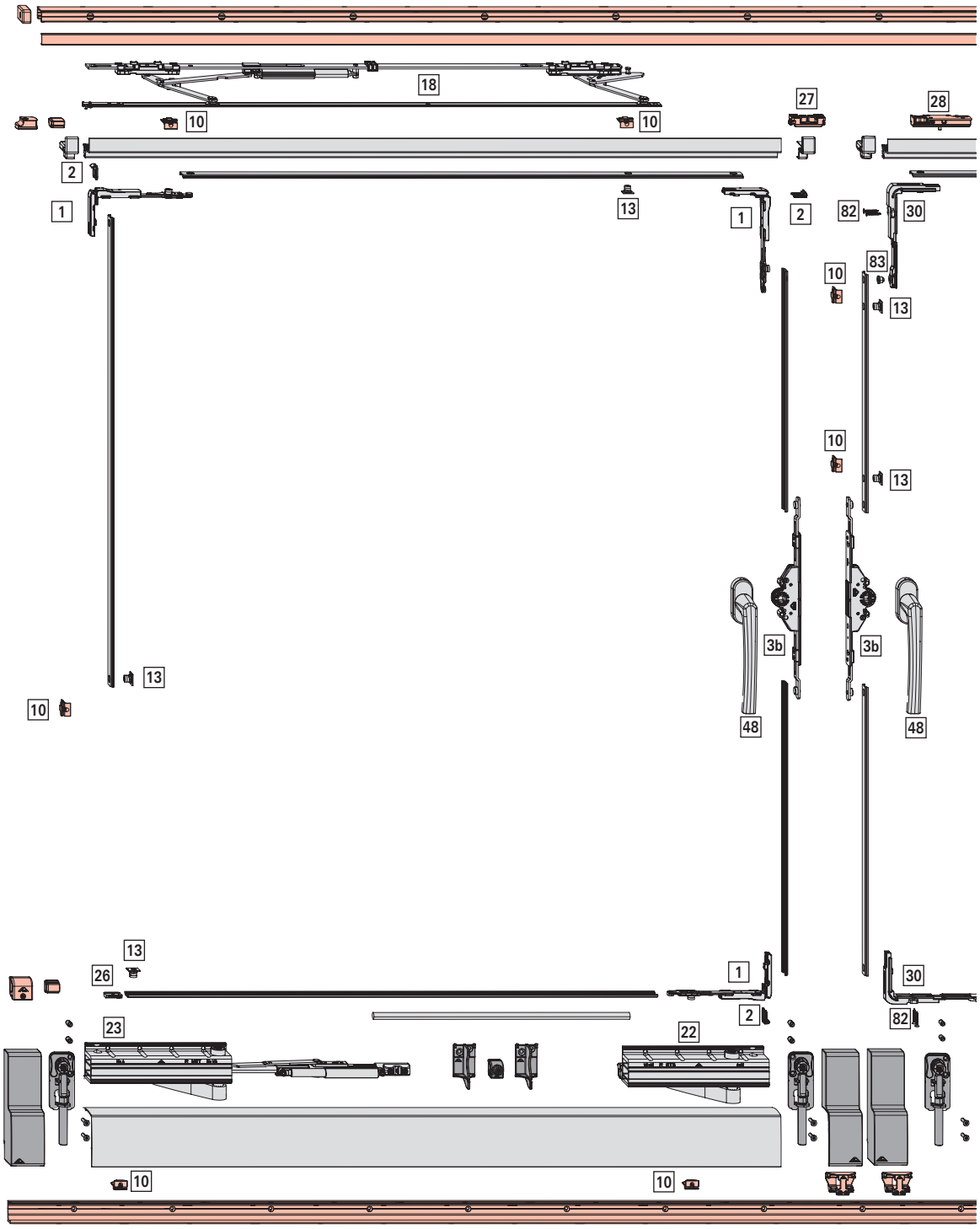
Additional components, size-dependent			
Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**
The striker set comprises:		Qty.	
[10]	Strikers V.01 / V.02	10	
[13]	Insertable cams	10	

PS Air Com – std.

Diagram A

PS Air Com second opening sash – std.

Diagram C



INFO

- Size-dependent components can be found in the parts list.
- Diagram C:
  second opening sash such as PS without night ventilation;
  first opening sash such as diagram A PS Air Com.

Reference set shown: up to 160 kg; standard; SW 1000; SH 1300; without centre post

Application range

Sash width **SW**.....760 – 2000 mm

Sash height **SH**.....930 – 2700 mm

Sash weight **S.kg**.....max. 200 kg

Corner drive set 626523

Pos.		Qty.
The corner drive set comprises:		
[1]	Corner drives	3
[2]	Retaining forks	3
[13]	Insertable cams	1

Tilt striker set

Pos.		PU	Material no.
	Tilt striker set V.01	1	**779421**
	Tilt striker set V.02	1	**779422**
The tilt striker set comprises:		Qty.	
[29]	Tilt strikers V.01 / V.02	2	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Locking set

Pos.		Qty.	Material no.
	Locking set V.01	1	**791720**
	Locking set V.01	1	**791721**
The locking set comprises:		PU	
[10]	Strikers V.01 / V.02	8	
[13]	Insertable cams	4	

Travel restrictor

Pos.		Qty.	Material no.
[26]	Travel restrictor	1	**786295**

Comfort set

Pos.	SW		DIN	PU	Material no.
	760	– 1400	Left	1	**772315**
			Right	1	**772316**
	1401	– 2000	Left	1	**786062**
			Right	1	**786063**
The comfort set comprises:				Qty.	
[34]	Comfort scissor stays			1–2	
[13]	Insertable cams			4	
[33]	Mishandling device			1	
[30]	Reinforced corner drives			3	
[82]	Countersunk tapping-screw ST3.9 x 25			12	
[83]	Special screws M6 x 10			3	

Comfort scissor stay frame component*

Pos.			PU	Material no.
[36]	for comfort scissor stay from comfort set	V.01	2	**772684**
		V.02	2	**786361**

Mishandling device frame component

Pos.			PU	Material no.
[35]	for mishandling device from comfort set	V.01	1	**786328**
		V.02	1	**786329**

Flush-encased gearbox (for Roto Line handles)

Pos.		BS	PU	Material no.
[3b]	Flush-encased gearbox	25	1	**625430**
		30	1	**625431**
		35	1	**625432**
		40	1	**625433**
	Lock. flush-encased gearbox	25	1	**625438**
		30	1	**625439**
		35	1	**625440**
		40	1	**625441**

[48] Handle → *CTL_1*

INFO

Only use handles with a length of 200 mm for Patio Alversa | PS Air Com.

Adjustable centre section

Pos.		PU	Material no.
[3c]	for Roto Line Alversa geared-handle	1	**779637**

Roto Line Alversa geared-handle set

Pos.		Colour	PU	Material no.
200 geared-handle	Silver	R01.5	1	**775916**
	Dark bronze	R05.4	1	**775919**
	Jet black	R06.2	1	**775918**
	Traffic white	R07.2	1	**775917**
	Uncoated	Raw	1	**775920**

The Roto Line Alversa geared-handle set comprises:		Qty.
[47]	Alversa 200 geared-handle	1
[32]	T connector	1
[56]	Countersunk screws M5x8	2
[57]	Countersunk screws M5x25	2
[58]	Square nuts M5	2
[59]	Countersunk tapping-screws ST4.8x50	4

Retrofit set for tilt assistance**

Pos.		DIN	PU	Material no.
[66]	for Parallel Sliding sliding scissor stay, tilt ventilation	Left	1	**808699**
		Right	1	**808732**

Parallel Sliding sliding scissor stay set, tilt ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**808816**
				Right	1	**808827**
	931	– 1280	Yes	Left	1	**808824**
				Right	1	**808828**
	1281	– 1680	Yes	Left	1	**808825**
				Right	1	**808829**
	1681	– 2000	Yes	Left		**808826**
				Right		**808830**

The Parallel Sliding sliding scissor stay set, tilt ventilation comprises:		Qty.
[19]	Parallel Sliding sliding scissor stay	1
[28]	Tiltable top guide block	1

* 2 comfort scissor stay frame components are required for a SW of 1401–2000
** When S.kg > 140 kg

Parallel Sliding sliding scissor stay set, night ventilation

Pos.	SW		Damping	DIN	PU	Material no.
	760	– 930	Yes	Left	1	**772220**
				Right	1	**772225**
	931	– 1280	Yes	Left	1	**772221**
				Right	1	**772226**
	1281	– 1680	Yes	Left	1	**772222**
				Right	1	**772227**
	1681	– 2000	Yes	Left	1	**772223**
				Right	1	**772228**

The Parallel Sliding sliding scissor stay set, night ventilation comprises:		Qty.
[18]	Parallel Sliding sliding scissor stay	1
[27]	Fixed top guide block	1

Parallel Sliding bogie set

Pos.	Weight	Damping	DIN	PU	Material no.
Bogies					
Bogies	Up to 160 kg	Yes	Left	1	**799898**
			Right	1	**799900**

The Parallel Sliding bogie set comprises:		Qty.
[22]	Leading bogie	1
[23]	Trailing bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	8

Tandem bogies					
Tandem bogies	Up to 200 kg	Yes	Left	1	**799901**
			Right	1	**799902**

The Parallel Sliding tandem bogie set comprises:		Qty.
not dep.	Leading tandem bogie	1
not dep.	Trailing tandem bogie	1
not dep.	Countersunk tapping-screws ST4.8x50	16

Track set → *page 88*

Reinforcement part set → *Page 87*

ECC connecting rod C-groove

Pos.		Length	
	Connecting rod	3 m	**735102**
	Connecting rod	6 m	**334665**

Optional

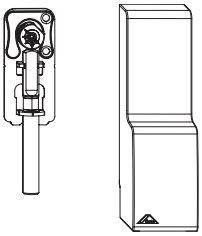
Additional components, size-dependent

Pos.		PU	Material no.
Striker set V.01		1	**786321**
Striker set V.02		1	**786322**

The striker set comprises:		Qty.
[10]	Strikers V.01 / V.02	10
[13]	Insertable cams	10

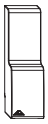
5 Hardware sets

5.1 Reinforcement part sets



Reinforcement parts and cover caps	For sash weights > 100 kg	Parallel Sliding Tilt&Slide	R01.5	Silver	1 Piece	793515
			R04.4	Black brown	1 Piece	797565
			R05.4	Dark bronze	1 Piece	793516
			R06.2	Jet black	1 Piece	793517
			R07.2	Traffic white	1 Piece	793518

Contents

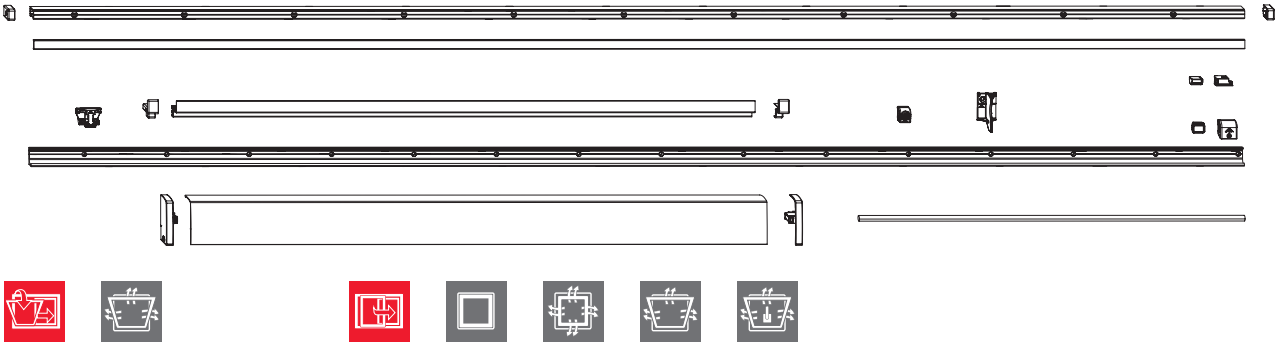
Figure	Quantity	Description
	2	Reinforcement parts
	2	Cover caps
	4	Rivet nuts
Not sh.	4	Screws M5 x 25

INFO

Using reinforcement parts

- **Tilt&Slide:** for sash weights > 100 kg
- **Parallel Sliding:** must always be used

5.2 Track sets



5.2.1 Track set with retaining track 13

					№
R01.5	Silver	670 – 930	1930	1 Piece	767051
		931 – 1080	2230	1 Piece	767052
		1081 – 1280	2630	1 Piece	767053
		1281 – 1480	3030	1 Piece	767054
		1481 – 1680	3430	1 Piece	767075
		1681 – 2000	4130	1 Piece	769841
R04.4	Black brown	670 – 930	1930	1 Piece	797635
		931 – 1080	2230	1 Piece	797636
		1081 – 1280	2630	1 Piece	797637
		1281 – 1480	3030	1 Piece	797638
		1481 – 1680	3430	1 Piece	797639
		1681 – 2000	4130	1 Piece	797640
R05.4	Dark bronze	670 – 930	1930	1 Piece	767076
		931 – 1080	2230	1 Piece	767077
		1081 – 1280	2630	1 Piece	767078
		1281 – 1480	3030	1 Piece	767079
		1481 – 1680	3430	1 Piece	767080
		1681 – 2000	4130	1 Piece	769842
R06.2	Jet black	670 – 930	1930	1 Piece	767081
		931 – 1080	2230	1 Piece	767082
		1081 – 1280	2630	1 Piece	767083
		1281 – 1480	3030	1 Piece	767084
		1481 – 1680	3430	1 Piece	767085
		1681 – 2000	4130	1 Piece	769843
R07.2	Traffic white	670 – 930	1930	1 Piece	767086
		931 – 1080	2230	1 Piece	767087
		1081 – 1280	2630	1 Piece	767088
		1281 – 1480	3030	1 Piece	767089
		1481 – 1680	3430	1 Piece	767090
		1681 – 2000	4130	1 Piece	769844
Roh	Uncoated	670 – 930	1930	1 Piece	767046
		931 – 1080	2230	1 Piece	767047
		1081 – 1280	2630	1 Piece	767048
		1281 – 1480	3030	1 Piece	767049
		1481 – 1680	3430	1 Piece	767050
		1681 – 2000	4130	1 Piece	769840

Contents

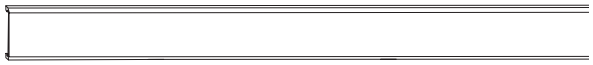
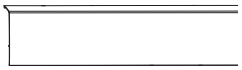
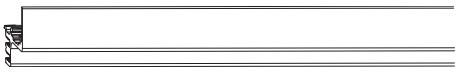
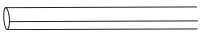
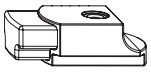
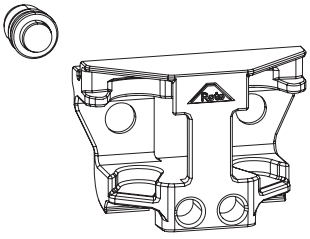
Figure	Quantity	Description
	1	Guide track
	1	Guide track cover profile
	2	End caps for guide track

Figure	Quantity	Description
	1	Roller track
	1	Bogie cover profile
	2	Cover caps for bogie cover profile
	1	Retaining track 13
	2	End caps for retaining track
	1	Connecting rod
	1	Guide block, bottom
	1	Stop part, top
	1	Stop part, bottom
	1	Rubber buffer stop part
	0 [8] 1 [9]	Support block
	1 [10] 2 [11]	Supporting piece
Not sh.	10	Flat-headed self-tapping screws ST3.9 x 9.5 ISR15
Not sh.	40	Countersunk tapping screws ST3.9 x 45 ISR15
Not sh.	4	Countersunk tapping screws ST4.8 x 50 ISR25

5.3 Guide block sets

For diagram D



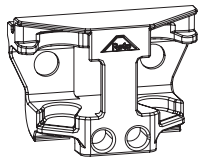
[8] With SW ≤ 1480 mm

[9] With SW > 1480 mm

[10] With SW ≤ 1480 mm

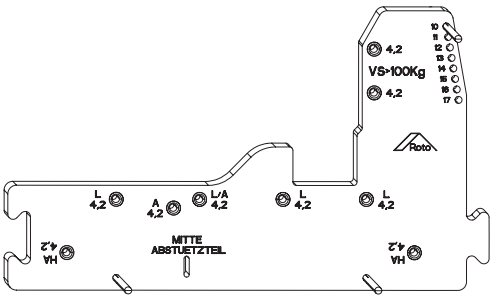
[11] With SW > 1480 mm

Movable bottom guide block and retaining pin	For diagram D	Roto Sil	1 Piece	809477
		Black	1 Piece	809478

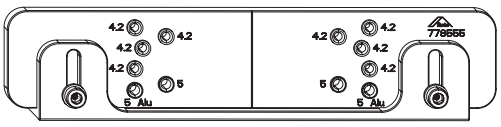
Figure	Quantity	Description
	1	Bottom guide block, movable
	2	Retaining pin

6 Jigs

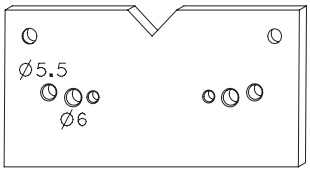
6.1 Drilling jigs



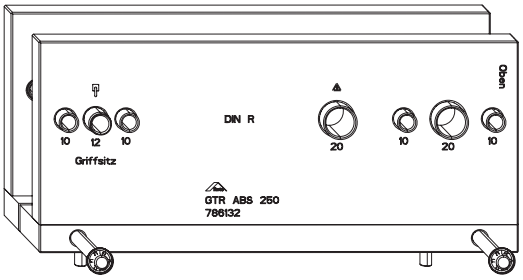
	№
Bogies	778522



	№
Roto Line Alversa geared-handle	778555

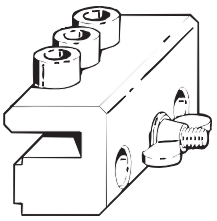


	№
Roto Line AL geared-handle	333473

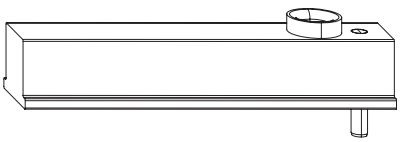


	№
Lockable T&T espagnolette	786132

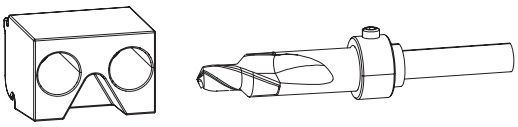
INFO
Use the “Lockable T&T espagnolette” drilling jig for:
Flush-encased gearbox without profile cylinder
Flush-encased gearbox with profile cylinder



	№
Flush-encased gearbox with / without mishandling device	212155

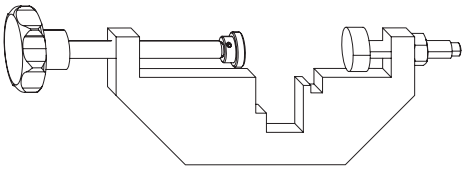


	№
Scissor stay retention	778523

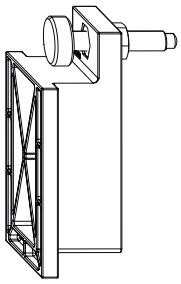


Drilling jig with step drill	For diagram D	794249

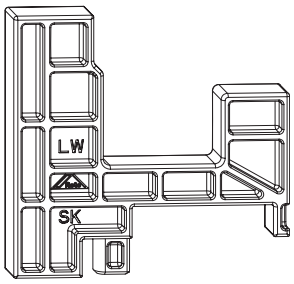
6.2 Installation jigs



Roller track and guide track	778520

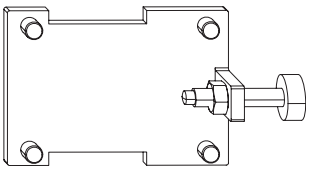


for installation



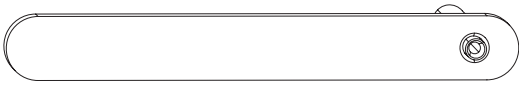
for adjustment

Top guide block for installation	806975
Top guide block for adjustment	782190

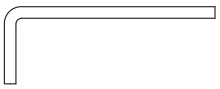


	№
Bottom guide block	778524

6.3 Tools



	№
Drilling aid for roller track and guide track	778521



	№
Hexalobular socket screwdriver ISR10	625172
Hexalobular socket screwdriver ISR15	625173
Hexalobular socket screwdriver ISR25	563971

7 Brief instructions

7.1 Roto Patio Alversa | Overall

Summary of IMO 408

	Installation sequence	Note	Page reference	KS	PS without / with SPL	PS Air	PS Air Com
Sash	Prepare the espagnolette		→ *from page 103*	■	■	■	■
	Preparing the connecting rods	Length of the connecting rods according to the installation drawing.	→ *from page 113*	■	■	■	■
	Installing the retaining track	Length: sash width - 16 mm Crop DIN L left. Crop DIN R right. Secure with screws so that it is centred.	→ *from page 119*	■	■	■	■
	Installing the connecting rod on the hinge side	Insert the cam. Note the alignment of the cam.	→ *from page 126* → *from page 118*	■	■	■	■
	Installing horizontal top connecting rods and corner drives	Insert the cam. Note the alignment of the cam.	→ *from page 128* → *from page 118*	■	■	■	■
	Installing the horizontal top night ventilation tracks	Only for PS with night ventilation (PS with SPL). Note the installation sequence of the night ventilation tracks.	→ *from page 128*	–	■	–	–
	Installing the horizontal top comfort scissor stays	Install one comfort scissor stay up to SW < 1401 mm. Always install two comfort scissor stays from SW ≥ 1401 mm. Note the installation direction of the comfort scissor stay.	→ *from page 128*	–	–	–	■
	Installing connecting rods, corner drives and espagnolettes on the locking side montieren	Insert the cam. Note the alignment of the cam. Insert the espagnolette component.	→ *from page 131* → *from page 118*	■	■	■	■
	Installing horizontal bottom connecting rods and corner drives	Insert the cam. Note the alignment of the cam.	→ *from page 138* → *from page 118*	■	■	■	■
	Installing horizontal bottom bullet-catch tracks	Note the alignment of the bullet-catch track.	→ *from page 138*	■	–	–	–
	Installing the horizontal bottom night ventilation tracks	Only for PS with night ventilation (PS with SPL). Note the installation sequence of the night ventilation tracks.	→ *from page 128*	–	■	–	–
	Installing the horizontal bottom mishandling device	Note the installation direction of the mishandling device. Only install the mishandling device together with the comfort scissor stay.	→ *from page 138*	–	–	–	■
	Install the travel restrictor	Only for PS without night ventilation.	→ *from page 141*	–	■	–	–
	Install the handle		→ *from page 142*	■	■	■	■
	Install the bogie	KS without damping. PS with damping.	→ *from page 147*	■	■	■	■
	Install the reinforcement part	KS > 100 kg	→ *from page 154*	■	■	■	■
	Install the supporting piece	Install one supporting piece up to SW ≤ 1480 mm. Always install two supporting pieces from SW > 1480 mm.	→ *from page 156*	■	■	■	■
	Install the connecting rod with support block	Measure the length of the connecting rod using the “VS” marking on the bogies. Only for PS: VS - 315 mm Support block from SW > 1480 mm.	→ *from page 157*	■	■	■	■

	Installation sequence	Note	Page reference	KS	PS without / with SPL	PS Air	PS Air Com
Frame	Install strikers	Position the strikers in accordance with the installation drawings.	→ *from page 161*	■	■	■	■
	Install the guide plates	Position the guide plates in accordance with the installation drawings.	→ *from page 161*	■	–	–	–
	Installing the night ventilation strikers	Only for PS with night ventilation. Position the night ventilation strikers in accordance with the installation drawings.	→ *from page 161*	–	■	–	–
	Install the tilt strikers	Position the tilt strikers in accordance with the installation drawings. Do not mix up strikers and tilt strikers. Tilt strikers are marked with a red glue dot.	→ *from page 162*	–	–	■	■
	Installing the comfort scissor stay frame components	Position the frame components in accordance with the installation drawings. SW < 1401 mm: install one comfort scissor stay frame component. SW ≥ 1401 mm: install two comfort scissor stay frame components.	→ *from page 161*	–	–	–	■
	Install the mishandling device frame component	Position the frame component in accordance with the installation drawings.	→ *from page 161*	–	–	–	■
	Install the guide track	Length: FIW + (2 x coverage) - 8 mm Secure with screws so that it is centred.	→ *from page 163*	■	■	■	■
	Prepare the sliding scissor stay	PS Air: Mandatory from dimension M 44 mm retrofit set for the lock-in position. PS Air Com: Mandatory from S.kg >140 kg retrofit set for tilt assistance.	→ *from page 167*	–	–	■	■
	Preassemble the sliding scissor stay	KS without damping. PS with damping and fitted top guide block. Installation of top guide block (use jig). The scissor stay retention must be located on the hinge side.	→ *from page 169*	■	■	■	■
	Install the roller track	Length: FIW + (2 x coverage) Secure with screws so that it is centred.	→ *from page 172*	■	■	■	■
	Preassemble the bottom guide block		→ *from page 175*	■	■	■	■

	Installation sequence	Note	Page reference	KS	PS without / with SPL	PS Air	PS Air Com
Joining the sash and frame	Place the sash on the roller track	Move the handle to the sliding position.	→ *from page 177*	■	■	■	■
	Install the sliding scissor stay	 Correctly lock the safety pin into the drill hole on the retaining track.	→ *from page 179*	■	■	■	■
	Installing end caps for the retaining track	Check the end caps to ensure that they lie flush with the sash.	→ *from page 181*	■	■	■	■
	Install the stop parts		→ *from page 186*	■	■	■	■
	Install the covers	Without reinforcement part: mark and crop the cover profile at the outer edges of the bogie profiles. With reinforcement part: crop the cover profile according to the markings “A” on the bogies.	→ *from page 187*	■	■	■	■
Final acceptance	Adjust		→ *from page 206*	■	■	■	■
	Screw down the bottom guide block		→ *from page 175*	■	■	■	■
	Lubricate the hardware		→ *from page 217*	■	■	■	■

8 Installation

8.1 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 construction 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 window and balcony door 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 window 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 windows have been installed.

Assembling hardware

Burglar inhibiting windows and balcony doors need hardware which meets special requirements.

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

The resistance of windows and balcony doors to wind loads when they are closed and locked depends on the individual design of the windows and balcony doors. The hardware system is capable of handling wind loads specified by legislation and standards (for example in accordance with EN 12210 – in particular test pressure P3).

Coordinate suitable hardware combinations and installation procedures in windows and balcony doors 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 window sashes and balcony door sashes, etc.) are binding.

Lubricating the hardware

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.

Ease of movement is improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated after installation in accordance with the specifications in the "Maintenance" chapter.

Recommended lubricants

- Roto NX / NT grease

For recommended lubrication points, see the "Maintenance" chapter → *12.3 "Care" from page 217*.

8.2 Screw connections

DANGER

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

Installing and screwing hardware components into place improperly may lead to hazardous situations and cause serious accidents or even death.

- During installation and screwdriving work in particular, observe the specifications provided by the profile manufacturer.
- Use the recommended screws.

CAUTION

Over-tightened screws may cause property damage.

Over-tightened screws lose their hold and no longer provide the necessary strength.

- Note the torques.
- Do not over-tighten screws.

CAUTION

Protruding screw heads may cause property damage.

Protruding screw heads can damage adjoining materials.

- Tighten screw heads until they are flush with the surface.

INFO

The length of the fixing screws must be selected according to the profiles used.

Fasten hardware components with the screws supplied. Observe the screwdriving specifications (→ *from page 102*) while doing so. Otherwise, select spare screws with an adapted length. Use fixing screws with additional sealing in more challenging climatic conditions.

The manufacturer must ensure that the hardware components are adequately secured and if necessary contact the screw manufacturer. Do not use any acid cross-linked sealing compounds that could lead to corrosion of the hardware components.

8.2.1 Screw connections for aluminium profiles

WARNING

Incorrect screw connections may lead to serious injuries.

The hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.

- ▶ Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.

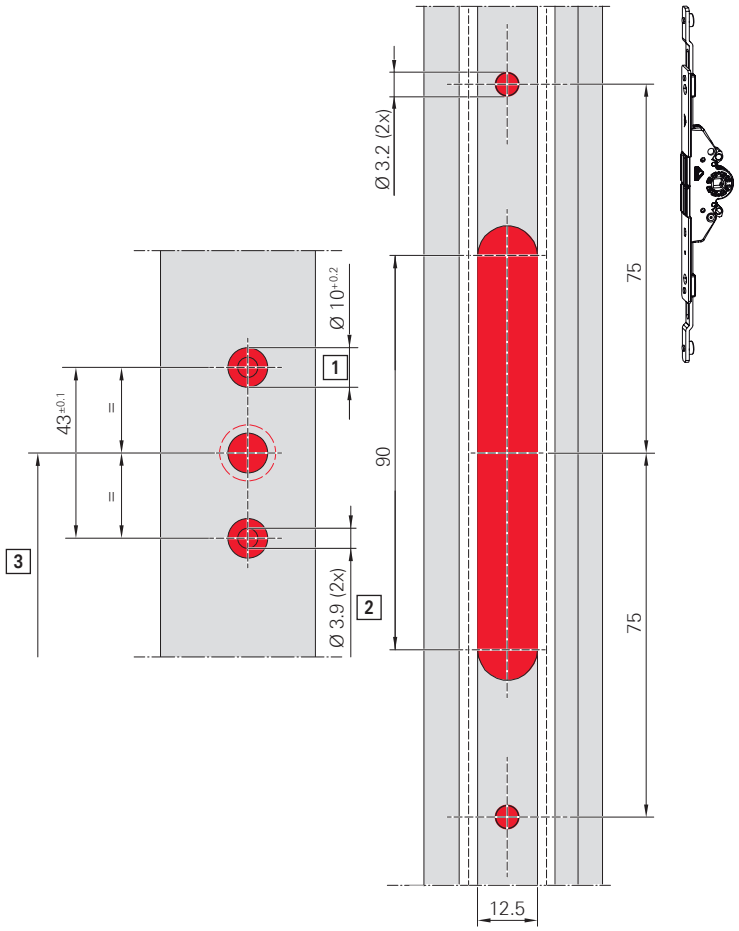
Components	Quantity	Size	d_h	Diameter to be drilled	Drive
Supporting piece	2	ST4.8 x 50	7.0 – 9.5	4.2	ISR 25
Reinforced corner drive	2	ST3.9 x 25	7,5	3.0	ISR 15
	1	M6 x 10 special screw	13	–	Wrench 5 mm
Guide track	...	ST3.9 x 45	7,0	3.0	ISR 15
Retaining track	...	ST3.9 x 9.5	7,0	4.2	ISR 15
Comfort scissor stay	2	ST3.9 x 25	7,5	3.0	ISR 15
Bogie	4	ST4.8 x 50	7.0 – 9.5	4.2	ISR 25
Roller track	...	ST3.9 x 45	7,0	3.0	ISR 15
Roto Line AL geared-handle	2	M5 x 12 ISO 7045	8,5	5,5	ISR 25
Roto Line Alversa geared-handle	4	ST4.8 x 50	7.0 – 9.5	4.2	ISR 25
	2	M5 x 25 + Square nuts	7.0 – 9.5	5,0	ISR 25
Roto Line handle	2	M5 x ...	–	10.1 / 12	Cross-headed screw
Roto Line handle for internal and external use	4	M5 x ...	–	10.1 / 12	Cross-headed screw
Mishandling device	2	ST3.9 x 25	7,5	3.0	ISR 15
SEC flush-encased gearbox without mishandling device	2	M5 x 6	–	–	ISR 25
SEC rebate-clearance reduction CD / ESP	1	ST4.8 x 16	–	4.2	ISR 25
SEC espagnolette protection	2	M5 x 10	–	–	ISR 25
Tandem bogie	8	ST4.8 x 50	7.0 – 9.5	4.2	ISR 25
T connector	2	M5 x 8	7.0 – 9.5	–	ISR 25
Reinforcement part	2	M5 x 25 + Rivet nuts	7.0 – 9.5	7.1 (for rivet nut)	ISR 25

INFO

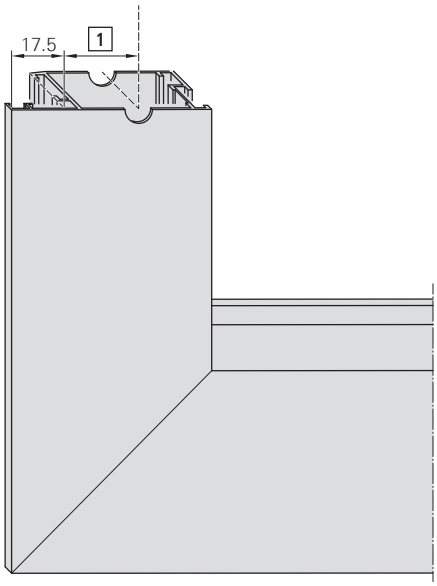
Without examining the corner connectors used, Roto is unable to make any statements about the suitable fastening options.

