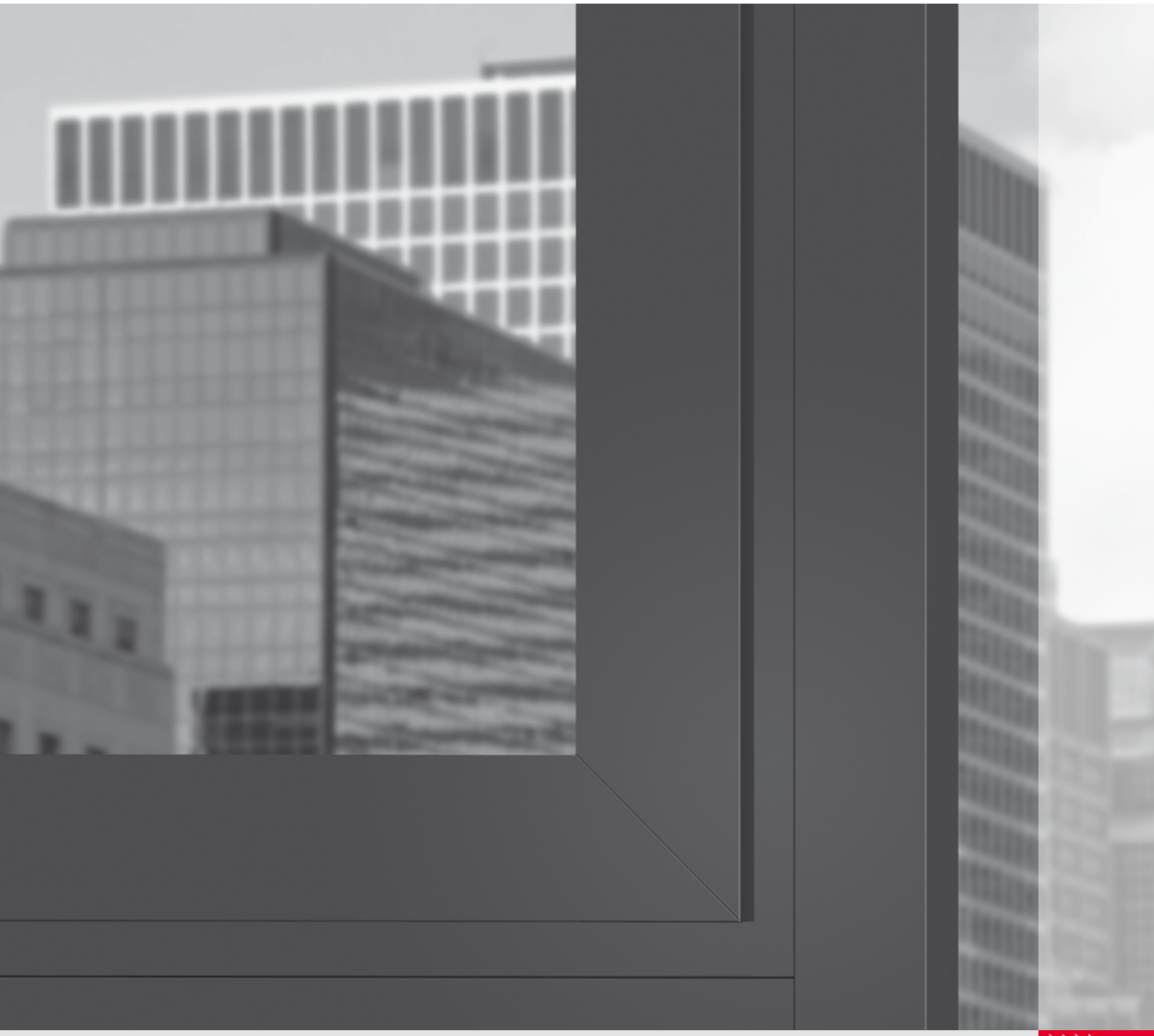
Window and Door Technology

Roto AL Designo

Concealed hardware for aesthetic aluminium windows and balcony doors

Installation, maintenance and operating instructions for aluminium profiles



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General information

Security

Information on the product

General installation

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 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!

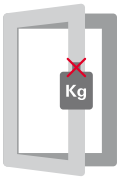
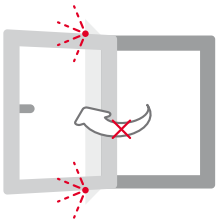
Misuse of windows or balcony doors can lead to hazardous situations.

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.

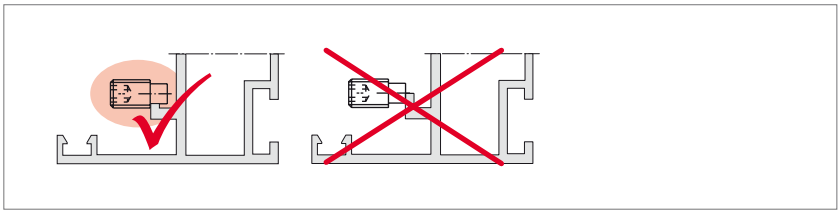
Installing hardware components improperly or screwing them into place incorrectly may lead to hazardous situations and cause serious accidents or even death.

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:

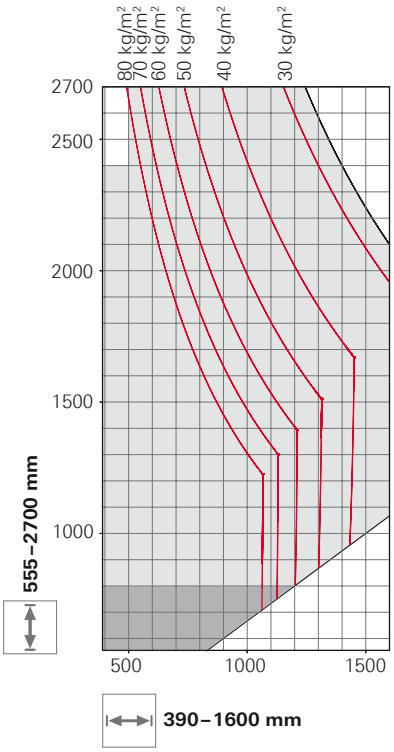
- Floating-mullion sash espagnolette, internal (FM)
- Floating-mullion shootbolt (FM-Sh)
- Floating-mullion sash espagnolette, surface-mounted (FM-Su)
- Floating-mullion sash espagnolette, surface-mounted, narrow version (FM-SuN)
- Floating-mullion sash espagnolette, slider (FM-R)

- Use of turn restrictor SW ≥ 1200 mm
- Use of turn restrictor (damped, braked) SW ≥ 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 ≙ 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

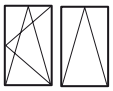
NOTE!

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

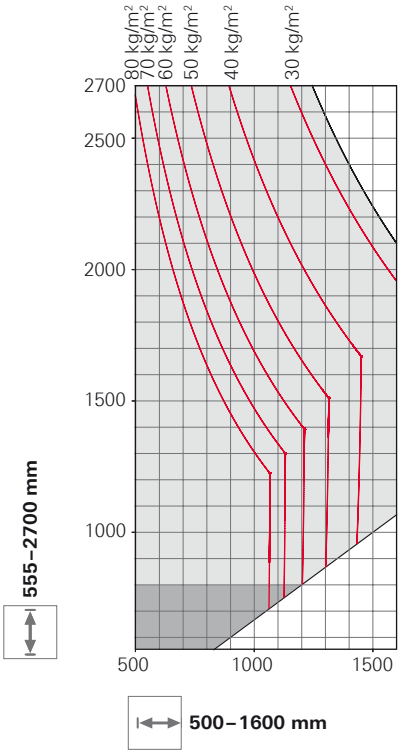
1) Glass weight max. 65 kg/m²

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 ≙ 2.5 kg

= Impermissible application range

= Tilt distance restrictor SH < 800 mm

Calculation basis for application diagram:

(IFT tool – version from February 2016)

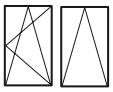
Glass clearance dimension **CG** ..... 20 mm
(Sash) profile weight **PW** ..... 2 kg/m

NOTE!

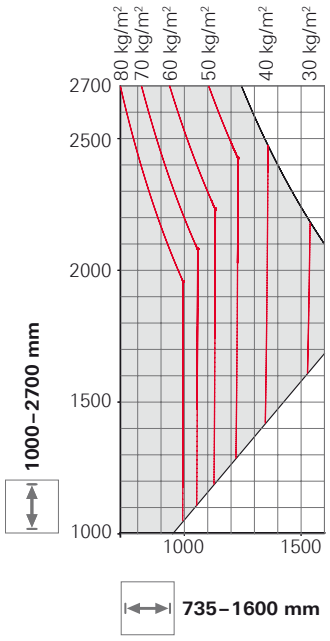
- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

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 ≙ 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

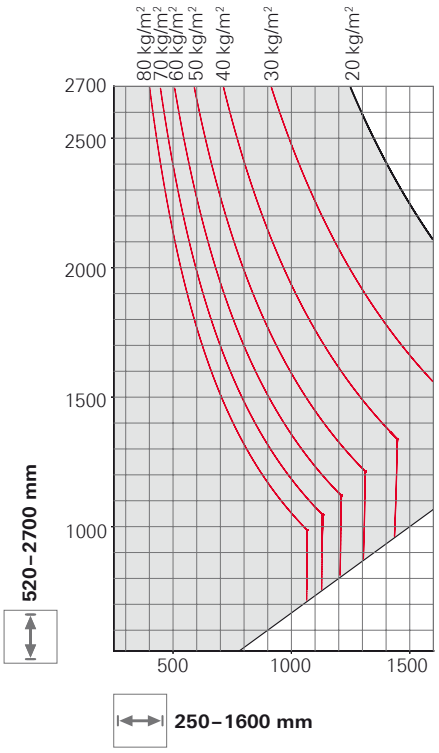
NOTE!

- 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 (max. glass weight 70 kg/m²)[2)]	300–900 mm
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 ≙ 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

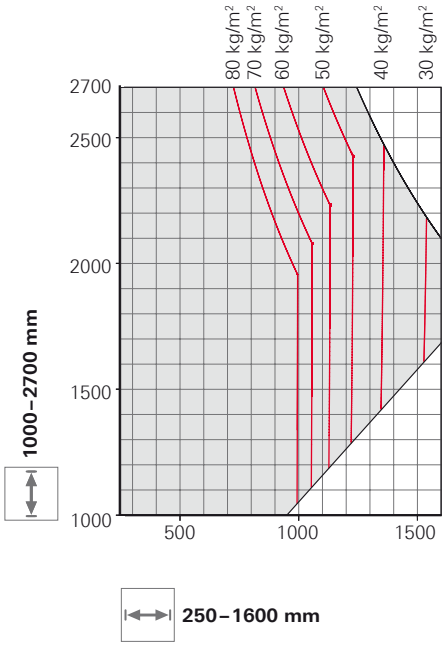
NOTE!

- 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 ≙ 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

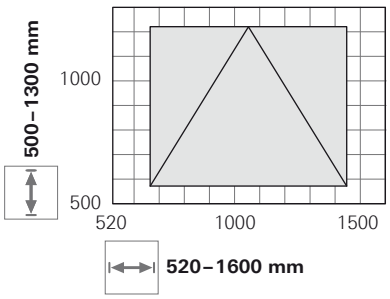
Application diagram up to 100 kg

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 ≙ 2.5 kg

= Impermissible application range

Calculation basis for application diagram:

(IFT tool – version from February 2016)

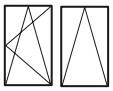
Glass clearance dimension **CG** ..... 20 mm
(Sash) profile weight **PW** ..... 2 kg/m

NOTE!

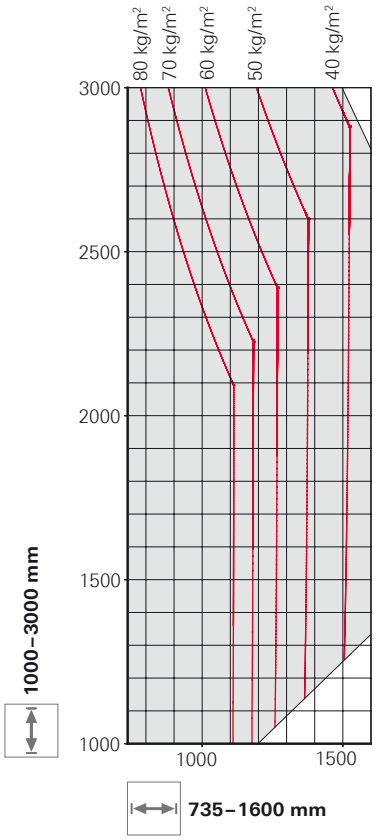
- Lower glass clearance dimensions or higher profile weights require a separate assessment.
- For information on the RC sash widths, see page 26

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 ≙ 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

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.

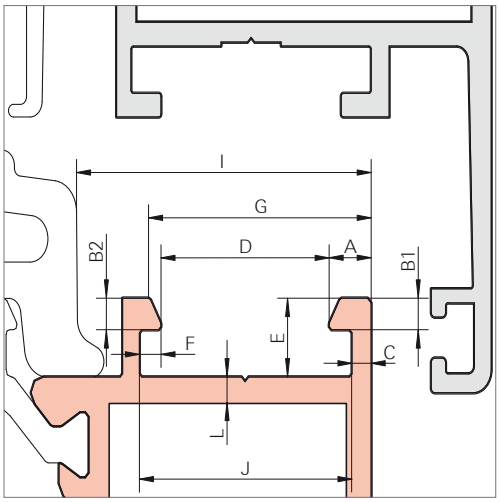
Profile-specific hardware components, hardware axis 10 mm

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

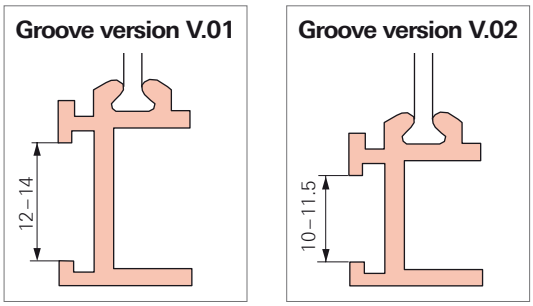
* For the drilling jig for groove base thickness > 2 mm, see page 248

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).



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

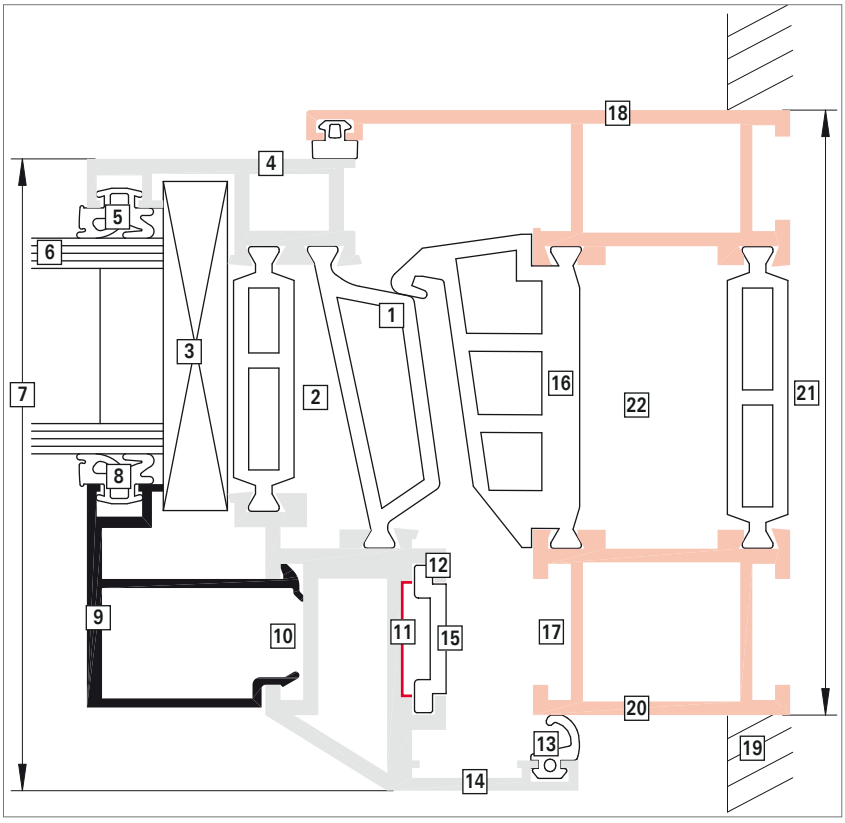
	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, coupleable
C+J Clamp strip dimensions	18.20	19.20	L	**624972**	**740853**	**624951**	**624953**	**627258**	**740844**
			R	**624971**	**740854**	**624950**	**624952**	**627257**	**740841**

Clamp strip version no. 4

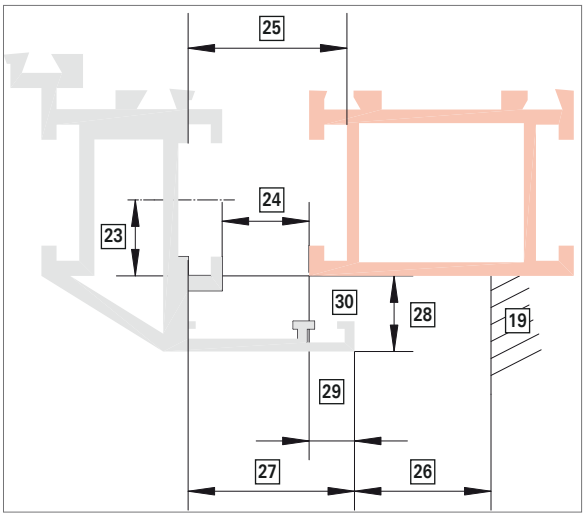
	Min.	Max.	DIN	Pivot rest	Sash stay 390	Sash stay 500	Sash stay 735	Rebate sash stay	Rebate sash stay set, coupleable
C+J Clamp strip dimensions	19.30	20.50	L	**624974**	**740855**	**624957**	**624959**	**627260**	**740845**
			R	**624973**	**740856**	**624956**	**624958**	**627259**	**740842**

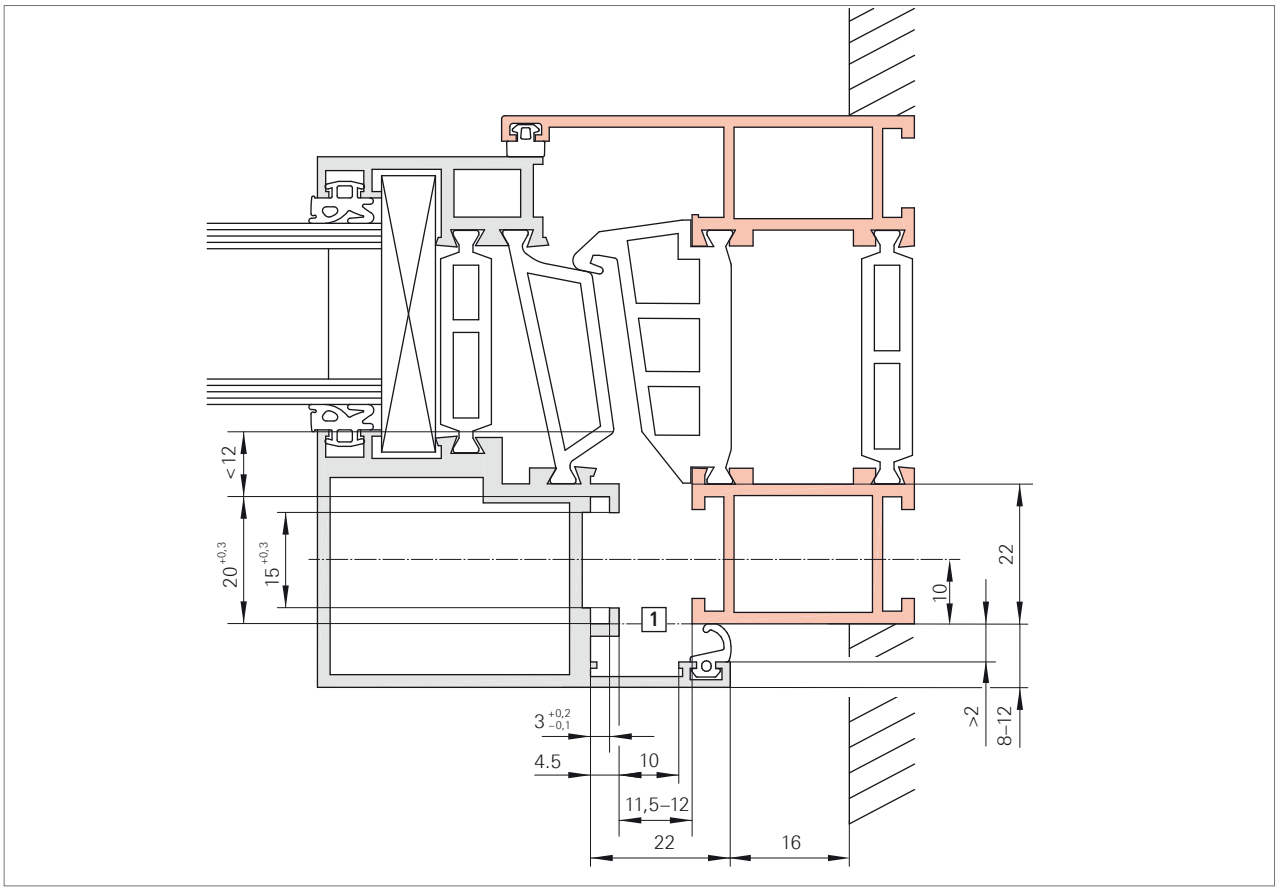
Sash profile	
[1]	Central gasket stop strut
[2]	Thermal separation
[3]	Spacer blocking
[4]	Outer shell (sash)
[5]	External glazing gasket
[6]	Glazing (laminated glass)
[7]	Sash profile – depth
[8]	Internal glazing gasket
[9]	Glazing bead
[10]	Sash glazing bead groove
[11]	Extended connecting rod groove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

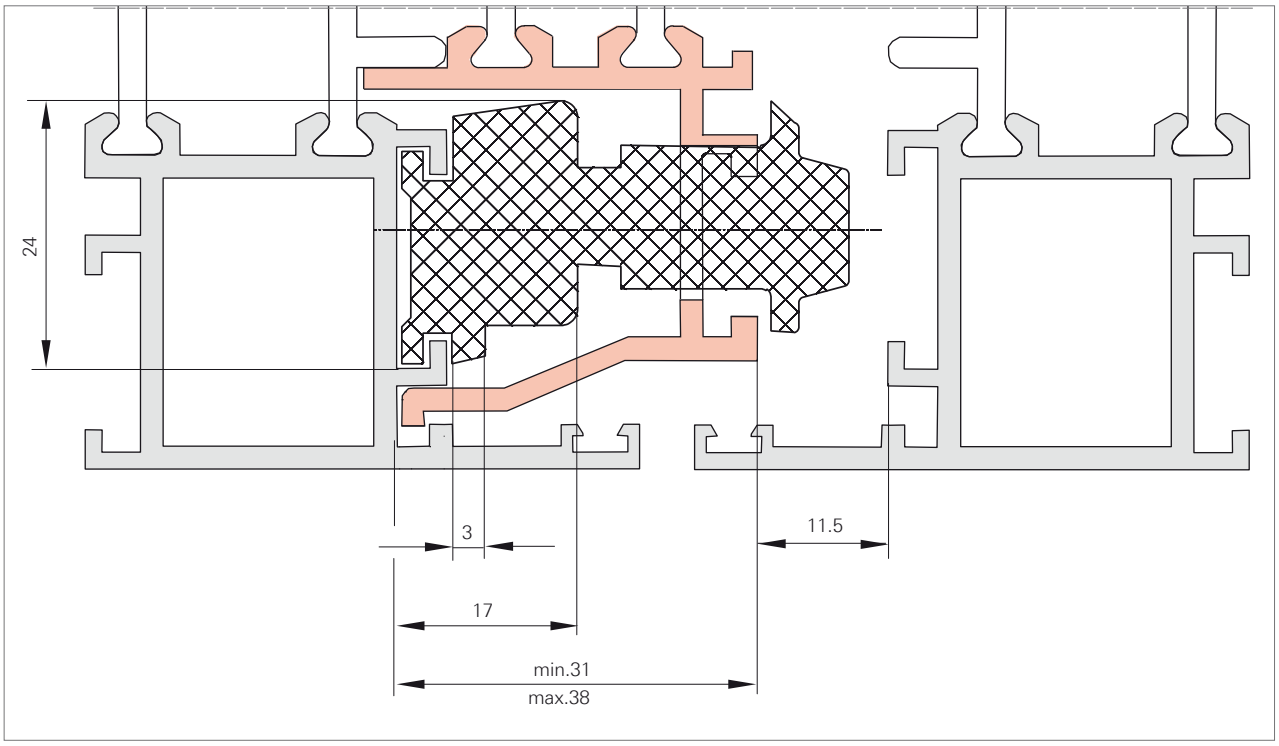




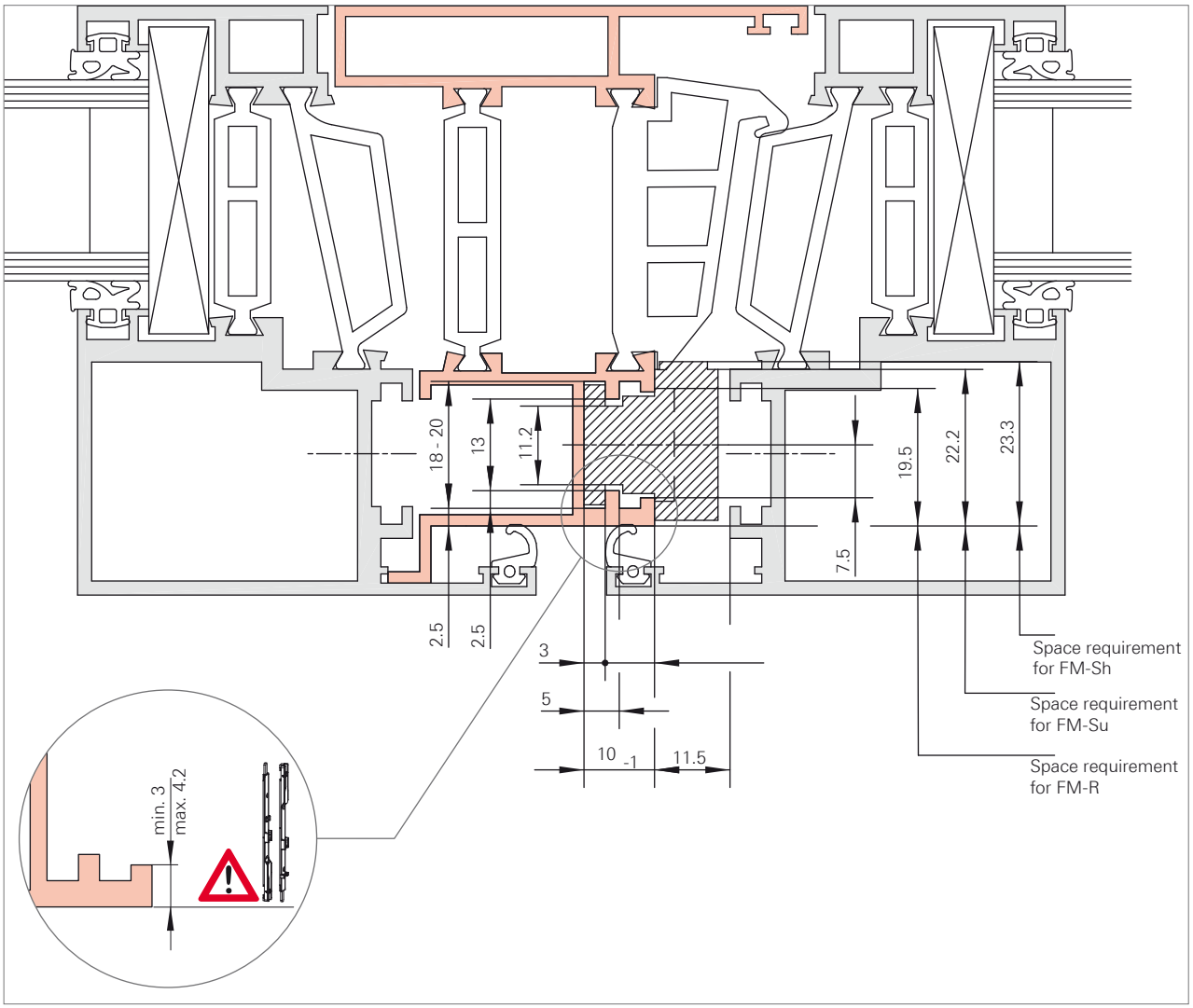
Note!

- 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.

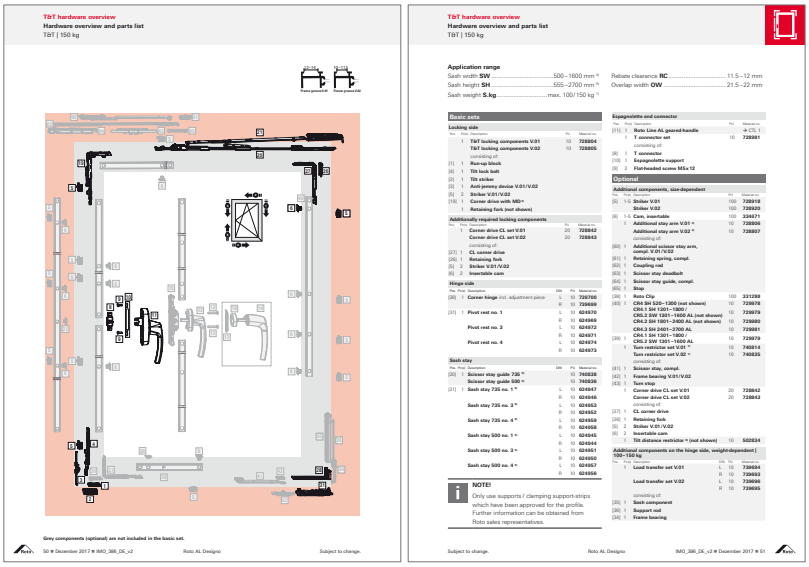
The parts list contains all profile-related variants of the AL hardware system. Please request technical details, special groove variants and rebate clearance variants separately.

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.



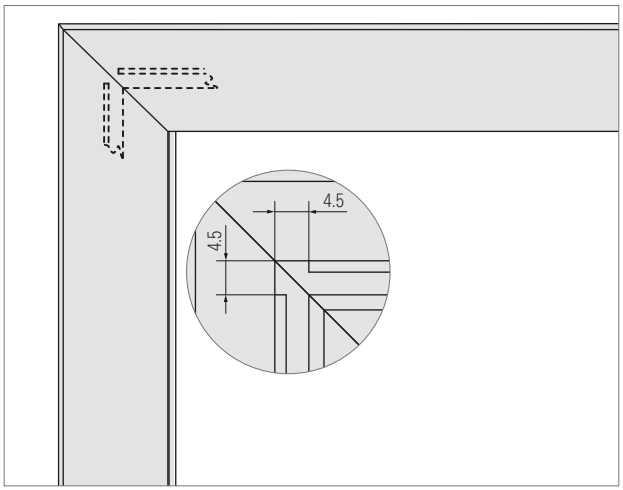
Determine the required quantity of essential hardware components with Roto Con Orders.

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

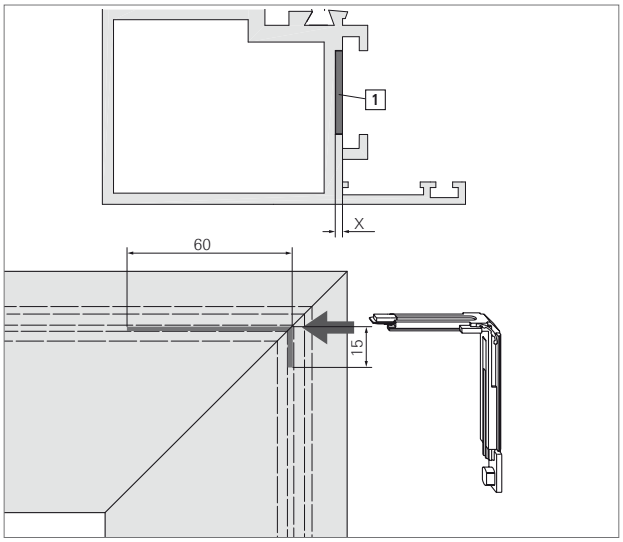


Opening the sash corners

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

NOTE!

Ensure that the edges are burr-free.

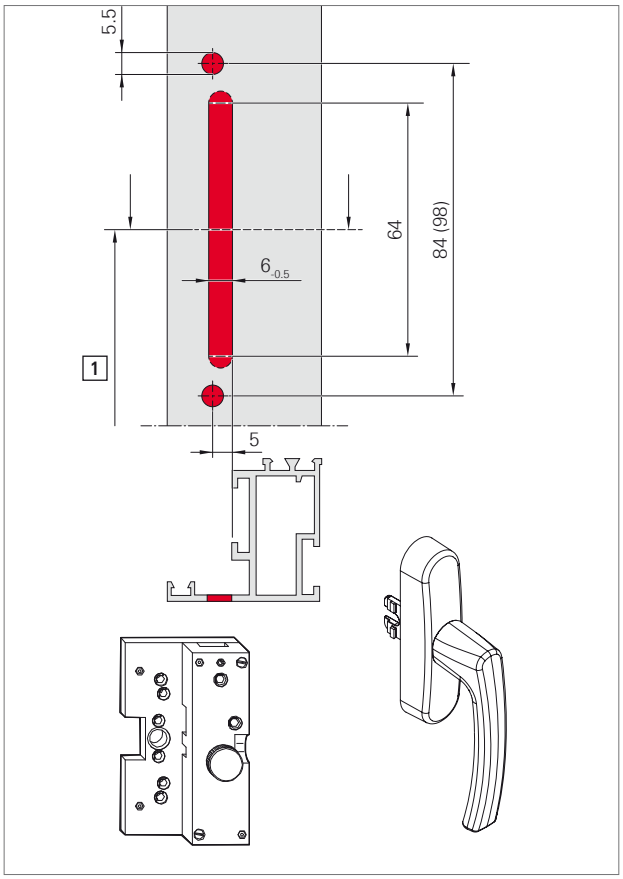


Placing supports under the CL corner drive – ECC-groove

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

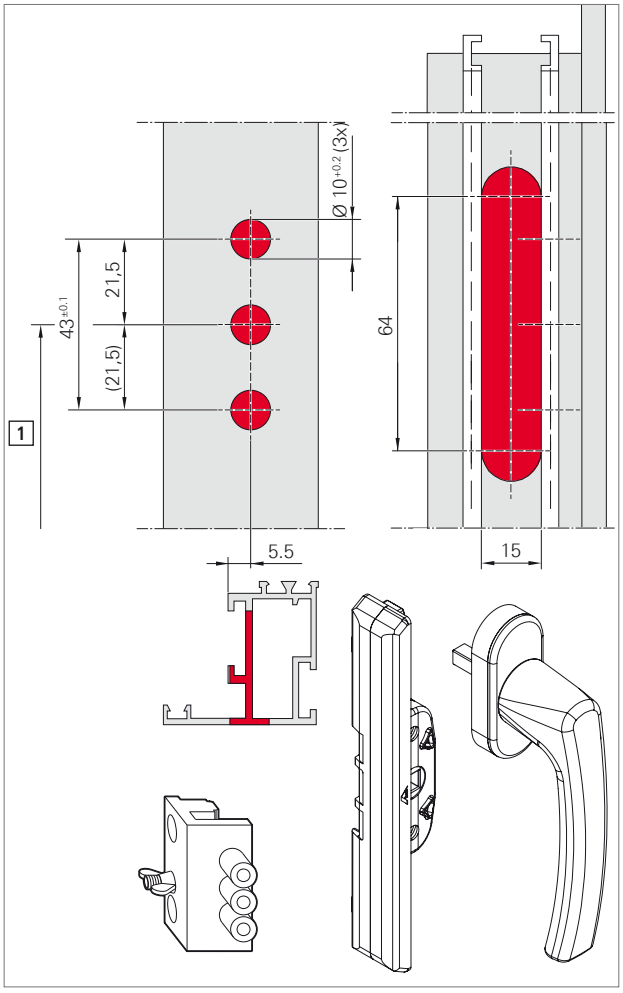
[1] = bracket



Geared-handle drilling and routing dimensions

Jig for geared-handle **212544**

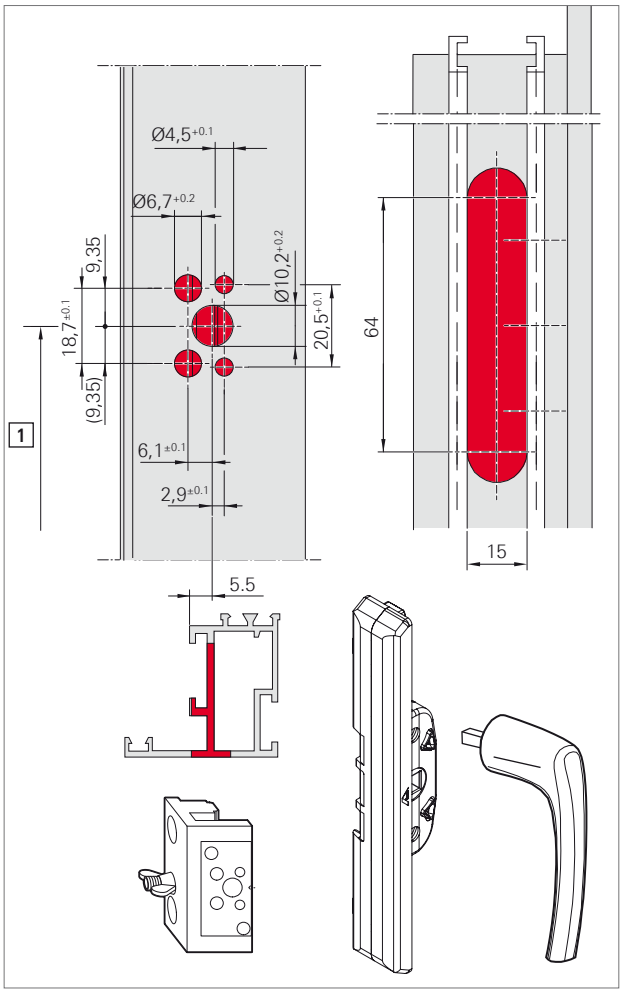
1. Determine the handle height [1] and place the drilling jig on the overlap.
2. Drill the hole:
   2 x Ø 5.5 mm
   2 x Ø $6.0_{-0.5}$ mm
3. Route the slot:
   1 x $6.0_{-0.5}$ mm



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 x Ø $10.0^{+0.2}$ mm
   2 x Ø 15.0 mm
3. Route the slot:
   1 x 15.0 mm



Drilling and routing dimensions for the handle without escutcheon

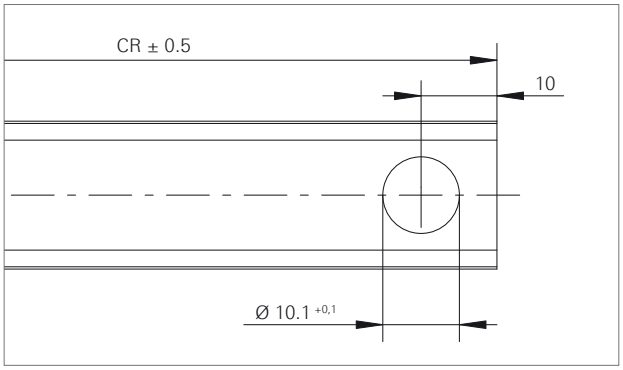
Flush-encased gearbox jig **365361**

1. Determine the handle height [1] and place the drilling jig on the connecting rod groove.
2. Drill holes:
   1 x Ø 10.2$^{+0.2}$ mm
   2 x Ø 4.5$^{+0.1}$ mm
   2 x Ø 6.7$^{+0.2}$ mm
   2 x Ø 15.0 mm
3. Route the slot:
   1 x 15.0 mm

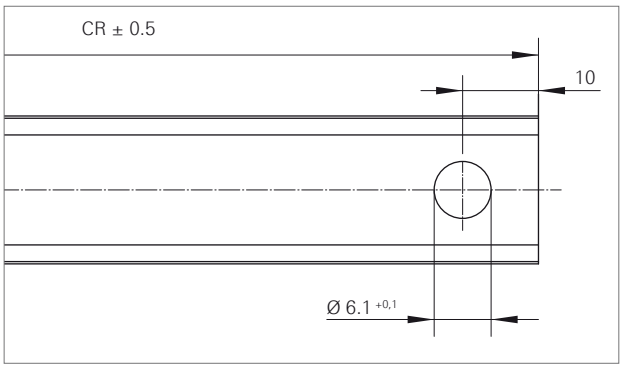
Dimension CR = All connecting rod dimensions ± 0.5 mm.

Note!

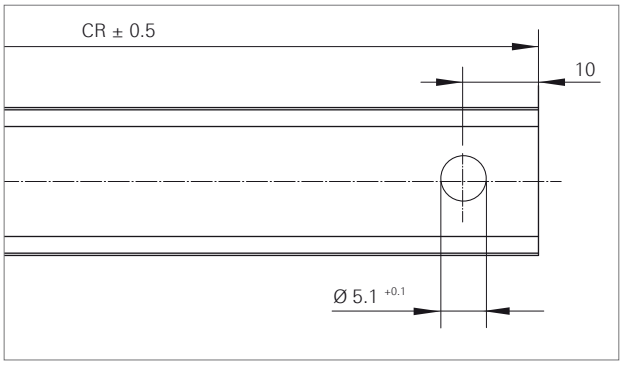
All connecting rod dimensions are based on an overlap width of 22 mm. If the overlap width differs from this, the connecting rod dimensions must be adapted accordingly.



