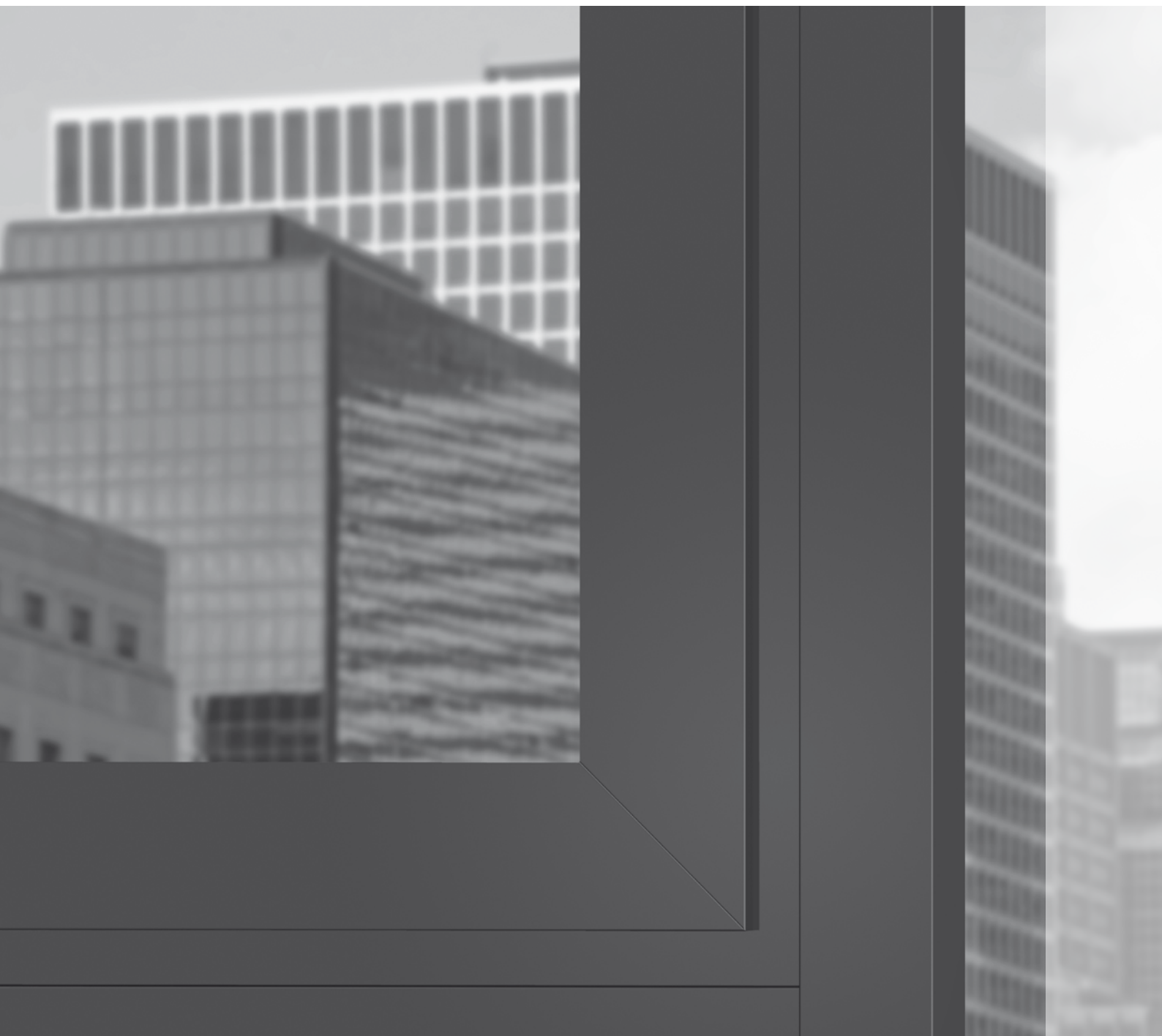


Roto AL Designo

Concealed hardware for aesthetic aluminium windows and balcony doors

Installation, maintenance and operating instructions for aluminium profiles



Imprint

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Roto Frank AG Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com

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This document contains important information and instructions as well as application diagrams (max. sash sizes and weights) and installation instructions for further processing the hardware.

These instructions also contain binding specifications in order to ensure that all parties involved, right up to the end user, comply with the obligation to give instructions.

The information and instructions contained in this document refer to products belonging to the Roto AL hardware system.

The following documents apply in addition to these installation, maintenance and operating instructions:

- Catalogue
- Directive TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association.
- Directive VHBH issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association.
- Directive VHBE issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association.

These instructions should be stored where they can be accessed quickly when required.

Further markings

The following markings are used in these instructions to emphasise instructions, results, lists, references and other elements:

Marking	Explanation
	Sash
	Frame
	Holes
[1]	Hardware components
[A]	Sequence of actions
1.	Steps
■	First-level list
►	Measure
→ p. 12	(Cross-)reference in tables
see page 12	(Cross-)reference in flow text

Symbols	Explanation
Material	
	Aluminium
Tilt&Turn opening types	
	Turn
	Tilt and turn
	Tilt
	Turn-Only sash

Symbols	Explanation
	Tilt&Turn sash / TiltFirst sash
	Tilt-Only sash
Table designation	
	Sash width
	Sash height

Abbreviation	Explanation
AL	Aluminium
ASA	Additional stay arm
BP	Bottom part
br. TR	Braked turn restrictor
CD	Corner drive
CG	Glass clearance dimension
CL	Centre lock
compl.	complete
Count. screw	Countersunk screw
CR1	Connecting rod designation, e.g. connecting rod 1
CTL	Catalogue
Cyl.	Cylinder
DIN	Left (L) or right (R) version
FG	Flush-encased gearbox
FHi	Frame height, internal
Fig.	Figure
FM	Floating-mullion sash espagnolette, internal
FM-R	Floating-mullion sash espagnolette, slider
FM-Sh	Floating-mullion shootbolt
FM-Su	Floating-mullion sash espagnolette, surface-mounted
FM-SuN	Floating-mullion sash espagnolette, surface-mounted, narrow version
FWi	Frame width, internal
HH	Handle height
HO	Hinge opening
HS	Hinge side
IMO	Installation instructions
incl.	including
kg	Kilograms
kN	Kilonewton
L	Left
LG	Long
M	Metric
m ²	Square metre
Max.	Maximum
MD	Mishandling device
Min.	Minimum
mm	Millimetre
Nm	Newton metres
No.	Number

Abbreviation	Explanation
Not sh.	Not shown
OH	Overlap height
OW	Overlap width
Pc(s)	Piece(s)
Pos.	Position
PU	Packaging unit
PW	Profile weight
R	Right
RC	Rebate clearance
RC2	Resistance class 2
RC3	Resistance class 3
S.kg	Sash weight
SEC	Security
SH	Sash height
SP. COL.	Special colour
SR	Shootbolt rod
ST	Striker
SW	Sash width
T 25	Hex key, e.g. T 25 hex key
T&T	Tilt&Turn hardware
TF	TiltFirst hardware
TiS	Tilt-Only hardware
TiSt	Tilt-Only hardware, handle at the top
TiSs	Tilt-Only hardware, handle at the side
TP	Top part
TR	Turn restrictor
TR size 1	With damped / braked turn restrictor size 1
TR size 2	With damped / braked turn restrictor size 2
TuS	Turn-Only hardware
TuS-C	Turn-Only hardware, comfort
TuS-H	Turn-Only hardware with centre lock
var.	Variable
VB	Multi-ported striker
WAF	Key size
with MD	With mishandling device
without MD	Without mishandling device

Figures are drawn DIN right. All dimensions are in mm. Otherwise, other values are specified.

Copyright protection

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

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

Hardware dealers

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

Window and balcony door manufacturers

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

Building element dealers / installation companies

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

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

Builders

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

End users

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

**Note!**

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

Unless specified otherwise in the text below, documents and information can be passed on as a printed document, on a CD-ROM or via the Internet.

Responsibility of hardware dealers

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

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

Responsibility of the window and balcony door manufacturer

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

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

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

Responsibility of building element dealers / the installation company

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

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

Responsibility of the builder

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

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

In these instructions, safety information is marked by symbols. The safety information is preceded by signal words which indicate the severity of the hazard.

**Danger!**

This combination of symbol and signal word indicates an imminently hazardous situation which may lead to death or serious injuries if not avoided.

**Warning!**

This combination of symbol and signal word indicates a potentially hazardous situation which may lead to death or serious injuries if not avoided.

**Caution!**

This combination of symbol and signal word indicates a potentially hazardous situation which may lead to minor or light injuries if not avoided.

**Note!**

This combination of symbol and signal word indicates a potentially hazardous situation which may lead to property damage and environmental damage if not avoided.

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

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable guidelines (see the chapter entitled "Security, stipulated use").
- Improper use/misuse (see the chapter entitled "Security, stipulated use").
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams.
- Increased contamination.

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

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

The warranty only covers original Roto components.

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

Turn-Only and Tilt&Turn hardware in the meaning of this definition is engagement, Turn-Only and Tilt&Turn hardware for windows and balcony doors in structural engineering. This hardware is used to move window sashes and balcony door sashes to a turned position by actuating a hand lever or a tilt position which is restricted by the scissor stay version. Turn-Only and Tilt&Turn hardware may only be used on vertically installed aluminium windows and balcony doors. Turn-Only and Tilt&Turn hardware in the sense of this definition close windows and balcony door sashes or move them into various ventilation positions. During the closing process, the gasket counter force must generally be overcome.

The stipulated use also includes compliance with all information contained in the product-specific documentation, such as:

- These installation, maintenance and operating instructions
- Product catalogues
- Information, specifications from profile manufacturers (e.g. light metal profiles, etc.)
- Directives TBDK, VHBH and VHBE issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association.
- Applicable national laws and directives

Any use that goes beyond or differs from the stipulated use is considered misuse.



Warning!

Danger in the event of misuse!

Misuse and incorrect installation of hardware can lead to hazardous situations.

- ▶ Never use hardware combinations that have not been approved by the hardware manufacturer.
 - ▶ Never use non-original accessories or accessories which have not been approved by the hardware manufacturer.
-

For windows or balcony doors with Turn-Only or Tilt&Turn hardware, windows or balcony door sashes can be moved to a turned position by operating a hand lever or to a tilt position restricted by the scissor stay version.

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

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

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

For this reason:

- ▶ When closing the sash, ensure that it does not come into contact with the frame or another sash.
- ▶ Ensure that the sash is guided by hand through the entire movement range up to the absolute closed position, and that it is moved towards the frame at a very low speed.
- ▶ Ensure that the sash never swings open or closed uncontrollably.

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

**Warning!****Danger in the event of misuse!**

Misuse of windows or balcony doors can lead to hazardous situations.

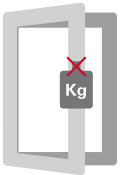
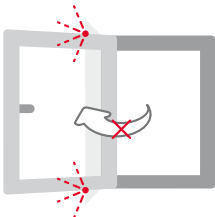
In particular, refrain from using windows and balcony doors as follows:

- ▶ Introducing obstacles into the opening area between the frame and window or window sashes.
- ▶ Deliberately applying additional loads which impact the window and balcony door sash or negligently permitting these loads.
- ▶ Intentionally or uncontrollably slamming or pushing the window sash or balcony door sash against the window reveal. This can destroy the hardware, frame materials or other individual components in windows or balcony doors.

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



Always note the following symbols and their meaning to prevent accidents, injuries and property damage.

Symbol	Meaning
	Danger! Falling from open windows and balcony doors poses a risk of injury. ▶ Take care when in the vicinity of open windows and balcony doors. ▶ Keep children and anyone unable to understand the risks away from the hazardous area.
	Warning! Trapping body parts in the opening between sash and frame poses a risk of injury. ▶ When closing windows and balcony doors, never grip between the sash and frame and always exercise caution. ▶ Keep children and anyone unable to understand the risks away from the hazardous area.
	Warning! Placing additional loads on the sash may pose a risk of injury and cause property damage ▶ Refrain from placing additional loads on the sash.
	Caution! Wind poses a risk of injury ▶ Avoid exposing the open sash to wind. ▶ Close and lock the window and balcony door sash in windy or draughty conditions.
	Caution! Introducing obstacles into the opening between sash and frame may pose a risk of injury and cause property damage ▶ Refrain from introducing obstacles into the opening between sash and frame.
	Caution! Pressing the sash against the edge of an opening (reveal) may pose a risk of injury and cause property damage ▶ Refrain from pressing the sash against the edge of an opening (reveal).

Maximum sash sizes and weights

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

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

Specifications from profile manufacturers

The window and balcony door manufacturer must comply with all specified system dimensions (e.g. gasket gap dimensions or locking distances). They must continue to ensure and check this on a regular basis, especially when new hardware components are used for the first time, during production and on a continuous basis, up to and including window installation.



NOTE!

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

Assembling hardware

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

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

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

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



NOTE!

The hardware manufacturer's specifications on the combination of hardware (e.g. the use of additional scissor stays, the design of hardware for burglar-inhibiting window sashes and balcony door sashes, etc.) are binding.

The spacer block guidelines for glazing methods must be complied with.



DANGER!

Incorrectly installed or screwed-in hardware components present a danger to life.

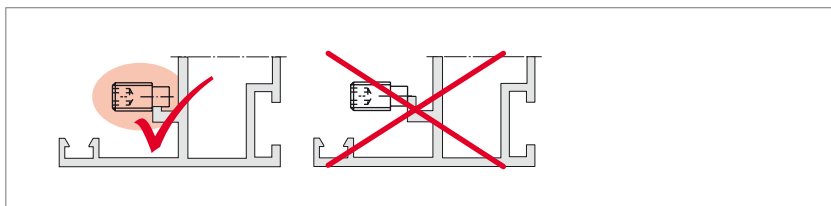
Installing hardware components improperly or screwing them into place incorrectly may lead to hazardous situations and cause serious accidents or even death.

For this reason:

- During installation and screwdriving work in particular, observe the product-specific documentation provided by the hardware manufacturer, the information from the profile manufacturer and the content of the TBDK guideline issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association in its entirety.

This hazard information applies to all hardware components which are screwed into place, in particular to security components which form part of the RC equipment. The type and quality of the screw fixing always depend on the aluminium profile used by the profile manufacturer and must be inspected before use (system assessment).

Other AL hardware components are usually fastened to the frame and sash by clamping. Specific tightening torques apply during installation. Please note the relevant information on this in the chapter entitled "Installation".



Tighten all piercing screws as shown in the figure.



NOTE!

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

Can be used on aluminium profiles with the following characteristics:

- Overlap width: 21.5 mm to 22 mm
- Rebate clearance: 11.5 mm to 12 mm
- Hardware axis: 10 mm
- Hardware certified in accordance with QM 328

- Hinge side / sash stay can be clamped in frame groove by preassembled clamp strip with clamping blocks
- Integrated piercing screw to prevent horizontal movement
- Preassembled sash stay with integrated anti-slam device and lateral adjustment
- Sash installation in tilted state
- Load transfer for sash weights 80–180 kg

- Sash stay 390: lateral adjustment on the scissor stay rod (-1.5 mm)
- Sash stay 500/735: lateral adjustment on the scissor stay guide (± 2 mm)
- Turn-Only sash with rebate sash stay and integrated lateral adjustment (± 2 mm), passive concealed locks on the hinge side
- Turn-Only sash with coupleable rebate sash stay and integrated lateral adjustment (± 2 mm) for active locking points (in conjunction with CL corner drive) on the hinge side
- Height adjustment (+2 mm/-0.5 mm) on the corner hinge
- Lateral adjustment (+2 mm/-1 mm) on the corner hinge (up to 150 kg) in the installed state

- Centre locks can be placed at any position thanks to the insertable locking cams
- The gasket compression can be adjusted by eccentric cams (± 1 mm)
- Burglary inhibition up to RC3 is possible (DIN EN 1627-1630)

- Geared-handle (window handles optionally lockable)
- Geared-handle with separate service handle
- Flush-encased gearbox with/without malfunction lock (window handles optionally lockable 40/100 Nm)
- Handle without escutcheon for flush-encased gearbox (optionally lockable)

Concealed floating-mullion hardware in the following variants:

- Floating-mullion sash espagnolette, internal (FM)
- Floating-mullion shootbolt (FM-Sh)
- Floating-mullion sash espagnolette, surface-mounted (FM-Su)
- Floating-mullion sash espagnolette, surface-mounted, narrow version (FM-SuN)
- Floating-mullion sash espagnolette, slider (FM-R)

- Use of turn restrictor $SW \geq 1200$ mm
- Use of turn restrictor (damped, braked) $SW \geq 1200$ mm
- Turn lock with cylinder lock, lockable
- Night vent
- Bullet catch



Application diagram up to 100 kg without load transfer

T&T



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 555–2700 mm

Sash weight **S.kg** max. 100 kg

T&T

Sash width (SW)

Sash stay 390 (max. 80 kg) ¹⁾ 390–500 mm

Sash stay 500 500–735 mm

Sash stay 735 735–1200 mm

Sash stay 735 + TR 1200–1300 mm

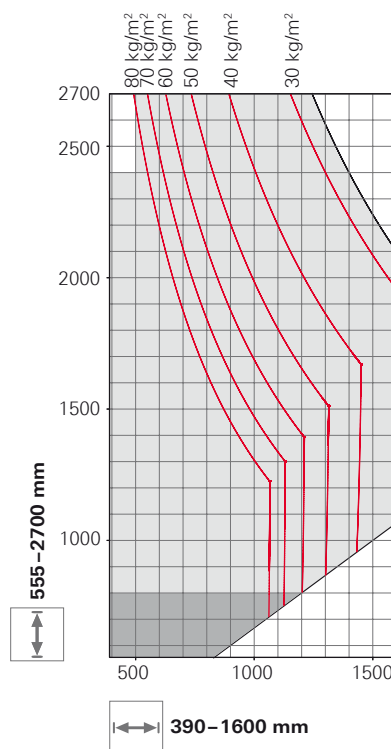
Sash stay 735 + TR + ASA 1300–1600 mm

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

1 mm/m² glass thickness Δ 2.5 kg

= Impermissible application range

= Tilt distance restrictor SH < 800 mm



Calculation basis for application diagram:

(IFT tool – version from February 2016)

Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

¹⁾ Glass weight max. 65 kg/m²

Application diagram up to 100 kg without load transfer

TF, TiSs



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 555–2700 mm

Sash weight **S.kg** max. 100 kg

TF, TiSs

Sash width (SW)

Sash stay 500 500–735 mm

Sash stay 735 735–1200 mm

Sash stay 735 + TR 1200–1300 mm

Sash stay 735 + TR + ASA 1300–1600 mm

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

1 mm/m² glass thickness $\pm$ 2.5 kg



= Impermissible application range



= Tilt distance restrictor SH < 800 mm

Calculation basis for application diagram:

(IFT tool – version from February 2016)

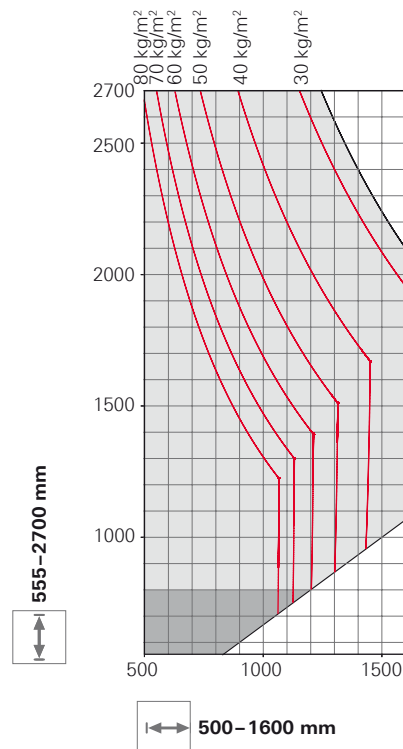
Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

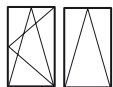
- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26





Application diagram 100–150 kg with load transfer

T&T, TF, TiSs



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 1000–2700 mm

Sash weight **S.kg** 100–150 kg

T&T, TF, TiSs

Sash width (SW)

Sash stay 735 735–1200 mm

Sash stay 735 + TR 1200–1300 mm

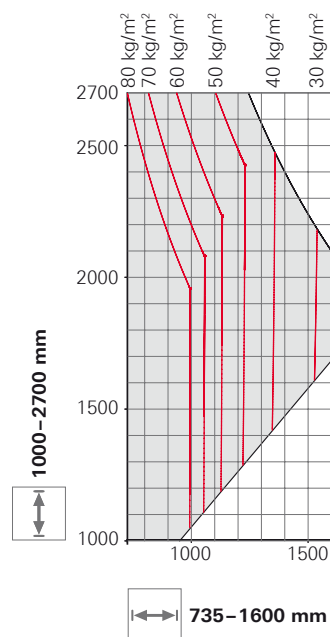
Sash stay 735 + TR + ASA 1300–1600 mm

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

1 mm/m² glass thickness $\pm$ 2.5 kg



= Impermissible application range



Calculation basis for application diagram:

(IFT tool – version from February 2016)

Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

Application diagram up to 80 kg without load transfer

TuS



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 520–2700 mm

Sash weight **S.kg** max. 80 kg

TuS (not coupleable)

Sash width (SW)

Rebate sash stay 250–1200 mm

Rebate sash stay + TR 1200–1600 mm

TuS (coupleable)

Sash width (SW)

Rebate sash stay, coupleable 300–900 mm
(max. glass weight 70 kg/m²)

Sash stay 500 (tilting disabled) 500–1200 mm

Sash stay 500 (tilting disabled) + TR 1200–1600 mm

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

1 mm/m² glass thickness $\pm$ 2.5 kg

 = Impermissible application range

Calculation basis for application diagram:

(IFT tool – version from February 2016)

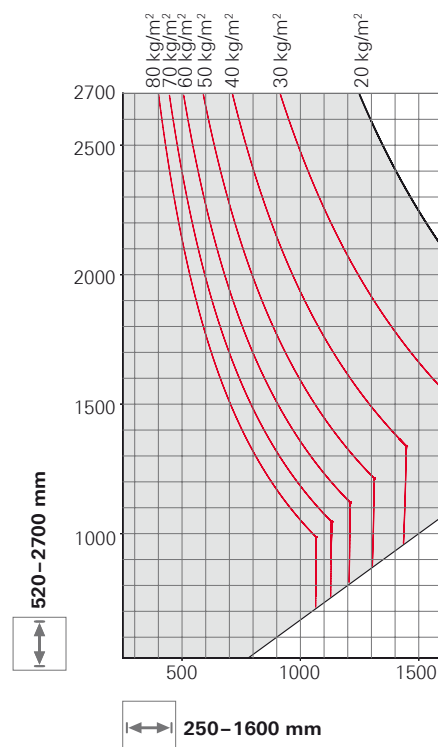
Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26





Application diagram 80–150 kg with load transfer

TuS



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 1000–2700 mm

Sash weight **S.kg** 80–150 kg

TuS (not coupleable)

Sash width (SW)

Rebate sash stay 250–1200 mm

Rebate sash stay + TR 1200–1600 mm

TuS (coupleable)

Sash width (SW)

Sash stay 500 (tilting disabled) 500–1200 mm

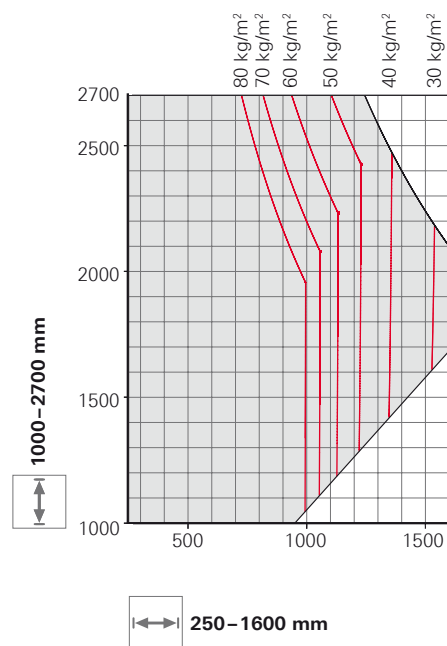
Sash stay 500 (tilting disabled) + TR 1200–1600 mm

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

1 mm/m² glass thickness Δ 2.5 kg



= Impermissible application range



Calculation basis for application diagram:

(IFT tool – version from February 2016)

Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

Application diagram up to 100 kg

TiSt



Limitation of sash formats with different glass thicknesses

Application range

Sash width **SW** 520–1600 mm

Sash height **SH** 500–1300 mm

Sash weight **S.kg** max. 100 kg

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

1 mm/m² glass thickness $\pm$ 2.5 kg



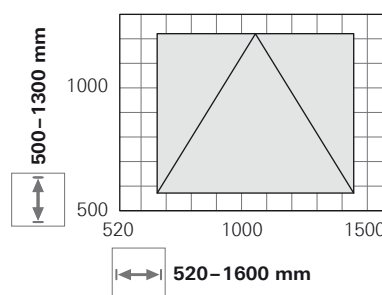
= Impermissible application range

Calculation basis for application diagram:

(IFT tool – version from February 2016)

Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

Application diagram 150–180 kg with load transfer and turn restrictor

T&T, TuS



Limitation of sash formats with different glass thicknesses

Application range

Sash height **SH** 1000–3000 mm

Sash weight **S.kg** 150–180 kg

T&T, TF, TiSs

Sash width (SW)

Sash stay 735 (180 kg) + TR 735–1300 mm

Sash stay 735 (180 kg) + TR + ASA 1300–1600 mm

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

1 mm/m² glass thickness Δ 2.5 kg



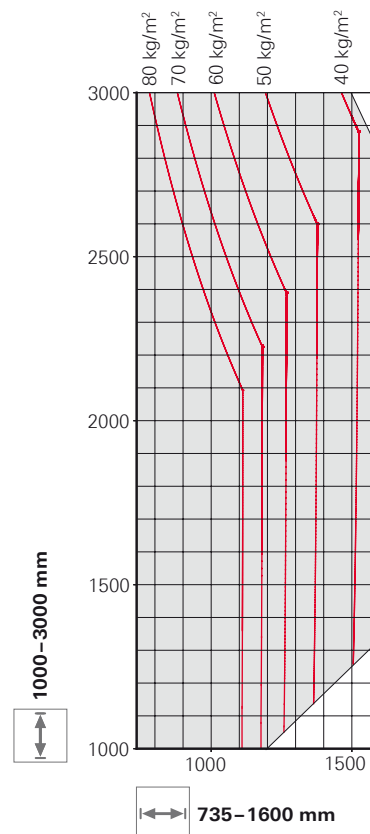
= Impermissible application range

Calculation basis for application diagram:

(IFT tool – version from February 2016)

Glass clearance dimension **CG** 20 mm

(Sash) profile weight **PW** 2 kg/m



NOTE!

- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

Information on the product
Minimum sash widths and heights

Sash dimensions – Standard									
	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH	HH
		Without TR	TR	TR size 1	TR size 2				
T&T									
Sash stay 390	80 kg	390	390	–	–	500	555	2400	> 260
Sash stay 500	100 kg	500	500	545	610	735	555	2700	
Sash stay 735	100 kg	735	735	735	735	1600	555	2700	
Sash stay 735	150 kg	735	735	735	735	1600	1000	2700	
Sash stay 735	180 kg	–	735	735	800	1600	1000	3000	
TF									
Sash stay 500	100 kg	500	500	645	715	735	555	2700	> 260
Sash stay 735	100 kg	735	735	735	735	1600	555	2700	
Sash stay 735	150 kg	735	735	735	735	1600	1000	2700	
TuS									
Rebate sash stay	80 kg	250	370	545	610	1600	520	2700	> 260
Rebate sash stay	150 kg	250	370	545	610	1600	1000	2700	
TuS, coupleable									
Rebate sash stay, coupleable	80 kg	300	365	–	–	900	555	2700	> 260
Sash stay 500 – tilting disabled	80 kg	500	500	545	610	1600	555	2700	
Sash stay 500 – tilting disabled	150 kg	500	500	545	610	1600	1000	2700	
Sash stay 735 – tilting disabled	180 kg	–	735	735	800	1600	1000	3000	
TiSt									
Rebate sash stay	100 kg	520	–	–	–	1600	500	1300	SW/2
TiSs									
Sash stay 500 – turning disabled	100 kg	500	–	–	–	735	555	2700	> 260
Sash stay 735 – turning disabled	100 kg	735	–	–	–	1600	555	2700	
Sash stay 735 – turning disabled	150 kg	735	–	–	–	1600	1000	2700	
Floating-mullion hardware (passive sash)									
Sash stay 500 – tilting disabled	80 kg	710	710	710	710	1600	555	2700	> 260
Sash stay 500 – tilting disabled	150 kg	710	710	710	710	1600	1000	2700	

Sash dimensions – RC2									
	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH	HH
		Without TR	TR	TR size 1	TR size 2				
T&T									
Sash stay 500	100 kg	625	625	780	850	900	720	2700	> 390
Sash stay 735	100 kg	800	800	800	850	1600	720	2700	
Sash stay 735	150 kg	800	800	800	850	1600	1000	2700	
Sash stay 735	180 kg	–	800	945	1015	1600	1000	3000	
TF									
Sash stay 500	100 kg	625	625	795	865	900	720	2700	> 390
Sash stay 735	100 kg	800	800	800	865	1600	720	2700	
Sash stay 735	150 kg	800	800	800	865	1600	1000	2700	
TuS									
Rebate sash stay	80 kg	530	620	795	865	1600	720	2700	> 390
Rebate sash stay	150 kg	530	620	795	865	1600	1000	2700	
TuS, coupleable									
Rebate sash stay, coupleable	80 kg	370	600	775	845	900	720	2700	> 390
Sash stay 500 – tilting disabled	80 kg	625	625	780	850	1600	720	2700	
Sash stay 500 – tilting disabled	150 kg	625	625	780	850	1600	1000	2700	
Sash stay 735 – tilting disabled	180 kg	–	800	945	1015	1600	1000	3000	
TiSt									
Rebate sash stay	100 kg	520	–	–	–	1600	500	1300	SW/2
TiSs									
Sash stay 500 – turning disabled	100 kg	625	–	–	–	900	720	2700	> 390
Sash stay 735 – turning disabled	100 kg	800	–	–	–	1600	720	2700	
Sash stay 735 – turning disabled	150 kg	800	–	–	–	1600	1000	2700	
Floating-mullion hardware (passive sash)									
Sash stay 500 – tilting disabled	80 kg	800	800	855	920	1600	720	2700	> 390
Sash stay 500 – tilting disabled	150 kg	800	800	855	920	1600	1000	2700	



Sash dimensions – RC3									
	Max. weight	Min. SW				Max. SW	Min. SH	Max. SH	HH
		Without TR	TR	TR size 1	TR size 2				
T&T									
Sash stay 500	100 kg	700	795	–	–	900	870	2700	> 465
Sash stay 735	100 kg	875	875	970	1040	1600	870	2700	
Sash stay 735	150 kg	875	875	970	1040	1600	1000	2700	
Sash stay 735	180 kg	–	915	1045	1115	1600	1000	3000	
TF									
Sash stay 500	100 kg	700	810	–	–	900	870	2700	> 465
Sash stay 735	100 kg	875	875	985	1055	1600	870	2700	
Sash stay 735	150 kg	875	875	985	1055	1600	1000	2700	
TuS									
Rebate sash stay	80 kg	680	810	985	1055	1600	1050	2700	> 465
Rebate sash stay	150 kg								
TuS, coupleable									
Rebate sash stay, coupleable	80 kg	485	800	–	–	900	870	2700	> 465
Sash stay 500 – tilting disabled	80 kg	700	795	970	1040	1600	870	2700	
Sash stay 500 – tilting disabled	150 kg	700	795	970	1040	1600	1000	2700	
Sash stay 735 – tilting disabled	180 kg	–	915	1045	1115	1600	1000	3000	
TiSt									
Rebate sash stay	100 kg	670	–	–	–	1600	500	1300	SW/2
TiSs									
Sash stay 500 – turning disabled	100 kg	700	–	–	–	900	870	2700	> 465
Sash stay 735 – turning disabled	100 kg	875	–	–	–	1600	870	2700	
Sash stay 735 – turning disabled	150 kg	875	–	–	–	1600	1000	2700	
Floating-mullion hardware (passive sash)									
Sash stay 500 – tilting disabled	80 kg	875	875	1045	1110	1600	870	2700	> 465
Sash stay 500 – tilting disabled	150 kg	875	875	1045	1110	1600	1000	2700	

– Not permissible / not possible



NOTE!

- Smaller sash widths are possible if the top and bottom security strikers are omitted.
- Depending on the profile stability, the test can also be passed with fewer security locking points, and the structure can therefore have a smaller design.

The hardware components listed in the table are profile-specific and represent a selection from the Roto AL Designo product range for profiles with a 15/20 mm sash groove. Further hardware component solutions (e.g. for different groove widths) can be supplied on request.

Request assistance from Roto with the generally recommended profile assessments from the Roto sales representative in charge of this.

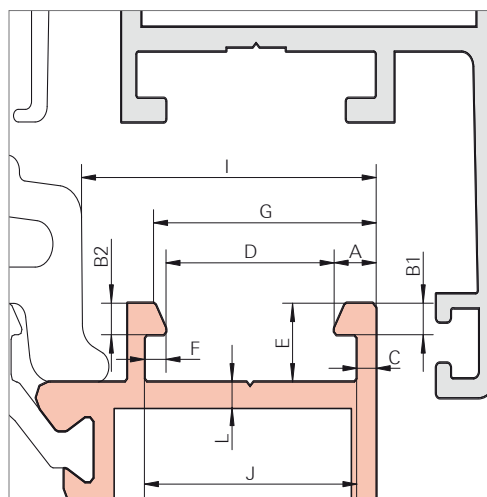
Profile-specific hardware components, hardware axis 10 mm

Basic requirements

Parameter	Min.	Max.
A Front flange width	3.50	4.30
B1 Front flange thickness	1.50	2.00
B2 Rear flange thickness	1.50	2.00
C Front strut thickness	1.50	2.00
D Groove width	10.00	14.00
E Groove depth	4.50	5.20
F Rear flange overhang	1.70	2.50
G Pivot rest supporting surface	13.20	18.50
L* Groove base thickness	1.50	2.00
I Installation space (frame)	22.00	
J Groove inside width	14.00	18.60

* For the drilling jig for groove base thickness > 2 mm, see page 248

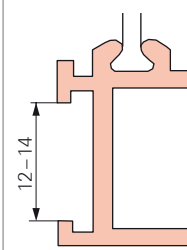
Profile cross section / hardware components



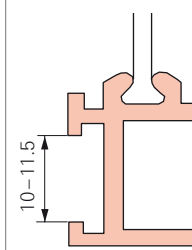
Frame groove variants

When ordering profile-specific frame components, the descriptions V.01 and V.02 must be noted (see page 30).

Groove version V.01



Groove version V.02



Note

With groove versions from 11.6 mm to 11.9 mm, the profile and the components on the frame must undergo testing in real-life conditions.

Clamp strip version no. 1

	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, coupleable
C+J Clamp strip dimensions	16.00	17.10	L	624970	740851	624945	624947	627256	740843
			R	624969	740852	624944	624946	627255	740840

Clamp strip version no. 3

	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, coupleable
C+J Clamp strip dimensions	18.20	19.20	L	624972	740853	624951	624953	627258	740844
			R	624971	740854	624950	624952	627257	740841

Clamp strip version no. 4

	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, coupleable
C+J Clamp strip dimensions	19.30	20.50	L	624974	740855	624957	624959	627260	740845
			R	624973	740856	624956	624958	627259	740842

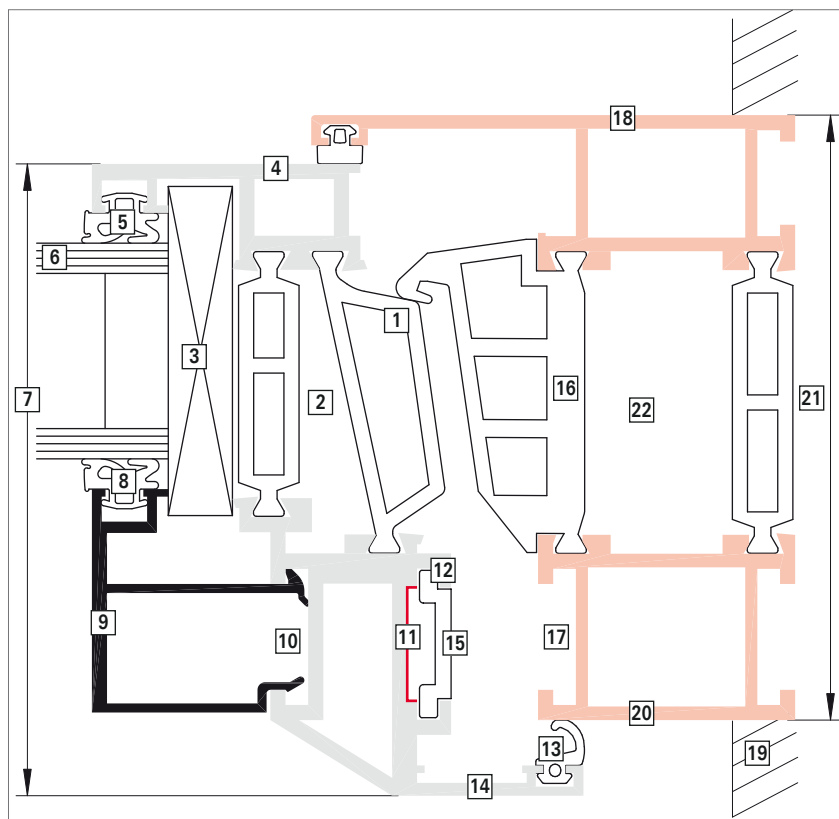


Sash profile

- [1] Central gasket stop strut
- [2] Thermal separation
- [3] Spacer blocking
- [4] Outer shell (sash)
- [5] External glazing gasket
- [6] Glazing (laminated glass)
- [7] Sash profile – depth
- [8] Internal glazing gasket
- [9] Glazing bead
- [10] Sash glazing bead groove
- [11] Extended connecting rod groove (ECC-groove)
- [12] Connecting rod C-groove
- [13] Overlap gasket
- [14] Inside shell (sash)
- [15] Connecting rod

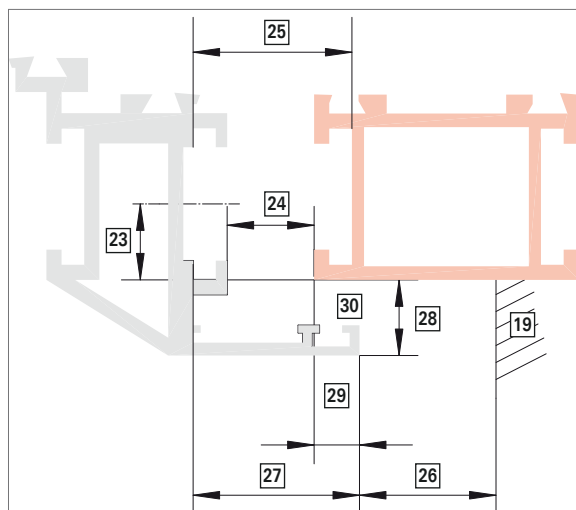
Frame profile

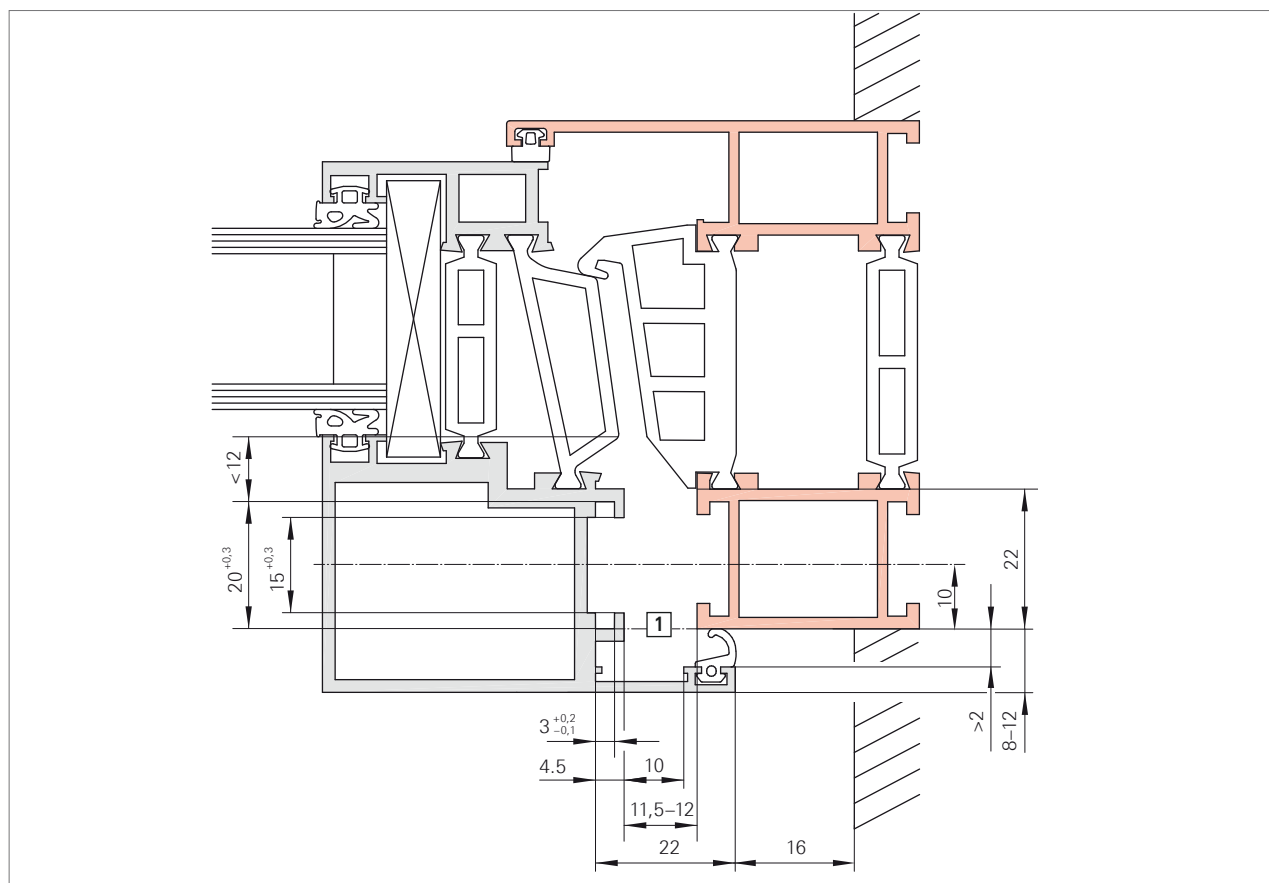
- [16] Central gasket
- [17] Frame clamping groove for hardware components (frame glazing bead groove)
- [18] Outer shell (frame)
- [19] Internal reveal
- [20] Frame inside shell
- [21] Frame profile – depth
- [22] Thermal separation



Dimensions

- [23] Hardware axis
- [24] Rebate clearance
- [25] Chamber dimension (hardware)
- [26] Frame clearance
- [27] Overlap width
- [28] Overlap height (including gasket)
- [29] Overlap coverage
- [30] Hinge opening

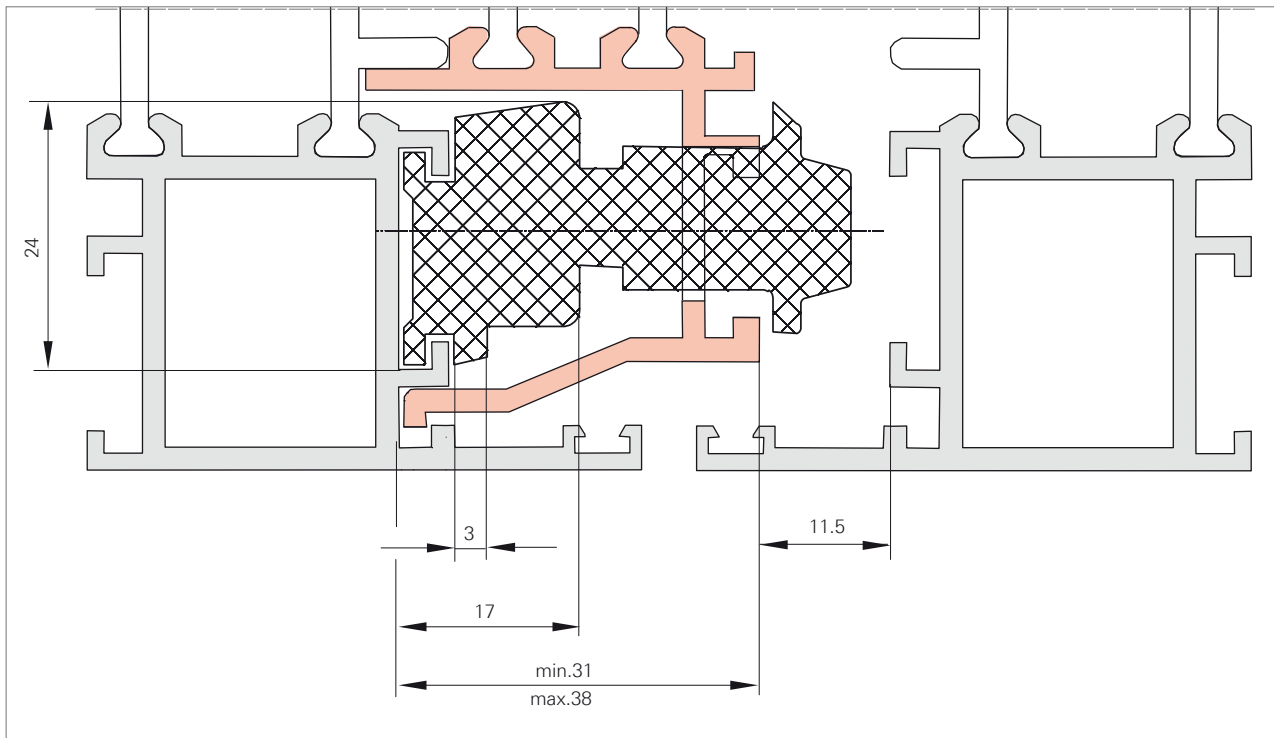




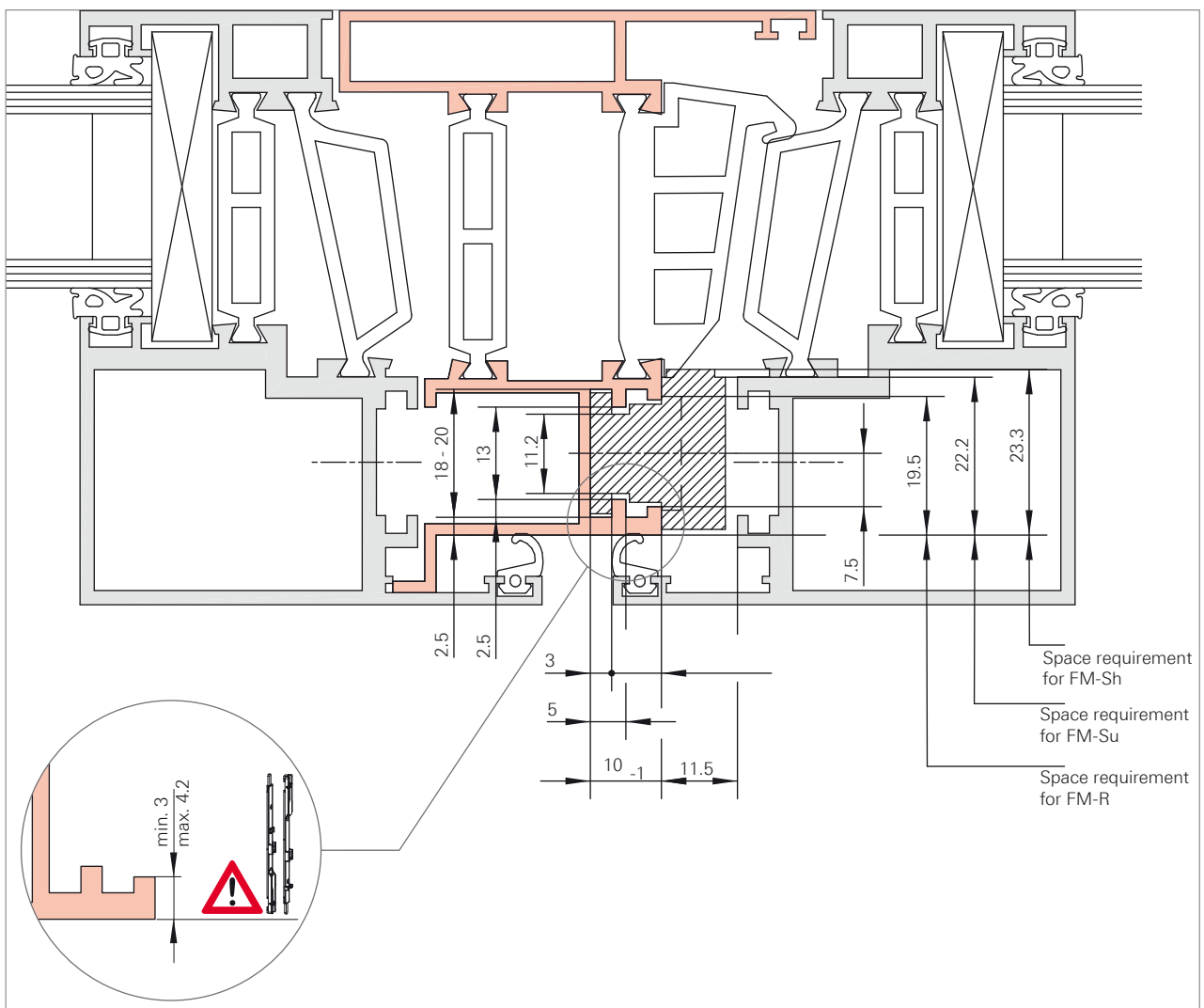
Note!

- All connecting rod dimensions are based on an overlap width of 22 mm. If the overlap width differs from this, the connecting rod dimensions must be adapted accordingly.
- Pay attention to the alignment [1] of the sash and frame.
- Request assistance from Roto with the generally recommended profile assessments from the Roto sales representative in charge of this.

FM espagnolette type



FM-Su, FM-R, FM-Sh, FM-SuN espagnolette type



Explanation of the "Hardware overview" chapter

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

The basic page layout in the hardware overview chapter shows examples of the individual hardware components on the left-hand page, and the associated parts list can be seen on the right-hand page.

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

The parts list contains all profile-related variants of the AL hardware system. Please request technical details, special groove variants and rebate clearance variants separately.

The actual composition of the hardware depends on:

- The height of the element
- The width of the element
- The weight of the element
- Security class

Large packages are located at the end of each hardware overview chapter.

Handles must be ordered separately.

T&T hardware overview
Hardware overview and parts list
T&T 150 kg

Key components (optional) are not included in the basic set.

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T&T hardware overview
Hardware overview and parts list
T&T 150 kg

Application range: 500–1000 mm²
Sash width **BW**: 550–2700 mm²
Sash height **BH**: 550–2700 mm²
Sash weight **S**: max. 100/150 kg²

Rebate clearance **RC**: 11.5–12 mm
Channel width **CW**: 29.5–32 mm

Item	Description	Part No.	Quantity
1	T&T locking components V01	728800	1
2	T&T locking components V02	728805	1
3	Rotating handle	728810	1
4	Rotating handle V01/V02	728815	1
5	Rotating handle V01/V02	728820	1
6	Rotating handle V01/V02	728825	1
7	Rotating handle V01/V02	728830	1
8	Rotating handle V01/V02	728835	1
9	Rotating handle V01/V02	728840	1
10	Rotating handle V01/V02	728845	1
11	Rotating handle V01/V02	728850	1
12	Rotating handle V01/V02	728855	1
13	Rotating handle V01/V02	728860	1
14	Rotating handle V01/V02	728865	1
15	Rotating handle V01/V02	728870	1
16	Rotating handle V01/V02	728875	1
17	Rotating handle V01/V02	728880	1
18	Rotating handle V01/V02	728885	1
19	Rotating handle V01/V02	728890	1
20	Rotating handle V01/V02	728895	1
21	Rotating handle V01/V02	728900	1
22	Rotating handle V01/V02	728905	1
23	Rotating handle V01/V02	728910	1
24	Rotating handle V01/V02	728915	1
25	Rotating handle V01/V02	728920	1
26	Rotating handle V01/V02	728925	1
27	Rotating handle V01/V02	728930	1
28	Rotating handle V01/V02	728935	1
29	Rotating handle V01/V02	728940	1
30	Rotating handle V01/V02	728945	1
31	Rotating handle V01/V02	728950	1
32	Rotating handle V01/V02	728955	1
33	Rotating handle V01/V02	728960	1
34	Rotating handle V01/V02	728965	1
35	Rotating handle V01/V02	728970	1
36	Rotating handle V01/V02	728975	1
37	Rotating handle V01/V02	728980	1
38	Rotating handle V01/V02	728985	1
39	Rotating handle V01/V02	728990	1
40	Rotating handle V01/V02	728995	1
41	Rotating handle V01/V02	729000	1
42	Rotating handle V01/V02	729005	1
43	Rotating handle V01/V02	729010	1
44	Rotating handle V01/V02	729015	1
45	Rotating handle V01/V02	729020	1
46	Rotating handle V01/V02	729025	1
47	Rotating handle V01/V02	729030	1
48	Rotating handle V01/V02	729035	1
49	Rotating handle V01/V02	729040	1
50	Rotating handle V01/V02	729045	1
51	Rotating handle V01/V02	729050	1
52	Rotating handle V01/V02	729055	1
53	Rotating handle V01/V02	729060	1
54	Rotating handle V01/V02	729065	1
55	Rotating handle V01/V02	729070	1
56	Rotating handle V01/V02	729075	1
57	Rotating handle V01/V02	729080	1
58	Rotating handle V01/V02	729085	1
59	Rotating handle V01/V02	729090	1
60	Rotating handle V01/V02	729095	1
61	Rotating handle V01/V02	729100	1
62	Rotating handle V01/V02	729105	1
63	Rotating handle V01/V02	729110	1
64	Rotating handle V01/V02	729115	1
65	Rotating handle V01/V02	729120	1
66	Rotating handle V01/V02	729125	1
67	Rotating handle V01/V02	729130	1
68	Rotating handle V01/V02	729135	1
69	Rotating handle V01/V02	729140	1
70	Rotating handle V01/V02	729145	1
71	Rotating handle V01/V02	729150	1
72	Rotating handle V01/V02	729155	1
73	Rotating handle V01/V02	729160	1
74	Rotating handle V01/V02	729165	1
75	Rotating handle V01/V02	729170	1
76	Rotating handle V01/V02	729175	1
77	Rotating handle V01/V02	729180	1
78	Rotating handle V01/V02	729185	1
79	Rotating handle V01/V02	729190	1
80	Rotating handle V01/V02	729195	1
81	Rotating handle V01/V02	729200	1
82	Rotating handle V01/V02	729205	1
83	Rotating handle V01/V02	729210	1
84	Rotating handle V01/V02	729215	1
85	Rotating handle V01/V02	729220	1
86	Rotating handle V01/V02	729225	1
87	Rotating handle V01/V02	729230	1
88	Rotating handle V01/V02	729235	1
89	Rotating handle V01/V02	729240	1
90	Rotating handle V01/V02	729245	1
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92	Rotating handle V01/V02	729255	1
93	Rotating handle V01/V02	729260	1
94	Rotating handle V01/V02	729265	1
95	Rotating handle V01/V02	729270	1
96	Rotating handle V01/V02	729275	1
97	Rotating handle V01/V02	729280	1
98	Rotating handle V01/V02	729285	1
99	Rotating handle V01/V02	729290	1
100	Rotating handle V01/V02	729295	1

NOTES:
Only one support / clamping support strip which has been approved for the profile. Further information can be obtained from Roto sales representatives.

Subject to change.

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

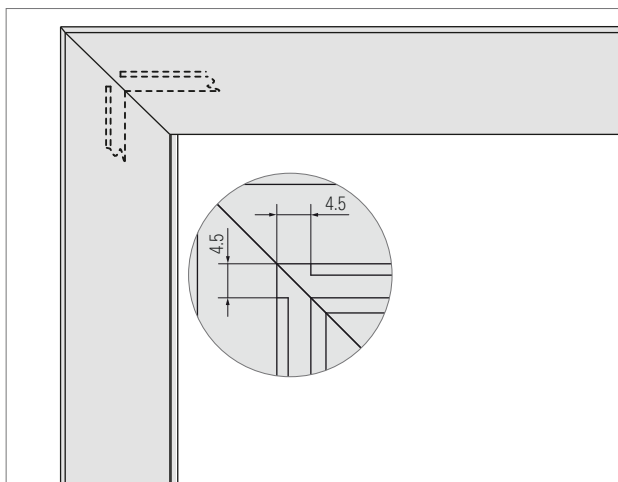


Note!

Roto Con Orders

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

www.roto-frank.com



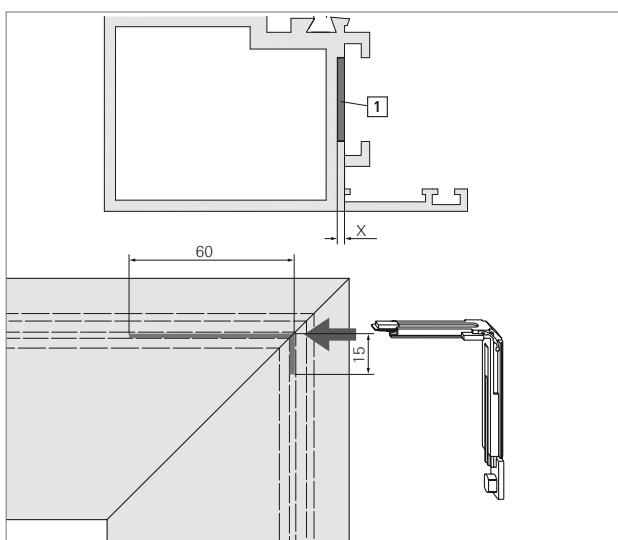
Opening the sash corners

Open the connecting rod groove at all sash corners according to the drawing.



NOTE!

Ensure that the edges are burr-free.

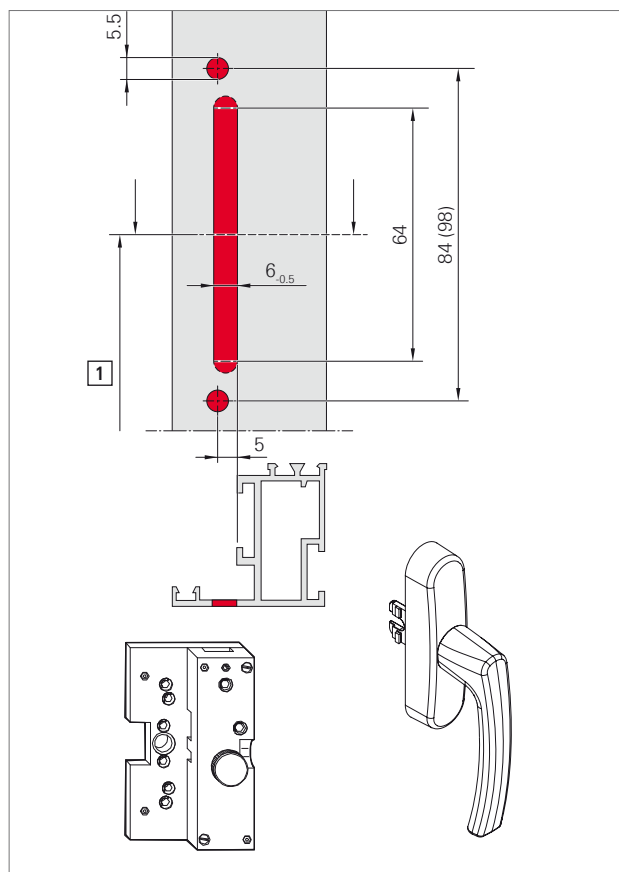


Placing supports under the CL corner drive – ECC-groove

When the CL corner drive is used in a profile with extended connecting rod C-groove (ECC), use a profile-related bracket as a support.

X = profile-related

[1] = bracket

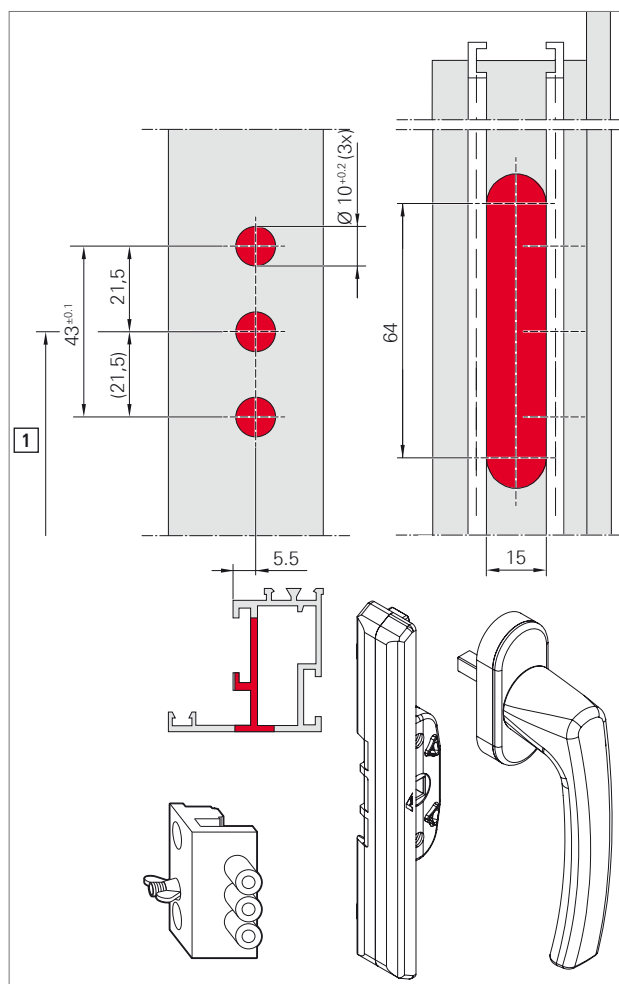


Geared-handle drilling and routing dimensions

Jig for geared-handle

212544

1. Determine the handle height [1] and place the drilling jig on the overlap.
2. Drill the hole:
 $2 \times \varnothing 5.5 \text{ mm}$
 $2 \times \varnothing 6.0_{-0.5} \text{ mm}$
3. Route the slot:
 $1 \times 6.0_{-0.5} \text{ mm}$

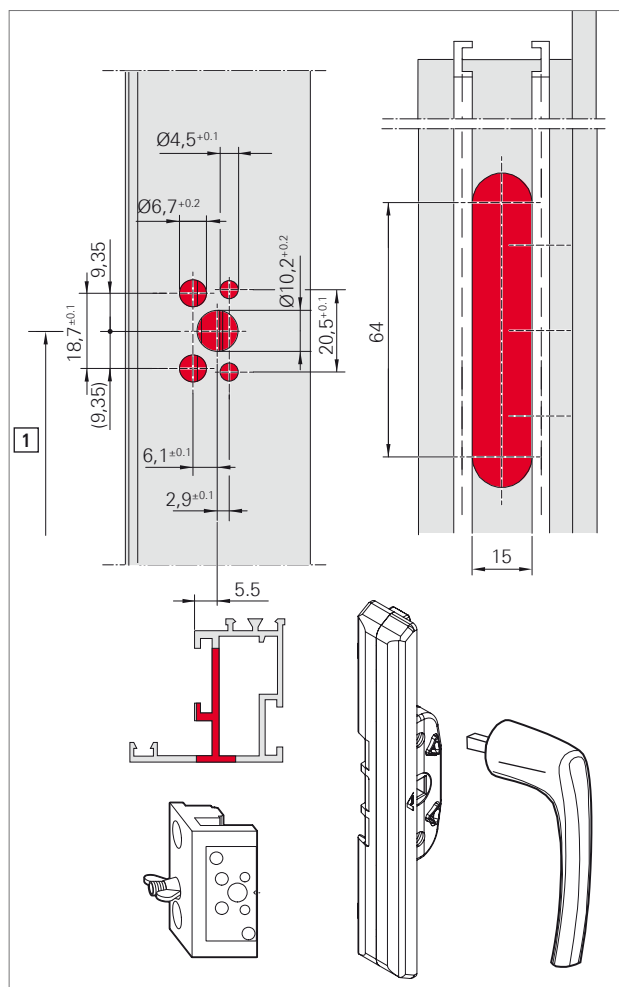


Drilling and routing dimensions for the flush-encased gearbox

Flush-encased gearbox jig

212155

1. Determine the handle height [1] and place the drilling jig on the connecting rod groove.
2. Drill holes:
 $3 \times \varnothing 10.0^{+0.2} \text{ mm}$
 $2 \times \varnothing 15.0 \text{ mm}$
3. Route the slot:
 $1 \times 15.0 \text{ mm}$



Drilling and routing dimensions for the handle without escutcheon

Flush-encased gearbox jig

365361

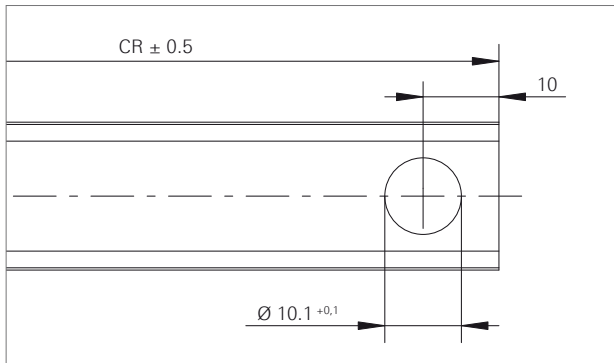
1. Determine the handle height [1] and place the drilling jig on the connecting rod groove.
2. Drill holes:
 - 1 x $\text{Ø } 10,2^{+0,2}$ mm
 - 2 x $\text{Ø } 4,5^{+0,1}$ mm
 - 2 x $\text{Ø } 6,7^{+0,2}$ mm
 - 2 x $\text{Ø } 15,0$ mm
3. Route the slot:
 - 1 x 15.0 mm

Dimension CR = All connecting rod dimensions ± 0.5 mm.

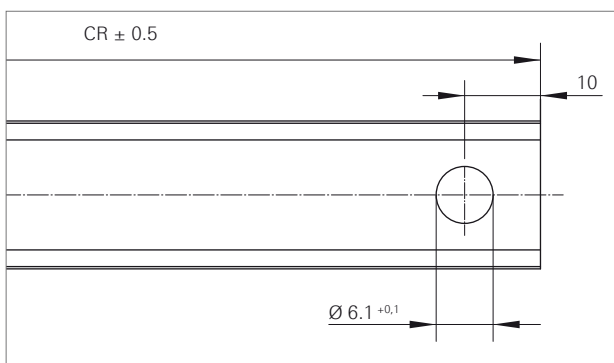


Note!

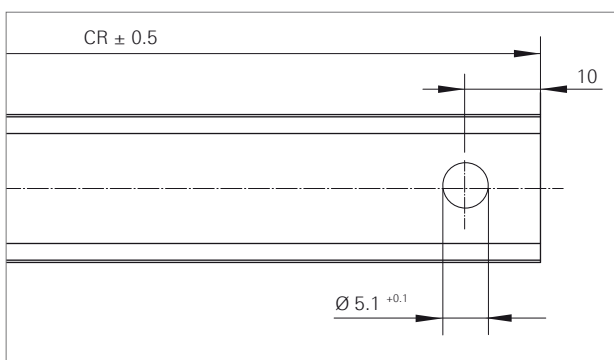
All connecting rod dimensions are based on an overlap width of 22 mm. If the overlap width differs from this, the connecting rod dimensions must be adapted accordingly.



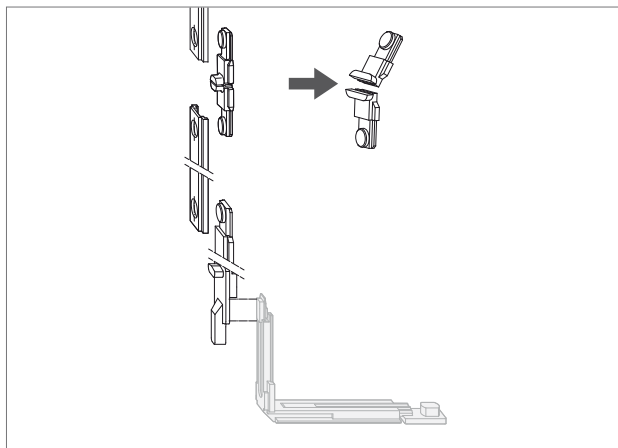
General dimensioning of all coupling points except for the faceplate (on connecting rods), unless otherwise specified.



General dimensioning of the coupling points between floating mullion and espagnolette (except for FM-SuN) (on connecting rods), unless otherwise specified.

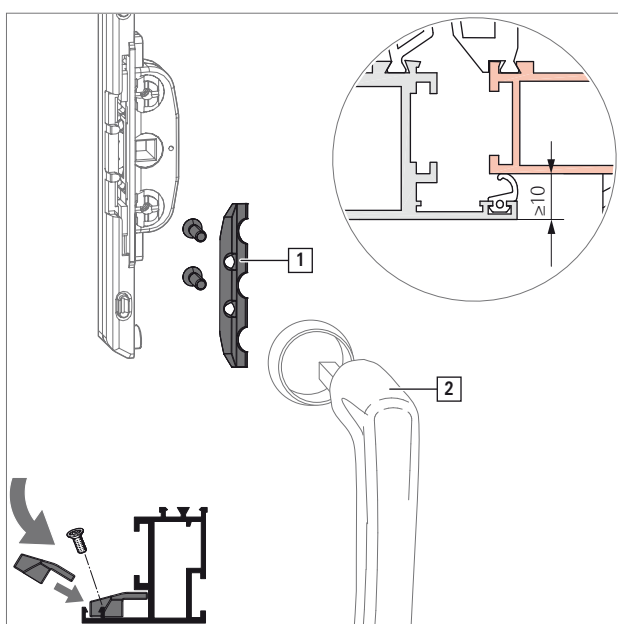


Dimensioning of the FM-SuN espagnolette coupling points (on connecting rods), unless otherwise specified.



Installing the T connector

When using the centre lock, break the lower horizontal T connector in the centre and insert it from above or below.



Installing the mounting plate

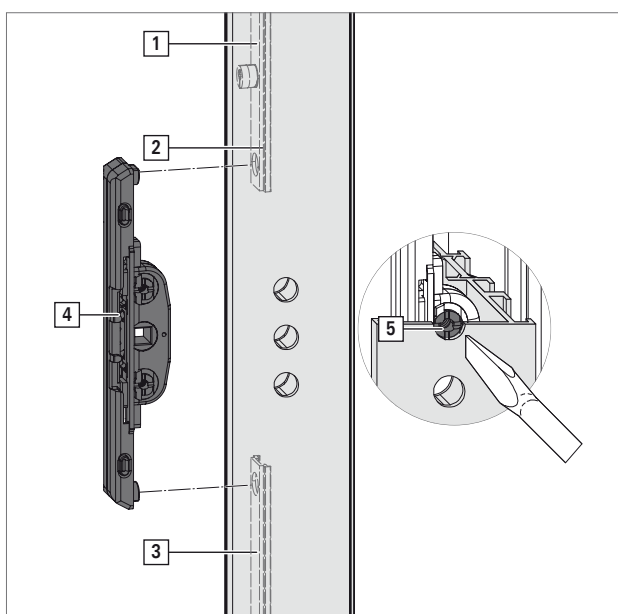
Swing the mounting plate [1] for installing the handle without escutcheon [2] into the profile as shown here.



NOTE!

The handle without escutcheon can only be used on profile systems with an overlap height of ≥ 10 mm.

Tool: hex key size 2.5



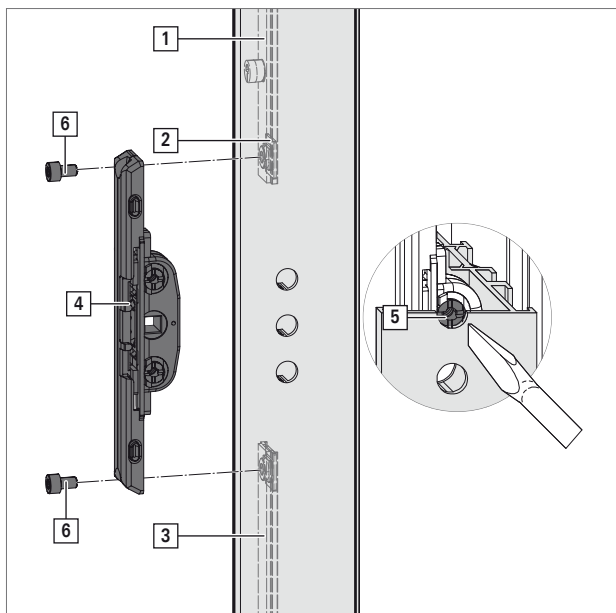
Installing the flush-encased gearbox

1. Insert connecting rod CR2 [1] and the SEC connector [2] into the connecting rod groove from above on the locking side.
2. Insert connecting rod CR1 [3] and the SEC connector into the connecting rod groove from below on the locking side.
3. Place the flush-encased gearbox [4] in the delivery state in the routing provided as shown.



NOTE!

Turning the clampable lugs after installing the espagnolette ensures that it is seated so that it can be transported safely.



Installing the SEC flush-encased gearbox

1. Insert connecting rod CR2 [1] and the SEC connector [2] into the connecting rod groove from above on the locking side.
2. Insert connecting rod CR1 [3] and the SEC connector into the connecting rod groove from below on the locking side.
3. Place the SEC flush-encased gearbox [4] in the delivery state in the routing provided as shown.



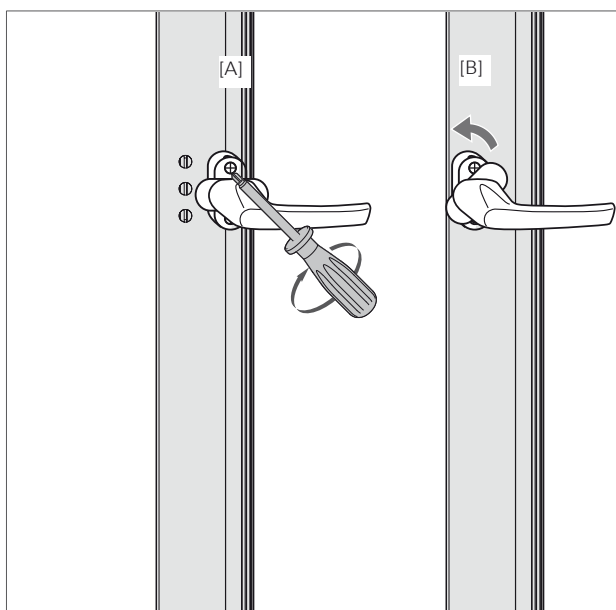
NOTE!

Turning the clampable lugs [5] after installing the espagnolette ensures that it is seated so that it can be transported safely.

4. Screw down the SEC flush-encased gearbox onto connecting rods CR1 and CR2 using screws [6] on the SEC connectors.

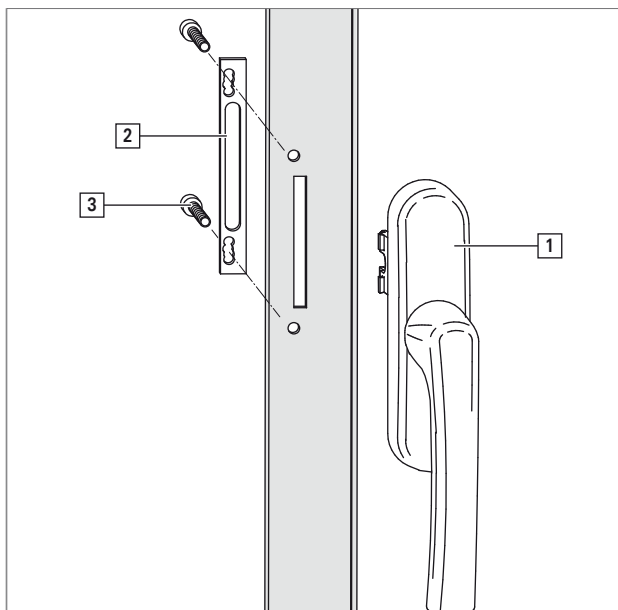
Tool: T 25 hex key

Torque: >2.5 Nm



Installing the Roto Line handle

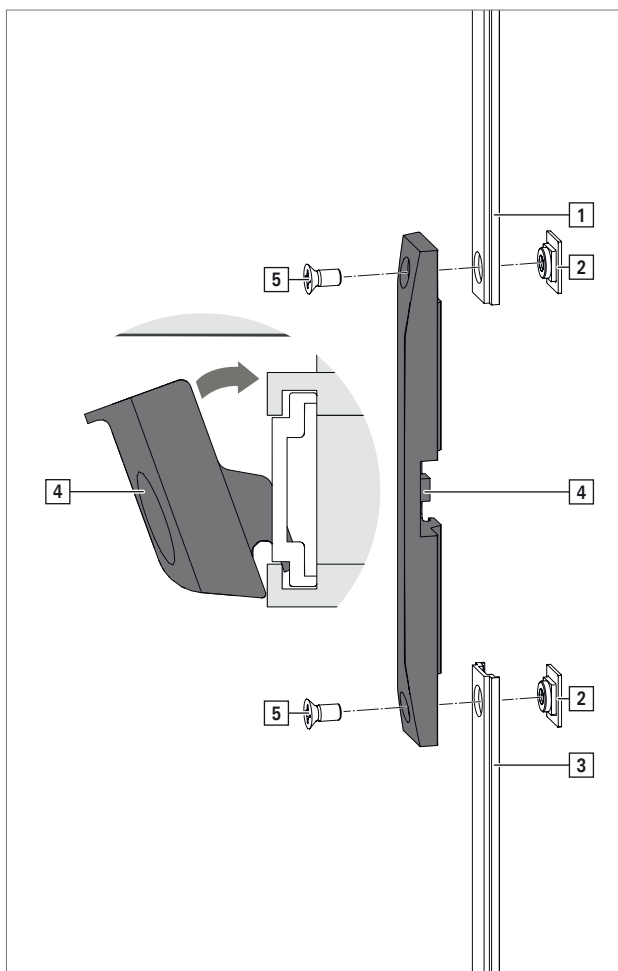
1. Bring the handle lever into the turn position.
2. Turn the escutcheon cover on the window handle 90°.
3. Insert the handle and screw down with 2 screws [A]. Overcome the resistance of the transport safety device while doing so.
Tool: cross-headed screw
4. Turn the escutcheon cover back 90° [B].



Installing the geared-handle

Install the geared-handle [1] and espagnolette support [2] using two screws with threadlocker [3].

Tool: T 25 hex key



Installing the geared-handle, lockable, with SEC espagnolette protection

1. Install the geared-handle, lockable, and espagnolette support.



NOTE!

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

2. Insert connecting rod CR2 [1] and the SEC connector [2] into the connecting rod groove from above on the locking side.
3. Insert connecting rod CR1 [3] and the SEC connector into the connecting rod groove from below on the locking side.
4. Swing the SEC espagnolette protection [4] into the connecting rod groove on the locking side.
5. Screw down the SEC espagnolette protection onto connecting rods CR1 and CR2 using screws [5] on the SEC connectors.

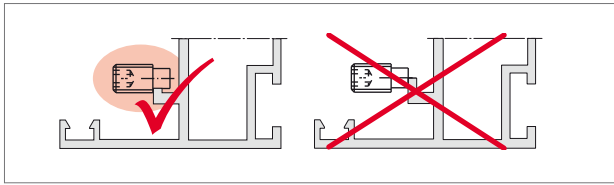
Tool: T 25 hex key

Torque: > 2.5 Nm



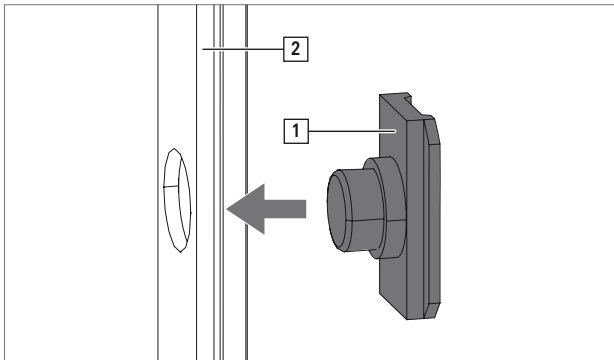
NOTE!

Dismantling is performed in reverse order.



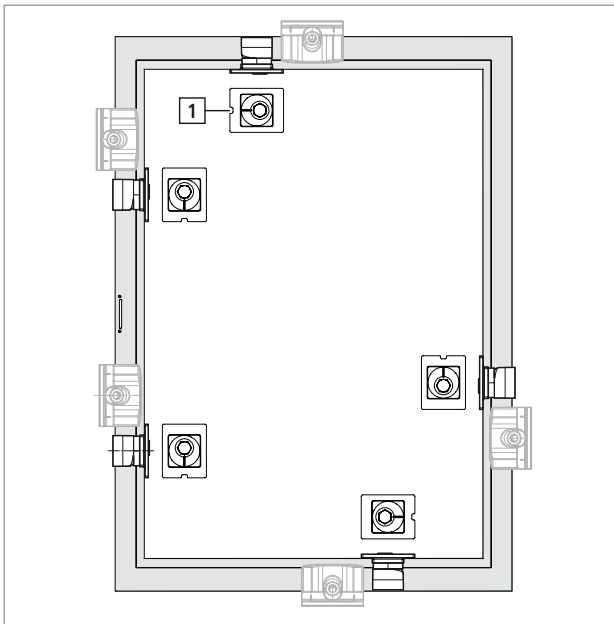
Tightening the piercing screws

Tighten all piercing screws as shown in the figure.



Installing the connector bolt, insertable

1. Connect the connector bolt, insertable [1], to the connecting rod [2].



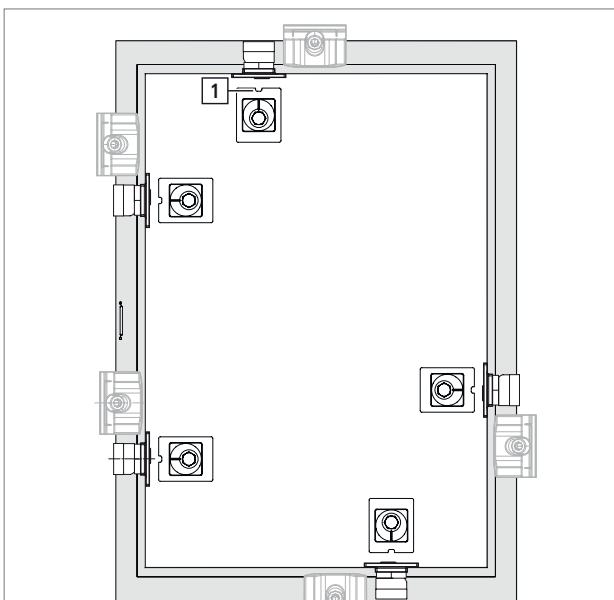
Installing the insertable cam

1. Install the insertable cam as shown.



NOTE!

Ensure that the cam is correctly aligned (recess [1] facing away from the striker position) during installation.