8.3 Drilling and routing dimensions

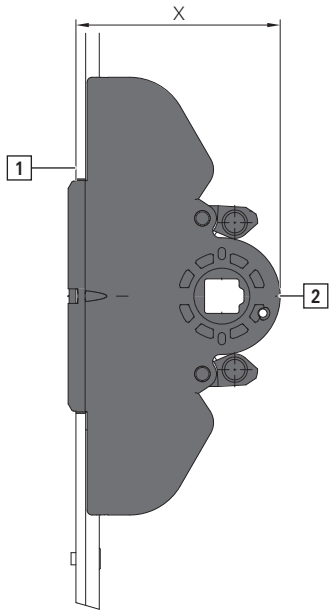
8.3.1 Flush-encased gearbox without profile cylinder



Drill holes for the handle's sprocket and lugs with SH ≥ 930
[1] Ø 10 + 0.2
only through the first profile wall
[2] Ø 3.9
only through the second profile wall or additional profile walls
[3] Handle height HH ≥ 260 mm

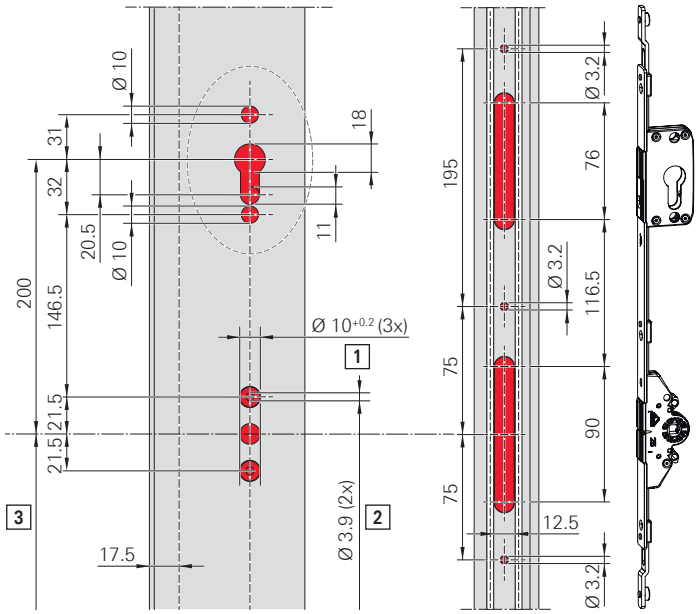


[1] Backset with 6 mm overlap coverage
Top edge of espagnolette faceplate

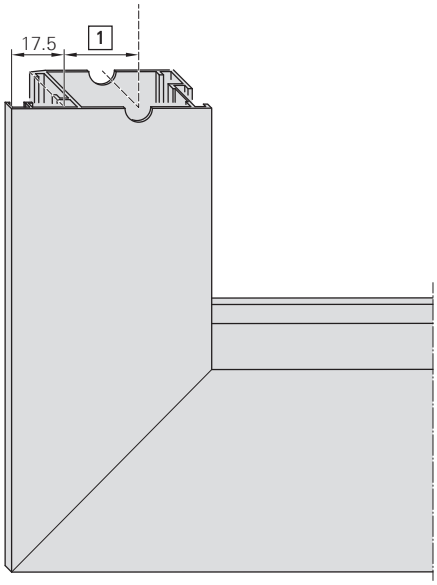


Gearbox routing depth
[1] Top edge of floating mullion
[2] Bottom edge of espagnolette
X = min. routing depth

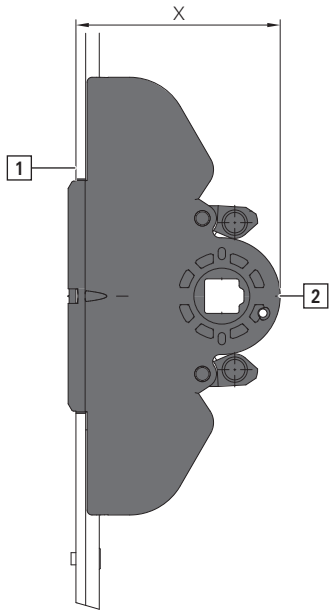
8.3.2 Flush-encased gearbox with profile cylinder



Drill holes for the handle's sprocket and lugs
[1] Ø 10 $^{+0.2}$
only through the first profile wall
[2] Ø 3.9
only through the second profile wall or additional profile walls
[3] Handle height HH = SH/2 (HH min. 600 mm)

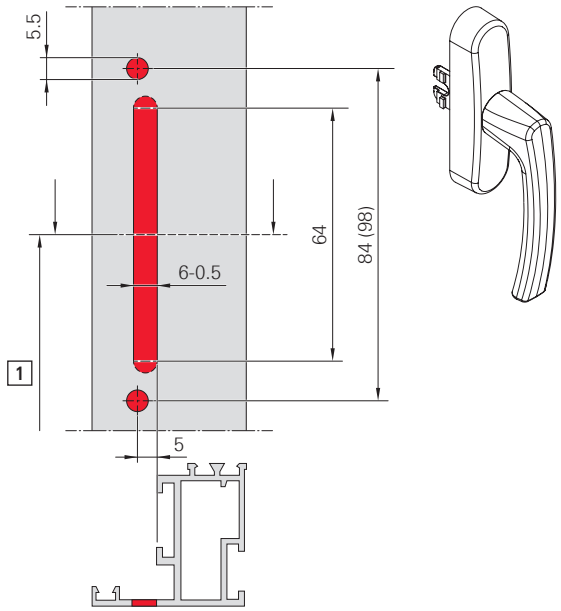


[1] Backset with 6 mm overlap coverage
Top edge of espagnolette faceplate



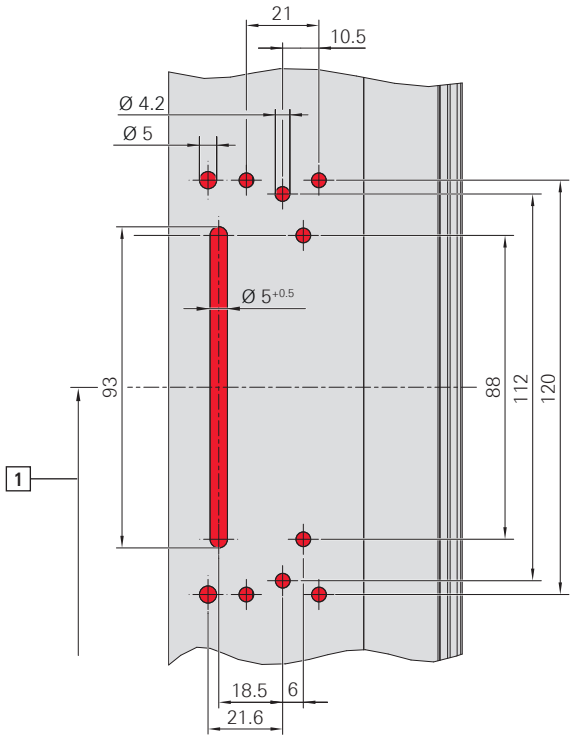
Gearbox routing depth
[1] Top edge of floating mullion
[2] Bottom edge of espagnolette
X = min. routing depth

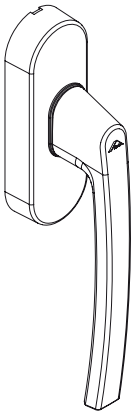
8.3.3 Roto Line AL geared-handle



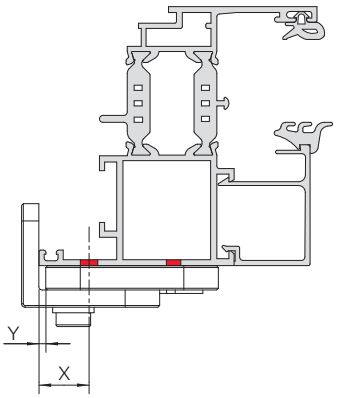
Drill holes for the handle's sprocket and lugs with SH ≥ 930
[1] Handle height HH ≥ 260 mm

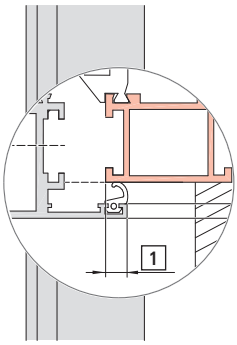
8.3.4 Roto Line Alversa geared-handle





Geared-handle drilling and routing dimensions
[1] Handle height

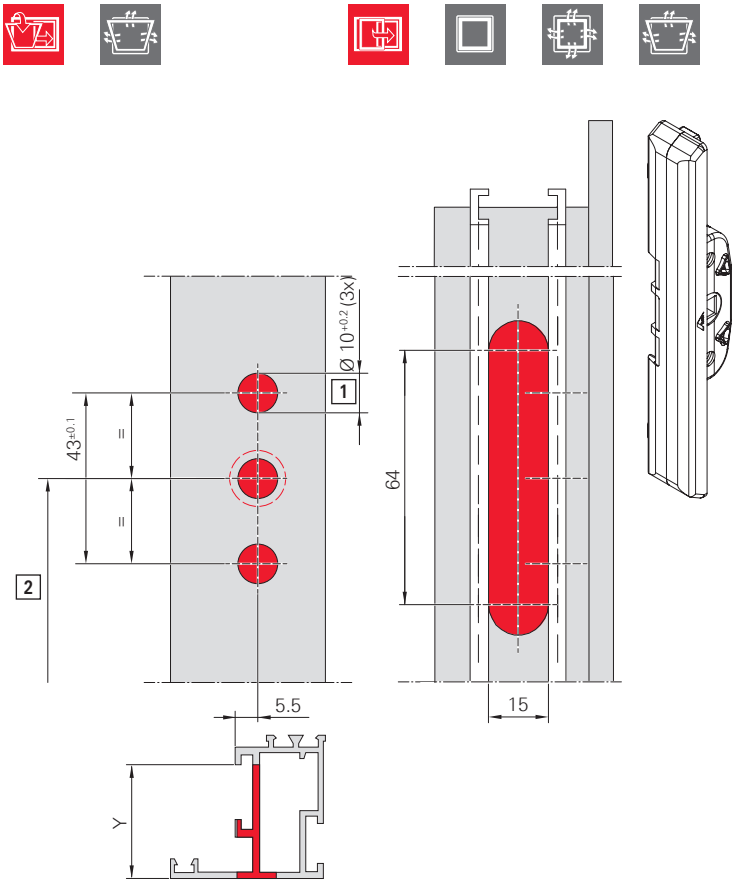




X= slot position
Y= reference dimension for drilling jig
[1] Coverage

Coverage	X	Y
6	14.5	2
5	13.5	1
4	12.5	0

8.3.5 Flush-encased gearbox without mishandling device



Drill holes for the handle's sprocket and lugs
with SH ≥ 930
[1] Ø 10 + 0.2
only through the first profile wall
[2] Handle height HH ≥ 260 mm
Y = drilling depth

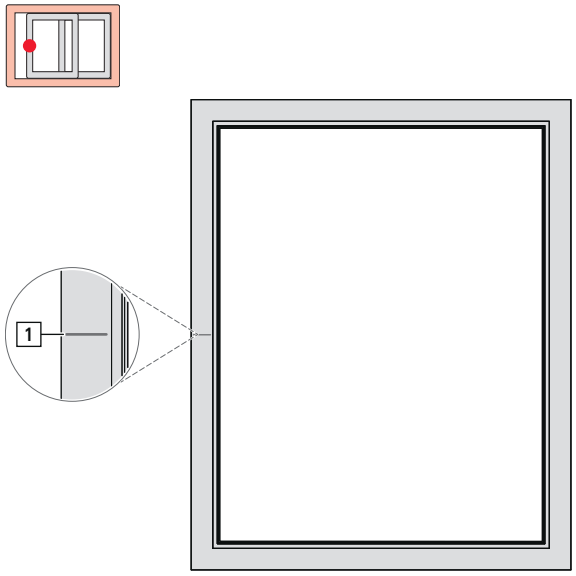
8.4 Sash

8.4.1 Preparing the sash for the flush-encased gearbox

8.4.1.1 Handle drillings

Creating the drillings for the handle

1. Mark the handle-height position on the inside of the sash [1].



2. Create the drillings.
   Note any different drilling dimensions. → *8.3 "Drilling and routing dimensions" from page 103*

3. Deburr the drillings.

8.4.1.2 Gearbox cutout

Routing the gearbox cutout

1. Route the espagnolette cutout.
   Observe the routing dimensions. → *8.3 "Drilling and routing dimensions" from page 103*

2. Deburr the espagnolette cutout.

8.4.1.3 Gearbox cutout with lock casing

Routing the gearbox cutout with lock casing

1. Route the espagnolette cutout.
   Observe the routing dimensions. → *8.3 "Drilling and routing dimensions" from page 103*

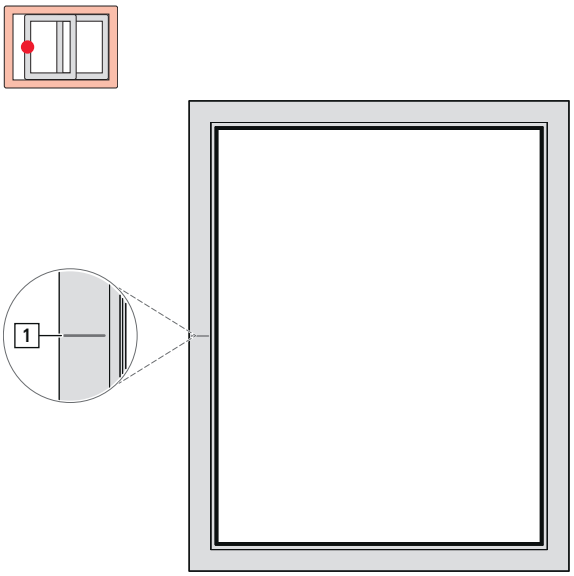
2. Deburr the espagnolette cutout.

8.4.2 Preparing the sash for the geared-handle

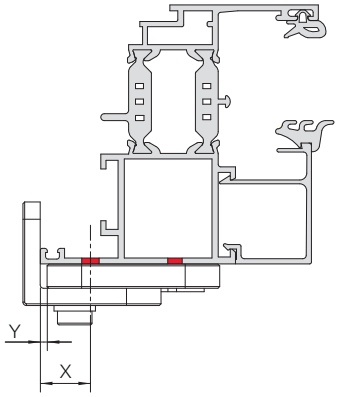
8.4.2.1 Handle drill holes

Drilling the holes for the handle

1. Mark the handle-height position on the inside of the sash [1].



2. Adjust the drilling jig depending on the overlap width.

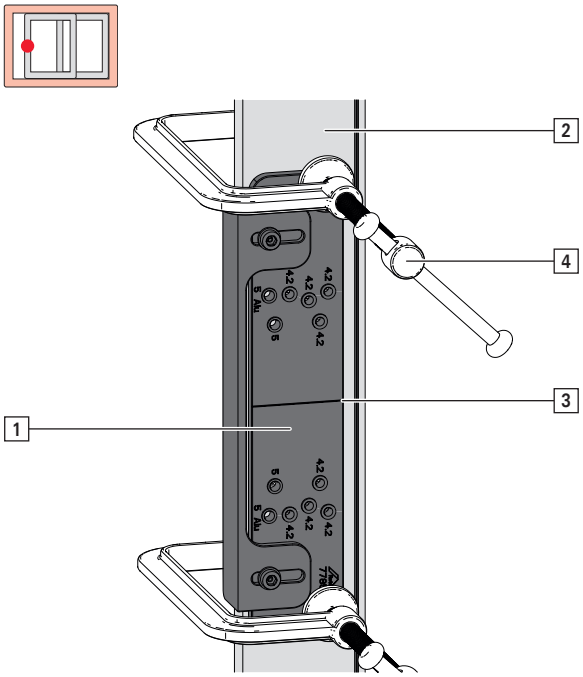


X= slot position
Y= reference dimension for drilling jig

Coverage	X	Y
6	14.5	2
5	13.5	1
4	12.5	0

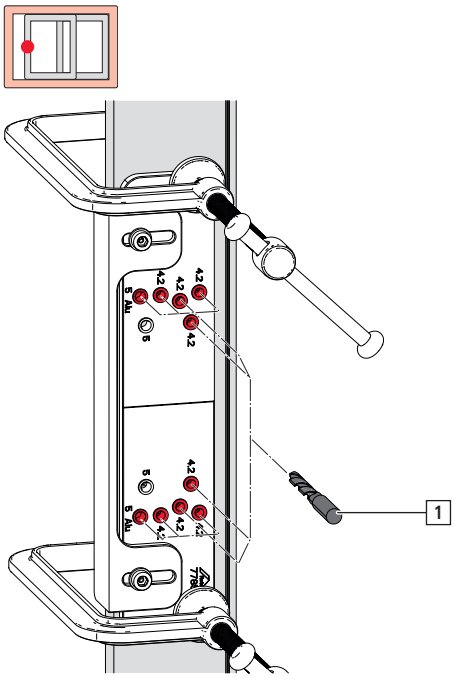
3. Position the drilling jig:

a. Place the drilling jig [1] on the sash [2].
b. Align the drilling jig on the marking [3].
c. Fix the drilling jig in place using a screw clamp [4].



4. Drill the holes [1].

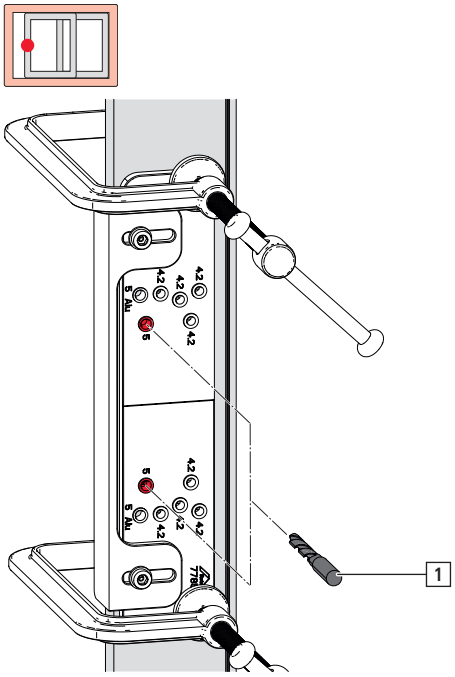
Observe the drilling dimensions. → *8.3.4 "Roto Line Alversa geared-handle" from page 107*



8.4.2.2 Longitudinal groove for the geared-handle

Routing the longitudinal groove for the geared-handle

1. Drill the holes [1].



2. Route the longitudinal groove.
   Observe the routing dimensions. → *8.3.3 "Roto Line AL geared-handle" from page 106*

3. Deburr the longitudinal groove.

8.4.3 Preparing the connecting rods

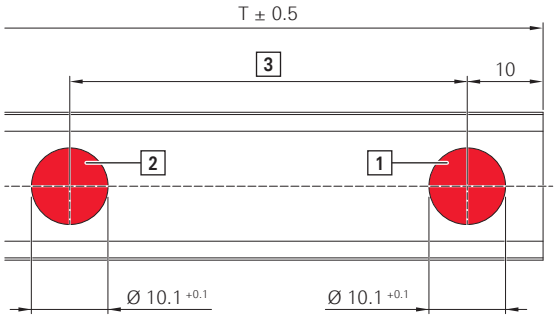
INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

Cropping

INFO
All connecting rod dimensions refer to an overlap width of 22 mm.
If the overlap width differs from this, adapt the connecting rod dimensions accordingly.
All connecting rod dimensions T ±0.5 mm.

1. Length of the connecting rods according to the installation drawing. → *from page 190*
2. Mark the length on the connecting rods.
3. Crop the connecting rods.

Drilling



Position	Description
[1]	Drill hole for coupling point
[2]	Drill hole for insertable cam
[3]	Position dimension for insertable cam

1. Position of the coupling points and insertable cams in the connecting rods in accordance with the installation drawing. → *from page 190*
2. Drill holes.

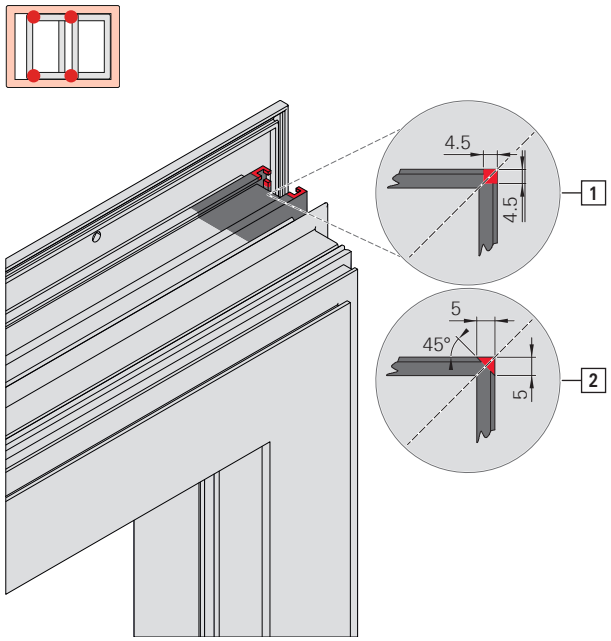
8.4.4 Opening the sash corners

Routing the sash corners

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

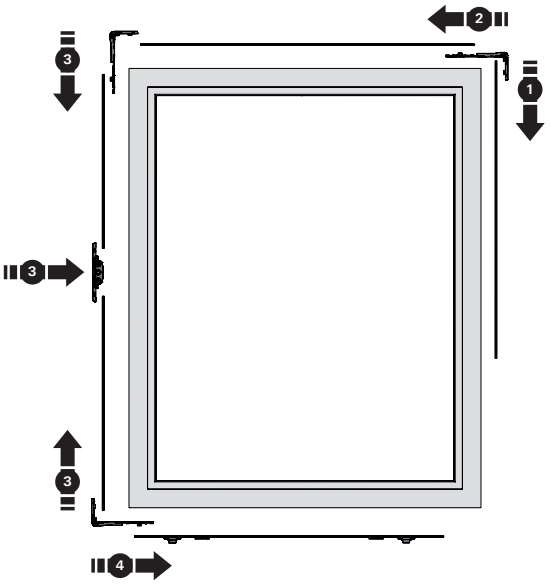
1. Open the connecting-rod groove at all sash corners.
   Comply with the dimensions from the drawing.

Position	Designation
[1]	Connecting-rod groove opening
[2]	Alternative connecting-rod groove opening



2. Deburr the edges.

8.4.5 Installation sequence



[1] Connecting-rod on the hinge side
[2] Horizontal top connecting-rods and components
[3] Connecting-rods and espagnolette on the locking side
[4] Horizontal bottom connecting-rod and components

Observing the installation sequence

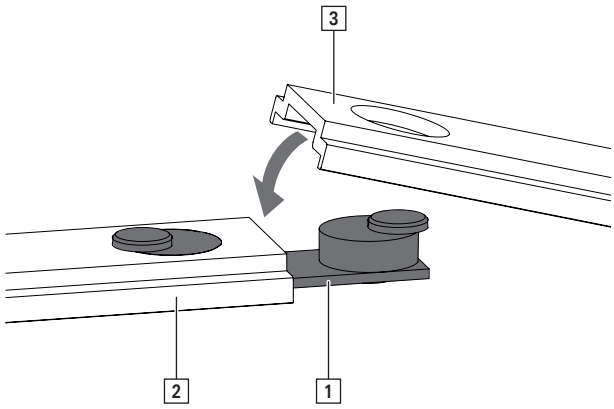
1. Open the sash corners. → *from page 114*
2. Crop and drill into the connecting-rods. → *from page 113*
3. Install the insertable cam. → *from page 118*
4. Install the connecting-rod on the hinge side. → *from page 126*
5. Install the horizontal top connecting-rods and components. → *from page 128*
6. Install the connecting-rods and espagnolette on the locking side. → *from page 131*
7. Install the horizontal bottom connecting-rod and components. → *from page 138*
8. Install the handle. → *from page 142*

8.4.6 Connecting the coupling points

INFO
Prepared connecting-rods always have coupling points.

Joining the connecting-rods

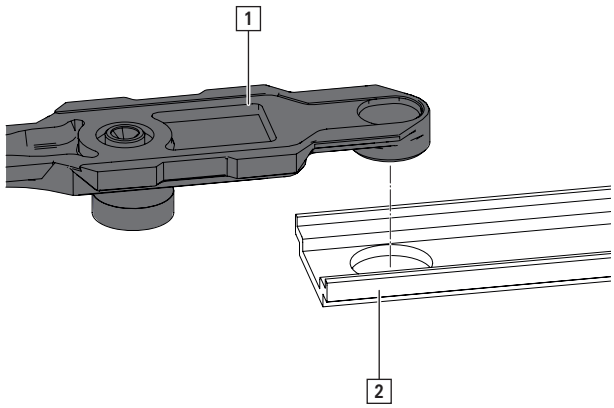
1. Use the SEC coupler component [1] at the coupling point on a connecting-rod [2].



2. Connect the unit to another connecting-rod [3] at the coupling point.

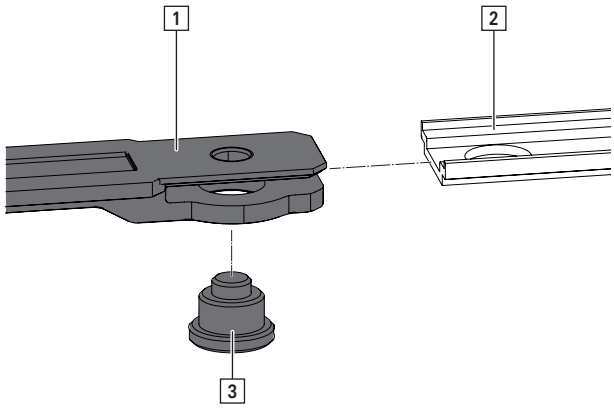
Connecting the corner drive to the connecting-rod

1. Connect the corner drive [1] at the coupling point on the connecting-rod [2].



Connecting the reinforced corner drive to the connecting-rod

1. Slide the reinforced corner drive [1] onto the connecting-rod [2].

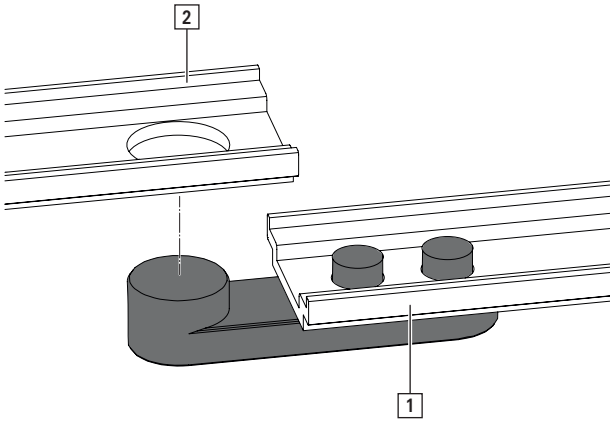


2. Screw down the unit with a screw [3].

Connecting the bullet catch track / night ventilation track to the connecting-rod

INFO
This is illustrated using a bullet catch track as an example.

1. Connect the bullet catch track [1] at the coupling point on the connecting-rod [2].



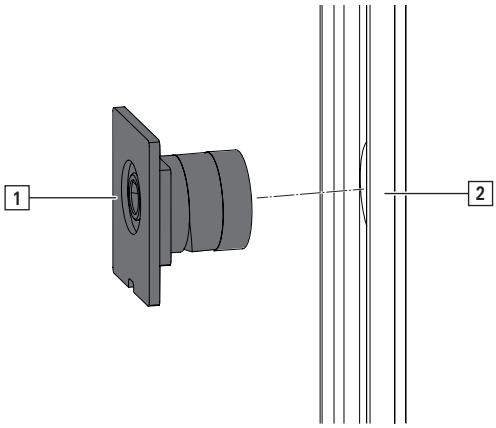
8.4.7 Insertable cam

Installing the insertable cam

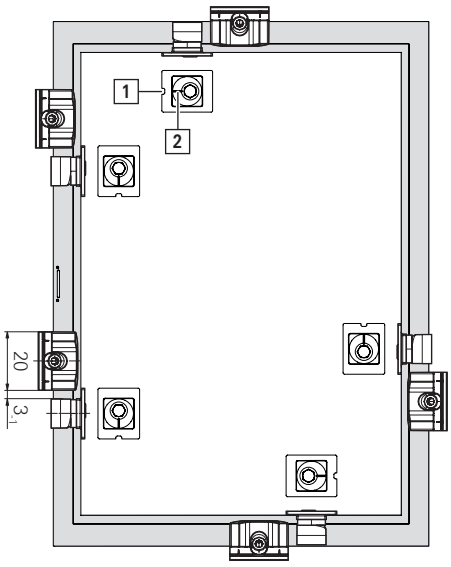
INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

1. Number and position of insertable cams in accordance with the installation drawings. → *from page 190*

2. Insert the insertable cams [1] into the connecting rod [2].



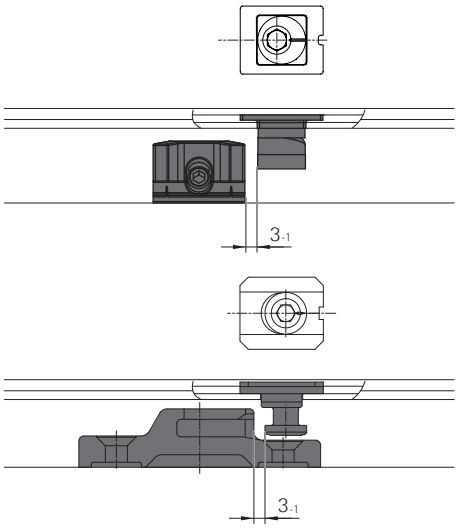
a. The recess [1] on the insertable cam points away from the striker.



b. Adjust the marking [2] for adjusting the insertable cam horizontally or vertically in relation to direction of travel.

Note the type of connecting rod (standard / with extended connecting rod groove). → *10.4 "Adjusting the insertable cams" from page 208*

3. Determine the striker position.
   The distance between the striker and the insertable cam is 3 mm.
   The distance between the SEC striker and the SEC cam is 3 mm.



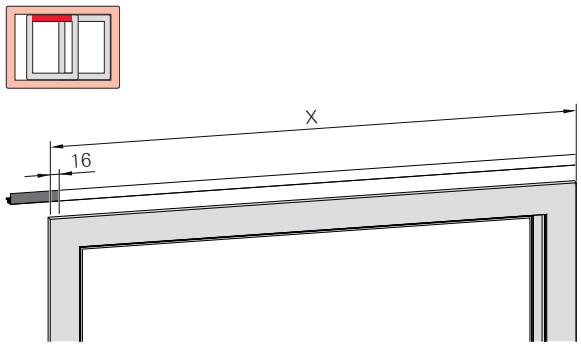
8.4.8 Stay-connecting profile

8.4.8.1 Cropping the stay-connecting profile

6 mm holes for securing the scissors-slider are provided at both ends of the stay-connecting profile at the factory.

Alternatively, drill the hole. → *8.4.8.4 "Retaining track (storage length)" from page 121*

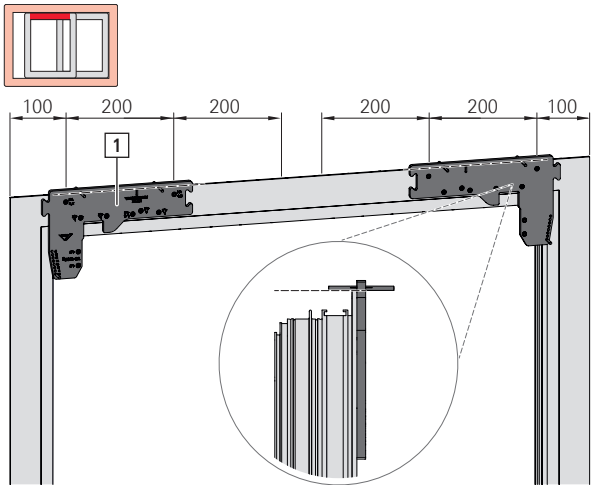
1. Crop the stay-connecting profile to the width of the sash, minus 16 mm [1].
   Crop the stay-connecting profile for sash DIN L on the left.
   Crop the stay-connecting profile for sash DIN R on the right.



8.4.8.2 Drilling holes in the retaining track

Positioning the drilling jig on the sash

1. Place the drilling jig stop [1] on the top edge of the window sash profile.



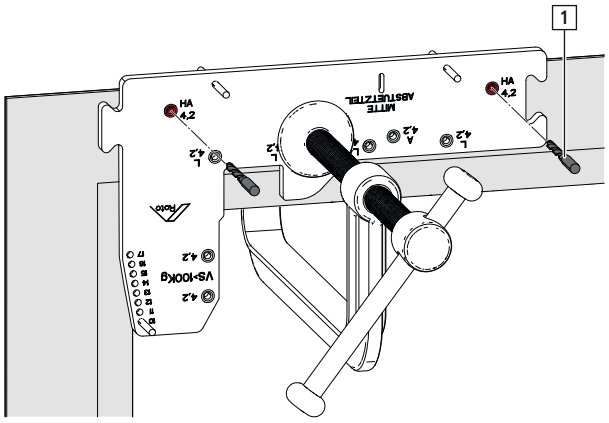
2. Fix the drilling jig(s) in place using a screw clamp.

INFO
Drill holes at a distance of 200 mm on the inside of the sash.

Drilling the holes

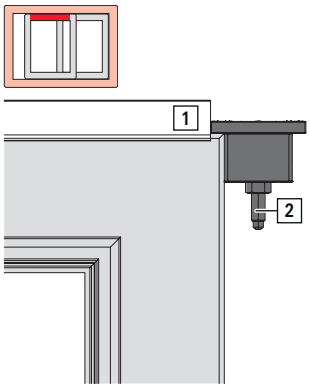
Drill: Ø 4.2 mm

1. Drill into the window sash using the drill [1].

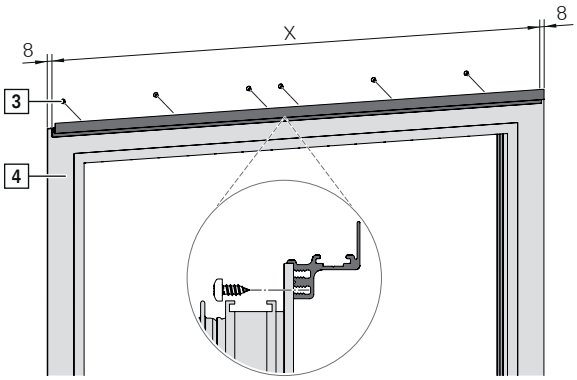


8.4.8.3 Installing the retaining track

1. Place the retaining track [1] on the top of the outer edge of the sash. (Jig [2] "Top guide block / installation" as installation aid)



2. Secure the retaining track in the centre of the sash [4] using screws [3].



8.4.8.4 Retaining track (storage length)

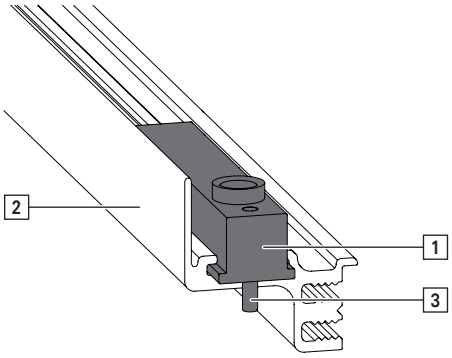
Drilling the hole in the retaining track (storage length)

1. Crop → *8.4.8.1 "Cropping the stay-connecting profile" from page 119* and install → *8.4.8.3*

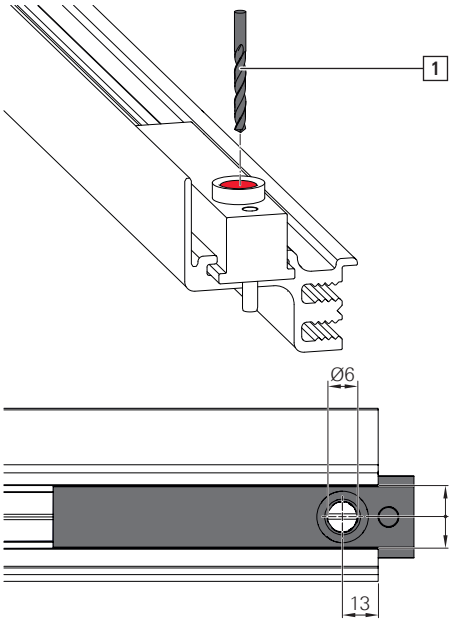
*"Installing the retaining track" from page 121*the retaining track.

2. Insert the drilling jig [1] into the retaining track [2] on the hinge side.

3. Position the drilling jig stop [3] on the retaining track.



4. Drill into the retaining track using a Ø 6 mm drill [1].



8.4.9 Corner drives

8.4.9.1

Installing the corner drives

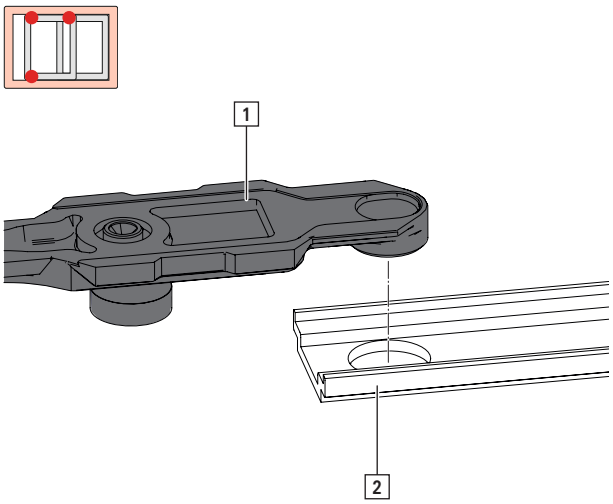
PRECONDITION

- Drill holes created in the handle → *from page 103*
- Cutout for the espagnolette routed → *from page 103*
- Sash corners opened → *from page 114*
- Connecting-rods prepared → *from page 113*
- Insertable cams installed → *from page 118*

INFO

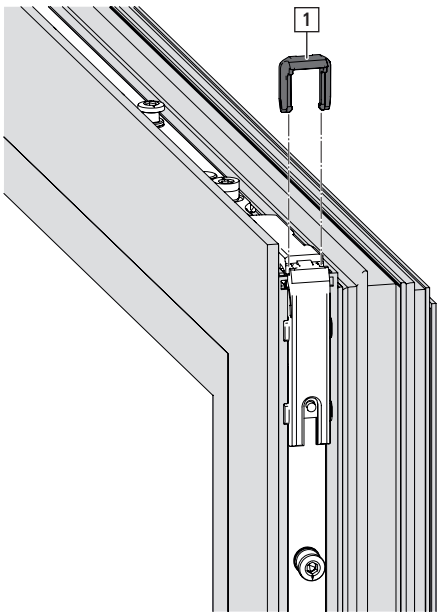
Comply with the installation sequence for the aluminium sash. → *from page 115*

1. Connect the corner drive [1] to the connecting-rod [2] and additional components at the coupling point.



2. Insert everything jointly into the connecting-rod groove.

3. Fix the corner drive to the sash using the retaining fork [1].



8.4.9.2

Installing reinforced corner drives

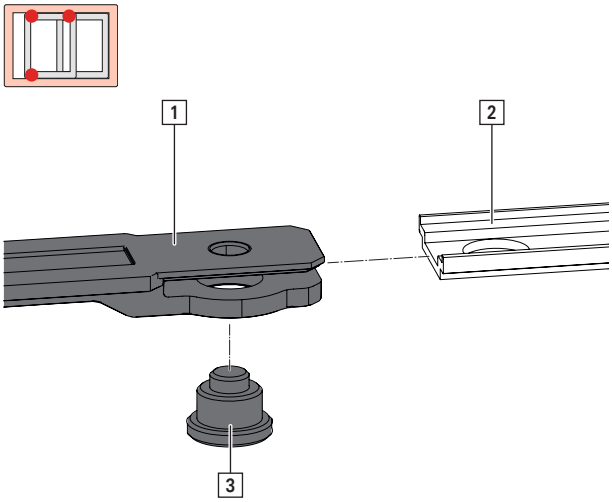
PRECONDITION

- Drill holes created in the handle → *from page 103*
- Cutout for the espagnolette routed → *from page 103*
- Sash corners opened → *from page 114*
- Connecting-rods prepared → *from page 113*
- Insertable cams installed → *from page 118*

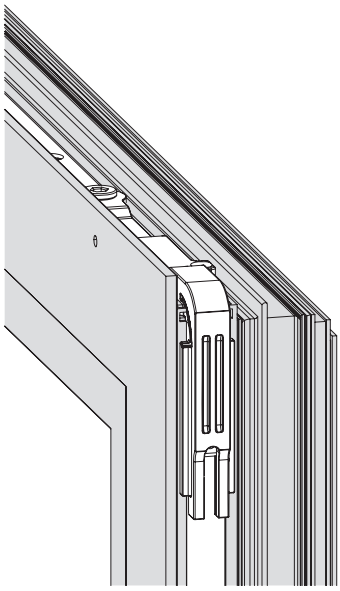
INFO

Comply with the installation sequence for the aluminium sash. → *from page 115*

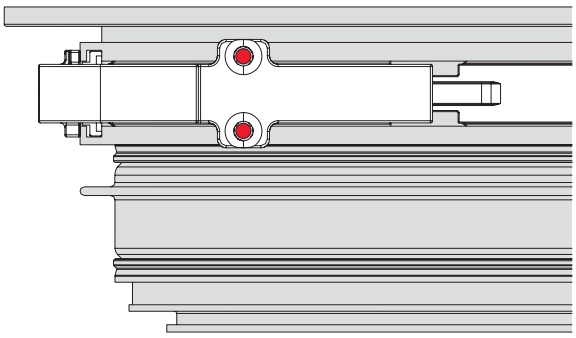
1. Connect the corner drive [1] to the connecting-rod [2] and additional components at the coupling point using the special screw [3].



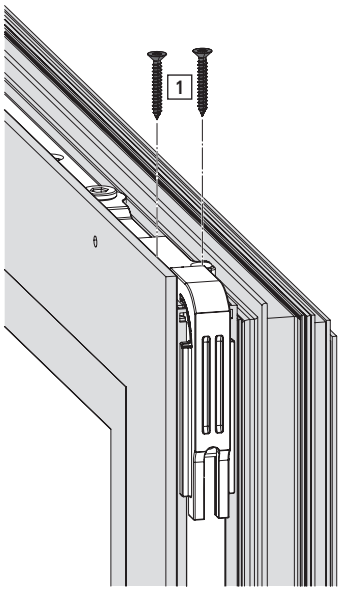
2. Insert everything jointly into the connecting-rod groove.



