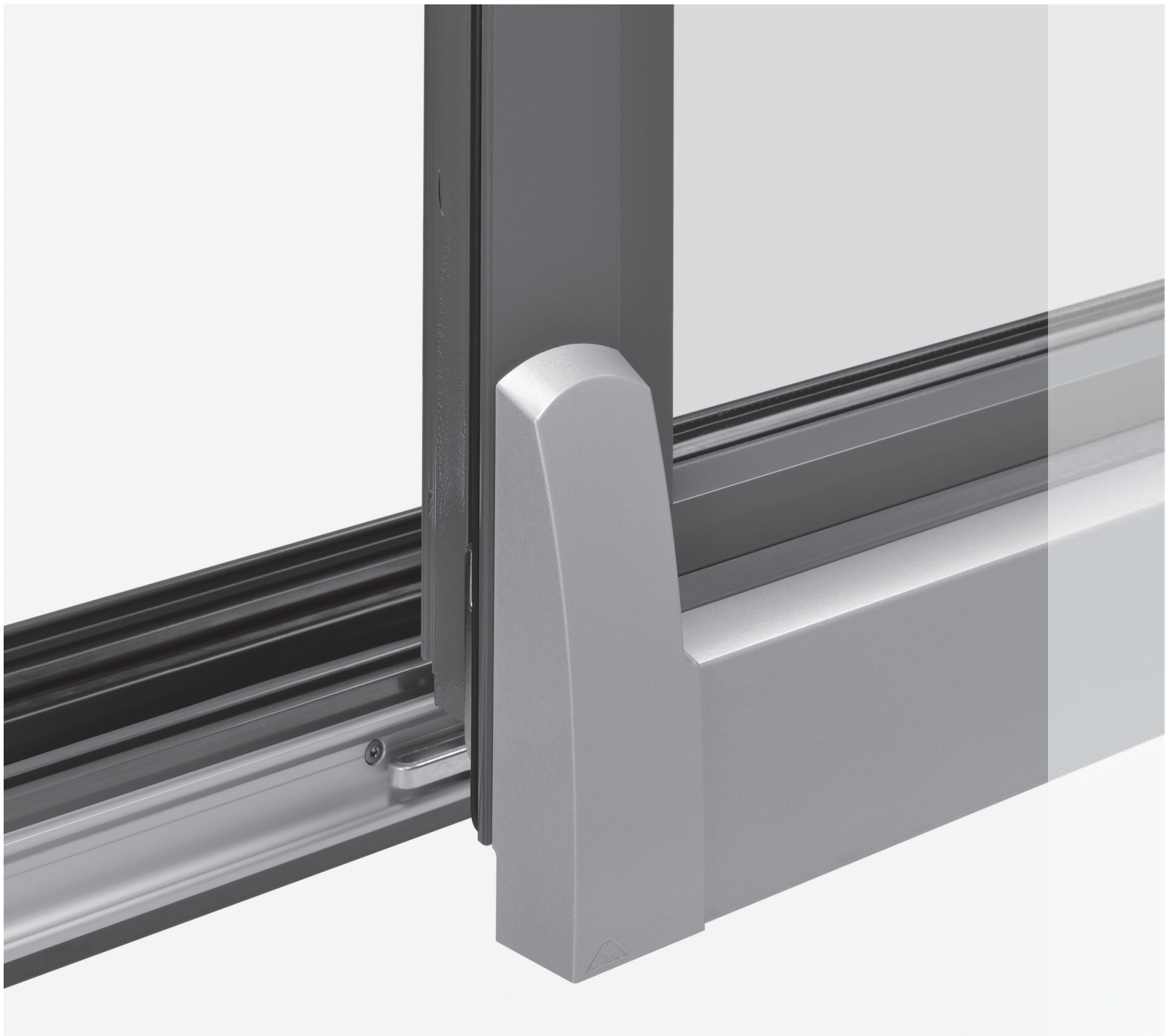
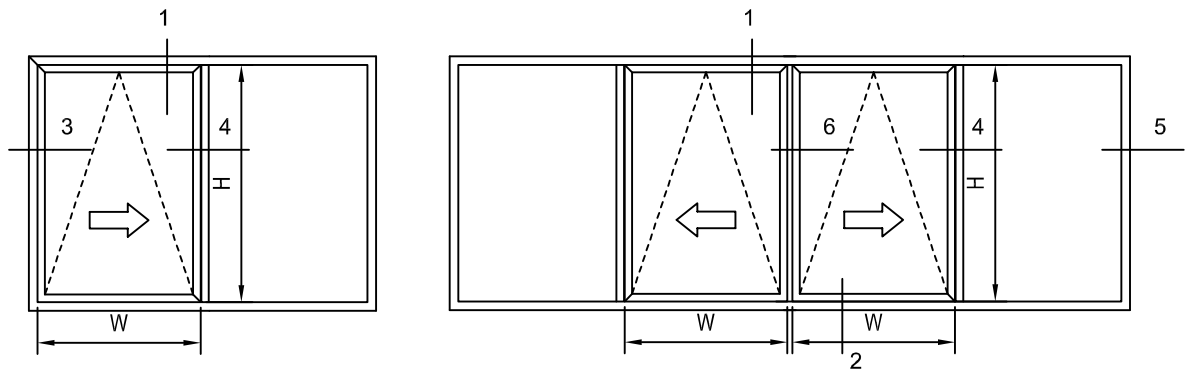
Roto Patio Z

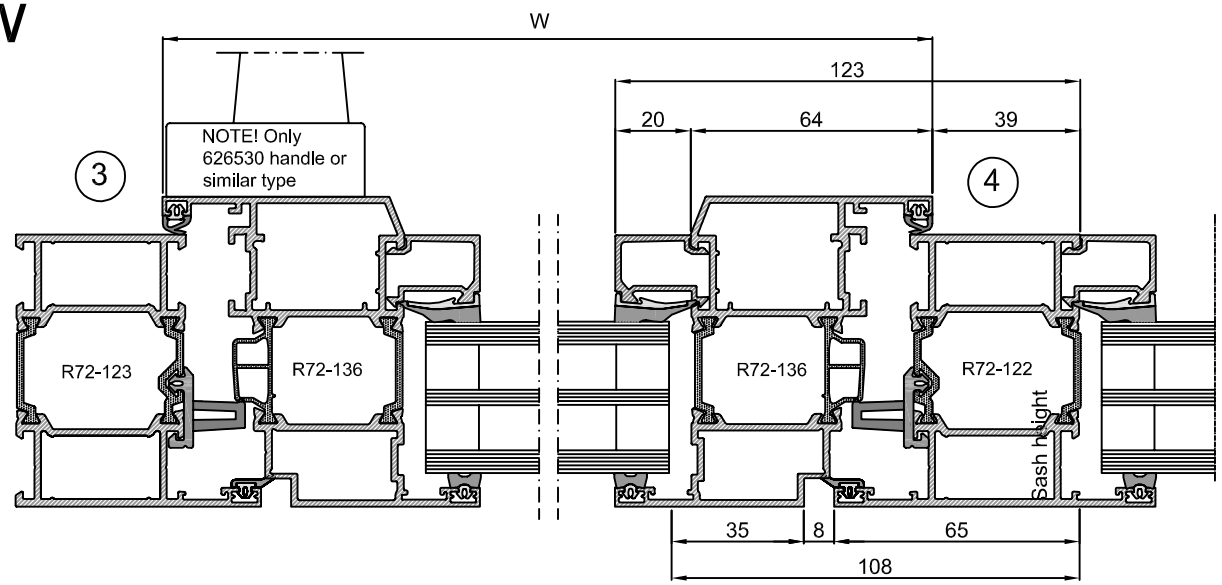
The standard hardware with positive control
for Tilt&Slide windows and doors up to 200 kg

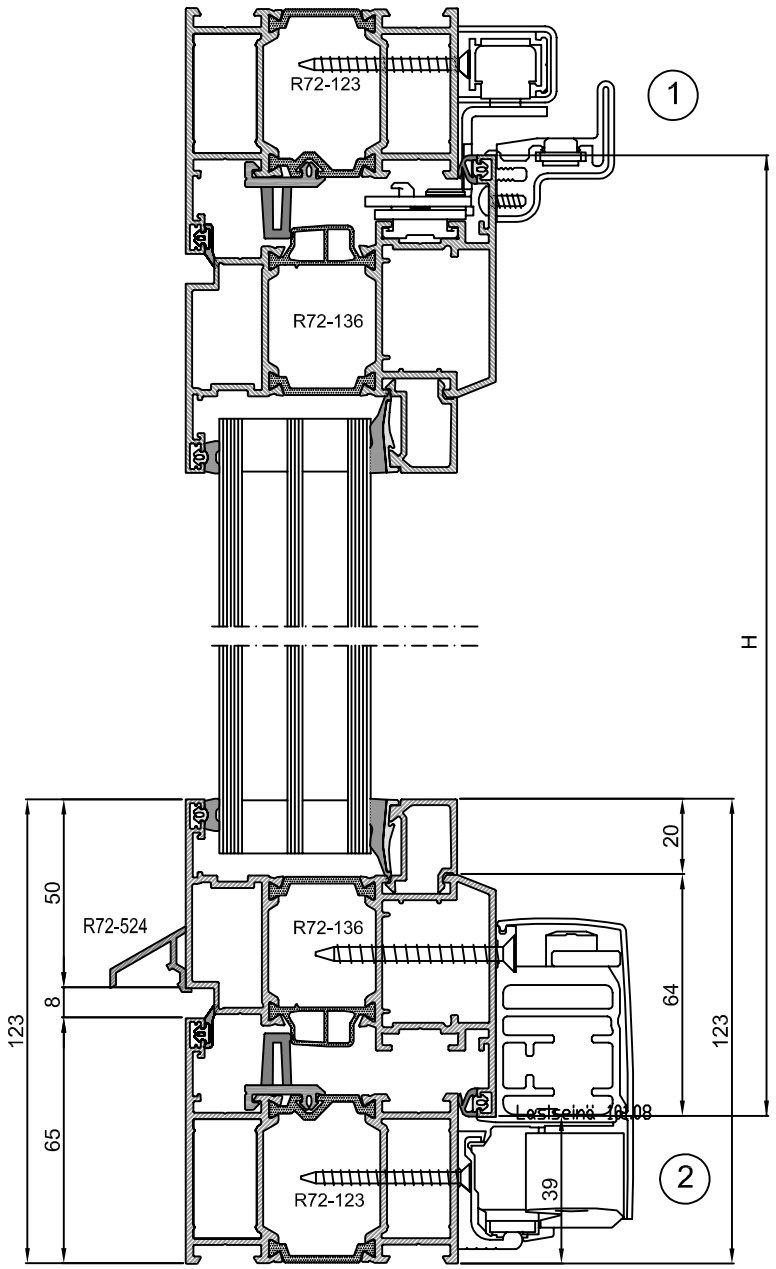
Installation, maintenance and operation instructions
for aluminium profiles

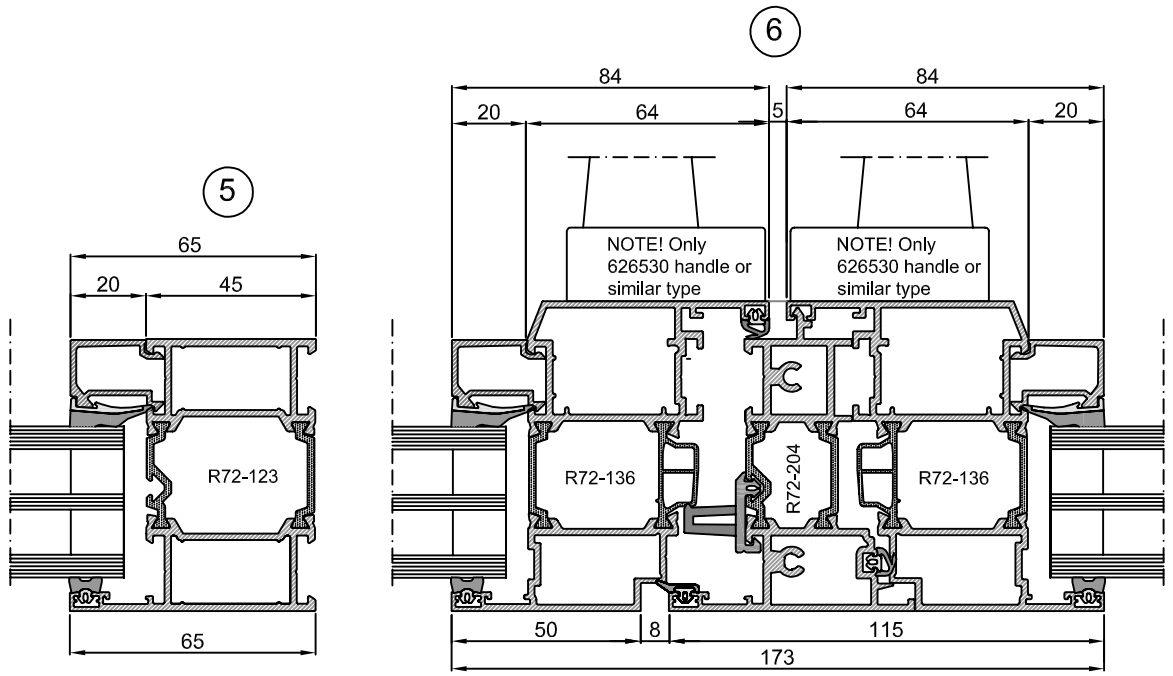


R72 PATIO Z sliding door/window









Osa	Esine		Kpl	Aine			Huom.	
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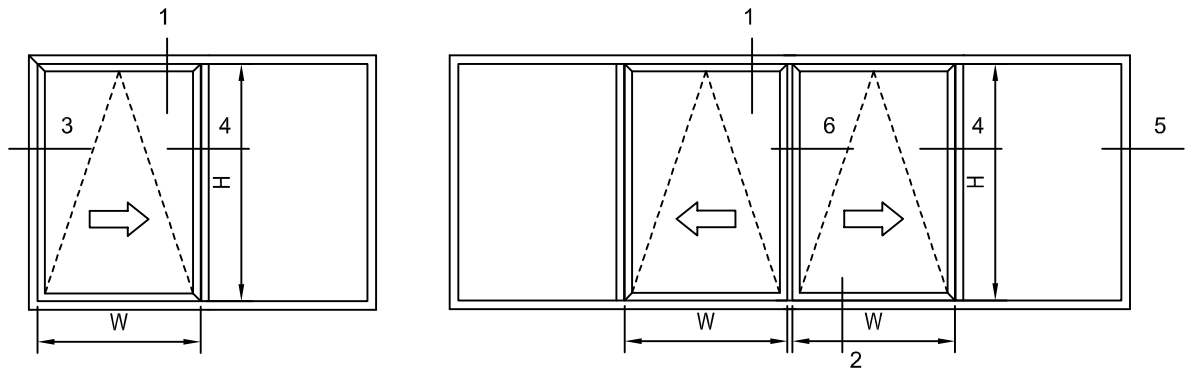
NOKIAN PROFIILIT

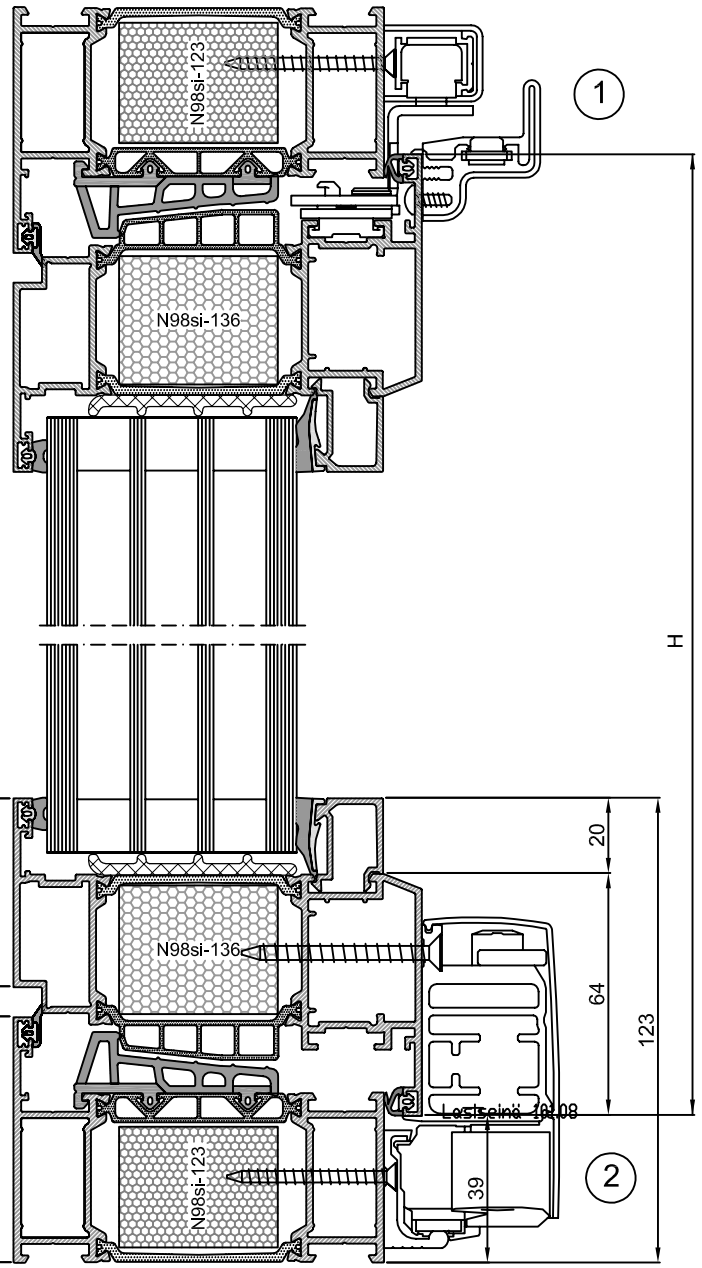
R72 PATIO Z rakenteen poikkileikkauskuvat

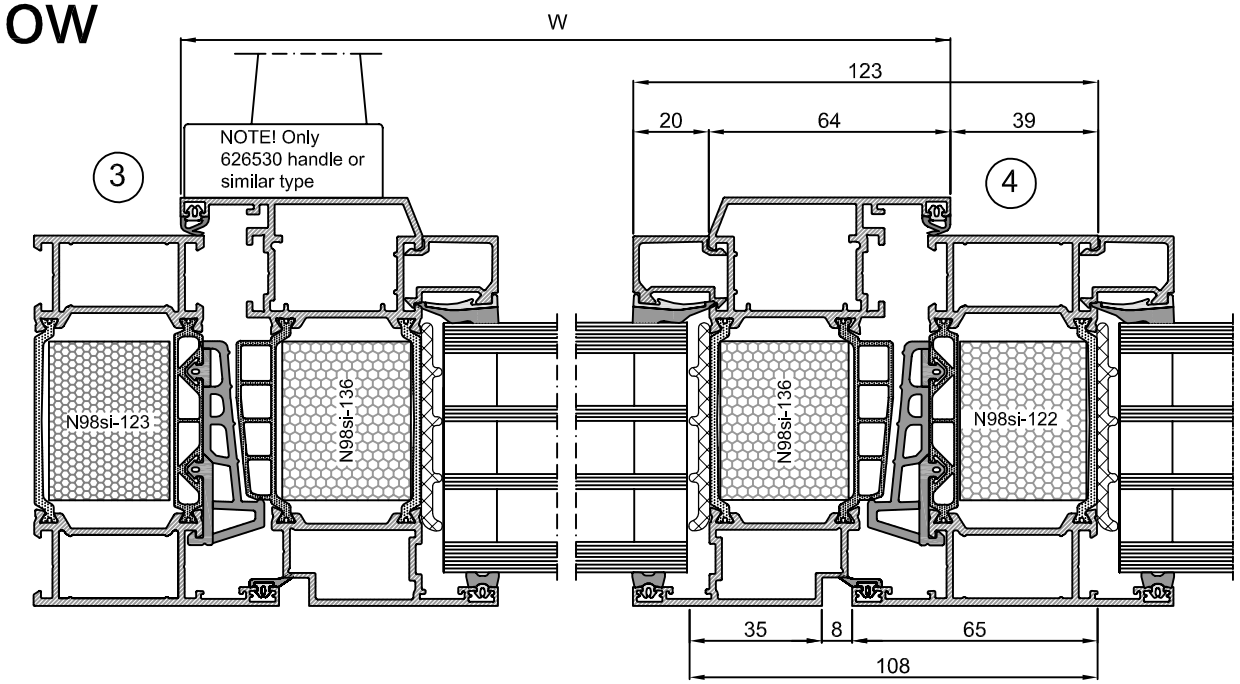
Piir.no NP30848

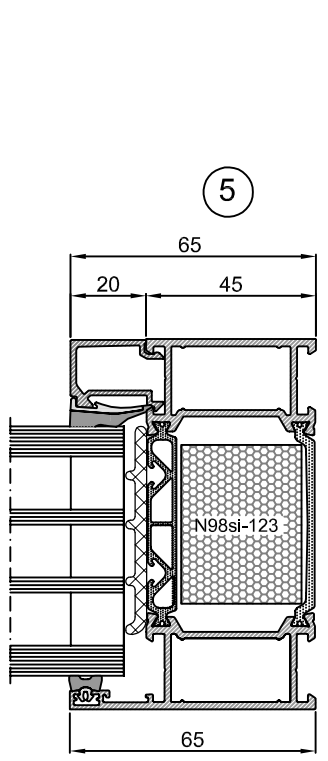
Korvaa

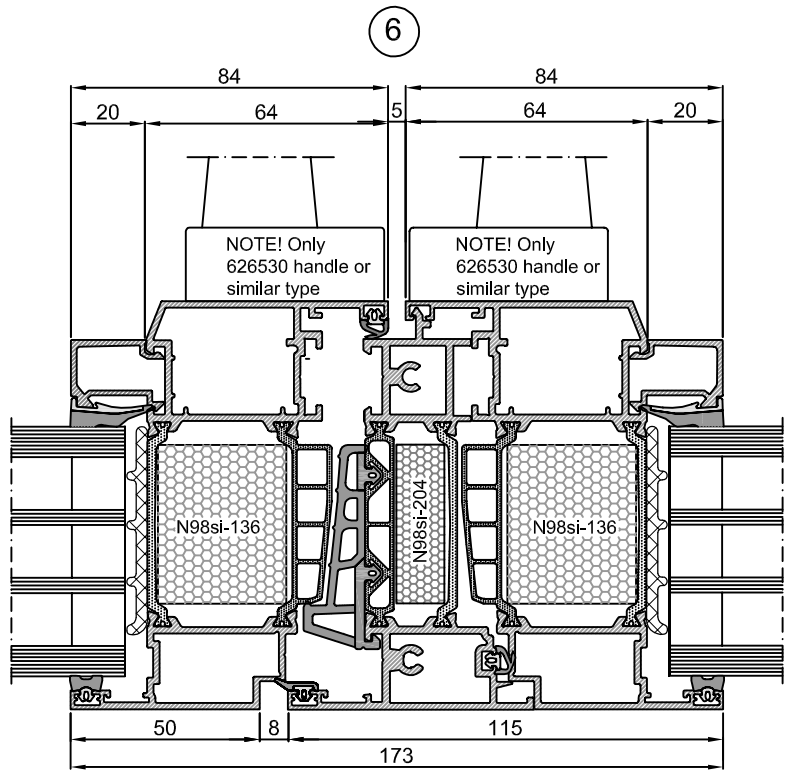
N98si PATIO Z sliding door/window











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NOKIAN PROFIILIT

N98si PATIO Z rakenteen poikkileikkauskuvat

Piir.no NP30847

Korvaa

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

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

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

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

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

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

Additional markings

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

Marking	Explanation
	Sash
	Frame
	Drilling-holes
①	Hardware components
1.	Action steps
■	First level of the hierarchy in a list
–	Unordered list (second level of the hierarchy)
→ page 12	(Cross) reference in tables
Refer to page 12	(Cross) reference in the text

Abbreviation	Explanation
SW	Sash width
SH	Sash height
S.kg	Sash weight

All dimensions stated in mm.

Protection of copyright

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

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

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

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

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

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

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

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

Responsibility of the hardware dealer
The hardware dealer must transmit the following documents to the manufacturer of windows and balcony doors:
– Catalogue
– Installation, Maintenance and Operation instructions
– Guidelines/advice on the product and on liability (VHBH)
– Guidelines/advice for end-users (VHBE)

Responsibility of the manufacturer of windows and balcony doors
The manufacturer of windows and balcony doors must transmit the following documents to the building element dealer or to the builder, even when a subcontractor (installation operation) is acting as an intermediary:
– Installation, Maintenance and Operation instructions
– Guidelines/advice on the product and on liability (VHBH)
– Guidelines/advice for end-users (VHBE)

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

Responsibility of the building element dealer/installation company
The building element dealer must transmit the following documents to the builder, even when a subcontractor (installation company) is acting as an intermediary:
– Maintenance and operating instructions (with the focus on hardware)
– Guidelines/advice on the product and on liability (VHBH)
– Guidelines/advice for end-users (VHBE)

Responsibility of the builder
The builder must transmit the following documents to the end-user:
– Maintenance and operating instructions (with the focus on hardware)
– Guidelines/advice for end-users (VHBE)

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

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

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

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

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

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

The hardware manufacturer accepts no liability for damages resulting from:
- Failure to comply with this document and all product-specific documents and related applicable directives (refer to the chapters Safety and Stipulated use).
- Operation other than that stipulated/misuse (refer to the chapters Safety and Stipulated use).
- Insufficient invitation to tender, failure to adhere to the installation instructions or application drawings.
- Increased soiling.

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

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

The warranty covers only original Roto components.

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

Sliding hardware is hardware for sliding sashes for windows and balcony doors that are mainly used as glazed exterior structures.
In combination with the sliding sashes, fixed-glazing-units and/or further sashes can be situated in a window element.
Sliding hardware is equipped with a locking mechanism that fastens the sliding sash. Sliding hardware is equipped with rollers that are mainly located on the bottom horizontal plane of the sliding sash.
In addition, scissor stay-arms for tilting and mechanisms to lift and/or parallel-retract the sashes can be specified. By means of the hardware, the sashes are locked, brought into the ventilation position and pushed to the side.
Sliding hardware is solely used for further processing of vertically installed windows and balcony door sashes made of timber, PVC or aluminium, and their corresponding material combinations.

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

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

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

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

WARNING!
Danger from misuse!
Misuse and incorrect installation of hardware can result in hazardous situations.
- Never use hardware combinations that have not been approved by the hardware manufacturer.
- Never use accessories that are not original products or that have not been approved by the hardware manufacturer.

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

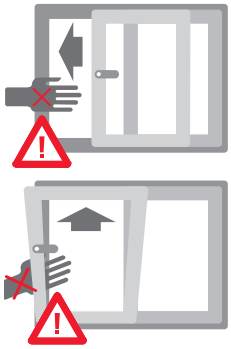
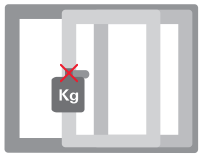
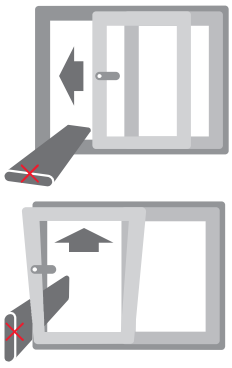
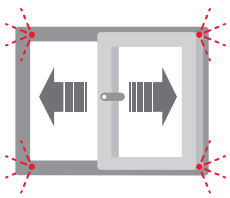
WARNING!
Danger of injury and material damage from incorrect closing and opening the sash!
Incorrect closing and opening of sashes can result in serious injuries and significant material damage.
Therefore:
- Ensure that when opening or closing the sash, it does not collide with the frame or with another sash.
- Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position, and that it is brought very slowly towards the frame, the opening restrictor or another sash (technical value – maximum reference speed of the closing edge $v \leq 0.2$ m/s).