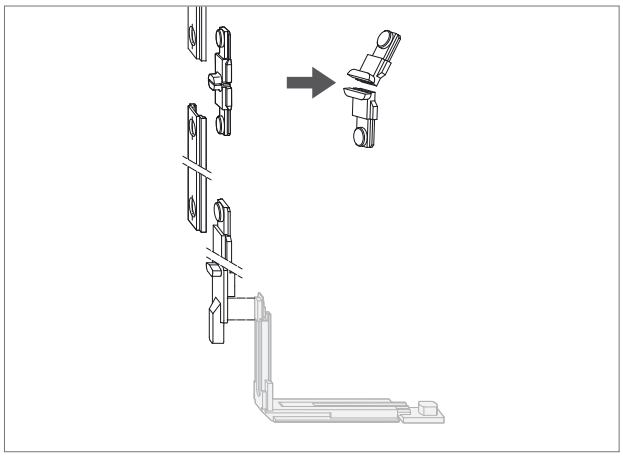
General dimensioning of all coupling points except for the faceplate (on connecting rods), unless otherwise specified.



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

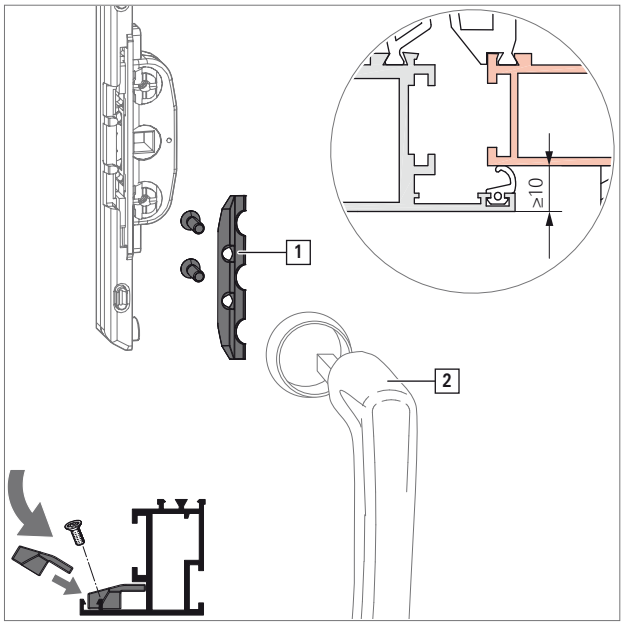


Dimensioning of the FM-SuN espagnolette coupling points (on connecting rods), unless otherwise specified.



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.



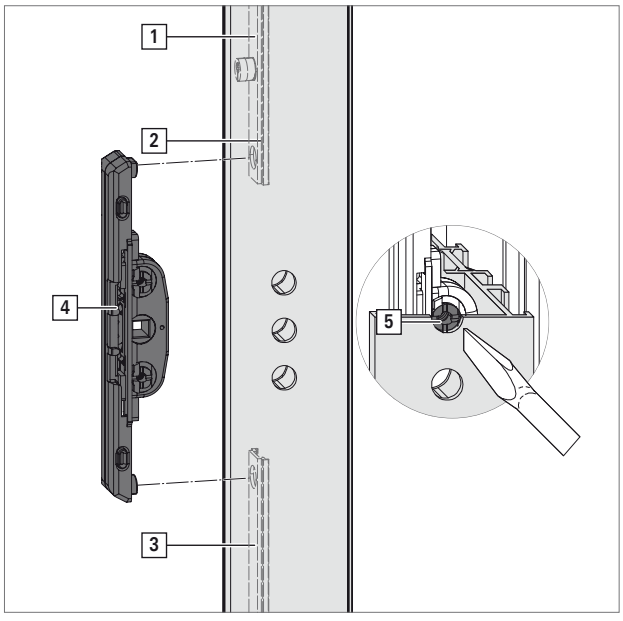
Installing the mounting plate

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

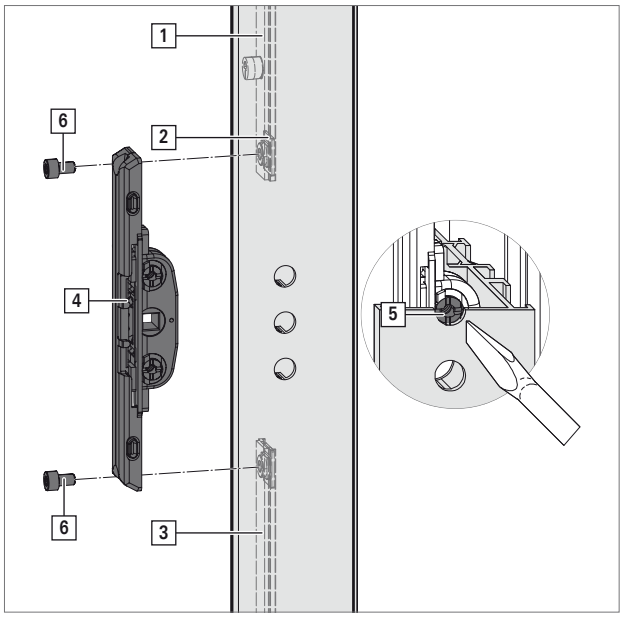


Installing the flush-encased gearbox

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.

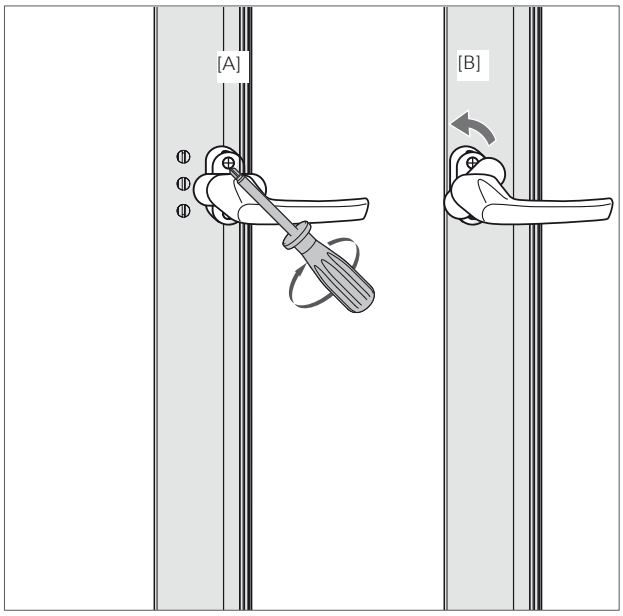
NOTE!

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

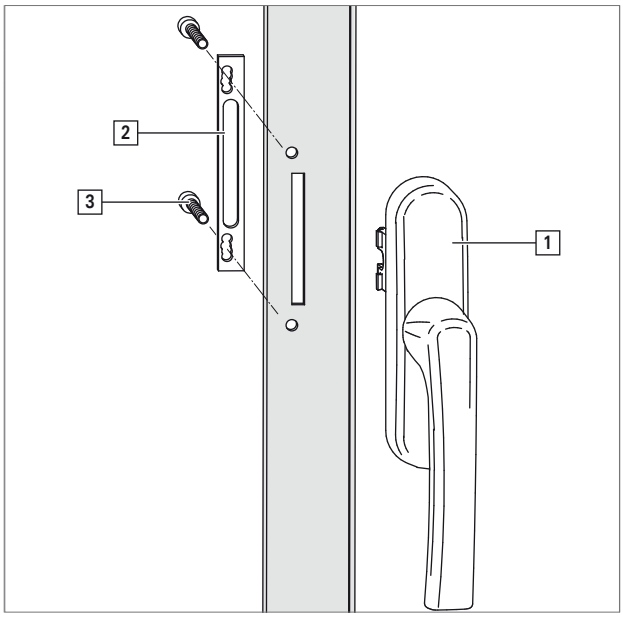


Installing the Roto Line handle

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

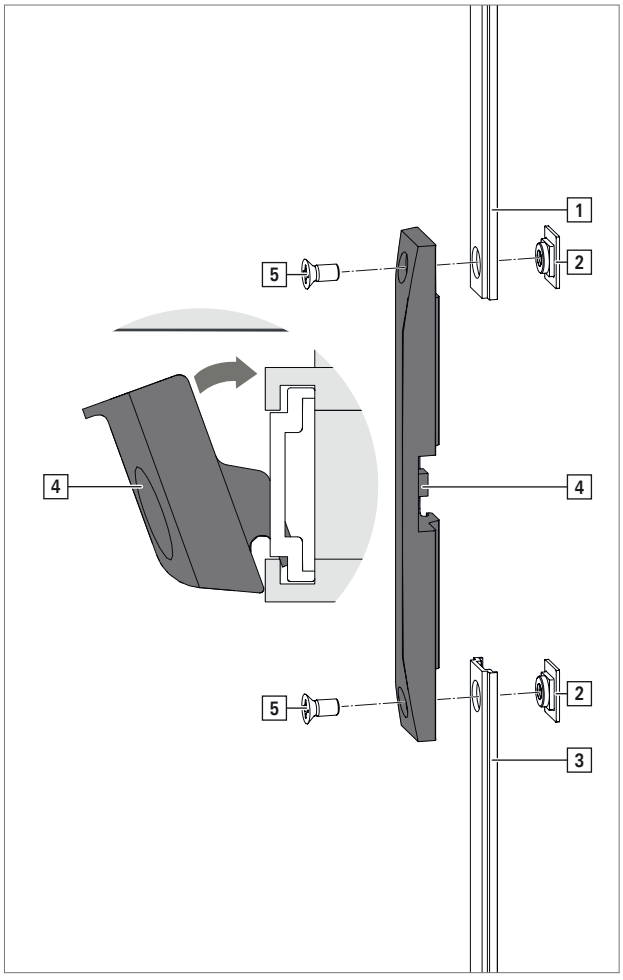
4. Turn the escutcheon cover back 90° [B].



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.

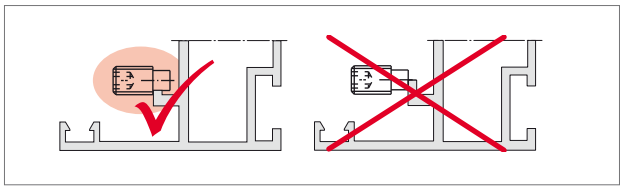
2. Insert connecting rod CR2 [1] and the SEC connector [2] into the connecting rod groove from above on the locking side.
3. Insert connecting rod CR1 [3] and the SEC connector into the connecting rod groove from below on the locking side.
4. Swing the SEC espagnolette protection [4] into the connecting 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

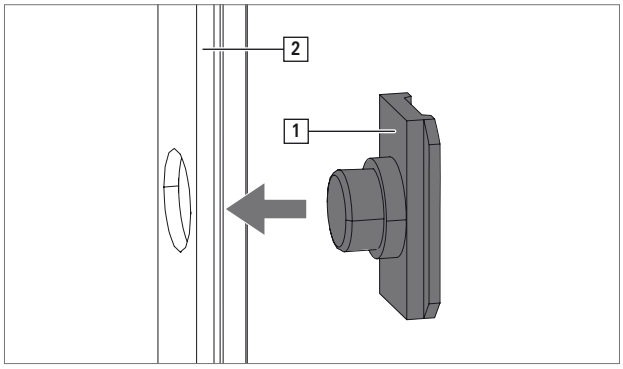
NOTE!

Dismantling is performed in reverse order.



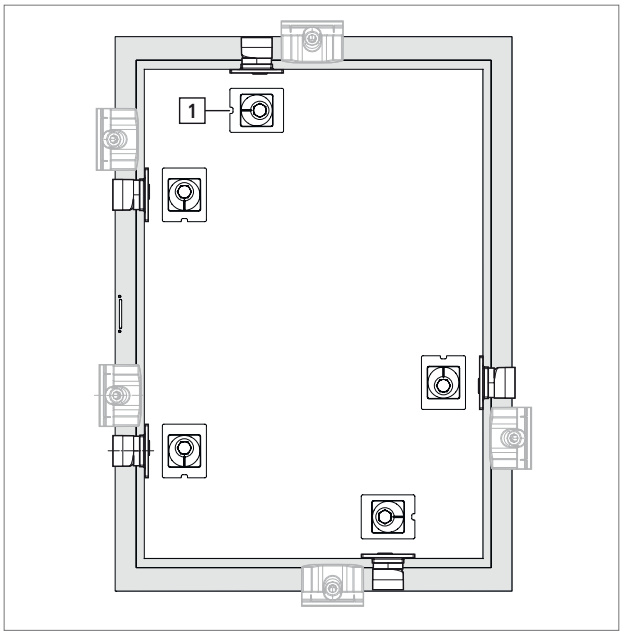
Tightening the piercing screws

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].

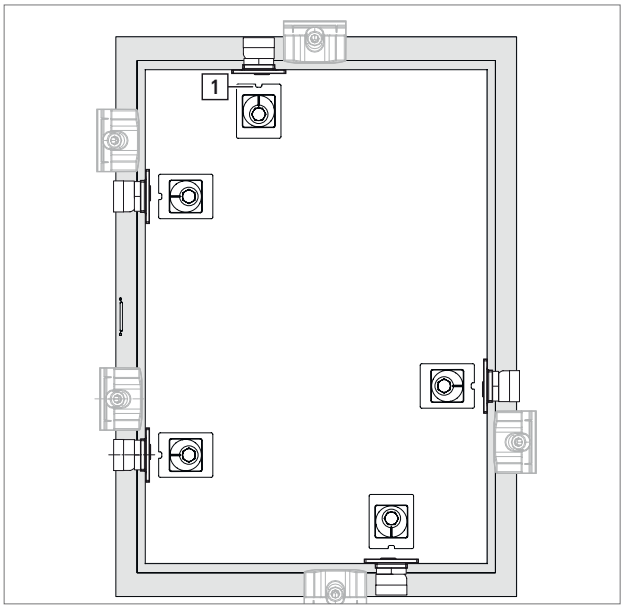


Installing the insertable cam

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.

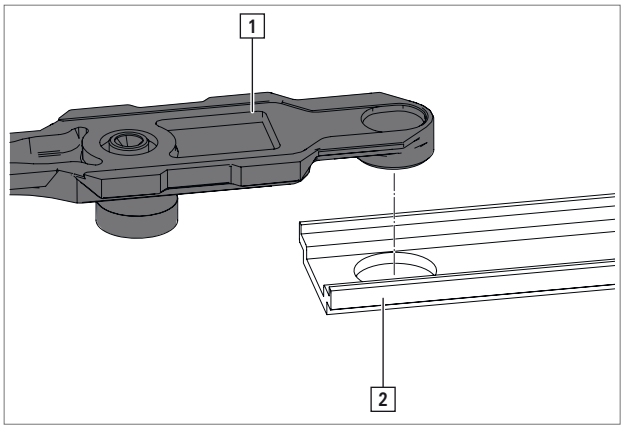


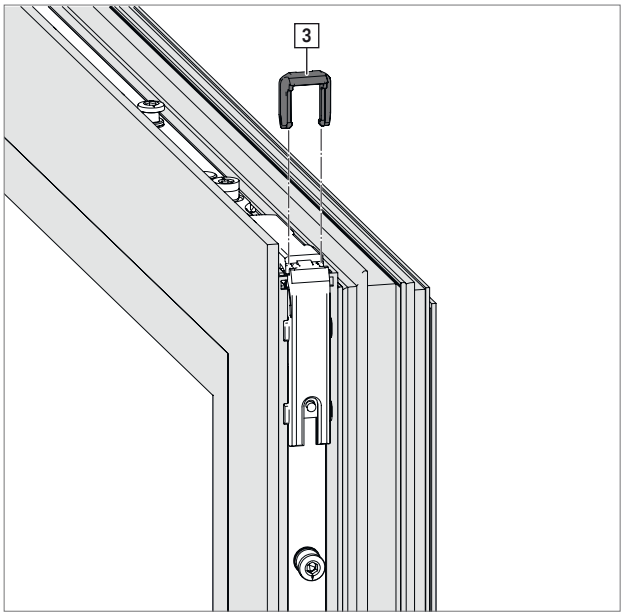
Installing the insertable cam – ECC-groove

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.

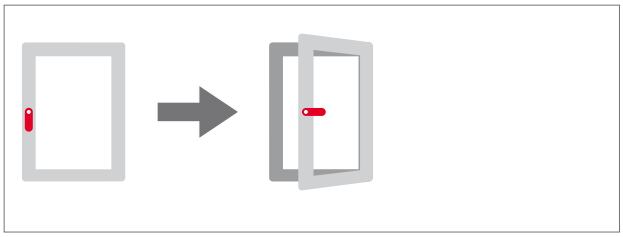




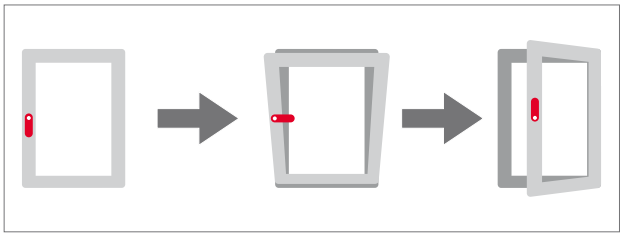
Installing the corner drive

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)

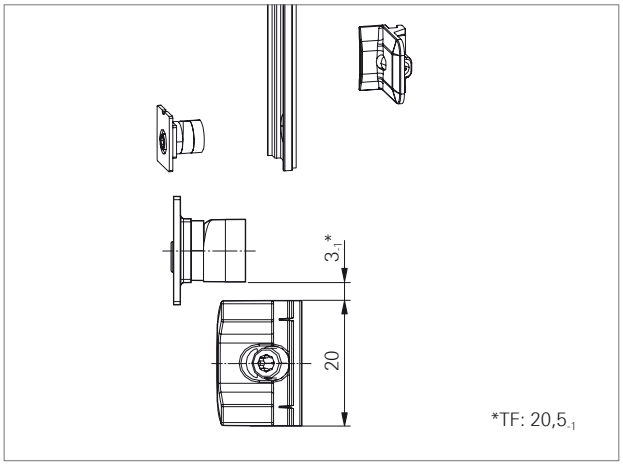


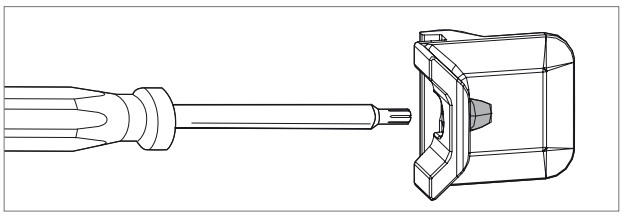
Exception: TF: 20.5_{-1} mm (after operating sequence: closed position then tilted, open position then turned, open position)

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

Note!

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

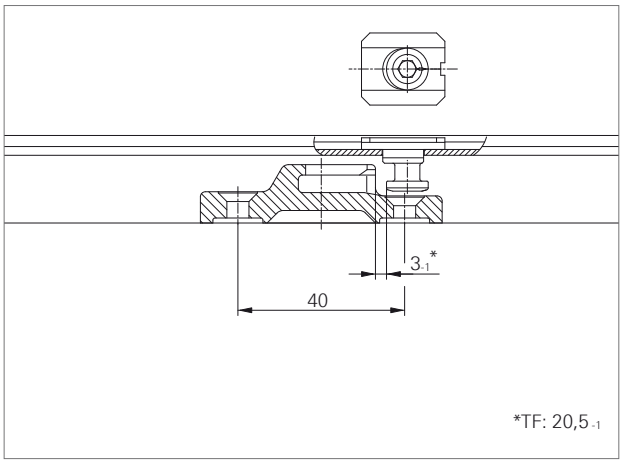




Screw down the striker using the threaded pin and check that it is securely fitted.

Tool: T 10 hex key

Torque: 2 – 2.5 Nm

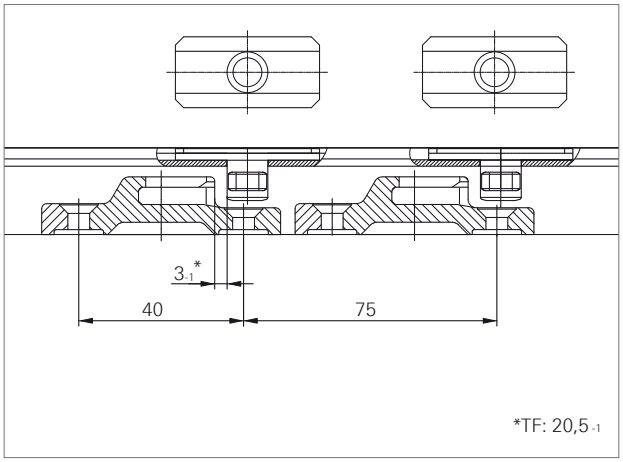


Installing security strikers RC2

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.

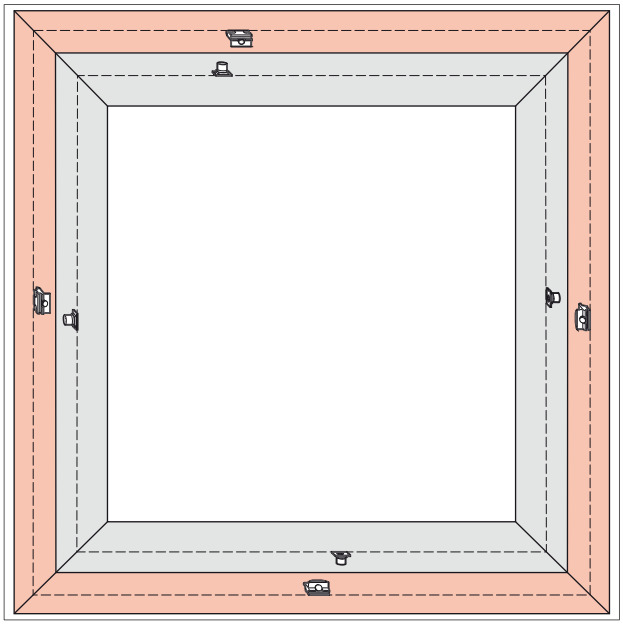


Installing security strikers RC3

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.

T&T hardware overview

T&T installation

T&T installation drawings

T&T adjustment

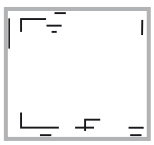
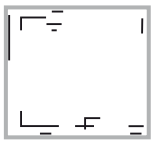
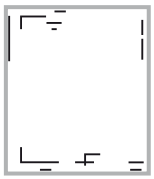
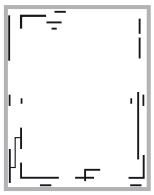
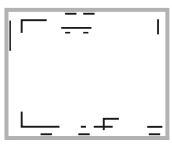
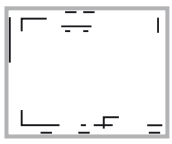
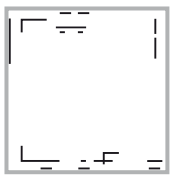
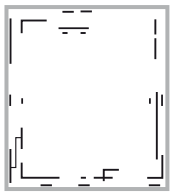
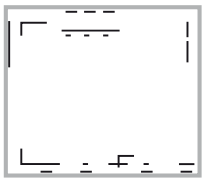
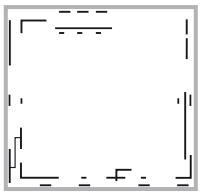
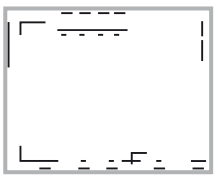
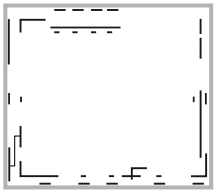
Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

SW / SH	390 – 500*	501 – 735*	736 – 1300*	1301 – 1600*
555 – 1300	Pc(s) Description — Material no. 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 — Material no. 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 — Material no. 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 SW > 1200 — 740814 Turn restrictor set V.02 SW > 1200 — 740835	Pc(s) Description — Material no. 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 SW > 1200 — 740814 Turn restrictor set V.02 SW > 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
1301 – 1800		Pc(s) Description — Material no. 1 Cam, insertable — 334671 1 Striker V.01 — 728918 Striker V.02 — 728920		
1801 – 2400		Pc(s) Description — Material no. 2 Cam, insertable — 334671 2 Striker V.01 — 728918 Striker V.02 — 728920		
2401 – 2700		Pc(s) Description — Material no. 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.

Set combinations

Up to 100 kg

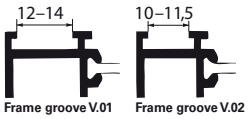
SW / SH	390–500	501–735	736–1300*	1301–1600*
555–1300				
1301–1800				
1801–2400				
2401–2700				

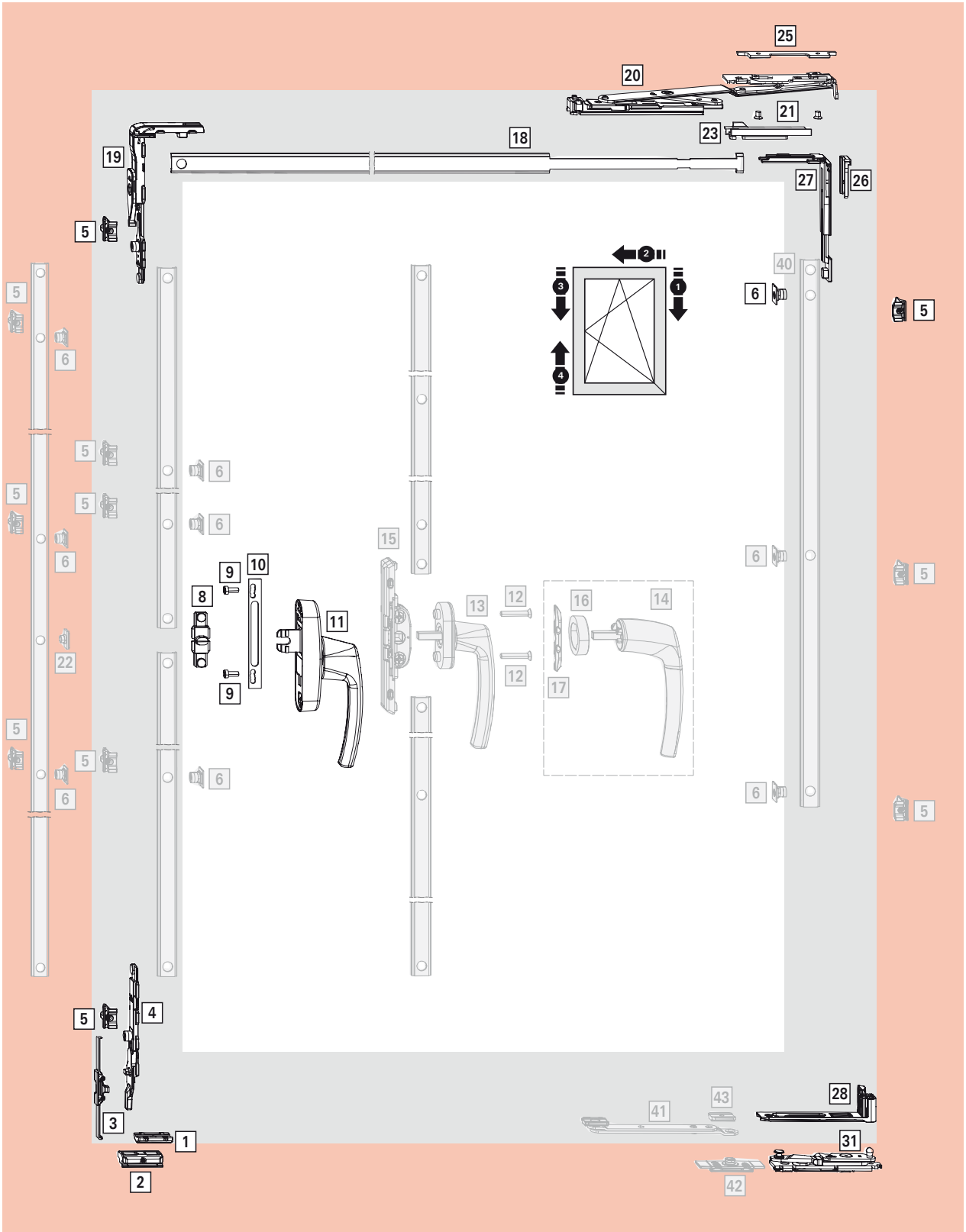
Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

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

Hardware overview and parts list

T&T | 80 kg





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**			

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	**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 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** [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.

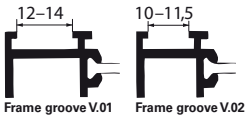
2) Installation of the mishandling device is prescribed in accordance with DIN 18360 (German construction contract procedures (VOB)). When using the centre lock on the hinge side and the additional stay arm, the mishandling device is mandatory for technical reasons.

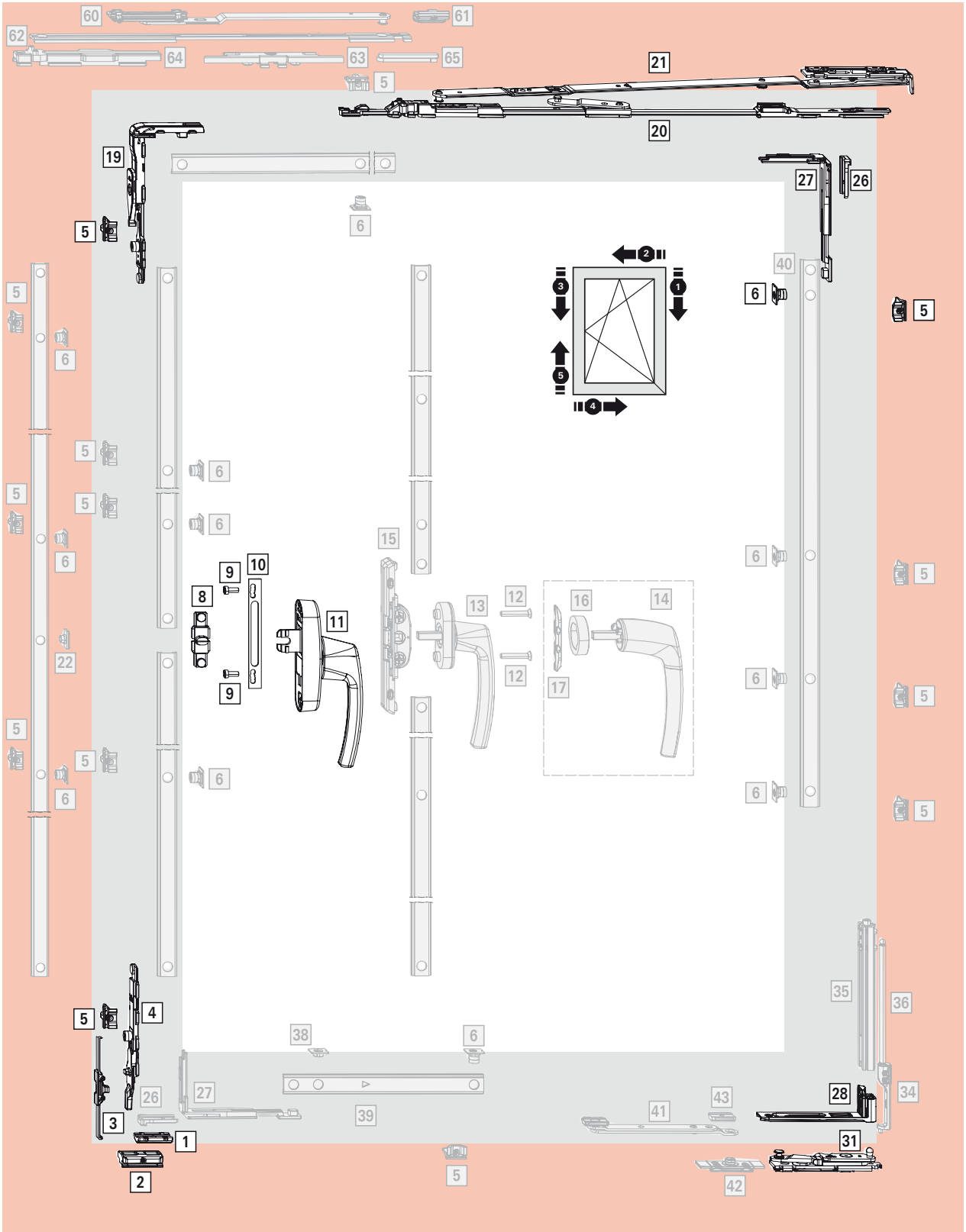
3) For the flush-encased gearbox with blocking device, see page 237.

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

Hardware overview and parts list

T&T | 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

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 / CR5.2 SW 1301 – 1600 AL**	10	**729979**
	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 M5x12**	100	**728925**
[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
[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.

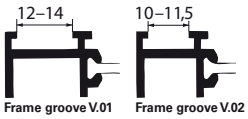
8) For the flush-encased gearbox with blocking device, see page 237.

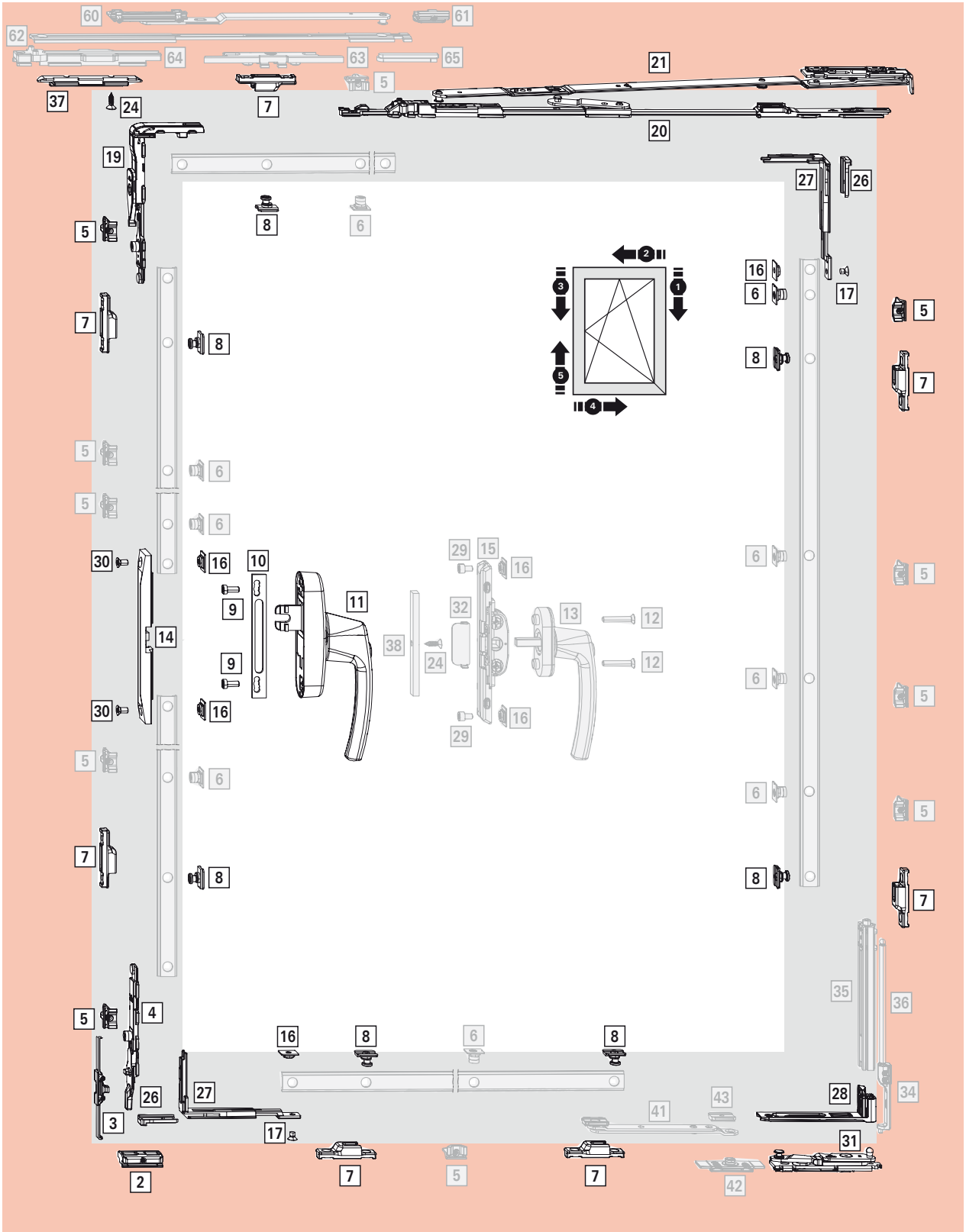
9) Tilt distance restrictor can be used from SH < 800 mm.

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

Hardware overview and parts list

T&T 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

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 ST4.8x16**		
[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.

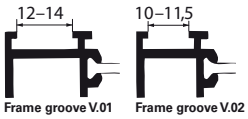
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

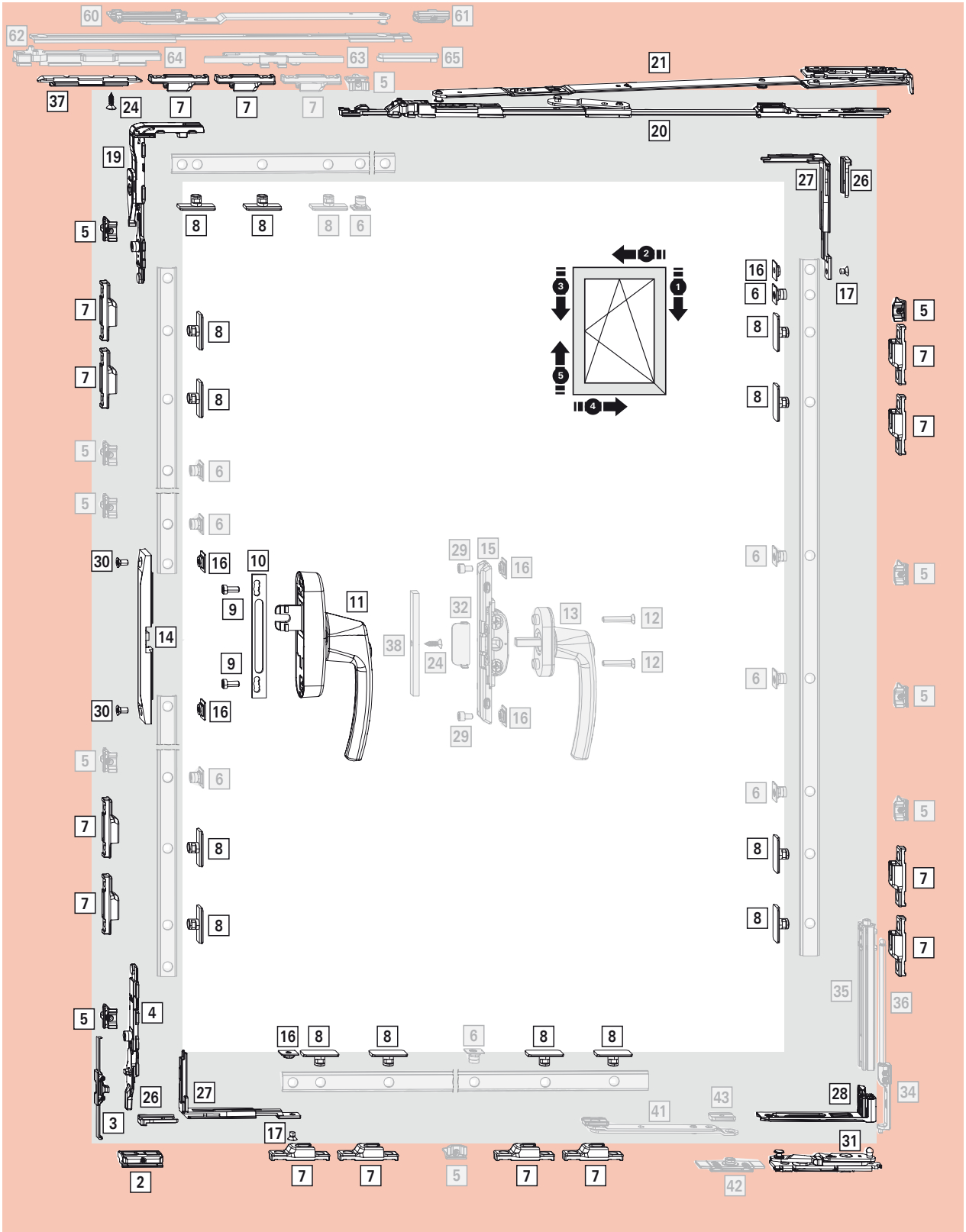
8) For the SEC flush-encased gearbox with blocking device, see page 237.

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

Hardware overview and parts list

T&T 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 [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 ST4.8x16**		
[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.

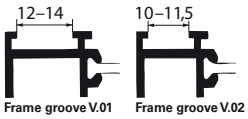
6) Sash stay 735 can be used from SW ≥ 875 mm.