Installing the insertable cam – ECC-groove

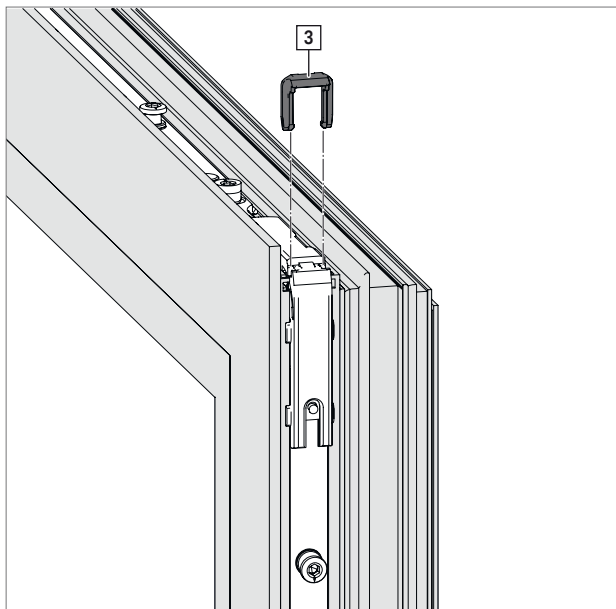
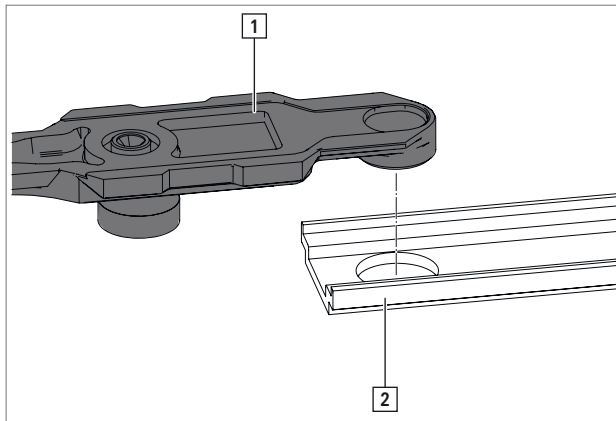
1. Install the insertable cam as shown.



NOTE!

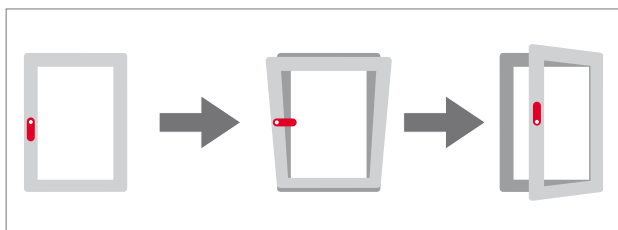
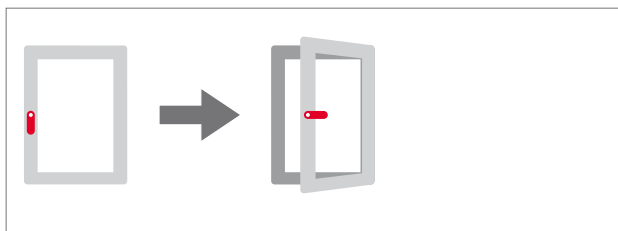
Ensure that the cam is correctly aligned (recess [1] facing towards the striker position) during installation.

ECC-groove width ≥ 11 mm, depth ≥ 0.5 mm
Fasten a support under the insertable cam.



Installing the corner drive

1. Connect the corner drive [1] to the connecting rod [2] and additional components at the coupling point.
2. Insert everything jointly into the connecting rod groove.
3. Secure the corner drive to the sash using the retaining fork [3].



Installing standard strikers

Determine the correct striker position (in relation to the position of the insertable cam):

The striker and insertable cam must be spaced 3_{-1} mm apart (after operating sequence: closed position then turned, open position)

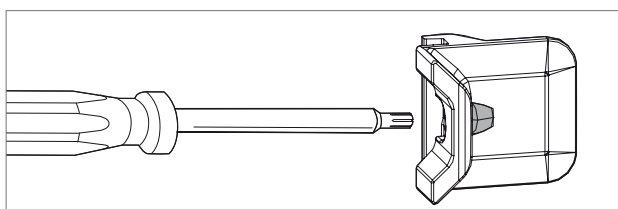
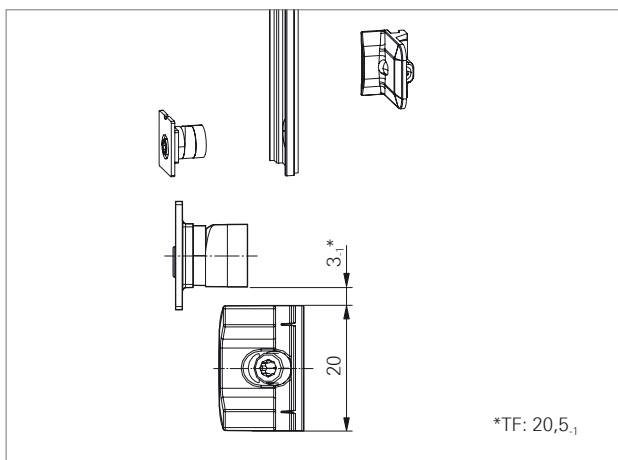
Exception: TF: 20.5_{-1} mm (after operating sequence: closed position then tilted, open position then turned, open position)

The security locking points must not collide with the standard locking points.



Note!

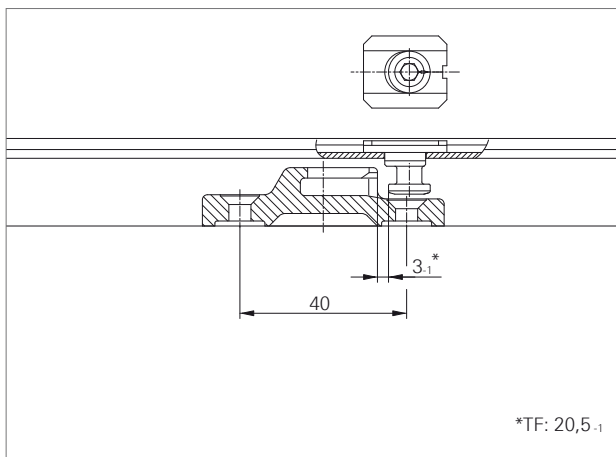
Check all installation dimensions during sample testing prior to series production.



Screw down the striker using the threaded pin and check that it is securely fitted.

Tool: T 10 hex key

Torque: 2–2.5 Nm



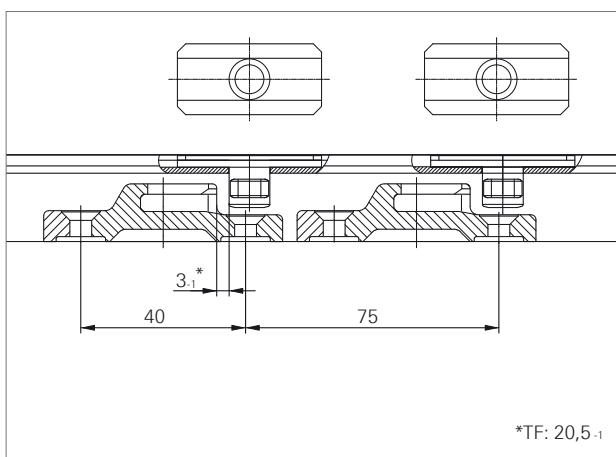
Installing security strikers RC2



Note!

The dimensioning of the security strikers in the installation drawings (** dimensions) is for approximate positioning only. It must be ensured that the strikers are securely fitted (in accordance with RC classification) for compatible RC hardware.

The support / fastening must be ensured on site.



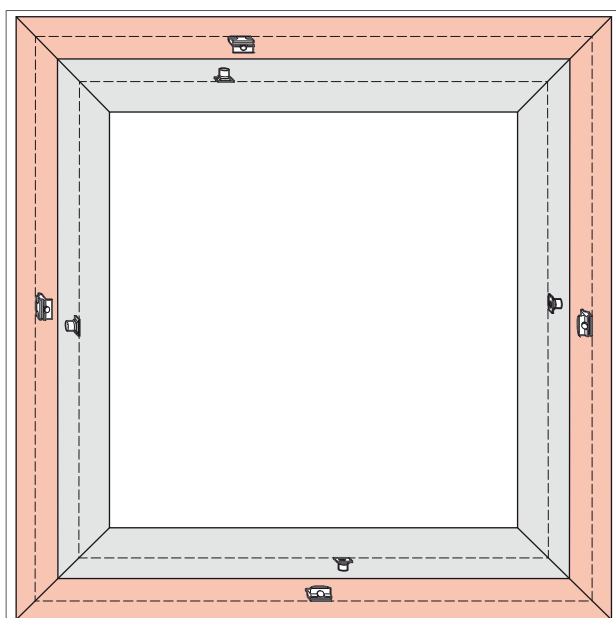
Installing security strikers RC3



Note!

The dimensioning of the security strikers in the installation drawings (** dimensions) is for approximate positioning only. It must be ensured that the strikers are securely fitted (in accordance with RC classification) for compatible RC hardware.

The support / fastening must be ensured on site.



Installing centre locks

Place centre locks horizontally and vertically from SW or SH > 1300 mm.

Depending on the profile stability and leaktightness requirements, the centre locks may have to be positioned at smaller sash widths or lower sash heights.



Note!

From 0.5 kN/m² wind load or SH > 1800 mm or > 2400 mm, place additional centre locks on the hinge side and locking side.



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Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

SW SH	390 – 500*	501 – 735*	736 – 1300*	1301 – 1600*
	Pc(s) Description 1 T&T locking components V.01 728804 T&T locking components V.02 728805 1 Corner drive CL set V.01 728842 Corner drive CL set V.02 728843 1 Espagnolette and connector var. 1 Pivot rest var. 1 Corner hinge var. 1 Connecting rod CR4 var. 1 Sash stay 390 var. 1 Tilt distance restrictor SH < 800 639346	Pc(s) Description 1 T&T locking components V.01 728804 T&T locking components V.02 728805 1 Corner drive CL set V.01 728842 Corner drive CL set V.02 728843 1 Espagnolette and connector var. 1 Pivot rest var. 1 Corner hinge var. 1 Connecting rod CR4 var. 1 Sash stay 500 var. 1 Scissor stay guide 500 740836 1 Tilt distance restrictor SH < 800 639346	Pc(s) Description 1 T&T locking components V.01 728804 T&T locking components V.02 728805 1 Corner drive CL set V.01 728842 Corner drive CL set V.02 728843 1 Espagnolette and connector var. 1 Pivot rest var. 1 Corner hinge var. 1 Connecting rod CR4 var. 1 Sash stay 735 var. 1 Scissor stay guide 735 740838 1 Tilt distance restrictor SH < 800 SW > 1200 639346 1 Turn restrictor set V.01 SH > 1200 740814 Turn restrictor set V.02 SH > 1200 740835	Pc(s) Description 1 T&T locking components V.01 728804 T&T locking components V.02 728805 1 Corner drive CL set V.01 728842 Corner drive CL set V.02 728843 1 Espagnolette and connector var. 1 Pivot rest var. 1 Corner hinge var. 1 Connecting rod CR4 var. 1 Sash stay 735 var. 1 Scissor stay guide 735 740838 1 Turn restrictor set V.01 SH > 1200 740814 Turn restrictor set V.02 SH > 1200 740835 1 Connecting rod CR5.2 729979 1 Additional stay arm V.01 728806 Additional stay arm V.02 728807 2 Cam, insertable 334671 2 Striker V.01 728918 Striker V.02 728920
555 – 1300				
1301 – 1800		Pc(s) Description 1 Cam, insertable 334671 1 Striker V.01 728918 Striker V.02 728920		
1801 – 2400		Pc(s) Description 2 Cam, insertable 334671 2 Striker V.01 728918 Striker V.02 728920		
2401 – 2700		Pc(s) Description 2 Cam, insertable 334671 2 Striker V.01 728918 Striker V.02 728920		

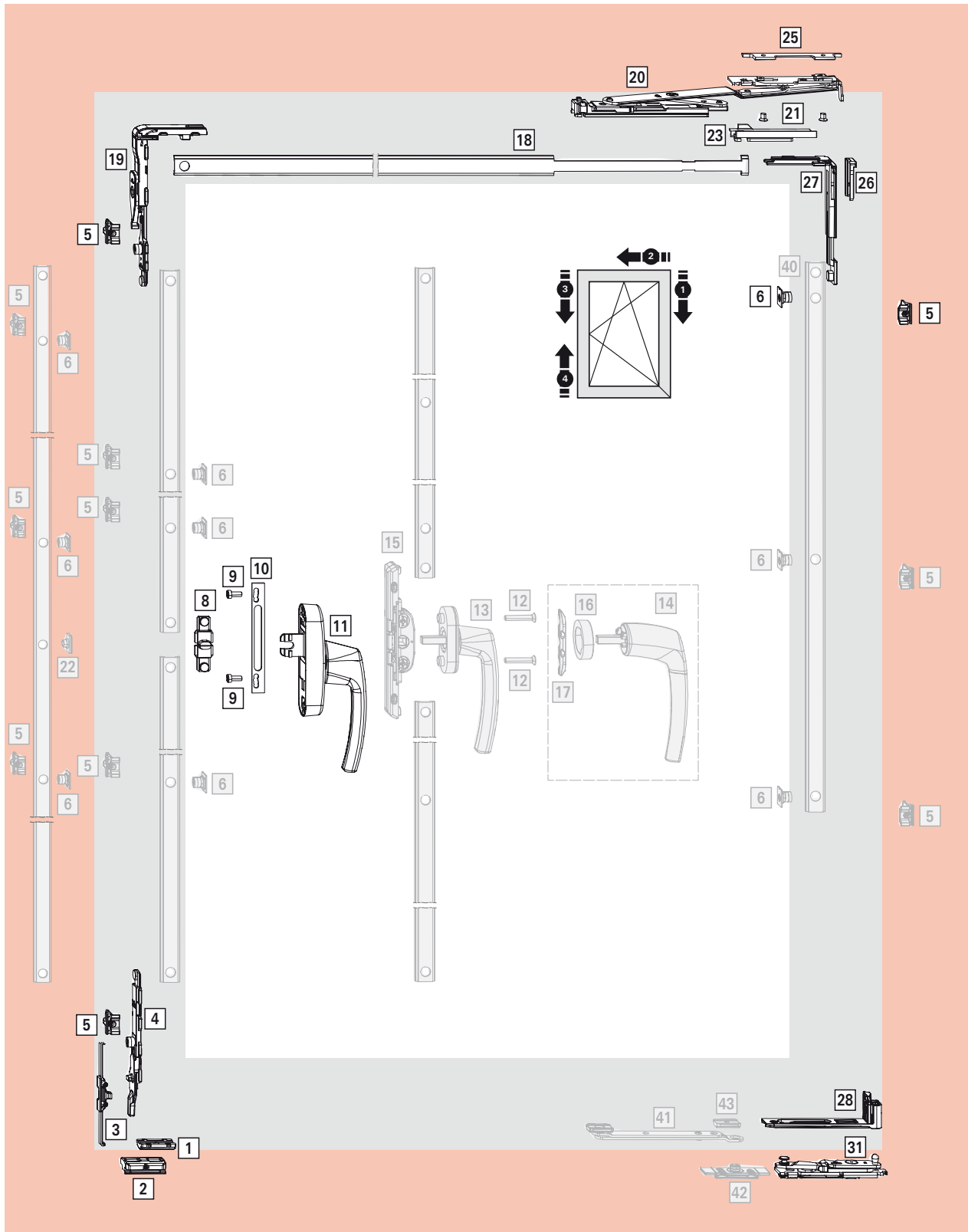
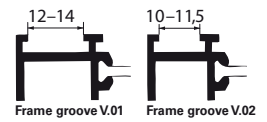
* ATTENTION! Refer to the corresponding application diagram for the use of size-dependent additional components.



Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

SW SH	390-500	501-735	736-1300*	1301-1600*
555-1300				
1301-1800				
1801-2400				
2401-2700				

* ATTENTION! Refer to the corresponding application diagram for the use of size-dependent additional components.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 390–500 mm

Sash height **SH** 555–2400 mm

Sash weight **S.kg** max. 80 kg

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components V.01	10	728804
		T&T locking components V.02	10	728805
		consisting of:		
[1]	1	Run-up block		
[4]	1	Tilt lock bolt		
[2]	1	Tilt striker		
[3]	1	Anti-jemmy device V.01/V.02		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ²⁾		
	1	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Sash stay 390 no. 1	L	10	740851
			R	10	740852
		Sash stay 390 no. 3	L	10	740853
			R	10	740854
		Sash stay 390 no. 4	L	10	740855
			R	10	740856
		consisting of:			
[18]	1	Coupling rod			
[23]	1	Scissor stay inclusion			
[20]	1	Sash stay 390			
[25]	1	Clamp strip			
[21]	2	Countersunk-head screw M5x6.4			

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5 x 12		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-5	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-5	Cam, insertable	100	334671
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
		CR4.1 SH 1301–1800 /		
		CR5.2 SW 1301–1600 AL (not shown)	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
	1	Turn restrictor set V.01	10	740814
		Turn restrictor set V.02	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
	1	Tilt distance restrictor ⁴⁾ (not shown)	10	502834

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
[22]	1	Connector bolt, insertable	100	254601
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5 x 12	100	728925
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ³⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[14]	1	Handle without escutcheon ¹⁾		→ CTL 1
[16]	1	Ring for handle without escutcheon		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ⁴⁾	10	378338

¹⁾ The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

²⁾ Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

³⁾ For the flush-encased gearbox with blocking device, see page 237.

⁴⁾ Tilt distance restrictor can be used from SH < 800 mm.

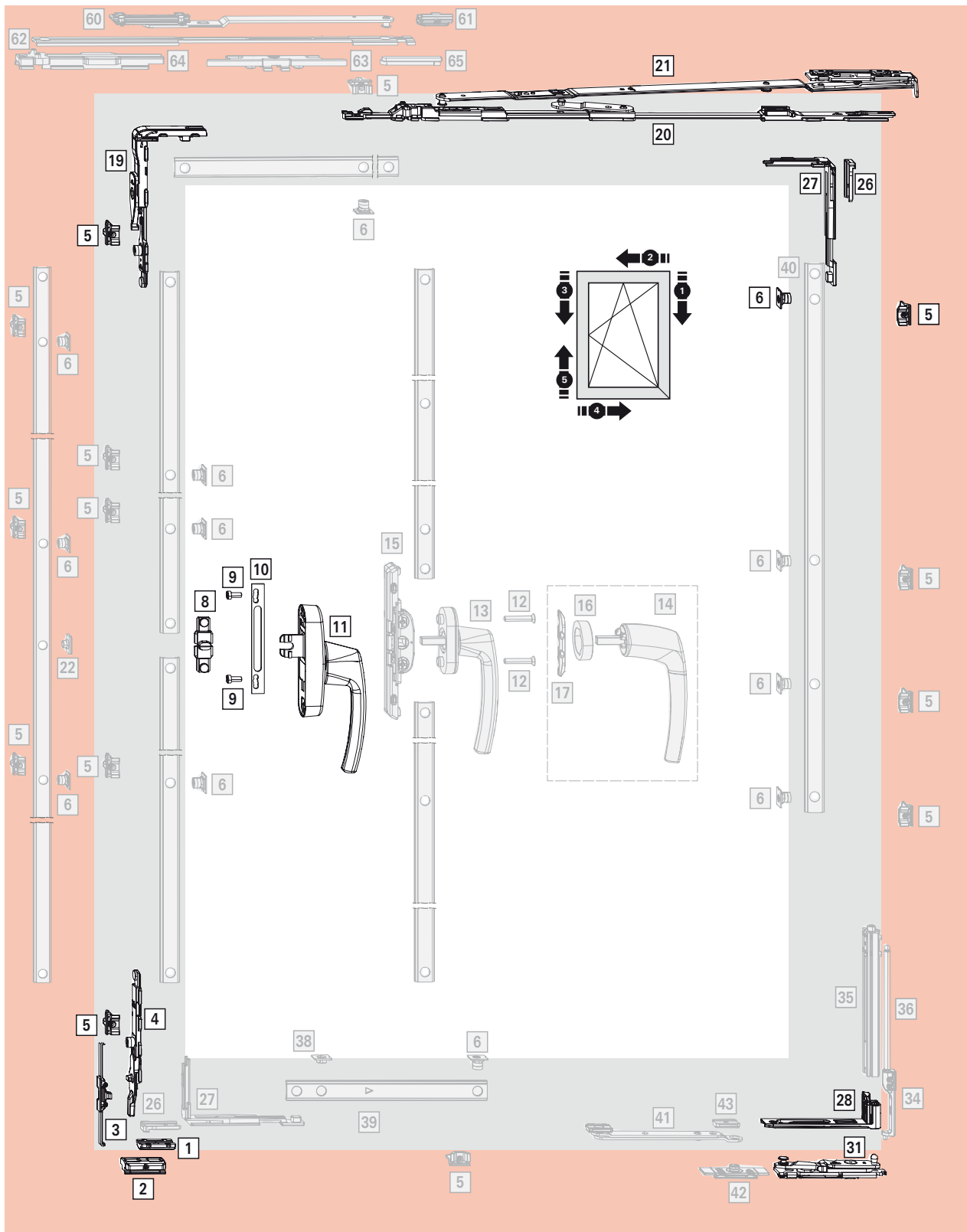


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from

Roto sales representatives.



Subject to change.



Application range

Sash width **SW**500–1600 mm ⁴⁾

Sash height **SH**555–2700 mm ⁹⁾

Sash weight **S.kg** max. 100/150 kg ¹⁾

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components V.01	10	728804
		T&T locking components V.02	10	728805
		consisting of:		
[1]	1	Run-up block		
[4]	1	Tilt lock bolt		
[2]	1	Tilt striker		
[3]	1	Anti-jemmy device V.01/V.02		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	1	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735 ⁶⁾		10	740838
		Scissor stay guide 500 ⁵⁾		10	740836
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5 x 12		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-5	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-5	Cam, insertable	100	334671
	1	Additional stay arm V.01 ⁴⁾	10	728806
		Additional stay arm V.02 ⁴⁾	10	728807
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		
[38]	1	Roto Clip	100	331288
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
		CR4.1 SH 1301–1800 /		
		CR5.2 SW 1301–1600 AL (not shown)	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
		CR4.3 SH 2401–2700 AL	10	729981
[39]	1	CR4.1 SH 1301–1800 /	10	729979
		CR5.2 SW 1301–1600 AL		
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		
	1	Tilt distance restrictor ⁹⁾ (not shown)	10	502834

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
[22]	1	Connector bolt, insertable ¹⁰⁾	100	254601
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5 x 12	100	728925
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ⁸⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5 x 30	100	212501
[14]	1	Handle without escutcheon ²⁾		→ CTL 1
[24]	1	Ring for handle without escutcheon		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ⁸⁾	10	378338

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

4) An additional stay arm is mandatory from SW > 1300 mm.

5) Sash stay 500 can be used up to max. SW 735 mm.

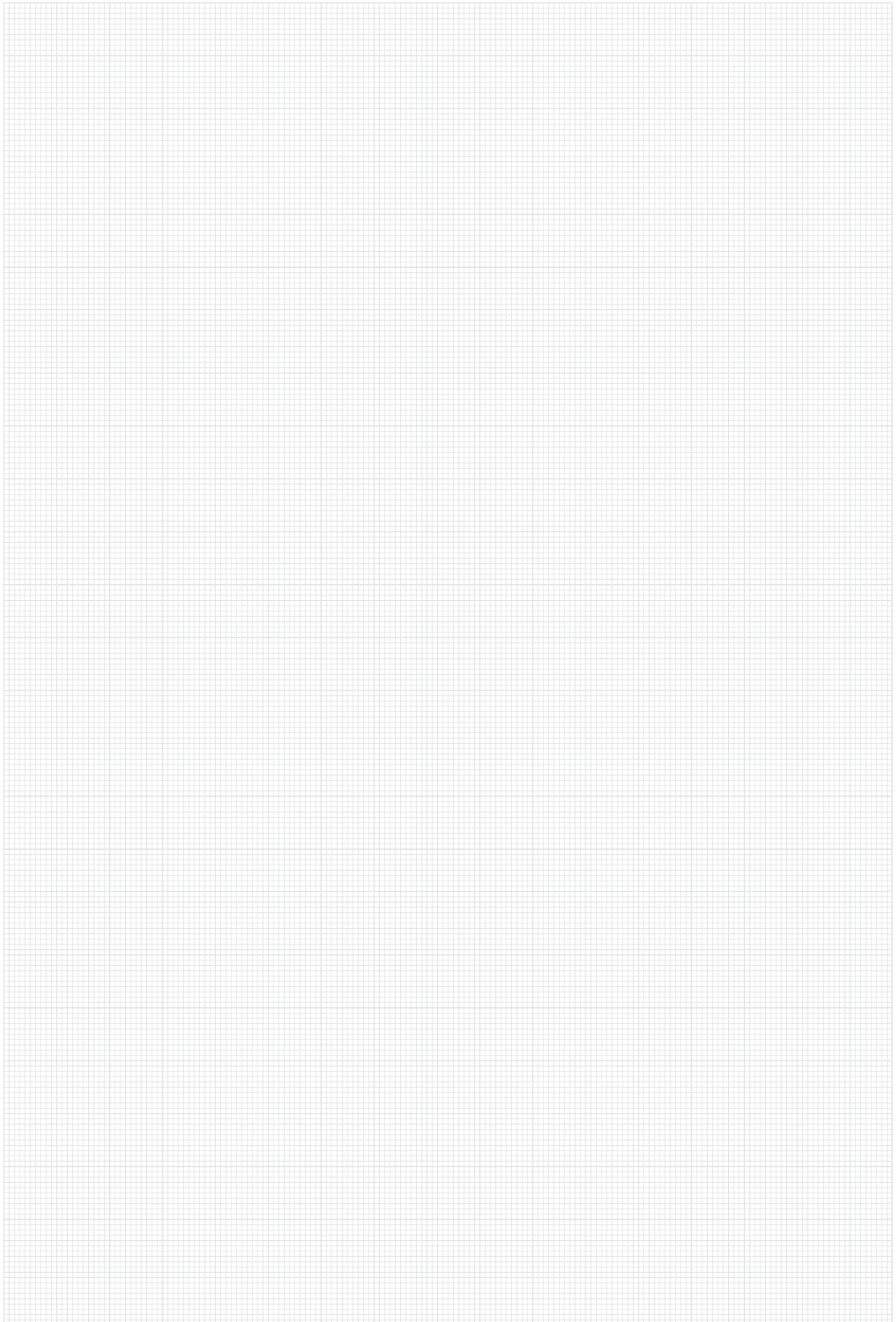
6) Sash stay 735 can be used from SW > 735 mm.

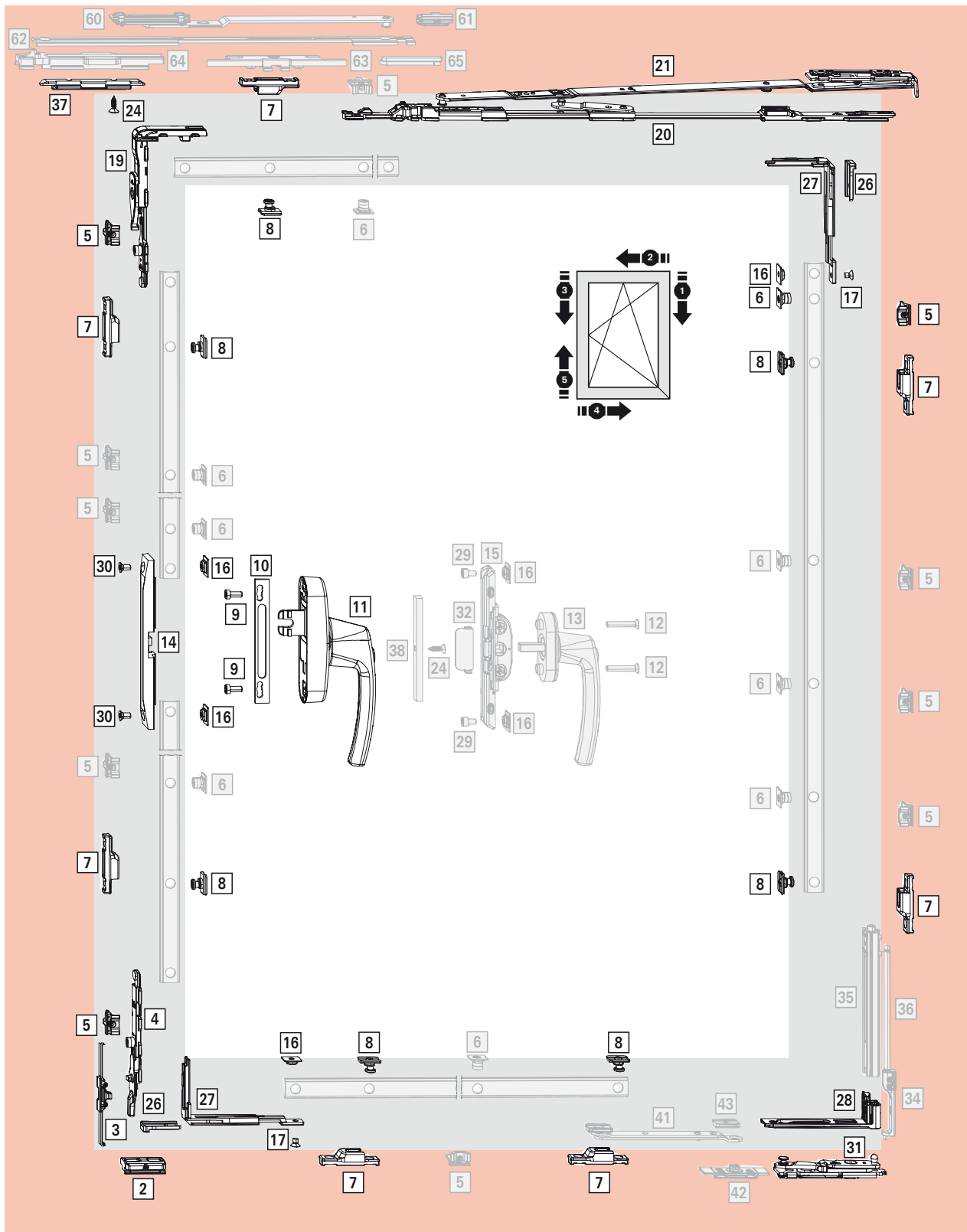
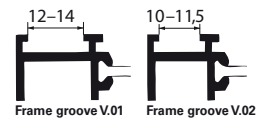
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the flush-encased gearbox with blocking device, see page 237.

9) Tilt distance restrictor can be used from SH < 800 mm.

10) The connector bolt, insertable, can be used with SW ≤ 1300 mm.





Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 625–1600 mm ⁴⁾Sash height **SH** 720–2700 mm ⁹⁾Sash weight **S.kg** max. 100/150 kg ¹⁾Rebate clearance **RC** 11.5–12 mmOverlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components V.01	10	728804
		T&T locking components V.02	10	728805
		consisting of:		
	1	Run-up block (not used)		
[4]	1	Tilt lock bolt		
[2]	1	Tilt striker		
[3]	1	Anti-jemmy device V.01/V.02		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	1	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	7	SEC cam, insertable	100	447245
[7]	7	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	2	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735 ⁶⁾		10	740838
		Scissor stay guide 500 ⁵⁾		10	740836
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956



NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671
	1	Additional stay arm V.01 ⁴⁾	10	728806
		Additional stay arm V.02 ⁴⁾	10	728807
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
	1	Tilt distance restrictor ⁹⁾ (not shown)	10	502834

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8 x 16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

4) An additional stay arm is mandatory from SW > 1300 mm.

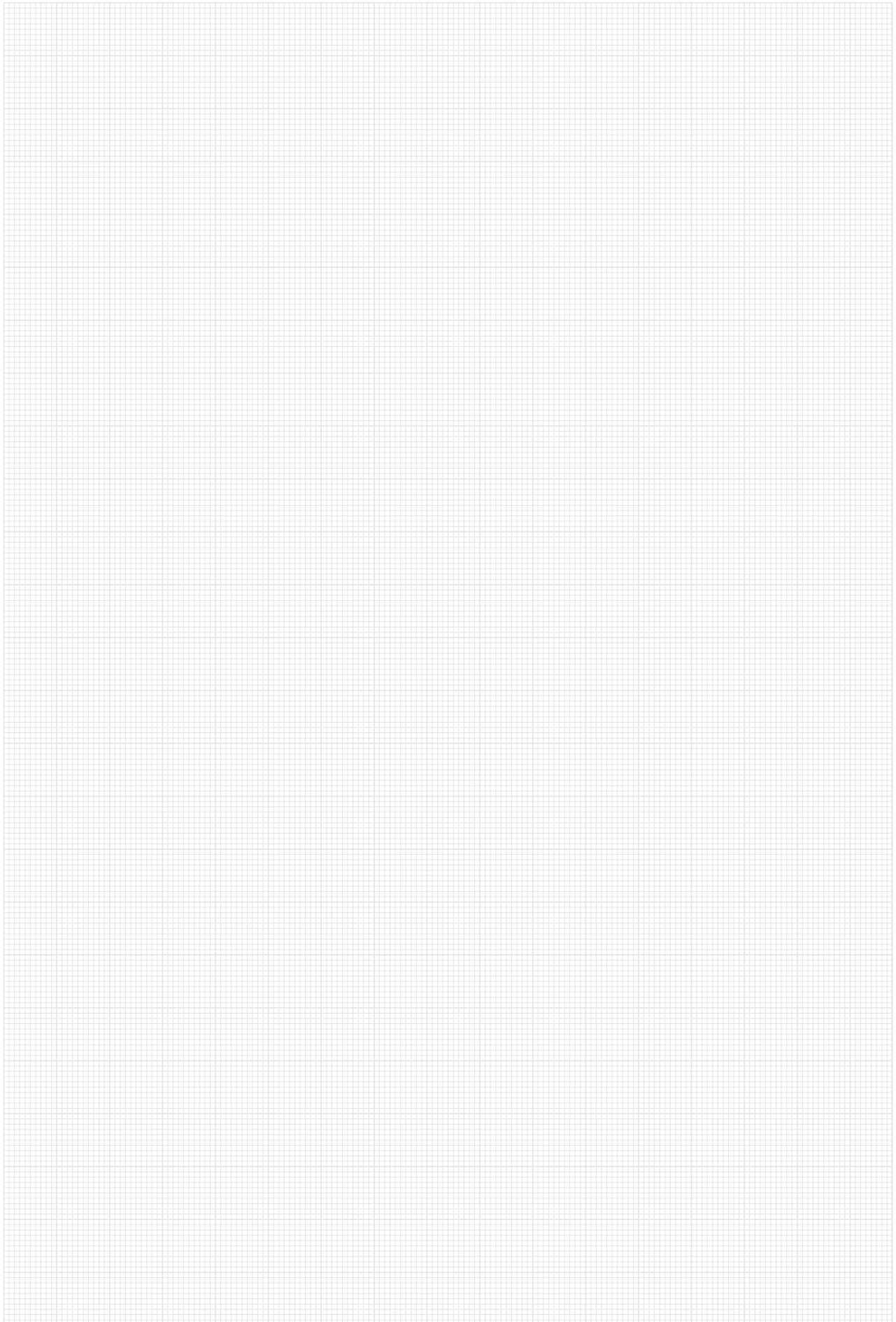
5) Sash stay 500 can be used up to max. SW 900 mm.

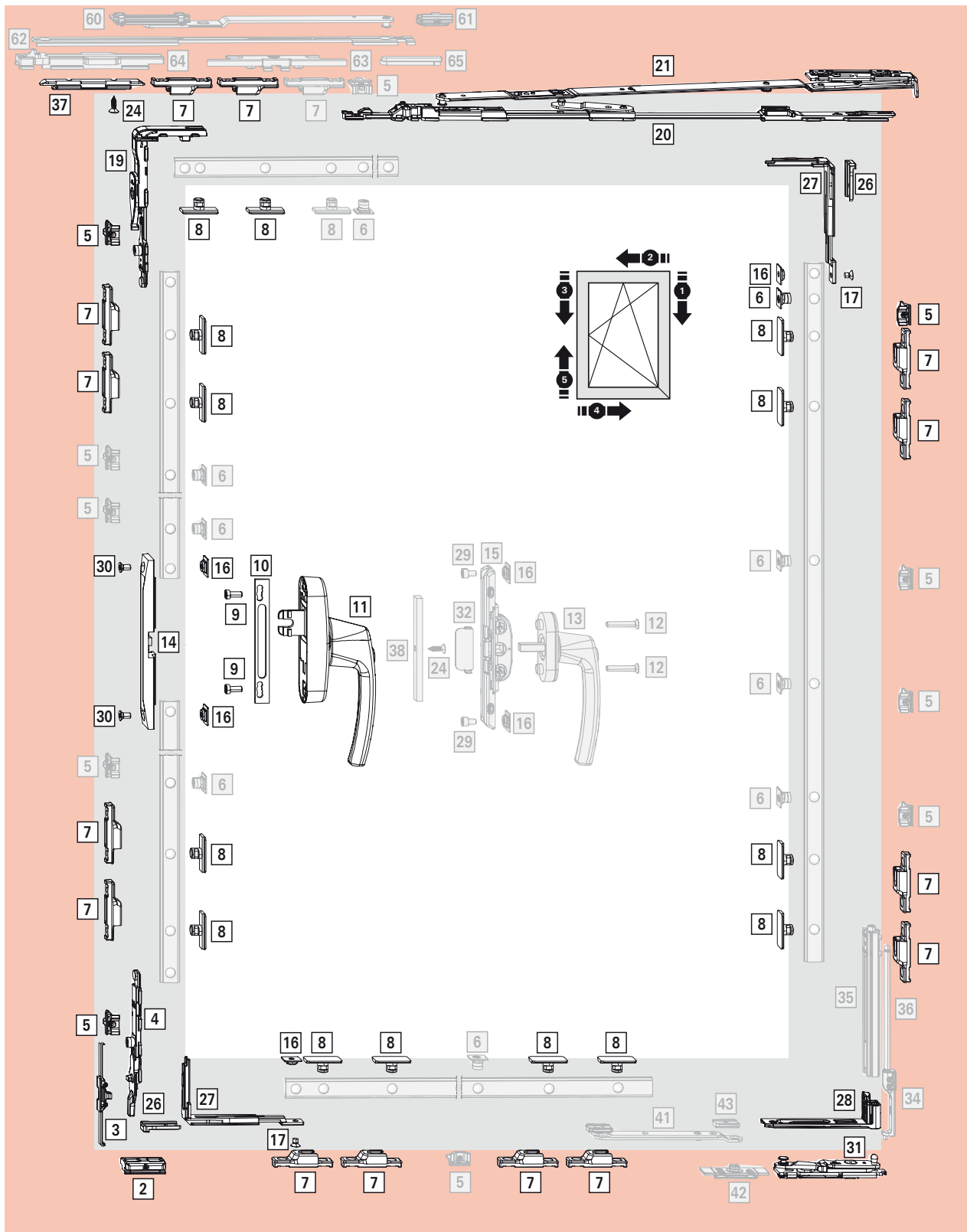
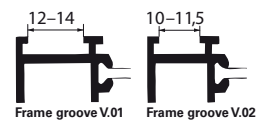
6) Sash stay 735 can be used from SW ≥ 800 mm.

7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the SEC flush-encased gearbox with blocking device, see page 237.

9) Tilt distance restrictor can be used from SH < 800 mm.





Grey components (optional) are not included in the basic set.



Application range

Sash width **SW**700–1600 mm ⁴⁾

Sash height **SH**870–2700 mm ⁹⁾

Sash weight **S.kg**max. 100/150 kg ¹⁾

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components V.01	10	728804
		T&T locking components V.02	10	728805
		consisting of:		
	1	Run-up block (not used)		
[4]	1	Tilt lock bolt		
[2]	1	Tilt striker		
[3]	1	Anti-jemmy device V.01/V.02		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	1	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	14	SEC cam RC3, insertable	100	443530
[7]	14	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	2	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735 ⁶⁾		10	740838
		Scissor stay guide 500 ⁵⁾		10	740836
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956



NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671
	1	Additional stay arm V.01 ⁴⁾	10	728806
		Additional stay arm V.02 ⁴⁾	10	728807
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
[8]	1	SEC cam RC3, insertable	100	443530
[7]	1	SEC striker V.01	100	212637
		SEC striker V.02	100	212638

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8 x 16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

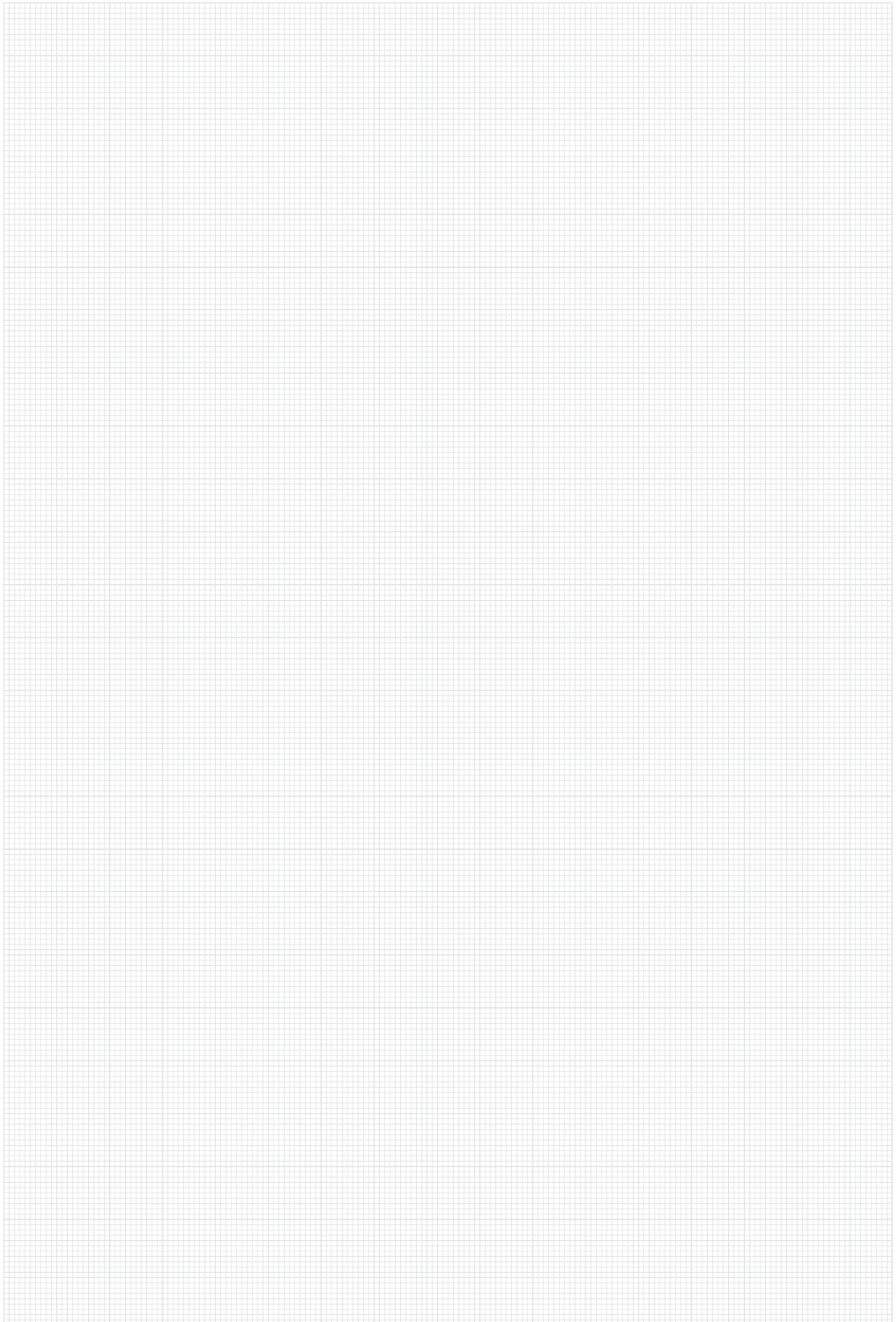
4) An additional stay arm is mandatory from SW > 1300 mm.

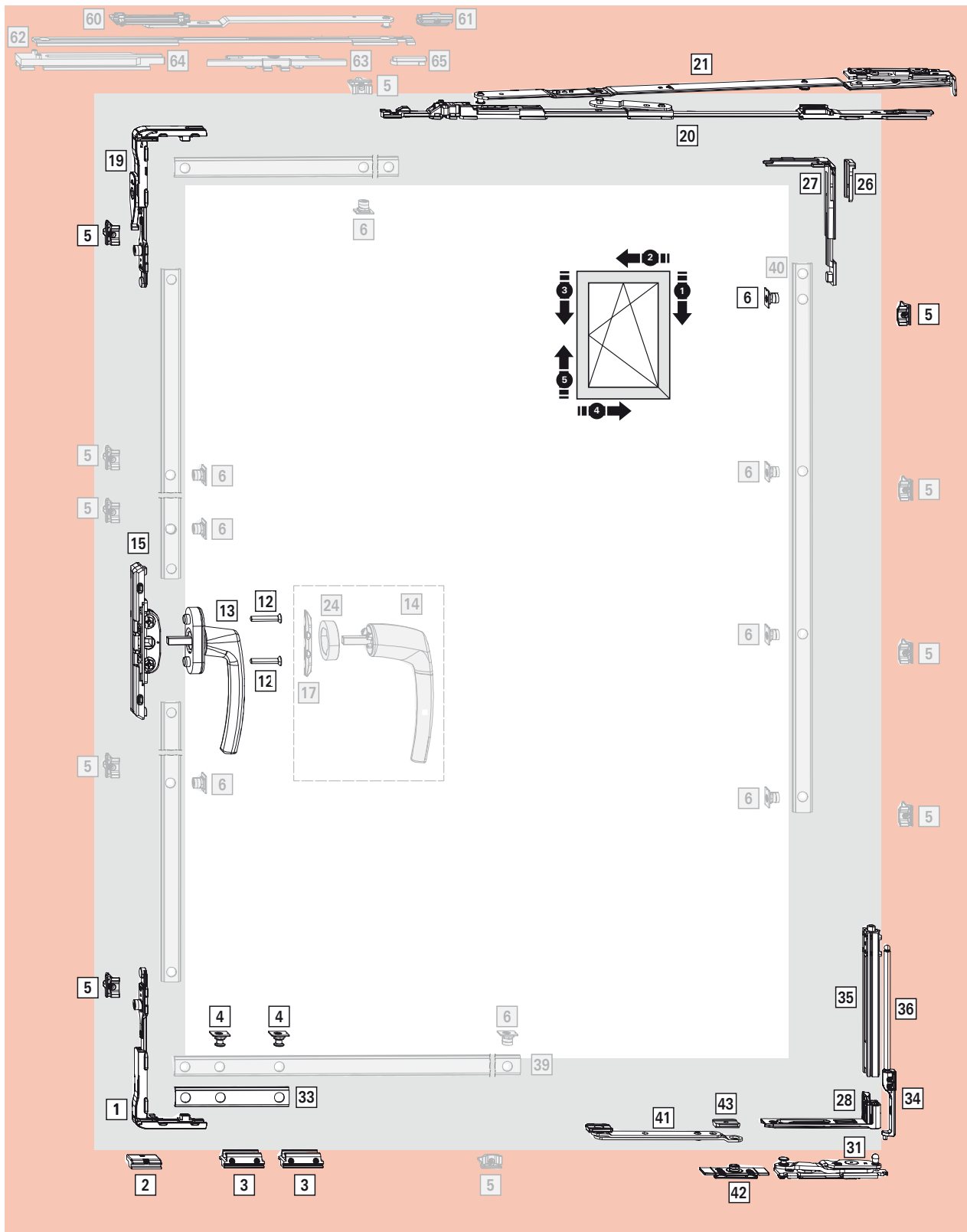
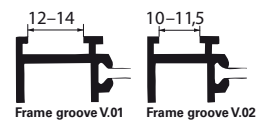
5) Sash stay 500 can be used up to max. SW 900 mm.

6) Sash stay 735 can be used from SW ≥ 875 mm.

7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the SEC flush-encased gearbox with blocking device, see page 237.





Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 735–1600 mm ³⁾Sash height **SH** 1000–3000 mmSash weight **S.kg** 150–180 kgRebate clearance **RC** 11.5–12 mmOverlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components 180 kg V.01	10	769016
		T&T locking components 180 kg V.02	10	769017
		consisting of:		
[1]	1	Corner drive without MD		
[2]	1	Run-up wedge V.01/V.02		
[3]	2	TF tilt striker		
[4]	2	TF tilt lock bolt		
[33]	1	ECC connecting rod L170		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ²⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg	L	10	641334
		incl. adjustment piece	R	10	641297
[31]	1	Pivot rest 180 kg no. 1	L	10	641328
			R	10	641327
		Pivot rest 180 kg no. 3	L	10	641326
			R	10	641325
		Pivot rest 180 kg no. 4	L	10	641330
			R	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ⁴⁾		10	740814
		Turn restrictor set V.02 ⁴⁾		10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L	10	641318
			R	10	641317
		Sash stay 735 180 kg no. 3	L	10	641320
			R	10	641319
		Sash stay 735 180 kg no. 4	L	10	641322
			R	10	641321



NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ⁵⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-7	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-7	Cam, insertable	100	334671
	1	Additional stay arm V.01 180 kg ³⁾	10	738559
		Additional stay arm V.02 180 kg ³⁾	10	738560
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
		CR4.1 SH 1301–1800 /		
		CR5.2 SW 1301–1600 AL (not shown)	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
		CR4.3 SH 2401–2700 AL	10	729981
[39]	1	CR5.3 T&T SW 1301–1600 AL	10	769015

Alternative espagnolettes and connectors

[14]	1	Handle without escutcheon ¹⁾		→ CTL 1
[24]	1	Ring for handle without escutcheon		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ⁵⁾	10	378338



WARNING!

Sash fall due to insufficient profile stability.

Insufficient profile stability may cause the sash to fall.

The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

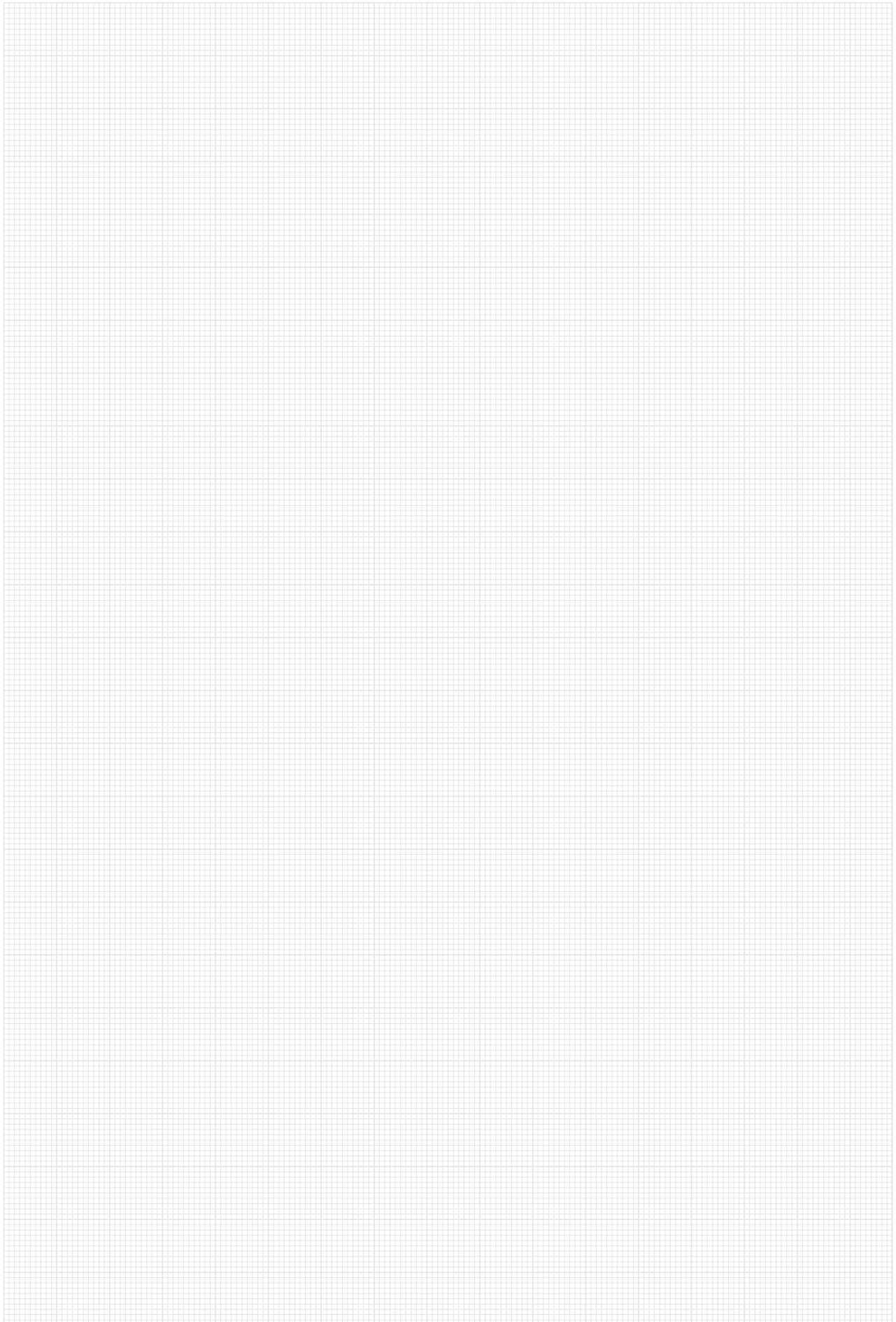
1) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

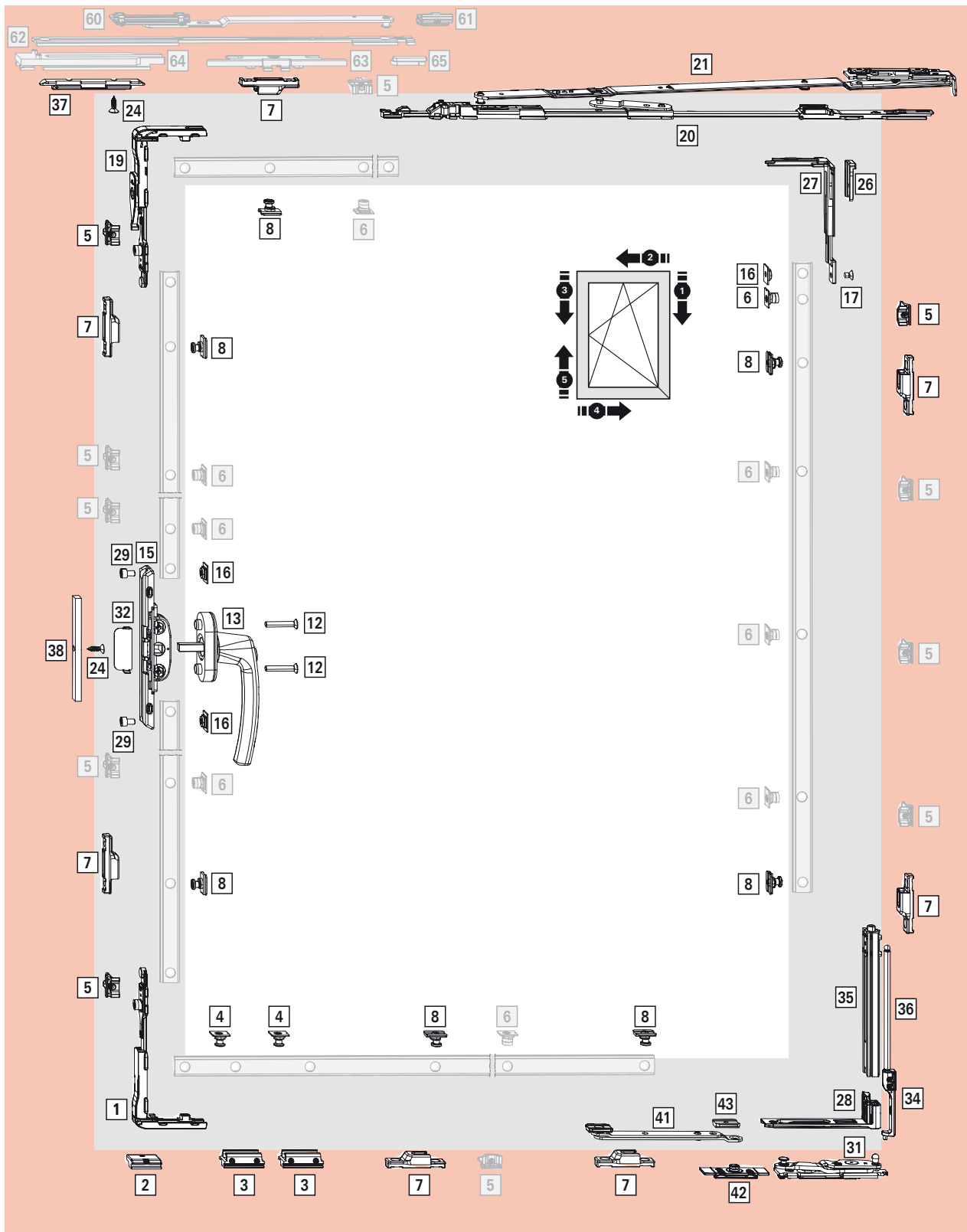
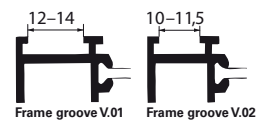
2) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

3) An additional stay arm is mandatory from SW > 1300 mm.

4) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

5) For the flush-encased gearbox with blocking device, see page 237.





Grey components (optional) are not included in the basic set.


Application range

Sash width **SW**800–1600 mm ²⁾

Sash height **SH** 1000–3000 mm

Sash weight **S.kg** 150–180 kg

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets
Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components 180 kg V.01	10	769016
		T&T locking components 180 kg V.02	10	769017
		consisting of:		
[1]	1	Corner drive without MD		
[2]	1	Run-up wedge V.01/V.02		
[3]	2	TF tilt striker		
[4]	2	TF tilt lock bolt		
	1	ECC connecting rod L170 (not used)		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ¹⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	7	SEC cam, insertable	100	447245
[7]	7	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg	L	10	641334
		incl. adjustment piece	R	10	641297
[31]	1	Pivot rest 180 kg no. 1	L	10	641328
			R	10	641327
		Pivot rest 180 kg no. 3	L	10	641326
			R	10	641325
		Pivot rest 180 kg no. 4	L	10	641330
			R	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ³⁾		10	740814
		Turn restrictor set V.02 ³⁾		10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L	10	641318
			R	10	641317
		Sash stay 735 180 kg no. 3	L	10	641320
			R	10	641319
		Sash stay 735 180 kg no. 4	L	10	641322
			R	10	641321


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[32]	1	SEC anti-drilling protection	10	487406
[38]	1	SEC rebate-clearance reduction flush-encased gearbox	50	334360
[24]	1	Countersunk tapping screw ST4.8x16	100	728933
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁴⁾		
[16]	2	SEC connector		
[29]	2	Cylinder-head screw M5x8		

Optional
Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671
	1	Additional stay arm V.01 180 kg ²⁾	10	738559
		Additional stay arm V.02 180 kg ²⁾	10	738560
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		


WARNING!

Sash fall due to insufficient profile stability. Insufficient profile stability may cause the sash to fall.

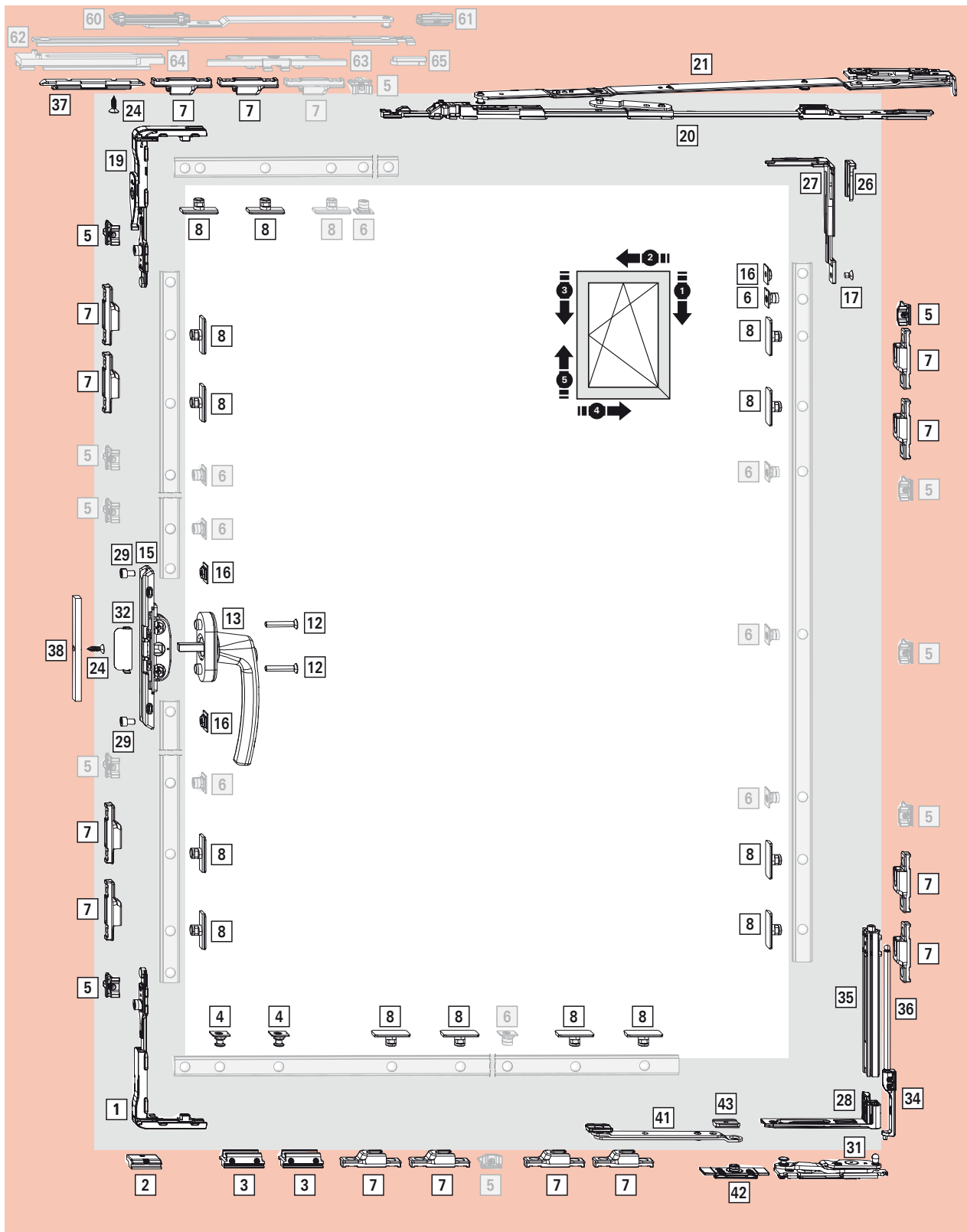
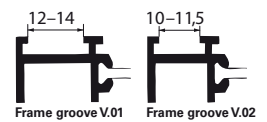
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

¹⁾ Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

²⁾ An additional stay arm is mandatory from SW > 1300 mm.

³⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

⁴⁾ For the SEC flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW**915–1600 mm ²⁾
 Sash height **SH** 1000–3000 mm
 Sash weight **S.kg** 150–180 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	T&T locking components 180 kg V.01	10	769016
		T&T locking components 180 kg V.02	10	769017
		consisting of:		
[1]	1	Corner drive without MD		
[2]	1	Run-up wedge V.01/V.02		
[3]	2	TF tilt striker		
[4]	2	TF tilt lock bolt		
	1	ECC connecting rod L170 (not used)		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ¹⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	14	SEC cam RC3, insertable	100	443530
[7]	14	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg	L	10	641334
		incl. adjustment piece	R	10	641297
[31]	1	Pivot rest 180 kg no. 1	L	10	641328
			R	10	641327
		Pivot rest 180 kg no. 3	L	10	641326
			R	10	641325
		Pivot rest 180 kg no. 4	L	10	641330
			R	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ³⁾		10	740814
		Turn restrictor set V.02 ³⁾		10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L	10	641318
			R	10	641317
		Sash stay 735 180 kg no. 3	L	10	641320
			R	10	641319
		Sash stay 735 180 kg no. 4	L	10	641322
			R	10	641321



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[32]	1	SEC anti-drilling protection	10	487406
[38]	1	SEC rebate-clearance reduction flush-encased gearbox	50	334360
[24]	1	Countersunk tapping screw ST4.8x16	100	728933
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁴⁾		
[16]	2	SEC connector		
[29]	2	Cylinder-head screw M5x8		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671
	1	Additional stay arm V.01 180 kg ²⁾	10	738559
		Additional stay arm V.02 180 kg ²⁾	10	738560
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Scissor stay deadbolt		
[64]	1	Scissor stay guide, compl.		
[65]	1	Stop		



WARNING!

Sash fall due to insufficient profile stability.

Insufficient profile stability may cause the sash to fall.

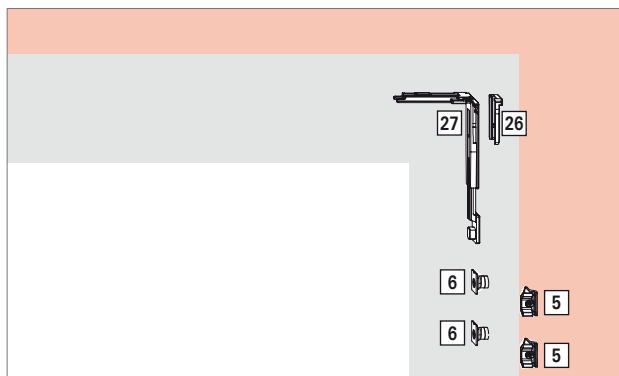
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

1) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

2) An additional stay arm is mandatory from SW > 1300 mm.

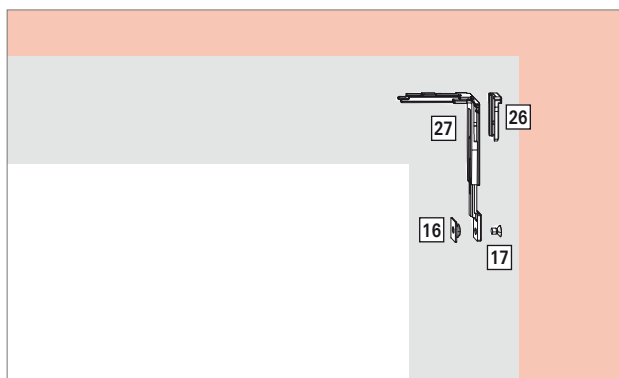
3) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

4) For the SEC flush-encased gearbox with blocking device, see page 237.



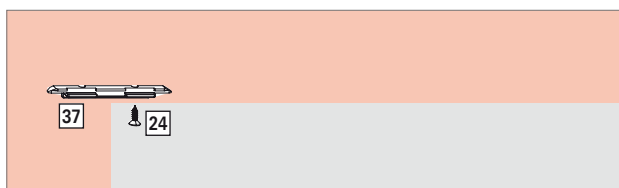
Corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	2	Insertable cam	100	334671
[26]	1	Retaining fork	100	221772
[27]	1	CL corner drive	20	331013



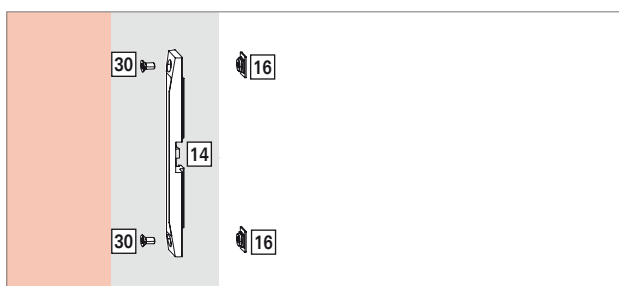
SEC corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[16]	1	SEC connector	100	447113
[17]	1	Countersunk screw M5 x 7	100	728928
[26]	1	SEC retaining fork	100	212636
[27]	1	SEC corner drive CL	10	334359



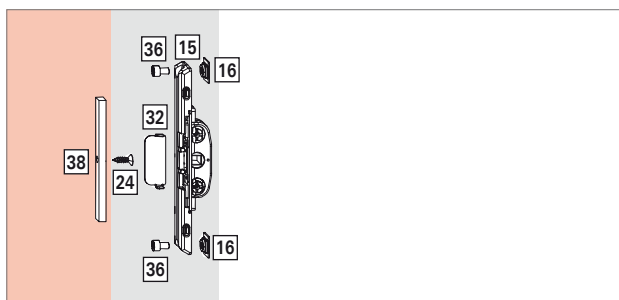
SEC rebate-clearance reduction set

Pos.	Pc(s)	Description	PU	Material no.
[24]	1	Countersunk tapping screw ST4.8 x 16	100	728932
[37]	1	SEC rebate-clearance reduction CD	50	447112



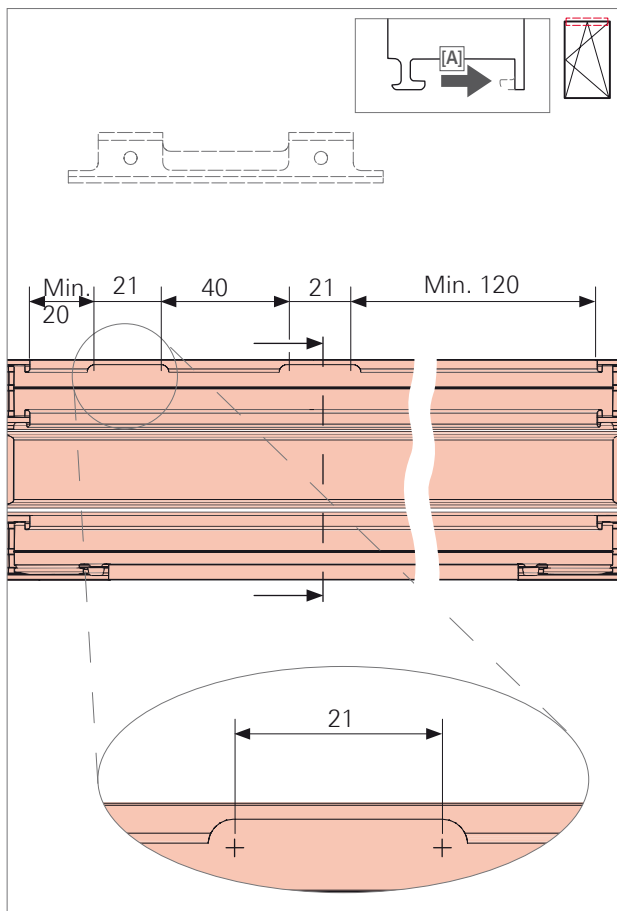
SEC espagnolette protection set

Pos.	Pc(s)	Description	PU	Material no.
[14]	1	SEC espagnolette protection	10	487407
[16]	2	SEC connector	100	447113
[30]	2	Countersunk screw M5 x 10	100	728926



SEC flush-encased gearbox set

Pos.	Pc(s)	Description	PU	Material no.
[15]	1	SEC flush-encased gearbox without MD	10	457210
[16]	2	SEC connector	100	447113
[24]	1	Countersunk tapping screw ST4.8 x 16	100	728932
[32]	1	SEC anti-drilling protection	10	487406
[36]	2	Cylinder-head screw M5 x 8	100	728936
[38]	1	SEC rebate-clearance reduction ESP	50	334360



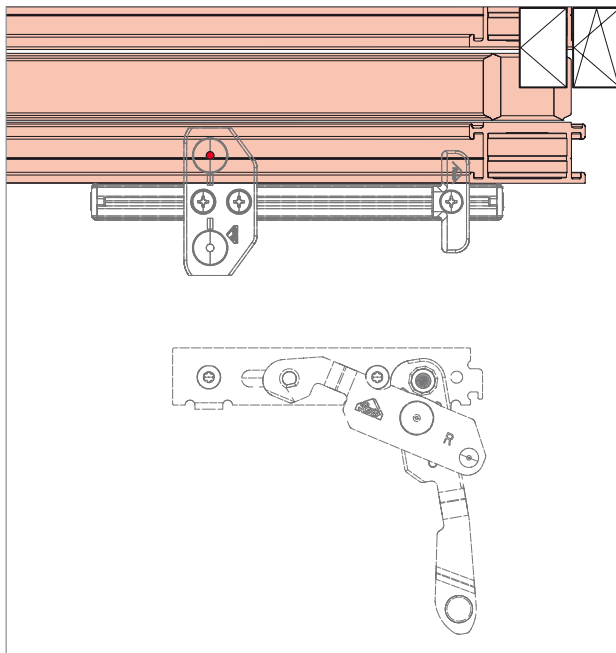
Sash stay 390

1. Open the frame profile by 21 mm to insert the sash stay clamp strip. Route the profile strut so that it is flat [A].



NOTE!

Do not perform routing work if the clamp strip for sash stay 390 has already been placed in the frame.



Pivot rest / stay bearing

Jig

628534

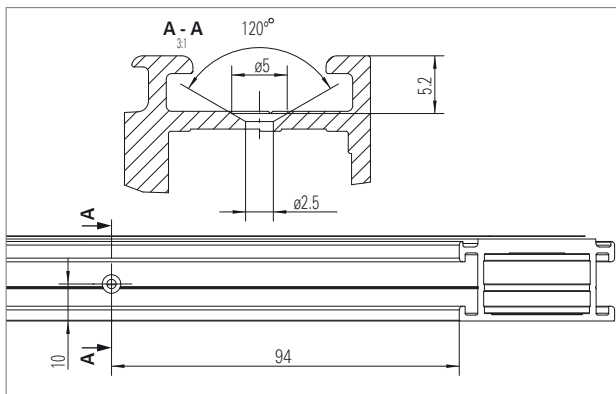
1. Place the drilling jig on the frame as shown in the drawing.
2. Drill holes:
1 x $\varnothing 2.5$ mm, at least 4 mm deep.



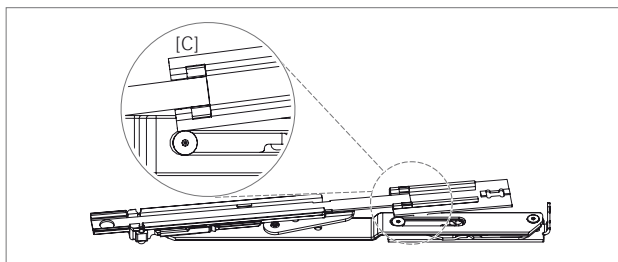
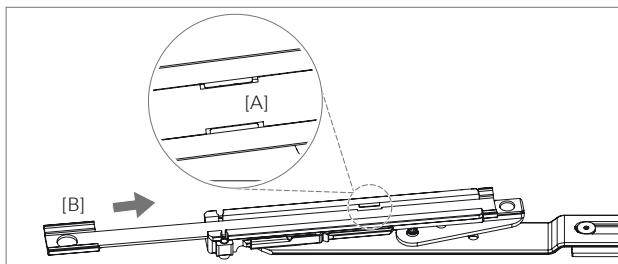
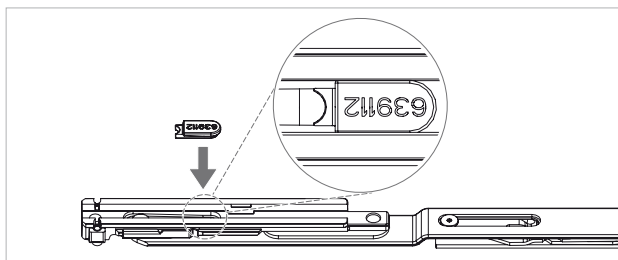
NOTE!

Drill holes if:

- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm)



Alternative (for mechanical production):
Drill the hole according to the drawing.

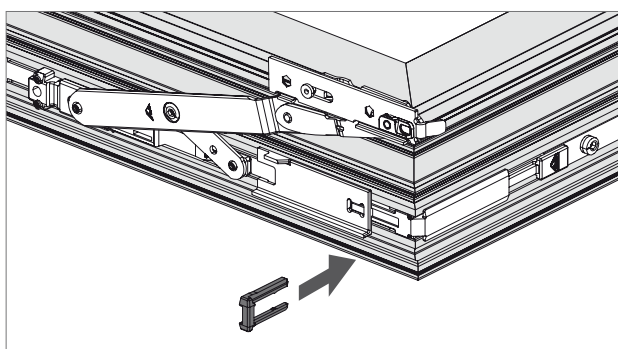
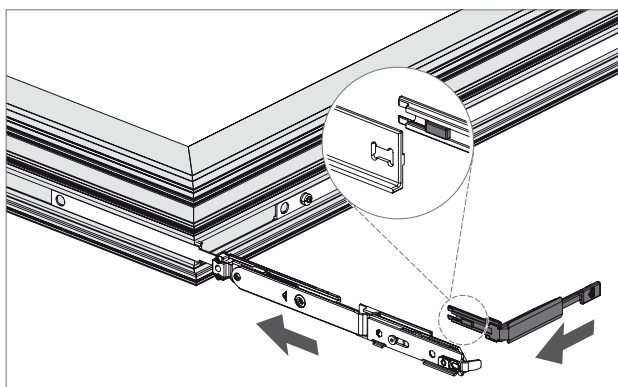


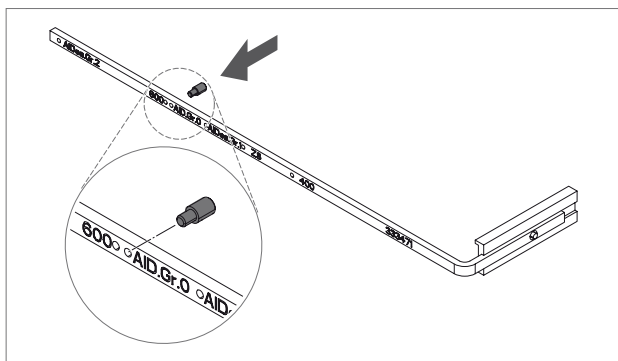
Preassembling sash stay 390 | SH < 800 mm

1. Use a tilt distance restrictor for elements with SH ≤ 800 mm.
2. Crop and punch the coupling rod. Open the sash stay and insert the coupling rod at the height of the guide lugs [A]. Insert the coupling rod as far as it will go [B].
3. Insert the control component into the coupling rod as shown [C].

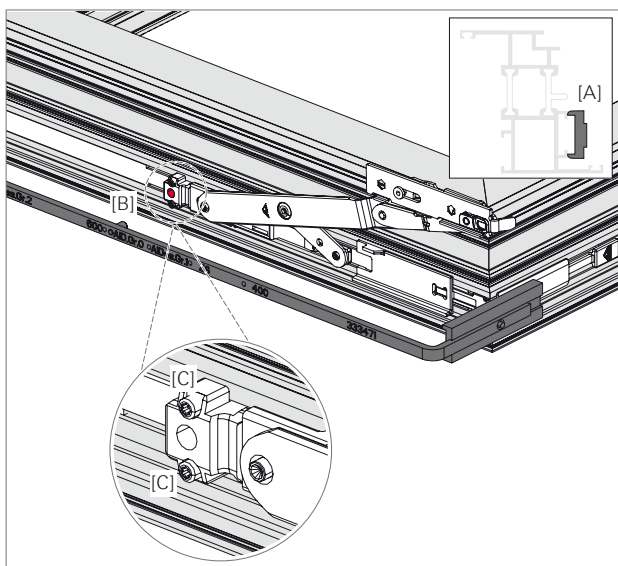
Installing sash stay 390

1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link the CL corner drive to the sash stay and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.
3. Slightly open the sash stay and secure the CL corner drive with the retaining fork.





4. Prepare the jig for the sash stay by fitting the positioning pin in the corresponding drill hole.
Sash stay 390 = AID. size 0



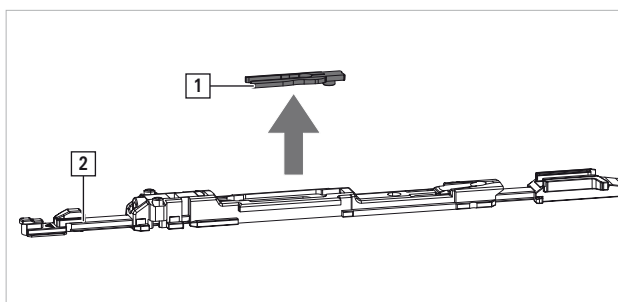
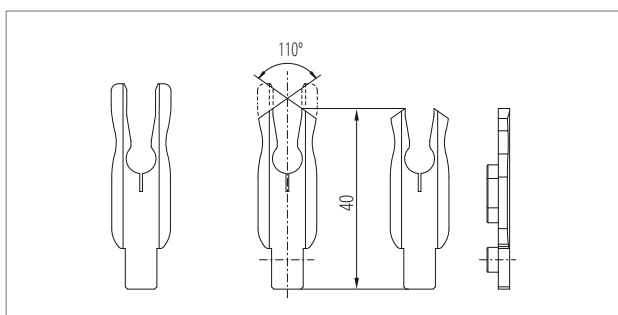
5. Position the jig on the Euro-groove so that it is level. Open the sash stay and insert the jig positioning pin into the sash stay hole provided [B].
Fix the sash stay in position with two piercing screws [A].
Tool: T 10 hex key
Torque: max. 2.5 Nm

Preassembling scissor stay guide 500, 735 | SH < 800 mm

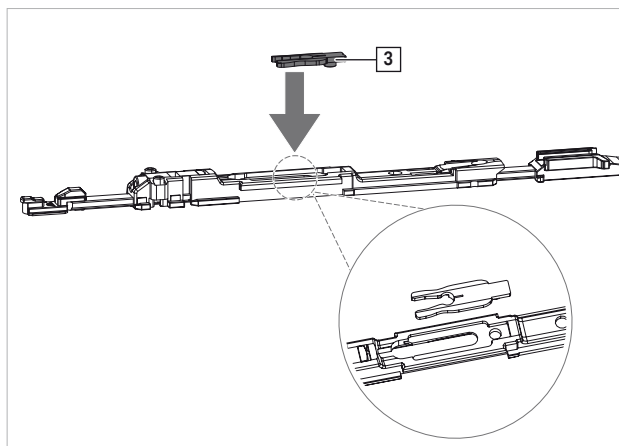


NOTE!

The installation of scissor stay guide 500 is shown here



1. For scissor stay guide 735, crop the tilt distance restrictor according to the drawing.
2. Use a tilt distance restrictor for elements with SH ≤ 800 mm or if a reduced tilt distance is required. To do so, remove preassembled spring clip [1] from the scissor stay guide [2].

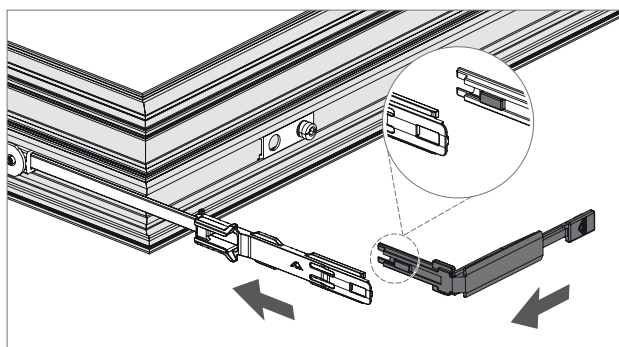


3. Insert the tilt distance restrictor [3].



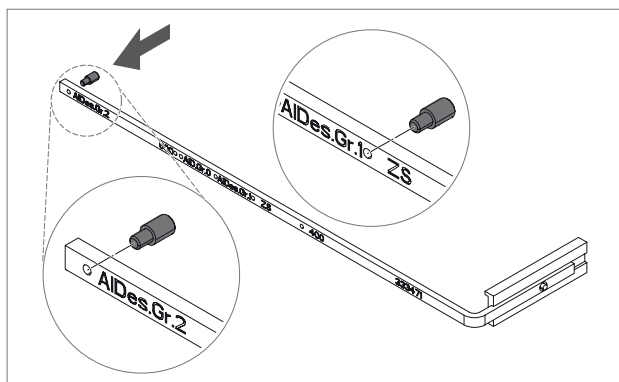
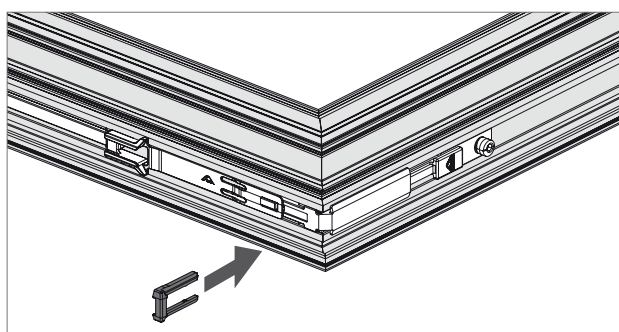
NOTE!