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

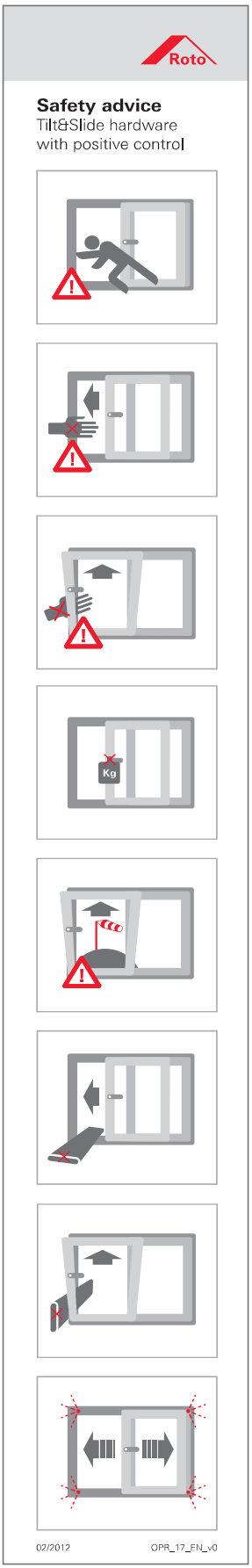
WARNING!
Danger from misuse!
Misuse of windows and balcony doors can result in dangerous circumstances.
In particular, avoid the following applications:
- insertion of obstacles in the opening area between the frame and the window and balcony door sashes.
- the deliberate or negligent application of excessive loads on windows and balcony doors,
- deliberate or uncontrolled slamming or pushing of windows and balcony doors against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows or balcony doors.

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

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

Symbol	Meaning
	**DANGER!** **Danger of injury from falling through open windows and balcony doors.** – Behave with care near to open windows and balcony doors. – Keep children and people who cannot estimate the dangers away from the point of danger.
	**WARNING!** **Danger of injury through trapping of body parts in the opening gap between sash and frame.** – When closing windows and balcony doors, never reach between sash and frame, and always act with care. – Keep children and people who cannot estimate the dangers away from the point of danger.
	**WARNING!** **Danger of injury and material damage from overloading the sash** – Do not overload the sash.
	**CAUTION!** **Danger of injury from the effect of wind** – Prevent wind from acting on the open sash. – During wind and drafts, close and lock windows and balcony door sashes.
	**CAUTION!** **Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** – Do not insert obstructions into the opening gap between sash and frame.
	**CAUTION!** **Injury and property damage from uncontrolled opening and closing of the sash** – Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position.

The following symbols can by used on windows and balcony doors to protect the end-user. Always keep these symbols in a clearly legible state. Please order stickers separately (OPR_17_EN_v0).



Maximum sash sizes and weights

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

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

Guidelines from the profile manufacturer

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

NOTE!

The hardware components should in principle be designed in such a manner, that the system-related dimensions can be adjusted to the extent that they are affected by the hardware. If a deviation from these dimensions is noticed only after the installation of the windows, the hardware manufacturer is not responsible for any possible additional work arising.

Composition of hardware

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

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

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

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

NOTE!

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

– The hardware components described in these installation, maintenance and operation instructions are made of steel, colourless passivated and sealed according to DIN EN 12329.
– The hardware components may only be used with aluminium profiles.
– The hardware components may not be used in environments with salty, aggressive or corrosion-promoting air.

– The guide track and the roller track must not be painted.
– Surface-treating of Tilt&Slide elements may only be carried out before installation. A subsequent surface treatment may restrict the functioning of the hardware components.

– If in some cases it is expected (due to operation in hotels, schools, kindergartens etc.) that the element will be excessively used, this must be prevented by adequate measures. Also in movable objects like trains or ships there may occur disorders caused by the object movement.

DANGER!

Danger to life from incorrectly installed and threaded hardware components!

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

Therefore:

– For installation and especially for threaded components, observe the product-specific documentation and the information of the hardware manufacturer.

– For Roto Patio Z for aluminium hardware the application ranges on page 18–20 apply.
– Information with respect to screwing speed and torque are binding. (Do not overtighten the screws!)
– Fasten the hardware components with the included screws.
– Install all hardware components properly in accordance with these instructions.
– For the glazing packers the Technical Guidelines of the Glazing Trade, no. 3 "Packing of Glazing Units" must be observed.

Fixing screws for hardware components (included in delivery scope)

For components	Quantity	Size	Diameter to be drilled	drive unit
Bogies, cover support brackets	12 (24)	4.8 x 50	4.2	Torx 25
Roller track, guide track	40	3.9 x 45	3.2	Torx 15
Stay-connecting profile	10	3.9 x 9.5	3.2	Torx 15
Reinforcement brackets	4	M5x25	7.1 (for riveting nut)	Torx 25
Corner drives, scissor stays	10	M5x25	3.5	Torx 25
Connector AG	2	M5x8	–	Torx 25
Surface mounted positive-control handle	4 2	4.8x50 M5x25	4.2 5.2	Torx 25 Torx 25
RotoLine handle	2	M5x50	10/12	⊕
RotoLine handle, inside and outside operation	4	M5x110	10/12	⊕

General hardware characteristics

– Positive-controlled central locking system for automatic starting and stopping of the tilt function
– Concealed central locking system
– Integrated mishandling device
– Sash arrangement according to diagram A, B, C, D, G, K
– Internal and external aesthetics like Tilt&Turn windows:
narrow profiles, no offset glazing in the facade, handle position when the door is closed “downwards”
– Retracting distance: max. 117 mm
– Sash width: max. 2000 mm
– Sash height: max. 2700 mm
– Sash weight: max. 200 kg
– Clearance 11.5 + 0.5 mm
– Min. overlap height 7 mm
– Frame groove V.01 / V.02
– Sash groove 15 / 20
– Sash thickness max. 87 mm
(for sash thicknesses of more than 87 mm, technical examination is necessary)

Application diagram
Patio 100Z Aluminium

Limitation of sash formats depending on the glass thickness

Application range
Sash width **SW**.....670–1280 mm
Sash height **SH**.....930–2380 mm
Sash weight **S.kg** ..... max. 100 kg
Sash thickness ..... max. 87 mm
(for sash thicknesses of more than 87 mm,
technical examination is necessary)

Glass weight .....max. 60 kg / m²

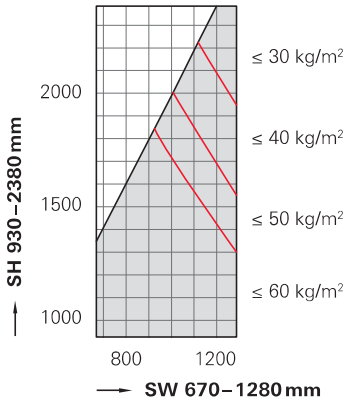
SH : SW = max. 2 : 1

The information in the application diagram refers
to the glass weight in kg / m².

1 mm / m² glass thickness = 2.5 kg

□□□ = Impermissible application range

No spring scissor needed.



Application diagram
Patio 160Z Aluminium

Limitation of sash formats depending on the glass thickness

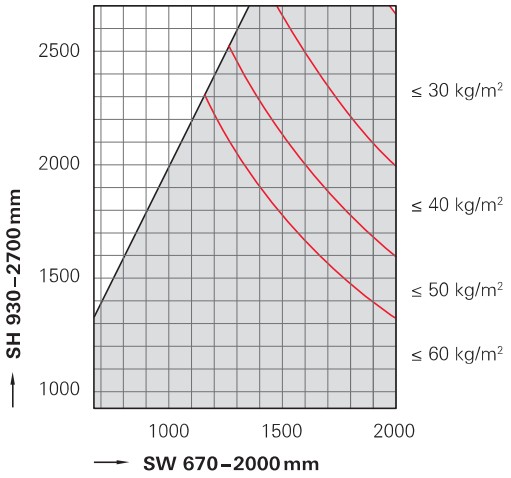
Application range
Sash width **SW** ..... 670–2000 mm
Sash height **SH** ..... 930–2700 mm
Sash weight **S.kg** ..... max. 160 kg
Sash thickness ..... max. 87 mm
(for sash thicknesses of more than 87 mm,
technical examination is necessary)

Glass weight .....max. 60 kg / m²

SH : SW = max. 2 : 1

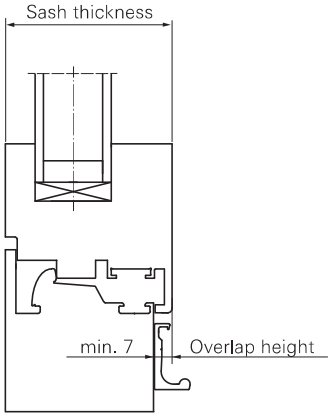
The information in the application diagram refers
to the glass weight in kg / m².

1 mm / m² glass thickness = 2.5 kg



= Impermissible application range

A spring scissor is needed for sash thicknesses between 75 mm and 87 mm.
In this case, the minimum sash width (SW) is 830 mm.



Application diagram

Patio 200Z Aluminium
Heavy-duty bogie from 160 kg

Limitation of sash formats depending on the glass thickness

Application range

Sash width **SW** ..... 1080 – 2000 mm
Sash height **SH** ..... 930 – 2700 mm
Sash weight **S.kg** ..... max. 200 kg
Sash thickness ..... max. 87 mm
(for sash thicknesses of more than 87 mm,
technical examination is necessary)

Glass weight ..... max. 60 kg / m²

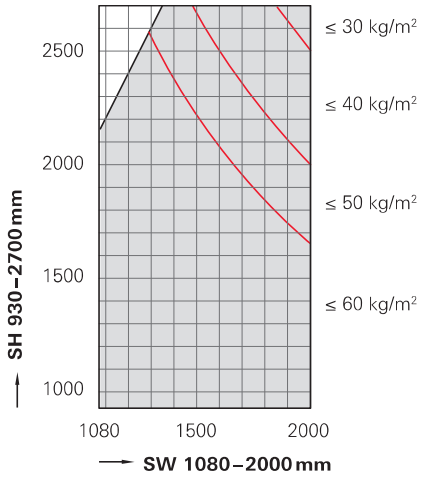
SH : SW = max. 2 : 1

The information in the application diagram refers to the glass weight in kg / m².

1 mm / m² glass thickness = 2.5 kg

= Impermissible application range

A spring scissor must always be used.



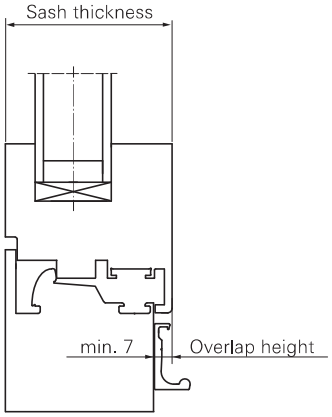


Diagram A

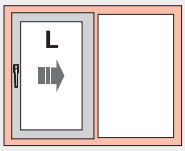


Diagram A
1 sliding sash (L or R)
1 fixed glazing

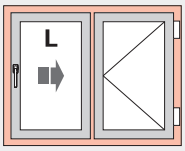


Diagram A
1 sliding sash (L or R)
1 Turn-Only sash

Diagram B

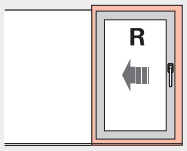


Diagram B
1 sliding sash (L or R)
Inside frame flush with the wall

Diagram C

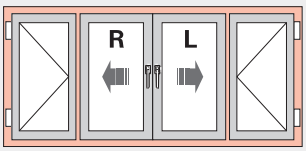


Diagram C
2 sliding sashes (L or R) with/without centre post
2 Turn-Only sashes (alternatively fixed glazing)

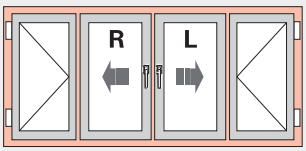


Diagram C
2 sliding sashes (L or R) with fixed centre post
2 Turn-Only sashes (alternatively fixed glazing)

Diagram D

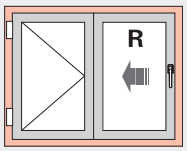


Diagram D
1 sliding sash (L or R) with/without centre post profile, slidable guide block required
(Installation situation of guide block see page 67).
1 Turn-Only sash

Diagram G

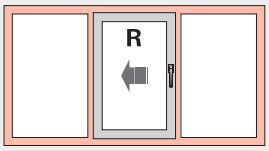


Diagram G
1 sliding sash (L or R)
2 fixed glazings

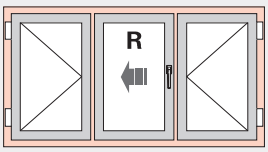


Diagram G
1 sliding sash (L or R)
2 Turn-Only sashes

Diagram K

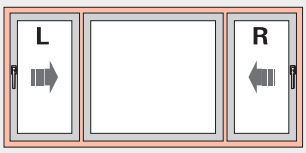
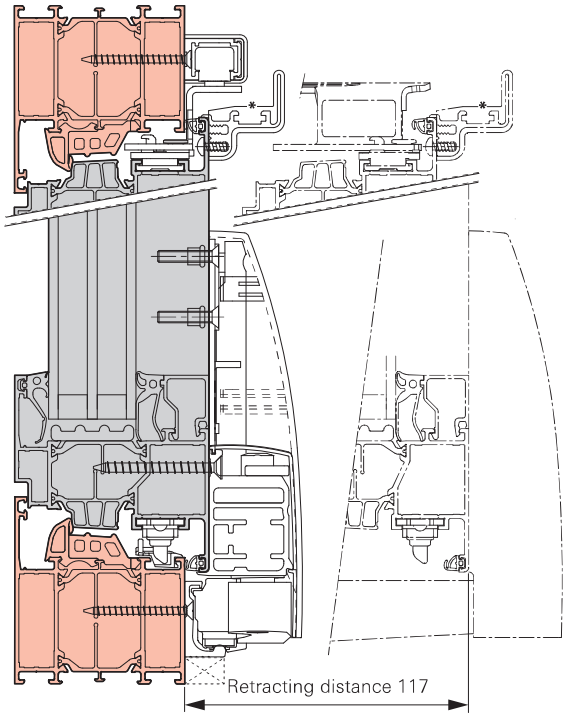


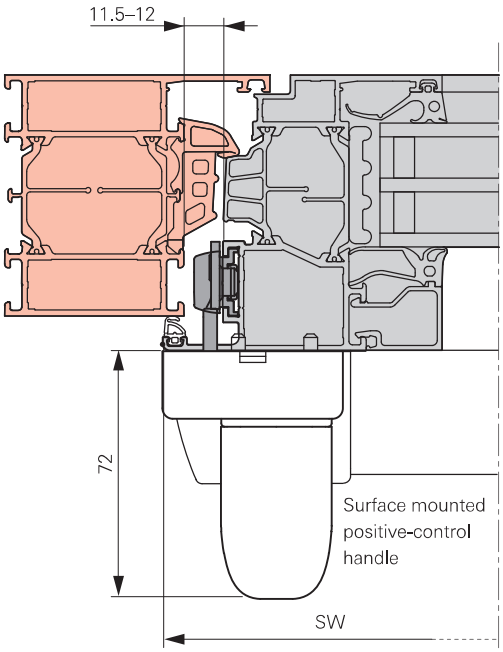
Diagram K
2 sliding sashes (L and R)
1 fixed glazing

Vertical cross section, top



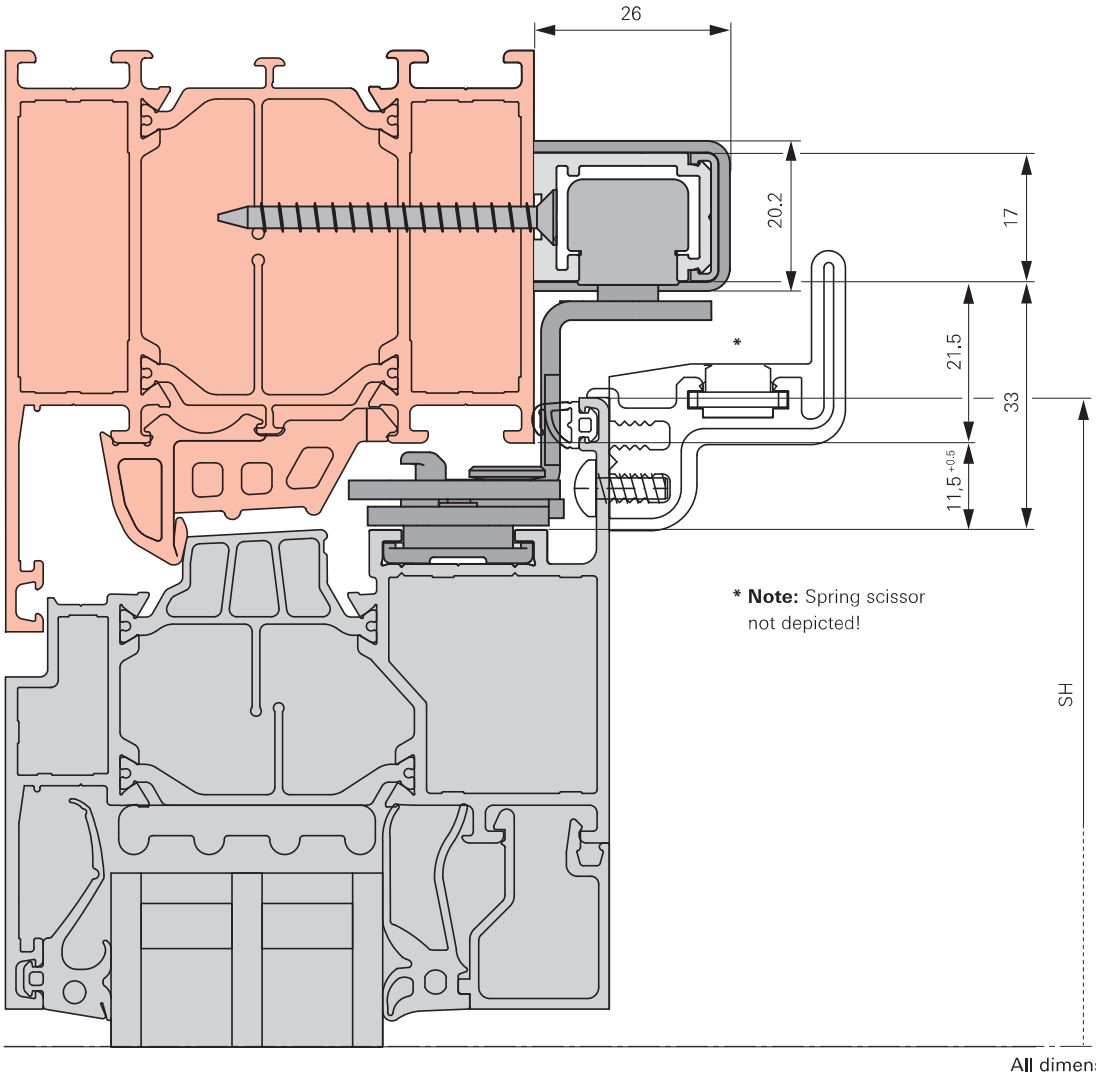
not to scale

Horizontal cross section, handle



Vertical cross section, top

Scale 1:1

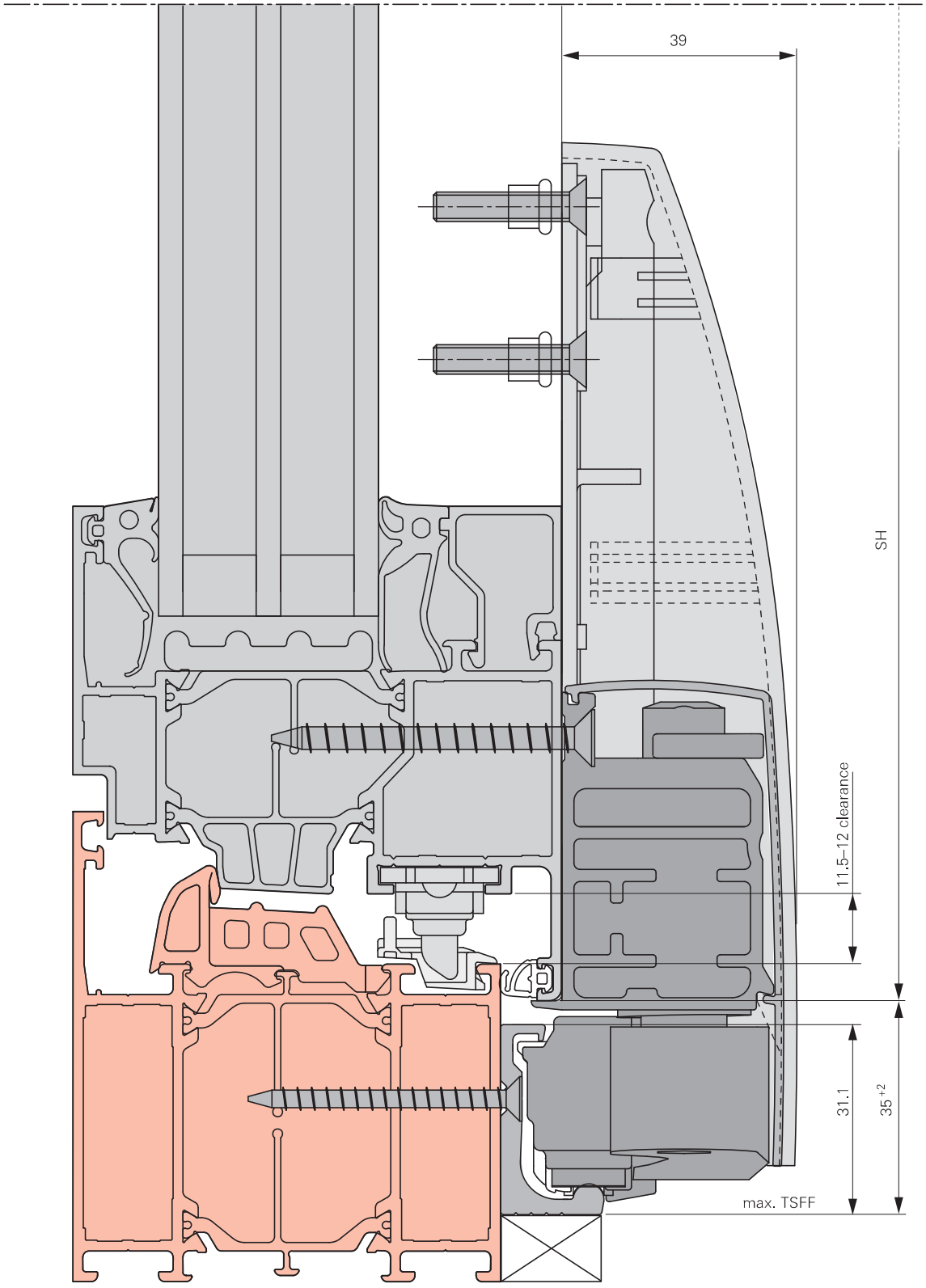


*** Note:** Spring scissor not depicted!

All dimensions stated in mm.

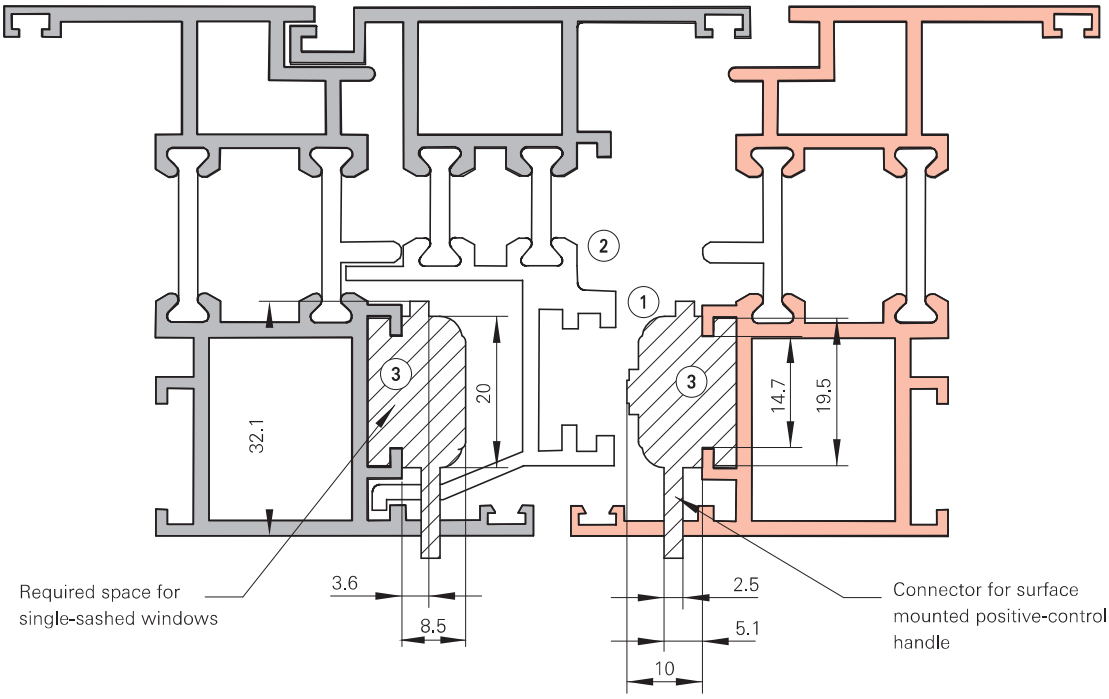
Vertical cross section, bottom

Scale 1:1



All dimensions stated in mm.

Space requirement for the hardware, diagram C

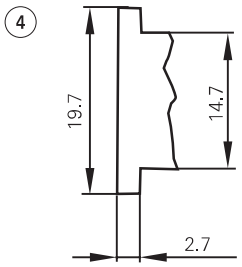


① It is imperative to adhere to the sash-frame alignment!

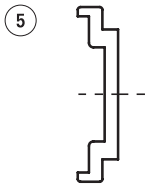
② No contact lip from the central gasket etc. may extend beyond the connecting-rod C-groove plane.

③ Required space.
Upon deviating dimensions, please consult with Roto!
All dimensions in mm.

④ Minimal dimensions of the connecting-rod C-groove, in which the hardware components must slide easily, even after colour coating.



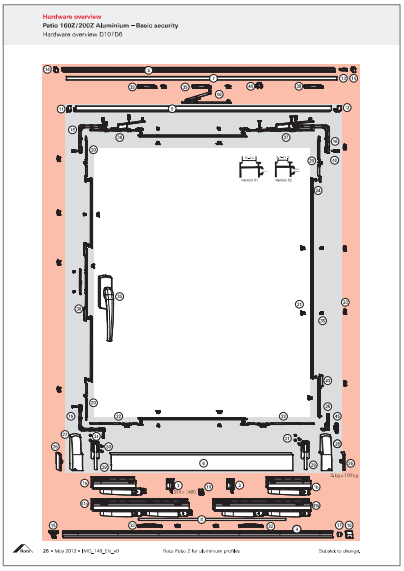
⑤ Specific connecting-rod profile for aluminium.