3. Drill holes through the corner drive in the sash using a Ø 3.0 drill.



4. Fix the corner drive to the sash using screws [1].



8.4.10 Connecting-rods on the hinge side

Installing connecting-rods on the hinge side

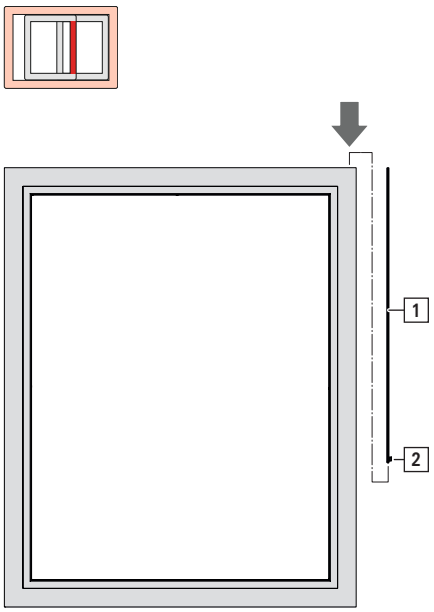
INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

1. Number and position of insertable cams in accordance with the installation drawings. → *from page 190*

2. Insert the insertable cams into the connecting-rod. → *8.4.7 "Insertable cam" from page 118*

Note the alignment of the insertable cam.

3. Insert the connecting-rod [1] with the insertable cam [2] into the connecting-rod groove from above on the hinge side.



8.4.11 Horizontal top connecting rods and components

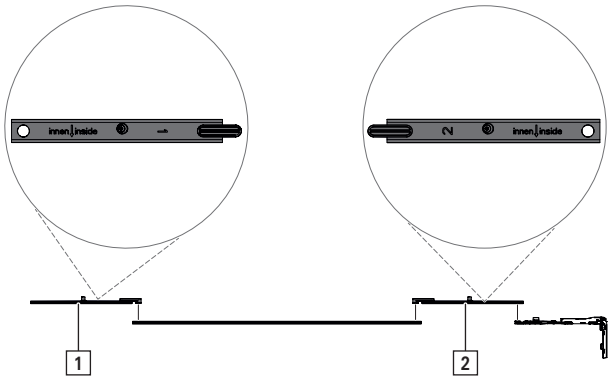
Variant	Number of connecting rods	Corner drive	Additional components
Roto Patio Alversa | KS	1	from corner drive set	–
Roto Patio Alversa | PS without night ventilation			
Roto Patio Alversa | PS Air			
Roto Patio Alversa | PS with night ventilation	1 3 (for RC2)		2 Night ventilation tracks 1 2 Night ventilation tracks 2 2 coupler components for RC2
Roto Patio Alversa | PS Air Com	2 (with SW < 1401 mm) 3 (with SW ≥ 1401 mm)	reinforced; from comfort set	Comfort scissor stay

Installing horizontal top connecting rods and components

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

PRECONDITION
Roto Patio Alversa | PS with night ventilation
Ensure that you install the night ventilation tracks in the following order (for DIN L):

1. Night ventilation track 1 [1]
2. Connecting rod
3. Night ventilation track 2 [2]
4. Corner drive

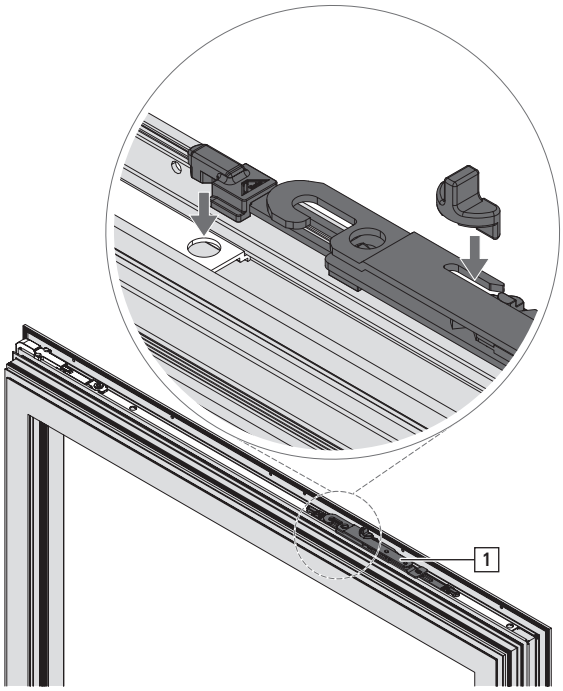


Installation is performed inversely for the DIN R sash.

PRECONDITION

Roto Patio Alversa | PS Air Com

Note the installation direction of the comfort scissor stay [1].



With SW ≥ 1401 mm, install 2 comfort scissor stays.

CAUTION

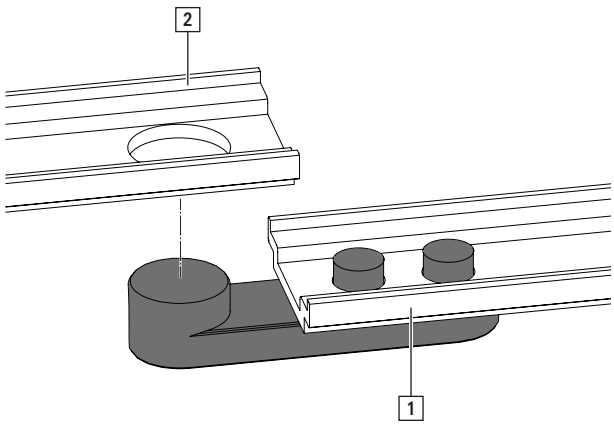
Selecting incorrect components may lead to property damage.

The comfort scissor stay must only be installed together with the mishandling device. Failure to do so may result in damage to the frame and hardware components.

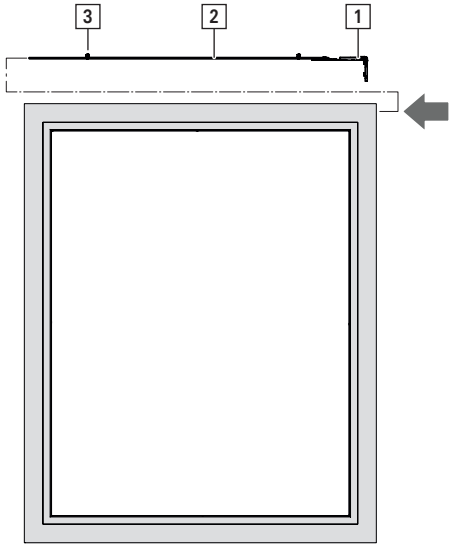
- Only install the comfort scissor stay together with the mishandling device.

1. Select additional components on the basis of the table.

2. Connect additional components [1] to connecting rods [2] at coupling points.



3. Connect the corner drive [1] to the connecting rod [2] and additional component at the coupling point. → *8.4.6 "Connecting the coupling points" from page 116*
   Install the insertable cam [3]. → *8.4.7 "Insertable cam" from page 118*



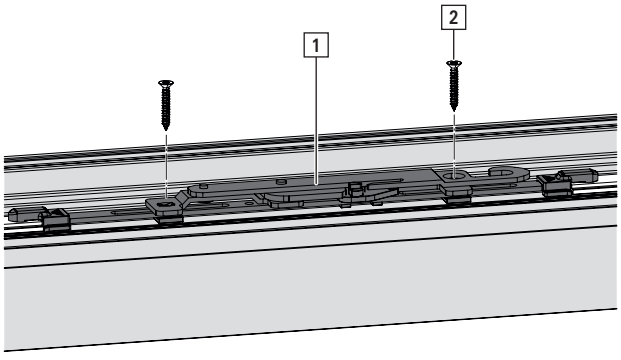
4. Insert everything jointly into the connecting rod groove at the top on the hinge side.

5. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*
   Roto Patio Alversa | PS Air Com:

CAUTION

A loose comfort scissor stay may cause property damage

1. If the comfort scissor stay is loose, this causes the hardware to lose its hold and it may bend out of shape.
   Predrill the comfort scissor stay with Ø 3.0 drill at the 2 mounting holes.
   Screw down the comfort scissor stay [1] using screws [2].



8.4.12 Connecting-rods and espagnolette on the locking side

8.4.12.1 Espagnolette overview

Variant	Number of connecting rods	Corner drive	Espagnolette	Espagnolette component	Handle
Roto Patio Alversa | KS Roto Patio Alversa | PS without / with night ventilation Roto Patio Alversa | PS Air	2	from corner drive set	Flush-encased gearbox without mishandling device	–	e.g. Roto Line AL window handle
	2		SEC flush-encased gearbox without mishandling device	SEC drilling protection SEC rebate-clearance reduction espagnolette SEC connector	
	1		Roto Line AL geared-handle	Insertable connector bolt Espagnolette support	–
	2		Roto Line AL lockable geared-handle	SEC espagnolette protection Espagnolette support SEC connector	
	2		Flush-encased gearbox without / with profile cylinder	–	e.g. Roto Line Patio Alversa interior handle
	2		Roto Line Alversa geared-handle Roto Line Alversa lockable geared-handle	Adjustable centre section T connector	–
Roto Patio Alversa | PS Air Com	2	reinforced; from comfort set	Roto Line Alversa geared-handle	Adjustable centre section T connector	–
			Flush-encased gearbox without / with profile cylinder	–	e.g. Roto Line Patio Alversa interior handle

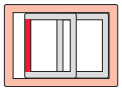
8.4.12.2 Flush-encased gearbox

Installing the flush-encased gearbox

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

INFO
This is illustrated using a flush-encased gearbox without / with profile cylinder as an example.
The step “Swivel the threaded eyes inwards” is omitted for flush-encased gearboxs without mishandling device. Turning the clampable lugs after installing a flush-encased gearbox without mishandling device ensures that it is seated so that it can be transported safely.

1. Position of the flush-encased gearbox in accordance with the installation drawings. → *from page 190*

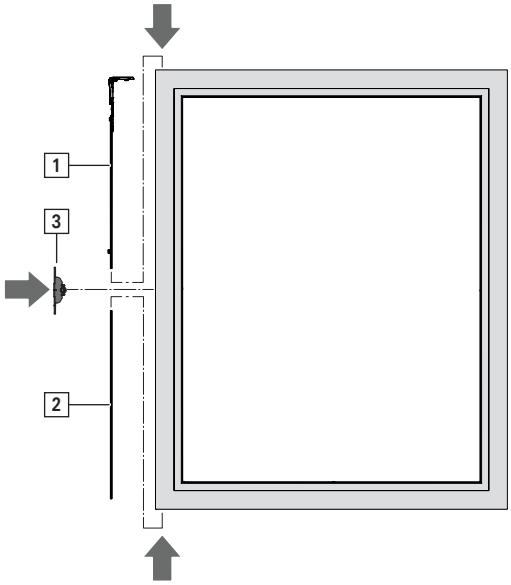


2. Connect the corner drive to the connecting rod [1] at the coupling point. → *8.4.6*

"Connecting the coupling points" from page 116

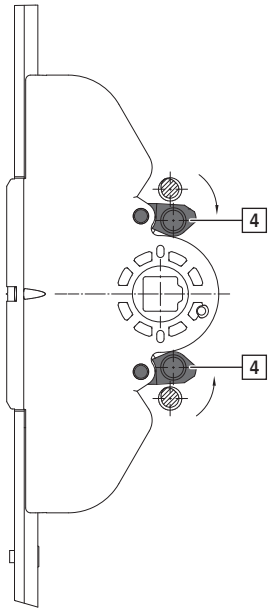
Install the insertable cam. → *8.4.7 "Insertable cam" from page 118*

3. Insert everything jointly into the connecting rod groove from above on the locking side.



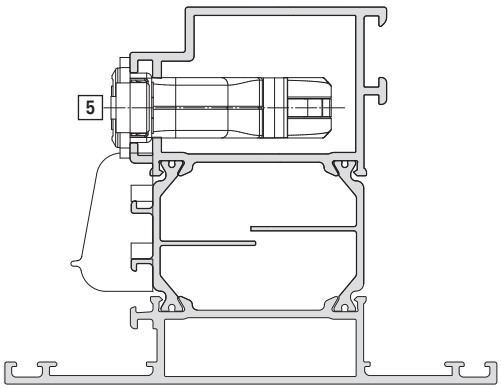
4. Insert the connecting rod [2] and the insertable cam into the connecting rod groove from below on the locking side.

5. Swivel the threaded eyes [4] on the flush-encased gearbox [3] inwards.



6. Place the flush-encased gearbox on the connecting rods on the locking side and connect it to the connecting rods at the coupling points.

7. Screw the espagnolette to the faceplate using screws [5].



8. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*

8.4.12.3 Insertable connector-bolt

for Roto Line AL geared-handle

Installing the insertable connector-bolt

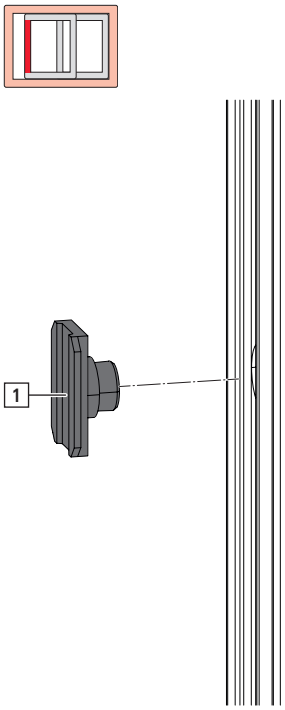
INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

1. Position of the insertable connector-bolt in accordance with the installation drawings. → *from page 190*

2. Connect the corner drive to the connecting-rod at the coupling point. → *8.4.6 "Connecting the coupling points" from page 116*

Install the insertable cam. → *8.4.7 "Insertable cam" from page 118*

3. Insert the insertable connector-bolt [1] into the continuous connecting-rod.



4. Insert everything jointly into the connecting-rod groove from above on the locking side.

5. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*

8.4.12.4 SEC espagnolette protection

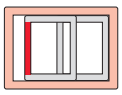
for Roto Line AL lockable geared-handle

Installing the SEC espagnolette protection

PRECONDITION
- Roto Line AL lockable geared-handle AL installed → *from page 144*

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

1. Position of the SEC espagnolette protection in accordance with the installation drawings. → *from page 190*



2. Install the Roto Line AL lockable geared-handle with espagnolette support. → *from page 144*

INFO

It is not possible to install the espagnolette support at a later point.

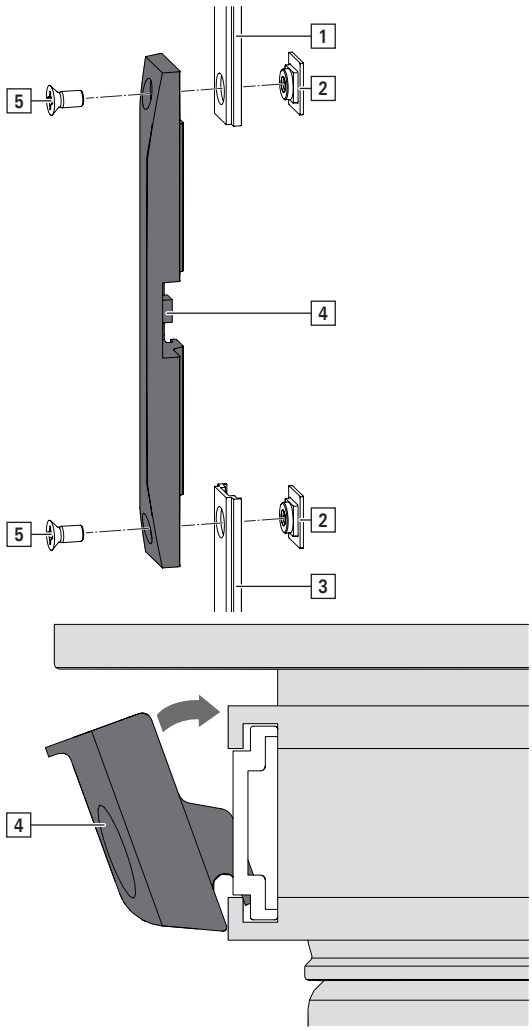
3. Screw down the SEC espagnolette protection onto the connecting rods as follows.

a. Insert the corner drive with connecting rod [1], SEC connector [2] and insertable cam into the connecting rod groove from above on the locking side.

b. Insert the connecting rod [3], SEC connector [2] and insertable cam into the connecting rod groove from below on the locking side.

c. Swing the SEC espagnolette protection [4] into the connecting rod groove on the locking side.

d. Screw down the SEC espagnolette protection onto the connecting rods using screws on the SEC connectors.



4. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*

8.4.12.5 Adjustable centre section

For Roto Line Alversa geared-handle

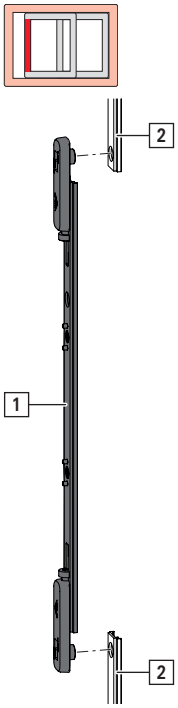
Installing the adjustable centre section

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

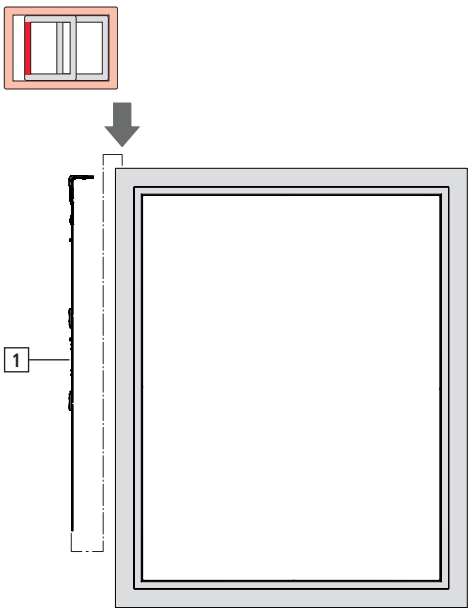
1. Position of the adjustable centre section in accordance with the installation drawings. → *from page 190*

2. Connect the corner drive to the connecting rod at the coupling point. → *8.4.6 "Connecting the coupling points" from page 116*
   Install the insertable cam. → *8.4.7 "Insertable cam" from page 118*

3. Connect the adjustable centre section [1] to connecting rods [2] at the coupling point.



4. Insert everything jointly into the connecting rod groove from above on the locking side.



5. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*

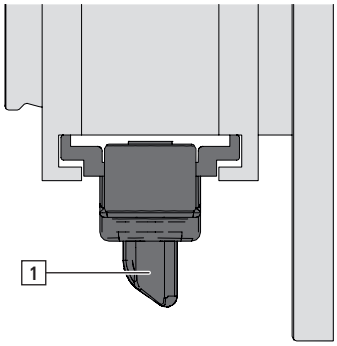
8.4.13 Horizontal bottom connecting rods and components

Variant	Number of connecting rods	Corner drive	Additional component
Roto Patio Alversa | KS	1 3 (for RC2)	from corner drive set	Left bullet-catch track Right bullet-catch track 2 coupler components for RC2
Roto Patio Alversa | PS without night ventilation	1		Travel restrictor → *8.4.14 "Travel restrictor" from page 141*
Roto Patio Alversa | PS Air			
Roto Patio Alversa | PS with night ventilation	1 3 (for RC2)		Night ventilation track 1 Night ventilation track 2 2 coupler components for RC2
Roto Patio Alversa | PS Air Com	2	reinforced; from comfort set	Mishandling device

Installing the horizontal bottom connecting rods and components

INFO
Comply with the installation sequence for the aluminium sash. → *from page 115*

PRECONDITION
Roto Patio Alversa | KS
Note the alignment of the bullet-catch track [1].

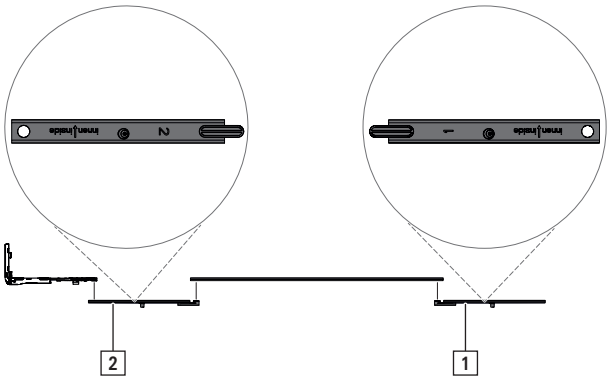


PRECONDITION

Roto Patio Alversa | PS with night ventilation

Ensure that you install the night ventilation tracks in the following order (for DIN L):

1. Night ventilation track 1 [1]
2. Connecting rod
3. Night ventilation track 2 [2]
4. Corner drive

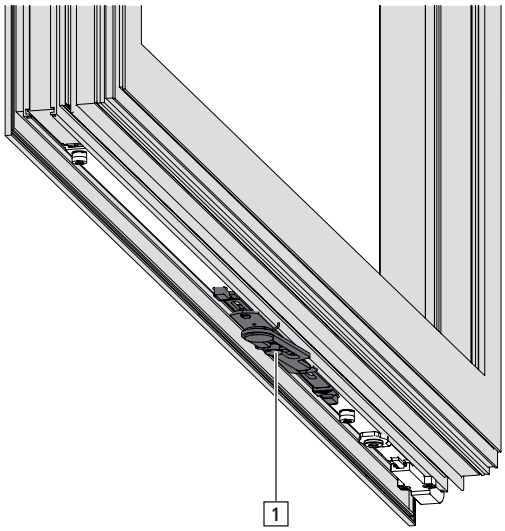


Installation is performed inversely for the DIN R sash.

PRECONDITION

Roto Patio Alversa | PS Air Com

Note the installation direction of the mishandling device [1].



CAUTION

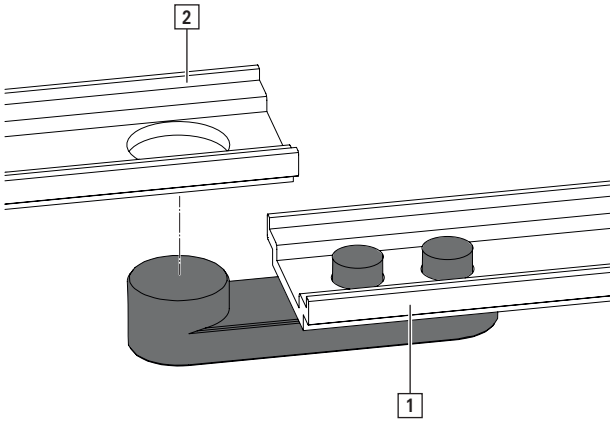
Selecting incorrect components may lead to property damage.

The mishandling device must only be installed together with the comfort scissor stay. Failure to do so may result in damage to the frame and hardware components.

- ▶ Only install the mishandling device together with the comfort scissor stay.

1. Select additional components on the basis of the table.

2. Connect additional components [1] to connecting rods [2] at coupling points.



3. Connect the corner drive to the connecting rod, insertable cam and additional component at coupling points. → *8.4.9 "Corner drives" from page 123*

4. Insert everything jointly into the connecting rod groove at the bottom on the locking side.

5. Fix the corner drive to the sash using the retaining fork. → *8.4.9 "Corner drives" from page 123*

   Roto Patio Alversa | PS Air Com:

CAUTION

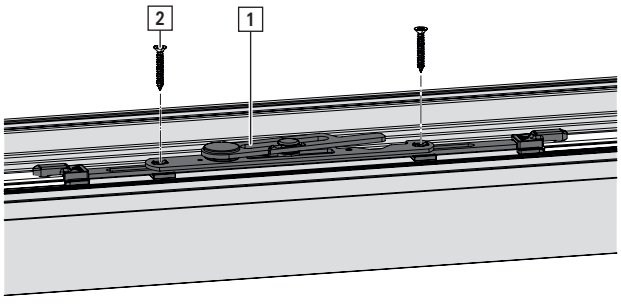
A loose mishandling device may cause property damage

1. If the mishandling device is loose, this causes the hardware to lose its hold and it may bend out of shape.

   Move the mishandling device [1] into the centre position.

   Predrill the mishandling device with Ø 3.0 drill at the 2 mounting holes.

   Screw down the mishandling device using screws [2].



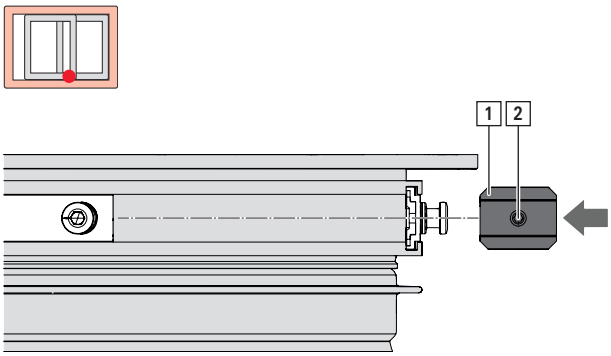
8.4.14 Travel restrictor

Installing the travel restrictor

PRECONDITION
Handle installed. → *8.4.15 "Handle" from page 142*

1. Move the handle to the sliding position (horizontally aligned with the escutcheon cover).

2. Slide the bottom travel restrictor [1] from the hinge side to the horizontal bottom connecting-rod and screw down with a screw [2].

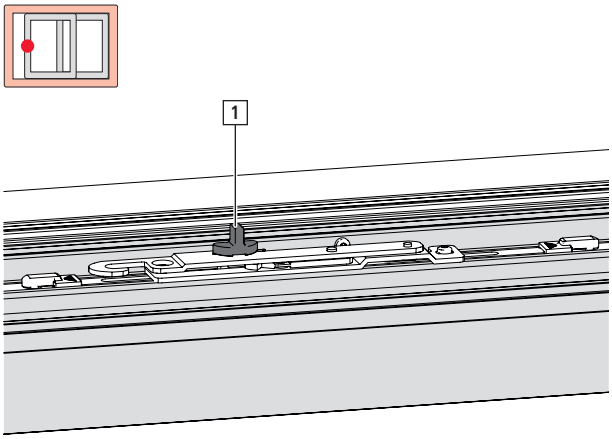


8.4.15 Handle

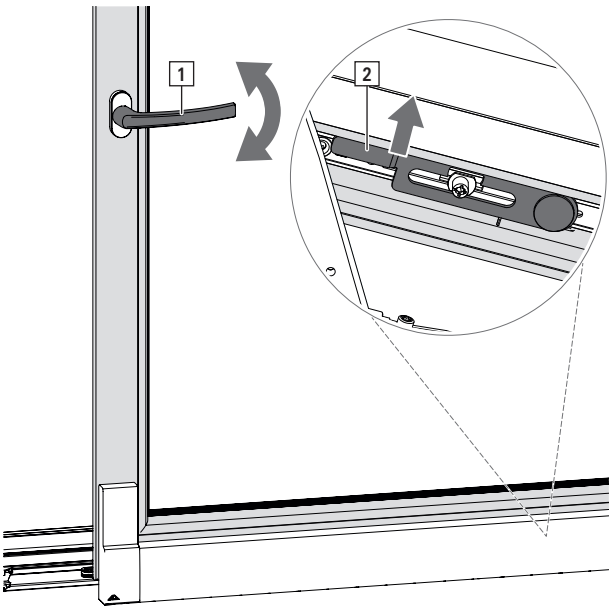
8.4.15.1 Centre-fixing

Removing the centre-fixing

1. Remove the centre-fixing [1] from the top comfort scissor stay.



2. Actuate the bottom mishandling device [2] to turn the handle.

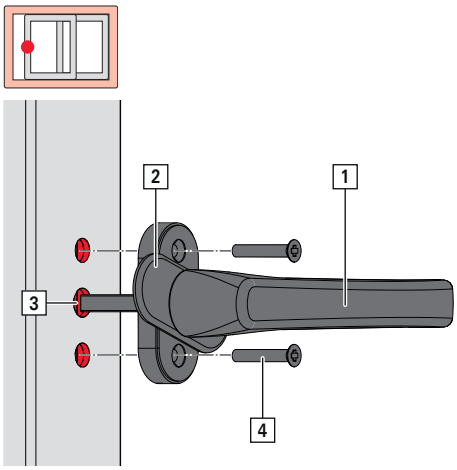


8.4.15.2 Roto Line Alversa standard

Installing the handle – Flush-encased gearbox

1. Move the handle [1] to the sliding position (horizontally aligned with the escutcheon cover).

2. Rotate the cover [2] on the handle 90°.



3. Insert the handle into the sash [3].

4. Screw down the handle using screws [4].
   Flush-encased gearbox without mishandling device: overcome the resistance of the transport protection.

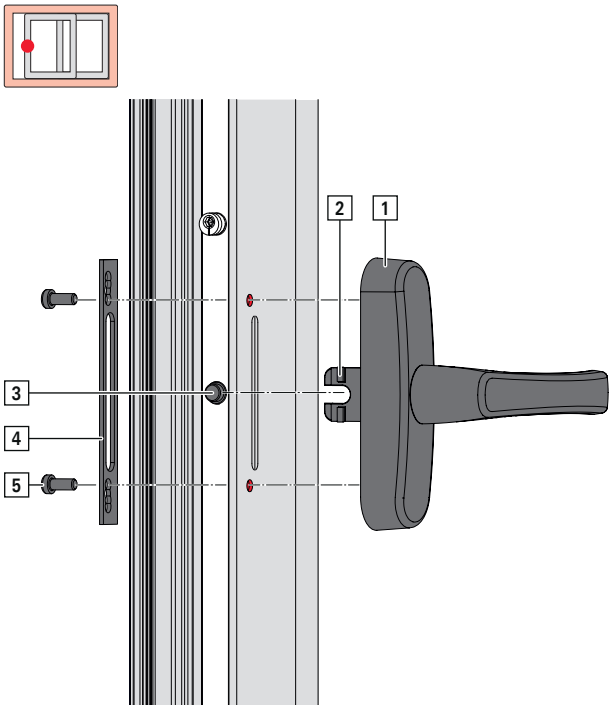
5. Rotate the cover on the handle 90°.

8.4.15.3 Roto Line AL geared-handle

Installing the handle – Insertable connector-bolt / SEC geared-handle protection

PRECONDITION
On RC2 with SEC geared-handle protection, the handle must be installed before the SEC geared-handle protection. → *from page 134*

1. Move the handle to the sliding position.



2. Place the espagnolette [1] on the sash from the inside of the sash.
   The fork [2] engages in the connector-bolt [3].

3. Install the geared-handle support [4] from the outside of the sash on the sash to the espagnolette.

a. Align the geared-handle support on the drill holes.
b. Screw down the espagnolette using screws [5].

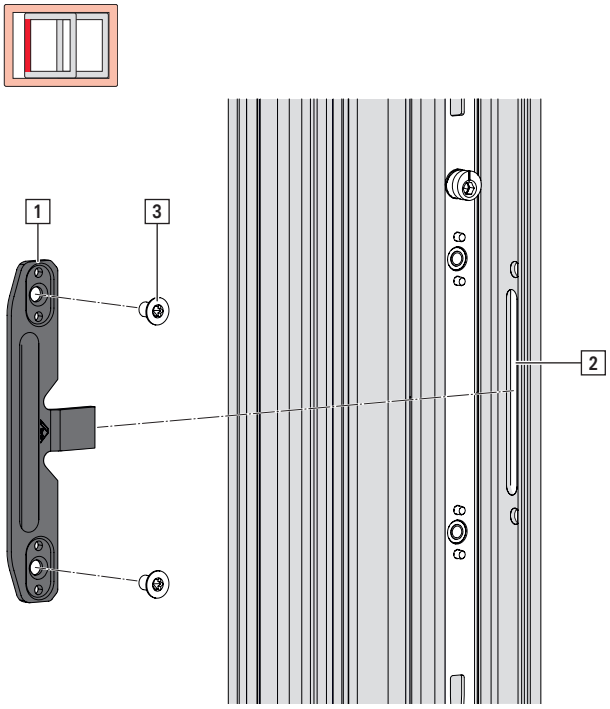
4. Turn the handle to check that it runs smoothly.

5. Move the handle to the closed position.

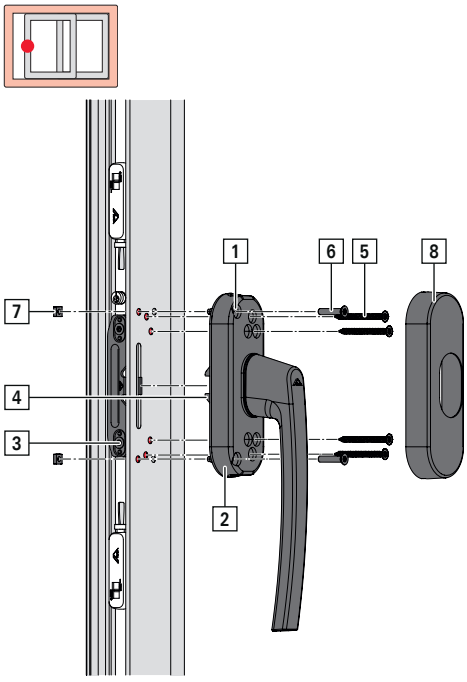
8.4.15.4 Roto Line Alversa geared-handle

Installing the handle – Adjustable centre section with T connector

1. Insert the T connector [1] through the slot on the handle [2].
   Screw down the T connector on the adjustable centre section using screws [3].



2. Open the drill holes [1] on the espagnolette [2].



3. Move the handle to the sliding position (horizontally aligned with the escutcheon).

4. Place the espagnolette on the sash.
   The connector [3] engages in the coupling point [4].

5. Screw down the espagnolette using screws [5] and [6] and square nuts [7].

> **INFO**
>
> Roto Patio Alversa | PS Air Com:
>
> Remove the centre fixing from the comfort scissor stay. → *from page 142*

6. Move the handle to the closed position and fit the cover [8].

7. Move the handle to the sliding position.

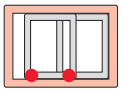
8.4.16 Bogies / reinforcement brackets

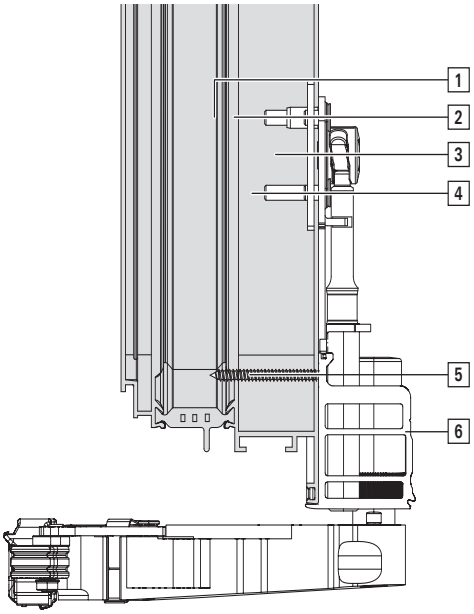
WARNING

Incorrect screw connections may lead to serious injuries.

The hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.

- ▶ Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.





Assignment	Designation
[1]	Screw for reinforcement bracket
[2]	Rivet nut
[3]	Reinforcement bracket
[4]	Screw for reinforcement bracket
[5]	Screw
[6]	Bogie

The following installation sequence applies to the following components:

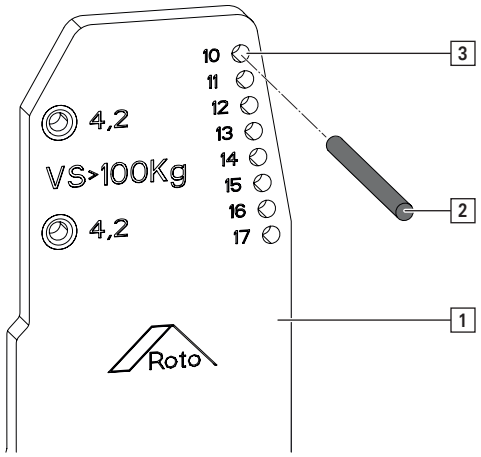
- Bogies up to 160 kg (with / without damping)
- Tandem bogies up to 200 kg (with damping)

INFO

Leading bogies are installed on the locking side.
Trailing bogies are installed on the hinge side.

8.4.16.1 Preparing the drilling jig

1. Insert the dowel pin [2] into the dowel pin position 10 [3] on the drilling jig [1].



INFO
Two drilling jigs are required for each sash side on tandem bogies. Only insert the dowel pin into the outer drilling jig.

INFO
Drill holes on the side of the sash that is facing the frame.

INFO
Always install two reinforcement parts for Roto Patio Alversa | PS.