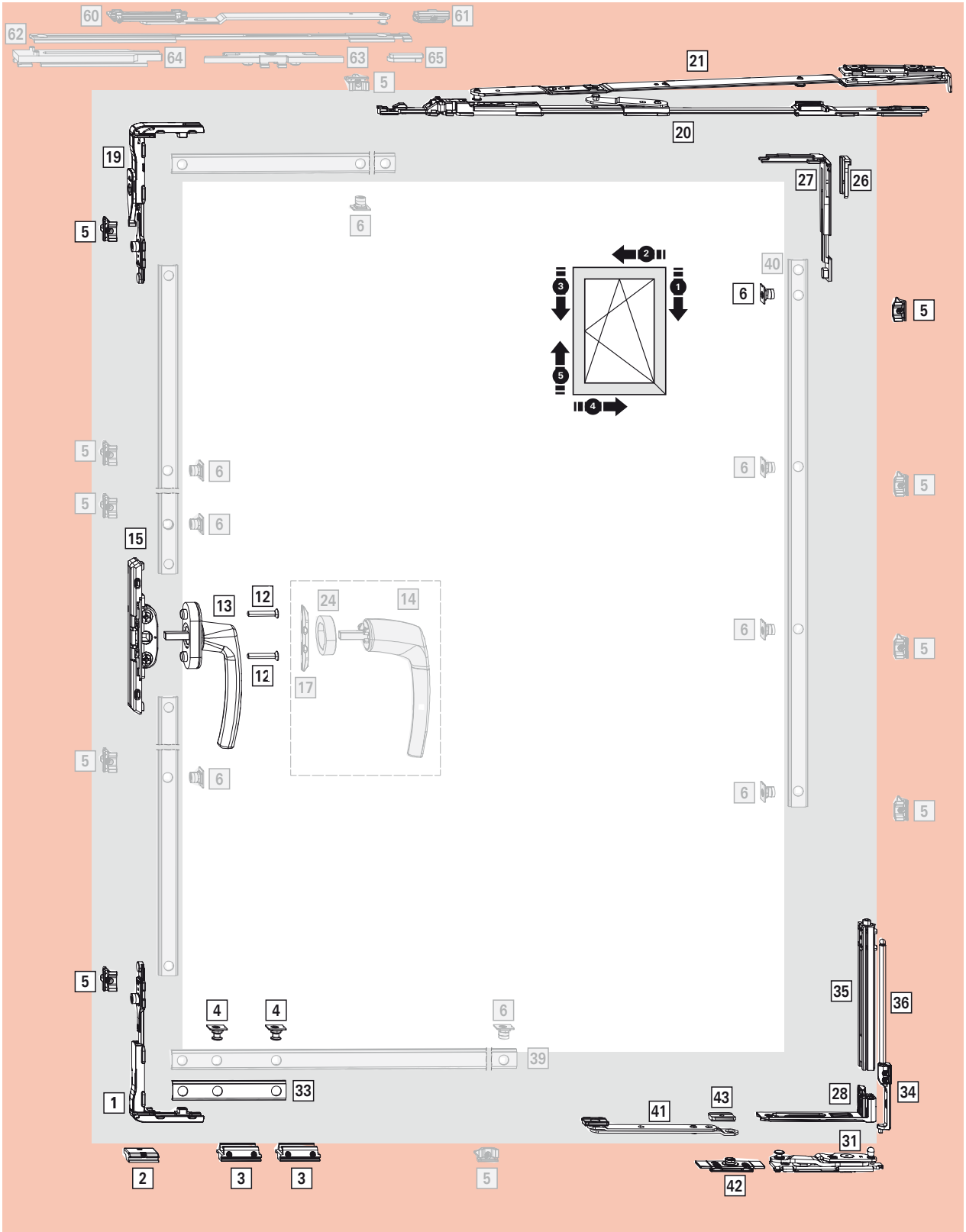
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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

Hardware overview and parts list

T&T | 180 kg





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

Application range

Sash width **SW** ..... 735 – 1600 mm [3)]
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**		
[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.

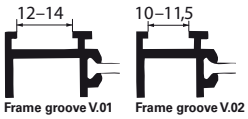
3) An additional stay arm is mandatory from SW > 1300 mm.

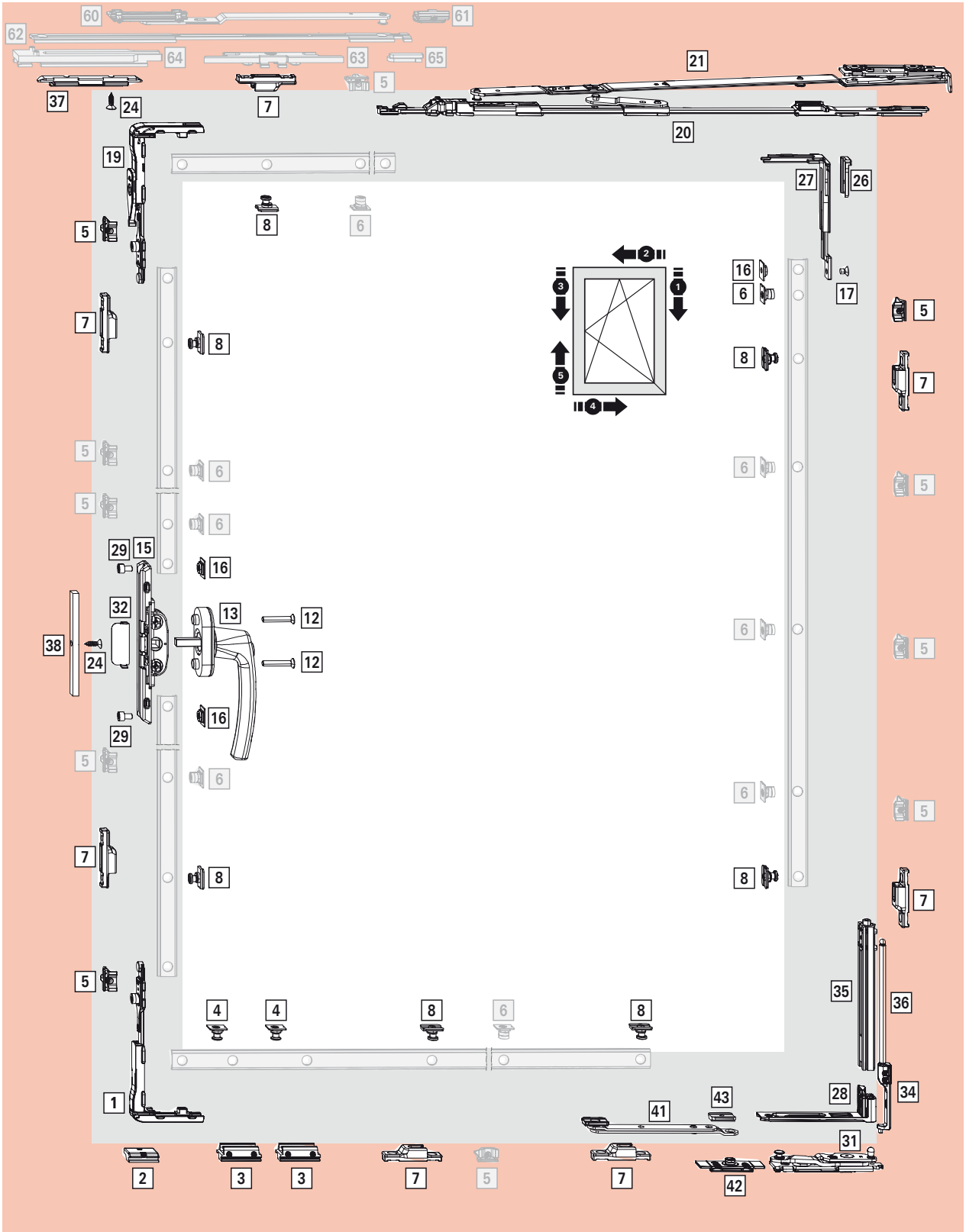
4) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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

Hardware overview and parts list

T&T RC2 | 180 kg





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.

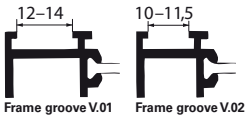
2) An additional stay arm is mandatory from SW > 1300 mm.

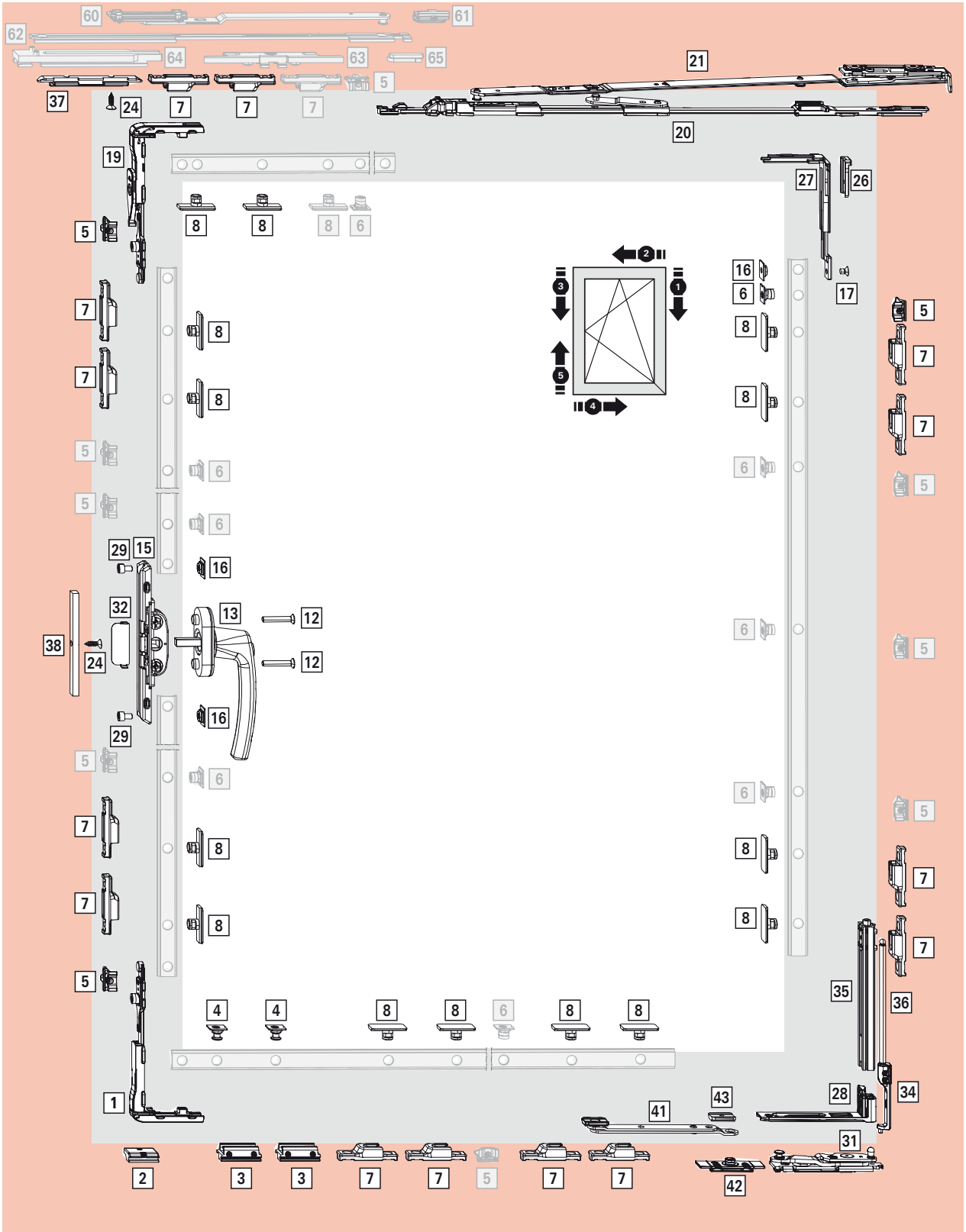
3) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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

Hardware overview and parts list

T&T RC3 | 180 kg





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.

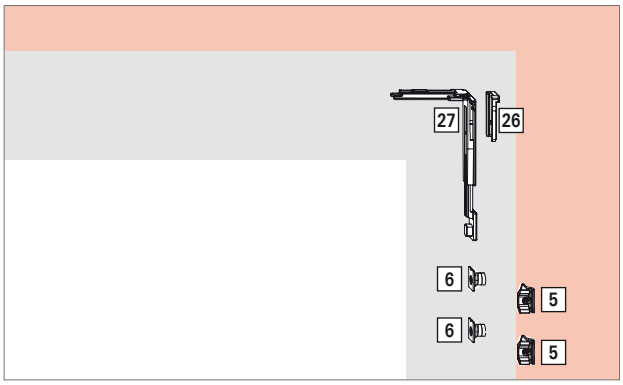
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

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.

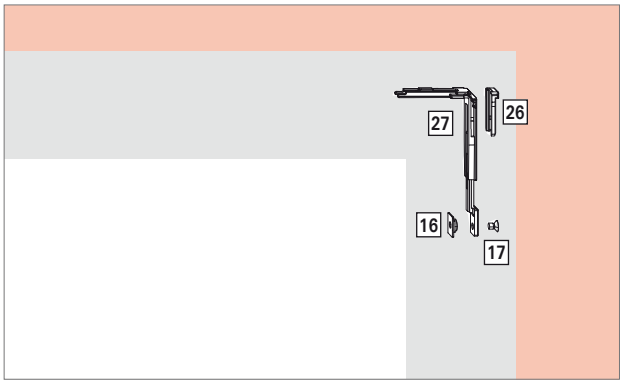
3) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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**

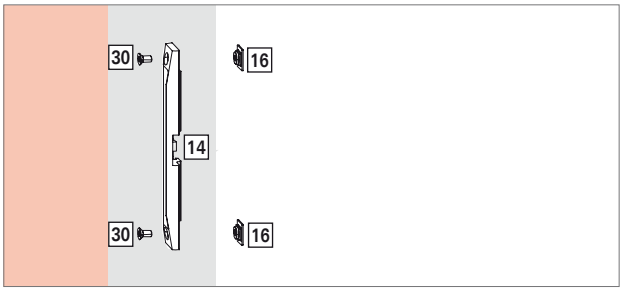


SEC corner drive CL set

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

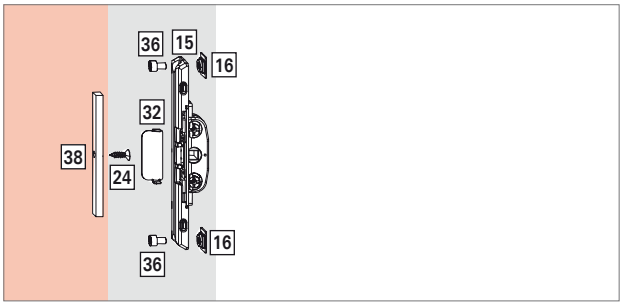
SEC rebate-clearance reduction set

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**



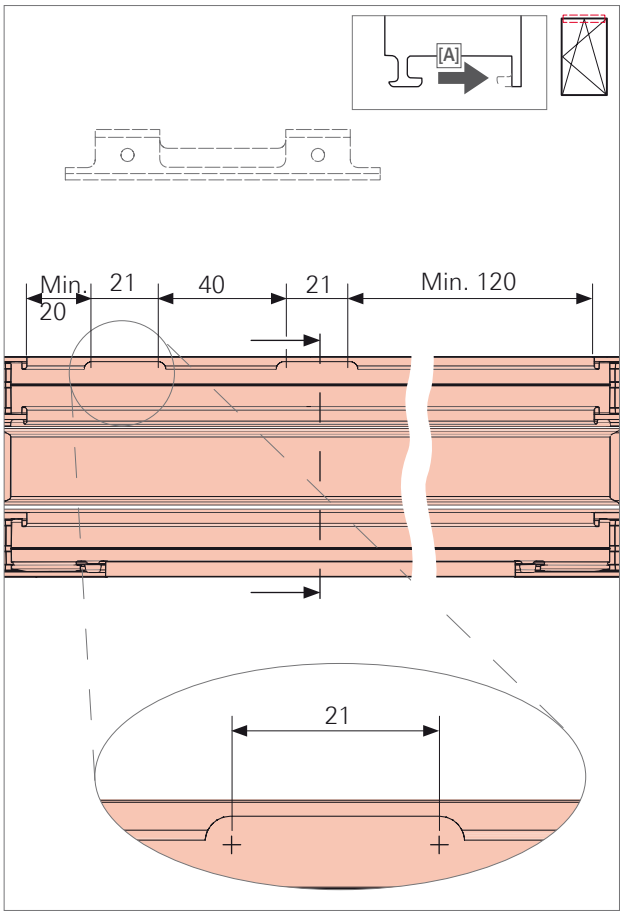
SEC espagnolette protection set

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

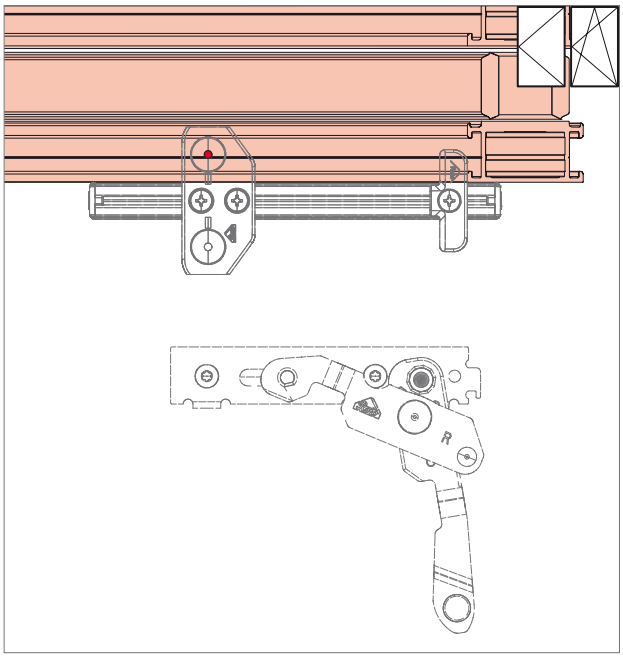
Pos.	Pc(s)	Description	PU	Material no.
[15]	1	**SEC flush-encased gearbox without MD**	10	**457210**
[16]	2	**SEC connector**	100	**447113**
[24]	1	**Countersunk tapping screw ST4.8x16**	100	**728932**
[32]	1	**SEC anti-drilling protection**	10	**487406**
[36]	2	**Cylinder-head screw M5x8**	100	**728936**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

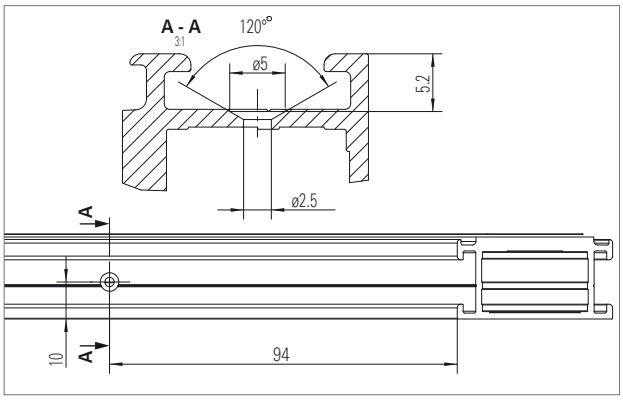


Sash stay 390

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 Ø 2.5 mm, at least 4 mm deep.

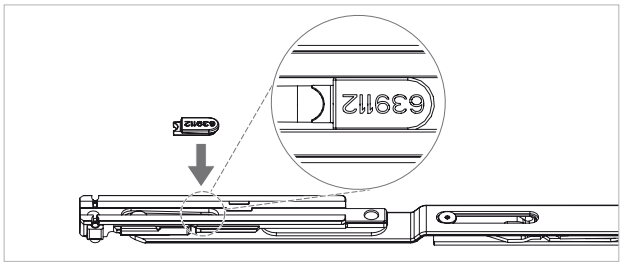
NOTE!

Drill holes if:

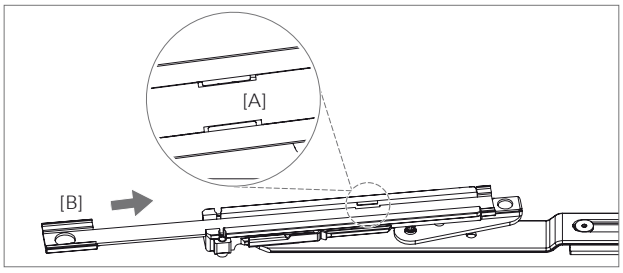
- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (> 2 mm)

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

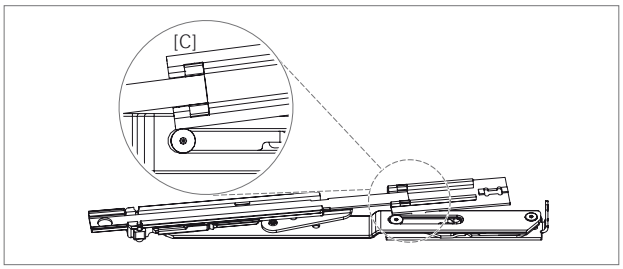
Preassembling sash stay 390 | SH < 800 mm



1. Use a tilt distance restrictor for elements with SH ≤ 800 mm.



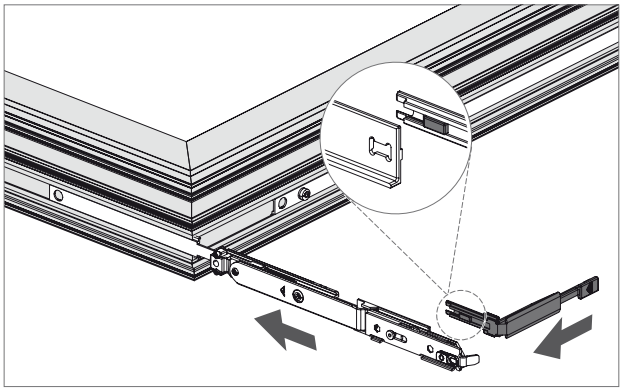
2. Crop and punch the coupling rod. Open the sash stay and insert the coupling rod at the height of the guide lugs [A].
Insert the coupling rod as far as it will go [B].



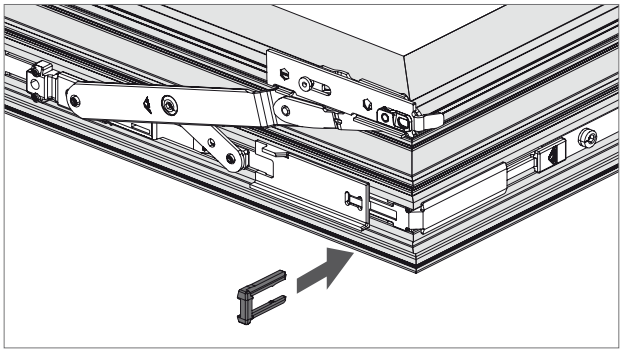
3. Insert the control component into the coupling rod as shown [C].

Installing sash stay 390

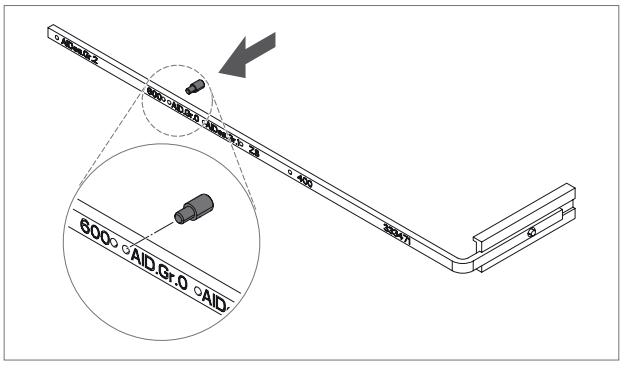
1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.



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.

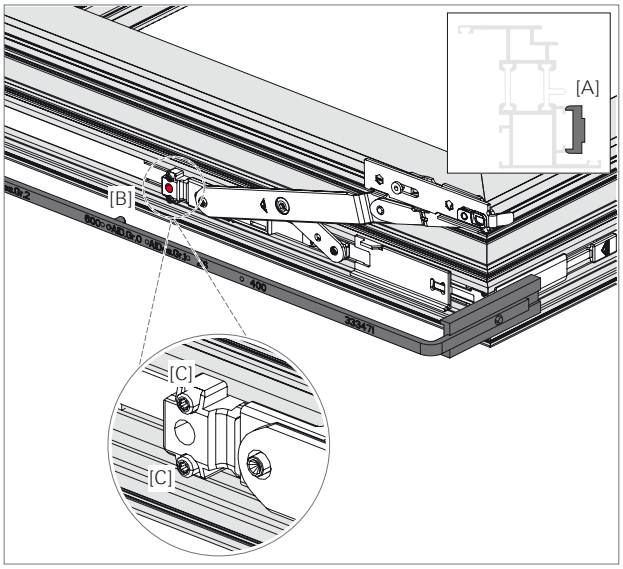


3. Slightly open the sash stay and secure the CL corner drive with the retaining fork.



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].

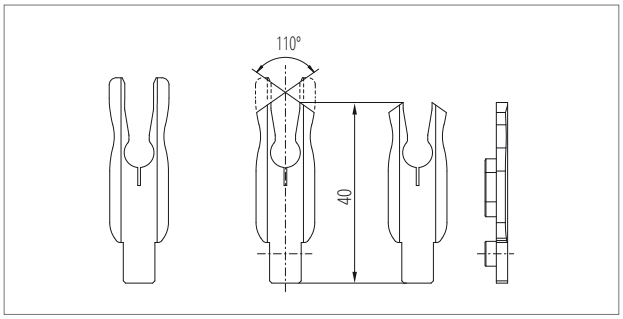
Tool: T 10 hex key

Torque: max. 2.5 Nm

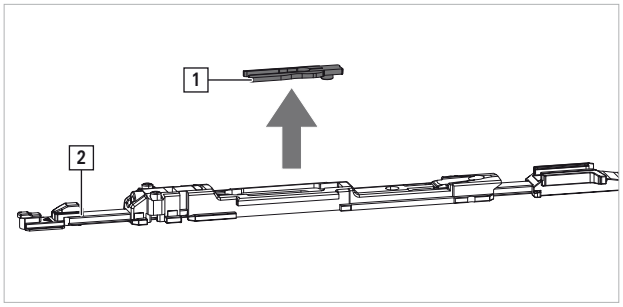
Preassembling scissor stay guide 500, 735 | SH < 800 mm

NOTE!

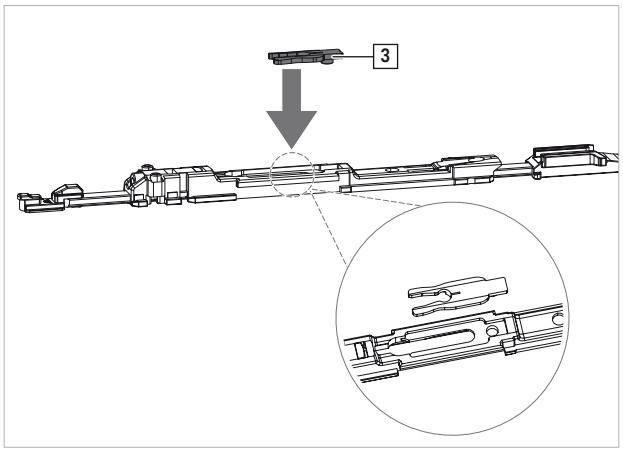
The installation of scissor stay guide 500 is shown here



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].



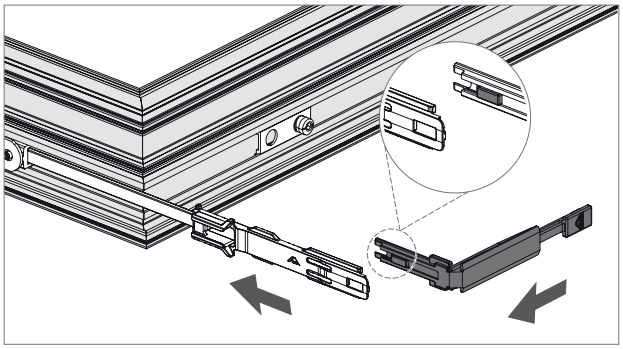
3. Insert the tilt distance restrictor [3].

NOTE!

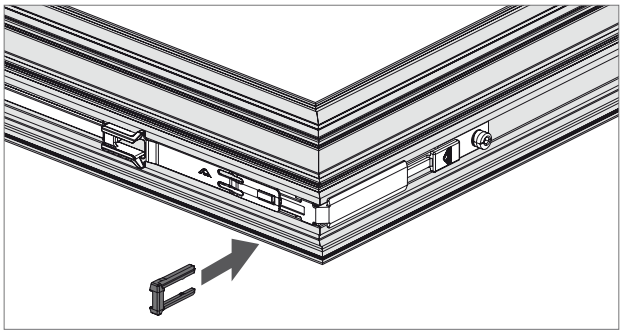
The installation of scissor stay guide 735 is shown here

Installing scissor stay guide 500, 735

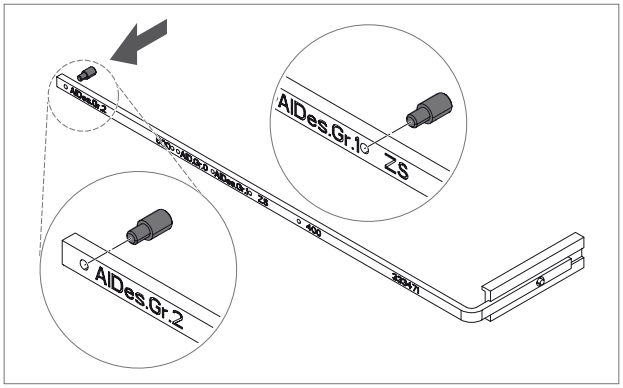
1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.



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.



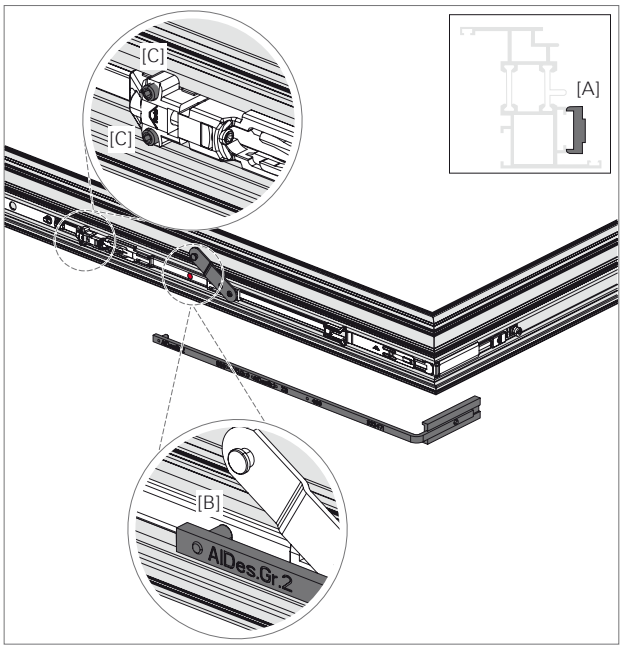
3. Secure the CL corner drive with the retaining fork.



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 = AlDes. size 1

   Scissor stay guide 735 = AlDes. size 2



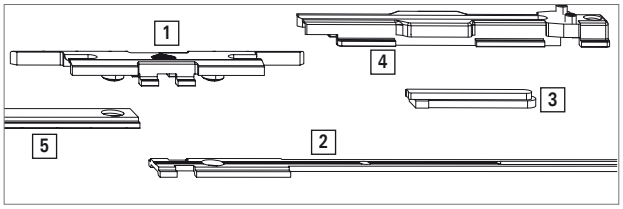
5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

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

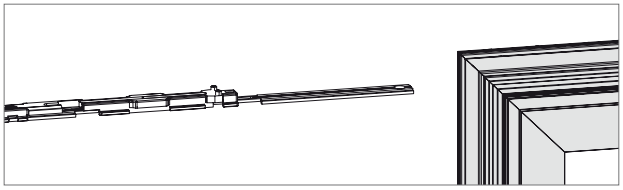
   Tool: T 10 hex key

   Torque: max. 2.5 Nm

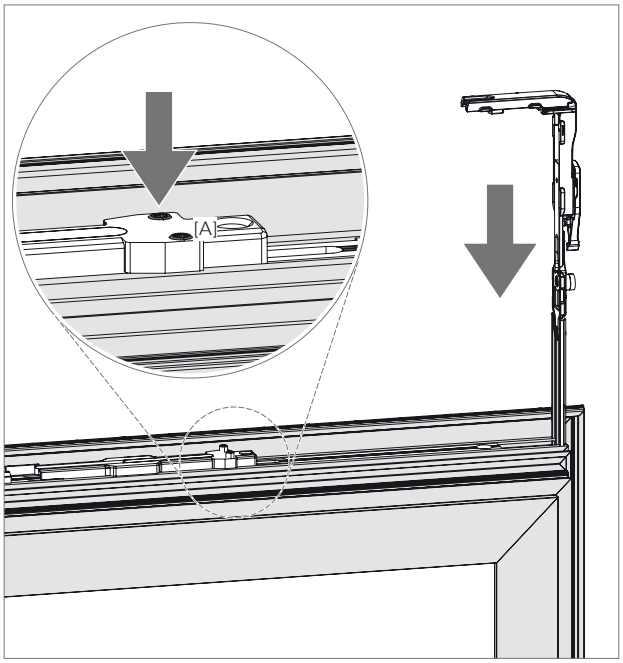
Installing the additional stay arm sash components | 150 kg



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.

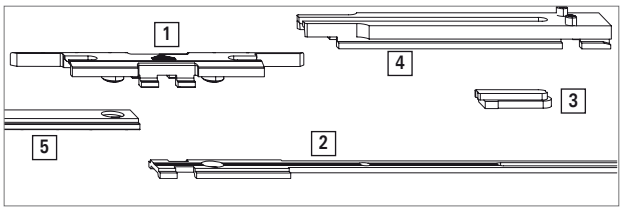


3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

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



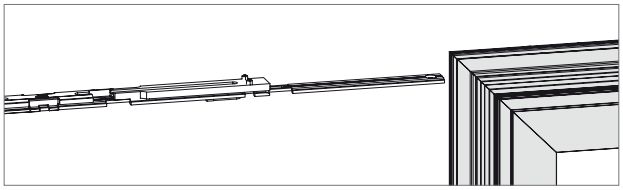
Installing the additional stay arm sash components | 180 kg

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

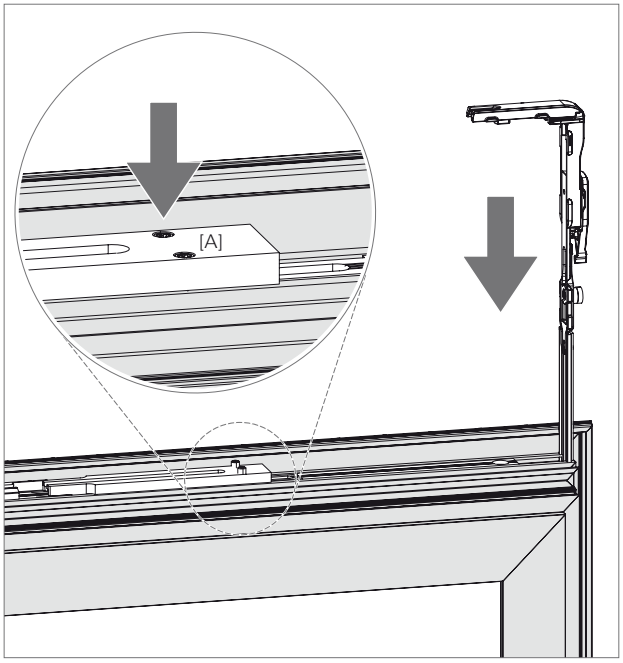
   Insert the stop [3] into the scissor stay guide [4] as shown.

   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.

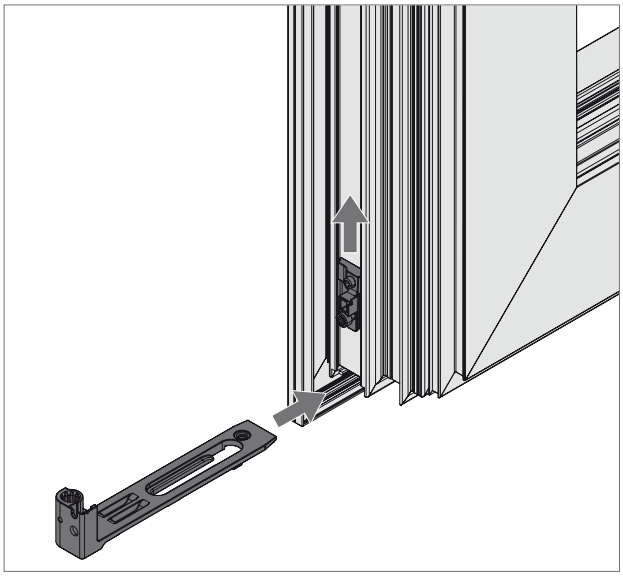


3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

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

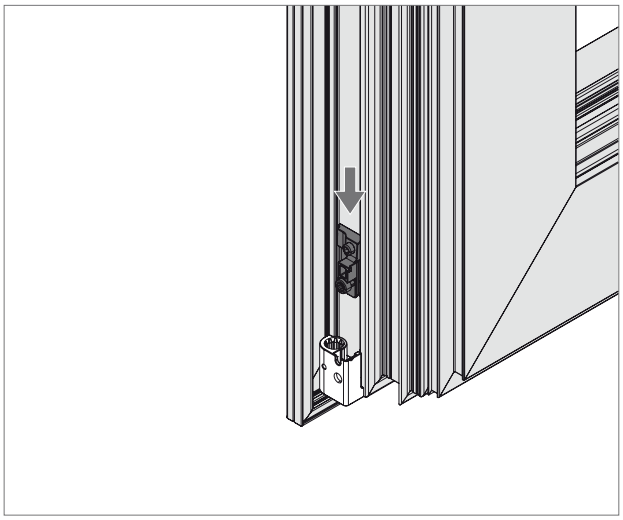


Installing the corner hinge

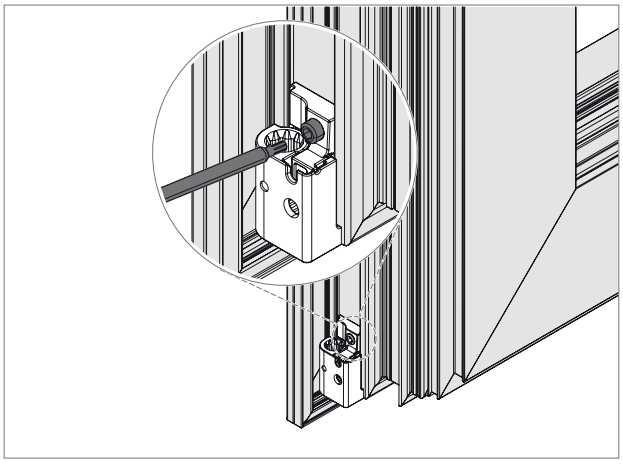
1. Insert the adjustment piece into the connecting rod groove.

NOTE!
The 180 kg adjustment piece does not feature lateral adjustment.

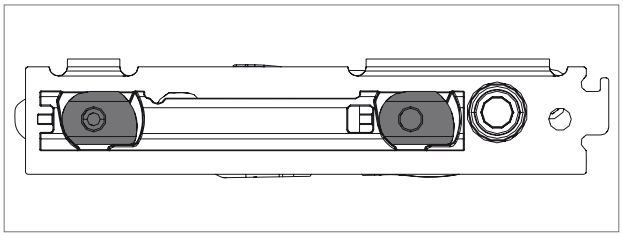
2. Insert the corner hinge into the connecting rod groove.



3. Push the adjustment piece into the corner hinge.



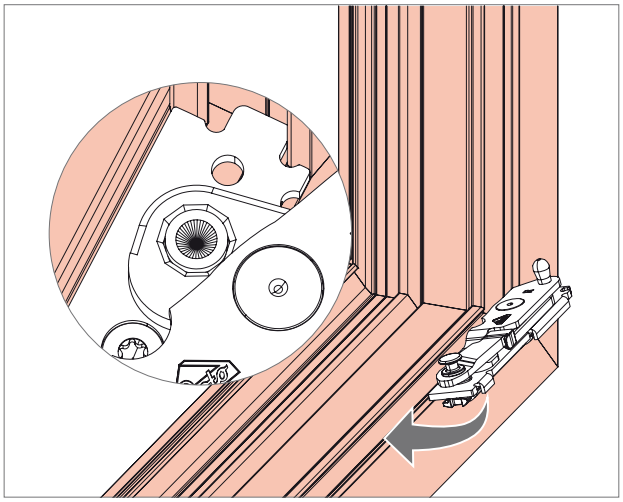
4. Screw in the threaded pin.
Tool: T 10 hex key
Torque: ≥ 2.5 Nm



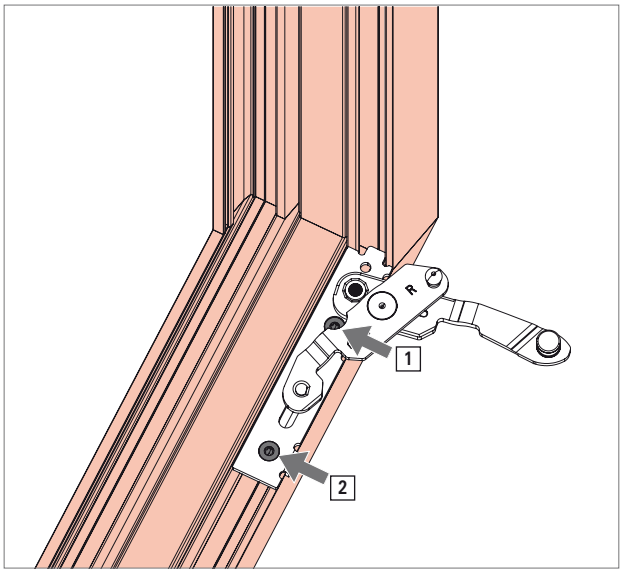
Installing the pivot rest

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].

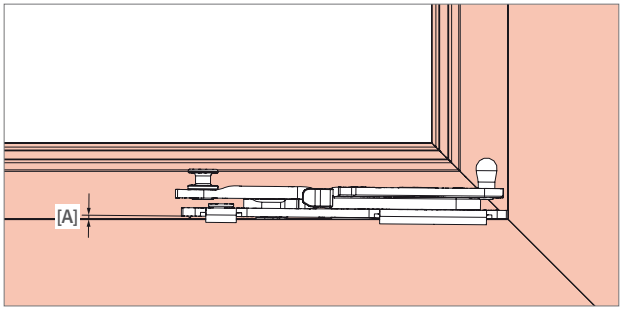
   After tightening the screw, check that the support is securely fitted.

   Tighten the screw [2].

   Tool: T 20 hex key

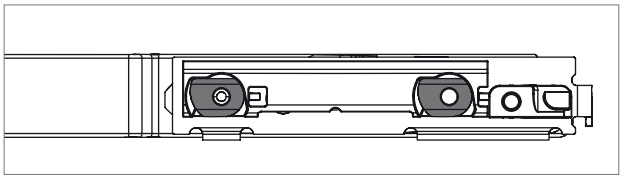
   Torque: max. 5.5 Nm

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].

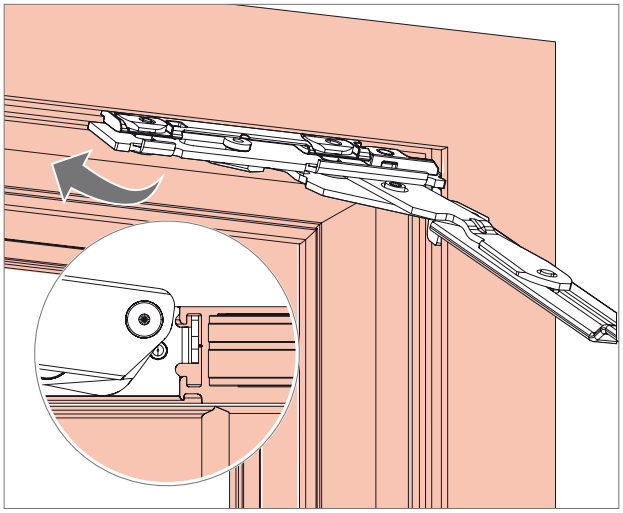
4. Close the support.