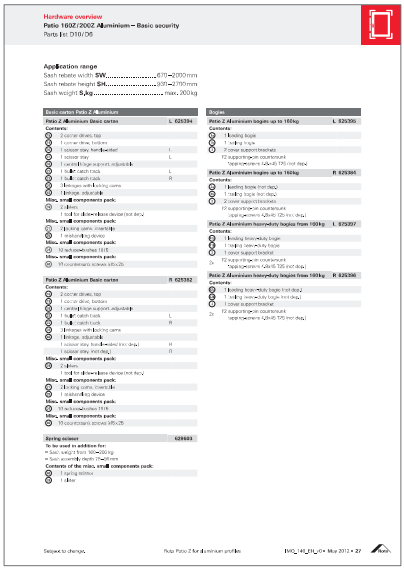


Explanation on the hardware overview chapter

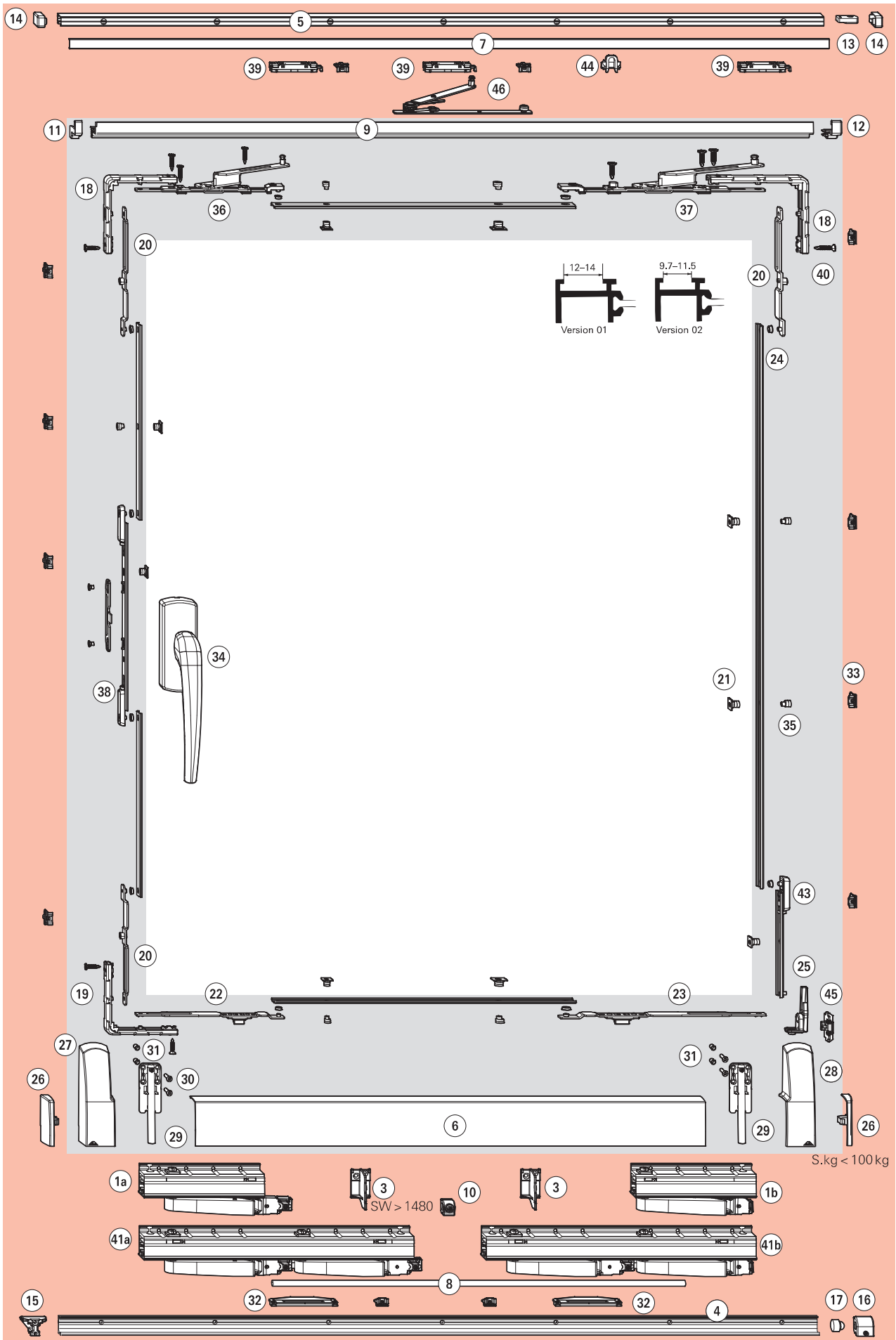
The hardware overviews on the following pages are recommendations of Roto Frank AG.

In the hardware overview chapter shows on the left page the single hardware components in the hardware overview and on the right page the respective parts list.
Position numbers in surrounding circles allow the allocation between hardware overview and parts list.





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


12–14
9.7–11.5
Version 01
Version 02
S.kg < 100 kg
SW > 1480

Application range

Sash rebate width **SW**.....670–2000 mm
Sash rebate height **SH**.....930–2700 mm
Sash weight **S.kg** ..... max. 200 kg

Basic carton Patio Z Aluminium

Patio Z Aluminium Basic carton		**L 625394**
Contents:		
(18)	2 corner drives, top	
(19)	1 corner drive, bottom	
(36)	1 scissor stay, handle-sided	L
(37)	1 scissor stay	L
(38)	1 central hinge support, adjustable	
(22)	1 bullet catch track	L
(23)	1 bullet catch track	R
(20)	3 linkages with locking cams	
(43)	1 linkage, adjustable	
Misc. small components pack:		
(39)	2 sliders	
	1 tool for slider-release device (not dep.)	
Misc. small components pack:		
(21)	2 locking cams, insertable	
(25)	1 mishandling device	
Misc. small components pack:		
(24)	10 reducer-bushes 10/6	
Misc. small components pack:		
(40)	10 countersunk screws M5x25	

Patio Z Aluminium Basic carton		**R 625382**
Contents:		
(18)	2 corner drives, top	
(19)	1 corner drive, bottom	
(38)	1 central hinge support, adjustable	
(22)	1 bullet catch track	L
(23)	1 bullet catch track	R
(20)	3 linkages with locking cams	
(43)	1 linkage, adjustable	
	1 scissor stay, handle-sided (not dep.)	R
	1 scissor stay, (not dep.)	R
Misc. small components pack:		
(39)	2 sliders	
	1 tool for slider-release device (not dep.)	
Misc. small components pack:		
(21)	2 locking cams, insertable	
(25)	1 mishandling device	
Misc. small components pack:		
(24)	10 reducer-bushes 10/6	
Misc. small components pack:		
(40)	10 countersunk screws M5x25	

Spring scissor	**629603**
To be used in addition for:	
■ Sash weight from 160–200 kg	
■ Sash assembly depth 75–90 mm	
Contents of the misc. small components pack:	
(46)	1 spring scissor
(39)	1 slider

Bogies

Patio Z Aluminium bogies up to 160 kg		**L 625395**
Contents:		
(1a)	1 leading bogie	
(1b)	1 trailing bogie	
(3)	2 cover support brackets	
	12 supporting-pin countersunk tapping-screws 4,8.x45 T25 (not dep.)	

Patio Z Aluminium bogies up to 160 kg		**R 625384**
Contents:		
(2a)	1 leading bogie (not dep.)	
(2b)	1 trailing bogie (not dep.)	
(3)	2 cover support brackets	
	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Patio Z Aluminium heavy-duty bogies from 160 kg		**L 625397**
Contents:		
(41a)	1 leading heavy-duty bogie	
(41b)	1 trailing heavy-duty bogie	
(3)	1 cover support bracket	
2x	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Patio Z Aluminium heavy-duty bogies from 160 kg		**R 625396**
Contents:		
(42a)	1 leading heavy-duty bogie (not dep.)	
(42b)	1 trailing heavy-duty bogie (not dep.)	
(3)	1 cover support bracket	
2x	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Track set

Track set for sash and frame incl. misc. small components pack

Non-treated

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625445**
931 – 1080	2230	**625450**
1081 – 1280	2630	**625455**
1281 – 1480	3030	**625460**
1481 – 1680	3430	**625465**
1681 – 2000	4130	**625470**

R01.5 Silver

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625442**
931 – 1080	2230	**625447**
1081 – 1280	2630	**625452**
1281 – 1480	3030	**625457**
1481 – 1680	3430	**625462**
1681 – 2000	4130	**625467**

R05.4 Dark bronze

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625446**
931 – 1080	2230	**625451**
1081 – 1280	2630	**625456**
1281 – 1480	3030	**625461**
1481 – 1680	3430	**625466**
1681 – 2000	4130	**625471**

R06.2 Jet-black

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625444**
931 – 1080	2230	**625449**
1081 – 1280	2630	**625454**
1281 – 1480	3030	**625459**
1481 – 1680	3430	**625464**
1681 – 2000	4130	**625469**

R07.2 Traffic-white

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625443**
931 – 1080	2230	**625448**
1081 – 1280	2630	**625453**
1281 – 1480	3030	**625458**
1481 – 1680	3430	**625463**
1681 – 2000	4130	**625468**

Contents:

Track set:

(4)	1 roller track*)	
(5)	1 guide track*)	
(6)	1 cover profile	
(7)	1 PVC cover profile	
(8)	1 connecting rod	
(9)	1 stay-connecting profile	
(10)	1 connecting-rod support-block (additionally included from SW > 1480)	

Misc. small components pack:

(11)	1 cover cap for stay-connecting profile	L
(12)	1 cover cap for stay-connecting profile	R
(13)	1 buffer stop, top	
(14)	2 cover caps guide track	
(15)	1 guide block	
(16)	1 bottom buffer stop	
(17)	1 rubber buffer stop, bottom	
	10 pan-head tapping screws 3.9 x 9.5 T15 (not dep.)	
	40 supporting-pin countersunk tapping-screws 3.9 x 45 T15 (not dep.)	

*) The guide track and the roller track must not be painted.

Cover caps

(26) **Cover caps** small (pair) 200Z up to 100 kg

Description	Material no.
Non-treated	**625398**
R01.5 Silver	**625399**
R05.4 Dark bronze	**625402**
R06.2 Jet-black	**625400**
R07.2 Traffic-white	**625401**

Cover caps large (pair) 200Z up to 200 kg

Description	Material no.
Non-treated	**625403**
R01.5 Silver	**625404**
R05.4 Dark bronze	**625407**
R06.2 Jet-black	**625405**
R07.2 Traffic-white	**625406**

Contents:

(27)	1 cover cap	L
(28)	1 cover cap	R
(29)	2 reinforcement brackets, adjustable	

Misc. small components pack:

(30)	4 countersunk screws M5x25 T25
(31)	4 blind rivet nuts M5

Locking plates

Locking plates V.01	**625486**
Locking plates V.02	**625487**

Contents of the misc. small components pack:

(32)	2 guide strikers
(33)	8 strikers
(44)	1 guidance
(45)	1 frame-striker, mishandling device

Profile system assignment → page 39

(21)	**Locking cam, insertable D10**	**625491**

Contents of the misc. small components pack:

3 locking cams, insertable

(35)	**CL cam D6**	**625492**

Contents of the misc. small components pack:

3 CL cams

Locking cam D10 V.01, complementary	**625493**
Locking cam D10 V.02, complementary	**625494**

Contents of the misc. small components pack:

(21)	10 locking cams, insertable
(33)	10 strikers

Profile system assignment → page 39

Locking cam D6 V.01, complementary	**625800**
Locking cam D6 V.02, complementary	**625801**

Contents of the misc. small components pack:

(35)	10 CL cams
(33)	10 strikers

Profile system assignment → page 39

Guide strikers (spare part)

Guide strikers V.01	**625499**
Guide strikers V.02	**625500**

Contents of the misc. small components pack:

(32)	2 guide strikers

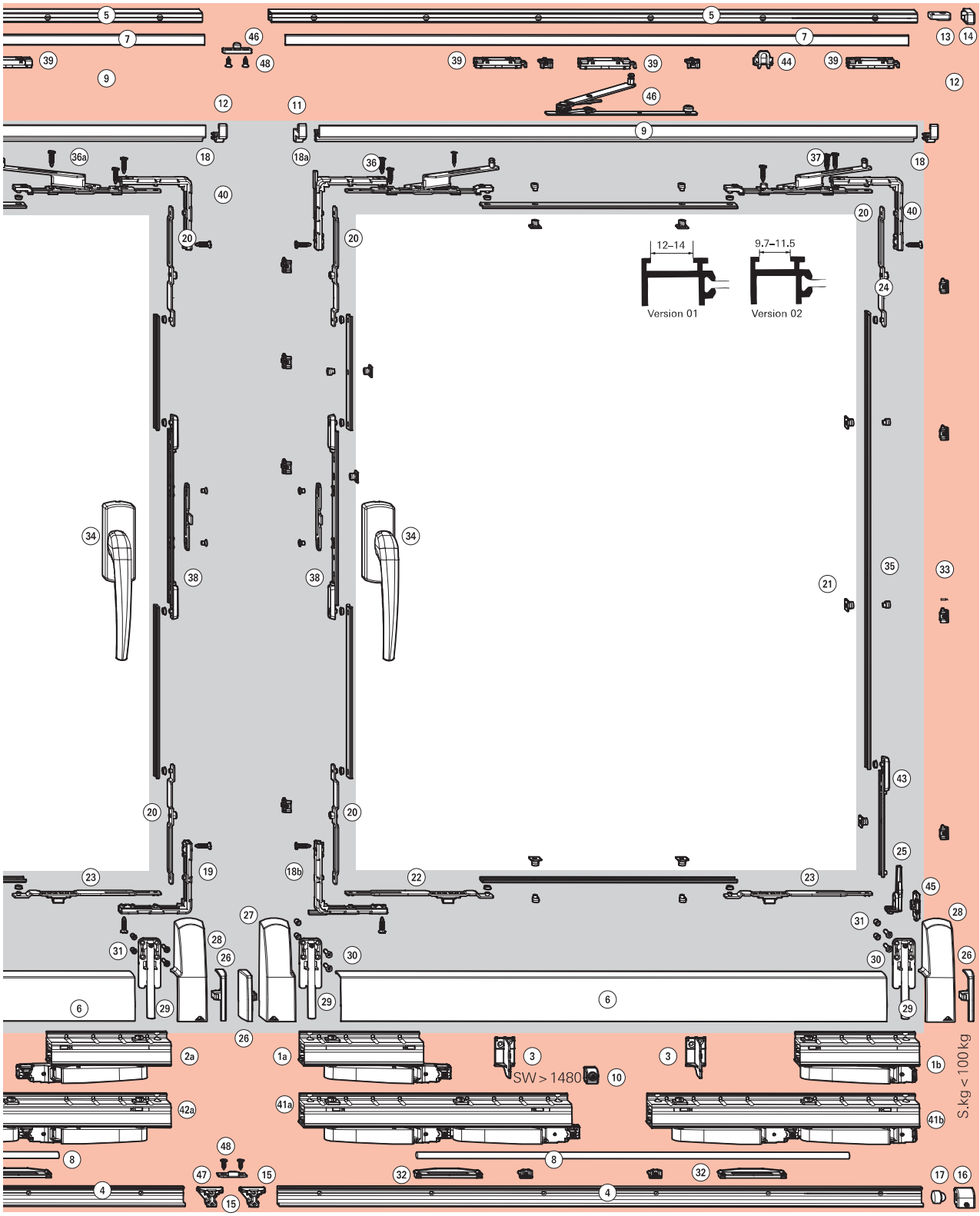
Profile system assignment → page 39

(34) **Handles and geared-handles** → page 34

Flush-encased gearbox → page 36

Patio 160Z/200Z Aluminium – Diagram C

Hardware overview D10/D6



Application range

Sash rebate width **SW**.....670–2000 mm
Sash rebate height **SH**.....930–2700 mm
Sash weight **S.kg** ..... max. 200 kg

Basic carton Patio Z Aluminium

Patio Z Aluminium Basic carton		**L 625394**
Contents:		
(18)	2 corner drives, top	
(19)	1 corner drive, bottom	
(36)	1 scissor stay, handle-sided	L
(37)	1 scissor stay	L
(38)	1 central hinge support, adjustable	
(22)	1 bullet catch track	L
(23)	1 bullet catch track	R
(20)	3 linkages with locking cams	
(43)	1 linkage, adjustable	
Misc. small components pack:		
(39)	2 sliders	
	1 tool for slider-release device (not dep.)	
Misc. small components pack:		
(21)	2 locking cams, insertable	
(25)	1 mishandling device	
Misc. small components pack:		
(24)	10 reducer-bushes 10/6	
Misc. small components pack:		
(40)	10 countersunk screws M5x25	

Patio Z Aluminium Basic carton faceplate		**625383**
Contents:		
(18)	1 corner drive, top	
(18a)	1 corner drive, top of faceplate	
(18b)	1 corner drive, bottom of faceplate	
(36a)	1 scissor stay, handle-sided	R
(38)	1 central hinge support, adjustable	
(22)	1 bullet catch track	L
(23)	1 bullet catch track	R
(20)	3 linkages with locking cams	
(43)	1 linkage, adjustable	
(37a)	1 scissor stay, (not dep.)	R
Misc. small components pack:		
(39)	2 sliders	
	1 tool for slider-release device (not dep.)	
Misc. small components pack:		
(21)	2 locking cams, insertable	
(25)	1 mishandling device	
Misc. small components pack:		
(24)	10 reducer-bushes 10/6	
Misc. small components pack:		
(40)	10 countersunk screws M5x25	

Spring scissor		**629603**
To be used in addition for:		
■ Sash weight from 160–200 kg		
■ Sash assembly depth 75–90 mm		
Contents of the misc. small components pack:		
(46)	1 spring scissor	
(39)	1 slider	

Bogies

Patio Z Aluminium bogies up to 160 kg		**L 625395**
Contents:		
(1a)	1 leading bogie	
(1b)	1 trailing bogie	
(3)	2 cover support brackets	
	12 supporting-pin countersunk tapping-screws 4,8x45 T25 (not dep.)	

Patio Z Aluminium bogies up to 160 kg		**R 625384**
Contents:		
(2a)	1 leading bogie	
(2b)	1 trailing bogie (not dep.)	
(3)	2 cover support brackets	
	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Patio Z Aluminium heavy-duty bogies from 160 kg		**L 625397**
Contents:		
(41a)	1 leading heavy-duty bogie	
(41b)	1 trailing heavy-duty bogie	
(3)	1 cover support bracket	
2x	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Patio Z Aluminium heavy-duty bogies from 160 kg		**R 625396**
Contents:		
(42a)	1 leading heavy-duty bogie	
(42b)	1 trailing heavy-duty bogie (not dep.)	
(3)	1 cover support bracket	
2x	12 supporting-pin countersunk tapping-screws 4.8x45 T25 (not dep.)	

Track Set, 1 piece per sash

Track set for sash and frame incl. misc. small components pack

Non-treated

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625445**
931 – 1080	2230	**625450**
1081 – 1280	2630	**625455**
1281 – 1480	3030	**625460**
1481 – 1680	3430	**625465**
1681 – 2000	4130	**625470**

R01.5 Silver

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625442**
931 – 1080	2230	**625447**
1081 – 1280	2630	**625452**
1281 – 1480	3030	**625457**
1481 – 1680	3430	**625462**
1681 – 2000	4130	**625467**

R05.4 Dark bronze

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625446**
931 – 1080	2230	**625451**
1081 – 1280	2630	**625456**
1281 – 1480	3030	**625461**
1481 – 1680	3430	**625466**
1681 – 2000	4130	**625471**

R06.2 Jet-black

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625444**
931 – 1080	2230	**625449**
1081 – 1280	2630	**625454**
1281 – 1480	3030	**625459**
1481 – 1680	3430	**625464**
1681 – 2000	4130	**625469**

R07.2 Traffic-white

SW / mm	Frame external width (FEW) / mm	Material no.
670 – 930	1930	**625443**
931 – 1080	2230	**625448**
1081 – 1280	2630	**625453**
1281 – 1480	3030	**625458**
1481 – 1680	3430	**625463**
1681 – 2000	4130	**625468**

Contents:

Track set:

(4)	1 roller track*)	
(5)	1 guide track*)	
(6)	1 cover profile	
(7)	1 PVC cover profile	
(8)	1 connecting rod	
(9)	1 stay-connecting profile	
(10)	1 connecting-rod support-block (additionally included from SW > 1480)	

Misc. small components pack:

(11)	1 cover cap for stay-connecting profile	L
(12)	1 cover cap for stay-connecting profile	R
(13)	1 buffer stop, top	
(14)	2 cover caps guide track	
(15)	1 guide block	
(16)	1 bottom buffer stop	
(17)	1 rubber buffer stop, bottom	
	10 pan-head tapping screws 3.9x9.5 T15 (not dep.)	
	40 supporting-pin countersunk tapping-screws 3.9x45 T15 (not dep.)	

*) The guide track and the roller track must not be painted.

Cover caps

(26) **Cover caps** small (pair) 200Z up to 100 kg

Description	Material no.
Non-treated	**625398**
R01.5 Silver	**625399**
R05.4 Dark bronze	**625402**
R06.2 Jet-black	**625400**
R07.2 Traffic-white	**625401**

Cover caps large (pair) 200Z up to 200 kg

Description	Material no.
Non-treated	**625403**
R01.5 Silver	**625404**
R05.4 Dark bronze	**625407**
R06.2 Jet-black	**625405**
R07.2 Traffic-white	**625406**

Contents:

(27)	1 cover cap	L
(28)	1 cover cap	R
(29)	2 reinforcement brackets, adjustable	

Misc. small components pack:

(30)	4 countersunk screws M5x25 T25
(31)	4 blind rivet nuts M5

Locking plates

Locking plates V.01	**625486**
Locking plates V.02	**625487**

Contents of the misc. small components pack:

(32)	2 guide strikers
(33)	8 strikers
(44)	1 guidance
(45)	1 frame-striker, mishandling device

Profile system assignment → page 39

Faceplate sheets 10 mm groove	**625488**
Faceplate sheets 12 mm groove	**625489**
Faceplate sheets 14 mm groove	**625490**

Contents of the misc. small components pack:

(46)	1 faceplate sheet, top
(47)	1 striker, bottom
(48)	4 countersunk tapping-screws 4.8 x 25

Profile system assignment → page 39

Locking cam, insertable D10	**625491**

Contents of the misc. small components pack:

(21)	3 locking cams, insertable

CL cam D6	**625492**

Contents of the misc. small components pack:

(35)	3 CL cams

Locking cam D10 V.01, complementary	**625493**
Locking cam D10 V.02, complementary	**625494**

Contents of the misc. small components pack:

(21)	10 locking cams, insertable
(33)	10 strikers

Profile system assignment → page 39

Locking cam D6 V.01, complementary	**625800**
Locking cam D6 V.02, complementary	**625801**

Contents of the misc. small components pack:

(35)	10 CL cams
(33)	10 strikers

Profile system assignment → page 39

Guide strikers (spare part)	
Guide strikers V.01	**625499**
Guide strikers V.02	**625500**

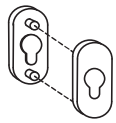
Contents of the misc. small components pack:

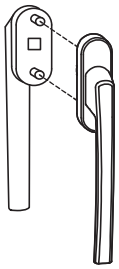
(32)	2 guide strikers

Profile system assignment → page 39

(34) **Handles and geared-handles → page 34**

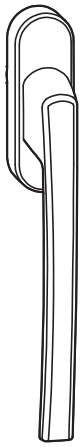
Flush-encased gearbox → page 36





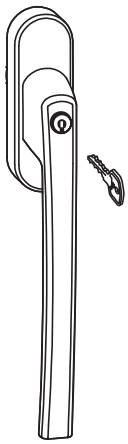
RotoLine handle, with Roto logo, inside and outside operation
spindle length 135 mm

Roto colour no.	Colour	Material no.
R 01.5	Silver	**626532**
R 05.4	Dark bronze	**601692**
R 06.2M	Jet-black, matt	**626533**
R 07.2	Traffic-white	**601693**



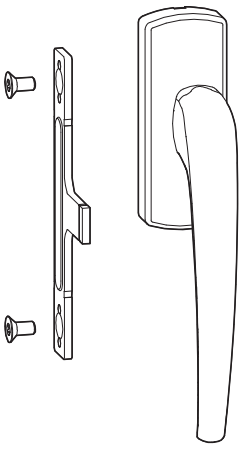
RotoLine handle, with Roto logo
spindle length 35 mm

Roto colour no.	Colour	Material no.
R01.5	Silver	**626528**
R05.4	Dark bronze	**494479**
R 06.2M	Jet-black, matt	**626529**
R07.2	Traffic-white	**494480**



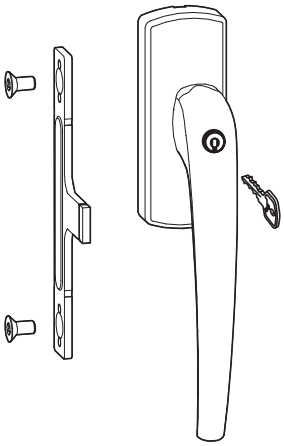
RotoLine handle, with Roto logo, lockable
spindle length 35 mm

Roto colour no.	Colour	Material no.
R01.5	Silver	**626530**
R05.4	Dark bronze	**494485**
R 06.2M	Jet-black, matt	**626531**
R07.2	Traffic-white	**494486**



Surface mounted positive-control handle, incl. connector

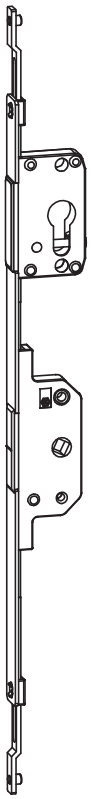
Roto colour no.	Colour	Material no.
R 01.5	Silver	L **625412**
		R **625408**
R 05.4	Dark bronze	L **625415**
		R **625411**
R 06.2M	Jet-black, matt	L **625414**
		R **625410**
R 07.2	Traffic-white	L **625413**
		R **625409**



Surface mounted positive-control handle, lockable, incl. connector

Roto colour no.	Colour	Material no.
R 01.5	Silver	L **625420**
		R **625416**
R 05.4	Dark bronze	L **625423**
		R **625419**
R 06.2M	Jet-black, matt	L **625422**
		R **625418**
R 07.2	Traffic-white	L **625421**
		R **625417**

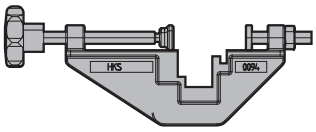
Flush-encased gearbox



Flush-encased gearbox, lockable espagnolette

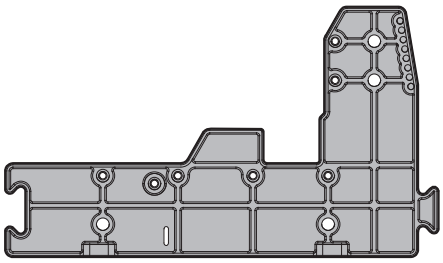
Backset/mm	Material no.
30	**625424**
40	**625425**

Slider-release device 562759

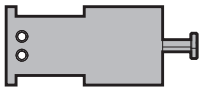


Jig for roller track and guide track 563967

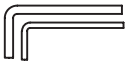
Drilling aid for roller track and guide track 207583



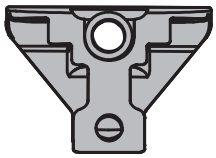
Drilling jig for bogie 563968



Jig for guide block 563969



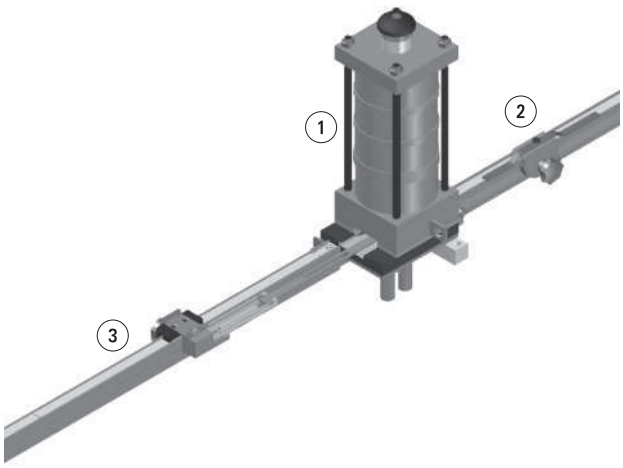
Torx key T10 625172
Torx key T15 625173
Torx key T25 563971
Torx key T40 563970



Drilling jig for guide block, adjustable 566970

Drilling jig for surface mounted positive-control handle and stay-connecting profile 623669

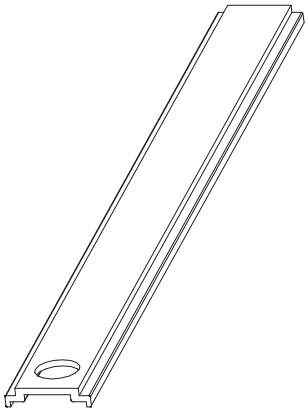
Drilling jig for corner drive and scissor stay 623668



Croppers

Pos.	Component description	PQ	Material no.
1	'Comfort' cropper PS4 G Ø 10 mm	1	**350309**
2	Standard linear ruler	1	**350314**
3	Linear ruler for sash stay 370 / 390	1	**383867**

Pneumatic cropper for cropping and hole-stamping the connecting-rod.