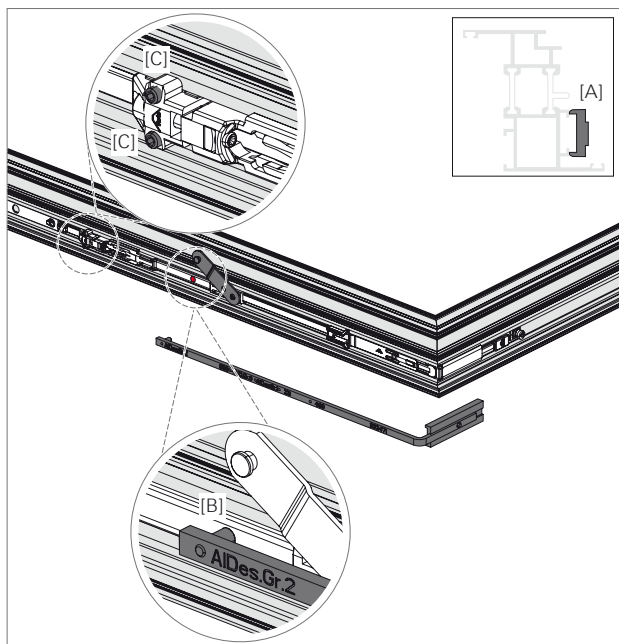
The installation of scissor stay guide 735 is shown here



Installing scissor stay guide 500, 735

1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.
3. Secure the CL corner drive with the retaining fork.
4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).
Scissor stay guide 500 = AIDes. size 1
Scissor stay guide 735 = AIDes. size 2



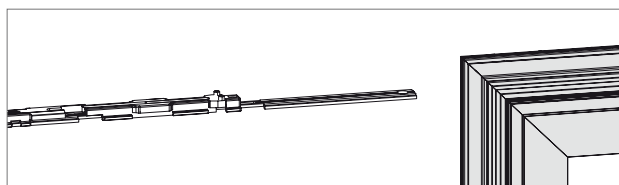
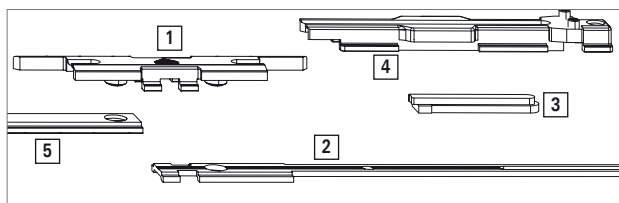


5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

Fix the scissor stay guide in position with 2 piercing screws [C].

Tool: T 10 hex key

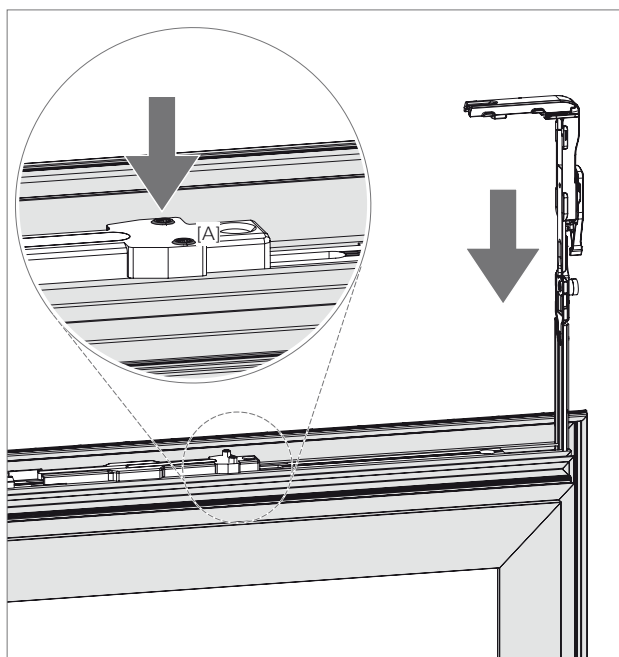
Torque: max. 2.5 Nm



Installing the additional stay arm sash components | 150 kg

1. Connect the scissor stay deadbolt [1] to the coupling rod [2]. Insert the stop [3] into the scissor stay guide [4] as shown and place the entire assembly on the coupling rod. Connect the additional stay arm sash components to connecting rod CR3 [5].

2. Insert the sash components into the sash profile at the top, starting from the hinge side.

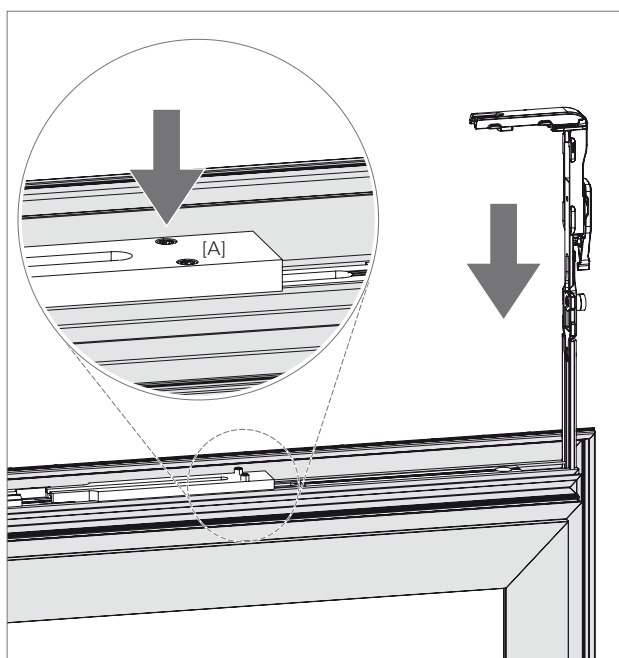
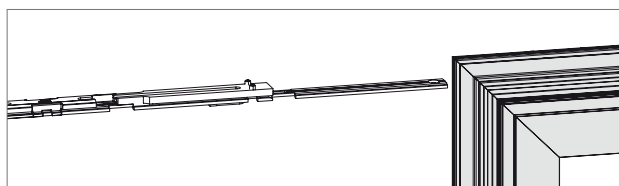
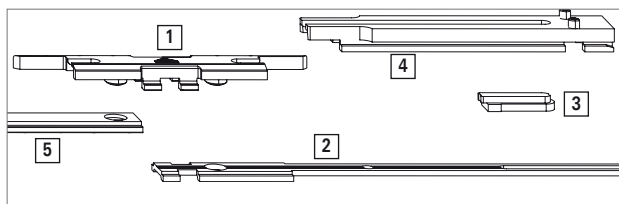


3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

4. Screw down the scissor stay guide at the specified position (see installation drawing) with two piercing screws [A].

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the additional stay arm sash components | 180 kg

1. Connect the scissor stay deadbolt [1] to the coupling rod [2].

Insert the stop [3] into the scissor stay guide [4] as shown.

Position the scissor stay guide on the coupling rod.

Connect the additional stay arm sash components to connecting rod CR3 [5].

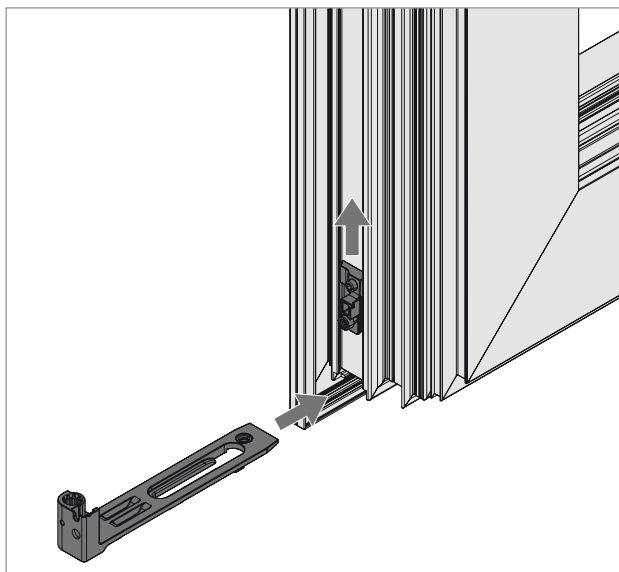
2. Insert the sash components into the sash profile at the top, starting from the hinge side.

3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

4. Screw down the scissor stay guide at the specified position (see installation drawing) with two piercing screws [A].

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the corner hinge

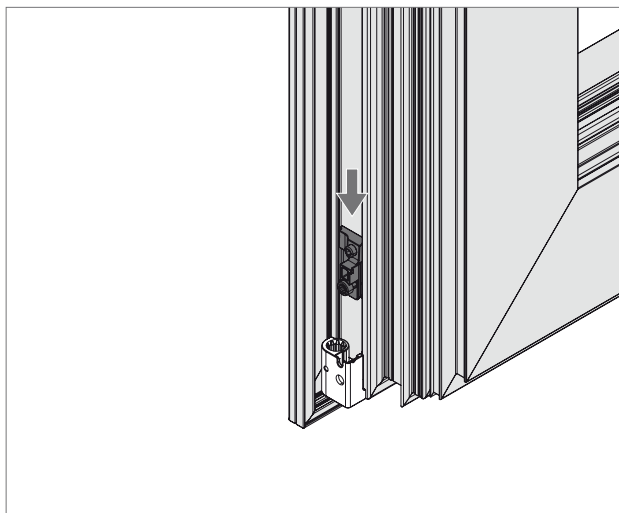
1. Insert the adjustment piece into the connecting rod groove.



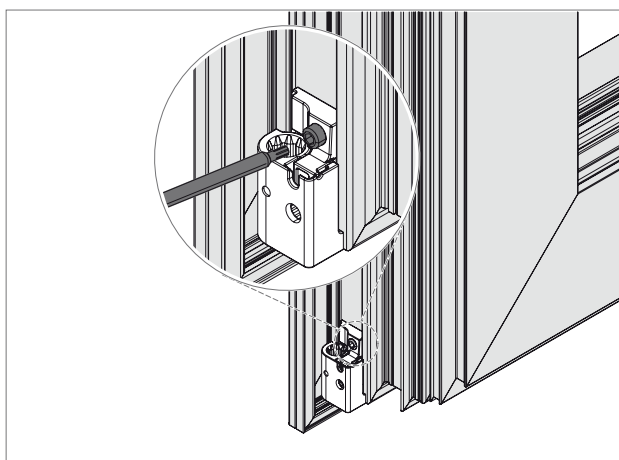
NOTE!

The 180 kg adjustment piece does not feature lateral adjustment.

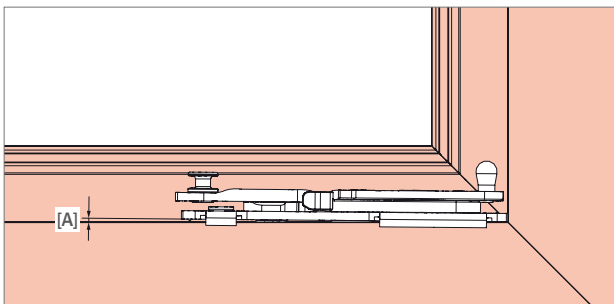
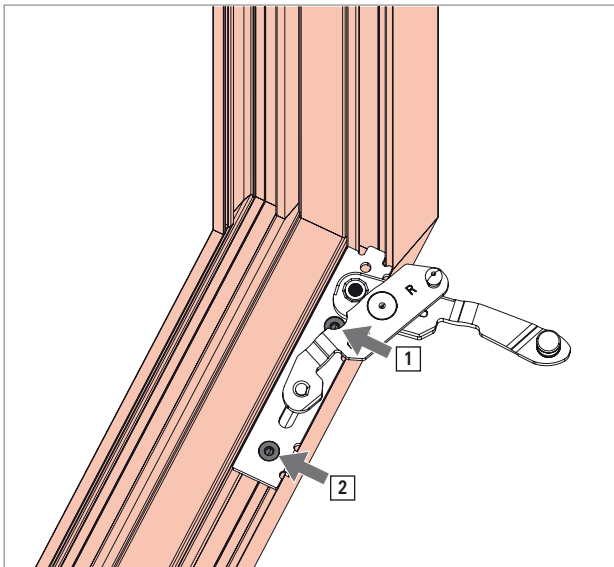
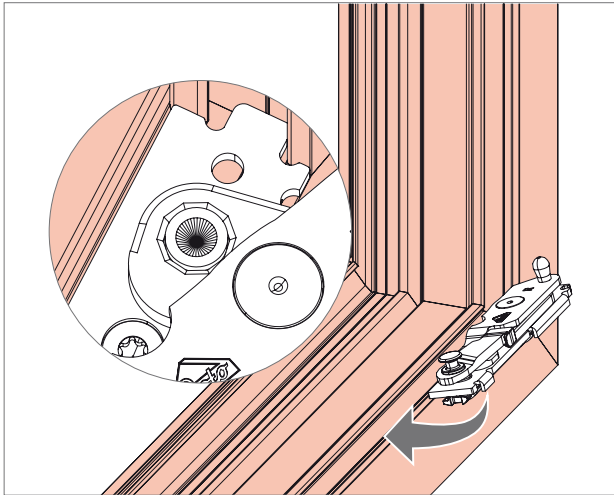
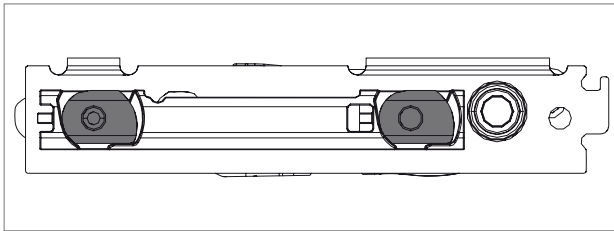
2. Insert the corner hinge into the connecting rod groove.



3. Push the adjustment piece into the corner hinge.



4. Screw in the threaded pin.
Tool: T 10 hex key
Torque: ≥ 2.5 Nm



Installing the pivot rest

1. Align the clamping blocks.



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Open the support and swing it into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the support is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

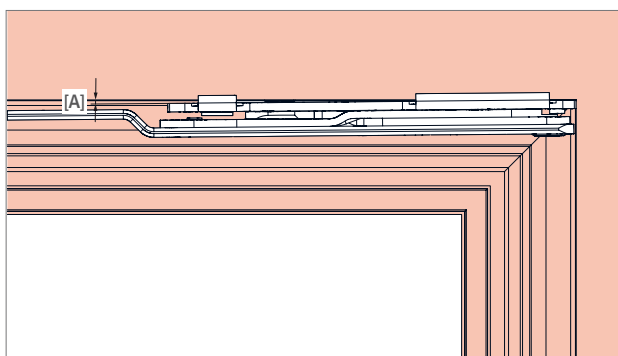
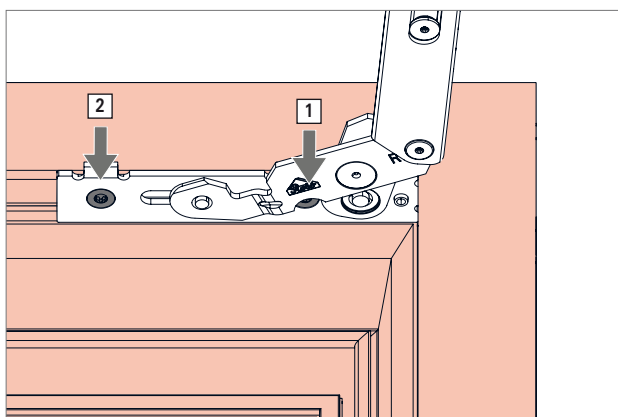
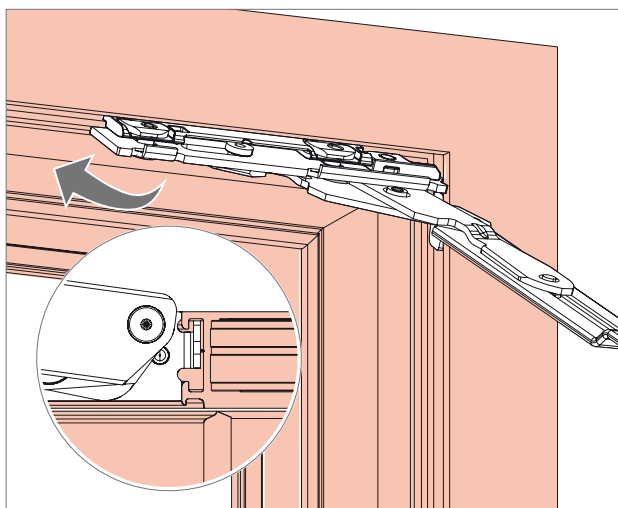
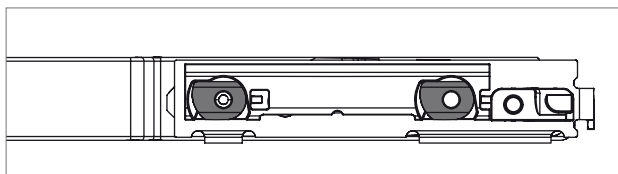
- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the support a maximum of two times.



NOTE!

Do not leave a gap between the baseplate and profile [A].

4. Close the support.



Installing sash stay 500, 735

1. Align the clamping blocks.



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Open the sash stay and swing the support into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the sash stay is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

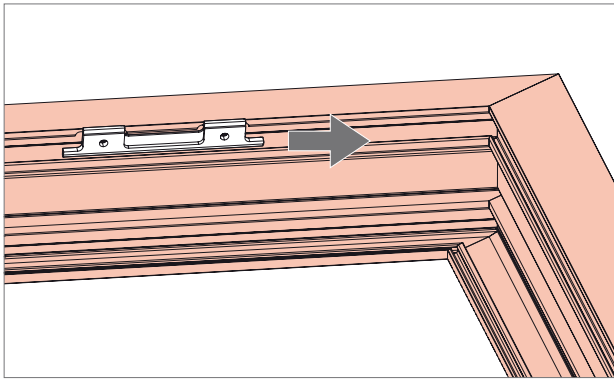
- Depending on the strength of the profile, or with a base groove thickness >2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.



NOTE!

Do not leave a gap between the baseplate and profile [A].

4. Close the sash stay.



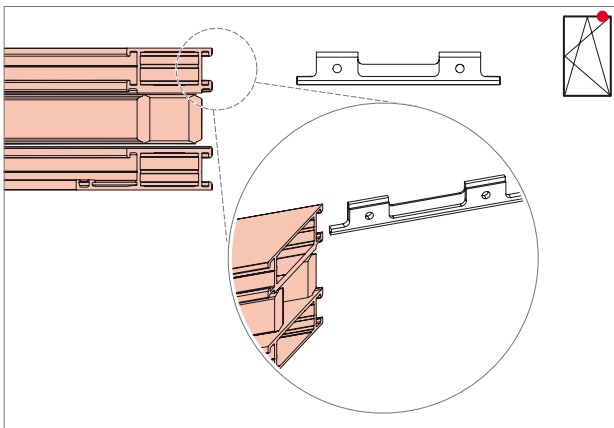
Installing the clamp strip on sash stay 390

1. Swing the clamp strip into the routing (see page 72). Prevent the clamp strip from falling out due to movement.

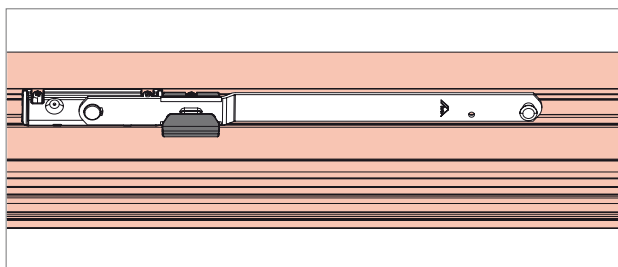
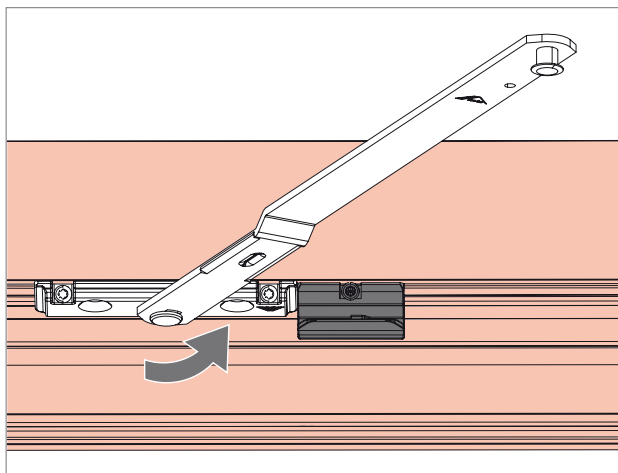
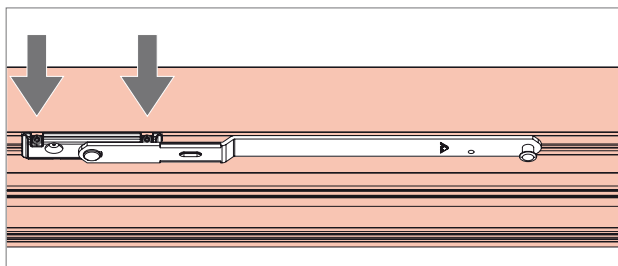


NOTE!

Ensure that the clamp strip is correctly aligned in the frame profile.

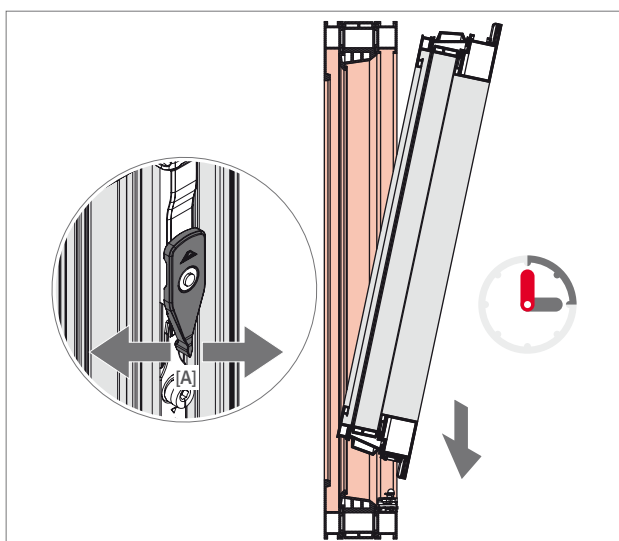
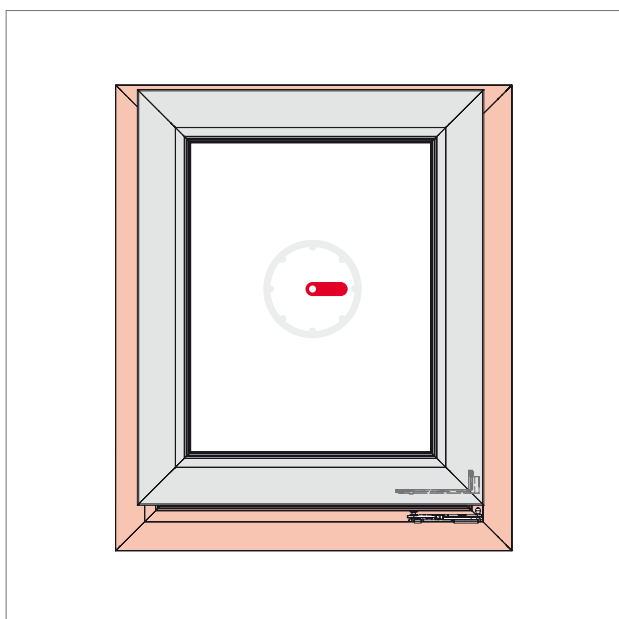
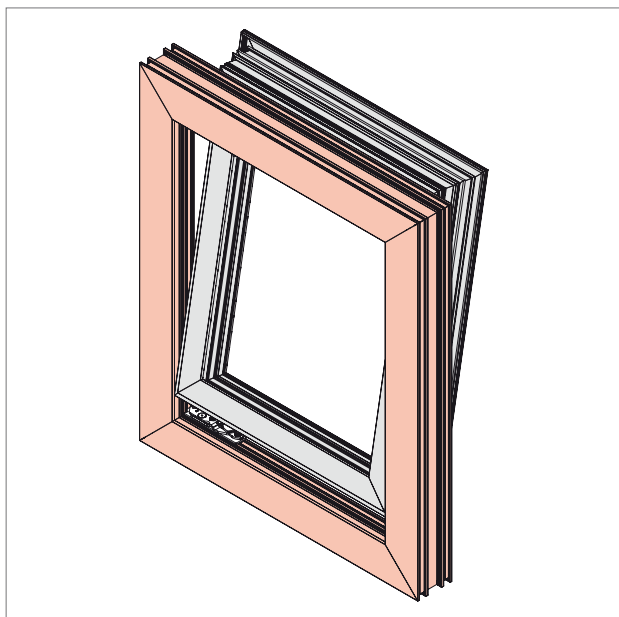


Alternatively: insert the clamp strip into the profile on the separate rod.

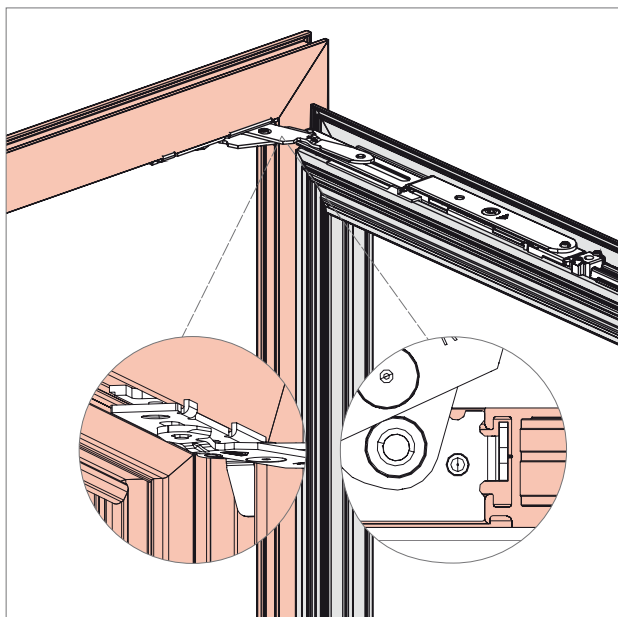


Installing the additional stay arm frame components

1. Swing the additional scissor stay arm, compl., into the frame at the specified position (see installation drawing).
2. Screw down the support with the two preinstalled threaded pins.
Tool: T 10 hex key
Torque: max. 2.5 Nm
3. Open the additional scissor stay arm and position the retaining spring next to the support. Screw down with the preinstalled threaded pin.
Tool: T 10 hex key
Torque: max. 2.5 Nm
4. Clip the additional scissor stay arm into the retaining spring.

**Connecting the pivot rest to the corner hinge**

1. Move the pivot rest and stay bearing to the initial position (= closed sash position).
2. Move the handle to the turn position.
3. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the corner hinge engage in the pivot rest.
4. Secure the sash to prevent it from falling.
5. Sash stay 390: open the sash approximately 90°.
Sash stay 500/735: open the sash approximately 10°.
6. Sash stay 500/735: push the mishandling device [A].
Move the handle to the tilt position.
(Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.)



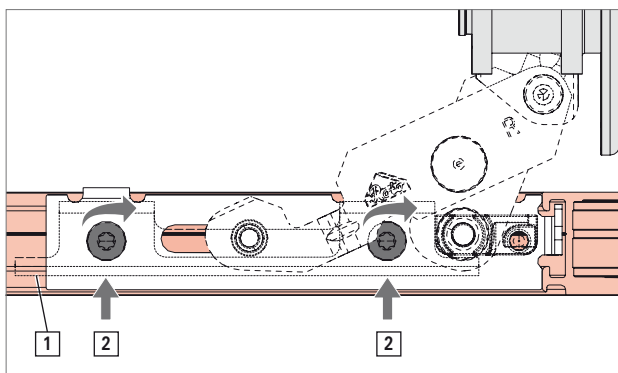
Mounting sash stay 390

1. Open the stay bearing 90° and swing it into the frame.



NOTE!

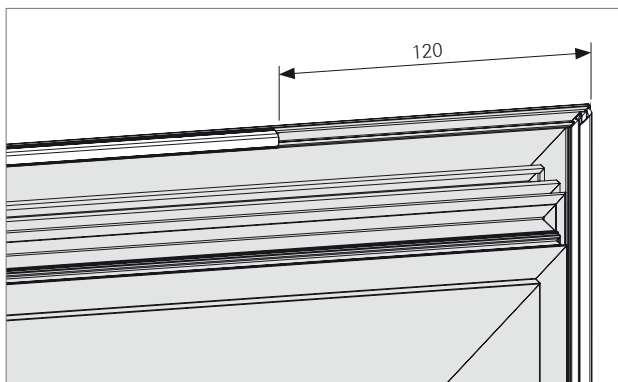
The baseplate must engage behind it.



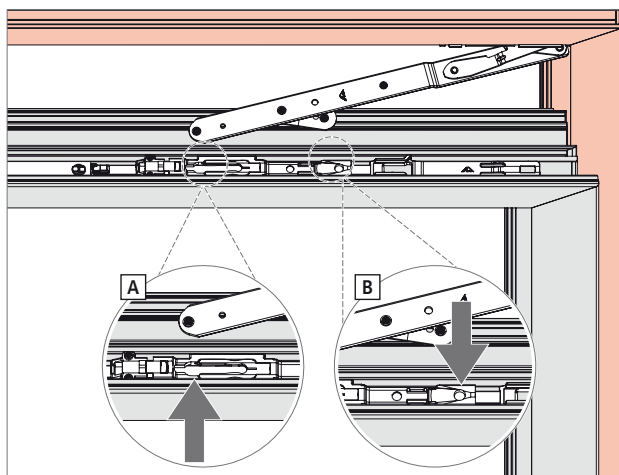
2. Move the clamp strip [1] as far as it will go. Push the baseplate onto the profile so that it is level and clamp the clamp strip with two screws [2]. After tightening the screws, check that the sash stay is securely fitted.

Tool: T 20 hex key

Torque: max. 5.5 Nm



3. Notch the gasket on the sash in the area of the sash stay by 120 mm, measured from the corner, if this is necessary for space reasons.

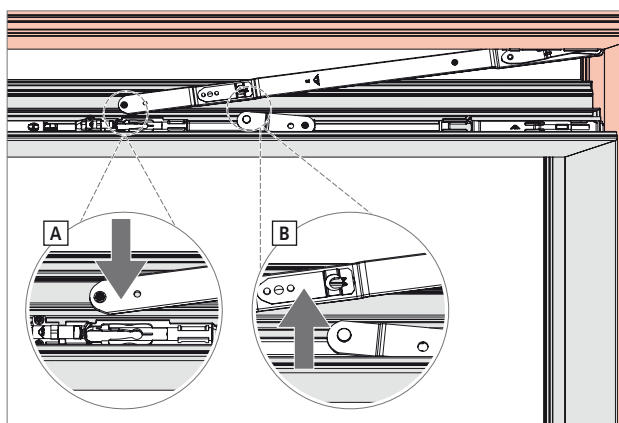


Mounting sash stay 500, 735

1. Mounting sequence for sash stay 500 (handle in tilt position and sash opened approximately 10°).

A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting").

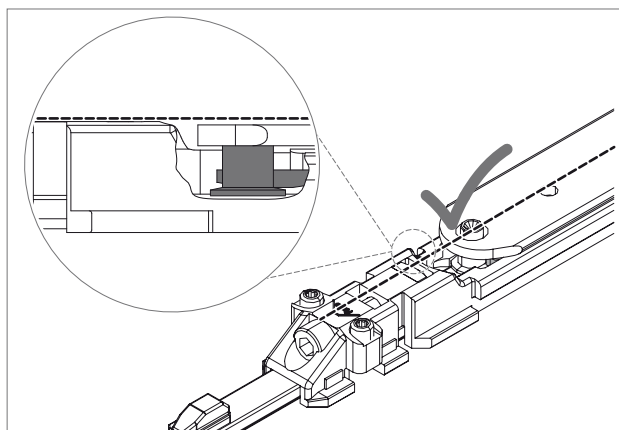
B = Mount the tab in the hole in the scissor stay guide.



Mounting sequence for sash stay 735 (handle in tilt position and sash opened approximately 10°).

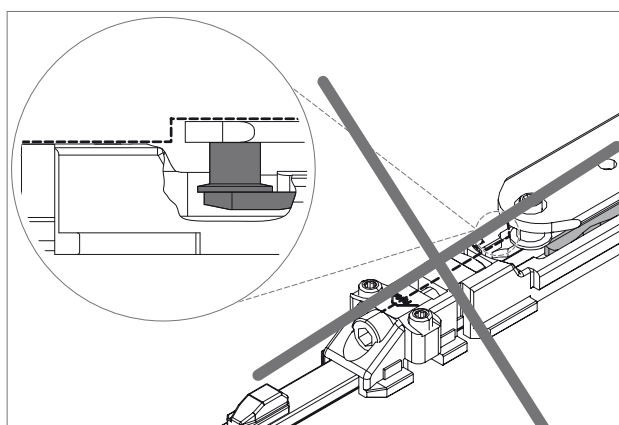
A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting")

B = Mount the tab in the sash stay rod (keyhole).



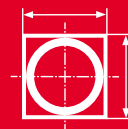
Correct mounting

No projection from the sash stay to the scissor stay guide.

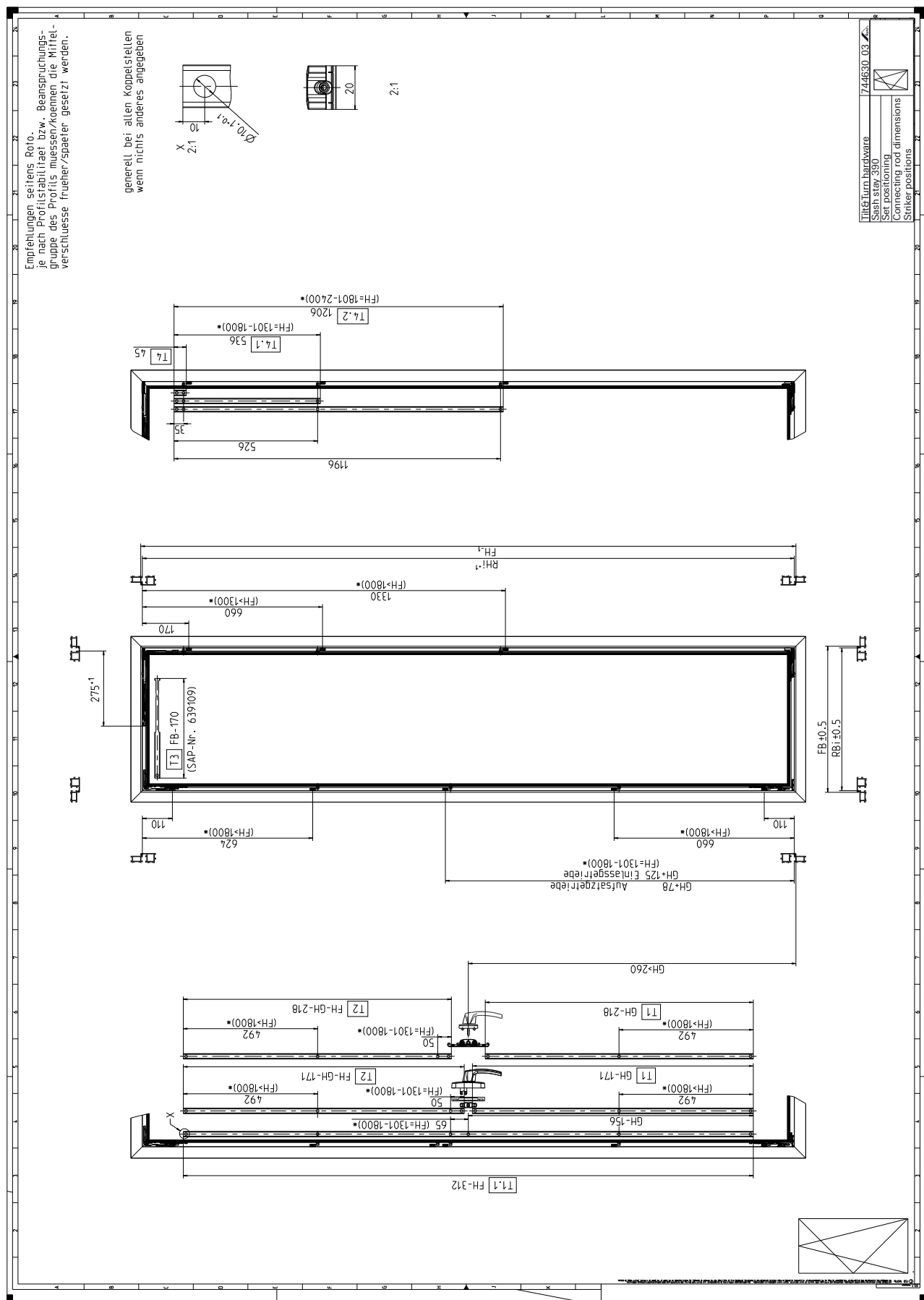


Incorrect mounting

Projection from the sash stay to the scissor stay guide is not permissible.



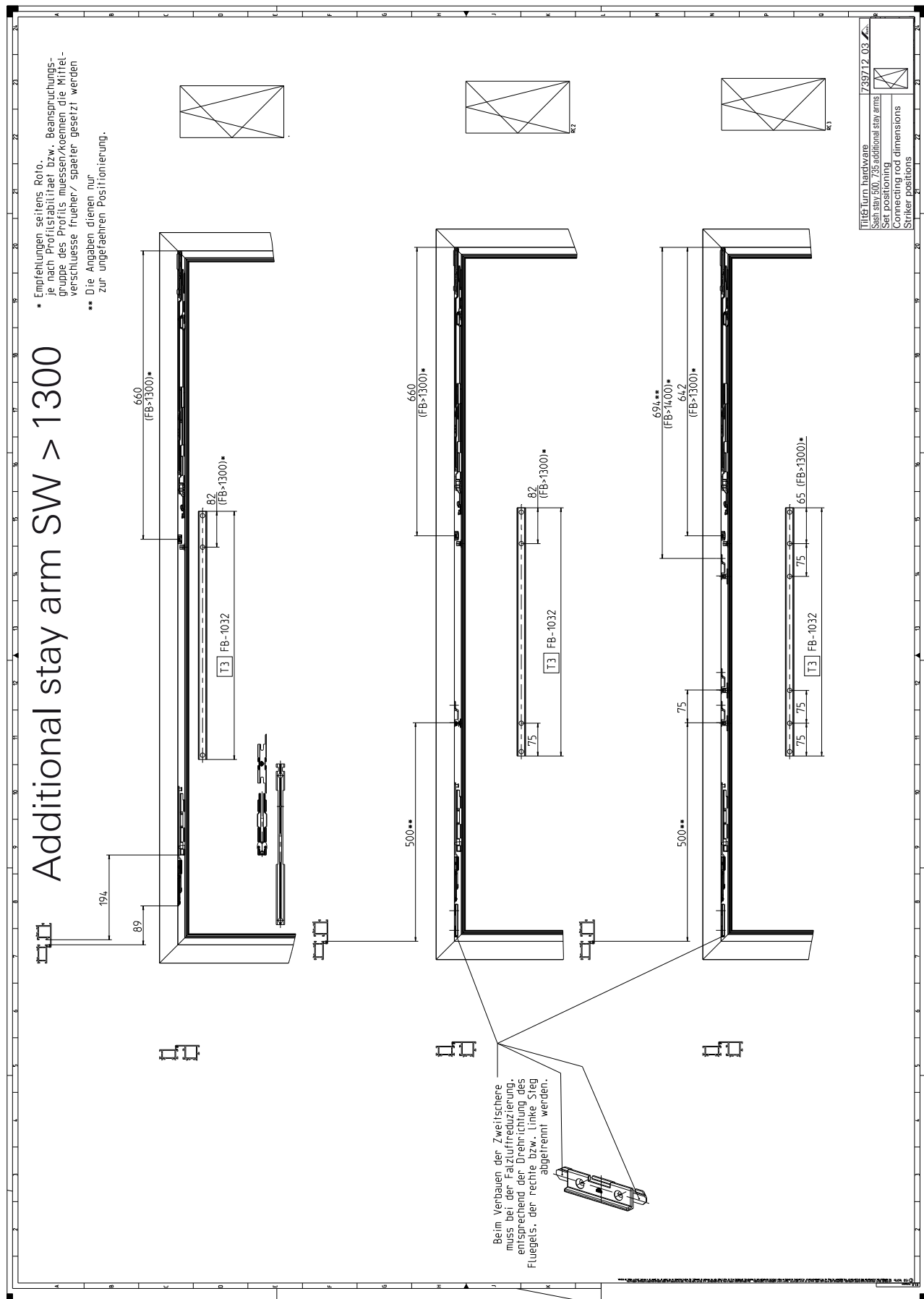
Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Abweichung Abstand RC SST mit DB	Deviation from distance RC ST with TR
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5 / Abstand RC SST	Deviation from connecting rod CR5 / distance RC ST
Axer	Sash stay
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung entsprechend der Drehrichtung des Flügels der rechte bzw. linke Steg abgetrennt werden.	When fitting the additional stay arm, the right or left strut must be detached for rebate-clearance reduction depending on the direction of rotation of the sash.
DB Gr. 1	TR size 1
DB Gr. 2	TR size 2
DB ungebr.	TR, unbraked
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto. Je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse früher/später gesetzt werden	Recommendations from Roto. Depending on the profile stability or profile loading group, the centre locks must/can be put in place at an earlier/later point
FB	SW
FH	SH
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise stated
GH	HH
mit DB	With TR
Mitgeltende Unterlagen für die Montage beachten!	Comply with the other applicable documents for installation.
ohne DB	Without TR
RBi	FWi
RC2 Ausführung	RC2 version
RHi	FHi
Spaltlüfter mit Zweitschere	Night vent with additional stay arm
Spaltlüfter ohne Zweitschere	Night vent without additional stay arm
SST	ST
T	CR
Zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)

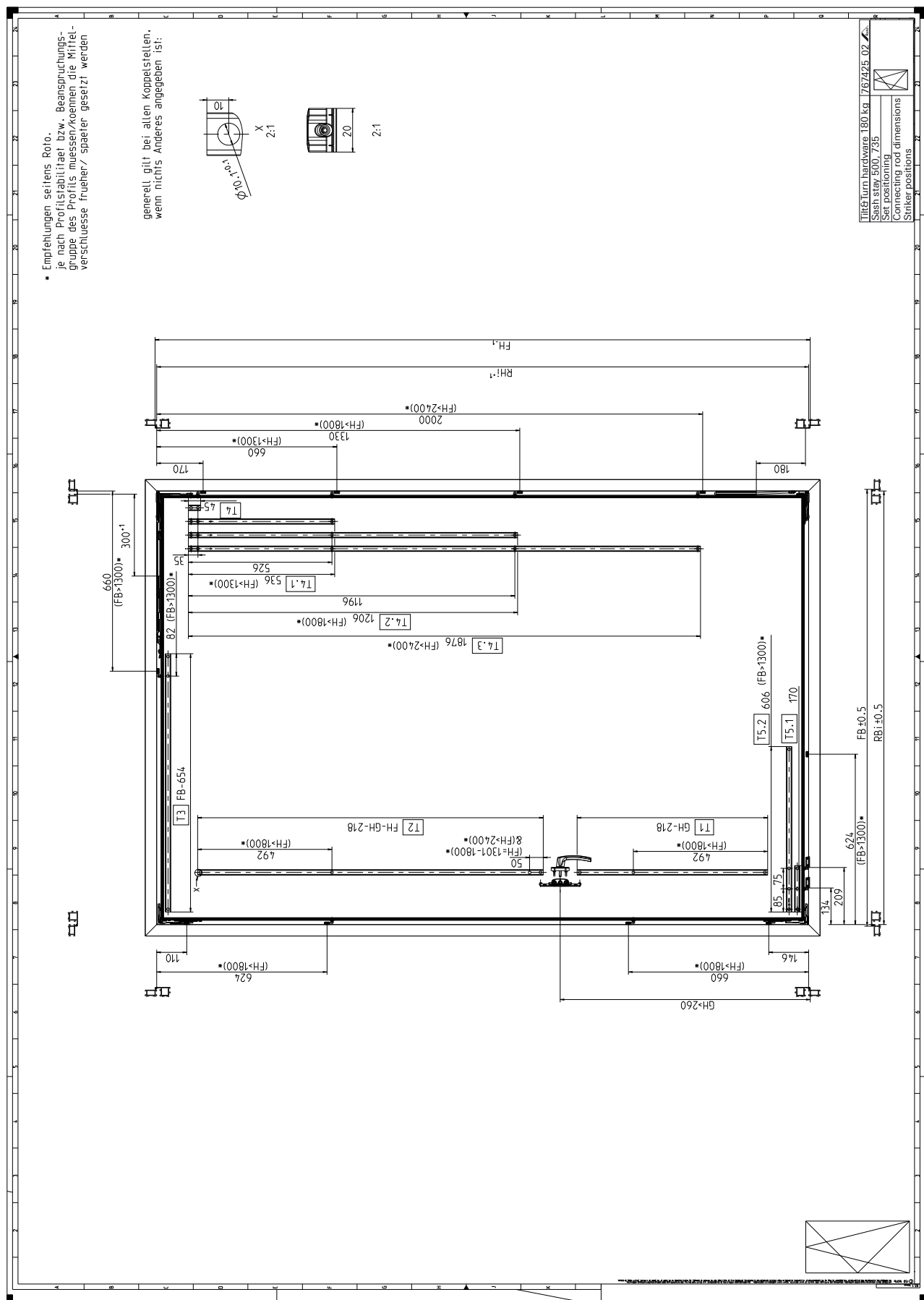


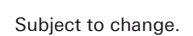




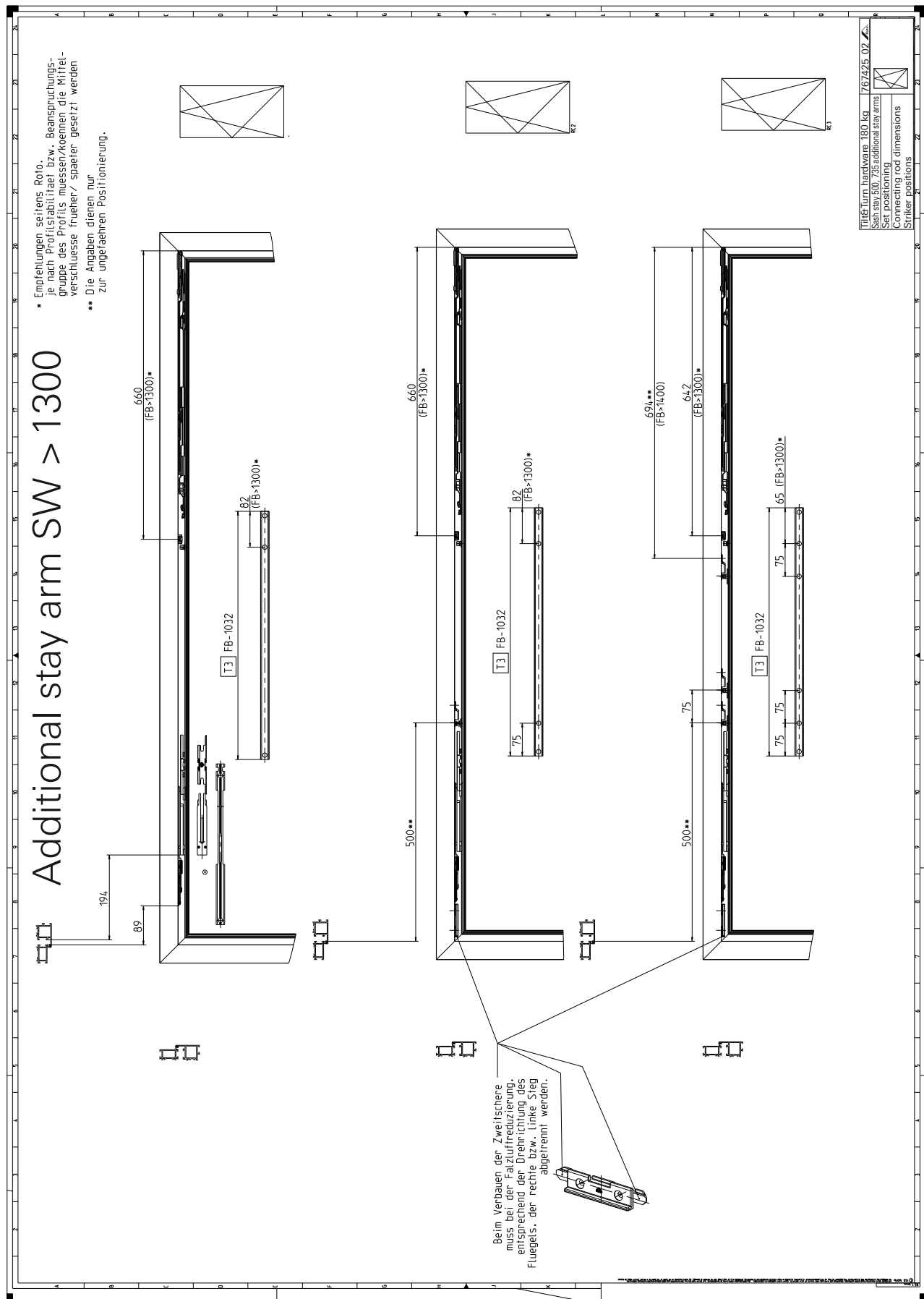


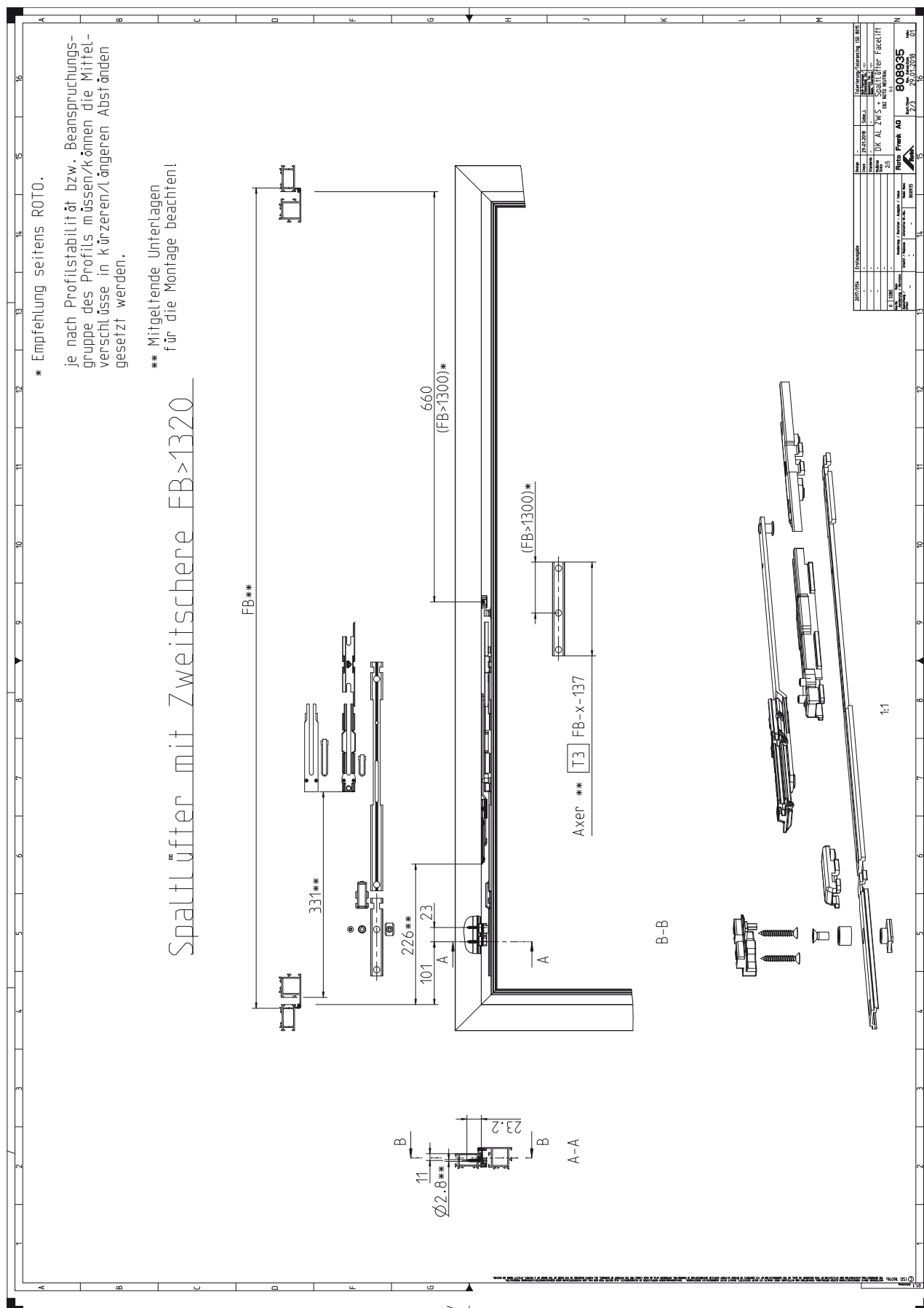


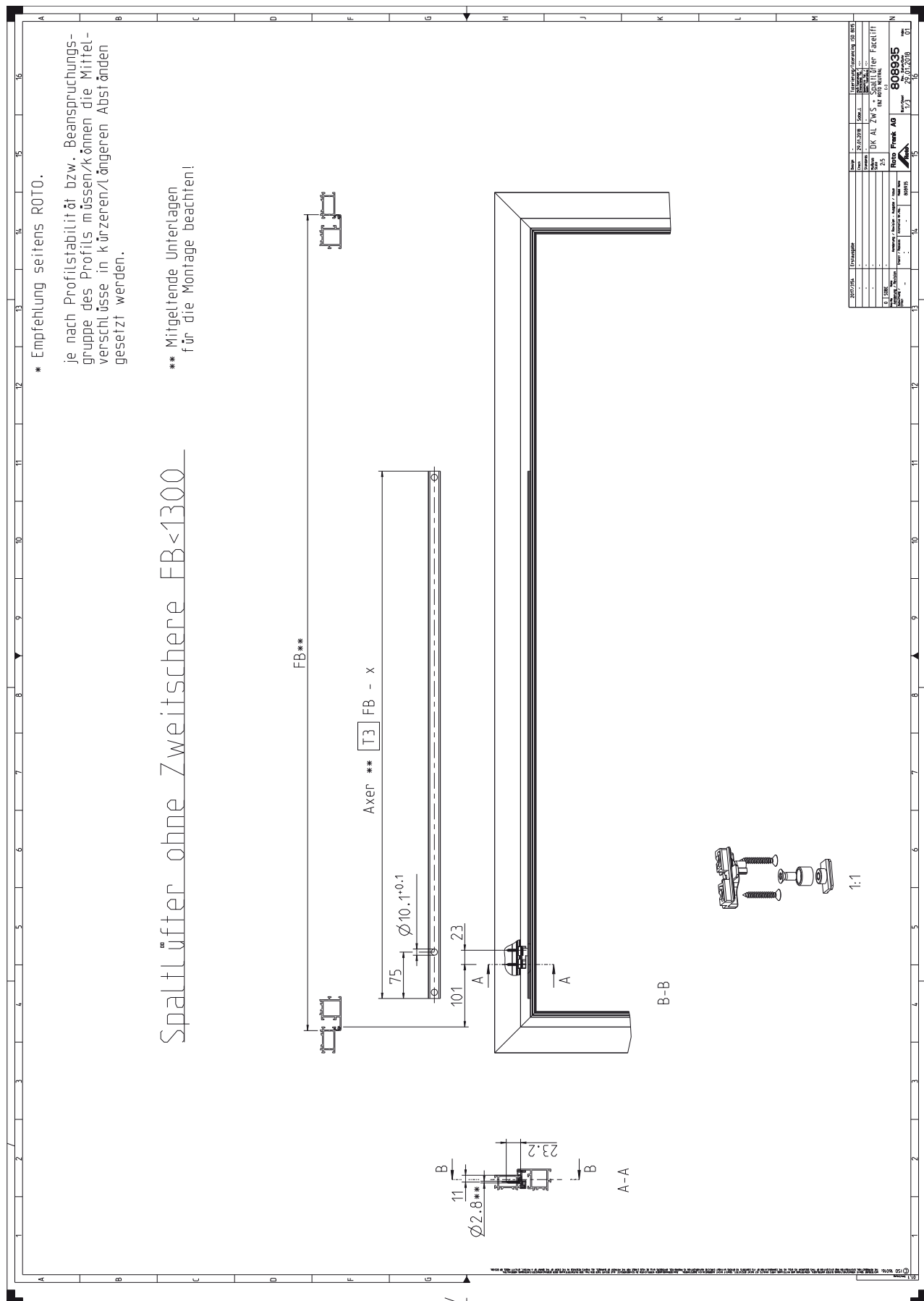








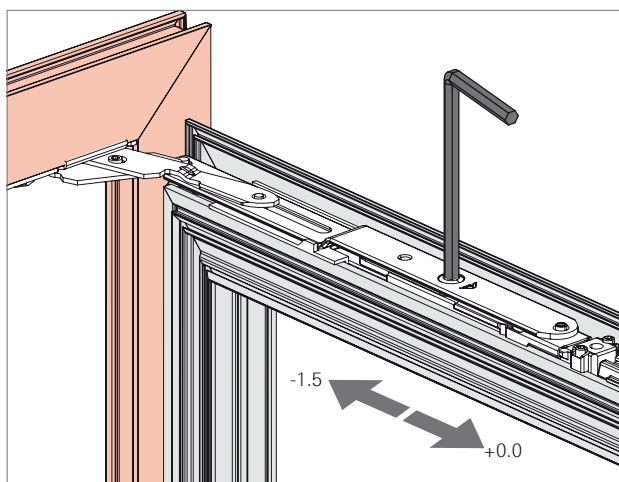






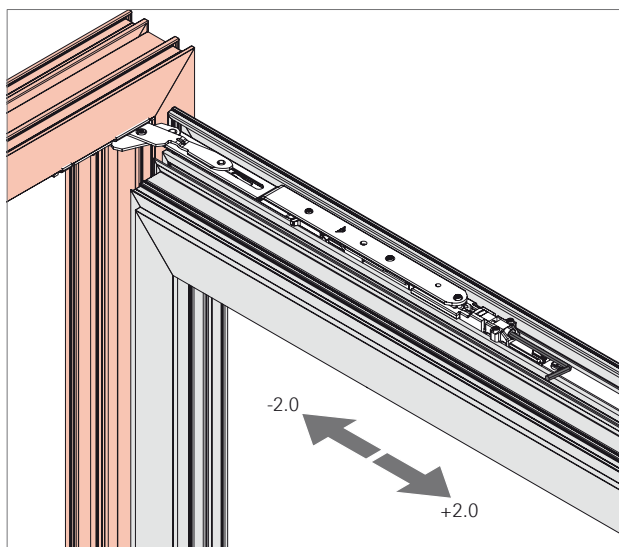
Note!

Roto hardware components may only be adjusted by authorised professionals.



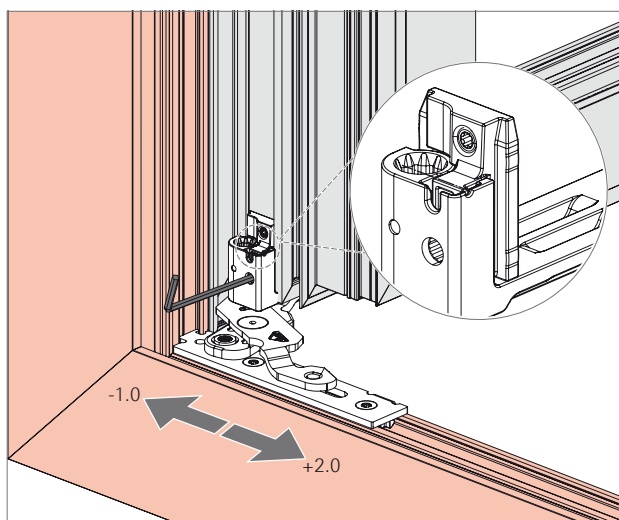
Sash stay 390

1. Open the window sash 90°.
2. Lateral adjustment -1.5 mm using hex key size 4.



Sash stay 500, 735

1. Open the window sash 90°.
2. Lateral adjustment ± 2 mm using hex key size 4.



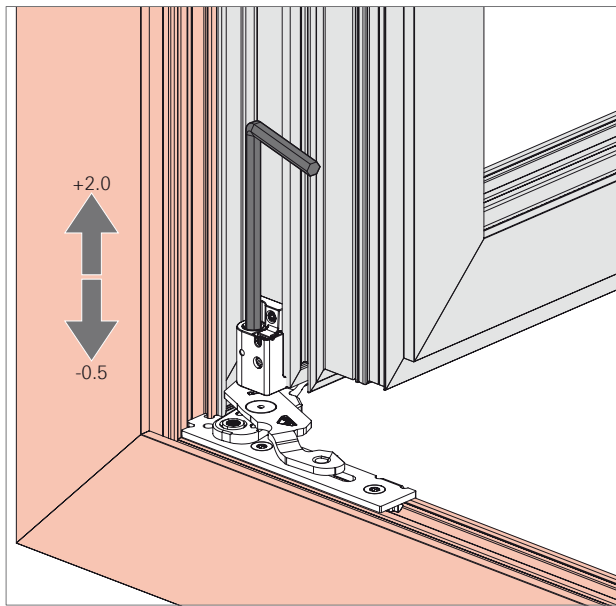
Corner hinge

1. Open the window sash 90°.
2. Lateral adjustment -1 mm/+2 mm using hex key size 4.



NOTE!

Control the lateral adjustment via the axis on the adjustment piece.



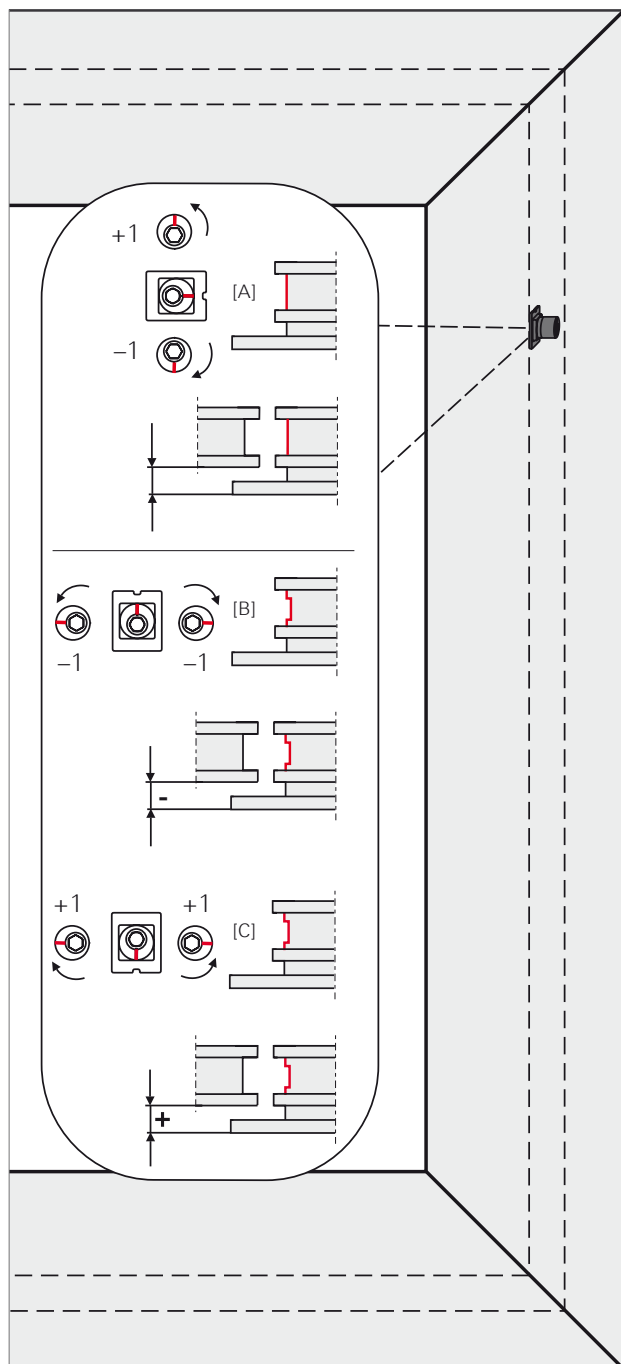
Height adjustment

1. Open the window sash 90°.
2. Height adjustment +2 mm/-0.5 mm via screw in the adjustment piece using hex key size 4.



Note!

Roto hardware components may only be adjusted by authorised professionals.



Strikers

Adjust the gasket compression using hex key size 4, depending on the installation situation.

[A] The gasket compression can be increased or reduced.

[B] The gasket compression can be increased only.

[C] The gasket compression can be reduced only.



TF, TiSs hardware overview

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TF, TiSs installation

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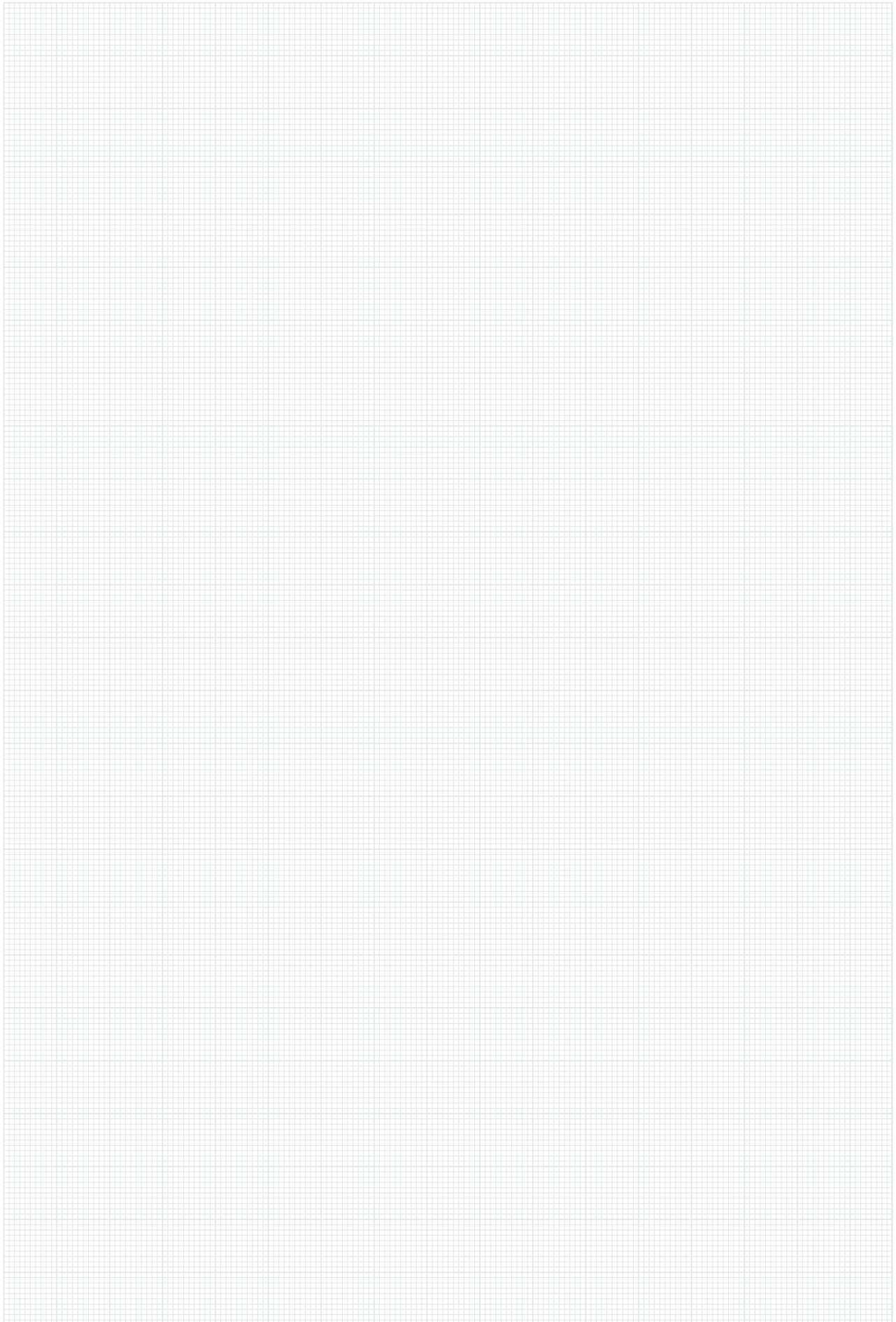
TF, TiSs installation drawings

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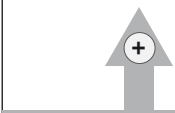


TF, TiSs adjustment

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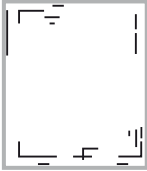
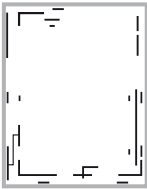
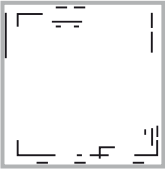
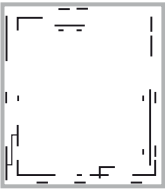
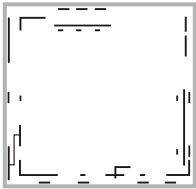
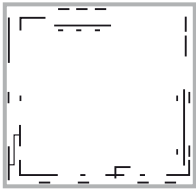
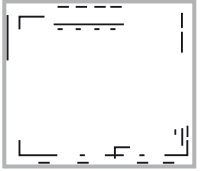
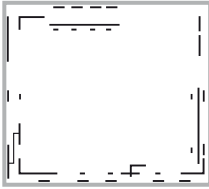


Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

SW SH	500 – 735*	736 – 1300*	1301 – 1600*
	Pci(s) Description 1 TF locking components V.01 1 TF locking components V.02 1 Corner drive CL set V.01 1 Corner drive CL set V.02 1 Hinge side 1 Espagnolette and connector 1 Connecting rod CR4 1 Sash stay 500 1 Scissor stay guide TF 500 1 Tilt distance restrictor SH <800 1 Connecting rod CR5.1 728976 728977 728842 728843 var. var. var. var. 740837 639346 729982	Pci(s) Description 1 TF locking components V.01 1 TF locking components V.02 1 Corner drive CL set V.01 1 Corner drive CL set V.02 1 Hinge side 1 Espagnolette and connector 1 Connecting rod CR4 1 Sash stay 735 1 Scissor stay guide TF 735 1 Tilt distance restrictor SH <800 1 Turn restrictor set V.01 SW >1200 1 Turn restrictor set V.02 SW >1200 1 Connecting rod CR5.1 728976 728977 728842 728843 var. var. var. var. 740839 639346 740814 740835 739375 728978 728979 334671 728918 728920	Pci(s) Description 1 TF locking components V.01 1 TF locking components V.02 1 Corner drive CL set V.01 1 Corner drive CL set V.02 1 Hinge side 1 Espagnolette and connector 1 Connecting rod CR4 1 Sash stay 735 1 Scissor stay guide TF 735 1 Turn restrictor set V.01 1 Turn restrictor set V.02 1 Connecting rod CR5.2 1 TF additional stay arm V.01 1 TF additional stay arm V.02 2 Cam, insertable 2 Striker V.01 2 Striker V.02 728976 728977 728842 728843 var. var. var. var. 740839 740814 740835 739375 728978 728979 334671 728918 728920
1301 – 1800		Pci(s) Description 2 Cam, insertable 2 Striker V.01 2 Striker V.02 334671 728918 728920	
1801 – 2400		Pci(s) Description 2 Cam, insertable 2 Striker V.01 2 Striker V.02 334671 728918 728920	
2401 – 2700		Pci(s) Description 2 Cam, insertable 2 Striker V.01 2 Striker V.02 334671 728918 728920	



Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

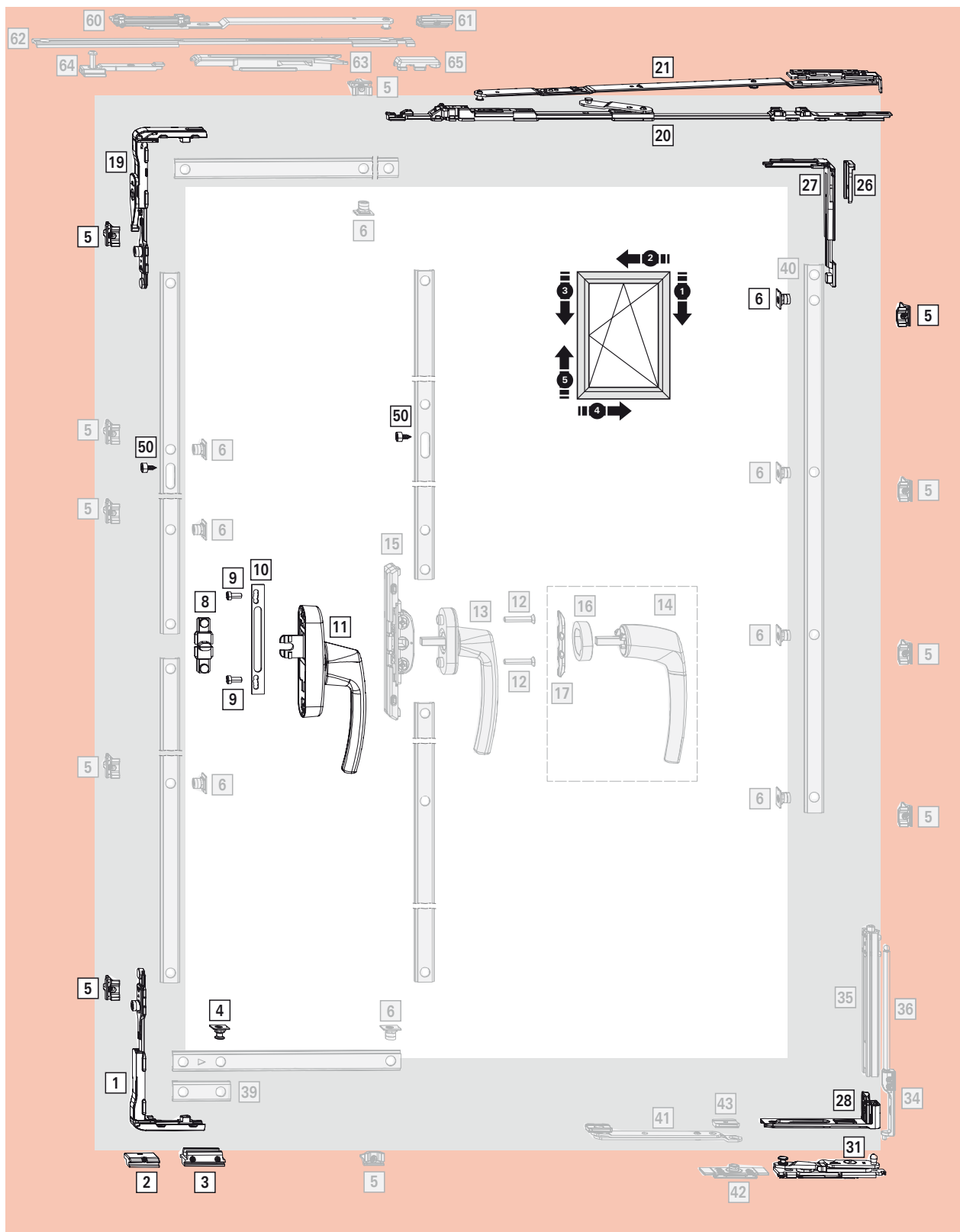
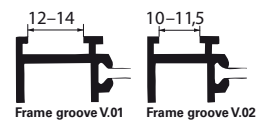
SW SH	500-735	736-1300*	1301-1600*
			
555-1300			
1301-1800			
1801-2400			
2401-2700			

* ATTENTION! Refer to the corresponding application diagram for the use of size-dependent additional components.

TF, TiSs hardware overview

Hardware overview and parts list

TF, TiSs | 150 kg



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW**500–1600 mm ⁴⁾
 Sash height **SH**555–2700 mm ⁹⁾
 Sash weight **S.kg** max. 100/150 kg ¹⁾

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

TF locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	TF locking components V.01	10	728976
		TF locking components V.02	10	728977
		consisting of:		
[2]	1	Run-up wedge V.01/V.02		
[4]	1	TF tilt lock bolt		
[3]	1	TF tilt striker		
[1]	1	Corner drive without MD		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Designed as a Tilt-Only window, handle at the side

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	Espagnolette lock	100	738549

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

TF sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide TF 735 ⁶⁾		10	740839
		Scissor stay guide TF 500 ⁵⁾		10	740837
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5 x 12		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	TF additional stay arm V.01 ⁴⁾	10	728978
		TF additional stay arm V.02 ⁴⁾	10	728979
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Coupler component, compl.		
[64]	1	Scissor stay guide, compl. TF		
[65]	1	TF stop		
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
	1	CR4.1 SH 1301–1800 / CR5.2 SW 1301–1600 AL	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
		CR4.3 SH 2401–2700 AL (not shown)	10	729981
[39]	1	CR5.1 SW 405–1300 AL	10	729982
		CR5.2 TuS/TF SW 1301–1600 AL	10	739375
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
	1	Tilt distance restrictor ⁹⁾ (not shown)	10	502834

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01 ¹⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ¹⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ⁸⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[14]	1	Handle without escutcheon ²⁾		→ CTL 1
[16]	1	Ring for handle without escutcheon		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ⁸⁾	10	378338

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

4) An additional stay arm is mandatory from SW > 1300 mm.

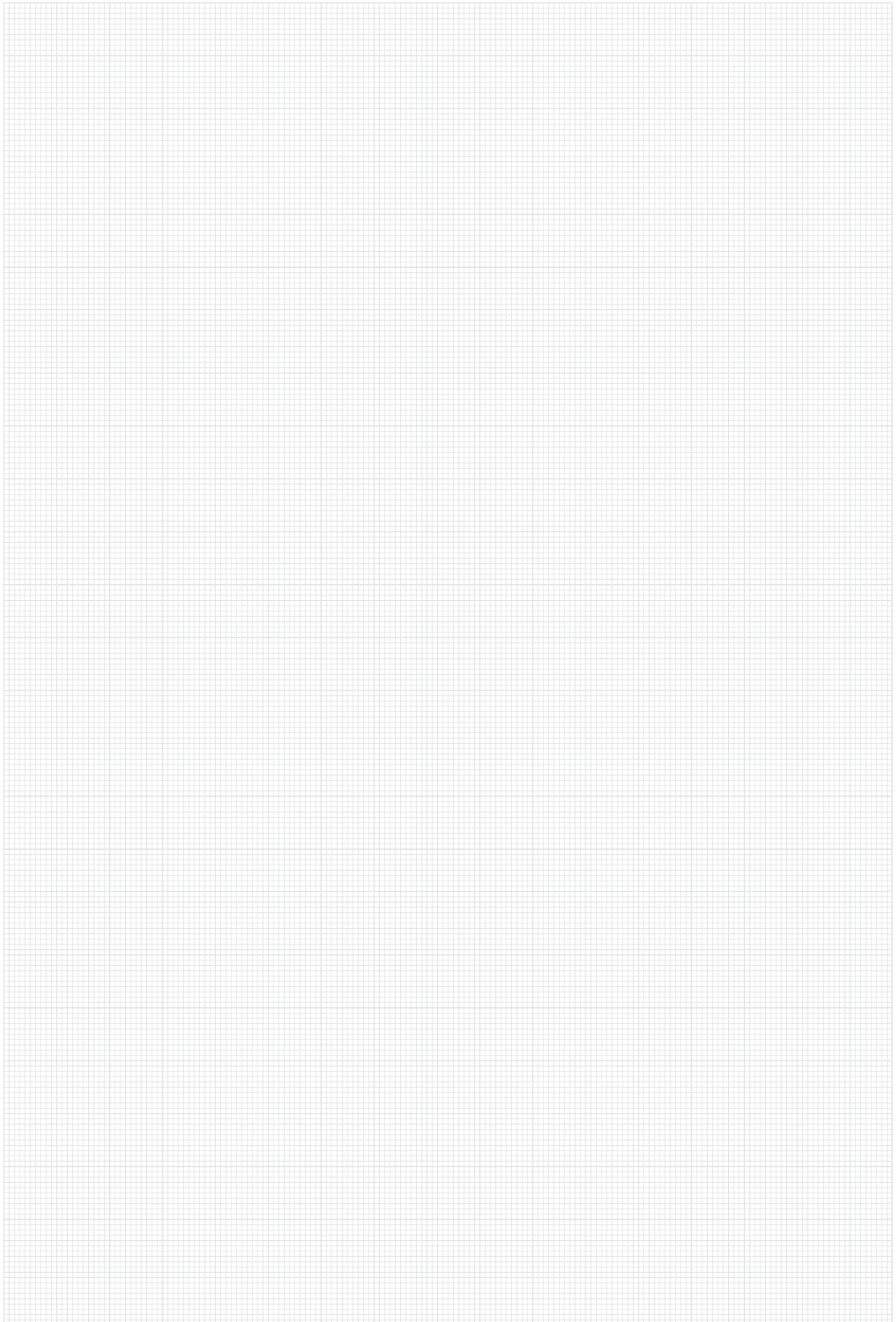
5) Sash stay 500 can be used up to max. SW 735 mm.

6) Sash stay 735 can be used from SW > 735 mm.

7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the flush-encased gearbox with blocking device, see page 237.

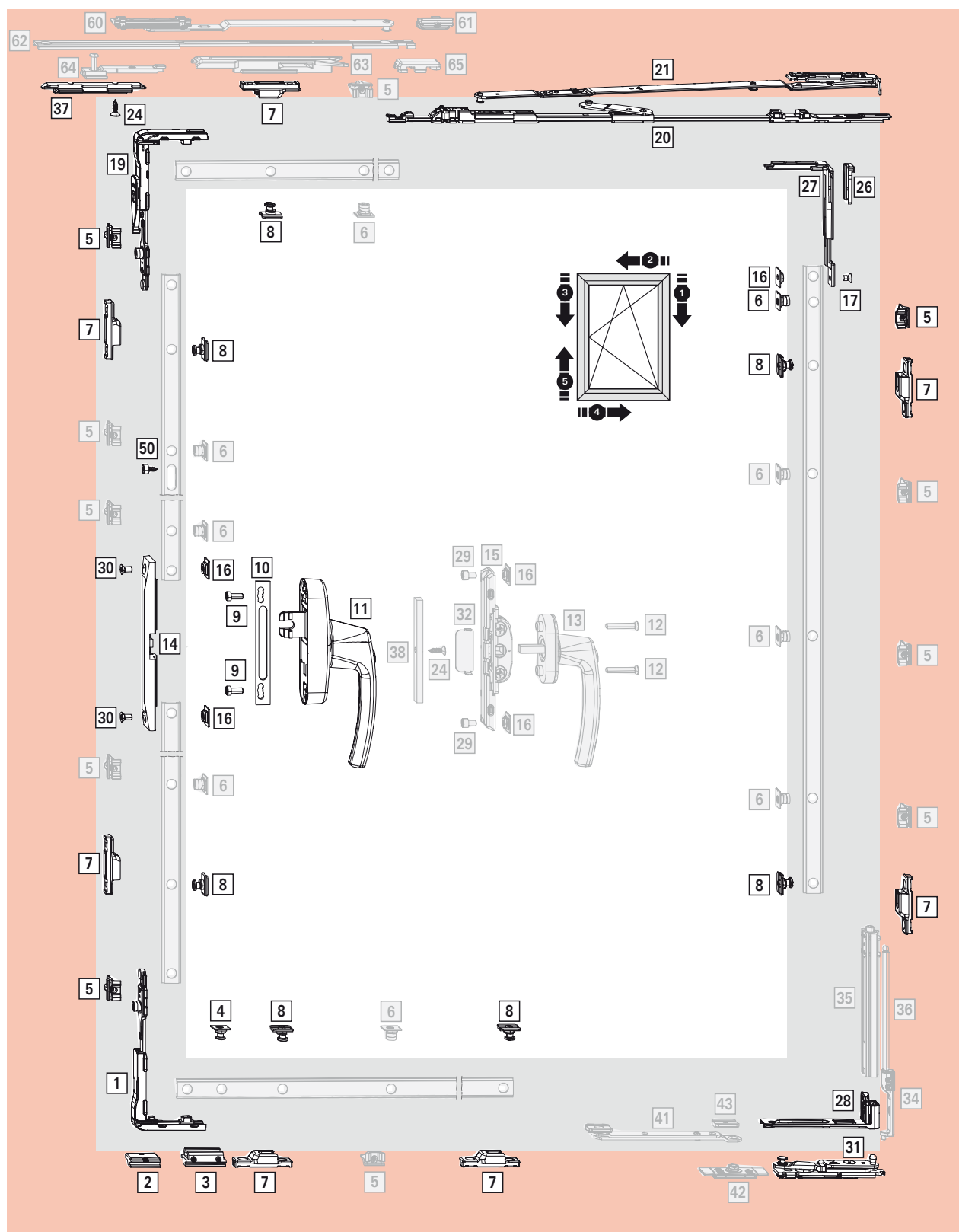
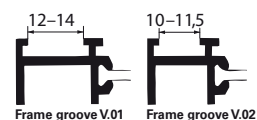
9) Tilt distance restrictor can be used from SH < 800 mm.