The following drill holes are required:

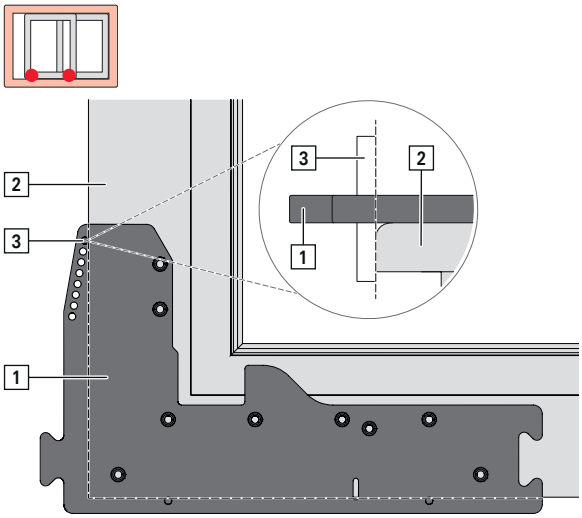
Determining the drill holes

Sash weight	Bogies	Reinforcement parts
Up to 100 kg For: Roto Patio Alversa | KS	2 bogies 4 drill holes each	without
Up to 160 kg	2 bogies 4 drill holes each	2 reinforcement parts 2 drill holes each
over 160 kg	2 tandem bogies 8 drill holes each	2 reinforcement parts 2 drill holes each

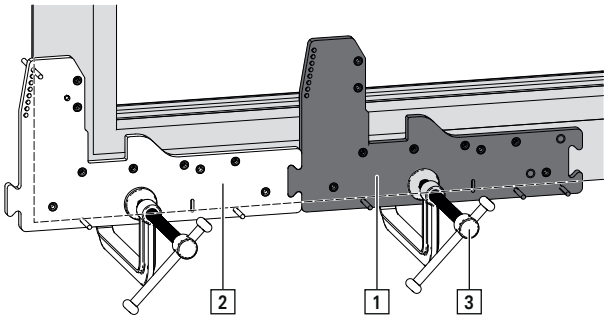
Positioning the drilling jig

1. Position the drilling jig [1] on the lower edge of the sash [2].

   The dowel pin [3] is located on the outside of the sash.



2. For tandem bogies, insert the second drilling jig [1] into the first drilling jig [2].



3. Check that the drilling jig is seated correctly.

4. Fasten the drilling jig(s) using a screw clamp [3].

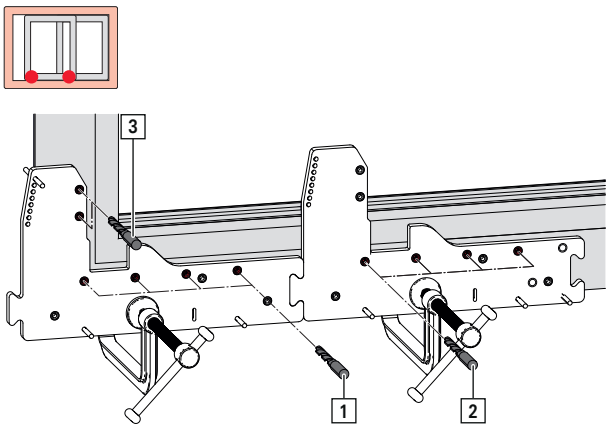
8.4.16.2 Drilling the holes

WARNING
Incorrect screw connections may lead to serious injuries.
The hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.
- ▸ Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.

INFO
2 drilling jigs are required for each sash side on tandem bogies. Only insert the dowel pin into the outer drilling jig.

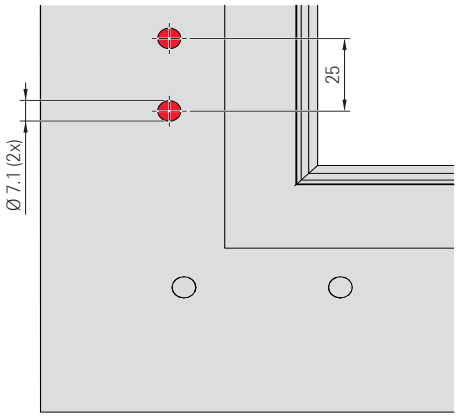
INFO
Drill holes on the inside of the sash.

INFO
Drill holes for reinforcement brackets in Tilt&Slide systems with a sash weight of over 100 kg.



1. Drill the holes [1] for the bogies, or
   Drill the holes [1] and [2] for the tandem bogie.
   S.kg > 100 kg: drill the holes [3] for the reinforcement brackets.
   Drill: Ø 4.2 mm

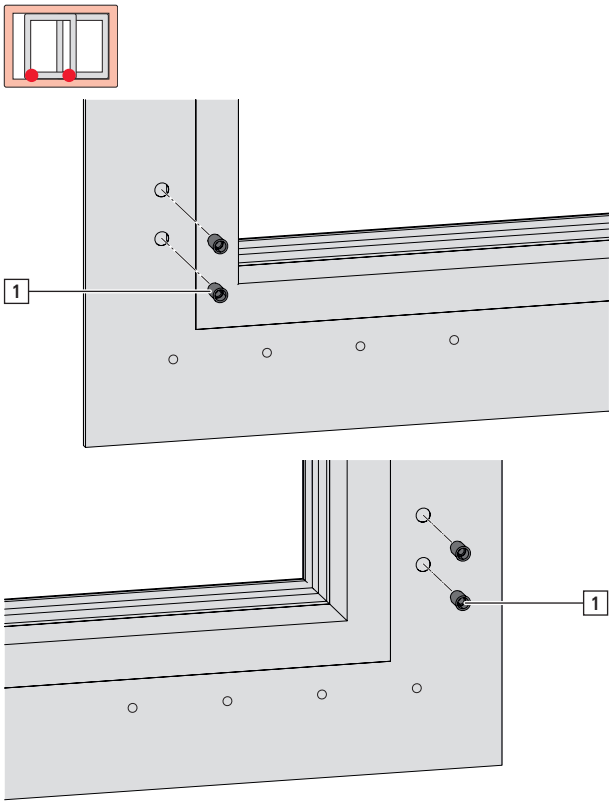
2. Drill Ø 4.2 mm inner holes with a Ø 7.1 mm drill.



8.4.16.3 Rivet nuts

Fitting rivet nuts

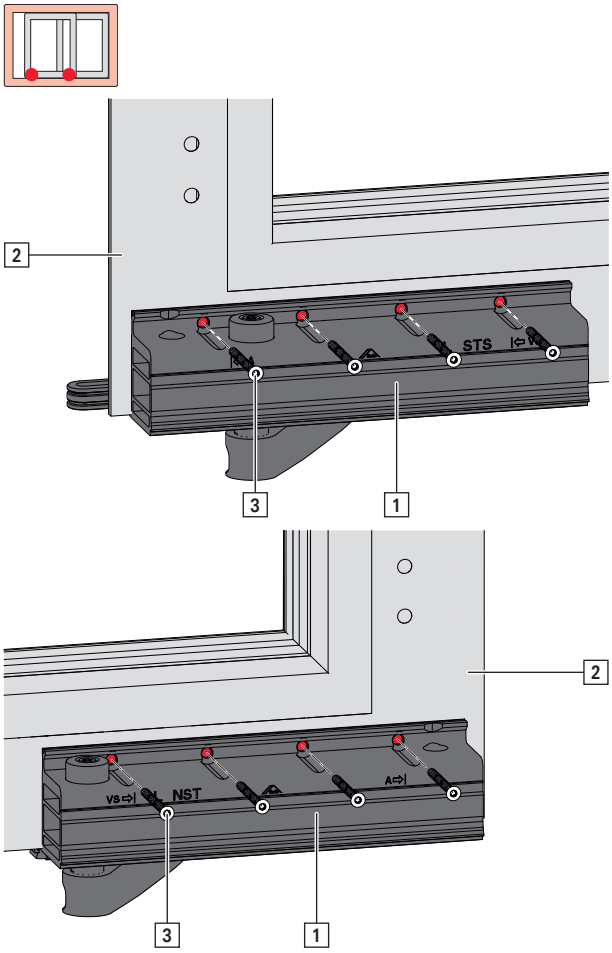
1. Fit rivet nuts [1] in the drill holes for the reinforcement brackets.



8.4.16.4 Bogies

Installing the bogies

1. Place the bogies [1] on the sash [2].

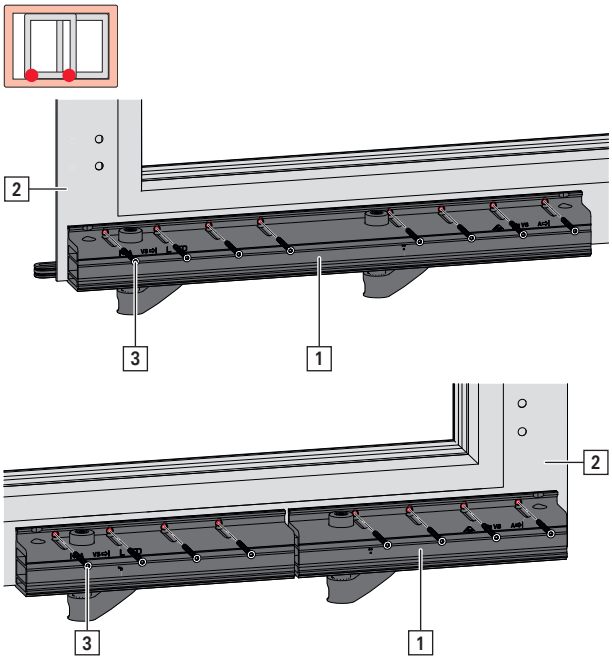


2. Check that the bogies are seated correctly:
   - Distance from the outer edges of the sash. → *8.4.16.1 "Preparing the drilling jig" from page 148*
   - Flush with the lower edge of the sash frame.

3. Screw down each bogie with 4 screws [3].

Installing the tandem bogies

1. Place the tandem bogies [1] on the sash [2].

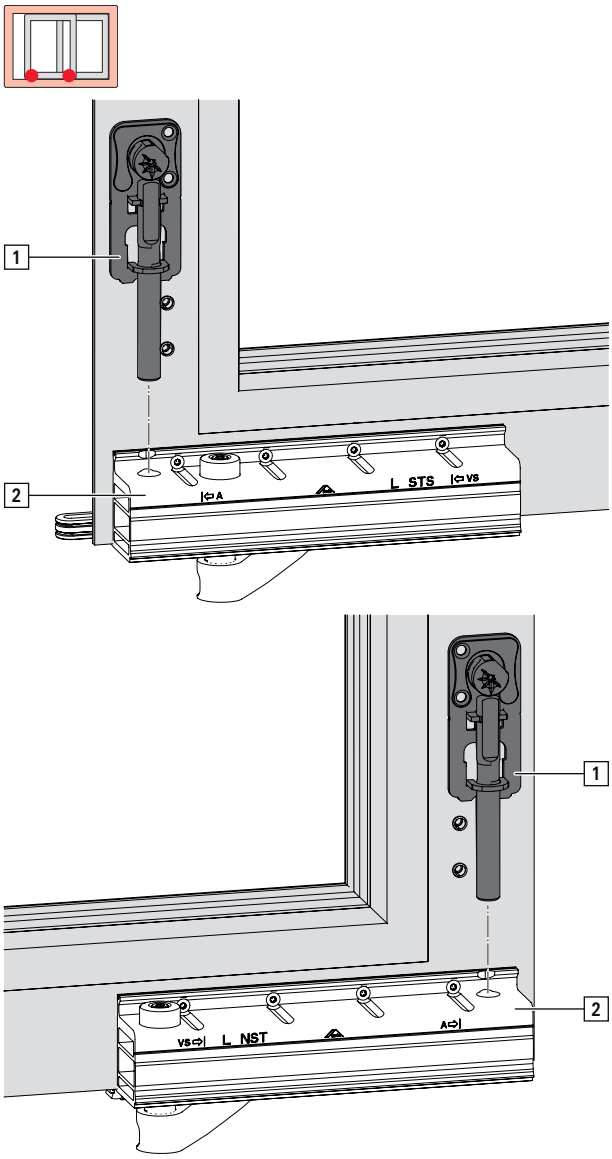


2. Check that the tandem bogies are seated correctly:
   - Distance from the outer edges of the sash. → *8.4.16.1 "Preparing the drilling jig" from page 148*
   - Flush with the lower edge of the sash frame.

3. Screw down each tandem bogie with 8 screws [3].

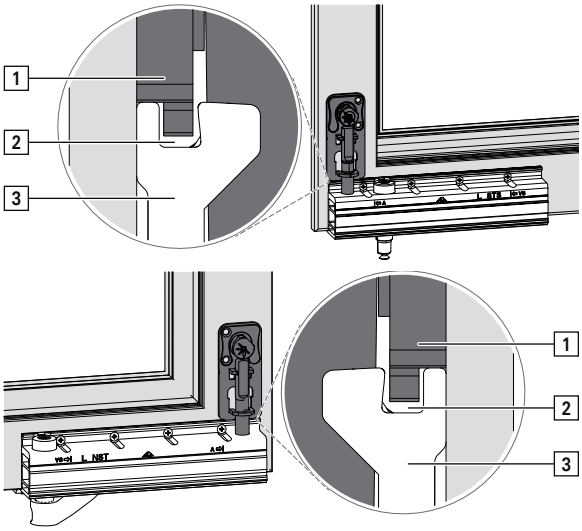
8.4.16.5 Installing the reinforcement parts

1. Insert the reinforcement parts [1] into the bogies [2].

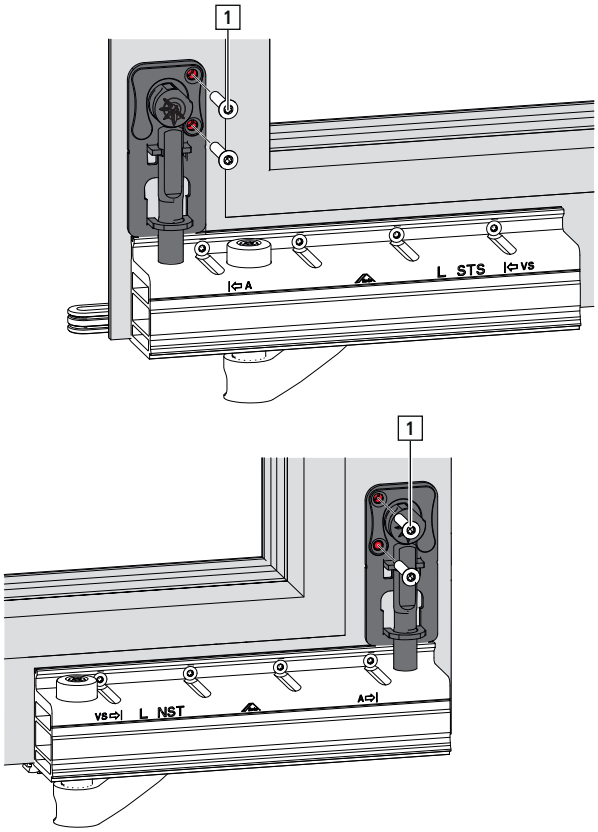


2. Check that the reinforcement parts are seated correctly.

   Has the reinforcement part [1] been inserted into the guide groove [2] in the bogie [3]?



3. Screw down the reinforcement parts with 2 screws [1].



8.4.17 Support bracket

8.4.17.1 Supporting piece drill holes

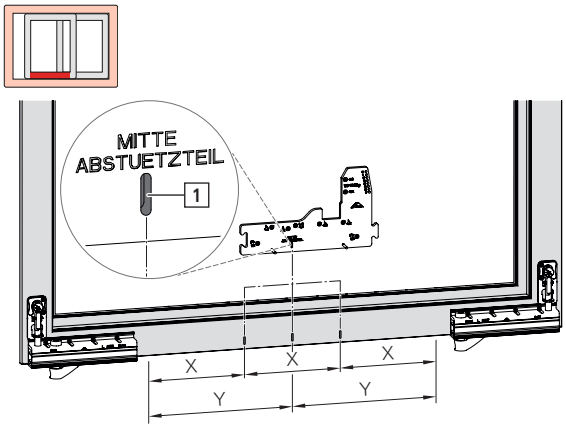
INFO
Install one supporting piece up to SW ≤ 1480. Always install two supporting pieces from SW > 1480 mm.

Drilling the holes for the supporting piece

1. Determine the position of the supporting pieces with the same distance on the right and left.

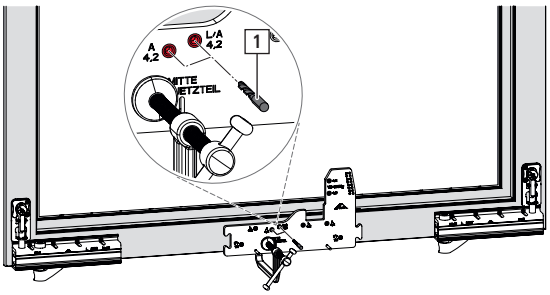
2. Mark the position of the supporting pieces.

3. Place the drilling jig on the marking [1].



4. Fix the drilling jig in place using the screw clamp.

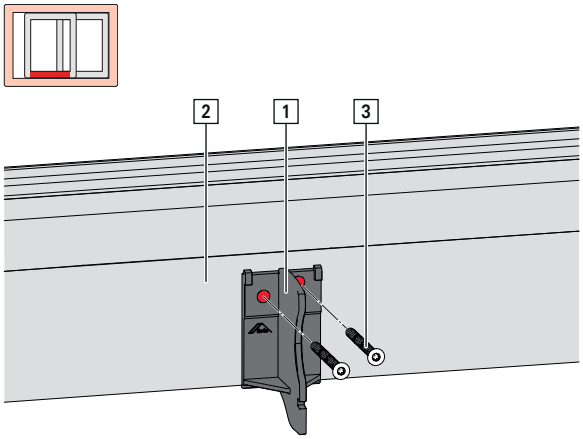
5. Drill the holes [1] for the supporting pieces.



8.4.17.2 Supporting piece

Install the supporting piece

1. Place the supporting piece [1] on the sash [2].



2. Screw down the supporting piece with 2 screws [3].

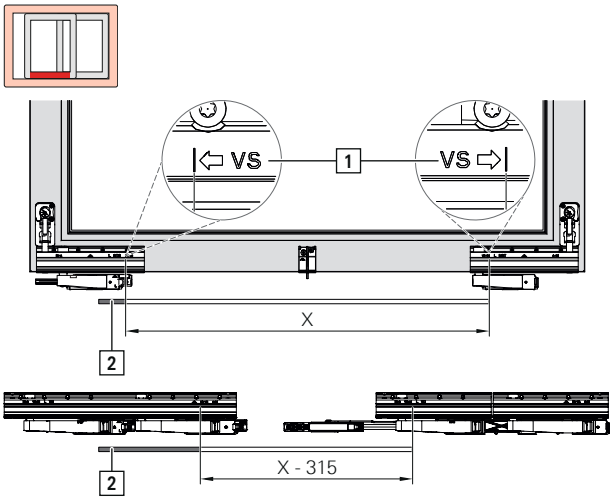
8.4.18 Connecting rod / connecting-rod support-block

8.4.18.1 Connecting rod

Cropping the connecting rod

Connecting rod for	Length
Bogies without damping (Roto Patio Alversa | KS only)	according to the marking
Bogies with damping (Roto Patio Alversa | PS only)	according to the marking, minus 315 mm

1. Mark the connecting rod according to the bogie markings [1].

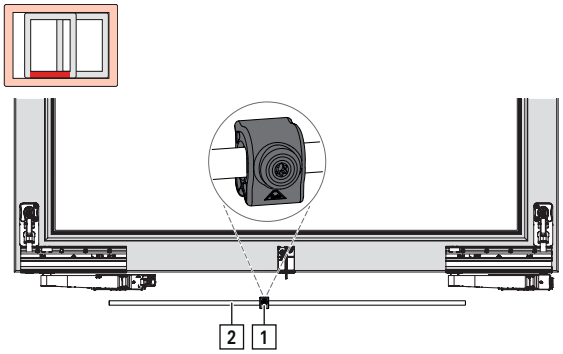


2. Crop the connecting rod [2].

8.4.18.2 Connecting-rod support-block

Installing the connecting-rod support-block

1. From an SW of > 1480 mm: push an additional connecting rod support-block [1] to the centre of the connecting rod [2].

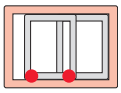


2. Align the connecting-rod support-block with the bogie.

> **INFO**
>
> Position the threaded bolt so that it is perpendicular to the inside of the sash.

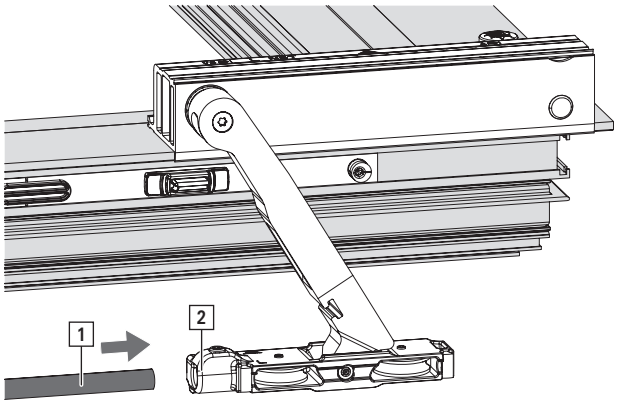
3. Screw down the connecting rod support-block on the connecting rod (torque: 2 – 3 Nm).

8.4.18.3 Connecting rod

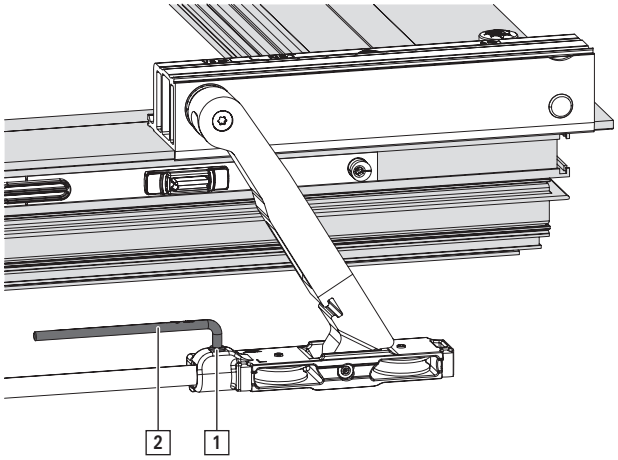


Installing the connecting rod

1. Insert the connecting rod [1] into the bogie roller unit [2] on the hinge side.

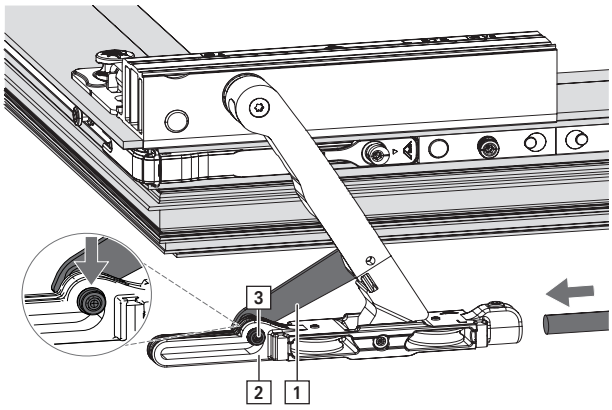


2. Secure the connecting rod with a screw [1] using a T25 hexalobular socket screwdriver [2] (torque: 5 – 7 Nm).

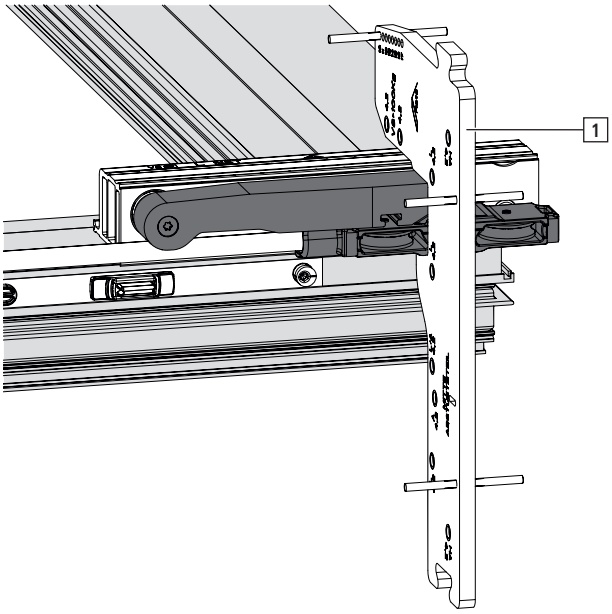


3. Insert the connecting rod into the bogie roller unit on the locking side.

   If the control arm [1] is engaged in the roller unit, push on the cam [2] to unlock it and fold up the support arm [3].



4. Fold in the support arms and align them so that they are parallel to the frame.



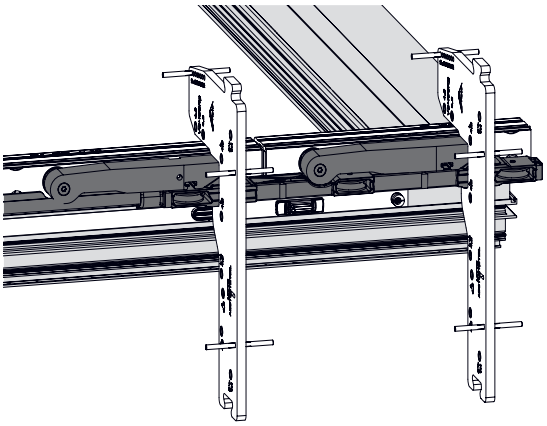
> **INFO**
> The “drilling jig for bogies” or the “installation jig for the top guide block” can be used to align the support arms on the bogies. While doing so, ensure that the jig rests flat on the sash component of the bogie.

Place the drilling jig [1] for fixing the folded-in support arm on the roller units on the hinge side.

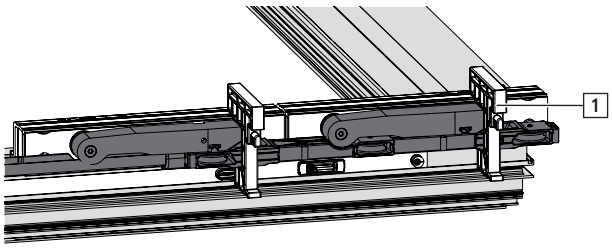
Check that the jig is resting flat on the sash component of the bogie.

If necessary, place a second drilling jig on the locking side of the bogie in order to fix the support arm.

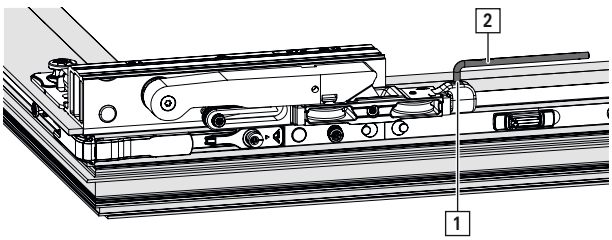
a. Tandem bogies: place two drilling jigs for fixing the folded-in support arms on the roller units on the hinge side.



b. **Alternatively:**
Place installation jigs for the top guide block [1] on the roller units on the hinge side to fix the folded-in support arms.



5. Tighten the screw [1] on the locking side using a T25 hexalobular socket screwdriver [2] (torque: 5 – 7 Nm).



8.5 Frame

INFO
Install the frame components when the frame is horizontal (workshop).
Once the frame is fitted, the reveal may prevent frame components from being installed correctly.

8.5.1 Frame hardware components

Installing the frame hardware components

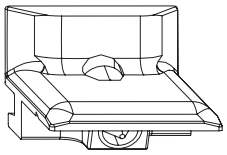
1. Position strikers, guide plates, tilt strikers, the frame component for the mishandling device and the frame component for the comfort scissor stay in accordance with the installation drawings. → *from page 190*

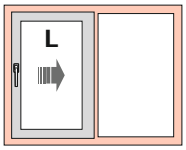
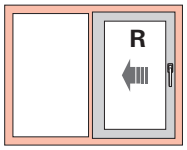
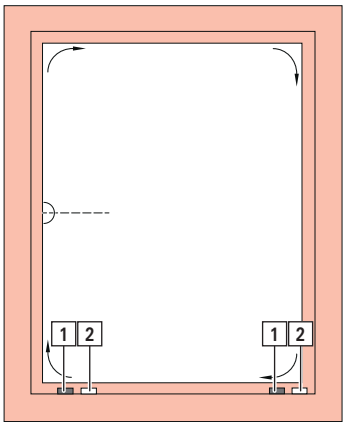
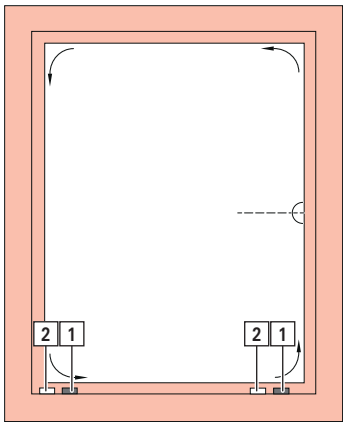
Variant	Frame component
Roto Patio Alversa | KS	Strikers Guide plates
Roto Patio Alversa | PS without night ventilation	Strikers
Roto Patio Alversa | PS with night ventilation	Strikers Night ventilation strikers
Roto Patio Alversa | PS Air	Strikers Tilt strikers
Roto Patio Alversa | PS Air Com	Strikers Tilt strikers Comfort scissor stay frame component (with SW > 1401, install 2 frame components) Mishandling device frame component

8.5.2 Tilt strikers

8.5.2.1 Overview with dimensional drawing

INFO
Do not mix up strikers and tilt strikers. Tilt strikers are marked with a red glue dot that can be removed after installation.

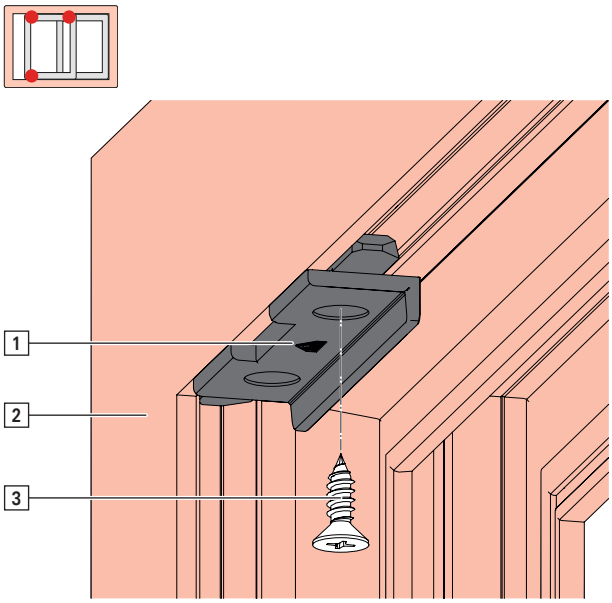


Tilt striker positions on the left	Tilt striker positions on the right
	
	
[1] Striker [2] Tilt striker	

8.5.3 SEC rebate-clearance reduction, corner drive

Installing corner drive SEC rebate-clearance reduction

1. Insert corner drive SEC rebate-clearance reductions [1] into the frame [2].



2. Push the corner drive SEC rebate-clearance reductions all the way into the corner and screw down with the screw [3].

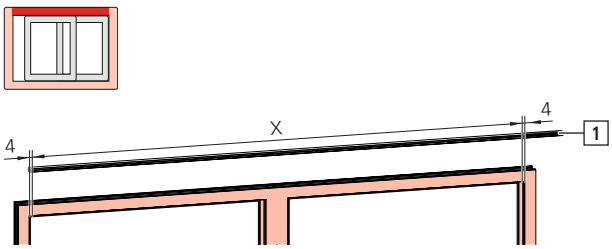
8.5.4 Guide track

WARNING
Incorrect screw connections may lead to serious injuries.
The hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.
- ▶ Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.

8.5.4.1 Preparing the guide track

Cropping the guide track

1. Crop the guide track [1].
   X = frame internal width + (2 x coverage) - 8

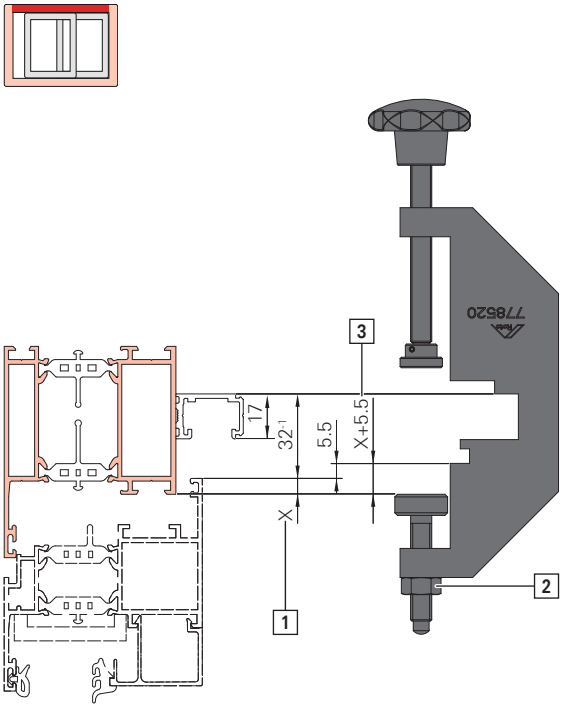


8.5.4.2 Guide track drill holes

Drilling the holes for the guide track

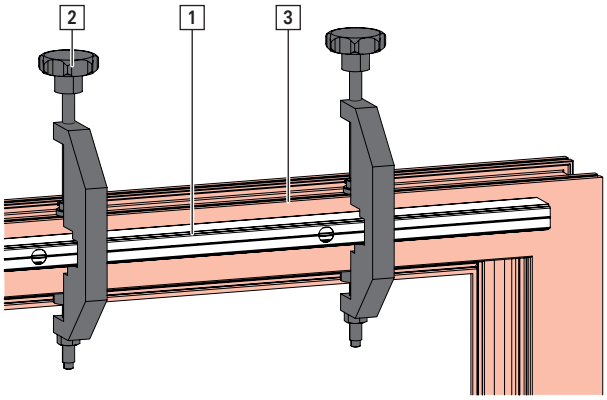
1. Adjust the jig for the guide track.

a. Determine coverage X [1] with a rebate clearance of 11.5 mm.
b. Undo the nut [2].
c. Adjust dimension X + 5.5 [3] for the guide track.
d. Tighten the nut.

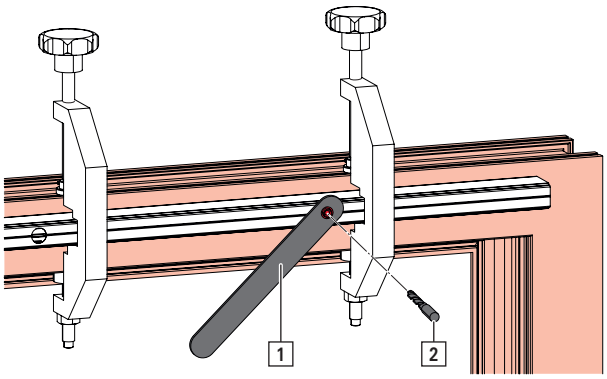


2. Align the guide track [1] with jigs [2] in the centre of the frame [3].

a. Position the guide track in two jigs.
b. Place the jigs with the guide track on the frame from below.
c. Secure the jigs to the frame.

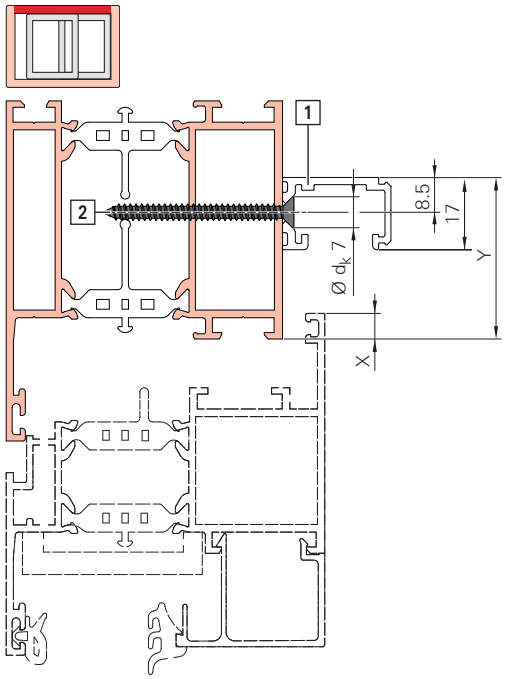


3. Use a drilling aid [1] to drill holes in the guide track.
   Drill [2]: Ø 3.0 mm



8.5.4.3 Installing the guide track

1. Fasten the guide track to the frame with the distance dimension Y. Note coverage X.
   With coverage 4: Y = 36 mm.
   With coverage 5: Y = 37 mm.
   With coverage 6: Y = 38 mm.



2. Screw down the guide track [1] in all predrilled holes using screws [2].

8.5.5 Sliding scissor stay

8.5.5.1 Inserting the KS sliding scissor stay

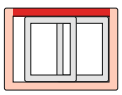
WARNING
Trapped limbs may result in injuries.
When being transported, the sliding scissor stay can open and close uncontrollably. This can result in limbs being trapped and seriously injured.
- Note the danger zone in the sliding scissor stay.
- Close the sliding scissor stay after installation and secure it in place for transport.
- Wear safety gloves.

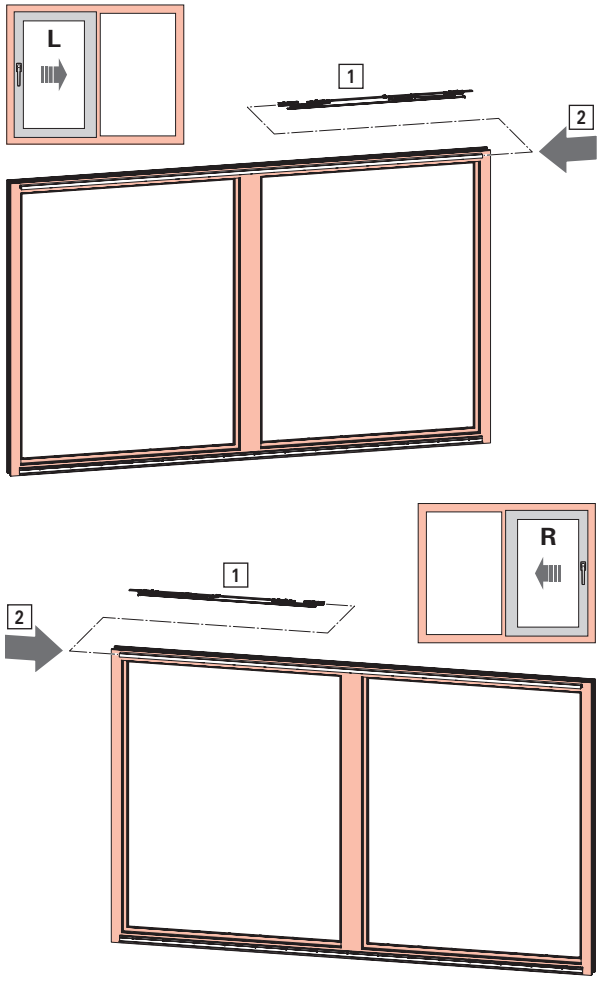
The scissor stay retention must always be located on the hinge side.