Connecting-rod

Component description	PQ	Material no.
AluVision connecting-rod	6 m	**334665**

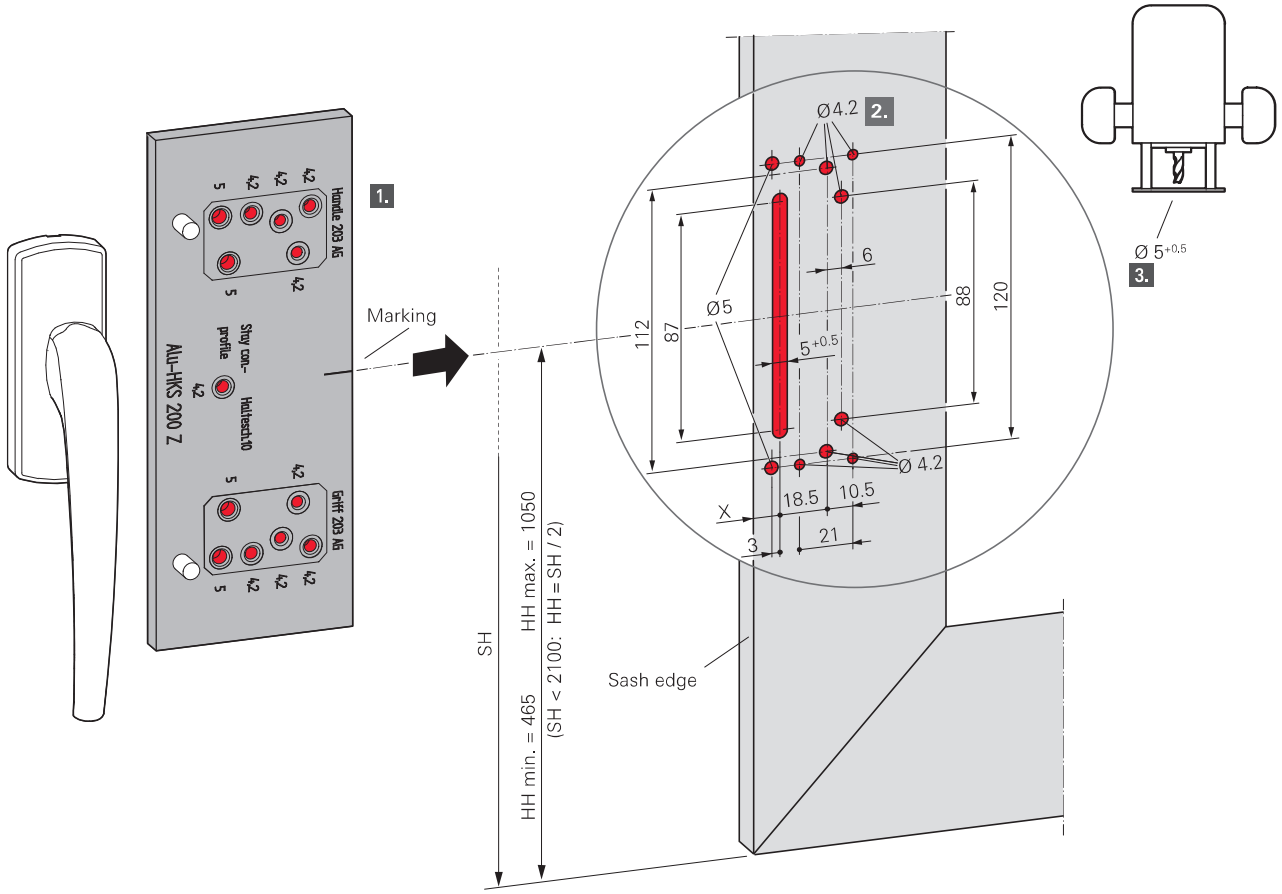
Specific connecting-rod profile

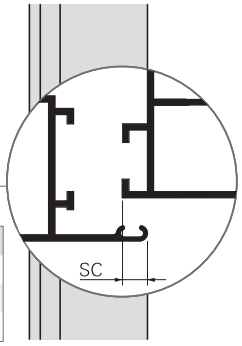
Description	Colour	Comment	Length in mm	Material no.
Tracks				
Roller track	R01.5	Silver	6070	**562764**
Roller track	R05.4	Dark bronze	6070	**562765**
Roller track	R06.2	Jet-black	6070	**625472**
Stay-connecting profile		Non-treated	5220	**625473**
Stay-connecting profile	R01.5	Silver	5220	**625474**
Stay-connecting profile	R05.4	Dark bronze	5220	**628493**
Stay-connecting profile	R06.2	Jet-black	5220	**625475**
Stay-connecting profile	R07.2	Traffic-white	5220	**625476**
Guide track	R01.5	Silver	6070	**217140**
Cover profiles				
Aluminium cover profile		Non-treated	5190	**625477**
Aluminium cover profile	R01.5	Silver	5190	**625478**
Aluminium cover profile	R05.4	Dark bronze	5190	**625481**
Aluminium cover profile	R06.2	Jet-black	5190	**625479**
Aluminium cover profile	R07.2	Traffic-white	5190	**625480**
PVC cover profile	R01.5	Silver	6080	**625482**
PVC cover profile	R06.2	Jet-black	6080	**217167**
PVC cover profile	R07.2	Traffic-white	6080	**562780**
Connecting rod			3600	**217057**
Guide block, slidable (jig 566970 required)				
Guide block, slidable	R01.5	Silver	6070	**563558**
Connecting-rod support-block				**625483**

Profile system	Series	Frame Groove in mm	Locking plates	Faceplate sheets	Guide strikers	Strikers and locking cams	
						D10	D6
Akotherm	AT 720/730–740	12	**625486**	**625489**	**625499**	**625493**	**625800**
Alcan	TC 2000	12	**625486**	**625489**	**625499**	**625493**	**625800**
Aliplast	Imperial Serie 800	12	**625486**	**625489**	**625499**	**625493**	**625800**
Alsec	Serie 3000	14	**625486**	**625490**	**625499**	**625493**	**625800**
Alumil	M 11000/11500/11600	14	**625486**	**625490**	**625499**	**625493**	**625800**
Alutherm	AT 700/800	14	**625486**	**625490**	**625499**	**625493**	**625800**
Bröckelmann	RG 60/75	10	**625487**	**625488**	**625500**	**625494**	**625801**
Domal Break	PA 63/70S	14	**625486**	**625490**	**625499**	**625493**	**625800**
Eural	65/75/1.0	14	**625486**	**625490**	**625499**	**625493**	**625800**
Graute	Therm 90	10	**625487**	**625488**	**625500**	**625494**	**625801**
Heroal (sash with groove 15/20)	110 ES	10	**625487**	**625488**	**625500**	**625494**	**625801**
	O65	10	**625487**	**625488**	**625500**	**625494**	**625801**
Hörmann		14	**625486**	**625490**	**625499**	**625493**	**625800**
Kawneer Alcoa	AA 610/630/720 HI	10	**625487**	**625488**	**625500**	**625494**	**625801**
Klauke	Softline	14	**625486**	**625490**	**625499**	**625493**	**625800**
Kubal	Serie 55/65	10	**625487**	**625488**	**625500**	**625494**	**625801**
Metra		12	**625486**	**625489**	**625499**	**625493**	**625800**
MKF	TKI 755	12	**625486**	**625489**	**625499**	**625493**	**625800**
Raico	Frame+	10	**625487**	**625488**	**625500**	**625494**	**625801**
Reynaers	all CS series	14	**625486**	**625490**	**625499**	**625493**	**625800**
SAPA	Avantis 75	14	**625486**	**625490**	**625499**	**625493**	**625800**
Sommer		12	**625486**	**625489**	**625499**	**625493**	**625800**
Sprangers		14	**625486**	**625490**	**625499**	**625493**	**625800**
Sun Flex		10	**625487**	**n.a.**	**625500**	**625494**	**625801**
Sykon	70/70 plus – 75/75 plus	10	**625487**	**625488**	**625500**	**625494**	**625801**
Technal	Soleal	10	**625487**	**625488**	**625500**	**625494**	**625801**
TSG	S 70/S 70V	10	**625487**	**625488**	**625500**	**625494**	**625801**
van Beveren	A/B/R 50	14	**625486**	**625490**	**625499**	**625493**	**625800**
Winsol		10	**625487**	**625488**	**625500**	**625494**	**625801**
Wipro					**625499**		
Yawal	TM 77 Hi	14	**625486**	**625490**	**625491**	**625493**	**625800**

Further profiles are available upon request.

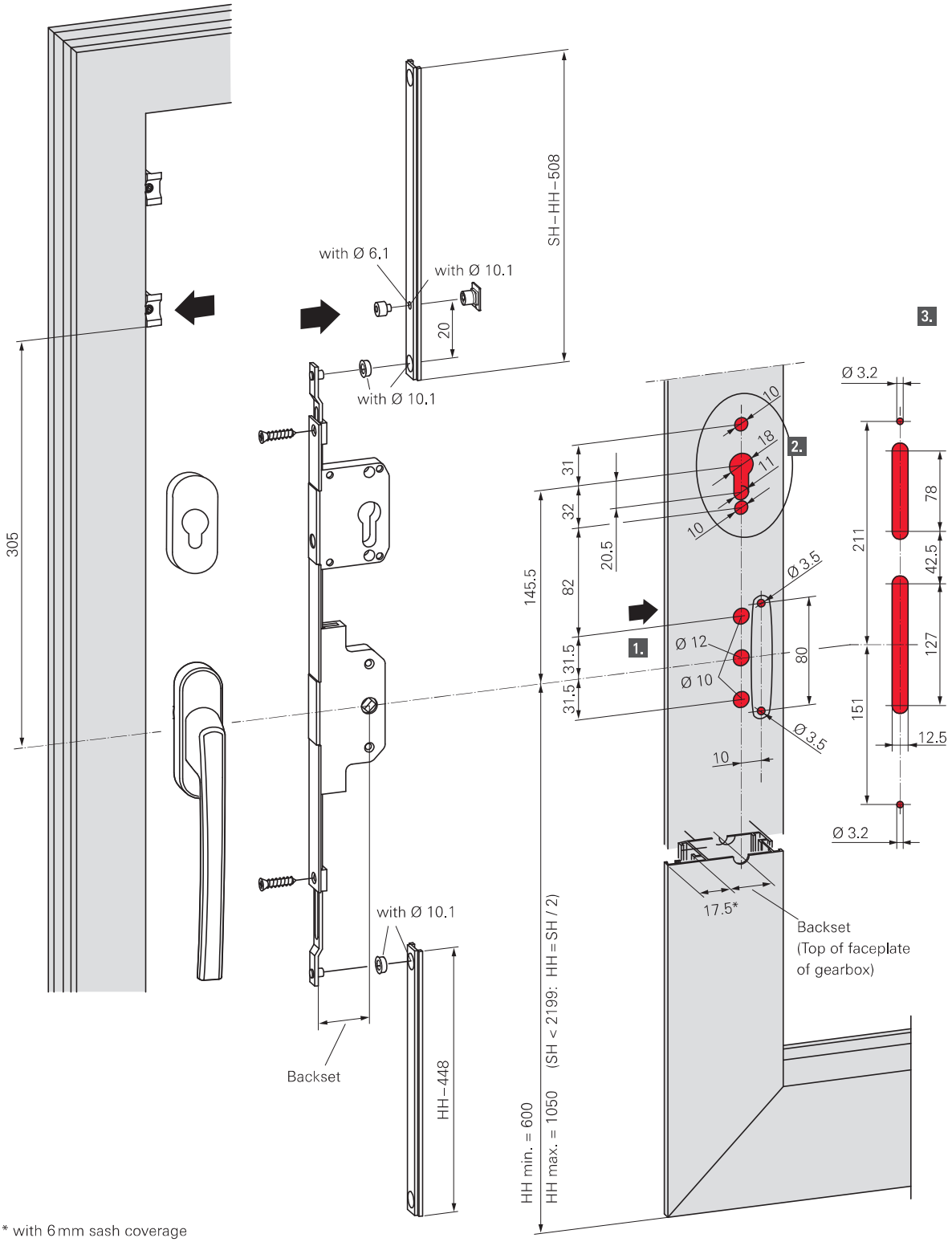
1. Position the drilling jig for surface mounted positive-control handle and stay-connecting profile (623669) at the marking for the desired handle height. If necessary, fix it with a screw clamp.
2. Carry out the handle drillings (12 drill-holes).
3. Cut the connector slot.





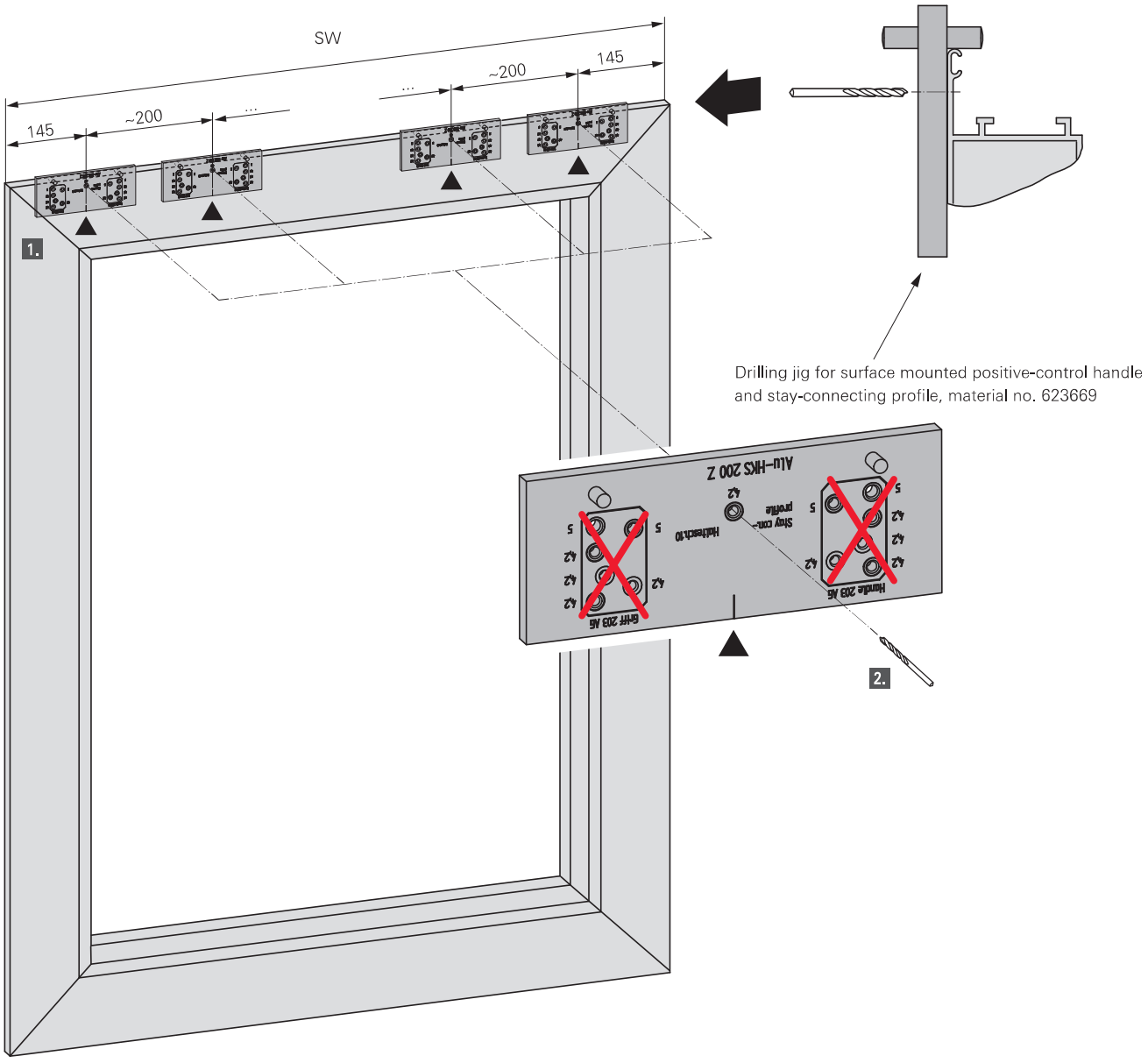
SC	X
6	14.5
5	13.5
4	12.5

1. Handle (sash inside): drill 2 x Ø 10 mm and 1 x Ø 12 mm for the handle.
2. Carry out the profile cylinder drillings.
3. Carry out the routings for the espagnolette.
4. Mount espagnolette and handle (not dep.).
5. If necessary, additional drillings to fix the handle can be carried out directly on the handle (not dep.).

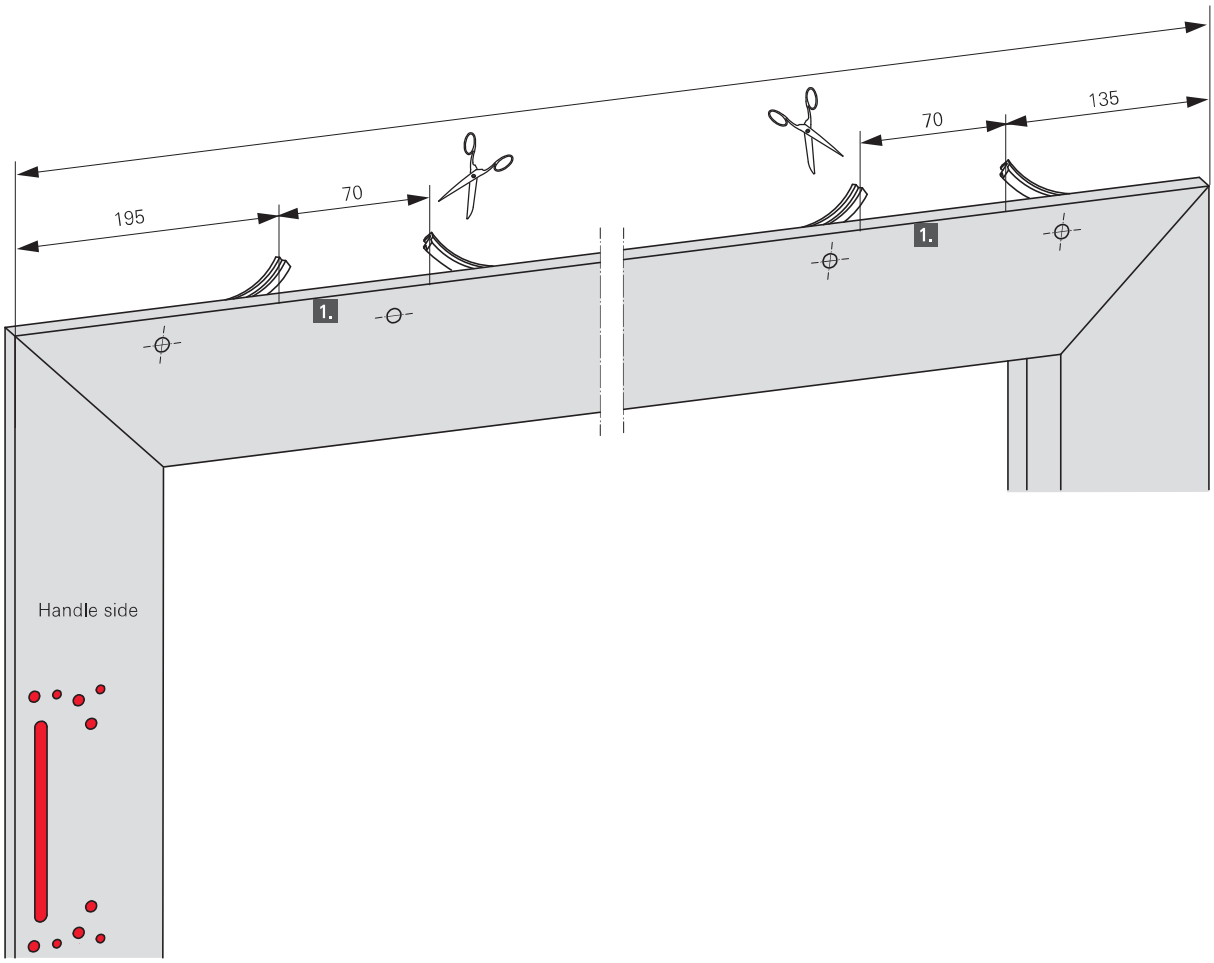


* with 6 mm sash coverage

1. Position the drilling jig for surface mounted positive-control handle and stay-connecting profile (623669) on the upper edge of the sash profile as shown.
   If necessary, fix it with a screw clamp.
2. Drill the holes with Ø 4.2 mm drill according to the illustration below.



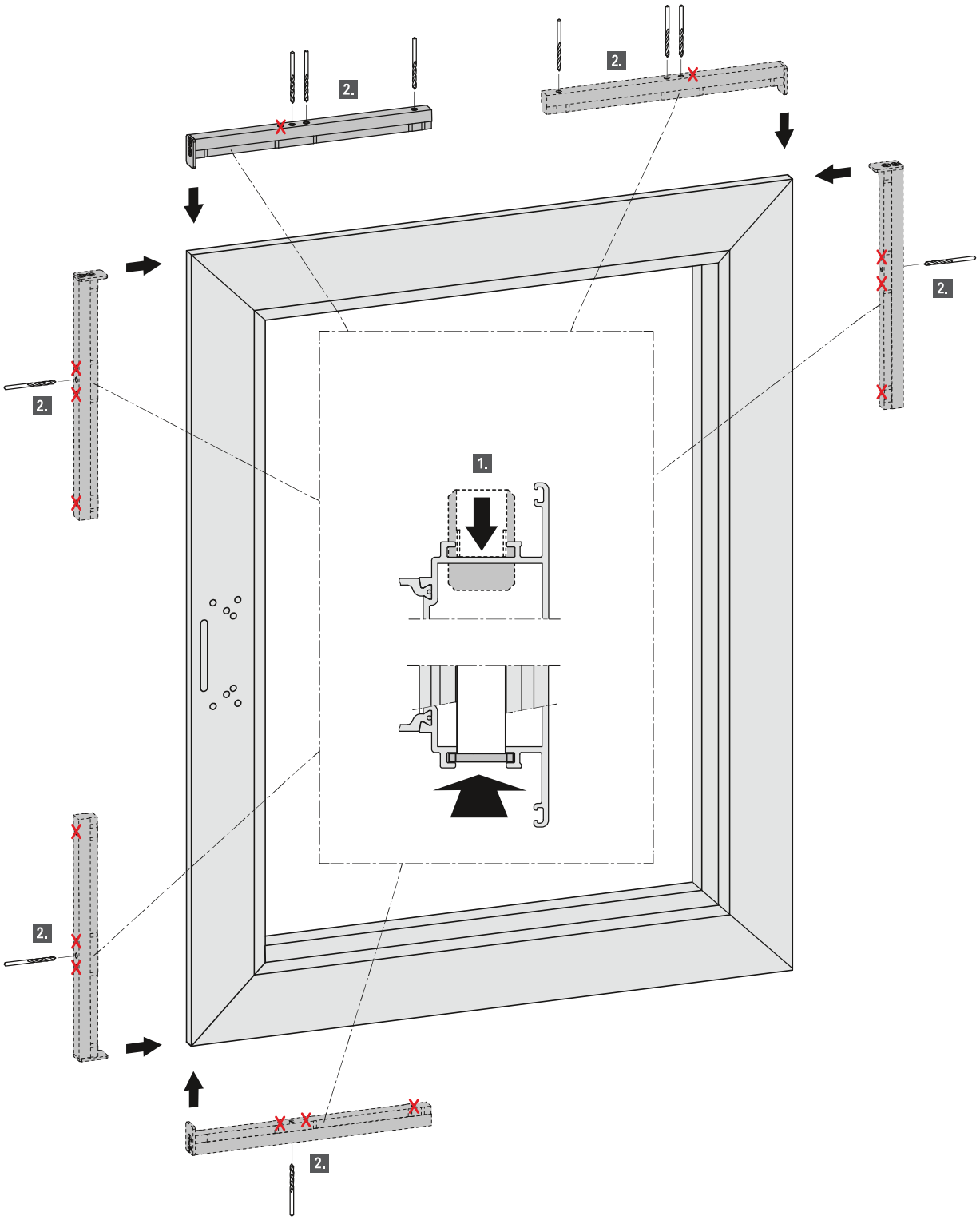
1. Notch out the sash gasket in both of the scissor-stay arms depicted areas.



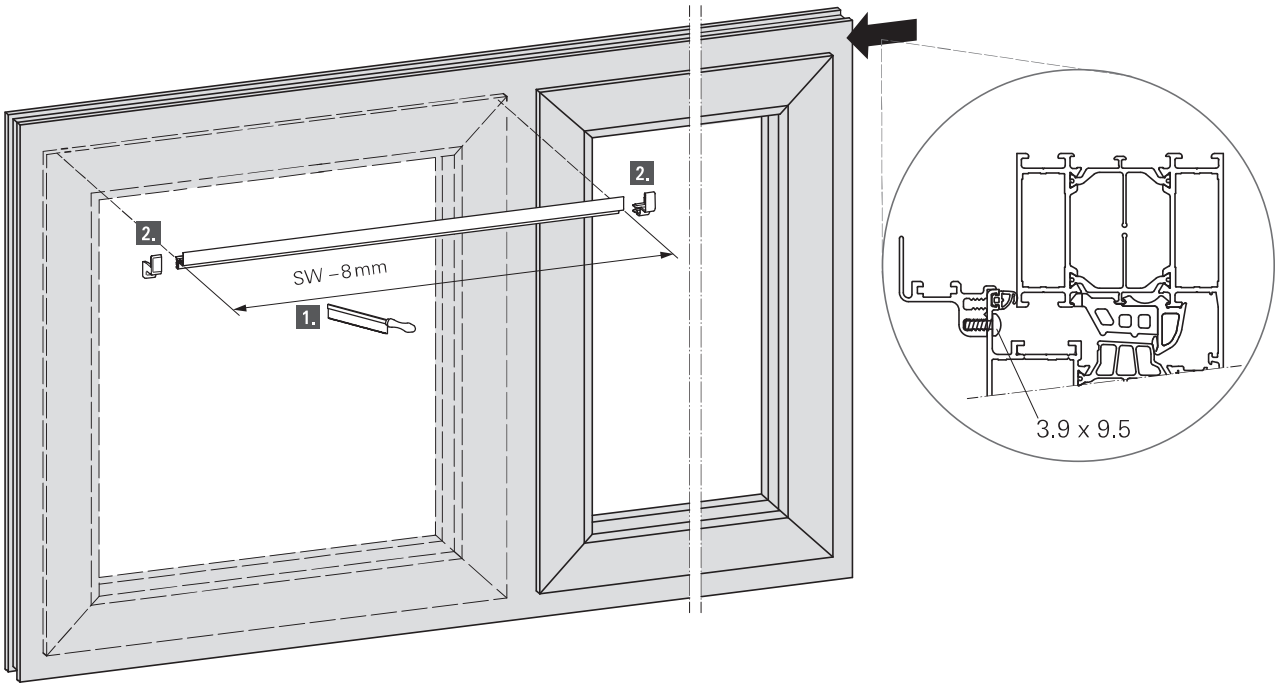
Sash

Drill the holes for the corner drive and the scissor stays.

1. Insert the drilling jig for corner drive and scissor stay (623668) with the buffer stop into the hardware groove successively as shown.
2. Drill the corresponding holes with Ø 3.5 mm drill.