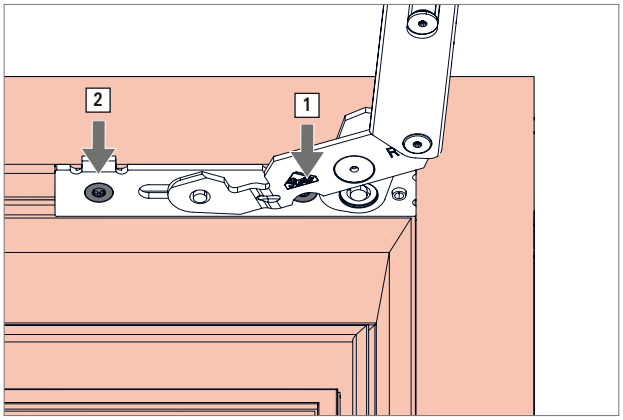
Installing sash stay 500, 735

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].

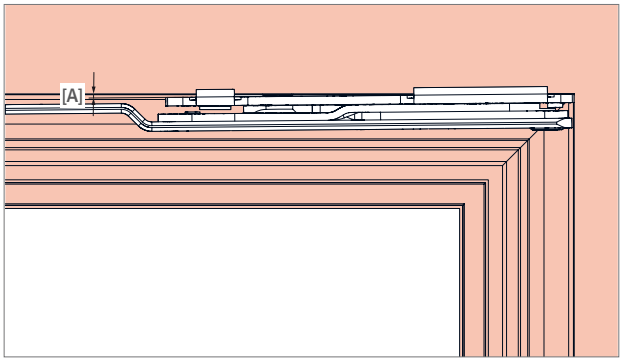
   After tightening the screw, check that the sash stay is securely fitted.

   Tighten the screw [2].

   Tool: T 20 hex key

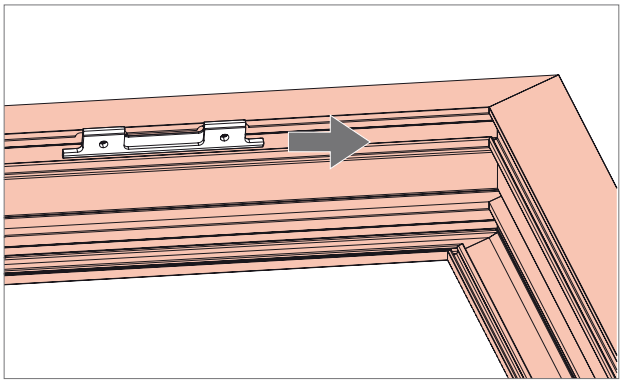
   Torque: max. 5.5 Nm

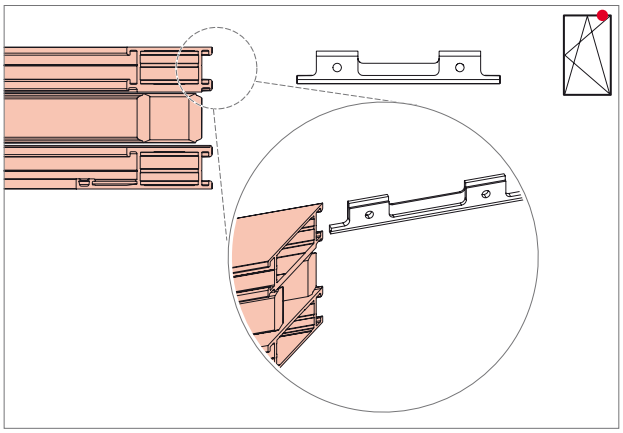
NOTE!
- Depending on the strength of the profile, or with a base groove thickness >2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence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



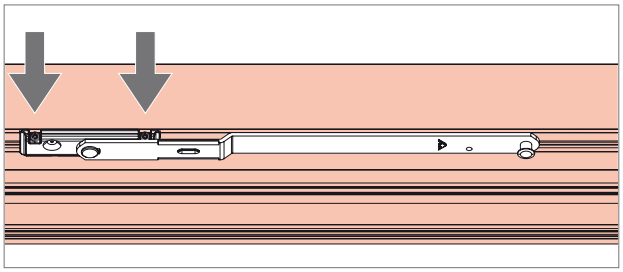


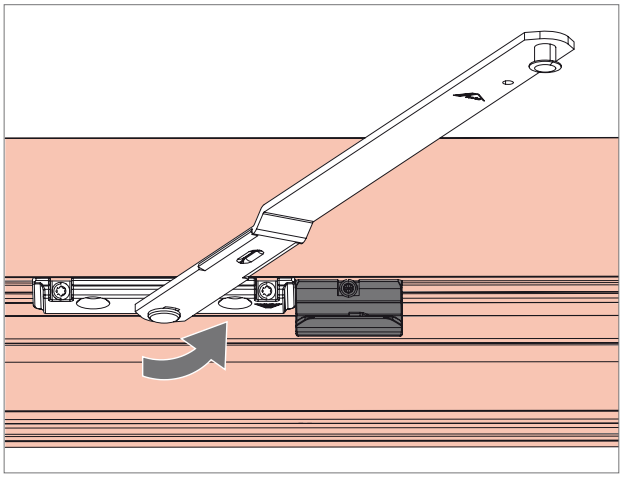
Installing the clamp strip on sash stay 390

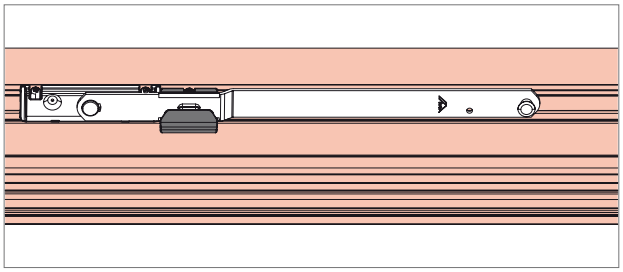
1. Swing the clamp strip into the routing (see page 72). Prevent the clamp strip from falling out due to movement.

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

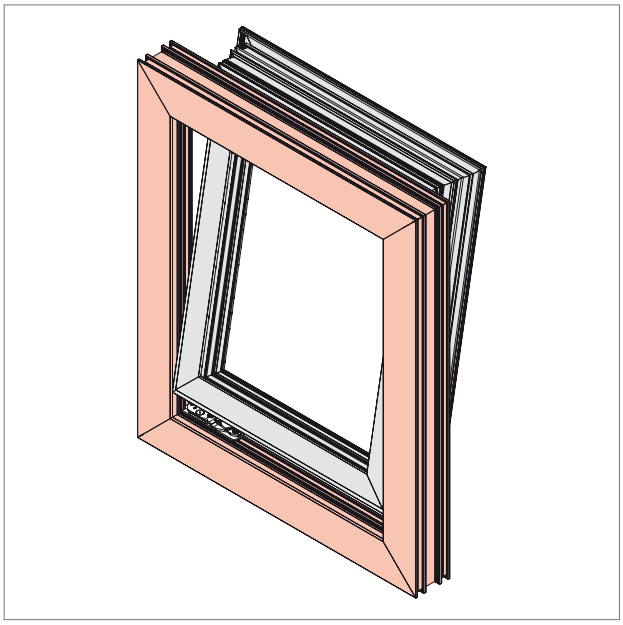
1. Swing the additional scissor stay arm, compl., into the frame at the specified position (see installation drawing).
2. Screw down the support with the two preinstalled threaded pins.

   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.

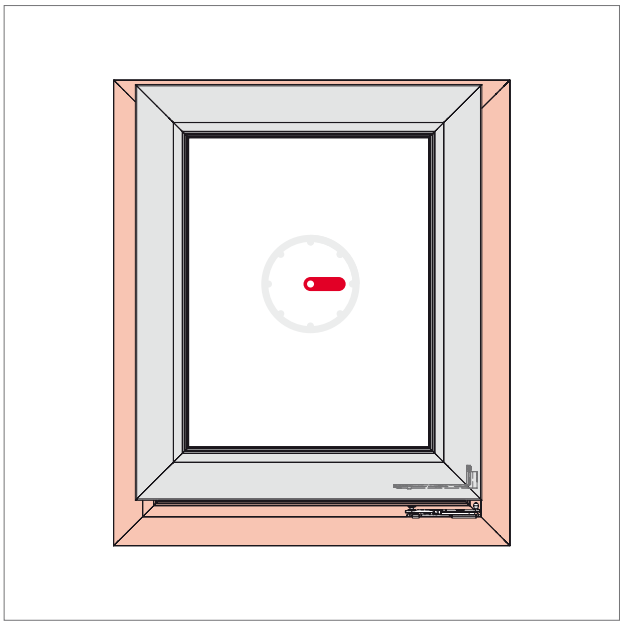
   Tool: T 10 hex key

   Torque: max. 2.5 Nm
4. Clip the additional scissor stay arm into the retaining spring.

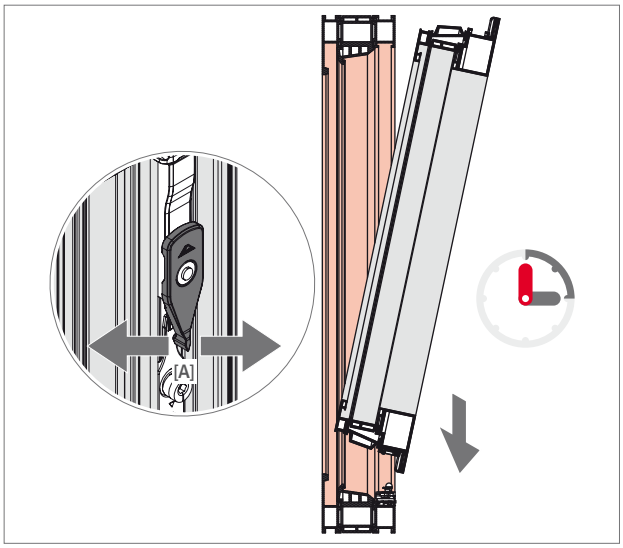


Connecting the pivot rest to the corner hinge

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.

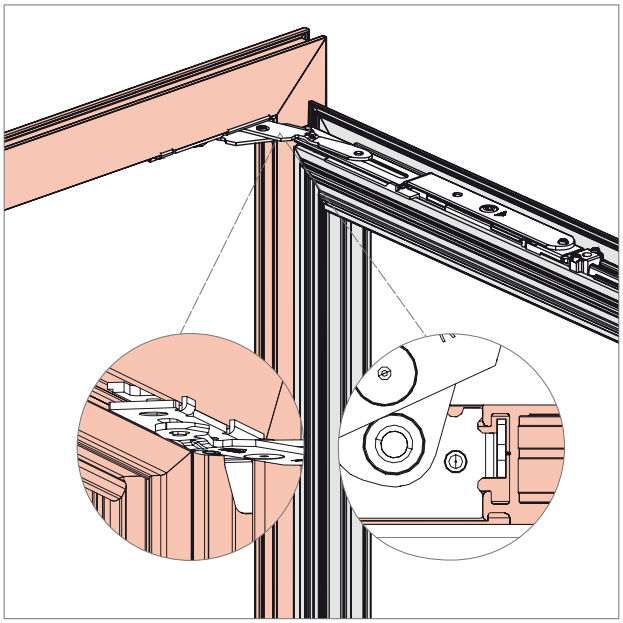
4. Secure the sash to prevent it from falling.

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].

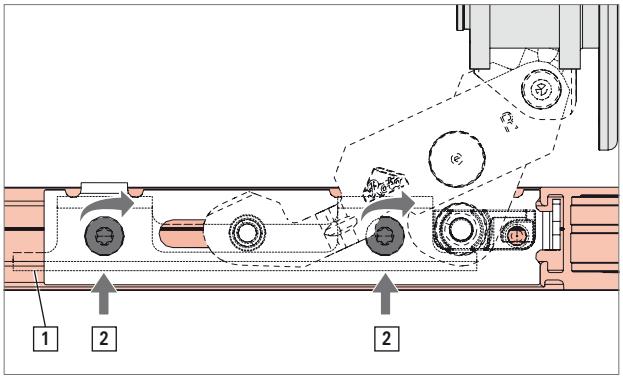
   Move the handle to the tilt position.
   (Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.)



Mounting sash stay 390

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

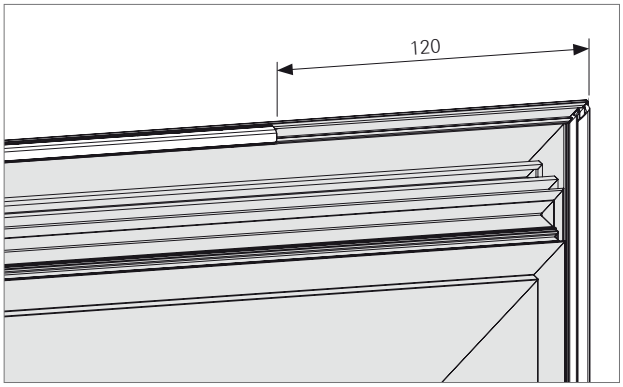
NOTE!
The baseplate must engage behind it.



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.

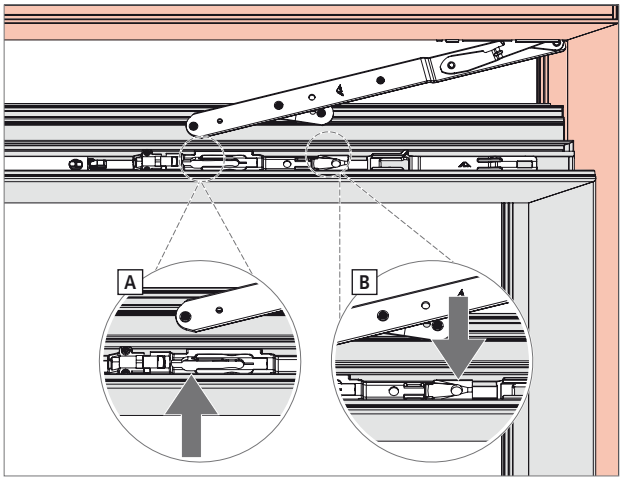
Tool: T 20 hex key

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.

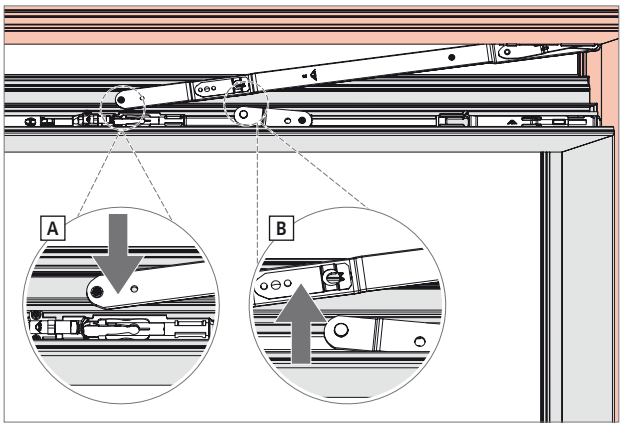
Mounting sash stay 500, 735



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").

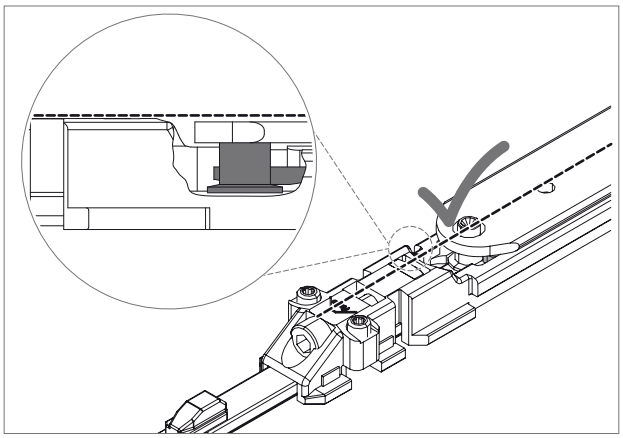
   B = Mount the tab in the hole in the scissor stay guide.



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

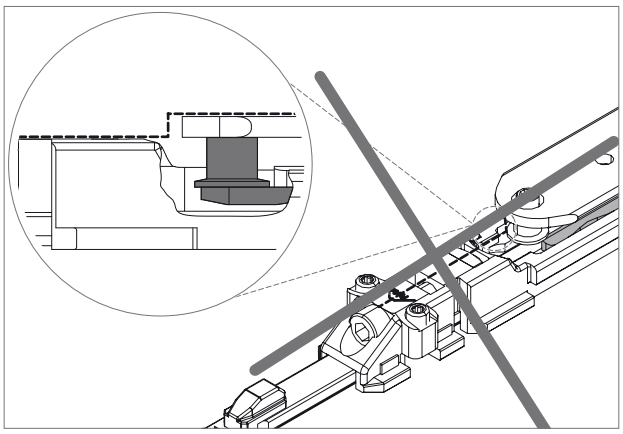
A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting")

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



Correct mounting

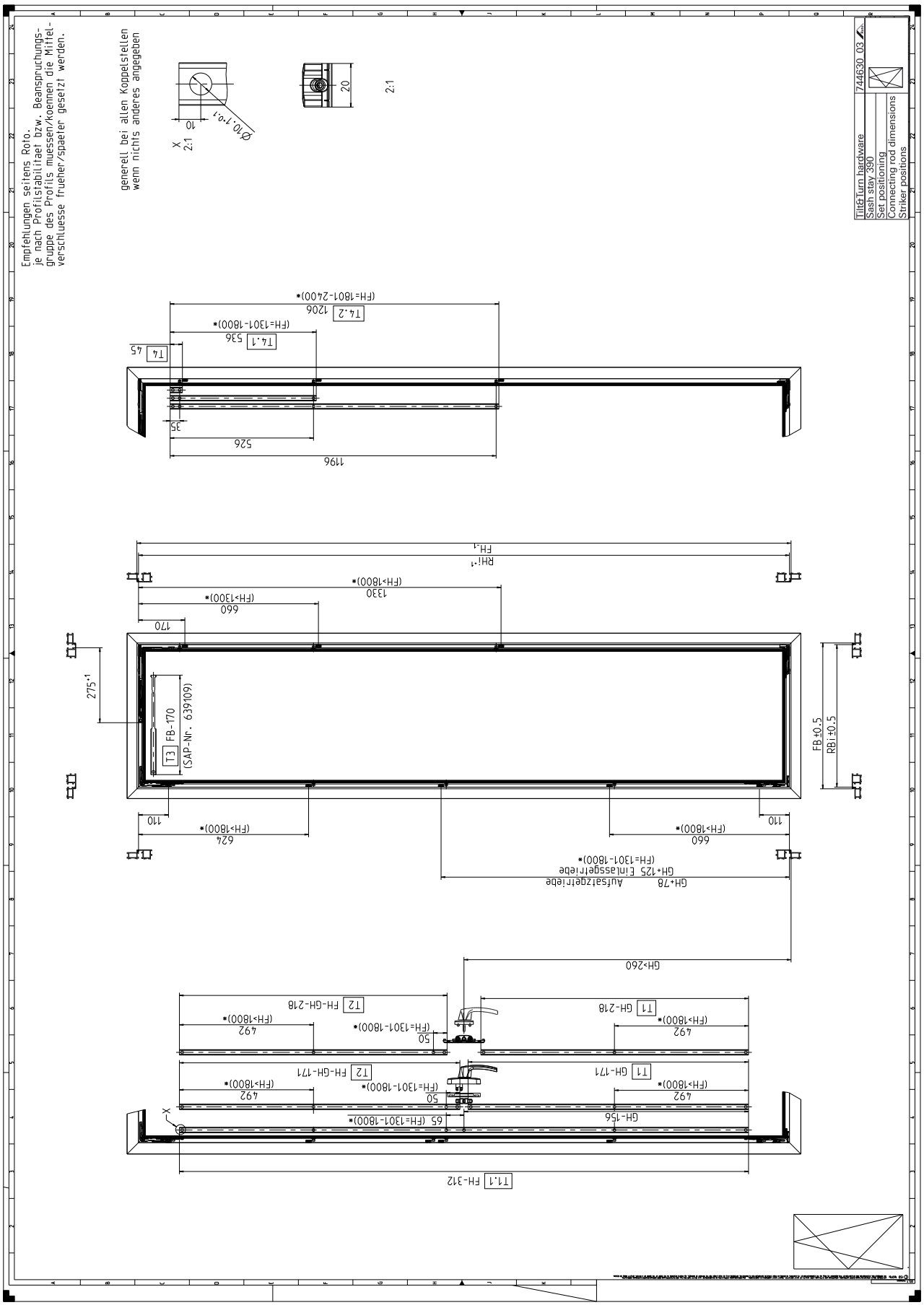
No projection from the sash stay to the scissor stay guide.

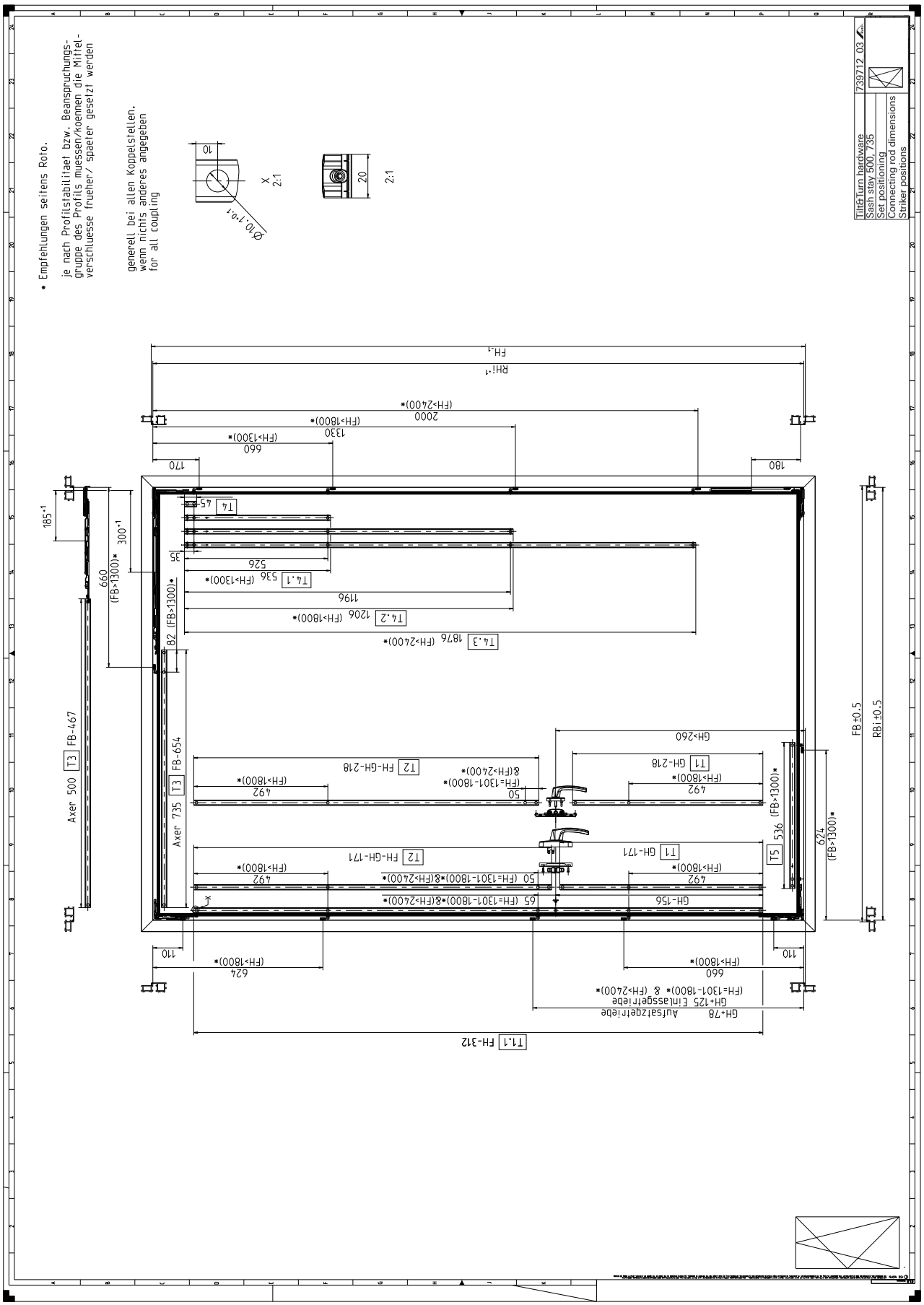


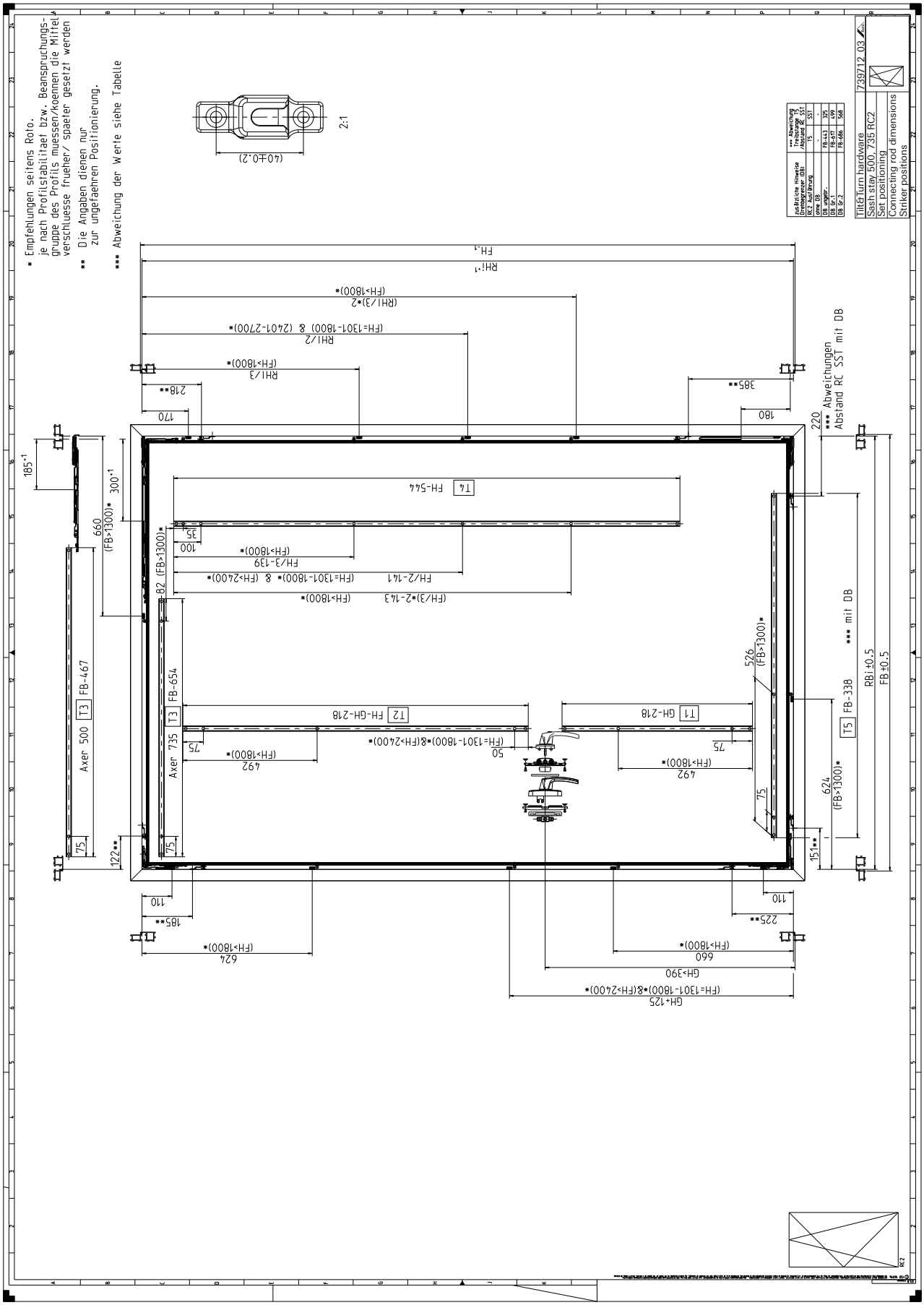
Incorrect mounting

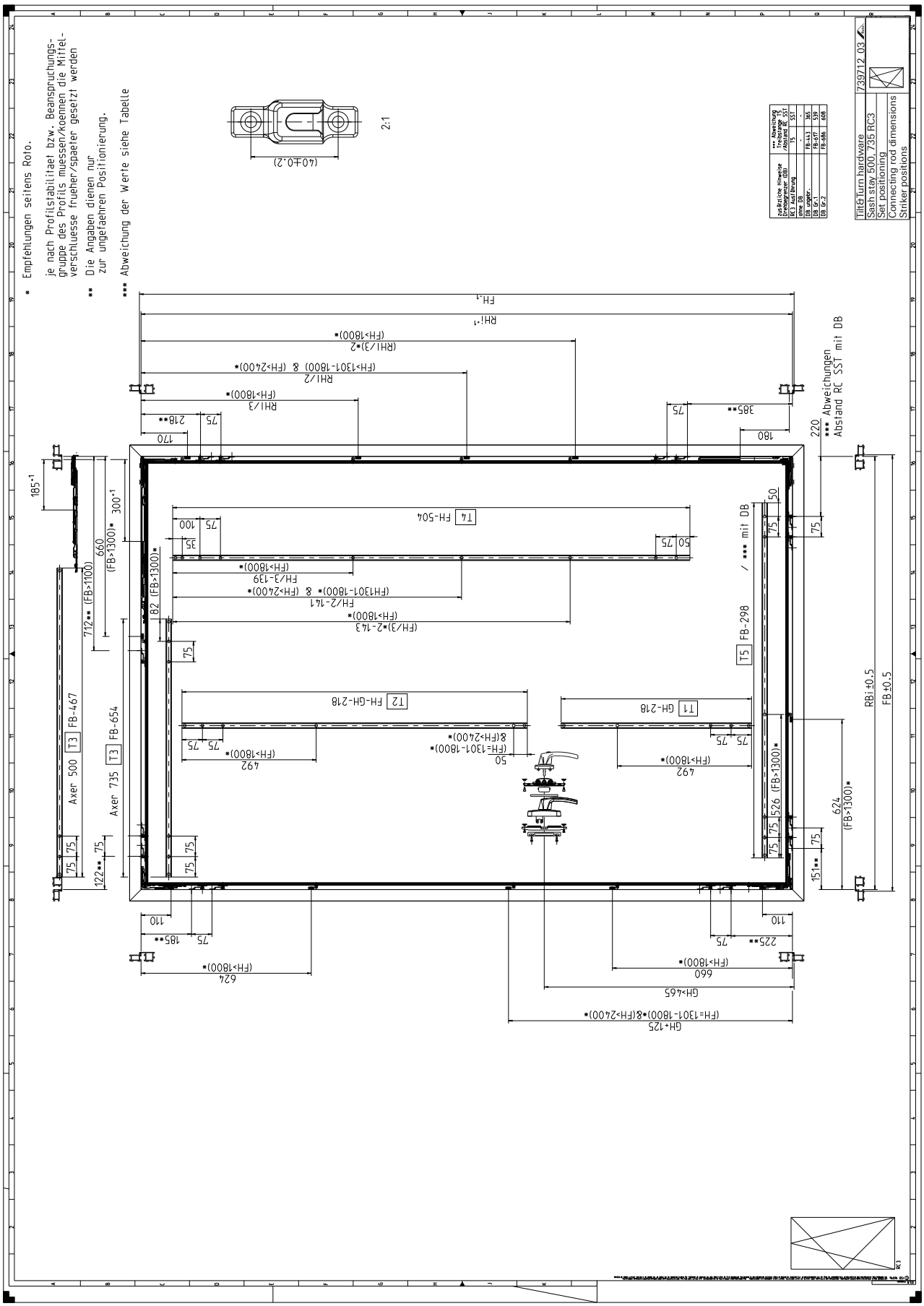
Projection from the sash stay to the scissor stay guide is not permissible.

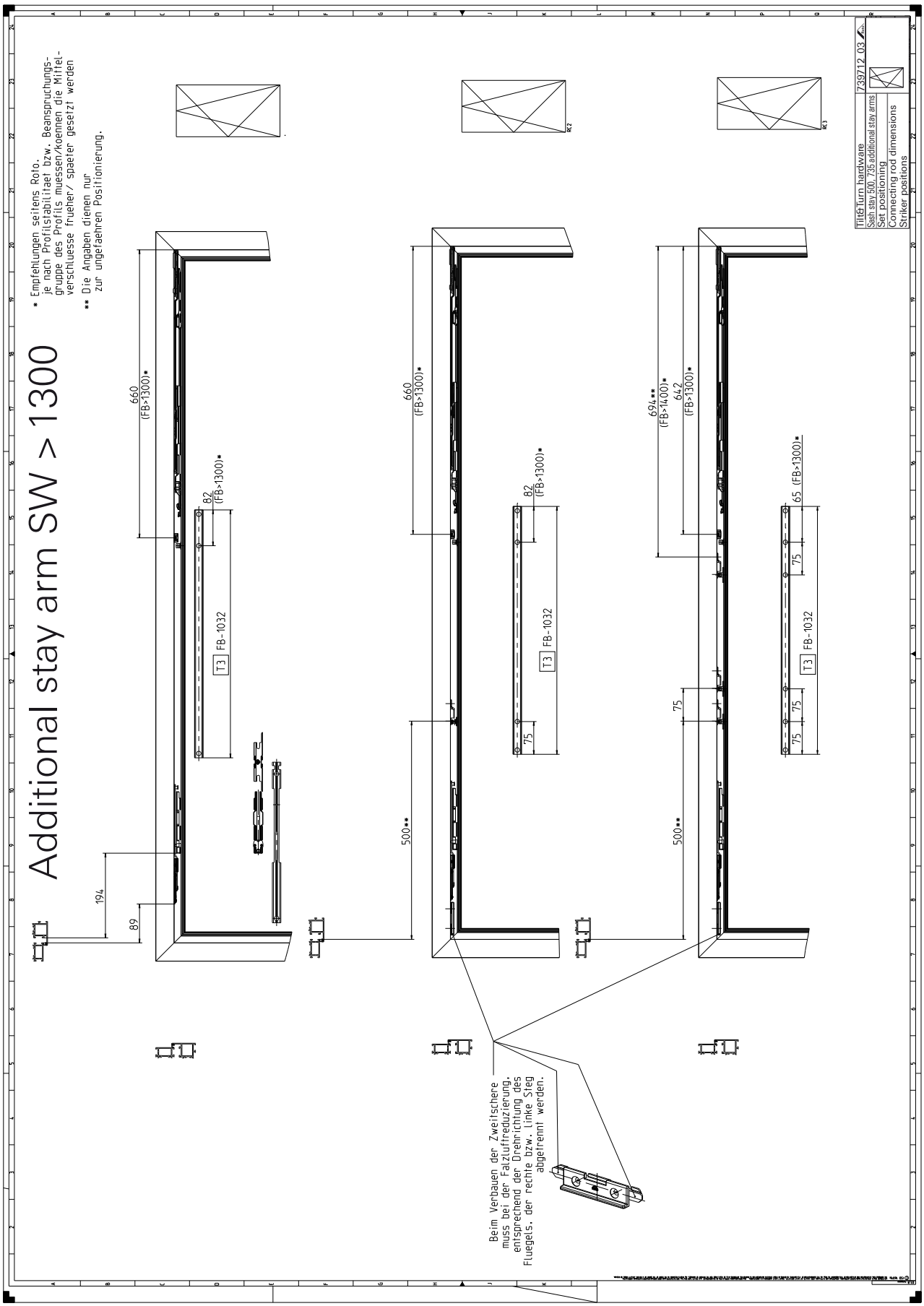
Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Abweichung Abstand RC SST mit DB	Deviation from distance RC ST with TR
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5 / Abstand RC SST	Deviation from connecting rod 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)

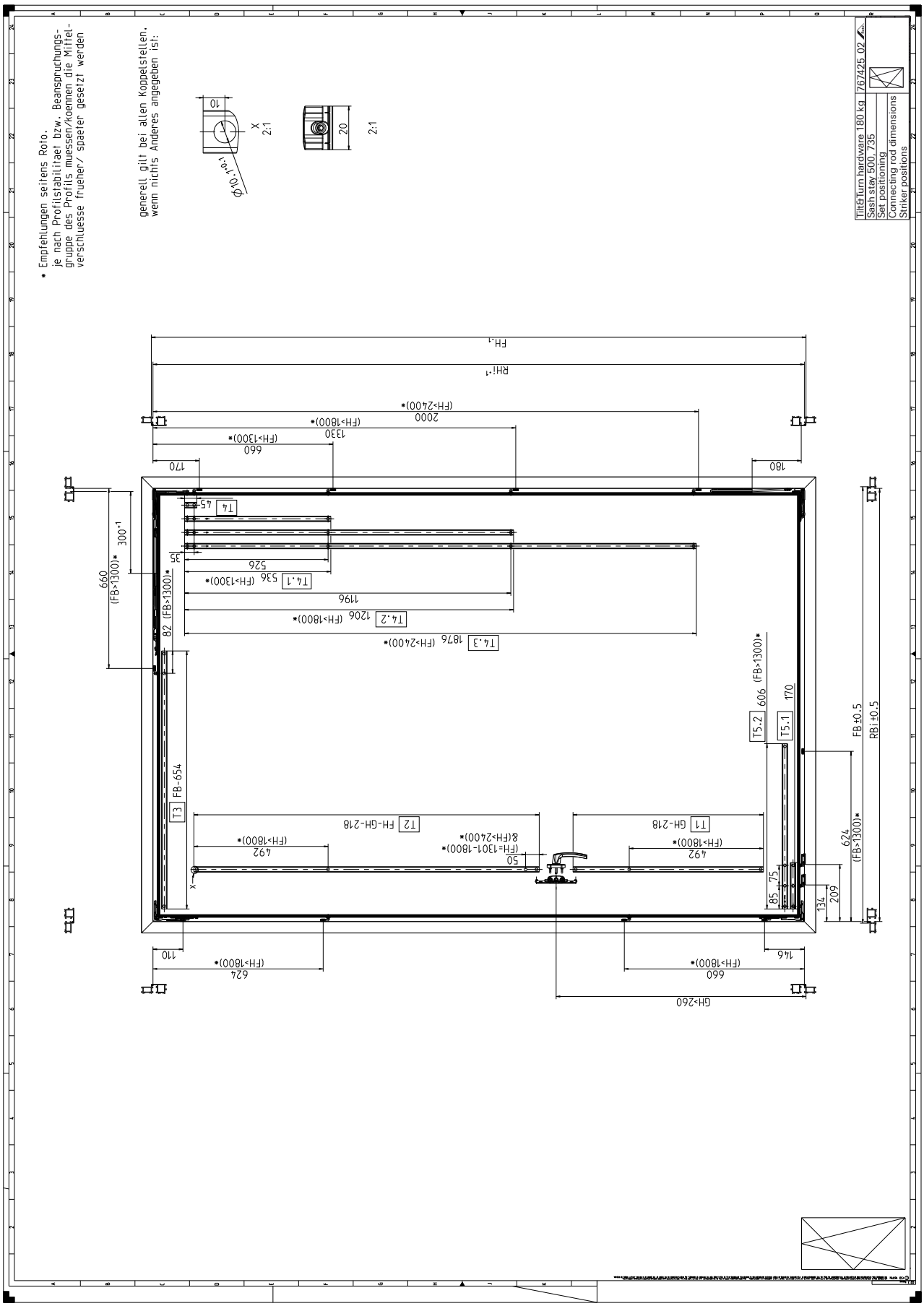

Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehe r/spaeter gesetzt werden.
generell bei allen Koppelstellen
wenn nichts anderes angegeben
744630 03
TiltTurn hardware
Sash stay 390
Set positioning
Connecting rod dimensions
Striker positions
(FH=1801-2400)*
1206
T4.2
(FH=1301-1800)*
536
T4.1
45
T4
35
526
1196
RH-1
FH-1
(FH>1800)*
1330
(FH>1300)*
660
170
275+1
T3
FB-170
(SAP-Nr. 639109)
FB ±0.5
RBi ±0.5
110
624
(FH>1800)*
660
(FH>1800)*
110
GH+78
Aufsatzgetriebe
GH+125 Einlassgetriebe
(FH=1301-1800)*
GH>260
T2
FH-GH-218
492
(FH>1800)*
50
(FH=1301-1800)*
T1
GH-218
492
(FH>1800)*
T2
FH-GH-171
492
(FH>1800)*
50
(FH=1301-1800)*
T1
GH-171
492
(FH>1800)*
65 (FH=1301-1800)*
GH-156
T1.1
FH-312