TF, TiSs hardware overview

Hardware overview and parts list

TF, TiSs RC2 | 150 kg



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 625–1600 mm ⁴⁾
 Sash height **SH** 720–2700 mm ⁹⁾
 Sash weight **S.kg** max. 100/150 kg ¹⁾

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

TF locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	TF locking components V.01	10	728976
		TF locking components V.02	10	728977
		consisting of:		
[2]	1	Run-up wedge V.01/V.02		
[4]	1	TF tilt lock bolt		
[3]	1	TF tilt striker		
[1]	1	Corner drive without MD		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	7	SEC cam, insertable	100	447245
[7]	7	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	2	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

Designed as a Tilt-Only window, handle at the side

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	Espagnolette lock	100	738549

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

TF sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide TF 735 ⁶⁾		10	740839
		Scissor stay guide TF 500 ⁵⁾		10	740837
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	TF additional stay arm V.01 ⁴⁾	10	728978
		TF additional stay arm V.02 ⁴⁾	10	728979
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Coupler component, compl.		
[64]	1	Scissor stay guide, compl. TF		
[65]	1	TF stop		
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
	1	Tilt distance restrictor ⁹⁾ (not shown)	10	502834

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01 ¹⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ¹⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8 x 16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

4) An additional stay arm is mandatory from SW > 1300 mm.

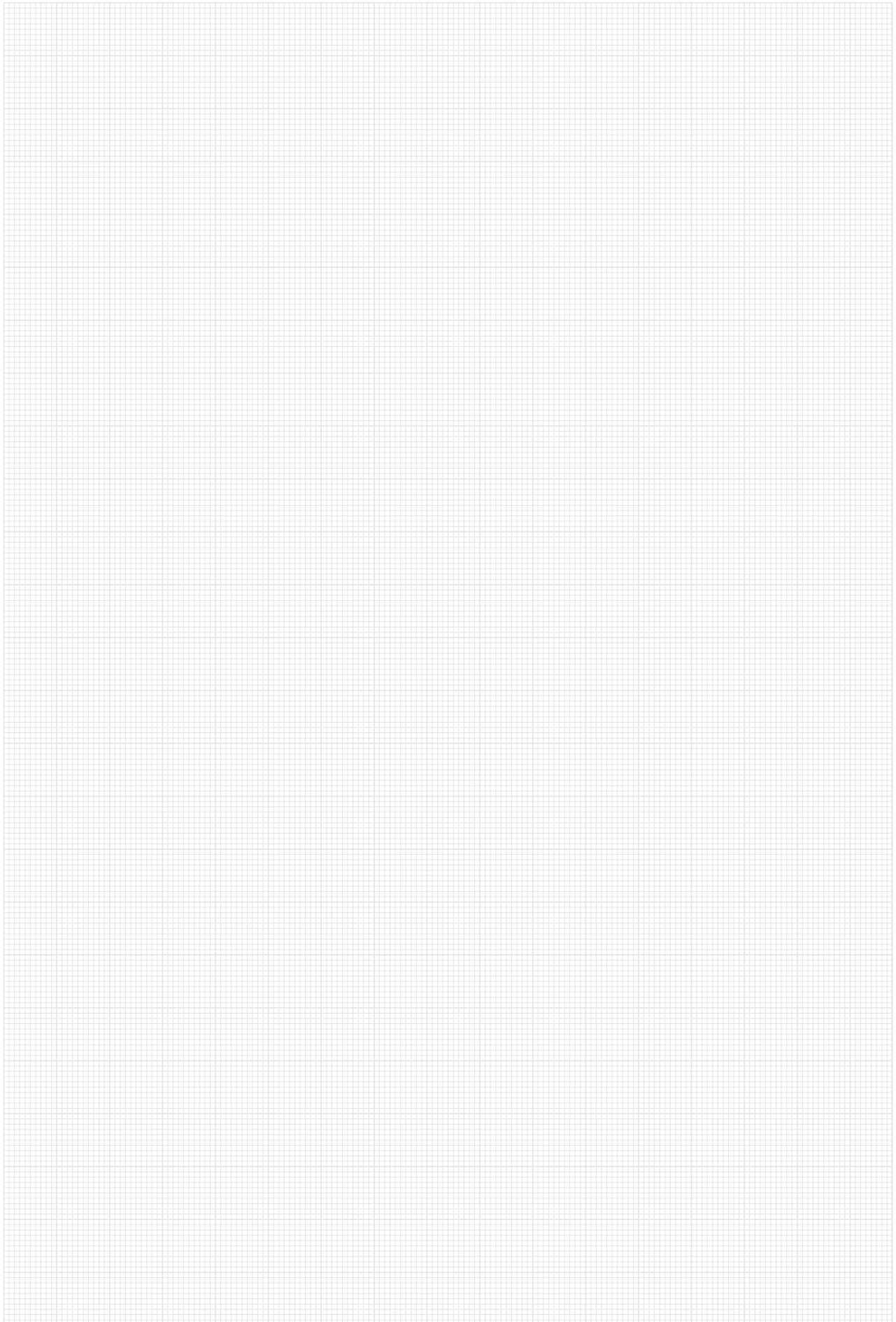
5) Sash stay 500 can be used up to max. SW 900 mm.

6) Sash stay 735 can be used from SW ≥ 800 mm.

7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the SEC flush-encased gearbox with blocking device, see page 237.

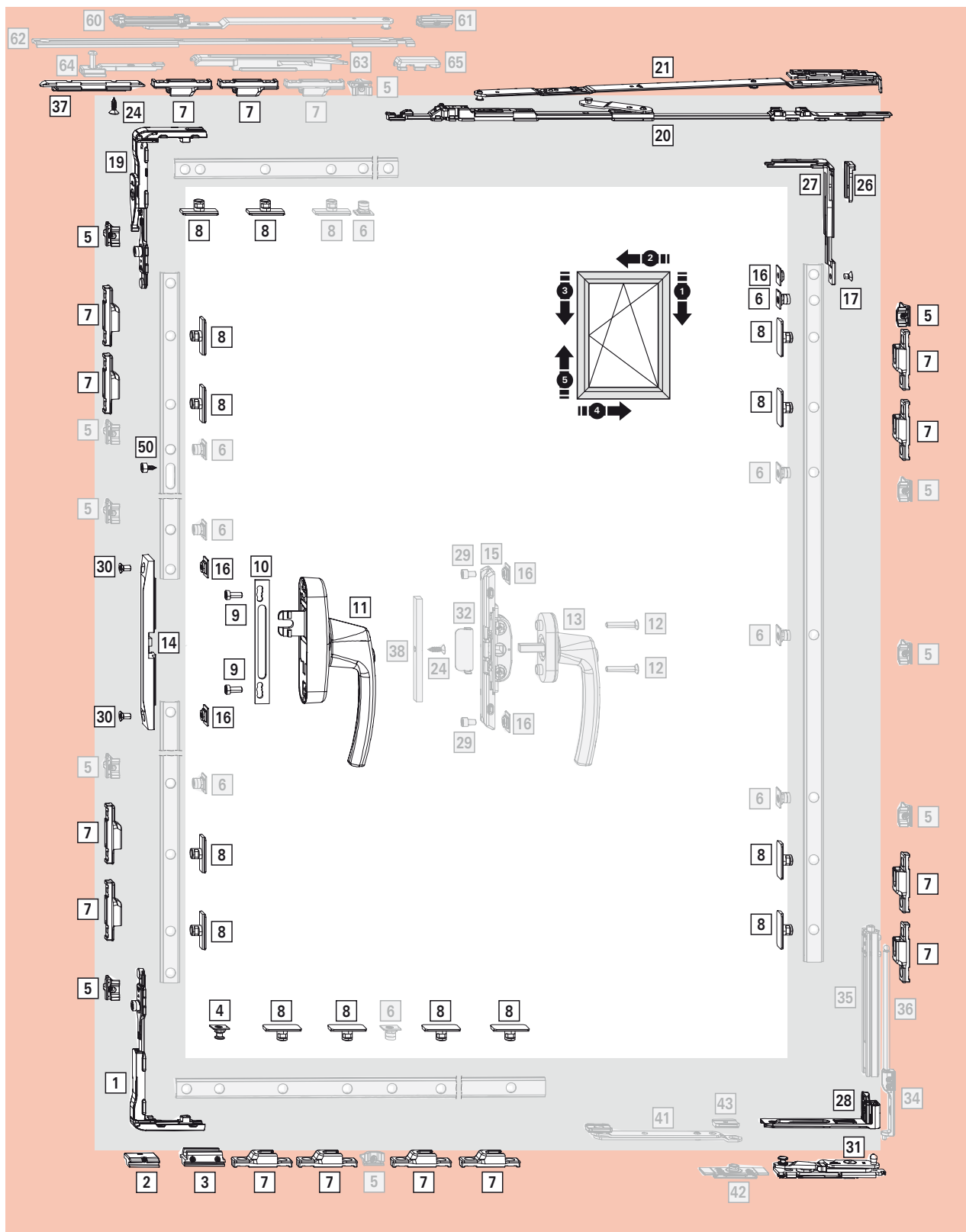
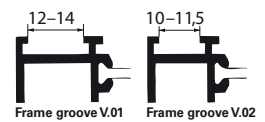
9) Tilt distance restrictor can be used from SH < 800 mm.



TF, TiSs hardware overview

Hardware overview and parts list

TF, TiSs RC3 | 150 kg



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 700–1600 mm ⁴⁾
 Sash height **SH** 870–2700 mm
 Sash weight **S.kg** max. 100/150 kg ¹⁾

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

TF locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	TF locking components V.01	10	728976
		TF locking components V.02	10	728977
		consisting of:		
[2]	1	Run-up wedge V.01/V.02		
[4]	1	TF tilt lock bolt		
[3]	1	TF tilt striker		
[1]	1	Corner drive without MD		
[5]	2	Striker V.01/V.02		
[19]	1	Corner drive with MD ³⁾		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	14	SEC cam RC3, insertable	100	443530
[7]	14	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	2	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

Designed as a Tilt-Only window, handle at the side

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	Espagnolette lock	100	738549

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

TF sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide TF 735 ⁶⁾		10	740839
		Scissor stay guide TF 500 ⁵⁾		10	740837
[21]	1	Sash stay 735 no. 1 ⁶⁾	L	10	624947
			R	10	624946
		Sash stay 735 no. 3 ⁶⁾	L	10	624953
			R	10	624952
		Sash stay 735 no. 4 ⁶⁾	L	10	624959
			R	10	624958
		Sash stay 500 no. 1 ⁵⁾	L	10	624945
			R	10	624944
		Sash stay 500 no. 3 ⁵⁾	L	10	624951
			R	10	624950
		Sash stay 500 no. 4 ⁵⁾	L	10	624957
			R	10	624956



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	TF additional stay arm V.01 ⁴⁾	10	728978
		TF additional stay arm V.02 ⁴⁾	10	728979
		consisting of:		
[60]	1	Additional scissor stay arm, compl. V.01/V.02		
[61]	1	Retaining spring, compl.		
[62]	1	Coupling rod		
[63]	1	Coupler component, compl.		
[64]	1	Scissor stay guide, compl. TF		
[65]	1	TF stop		
	1	Turn restrictor set V.01 ⁷⁾	10	740814
		Turn restrictor set V.02 ⁷⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		

Additional components on the hinge side, weight-dependent | 100–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01 ¹⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ¹⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8 x 16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) S.kg ≥ 100 kg with load transfer 150 kg.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

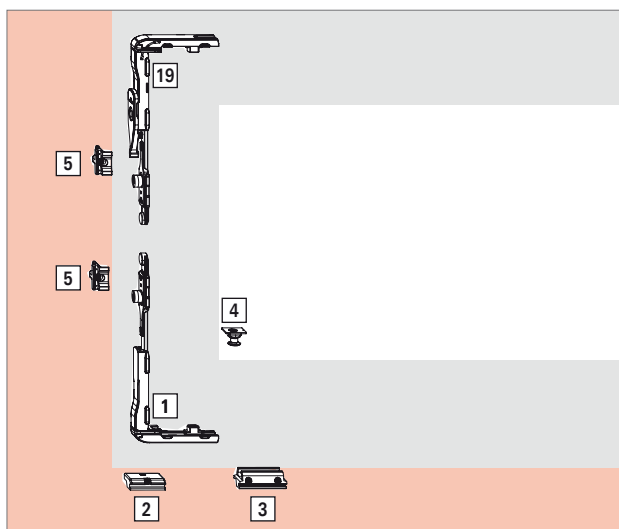
4) An additional stay arm is mandatory from SW > 1300 mm.

5) Sash stay 500 can be used up to max. SW 900 mm.

6) Sash stay 735 can be used from SW ≥ 875 mm.

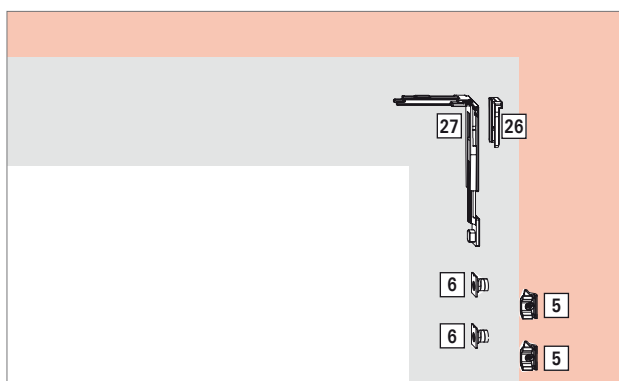
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

8) For the SEC flush-encased gearbox with blocking device, see page 237.



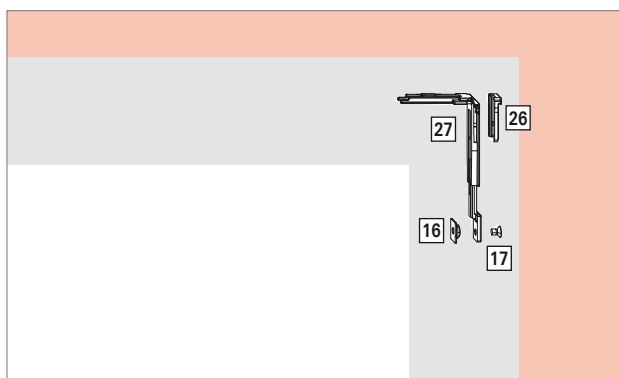
TF locking components

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	Corner drive without MD	50	728844
[2]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[3]	1	TF tilt striker	100	728973
[4]	1	TF tilt lock bolt	100	334757
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[19]	1	Corner drive with MD	50	490173



Corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	2	Insertable cam	100	334671
[26]	1	Retaining fork	100	221772
[27]	1	CL corner drive	20	331013



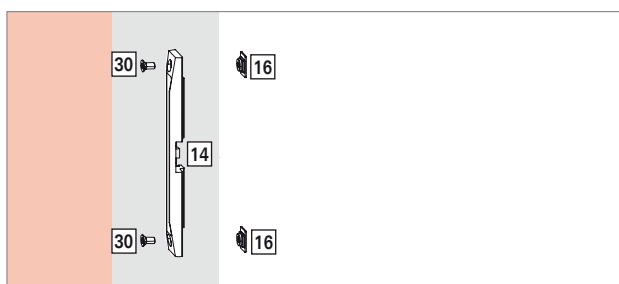
SEC corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[16]	1	SEC connector	100	447113
[17]	1	Countersunk screw M5x7	100	728928
[26]	1	SEC retaining fork	100	212636
[27]	1	SEC corner drive CL	10	334359



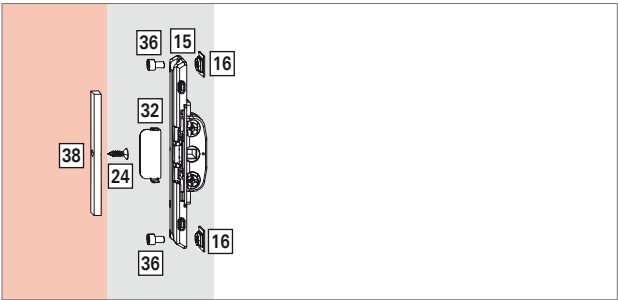
SEC rebate-clearance reduction set

Pos.	Pc(s)	Description	PU	Material no.
[24]	1	Countersunk tapping screw ST4.8x16	100	728932
[37]	1	SEC rebate-clearance reduction CD	50	447112

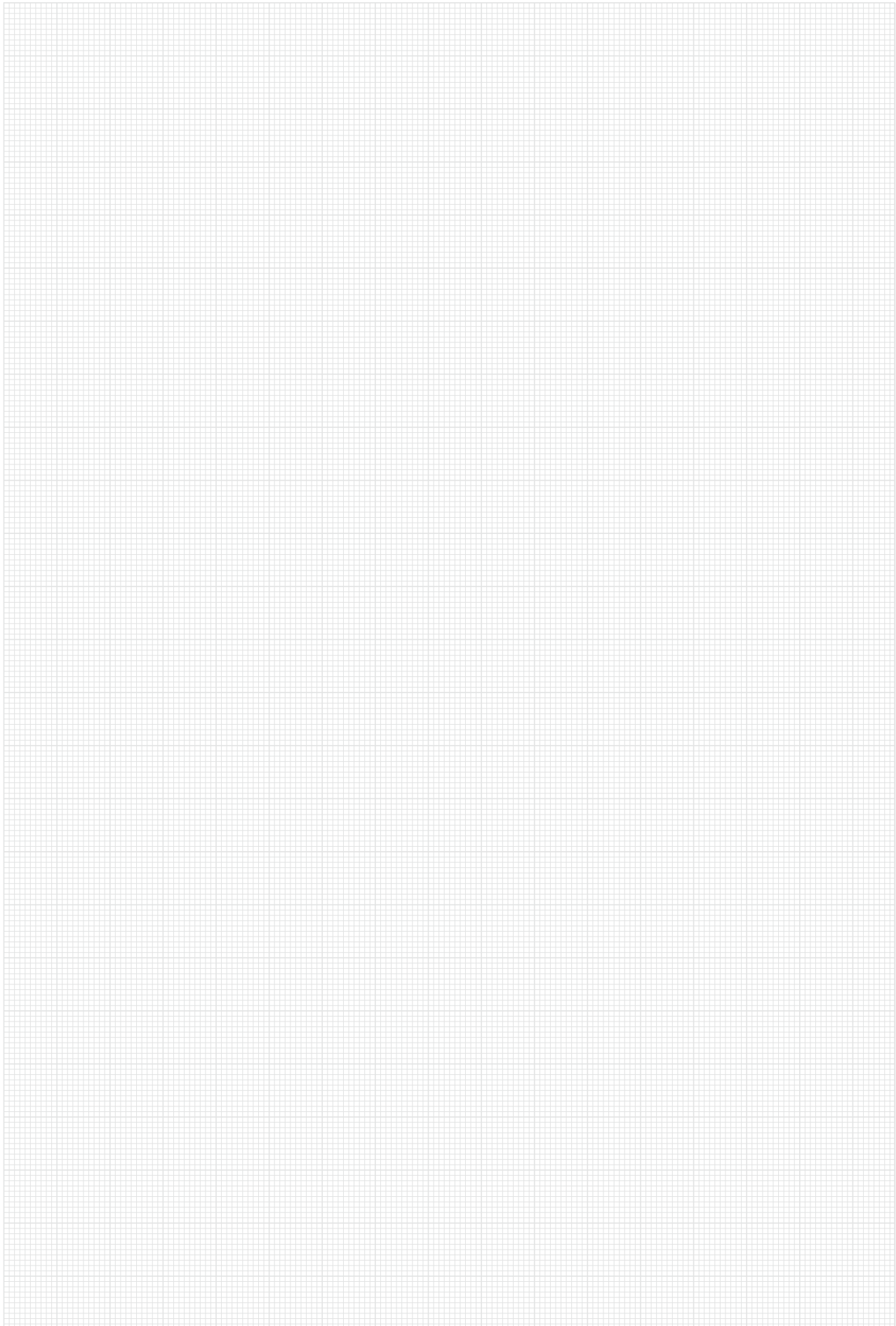


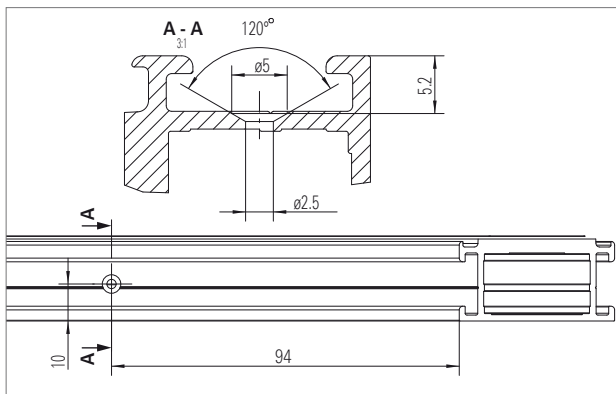
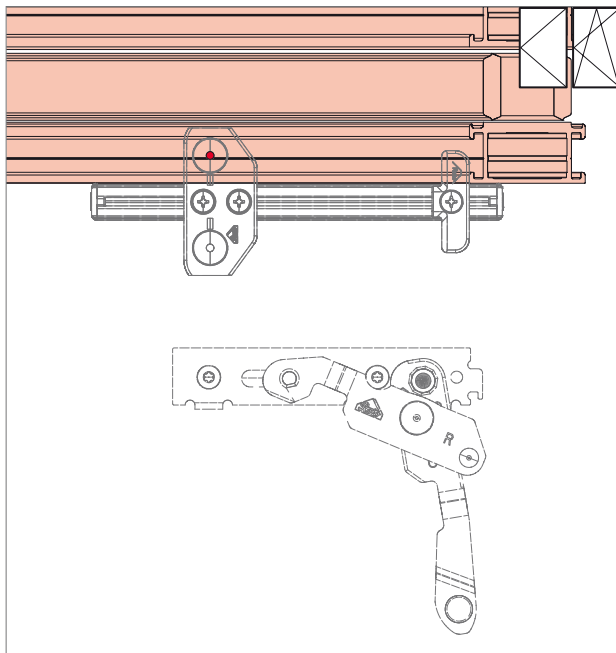
SEC espagnolette protection set

Pos.	Pc(s)	Description	PU	Material no.
[14]	1	SEC espagnolette protection	10	487407
[16]	2	SEC connector	100	447113
[30]	2	Countersunk screw M5x10	100	728926



SEC flush-encased gearbox set				
Pos.	Pc(s)	Description	PU	Material no.
[15]	1	SEC flush-encased gearbox without MD	10	457210
[16]	2	SEC connector	100	447113
[24]	1	Countersunk tapping screw ST4.8x 16	100	728932
[32]	1	SEC anti-drilling protection	10	487406
[36]	2	Cylinder-head screw M5x8	100	728936
[38]	1	SEC rebate-clearance reduction ESP	50	334360





Pivot rest / stay bearing

Jig

628534

1. Place the drilling jig on the frame as shown in the drawing.
2. Drill holes:
1 x Ø 2.5 mm, at least 4 mm deep.



NOTE!

Drill holes if:

- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm)

Alternative (for mechanical production):
Drill the hole according to the drawing.

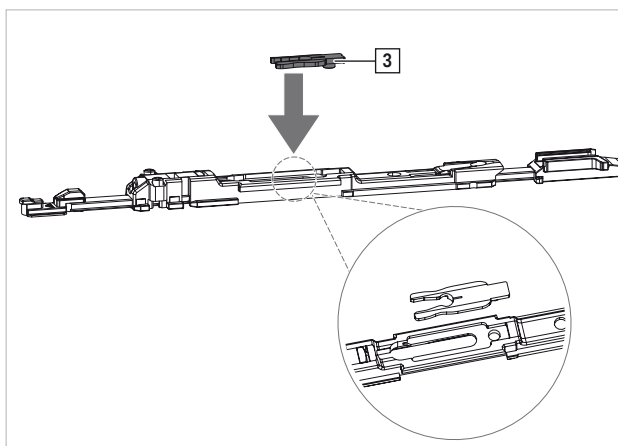
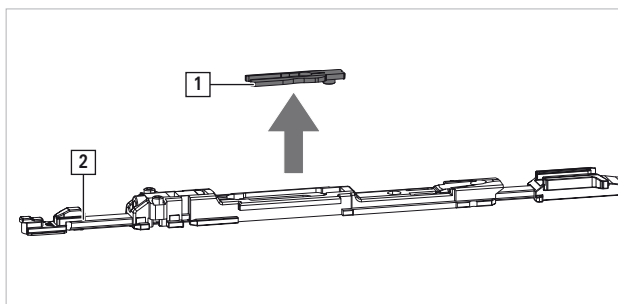
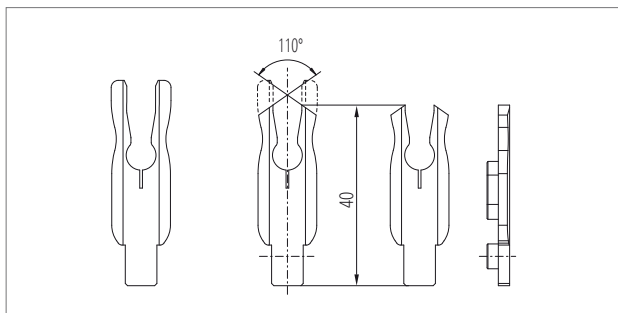


**Preassembling scissor stay guide 500, 735 |
SH < 800 mm**



NOTE!

The installation of scissor stay guide 500 is shown here

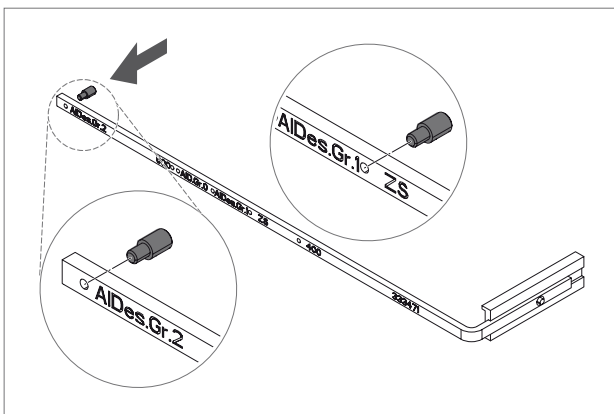
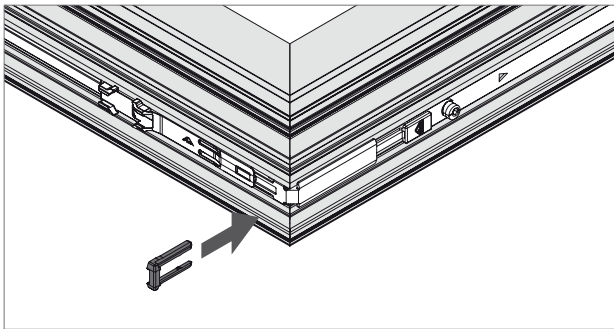
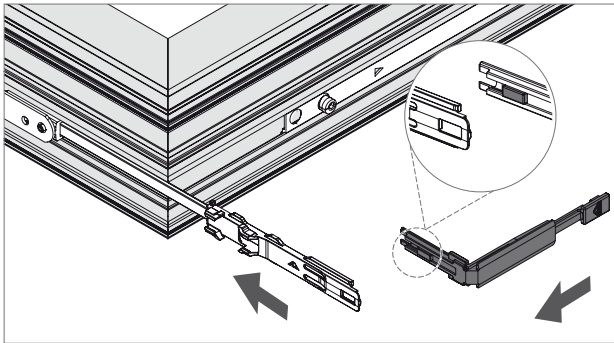


1. For scissor stay guide 735, crop the tilt distance restrictor according to the drawing.
2. Use a tilt distance restrictor for elements with $SH \leq 800$ mm or if a reduced tilt distance is required. To do so, remove preassembled spring clip [1] from the scissor stay guide [2].
3. Insert the tilt distance restrictor [3].



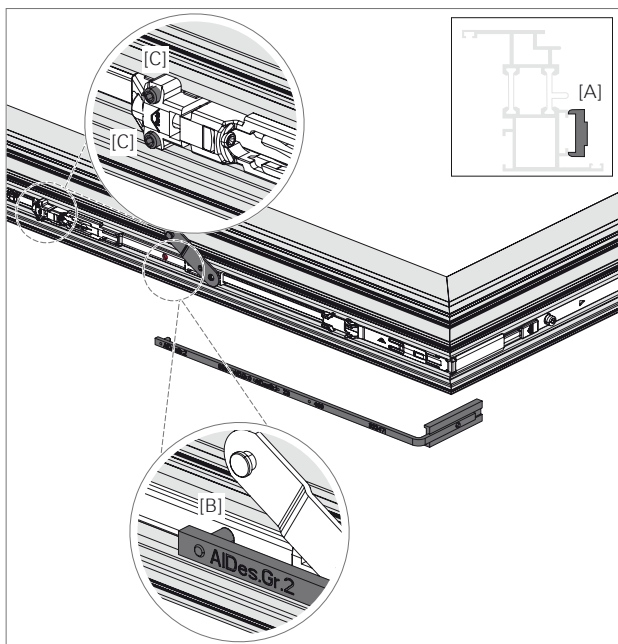
NOTE!

The installation of scissor stay guide 735 is shown here



Installing scissor stay guide 500, 735

1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.
3. Secure the CL corner drive with the retaining fork.
4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).
 Scissor stay guide 500 = AlDes. size 1
 Scissor stay guide 735 = AlDes. size 2

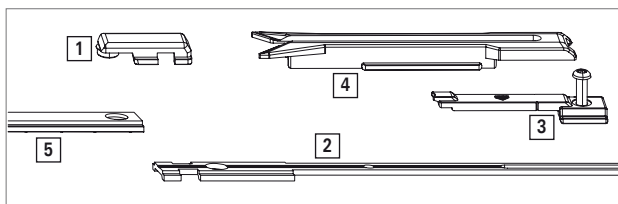


5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

Fix the scissor stay guide in position with 2 piercing screws [C].

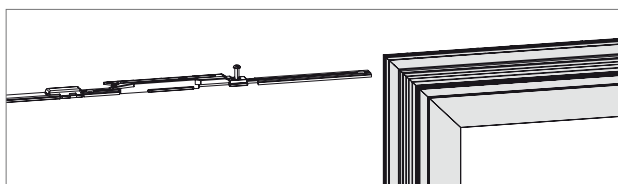
Tool: T 10 hex key

Torque max. 2.5 Nm

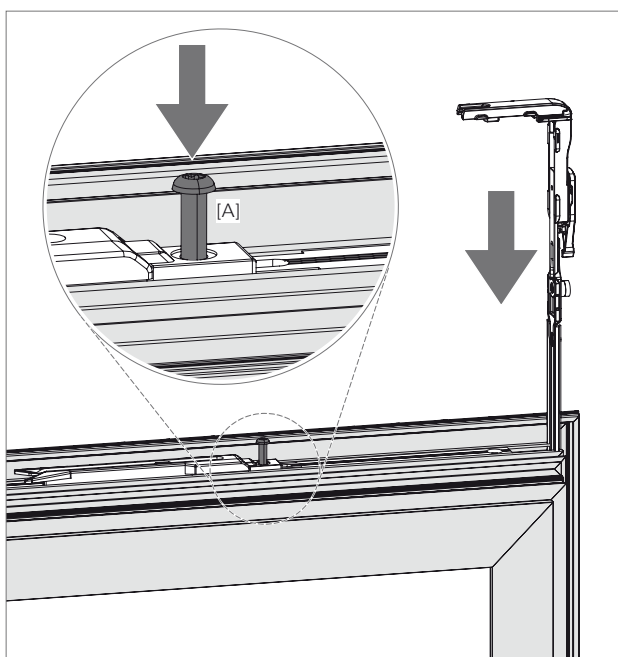


Installing the additional stay arm sash components

1. Connect the coupler component [1] to the coupling rod [2]. Insert the stop [3] into the scissor stay guide [4] as shown and place the entire assembly on the coupling rod. Connect the additional stay arm sash components to connecting rod CR3 [5].



2. Insert the sash components into the sash profile at the top, starting from the hinge side.

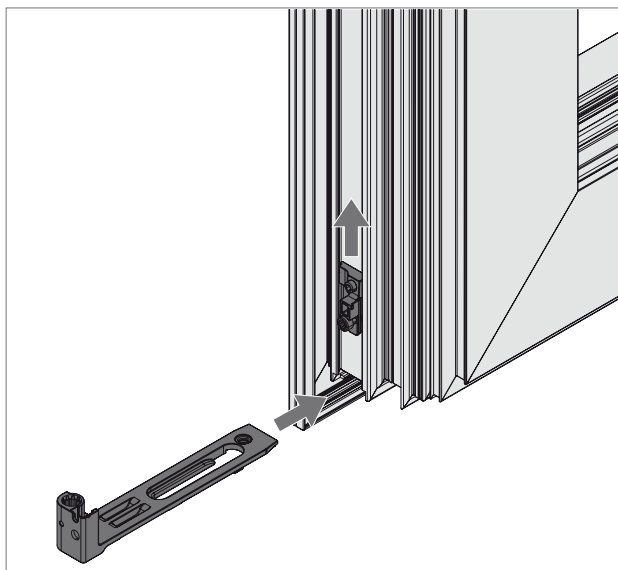


3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

4. Screw down the stop at the predrilled position with the screw [A].

Tool: T 25 hex key

Torque: max. 2.5 Nm



Installing the corner hinge

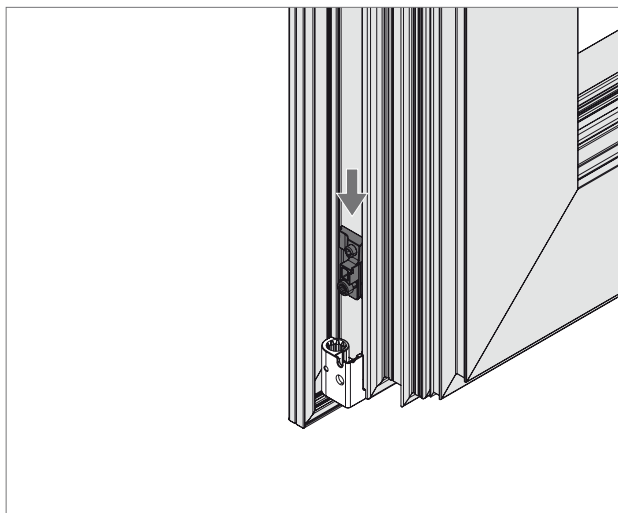
1. Insert the adjustment piece into the connecting rod groove.



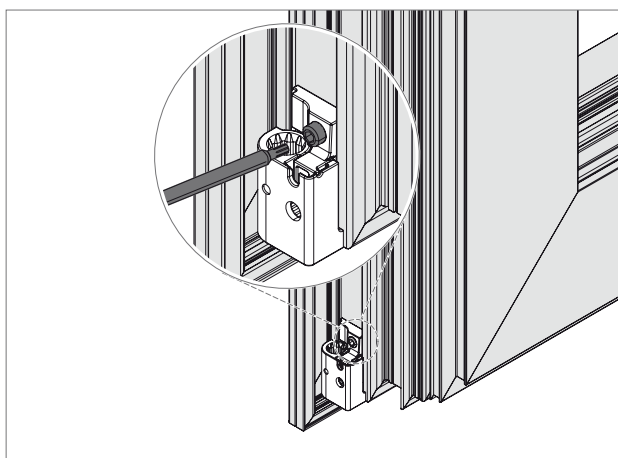
NOTE!

The 180 kg adjustment piece does not feature lateral adjustment.

2. Insert the corner hinge into the connecting rod groove.



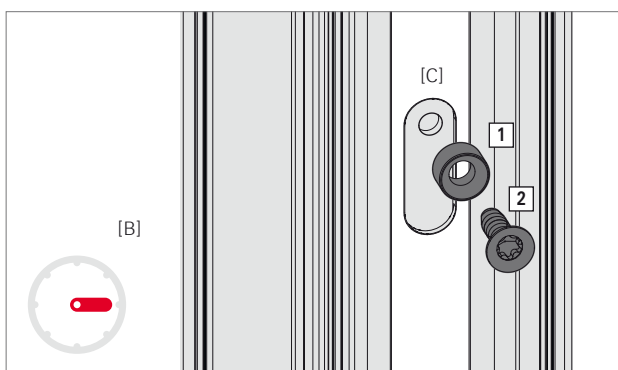
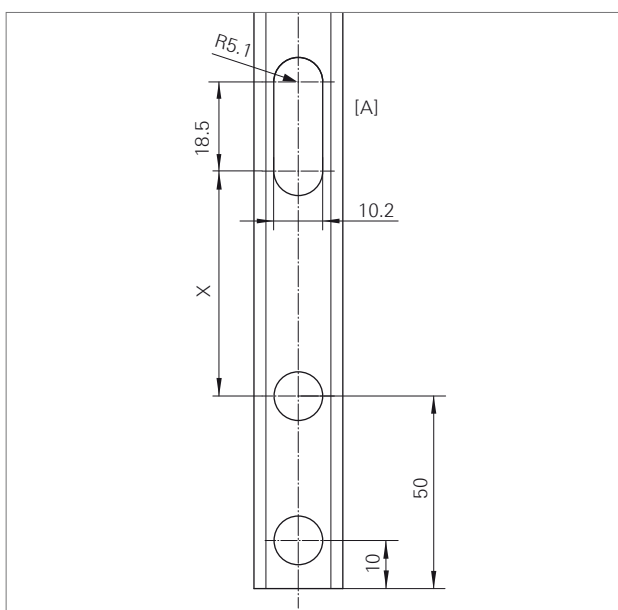
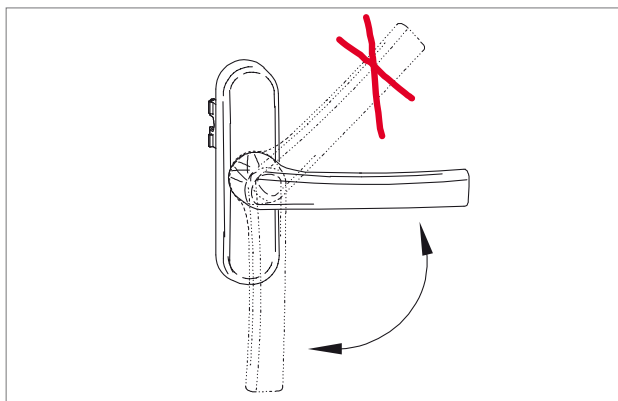
3. Push the adjustment piece into the corner hinge.



4. Screw in the threaded pin.

Tool: T 10 hex key

Torque: ≥ 2.5 Nm



Installing the espagnolette lock

Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

1. Produce the slot in connecting rod CR2 before installation, as shown in the drawing opposite [A].



NOTE!

X = freely positionable (suggestion: 60 mm)

2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill holes:

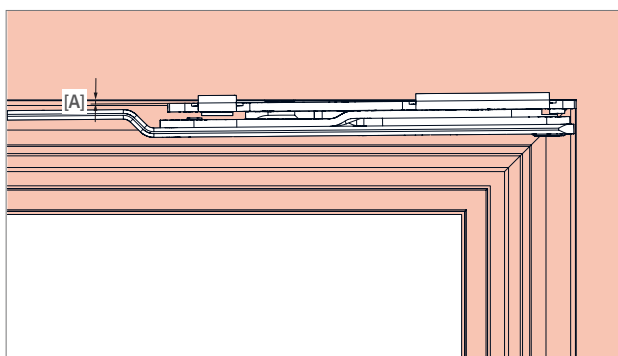
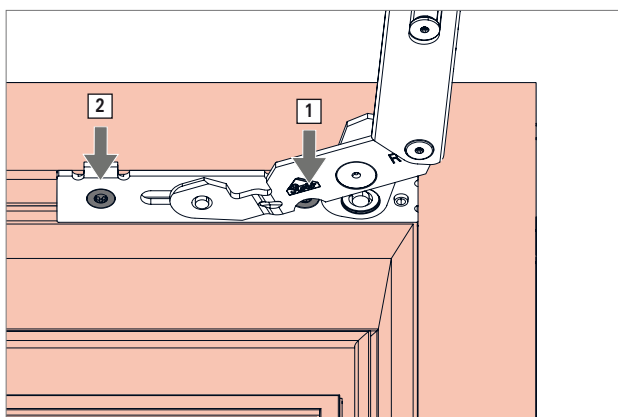
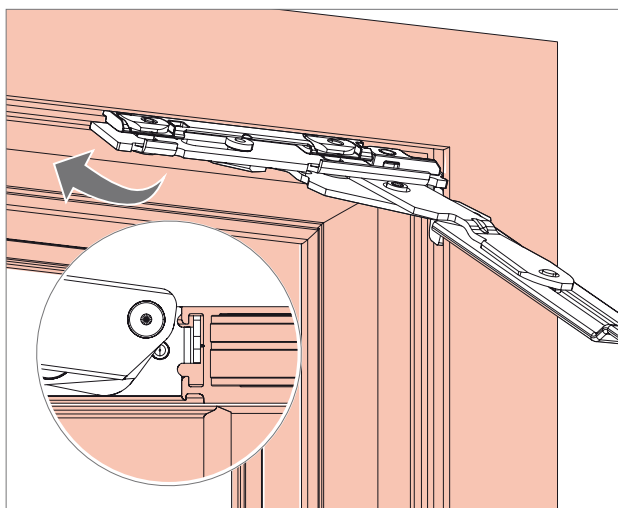
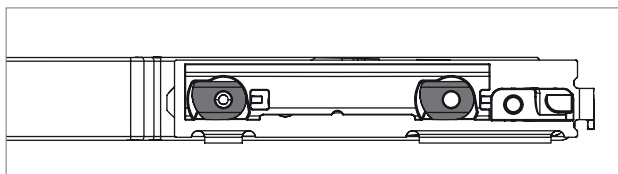
1 x Ø 3.5 mm, at least 4 mm deep.

3. Screw down the locking sleeve [1] with the screw [2].
Tool: T 25 hex key



NOTE!

TiSs: only screw down the locking sleeve with the screw after the sash stay has been mounted.



Installing sash stay 500, 735

1. Align the clamping blocks.



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Swing the support into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the sash stay is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

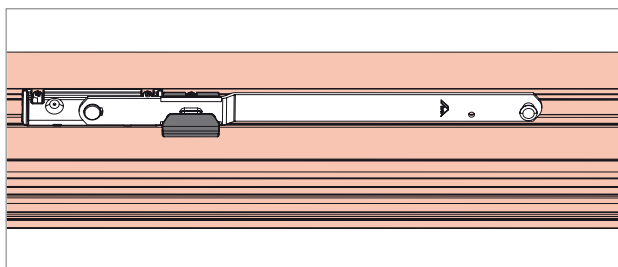
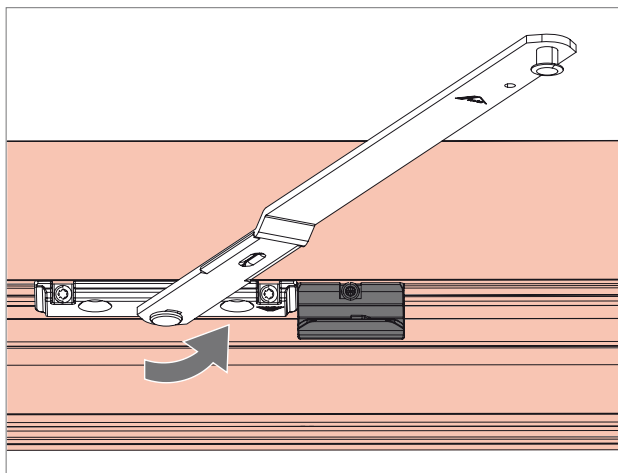
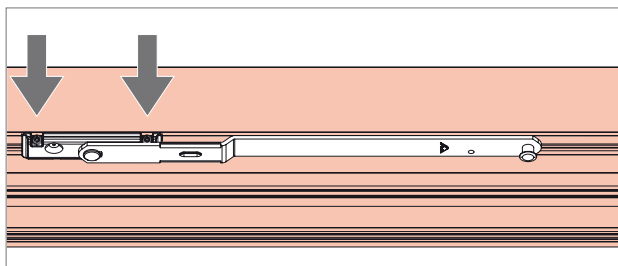
- Depending on the strength of the profile, or with a base groove thickness >2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.



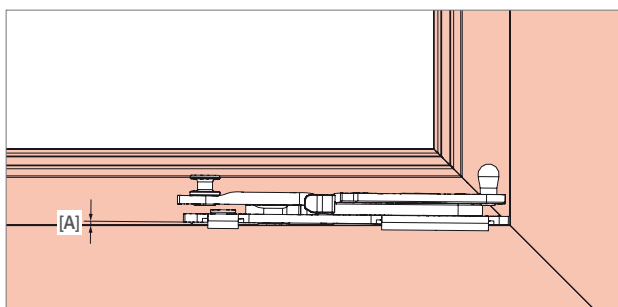
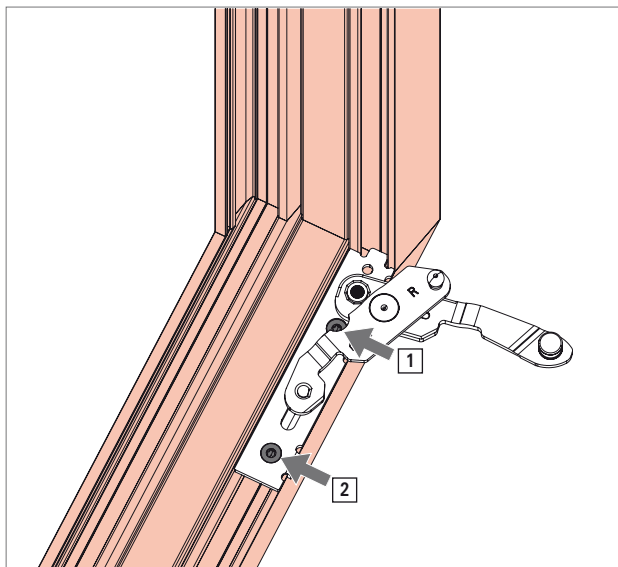
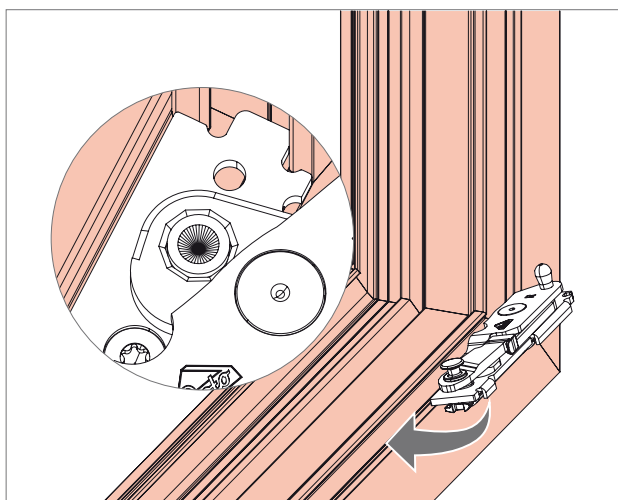
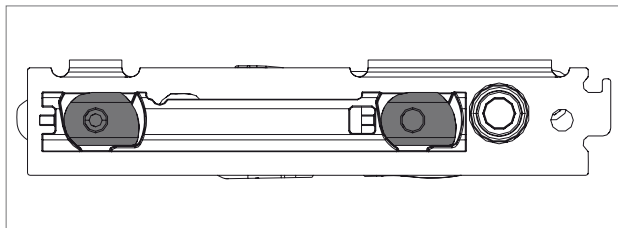
NOTE!

Do not leave a gap between the baseplate and profile [A].

4. Close the support.

**Installing the additional stay arm frame components**

1. Swing the additional scissor stay arm, compl., into the frame at the specified position (see installation drawing).
2. Tighten the support with the preinstalled threaded pins.
Tool: T 10 hex key
Torque: max. 2.5 Nm
3. Open the additional scissor stay arm and position the retaining spring next to the support. Tighten with the preinstalled threaded pin.
Tool: T 10 hex key
Torque: max. 2.5 Nm
4. Clip the additional scissor stay arm into the retaining spring.

**Installing the pivot rest**

1. Align the clamping blocks (see image).

**NOTE!**

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Swing the support into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the support is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm

**NOTE!**

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the support a maximum of two times.

**NOTE!**

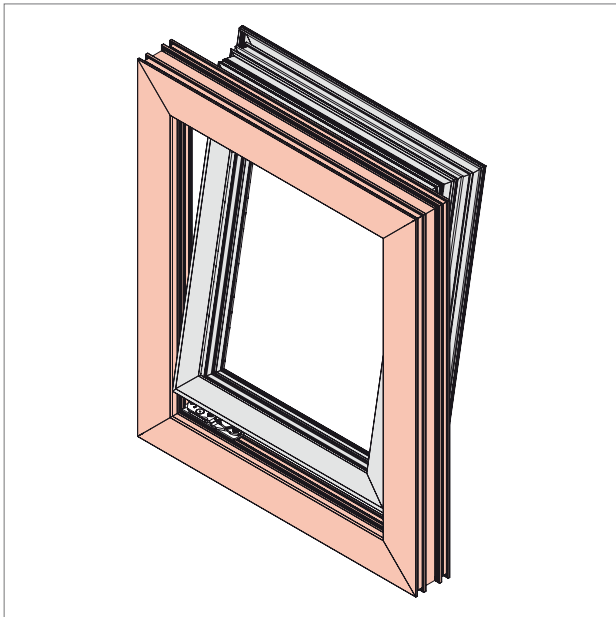
Do not leave a gap between the baseplate and profile [A].

4. Close the support.

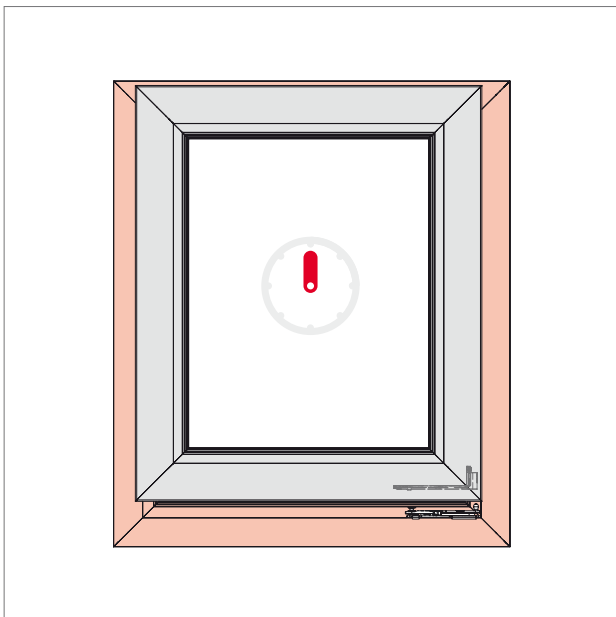


Connecting the pivot rest to the corner hinge

1. Move the pivot rest and stay bearing to the initial position (= closed sash position).



2. Move the handle to the turn position.



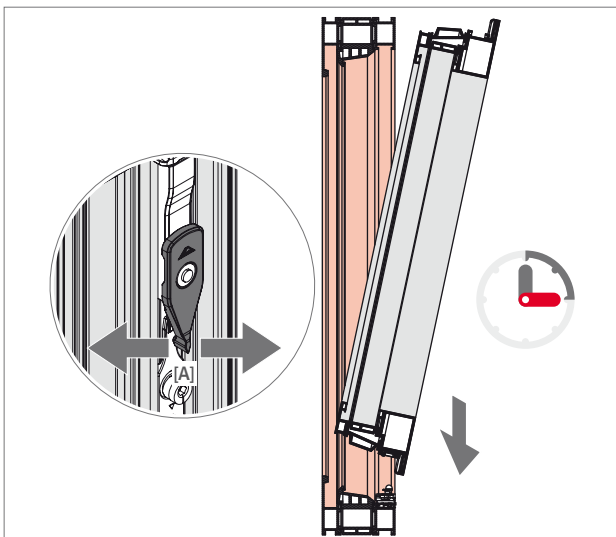
3. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the corner hinge engage in the pivot rest.

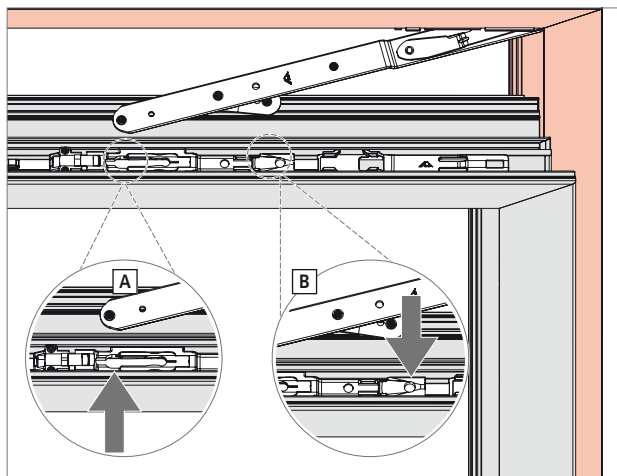
4. Secure the sash to prevent it from falling.

5. Open the sash approximately 10°.

6. Push the mishandling device [A].

Move the handle to the tilt position.
(Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.)

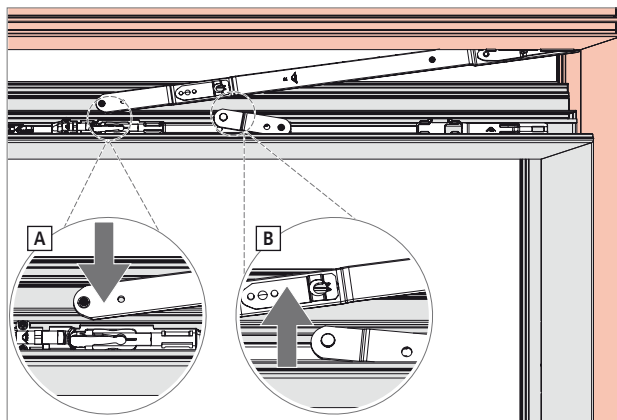


**Mounting sash stay 500, 735**

1. Mounting sequence for sash stay 500 (handle in tilt position and sash opened approximately 10°).

A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting").

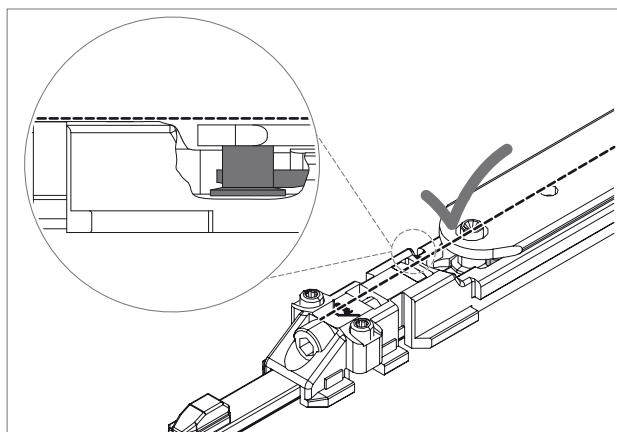
B = Mount the tab in the hole in the scissor stay guide.



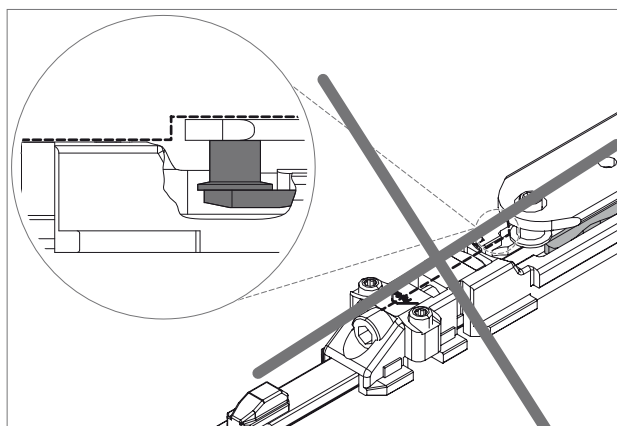
Mounting sequence for sash stay 735 (handle in tilt position and sash opened approximately 10°).

A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting").

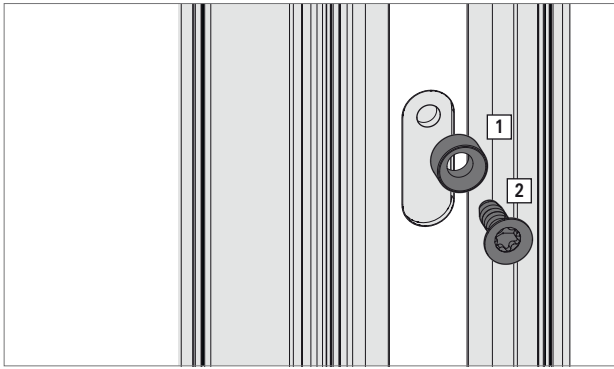
B = Mount the tab in the sash stay rod (keyhole).

**Correct mounting**

No projection from the sash stay to the scissor stay guide.

**Incorrect mounting**

Projection from the sash stay to the scissor stay guide is not permissible.



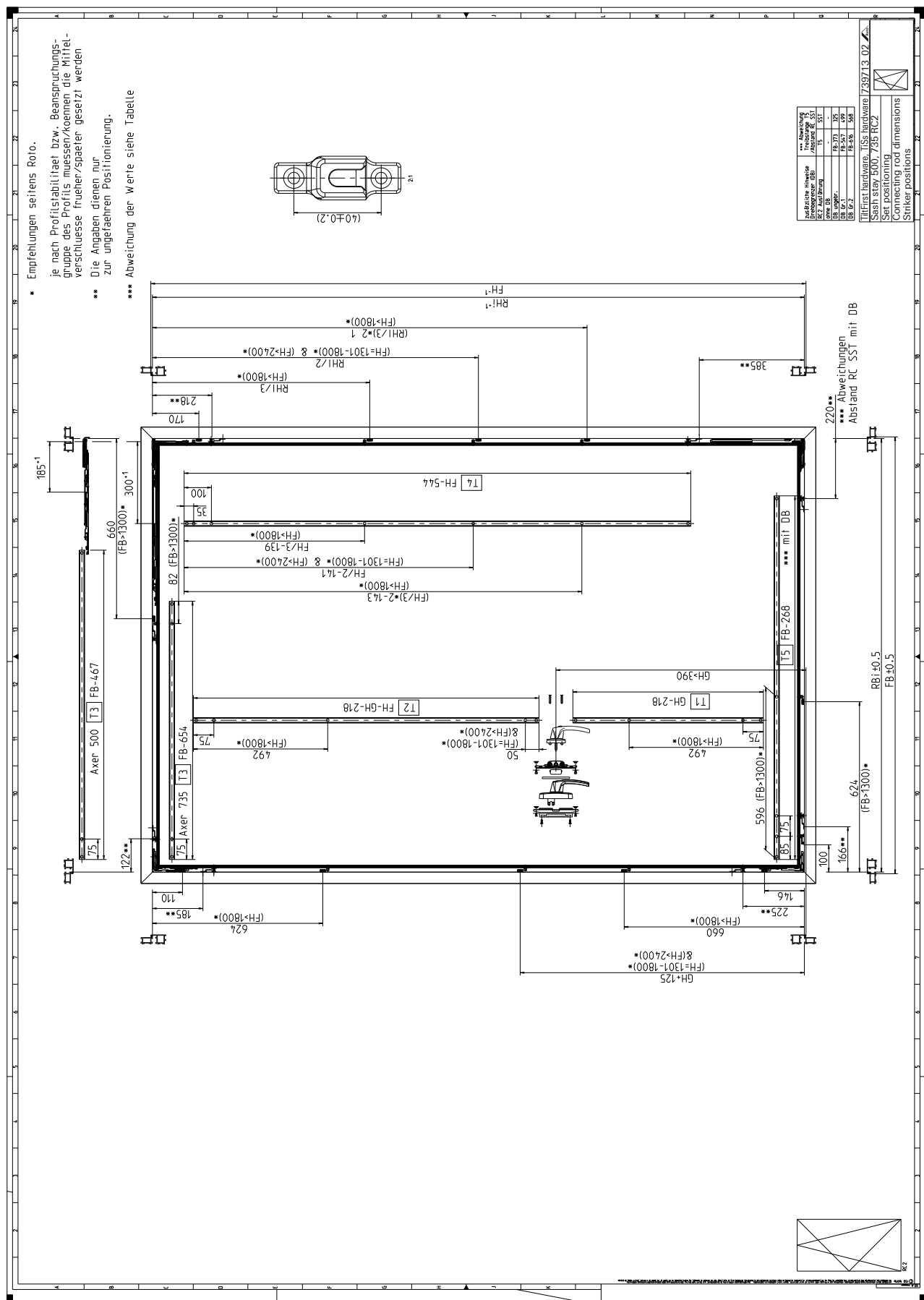
- 2.** TiSs: screw down the locking sleeve [1] with the screw [2].

Tool: T 25 hex key

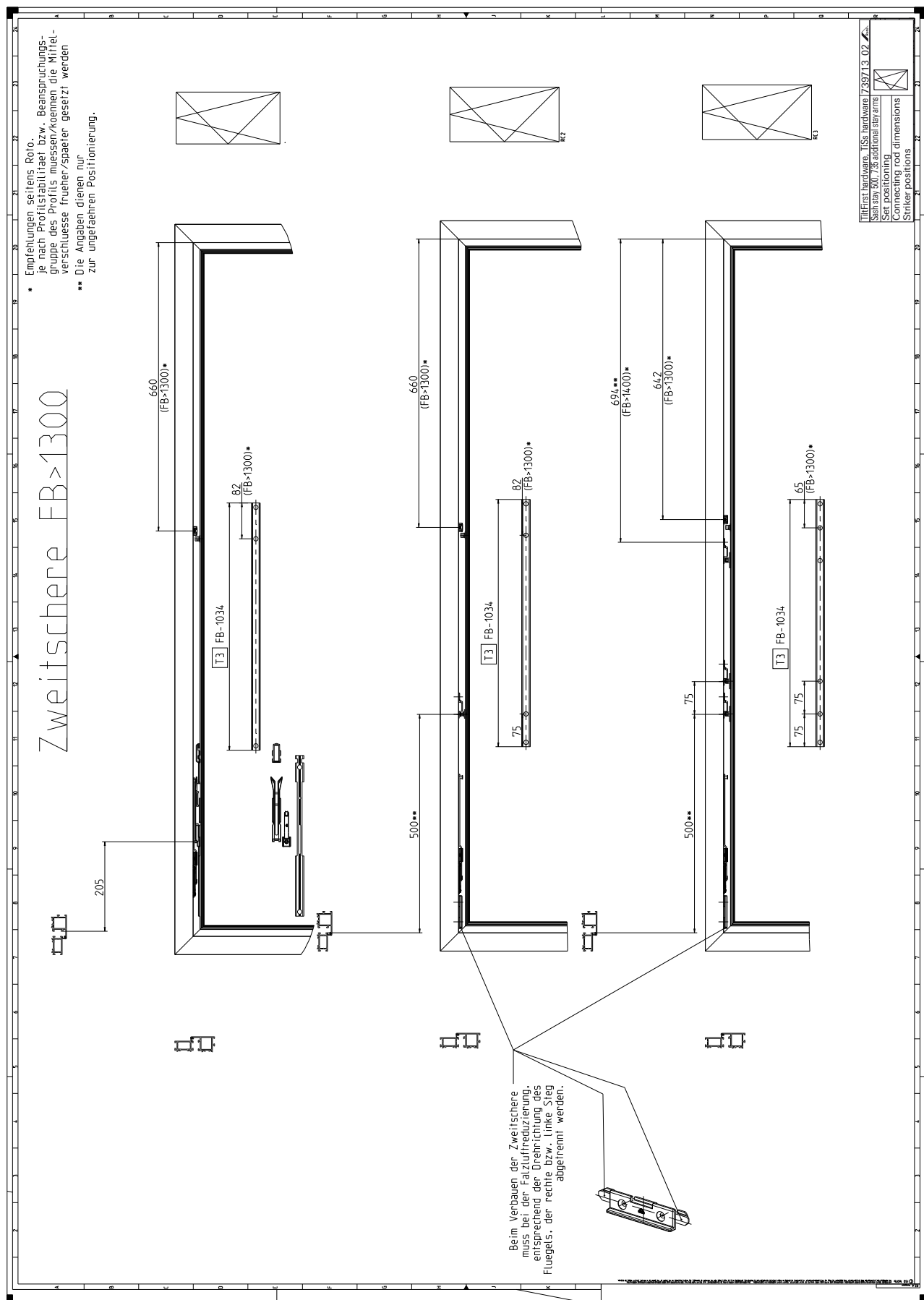
Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Abweichung Abstand RC SST mit DB	Deviation from distance RC ST with TR
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5 / Abstand RC SST	Deviation from connecting rod CR5 / distance RC ST
Axer	Sash stay
Beim Verbauen der Zweitschere muss bei der Falzluftrreduzierung entsprechend der Drehrichtung des Flügels der rechte bzw. linke Steg abgetrennt werden.	When fitting the additional stay arm, the right or left strut must be detached for rebate-clearance reduction depending on the direction of rotation of the sash.
DB Gr. 1	TR size 1
DB Gr. 2	TR size 2
DB ungebr.	TR, unbraked
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto. Je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse früher/später gesetzt werden	Recommendations from Roto. Depending on the profile stability or profile loading group, the centre locks must/can be put in place at an earlier/later point
FB	SW
FH	SH
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise stated
GH	HH
mit DB	With TR
ohne DB	Without TR
RBi	FWi
RC2 Ausführung	RC2 version
RHi	FHi
SST	ST
T	CR
Zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)

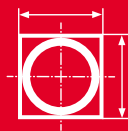
Clearance dimensions and positioning

TF, TiSs RC2 | 150 kg







**Note!**

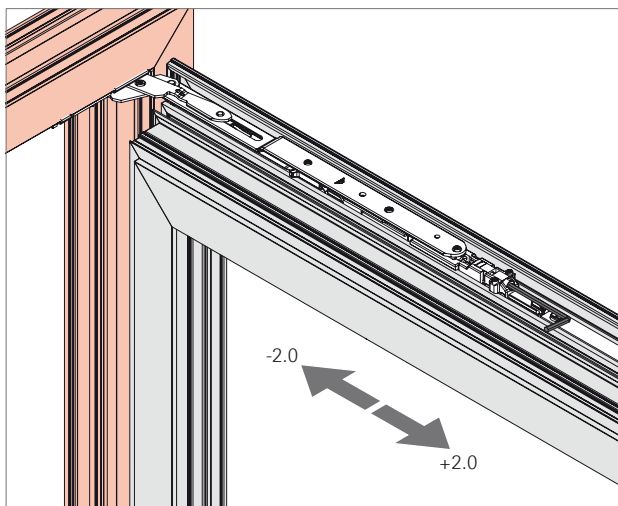
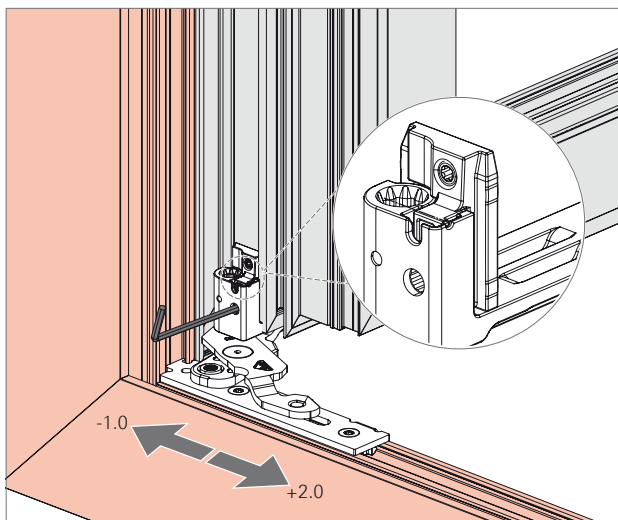
Roto hardware components may only be adjusted by authorised professionals.

Lateral adjustment**Corner hinge**

1. Open the window sash 90°.
2. Lateral adjustment -1 mm/+2 mm using hex key size 4.

**NOTE!**

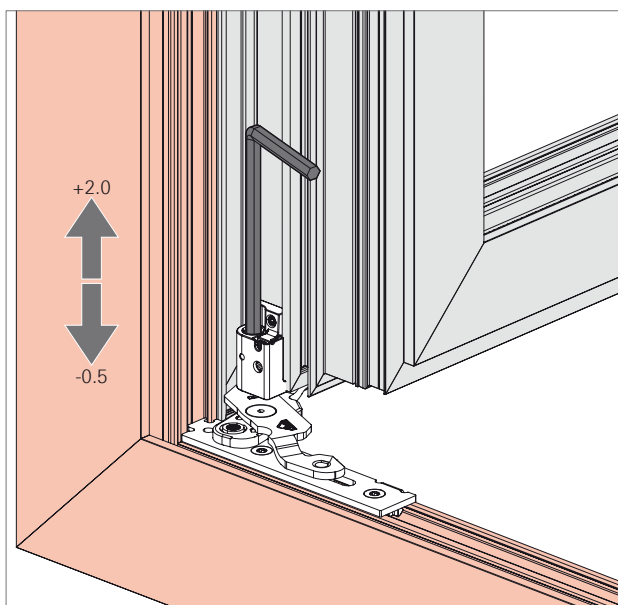
Control the lateral adjustment via the axis on the adjustment piece.

**Sash stay 500, 735**

1. Open the window sash 90°.
2. Lateral adjustment ± 2 mm using hex key size 4.

Height adjustment

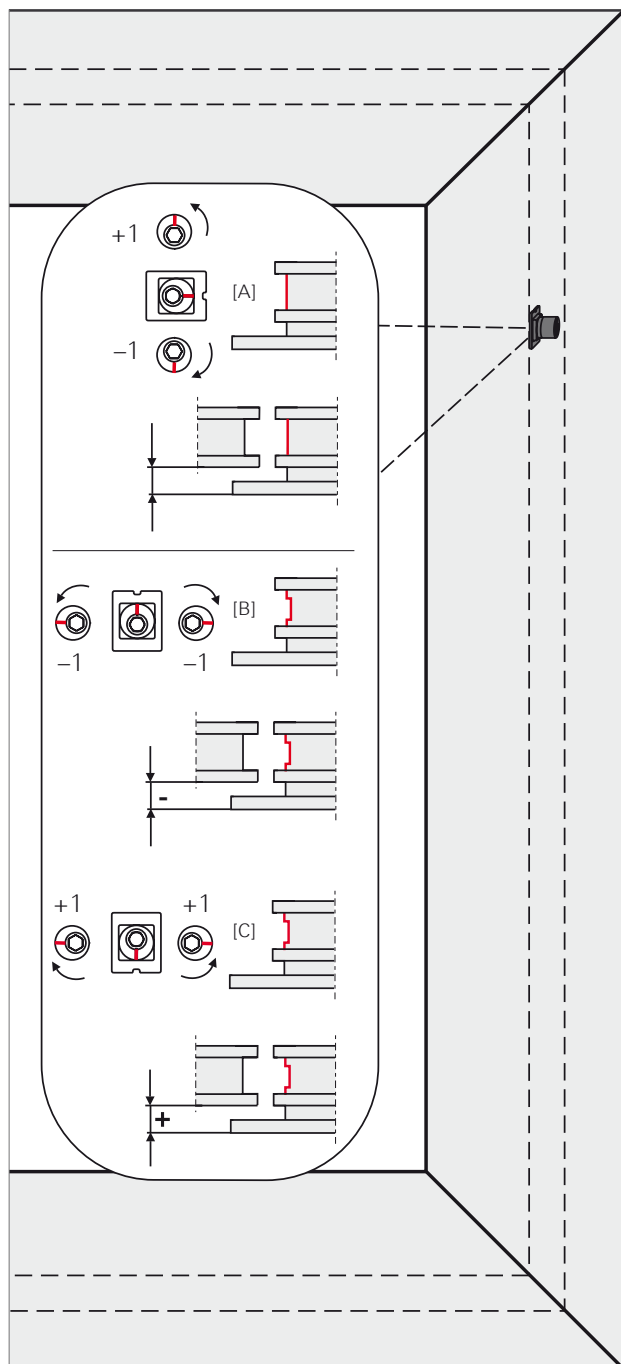
1. Open the window sash 90°.
2. Height adjustment +2 mm/-0.5 mm via screw in the adjustment piece using hex key size 4.





Note!

Roto hardware components may only be adjusted by authorised professionals.



Strikers

Adjust the gasket compression using hex key size 4, depending on the installation situation.

[A] The gasket compression can be increased or reduced.

[B] The gasket compression can be increased only.

[C] The gasket compression can be reduced only.