The Roto Patio Alversa | KS sliding scissor stay can be pushed past the middle (dead centre) and be used for left and right-hand sashes. Always note the correct side during insertion.

INFO
Slide the sliding scissor stay onto the frame when it is horizontal (workshop).

1. Open the sliding scissor stay [1].
   Insert the sliding scissor stay into the guide track from the hinge side [2].





2. Secure the sliding scissor stay for transport to prevent it from opening and falling out.

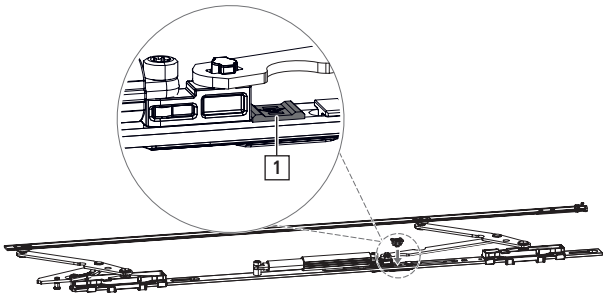
8.5.5.2 Preassembling the PS sliding scissor stay with retrofit set

Choosing a retrofit set

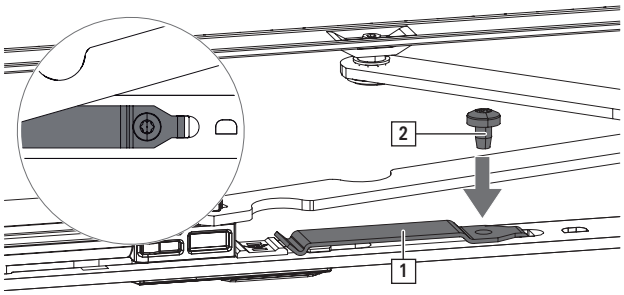
Variant	Requirements
Lock-in position	Mandatory from dimension M > 44 mm
Tilt assistance	Mandatory from S.kg > 140 kg

Installing the retrofit set for lock-in position

1. Open the PS sliding scissor stay.
   Clip the catch cam [1] into the slot next to the damper.



2. Place the leaf spring [1] with lug into the opening and align it so that it is parallel.
   Secure to the sliding scissor stay with the self-tapping screw provided [2] using a T20 hexalobular socket screwdriver.



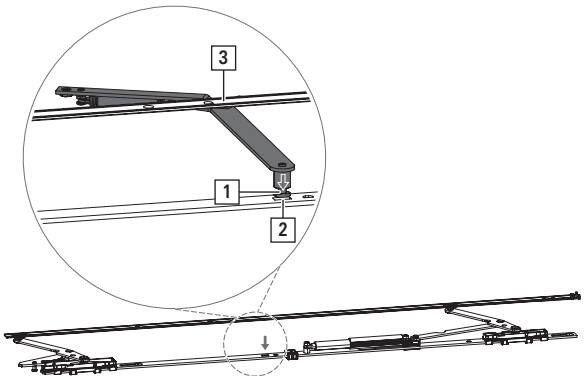
Installing the retrofit set for tilt assistance

1. Open the PS sliding scissor stay.

INFO

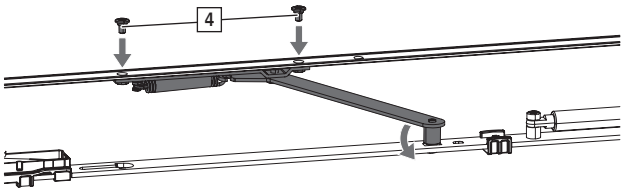
Guide the retrofit set underneath the floating mullion connecting rod [3]. This is no longer possible at a later point.

Insert the mounting bolt [1] from the retrofit set into the slot on the scissor stay connecting rod [2].



2. Turn the installed retrofit set until its drill holes are located beneath those of the floating mullion connecting rod.

   Secure in the floating mullion connecting rod with two screws [4] using a T25 hexalobular socket screwdriver.



8.5.5.3 Inserting the PS sliding scissor stay and installing the top guide block

WARNING

Trapped limbs may result in injuries.

When being transported, the sliding scissor stay can open and close uncontrollably. This can result in limbs being trapped and seriously injured.

- Note the danger zone in the sliding scissor stay.
- Close the sliding scissor stay after installation and secure it in place for transport.
- Wear safety gloves.

The scissor stay retention must always be located on the hinge side.

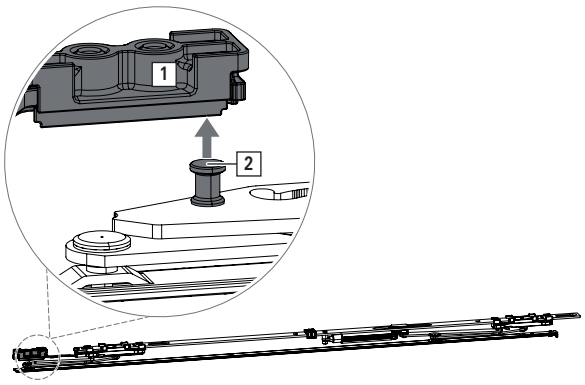
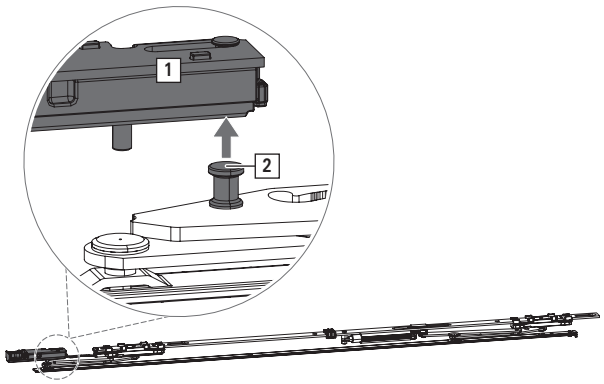
The Roto Patio Alversa | PS sliding scissor stay is available in left or right-hand variants. During insertion, ensure that the guide block is preassembled.

INFO

Roto Patio Alversa | PS Air Com: for a sliding scissor stay with installed retrofit set, install the top guide block as described in the "Adjustment" chapter → *10.6 "Top guide block, fixed" from page 209* → *10.7 "Top guide block, tiltable" from page 210*.

Preparing the PS sliding scissor stay

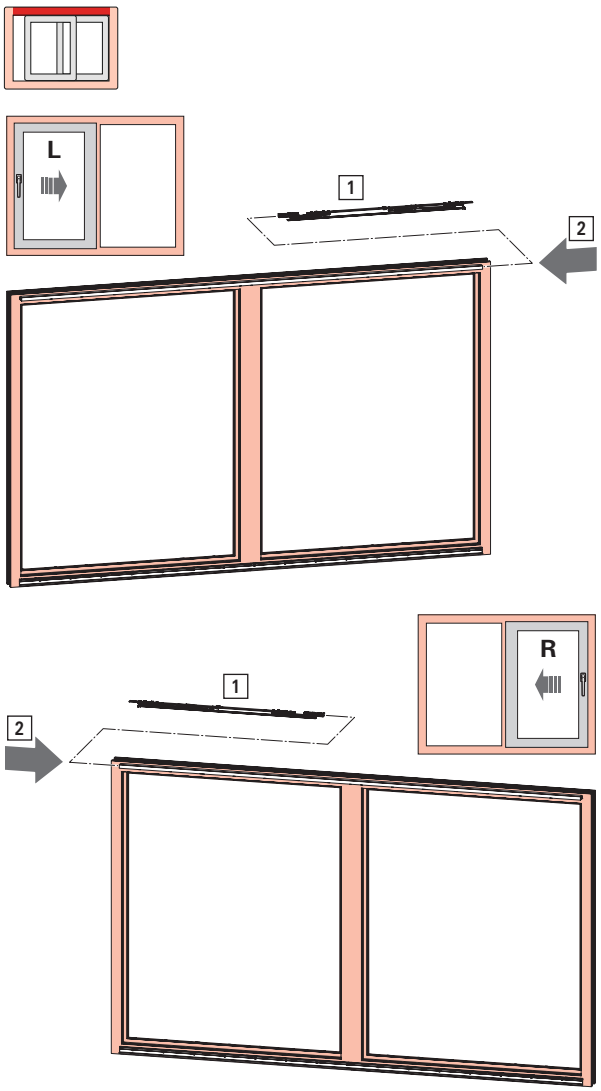
1. Mount the top guide block [1] into the sliding scissor stay bolt [2].

Variant	Guide block	Figure
Roto Patio Alversa | PS without night ventilation Roto Patio Alversa | PS with night ventilation	Top guide block, fixed	
Roto Patio Alversa | PS Air Roto Patio Alversa | PS Air Com	Top guide block, tiltable	

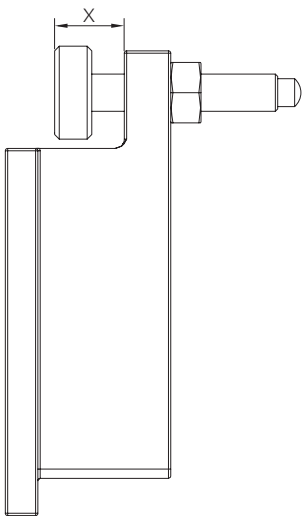
Inserting the PS sliding scissor stay and installing the top guide block

INFO
Slide the closed sliding scissor stay onto the frame when it is horizontal (workshop).

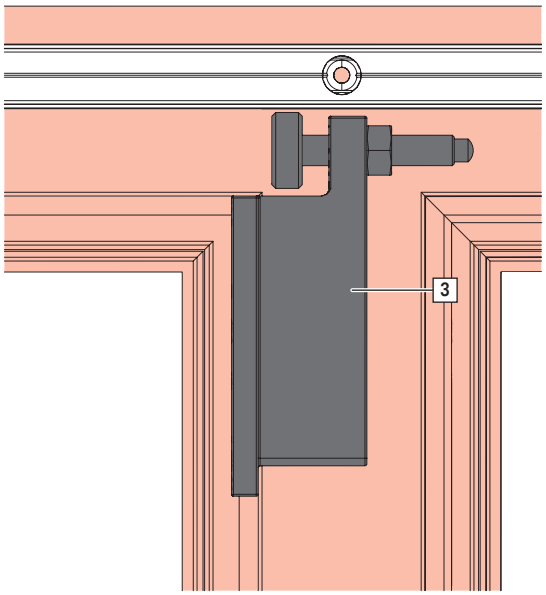
1. Insert the closed sliding scissor stay [1], with fitted guide block, into the guide track [2] from the hinge side.



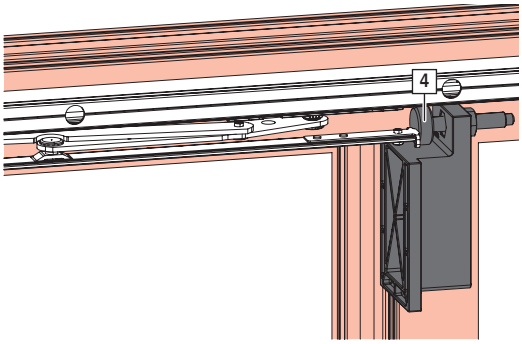
2. Adjust the installation jig for the top guide block.
   X = 23 + rebate clearance - overlap width
   (e.g.: X = 23 + 12 - 20 = 15 mm)



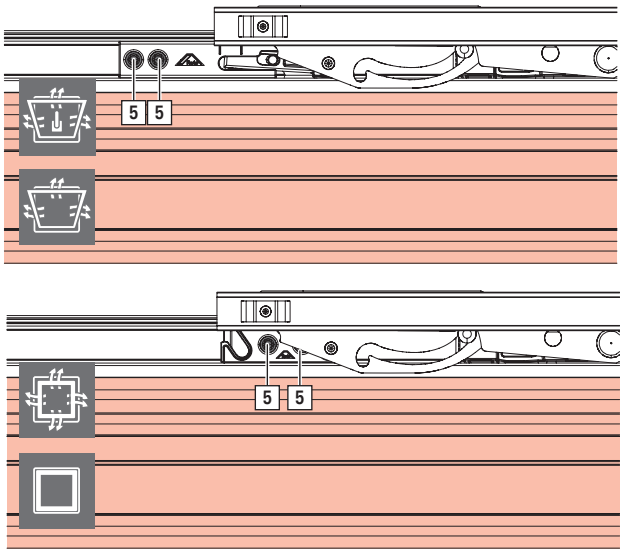
3. Place the installation jig [3] on the frame.



4. Push the sliding scissor stay towards the installation jig [4] as far as it will go.



5. Tighten both screws [5] on the top guide block using a T25 hexalobular socket screwdriver (torque: max. 3 - 4 Nm).



6. Secure the sliding scissor stay for transport to prevent it from opening and falling out.

8.5.6 Roller track

WARNING
Incorrect screw connections may lead to serious injuries.
The hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.
- ▸ Select the length of the screws so that they will hold in the aluminium profile. Alternatively, insert additional aluminium profiles.

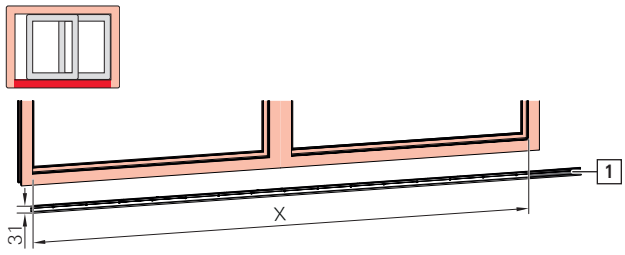
CAUTION
Inadequate load transfer may lead to crushing and property damage.
If no underlay is present between the roller track and base, this can cause the sash to fall.
- ▸ Underlay the roller track over the entire length on site in order to transfer the load.

8.5.6.1 Preparing the roller track

Cropping the roller track

INFO
Install the roller track on the frame when it is horizontal (workshop).
Roto Patio Alversa | KS: leave the roller track for diagram D 55 mm longer on the locking side.

1. Crop the roller track [1].
   X = frame internal width + (2 x coverage)

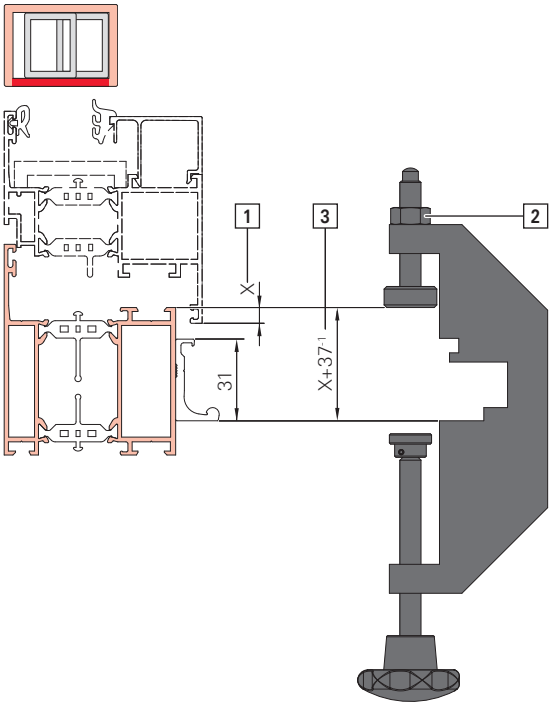


8.5.6.2 Roller track drill holes

Drilling the holes for the roller track

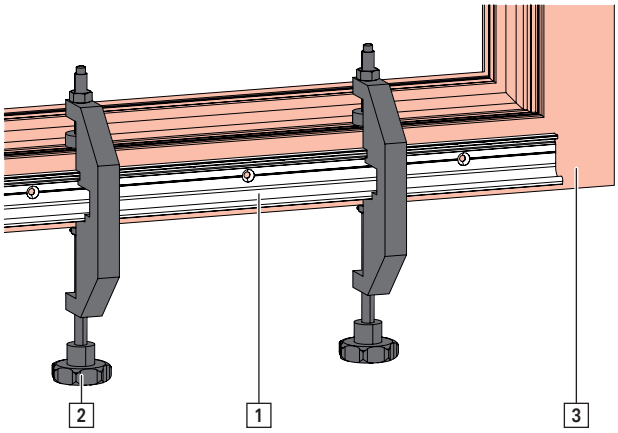
1. Adjust the jig for the roller track.

a. Determine coverage X [1] with a rebate clearance of 11.5 mm.
b. Undo the nut [2].
c. Adjust dimension X + 37 $^{-1}$ [3] for the roller track.
d. Tighten the nut.

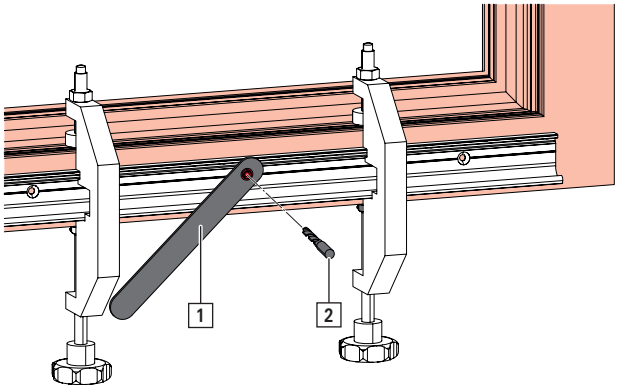


2. Align the roller track [1] with jigs [2] in the centre of the frame [3].

a. Position the roller track in two jigs.
b. Place the jigs with the roller track on the frame from above.
c. Secure the jigs to the frame.



3. Use a drilling aid [1] to drill holes in the roller track.
   Drill [2]: Ø 3.0 mm



8.5.6.3 Roller track

Installing the roller track

CAUTION

Inadequate load transfer may lead to crushing and property damage.

If no underlay is present between the roller track and base, this can cause the sash to fall.

- ▶ Underlay the roller track over the entire length on site in order to transfer the load.

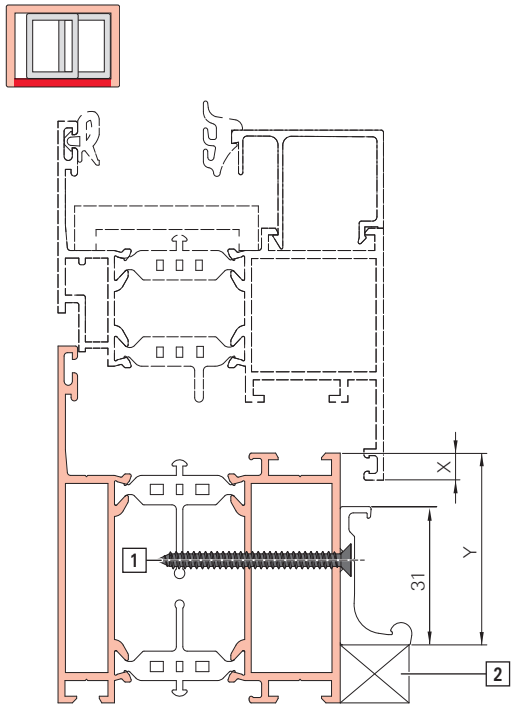
1. Fasten the roller track to the frame with the distance dimension Y. Note coverage X.

   With coverage 4: Y = 41 mm.

   With coverage 5: Y = 42 mm.

   With coverage 6: Y = 43 mm.

   Screw down the roller track in all predrilled holes using screws [1].



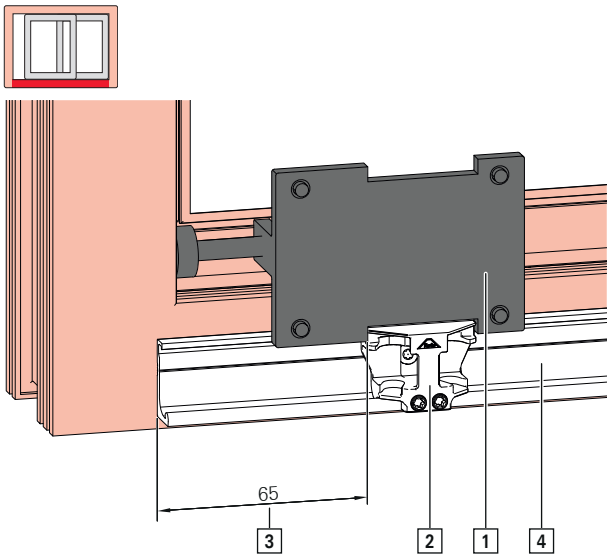
2. Underlay the roller track over the entire length on site in order to transfer the load [2].

8.5.7 Bottom guide block

8.5.7.1 Installing the bottom guide block

1. Diagram A: installation using a positioning jig

a. Adjust the jig [1] for the guide block [2] to approximately 65 mm [3] according to the figure.



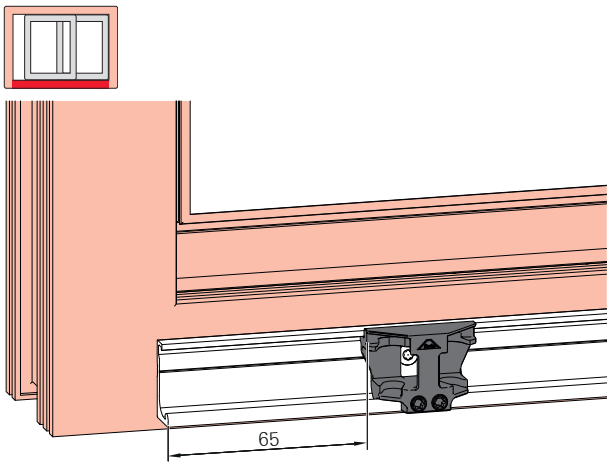
b. Insert the guide block in the roller track [4].

c. Place the jig for the guide block on the roller track.

2. Diagram A (alternative): installation using a dimensional drawing

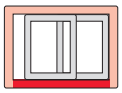
a. Insert the guide block [2] on the locking side without a jig.

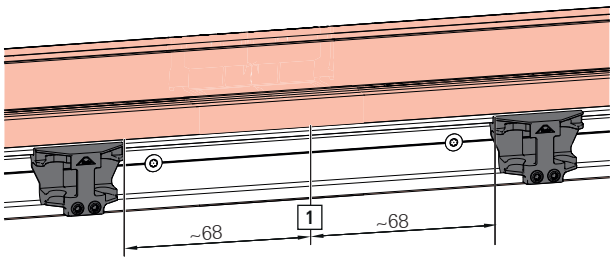
b. Position the guide block approximately 65 mm from the outer edge of the roller track on the locking side.



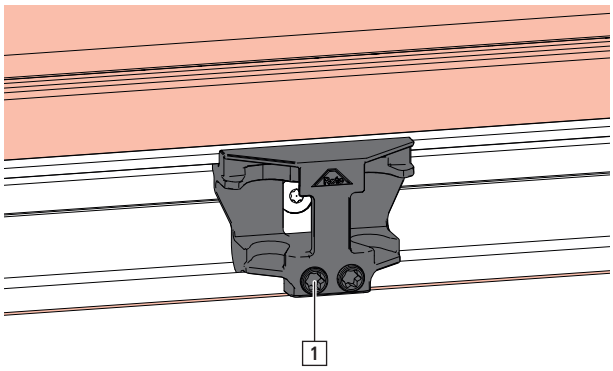
3. Diagram C: installation using a dimensional drawing

a. Position the guide block approximately 68 mm from the centre of the frame [1] if there is a continuous roller track.





4. Gently tighten one of the two screws [1] on the guide block using a T25 hexalobular socket screwdriver (torque: max. 1 Nm).



INFO
Join the sash and frame. Performing adjustment
Then tighten both screws on the guide block using a T25 hexalobular socket screwdriver (torque: max. 3 - 4 Nm).

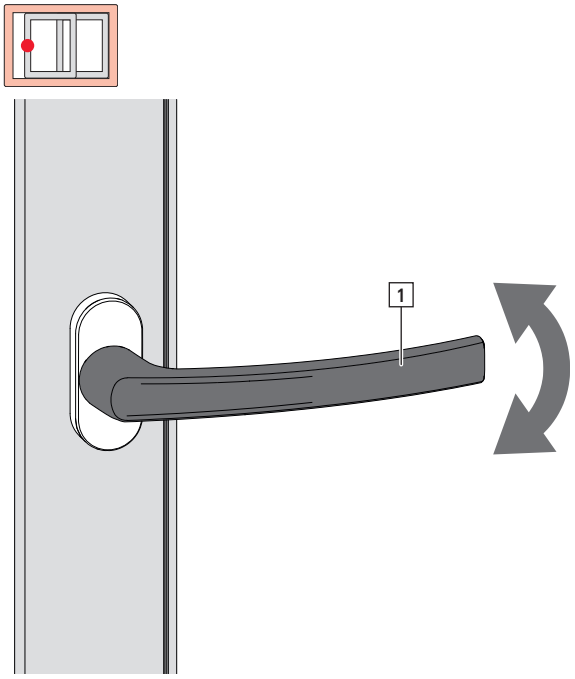
8.6 Joining the sash and frame

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.
- Do not rest sashes on the bogies.
- Use transportation means. → *14 "Transport" from page 225*

8.6.1 Sash

Placing the sash on the roller track

1. Move the handle [1] into the sliding position.



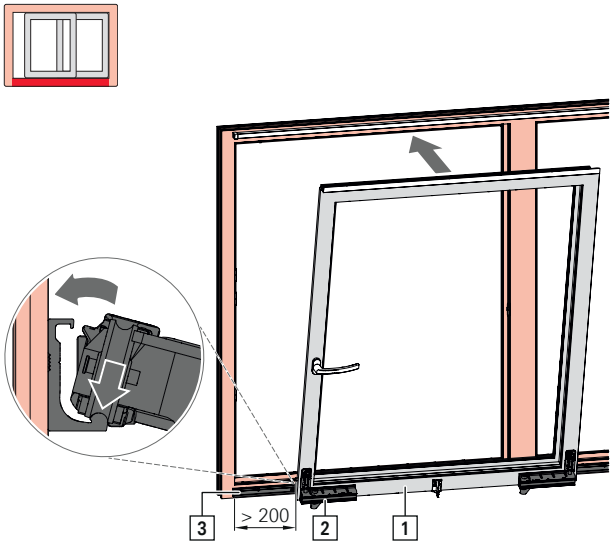
2. Lock the bogies in the stopped position.

3. Place the sash in front of the frame.

a. Use a clean underlay.
b. Only use a support-brace in the centre of the frame so that the bogies can hang free.

4. Lift the sash at a slight incline.

5. Place the sash [1] with the bogie rollers [2] on the front edge of the roller track [3].



6. Check that the bogie rollers are correctly positioned on the roller track by pushing the sash.

The bogies must run smoothly.

8.6.2 Sliding scissor stay

DANGER

Connecting the sliding scissor stay to the sash incorrectly presents an immediate risk of death and may cause serious injuries.

The window sash can fall out if the sliding scissor stay is not engaged correctly or not engaged at all in the drill hole in the retaining track, and if the end caps for the retaining track have not been installed. This results in an immediate risk of death.

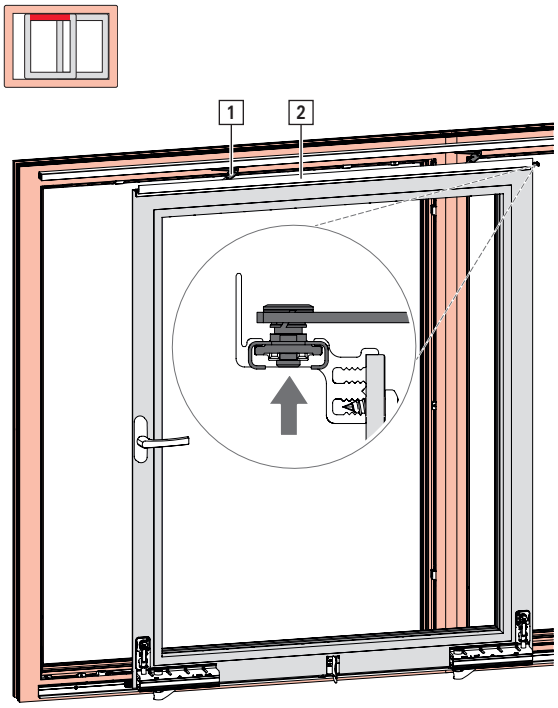
- Engage the sliding scissor stay safety pin in the drill hole in the retaining track correctly (see the following figure).
- Install the end caps for the retaining track with the preassembled locking plate. → *8.6.3 "End caps for retaining track" from page 181*

Inserting the sliding scissor stay into the sash

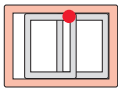
Drill hole in the retaining track. → *8.4.8.4 "Retaining track (storage length)" from page 121*

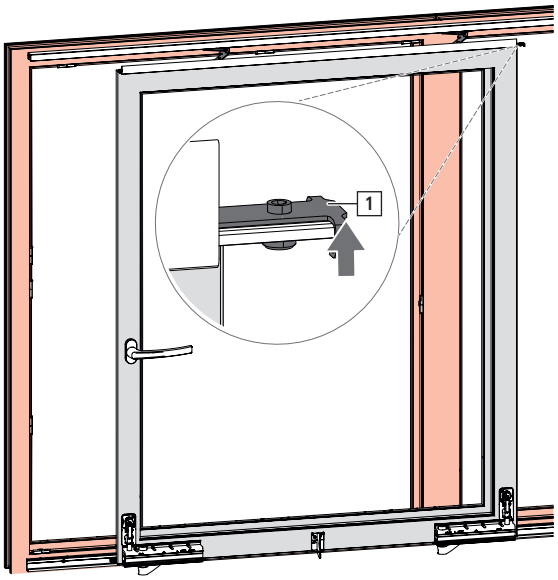
1. Push the sliding scissor stay [1] towards the fixed glazing.

   Insert the sliding scissor stay into the groove of the retaining track [2] from the hinge side.



2. Push the sliding scissor stay spring [1] upwards.

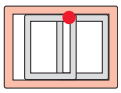


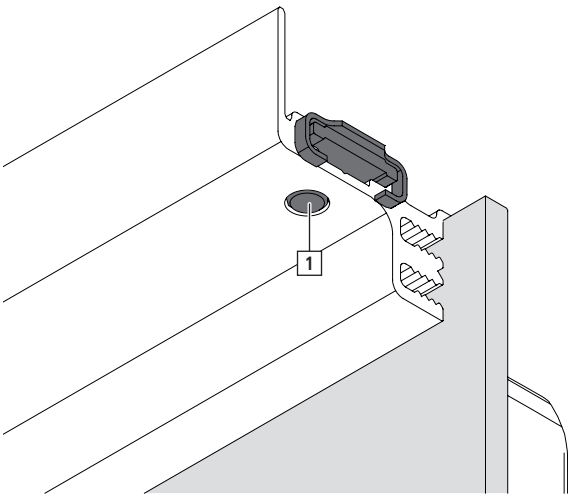


3. Continue to push the sliding scissor stay until the sliding scissor stay safety pin engages in the drill hole in the retaining track.

4. Check that the sliding scissor stay has been installed correctly.

   The safety pin must be visibly engaged in the drill hole [1] in the retaining track from below.



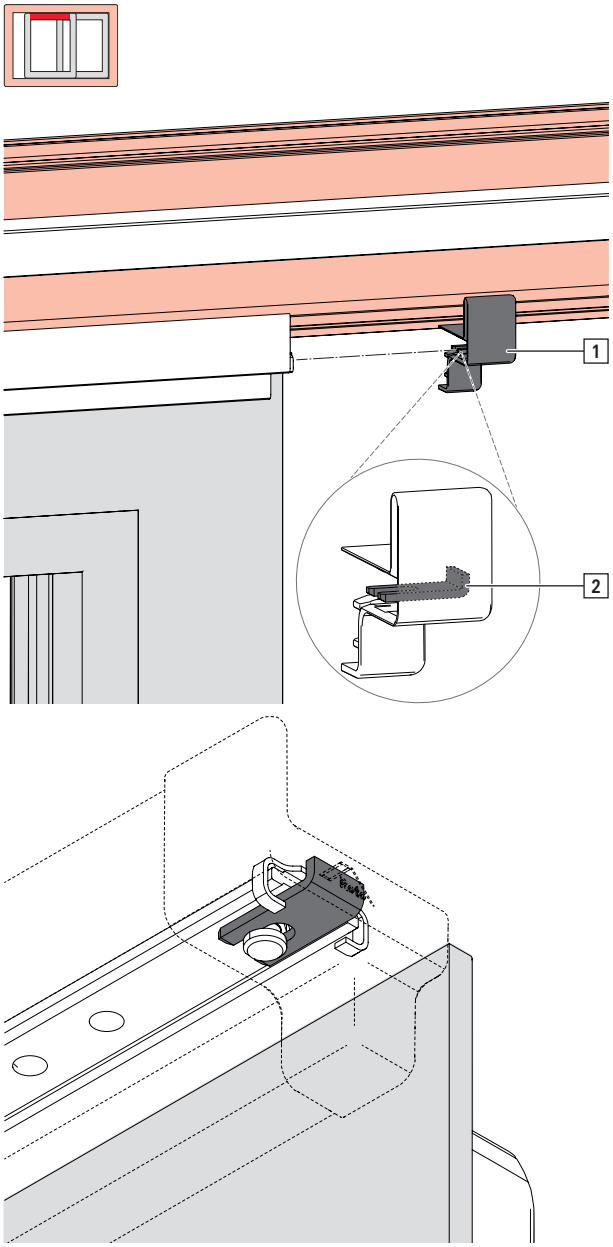


8.6.3 End caps for retaining track

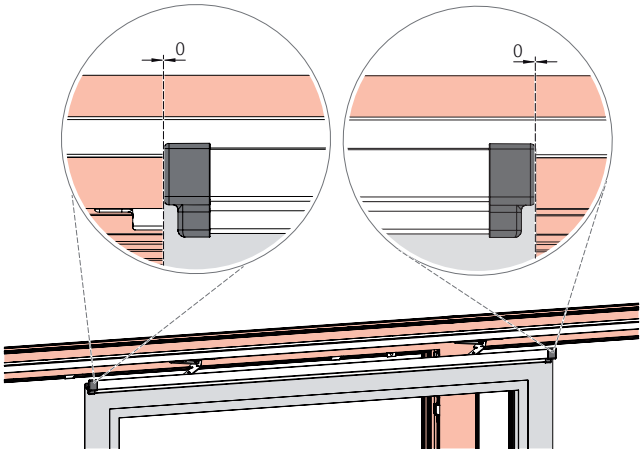
Installing end caps for the retaining track

1. Place the end caps [1] on the left and right ends of the retaining track.

   The locking plate [2] in the end caps prevents the safety pin from inadvertently coming out of the retaining track.



2. Check the end caps to ensure that they lie flush with the sash.



INFO
Roto Patio Alversa | PS:
Check for 11.5 mm rebate clearance on both sides.
Check that the top and bottom guide blocks are installed in the same way.
If necessary, reposition the top guide block.
→ *10.6 "Top guide block, fixed" from page 209*
→ *10.7 "Top guide block, tiltable" from page 210*

8.6.4 Bottom guide block, movable

INFO
Turn-Only sash (diagram D) can be opened for cleaning and maintenance work.

8.6.4.1 Bottom guide block, movable

Drilling the hole for the movable bottom guide block

PRECONDITION
Adjustment completed. → *10 "Adjustment" from page 206*
- Bogies, horizontal
- Rebate clearance, horizontal

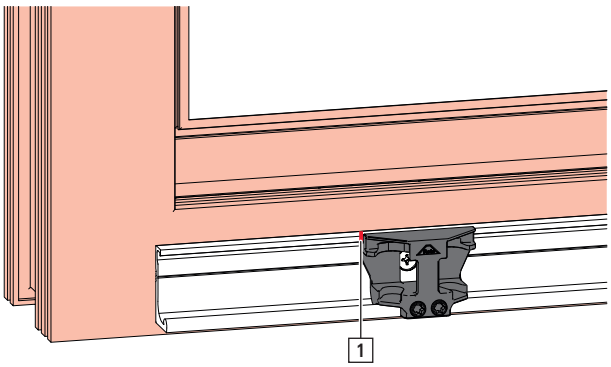
The bottom guide block is installed. → *8.5.7 "Bottom guide block" from page 175*
Roto Patio Alversa | KS: leave the roller track for diagram D 55 mm longer on the locking side.

1. Move the sash into the sliding position.

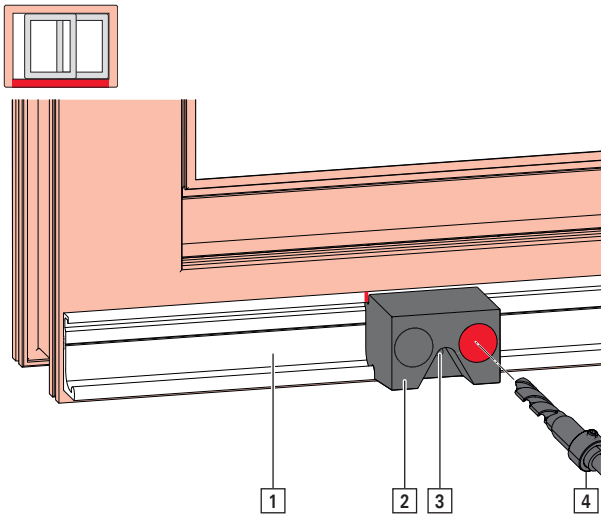
2. Check for 12 mm rebate clearance on both sides.