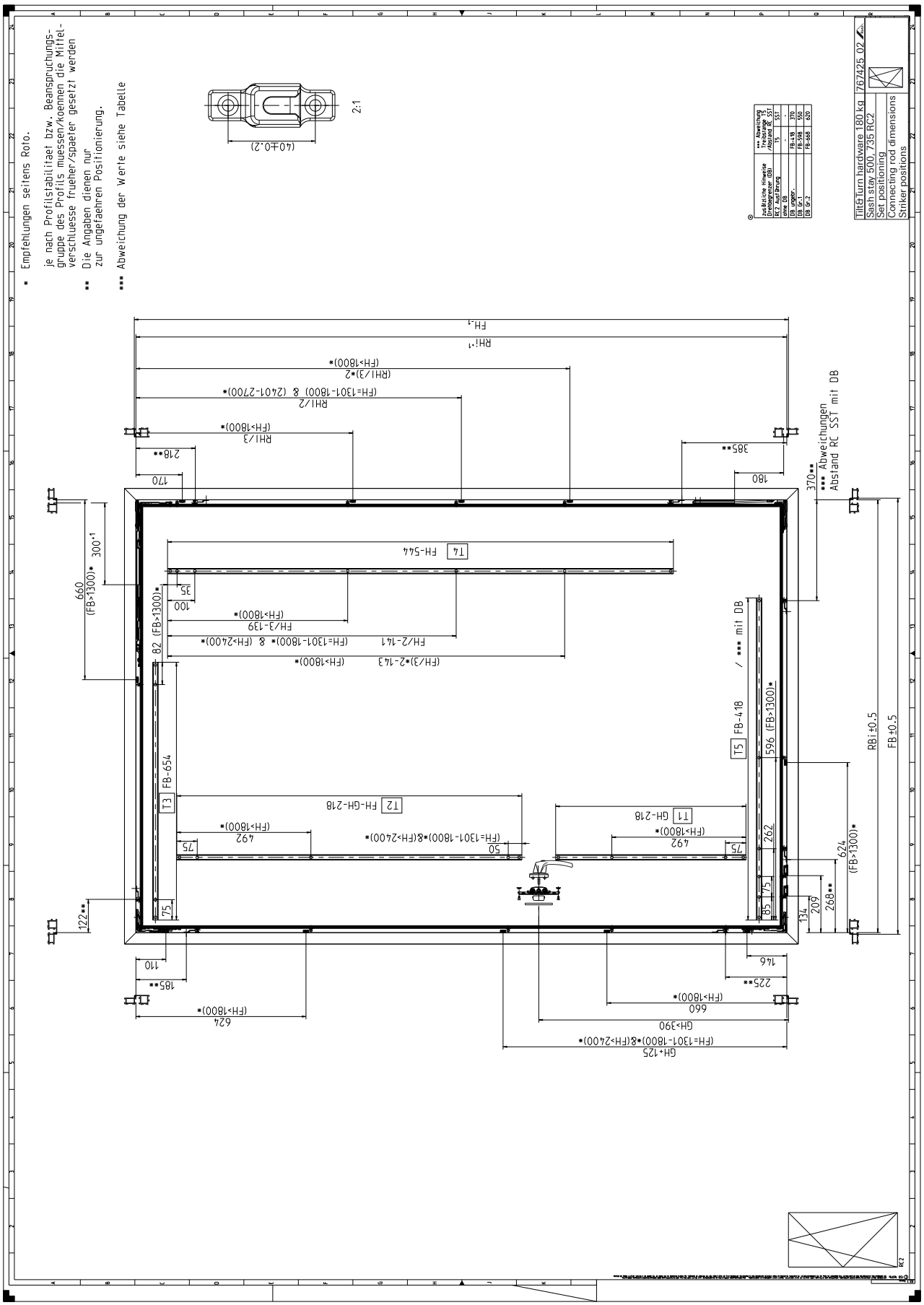

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-gruppe des Profils muessen/koennen die Mittel-verschluesse frueher/ spaeter gesetzt werden
generell bei allen Koppelstellen, wenn nichts anderes angegeben
for all coupling
Ø10.1*0.1
10
X 2:1
20
2:1
739712 03
TiltTurn hardware
Sash stay 500, 735
Set positioning
Connecting rod dimensions
Striker positions
FH-1
RH-1
2000 (FH>2400)*
1330 (FH>1800)*
660 (FH>1300)*
170
180
185-1
300-1
660 (FB>1300)*
T4 45
35
526
T4.1 536 (FH>1300)*
1196
T4.2 1206 (FH>1800)*
82 (FB>1300)*
T4.3 1876 (FH>2400)*
Axer 500 T3 FB-467
Axer 735 T3 FB-654
GH>260
T2 FH-GH-218
8(FH=1301-1800)*
8(FH>2400)*
50
492 (FH>1800)*
T1 GH-218
T2 FH-GH-171
T1 GH-171
50 (FH=1301-1800)*8(FH>2400)*
65 (FH=1301-1800)*8(FH>2400)*
GH-156
T5 536 (FB>1300)*
624 (FB>1300)*
FB±0.5
RB±0.5
110
624 (FH>1800)*
660 (FH>1800)*
GH+78 Aufsatzgetriebe
GH+125 Einlassgetriebe
(FH=1301-1800)* & (FH>2400)*
T1.1 FH-312

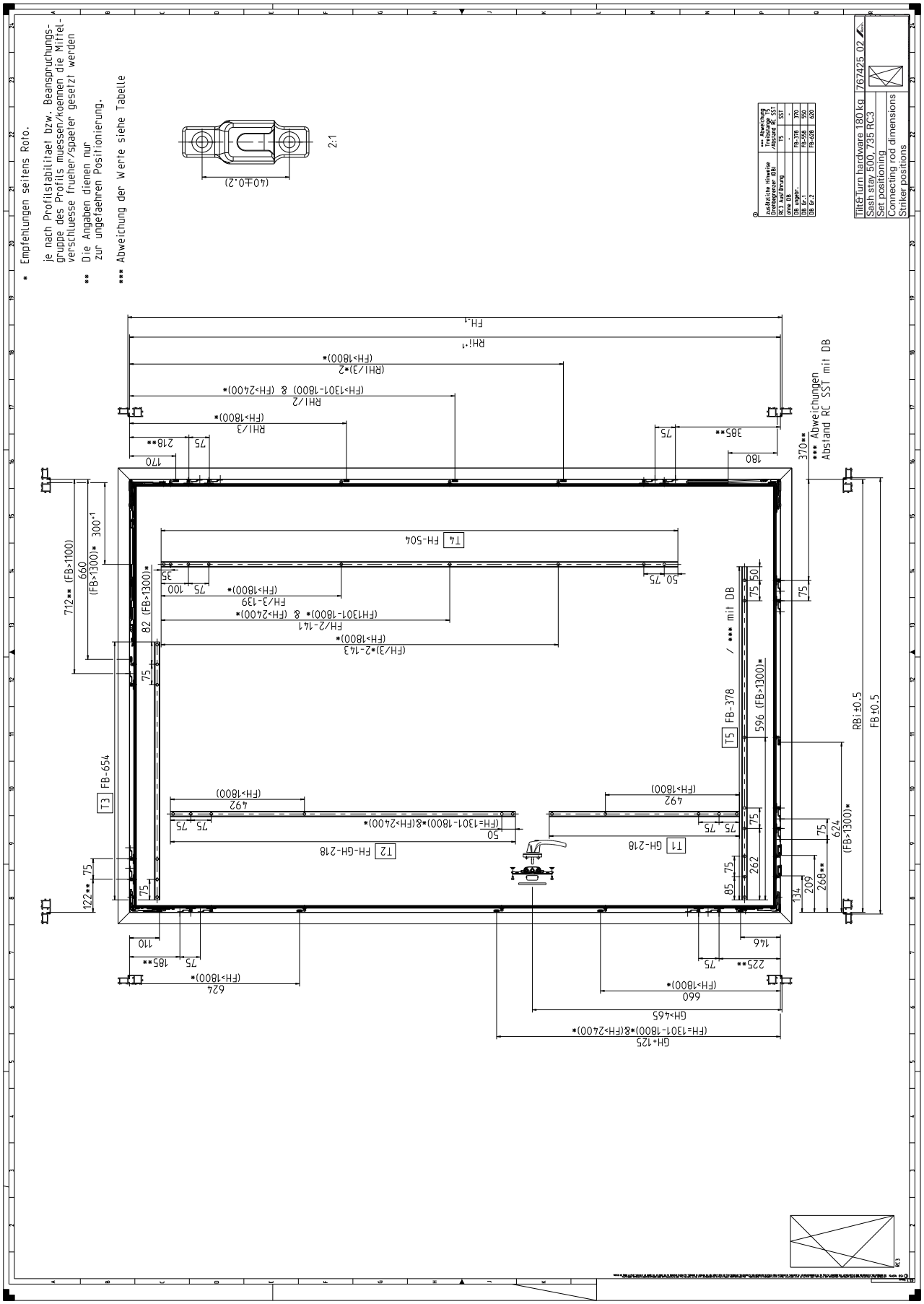

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel
verschluesse frueher/ spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
zusätzliche Hinweise
Drehbeschläge DBH
RC2 falls
anders DB
*** Abweichung
Abstand RC
FS
FB-443
DB ungeh.
DB GI-1
DB GI-2
SST
325
499
568
7399712 03
Tilt&Turn hardware
Sash stay 500, 735 RC2
Set positioning
Connecting rod dimensions
Striker positions
FH-1
RH-1
(RH1/3)*2
(FH>1800)*
RH1/2
(FH=1301-1800) & (2401-2700)*
RH1/3
(FH>1800)*
218**
170
385**
180
220
*** Abweichungen
Abstand RC SST mit DB
185-1
300-1
660
(FB>1300)*
T4
FH-544
35
100
(FH>1800)*
FH/3-139
FH/2-141
(FH=1301-1800)* & (FH>2400)*
82
(FB>1300)*
(FH/3)*2-143
(FH>1800)*
526
(FB>1300)*
T3
FB-654
T2
FH-GH-218
T1
GH-218
T3
Axer 735
T3
FB-467
Axer 500
(FH=1301-1800)*&(FH>2400)*
50
492
(FH>1800)*
75
492
(FH>1800)*
75
624
(FB>1300)*
T5
FB-338
*** mit DB
RB±0.5
FB±0.5
75
75
122**
151**
110
185**
110
225**
624
(FH>1800)*
660
(FH>1800)*
GH>390
GH+125
(FH=1301-1800)*&(FH>2400)*

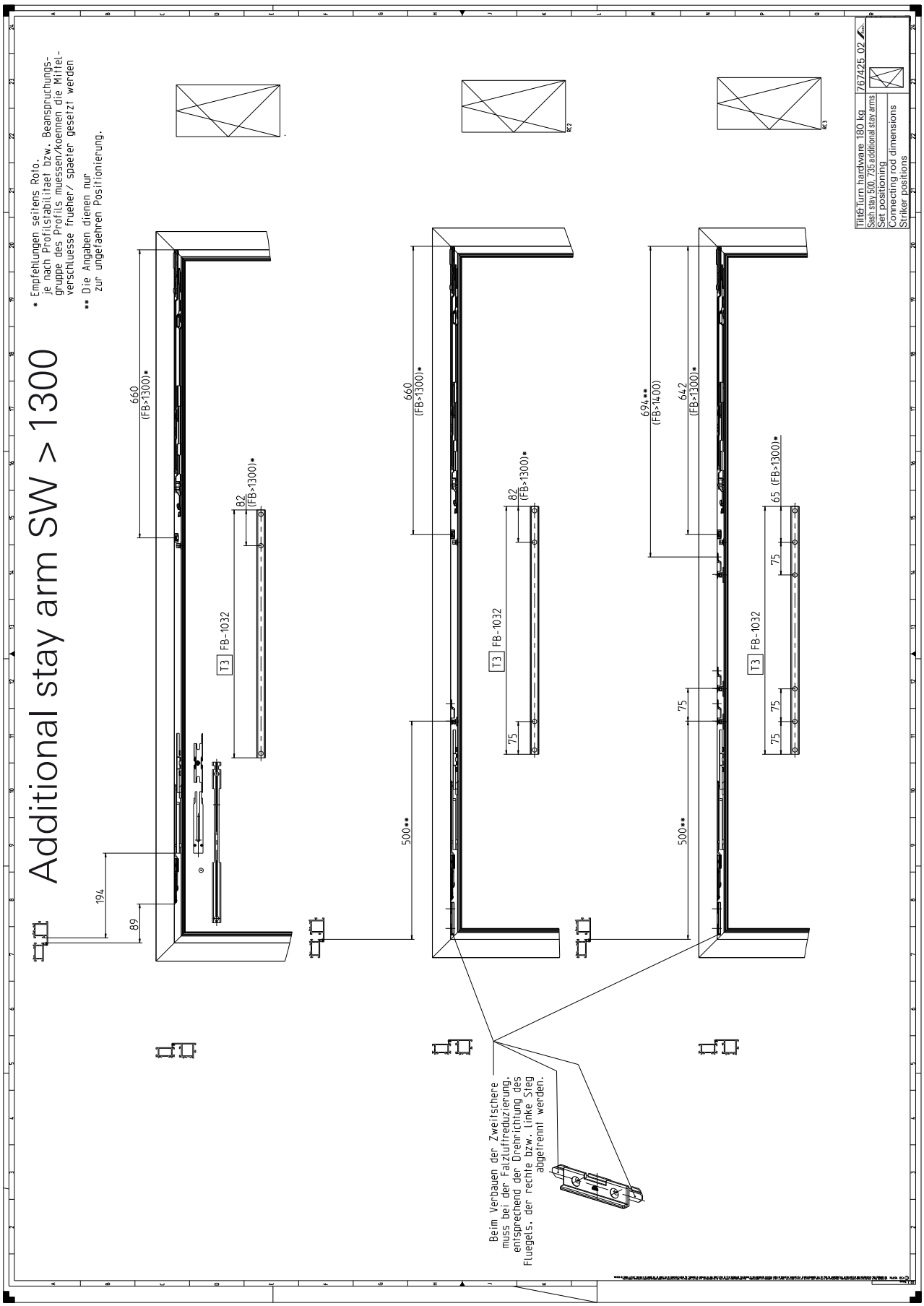

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehr/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
Tilt&Turn hardware
7339712 03
Sash stay 500, 735 RC3
Set positioning
Connecting rod dimensions
Striker positions
*** Abweichungen
Abstand RC SST mit DB
FH-1
RH1
(FH>1800)*
RH1/2
RH1/3
(FH>1301-1800) & (FH>2400)*
385**
218**
170
180
220
185-1
300-1
660
(FB>1300)*
712** (FB>1100)
82 (FB>1300)*
T4 FH-504
100
35
50
75
(FH>1800)*
FH/3-139
(FH1301-1800)* & (FH>2400)*
FH/2-141
(FH/3)*2-143
T5 FB-298 / *** mit DB
T2 FH-GH-218
T1 GH-218
492
8(FH=1301-1800)*
8(FH>2400)*
526 (FB>1300)*
624
(FB>1300)*
RB1±0.5
FB±0.5
T3 FB-467
Axer 500
T3 FB-654
Axer 735
122**
151**
110
185**
225**
624
660
GH>465
GH>125
(FH=1301-1800)*8(FH>2400)*

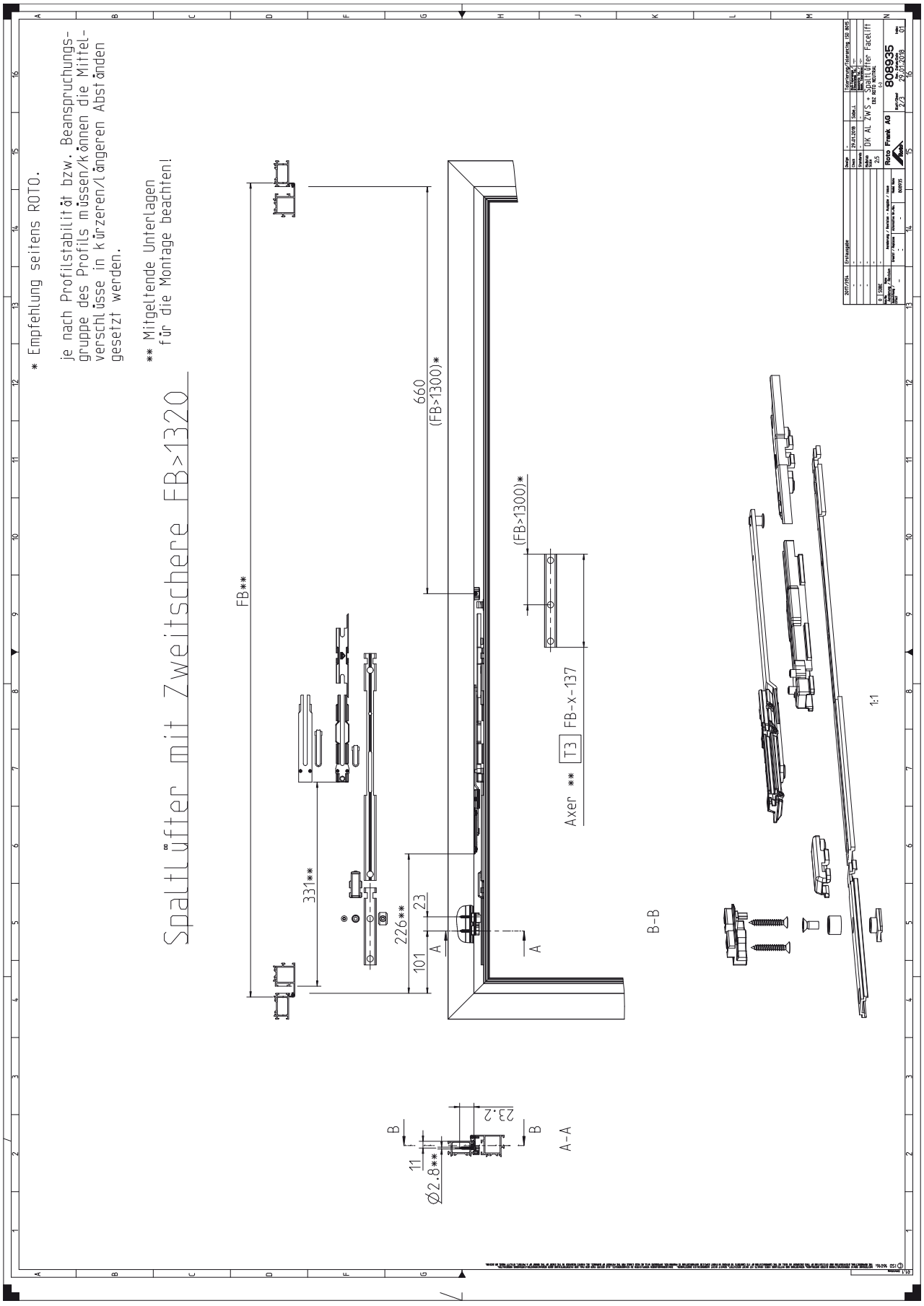

Additional stay arm SW > 1300
* Empfehlungen seitens Roto, je nach Profilsrabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse frueher/ spaeter gesetzt werden
** Die Angaben dienen nur zur ungefaehren Positionierung.
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1032
194
89
500**
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1032
75
694** (FB>1400)*
642 (FB>1300)*
65 (FB>1300)*
75
75
75
T3 FB-1032
500**
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung, entsprechend der Drehrichtung des Fluegels, der rechte bzw. linke Steg abgetrennt werden.
TiltTurn hardware
Satin stay 500 / 739 additional stay arms
Set positioning
Connecting rod dimensions
Striker positions
7397712 03

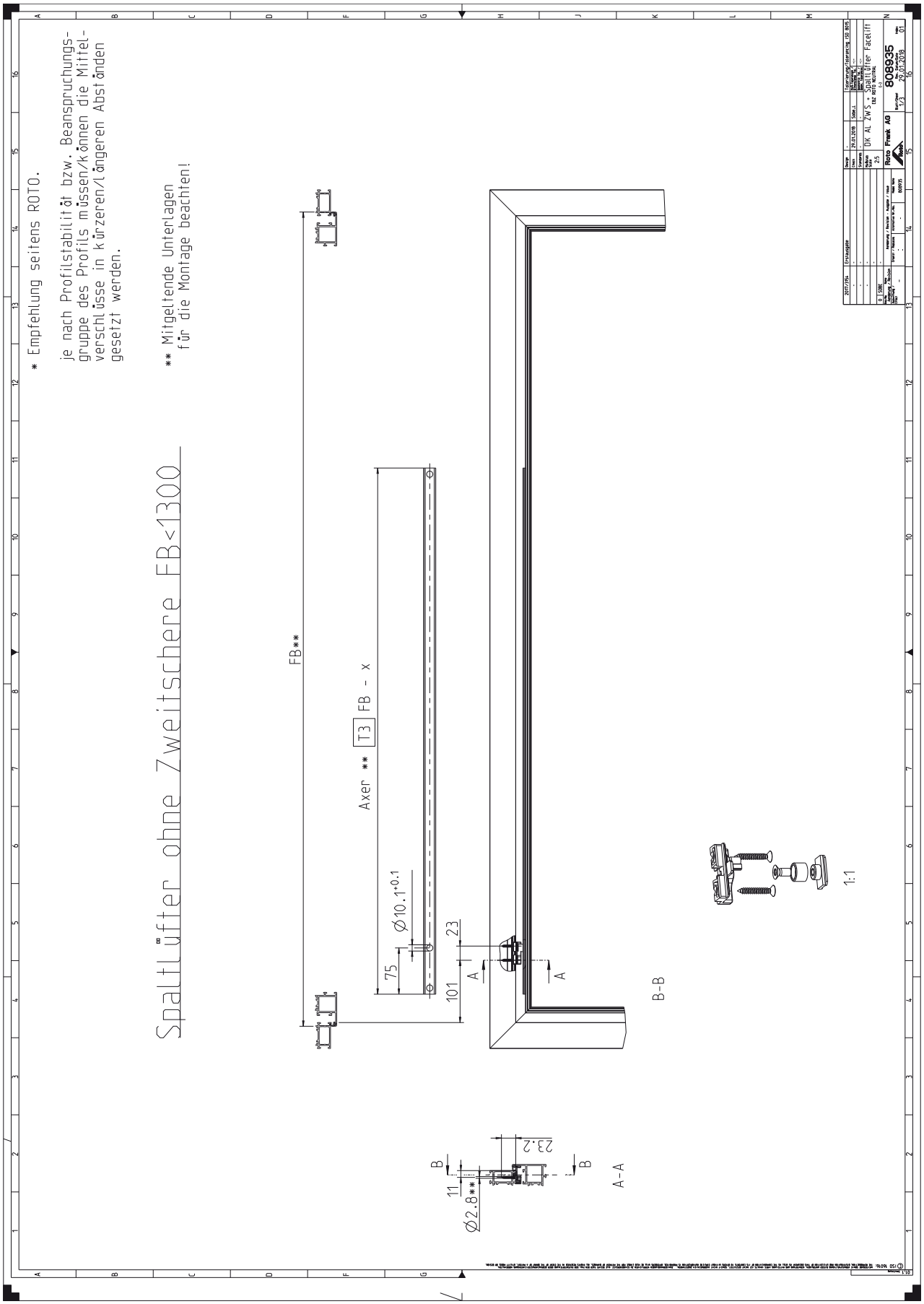

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehe r/ spaeter gesetzt werden
generell gilt bei allen Koppelstellen,
wenn nichts Anderes angegeben ist:
Tilt&Turn hardware 180 kg 7674?5 02
Sash stay 500, 735
Set positioning
Connecting rod dimensions
Striker positions
FH-1
RH-1
(FH>2400)*
2000
(FH>1800)*
1330
(FH>1300)*
660
170
180
T4
45
35
526
T4.1
536 (FH>1300)*
1196
T4.2
1206 (FH>1800)*
T4.3
1876 (FH>2400)*
300-1
660
(FB>1300)*
82
(FB>1300)*
T5.2
606
T5.1
170
FB±0.5
RBi±0.5
T3
FB-654
T2
FH-GH-218
T1
GH-218
(FH>1800)*
492
(FH=1301-1800)*
8(FH>2400)*
50
(FH>1800)*
492
624
(FB>1300)*
85
75
134
209
110
(FH>1800)*
624
(FH>1800)*
660
146
GH>260


* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
Tilt&Turn hardware 180 kg 7667425 02
Sash stay 500, 735 RC2
Set positioning
Connecting rod dimensions
Striker positions
*** Abweichung Treibstange TS /Abstand RC SST
zusätzliche Hinweise Dreh-Kippriegel (DBI)
DIN EN 179
ohne DB
DB ungepr.
DB Gr.1
DB Gr.2
-
FB-418
FB-598
FB-668
-
370
390
420
FH-544
FH-GH-218
FB-654
FB-418 / *** mit DB
FH-GH-218
FH-544
FH-1
RH-1
(FH>1800)*
RH/2
(FH=1301-1800) & (2401-2700)*
RH/3
(RH/3)*2
(FH=1301-1800)*&(FH>2400)*
FH/3-139
FH/2-141
FH/2-143
218**
170
385**
180
370**
*** Abweichungen
Absland RC SST mit DB
660
(FB>1300)*
300-1
35
100
82
(FB>1300)*
75
122**
110
185**
624
(FH>1800)*
492
50
596
(FB>1300)*
262
85
75
134
209
268**
624
(FB>1300)*
RBi±0.5
FB±0.5
146
225**
660
GH>390
GH+125
(FH=1301-1800)*&(FH>2400)*


* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
(40±0.2)
2:1
Tilt&Turn hardware 180 kg 7671425 02
Sash stay 500, 735 RC3
Set positioning
Connecting rod dimensions
Striker positions
FH-504
FH-GH-218
GH-218
FB-654
FB-378
T1
T2
T3
T4
T5
FH>1800)*
FH=1301-1800)*&(FH>2400)*
FH1301-1800) & (FH>2400)*
FH1301-1800)* & (FH>2400)*
FH-139
FH2-141
FH3-143
RH1/3
RH1/2
RH1/3)*2
FH-1
RH-1
GH>465
GH+125
660
624
492
596 (FB>1300)*
712** (FB>1100)
660
(FB>1300)* 300-1
82 (FB>1300)*
370**
*** Abweichungen
Abstand RC SST mit DB
/ *** mit DB
RBi±0.5
FB±0.5
385**
218**
185**
225**
268**
122**
134
209
262
85
146
110
170
180
75
100
50
35

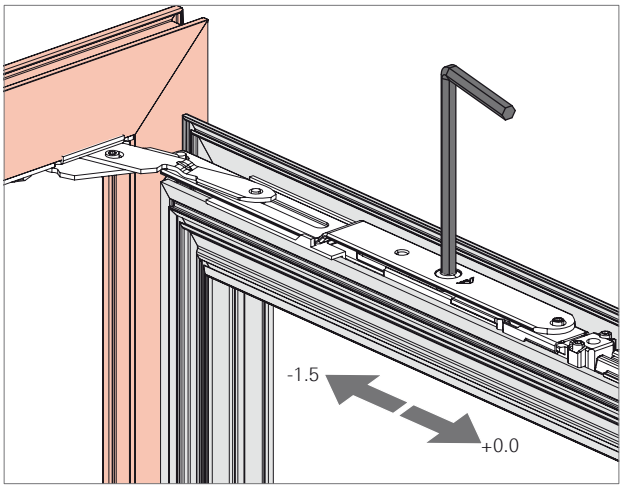

Additional stay arm SW > 1300
* Empfehlungen seitens Roto, je nach Profilsrabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse frueher/ spaeter gesetzt werden
** Die Angaben dienen nur zur ungefaehren Positionierung.
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1032
194
89
500**
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1032
75
500**
694** (FB>1400)
642 (FB>1300)*
65 (FB>1300)*
T3 FB-1032
75
75
75
500**
Beim Verbauen der Zweitschere muss bei der Falzluftreduzierung, entsprechend der Drehrichtung des Fluegels, der rechte bzw. linke Steg abgetrennt werden.
TiltTurn hardware 180 kg
Satin stay 500 / 730 additional stay arms
Set positioning
Connecting rod dimensions
Striker positions
7674425 02


Spaltlüfter mit Zweitschere FB>1320
* Empfehlung seitens ROTO.
je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse in kürzeren/längeren Abständen gesetzt werden.
** Mitgeltende Unterlagen für die Montage beachten!
FB**
660 (FB>1300)*
(FB>1300)*
Axer ** T3 FB-x-137
331**
226**
23
101
A
A
B-B
B
B
11
Ø2.8**
23.2
A-A
1:1
808935
DK AL ZW S + Spaltlüfter Fazelift
Roto Frank AG


Spaltlüfter ohne Zweitschere FB<1300
* Empfehlung seitens ROTO.
je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse in kürzeren/längeren Abständen gesetzt werden.
** Mitgeltende Unterlagen für die Montage beachten!
FB**
Axer ** T3 FB - x
Ø10.1+0.1
75
101
23
A
A
B-B
B
B
11
Ø2.8**
23.2
A-A
1:1
DK AL ZW S + Schattlüfter Fazelift
808935
Roto Frank AG

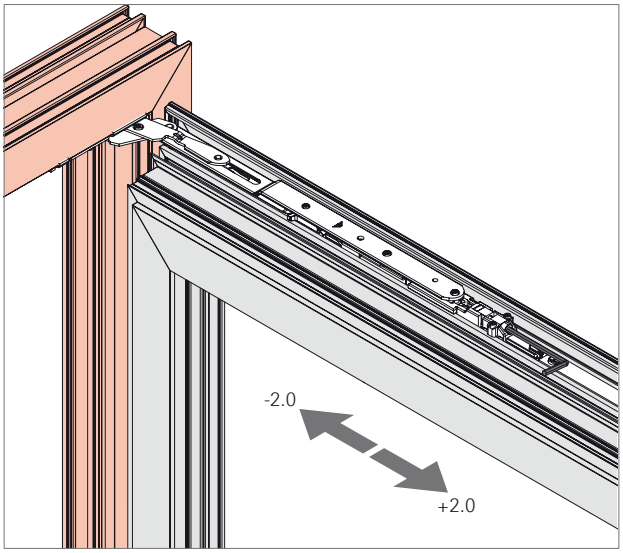
Note!

Roto hardware components may only be adjusted by authorised professionals.



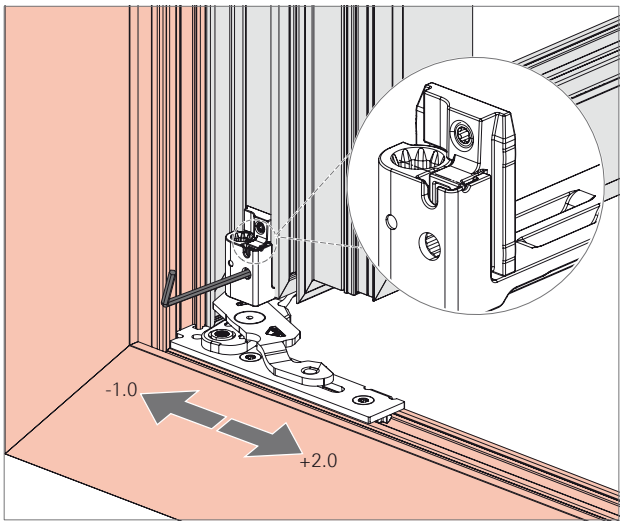
Sash stay 390

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.

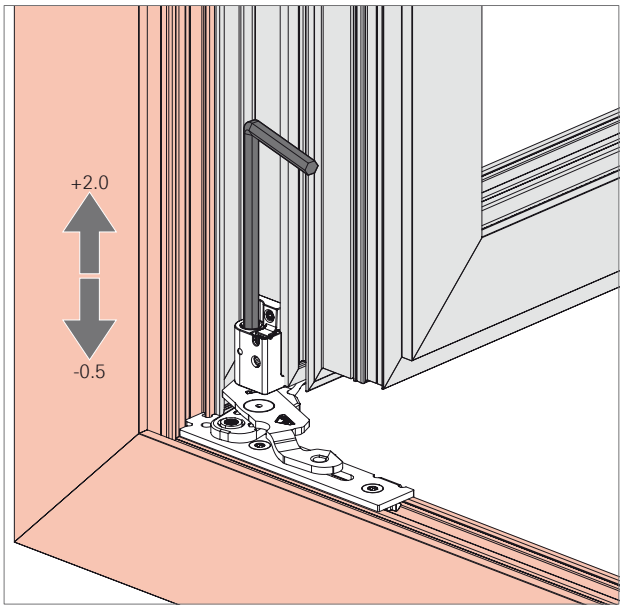


Corner hinge

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.



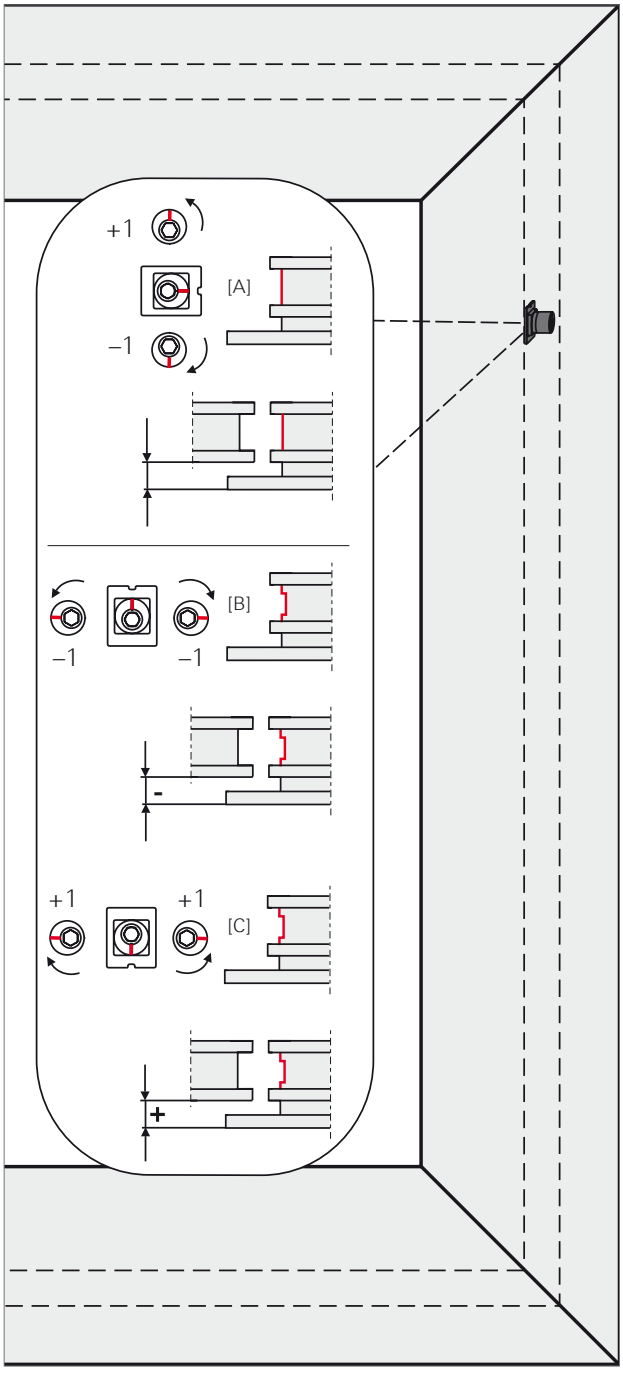
Height adjustment

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

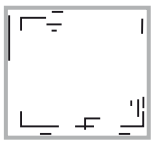
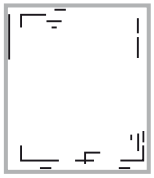
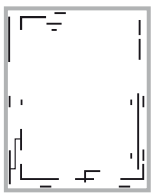
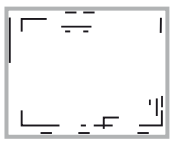
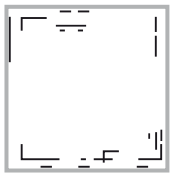
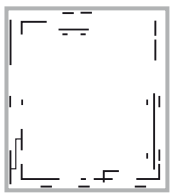
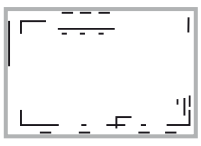
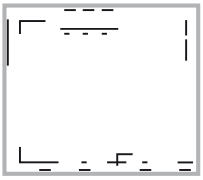
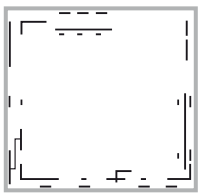
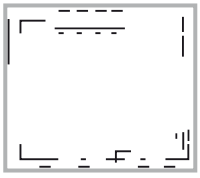
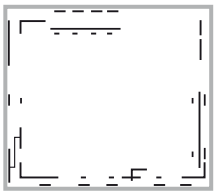
TF, TiSs installation

TF, TiSs installation drawings

TF, TiSs adjustment

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.

<table>
<tr><th>SW
SH</th><th>500 – 735*</th><th>736 – 1300*</th><th>1301 – 1600*</th></tr>
<tr><td>555 – 1300</td><td>
Pc(s) Description — Material no.
1 TF locking components V.01 — 728976
1 TF locking components V.02 — 728977
1 Corner drive CL set V.01 — 728842
Corner drive CL set V.02 — 728843
1 Hinge side — var.
1 Espagnolette and connector — var.
1 Connecting rod CR4 — var.
1 Sash stay 500 — var.
1 Scissor stay guide TF 500 — 740837
1 Tilt distance restrictor SH <800 — 639346
1 Connecting rod CR5.1 — 729982
</td><td>
Pc(s) Description — Material no.
1 TF locking components V.01 — 728976
1 TF locking components V.02 — 728977
1 Corner drive CL set V.01 — 728842
Corner drive CL set V.02 — 728843
1 Hinge side — var.
1 Espagnolette and connector — var.
1 Connecting rod CR4 — var.
1 Sash stay 735 — var.
1 Scissor stay guide TF 735 — 740839
1 Tilt distance restrictor SH <800 — 639346
1 Turn restrictor set V.01 SW >1200 — 740814
Turn restrictor set V.02 SW >1200 — 740835
1 Connecting rod CR5.1 — 729982
</td><td>
Pc(s) Description — Material no.
1 TF locking components V.01 — 728976
1 TF locking components V.02 — 728977
1 Corner drive CL set V.01 — 728842
Corner drive CL set V.02 — 728843
1 Hinge side — var.
1 Espagnolette and connector — var.
1 Connecting rod CR4 — var.
1 Sash stay 735 — var.
1 Scissor stay guide TF 735 — 740839
1 Turn restrictor set V.01 — 740814
Turn restrictor set V.02 — 740835
1 Connecting rod CR5.2 — 739375
1 TF additional stay arm V.01 — 728978
TF additional stay arm V.02 — 728979
2 Cam, insertable — 334671
2 Striker V.01 — 728918
Striker V.02 — 728920
</td></tr>
<tr><td>1301 – 1800</td><td rowspan="3"></td><td>
Pc(s) Description — Material no.
2 Cam, insertable — 334671
2 Striker V.01 — 728918
Striker V.02 — 728920
</td><td rowspan="3"></td></tr>
<tr><td>1801 – 2400</td><td>
Pc(s) Description — Material no.
2 Cam, insertable — 334671
2 Striker V.01 — 728918
Striker V.02 — 728920
</td></tr>
<tr><td>2401 – 2700</td><td>
Pc(s) Description — Material no.
2 Cam, insertable — 334671
2 Striker V.01 — 728918
Striker V.02 — 728920
</td></tr>
</table>

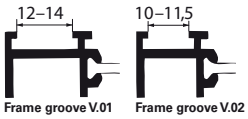
SW / SH	500–735	736–1300*	1301–1600*
555–1300			
1301–1800			
1801–2400			
2401–2700			

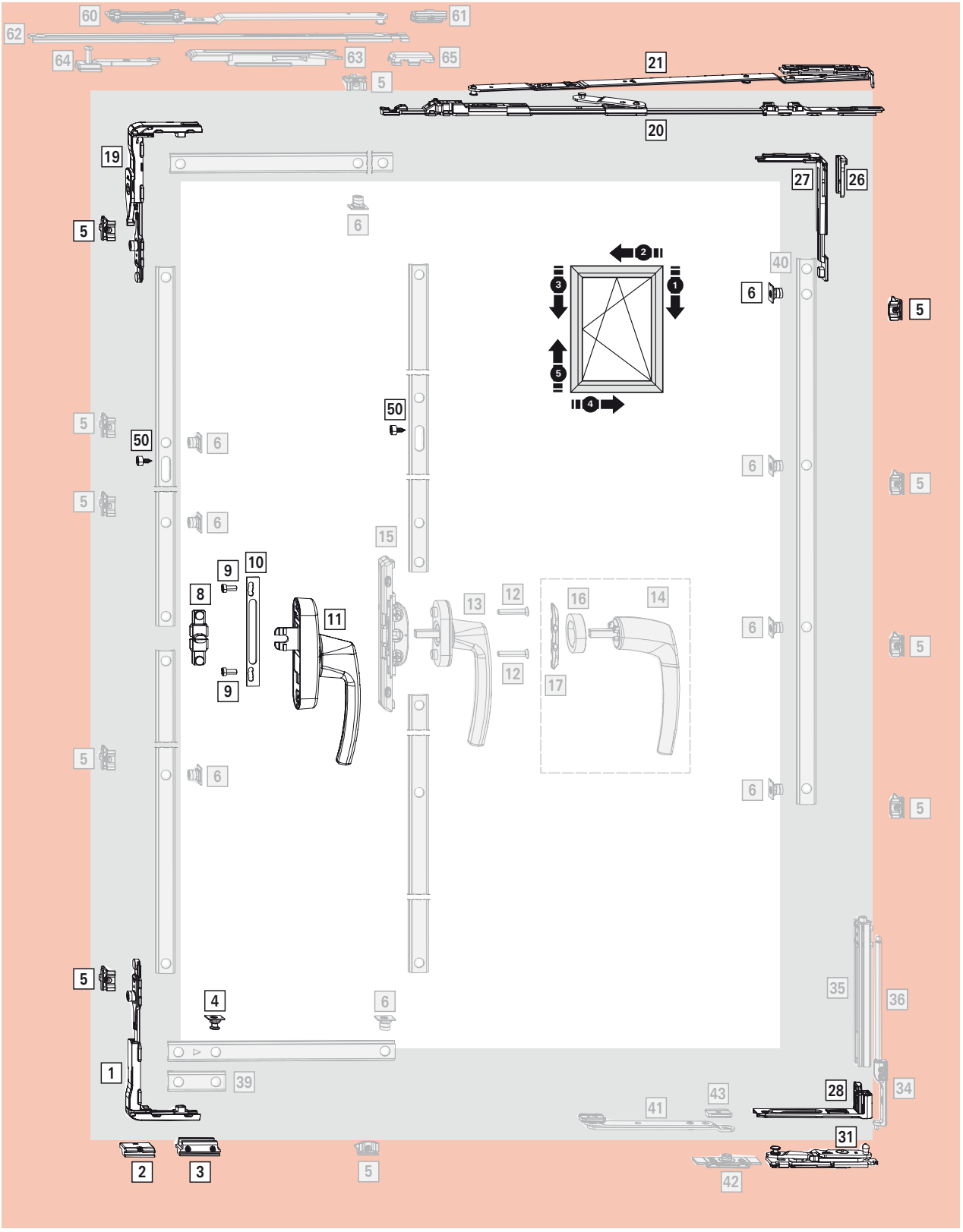
Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

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

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.