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TuS adjustment

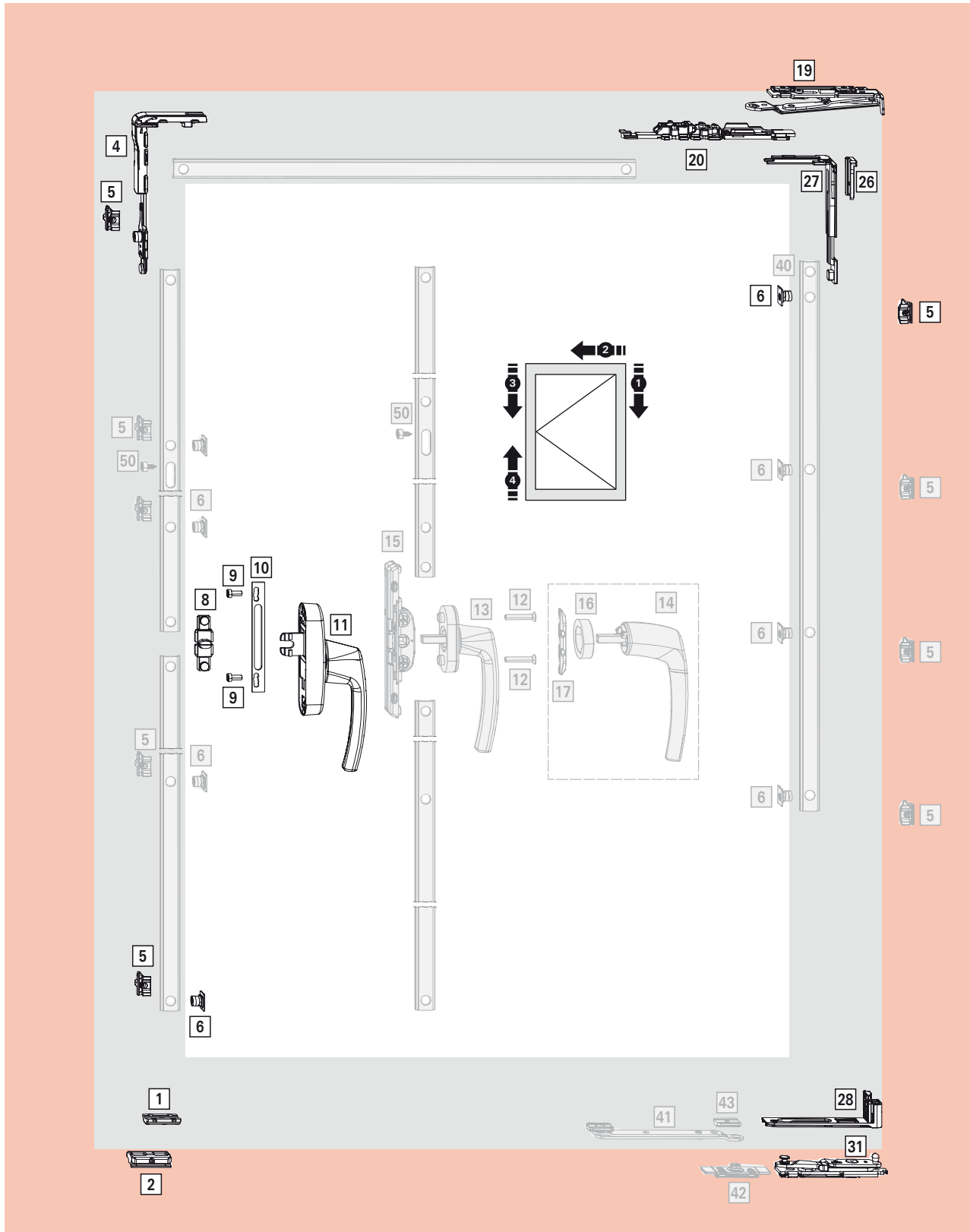
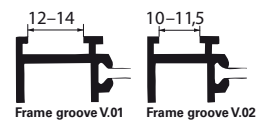
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Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

SW SH	250 – 1300		1301 – 1600
520 – 1300	Pc(s) Description Material no.		Pc(s) Description Material no.
	1 TuS locking components V.01 728756		1 TuS-H locking components V.01 728743
	TuS locking components V.02 728757		TuS-H locking components V.02 728744
	1 Espagnolette and connector var.		1 Espagnolette and connector var.
	1 Rebate sash stay var.		1 CR5.2 SW 1301 – 1600 AL 739375
	1 Rebate stay hinge 740811		1 Rebate sash stay var.
	1 Corner hinge L 739700		1 Rebate stay hinge 740811
	Corner hinge R 739699		1 Pivot rest var.
1 Pivot rest var.		1 Corner hinge L 739700	
		Corner hinge R 739699	
		1 Roto Clip 331288	
1301 – 1800		1 CL central set V.02 740814	
		CL central set V.02 740835	
		1 Insertable cam 334671	
		1 Striker V.01 728918	
		Striker V.02 728920	
1801 – 2400		1 CL central set V.02 740814	
		CL central set V.02 740835	
		1 Insertable cam 334671	
		1 Striker V.01 728918	
		Striker V.02 728920	
2401 – 2700		1 CL central set V.02 740814	
		CL central set V.02 740835	
		1 Insertable cam 334671	
		1 Striker V.01 728918	
		Striker V.02 728920	

SW SH	250-1300		1301-1600
520-1300			
1301-1800			
1801-2400			
2401-2700			



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 300–900 mm
 Sash height **SH** 555–2700 mm
 Sash weight **S.kg** max. 80 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side				
Pos.	Pc(s)	Description	PU	Material no.
	1	TuS locking components, coupleable, V.01	10	740848
		TuS locking components, coupleable, V.02	10	740849
		consisting of:		
[1]	1	Run-up block		
[2]	1	Tilt striker		
[5]	2	Striker V.01/V.02		
[6]	1	Insertable cam		
[4]	1	Corner drive without MD		
	1	Retaining fork (not shown)		

Additionally required locking components				
Pos.	Pc(s)	Description	PU	Material no.
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Rebate sash stay					
Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Rebate sash stay set, coupleable, no. 1	L	10	740843
		Rebate sash stay set, coupleable, no. 3	R	10	740840
		Rebate sash stay set, coupleable, no. 4	L	10	740844
			R	10	740841
			L	10	740845
			R	10	740842
		consisting of:			
[20]		Rebate stay hinge, coupleable			
[19]		Rebate sash stay, coupleable, L/R			
[28]		Corner hinge incl. adjustment piece, L/R			
[31]		Pivot rest L/R			

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5x12		

Optional

Additional components, size-dependent				
Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
[40]	1	CR4 SH 520–1300 (not shown)	10	781770
		CR4.1 SH 1301–1800 (not shown)	10	781771
		CR4.2 SH 1801–2400 AL (not shown)	10	781772
		CR4.3 SH 2401–2700 AL	10	781773
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
[50]	1	Espagnolette lock	100	738549

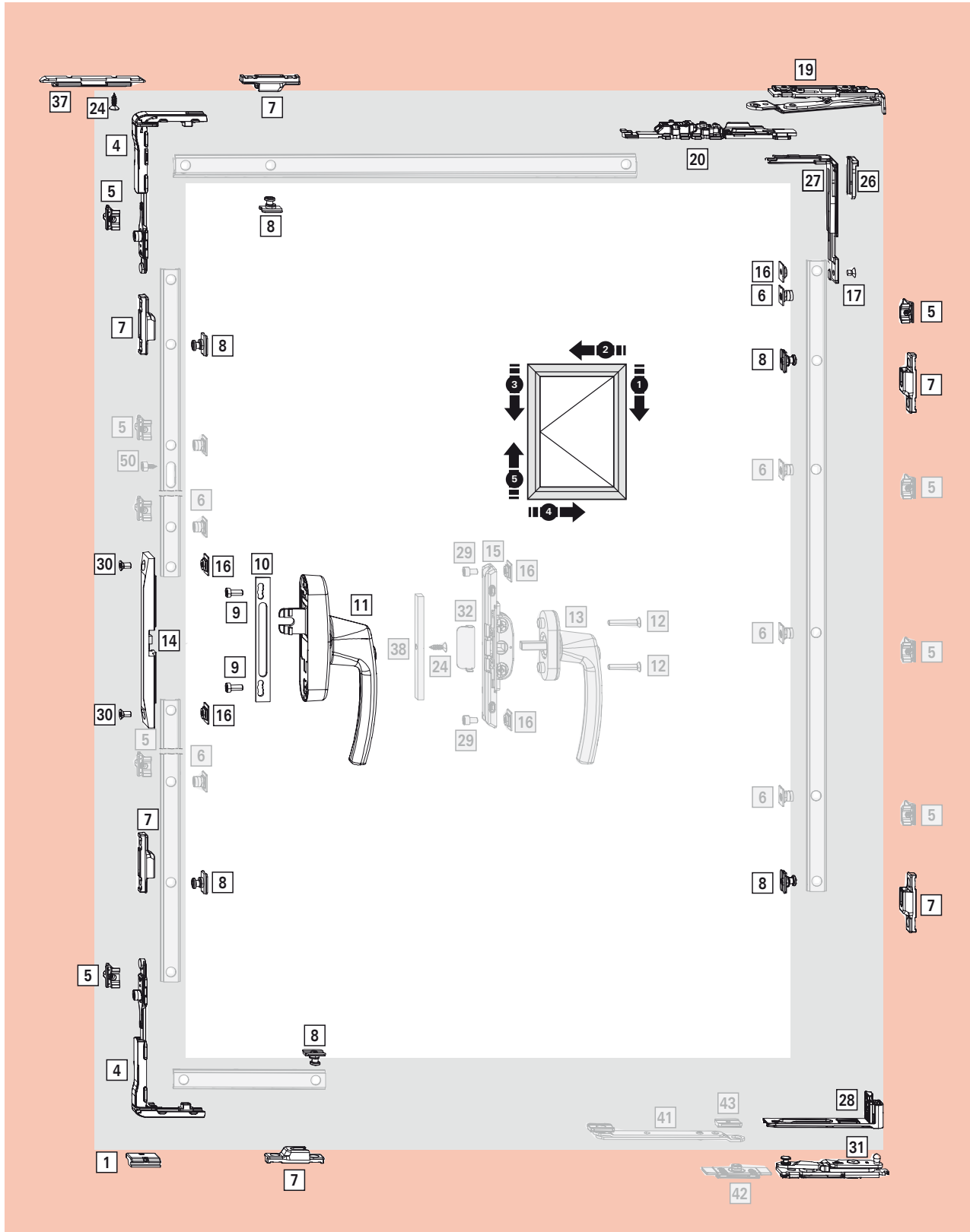
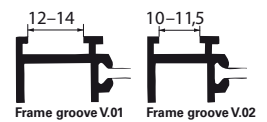
Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ³⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[14]	1	Handle without escutcheon		→ CTL 1
[16]	1	Ring for handle without escutcheon ²⁾		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ³⁾	10	378338

1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

3) For the flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 370–900 mm
 Sash height **SH** 720–2700 mm
 Sash weight **S.kg** max. 80 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side				
Pos.	Pc(s)	Description	PU	Material no.
	1	TuS locking components, coupleable, V.01	10	740848
		TuS locking components, coupleable, V.02	10	740849
		consisting of:		
[1]	1	Run-up block		
	1	Tilt striker (not used)		
[5]	2	Striker V.01/V.02		
[6]	1	Insertable cam		
[4]	1	Corner drive without MD		
	1	Retaining fork (not shown)		

Additionally required locking components				
Pos.	Pc(s)	Description	PU	Material no.
[8]	6	SEC cam, insertable	100	447245
[7]	6	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		
[4]	1	Corner drive without MD	50	728844

Rebate sash stay					
Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Rebate sash stay set, coupleable, no. 1	L	10	740843
			R	10	740840
		Rebate sash stay set, coupleable, no. 3	L	10	740844
			R	10	740841
		Rebate sash stay set, coupleable, no. 4	L	10	740845
			R	10	740842
		consisting of:			
[20]		Rebate stay hinge, coupleable			
[19]		Rebate sash stay, coupleable, L/R			
[28]		Corner hinge incl. adjustment piece, L/R			
[31]		Pivot rest L/R			

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

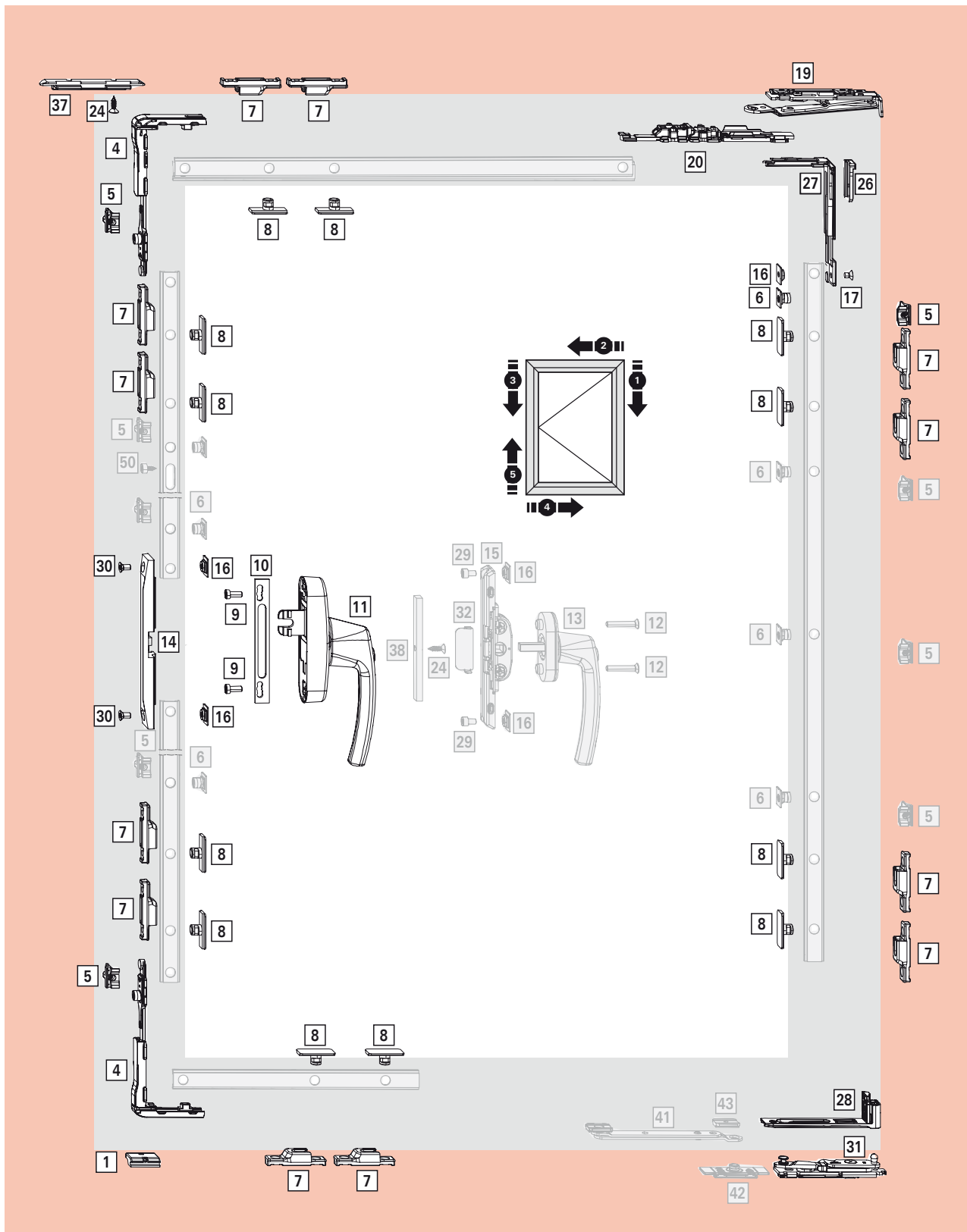
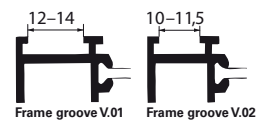
Additional components, size-dependent				
Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
[50]	1	Espagnolette lock	100	738549

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ²⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) For the SEC flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 485–900 mm
 Sash height **SH** 870–2700 mm
 Sash weight **S.kg** max. 80 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side				
Pos.	Pc(s)	Description	PU	Material no.
	1	TuS locking components, coupleable, V.01	10	740848
		TuS locking components, coupleable, V.02	10	740849
		consisting of:		
[1]	1	Run-up block		
	1	Tilt striker (not used)		
[5]	2	Striker V.01/V.02		
[6]	1	Insertable cam		
[4]	1	Corner drive without MD		
	1	Retaining fork (not shown)		

Additionally required locking components				
Pos.	Pc(s)	Description	PU	Material no.
[8]	12	SEC cam RC3, insertable	100	443530
[7]	12	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		
[4]	1	Corner drive without MD	50	728844

Rebate sash stay					
Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Rebate sash stay set, coupleable, no. 1	L	10	740843
		Rebate sash stay set, coupleable, no. 3	R	10	740840
		Rebate sash stay set, coupleable, no. 4	L	10	740844
			R	10	740841
			L	10	740845
			R	10	740842
		consisting of:			
[20]		Rebate stay hinge, coupleable			
[19]		Rebate sash stay, coupleable, L/R			
[28]		Corner hinge incl. adjustment piece, L/R			
[31]		Pivot rest L/R			

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

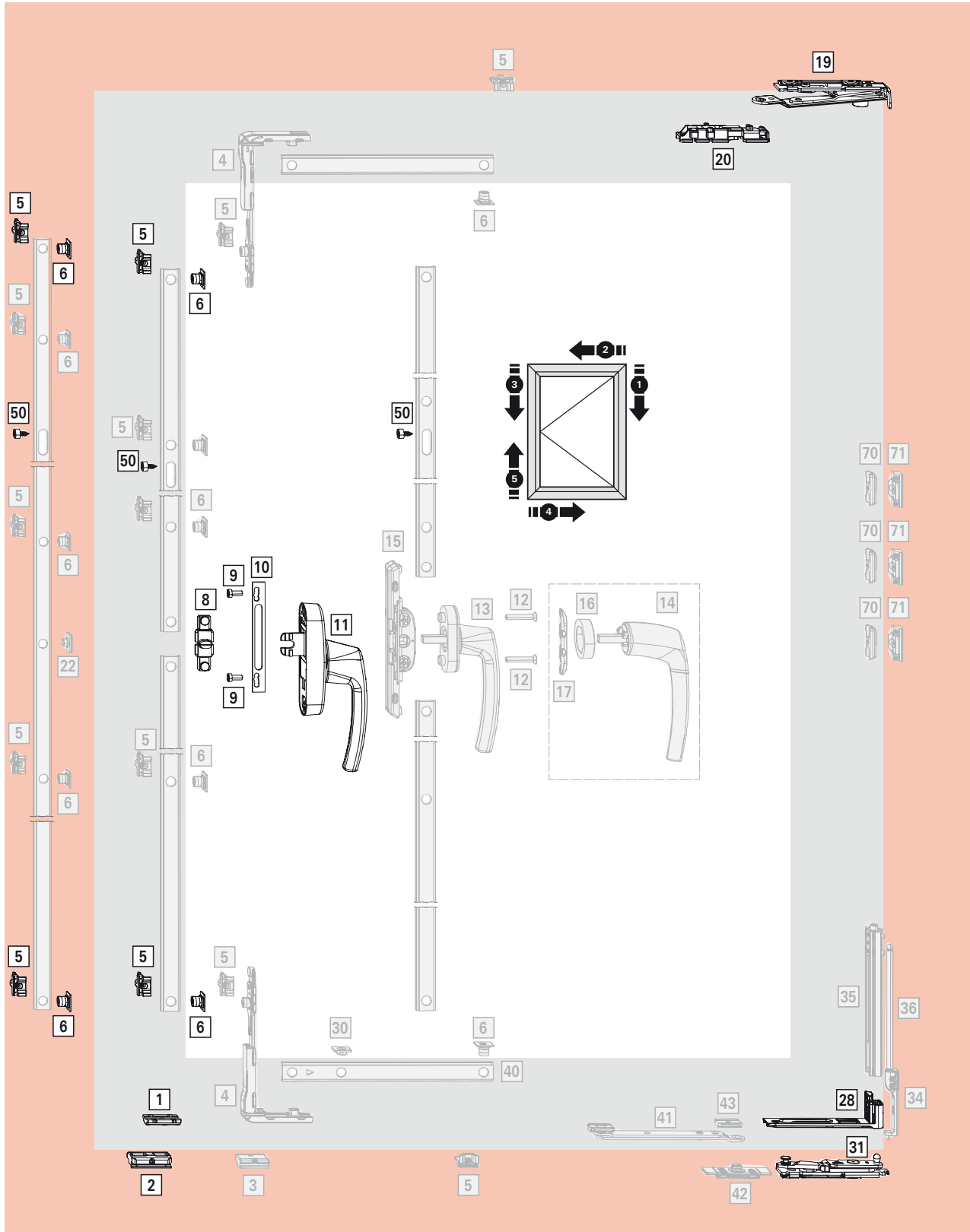
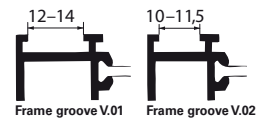
Additional components, size-dependent				
Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
[50]	1	Espagnolette lock	100	738549

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ²⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) For the SEC flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW**250–1600 mm ¹⁾

Sash height **SH** 520–2700 mm

Sash weight **S.kg** max. 80/150 kg ⁵⁾

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side				
Pos.	Pc(s)	Description	PU	Material no.
Sash width < 1300 mm				
1		TuS locking components V.01	10	728756
		TuS locking components V.02	10	728757
		consisting of:		
[1]	1	Run-up block		
[2]	1	Tilt striker		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Sash width ≥ 1300 mm				
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	Espagnolette lock	100	738549

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	1	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	1	Rebate stay hinge		10	740811

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5x12		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-5	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-5	Cam, insertable	100	334671
[40]	1	CR5.2 SW 1301–1600 AL	10	739375
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		
[30]	1	Roto Clip	100	331288
	1-3	CL central set V.01	10	740813
		CL central set V.02	10	740812
		consisting of:		
[70]		CL sash component		
[71]		CL frame component V.01/V.02		

Additional components on the hinge side, weight-dependent | 80–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Load transfer set V.01 ³⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ³⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
[22]	1	Connector bolt, insertable ⁶⁾	100	254601
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ³⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[14]	1	Handle without escutcheon		→ CTL 1
[16]	1	Ring for handle without escutcheon ²⁾		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ³⁾	10	378338

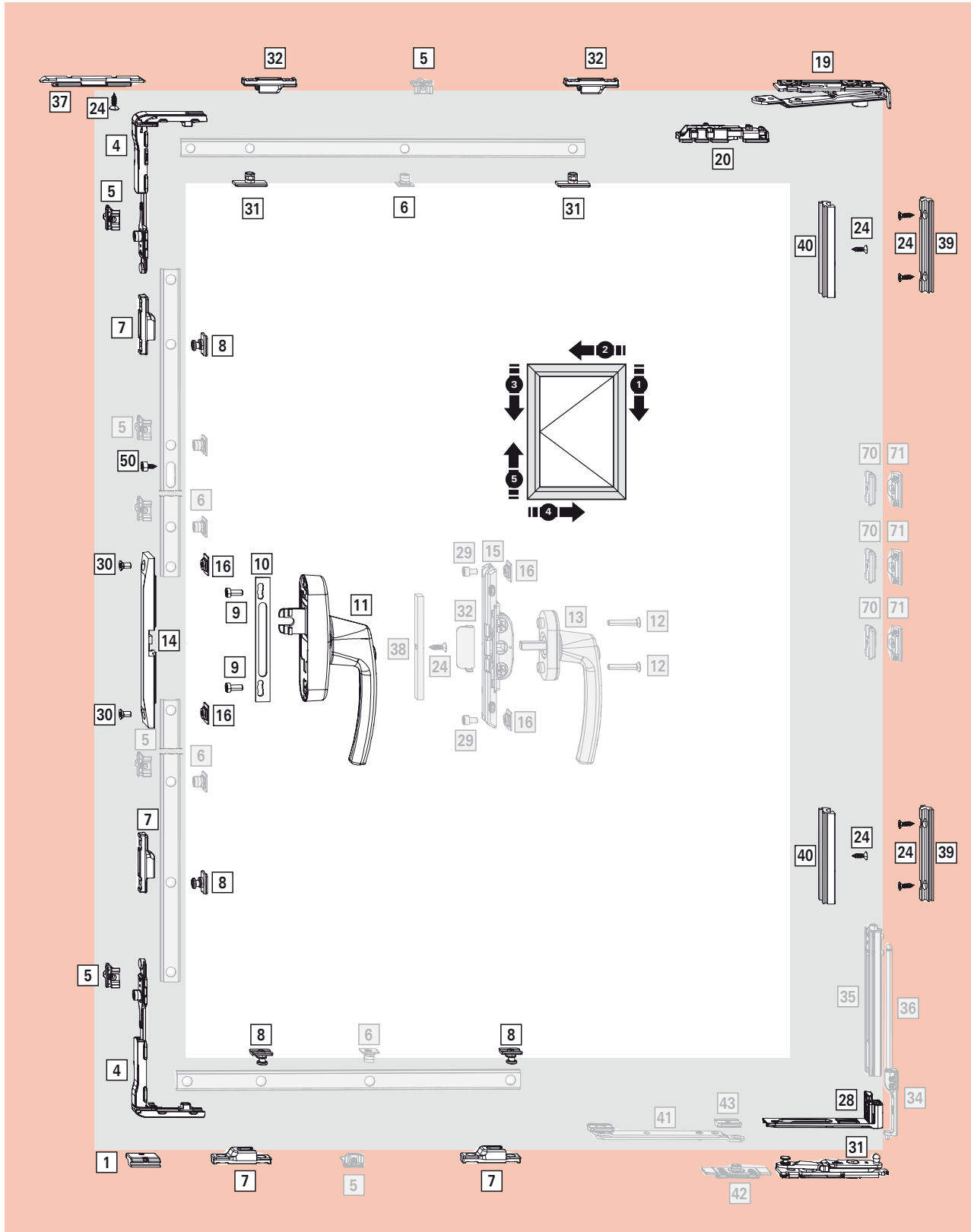
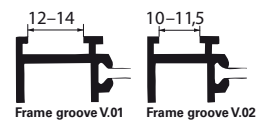
¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

³⁾ For the flush-encased gearbox with blocking device, see page 237.

⁴⁾ The connector bolt, insertable, can be used with SW ≤ 1300 mm.

⁵⁾ S.kg ≥ 80 kg with load transfer 150 kg.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 530–1600 mm ¹⁾

Sash height **SH** 720–2700 mm

Sash weight **S.kg** max. 80/150 kg ³⁾

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	6	SEC cam, insertable	100	447245
[7]	6	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
[50]	1	Espagnolette lock	100	738549
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

SEC components on the hinge side

Pos.	Pc(s)	Description	PU	Material no.
2		SEC hinge lock set V.01	10	728940
		SEC hinge lock set V.02	10	728941
		consisting of:		
[39]	1	Frame component V.01/V.02		
[40]	1	Sash component		
[24]	3	Countersunk tapping screw ST4.8x16		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	1	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	1	Rebate stay hinge		10	740811

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		

Additional components on the hinge side, weight-dependent | 80–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Load transfer set V.01 ³⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ³⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

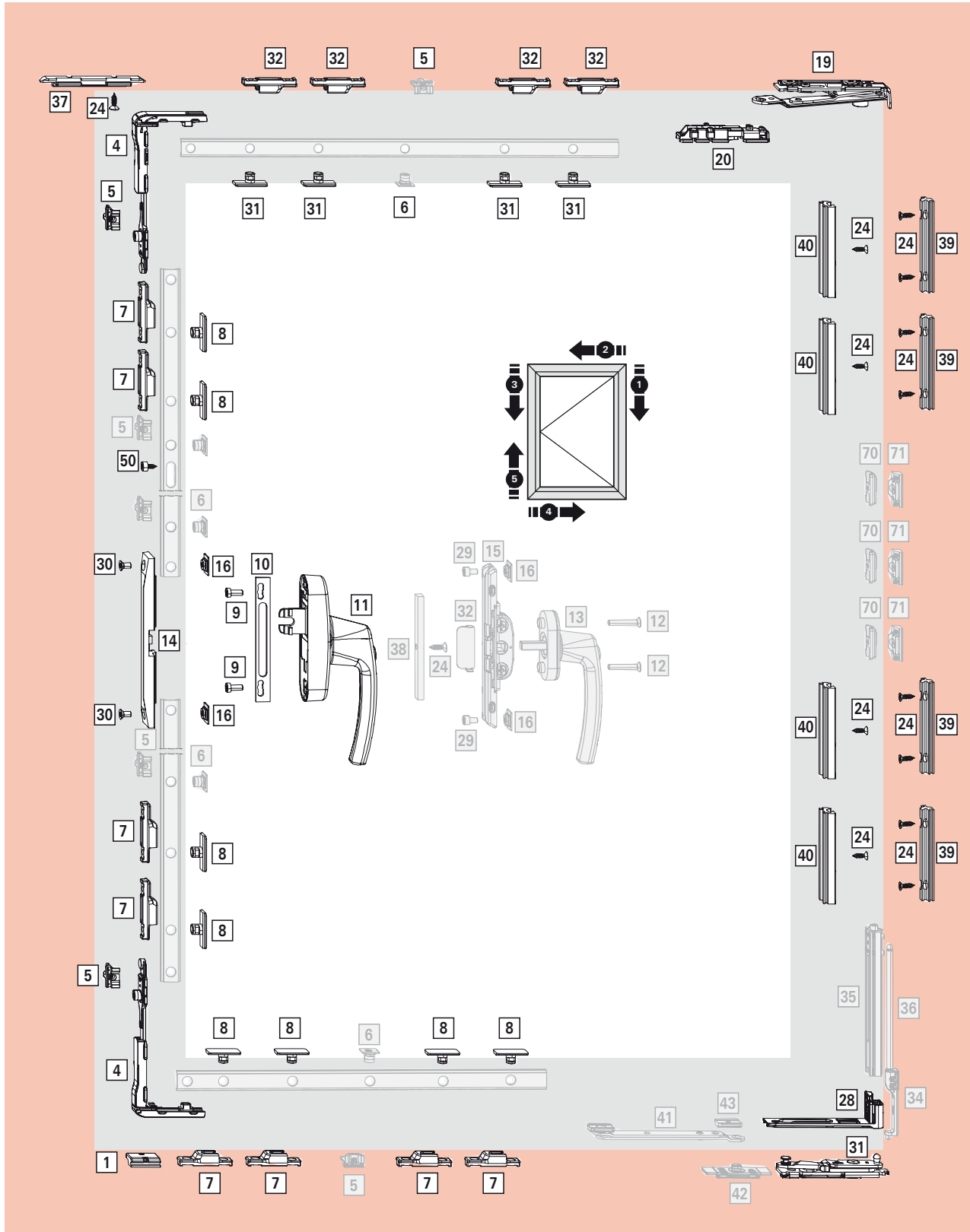
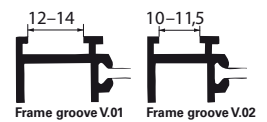
Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ For the SEC flush-encased gearbox with blocking device, see page 237.

³⁾ S.kg ≥ 80 kg with load transfer 150 kg.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 680–1600 mm ¹⁾

Sash height **SH** 1050–2700 mm

Sash weight **S.kg** max. 80/150 kg ³⁾

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	12	SEC cam RC3, insertable	100	443530
[7]	12	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
[50]	1	Espagnolette lock	100	738549
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

SEC components on the hinge side

Pos.	Pc(s)	Description	PU	Material no.
2		SEC hinge lock set V.01	10	728940
		SEC hinge lock set V.02	10	728941
		consisting of:		
[39]	1	Frame component V.01/V.02		
[40]	1	Sash component		
[24]	3	Countersunk tapping screw ST4.8x16		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	1	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	1	Rebate stay hinge		10	740811

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-6	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-6	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing V.01/V.02		
[43]	1	Turn stop		

Additional components on the hinge side, weight-dependent | 80–150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Load transfer set V.01 ³⁾	L	10	739694
			R	10	739693
		Load transfer set V.02 ³⁾	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

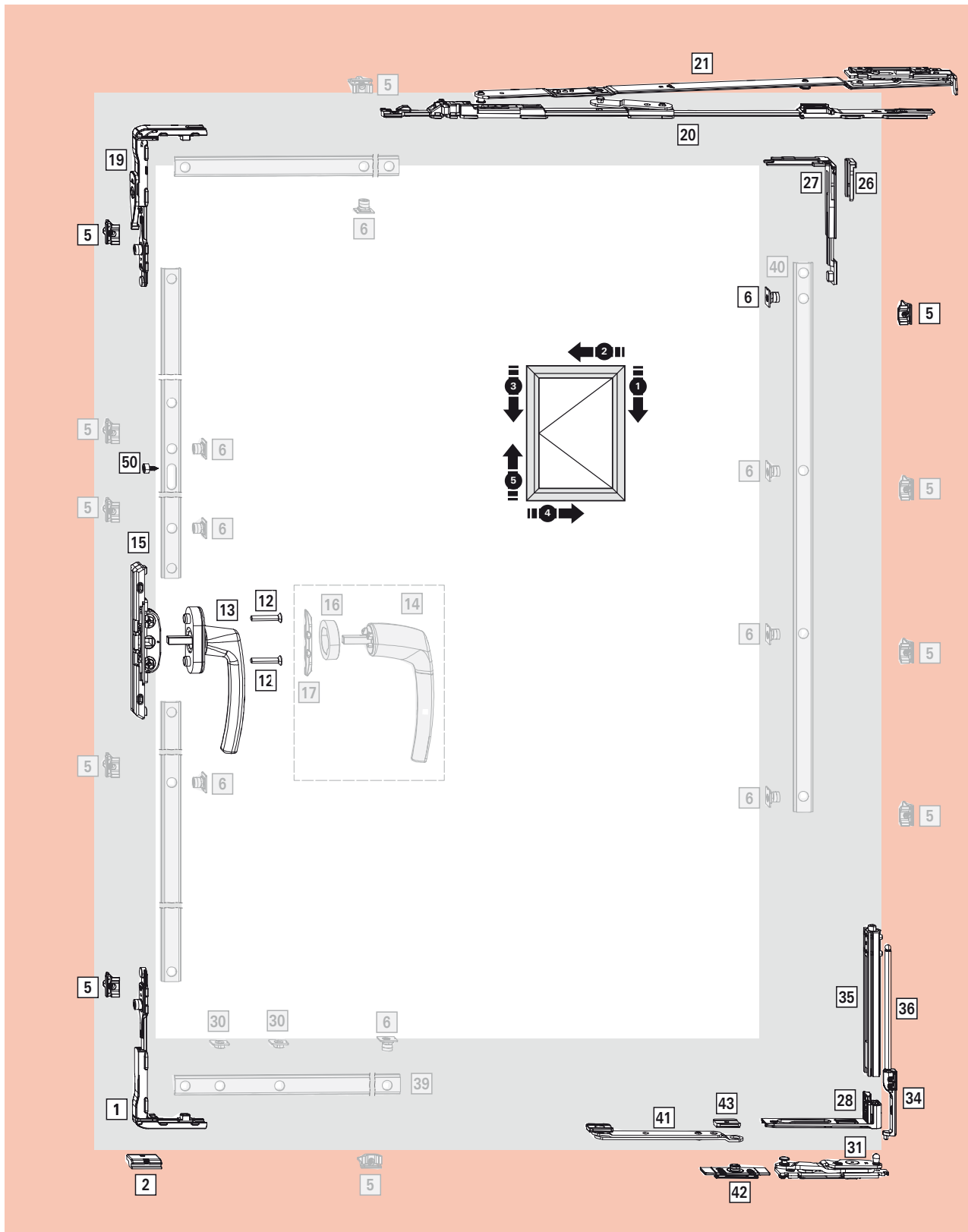
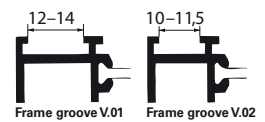
Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ⁸⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ For the SEC flush-encased gearbox with blocking device, see page 237.

³⁾ S.kg ≥ 80 kg with load transfer 150 kg.



Grey components (optional) are not included in the basic set.



Application range

Sash width SW	735–1600 mm
Sash height SH	1000–3000 mm
Sash weight S.kg	150–180 kg

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	Corner drive without MD	50	728844
[2]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[5]	1	Striker V.01	100	728918
		Striker V.02	100	728920
[19]	1	Corner drive with MD ²⁾	50	490173
[50]	1	Espagnolette lock	100	738549
	1	Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg	L	10	641334
		incl. adjustment piece	R	10	641297
[31]	1	Pivot rest 180 kg no. 1	L	10	641328
			R	10	641327
		Pivot rest 180 kg no. 3	L	10	641326
			R	10	641325
		Pivot rest 180 kg no. 4	L	10	641330
			R	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ³⁾		10	740814
		Turn restrictor set V.02 ³⁾		10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L	10	641318
			R	10	641317
		Sash stay 735 180 kg no. 3	L	10	641320
			R	10	641319
		Sash stay 735 180 kg no. 4	L	10	641322
			R	10	641321

Rebate clearance RC	11.5–12 mm
Overlap width OW	21.5–22 mm



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle		→ CTL 1
[15]	1	Flush-encased gearbox without MD ⁴⁾	10	378338
[12]	2	Countersunk screw (stainless steel) M5 x 30	100	212501

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-7	Cam, insertable	100	334671
[30]	2	Roto Clip	100	331288
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
		CR4.1 SH 1301–1800 /		
		CR5.2 SW 1301–1600 AL (not shown)	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
		CR4.3 SH 2401–2700 AL	10	729981
[39]	1	CR5.3 T&T SW 1301–1600 AL	10	769015

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[14]	1	Handle without escutcheon ¹⁾		→ CTL 1
[16]	1	Ring for handle without escutcheon		→ CTL 1
[17]	1	Mounting plate	10	378134
[15]	1	Flush-encased gearbox without MD ⁴⁾	10	378338



WARNING!

Sash fall due to insufficient profile stability.

Insufficient profile stability may cause the sash to fall.

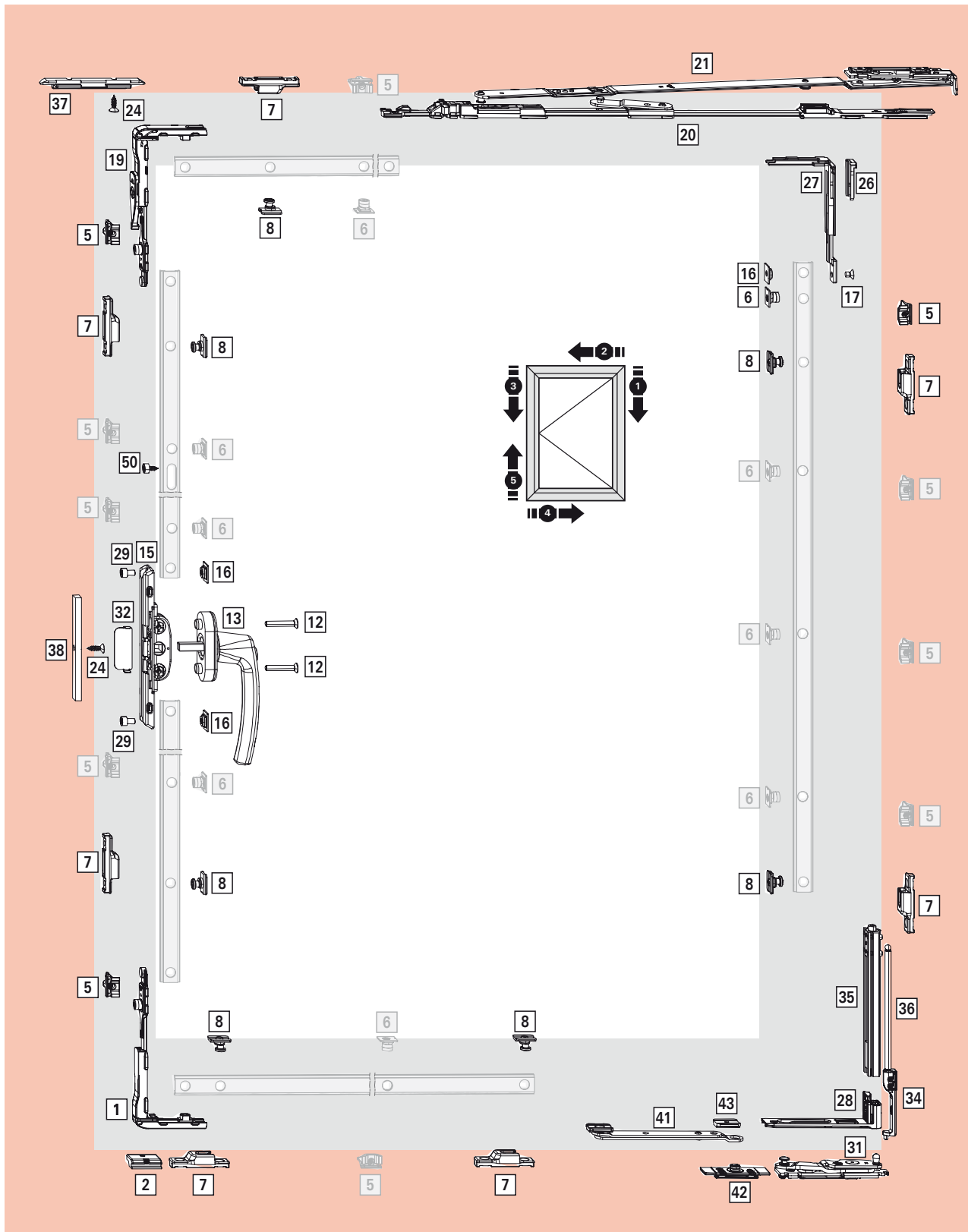
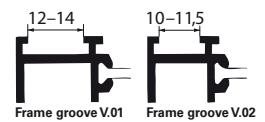
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

1) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

2) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

3) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

4) For the flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 800–1600 mm
 Sash height **SH** 1000–3000 mm
 Sash weight **S.kg** 150–180 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	Corner drive without MD	50	728844
[2]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[5]	3	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Cam, insertable	100	334671
[19]	1	Corner drive with MD ¹⁾	50	490173
[50]	1	Espagnolette lock	100	738549
[8]	7	SEC cam, insertable	100	447245
[7]	7	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set consisting of:	10	728950
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set consisting of:	10	728944
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg incl. adjustment piece	L 10	10	641334
			R 10	10	641297
[31]	1	Pivot rest 180 kg no. 1	L 10	10	641328
			R 10	10	641327
		Pivot rest 180 kg no. 3	L 10	10	641326
			R 10	10	641325
		Pivot rest 180 kg no. 4	L 10	10	641330
			R 10	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L 10	10	739694
			R 10	10	739693
		Load transfer set V.02	L 10	10	739696
			R 10	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ²⁾	10	10	740814
		Turn restrictor set V.02 ²⁾	10	10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L 10	10	641318
			R 10	10	641317
		Sash stay 735 180 kg no. 3	L 10	10	641320
			R 10	10	641319
		Sash stay 735 180 kg no. 4	L 10	10	641322
			R 10	10	641321



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[32]	1	SEC anti-drilling protection	10	487406
[38]	1	SEC rebate-clearance reduction flush-encased gearbox	50	334360
[24]	1	Countersunk tapping screw ST4.8x16	100	728933
	1	SEC flush-encased gearbox set consisting of:	10	728947
[15]	1	SEC flush-encased gearbox without MD ³⁾		
[16]	2	SEC connector		
[29]	2	Cylinder-head screw M5x8		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671



WARNING!

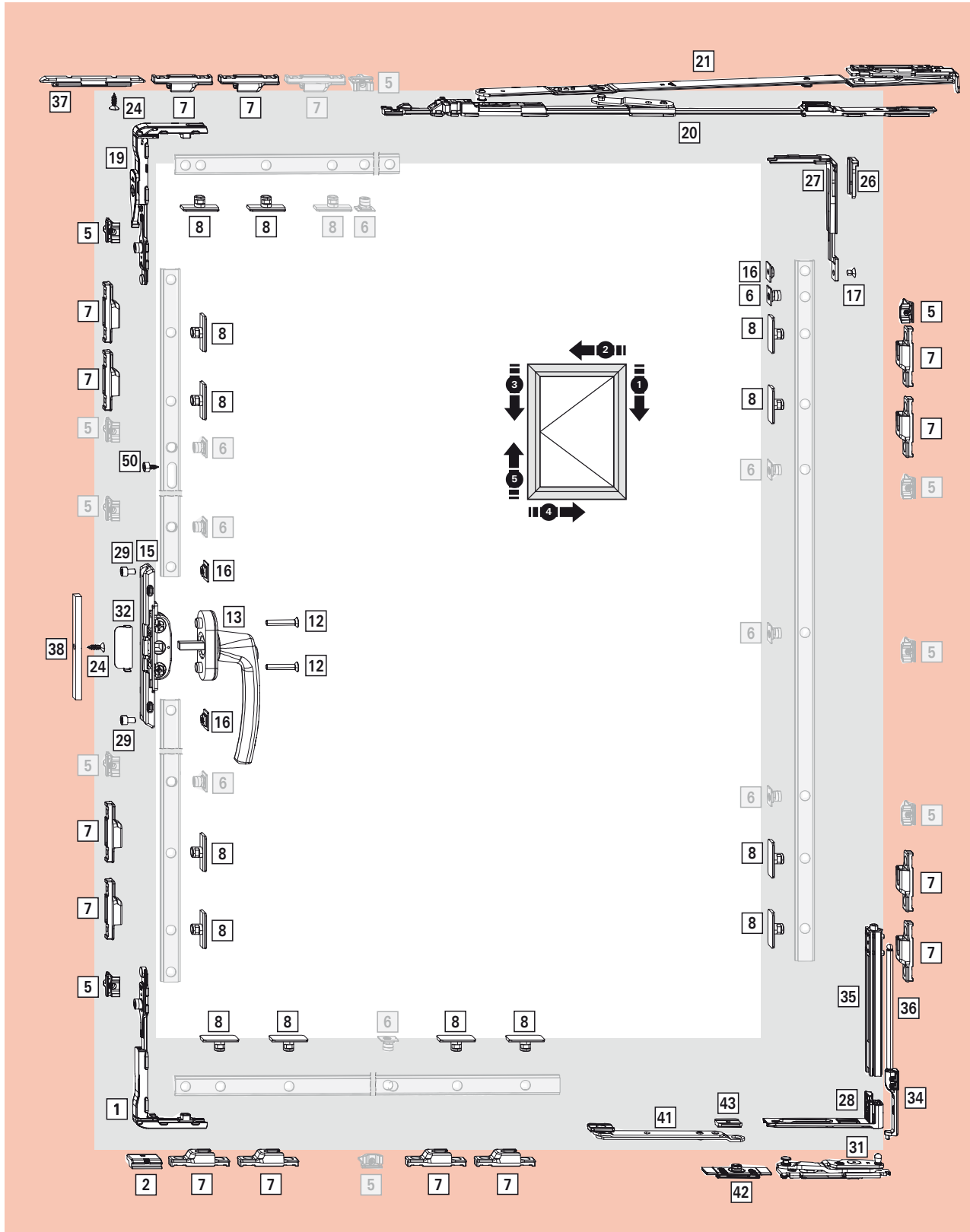
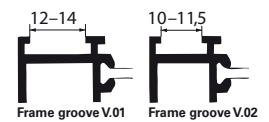
Sash fall due to insufficient profile stability. Insufficient profile stability may cause the sash to fall.

The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

¹⁾ Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

²⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

³⁾ For the SEC flush-encased gearbox with blocking device, see page 237.



Grey components (optional) are not included in the basic set.



Application range

Sash width SW	915–1600 mm
Sash height SH	1000–3000 mm
Sash weight S.kg	150–180 kg

Rebate clearance RC	11.5–12 mm
Overlap width OW	21.5–22 mm

Basic sets

Locking side

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	Corner drive without MD	50	728844
[2]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[5]	3	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Cam, insertable	100	334671
[19]	1	Corner drive with MD ¹⁾	50	490173
[50]	1	Espagnolette lock	100	738549
[8]	15	SEC cam RC3, insertable	100	443530
[7]	15	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
	1	SEC rebate-clearance reduction set consisting of:	10	728950
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
	1	SEC corner drive CL set consisting of:	10	728944
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5x7		

T&T hinge side | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge 180 kg incl. adjustment piece	L 10	10	641334 641297
[31]	1	Pivot rest 180 kg no. 1	L 10	10	641328
			R 10	10	641327
		Pivot rest 180 kg no. 3	L 10	10	641326
			R 10	10	641325
		Pivot rest 180 kg no. 4	L 10	10	641330
			R 10	10	641329

Additionally required hinge-side components

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L 10	10	739694
			R 10	10	739693
		Load transfer set V.02	L 10	10	739696
			R 10	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			
	1	Turn restrictor set V.01 ²⁾	10	10	740814
		Turn restrictor set V.02 ²⁾	10	10	740835
		consisting of:			
[41]	1	Scissor stay, compl.			
[42]	1	Frame bearing V.01/V.02			
[43]	1	Turn stop			

Sash stay | 180 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide 735		10	740838
[21]	1	Sash stay 735 180 kg no. 1	L 10	10	641318
			R 10	10	641317
		Sash stay 735 180 kg no. 3	L 10	10	641320
			R 10	10	641319
		Sash stay 735 180 kg no. 4	L 10	10	641322
			R 10	10	641321



NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
[32]	1	SEC anti-drilling protection	10	487406
[38]	1	SEC rebate-clearance reduction flush-encased gearbox	50	334360
[24]	1	Countersunk tapping screw ST4.8x16	100	728933
	1	SEC flush-encased gearbox set consisting of:	10	728947
[15]	1	SEC flush-encased gearbox without MD ³⁾		
[16]	2	SEC connector		
[29]	2	Cylinder-head screw M5x8		

Optional

Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-8	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-8	Cam, insertable	100	334671



WARNING!

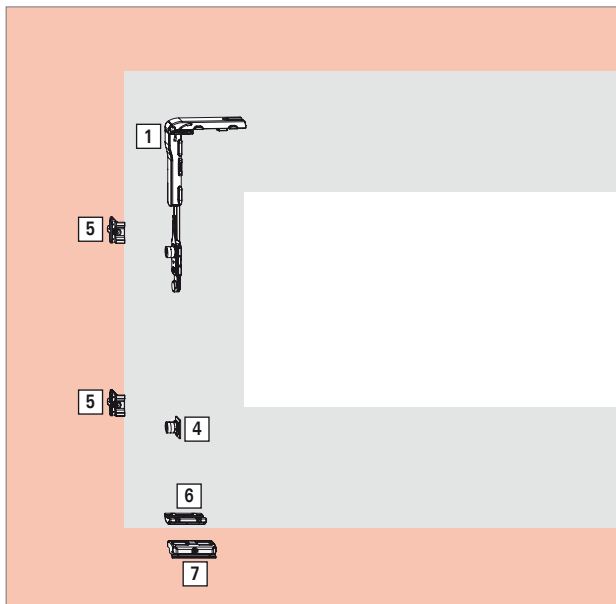
Sash fall due to insufficient profile stability. Insufficient profile stability may cause the sash to fall.

The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

¹⁾ Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

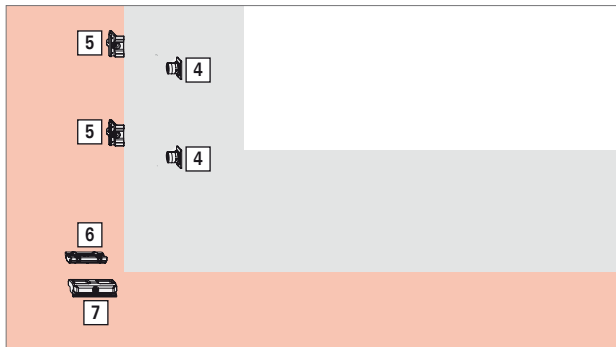
²⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

³⁾ For the SEC flush-encased gearbox with blocking device, see page 237.



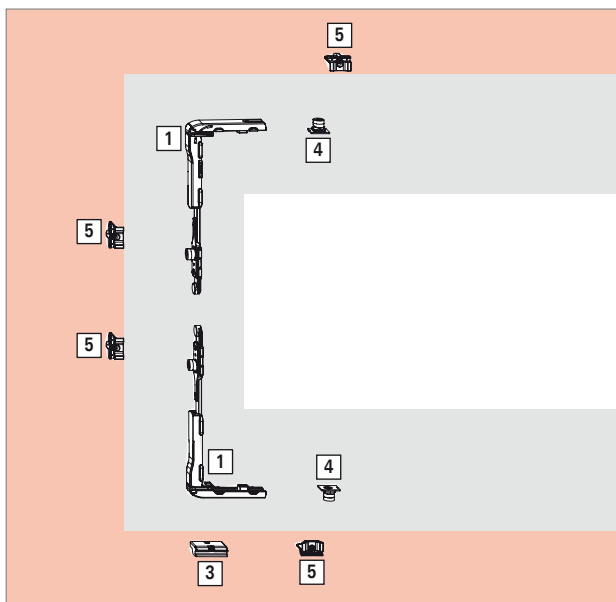
TuS locking components, coupleable

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	Corner drive without MD	50	728844
[4]	1	Insertable cam	100	334671
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Run-up block	100	212008
[7]	1	Tilt striker	100	728860



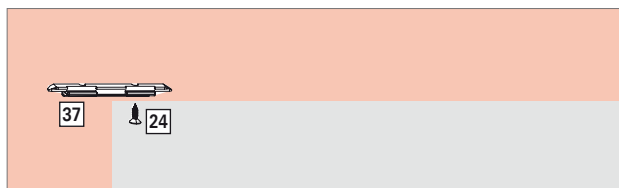
TuS locking components

Pos.	Pc(s)	Description	PU	Material no.
[4]	2	Insertable cam	100	334671
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Run-up block	100	212008
[7]	1	Tilt striker	100	728860



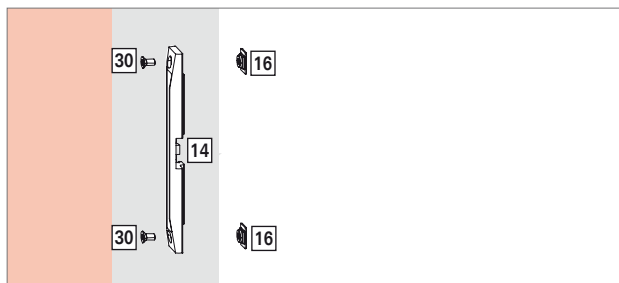
TuS-H locking components

Pos.	Pc(s)	Description	PU	Material no.
[1]	2	Corner drive without MD	50	728844
[3]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[4]	2	Insertable cam	100	334671
[5]	4	Striker V.01	100	728918
		Striker V.02	100	728920



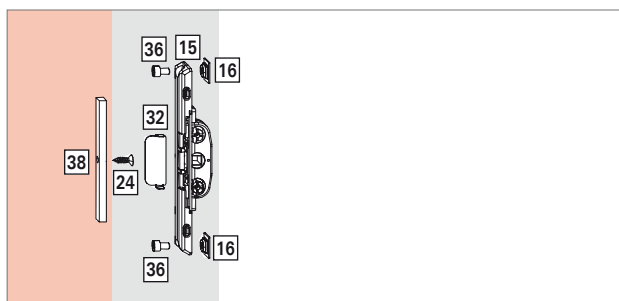
SEC rebate-clearance reduction set

Pos.	Pc(s)	Description	PU	Material no.
[24]	1	Countersunk tapping screw ST4.8x16	100	728932
[37]	1	SEC rebate-clearance reduction CD	50	447112



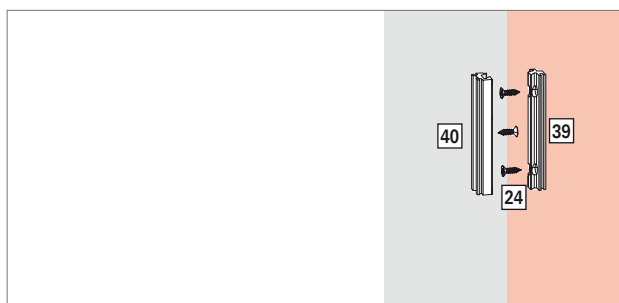
SEC espagnolette protection set

Pos.	Pc(s)	Description	PU	Material no.
[14]	1	SEC espagnolette protection	10	487407
[16]	2	SEC connector	100	447113
[30]	2	Countersunk screw M5x10	100	728926



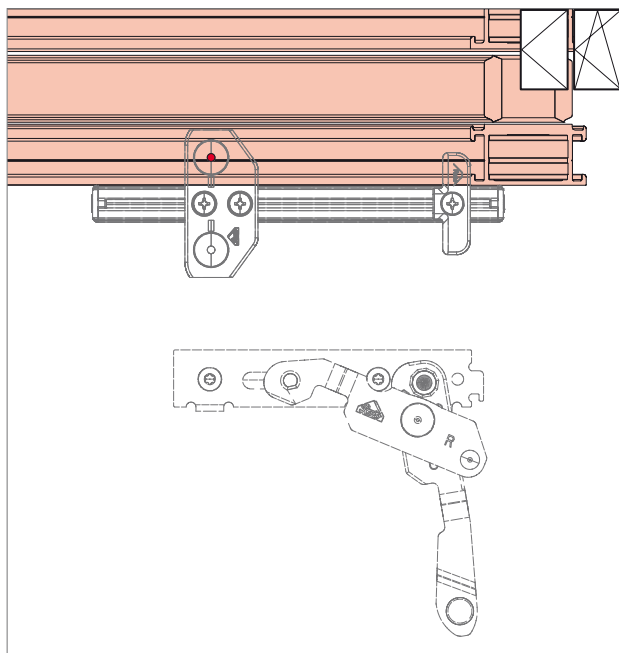
SEC flush-encased gearbox set

Pos.	Pc(s)	Description	PU	Material no.
[15]	1	SEC flush-encased gearbox without MD	10	457210
[16]	2	SEC connector	100	447113
[24]	1	Countersunk tapping screw ST4.8x16	100	728932
[32]	1	SEC anti-drilling protection	10	487406
[36]	2	Cylinder-head screw M5x8	100	728936
[38]	1	SEC rebate-clearance reduction ESP	50	334360



SEC hinge lock set

Pos.	Pc(s)	Description	PU	Material no.
[24]	3	Countersunk tapping screw ST4.8x16	100	728932
[39]	1	Frame component V.01	20	331788
		Frame component V.02	20	331789
[40]	1	Sash component	20	331790



Pivot rest / stay bearing

Jig

628534

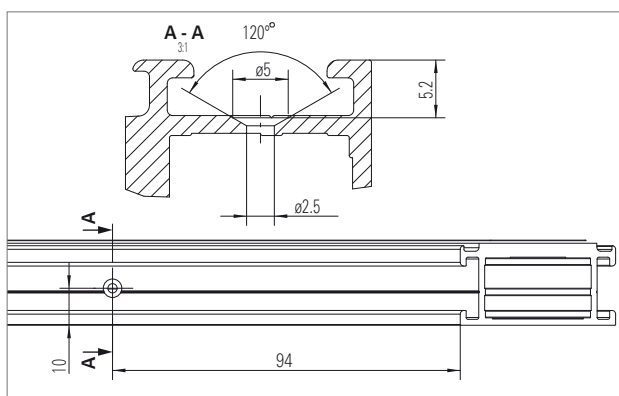
1. Place the drilling jig on the frame as shown in the drawing.
2. Drill holes:
1 x Ø 2.5 mm, at least 4 mm deep.



NOTE!

Drill holes if:

- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm)

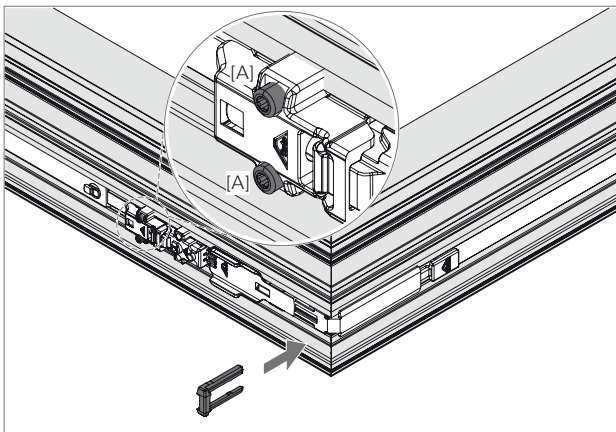
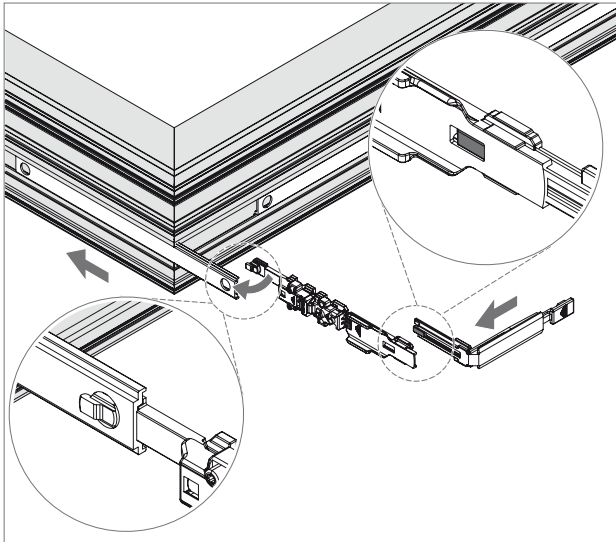


Alternative (for mechanical production):
Drill the hole according to the drawing.



Installing the rebate stay hinge, coupleable

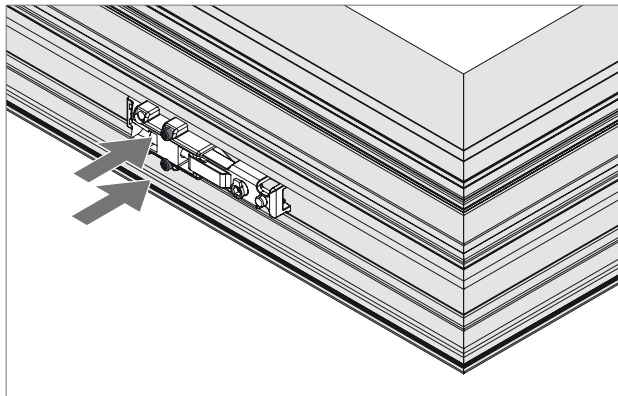
1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link connecting rod CR3 and the CL corner drive to the rebate stay hinge and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.



3. Secure the CL corner drive with the retaining fork.
4. Fix the rebate stay hinge in position with two piercing screws [A].

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the rebate stay hinge

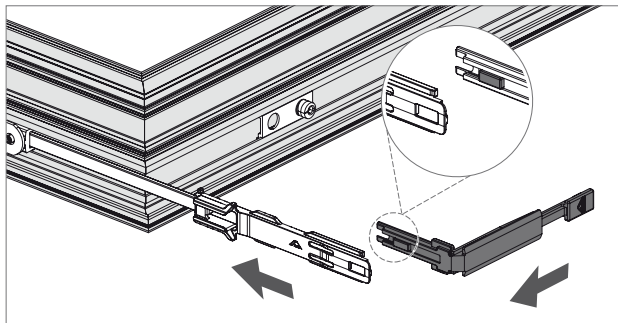
1. Insert the rebate stay hinge into the Euro-groove at the top. Fix the rebate stay hinge in position (as shown in the installation drawing) with two piercing screws.

Tool: T 10 hex key

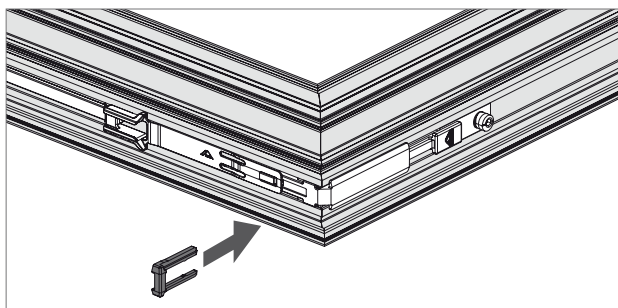
Torque: max. 2.5 Nm



Installing scissor stay guide 735

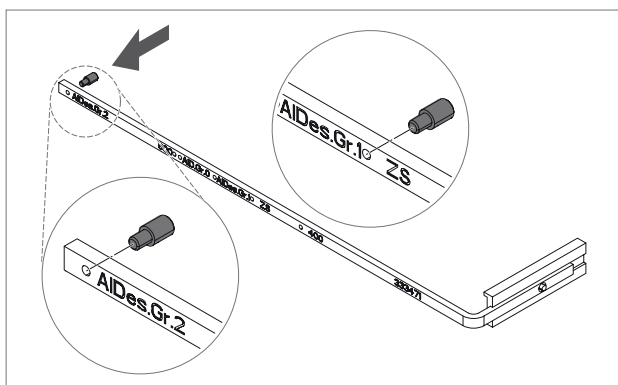


1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.



2. Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.

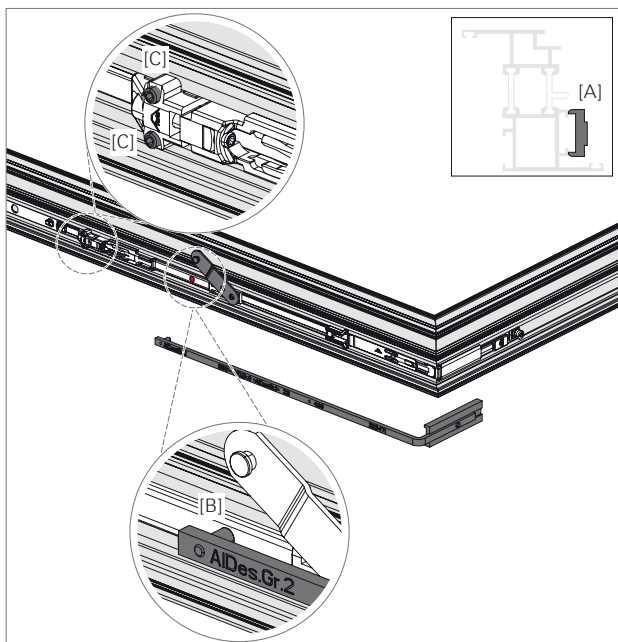
3. Secure the CL corner drive with the retaining fork.



4. Prepare the jig for the scissor stay guide by inserting the positioning pin into the corresponding drill hole (depending on the scissor stay guide selected).

Scissor stay guide 500 = AIDes. size 1

Scissor stay guide 735 = AIDes. size 2

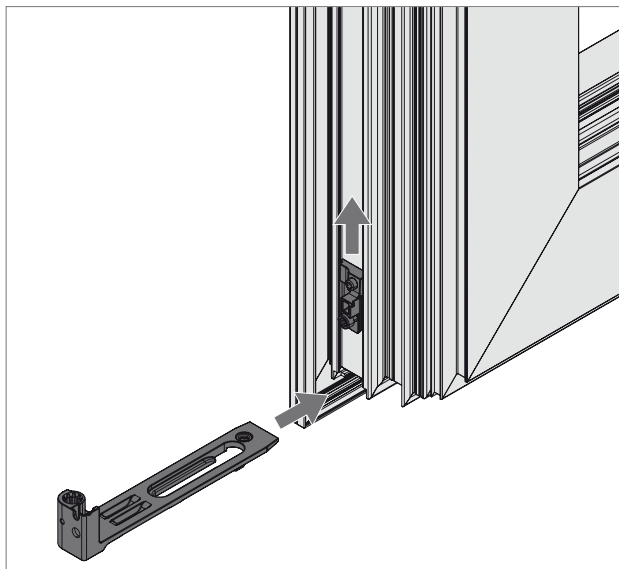


5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

Fix the scissor stay guide in position with two piercing screws [C].

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the corner hinge

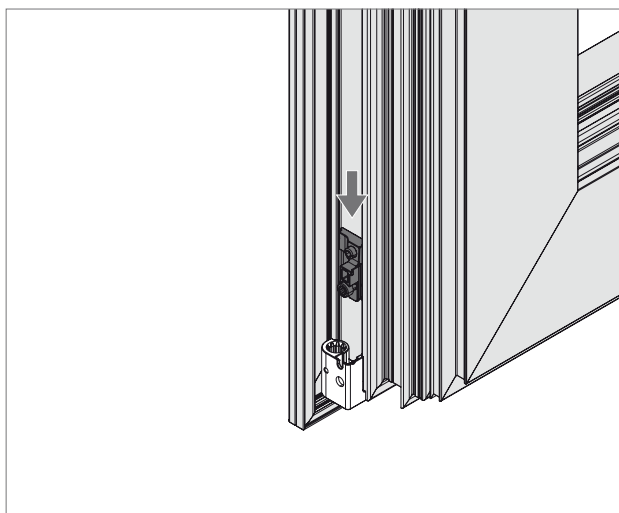
1. Insert the adjustment piece into the connecting rod groove.



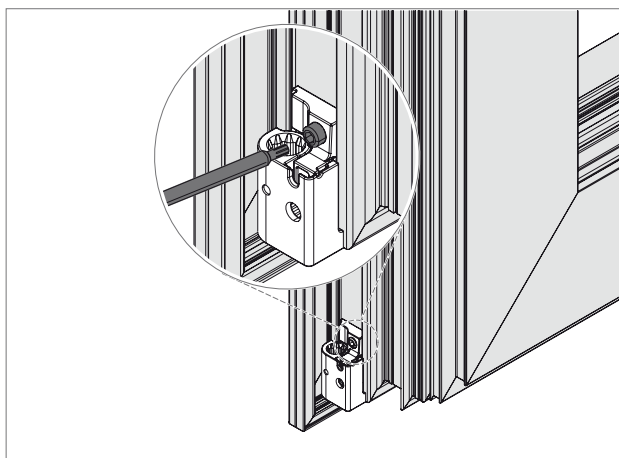
NOTE!

The 180 kg adjustment piece does not feature lateral adjustment.

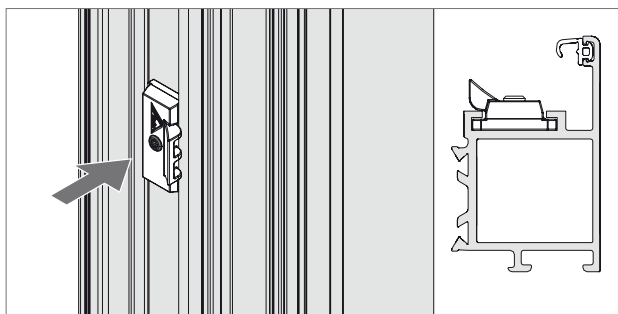
2. Insert the corner hinge into the connecting rod groove.



3. Push the adjustment piece into the corner hinge.



4. Screw in the threaded pin.
Tool: T 10 hex key
Torque: ≥ 2.5 Nm

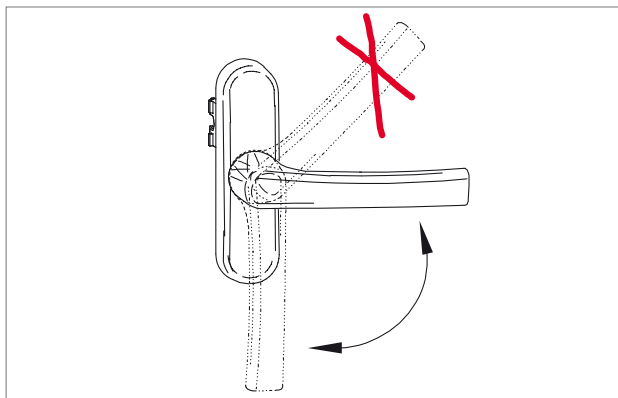


Installing the CL sash component

1. Insert the CL sash component into the sash groove on the hinge side.
2. Tighten the CL sash component with the preinstalled threaded pin.

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the espagnolette lock

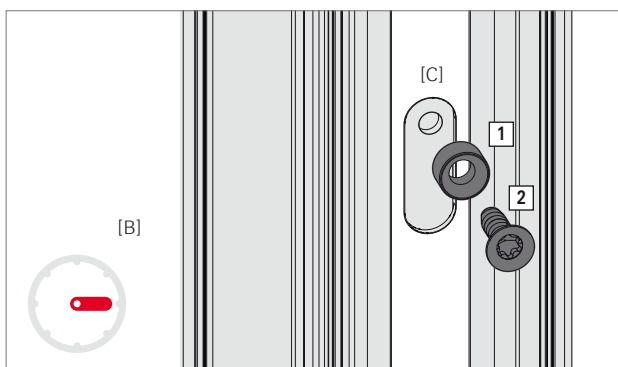
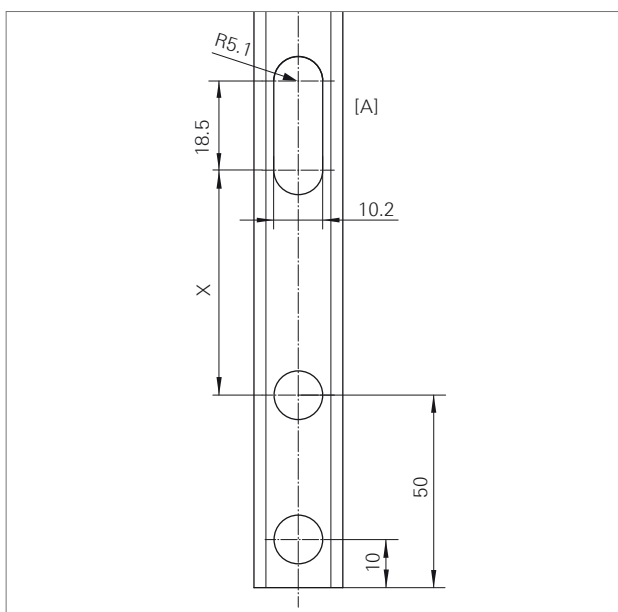
Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

1. Produce the slot in connecting rod CR2 before installation, as shown in the drawing opposite [A].



NOTE!

X = freely positionable (suggestion: 60 mm)



2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill holes:

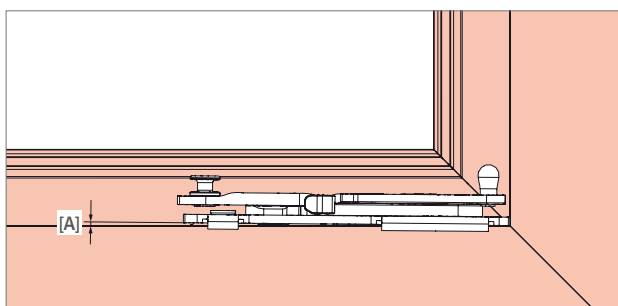
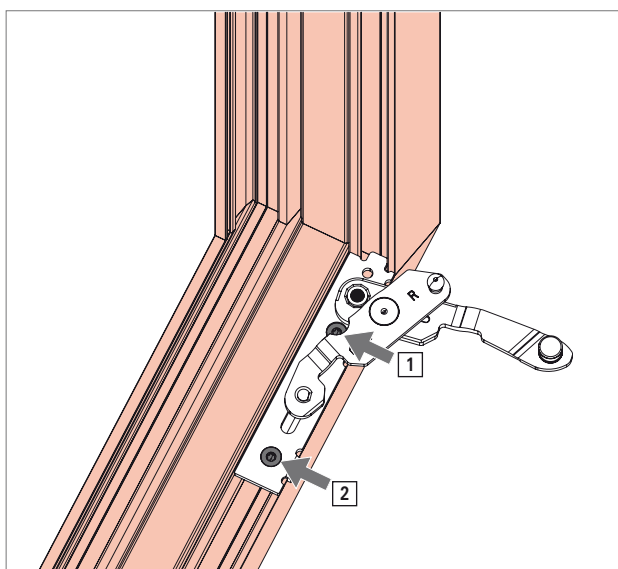
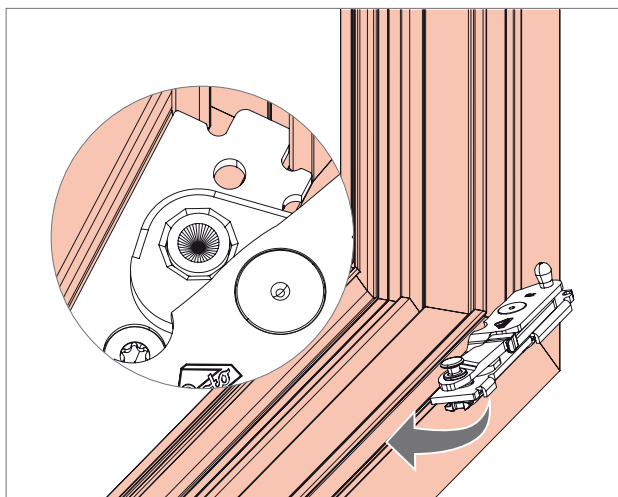
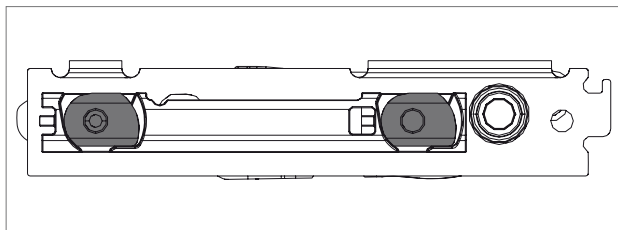
1 x Ø 3.5 mm, at least 4 mm deep.

3. Screw down the locking sleeve [1] with the screw [2].
- Tool: T 25 hex key



NOTE!

Sash stay 735: only screw down the locking sleeve with the screw after the sash stay has been mounted.



Installing the pivot rest

1. Align the clamping blocks.



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Swing the support into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the support is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the support a maximum of two times.



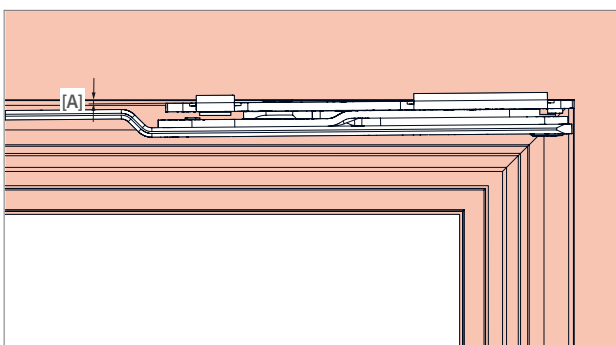
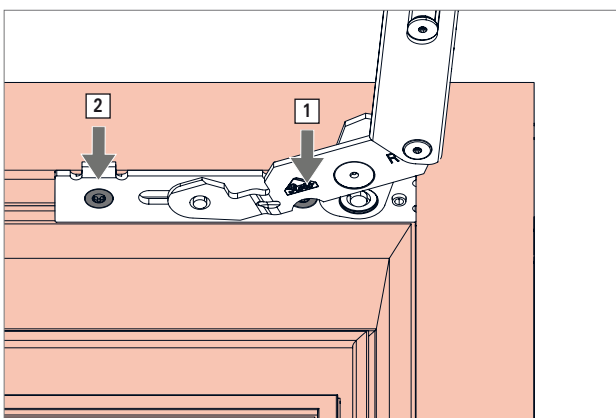
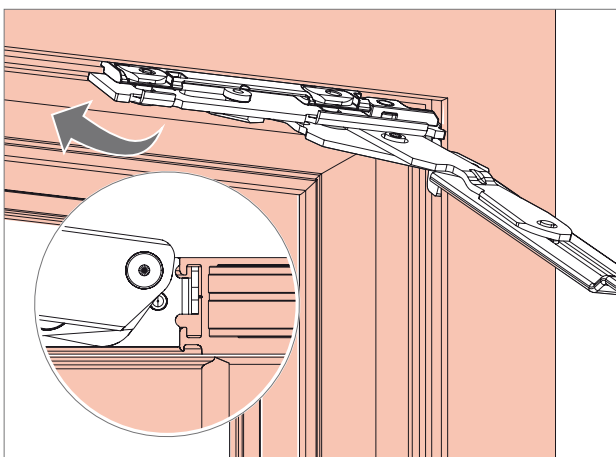
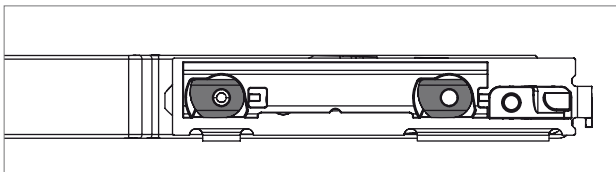
NOTE!

Do not leave a gap between the baseplate and profile [A].



NOTE!

The installation of sash stay 735 is shown here



Installing the rebate sash stay / rebate sash stay, coupleable / sash stay 735

1. Align the clamping blocks.



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

2. Open the sash stay and swing the support into the profile so that the baseplate engages behind it.

3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the sash stay is securely fitted.

Tighten the screw [2].

Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

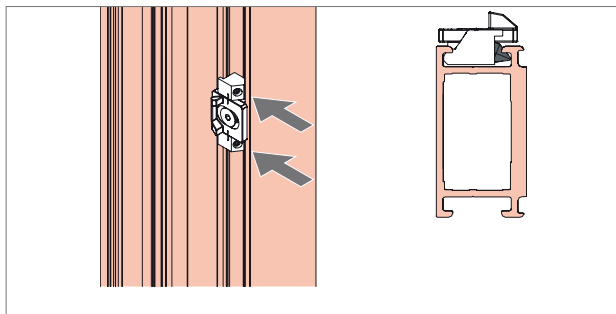
- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.



NOTE!

Do not leave a gap between the baseplate and profile [A].

4. Close the sash stay.

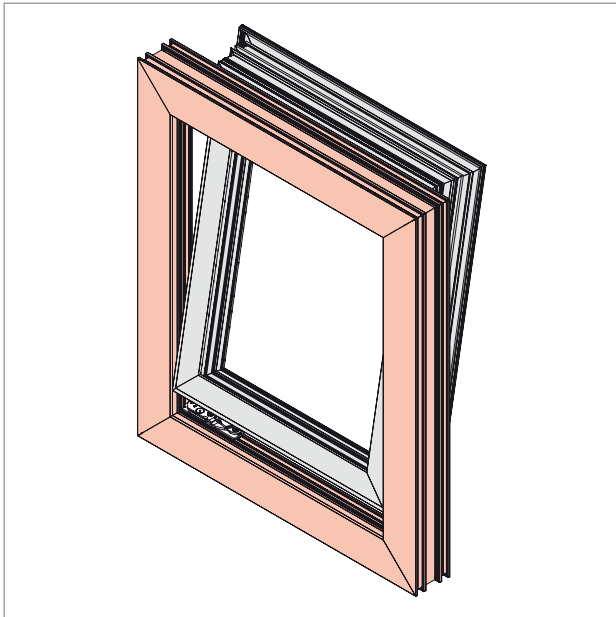


Installing the CL frame component

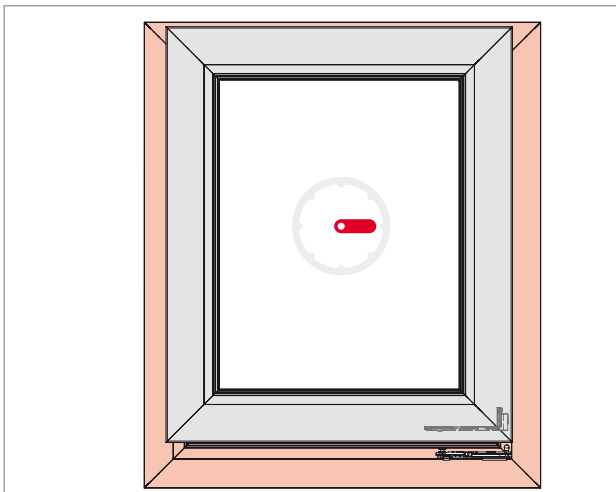
1. Swing the CL frame component into the profile on the hinge side.
2. Tighten the CL frame component with the preinstalled threaded pins.

Tool: T 10 hex key

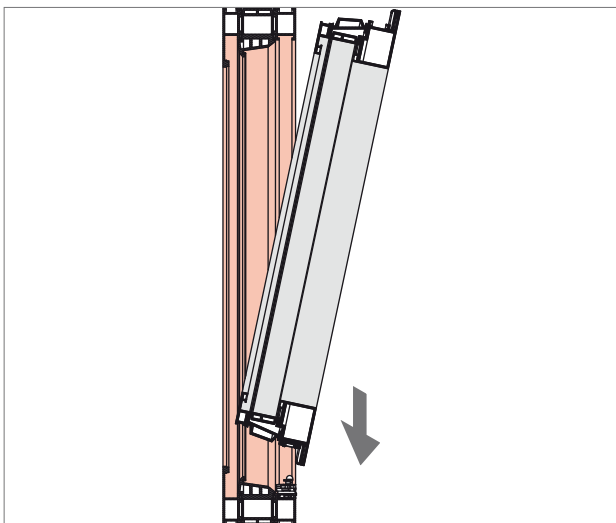
Torque: max. 2.5 Nm

**Connecting the pivot rest to the corner hinge**

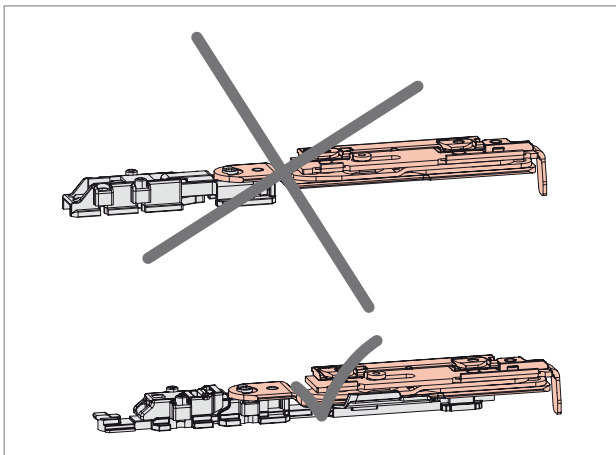
1. Move the pivot rest and stay bearing to the initial position (= closed sash position).



2. Move the handle to the turn position.



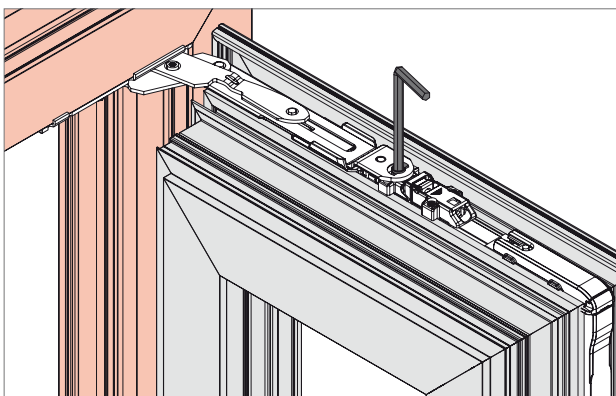
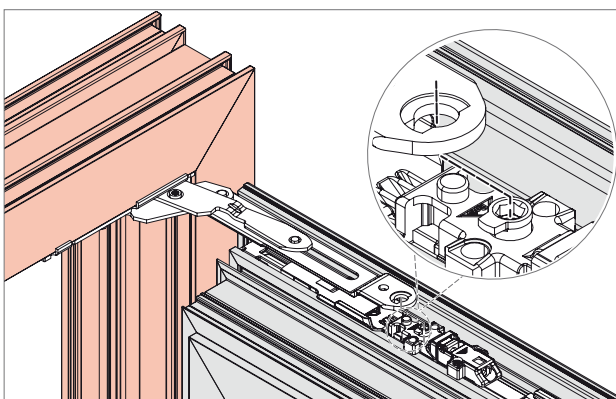
3. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the corner hinge engage in the pivot rest.
4. Secure the sash to prevent it from falling.
5. Open the sash approximately 90°.

**Mounting the rebate sash stay, coupleable****WARNING!**

Danger in the event of prohibited installation!

The combination of rebate sash stay, coupleable, and rebate stay hinge can lead to hazardous situations or even cause the sash to fall.

Only install the rebate sash stay, coupleable, in conjunction with the rebate stay hinge, coupleable.



1. Connect the pivot rest to the corner hinge (see page 171).

2. Open the rebate sash stay, coupleable, and guide it on the sash via the rebate stay hinge, coupleable.

3. Guide the swivel pin on the rebate stay hinge, coupleable, through the drill hole on the rebate sash stay, coupleable [C].

4. Lock the connection by turning the cam 180°.

Tool:

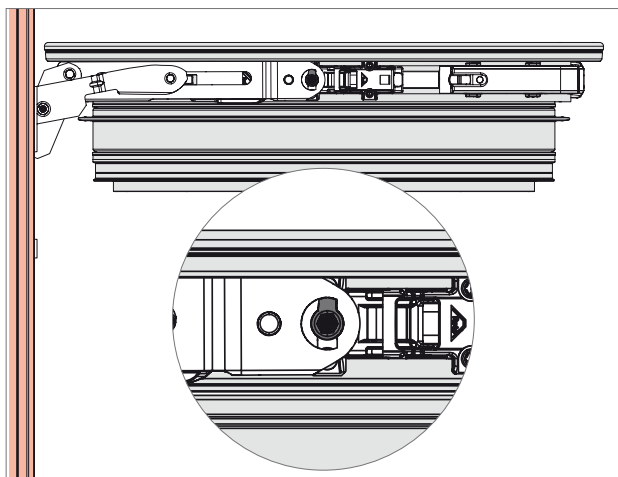
Hex key size 4

**WARNING!**

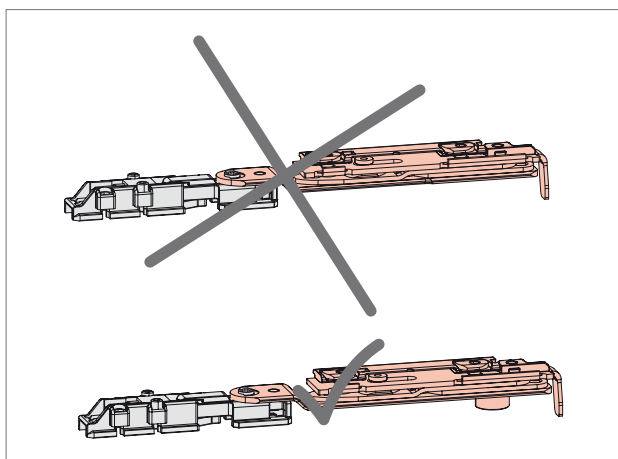
Danger in the event of prohibited installation!

A missing connection can lead to hazardous situations or even cause the sash to fall.

Lock by turning the cam 180°.



5. View from above, after locking.



Mounting the rebate sash stay

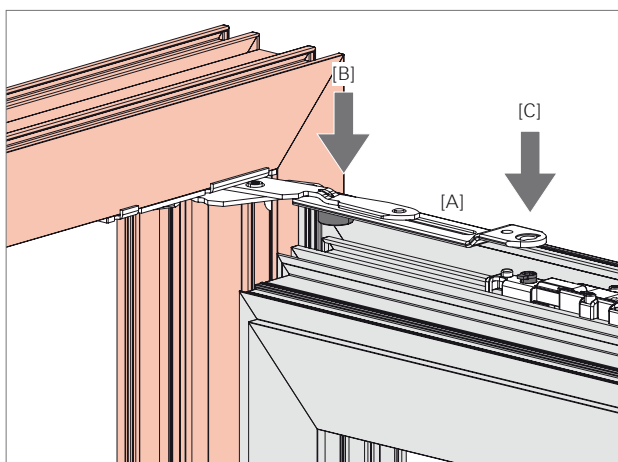


WARNING!

Danger in the event of prohibited installation!

The combination of rebate sash stay, coupleable, and rebate stay hinge can lead to hazardous situations or even cause the sash to fall.

Only install the rebate sash stay in conjunction with the rebate stay hinge.

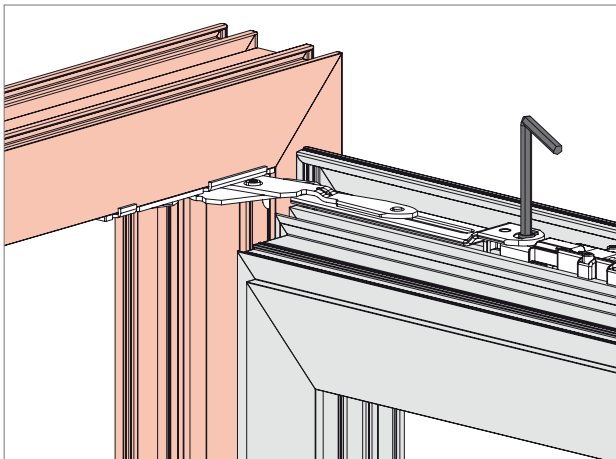


1. Connect the pivot rest to the corner hinge (see page 171).
2. Open the rebate sash stay and guide it on the sash via the rebate stay hinge [A].
3. Insert the eccentric cam into the sash groove [B].
4. Guide the swivel pin on the rebate stay hinge through the drill hole in the rebate sash stay [C].

TuS installation

Joining the sash and frame

Turn-Only hardware



5. Lock the connection by turning the cam 180°.

Tool:

Hex key size 4

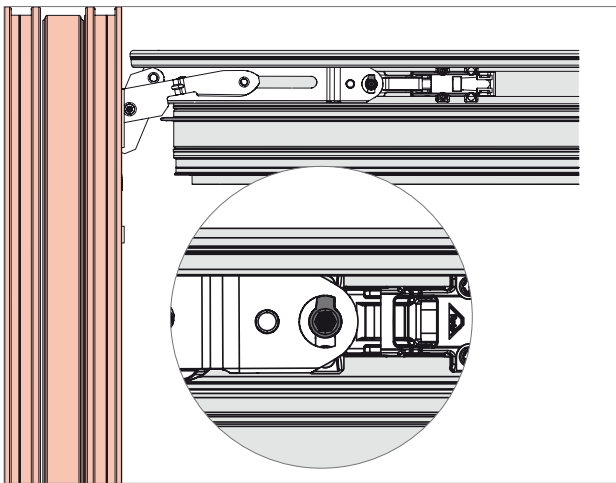


WARNING!