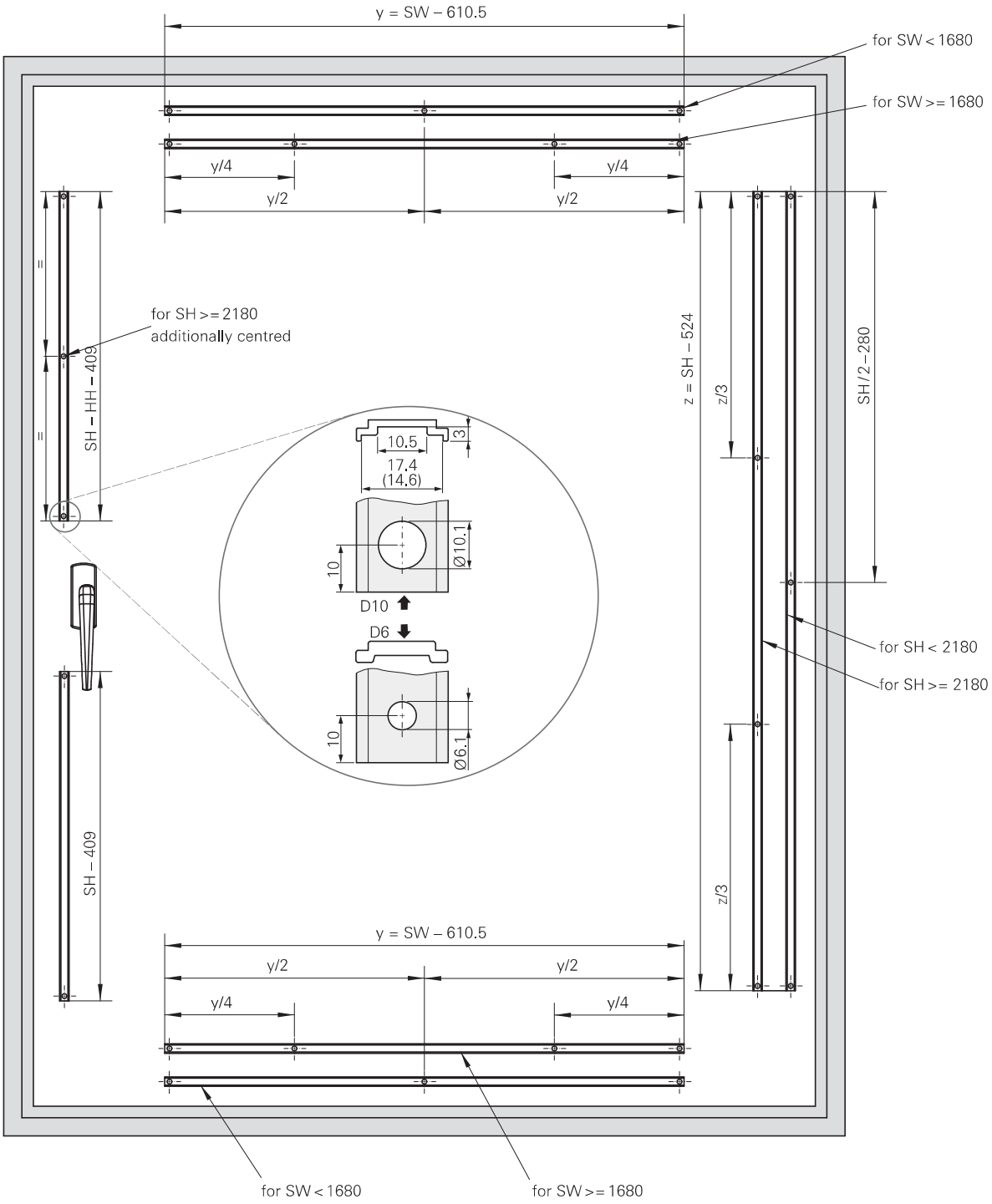


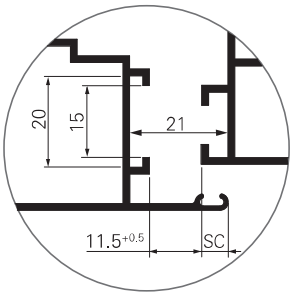
1. Length of the stay-connecting profile:
   Sash width minus 8 mm. Screw-fix centred onto the sash (3.9 x 9.5).
2. Mount the cover caps on the ends of the stay-connecting profile at the left and right.



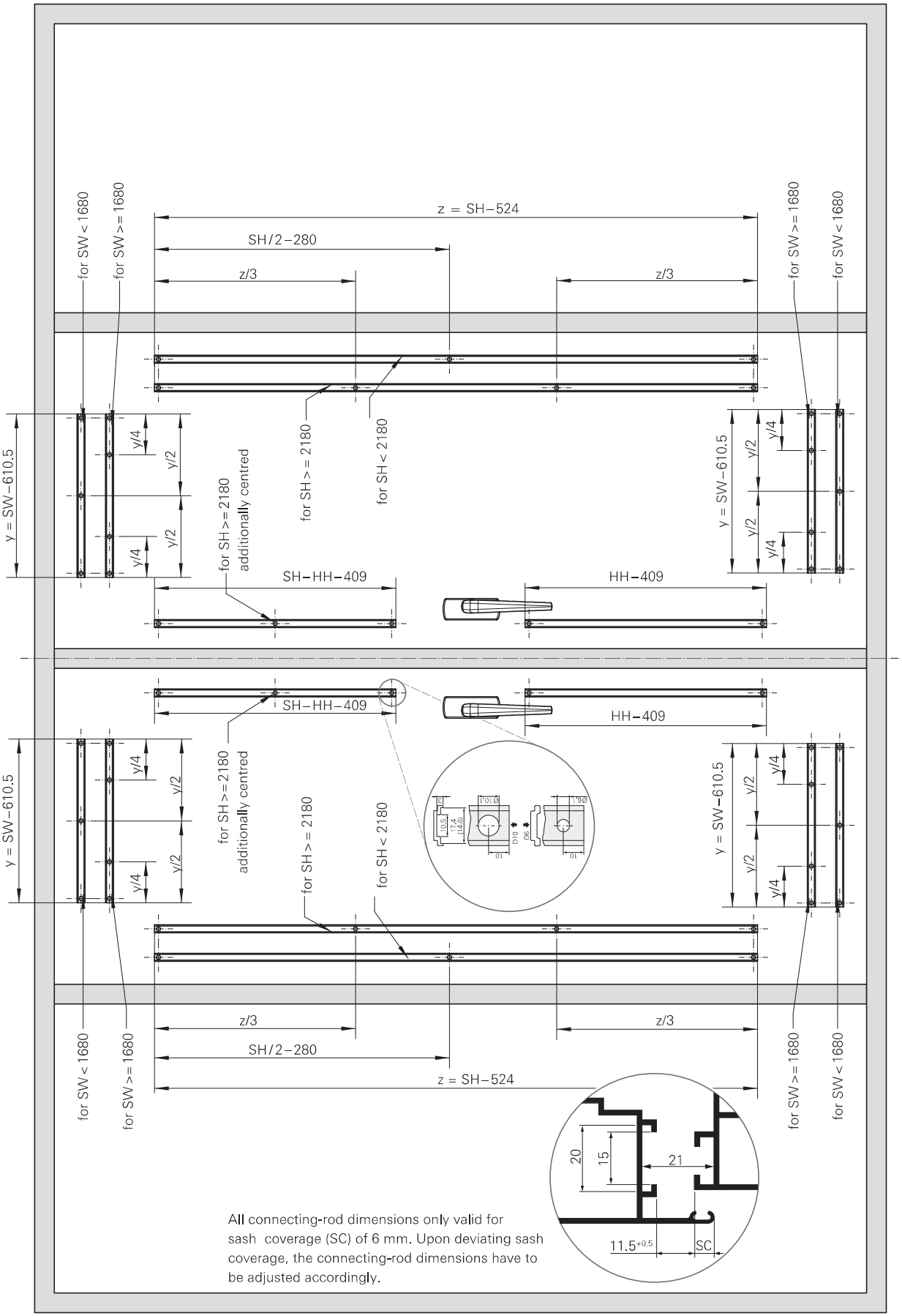
Sash

Shortening the connecting-rods Patio Z Aluminium D10/D6, diagram A



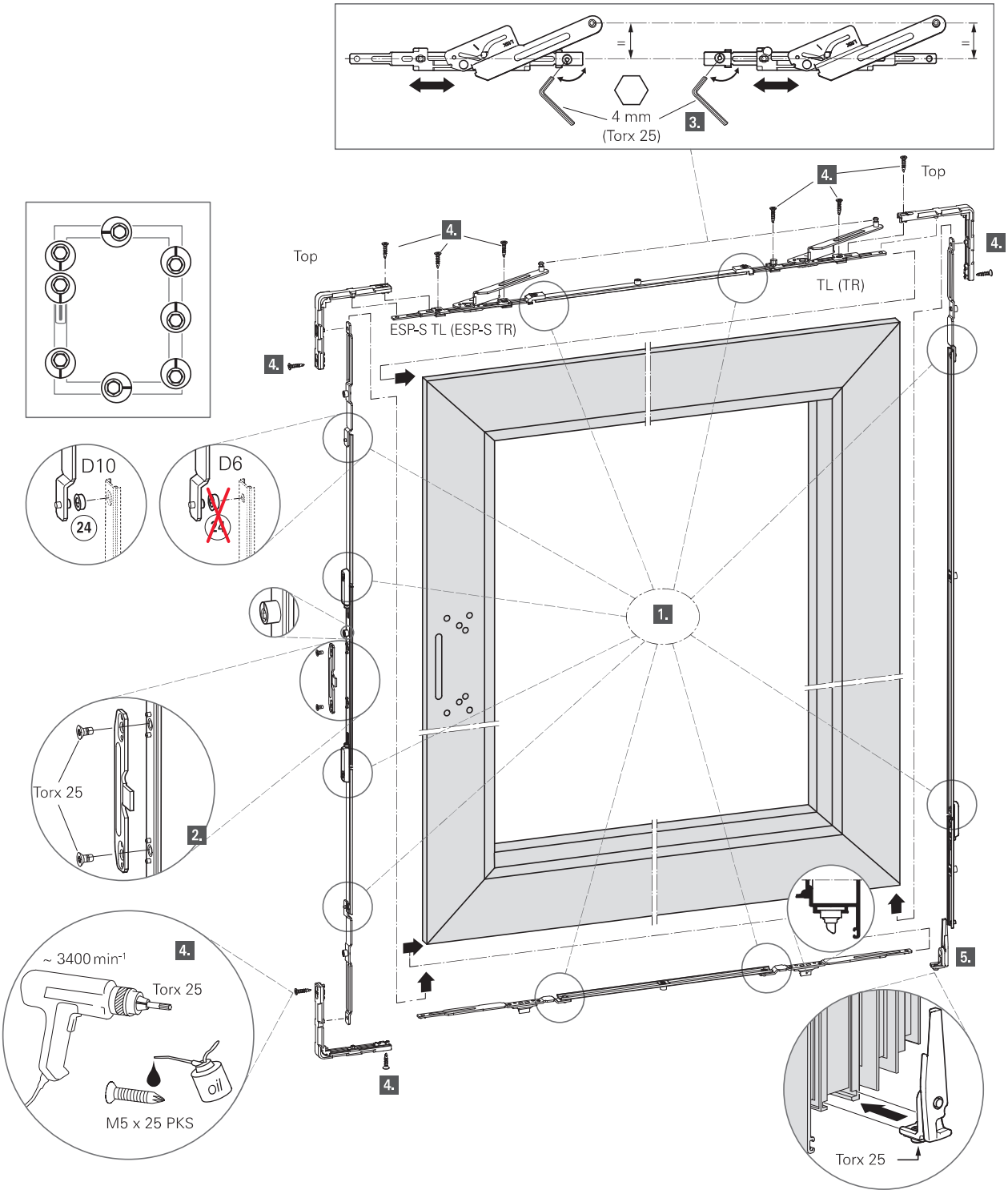


All connecting-rod dimensions only valid for sash coverage (SC) of 6 mm. Upon deviating sash coverage, the connecting-rod dimensions have to be adjusted accordingly.

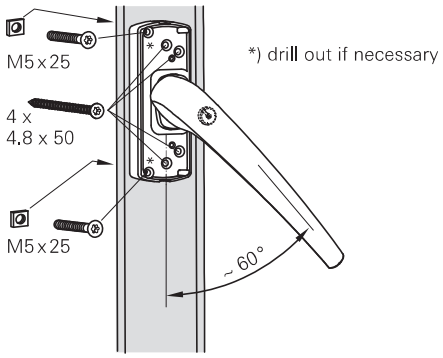


All connecting-rod dimensions only valid for sash coverage (SC) of 6 mm. Upon deviating sash coverage, the connecting-rod dimensions have to be adjusted accordingly.

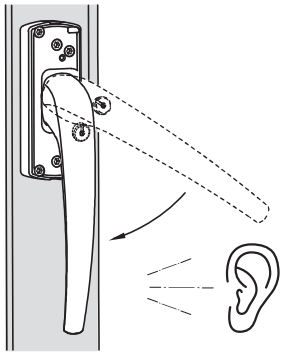
1. Connect the corresponding components with each other step-by-step and slide into the profile groove of the sash. Ensure the correct orientation of the cams.
   When using connecting-rods with Ø 10.1 mm drill holes, reducer-bushes have to be attached to the connection points of the hardware components as shown (see also hardware overview on page 26).
2. Push through the connector at the handle slot and screw-fix with the central hinge support (2 x M5 x 8).
3. Make sure that the scissors are in the same position. Set the scissor-stay arms parallel to each other with an Allen key 4 mm (alternatively Torx key T25) at the indicated positions.
4. Fix the central locking system with fixing screws M5 x 25 PKS.
   Test the function via the connector.
5. Install the mishandling device.



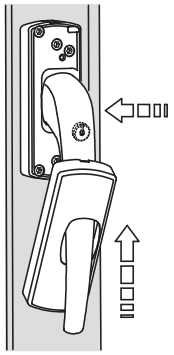
1. Position the surface mounted positive-control handle, move it approx. 60° from the closing position and screw-fix with screws 4.8 x 50 (4 pcs.) and M5 x 25 and nuts (each 2 pcs.) (if necessary, drill out the handle casing with Ø 5 mm drill).



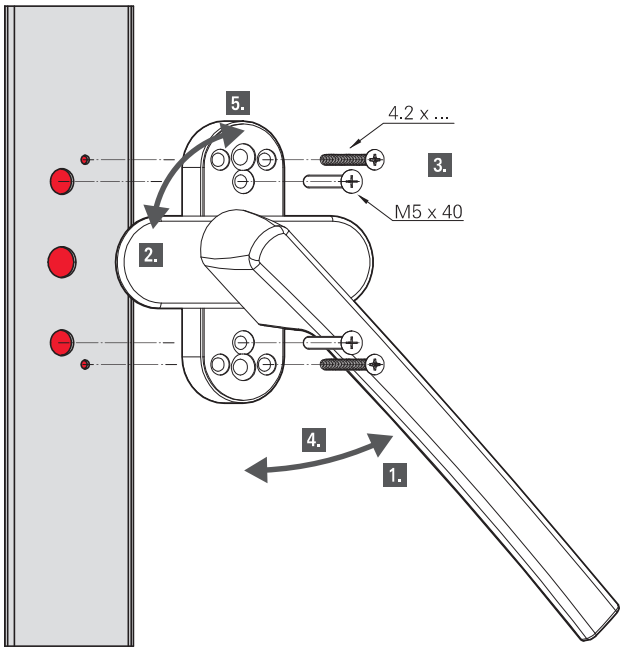
2. Check the gearbox function for ease of movement (audible click sound OK?) If necessary, check the central locking system.



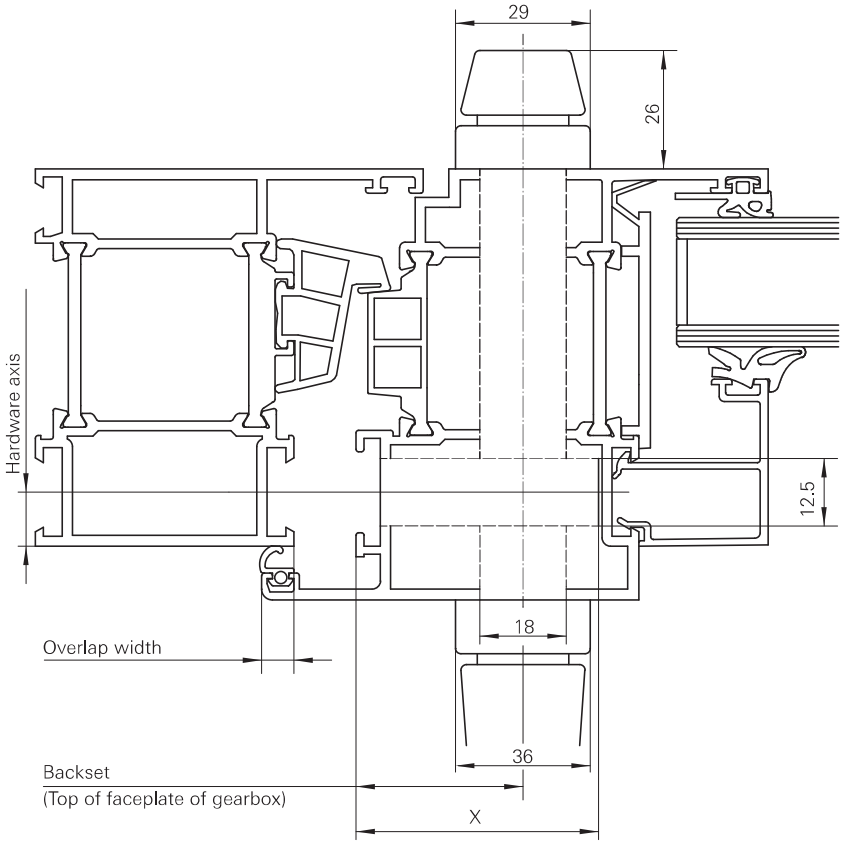
3. Position the rosette and clip on the handle casing.



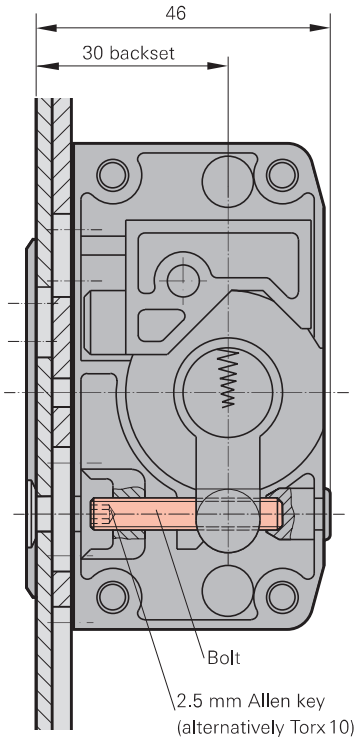
1. Position the handle and move it approx. 45° from the closing position.
2. Rotate the rosette 90°.
3. Install the handle with the depicted screws. Tighten the screws M5 x 40 only so much that jamming of the espagnolette casing is avoided. The length of the self-tapping screws 4.2 is profile-dependent.
4. Rotate the handle to check its function for ease of movement.
5. Turn the rosette and let it click into place on the base plate.



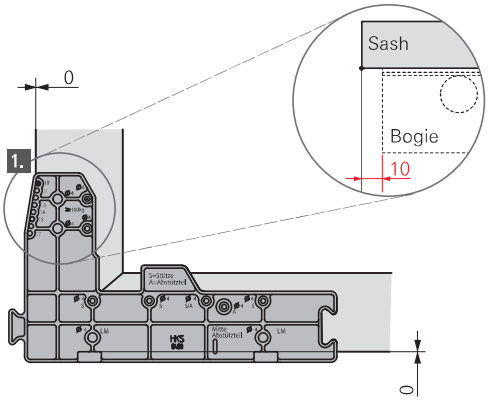
Backset	Dimension X
30 mm	43.5 mm
40 mm	53.5 mm

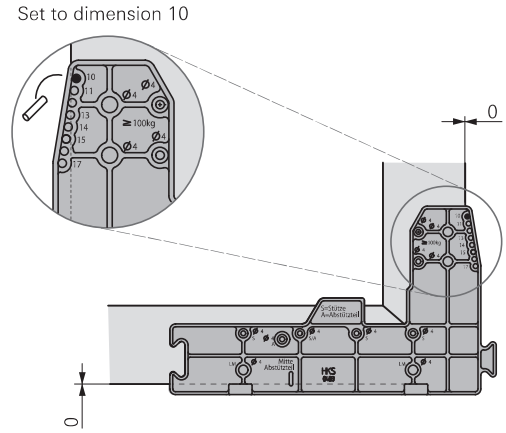


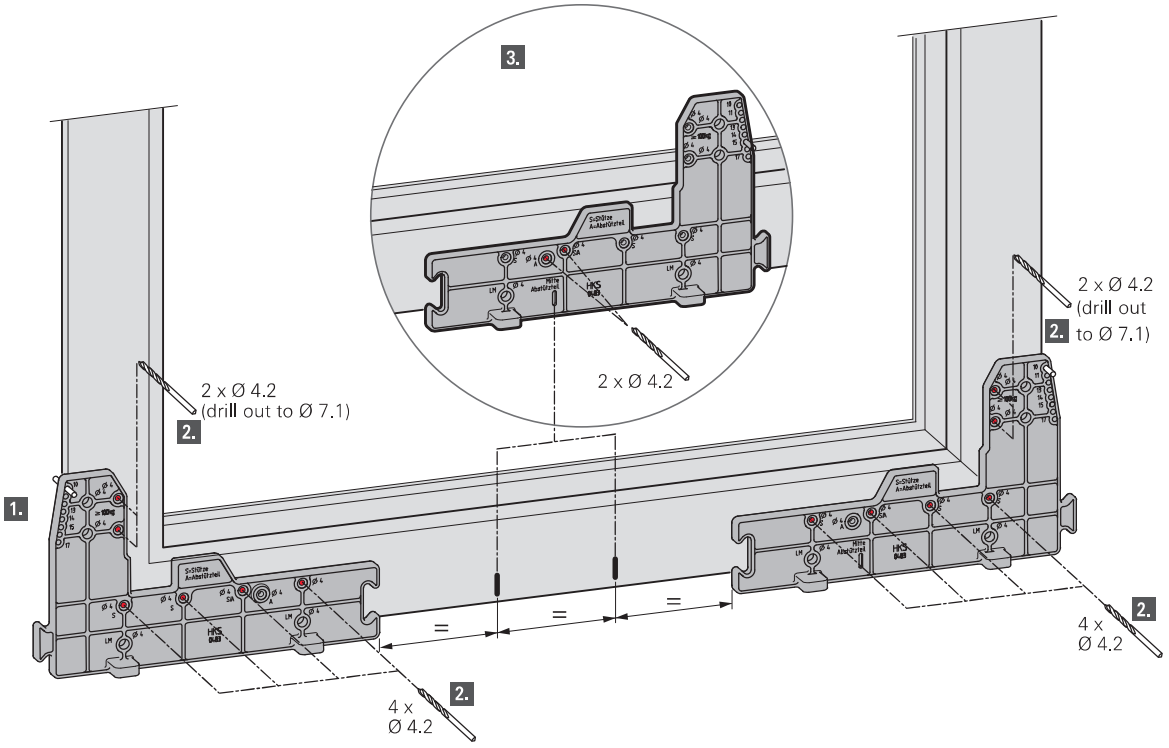
1. Bring the espagnolette into the centre position.
2. Unscrew the preassembled bolt (M5 x 30 or M5 x 40) with a 2.5 mm Allen key (alternatively Torx 10) until the cylinder opening is unrestricted.
3. Insert the cylinder.
4. Screw in the bolt as far as it will go.



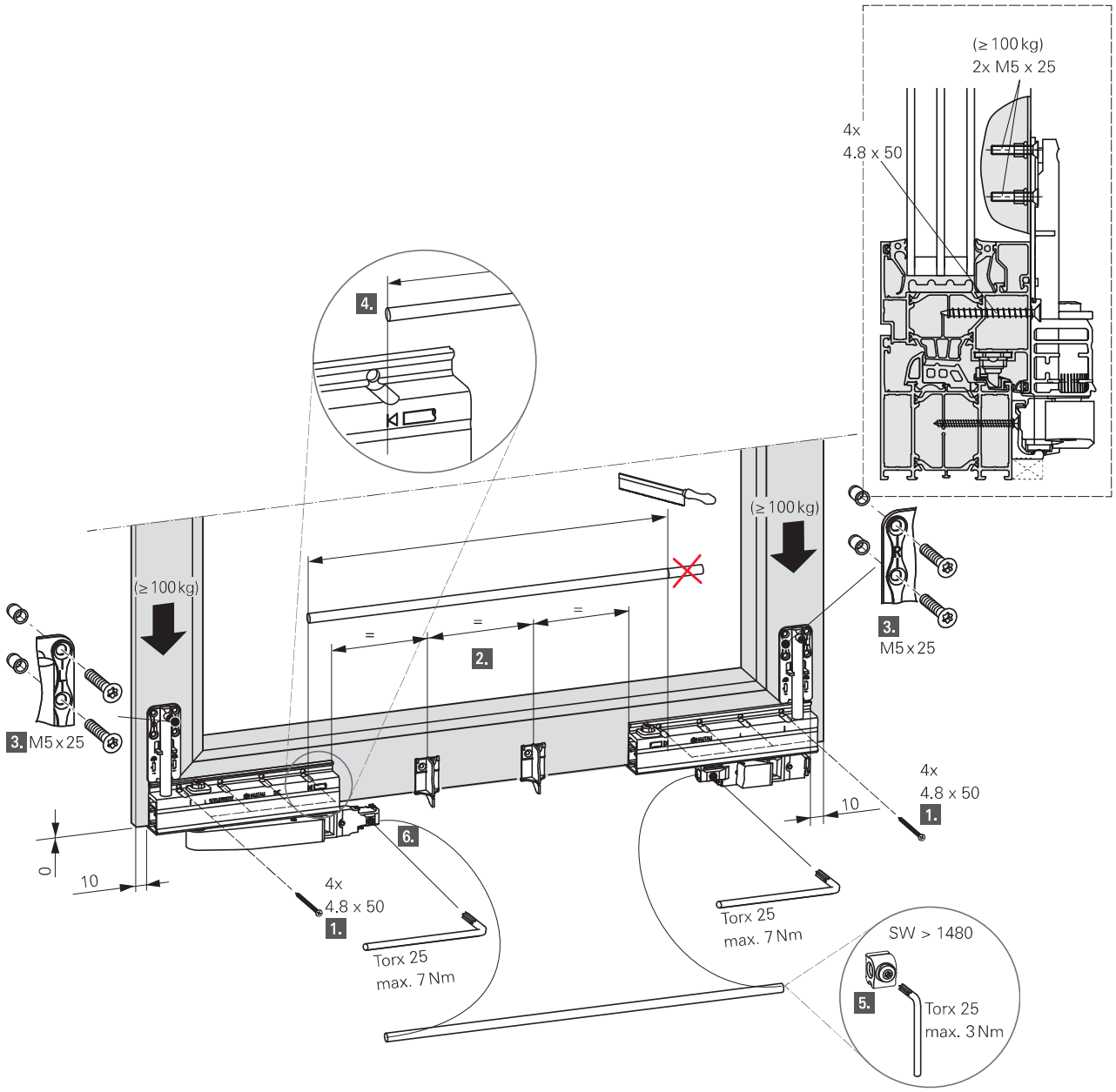
1. Set the bogie drilling jig (563968) to dimension 10 with the dowel pin.
2. Drill the holes for the bogies.
   Drill holes for reinforcement brackets only for sash weights of ≥ 100 kg.
3. Mark the cover support bracket's position and drill (SW ≤ 1480 mm 1 cover support bracket, SW ≥ 1480 mm 2 cover support brackets).