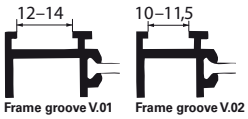
5) Sash stay 500 can be used up to max. SW 735 mm.

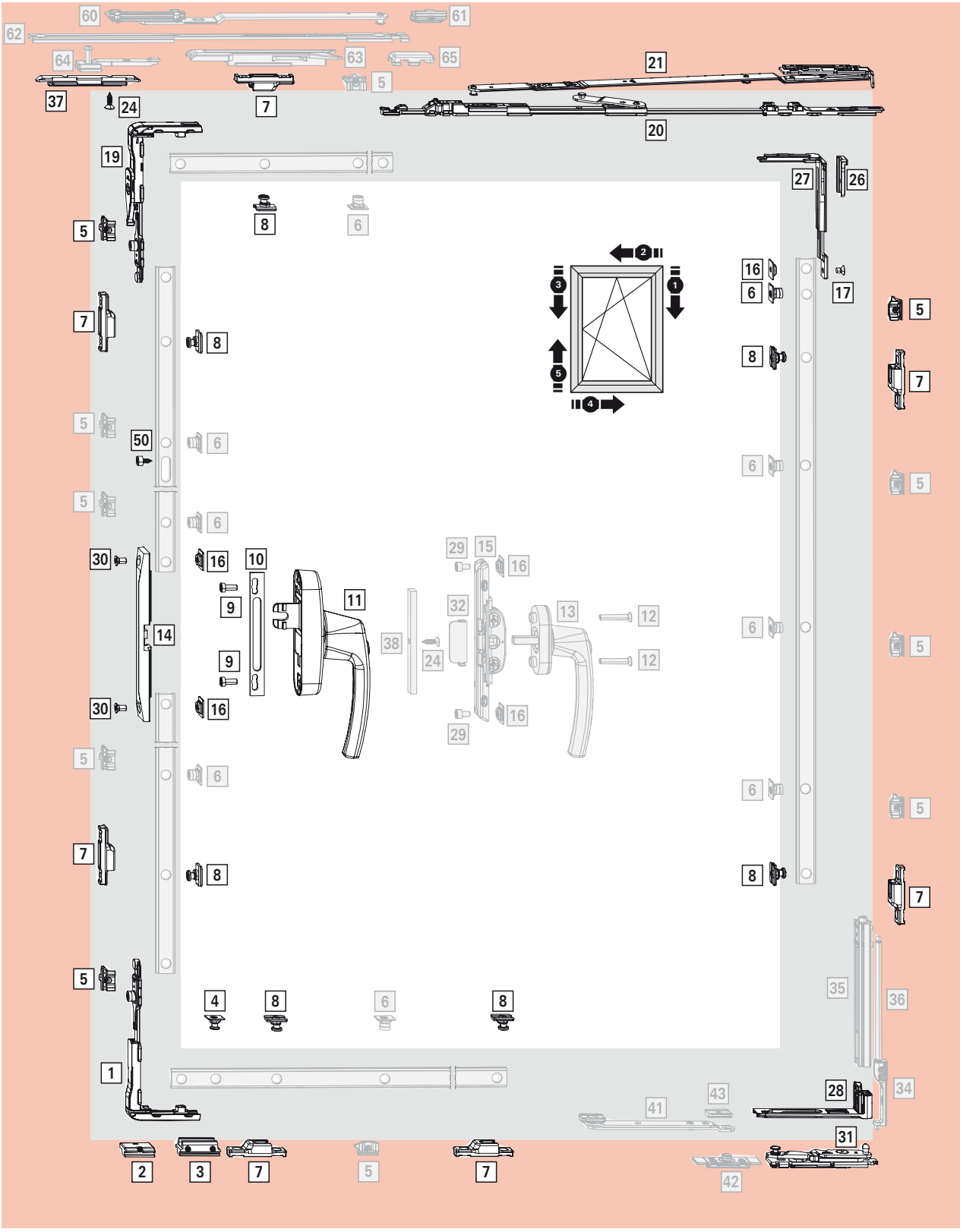
6) Sash stay 735 can be used from SW > 735 mm.

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.





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 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) 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.

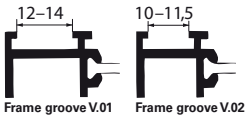
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

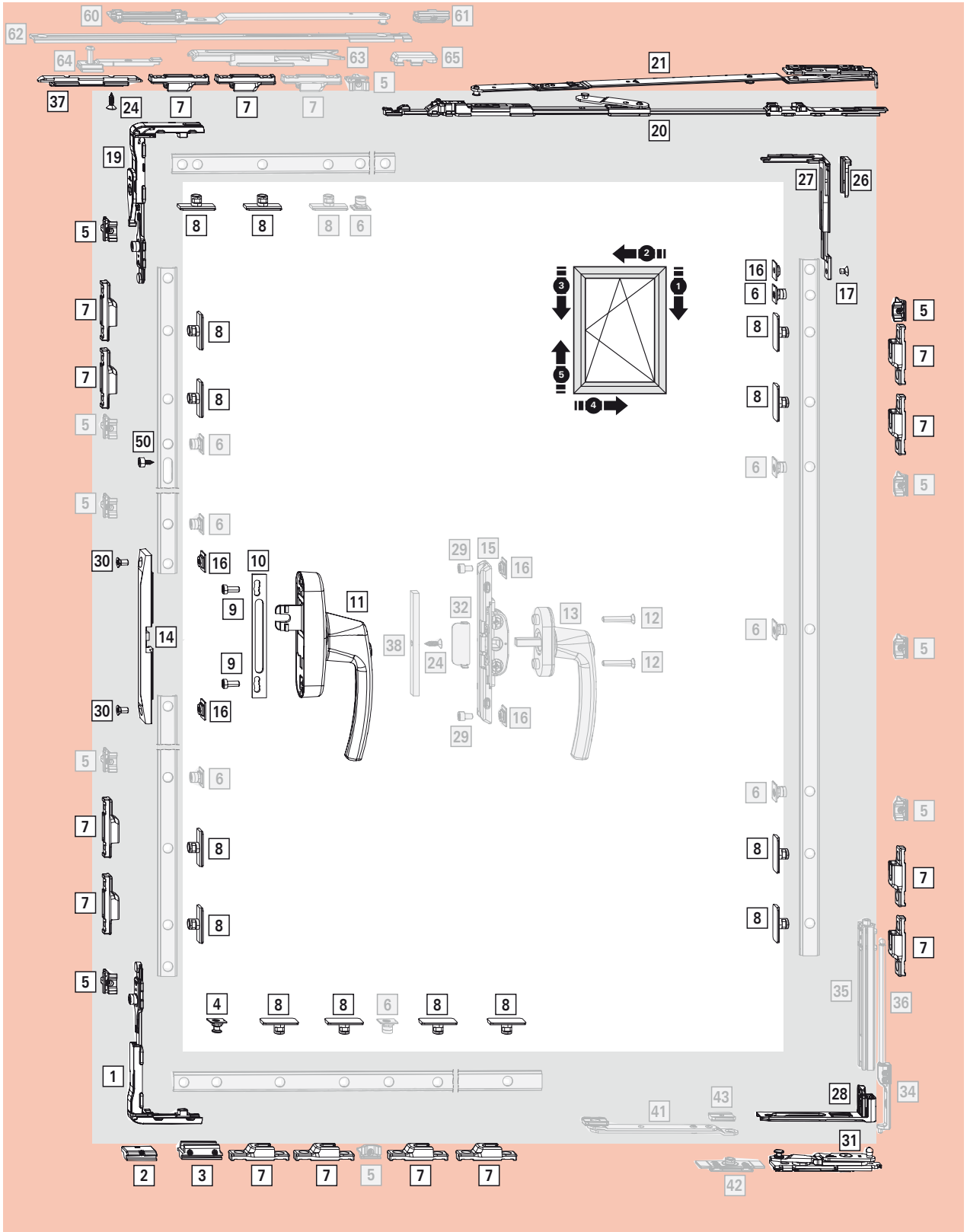
8) For the SEC flush-encased gearbox with blocking device, see page 237.

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

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 ST4.8x16**		
[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.

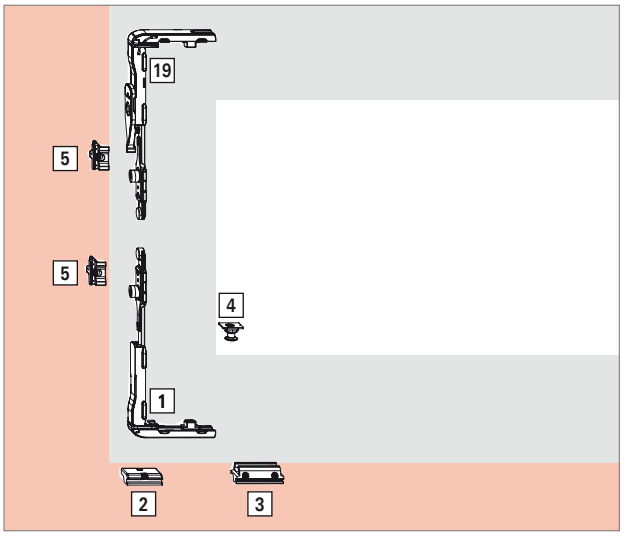
4) An additional stay arm is mandatory from SW > 1300 mm.

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

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

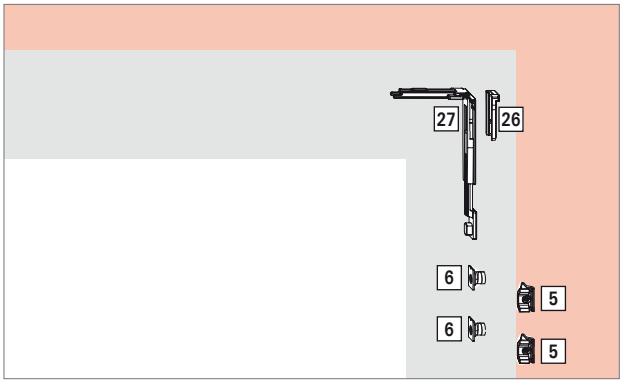
7) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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



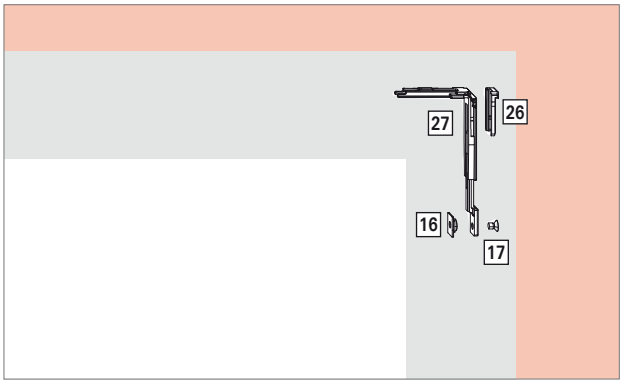
TF locking components

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**



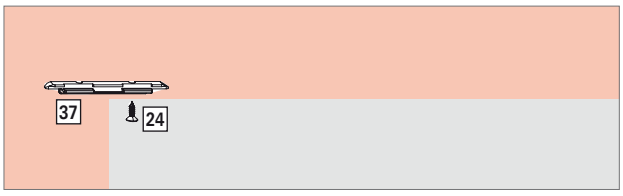
Corner drive CL set

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**



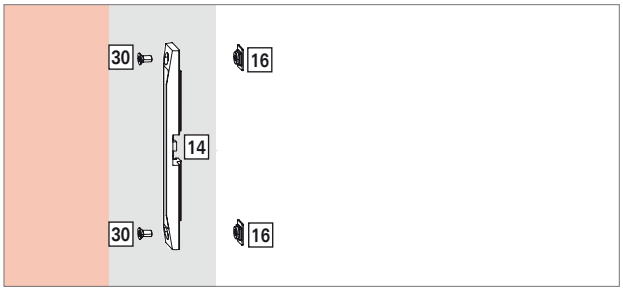
SEC corner drive CL set

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**



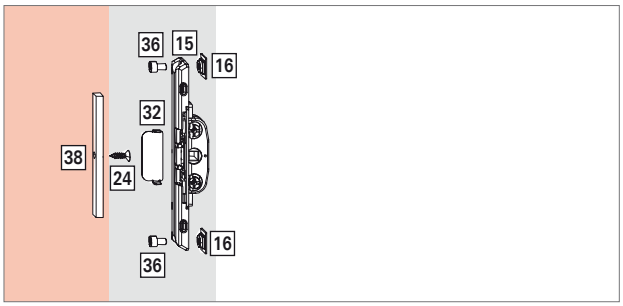
SEC rebate-clearance reduction set

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**



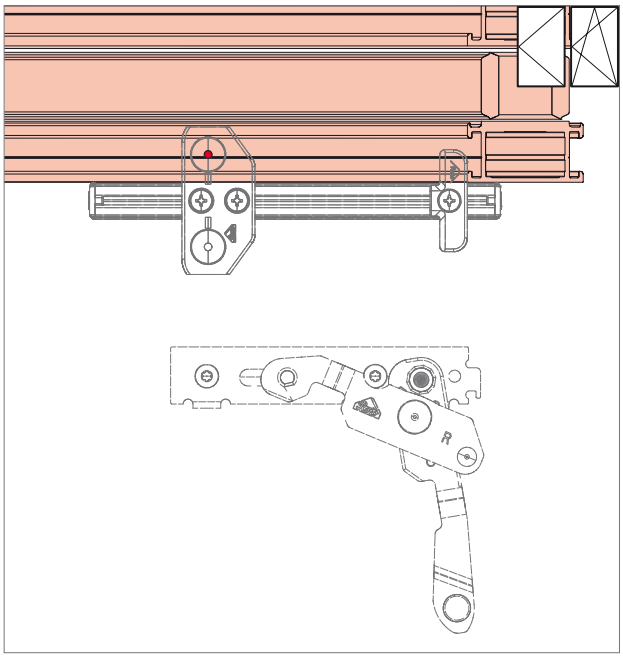
SEC espagnolette protection set

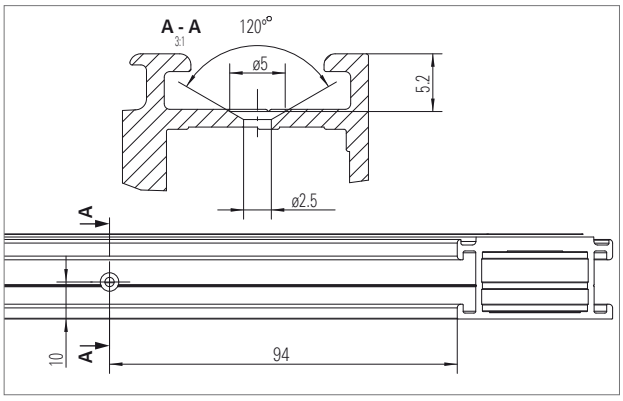
Pos.	Pc(s)	Description	PU	Material no.
[14]	1	**SEC espagnolette protection**	10	**487407**
[16]	2	**SEC connector**	100	**447113**
[30]	2	**Countersunk screw M5x10**	100	**728926**



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 ST4.8 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**





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:

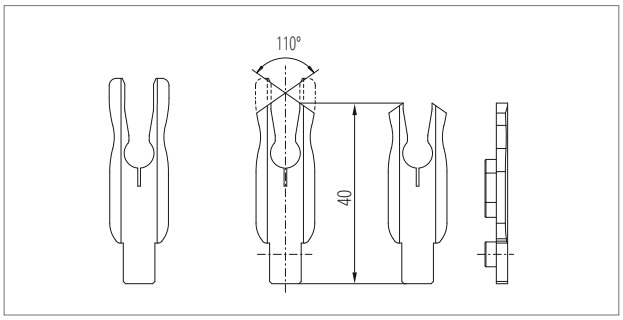
- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (>2 mm)

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

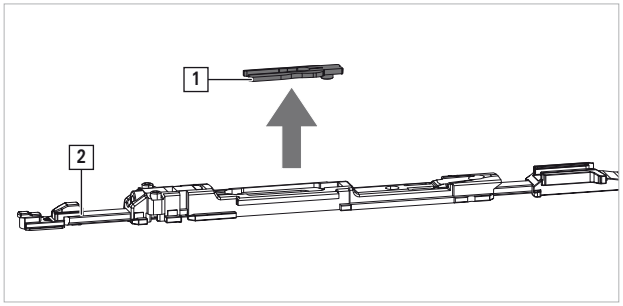
Preassembling scissor stay guide 500, 735 | SH < 800 mm

NOTE!

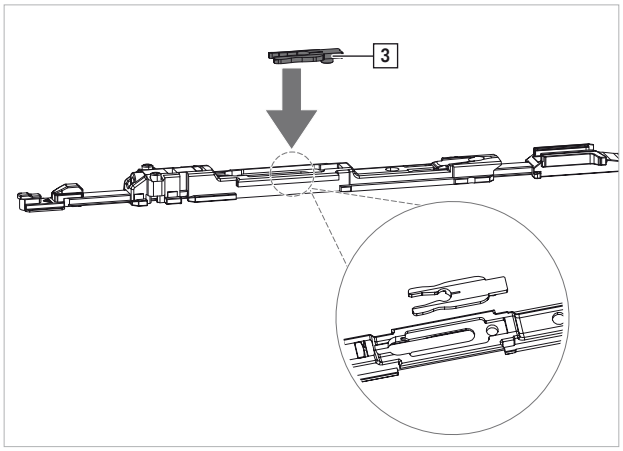
The installation of scissor stay guide 500 is shown here



1. For scissor stay guide 735, crop the tilt distance restrictor according to the drawing.



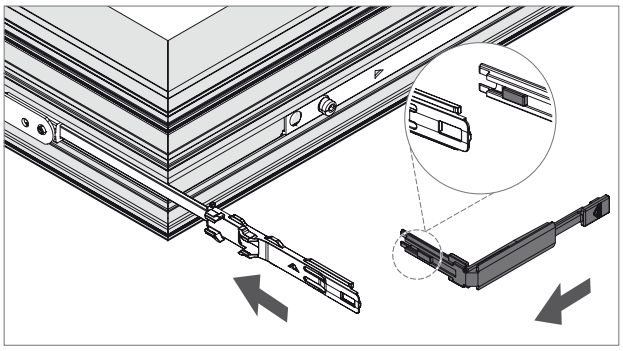
2. Use a tilt distance restrictor for elements with SH ≤ 800 mm or if a reduced tilt distance is required. To do so, remove preassembled spring clip [1] from the scissor stay guide [2].

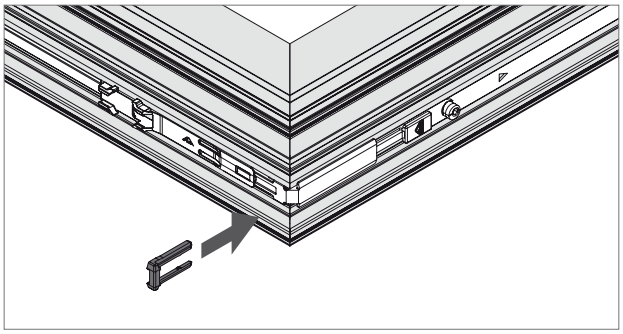


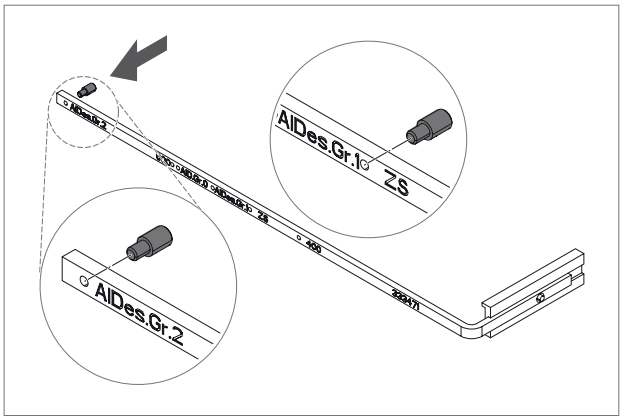
3. Insert the tilt distance restrictor [3].

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.

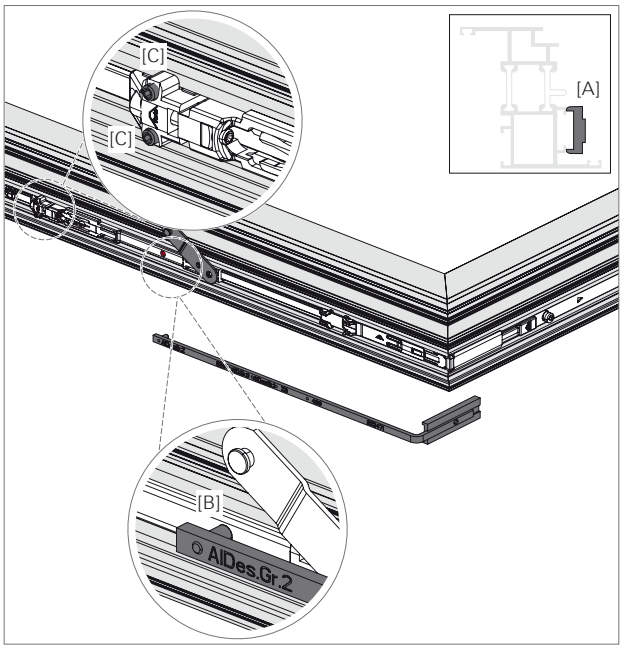
2. Link connecting rod CR3 and the CL corner drive to the scissor stay guide and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the CL corner drive.

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



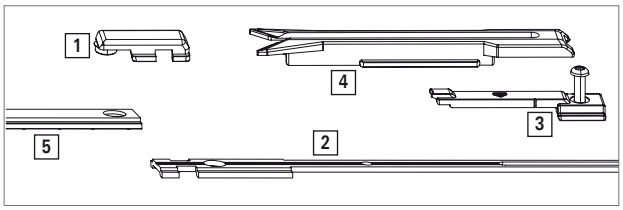
5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

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

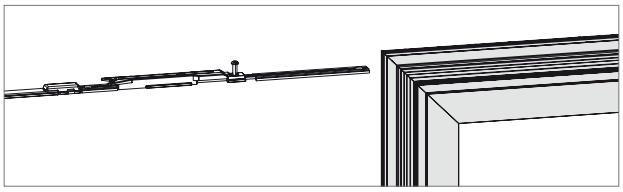
   Tool: T 10 hex key

   Torque max. 2.5 Nm

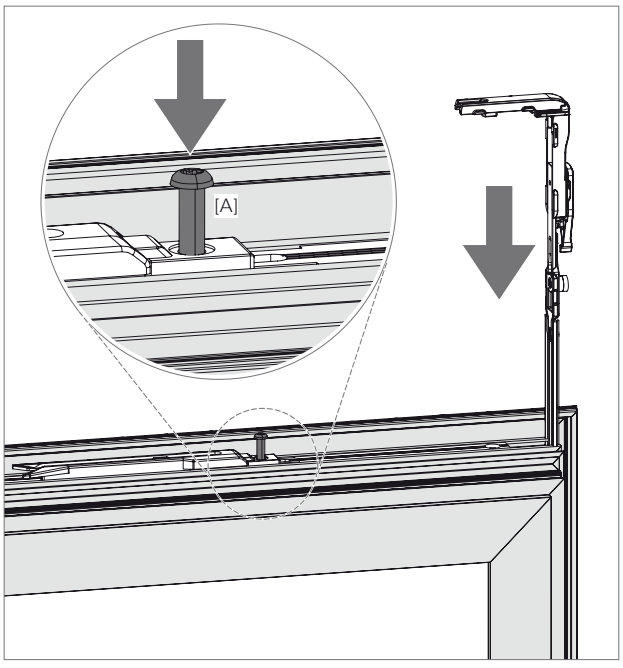
Installing the additional stay arm sash components



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.

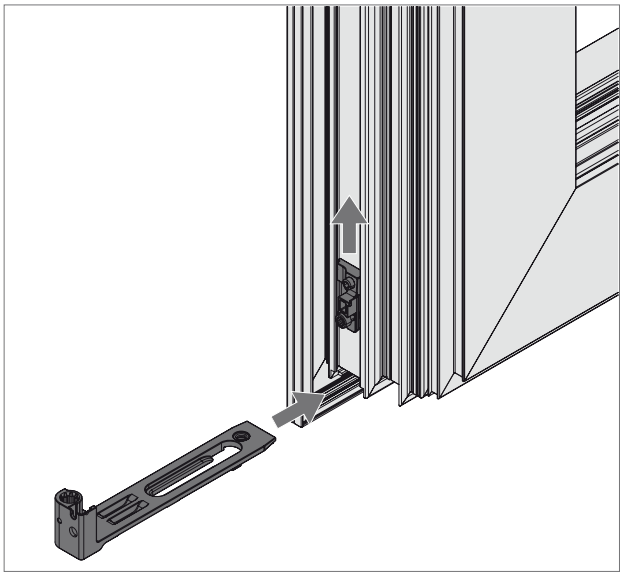


3. Connect the corner drive to connecting rod CR2 and insert it from above into the sash groove on the locking side. Join with the coupling rod.

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

   Tool: T 25 hex key

   Torque: max. 2.5 Nm

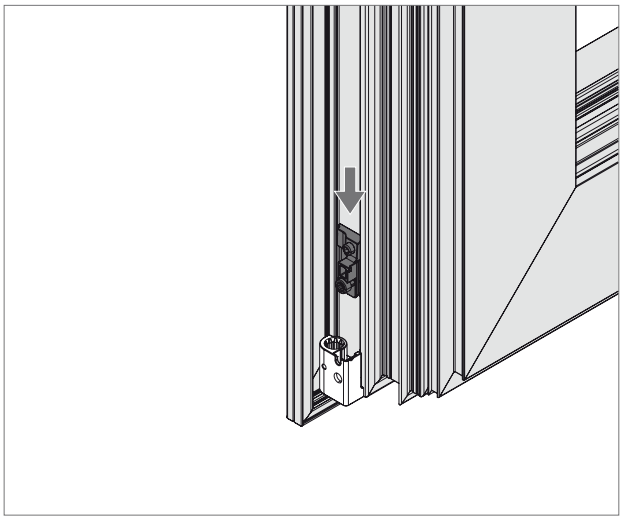


Installing the corner hinge

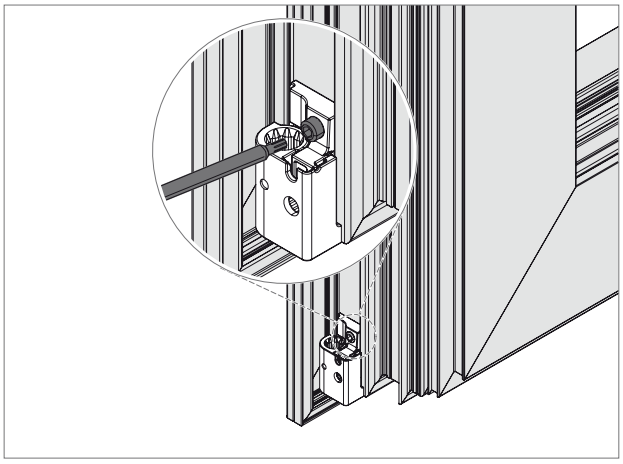
1. Insert the adjustment piece into the connecting rod groove.

NOTE!
The 180 kg adjustment piece does not feature lateral adjustment.

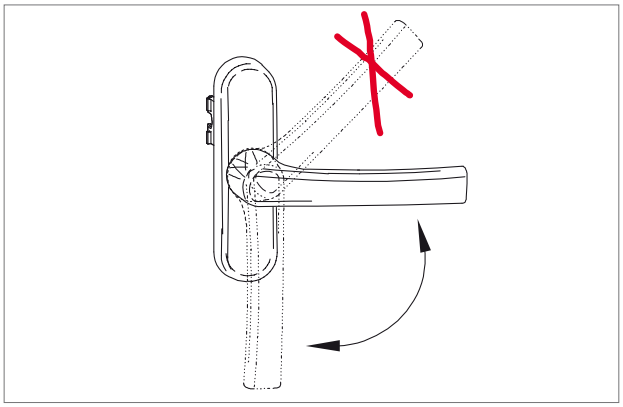
2. Insert the corner hinge into the connecting rod groove.



3. Push the adjustment piece into the corner hinge.

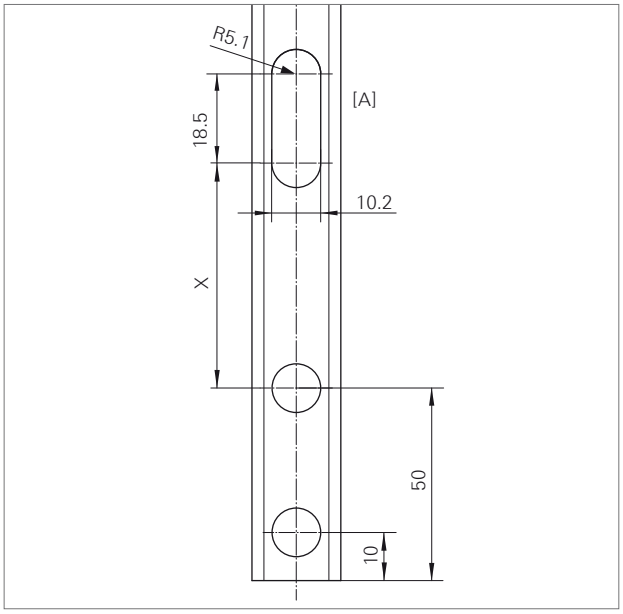


4. Screw in the threaded pin.
Tool: T 10 hex key
Torque: ≥ 2.5 Nm



Installing the espagnolette lock

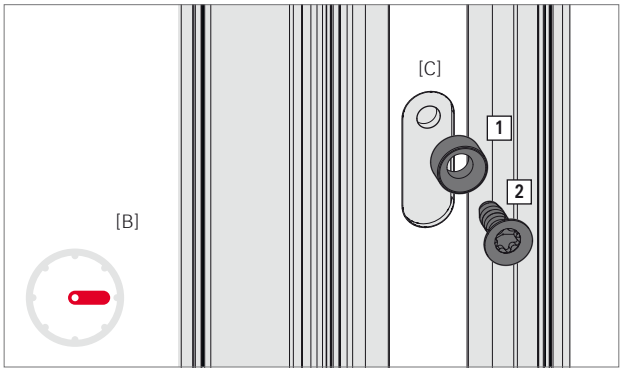
Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.



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

NOTE!

X = freely positionable (suggestion: 60 mm)



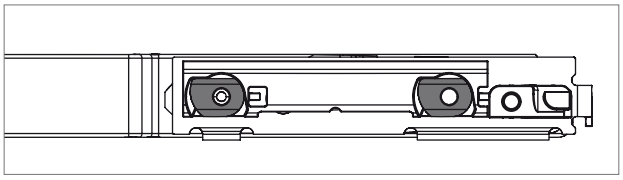
2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

   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!

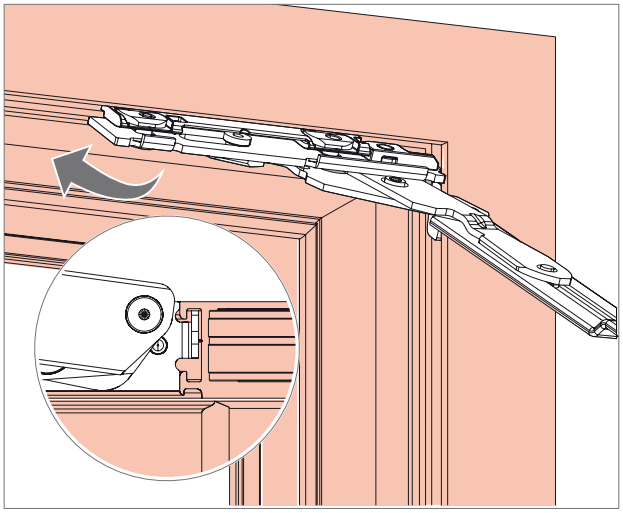
TiSs: only screw down the locking sleeve with the screw after the sash stay has been mounted.



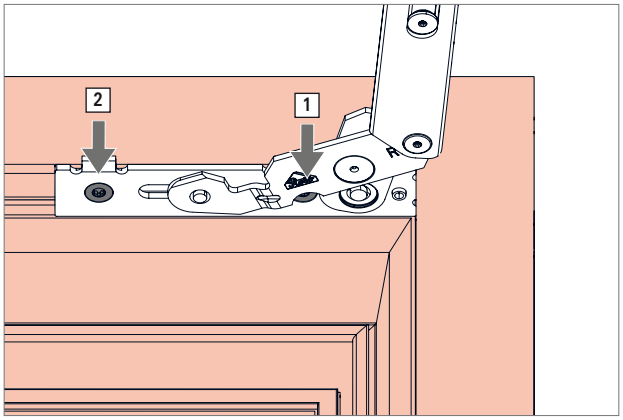
Installing sash stay 500, 735

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].

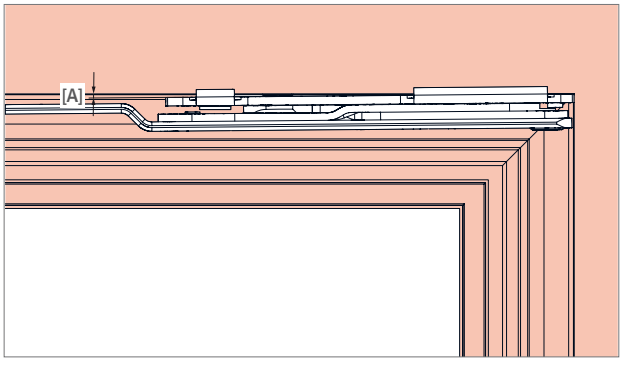
   After tightening the screw, check that the sash stay is securely fitted.

   Tighten the screw [2].

   Tool: T 20 hex key

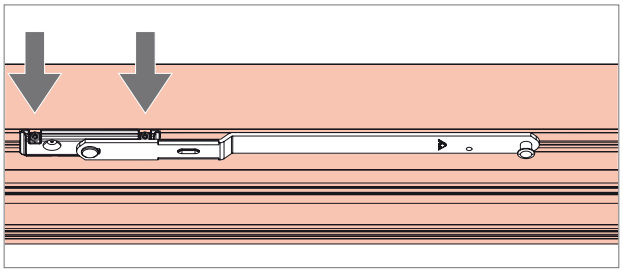
   Torque: max. 5.5 Nm

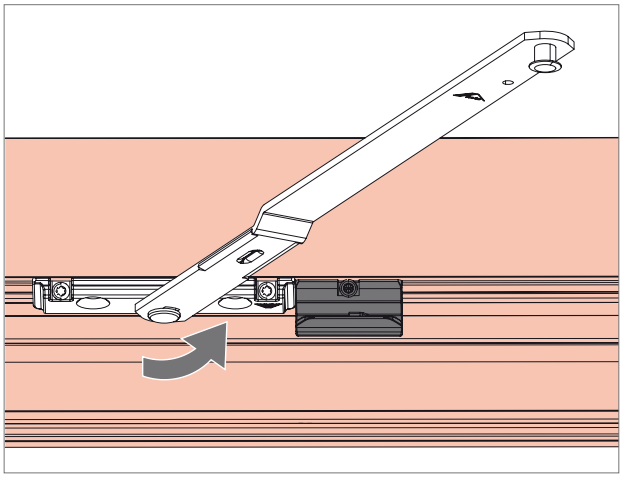
NOTE!
- Depending on the strength of the profile, or with a base groove thickness >2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence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

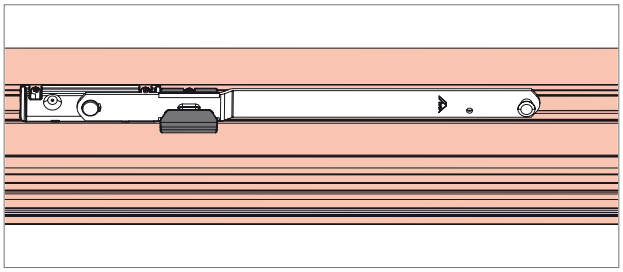


NOTE!
Do not leave a gap between the baseplate and profile [A].

4. Close the support.







Installing the additional stay arm frame components

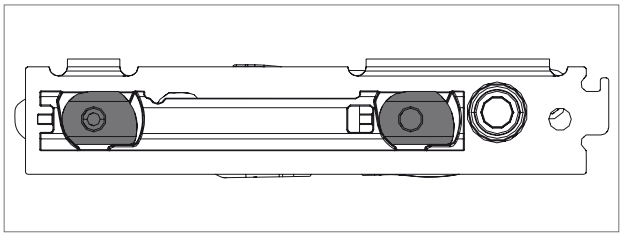
1. Swing the additional scissor stay arm, compl., into the frame at the specified position (see installation drawing).
2. Tighten the support with the preinstalled threaded pins.

   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

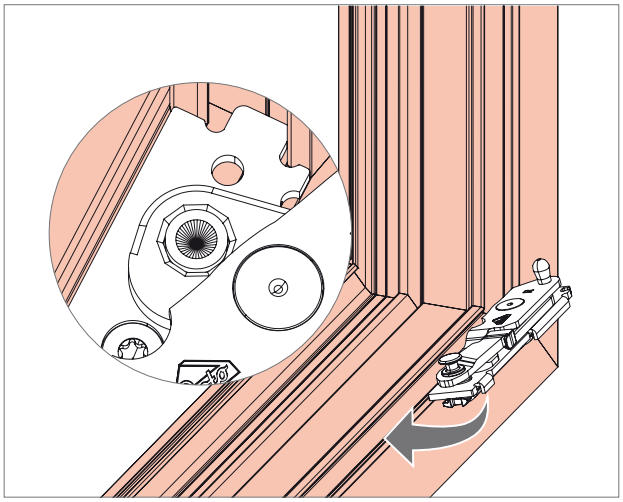
   Torque: max. 2.5 Nm
4. Clip the additional scissor stay arm into the retaining spring.



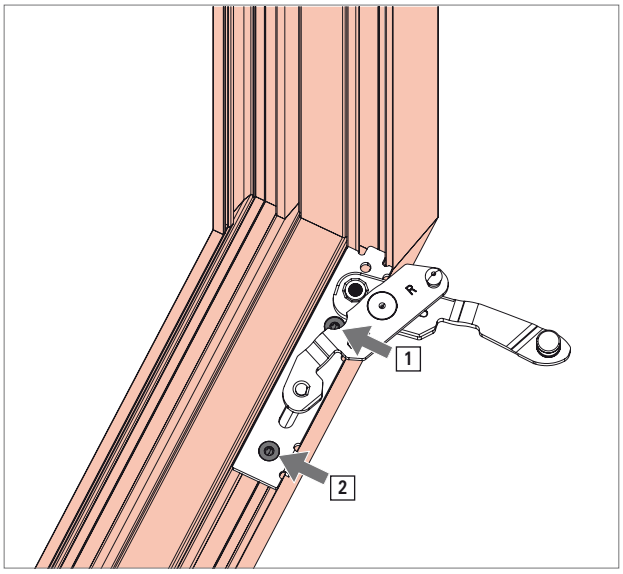
Installing the pivot rest

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].

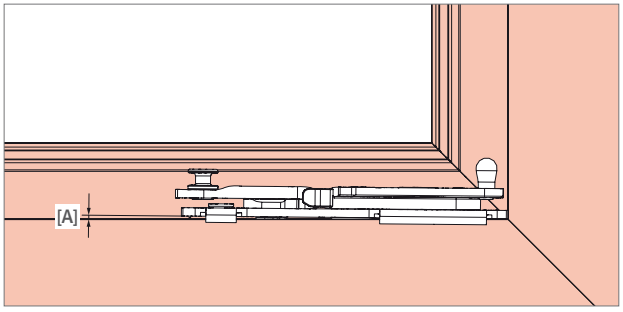
   After tightening the screw, check that the support is securely fitted.

   Tighten the screw [2].

   Tool: T 20 hex key

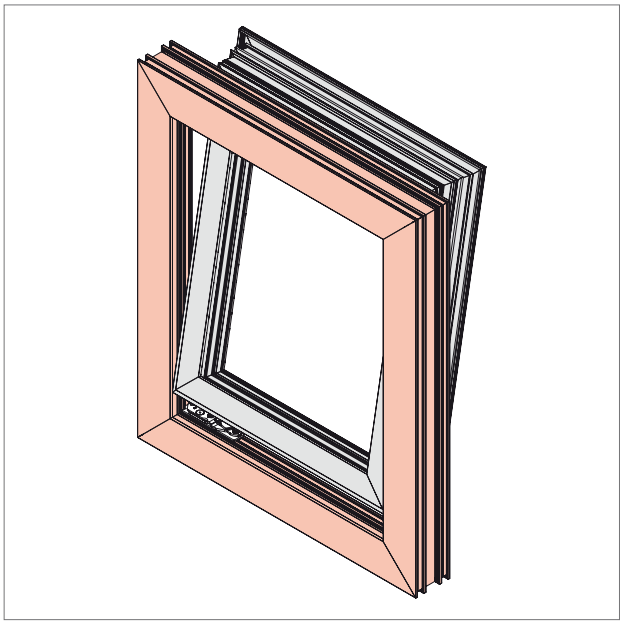
   Torque: max. 5.5 Nm

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.



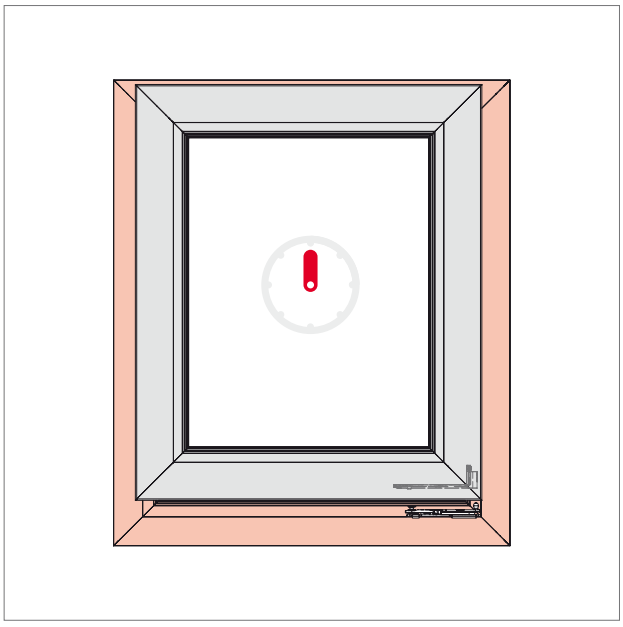
NOTE!
Do not leave a gap between the baseplate and profile [A].