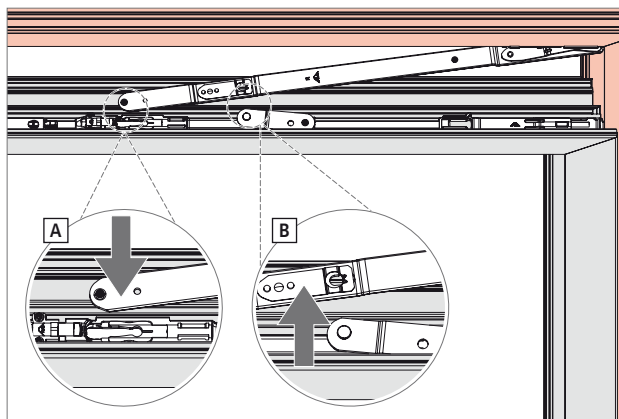
Danger in the event of prohibited installation!

A missing connection can lead to hazardous situations or even cause the sash to fall.

Lock by turning the cam 180°.



6. View from above, after locking.

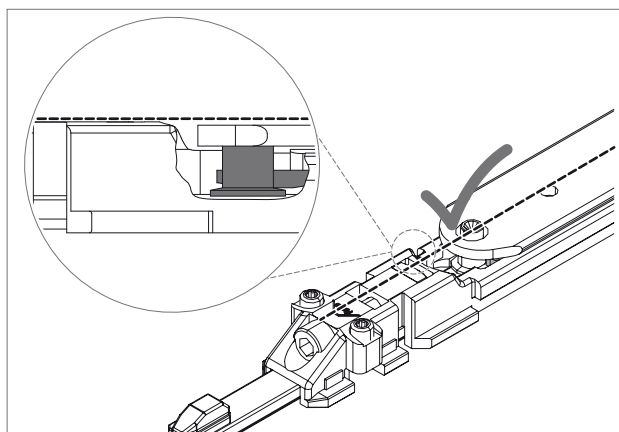


Mounting sash stay 735

1. Handle in tilt position and sash opened approximately 10°.

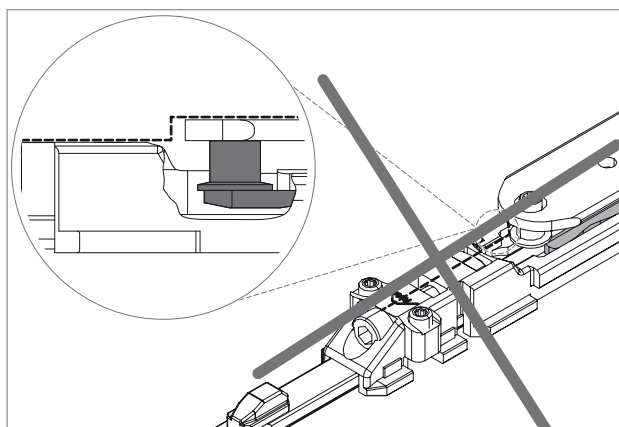
A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting")

B = Mount the tab in the sash stay rod (keyhole).



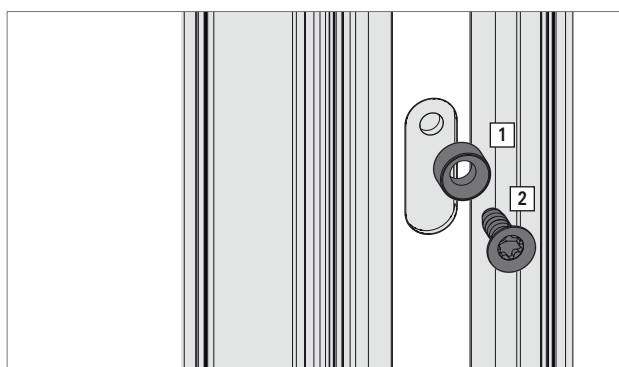
Correct mounting

No projection from the sash stay to the scissor stay guide.



Incorrect mounting

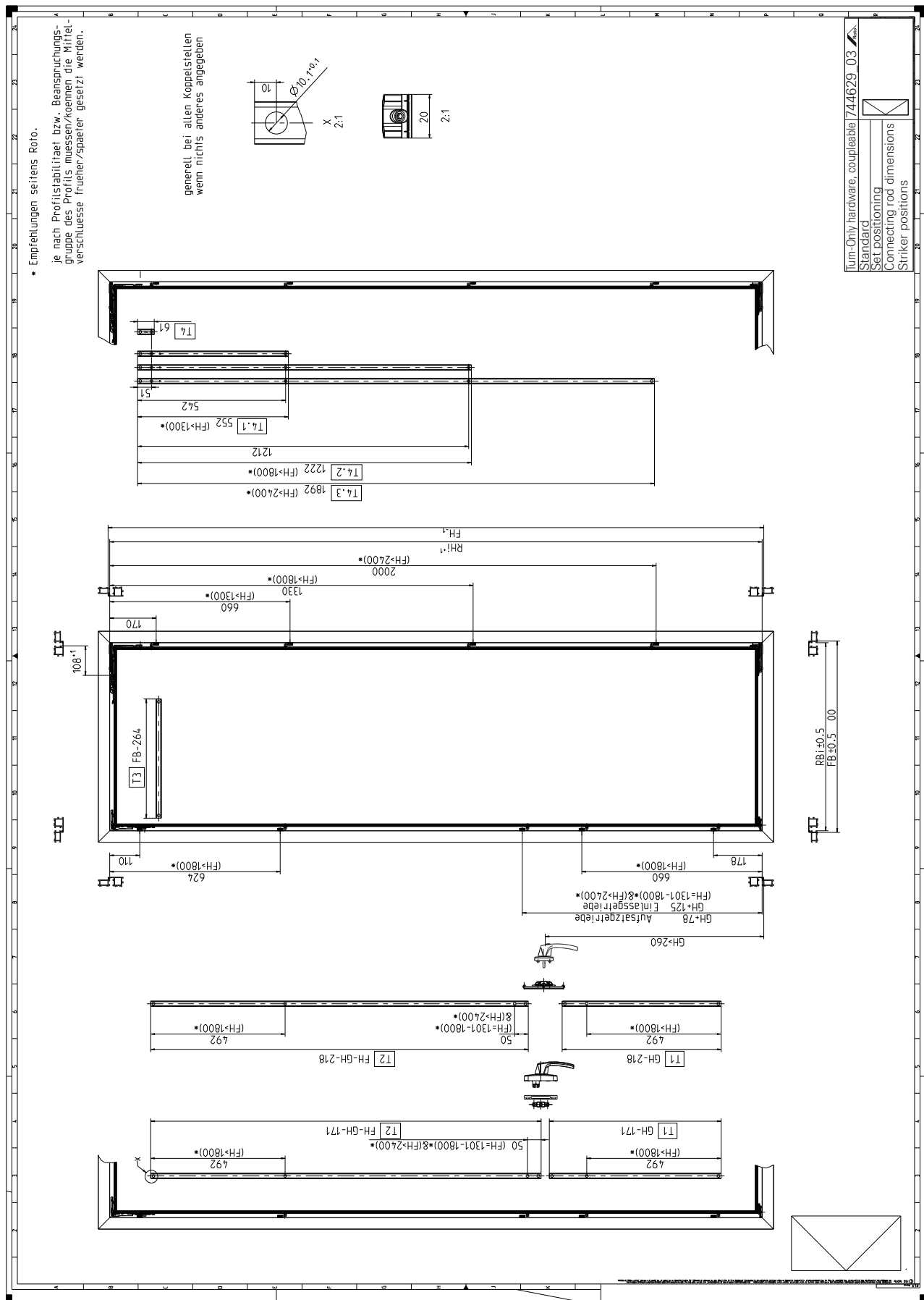
Projection from the sash stay to the scissor stay guide is not permissible.



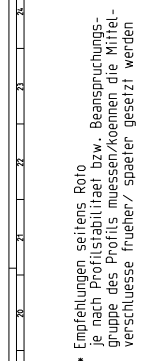
3. Screw down the locking sleeve [1] with the screw [2].

Tool: T 25 hex key

Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Abweichung Abstand RC SST mit DB	Deviation from distance RC ST with TR
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5 / Abstand RC SST	Deviation from connecting rod CR5 / distance RC ST
Axer	Sash stay
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung entsprechend der Drehrichtung des Flügels der rechte bzw. linke Steg abgetrennt werden.	When fitting the additional stay arm, the right or left strut must be detached for rebate-clearance reduction depending on the direction of rotation of the sash.
DB Gr. 1	TR size 1
DB Gr. 2	TR size 2
DB ungebr.	TR, unbraked
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto. Je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse früher/später gesetzt werden	Recommendations from Roto. Depending on the profile stability or profile loading group, the centre locks must/can be put in place at an earlier/later point
FB	SW
FH	SH
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise stated
GH	HH
mit DB	With TR
ohne DB	Without TR
RBi	FWi
RC2 Ausführung	RC2 version
RHi	FHi
SST	ST
T	CR
Zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)

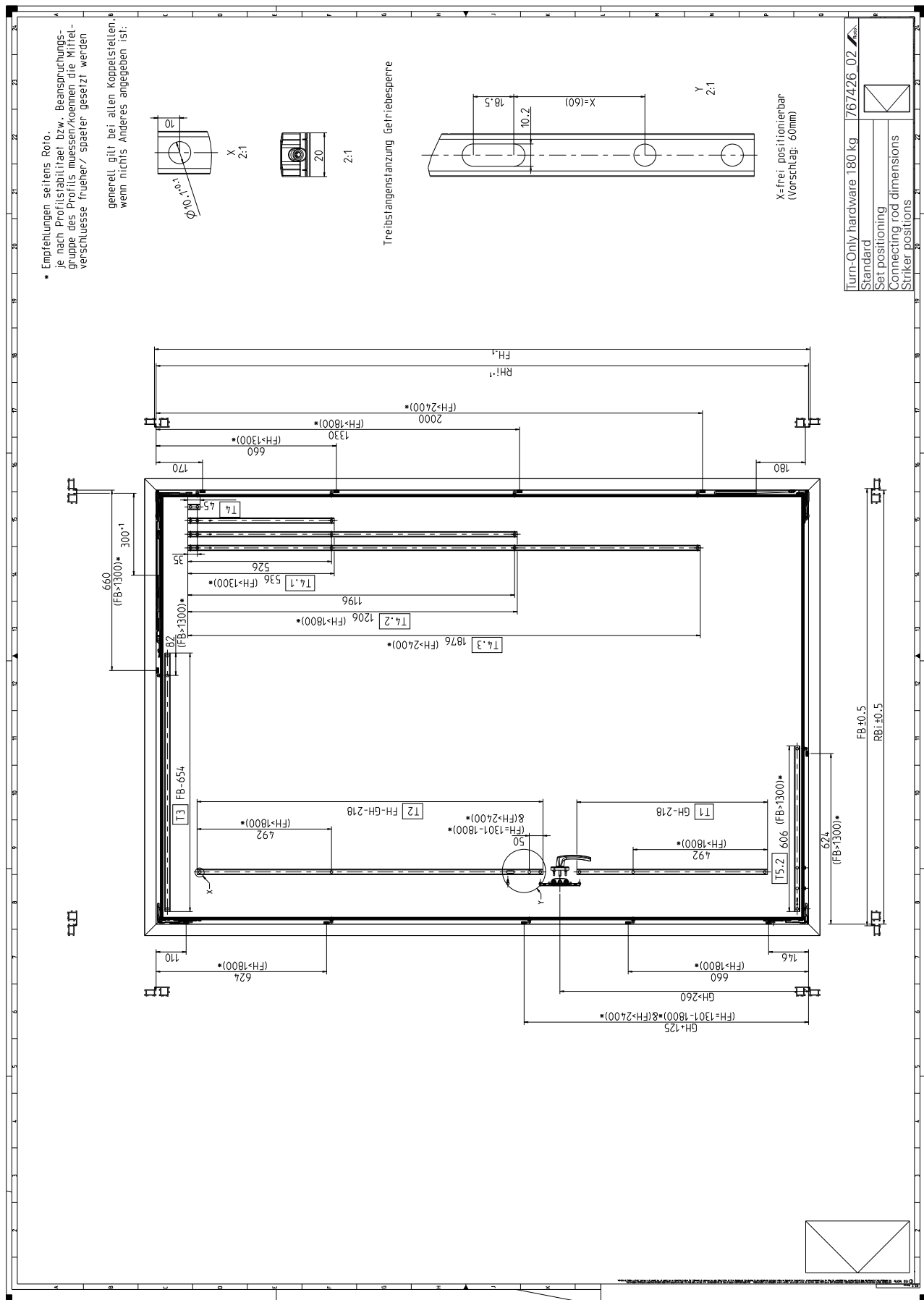




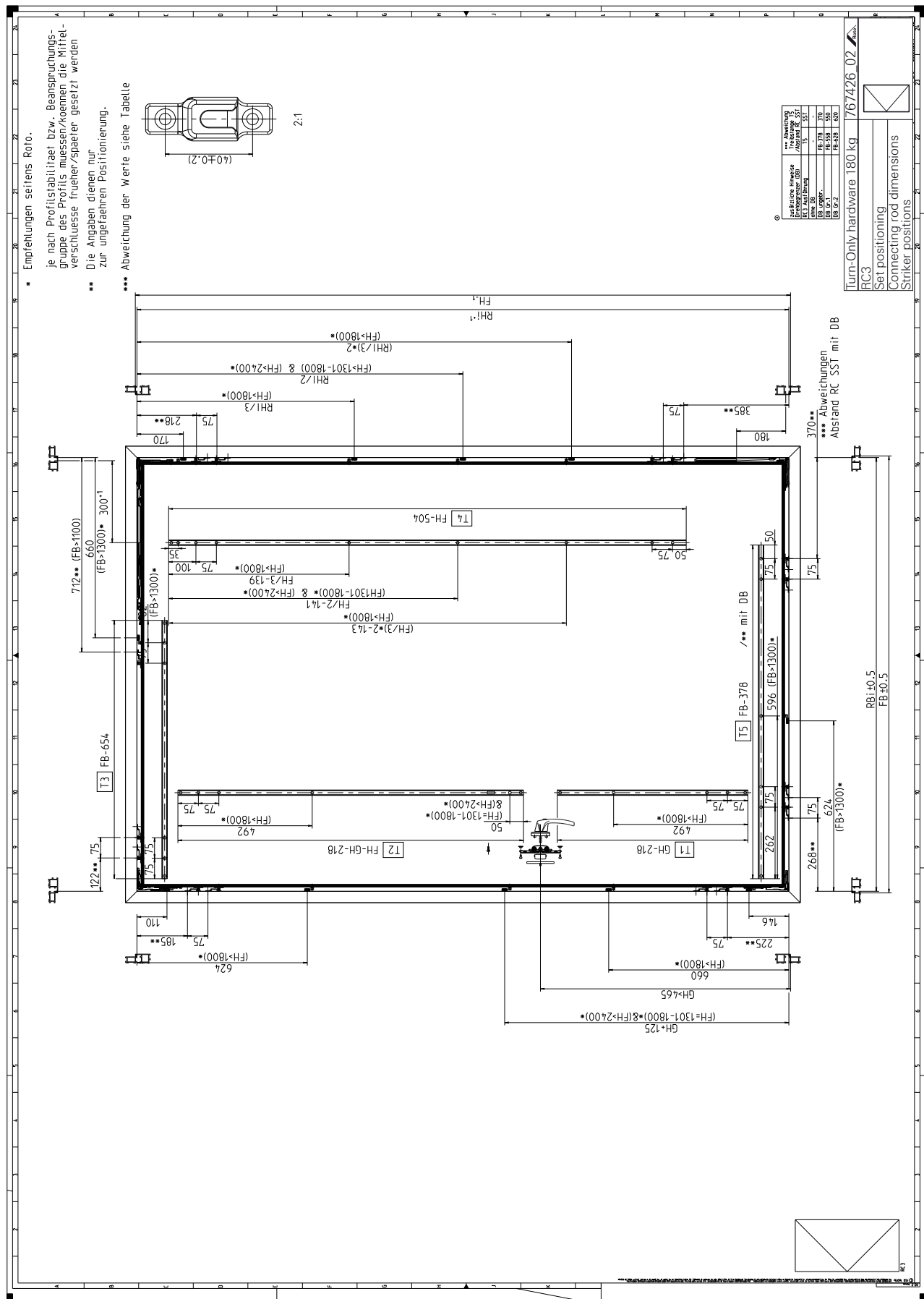








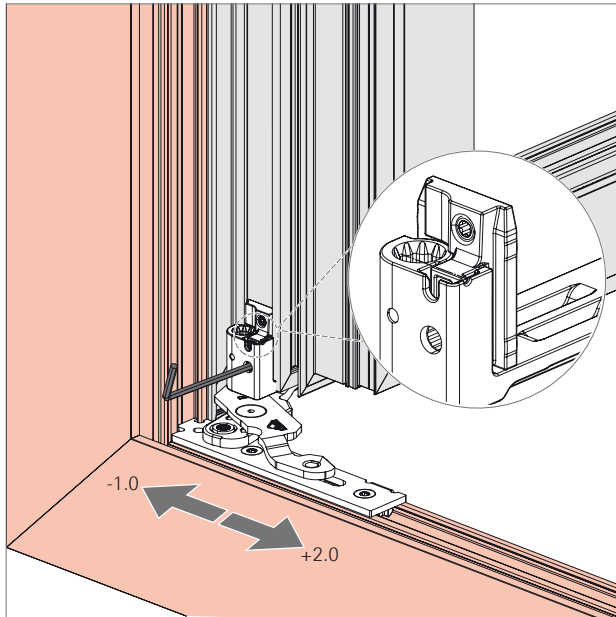






Note!

Roto hardware components may only be adjusted by authorised professionals.



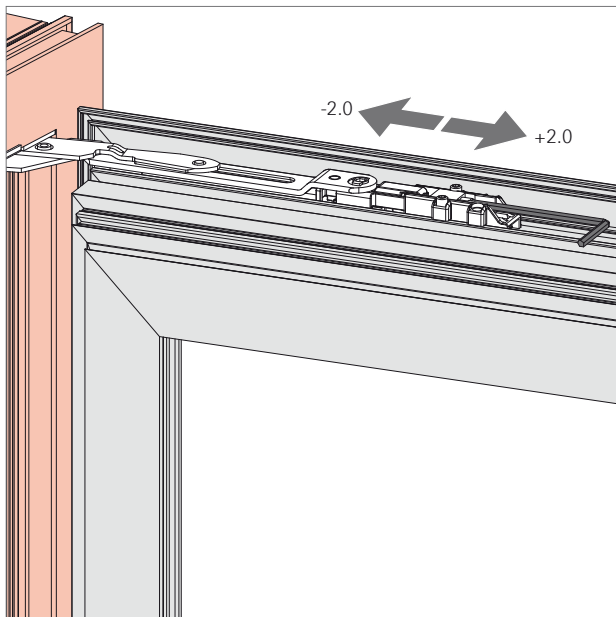
Corner hinge

1. Open the window sash 90°.
2. Lateral adjustment -1 mm/+2 mm using hex key size 4.



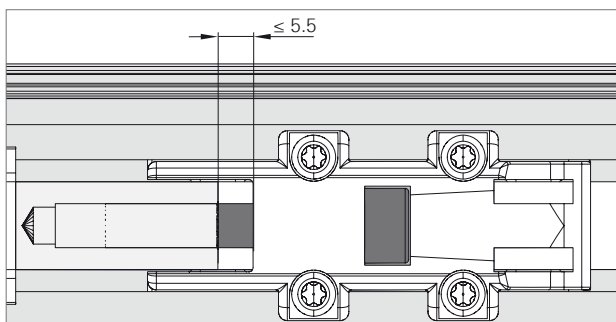
NOTE!

Control the lateral adjustment via the axis on the adjustment piece.



Rebate sash stay and sash stay 735

1. Open the window sash 90°.
2. Lateral adjustment ± 2 mm using hex key size 4.



Danger!

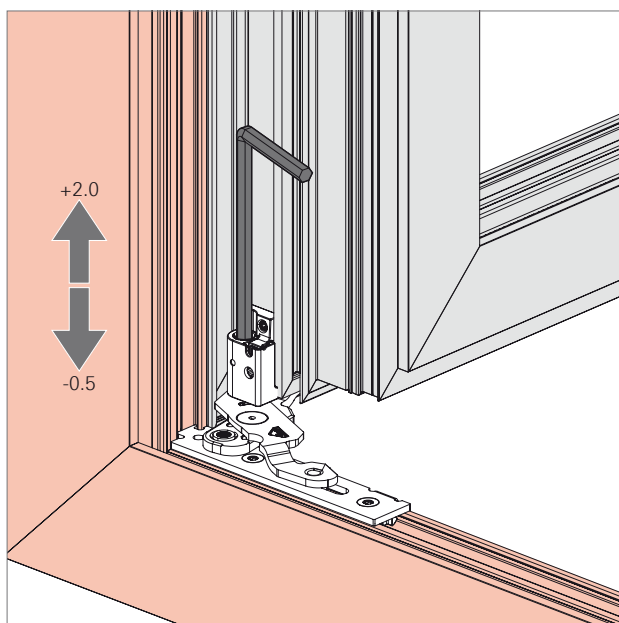
Proceed with caution before unhinging the sash.

- Roto hardware components may only be adjusted by authorised professionals.
- The gap must be smaller than 5.5 mm.



Note!

Roto hardware components may only be adjusted by authorised professionals.



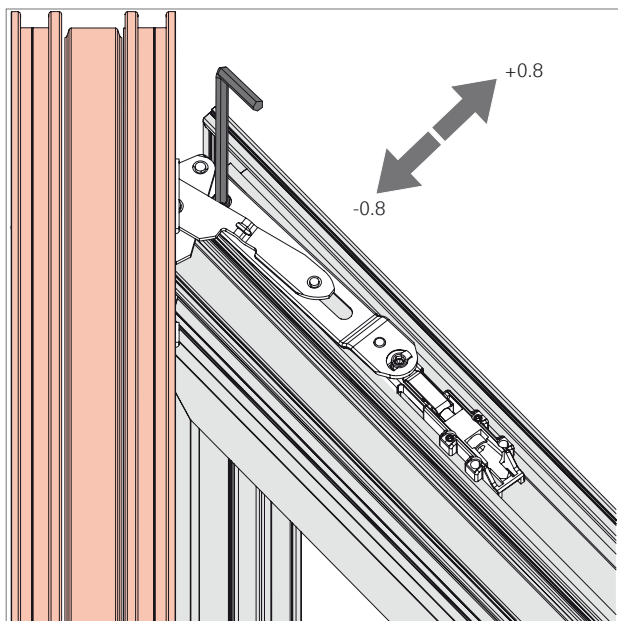
Corner hinge

1. Open the window sash 90°.
2. Height adjustment -0.5 mm/+2.0 mm via screw in the adjustment piece using hex key size 4.



Note!

Roto hardware components may only be adjusted by authorised professionals.



Rebate stay hinge | 80 kg

1. Move the window sash to the tilt position.
2. Gasket compression adjustment ± 0.8 mm using hex key size 4.

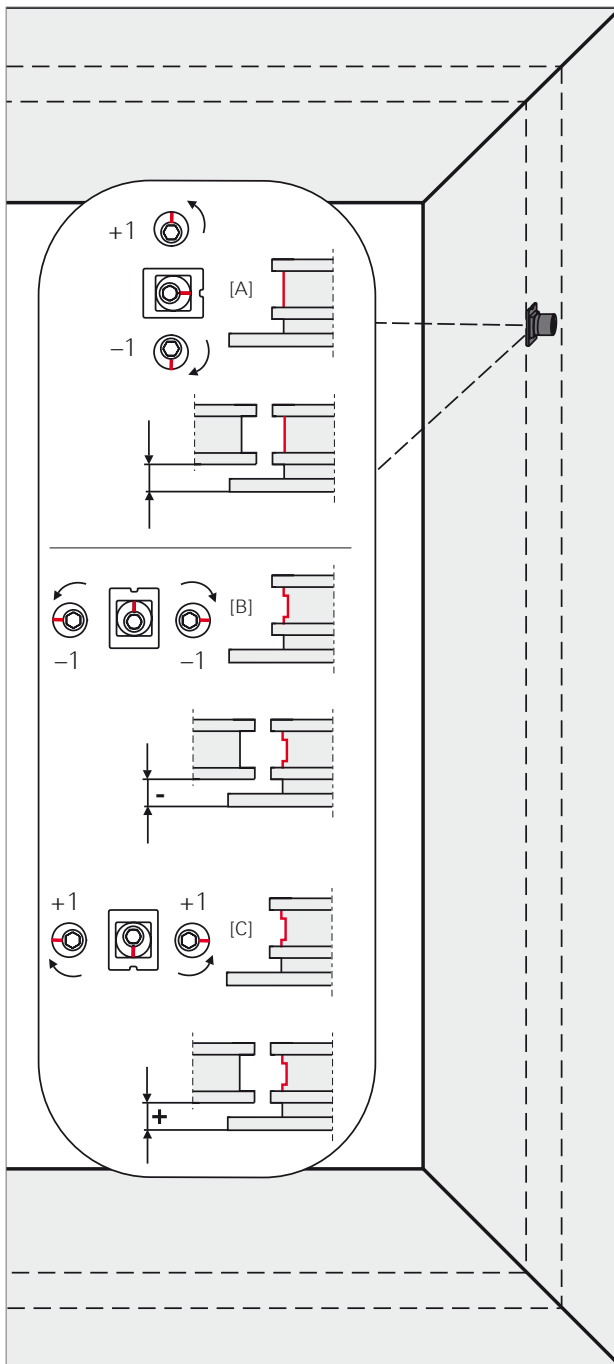


Note!

Roto hardware components may only be adjusted by authorised professionals.

Strikers

Adjust the gasket compression using hex key size 4, depending on the installation situation.



[A] The gasket compression can be increased or reduced.

[B] The gasket compression can be increased only.

[C] The gasket compression can be reduced only.



TiSt hardware overview

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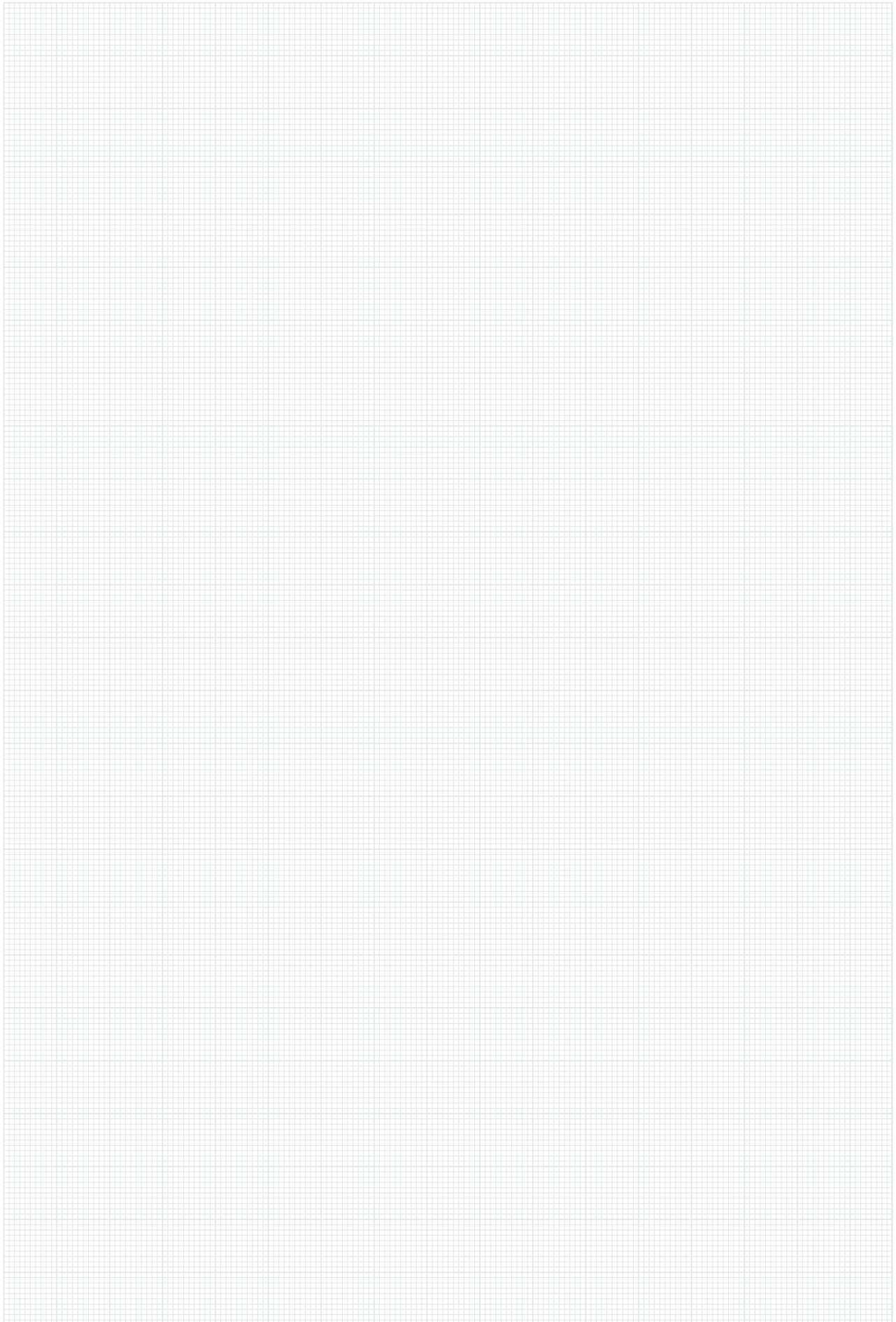
TiSt installation drawings

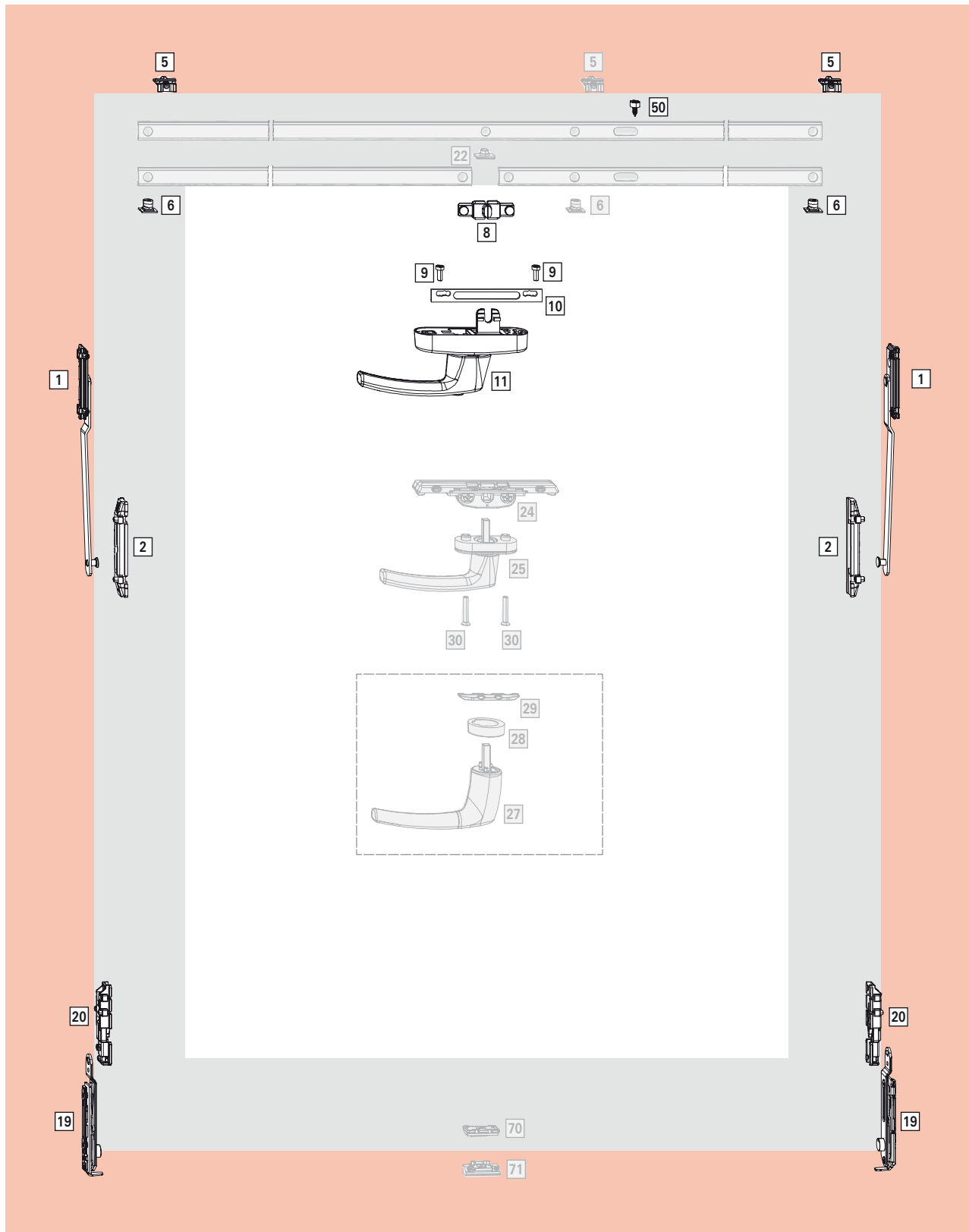
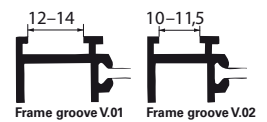
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TiSt adjustment

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Grey components (optional) are not included in the basic set.



Application range

Sash width **SW** 520–1600 mm
Sash height **SH** 500–1300 mm
Sash weight **S.kg** max. 100 kg

Rebate clearance **RC** 11.5–12 mm
Overlap width **OW** 21.5–22 mm

Basic sets

Locking side					
Pos.	Pc(s)	Description	PU	Material no.	
	1	TiSt locking components V.01	10	728858	
		TiSt locking components V.02	10	728859	
		consisting of:			
[1]	2	Tilt-Only stay arm, compl. V.01/V.02			
[2]	2	Tilt-Only stay arm slide bar, compl.			
[5]	2	Striker V.01/V.02			
[6]	2	Insertable cam			
Additionally required locking components					
Pos.	Pc(s)	Description	PU	Material no.	
[50]	1	Espagnolette lock	100	738549	
Sash stay					
Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	2	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	2	Rebate stay hinge		10	740811

NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
	1	T connector set	10	728981
		consisting of:		
[8]	1	T connector		
[10]	1	Espagnolette support		
[9]	2	Flat-headed screw M5 x 12		

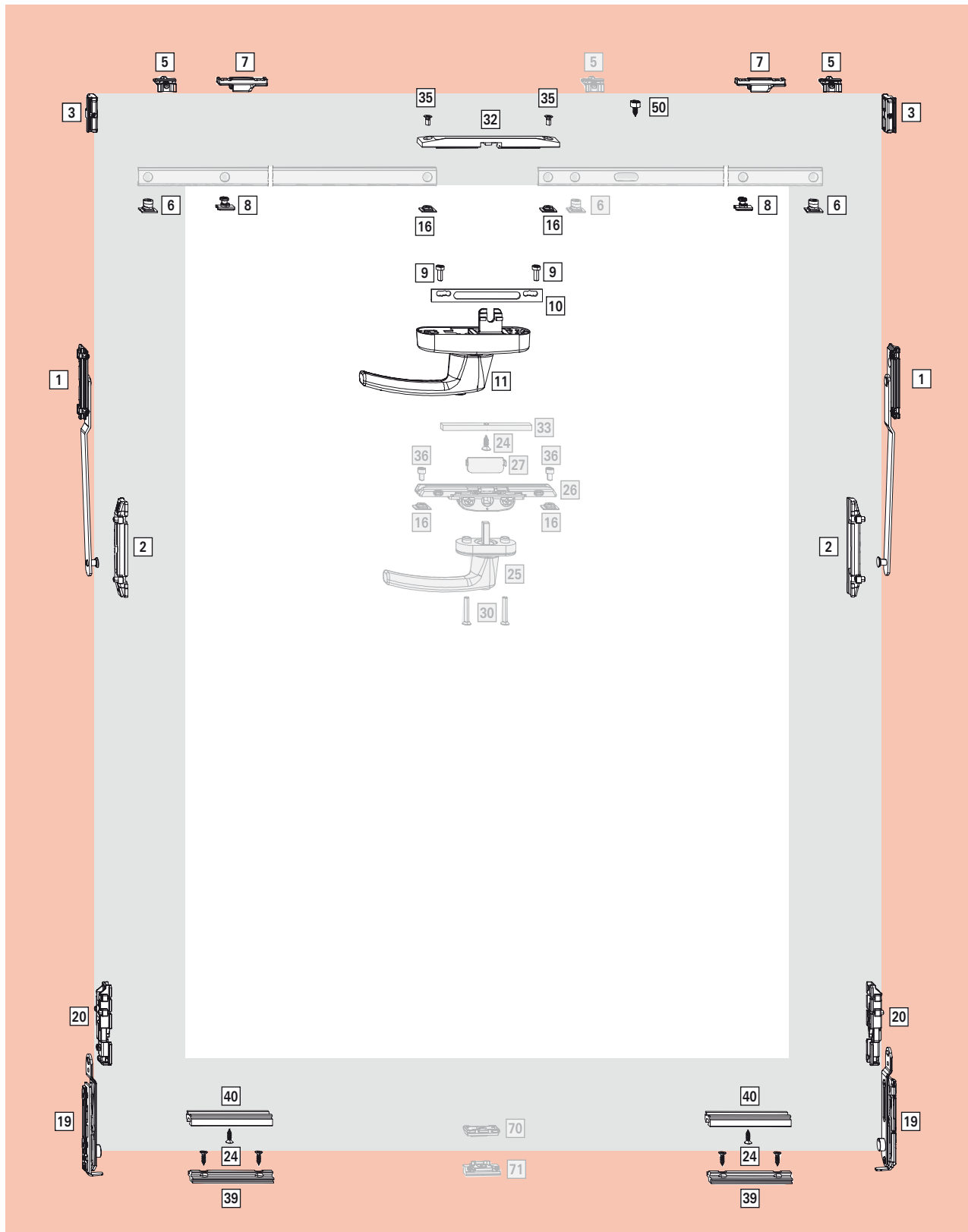
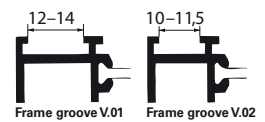
Optional

Additional components, size-dependent				
Pos.	Pc(s)	Description	PU	Material no.
[5]	1	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Cam, insertable	100	334671
	1-3	CL central set V.01	10	740813
		CL central set V.02	10	740812
		consisting of:		
[70]		CL sash component		
[71]		CL frame component V.01/V.02		

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle		→ CTL 1
[22]	1	Connector bolt, insertable	100	254601
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5 x 12	100	728925
[25]	1	Handle		→ CTL 1
[24]	1	Flush-encased gearbox without MD	10	378338
[30]	2	Countersunk screw (stainless steel) M5 x 30	100	212501
[27]	1	Handle without escutcheon ¹⁾		→ CTL 1
[28]	1	Ring for handle without escutcheon		→ CTL 1
[29]	1	Mounting plate	10	378134
[24]	1	Flush-encased gearbox without MD	10	378338

1) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.



Grey components (optional) are not included in the basic set.


Application range

Sash width **SW** 520–1600 mm
 Sash height **SH** 500–1300 mm
 Sash weight **S.kg** max. 100 kg

Rebate clearance **RC** 11.5–12 mm
 Overlap width **OW** 21.5–22 mm

Basic sets

Locking side				
Pos.	Pc(s)	Description	PU	Material no.
	1	TiSt locking components V.01	10	728858
		TiSt locking components V.02	10	728859
		consisting of:		
[1]	2	Tilt-Only stay arm, compl. V.01/V.02		
[2]	2	Tilt-Only stay arm slide bar, compl.		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	2	SEC cam, insertable	100	447245
[7]	2	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
[50]	1	Espagnolette lock	100	738549
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
[3]	2	Tilt striker	100	728860

SEC components on the hinge side

Pos.	Pc(s)	Description	PU	Material no.
	2	SEC hinge lock set V.01	10	728940
		SEC hinge lock set V.02	10	728941
		consisting of:		
[39]	1	Frame component V.01/V.02		
[40]	1	Sash component		
[24]	3	Countersunk tapping screw ST4.8x16		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	2	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	2	Rebate stay hinge		10	740811


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.
 Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

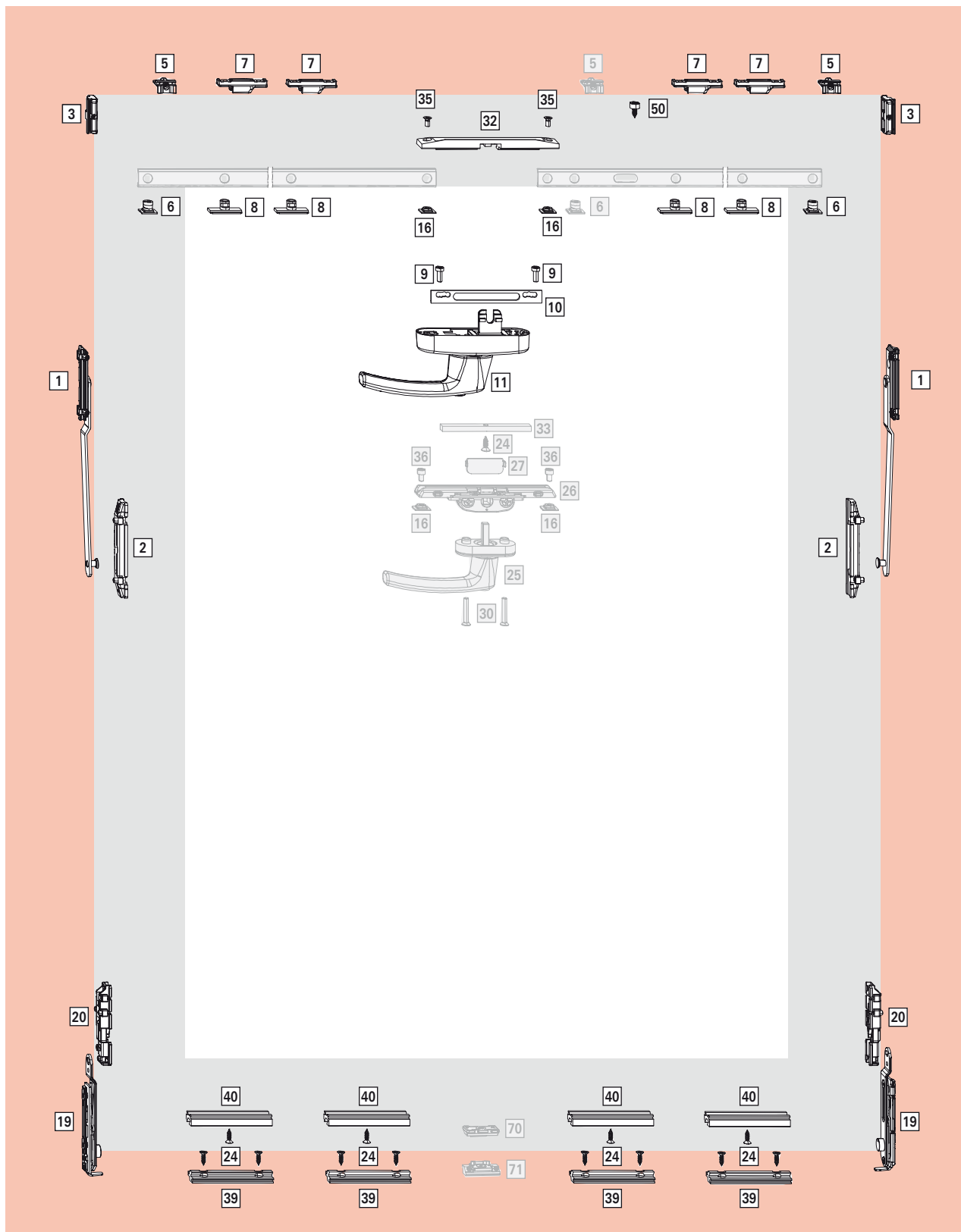
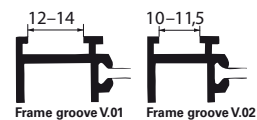
Optional
Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Cam, insertable	100	334671
	1-3	CL central set V.01	10	740813
		CL central set V.02	10	740812
		consisting of:		
[70]		CL sash component		
[71]		CL frame component V.01/V.02		

Alternative espagnolettes and connectors

Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ¹⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) For the SEC flush-encased gearbox with blocking device, see page 237.




Application range

Sash width **SW** 670–1600 mm

Sash height **SH** 500–1300 mm

Sash weight **S.kg** max. 100 kg

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm

Basic sets
Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	TiSt locking components V.01	10	728858
		TiSt locking components V.02	10	728859
		consisting of:		
[1]	2	Tilt-Only stay arm, compl. V.01/V.02		
[2]	2	Tilt-Only stay arm slide bar, compl.		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
[8]	4	SEC cam RC3, insertable	100	443530
[7]	4	SEC striker V.01	100	212637
		SEC striker V.02	100	212638
[50]	1	Espagnolette lock	100	738549
	1	SEC rebate-clearance reduction set	10	728950
		consisting of:		
[37]	1	SEC rebate-clearance reduction CD		
[24]	1	Countersunk tapping screw ST4.8x16		
[3]	2	Tilt striker	100	728860

SEC components on the hinge side

Pos.	Pc(s)	Description	PU	Material no.
	4	SEC hinge lock set V.01	10	728940
		SEC hinge lock set V.02	10	728941
		consisting of:		
[39]	1	Frame component V.01/V.02		
[40]	1	Sash component		
[24]	3	Countersunk tapping screw ST4.8x16		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[19]	2	Rebate sash stay no. 1	L	10	627256
			R	10	627255
		Rebate sash stay no. 3	L	10	627258
			R	10	627257
		Rebate sash stay no. 4	L	10	627260
			R	10	627259
[20]	2	Rebate stay hinge		10	740811


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from

Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[11]	1	Roto Line AL geared-handle, lockable		→ CTL 1
[10]	1	Espagnolette support	100	331937
[9]	2	Flat-headed screw M5x12	100	728925
	1	SEC espagnolette protection set	10	728952
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC espagnolette protection		
[30]	2	Countersunk screw M5x10		

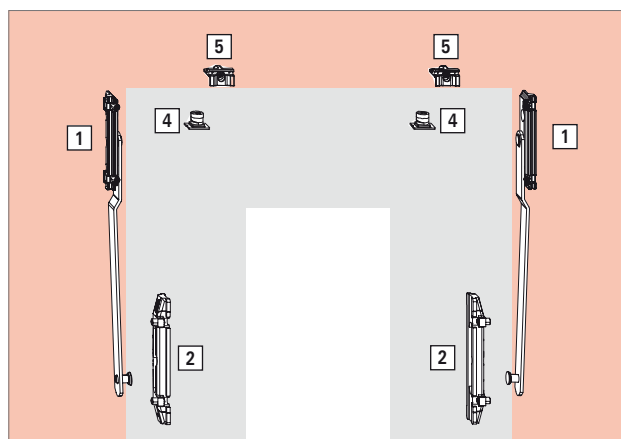
Optional
Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1	Cam, insertable	100	334671
	1-3	CL central set V.01	10	740813
		CL central set V.02	10	740812
		consisting of:		
[70]		CL sash component		
[71]		CL frame component V.01/V.02		

Alternative espagnolettes and connectors

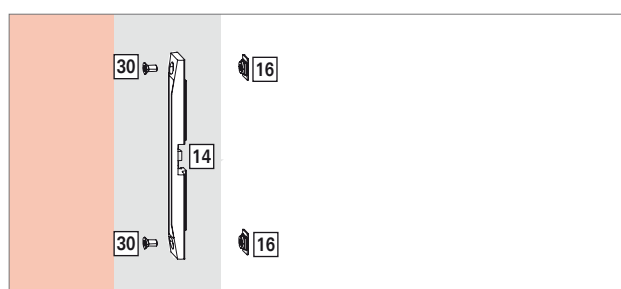
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	Handle, lockable		→ CTL 1
[12]	2	Countersunk screw (stainless steel) M5x30	100	212501
	1	SEC flush-encased gearbox set	10	728947
		consisting of:		
[15]	1	SEC flush-encased gearbox without MD ¹⁾		
[16]	2	SEC connector		
[24]	1	Countersunk tapping screw ST4.8x16		
[32]	1	SEC anti-drilling protection		
[36]	2	Cylinder-head screw M5x8		
[38]	1	SEC rebate-clearance reduction flush-encased gearbox		

1) For the SEC flush-encased gearbox with blocking device, see page 237.



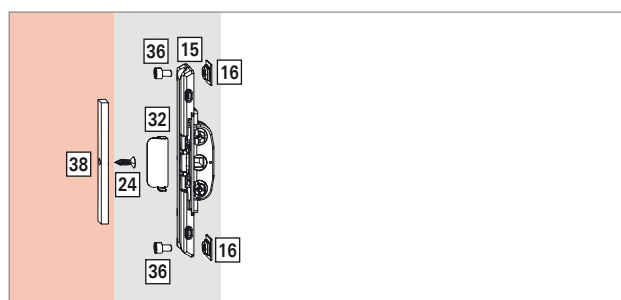
TiSt locking components

Pos.	Pc(s)	Description	PU	Material no.
1	1	Tilt-Only stay arm, compl. V.01	20	728862
	1	Tilt-Only stay arm, compl. V.02	20	728863
		consisting of:		
[1]	1	Tilt-Only stay arm, compl. V.01/V.02		
[2]	1	Tilt-Only stay arm slide bar, compl.		
[4]	2	Insertable cam	100	334671
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920



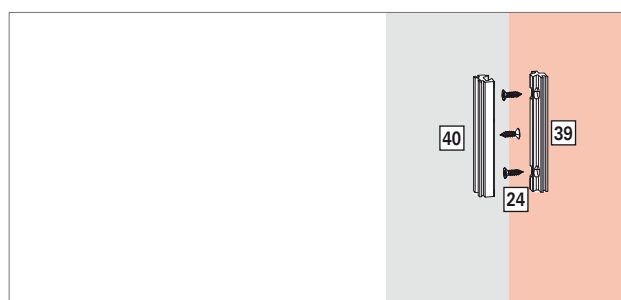
SEC espagnolette protection set

Pos.	Pc(s)	Description	PU	Material no.
[14]	1	SEC espagnolette protection	10	487407
[16]	2	SEC connector	100	447113
[30]	2	Countersunk screw M5 x 10	100	728926



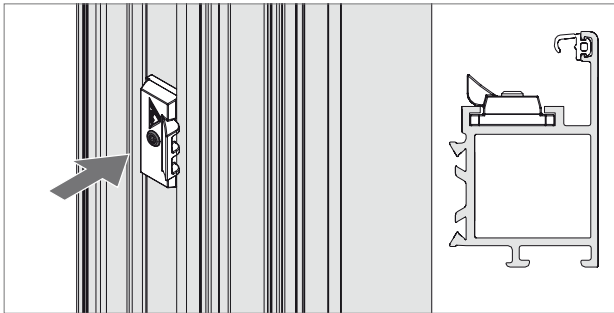
SEC flush-encased gearbox set

Pos.	Pc(s)	Description	PU	Material no.
[15]	1	SEC flush-encased gearbox without MD	10	457210
[16]	2	SEC connector	100	447113
[24]	1	Countersunk tapping screw ST4.8 x 16	100	728932
[32]	1	SEC anti-drilling protection	10	487406
[36]	2	Cylinder-head screw M5 x 8	100	728936
[38]	1	SEC rebate-clearance reduction ESP	50	334360



SEC hinge lock set

Pos.	Pc(s)	Description	PU	Material no.
[24]	3	Countersunk tapping screw ST4.8 x 16	100	728932
[39]	1	Frame component V.01	20	331788
		Frame component V.02	20	331789
[40]	1	Sash component	20	331790

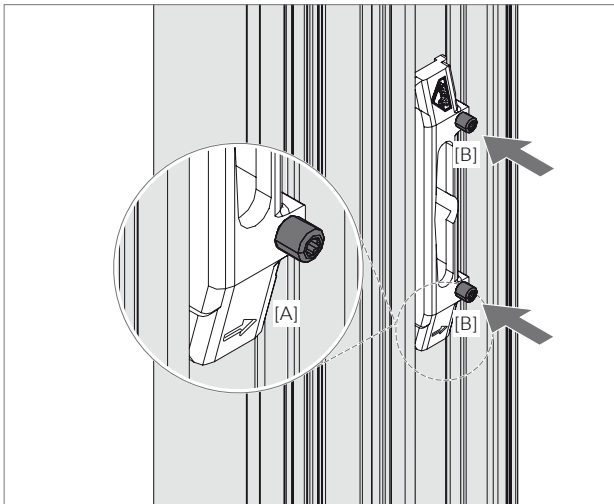


Installing the CL sash component

1. Insert the CL sash component into the sash groove on the hinge side.
2. Tighten the CL sash component with the preinstalled threaded pin.

Tool: T 10 hex key

Torque: max. 2.5 Nm



Installing the Tilt-Only stay arm slide bar

1. Insert the Tilt-Only stay arm slide bar into the sash groove.



NOTE!

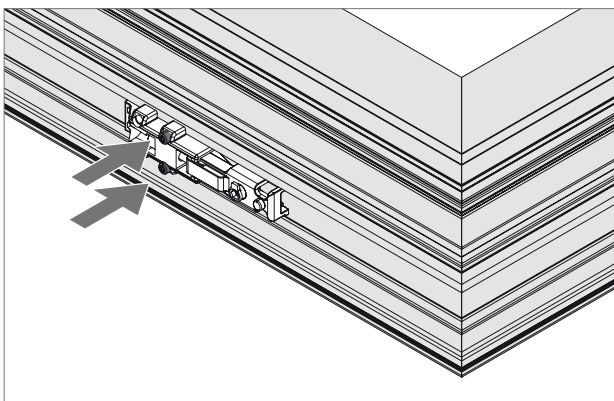
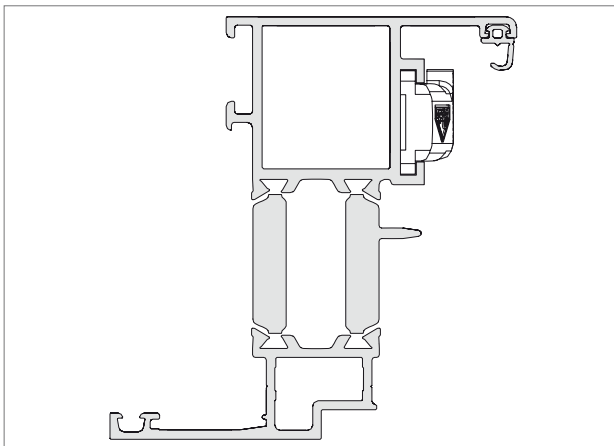
Pay attention to the installation direction of the slide bar. The arrow [A] must point towards the sash overlap.

2. Screw down the slide bar with 2 preinstalled piercing screws [B].

After tightening the screw, check that the slide bar is securely fitted.

Tool: T 10 hex key

Torque: 2–2.5 Nm

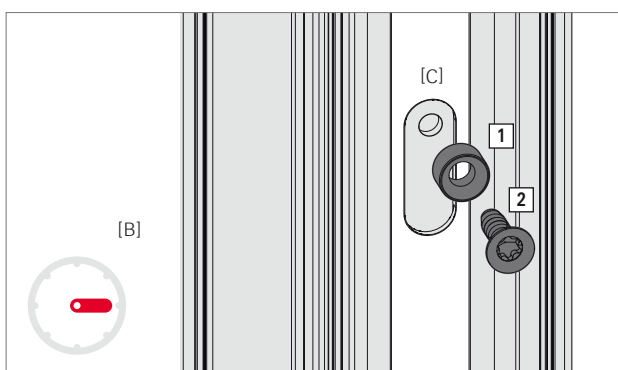
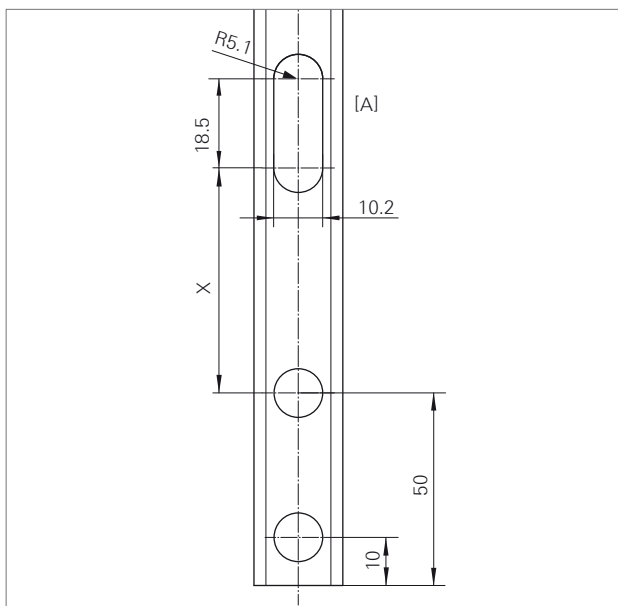
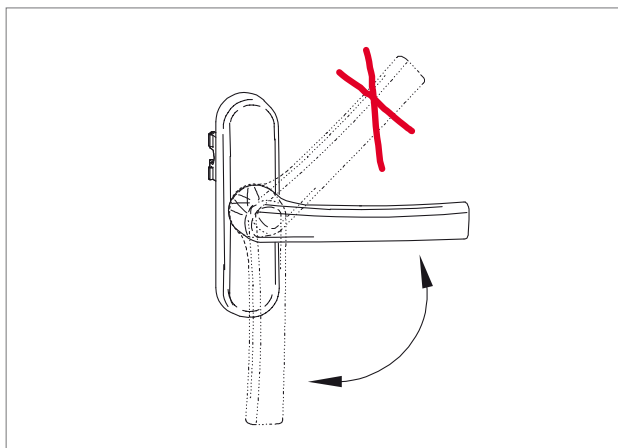


Installing the rebate stay hinge

1. Insert the rebate stay hinge into the Euro-groove at the top. Fix the rebate stay hinge in position (as shown in the installation drawing) with 2 piercing screws.

Tool: T 10 hex key

Torque max. 2.5 Nm



Installing the espagnolette lock

Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

1. Produce the slot in connecting rod CR2 before installation, as shown in the drawing opposite [A].



NOTE!

X = freely positionable (suggestion: 60 mm)

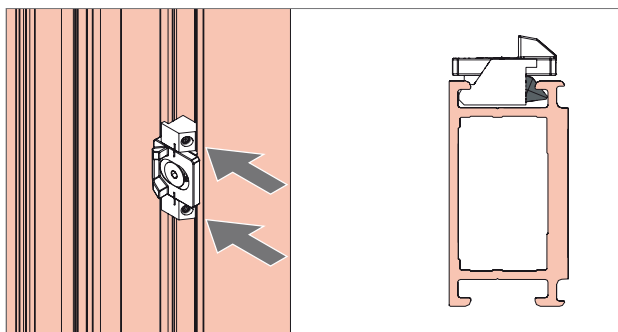
2. Drill out the sash in the 90° handle position [B] for locking sleeve with M5 screw [C].

Drill holes:

1 x Ø 3.5 mm, at least 4 mm deep.

3. Screw down the locking sleeve [1] with the screw [2].

Tool: T 25 hex key

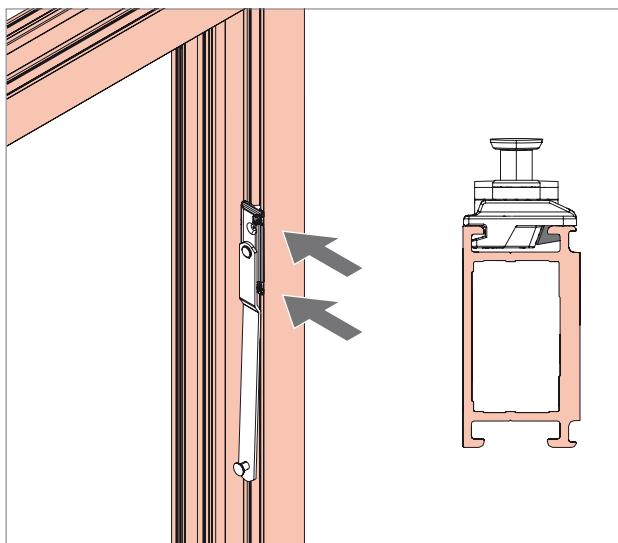


Installing the CL frame component

1. Swing the CL frame component into the profile on the hinge side.
2. Screw down the CL frame component with the pre-installed threaded pins.

Tool: T 10 hex key

Torque: max. 2.5 Nm

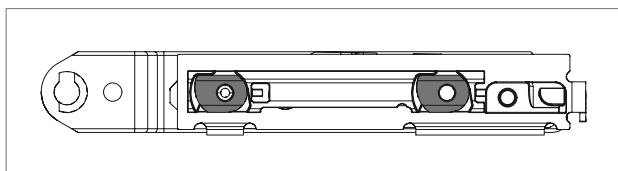


Installing the Tilt-Only stay arm

1. Swing the Tilt-Only stay arms into the frame at the specified position (see installation drawing).
2. Screw down the Tilt-Only stay arms with the 2 pre-installed threaded pins.

Tool: T 10 hex key

Torque: max. 2.5 Nm



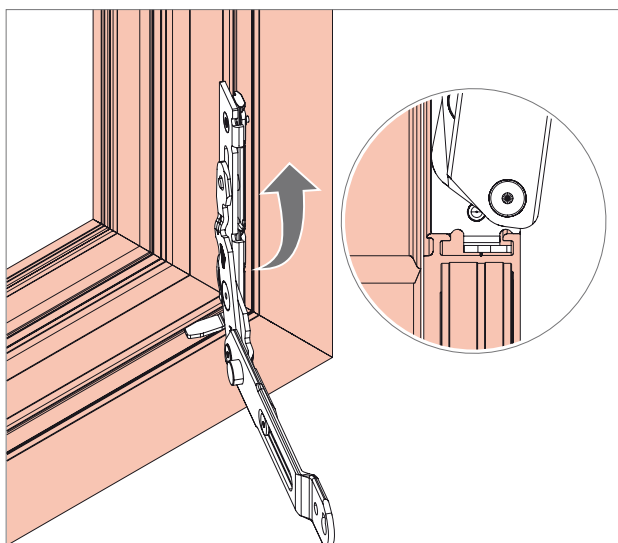
Installing the rebate sash stay

1. Align the clamping blocks (see image).



NOTE!

For selecting the clamp strip version depending on the clamp strip dimensions = C (front strut thickness) + J (groove inside width), → p. 28.

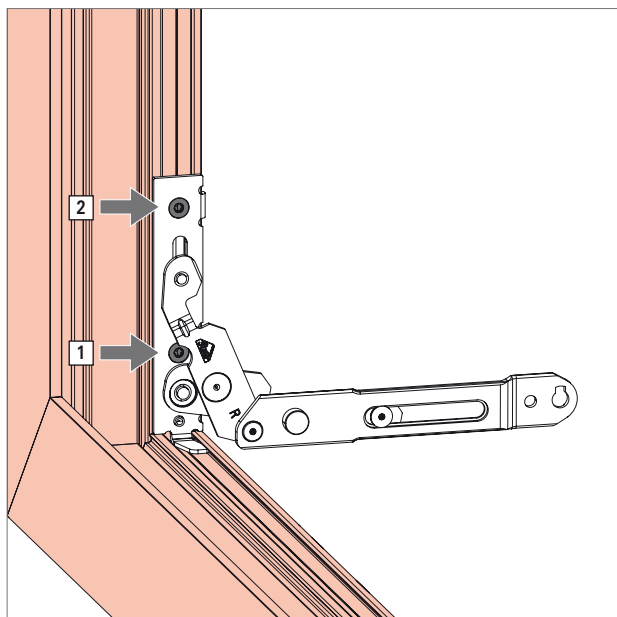


2. Open the sash stay and swing the support into the profile so that the baseplate engages behind it.

TiSt installation

Frame

Tilt-Only hardware, handle at the top



3. Push the baseplate onto the profile so that it is level and tighten the preinstalled screw [1].

After tightening the screw, check that the sash stay is securely fitted.

Tighten the screw [2].

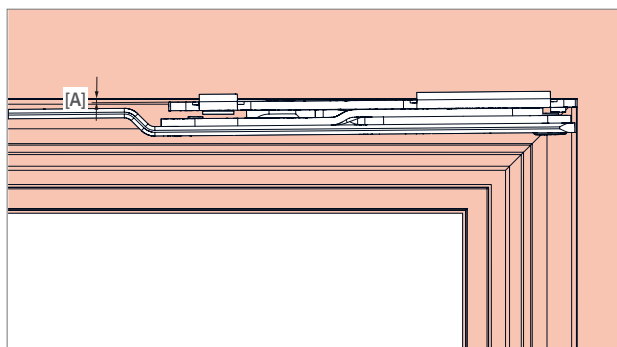
Tool: T 20 hex key

Torque: max. 5.5 Nm



NOTE!

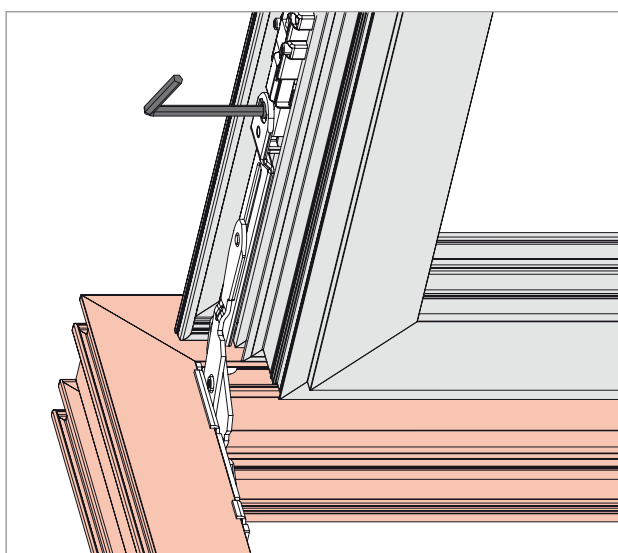
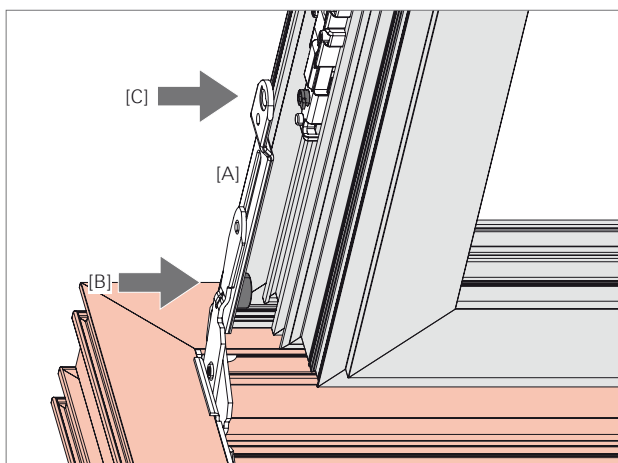
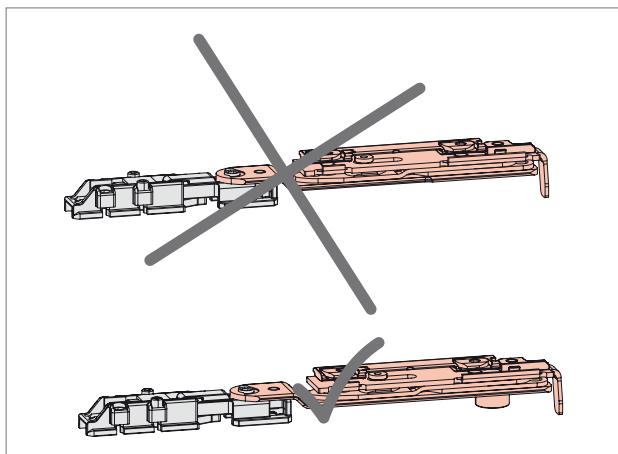
- Depending on the strength of the profile, or with a base groove thickness > 2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence [1], [2].
- Install and remove the sash stay a maximum of two times.



NOTE!

Do not leave a gap between the baseplate and profile [A].

4. Close the sash stay.



Mounting the rebate sash stay



WARNING!

Danger in the event of prohibited installation!

The combination of rebate sash stay, coupleable, and rebate stay hinge can lead to hazardous situations or even cause the sash to fall.

Only install the rebate sash stay in conjunction with the rebate stay hinge.

1. Open both rebate sash stays and guide them on the sash via the rebate stay hinge [A].
3. Insert the eccentric cam into the sash groove [B].
4. Guide the swivel pin on the rebate stay hinge through the drill hole in the two rebate sash stays [C].

5. Lock the connection by turning the cams (right and left) 180°.

Tool: hex key size 4

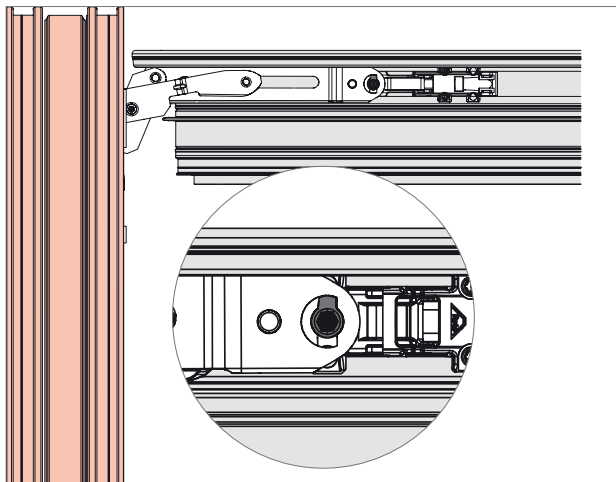


WARNING!

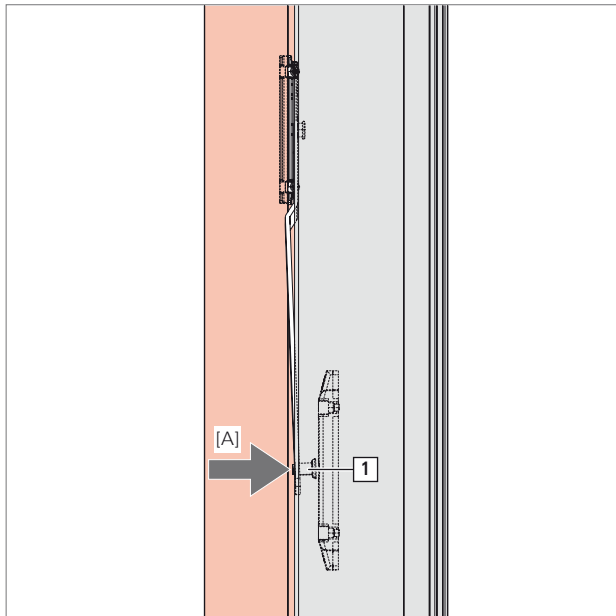
Danger in the event of prohibited installation!

A missing connection can lead to hazardous situations or even cause the sash to fall.

Lock by turning the cams (right and left) 180°.



6. View from above, after locking.



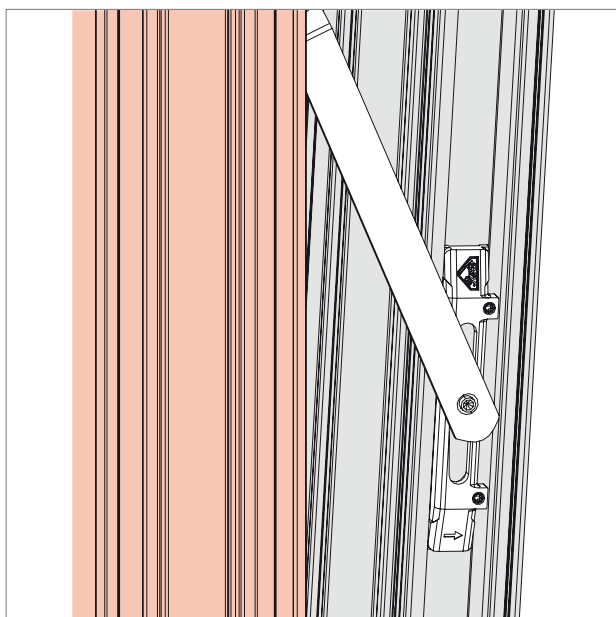
Connecting the Tilt-Only stay arm to the slide bar

1. In the tilted sash position, guide the scissor stay arm of the Tilt-Only stay arm across the centre of the slide bar with the mounting pin [1] [A].



NOTE!

Secure the sash to prevent it from falling.

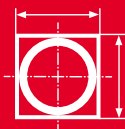


2. Insert the mounting pin in the slide bar and close the sash.

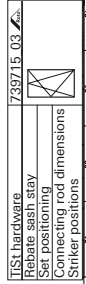


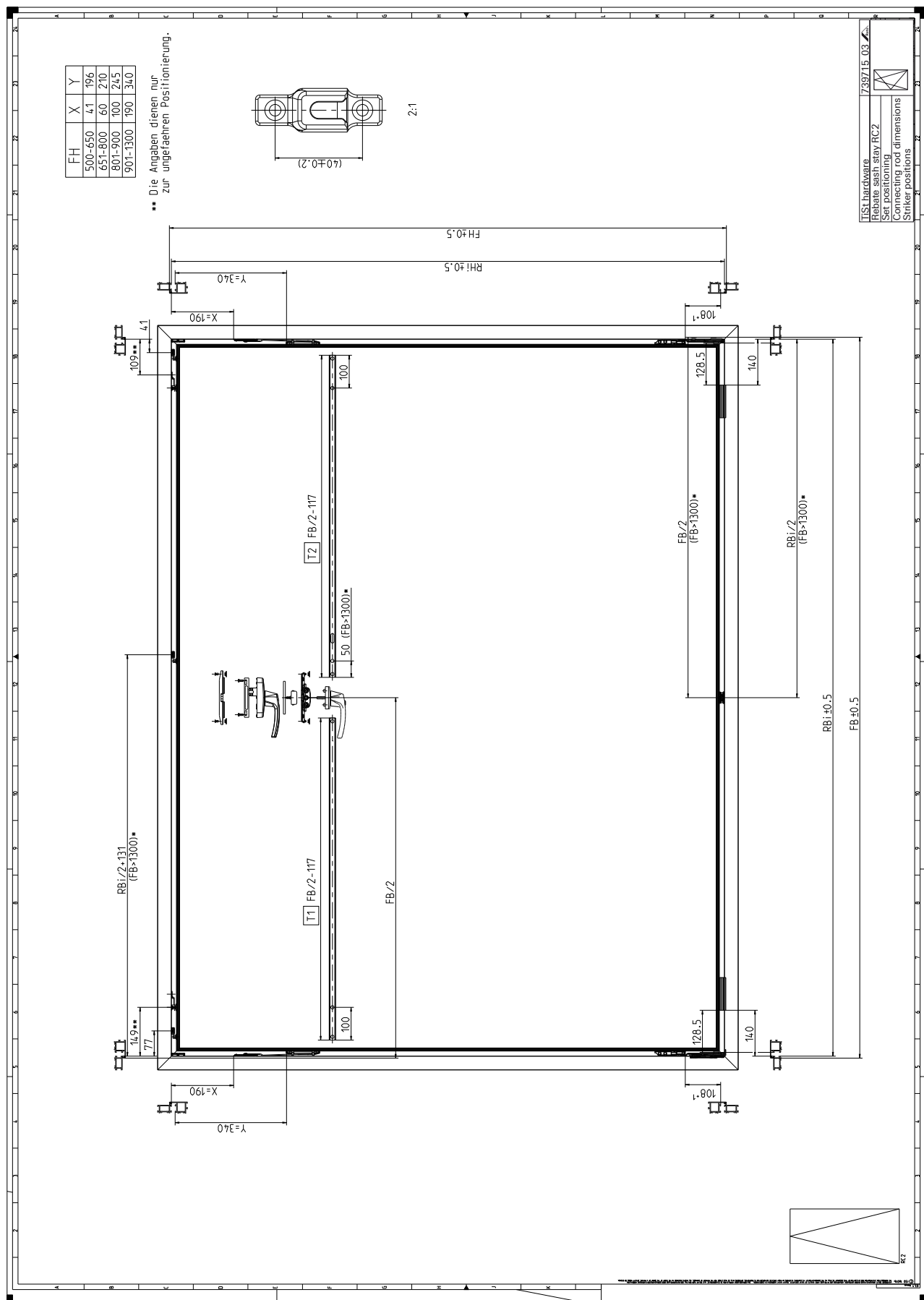
NOTE!

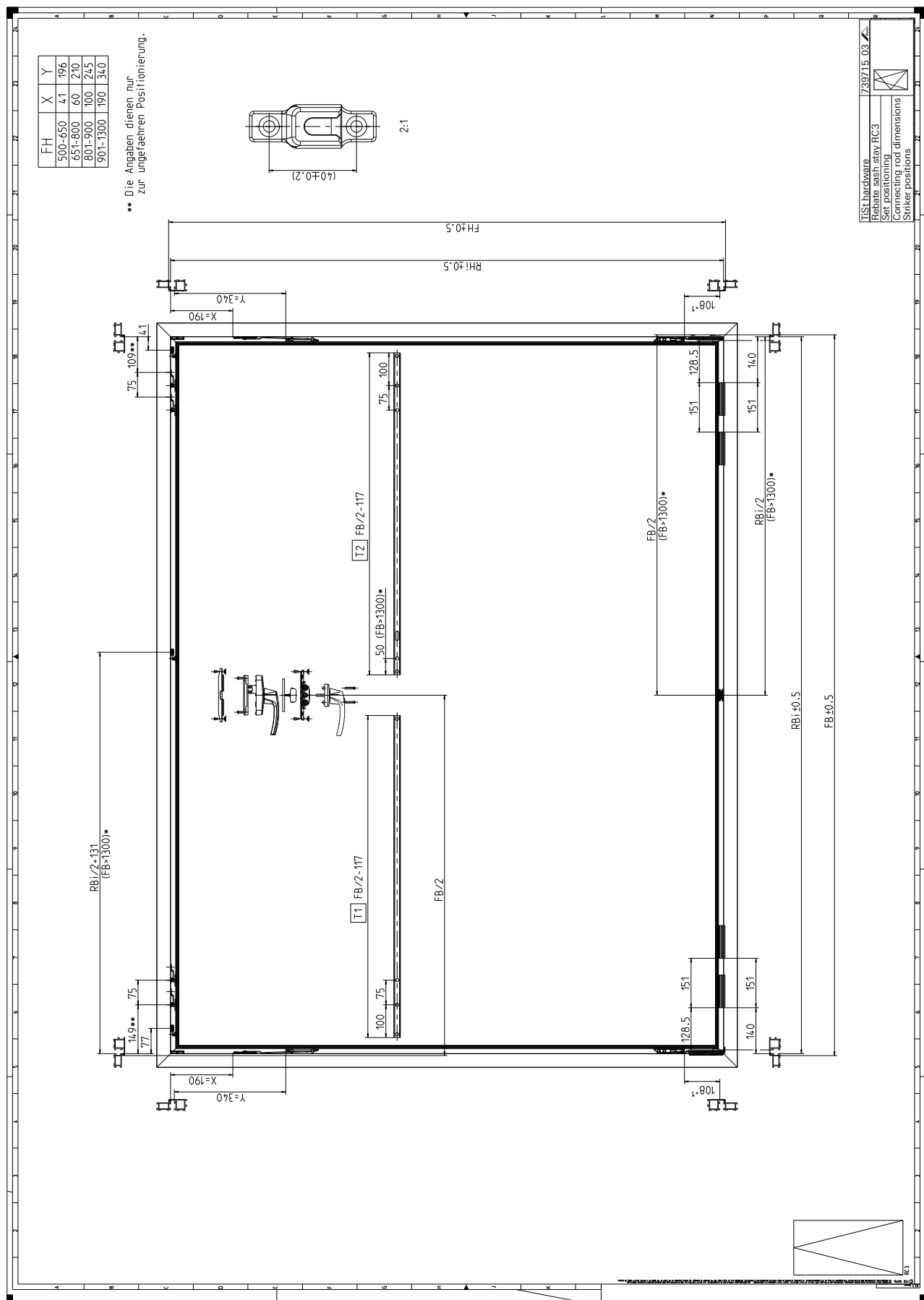
Dismantling is performed in reverse order.