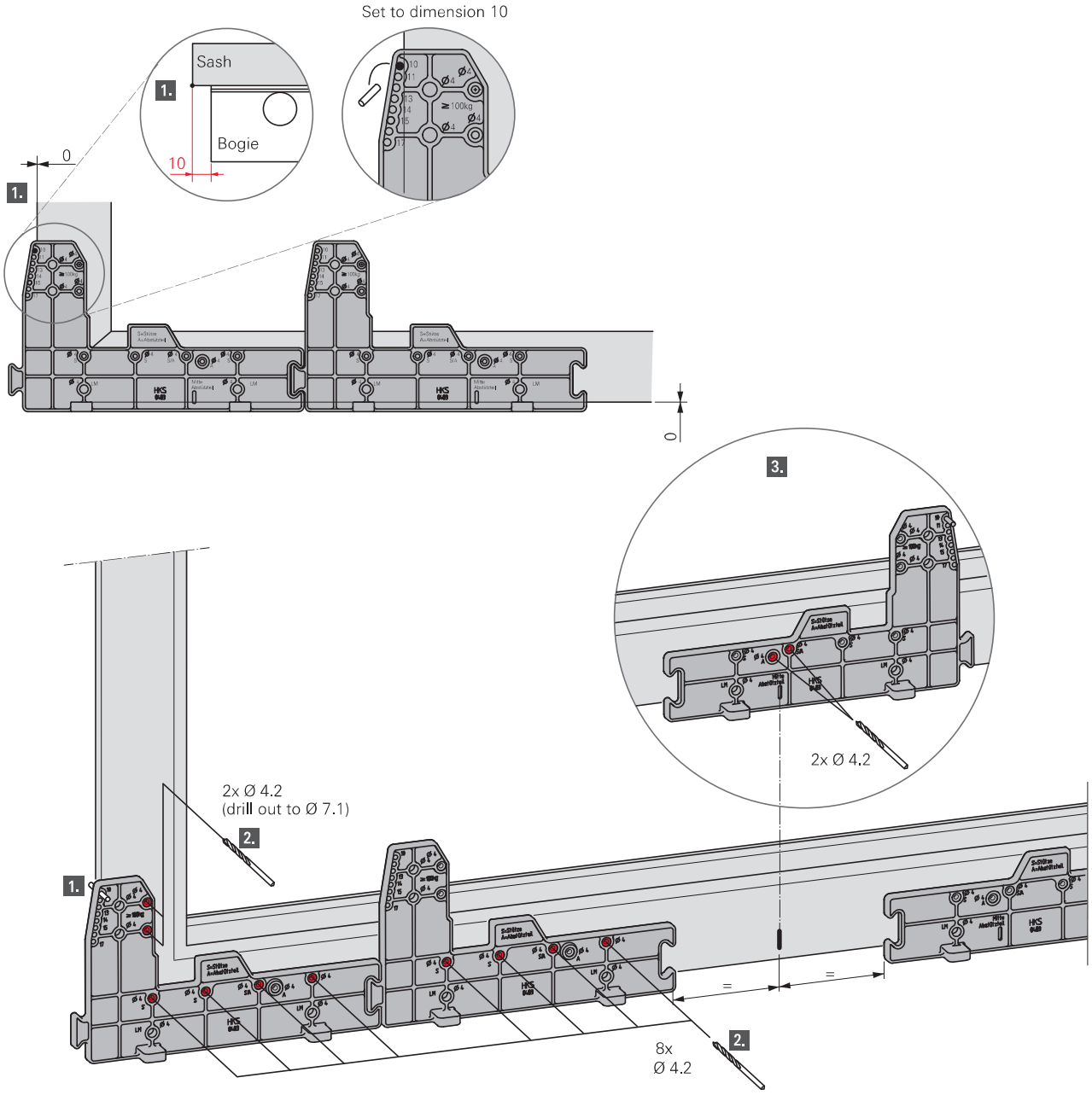




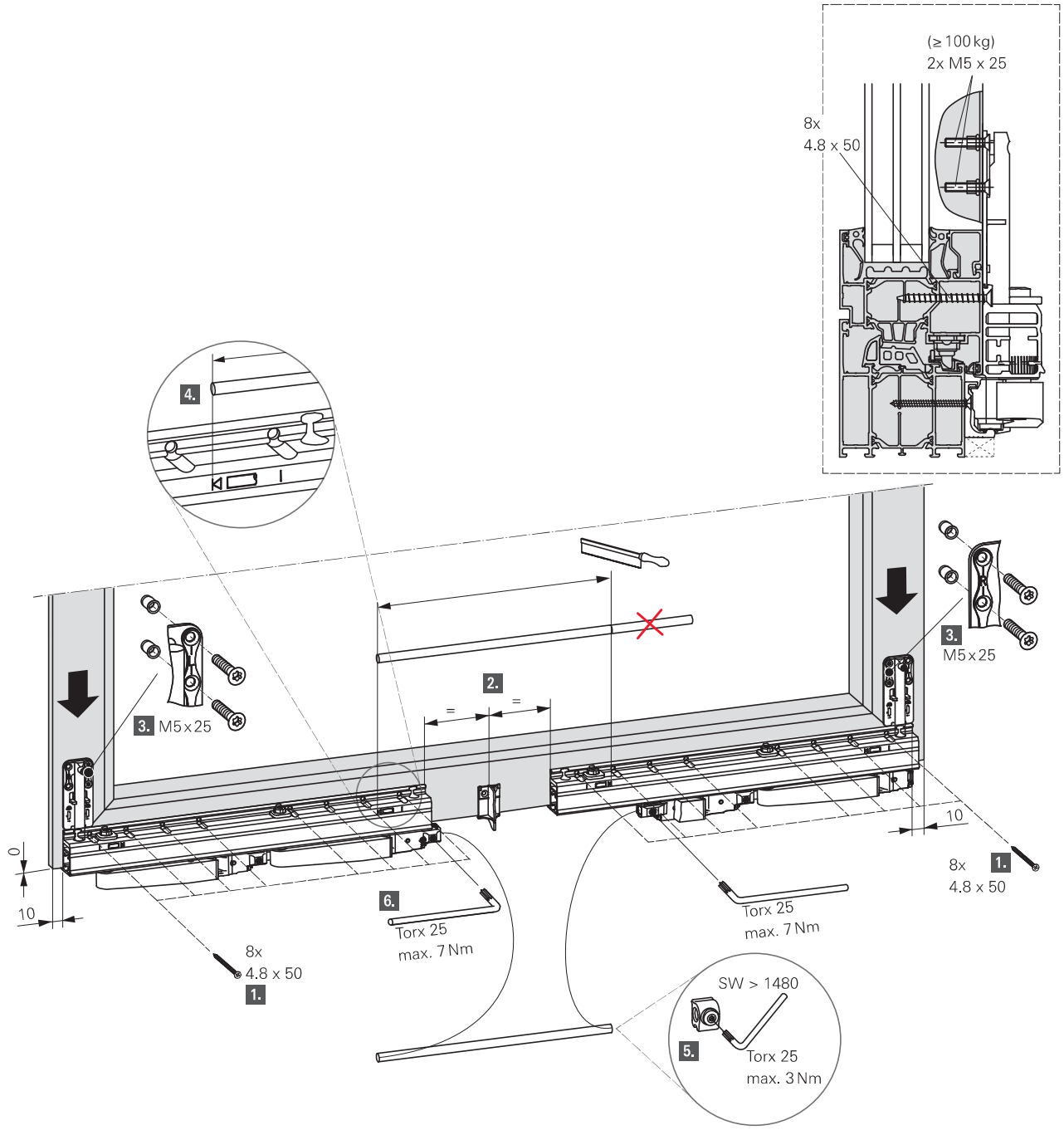
1. Screw on each bogie with 4 screws 4.8 x 50 at a lateral distance of 10 mm to the sash outer-edges and flush with the bottom edge of the sash profile.
2. Position the cover support bracket(s) evenly between the bogies and screw-fix each with 2 screws 4.8 x 50. For SW < 1480 mm only one centred cover support bracket.
3. For sash weights of ≥ 100 kg: fasten each 2 riveting nuts Ø 7 mm in the designated holes. Screw-fix each of the reinforcement brackets with 2 M5 x 25 screws.
4. Mark and cut the connecting rod to length in line with the bogie marks.
5. On SW >1480: slide additional connecting rod support-block to the centre of the connecting rod and fix. (Torx key; T25 hexalobular socket, max. 3 Nm).
6. Insert the connecting rod into the bogie couplings; tighten the bogie on the opposite side of the handle first, then fold up both bogies and align them parallel to the sash. In this position screw-fix the espagnolette-sided bogie (Torx key; T25 hexalobular socket, max. 7 Nm).



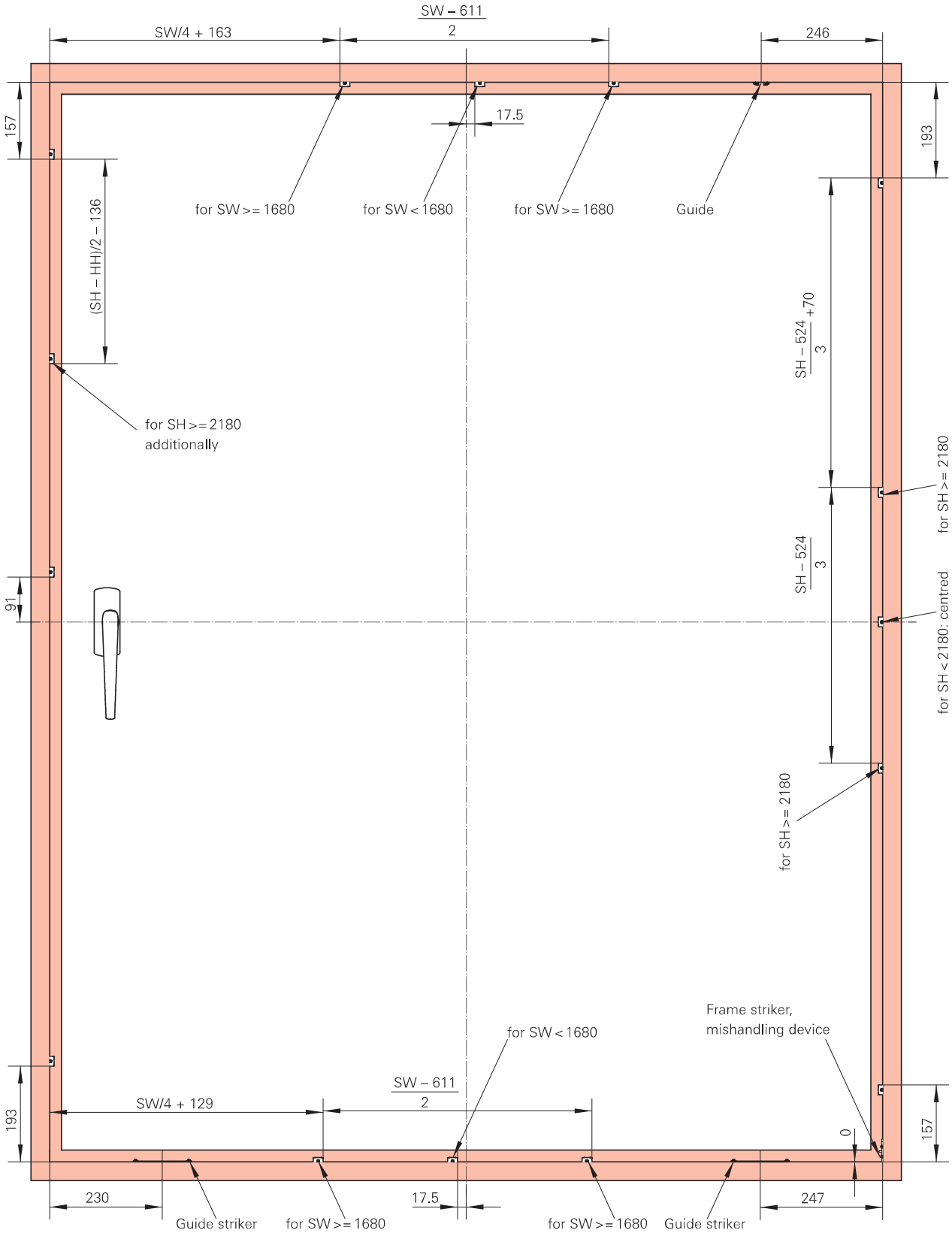
1. Set the bogie drilling jig (563968) to dimension 10 with the dowel pin.
2. Drill the holes for the bogies and reinforcement brackets.
3. Mark the cover support bracket's position and drill.



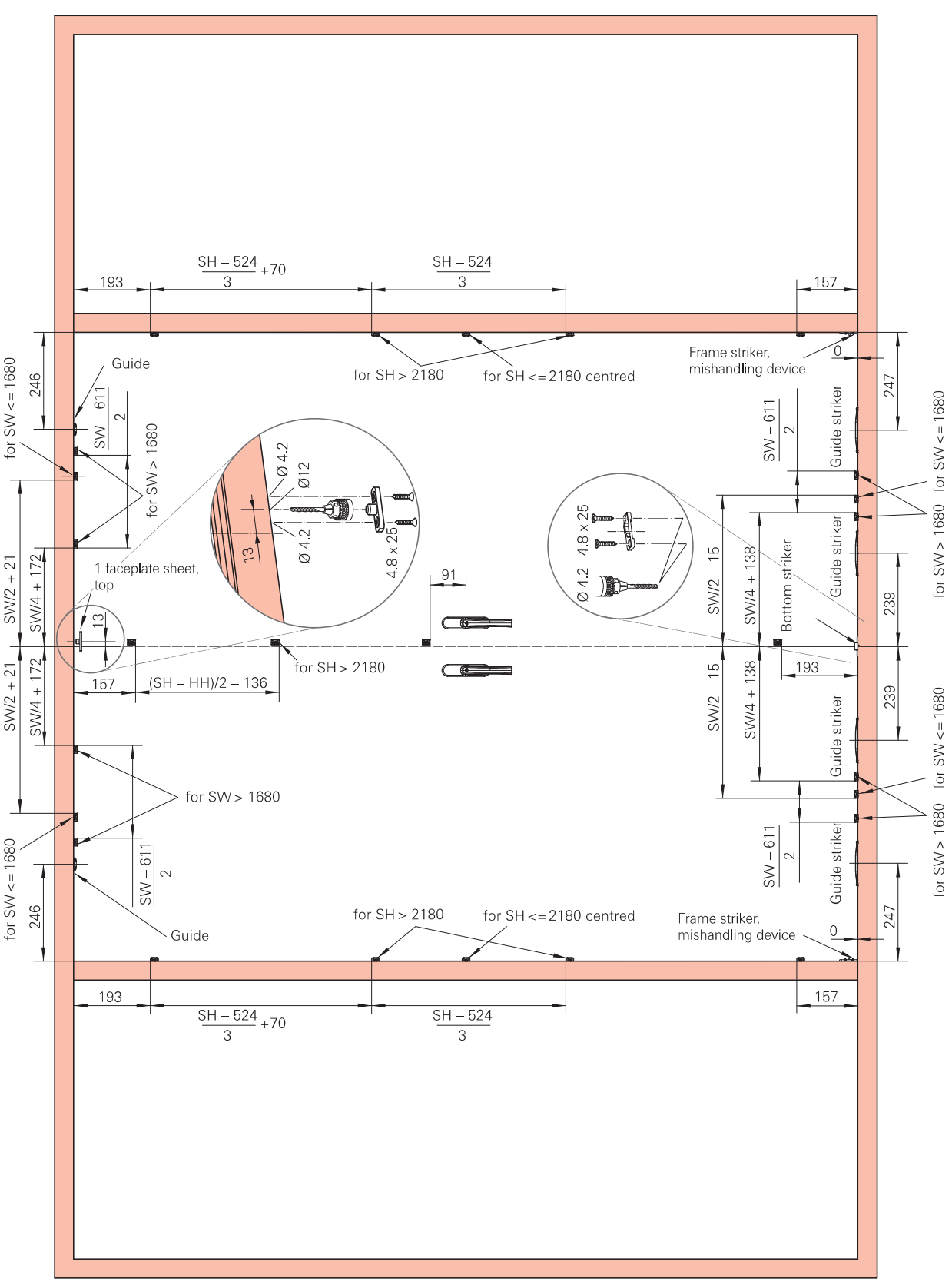
1. Screw on each heavy-duty bogie with 8 screws 4.8 x 50 at a lateral distance of 10 mm to the sash edges and flush with the bottom edge of the sash profile.
2. Screw-fix the reinforcement bracket with 2 screws 4.8 x 50 at the designated position.
3. Fasten each 2 riveting nuts Ø 7 mm in the designated holes on both sides. Screw-fix each of the reinforcement brackets with 2 M5 x 25 screws.
4. Mark and cut the connecting rod to length in line with the bogie marks.
5. From SRW >1450: slide additional connecting rod support-block to the centre of the connecting rod and fix. (Torx key; T25 hexalobular socket, max. 3 Nm).
6. Insert the connecting rod into the bogie couplings; tighten the bogie on the opposite side of the handle first, then fold up both bogies and align them parallel to the sash. In this position screw-fix the espagnolette-sided bogie (Torx key; T25 hexalobular socket, max. 7 Nm).



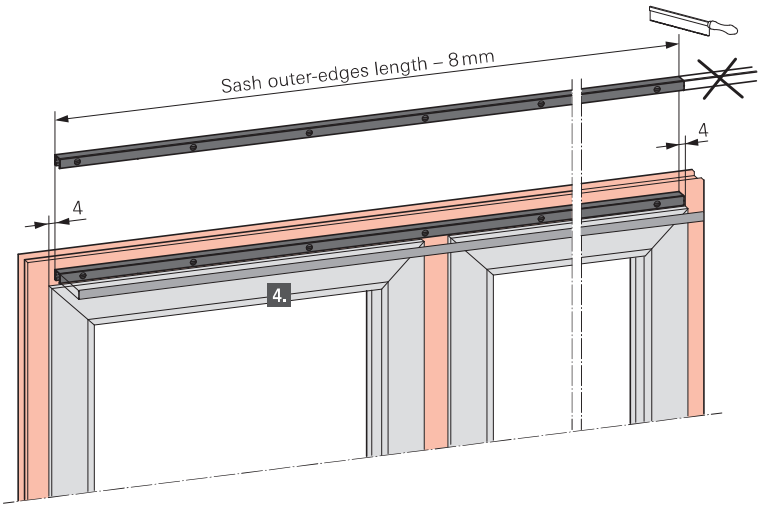
NOTE!
Guide strikers must be tightened with a Torx key T10.
Strikers can be tightened with a Torx key T10 or an Allen key 2.5.



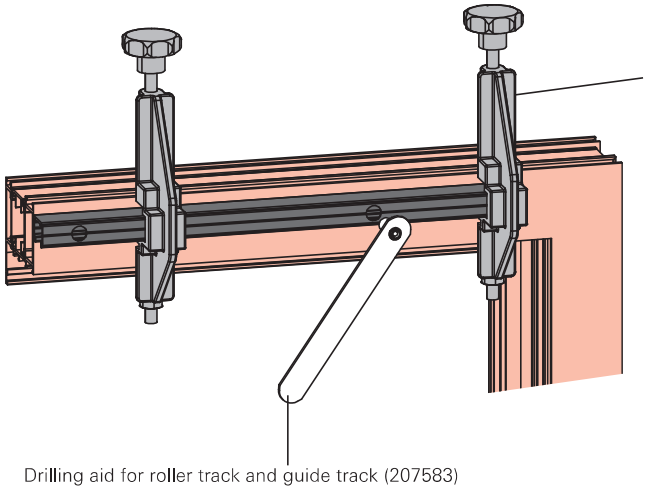
NOTE!
Guide strikers must be tightened with a Torx key T10.
Strikers can be tightened with a Torx key T10 or an Allen key 2.5.

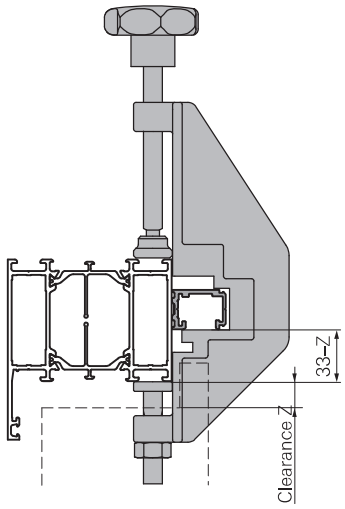


1. Cut the guide track to length: Sash outer-edges length – 8 mm
2. Fix the guide track to the frame using the jig for roller track and guide track (563967), predrill with drilling aid (207583) and Ø 3.2 mm drill.
3. Screw-fix the guide track to the frame with 3.9 x 45 screws.
4. Cut the PVC cover profile to the length of the guide track and clip on.

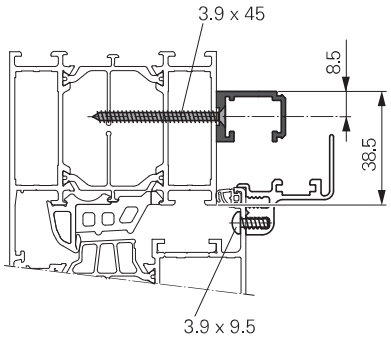


2.



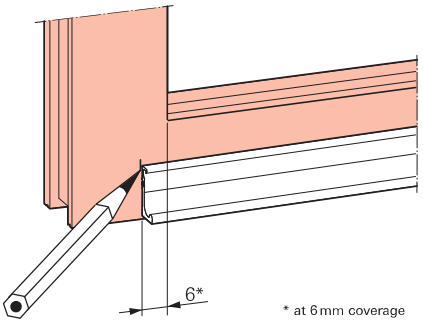


3.

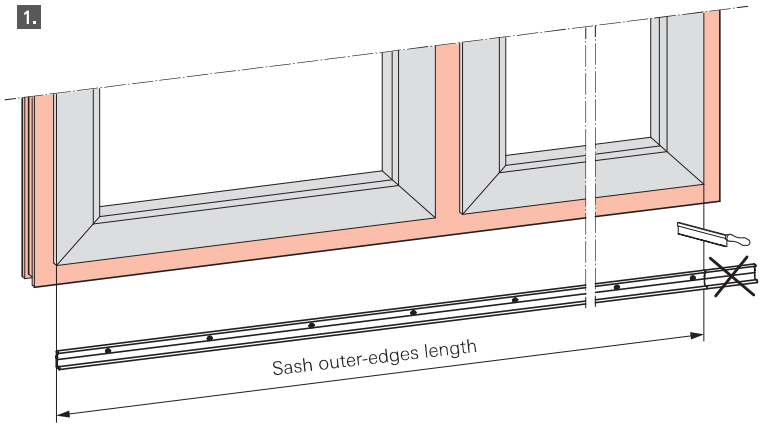


1. Cut the roller track to the length between the sash outer edges.
2. Fix the roller track to the frame using the jig for roller track and guide track (563967), predrill with drilling aid (207583) and Ø 3.2 mm drill.
3. Screw-fix the roller track to the frame with 3.9 x 45 screws.
4. Underlay the roller track over the entire length on site in order to distribute the load.

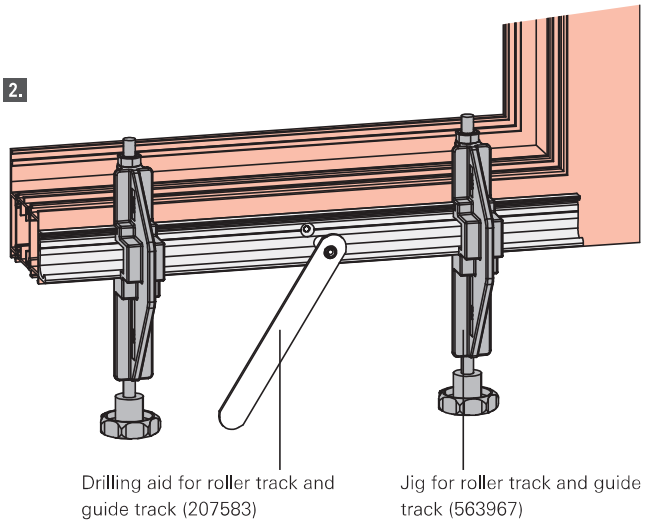
Example:

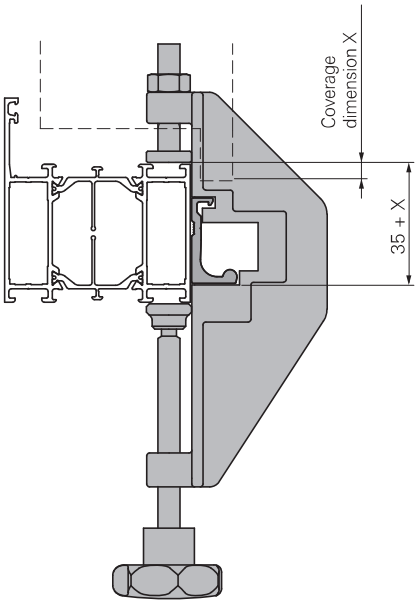


1.

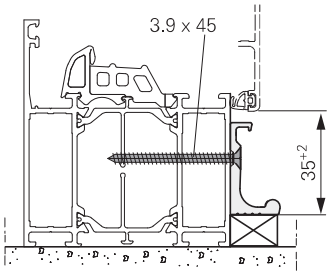


2.

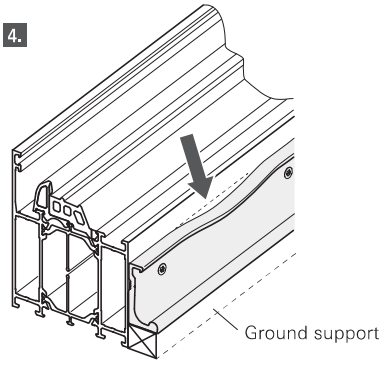




3.

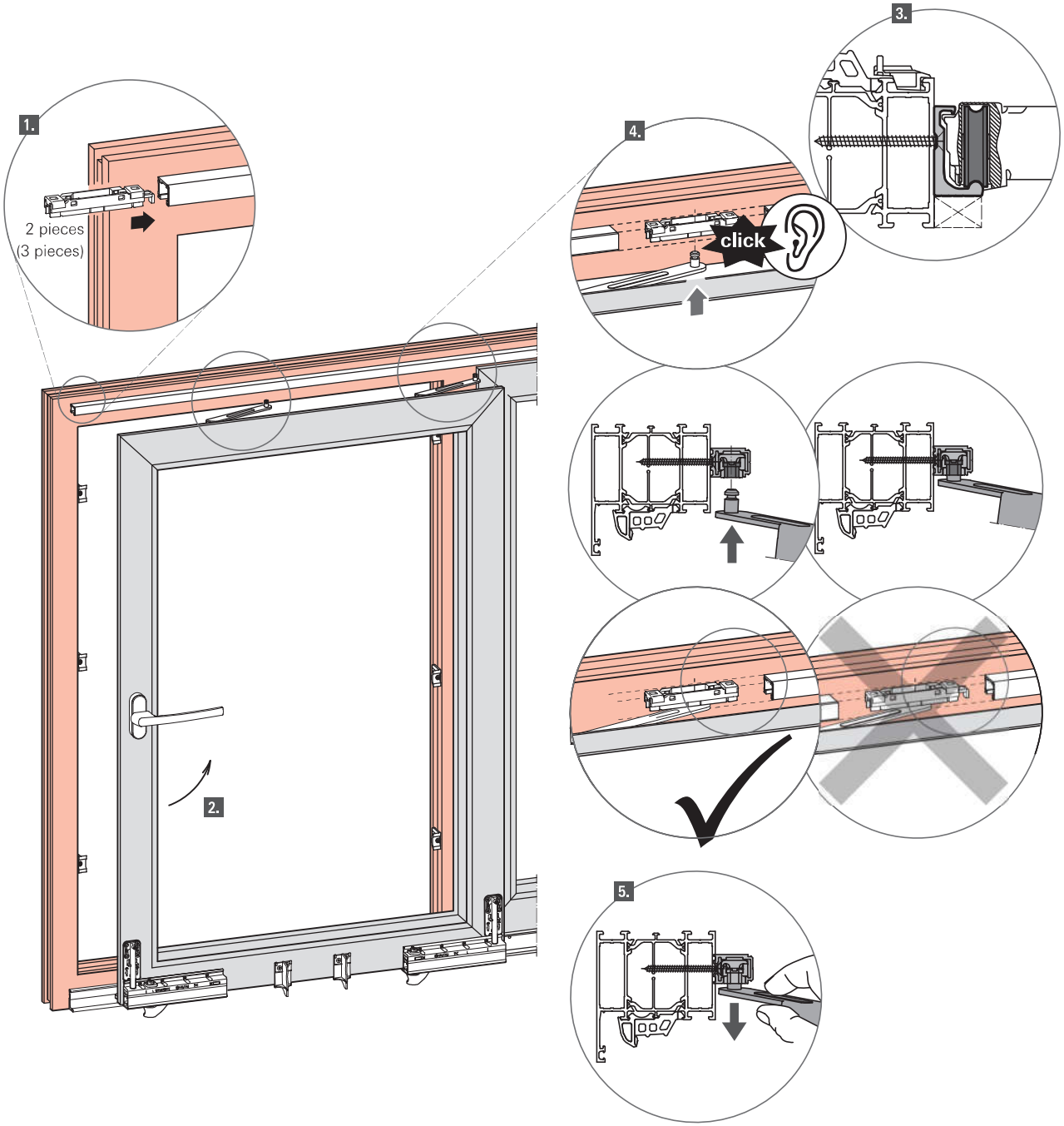


4.