4. Close the support.

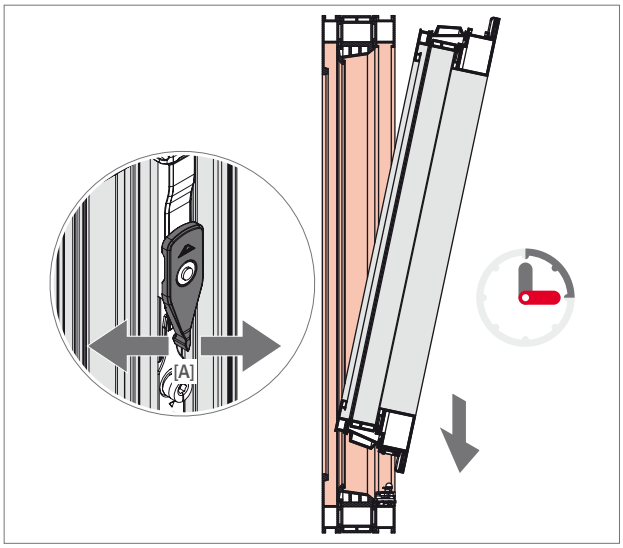


Connecting the pivot rest to the corner hinge

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



2. Move the handle to the turn position.



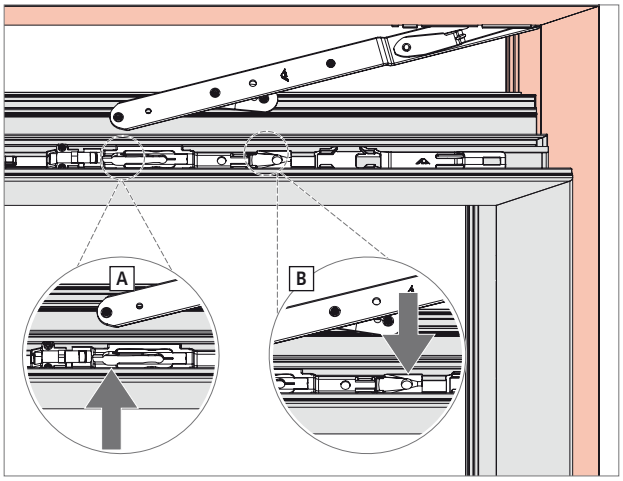
3. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the corner hinge engage in the pivot rest.

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.)

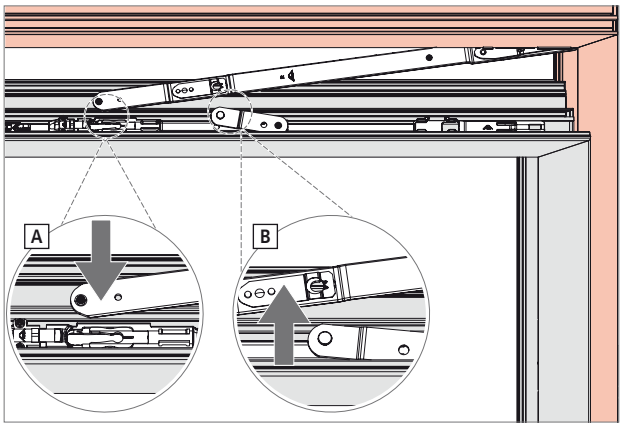


Mounting sash stay 500, 735

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").

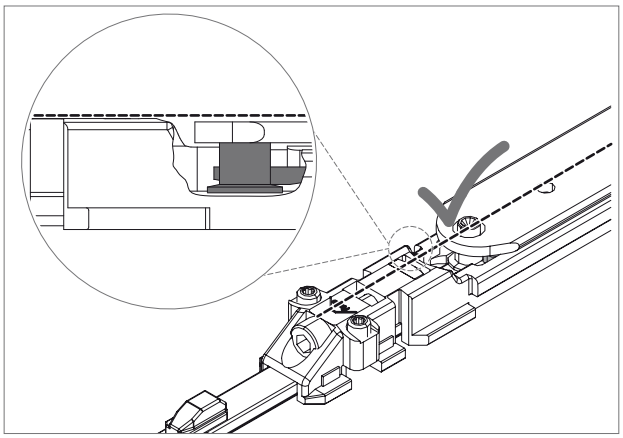
   B = Mount the tab in the hole in the scissor stay guide.



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

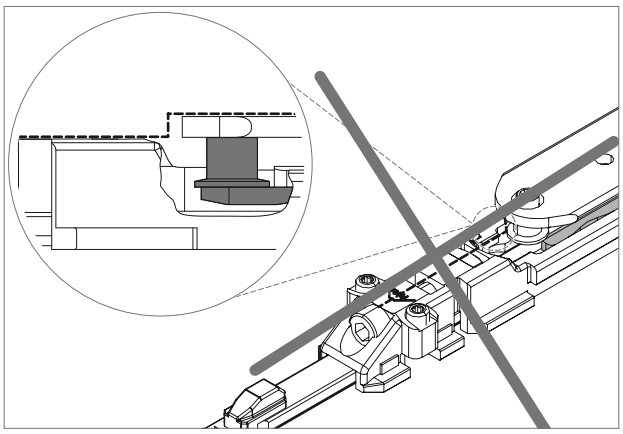
A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting").

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



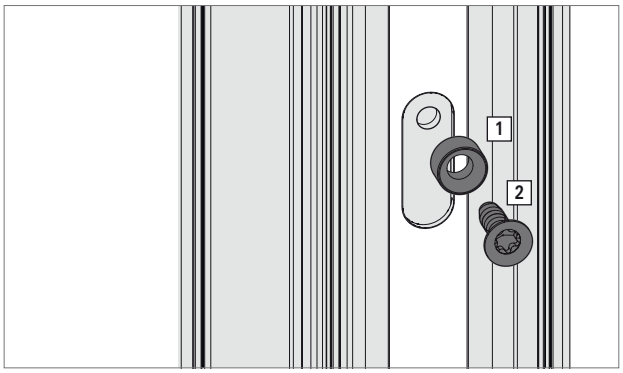
Correct mounting

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



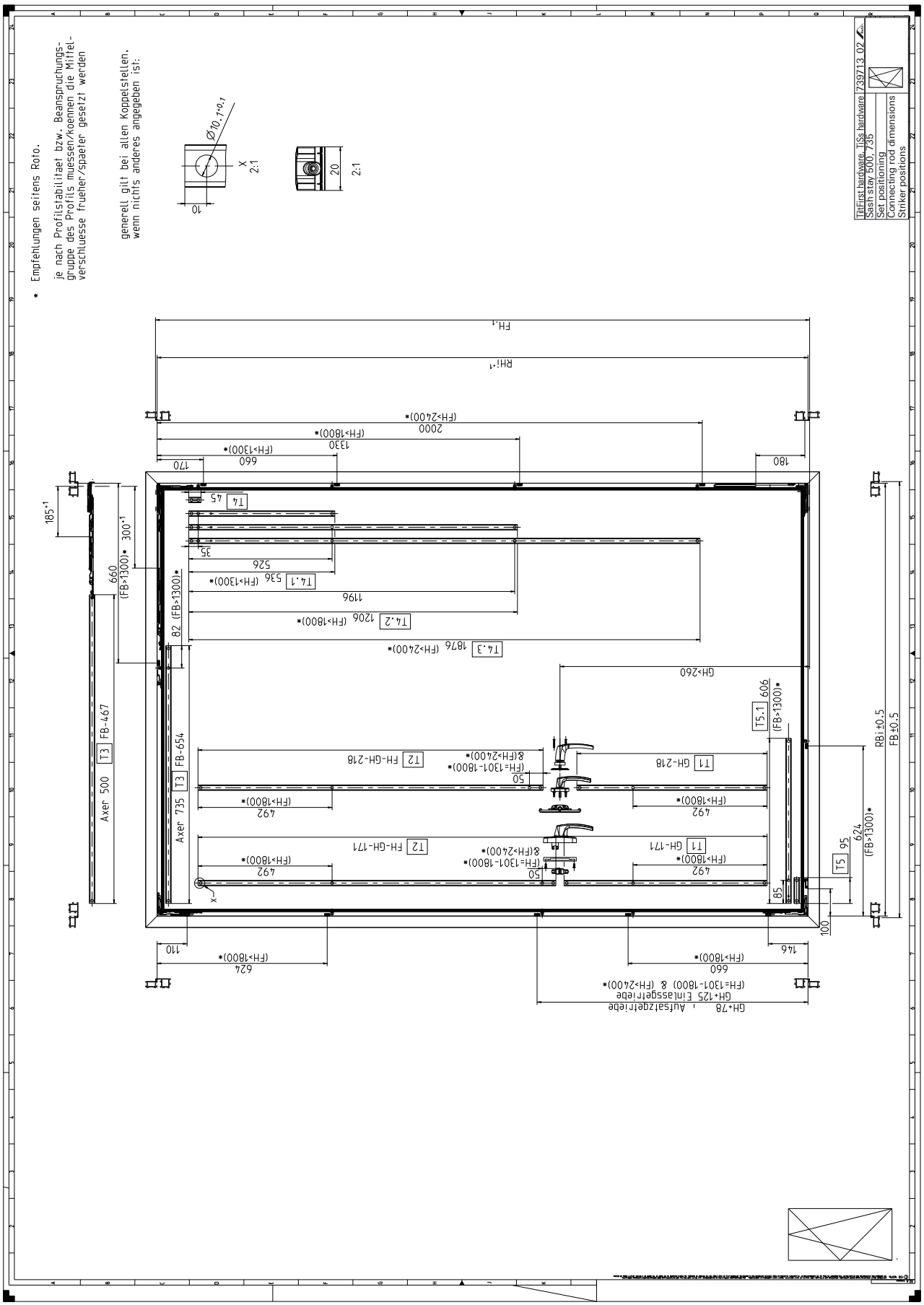
Incorrect mounting

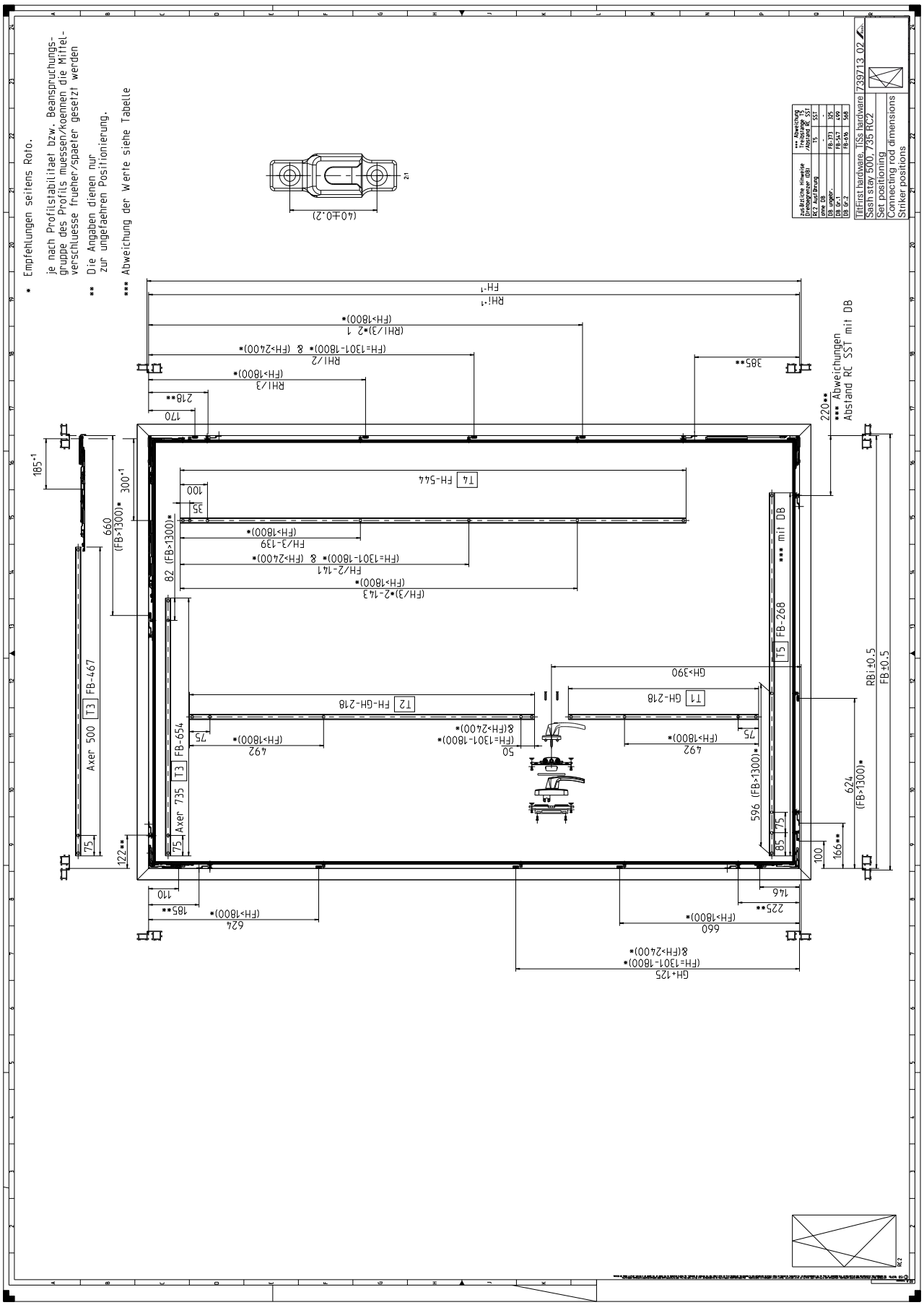
Projection from the sash stay to the scissor stay guide is not permissible.

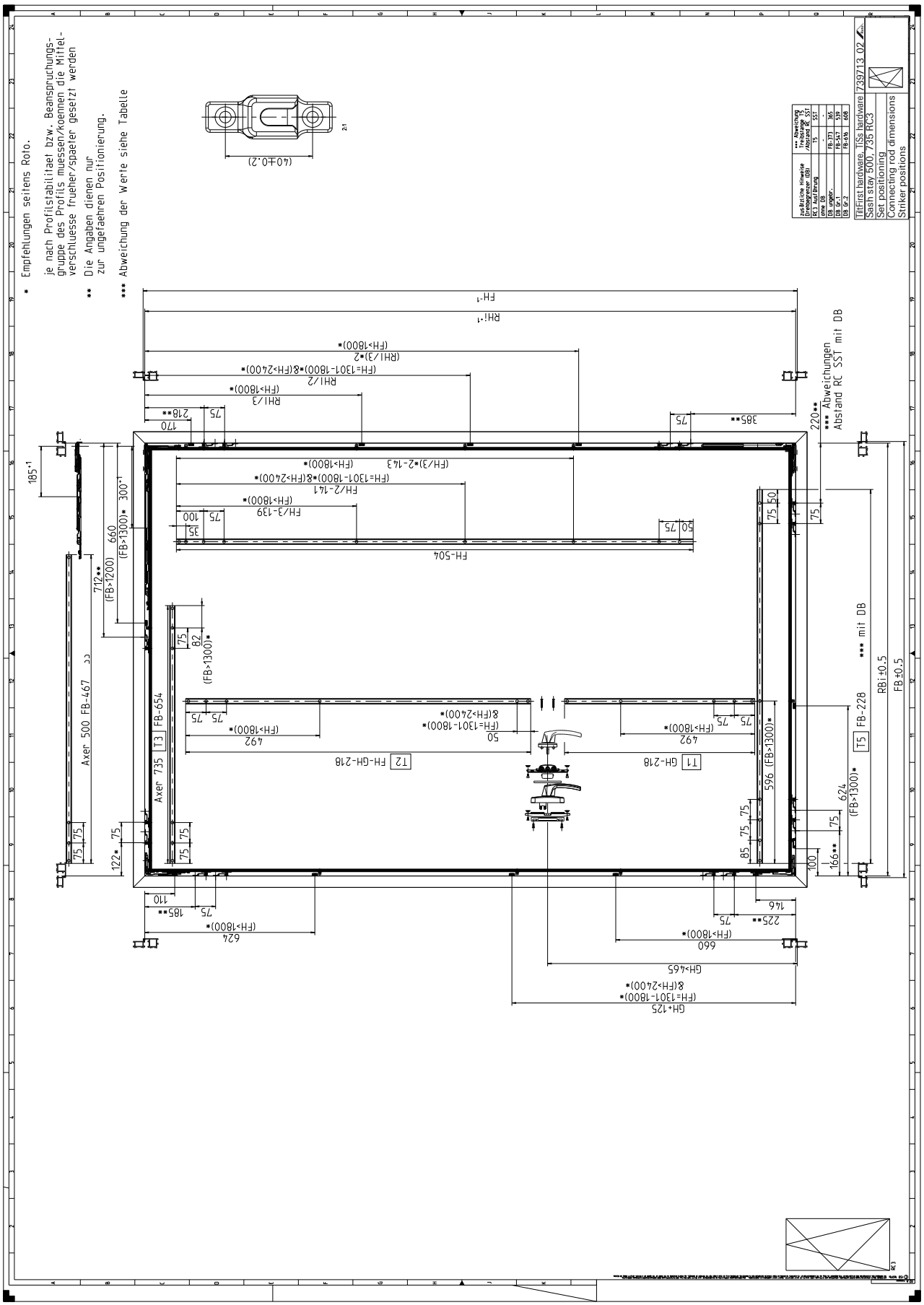


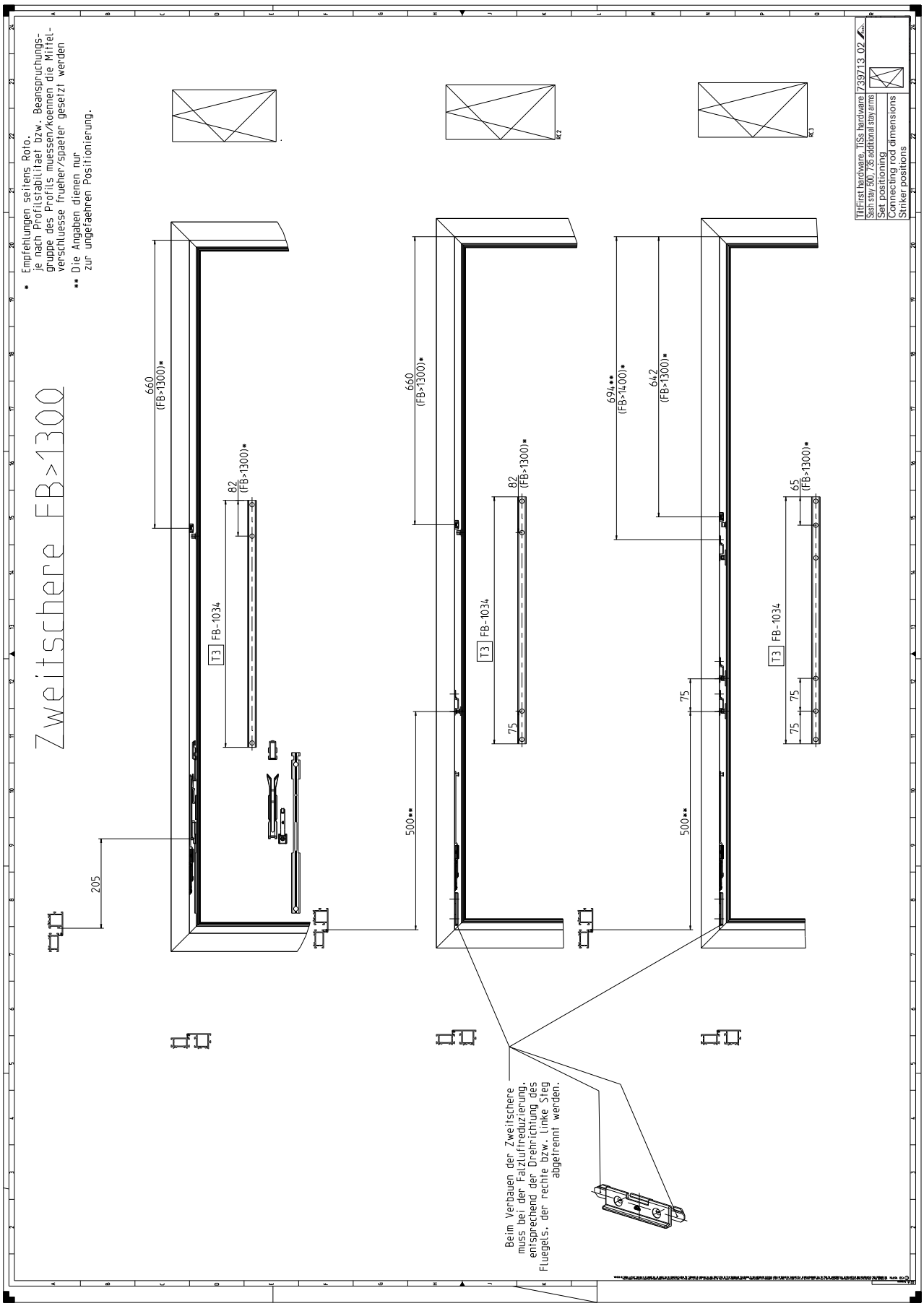
2. TiSs: screw down the locking sleeve [1] with the screw [2].
   Tool: T 25 hex key

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 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)


* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehe/spaeter gesetzt werden
generell gilt bei allen Koppelstellen,
wenn nichts anderes angegeben ist:
TiltFirst hardware, TiSs hardware 7339713 02
Sash stay 500, 735
Set positioning
Connecting rod dimensions
Striker positions
Axer 500
Axer 735
FB-467
FB-654
(FB>1300)*
(FH>1300)*
(FH>1800)*
(FH>2400)*
RBi±0.5
FB±0.5

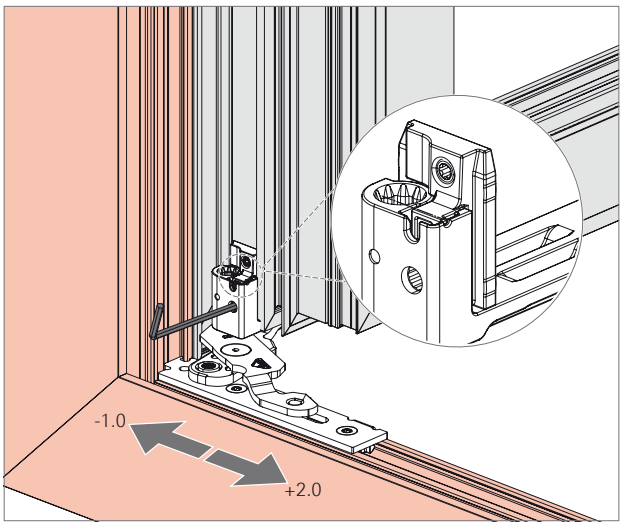

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
TiltFirst hardware, TiSs hardware 7397I3 02
Sash stay 500, 735 RC2
Set positioning
Connecting rod dimensions
Striker positions
*** Abweichung
Treibstange TS
Abstand RC SST
TS SST
FB-373 195
FB-567 490
FB-476 568
Zusätzliche Hinweise
Dreh-Kippfenster DIN
RC2 Aufdrehung
ohne DB
DB ungefr.
DB Gr-1
DB Gr-2
Axer 500 T3 FB-467
Axer 735 T3 FB-654
T5 FB-268
*** mit DB
T1 GH-218
T2 FH-GH-218
T4 FH-544
220** *** Abweichungen Abstand RC SST mit DB
385**
RBI±0.5
FB±0.5
(40±0.2)


* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehen/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
TiltFirst hardware TiSs hardware 7397I3 02
Sash stay 500, 735 RC3
Set positioning
Connecting rod dimensions
Striker positions
*** mit DB
RBi±0.5
FB±0.5
Axer 500 FB-467
Axer 735 T3 FB-654
T5 FB-228
T2 FH-GH-218
T1 GH-218
FH-504
GH+125
GH>465
660
624
596 (FB>1300)*
712** (FB>1200)
660 (FB>1300)*
300*1
185*1
170
218**
385**
220**
*** Abweichungen
Abstand RC SST mit DB


Zweitschere FB>1300
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehen/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1034
205
660 (FB>1300)*
82 (FB>1300)*
T3 FB-1034
75
500**
694** (FB>1400)*
642 (FB>1300)*
65 (FB>1300)*
T3 FB-1034
75
75
75
500**
Beim Verbauen der Zweitschere
muss bei der Falzluftreduzierung,
entsprechend der Drehrichtung des
Fluegels, der rechte bzw. linke Steg
abgetrennt werden.
TiltFirst hardware, TiSs hardware 7397713 02
Slotted stay 500, 735 additional stay arms
Set positioning
Connecting rod dimensions
Striker positions

Note!
Roto hardware components may only be adjusted by authorised professionals.

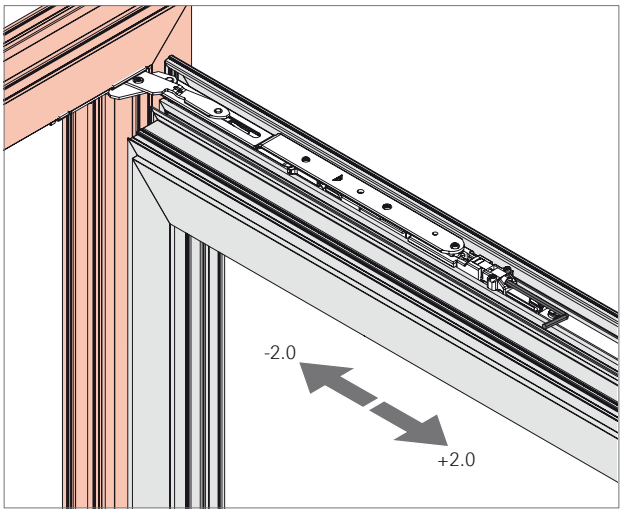
Lateral adjustment



Corner hinge

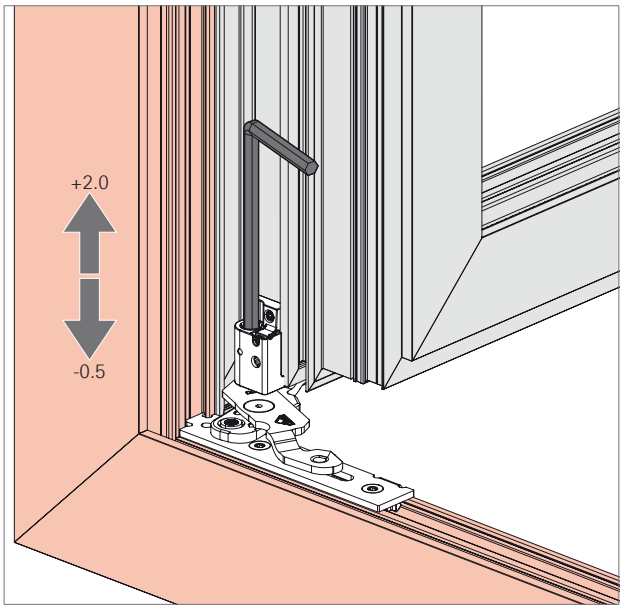
1. Open the window sash 90°.
2. Lateral adjustment -1 mm/+2 mm using hex key size 4.

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.

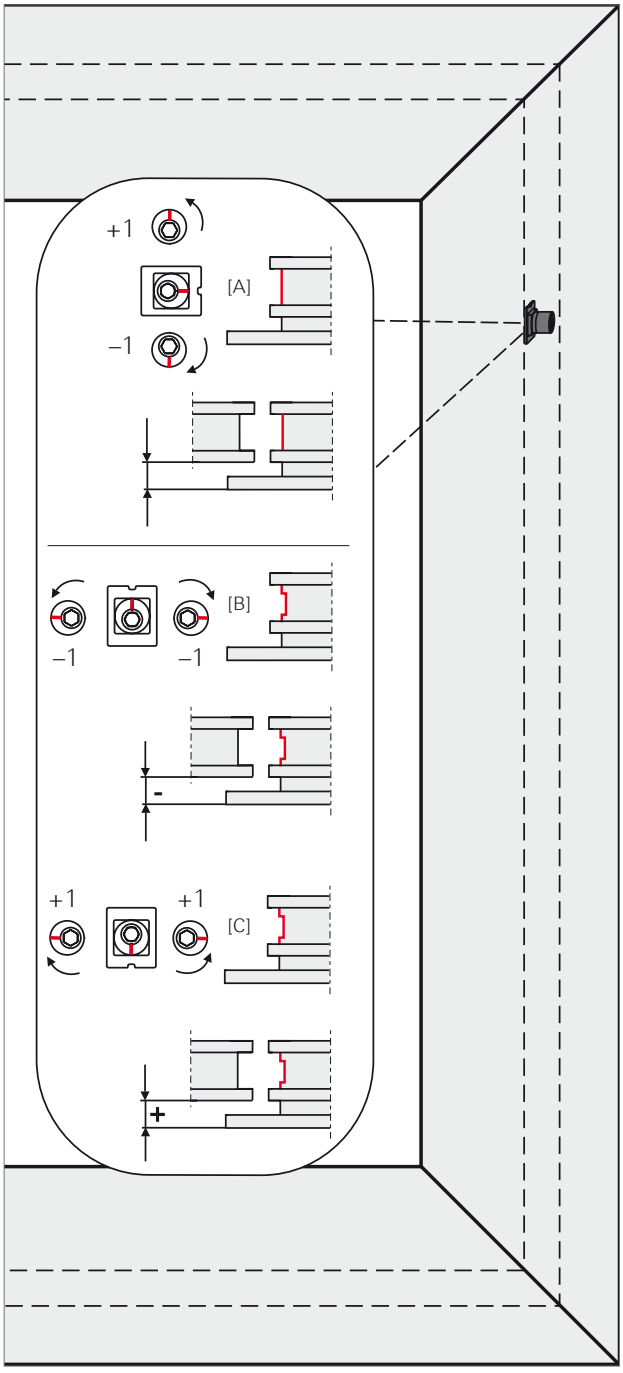


Height adjustment

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.

TuS hardware overview

TuS installation

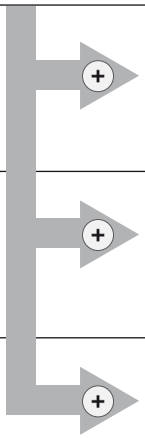
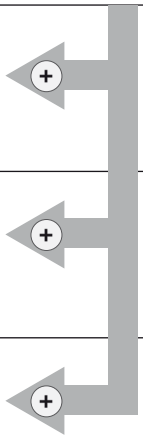
TuS installation drawings

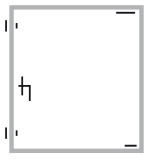
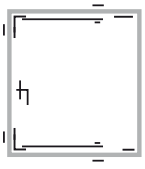
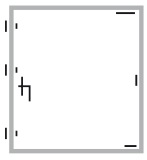
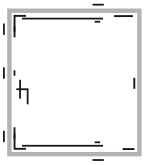
TuS adjustment

Set combinations

Up to 80 kg

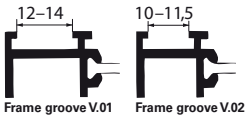
Pay attention to the application diagrams for the various hinge sides. The quantity of centre locks depends on the profile stability (profile system) and must be adapted in line with requirements.

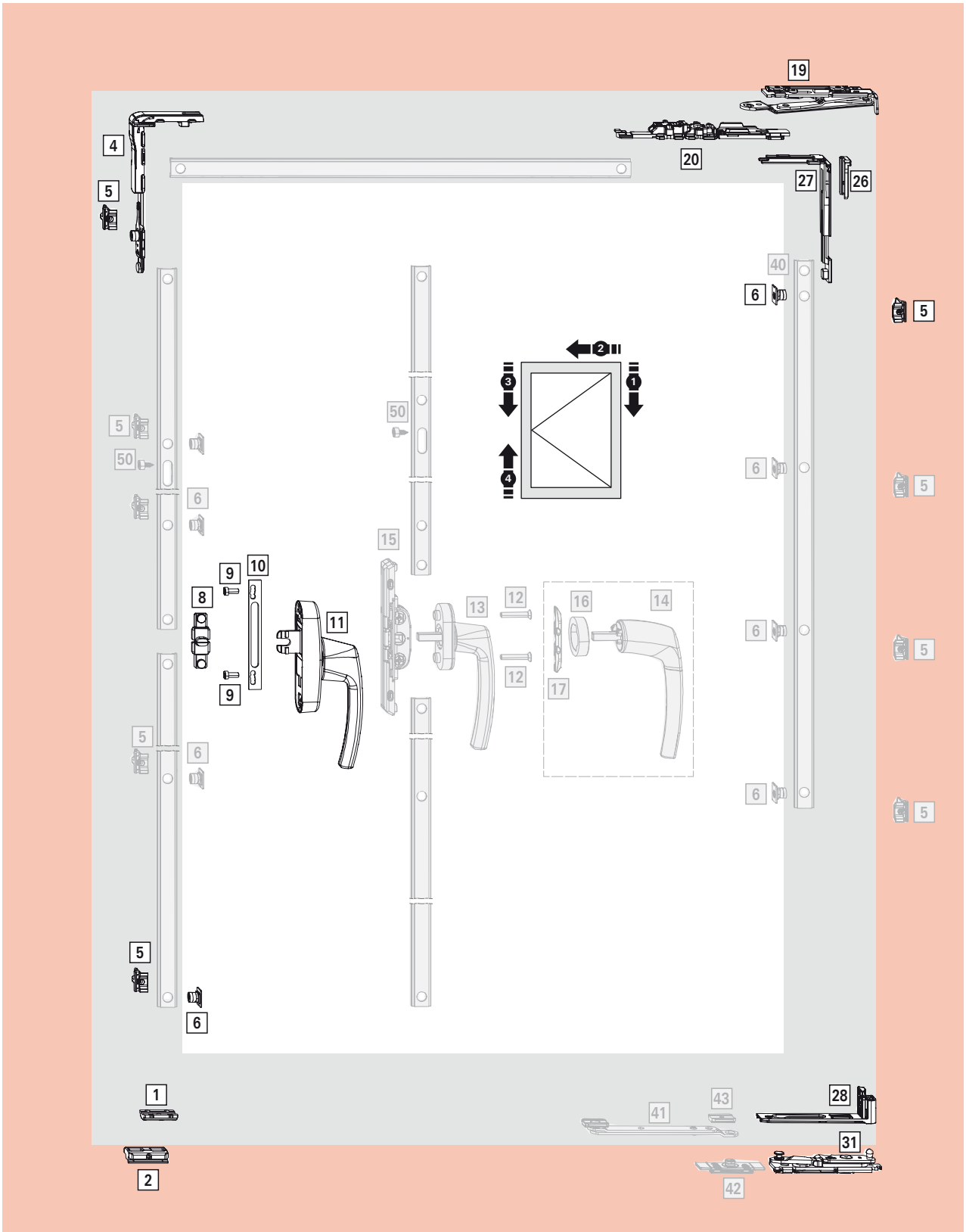
SW / SH	250–1300		1301–1600
520–1300	Pc(s) Description Material no. 1 TuS locking components V.01 728756 TuS locking components V.02 728757 1 Espagnolette and connector var. 1 Rebate sash stay var. 1 Rebate stay hinge 740811 1 Corner hinge L 739700 Corner hinge R 739699 1 Pivot rest var.		Pc(s) Description Material no. 1 TuS-H locking components V.01 728743 TuS-H locking components V.02 728744 1 Espagnolette and connector var. 1 CR5.2 SW 1301–1600 AL 739375 1 Rebate sash stay var. 1 Rebate stay hinge 740811 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			

Hardware overview and parts list

TuS rebate sash stay, coupleable | 80 kg





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**
			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**		→ 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**

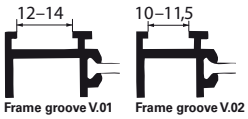
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

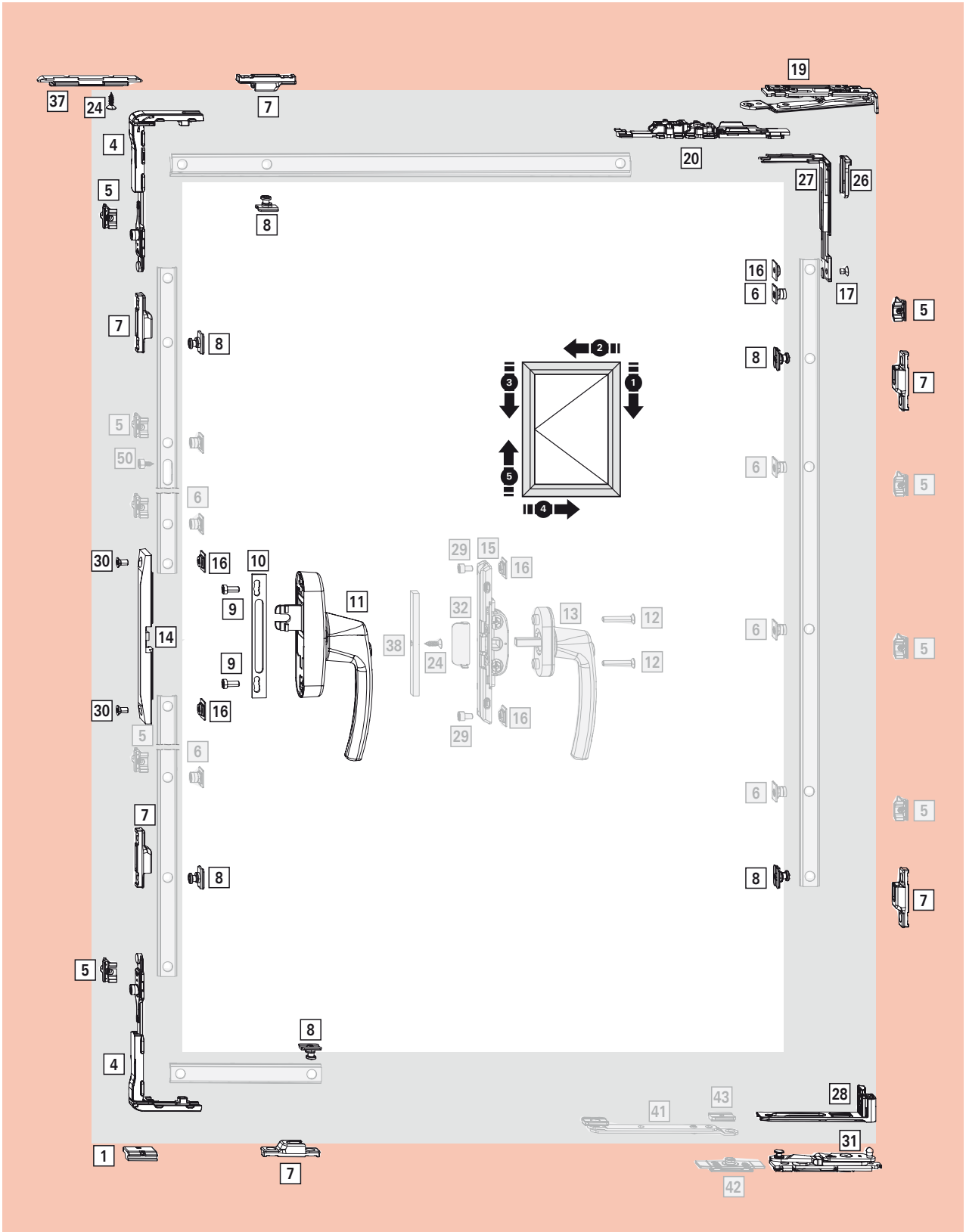
2) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

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

Hardware overview and parts list

TuS RC2 rebate sash stay, coupleable | 80 kg





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

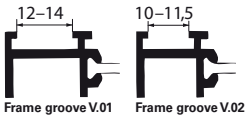
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	**Handle, lockable**		→ CTL 1
[12]	2	**Countersunk screw (stainless steel) M5x30**	100	**212501**
	1	**SEC flush-encased gearbox set**	10	**728947**
		consisting of:		
[15]	1	**SEC flush-encased gearbox without MD** [8]		
[16]	2	**SEC connector**		
[24]	1	**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**		

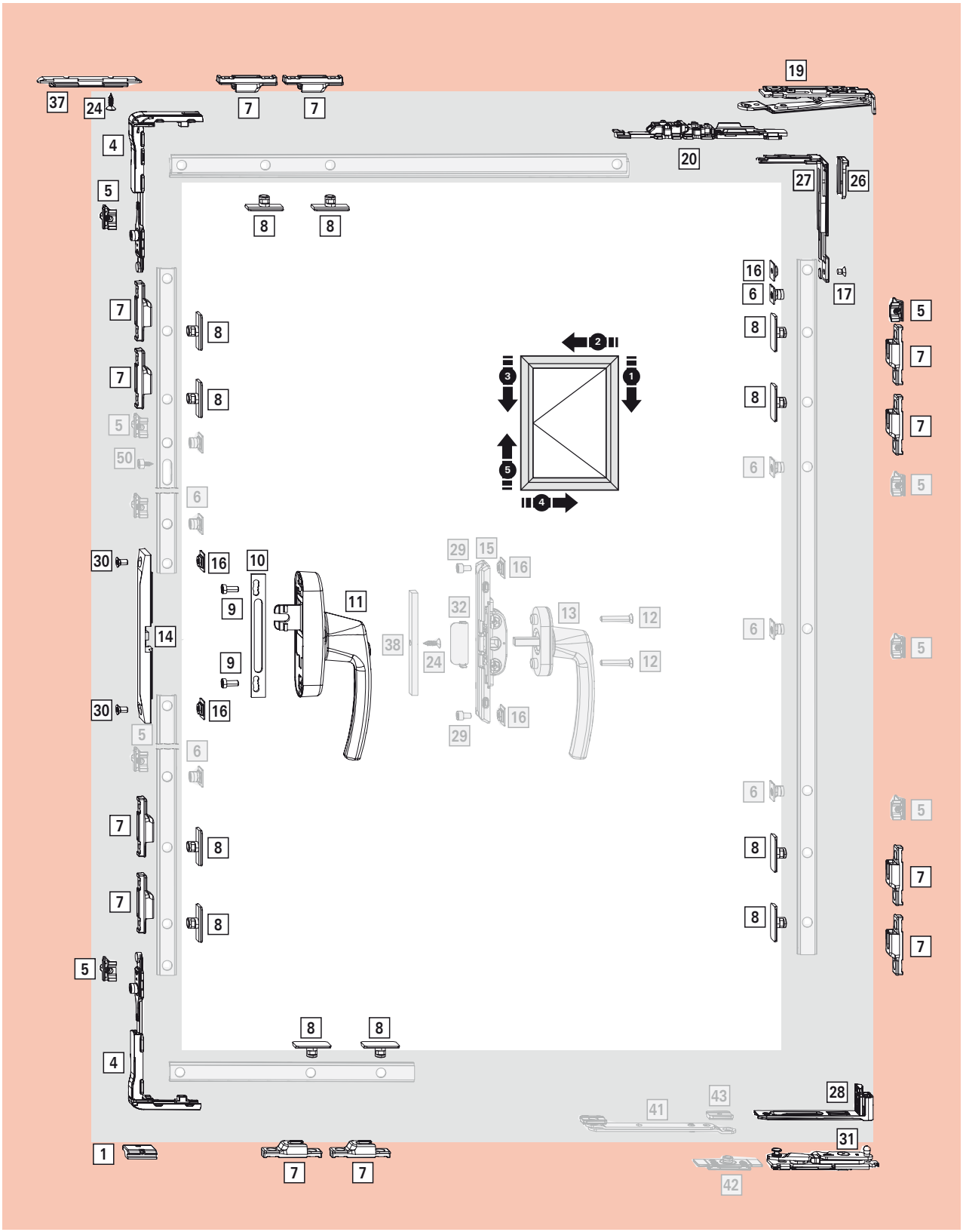
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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

Hardware overview and parts list

TuS RC3 rebate sash stay, coupleable | 80 kg





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**
			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

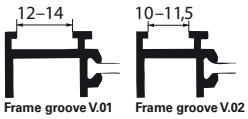
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	**Handle, lockable**		→ CTL 1
[12]	2	**Countersunk screw (stainless steel) M5x30**	100	**212501**
	1	**SEC flush-encased gearbox set**	10	**728947**
		consisting of:		
[15]	1	**SEC flush-encased gearbox without MD** [8]		
[16]	2	**SEC connector**		
[24]	1	**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**		

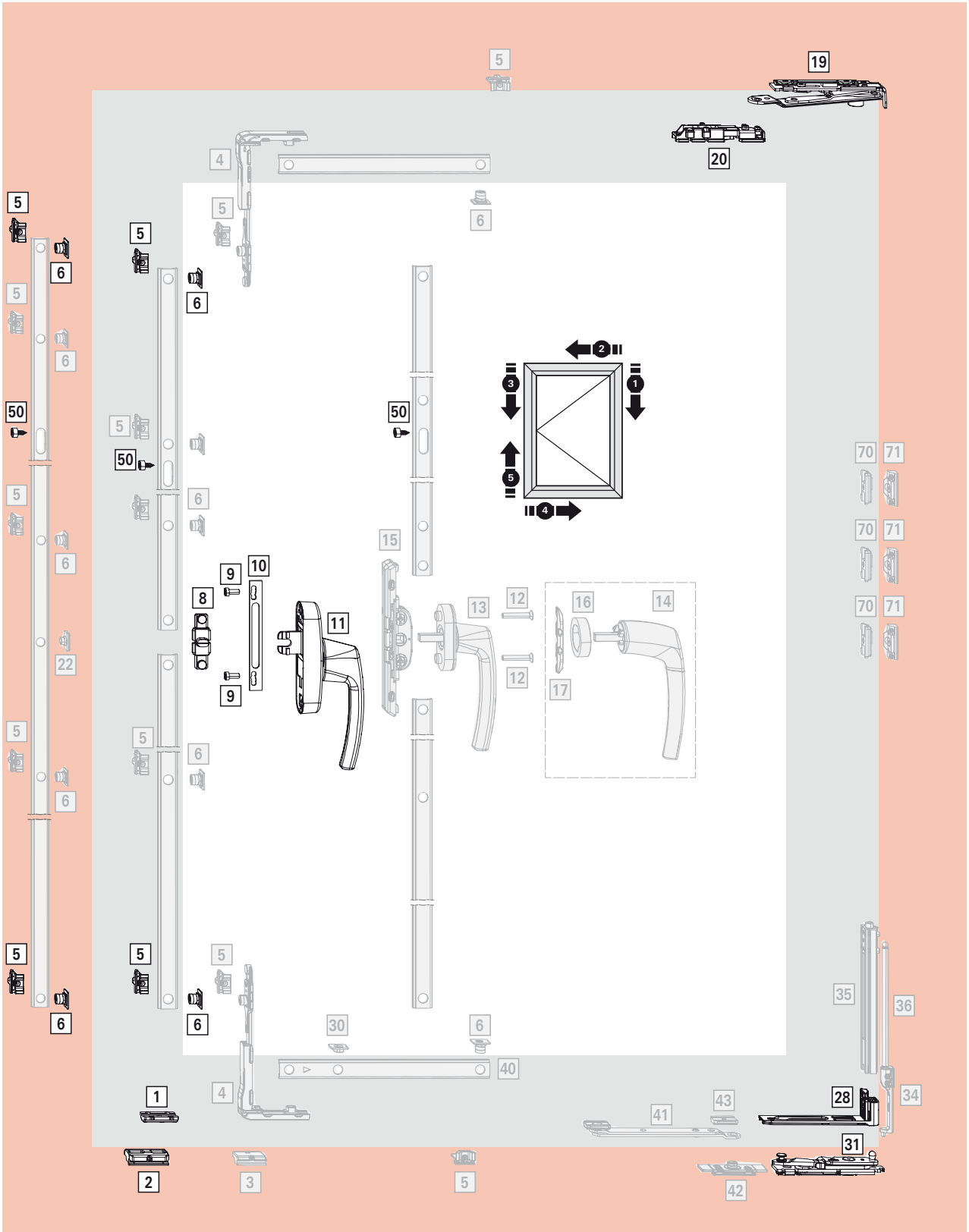
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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

Hardware overview and parts list

TuS | 150 kg





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.