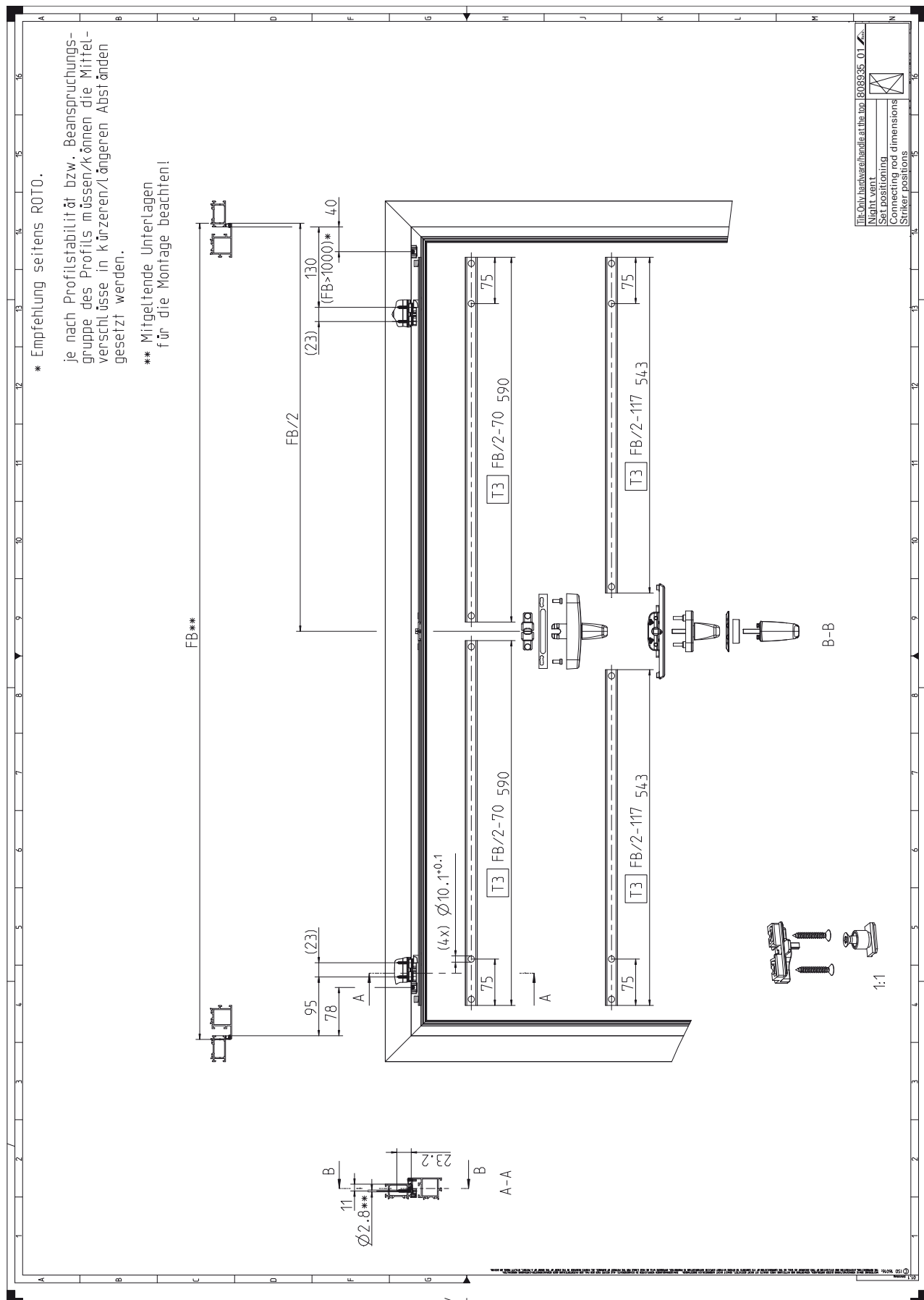


Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Die Angaben dienen nur zur ungefähren Positionierung	The information is for approximate positioning only
Einlassgetriebe	Flush-encased gearbox
Empfehlung seitens Roto	Recommendation from Roto
FB	SW
FH	SH
generell bei allen Koppelstellen, wenn nichts anderes angegeben	Generally for all coupling points, unless otherwise stated
je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/ können die Mittelverschlüsse in kürzeren/längeren Abständen gesetzt werden	Depending on the profile stability or profile loading group, the centre locks must/can be spaced closer together/further apart werden
Mitgeltende Unterlagen für die Montage beachten!	Comply with the other applicable documents for installation.
RBi	FWi
RHi	FHi





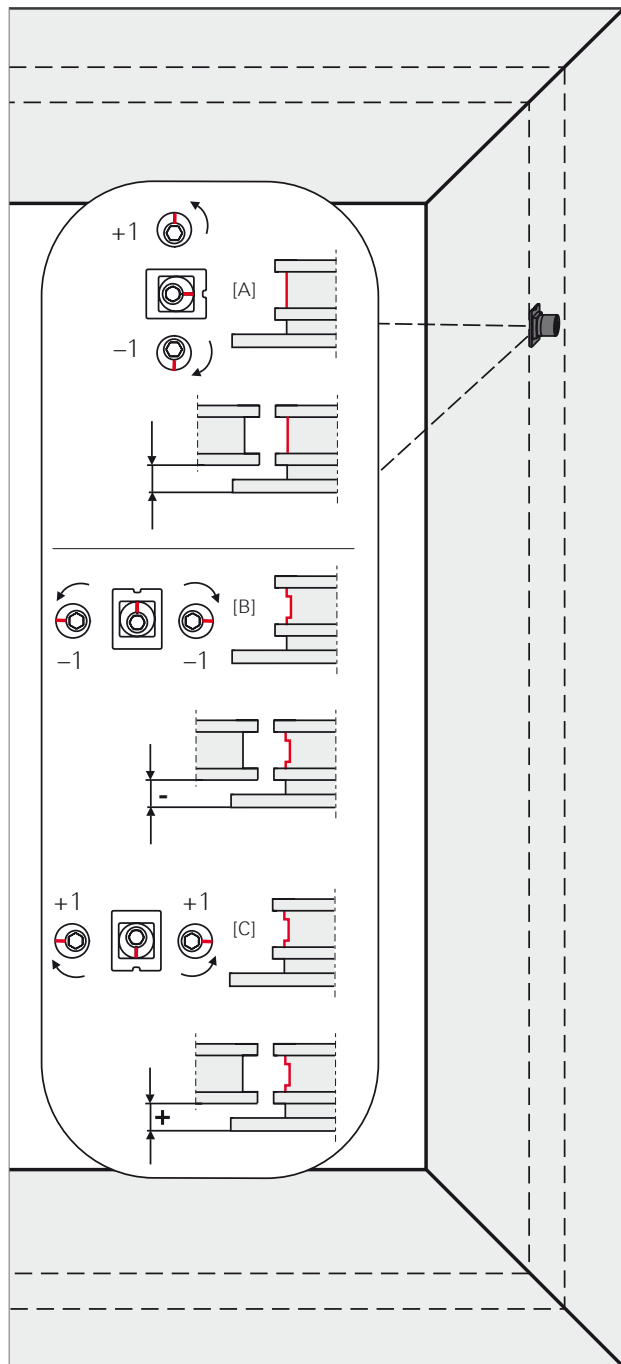






Note!

Roto hardware components may only be adjusted by authorised professionals.



Strikers

Adjust the gasket compression using hex key size 4, depending on the installation situation.

[A] The gasket compression can be increased or reduced.

[B] The gasket compression can be increased only.

[C] The gasket compression can be reduced only.



FM hardware overview

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FM installation

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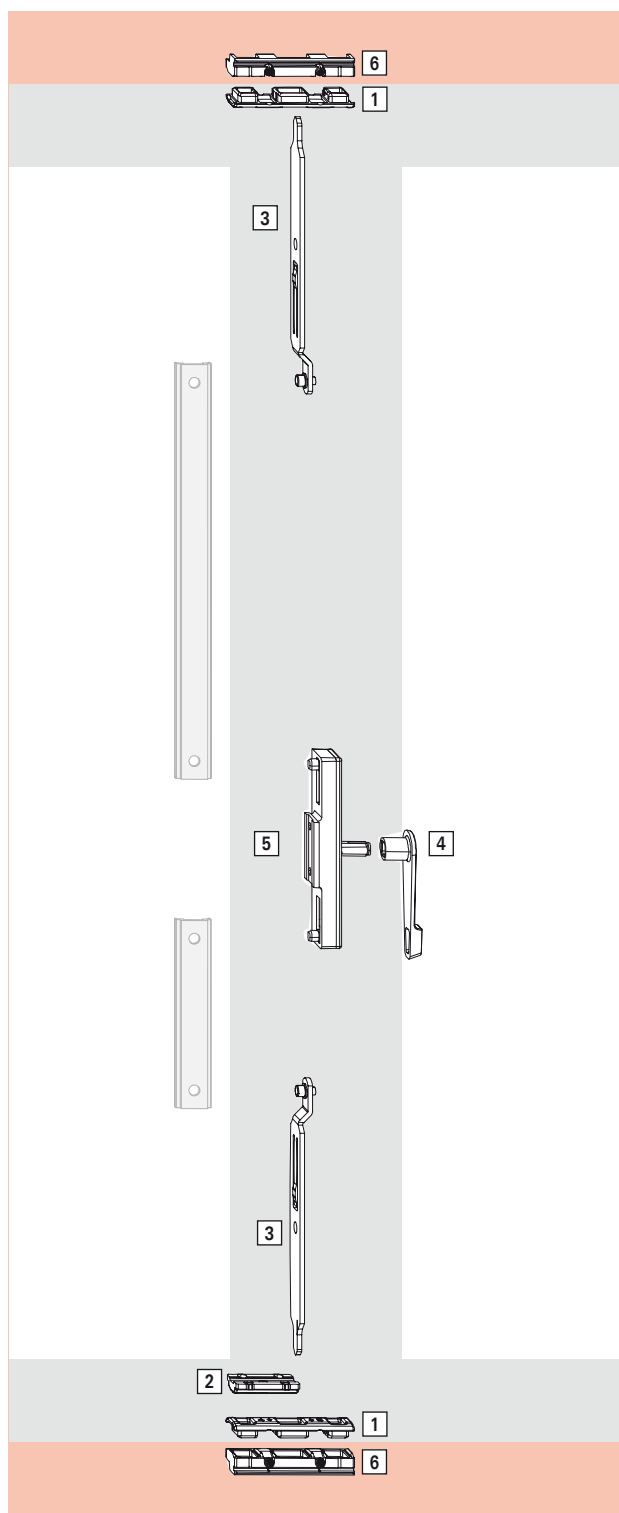
Application range

Sash width **SW** (passive sash: TuS) 250–1600 mm

Sash height **SH** max. 2700 mm

Rebate clearance **RC** 11.5–12 mm

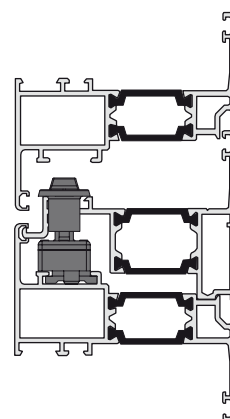
Overlap width **OW** 21.5–22 mm



Basic set

Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
1		FM espagnolette, internal	10	798167
consisting of:				
[1]	2	Multi-ported striker TP	VB 5/6	
[2]	1	Run-up block		
[3]	2	Shootbolt rod	SR1	
[4]	1	Operating lever		
[5]	1	FM espagnolette		
[6]	2	Multi-ported striker BP		



Grey components (optional) are not included in the basic set.



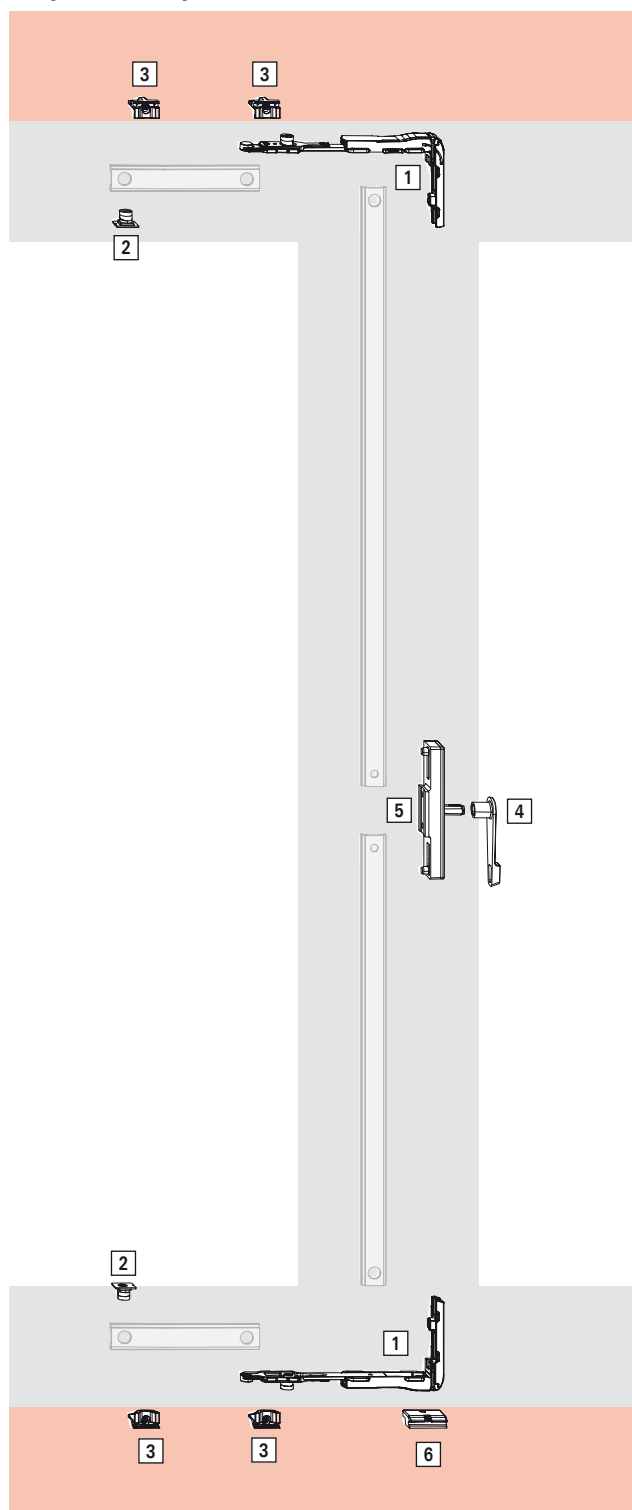
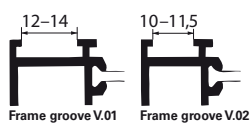
Application range

Sash width **SW** (passive sash: TuS) 420–1600 mm

Sash height **SH** max. 2700 mm

Rebate clearance **RC** 11.5–12 mm

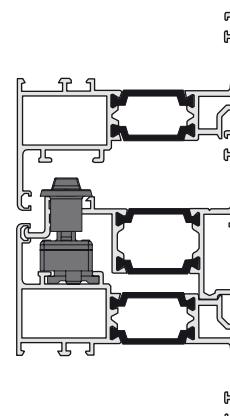
Overlap width **OW** 21.5–22 mm



Basic set

Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
[2]	2	Insertable cam	100	334671
[3]	4	Striker V.01	100	728918
		Striker V.02	100	728920
[1]	2	Corner drive without MD	50	728844
		FM espagnolette, internal	20	728965
		consisting of:		
[4]	1	Operating lever		
[5]	1	FM espagnolette		
[6]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283



Grey components (optional) are not included in the basic set.

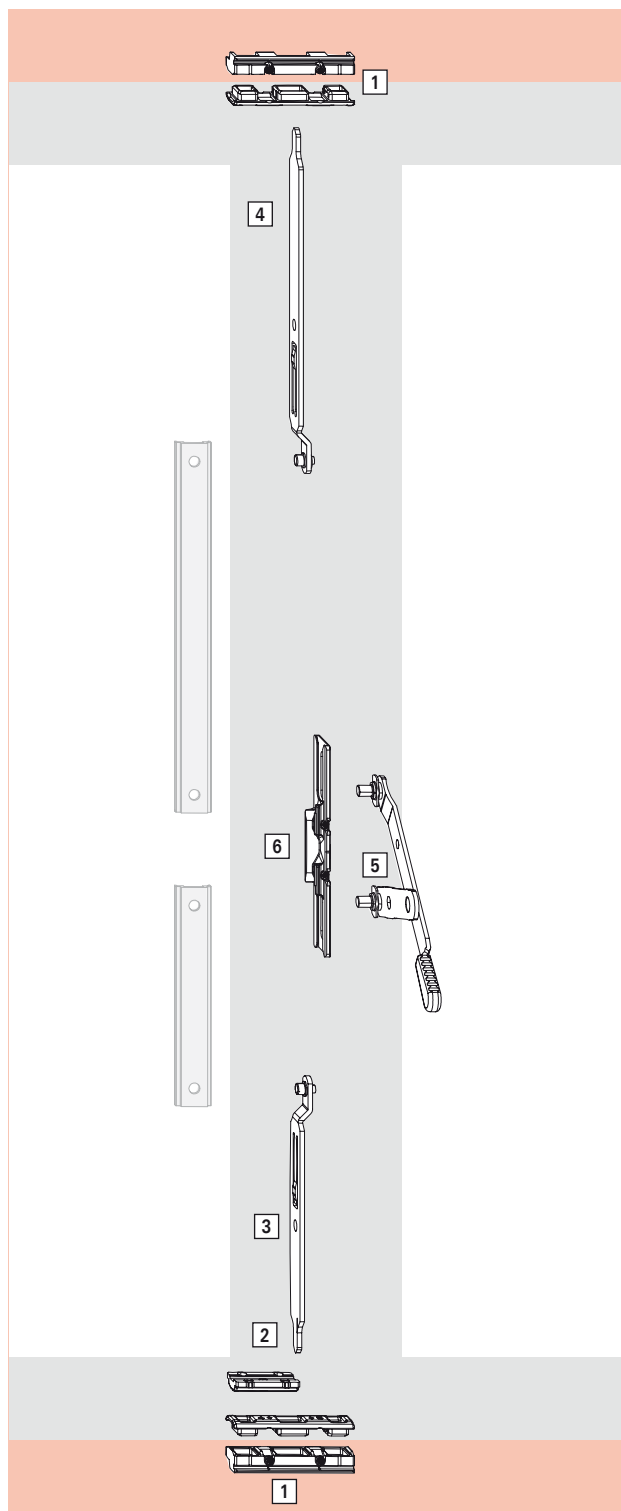
Application range

Sash width **SW** (passive sash: TuS) 250–1600 mm

Sash height **SH** max. 2700 mm

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm



Basic set

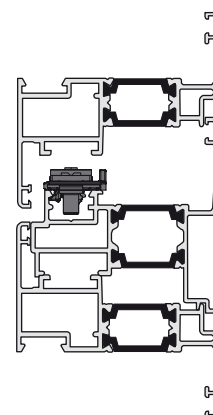
Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
[4]	1	Shootbolt rod		
		SR1 LG	100	341486
		SR2 LG		341487
		SR3 LG		341488
[3]	1	Shootbolt rod		
		SR1	100	212144
		SR2		212145
		SR3		212146
[1]	2	Multi-ported striker		
		VB 1/2	20	728912
		VB 3/4		728913
		VB 5/6		728914
	1	FM-Su espagnolette, surface-mounted	20	728964
		consisting of:		
[5]	1	Toggle lever, compl.		
[6]	1	Guide rail, compl.		
[2]	1	Run-up block	100	212008



Note

- FM-Su floating-mullion hardware can only be used in profiles with a double-C-groove.
- Roto assists with choosing the right components by means of a profile assessment.



Grey components (optional) are not included in the basic set.



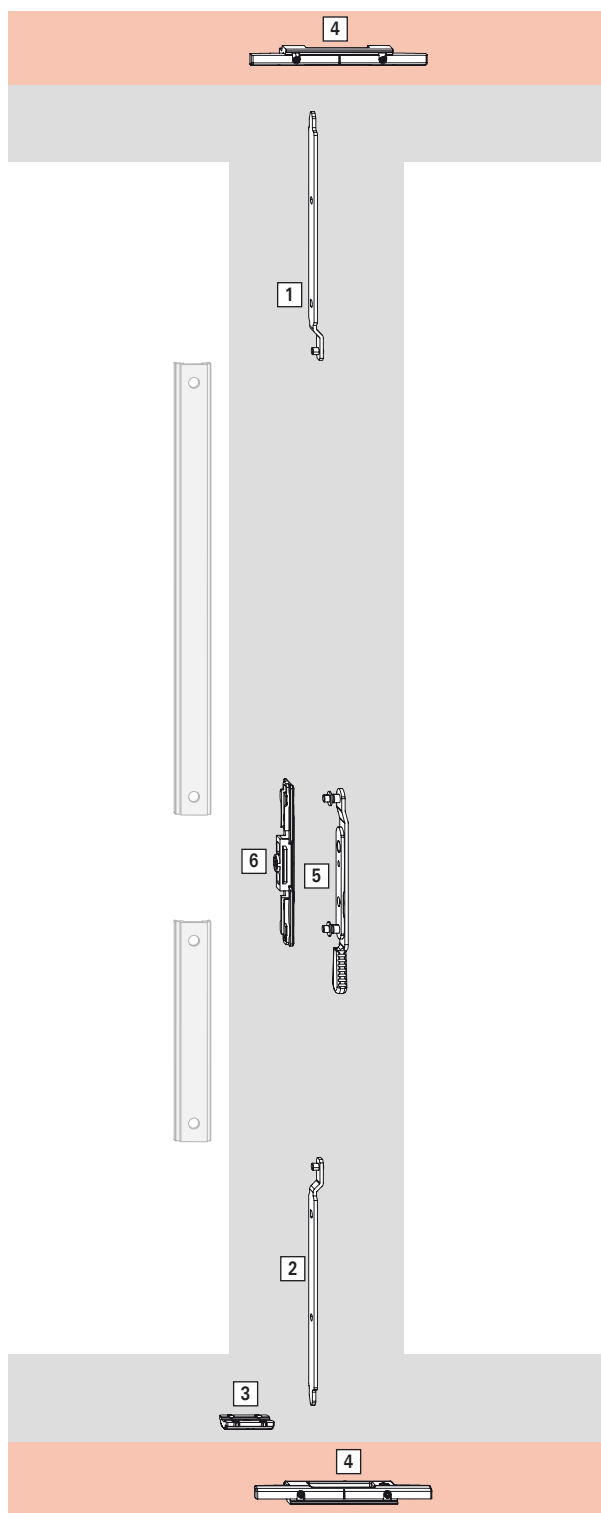
Application range

Sash width **SW** (passive sash: TuS) 250–1600 mm

Sash height **SH** max. 2700 mm

Rebate clearance **RC** 11.5–12 mm

Overlap width **OW** 21.5–22 mm



Basic set

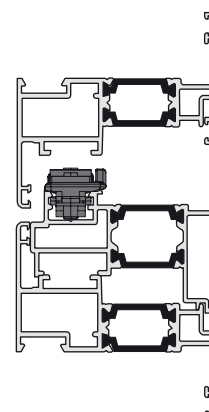
Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
		FM-SuN locking set	10	776947
		consisting of:		
[1]	1	FM shootbolt rod, compl., right		
[2]	1	FM shootbolt rod, compl., left		
[3]	1	Run-up block		
[4]	1	FM-Sh multi-ported striker, compl.		
[5]	1	Toggle lever, compl.		
[6]	1	Guide rail, compl.		



Note

FM-SuN floating-mullion hardware can only be used in profiles with a double-C-groove.



Grey components (optional) are not included in the basic set.

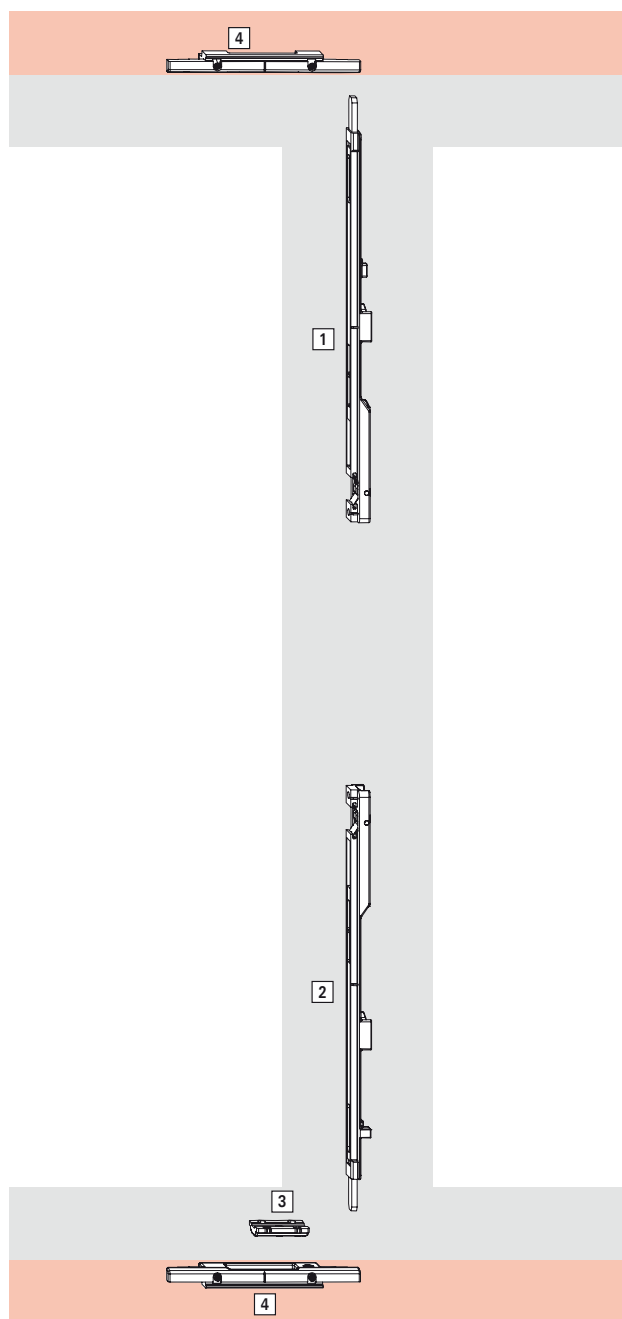
Application range

Sash width **SW** (passive sash: TuS) 250–1600 mm

Sash height **SH** max. 2700 mm

Rebate clearance **RC** 11.5–12 mm

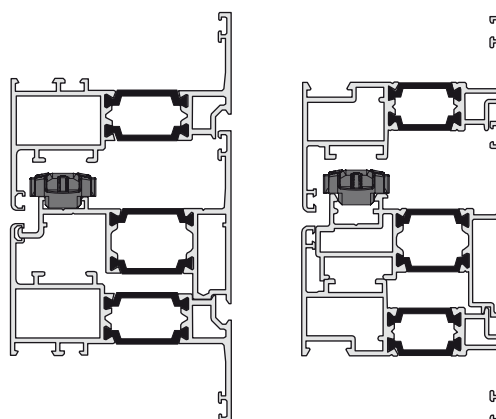
Overlap width **OW** 21.5–22 mm



Basic set

Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
		FM-Sh locking set	10	728960
		consisting of:		
[1]	1	FM shootbolt, compl., top		
[2]	1	FM shootbolt, compl., bottom		
[3]	1	Run-up block		
[4]	2	FM-Sh multi-ported striker, compl.		
	4	Self-tapping screw ST3.9 x 25 (not shown)		



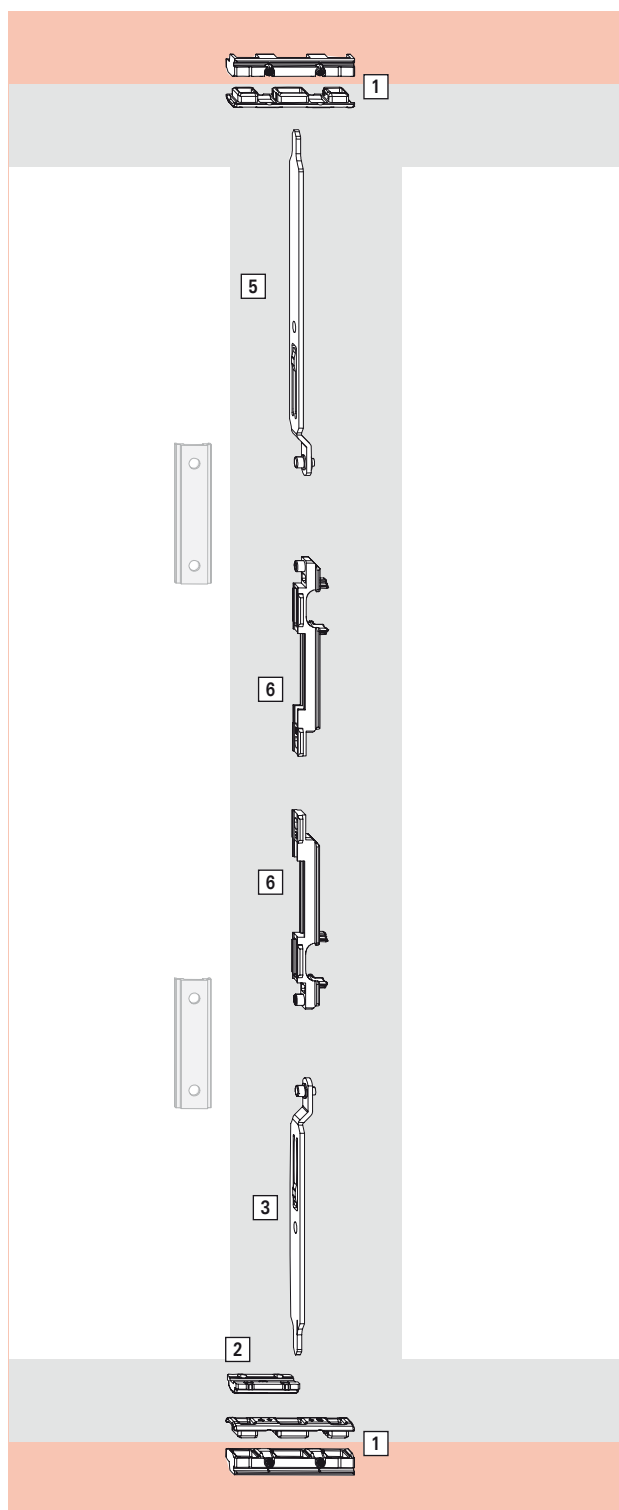
Grey components (optional) are not included in the basic set.


Application range

 Sash width **SW** (passive sash: TuS) 250–1600 mm

 Sash height **SH** max. 2700 mm

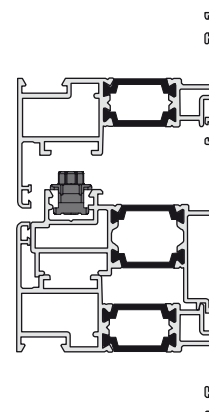
 Rebate clearance **RC** 11.5–12 mm

 Overlap width **OW** 21.5–22 mm

Basic set
Passive sash locking side

Pos.	Pc(s)	Description	PU	Material no.
[5]	1	Shootbolt rod	SR1 LG	100 341486
		Shootbolt rod	SR2 LG	341487
		Shootbolt rod	SR3 LG	341488
[3]	1	Shootbolt rod	SR1	100 212144
		Shootbolt rod	SR2	212145
		Shootbolt rod	SR3	212146
[1]	2	Multi-ported striker	VB 1/2	20 728912
		Multi-ported striker	VB 3/4	728913
		Multi-ported striker	VB 5/6	728914
[6]	2	Slider	SR1	100 212141
		Slider	SR2	212142
		Slider	SR3	212143
[2]	1	Run-up block		100 212008


Note

- FM-R floating-mullion hardware can only be used in profiles with a double-C-groove.
- Roto assists with choosing the right components by means of a profile assessment.

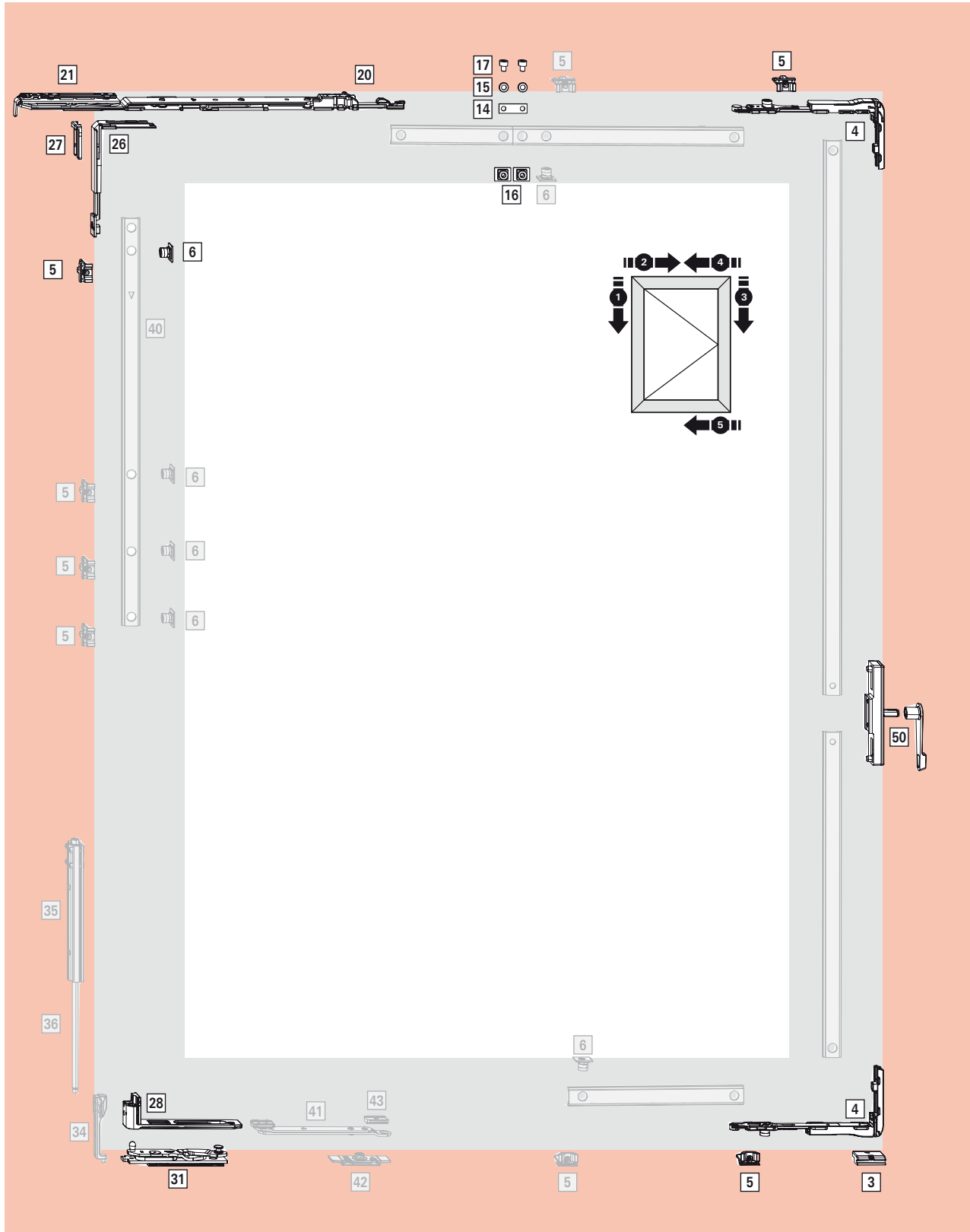
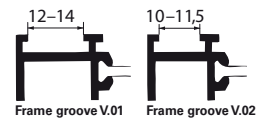


Grey components (optional) are not included in the basic set.

FM hardware overview

Hardware overview and parts list

FM, coupleable (passive sash DIN L) | 150 kg



Grey components (optional) are not included in the basic set.


Application range

 Sash width **SW** (passive sash: TuS) 710–1600 mm

 Sash height **SH** 555–2700 mm

 Sash weight **S.kg** max. 80/150 kg ²⁾

 Rebate clearance **RC** 11.5–12 mm

 Overlap width **OW** 21.5–22 mm

Basic sets
Locking side

Pos.	Pc(s)	Description	PU	Material no.
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
2		Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
1		Coupler component set	100	728856
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC coupler component, plate		
[15]	2	Washer		
[17]	2	Cyl. screw M5 x 6		

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Additionally required hinge-side components

Pos.	Pc(s)	Description	PU	Material no.
1		Corner drive CL set V.01	20	728842
		Corner drive CL set V.02	20	728843
		consisting of:		
[27]	1	CL corner drive		
[26]	1	Retaining fork		
[5]	2	Striker V.01/V.02		
[6]	2	Insertable cam		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide faceplate 500		10	740850
[21]	1	Sash stay 500 no. 1	L	10	624945
			R	10	624944
		Sash stay 500 no. 3	L	10	624951
			R	10	624950
		Sash stay 500 no. 4	L	10	624957
			R	10	624956


NOTE!

Only use supports / clamping support-strips which have been approved for the profile. Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	FM floating-mullion espagnolette, internal	20	728965


NOTE!

The active sash is not shown in all floating-mullion hardware overviews – see Tilt&Turn, TiltFirst, standard Turn-Only, RC2 and RC3 hardware overviews.

Optional
Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-2	Cam, insertable	100	334671
1		Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing		
[43]	1	Turn stop		
[40]	1	CR4 SH 520–1300 (not shown)	10	729978
		CR4.1 SH 1301–1800 /		
		CR5.2 SW 1301–1600 AL (not shown)	10	729979
		CR4.2 SH 1801–2400 AL (not shown)	10	729980
		CR4.3 SH 2401–2700 AL	10	729981

Additional components on the hinge side, weight-dependent | 150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

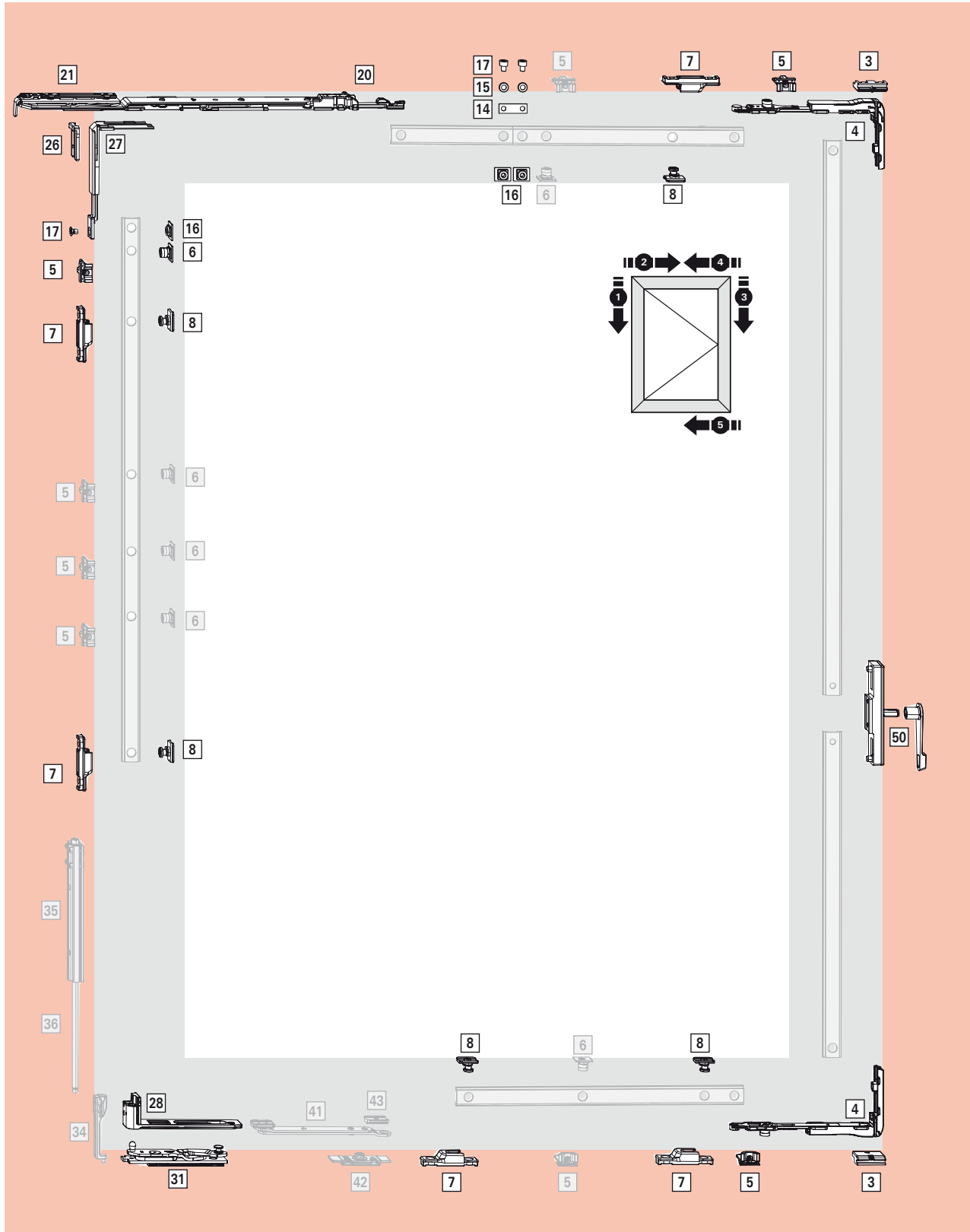
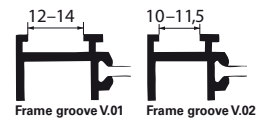
¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ S.kg ≥ 80 kg with load transfer.

FM hardware overview

Hardware overview and parts list

FM, coupleable (passive sash DIN L) | RC2 150 kg



Grey components (optional) are not included in the basic set.


Application range

 Sash width **SW** (passive sash: TuS) 800–1600 mm

 Sash height **SH** 720–2700 mm

 Sash weight **S.kg** max. 80 / 150 kg ²⁾

 Rebate clearance **RC** 11.5–12 mm

 Overlap width **OW** 21.5–22 mm

Basic sets
Locking side

Pos.	Pc(s)	Description	PU	Material no.
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
1		Coupler component set	100	728856
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC coupler component, plate		
[15]	2	Washer		
[17]	2	Cyl. screw M5 x 6		
[3]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[8]	5	SEC cam, insertable	100	447245
[7]	5	SEC striker V.01	100	212637
		SEC striker V.02	100	212638

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Additionally required hinge-side components

Pos.	Pc(s)	Description	PU	Material no.
1		SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5 x 7		
[6]	2	Insertable cam		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide faceplate 500		10	740850
[21]	1	Sash stay 500 no. 1	L	10	624945
			R	10	624944
		Sash stay 500 no. 3	L	10	624951
			R	10	624950
		Sash stay 500 no. 4	L	10	624957
			R	10	624956


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	FM floating-mullion espagnolette, internal	20	728965


NOTE!

The active sash is not shown in all floating-mullion hardware overviews – see Tilt&Turn, TiltFirst, standard Turn-Only, RC2 and RC3 hardware overviews.

Optional
Additional components, size-dependent

Pos.	Pc(s)	Description	PU	Material no.
[5]	1-2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-2	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing		
[43]	1	Turn stop		

Additional components on the hinge side, weight-dependent | 150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

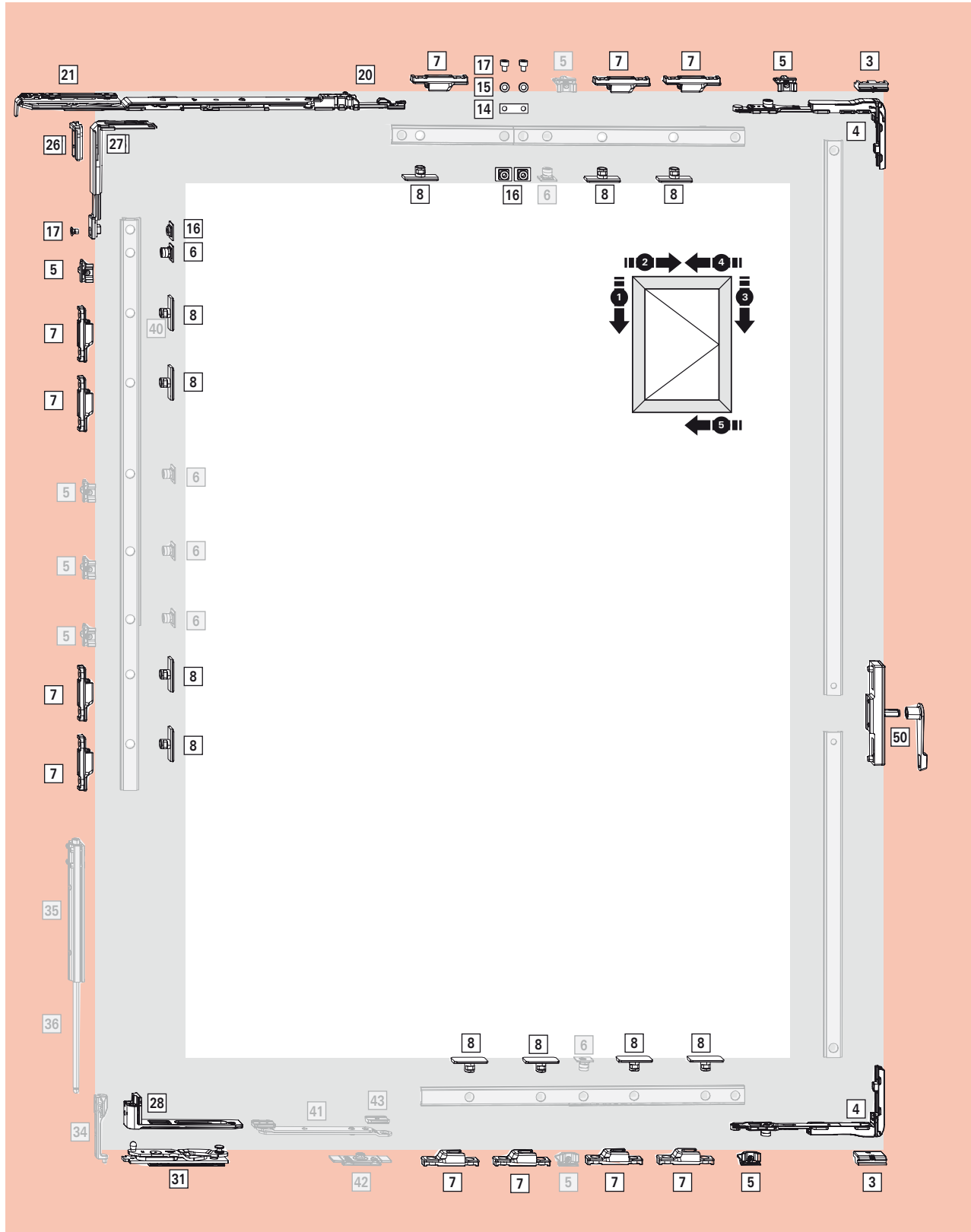
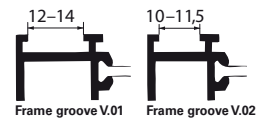
¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ S.kg ≥ 80 kg with load transfer.

FM hardware overview

Hardware overview and parts list

FM, coupleable (passive sash DIN L) | RC3 150 kg



Grey components (optional) are not included in the basic set.


Application range

 Sash width **SW** (passive sash: TuS) 875–1600 mm

 Sash height **SH** 870–2700 mm

 Sash weight **S.kg** max. 80 / 150 kg ²⁾

 Rebate clearance **RC** 11.5–12 mm

 Overlap width **OW** 21.5–22 mm

Basic sets
Locking side

Pos.	Pc(s)	Description	PU	Material no.
	1	TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[6]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[4]	2	Corner drive without MD		
	2	Retaining fork (not shown)		

Additionally required locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	Coupler component set	100	728856
		consisting of:		
[16]	2	SEC connector		
[14]	1	SEC coupler component, plate		
[15]	2	Washer		
[17]	2	Cyl. screw M5 x 6		
[3]	1	Run-up wedge V.01	100	684282
		Run-up wedge V.02	100	684283
[8]	11	SEC cam RC3, insertable	100	443530
[7]	11	SEC striker V.01	100	212637
		SEC striker V.02	100	212638

Hinge side

Pos.	Pc(s)	Description	DIN	PU	Material no.
[28]	1	Corner hinge incl. adjustment piece	L	10	739700
			R	10	739699
[31]	1	Pivot rest no. 1	L	10	624970
			R	10	624969
		Pivot rest no. 3	L	10	624972
			R	10	624971
		Pivot rest no. 4	L	10	624974
			R	10	624973

Additionally required hinge-side components

Pos.	Pc(s)	Description	PU	Material no.
	1	SEC corner drive CL set	10	728944
		consisting of:		
[27]	1	SEC corner drive CL		
[26]	1	SEC retaining fork		
[16]	1	SEC connector		
[17]	1	Countersunk screw M5 x 7		
[6]	2	Insertable cam		

Sash stay

Pos.	Pc(s)	Description	DIN	PU	Material no.
[20]	1	Scissor stay guide faceplate 500		10	740850
[21]	1	Sash stay 500 no. 1	L	10	624945
			R	10	624944
		Sash stay 500 no. 3	L	10	624951
			R	10	624950
		Sash stay 500 no. 4	L	10	624957
			R	10	624956


NOTE!

Only use supports / clamping support-strips which have been approved for the profile.

Further information can be obtained from

Roto sales representatives.

Espagnolette and connector

Pos.	Pc(s)	Description	PU	Material no.
[50]	1	FM floating-mullion espagnolette, internal	20	728965


NOTE!

The active sash is not shown in all floating-mullion hardware overviews – see Tilt&Turn, TiltFirst, standard Turn-Only, RC2 and RC3 hardware overviews.

Optional
Additional components, size-dependent

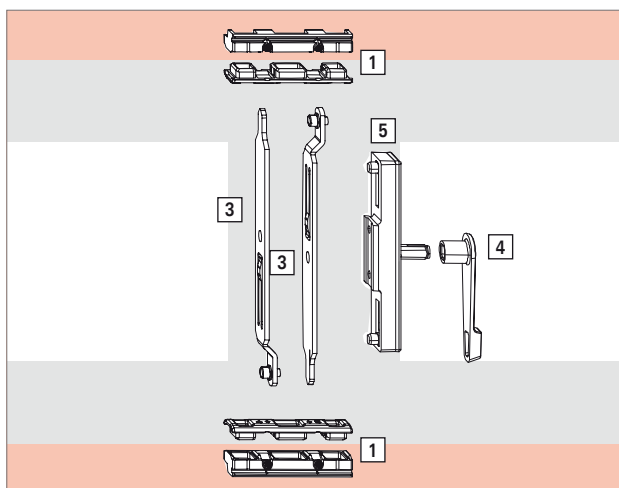
Pos.	Pc(s)	Description	PU	Material no.
[5]	1-2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	1-2	Cam, insertable	100	334671
	1	Turn restrictor set V.01 ¹⁾	10	740814
		Turn restrictor set V.02 ¹⁾	10	740835
		consisting of:		
[41]	1	Scissor stay, compl.		
[42]	1	Frame bearing		
[43]	1	Turn stop		

Additional components on the hinge side, weight-dependent | 150 kg

Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[35]	1	Sash component			
[36]	1	Support rod			
[34]	1	Frame bearing			

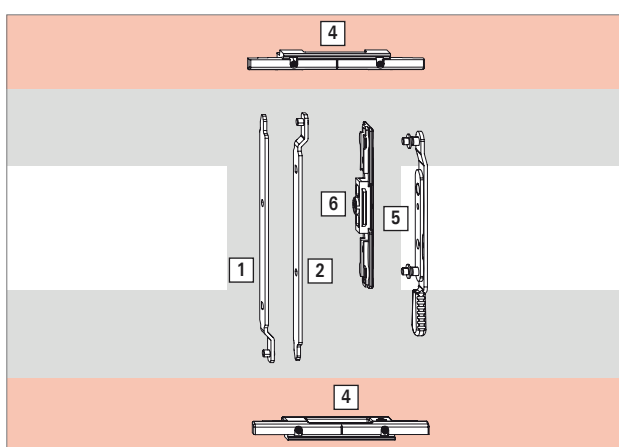
¹⁾ Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

²⁾ S.kg ≥ 80 kg with load transfer.



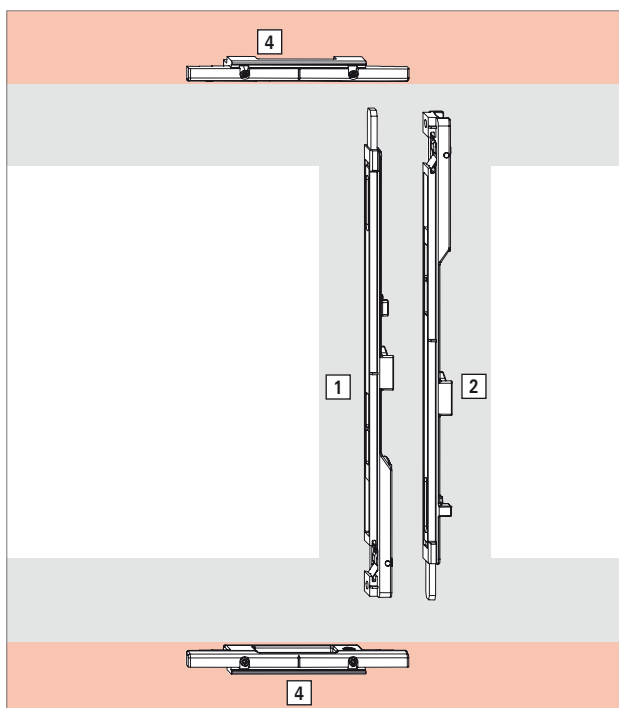
FM locking components

Pos.	Pc(s)	Description	PU	Material no.
[1]	2	Multi-ported striker VB 5/6	20	728913
[3]	2	Shootbolt rod SR1	100	212144
[4]	1	FM espagnolette, internal	20	728965



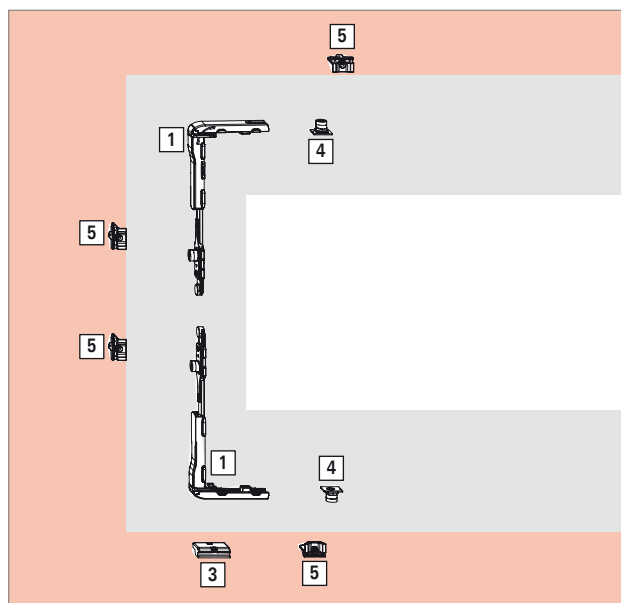
FM-SuN locking components

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	FM shootbolt rod, compl., right	100	373979
[2]	1	FM shootbolt rod, compl., left	100	373980
[4]	1	FM-Sh multi-ported striker, compl.	100	728961
[5]	1	Toggle lever, compl.	100	379013
[6]	1	Guide rail, compl.	10	634348



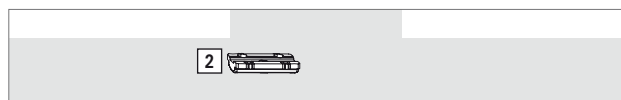
FM-Sh locking components

Pos.	Pc(s)	Description	PU	Material no.
[1]	1	FM shootbolt, compl., top	50	355560
[2]	1	FM shootbolt, compl., bottom	50	355561
[4]	2	FM-Sh multi-ported striker, compl.	100	728961



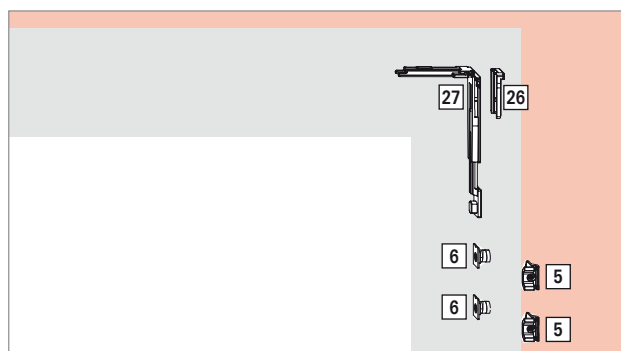
FM-Sh locking components set

Pos.	Pc(s)	Description	PU	Material no.
1		TuS-H locking components V.01	10	728743
		TuS-H locking components V.02	10	728744
		consisting of:		
[3]	1	Run-up wedge V.01/V.02		
[4]	2	Insertable cam		
[5]	4	Striker V.01/V.02		
[1]	2	Corner drive without MD		
	2	Retaining fork (not shown)		



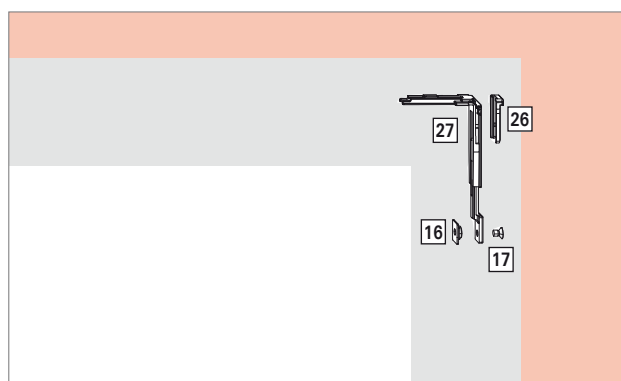
Run-up block

Pos.	Pc(s)	Description	PU	Material no.
[2]	1	Run-up block	100	212008



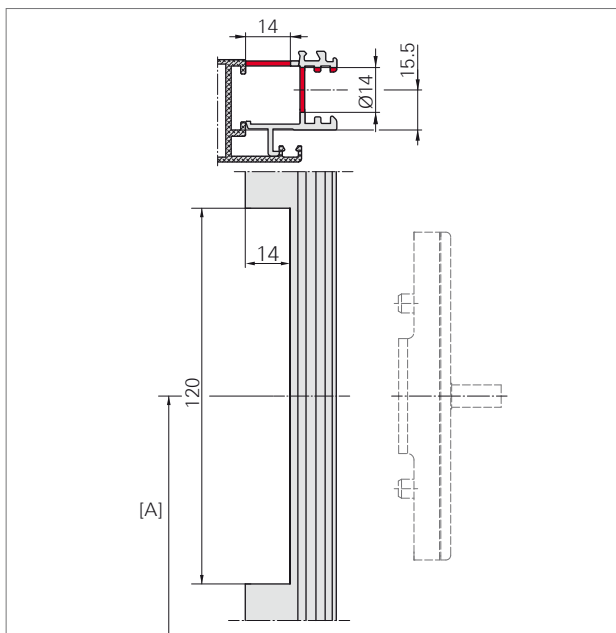
Corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[5]	2	Striker V.01	100	728918
		Striker V.02	100	728920
[6]	2	Insertable cam	100	334671
[26]	1	Retaining fork	100	221772
[27]	1	CL corner drive	20	331013



SEC corner drive CL set

Pos.	Pc(s)	Description	PU	Material no.
[16]	1	SEC connector	100	447113
[17]	1	Countersunk screw M5x7	100	728928
[26]	1	SEC retaining fork	100	212636
[27]	1	SEC corner drive CL	10	334359

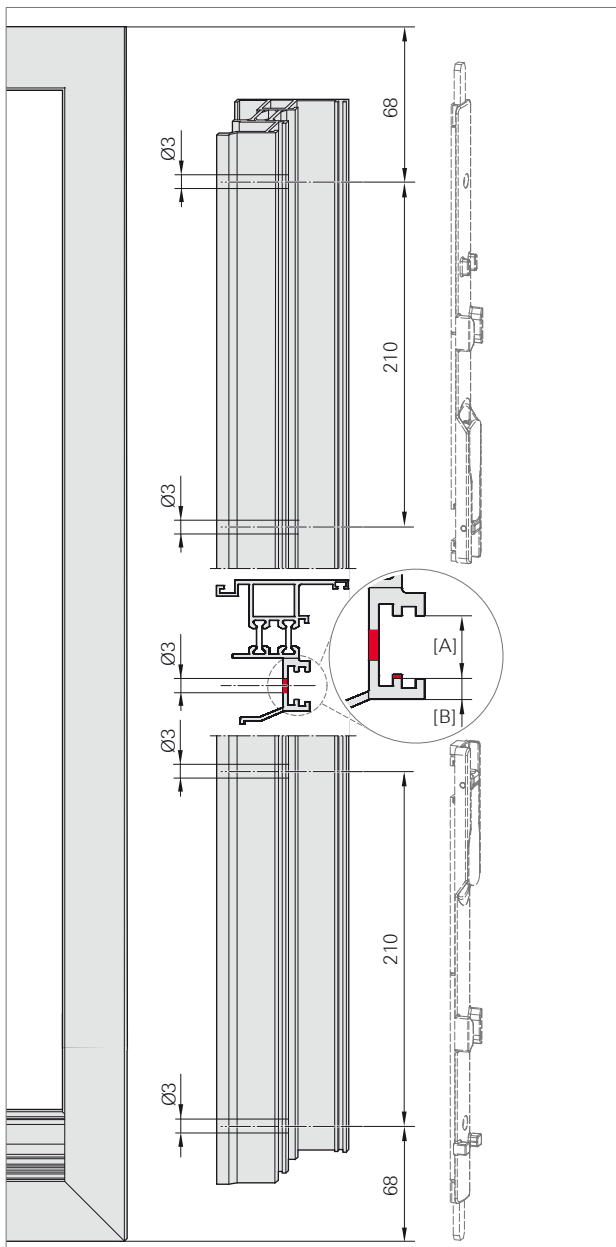


FM espagnolette, internal

1. Perform routing in the surface-mounted faceplate profile.

[A] Floating mullion handle height (HH(FM))

2. Drill the hole:
1 x Ø 14 mm

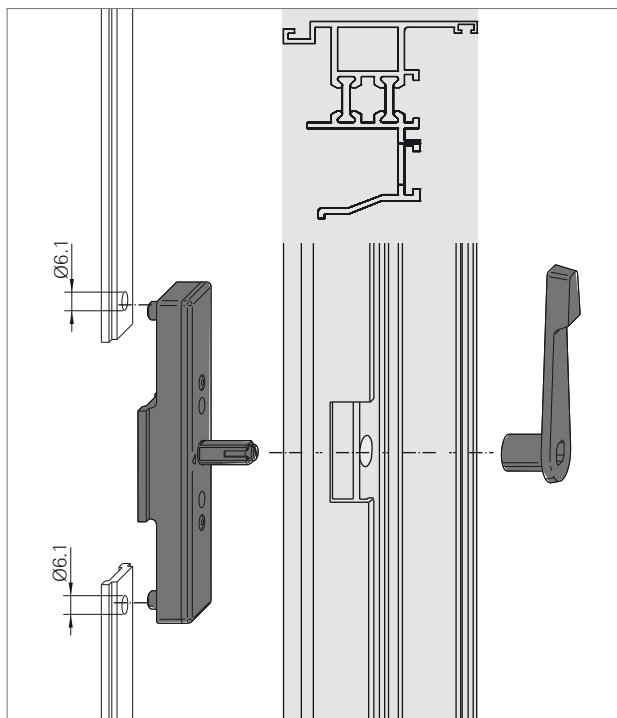


FM-Sh espagnolette

1. Drill the hole:
4 x Ø 3 mm

[A] 14 mm (12–13.9 mm available upon request)

[B] Min. 3 mm, max. 4.2 mm



Installing the FM espagnolette

1. Connect the FM espagnolette to the sash components, insert into the sash profile and screw down with the two preinstalled threaded pins.

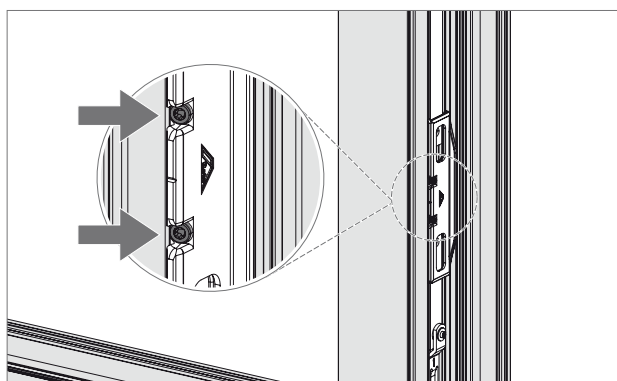
Tool: T 10 hex key

Torque: max. 2.5 Nm

2. Install the surface-mounted faceplate profile on the sash. While doing so, guide the mount for the operating lever through the drill hole.
3. Install the operating lever on the FM espagnolette and screw down using the preinstalled screw.

Tool: hex key size 2.5

Torque: max. 2.5 Nm



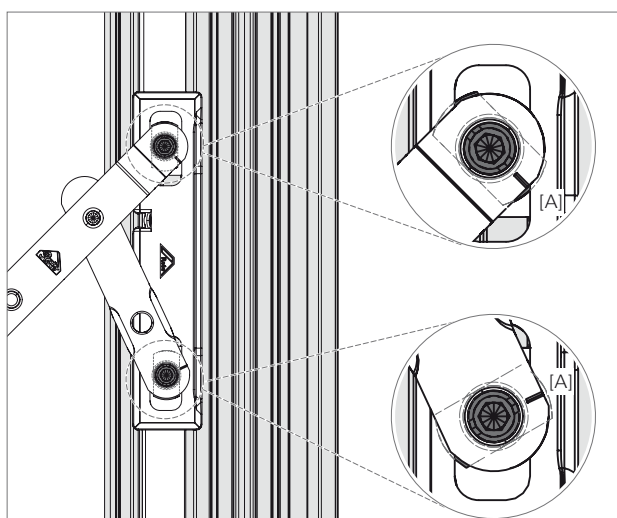
Installing the FM-Su espagnolette

1. Insert the connecting rods with shootbolt rods into the sash groove. Swing the guide rail in and connect it to connecting rods at the coupling points.

2. Screw down the guide rail with the preinstalled threaded pins.

Tool: T 10 hex key

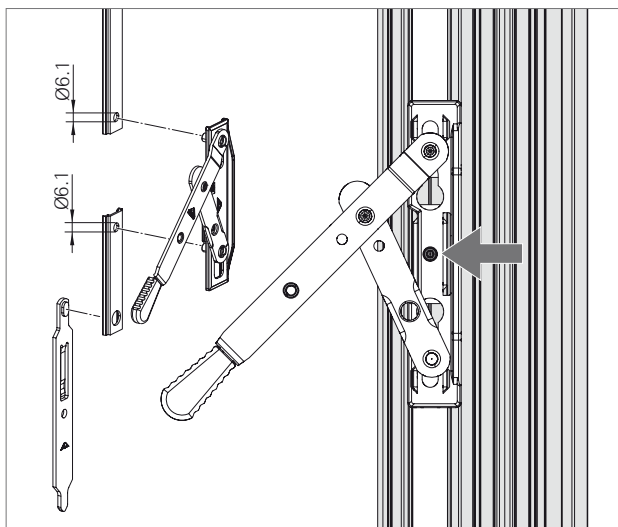
Torque: max. 2.5 Nm



3. Insert the toggle lever when it is open. Turn the notch in the bolt to face the notch in the toggle lever to fix the toggle lever in position in the guide rail [A].

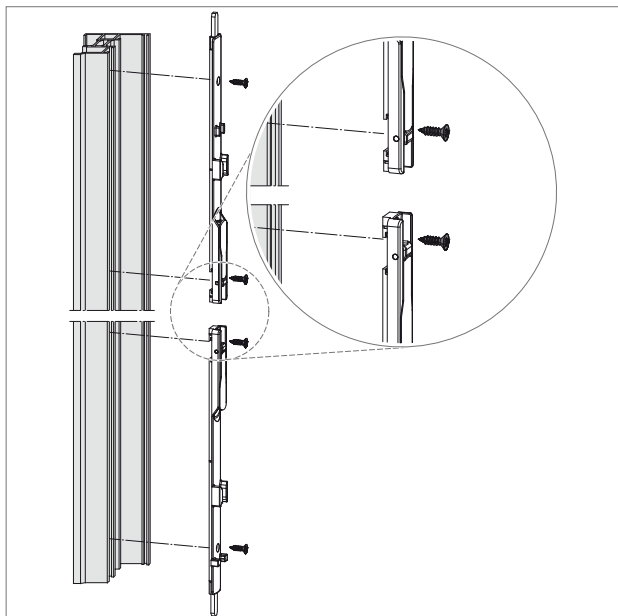
Tool: hex key size 4

4. Close the toggle lever.



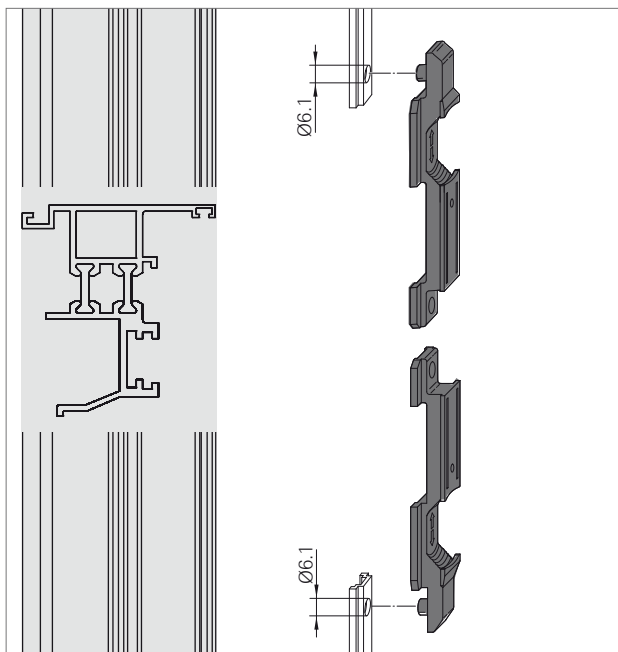
Installing the FM-SuN espagnolette

1. Insert the connecting rods with shootbolt rods into the sash groove. Swing the guide rail in and connect it to connecting rods at the coupling points.
2. Screw down the guide rail with the preinstalled threaded pin.
Tool: T 10 hex key
Torque: max. 2.5 Nm
3. Insert the toggle lever when it is open and fix in position in the guide rail by closing it.



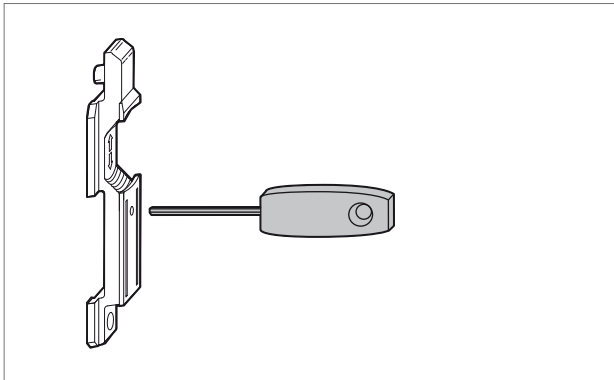
Installing the FM-Sh espagnolette

1. Insert the shootbolt into the sash profile.
2. Screw the shootbolt down when locked.
Tool: T 15 hex key



Installing the FM-R espagnolette

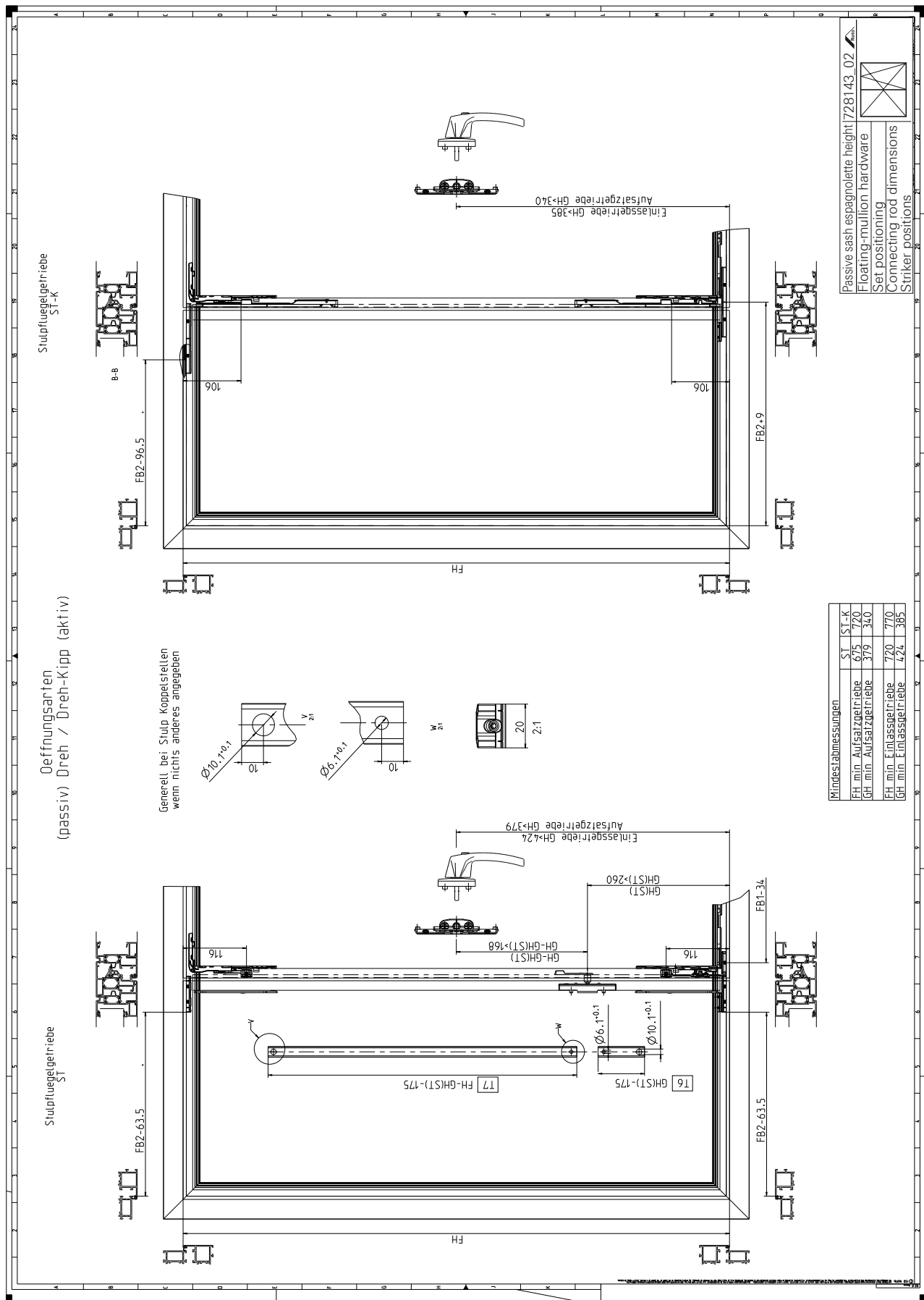
1. Connect the slider to the sash components and insert into the sash profile.



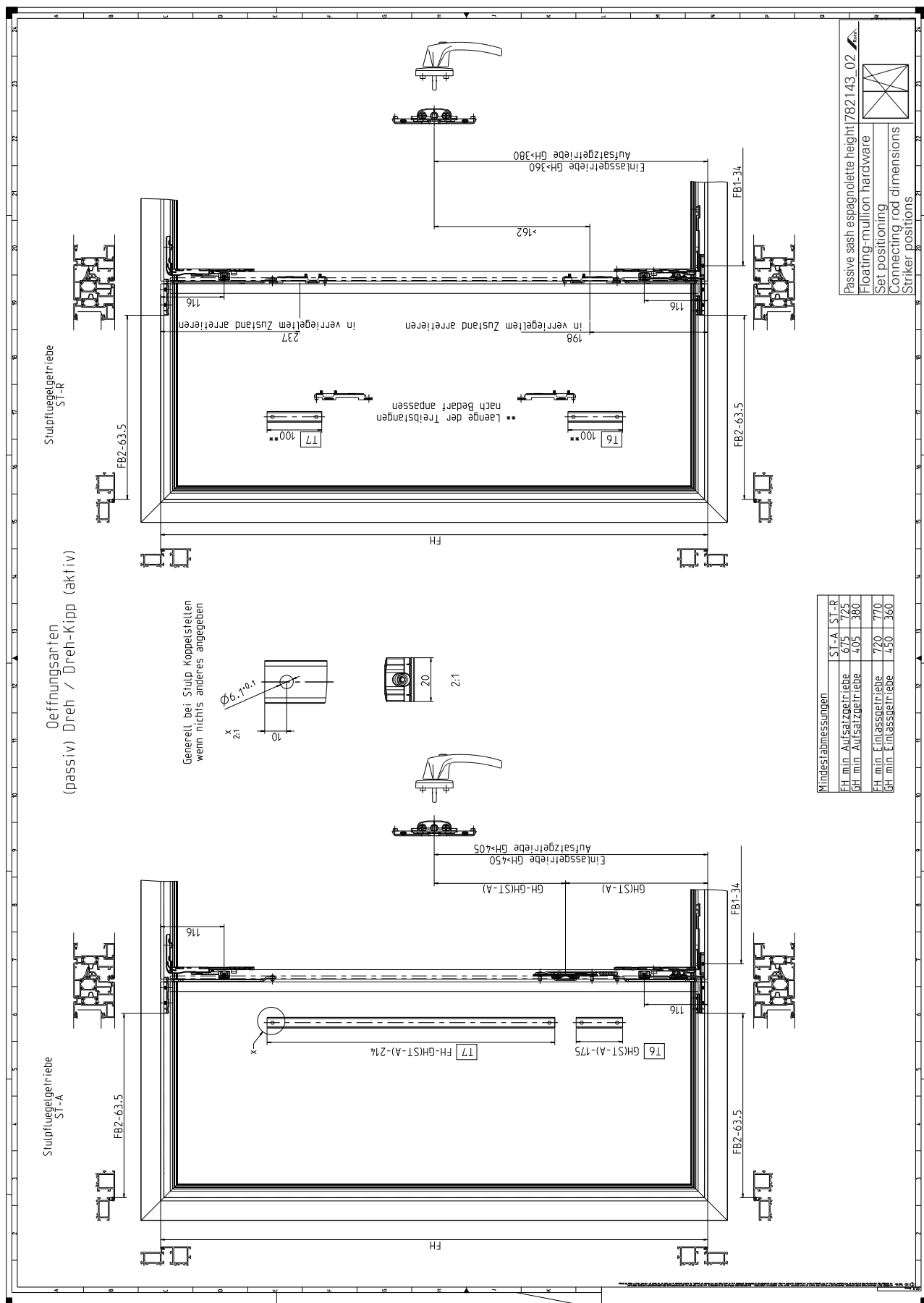
- 2.** Stop the slider when locked.

Tool: hex key size 2.5

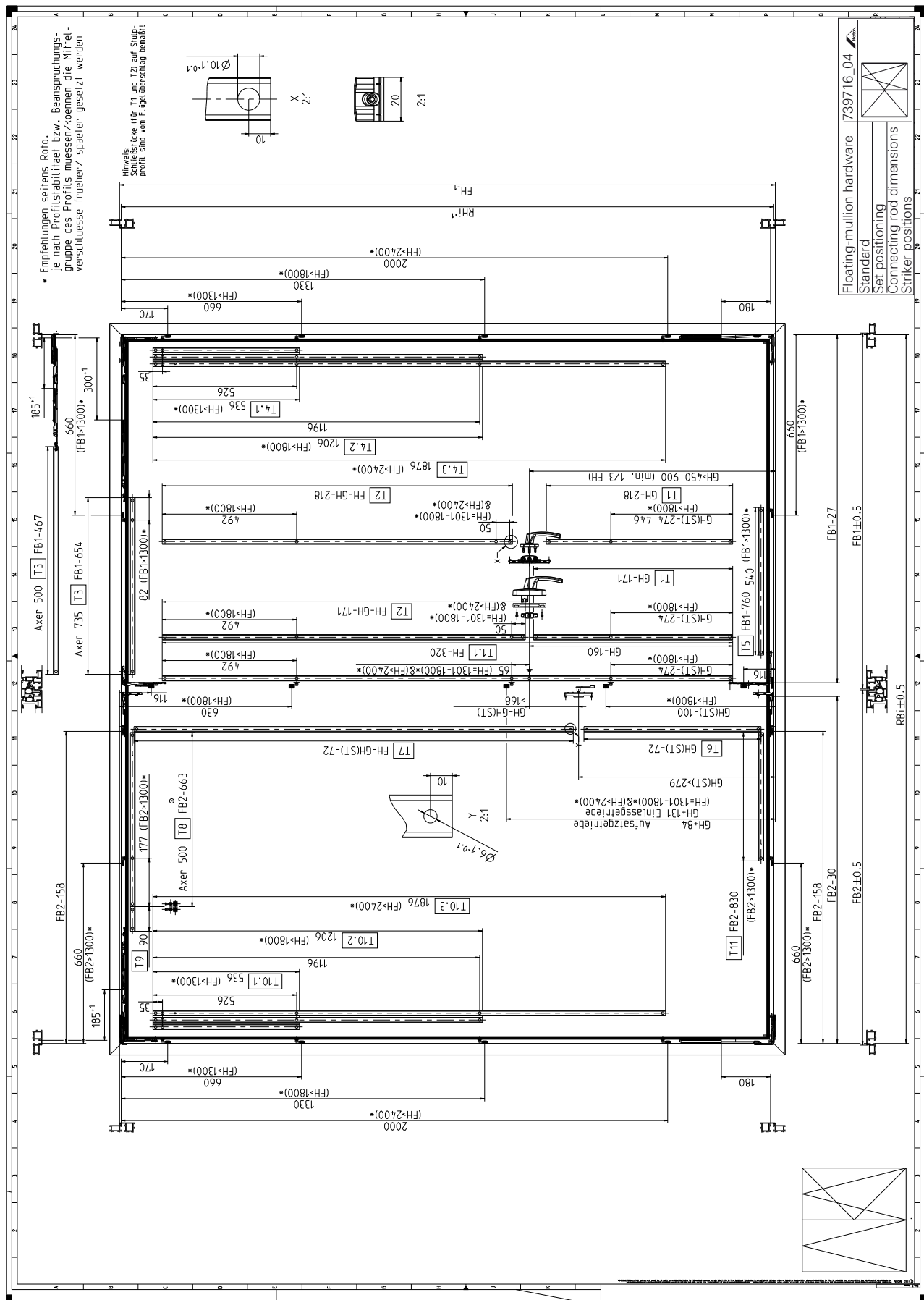
Text in the installation drawings	Translation
Abweichungen der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichungen Abstand RC SST mit DB	Deviations from distance RC ST with TR
Aktiv *** Abweichung Treibstange T5 / Abstand RC SST	Active *** deviation from connecting rod CR5 / distance RC ST
Aufsatzgetriebe	Geared-handle
Axer	Sash stay
Die Angaben dienen nur zur ungefähren Positionierung.	The information is for approximate positioning only.
Einbaurichtung beachten. Pfeil zeigt zum Überschlag.	Note the installation direction. The arrow points to the overlap.
Einlassgetriebe	Flush-encased gearbox
Empfehlungen seitens Roto. Je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse früher/später gesetzt werden	Recommendations from Roto. Depending on the profile stability or profile loading group, the centre locks must/can be put in place at an earlier/later point
FB	SW
FH	SH
generell bei Stulp Koppelstellen, wenn nichts anderes angegeben	Generally for faceplate coupling points, unless otherwise stated
GH	HH
Hinweis: Schließstücke (für T1 und T2) auf Stulpprofil sind vom Flügel-überschlag bemaßt!	Note: strikers (for CR1 and CR2) on the faceplate profile are dimensioned from the sash overlap.
Laenge der Treibstangen nach Bedarf anpassen.	Adapt the length of the connecting rods as required.
in verriegeltem Zustand arretieren	Stop when locked
Mindestabmessungen	Minimum dimensions
mit DB	With TR
Oeffnungsarten	Opening types
Passiv *** Abweichung Treibstange T11 / Abstand RC SST	Passive *** deviation from connecting rod CR11 / distance RC ST
(passiv) Dreh / Dreh-Kipp (aktiv)	(passive) Turn-Only / Tilt&Turn (active)
RBi	FWi
RC2 Ausführung	RC2 version
RHi	FHi
SST	ST
Stulpfluegelgetriebe	Floating-mullion sash espagnolette
T	CR
Zusätzliche Hinweise Drehbegrenzer (DB)	Additional information on the turn restrictor (TR)

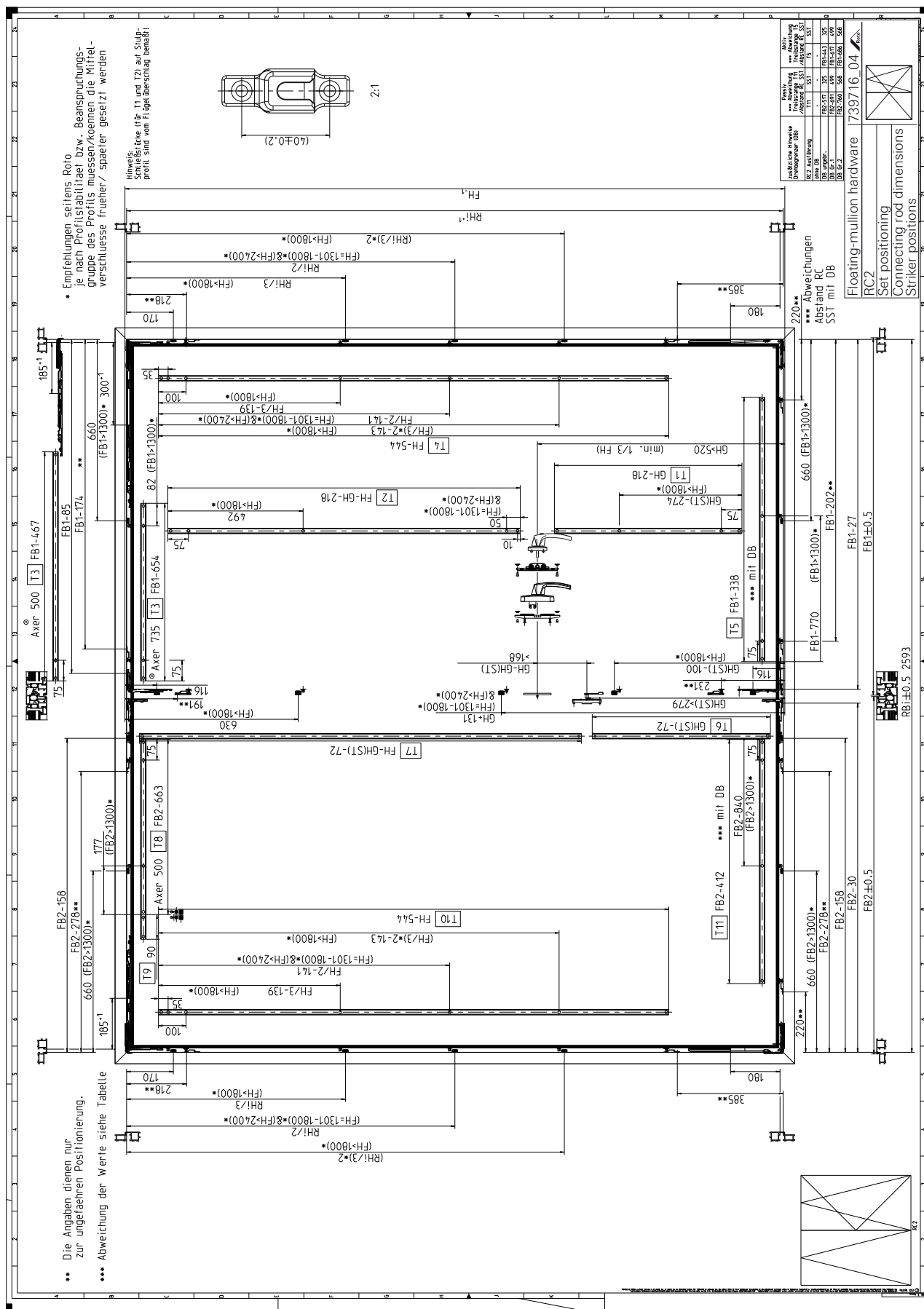


FM installation drawings
Clearance dimensions and positioning
 FM-Su and FM-R, passive sash

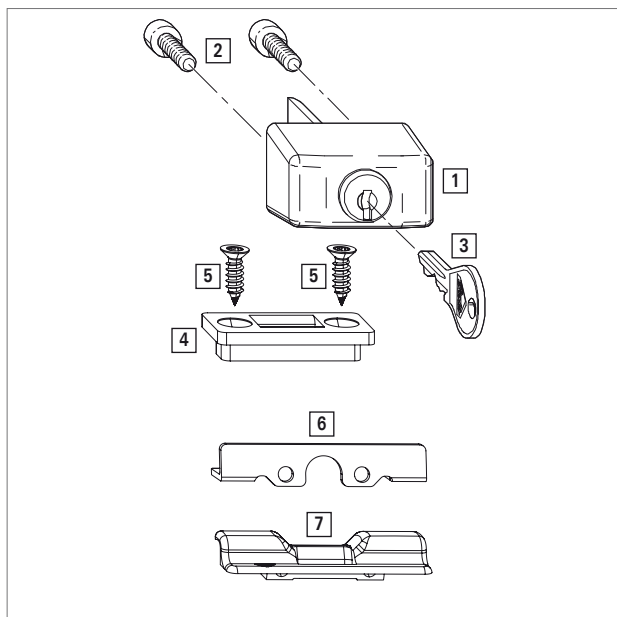










**Turn lock with accessories**

Pos.	Pc(s)	Description	Colour	PU	Material no.
1		Turn lock with cylinder lock	R01.1	20	728815
			R01.5	20	728816
			R05.4	20	728817
			R07.1	20	728818
			R07.2	20	728819
			SP. COL.	20	728820

consisting of:

[1] 1 **Turn lock, compl.**[2] 2 **Cylinder screw M5x12**[3] 1 **Set of keys** 10 **208248**

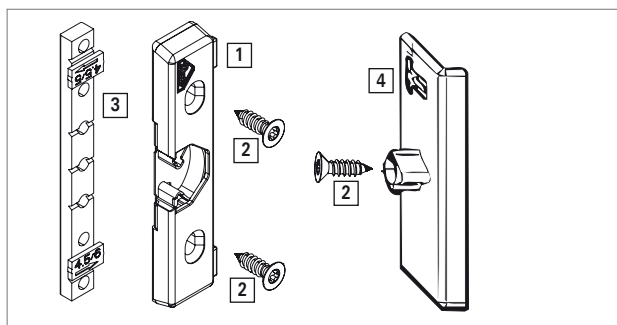
consisting of:

2 **Key**1 **Key ring**1 **Locking plate** 100 **728916**

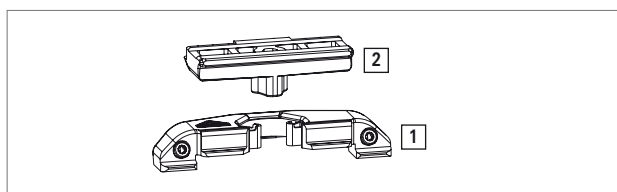
consisting of:

[4] 1 **Locking plate**[5] 2 **Countersunk tapping screw ST4.8x16****Additional parts bag for the anti-jemmy version**

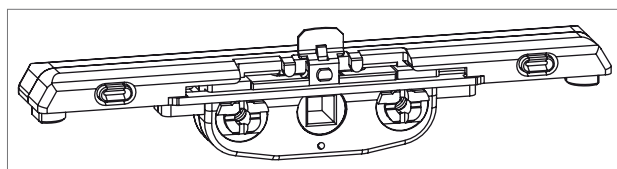
Pos.	Pc(s)	Description	PU	Material no.
1		Upgrade set for turn lock	10	684284
		consisting of:		
[6]	1	Locking plate		
[7]	1	Multi-ported striker, compl.		