1. Slide in the 2 scissor-stay sliders into the guide track from the side (3 sliders if a spring scissor is used).
2. Position the handle horizontally.
3. Place the sash's bogie rollers on the roller track.
4. Click in the scissor-stay pins into the central slider openings of the both outer sliders (audible click sound!) If correctly installed, the sliders' lateral lock-sliders are flush with the slider-casing's edges.
5. Check the installation by means of pulling/pushing down the scissors-stay arms!

WARNING!
If the scissor-stay pins are not securely engaged in the sliders, the sash is not safeguarded against falling out.
This can lead to grievous bodily harm.



For application ranges of the spring scissor, refer to page 18–20.

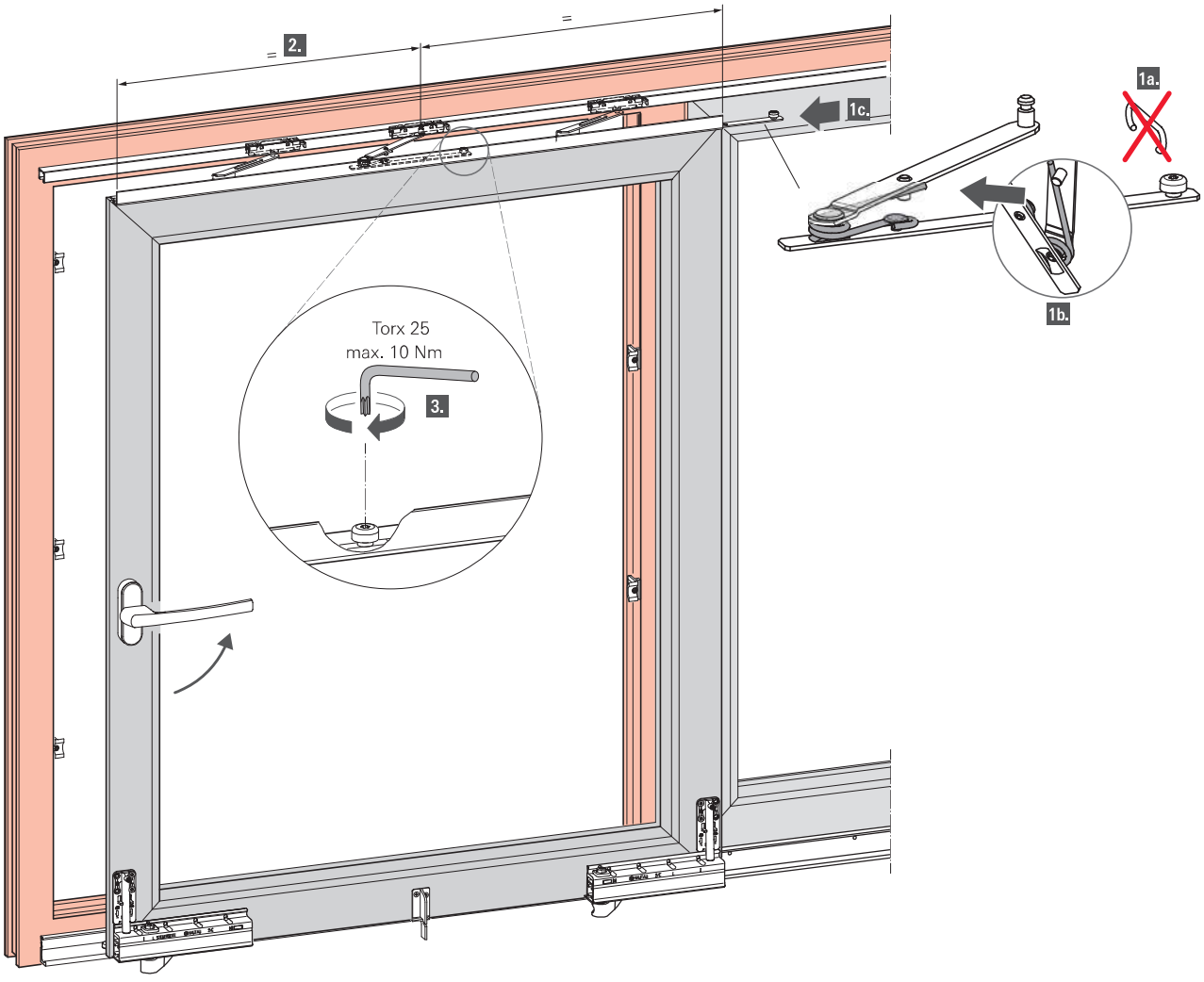
1a. Remove the transport clamp.

1b. Ensure the correct position of the spring at the bolt to properly adjust the spring tension.

1c. Slide the spring scissor into the stay-connecting profile.

2. Engage the scissor-stay pin into the central slider opening of the middle slider (audible click sound!)
If correctly installed, the sliders' lateral lock-slider is flush with the slider-casing's edge (see also page 64, no. 4.).
The scissor-stay pin must be positioned centrally to the stay-connecting profile.

3. Tighten the locking screw of the spring scissor to the stay-connecting profile (Torx key T25, max. 10 Nm).

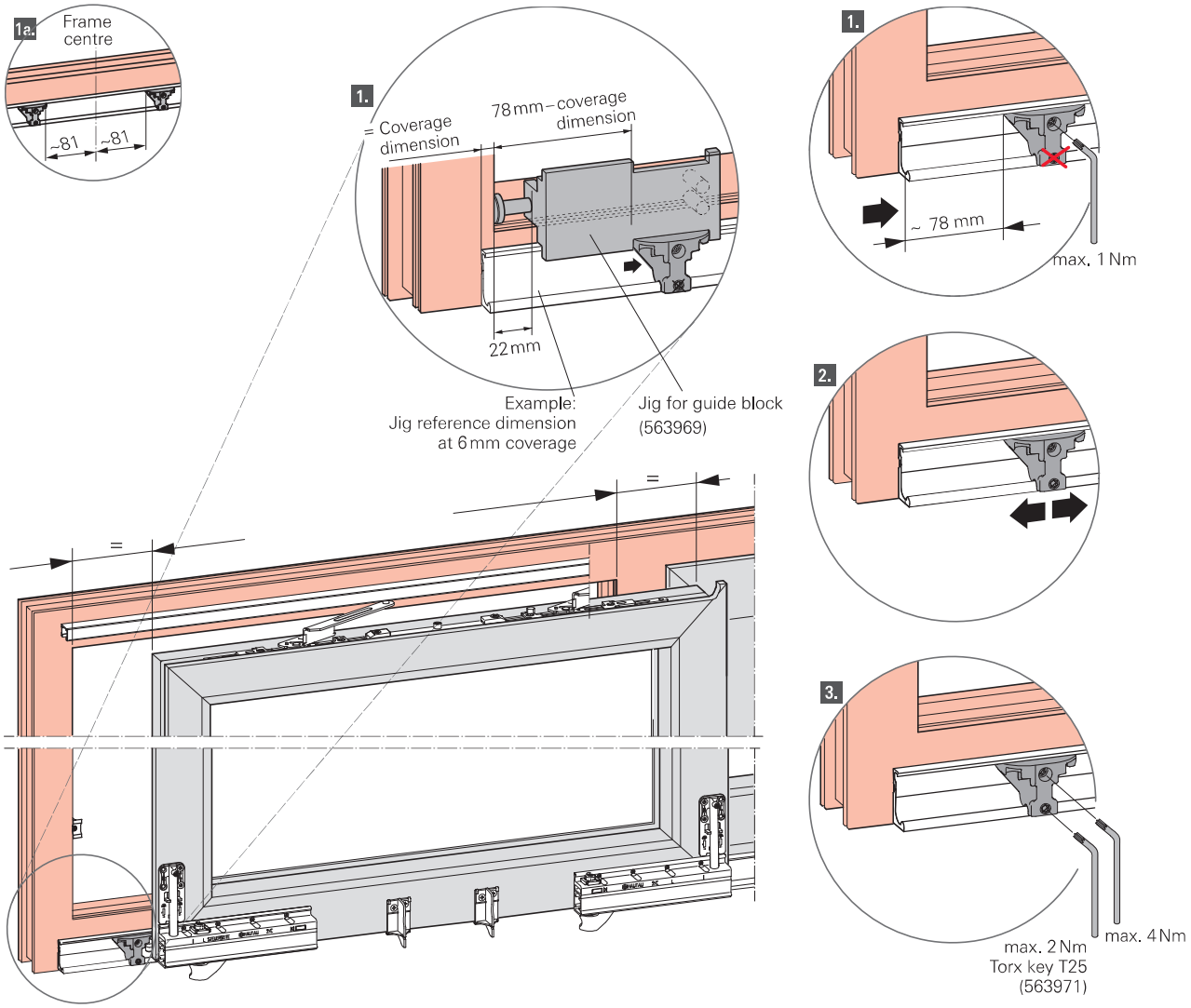


1. Position the guide block jig (563969) as depicted in the drawing, alternatively position the guide block on the handle side approx. 78 mm from the roller track's outer edge. Lightly tighten the top screw with a T25 hexalobular socket Torx key (563971) (max. 1 Nm).

1a. Note to diagram C:
With a continuous roller track, the position of the guide blocks is approx. 81 mm from the frame centre.

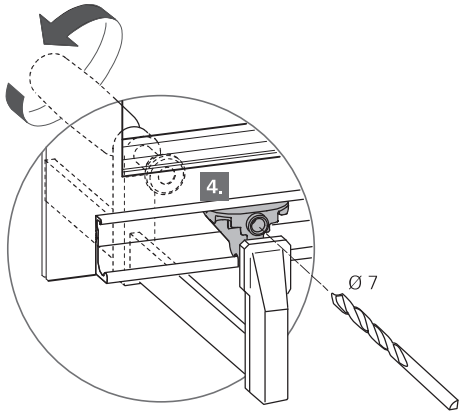
2. Bring the sash into the tilted position and check the clearance on both sides (11.5 – 12 mm).
Reposition the guide block if need be.

3. Firmly tighten the top screw on the guide block with a T25 hexalobular socket Torx key (max. 4 Nm). Then firmly tighten the bottom screw with a Torx key T25 (max. 2 Nm).

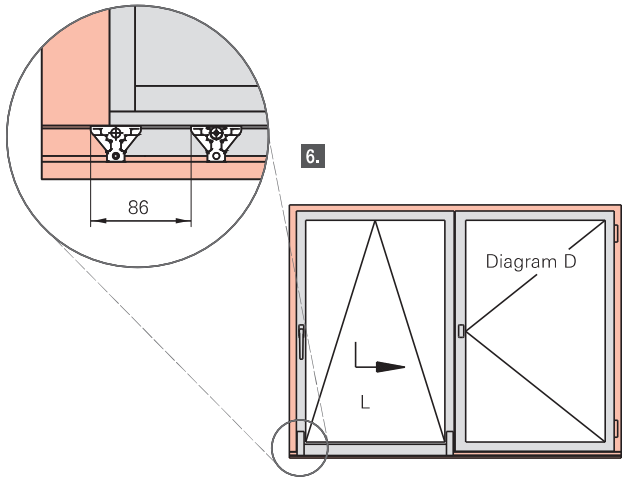


NOTE!
For diagram D keep the espagnolette-sided roller track as long as possible.

1. Installing the guide block → page 64 (dimension ~78 mm). Lightly tighten the top screw (Torx key T25, max. 1 Nm)
2. Bring the sash into the tilted position and check the clearance on both sides. Reposition the guide block if need be.
3. Mark the position of the guide block, then remove the guide block.
4. Align the drilling jig for the guide block along the marking, then fix it with a screw clamp. Using a drill centring device, drill Ø 7 mm completely through the roller track. Remove the drilling jig for guide block.



5. Slide the slidable guide block on the roller track, click into place at the drilling.
6. Use the drilling jig for the guide block to drill the retracting security hole with 86 mm offset. (cf. 4.)



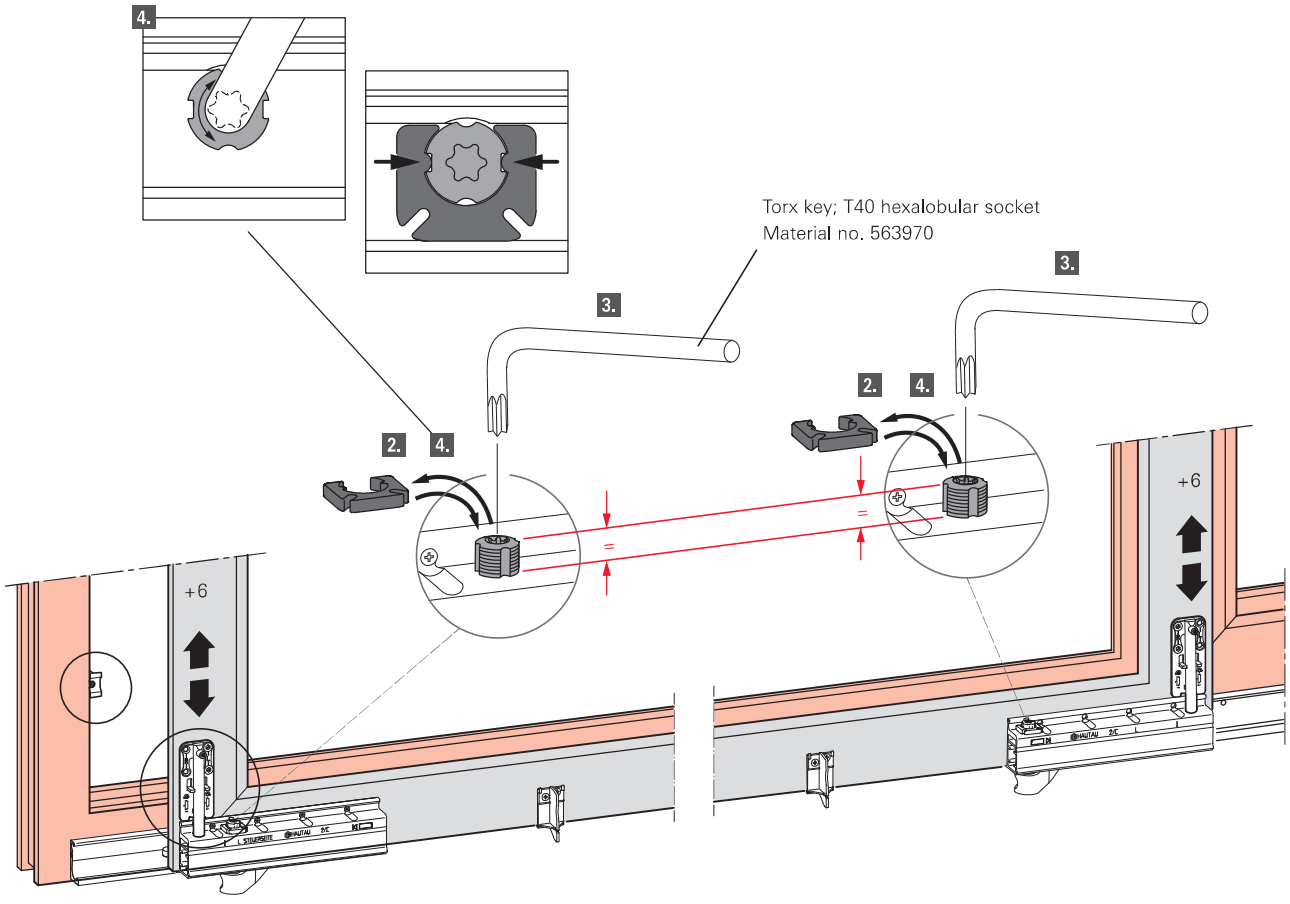
Opening of the Turn-Only sash of diagram D for cleaning and maintenance purposes

1. Open the sliding sash.
2. Pull out the lock of the slidable guide block.
3. Slide the guide block and let the lock click into place at the retracting security hole.
4. Slowly slide the sliding sash in locking direction, until the bogie meets the guide block.
5. Open the Turn-Only sash.

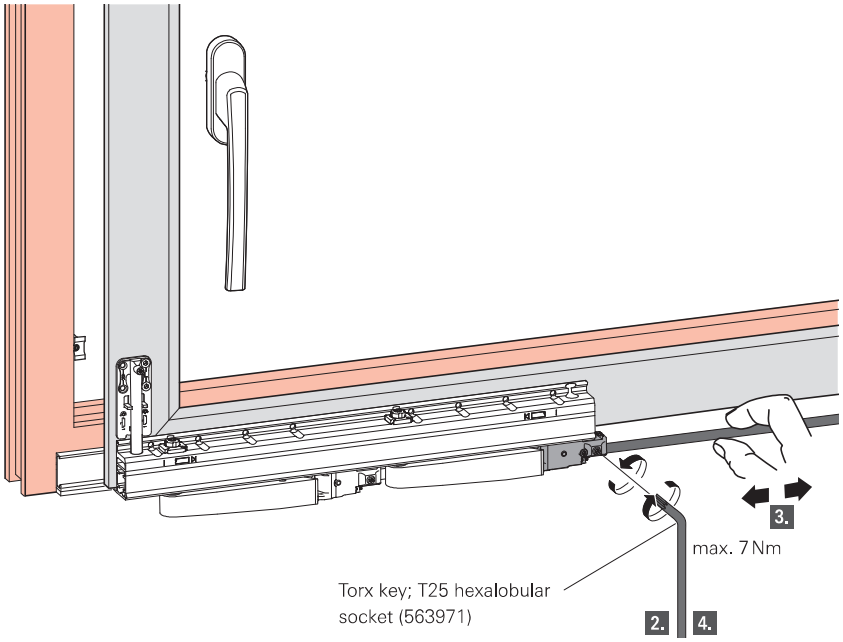
1. Check the clearance all round (not dep.).
2. Remove the anti-twist devices.
3. Raise or lower the bogies via the adjusting screws with a T40 hexalobular socket Torx key (563970).
   2 adjusting screws per heavy-duty bogie, 1 adjusting screw per bogie.

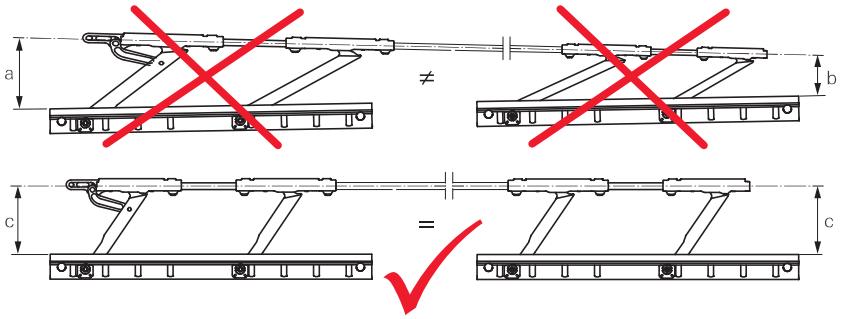
PLEASE NOTE!
When installing the sash without glass or with a low sash weight, lower the bogies as far as possible with the adjusting screws.
The bogies must be adjusted evenly at their adjusting screws in order to avoid jamming. (The bogies are uniformly preset in the factory.)

4. Install the anti-twist devices after adjusting the bogies, correct the adjusting screws' setting beforehand if necessary.



1. Move the sash into the tilted position.
2. Loosen the connecting rod on the handle-sided heavy-duty bogie / bogie with a T25 hexalobular socket Torx key (563971).
3. Align the hinge-sided bogie parallel by sliding the connecting rod to the left or right.
4. Tighten up the connecting rod on the handle-sided bogie with a T25 hexalobular socket Torx key, max. 7 Nm.
   The parallel alignment of the bogies warrants the sash entering the frame smoothly.

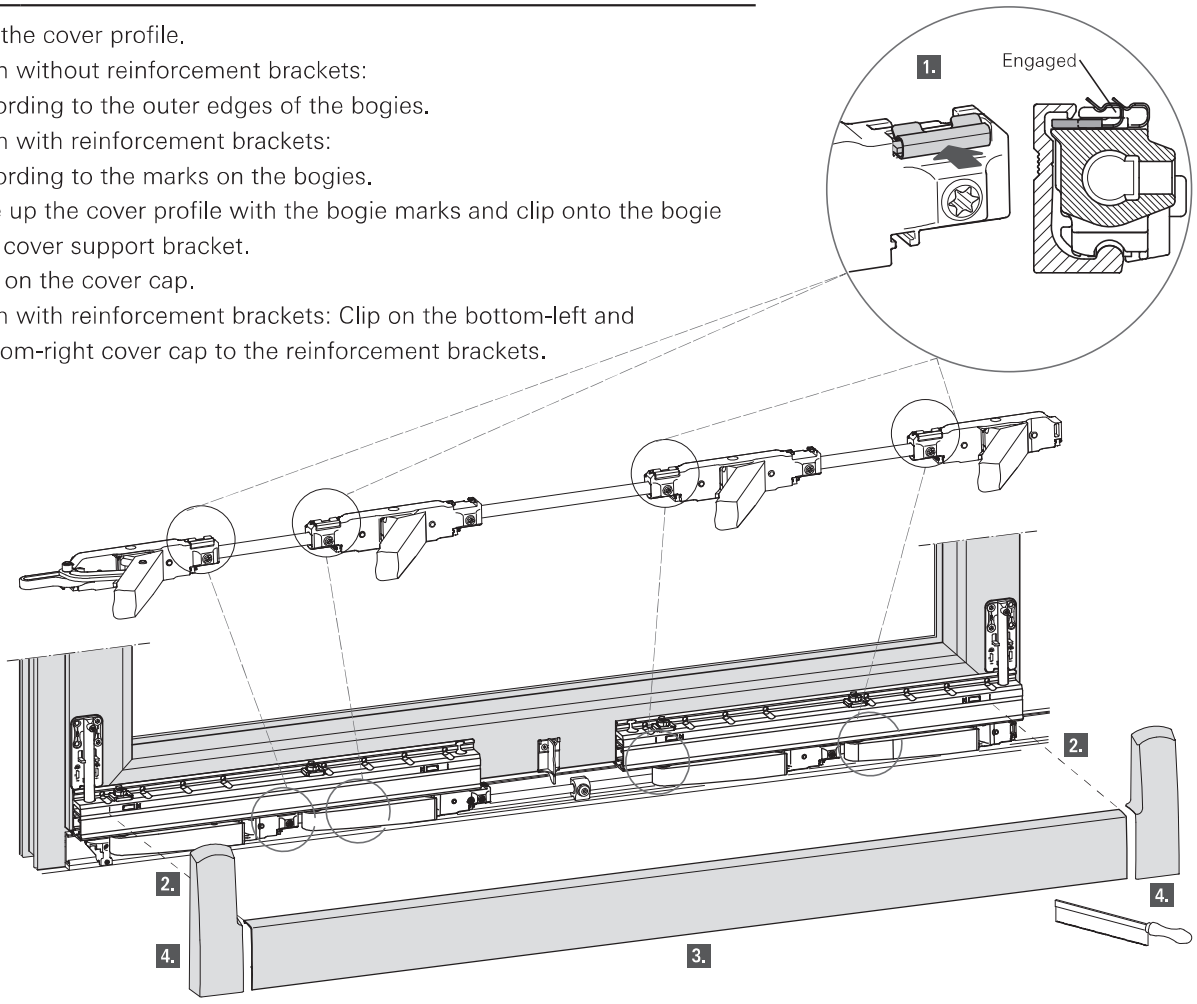




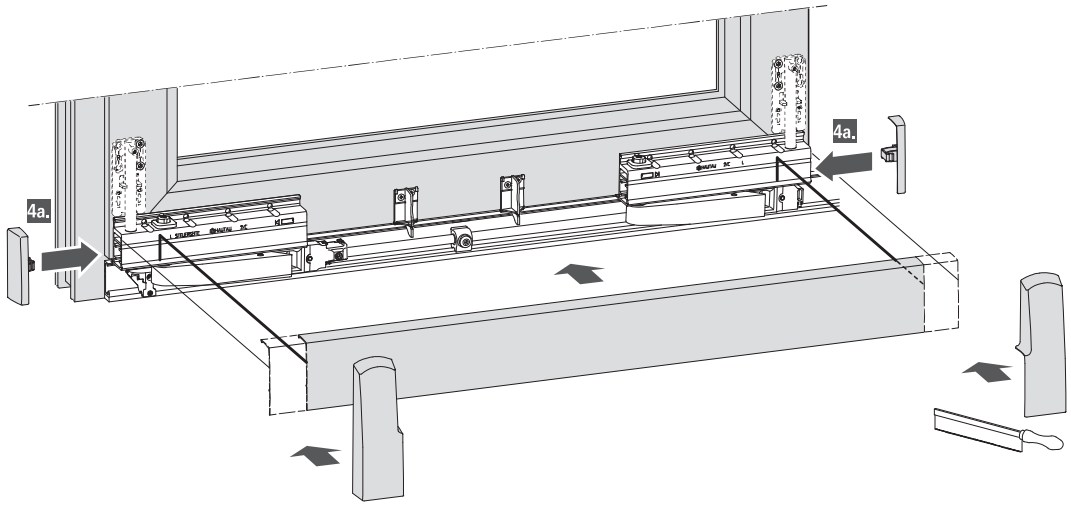
1. Slide back the bogie safety mechanism on both bogies, until they engage in the depicted position.

WARNING!
If the bogie safety mechanism is not correctly engaged (or not at all) in the depicted position, the sash is not sufficiently safeguarded.
This can lead to grievous bodily harm.

2. Cut the cover profile.
   Sash without reinforcement brackets:
   according to the outer edges of the bogies.
   Sash with reinforcement brackets:
   according to the marks on the bogies.
3. Line up the cover profile with the bogie marks and clip onto the bogie and cover support bracket.
4. Clip on the cover cap.
   Sash with reinforcement brackets: Clip on the bottom-left and bottom-right cover cap to the reinforcement brackets.