If necessary, reposition the bottom guide block.

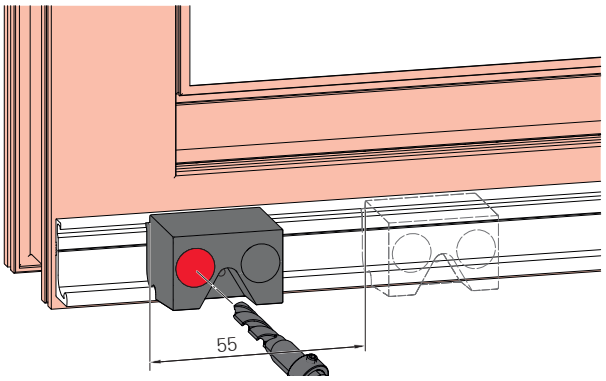
3. Mark the position of the bottom guide block [1].
   Remove the bottom guide block.



4. Insert the drilling jig for the movable bottom guide block in the roller track [2].
   Align the drilling jig for the movable bottom guide block [1] on the marking.
   Fix the drilling jig in place using a threaded pin [3].
   Use a special step drill [4] to drill into the roller track up to the stop.



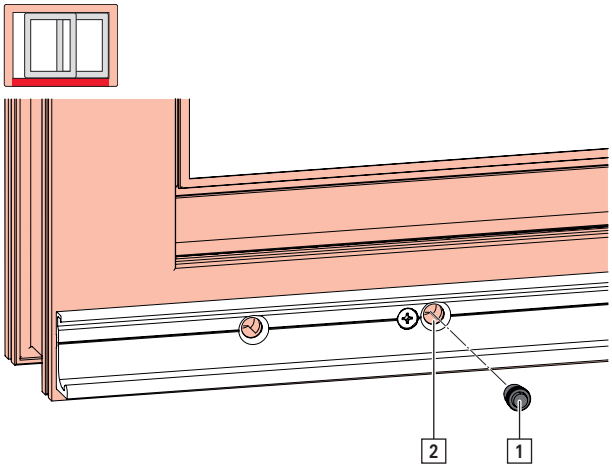
5. Move the drilling jig 55 mm to the left.
   Drill up to the stop again in the second hole on the drilling jig.
   Remove the drilling jig for the movable bottom guide block.



8.6.4.2 Bottom guide block, movable

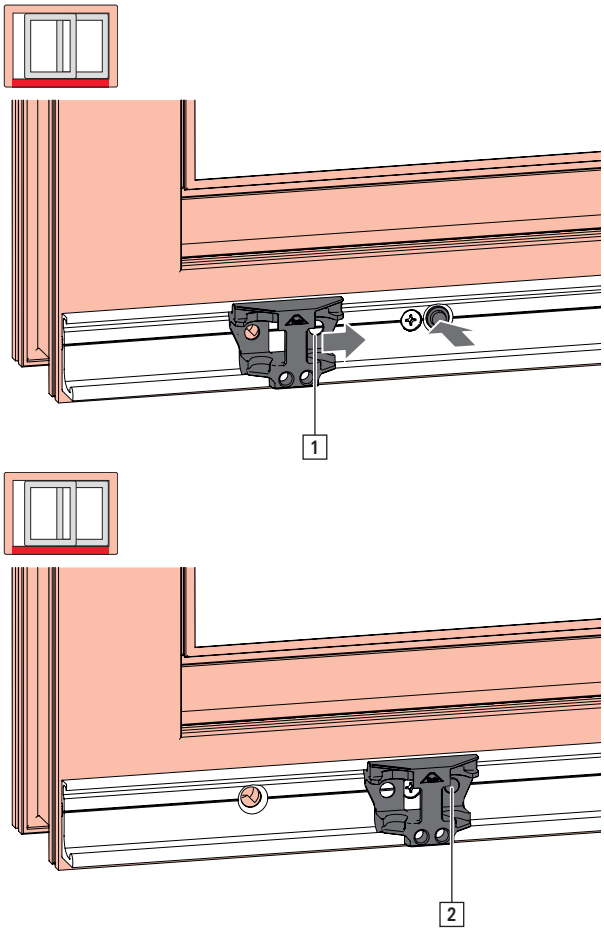
Installing the movable bottom guide block

1. Insert the locking mechanism [1] for the movable bottom guide block into the drill hole [2].

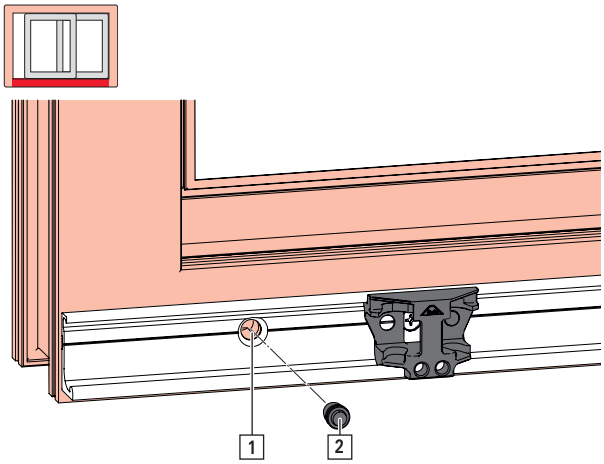


2. Insert the movable bottom guide block [1] into the roller track.

   Let the locking mechanism of the movable bottom guide block engage in the drill hole [2].



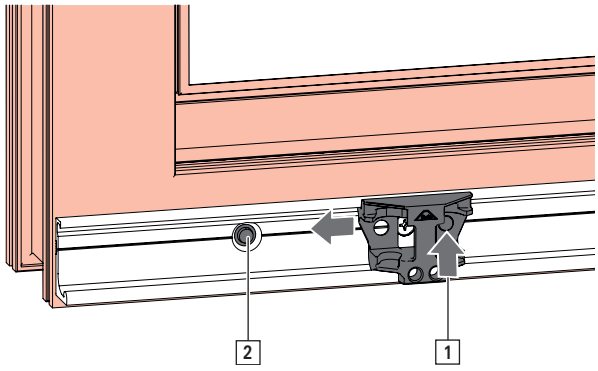
3. Insert the additional locking mechanism [2] for the movable bottom guide block into the outer drill hole [1].



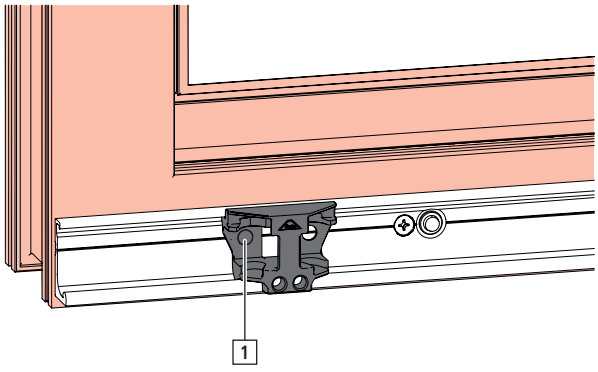
Opening the Turn-Only sash (diagram D) for cleaning and maintenance work

1. Open the window sash in the sliding position.

2. Push out the locking mechanism for the movable bottom guide block [1] and move it [2].



3. Let the movable bottom guide block engage in the outer locking mechanism [1].



4. Slowly push the window sash in the locking direction until the roller unit reaches the movable bottom guide block.

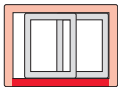
5. Open the Turn-Only sash.

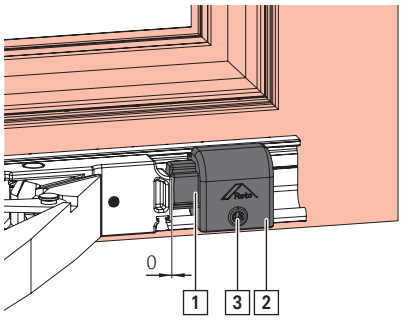
INFO
When closing, ensure that the movable bottom guide block is locked back in the original position.

8.6.5 Buffer stops

Installing the bottom buffer stop

1. Insert the rubber buffer [1] into the buffer stop [2].





2. Insert the bottom buffer stop into the required position in the roller track.

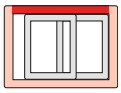
3. Tighten the screw [3] using a T25 hexalobular socket screwdriver (torque: 2 - 3 Nm).

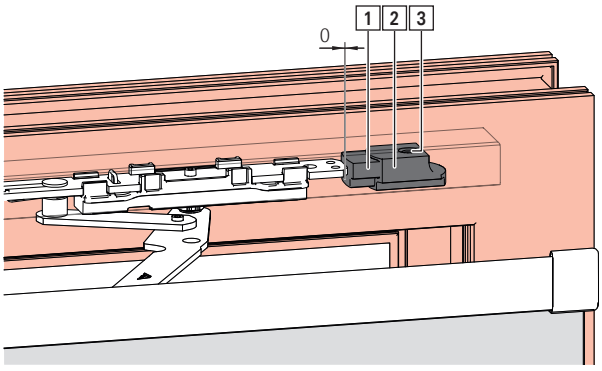
Installing the top buffer stop

1. Insert the rubber buffer [1] into the buffer stop [2].

2. Open the sash until it reaches the buffer stop.

3. Insert the top buffer stop into the guide track until it reaches the scissors-slider.





4. Tighten the screw [3] using a T25 hexalobular socket screwdriver (torque: 2 - 3 Nm).

5. Check whether the sash touches the top and bottom buffer stop at the same time.
   If necessary, realign the top buffer stop.

8.6.6 Covers

8.6.6.1 Bogie cover profile

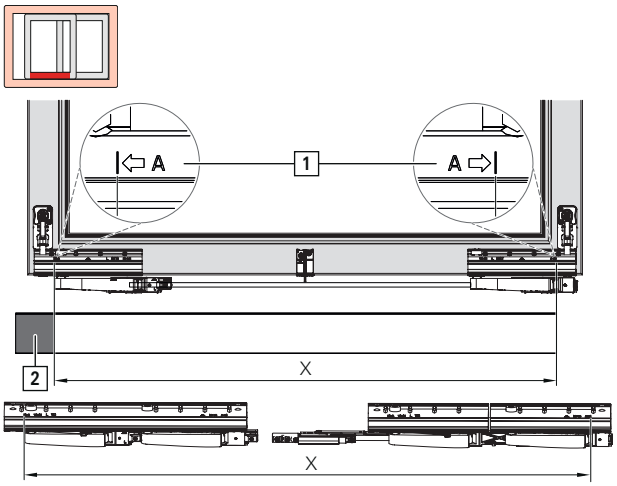
Installing the bogie cover profile

1. Carry out the necessary adjustments before installing the bogie cover. → *10 "Adjustment" from page 206*

2. Crop the cover profile.

a. Without reinforcement part: mark and crop the cover profile at the outer edges of the bogie profiles.

b. With reinforcement part: crop the cover profile according to the markings [1] on the bogies [2].

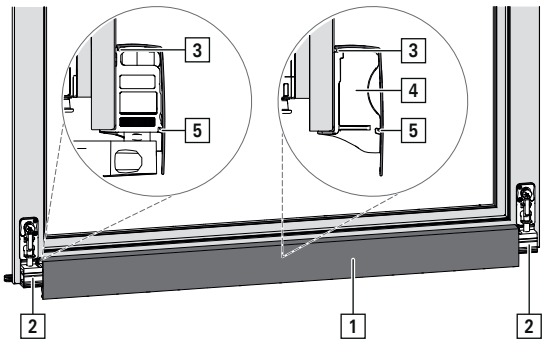


3. Move the cover profile into place.

a. Align the cover profile [1] with the markings on the bogies [2].

b. Insert the top of the cover profile [3] into the bogie and the supporting piece [4].

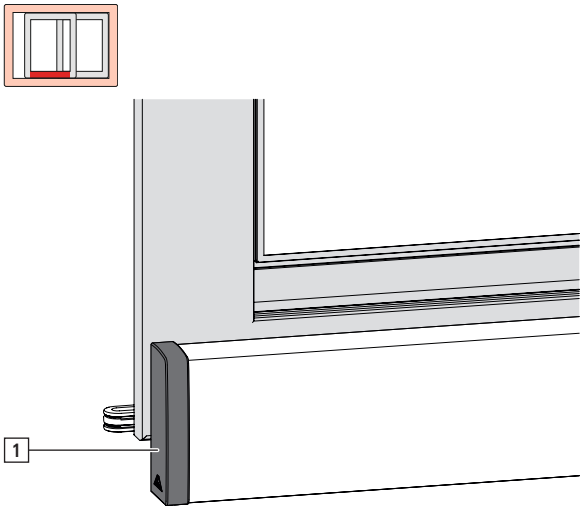
c. Clip the bottom of the cover profile into the bogie and the supporting piece [5].



8.6.6.2 Cover caps for bogies without a reinforcement bracket

Installing cover caps for bogies without a reinforcement bracket

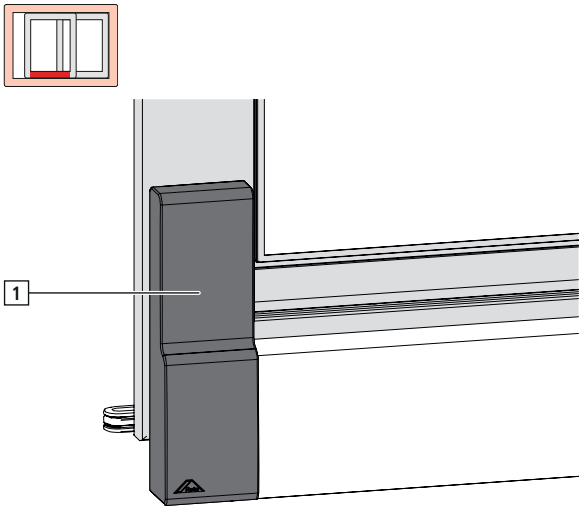
1. Place the corresponding cover caps [1] on the left and right of the cover profile bogies.



8.6.6.3 Cover caps for bogies with a reinforcement bracket

Installing cover caps for bogies with a reinforcement bracket

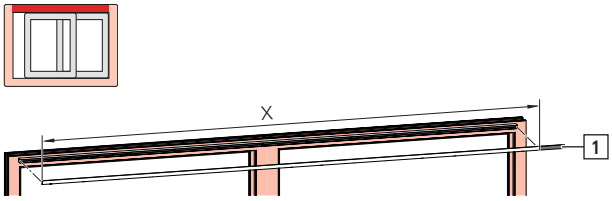
1. Clip the corresponding cover caps [1] to the left and right of the reinforcement brackets.



8.6.6.4 Guide track cover profile

Installing the guide track cover profile

1. Crop the cover to the dimension of the guide track [1].

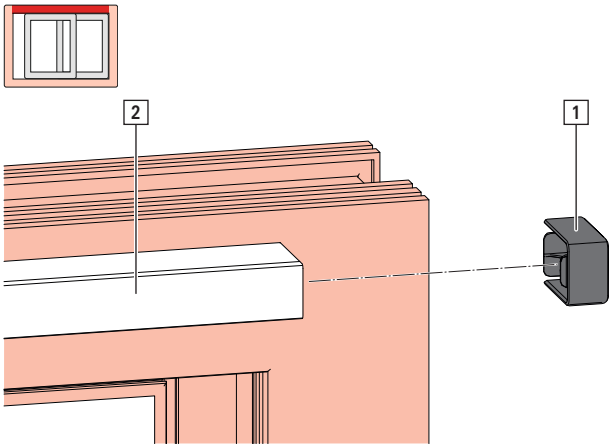


2. Place the cover on the guide track.

8.6.6.5 Guide track end caps

Installing guide track end caps

1. Place the end caps [1] on the right and left of the guide track [2].



9 Installation drawings

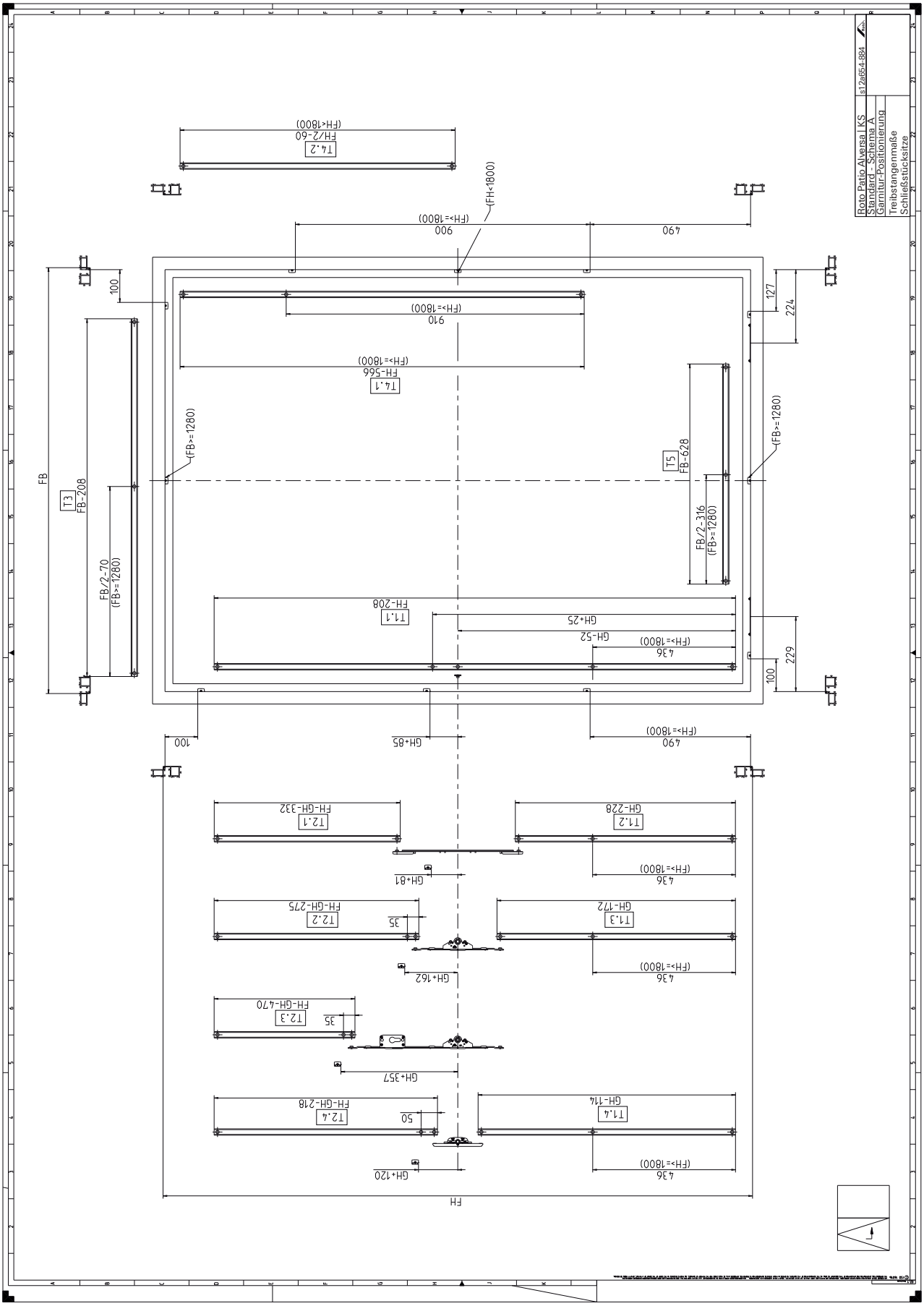
9.1 Explanation

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

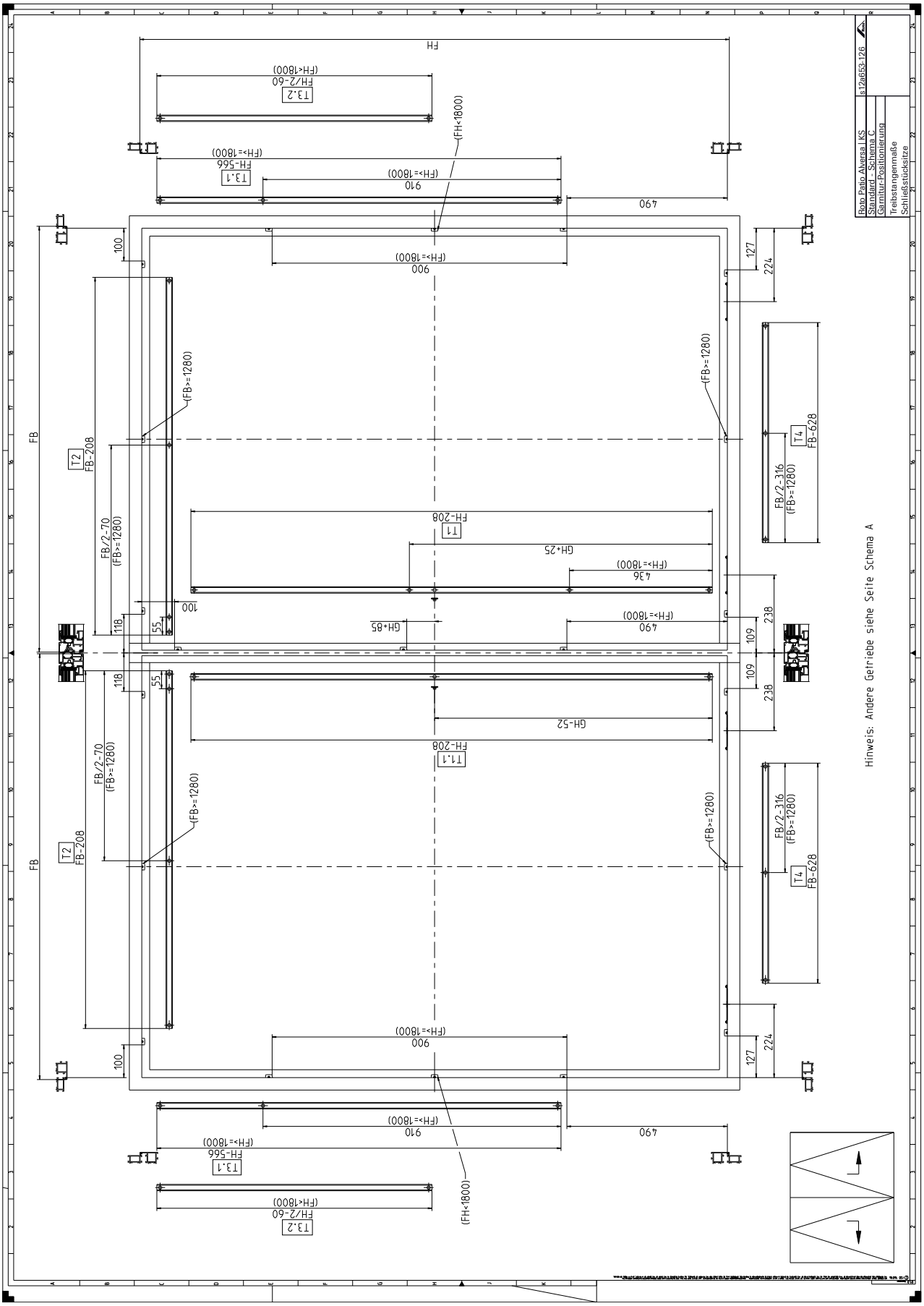
Marking	Meaning
FB	Sash width
FH	Sash height
Garnitur-Positionierung	Set positioning
Getriebevarianten	Espagnolette variants
GH	Handle height
Hinweis: Andere Getriebe siehe folgende Seite	Note: see the following page for other espagnolettes
Hinweis: Andere Getriebe siehe Seite Schema A	Note: see diagram A for other espagnolettes
Kipplager	Tilt strikers
Schema A	Diagram A
Schema C	Diagram C
Schließstücksitze	Striker positions
STD	Standard
T	Connecting rod
Treibstangenmaße	Connecting rod dimensions

INFO
All connecting rod dimensions refer to an overlap width of 22 mm.
If the overlap width differs from this, adapt the connecting rod dimensions accordingly.
All connecting rod dimensions T ±0.5 mm.

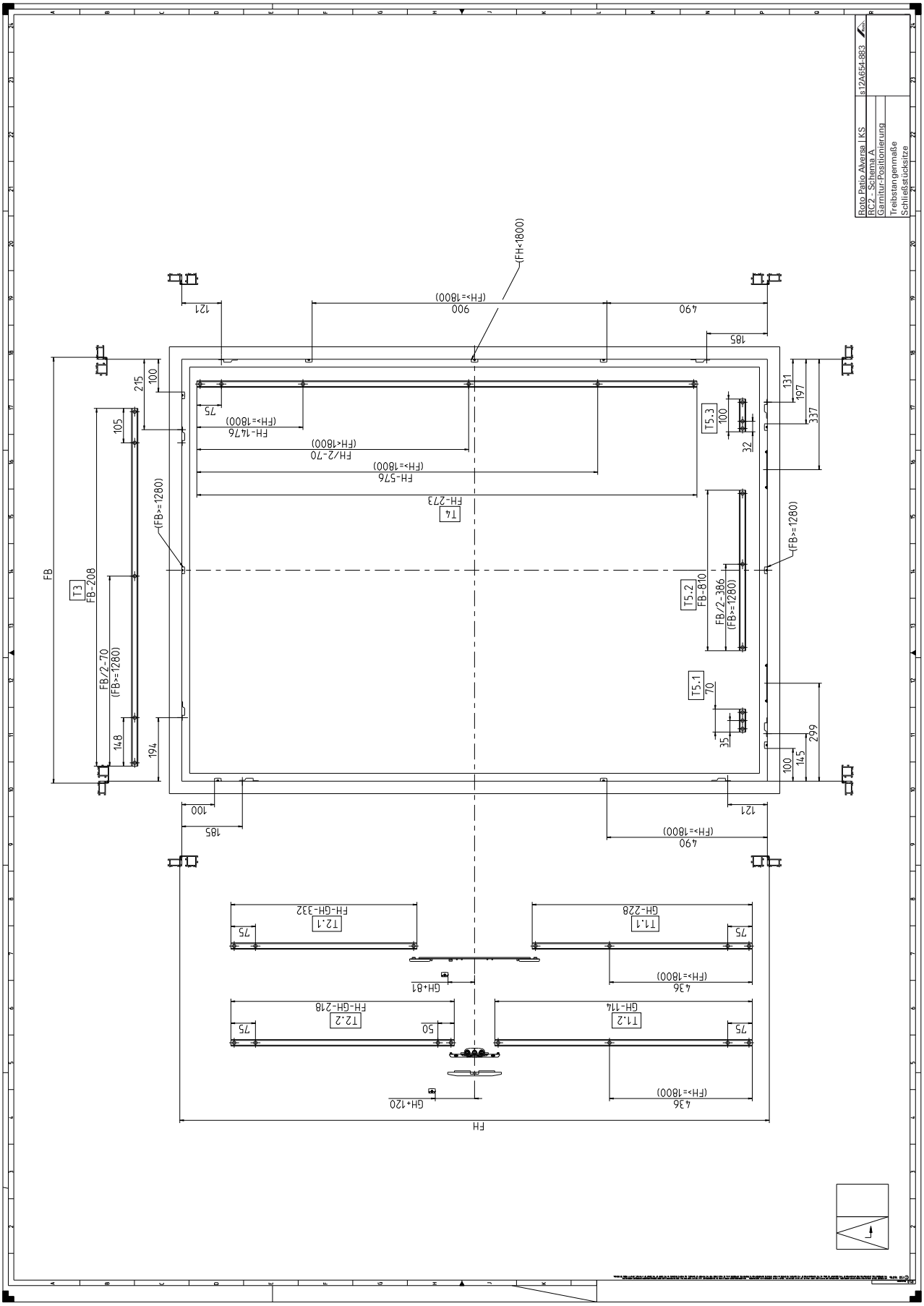
9.2 Installation drawings for Roto Patio Alversa | KS; diagram A; std.



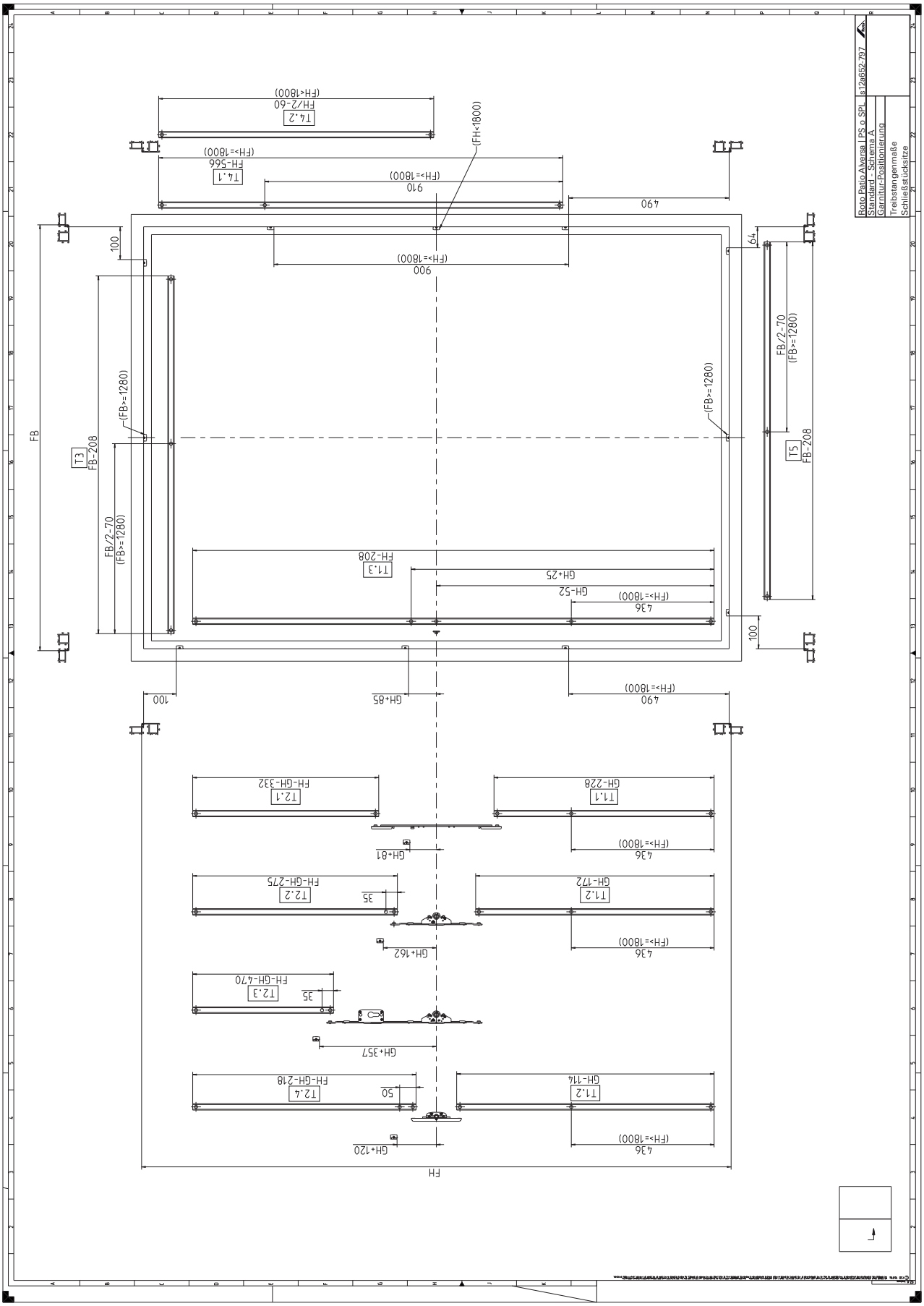
9.3 Installation drawings for Roto Patio Alversa | KS; diagram C; std.



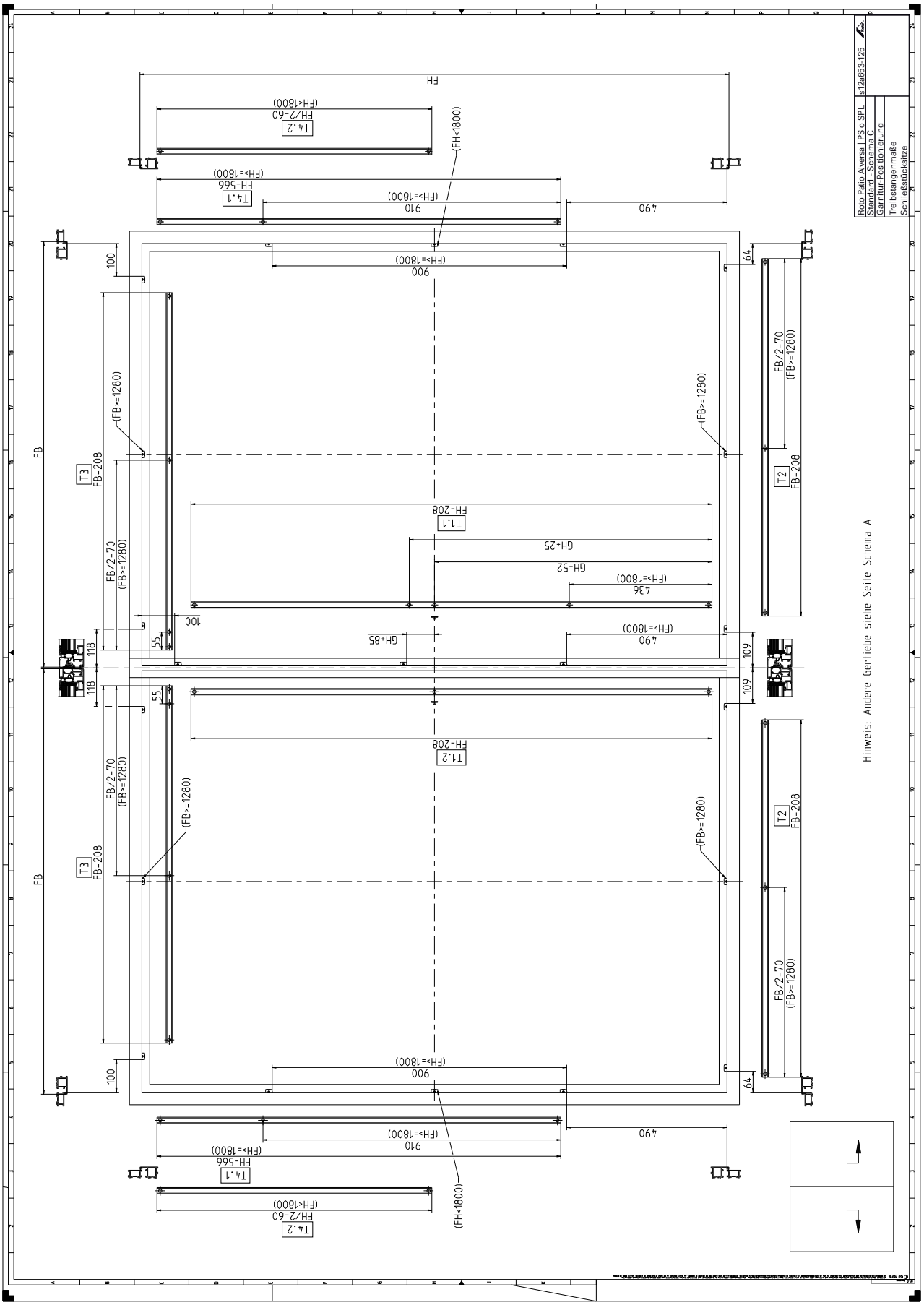
9.4 Installation drawings for Roto Patio Alversa | KS; diagram A; RC2 / RC2N



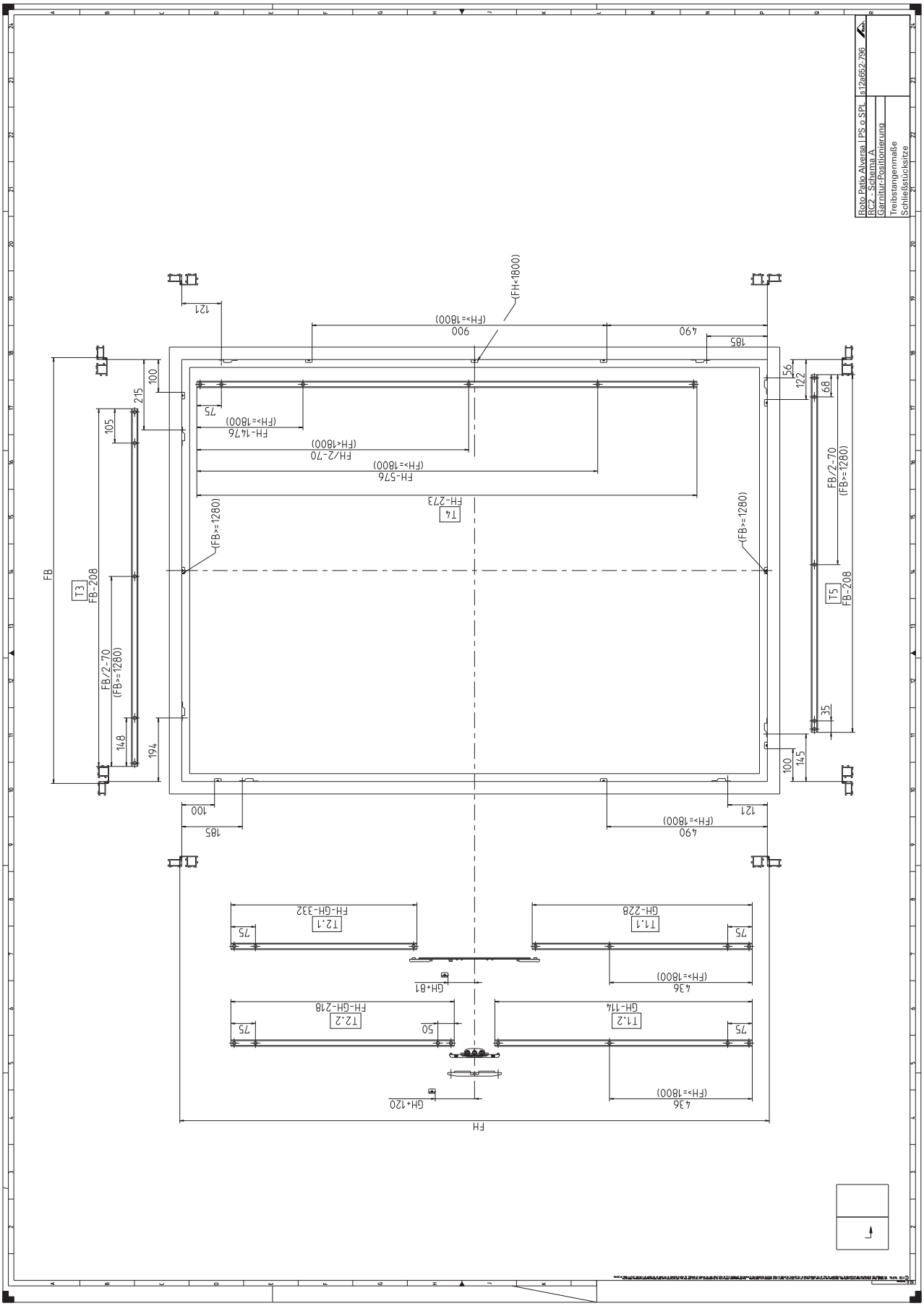
9.5 Installation drawings for Roto Patio Alversa | PS without night ventilation; diagram A; std.