**Balcony door bullet catch set**

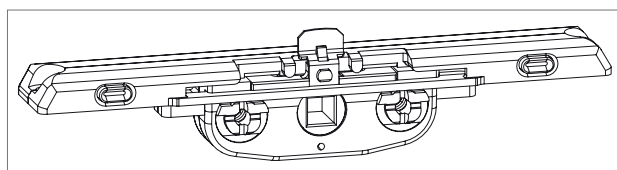
Pos.	Pc(s)	Description	PU	Material no.
		Balcony door bullet catch set	20	728714
		consisting of:		
[1]	1	Bullet catch		
[2]	3	Self-tapping screw ST3.9x25		
[3]	1	Support		
[4]	1	Bullet-catch cam		
	1	Installation instructions (not shown)		

**Bullet catch set**

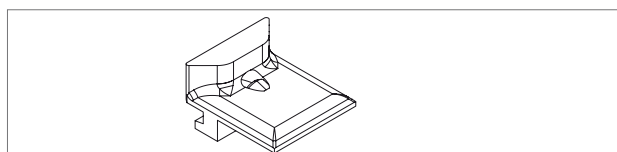
Pos.	Pc(s)	Description	PU	Material no.
		Bullet catch set	10	728924
		consisting of:		
[1]	1	Bullet catch, compl.		
[2]	1	Bullet-catch cam, compl.		

**Corner drive, with blocking device**

Description	PU	Material no.
Corner drive, with blocking device	10	378337

**SEC corner drive, with blocking device**

Description	PU	Material no.
SEC corner drive, with blocking device	10	607736

**Striker, 8 mm installation height**

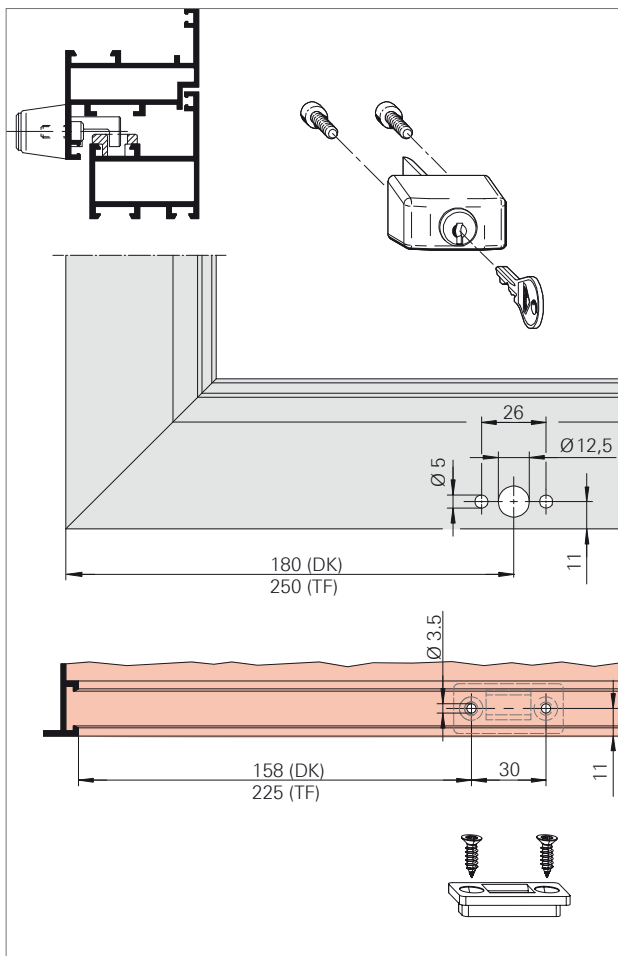
(for an unfavourable sash turning curve)

Pc(s)	Description	PU	Material no.
1	Striker, 8 mm	V.01	100 728917
1	Striker, 8 mm	V.02	100 728919

Accessories

Turn lock, bullet catch, striker 8 mm

Installing the turn lock, bullet catch



Installing the turn lock

1. Drill holes in the sash and frame as shown in the drawing.
2. Screw the turn lock to the sash with two screws.

Tool: T 25 hex key



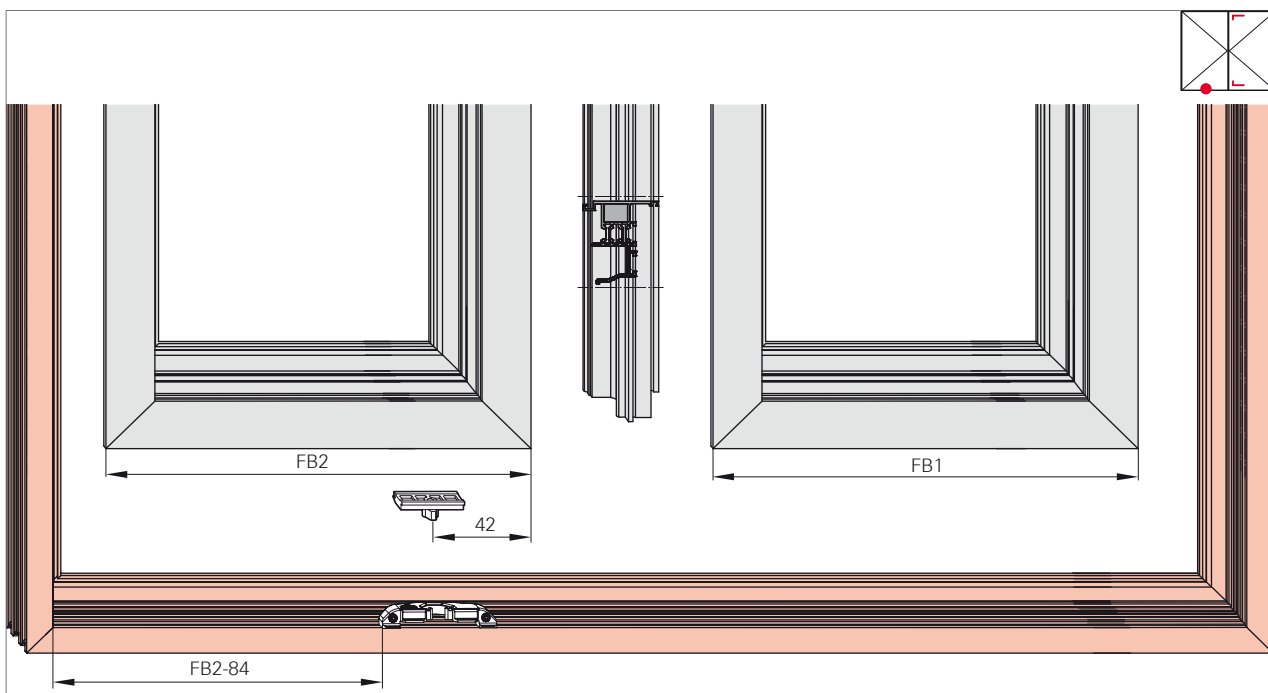
NOTE!

When installing the turn lock, pay attention to the position of the lock hook.

3. Screw the locking plate to the frame with two screws.

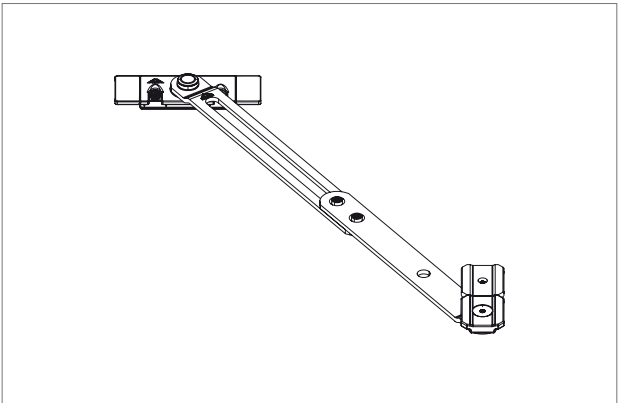
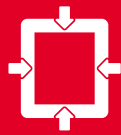
Tool: T 25 hex key

Installing the bullet catch



Note!

The bullet catch is only intended for horizontal installation. (Active sash with corner drives)



Turn restrictor set with brake and stop

Description	PU	Material no.
Turn restrictor set V.01	10	740814
Turn restrictor set V.02	10	740835



Caution!
Incorrect or negligent installation poses a hazard.

Installing the turn restrictor incorrectly can lead to hazardous situations. Use only the turn restrictors mentioned in this document.



Turn restrictor, damped, braked size 1

Description	PU	Material no.
Turn restrictor damped, braked size 1 V.01	10	774487
Turn restrictor damped, braked size 1 V.02	10	774484



NOTE!
Application ranges from see page 19.



NOTE!
Comfort component
Not a security component in accordance with DIN EN 13126-5



Caution!
Incorrect or negligent installation poses a hazard.

Installing the turn restrictor incorrectly can lead to hazardous situations. Use only the braked and damped turn restrictors mentioned in this document.

**Turn restrictor, damped, braked size 2**

Description	PU	Material no.
Turn restrictor damped, braked size 2 V.01	10	774495
Turn restrictor damped, braked size 2 V.02	10	774496

**NOTE!**

Application ranges from see page 19.

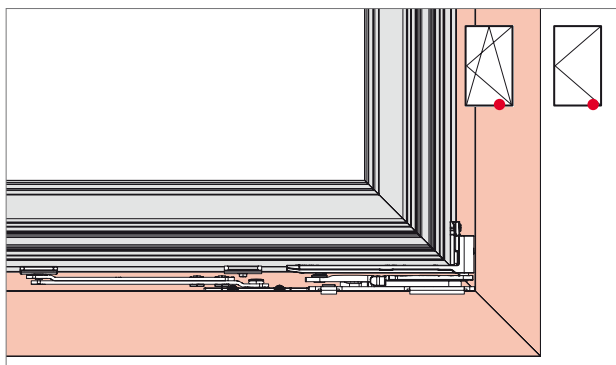
**NOTE!**

The turn restrictor is recommended when sashes could hit against window reveals on aluminium supports uncontrollably (e.g. due to wind) in such a way as to damage or destroy the hardware or profile.

**Caution!**

Incorrect or negligent installation poses a hazard.

Installing the turn restrictor incorrectly can lead to hazardous situations. Use only the braked and damped turn restrictors mentioned in this document.



NOTE!

Not a security component in accordance with DIN EN 13126-5.

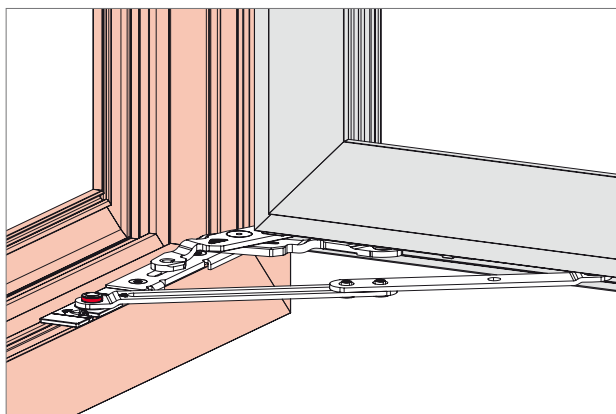
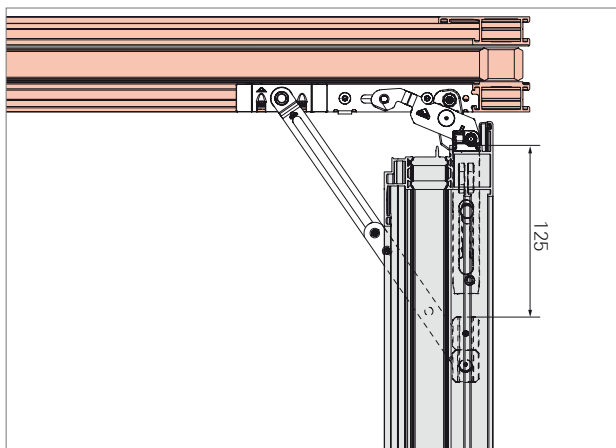
Install the turn restrictor:

- When window sashes could hit against window reveals or aluminium supports uncontrollably (e.g. due to wind) in such a way as to damage or destroy the hardware or profiles.
- In public buildings
- Mandatory with SW ≥ 1200 mm



NOTE!

The maximum opening angle with the turn restrictor is 90°.



Push the hole in the end of the sash component over the rubber ring of the bolt on the frame component.



CAUTION!

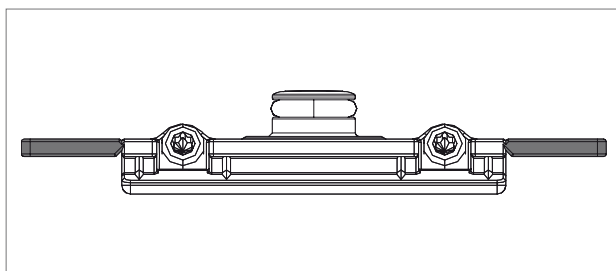
Incorrect or negligent installation poses a hazard.

Installing the turn restrictor incorrectly can lead to hazardous situations. Use only the turn restrictors mentioned in this document.



NOTE!

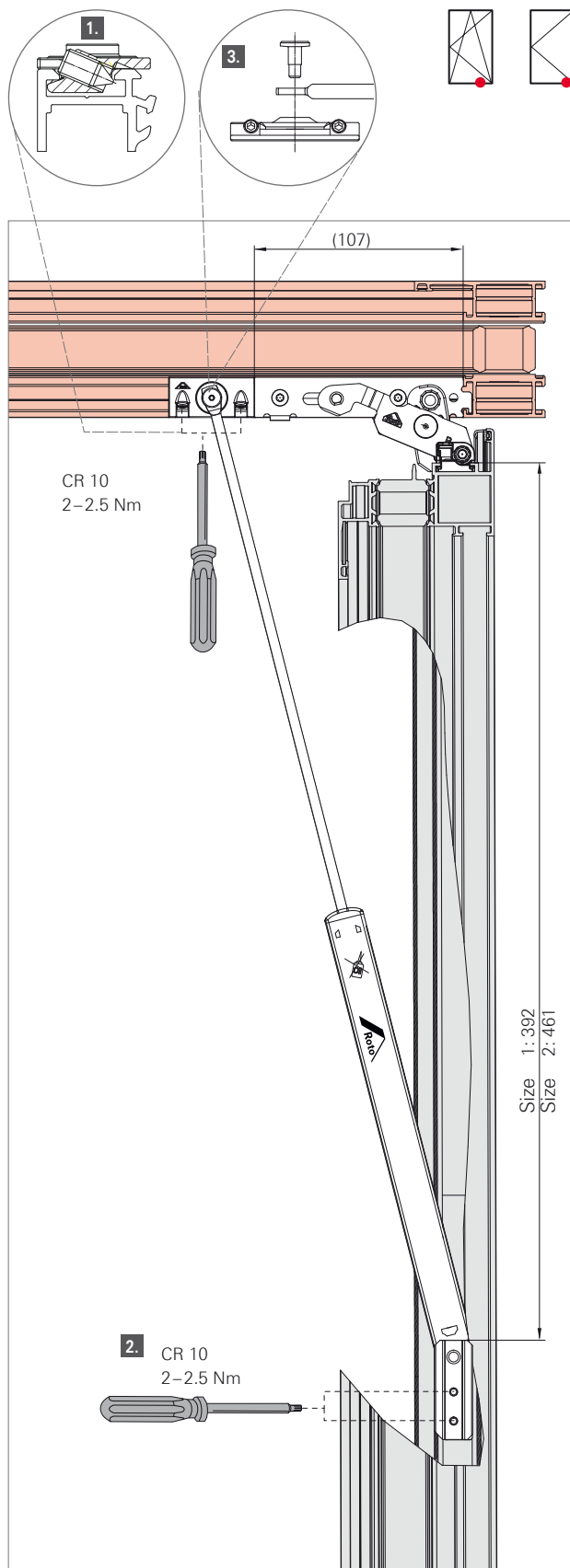
For an opening angle of 94°, break both the right and left sash of the turn restrictor frame component before installation.



Accessories

Turn restrictor

Installing the turn restrictor (braked, damped)



1. Screw down the frame bearing with two threaded pins.

Tool: T 10 hex key

Torque: 2–2.5 Nm

2. Insert the sash bearing in the sash groove and secure with screws.

Tool: T 10 hex key

Torque: 2–2.5 Nm

3. Screw the pull rod to the frame bearing using the M4 mushroom-head screw provided.

Tool: T 10 hex key

i NOTE!

- Maximum opening width with the braked, damped opening restrictor:
Size 1: approx. 63°
Size 2: approx. 90°
- After installation, you must check the end position of the sash rotation and correct it if necessary by moving the sash component slightly.

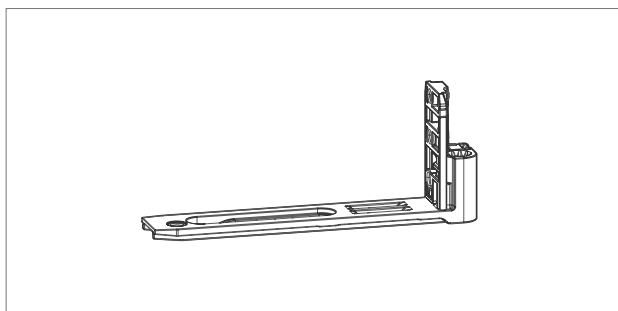


CAUTION!

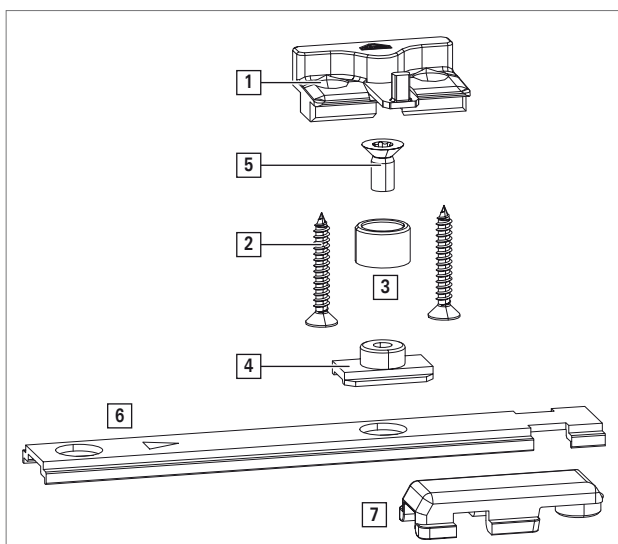
Incorrect or negligent installation poses a hazard.

Installing the opening restrictor incorrectly can lead to hazardous situations. Use only the braked and damped opening restrictors mentioned in this document.

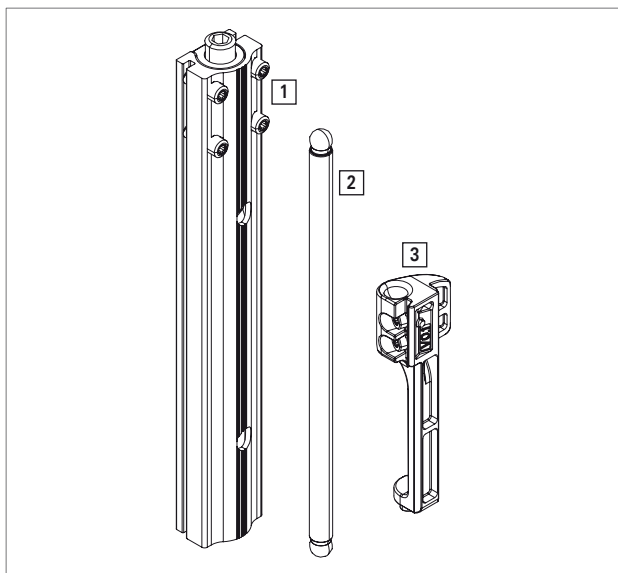
Roto hardware components may only be adjusted by authorised professionals.

**Corner hinge set with increased fixing**

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Adjustment piece with increased fixing for profile systems which feature a raised section of the corner connector in the area of the fixing	L	10	769855
			R	10	769494

**Night vent set AL**

Pos.	Pc(s)	Description	DIN	PU	Material no.
1		Night vent set AL		10	728958
		consisting of:			
[1]	1	Night vent			
[2]	2	Self-tapping screw ST3.9 x 25			
[3]	1	Night vent locking cam			
[4]	1	Coupler component			
[5]	1	Countersunk screw M5 x 10			
1		Night vent set AL for ASA		10	810364
		consisting of:			
[1]	1	Night vent			
[2]	2	Self-tapping screw ST3.9 x 25			
[3]	1	Night vent locking cam			
[4]	1	Coupler component			
[5]	1	Countersunk screw M5 x 10			
[6]	1	Connecting rod			
[7]	1	Coupler component			

**Load transfer set AL**

Pos.	Pc(s)	Description	DIN	PU	Material no.
		Load transfer set V.01	L	10	739694
			R	10	739693
		Load transfer set V.02	L	10	739696
			R	10	739695
		consisting of:			
[1]	1	Sash component			
[2]	1	Support rod			
[3]	1	Frame bearing V.01/V.02			

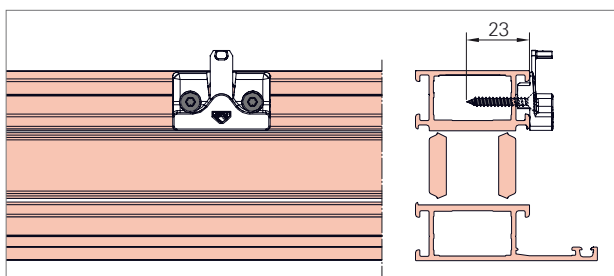
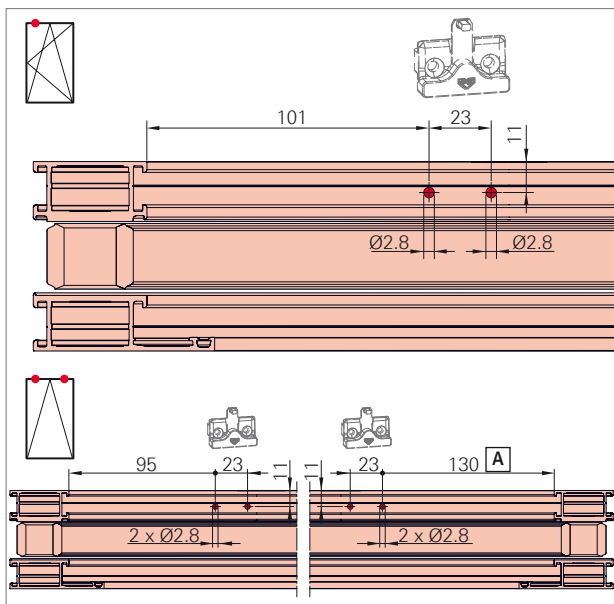
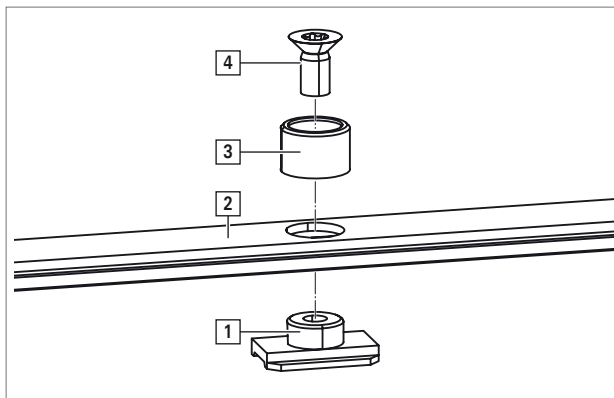
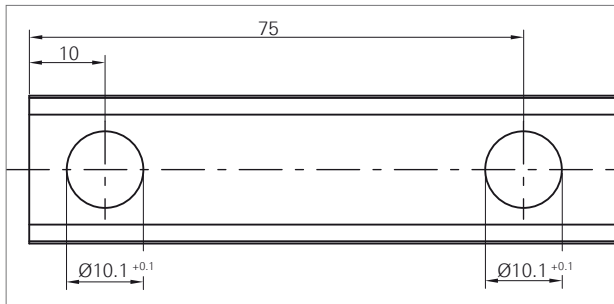
Night vent

Installing the night vent



INFO

Check all dimensions and functions during sample testing prior to series production.



Installing the night vent

1. Prepare the connecting rod (see installation drawing of night vent without and with additional stay arm for T&T and TiSt).

T&T = connecting rod CR3: drill the hole:

1 x Ø 10.1^{+0.1} mm

TiSt = connecting rod CR1 and CR2: drill holes:

each 1 x Ø 10.1^{+0.1} mm

2. Secure the coupler component [1] with connecting rod [2], night vent locking cam [3] and one screw [4].

3. Insert the connecting rod with components (depending on the corresponding opening type and additional stay arm).

4. Drill the inside of the frame.

Drill holes:

2 x Ø 2.8 mm, at least 23 mm deep.



INFO

Note that the drill hole dimensions for T&T differ from those for TiSt.

[A] An additional night vent is recommended with SW ≥ 1000 mm (for TiSt)

2. Secure the night vent with two screws.

Tool: T 15 hex key

Tightening torque max. 1.0 Nm



Functional principle

The spring in the load transfer permanently takes a load of approximately 60 to 80 kg off the pivot rest. For this, it is necessary to pre-tension the spring to a certain length. This applies regardless of the set height of the sash. The load is relieved from the pivot rest over the entire service life of the hardware components, also taking account of subsidence and wear.

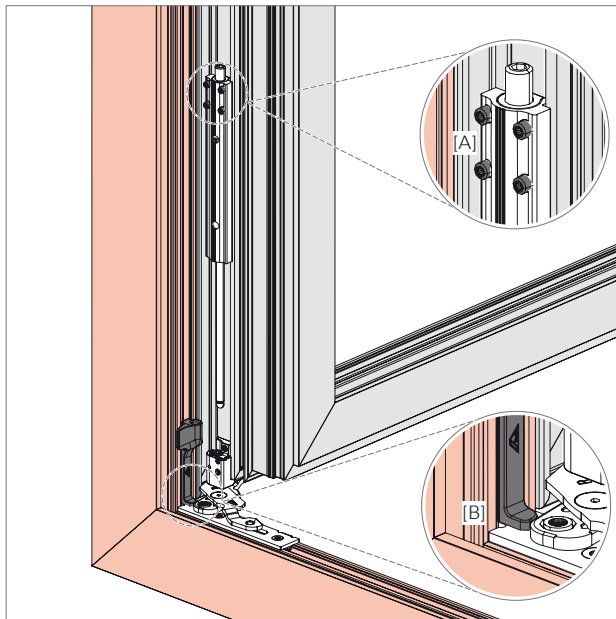
Installation



NOTE!

Sash installation with load transfer (sash weight 80 kg – 180 kg).

Do not use load transfer with sash weights ≤ 80 kg.



1. Insert the load transfer sash component into the sash groove as shown in the installation drawing and screw it down with four preinstalled threaded pins [A].

Tool: T 10 hex key

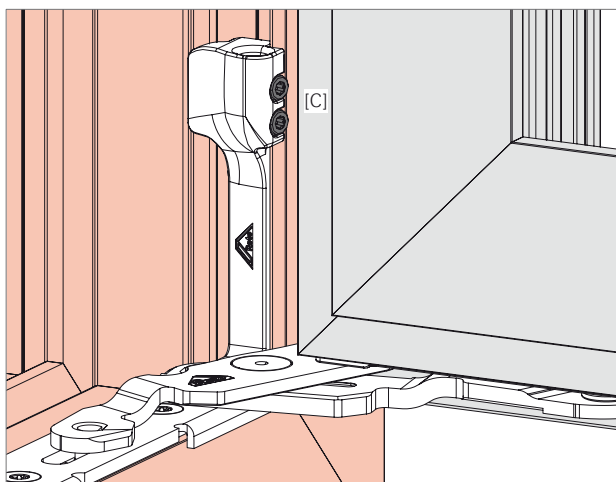
Torque: ≥ 2.5 Nm

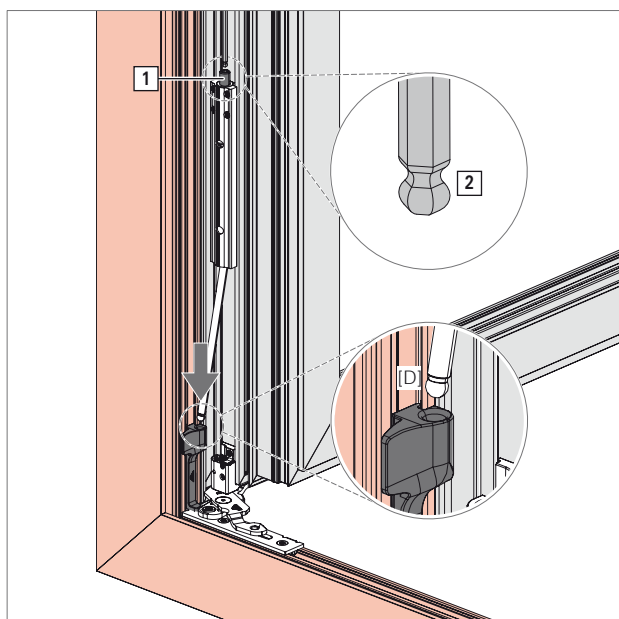
2. Place the load transfer frame bearing onto the pivot rest baseplate without leaving a gap [B].

3. Screw down the load transfer frame bearing with 2 preinstalled threaded pins [C].

Tool: T 10 hex key

Torque: ≥ 2.5 Nm

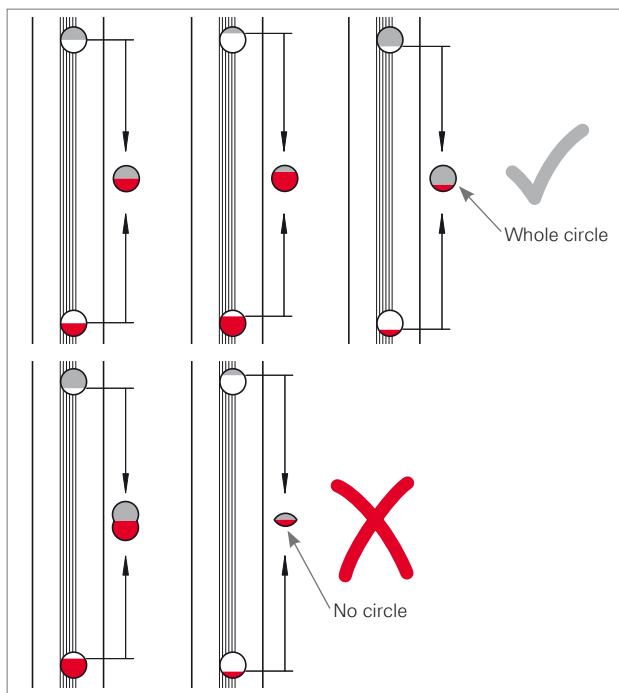




3. Position the load transfer support rod over the recess in the installed frame bearing [D].

4. Use the adjusting screw [1] to lower the support rod clockwise, until it is securely seated in the recess of the frame bearing.

Tool: hex key (with ball-shaped head [2]) size 4



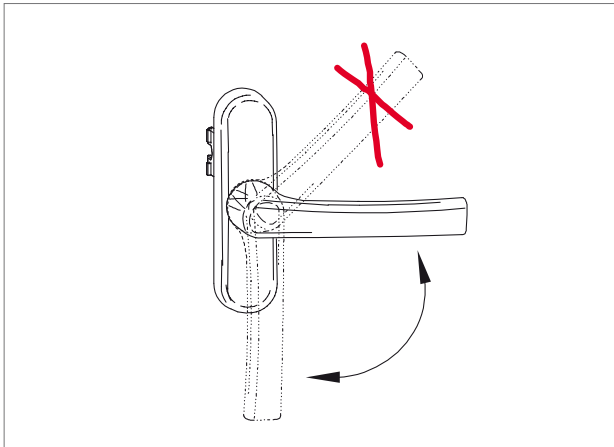
5. Adjust the load transfer pre-tensioning.

To do so, use a 4 mm hex key to adjust the load transfer at the adjusting screw when the sash in the open position (90°). Adjust the adjusting screw so that a whole circle is produced by adding together the red and silver partial circles. Check at the view windows.

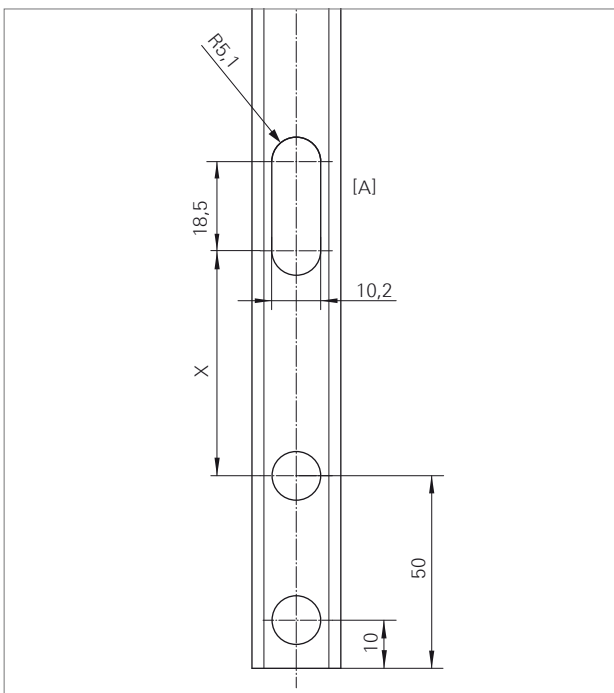


NOTE!

Only set and adjust the load transfer after the window has been installed on the construction site. If the load transfer is adjusted before the window is installed, the window may only be transported upright and with the glazing installed.



Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.

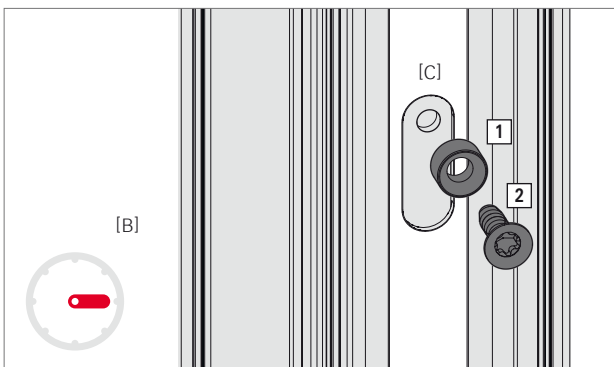


1. Produce the slot in connecting rod CR2 before installation, as shown in the drawing opposite [A].



NOTE!

X = freely positionable (suggestion: 60 mm)



2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

Drill holes:

1 x Ø 3.5 mm, at least 4 mm deep.

3. Screw down the locking sleeve [1] with the screw [2].
Tool: T 25 hex key



NOTE!

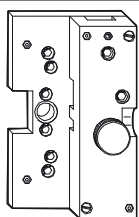
Sash stay 735: only screw down the locking sleeve with the screw after the sash stay has been mounted.



Jig for stay bearing and pivot rest

Description	Material no.
-------------	--------------

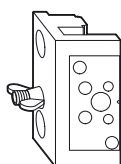
Jig for groove base thickness > 2 mm	628534
--	---------------



Jig for geared-handle

Description	Material no.
-------------	--------------

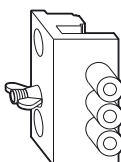
Jig for geared-handle, connecting rod, turn lock	212544
---	---------------



Jig for flush-encased gearbox

Description	Material no.
-------------	--------------

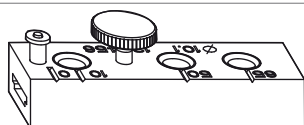
Jig for flush-encased gearbox and handle without escutcheon	365361
--	---------------



Jig for flush-encased gearbox

Description	Material no.
-------------	--------------

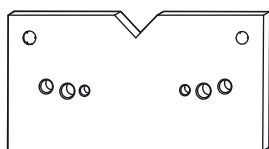
Jig for flush-encased gearbox and handle	212155
---	---------------



Jig for connecting rod

Description	Material no.
-------------	--------------

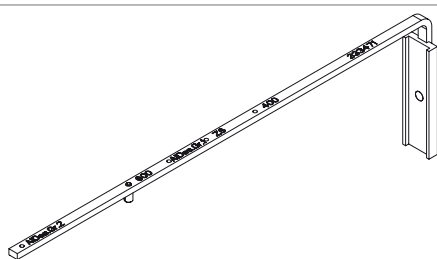
Jig for connecting rod	333472
-------------------------------	---------------



Jig for geared-handle

Description	Material no.
-------------	--------------

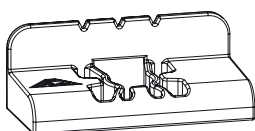
Jig for geared-handle	333473
------------------------------	---------------



Jig for sash stay

Description	Material no.
-------------	--------------

Jig for sash stay 390, sash stay 500 and sash stay 735	333471
---	---------------



Jig for strikers

Description	Material no.
-------------	--------------

Striker jig RAL 3020	774540
-----------------------------	---------------



Mounting tools

Description

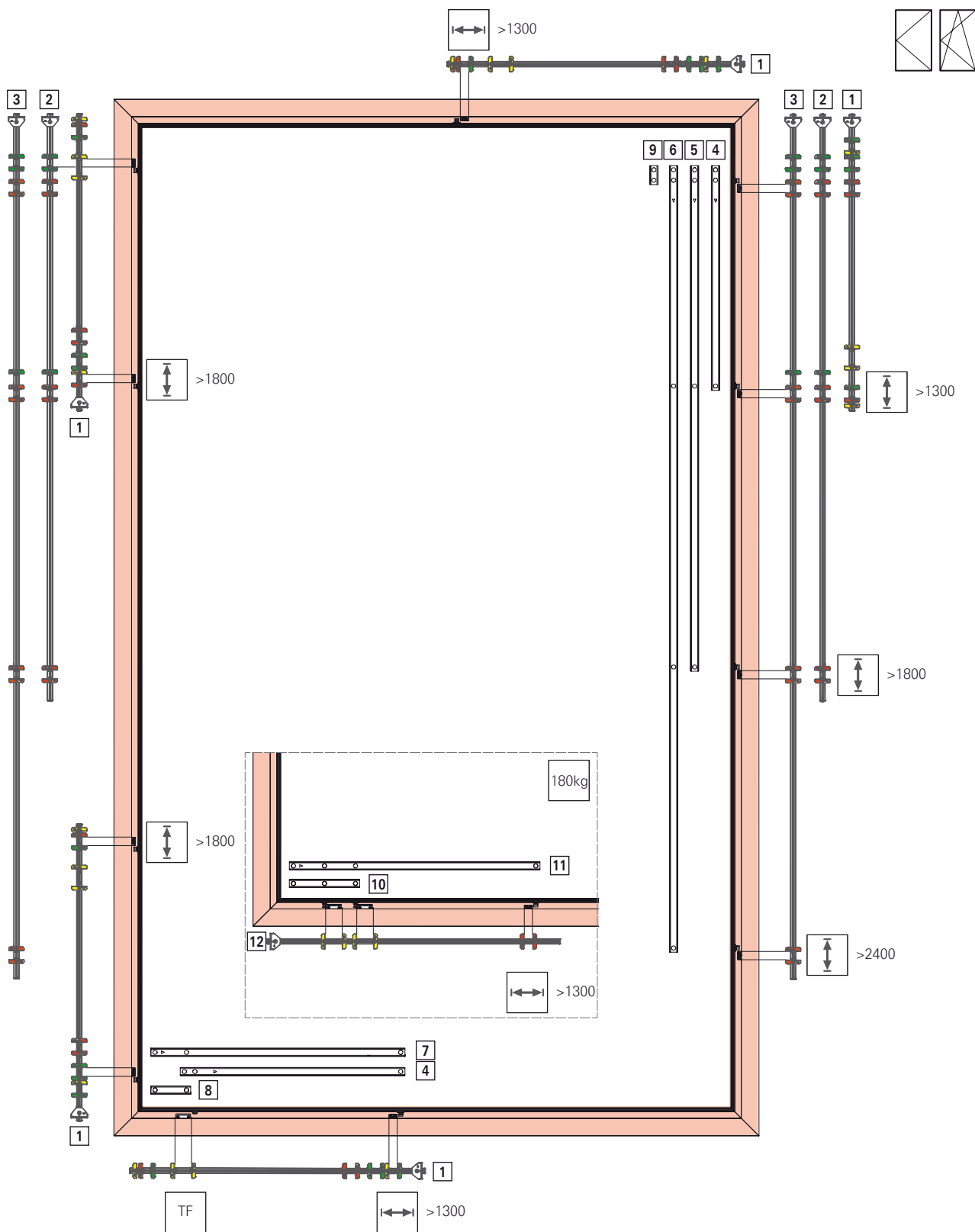
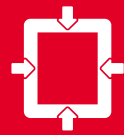
T 10; T 20; T 25 hex key
Hex key size 2.5



Adjustment tools

Description

Hex key with ball-shaped head size 2.5, size 4



NOTE!

You can find all possible uses for jigs and fixed connecting rods in the overview, regardless of the opening type.

Symbols	Explanation
	Sash width
	Sash height
TF	TiltFirst

Striker positioning jigs for figure, see page 250

Pos.	Description	PU	Material no.
[1]	Short positioning jig SH 1301–1800 / SW > 1300	1	739601
[2]	Medium positioning jig SH 1801–2400	1	739602
[3]	Long positioning jig SH > 2400	1	739600
[12]	Positioning jig 180 kg SW > 1300	1	768934

Connecting rods with fixed dimensions for figure, see page 250

Pos.	Description	PU	Material no.
[4]	CR 4.1 SH 1301–1800 / CR 5.2 SW 1301–1600 AL	10	729979
[5]	CR 4.2 SH 1801–2400 AL	10	729980
[6]	CR 4.3 SH 2401–2700 AL	10	729981
[7]	CR 5.2 TuS/TF SW 1301–1600 AL	10	739375
[8]	CR 5.1 SW 405–1300	10	729982
[9]	CR 4 SH 520–1300	10	729978
[10]	ECC connecting rod L170	10	772751
[11]	CR 5.2 180 kg SW 1301–1600	10	769015

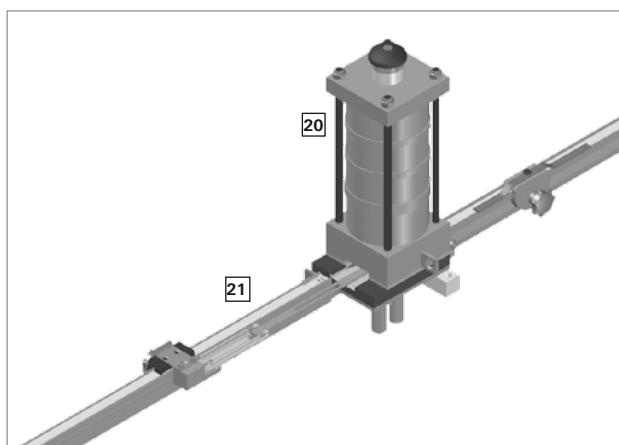


NOTE!

Insert the connecting rod in accordance with the marking.

Connecting rod without fixed dimensions (not shown)

Description	Length	PU	Material no.
Connecting rod	3 m		735102
Connecting rod	6 m		334665



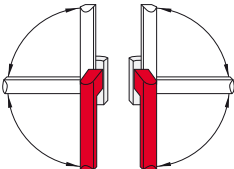
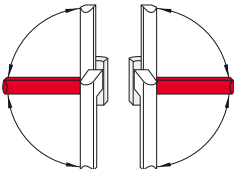
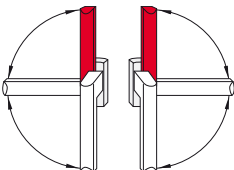
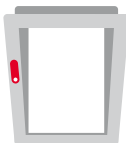
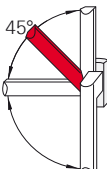
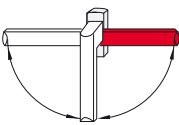
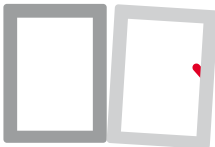
Punch

Pneumatic punch for cutting connecting rods to length and creating holes in them.

Pos.	Description	PU	Material no.
[20]	Comfort punch PS4 G Ø 10 mm	1	350309
[21]	Standard ruler	1	350314



The following symbols illustrate the different lever positions and the resultant sash positions of the windows and balcony doors.

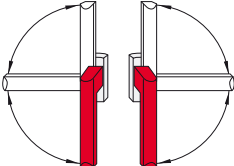
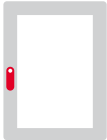
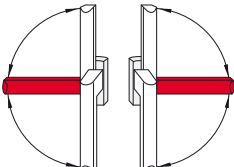
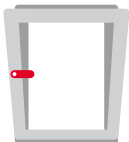
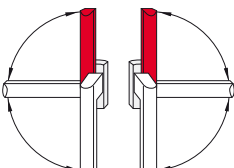
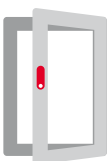
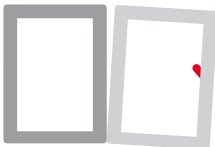
Handle position	Sash position	Symbol	Meaning
			Sash in closed position.
			Sash in turned, open position.
			Sash in tilted, open position.
			Sash in night ventilation position for T&T.
			Sash in night ventilation position for TiSt.
			Sash in incorrect position.

Operation

Operation information

Handle position with TiltFirst hardware

The following symbols illustrate the different lever positions and the resultant sash positions of the windows and balcony doors.

Handle position	Sash position	Symbol	Meaning
			Sash in closed position.
			Sash in tilted, open position.
			Sash in turned, open position.
			Sash in incorrect position.



Fault assistance

Problem	Cause	Corrective action	Specialist company	End user
Handle is difficult to turn.	- Frame components have not been greased. - Handle is faulty. - Handle screwed into place too tightly. - Sash components with slanting screws. - Sash components are faulty. - Incorrect striker positions. - Sash stay gasket compression is too strong (accumulation on gasket).	- Grease the frame components. - Replace the handle. - Undo the screw fixing slightly. - Screw the sash components in straight. - Replace the sash components. - Adapt the striker positions. - Adjust the sash stay gasket compression or clean the sash stay.	☐ ☒ ☒ ☒ ☒ ☒ ☒	☐ – – – – – –
Handle cannot be turned 180°.	- Sash components hinged incorrectly. - Connecting rod dimensions not OK.	- Check the setting in the turn position (rehang if necessary – start from the T&T espagnolette). - Check the connecting rod dimensions.	☒ ☒	– –
Sash falls into the tilt position when in the turn position.	Too much clearance at the top.	- Check the fit of the corner hinge. - Check the fit of the pivot rest. - Position the corner hinge higher. (Pay attention to the tilt striker)	☒ ☒ ☒	– – –
Sash falls into the turn position when in the tilt position.	- Tilting component is faulty. - Scissor stay inclusion not OK due to incorrect connecting rod dimensions.	- Replace the tilting component. - Check the connecting rod dimensions.	☒ ☒	– –
Sash scrapes in the tilt position.	Insufficient clearance at the top.	Lower the corner hinge. (Pay attention to the tilt striker)	☒	–
Locking cams brush against the striker.	- Sash mounted incorrectly. - Incorrect striker positions.	- Rehang the sash. - Adapt the striker positions.	☒ ☒	– –

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

– = Must **not** be carried out by the end user; the end user must not perform any assembly work.

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

Maintenance



WARNING!

Improperly performed maintenance work may result in injuries.

Improper maintenance can lead to serious injuries or property damage.

- Before starting work, ensure that sufficient installation space is available.
- Ensure that the installation site is clean and tidy.
- Ensure that the window or the balcony door cannot swing open or closed unintentionally during maintenance work.
- Only allow a specialist company to perform adjustment work on the hardware – especially around the pivot rests and scissor stays – and replace components and hinge and unhinge the sash.
- Do not unhinge the window for maintenance.

At least once per year, every six months in school and hotel buildings:

	Specialist company	End user
Retighten fixing screws if required.	■	–
Replace damaged screws.	■	–
Replace components if required.	■	–
Lubricate all movable parts with acid-free and resin-free oil from a specialist retailer.	□	□
Lubricate steel strikers with acid-free and resin-free grease from a specialist retailer.	□	□

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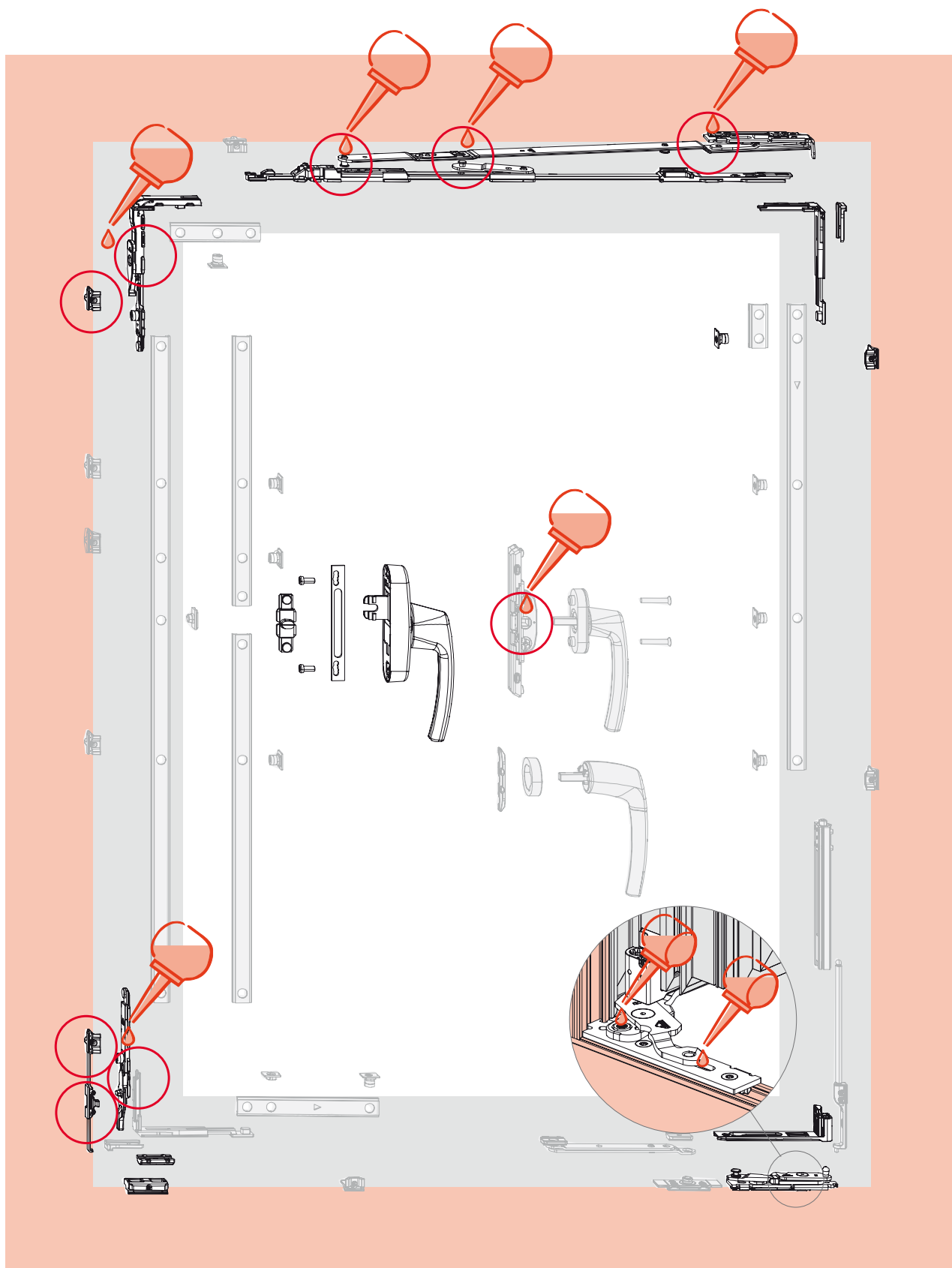
NOTE!

Pay attention to the following information on environmental protection when performing maintenance work:

- Remove leaking or excess grease at lubrication points and dispose of it in accordance with the applicable local provisions.
- Collect replaced oil in suitable tanks and dispose of it in an environmentally friendly manner.



The hardware overview shown displays the arrangement of possible lubrication points and does not necessarily match the installed hardware. The quantity of lubrication points varies depending on the size and design of the window.



Inspection

At least once per year, every six months in school and hotel buildings:

	Specialist company	End user
Check that safety-relevant hardware components are fitted securely.	☐	☐
Inspect safety-relevant hardware components for wear.	☐	☐
Check that all movable parts work properly.	☐	☐
Check that all locking points work properly.	☐	☐
The hardware's ease of movement can be checked on the window handle:		
■ Locking and unlocking torque according to DIN 18055: max. 10 Nm.	■	–
■ The test can be performed using a torque wrench.	■	–
■ Ease of movement can be improved by greasing / lubricating or adjusting the hardware.	■	–

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

Care

	Specialist company	End user
Keep the hardware free of deposits and contaminants.	☐	☐
Never use aggressive, acidic cleaners or abrasive cleaners.	☐	☐
Only use mild, pH-neutral cleaning agents that have been diluted.	☐	☐
Always clean using a soft cloth.	☐	☐

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

No legal claims can be derived from these recommendations. Their application is to be based on the specific individual case. The window and balcony door manufacturer must draw the attention of builders and end consumers to these maintenance instructions. Roto Frank recommends the window manufacturer conclude a maintenance agreement with their end users.



Protection against corrosion

	Specialist company	End user
Avoid aggressive vapours (e.g. produced by formic acid, acetic acid, ammonia, amine compounds, ammonia compounds, aldehyde, carboic acid, chlorine, tannic acid, etc.) around the windows.	■	–
Do not use any acetic acid-crosslinking or acid-crosslinking sealing compounds or those with the aforementioned constituents as both direct contact with the sealing compound and its fumes can attack the surface of the hardware.	■	–
A shorter lubrication and maintenance interval is required (every three months) in coastal areas due to the increased risk of salt deposits on the hardware.	■	–

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Protection against dirt

	Specialist company	End user
Remove deposits and contaminants caused by construction materials (construction dust, plaster, stucco, mortar, cement, etc.) or the like before they bond with water.	□	□
Keep the hardware free of deposits and contaminants.	□	□
Never use aggressive, acidic cleaners or abrasive cleaners.	□	□
Only use mild, pH-neutral cleaning agents that have been diluted.	□	□
Always clean using a soft cloth.	□	□

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– = Must **not** be carried out by the end user; the end user must not perform any assembly work.

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

Protection against (permanently) damp room air

	Specialist company	End user
Ventilate hardware and rebate areas sufficiently – particularly during the construction phase – so that they are not exposed to the direct effects of moisture or to the formation of condensation.	☐	☐
Ensure (on an ongoing basis) that damp room air cannot condense in the rebate areas: ■ Intensively air out the room several times per day by opening all windows for approximately 15 minutes. ■ Provide adequate ventilation during holiday periods as well. ■ Establish a ventilation plan for more complex construction projects if necessary. If the type of ventilation described is not an option, e.g. if there is fresh screed that cannot be walked on or must not be exposed to draughts, move the window to tilt position and provide airtight masking inside the room. Discharge any humidity present in the room air to the outside using condensation dryers.	☐	☐

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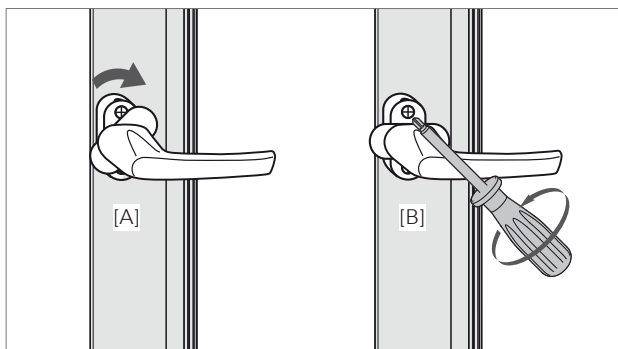
Protection against damage caused by renovation work

	Specialist company	End user
When performing surface treatment on windows, do not treat any hardware components and protect them from contamination caused by this.	☐	☐
Only use adhesive tape that does not damage the paint coats. Consult the window manufacturer if in doubt.	☐	☐

■ = Must be carried out by a specialist company

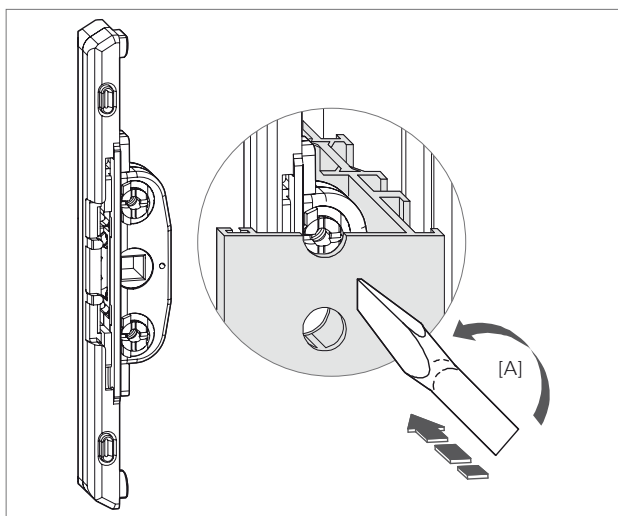
– = Must **not** be carried out by the end user; the end user must not perform any assembly work.

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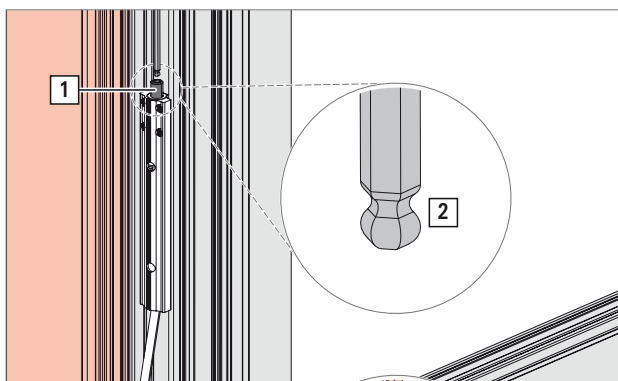
Window handle

1. Move the handle into the turn position (into the tilt position for TF).
2. Lift the escutcheon cover and turn it 90° [A].
3. Remove the two screws [B].
Tool: Phillips screwdriver PH2
4. Remove the handle.



Flush-encased gearbox

1. Push the engaged clampable lugs towards the espagnolette and turn anticlockwise [A].
Tool: flat-tip screwdriver 8x1.2 mm
2. Remove the flush-encased gearbox by pulling it to the side.



Load transfer

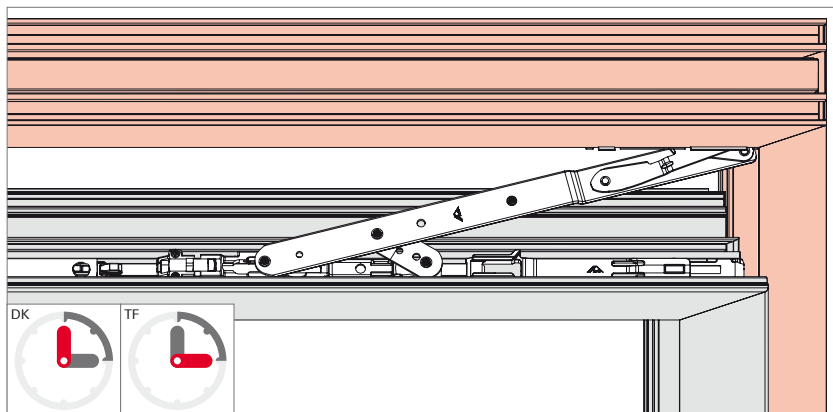
1. Use the adjusting screw [1] to fully unbend the load transfer spring.
Tool: hex key (with ball-shaped head [2]) size 4
2. Unhinge the sash.



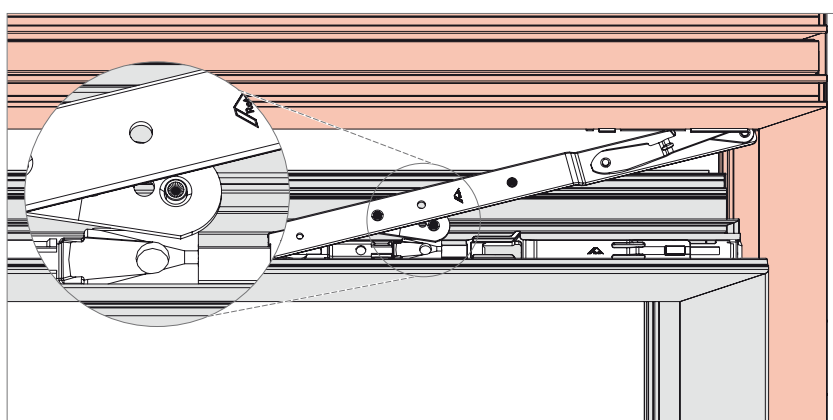
NOTE!

If the spring is not fully unbent, the sash cannot be rehinged.

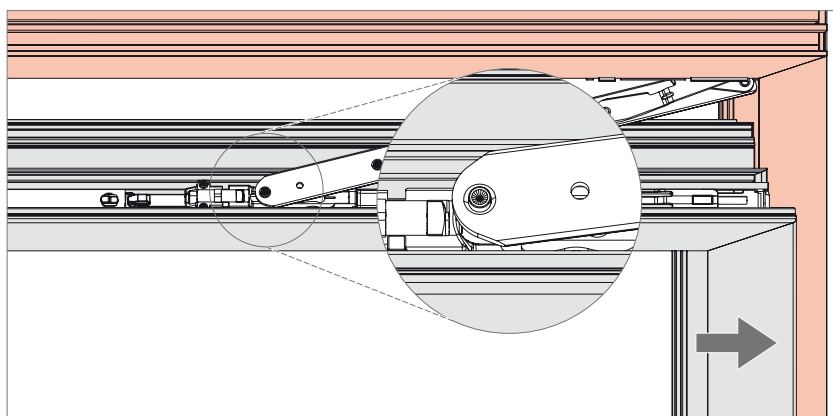
Sash stay 500



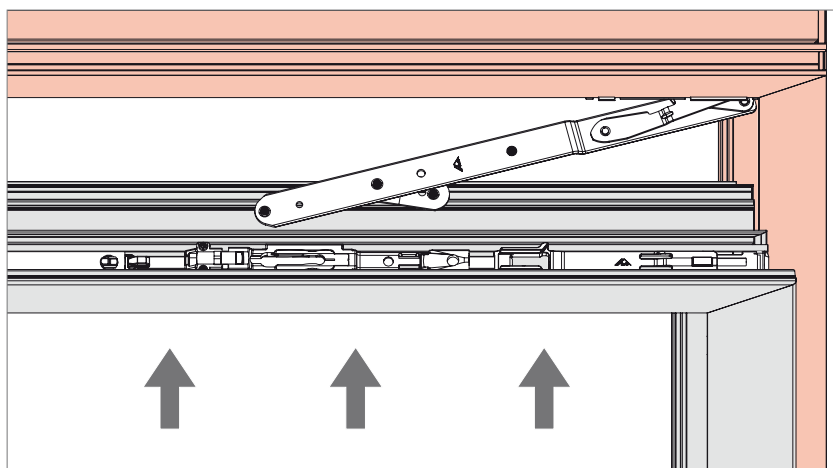
1. Move the handle to the turn position.
2. Open the sash approximately 10°.
3. Secure the sash to prevent it from falling.
4. Push the mishandling device. Move the handle to the tilt position (under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case).



5. Lift the supporting arm upwards out of its support.



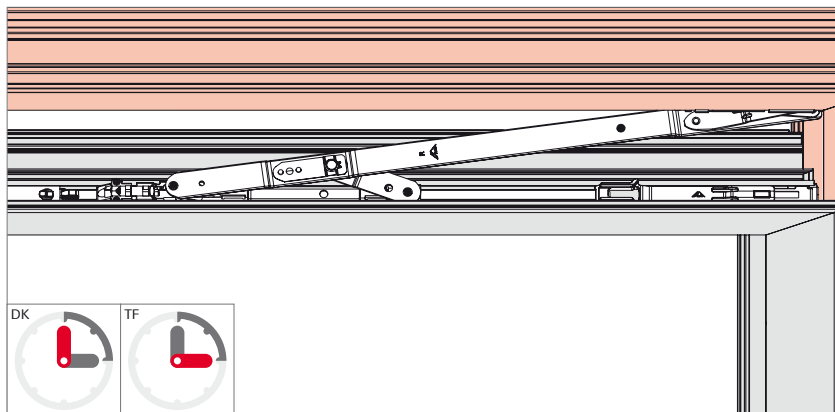
6. Push the sash towards the hinge side so that the stay arm cam in the scissor stay guide slides forward up to the recess.



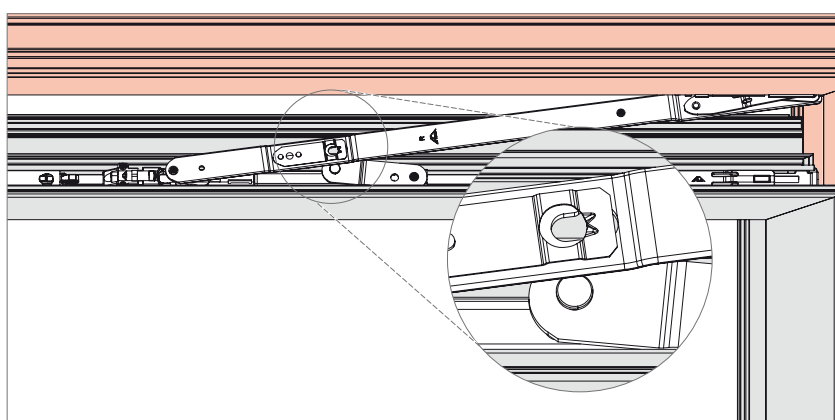
7. Unhinge the stay arm and raise the sash upwards, parallel to the frame, until the pivot rest cam is free. Then lift the sash carefully out of the frame.



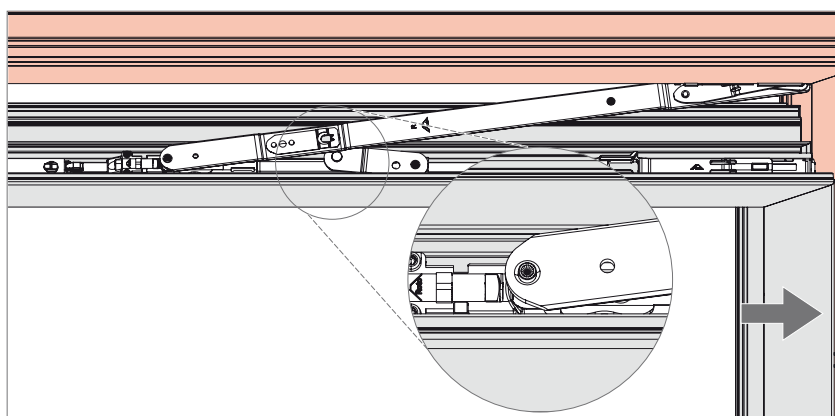
Sash stay 735



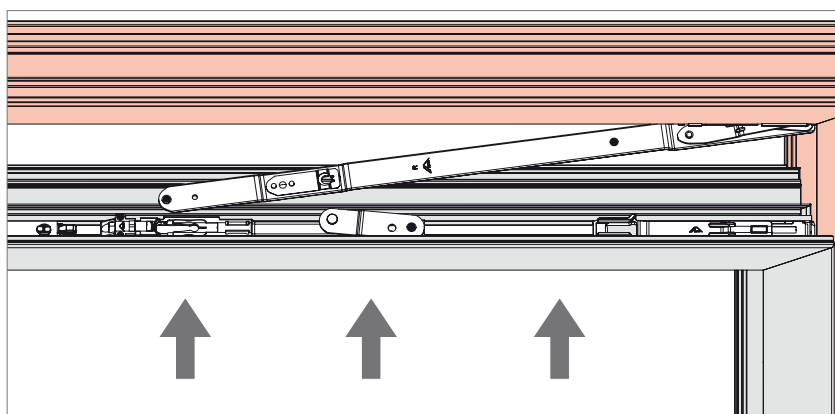
1. Move the handle to the turn position.
2. Open the sash approximately 10°.
3. Secure the sash to prevent it from falling.
4. Push the mishandling device. Move the handle to the tilt position. (Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.)



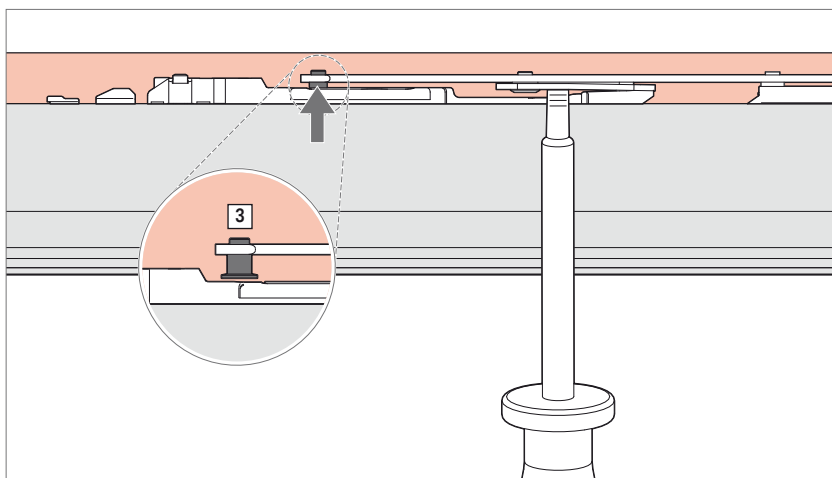
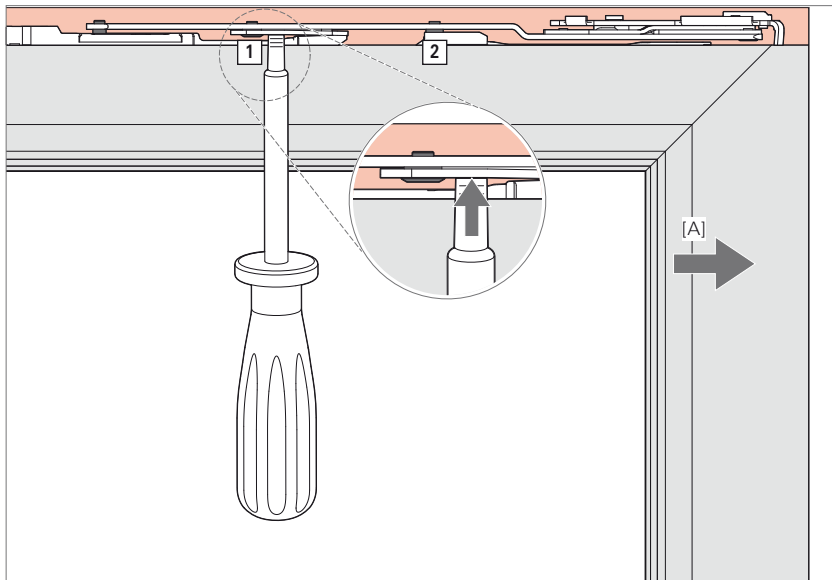
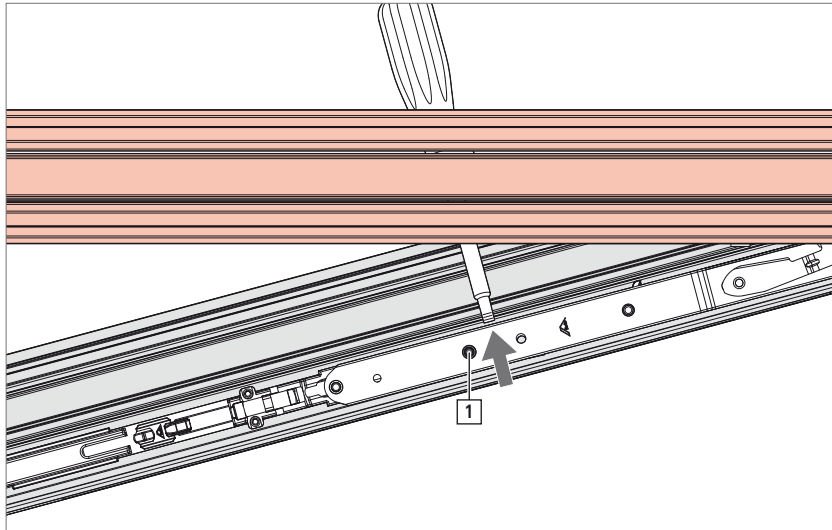
5. Lift the spring clip using a screwdriver and push the supporting arm cam downwards.



6. Push the sash towards the hinge side so that the stay arm cam in the scissor stay guide slides forward up to the recess.

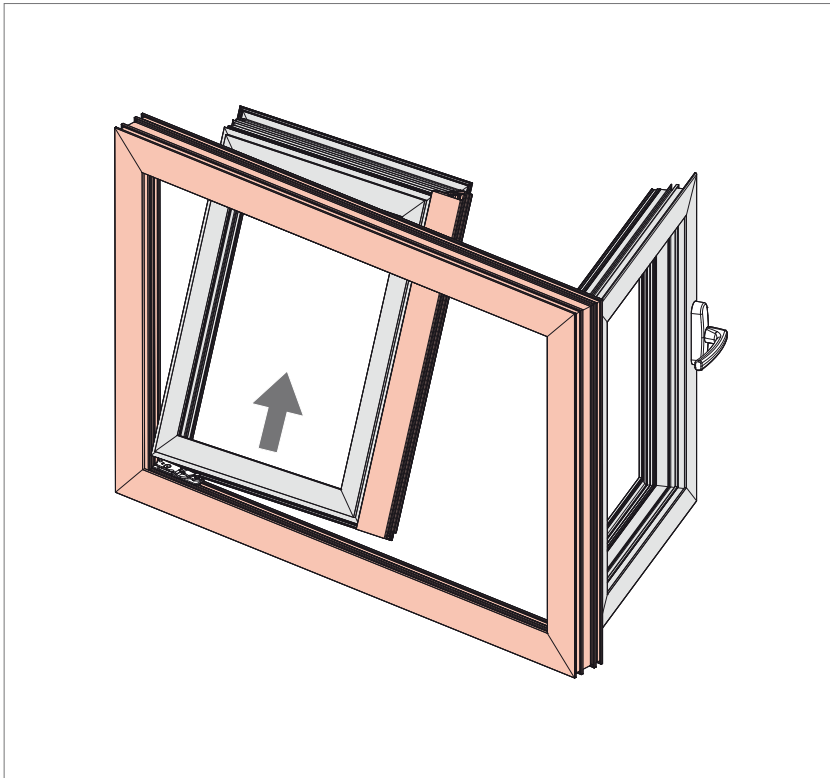


7. Unhinge the stay arm and raise the sash upwards, parallel to the frame, until the pivot rest cam is free. Then lift the sash carefully out of the frame.



FM – passive sash

1. Open the active floating-mullion sash and prevent it from swinging closed unintentionally.
2. Move the FM espagnolette handle to the turn position.
3. Open the passive floating-mullion sash approximately 30°–50°.
4. Move the FM espagnolette handle to the locked position.
5. Secure the floating-mullion sash to prevent it from falling.
6. Slide the flat side of a screwdriver blade (blade min. 8 mm) under the stay arm next to the cam [1].
7. Turn the screwdriver blade to lever the cams [1] and [2] out of their inclusions.
8. Push the sash towards the hinge side [A].
9. Lever the cam [3] out of its inclusion.
10. Close the passive floating-mullion sash. Before doing so, move the FM espagnolette handle to the turn position.



- 11.** Tilt the passive floating-mullion sash inwards and carefully guide it upwards out of the frame.

Transporting / handling window elements



Danger!

Incorrect handling and improper transport may pose a risk of death!

Incorrect handling and improper transport of window elements may lead to hazardous situations and cause serious accidents or even death.

For this reason:

- ▶ During loading and unloading processes, choose force application points which solely generate reaction forces appropriate for the design of the hardware components for the intended installation position.
- ▶ During handling and transport, ensure that the hardware is in the locked position, in order to prevent the sash from opening uncontrollably. Use additional suitable protective devices during transport, e.g. lashing straps.
- ▶ Only use transport safety devices that have been adapted to the specific rebate clearance.
- ▶ Transport windows in the intended installation position if possible – with the window upright and with glazing installed.
- ▶ Prevent the sash from moving diagonally or slipping out of position diagonally in relation to the frame (e.g. by using spacers).
- ▶ If transport is not possible in the intended installation position, unhinge the sash and transport it separately from the associated frame.



NOTE!

The type and the force application points during transport, loading and unloading processes have a significant influence on the reaction forces which occur. Especially when tools such as suction lifters, transport nets, forklifts or cranes are used to provide assistance, reaction forces which cause damage to or incorrect loads on the installed hardware may occur.

You should therefore pay attention to the following information for all transport, loading and unloading processes:

- ▶ Always choose force application points so that the resulting reaction forces are deflected as appropriate for the design of the hardware components for the intended installation position. This applies to the support points in particular.



Transport inspection

Immediately check the delivery for completeness and transport damage on receipt.



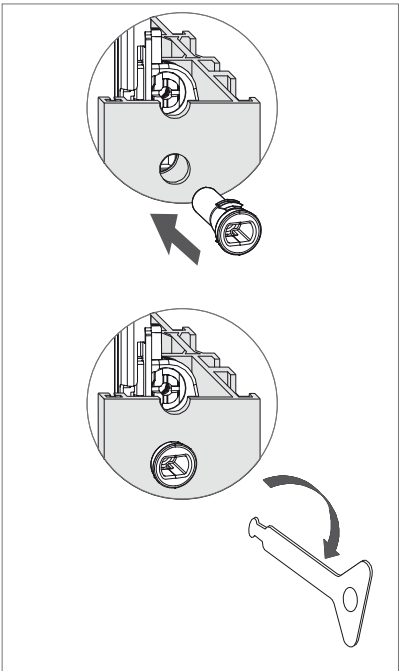
NOTE!

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

Transport safety device

Transport safety device for flush-encased gearboxes with a handle without escutcheon.

Insert the transport safety device (included in the handle set) in the square hole after the flush-encased gearbox has been installed. Remove the transport safety device with the pull key before installing the handle.



Pull key			
Pc(s)	Description	PU	Material no.
1	Pull key for handle without escutcheon	10	377995



Attention!

Incorrect disposal can harm the environment.

Pieces of hardware are raw materials.

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

Disposing of packaging

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

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

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

Disposing of hardware

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

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

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





Roto Frank AG
Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com



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