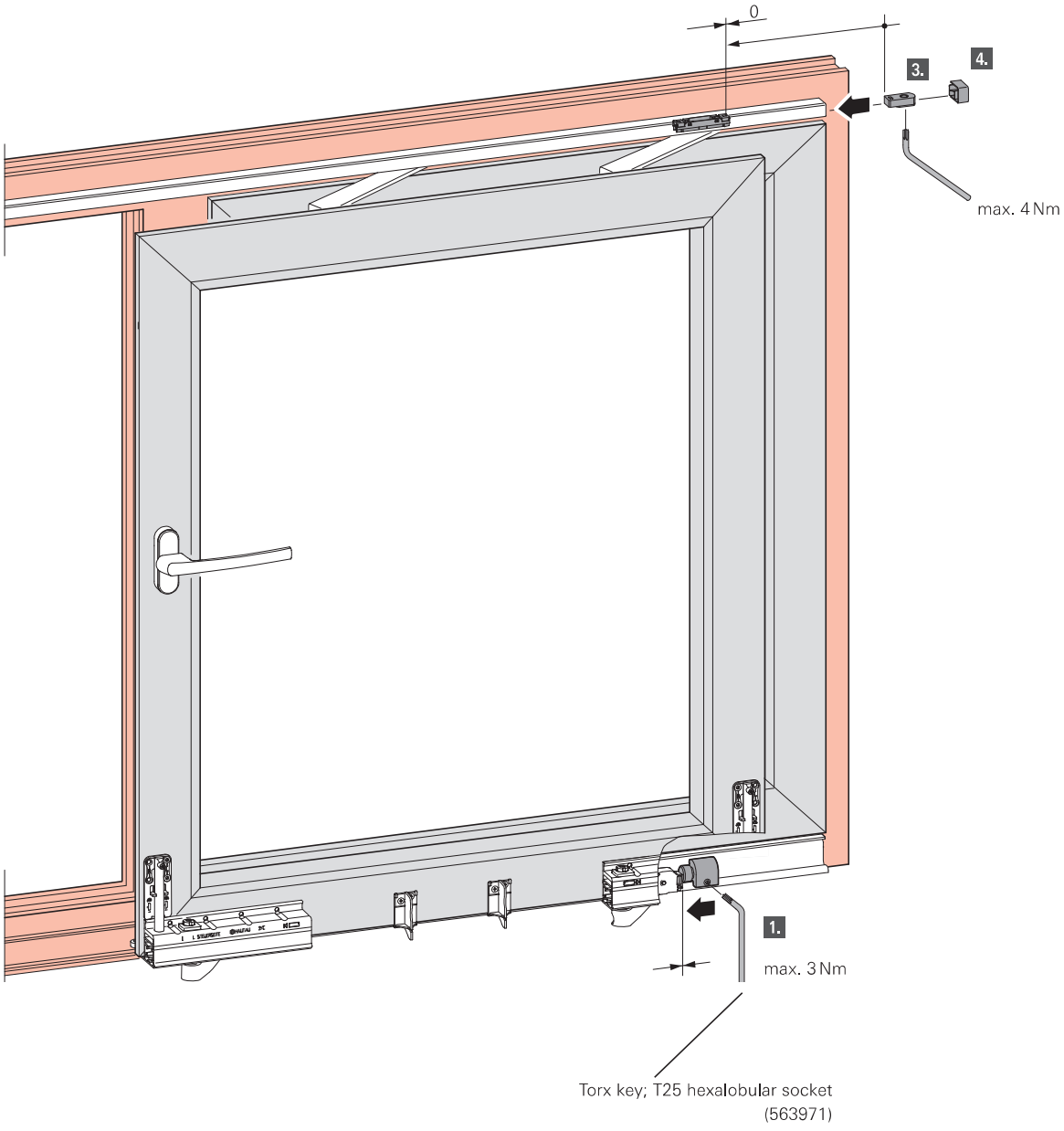


4a. Sash without reinforcement brackets:
Mount the bottom-left and bottom-right cover cap on the side over the cover profile and clip into the bogie.



1. Screw on the bottom buffer-stop to the roller track in the desired position. Torx key; T25 hexalobular socket (563971), max. 3 Nm.
2. Slide the sash as far as the buffer-stop.
3. Slide in the top buffer-stop into the guide track and screw-fix Torx key; T25 hexalobular socket, max. 4 Nm
4. Mount the guide track's cover cap.

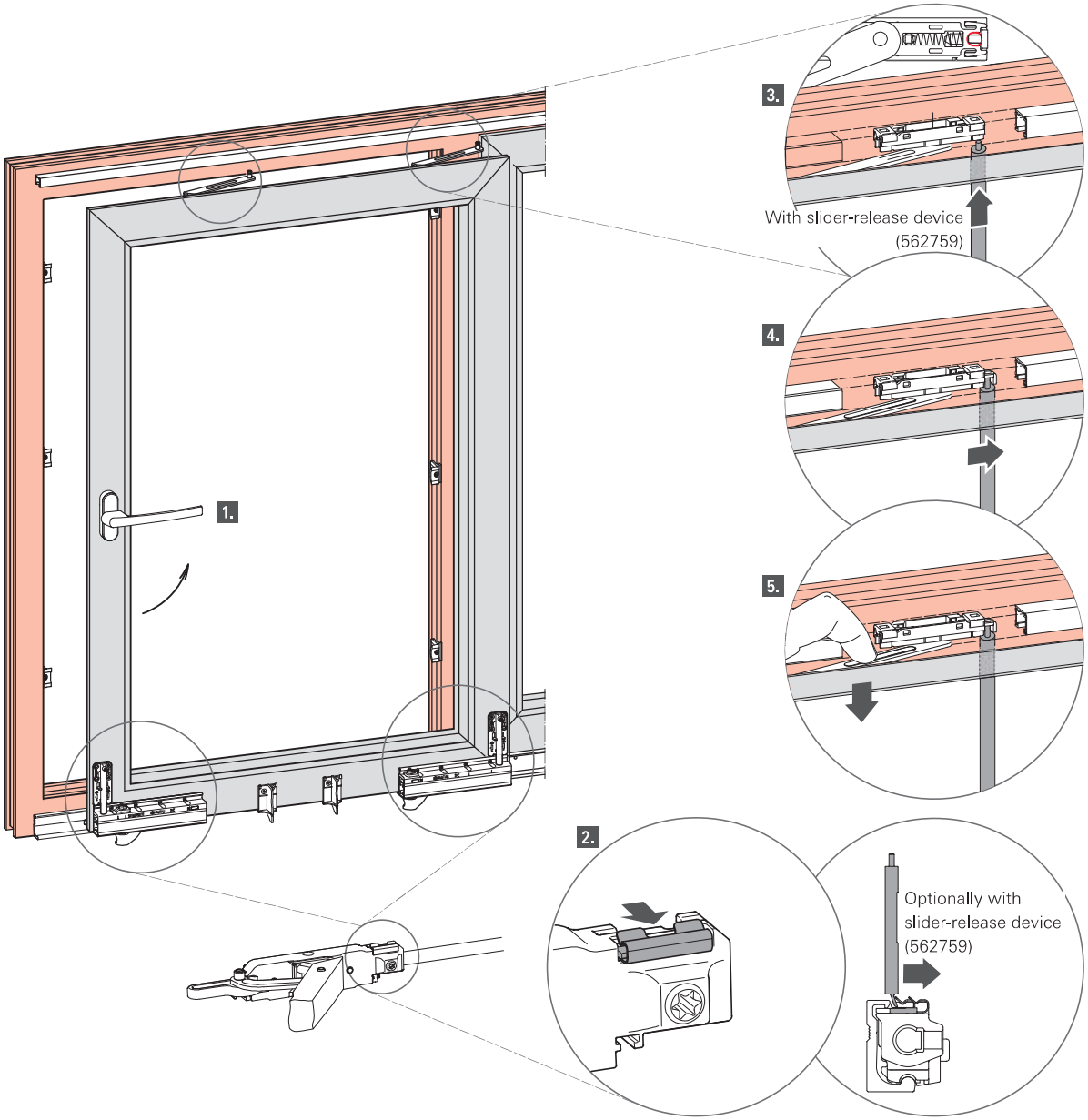
NOTE!
In order to avoid damaging the hardware components, the sash must run up against the top and bottom buffer-stop simultaneously.



1. Open the sash.
2. Bring each of the bogie safety mechanisms into the disengaged position.

PLEASE NOTE!
Safeguard the sash against falling out prior to releasing the scissor-stay connection.

3. Push in the slider-release device (562759) into the slider-opening beside the lock-slider.
4. Pull out the lock-slider with the slider-release device from the side of the slider.
5. Press the scissor-stay pin downwards out of the slider.
   Repeat the procedure on the second slider.
6. Tilt the disengaged sash and lift it from the roller track (not dep.).



Transport/handling of the window elements

DANGER!
Danger to life from incorrect handling and transport!
Incorrect handling and unsuitable transport of window elements can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:
- During loading and unloading, select force application points which exclusively create reaction forces appropriate to the designed layout of the hardware components for the intended installation location.
- During handling and transport, ensure that hardware is in the locked position, so as to prevent an uncontrolled opening of the window. Use suitable means of securing for this.
- Use only transport fastenings designed for the respective clearance.
- Wherever possible, undertake transport in the intended installation position. If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the frame to which it belongs.

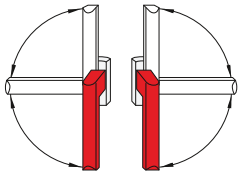
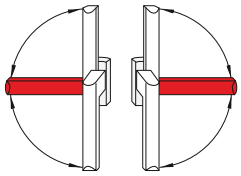
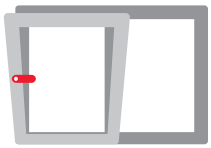
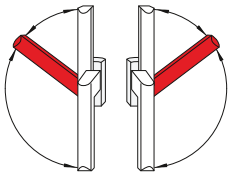
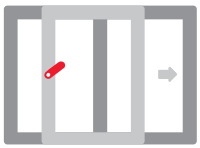
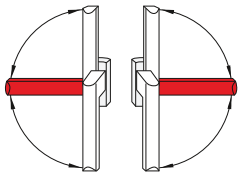
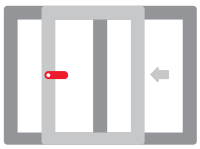
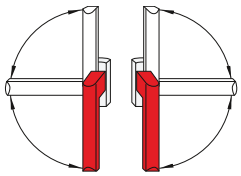
During transport, loading, and unloading, especially when auxiliaries such as suckers, transport nets, forklifts, or cranes, reaction forces may arise which result in damage or overloading to the installed hardware. Therefore observe the following during all transport, loading, and unloading:
- The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise.
  - Always choose the force application points so that the resulting reaction forces are dissipated appropriate to the designed layout of the hardware components for the intended installation location. This applies particularly for the hinge positions.

Transport inspection

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

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

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

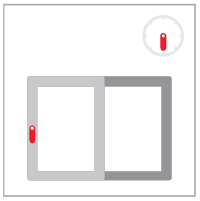
Handle position	Sash position	Symbol	Meaning
ROTO TILT&SLIDE HARDWARE			
			Closed position of the sash
			Opened tilt position of the sash
			Opened slide position of the sash
			Closed slide position of the sash
			Closed position of the sash

The following symbols and signs can be used on windows and balcony doors to protect the end-user.
Please order stickers separately (WB 141-0 EN).

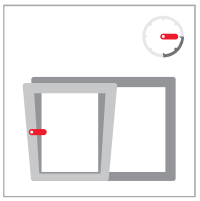
Roto Patio Z

Kippschiebe-Beschlag mit Zwangssteuerung
Tilt&Slide hardware with positive control

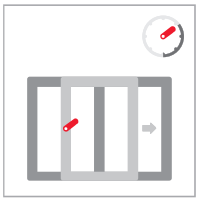
geschlossen
closed



kippen
tilt



schieben
slide



Nichteinrasten beim Schließen
Non-engagement when closing

Einrasten beim Schließen
Engagement when closing

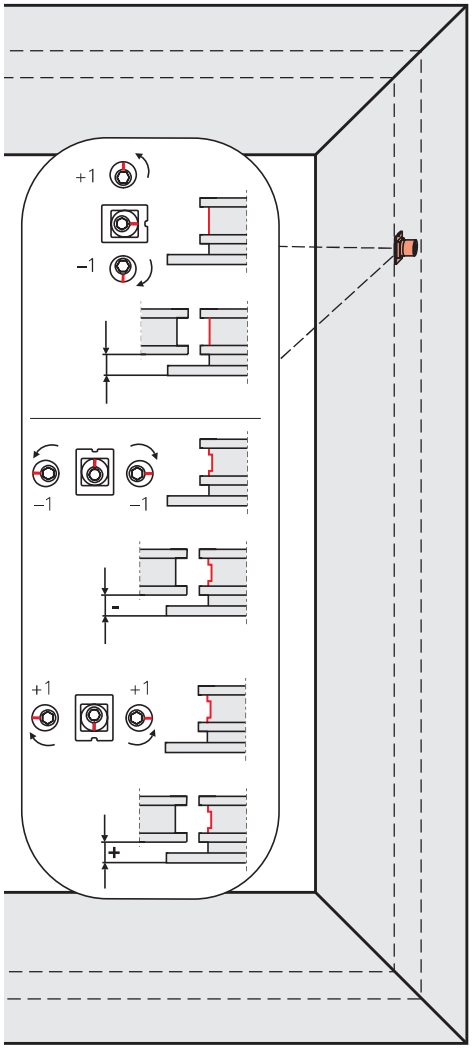
04/2008 WB 141-0

Troubleshooting

Problem	Cause	Corrective action	Specialist company	End-users
Handle is difficult to rotate.	– Frame parts are not properly greased.	– Grease frame parts.	□	□
	– Faulty handle.	– Replace the handle.	■	–
	– Handle screws are screwed in too strong.	– Slightly loosen the screws.	■	–
	– Oblique screws in the sash.	– Straight screw-fixing of the sash parts.	■	–
	– Faulty sash parts.	– Replace the sash parts.	■	–
	– Faulty striker locations.	– Adjust the striker locations.	■	–
	– Sash stay gasket compression too strong (accumulation of gaskets).	– Notch out or take out the sash stay gasket compression.		
Handle can not rotate 135°.	– Faulty installation of sash parts or connecting-rod dimensions not correct.	– Unhinge the sash and check whether the sash components are installed correctly. If necessary, produce new connecting-rods.	■	–
Sash is rubbing in tilt mode.	– Insufficient clearance on top.	– Lower the bogie.	■	–
Locking cams rubber at striker.	– Faulty hinging of the sash.	– Rehinge the sash.	■	–
	– Faulty striker locations.	– Adjust the striker locations.	■	–
	– Connecting-rod dimensions are not correct.	– Produce new connecting-rods.		

■ = To be carried out **only** by a specialist company
– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!
□ = To be carried out either by a specialist company or by the end-user.

1. Adjust the gasket compression with a 4 mm Allen key (alternatively Torx key T25).
   To be carried out only by a specialist company



Increasing and reduction of the gasket compression possible.

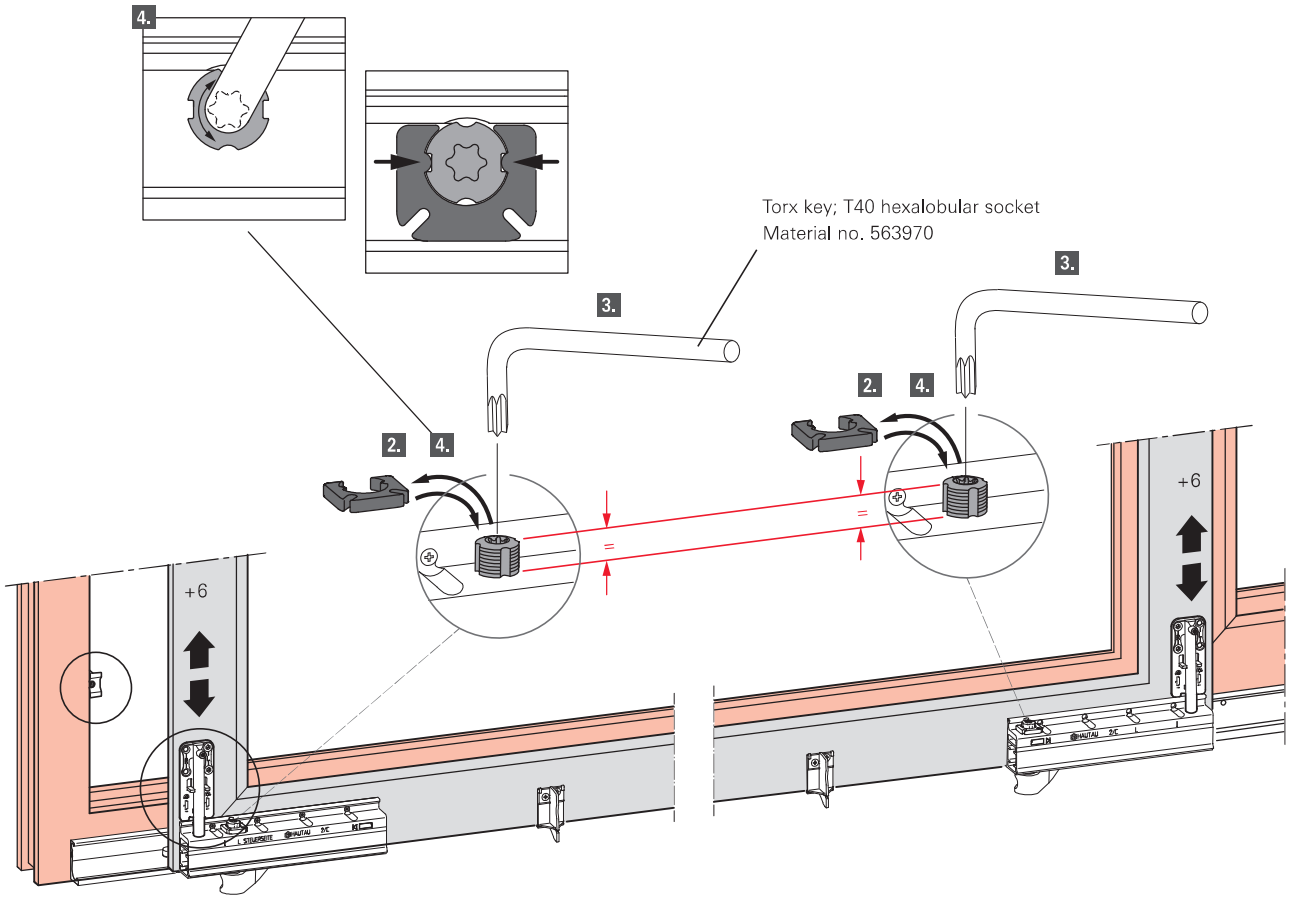
Only reduction of the gasket compression possible.

Only increasing of the gasket compression possible.

1. Check the clearance all round (not dep.).
2. Remove the anti-twist devices.
3. Raise or lower the bogies via the adjusting screws with a T40 hexalobular socket Torx key (563970).
   2 adjusting screws per heavy-duty bogie, 1 adjusting screw per bogie.

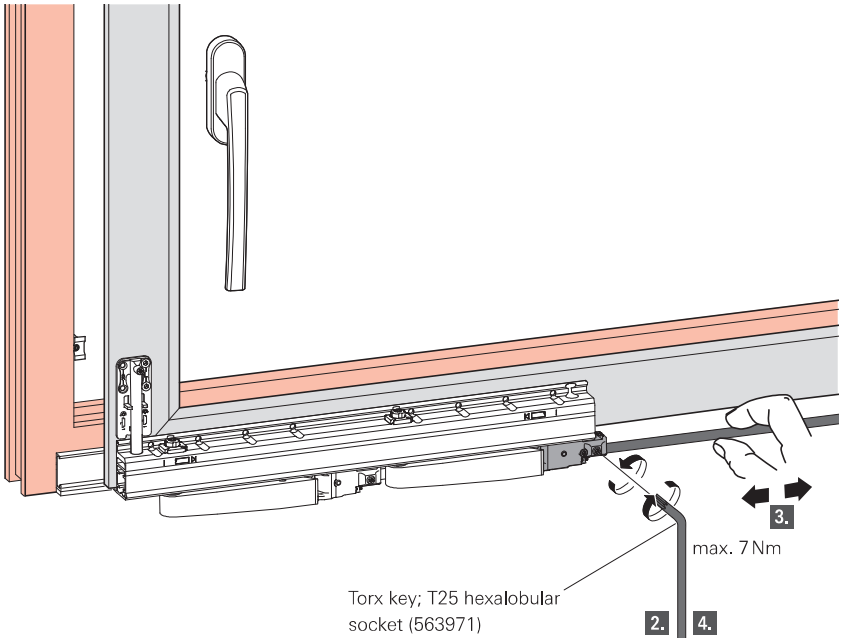
PLEASE NOTE!
When installing the sash without glass or with a low sash weight, lower the bogies as far as possible with the adjusting screws.
The bogies must be adjusted evenly at their adjusting screws in order to avoid jamming. (The bogies are uniformly preset in the factory.)

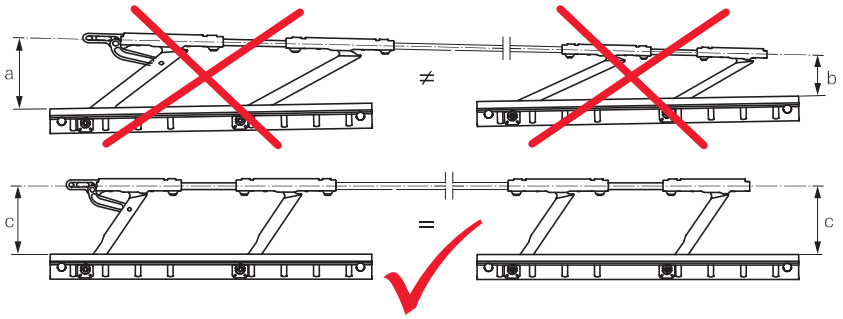
4. Install the anti-twist devices after adjusting the bogies, correct the adjusting screws' setting beforehand if necessary.



Aligning the bogies parallel

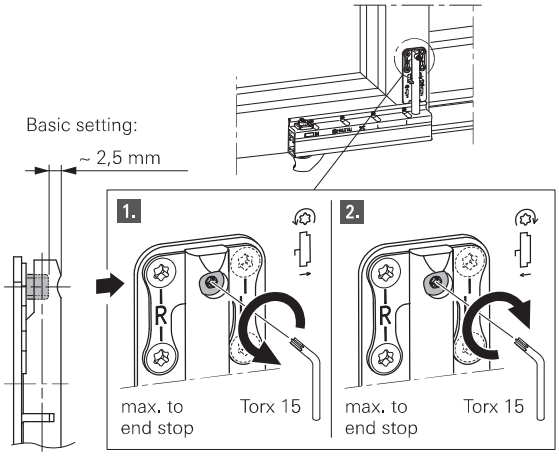
1. Move the sash into the tilted position.
2. Loosen the connecting rod on the handle-sided heavy-duty bogie / bogie with a T25 hexalobular socket Torx key (563971).
3. Align the hinge-sided bogie parallel by sliding the connecting rod to the left or right.
4. Tighten up the connecting rod on the handle-sided bogie with a T25 hexalobular socket Torx key, max. 7 Nm.
   The parallel alignment of the bogies warrants the sash entering the frame smoothly.





1. Facilitate running in.
2. Facilitate running out.
   To be carried out only by a specialist company.

NOTE!
From the basic setting, both reinforcement brackets should only be moved in 1. direction. Too strong adjustment in 1. direction may result in rubbing of the bogies, depending on profile and sash weight. In this case, adjust the reinforcement brackets in 2. direction until the bogies can be moved without rubbing.



Maintenance

WARNING!
Danger of injury through incorrectly conducted maintenance work!
Incorrect maintenance can result in serious personal injury or material damage.

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

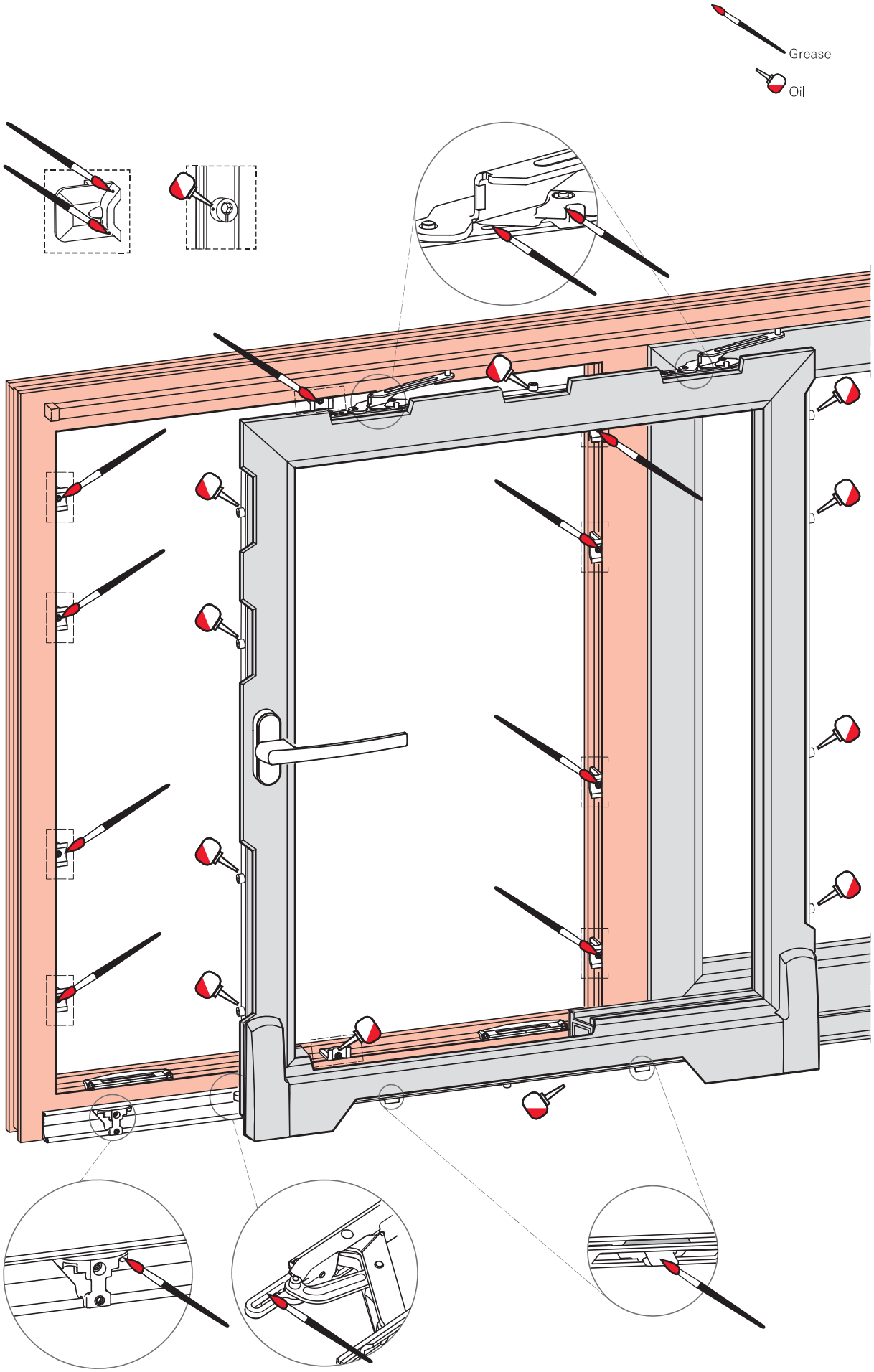
At least annually, every six months for school and hotel buildings:	**Specialist company**	**End-users**
If necessary, tighten fixing screws.	■	–
Replace damaged screws.	■	–
If necessary, replace components.	■	–
Lubricate all moving components with acid free and non resinous oil from a specialised dealer.	□	□
Lubricate strikers with acid free and non resinous grease from a specialised dealer.	□	□

■ = To be carried out **only** by a specialist company.
– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!
□ = To be carried out either by a specialist company or by the end-user.

NOTE!
Observe the following environmental protection notes during maintenance work:

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

The hardware overview shows the arrangement of the lubrication points. The illustrated overview does not necessarily correspond to the installed hardware. The number of lubrication points depends on the size and design of the window.


Grease
Oil

Inspection

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

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

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Care

	Specialist company	End-users
Keep the hardware free from deposits and soiling.	□	□
Never use aggressive, acidiferous cleaners or abrasive cleaning agents.	□	□
Only use mild, pH-neutral cleaning agents in diluted form.	□	□
Only use a soft cloth for cleaning.	□	□

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

Protection against corrosion

	Specialist company	End-users
Aggressive vapours (e.g. by means of formic acid or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid etc.) in the vicinity of the windows must be absolutely avoided.	■	–
Never use acetic-acid or crosslinked acidic sealing compounds or those with the above mentioned contents, since both the direct contact with the sealing compound and its vaporisation can attack the hardware's surface.	■	–
Always use stainless-steel screws.	■	–

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Protection against dirt

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

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Protection against (permanent) moist interior air

	Specialist company	End-users
Ventilate the hardware and the rebate areas – especially in the construction phase – so that they are neither exposed to direct contact with water nor to formation of condensation water.	☐	☐
Ensure that (permanently) damp spatial air cannot condense in the hinge and rebate areas: – Force ventilate several times each day (open all windows for approx. 15 minutes). – Also ventilate during holidays and absences. – For more complex construction projects, develop a ventilation plan if necessary. If described systematic ventilation is not possible, e.g. because fresh screed must not be traversed, or it cannot take draughts, put the windows into the tilted position and make them airtight by taping on the indoor side. Divert the moisture present in the room air to the outside by means of condensation dryers.	☐	☐

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

Roto
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Roto Frank AG
Window and door technology

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