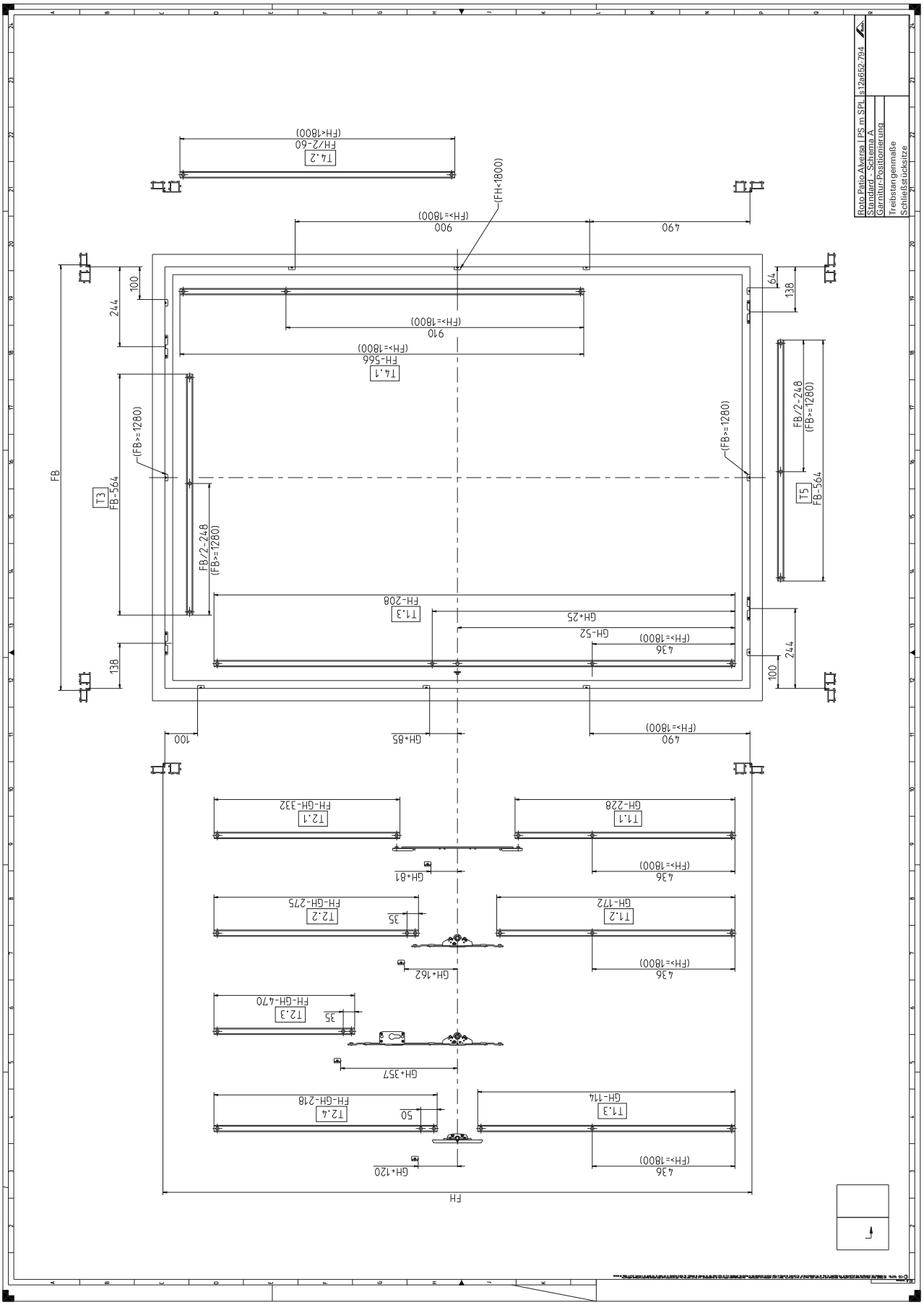
9.6 Installation drawings for Roto Patio Alversa | PS without night ventilation; diagram C; std.



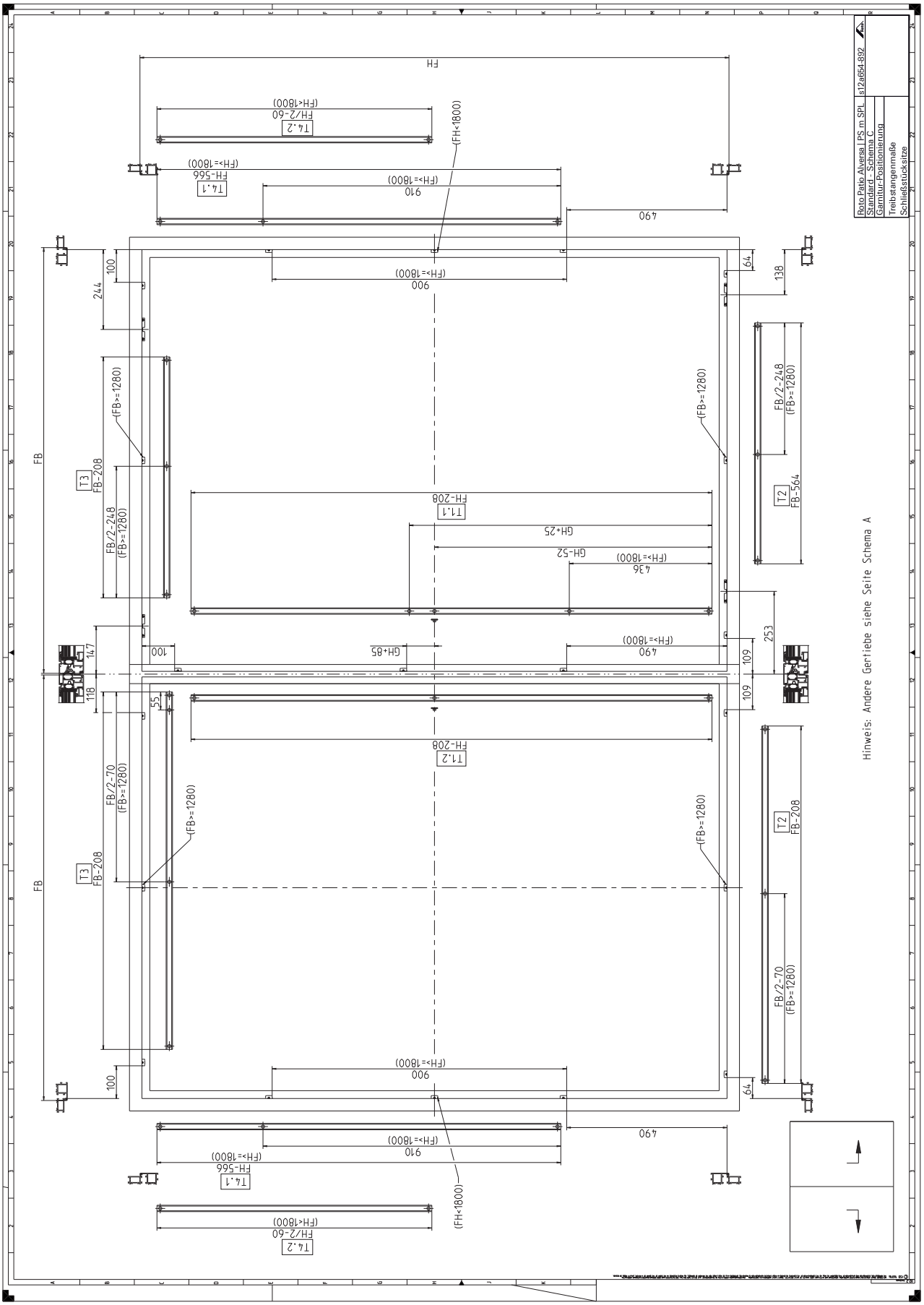
9.7 Installation drawings for Roto Patio Alversa | PS without night ventilation; diagram A; RC2 / RC2N



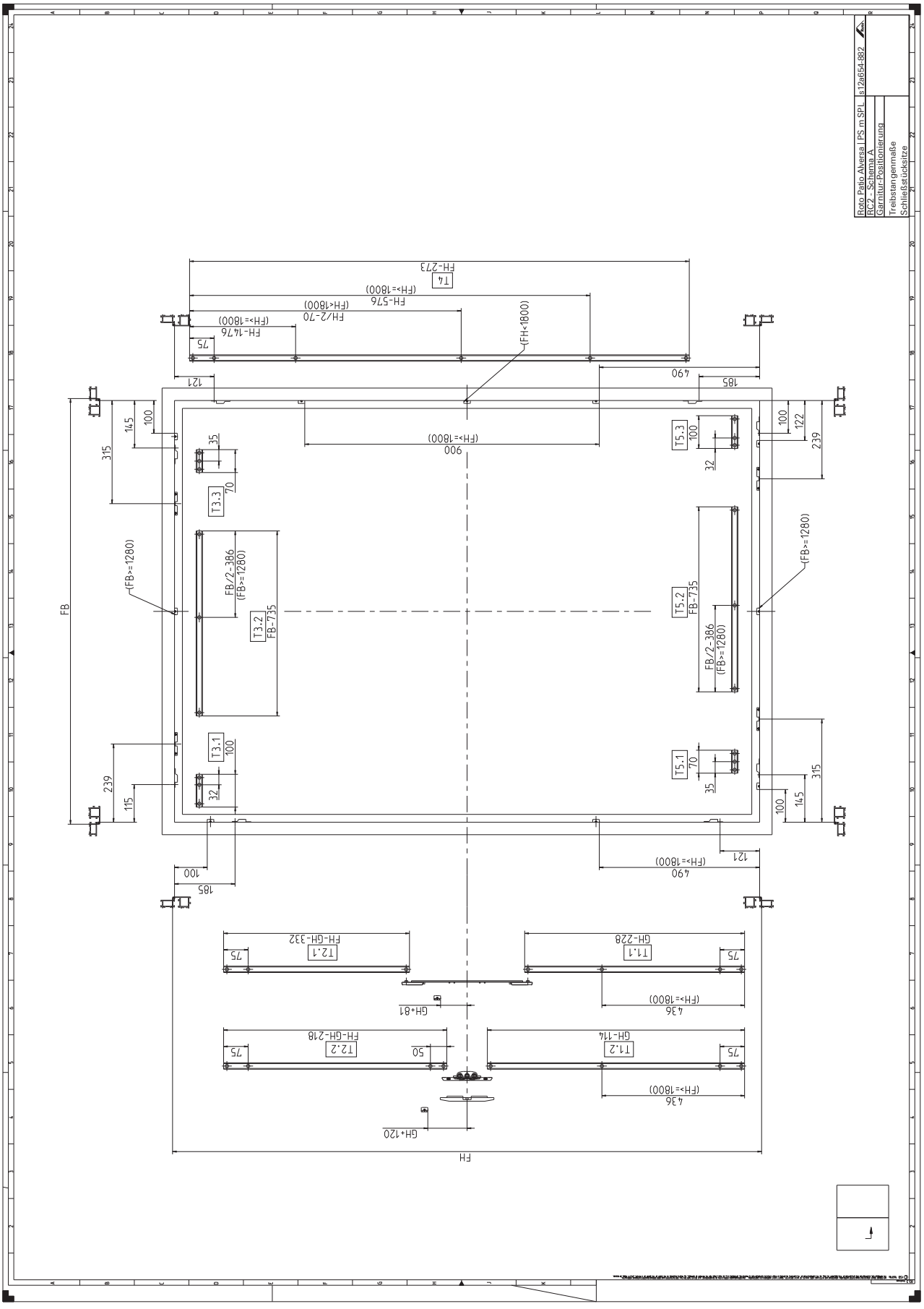
9.8 Installation drawings for Roto Patio Alversa | PS with night ventilation; diagram A; std.



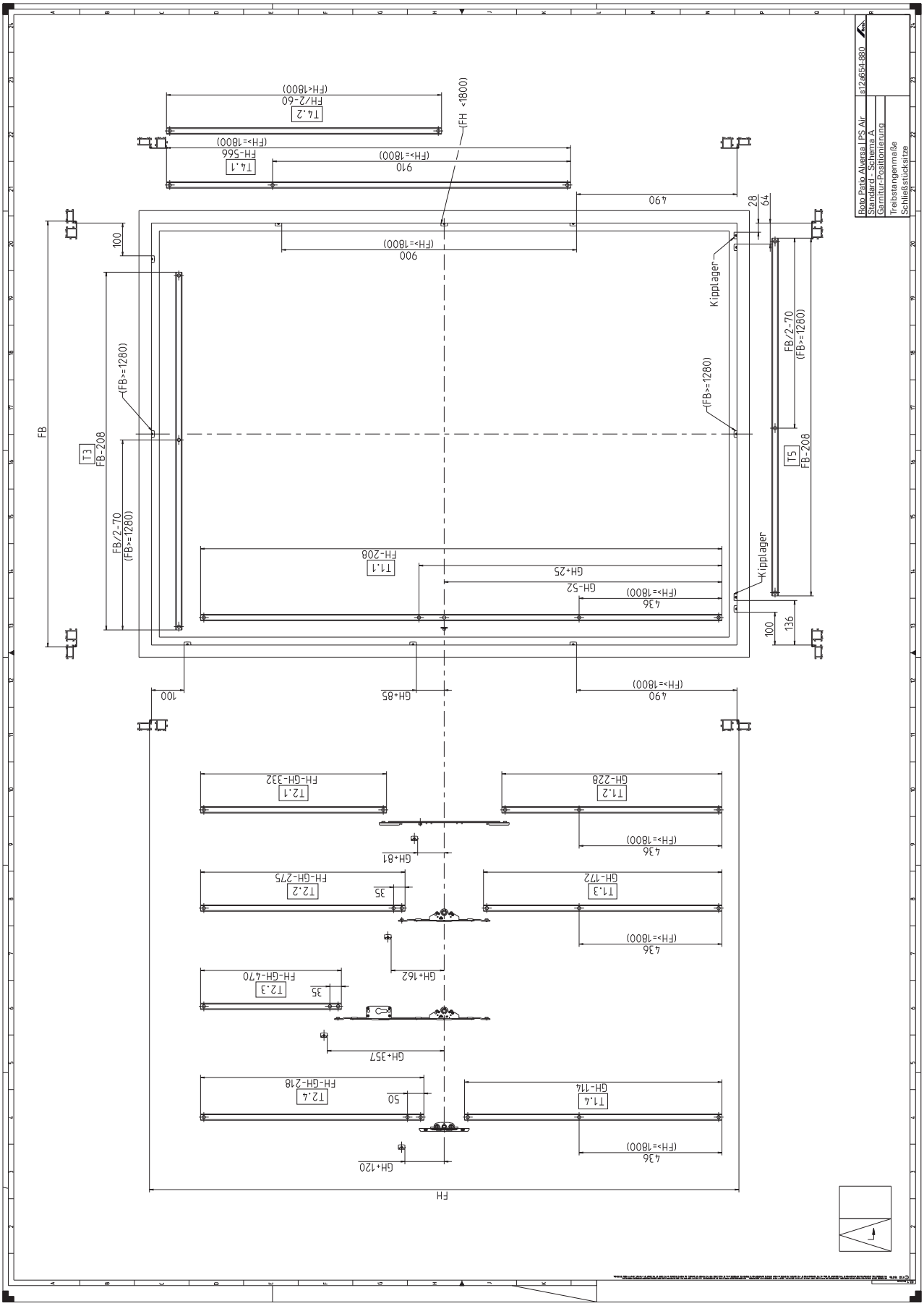
9.9 Installation drawings for Roto Patio Alversa | PS with night ventilation; diagram C; std.



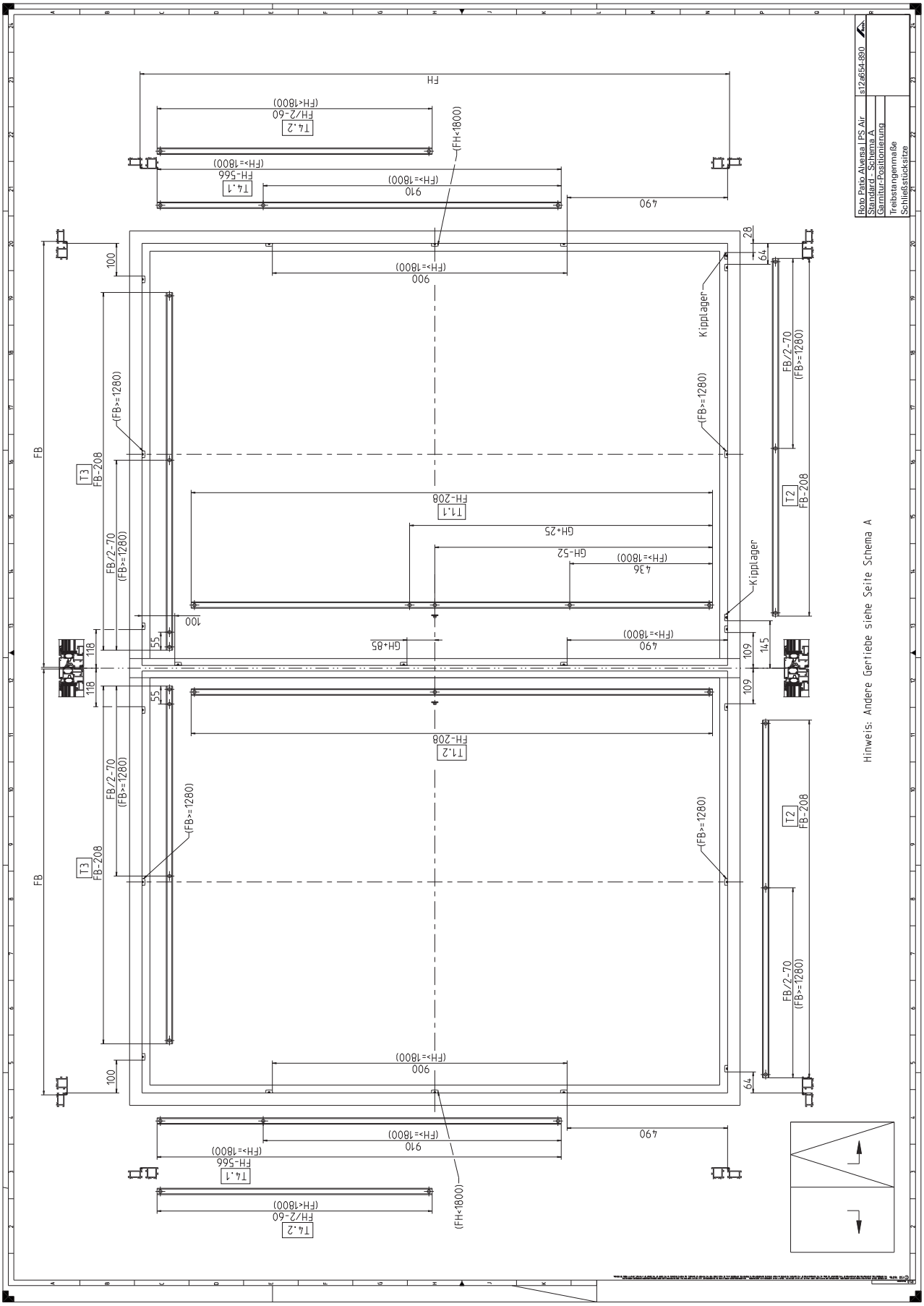
9.10 Installation drawings for Roto Patio Alversa | PS with night ventilation; diagram A; RC2 / RC2N



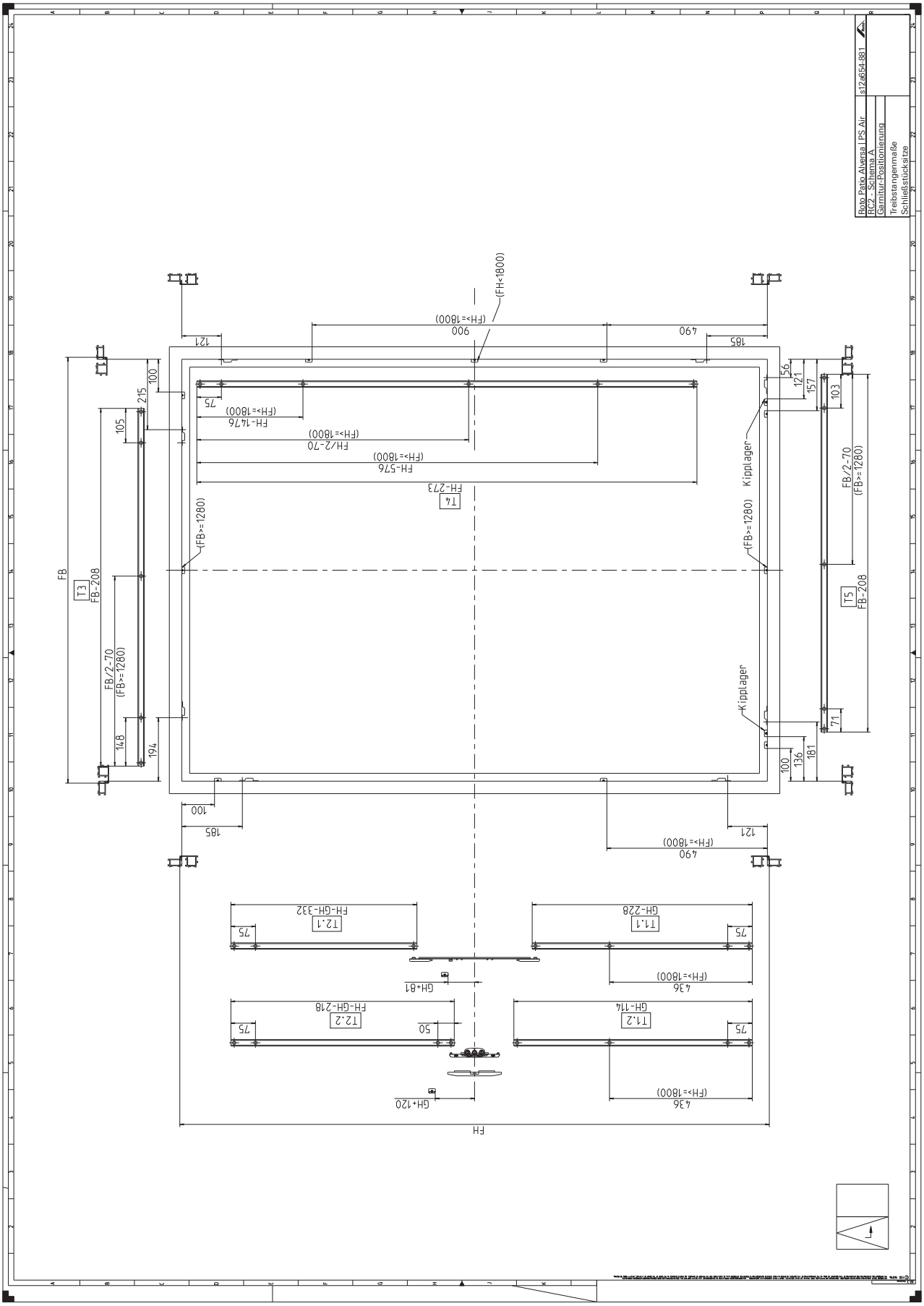
9.11 Installation drawings for Roto Patio Alversa | PS Air; diagram A; std.



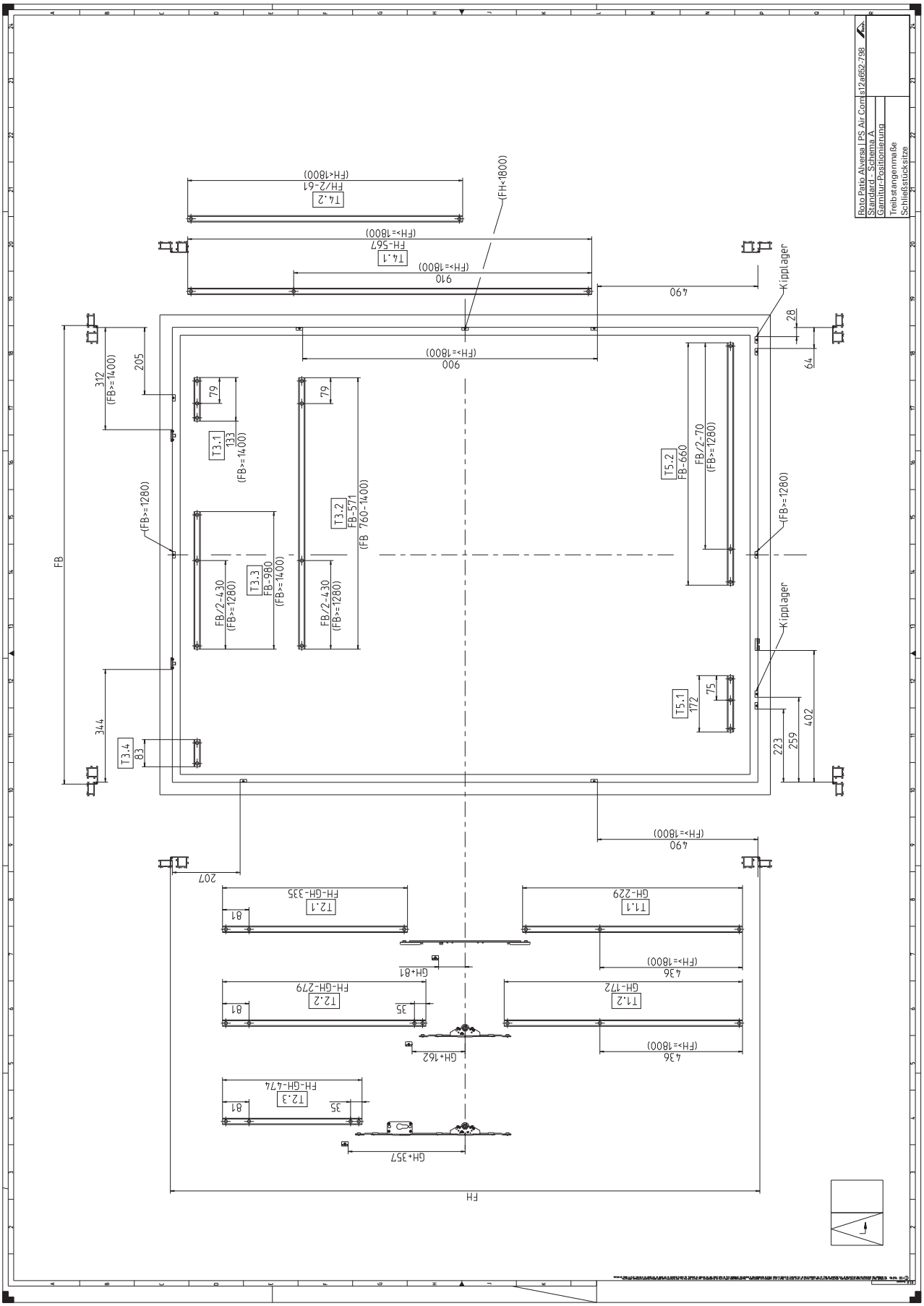
9.12 Installation drawings for Roto Patio Alversa | PS Air; diagram C; std.



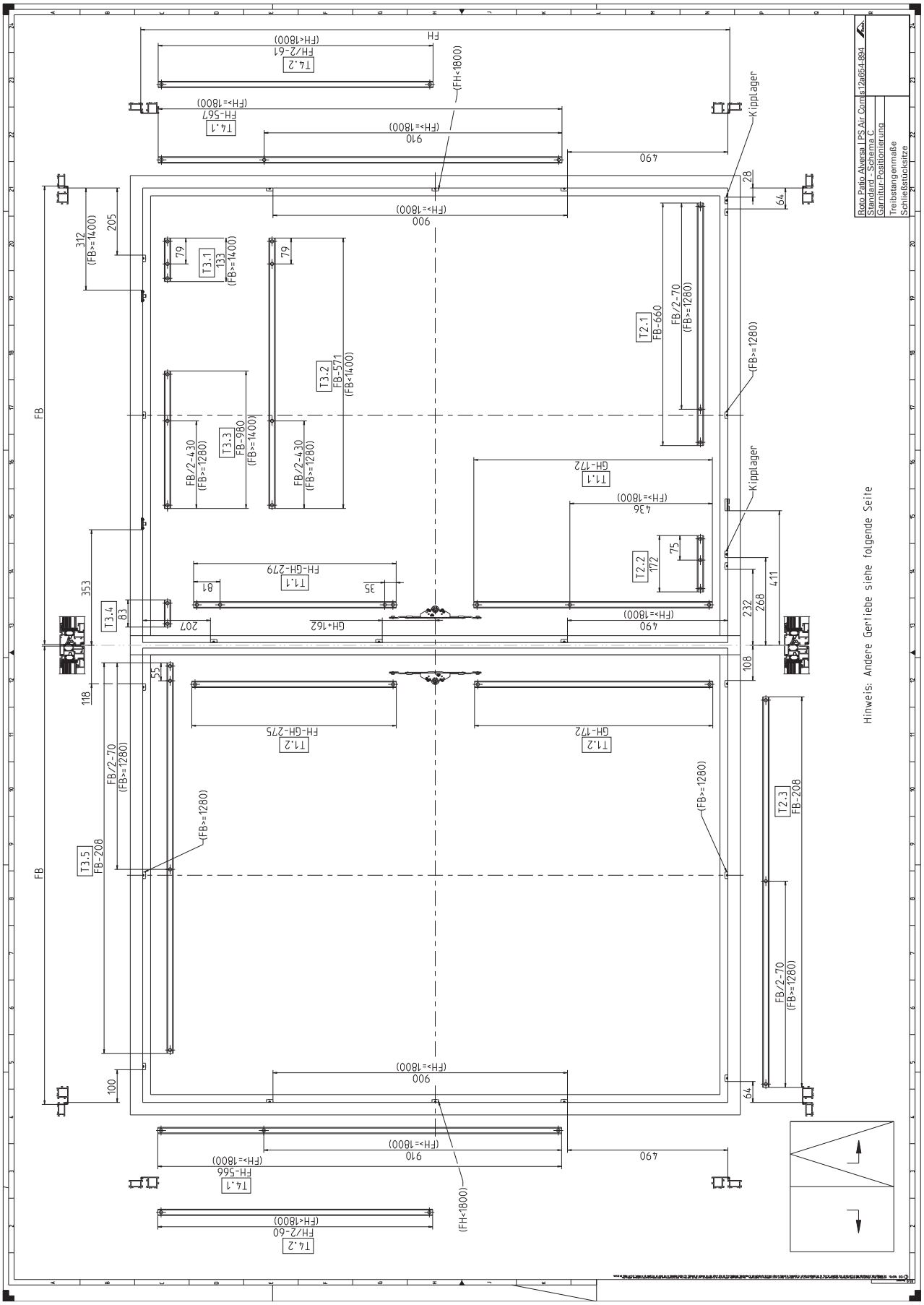
9.13 Installation drawings for Roto Patio Alversa | PS Air; diagram A; RC2



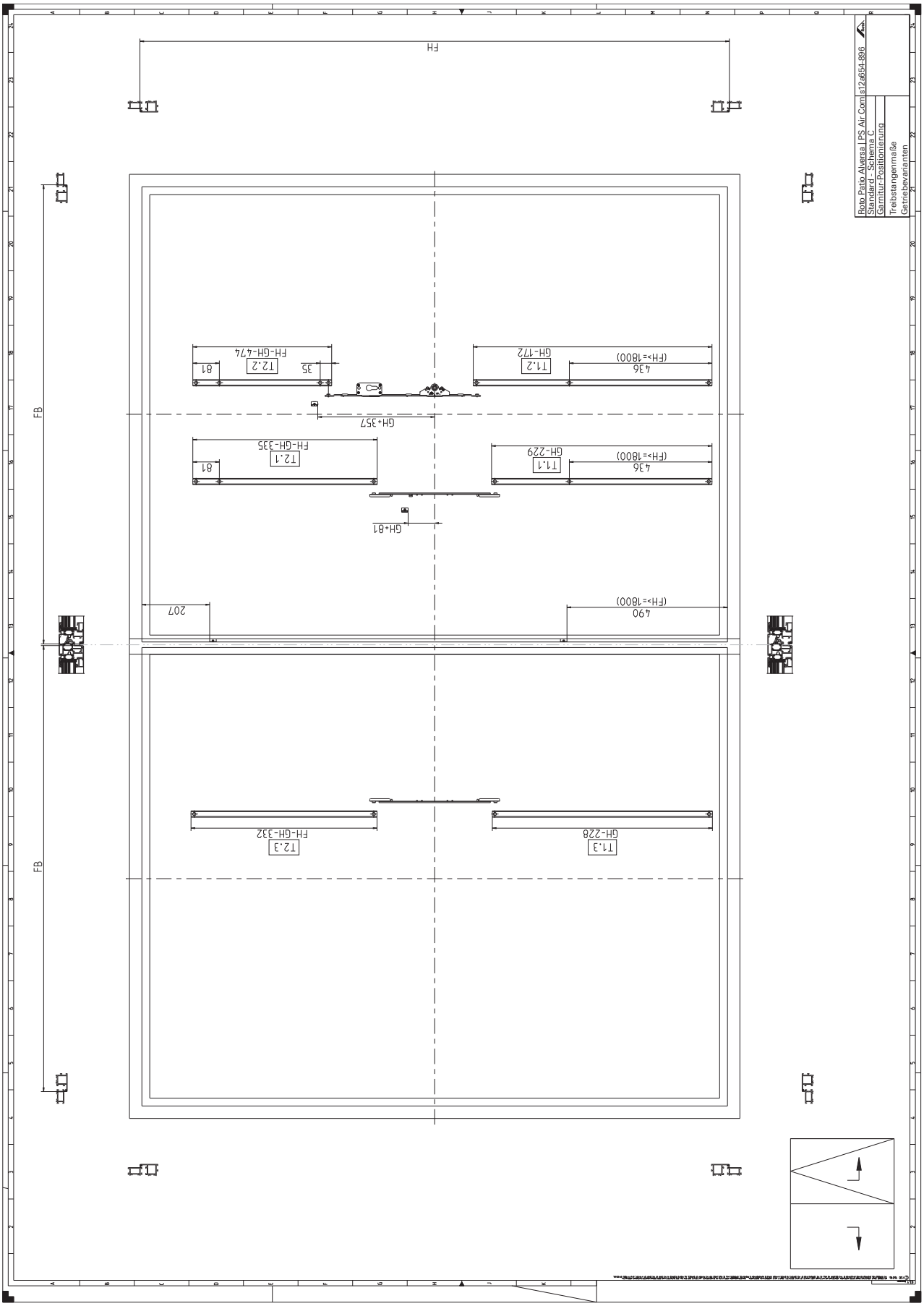
9.14 Installation drawings for Roto Patio Alversa | PS Air Com; diagram A; std.



9.15 Installation drawings for Roto Patio Alversa | PS Air Com; diagram C; std.



9.16 Installation drawings for Roto Patio Alversa | PS Air Com; diagram C; std.; alternative espagnolettes



10 Adjustment

10.1 Aligning the sash horizontally

ATTENTION

Uneven adjustment may result in property damage.

The bogies are preset evenly at the factory. To correctly align the sash, adjust the bogies evenly – in order to avoid jamming – using their adjusting screws.

- ▶ Align both bogies evenly using their adjusting screws.

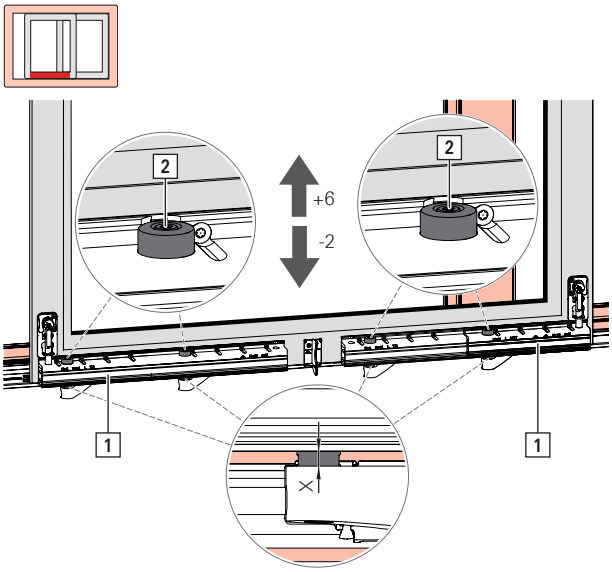
Setting the height of the sash in the frame

1. Check the bottom horizontal rebate clearance.

2. Use a T25 hexalobular socket screwdriver on the adjusting screws [2] to align the bogies [1].
   1 adjusting screw per bogie
   2 adjusting screws per tandem bogie

a. Too little rebate clearance:
   Evenly adjust the adjusting screws in a clockwise direction.

b. Too much rebate clearance:
   Evenly adjust the adjusting screws in an anticlockwise direction.



INFO

Adjusting screw initial position X ~ 5 mm

$X_{max.}$ = 11 mm

$X_{min.}$ = 3 mm

10.2 Aligning the bogies parallel

Setting the sash to run into the frame evenly

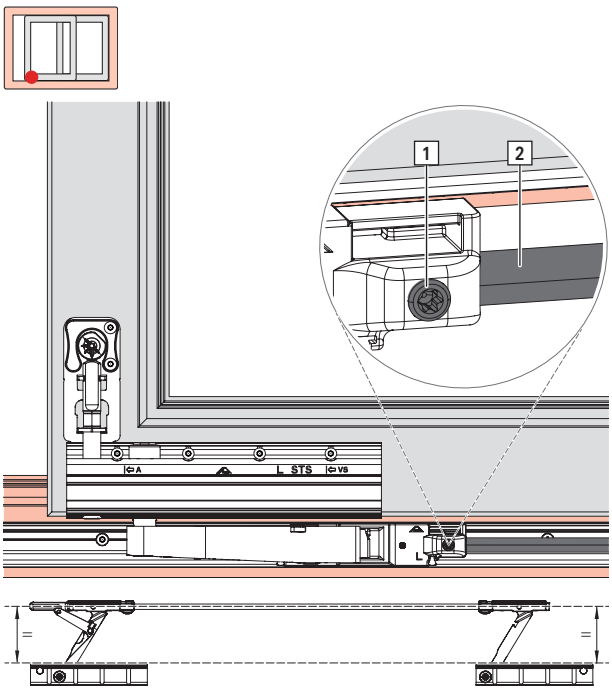
1. Move the sash into the sliding position.

2. Adjust the connecting rod.

a. Loosen the screw [1] on the connecting rod [2] using a T25 hexalobular socket screwdriver on the locking side bogie.

b. Align the bogie on the hinge side to be parallel by moving the connecting rod to the left or right.

c. Tighten the screw on the connecting rod using a T25 hexalobular socket screwdriver (torque: max. 5 – 7 Nm) on the locking side bogie.

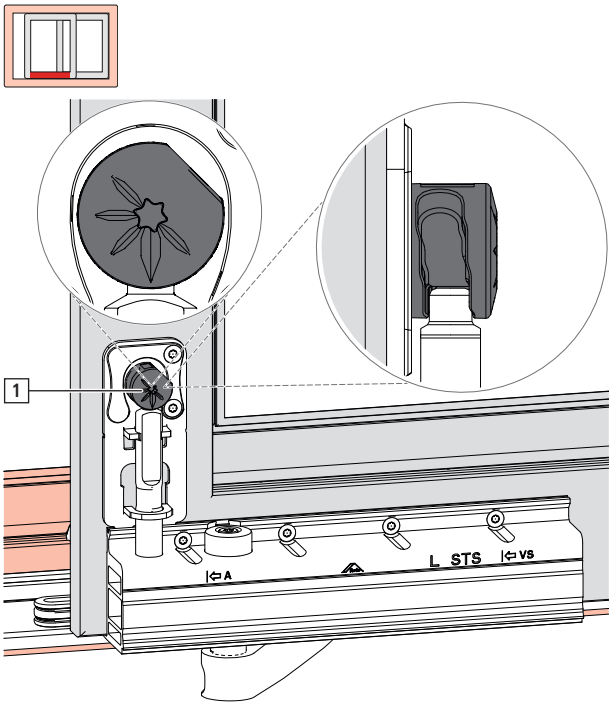


10.3 Adjusting reinforcement brackets

Adjust the reinforcement brackets to optimise the smooth running of the sash into the frame.

Adjusting reinforcement brackets from their original position

1. Adjust both reinforcement brackets evenly [1].
   The markings must be in the same position on both sides of the sash.

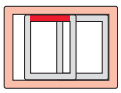


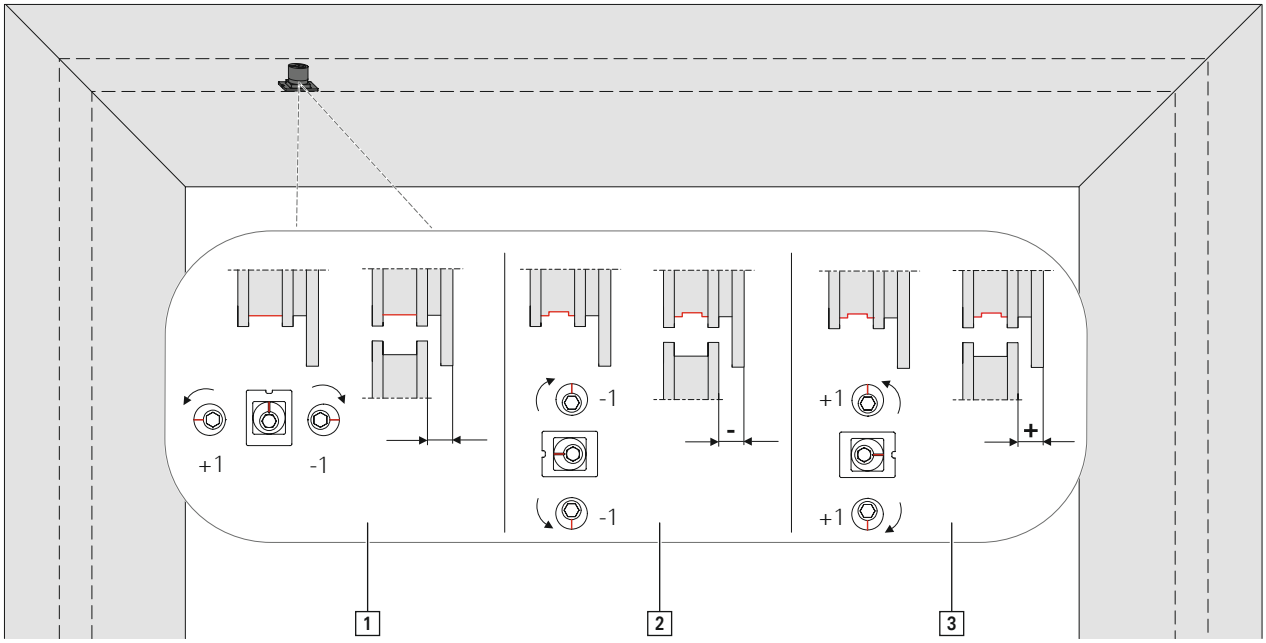
2. Adjust by turning counterclockwise with a T25 hexalobular socket screwdriver and the sash will close more easily.

Adjust by turning clockwise with a T25 hexalobular socket screwdriver and the sash will open more easily.

3. Check whether the bogies run smoothly.
   If too extreme an adjustment is made, the bogies may drag.

10.4 Adjusting the insertable cams





Adjusting the gasket-compression

4 mm hex key

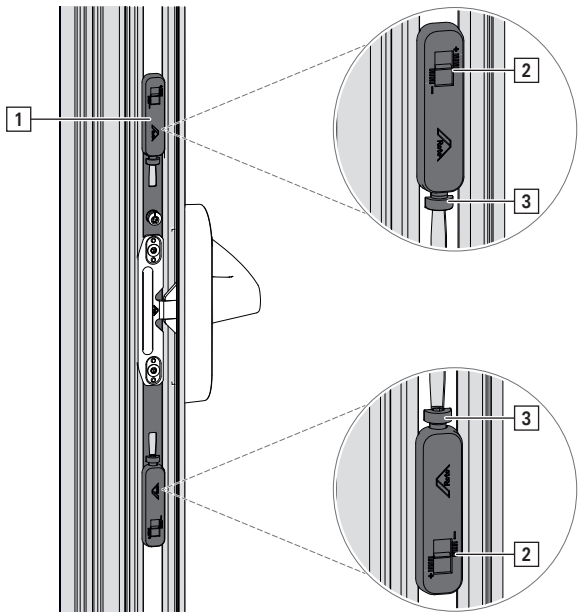
1. Adjust the locking cam as shown.

- [1] Increase / reduce the gasket-compression
- [2] Reduce the gasket-compression
- [3] Increase the gasket-compression

10.5 Adjusting the travel

Adjusting the adjustable centre section

1. Use the screws [3] to adjust the travel on the adjustable centre section [1] by means of the scale [2].



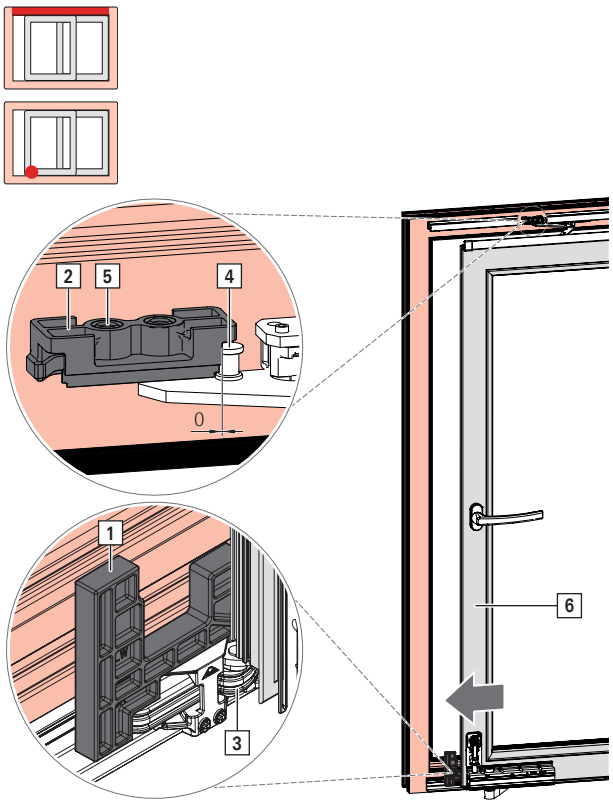
10.6 Top guide block, fixed

INFO
Required when the bottom and top guide blocks do not trigger the sliding scissor stay and bogie at the same time.

Adjusting the fixed top guide block

1. Undo the screws on the fixed top guide block.

2. Place the jig [1] for the fixed top guide block [2] on the bottom guide block with roller units [3].
   Push the guide block until it reaches the sliding scissor stay pilot bolt [4].



3. Gently tighten the screws [5] on the fixed top guide block using a T25 hexalobular socket screwdriver (torque: max. 1 Nm).

4. Remove the jig.

5. Move the sash [6] into the closed position.

6. Check for 11.5 mm rebate clearance on both sides.
   If necessary, reposition the fixed top guide block.

7. Tighten both screws on the fixed top guide block using a T25 hexalobular socket screwdriver (torque: max. 3 - 4 Nm).

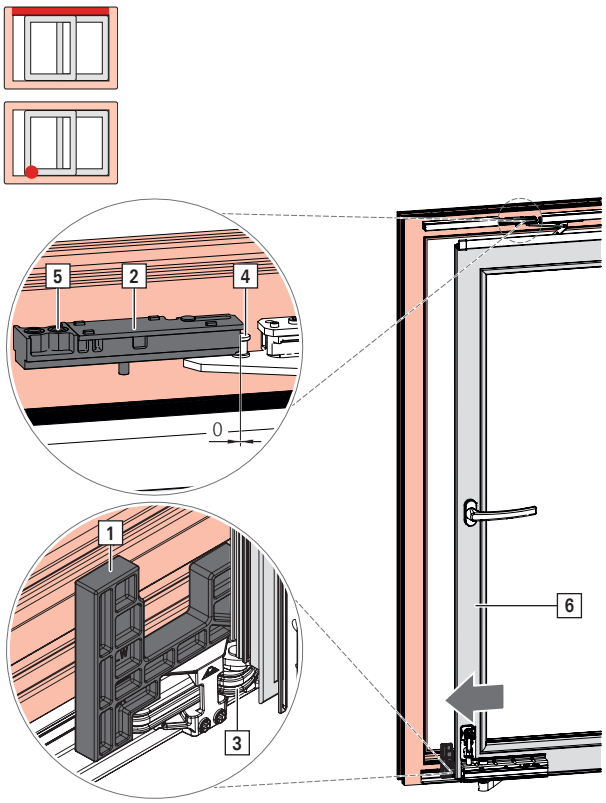
10.7 Top guide block, tiltable

INFO
Required when the bottom and top guide blocks do not trigger the sliding scissor stay and bogie at the same time.

Adjusting the tiltable top guide block

1. Undo the screws on the tiltable top guide block.

2. Place the jig [1] for the tiltable top guide block [2] on the bottom guide block with roller units [3].
   Push the guide block until it reaches the sliding scissor stay pilot bolt [4].



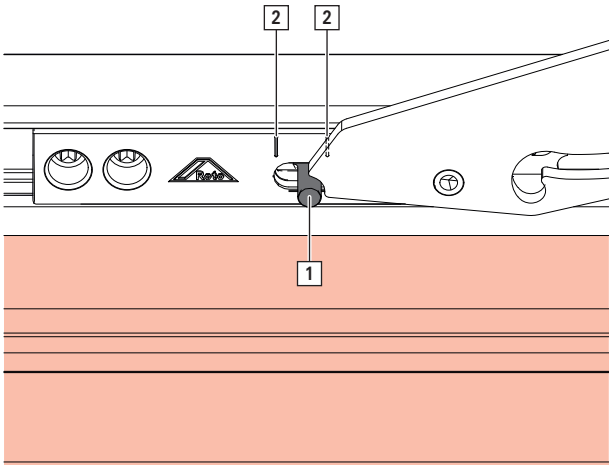
3. Gently tighten the screws [5] on the tiltable top guide block using a T25 hexalobular socket screwdriver (torque: max. 1 Nm).

4. Remove the jig.

5. Move the sash [6] into the closed position.

6. Check for 11.5 mm rebate clearance on both sides.
   If necessary, reposition the tiltable top guide block.

7. Check the sash tilt function.
   Ensure that the control bolt [1] on the tiltable top guide block is between the two markings [2] when the sash is tilted.
   If necessary, reposition the tiltable top guide block.



8. Tighten both screws on the tiltable top guide block using a T25 hexalobular socket screwdriver (torque: max. 3 - 4 Nm).

11 Operation

11.1 Operating information

The windows and balcony doors are operated using a handle.

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

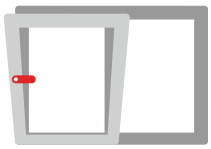
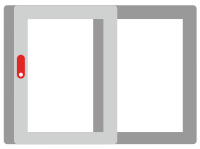
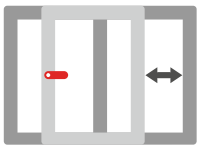
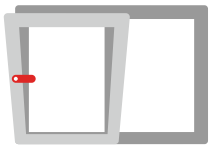
11.1.1 Roto Patio Alversa | KS

ATTENTION

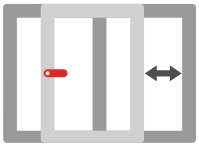
Risk of being accidentally locked out.

If the sash is in the sliding position and closes, the sash can engage and then be impossible to reopen from the outside.

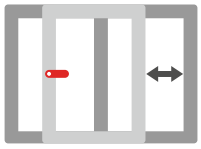
- Secure the sash against accidentally engaging when in the sliding position.
- Ensure that access is possible if necessary.

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in tilted position.
		Sash opened.
		Sash in sliding position.
		Sash engaged.
		Sash in closed position.

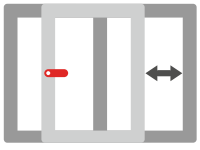
11.1.2 Roto Patio Alversa | PS without night ventilation

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in sliding position.

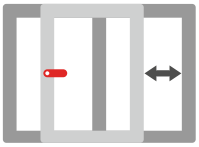
11.1.3 Roto Patio Alversa | PS with night ventilation

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in sliding position.
		Sash in night ventilation position.

11.1.4 Roto Patio Alversa | PS Air

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in sliding position.
		Sash in tilted position.

11.1.5 Roto Patio Alversa | PS Air Com

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in sliding position.
		Sash in comfortable tilted position.

11.2 Fault assistance

Fault	Cause	Corrective action	Specialist company	End user
Handle is difficult to turn.	Frame components have not been greased	Grease the frame components	☐	☐
	Handle is faulty	Replace the handle	■	
	Handle screwed into place too tightly	Undo the screw fixing slightly	■	
	Sash components with slanting screws	Screw the sash components in straight	■	
	Sash components are faulty	Replace the sash components	■	
	Incorrect striker positions	Adapt the striker positions	■	
Handle cannot be turned 180°.	Sash components hinged or installed incorrectly	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette).	■	
Locking cams brush against the striker.	Sash components hinged or installed incorrectly	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette).	■	
	Incorrect striker positions	Adapt the striker positions	■	

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

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

12 Maintenance

CAUTION

Improperly performed maintenance work may result in injuries.

Improper maintenance can lead to serious injuries or property damage.

- 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 windows or balcony doors against unintentionally opening or closing.
- Do not unhinge windows or balcony doors for maintenance purposes.

ATTENTION

Incomplete or incorrect checks may result in property damage.

Adjusting the hardware incorrectly or improperly may cause the window or balcony door to malfunction.

- Check the hardware when installed.
- If defects need to be remedied, have the window or balcony door unhinged and remounted by a specialist company.

INFO

The manufacturer must draw the attention of builders and end-users to these maintenance instructions. Roto Frank AG 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.

12.1 Maintenance intervals

ATTENTION

Inadequate maintenance may cause property damage.

The maintenance intervals must be adapted to the respective ambient conditions. The maintenance intervals correspond to the current directives and represent a maximum time frame.

- Determine the appropriate maintenance interval in accordance with the ambient conditions.

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.

	Responsibility	
Cleaning		→ *from page 217*
Clean hardware	□	
Care		→ *from page 217*
Lubricate movable parts	□	
Lubricate locking points	□	
Performance test		→ *from page 221*
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 221*
Retighten fixing screws	■	
Replace damaged components	■	

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

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

12.2 Cleaning

ATTENTION
Incompatible cleaning agents may cause property damage.
Incompatible cleaning agents may damage surfaces and destroy gaskets.
- Never use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- Only use cleaning and care agents that do not adversely affect the corrosion protection of the hardware components and gaskets.
- Only use mild, pH-neutral cleaning agents that have been diluted.

Cleaning the hardware

- Clean deposits and contaminants off the hardware using a soft cloth.
- Lubricate movable parts and locking points after cleaning. → *12.3 "Care" from page 217*
- Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

12.3 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.

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.

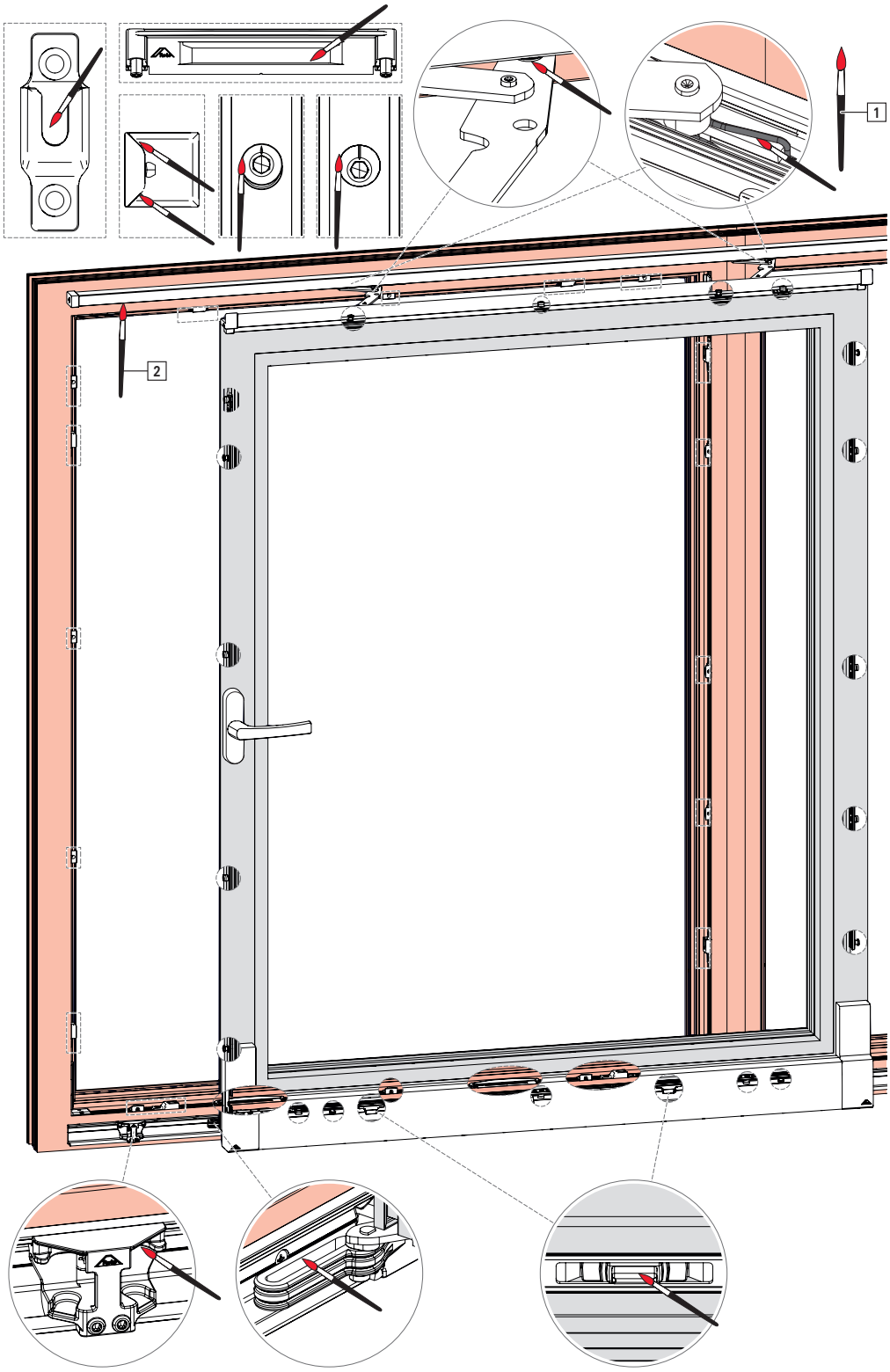
Ease of movement can be improved by lubricating or adjusting the hardware. All functional hardware components must be lubricated on a regular basis.

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.

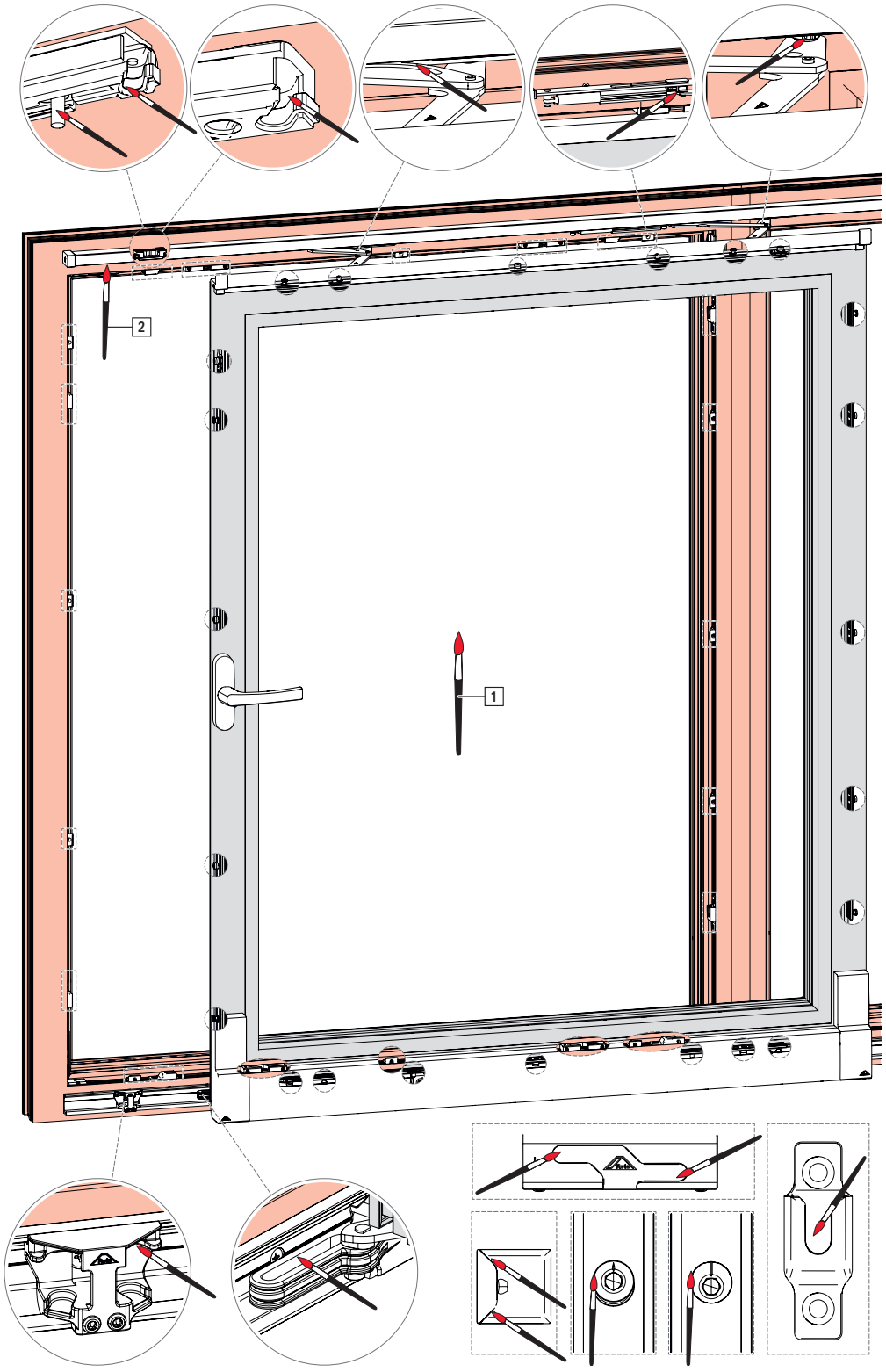
12.3.1 Roto Patio Alversa | KS



[1] Grease

[2] Grease along the entire length.

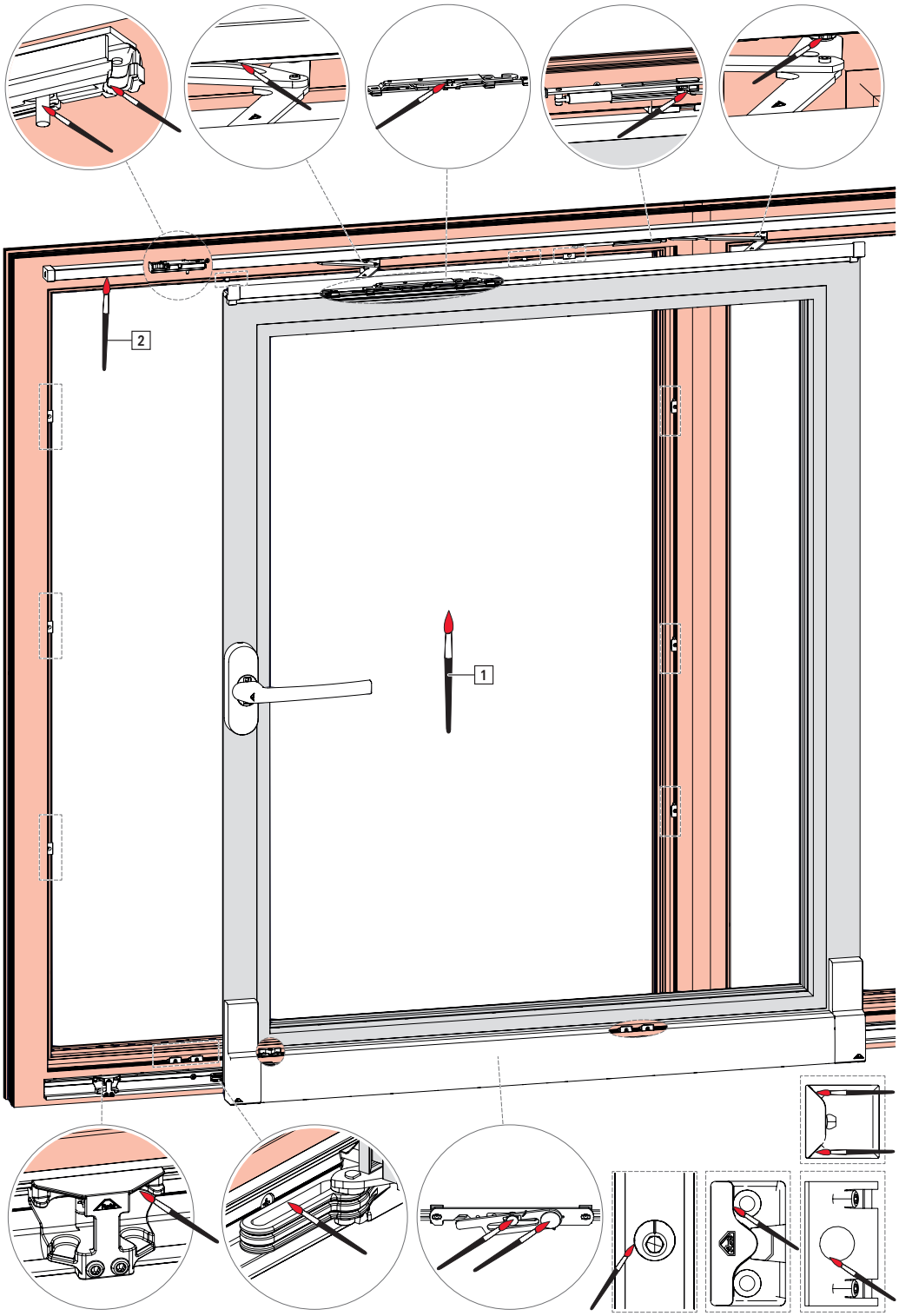
12.3.2 Roto Patio Alversa | PS (except for PS Air Com)



[1] Grease

[2] Grease along the entire length.

12.3.3 Roto Patio Alversa | PS Air Com



[1] Grease

[2] Grease along the entire length.

12.4 Performance test

WARNING
Potential danger to life, risk of injury and property damage.
Improperly performed repairs impair the safety of the windows and balcony doors.
- ▸ Always have repair work performed by a specialist company.

Check for proper operation:

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

Have malfunctions remedied by a specialist company.

12.5 Repair

ATTENTION
Securing components incorrectly may lead to 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 immediately.
- ▸ Only use the screws suggested for repairs.

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, doors or balcony doors

The specialist company must observe the following:

- The necessary repair work must be performed properly, according to generally recognised engineering practice and in accordance with the applicable regulations.
- Makeshift repairs must not be performed on worn or damaged components.
- Only original or approved spare parts may be used in the course of repairs.

12.6 Preventative measures

These measures are intended to preserve the surface finish and durability. They aim to prevent premature wear or contamination and thereby simplify maintenance.

Corrosion protection

Cleaning agents can corrode the surface of the hardware.

Protect the hardware:

1. Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.

2. Only use mild, pH-neutral cleaning agents that have been diluted.

3. Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

4. Only use high-quality components for repairs, such as stainless steel screws.

Protection from contaminants

Contaminants impair the proper operation of the hardware.

Protect the hardware:

1. Remove deposits and contaminants caused by construction materials before they bond with water, e.g. builder's dust, plaster, stucco, mortar and cement.

2. Always clean using a soft cloth.

Protection against (permanently) damp room air

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

Protect the hardware:

1. Provide adequate ventilation for hardware, particularly during the construction phase.

2. Intensively air out the room several times per day by opening all windows or balcony doors for approximately 15 minutes.
   If intensive airing is not an option, place the windows or balcony doors in tilt mode 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 drafts. Discharge outside any humidity present in the room air using dehumidifiers.

3. Establish a ventilation plan for more complex construction projects if necessary.

4. Provide adequate ventilation during holiday periods as well.

13 Dismantling

ATTENTION

Incorrect dismantling poses the potential risk of injury and property damage.

- Always have dismantling carried out by an authorised specialist company.

13.1 Sash

WARNING

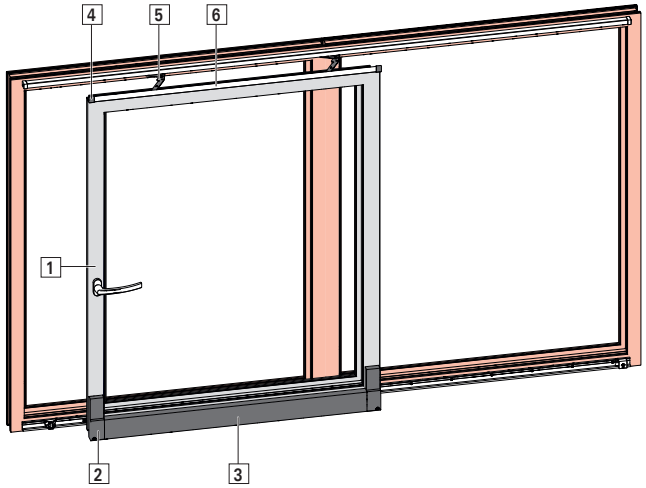
Heavy loads pose the risk of injury and property damage.

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

- Transport and removal must be carried out by at least two people.
- Do not rest sashes on the bogies.
- Use transportation means. → *14 "Transport" from page 225*

Unhinging the sash

1. Move the sash [1] into the sliding position.



2. Remove the covers.

- Cover caps for the bogie [2] on the left and right
- Bogie cover [3]
- Cover caps for the retaining track [4] on the left and right

a. Remove the bogie cover caps by pulling them forwards.

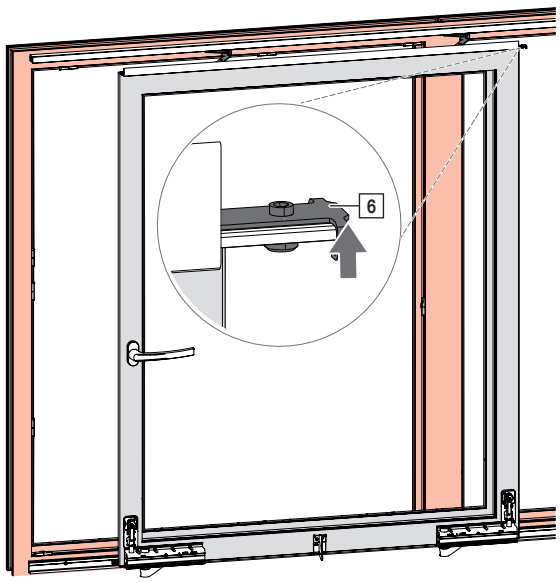
b. Grasp the back of the bogie cover from below and pull it diagonally upwards.

Pull forcefully, using both hands.

c. Remove the cover caps for the retaining track on the side.

3. Secure the sash to prevent it falling out before pushing the sliding scissor stay [5] out.

4. Push the sliding scissor stay spring [6] upwards and undo the form-fitting connection between the sliding scissor stay and retaining track.



5. Push the sliding scissor stay out of the retaining track.

6. Lift the sash at a slight incline.

7. Place the sash in front of the frame.

a. Use a clean packer.
b. Only use a support in the centre of the sash so that the bogies can hang free.

13.2 Hardware components

Removing hardware components

1. Undo all screw connections.

2. Remove the hardware components.

3. Dispose of the hardware components properly.

14 Transport

14.1 Transporting the hardware

WARNING
Trapped limbs may result in injuries.
The transported goods can skid or fall during transportation tasks. This can result in limbs being trapped and seriously injured.
- Wear safety gloves and protective footwear.

WARNING
Heavy loads present an injury risk.
Lifting and carrying heavy loads in an uncontrolled manner may lead to injuries in the event of a fall or physical overexertion.
- Observe the applicable accident prevention regulations.
- Transport heavy loads with two people and / or use suitable transportation means, such as an industrial truck.

WARNING
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 40 kg for men and 25 kg for women.
- Always carry and lift smaller shipments with an ergonomically correct posture.

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

Observe the following basic instructions when transporting hardware:

- Transport larger shipments using appropriate transportation means, such as industrial trucks.
- Note the transport weight in order to select appropriate transportation means.
- 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 shipments:

- 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.

14.2 Storing the hardware

Store all hardware components as follows until they are installed:

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

15 Disposal

ATTENTION
Incorrect disposal can harm the environment.
Pieces of hardware are raw materials.
- Dispose of hardware for environmentally friendly material reutilisation as mixed scrap.

15.1 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.

15.2 Disposing of hardware

Once the hardware is finished with, the end user or builder is responsible for properly disposing of the windows, doors or balcony doors 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.
- Separate hardware components from windows, doors or balcony doors.
- 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.

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