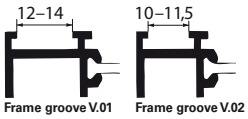
3) For the flush-encased gearbox with blocking device, see page 237.

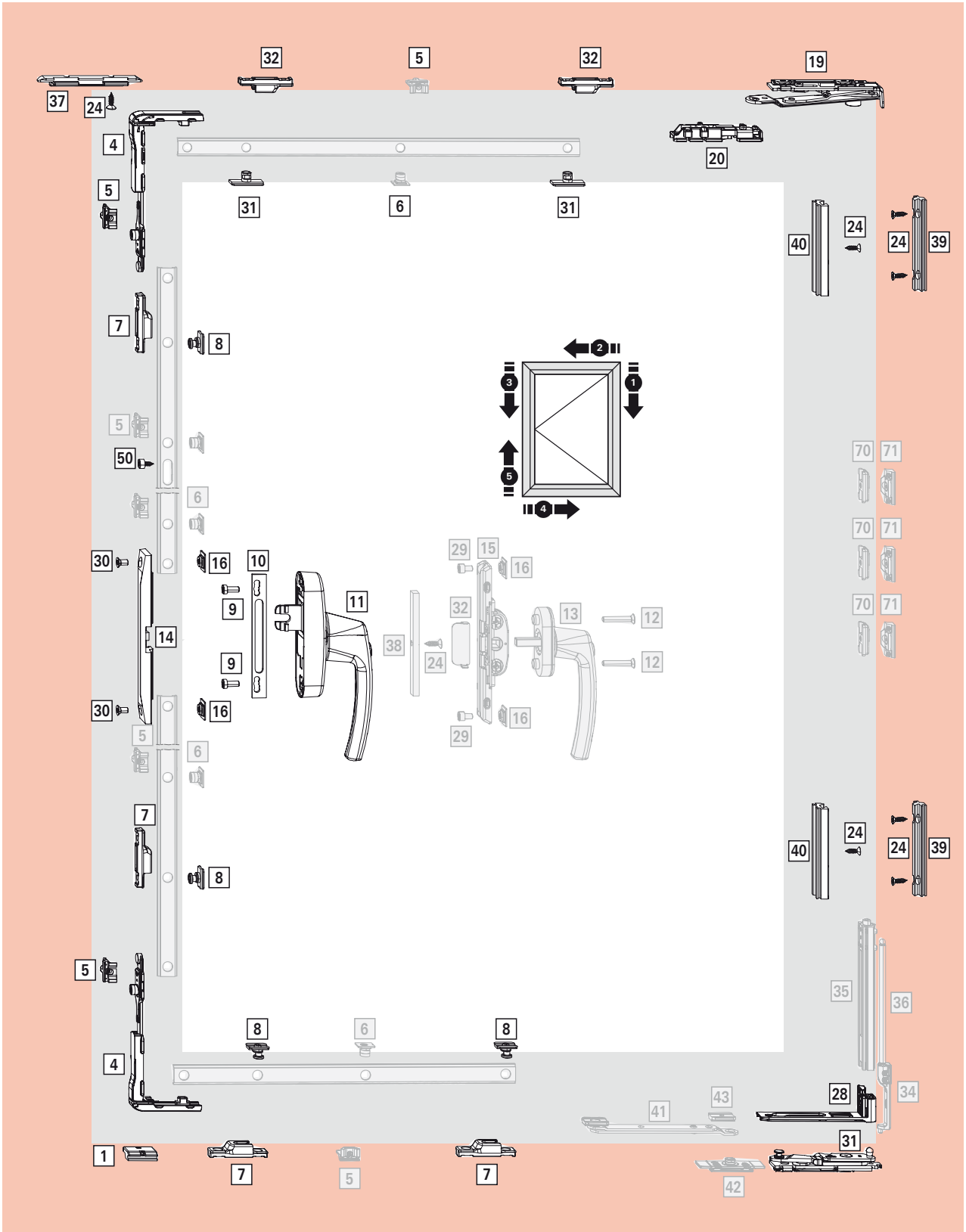
4) The connector bolt, insertable, can be used with SW ≤ 1300 mm.

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

Hardware overview and parts list

TuS RC2 | 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**			

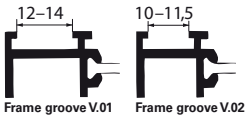
Alternative espagnolettes and connectors

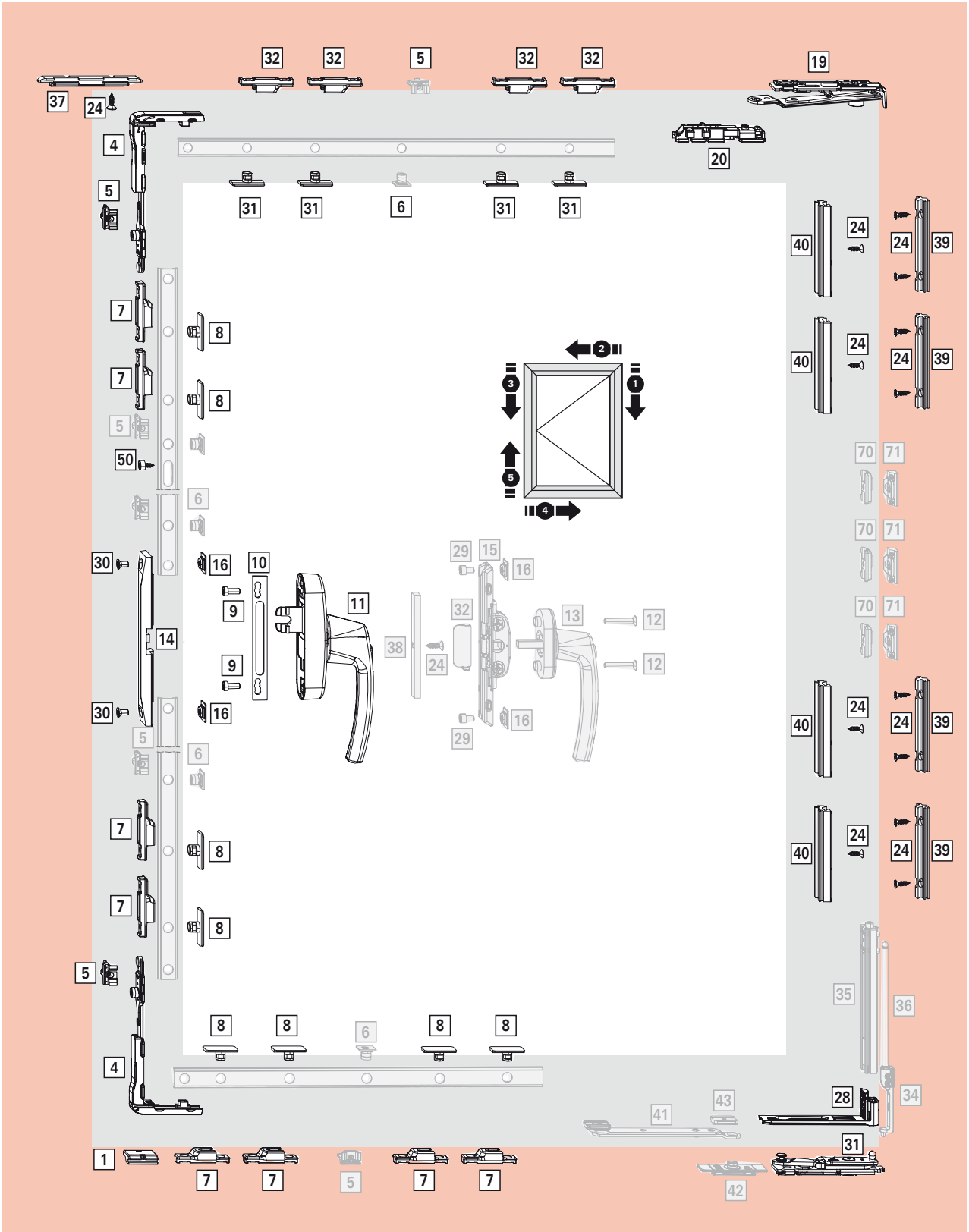
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	**Handle, lockable**		→ CTL 1
[12]	2	**Countersunk screw (stainless steel) M5x30**	100	**212501**
	1	**SEC flush-encased gearbox set**	10	**728947**
		consisting of:		
[15]	1	**SEC flush-encased gearbox without MD** [8)]		
[16]	2	**SEC connector**		
[24]	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**		

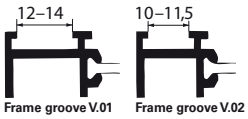
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

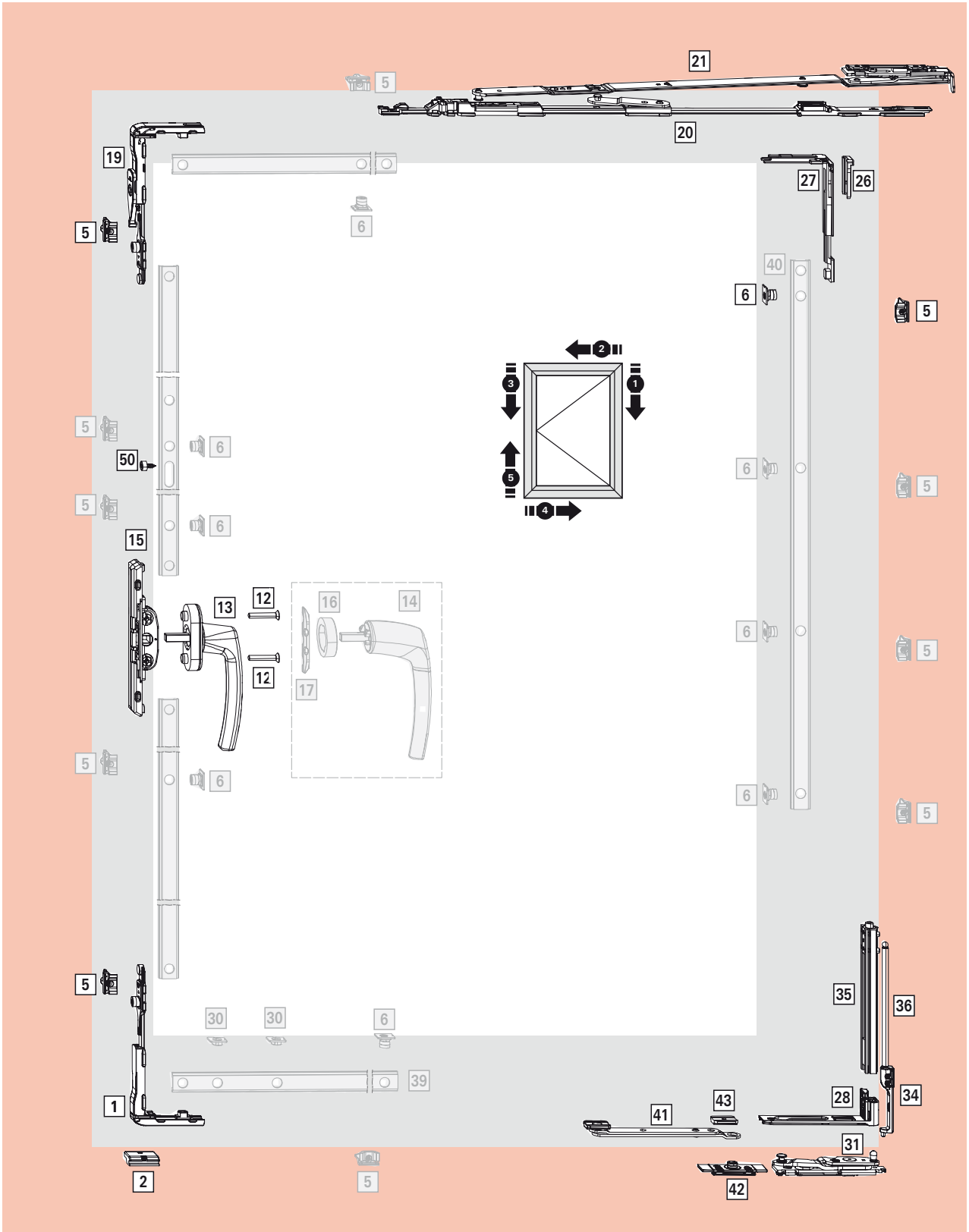
2) For the SEC flush-encased gearbox with blocking device, see page 237.

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

Hardware overview and parts list

TuS | 180 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

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]	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**

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) M5x30**	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!

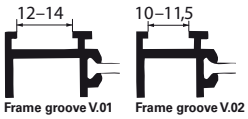
Sash fall due to insufficient profile stability.
Insufficient profile stability may cause the sash to fall.
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

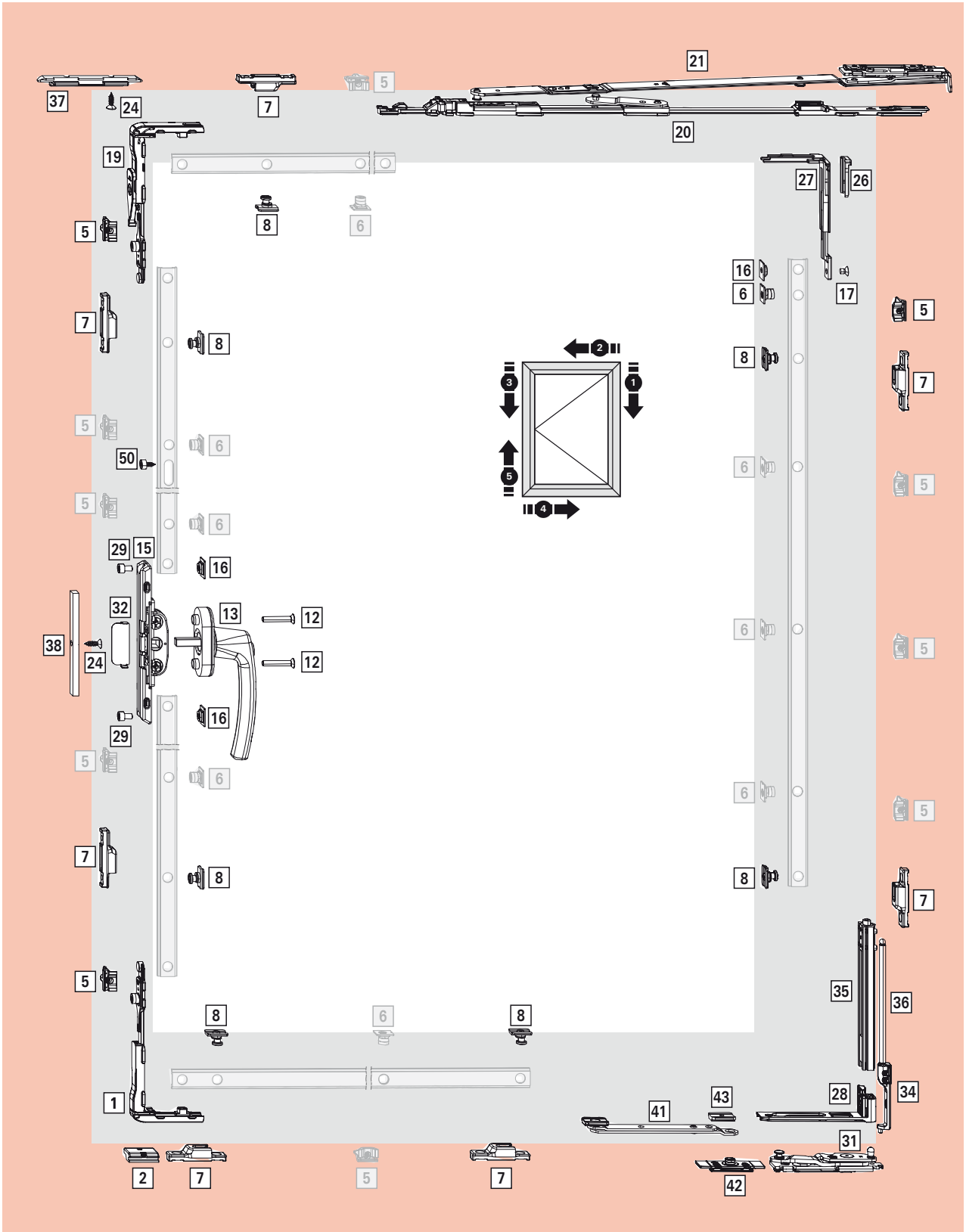
1) The handle without escutcheon can only be used on profile systems with an overlap height (OH) of ≥ 10 mm.

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**	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** [2]		10	**740814**
		Turn restrictor set V.02 [2]		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** [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**

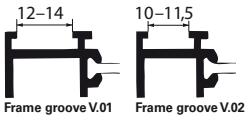
WARNING!

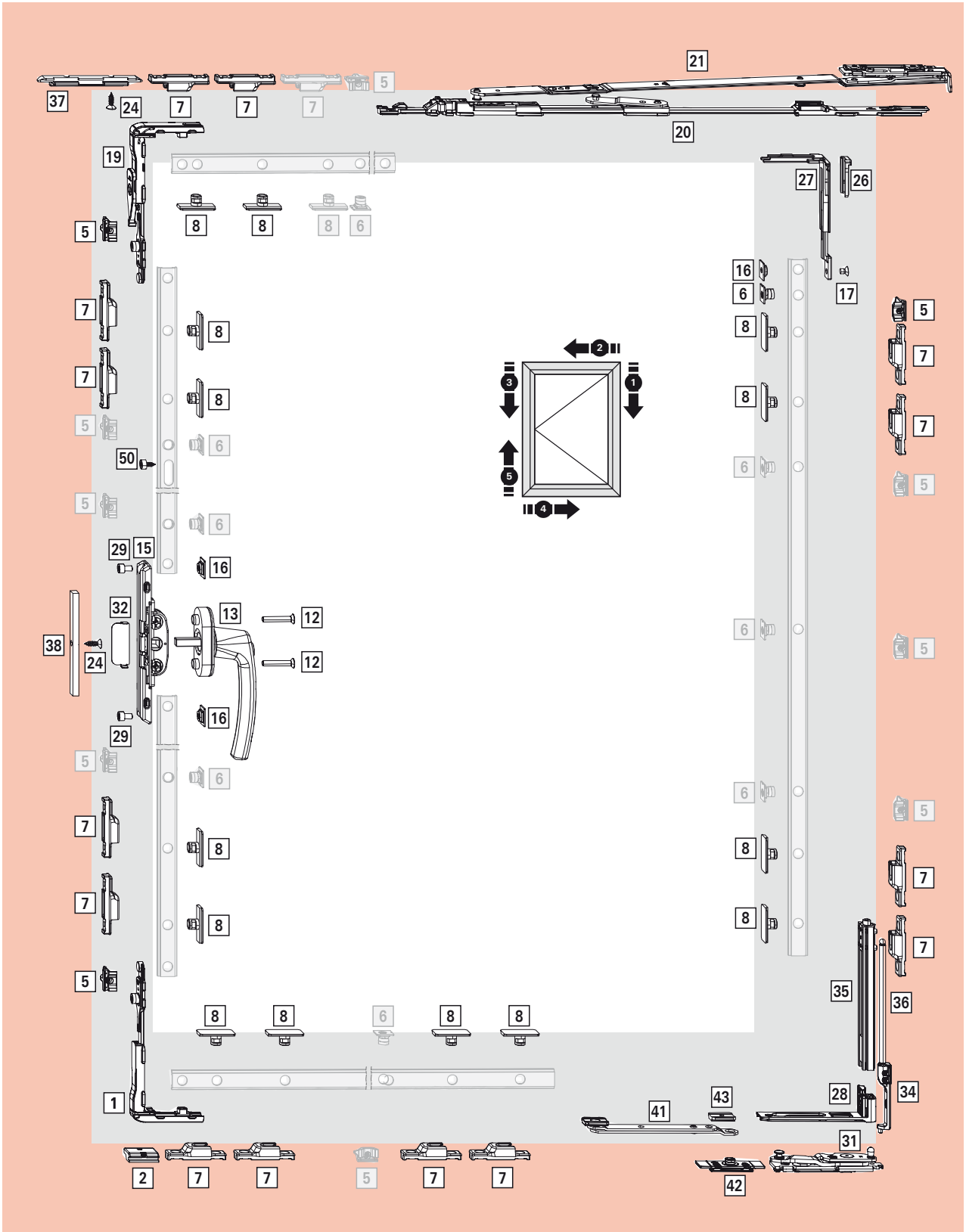
Sash fall due to insufficient profile stability.
Insufficient profile stability may cause the sash to fall.
The hardware may only be used after a profile assessment specially approved for the 150–180 kg hardware has been performed by Roto.

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**	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** [2]		10	**740814**
		Turn restrictor set V.02 [2]		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** [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**

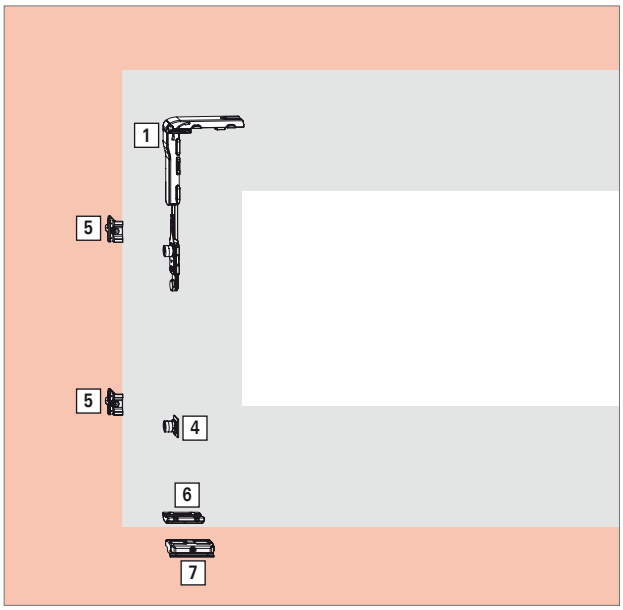
WARNING!

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.

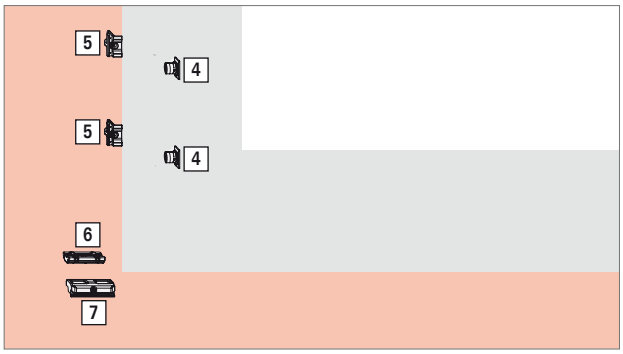
2) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

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



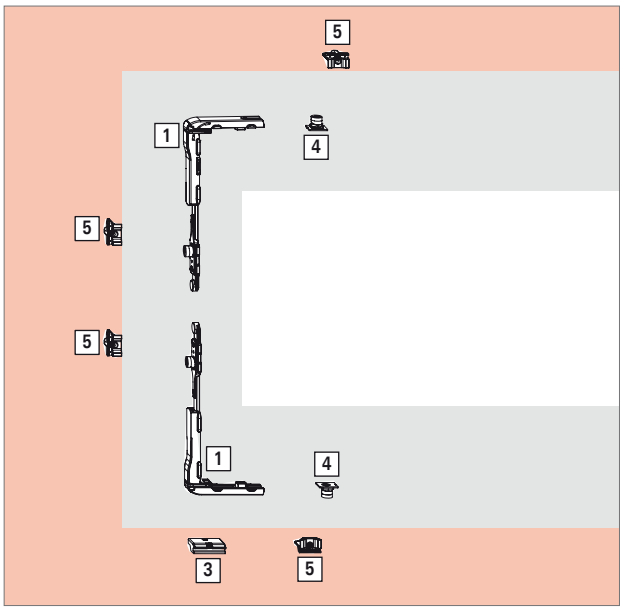
TuS locking components, coupleable

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**

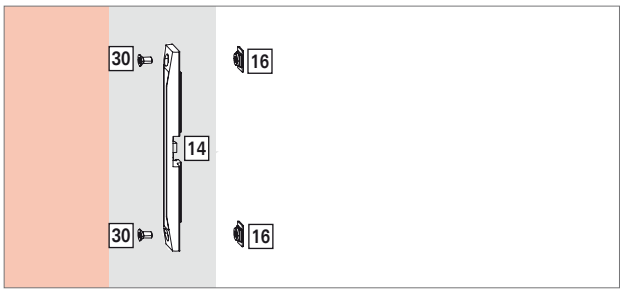


TuS-H locking components

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**

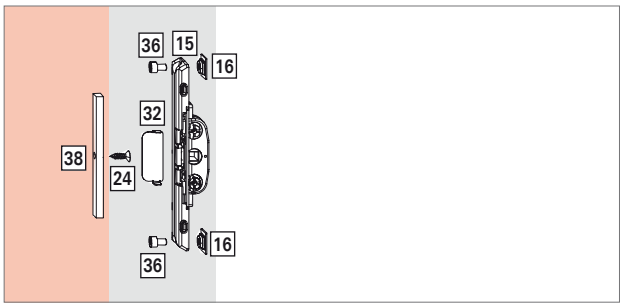
SEC rebate-clearance reduction set

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**

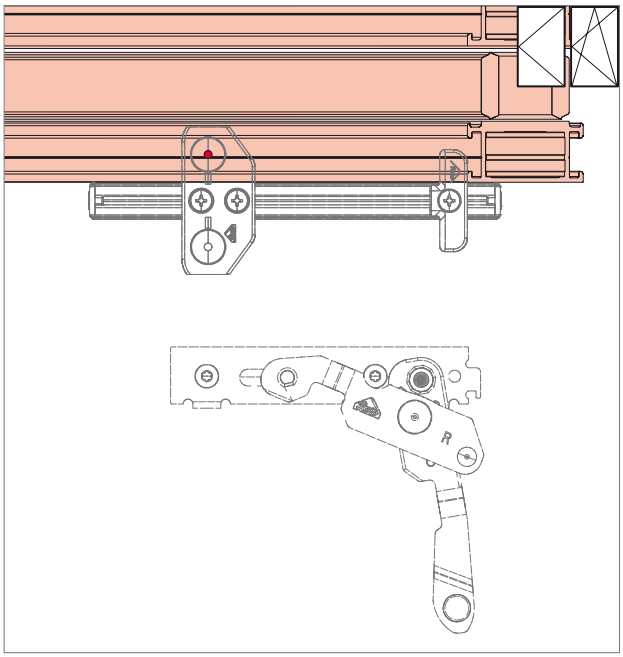


SEC flush-encased gearbox set

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**

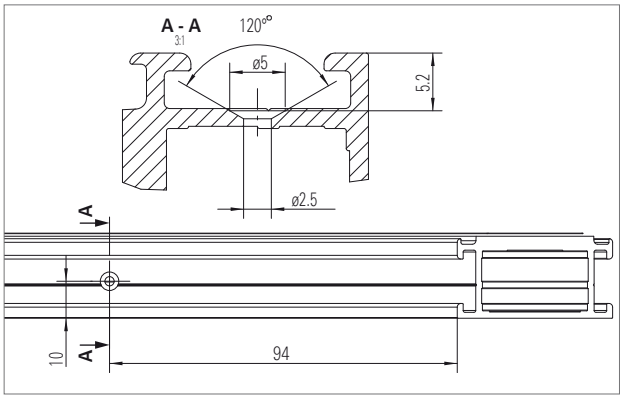


Pivot rest / stay bearing

Jig **628534**

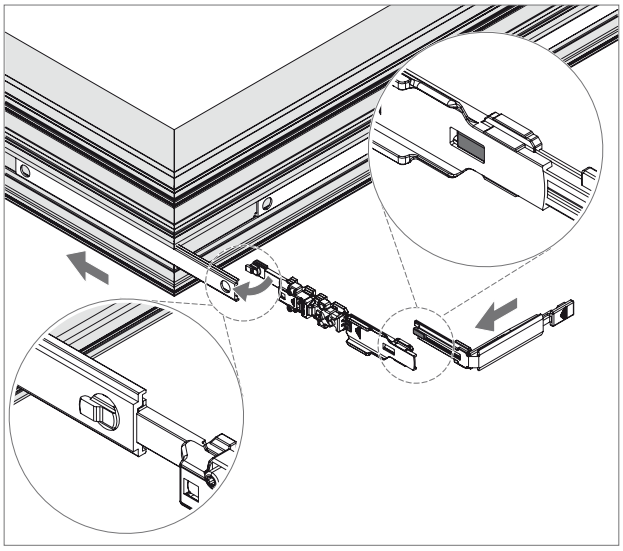
1. Place the drilling jig on the frame as shown in the drawing.
2. Drill holes:
   1 x Ø 2.5 mm, at least 4 mm deep.

NOTE!
Drill holes if:
- The punched hole produced by the screw is not sufficient.
- The base of the groove is too thick (>2 mm)

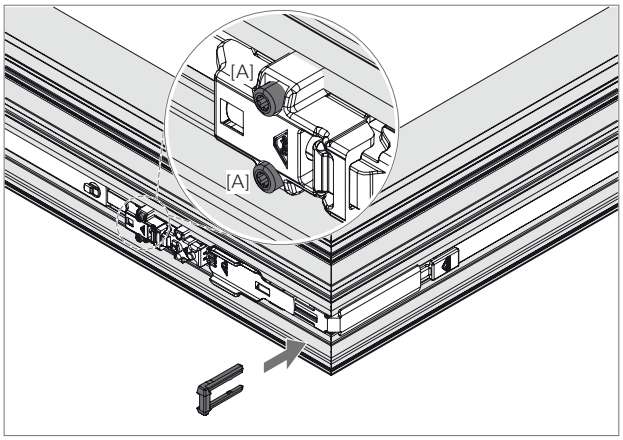


Alternative (for mechanical production):
Drill the hole according to the drawing.

Installing the rebate stay hinge, coupleable



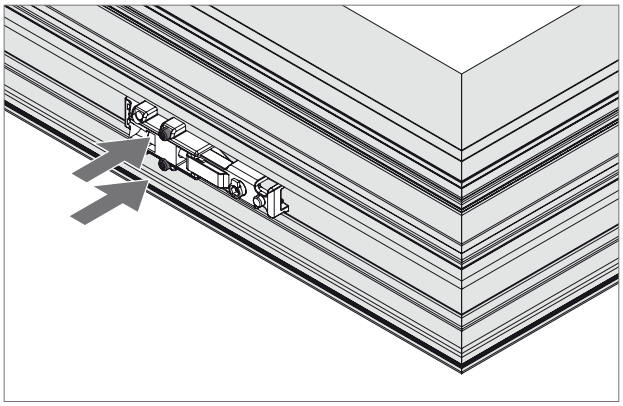
1. Insert connecting rod CR4 with components (according to the installation drawing) in the Euro-groove on the hinge side.
2. Link connecting rod CR3 and the CL corner drive to the rebate stay hinge and insert the entire assembly at the top, starting from the hinge side. Link connecting rod CR4 to the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



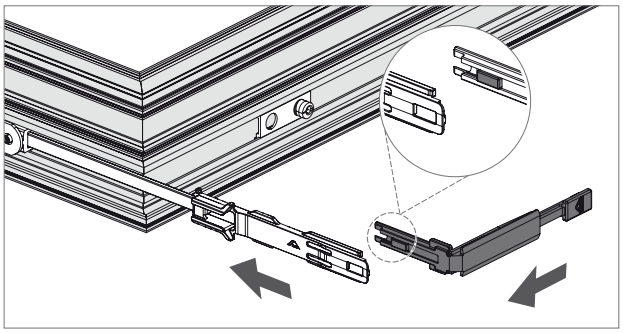
Installing the rebate stay hinge

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.

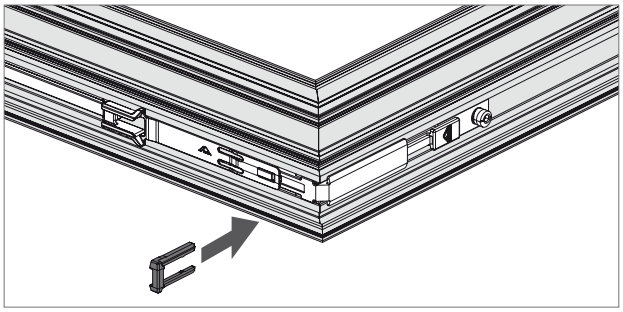
   Tool: T 10 hex key

   Torque: max. 2.5 Nm

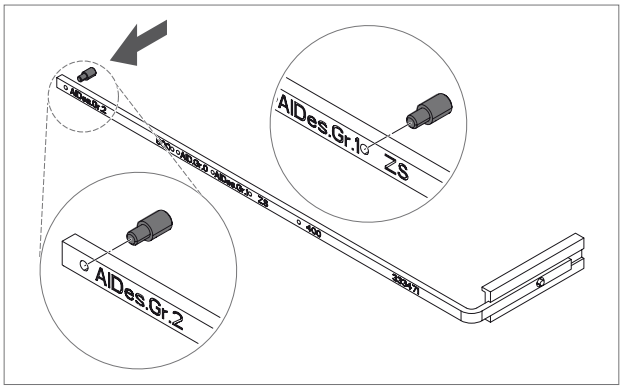
Installing scissor stay guide 735



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.



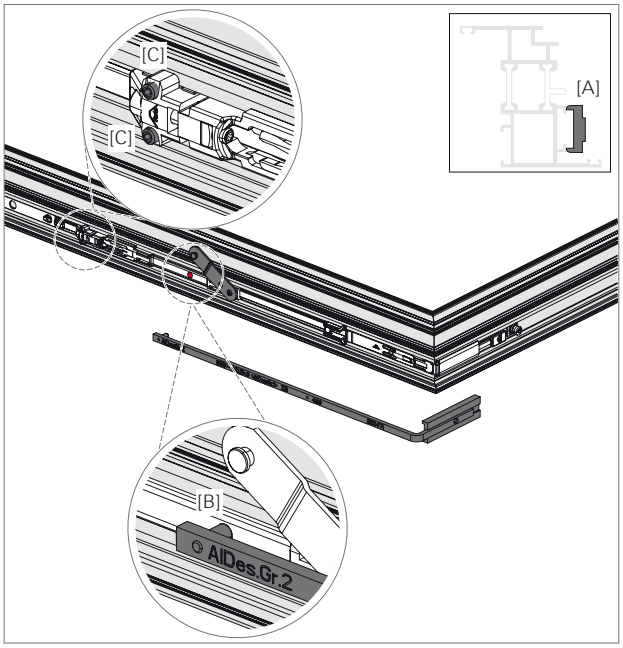
3. Secure the CL corner drive with the retaining fork.



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 = AlDes. size 1

   Scissor stay guide 735 = AlDes. size 2

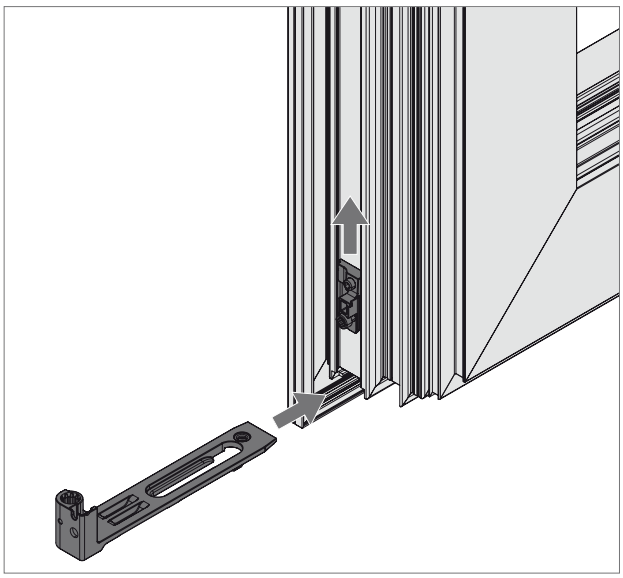


5. Position the jig on the Euro-groove so that it is level. Open the scissor stay guide tab and insert the jig positioning pin into the drill hole provided [B].

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

   Tool: T 10 hex key

   Torque: max. 2.5 Nm

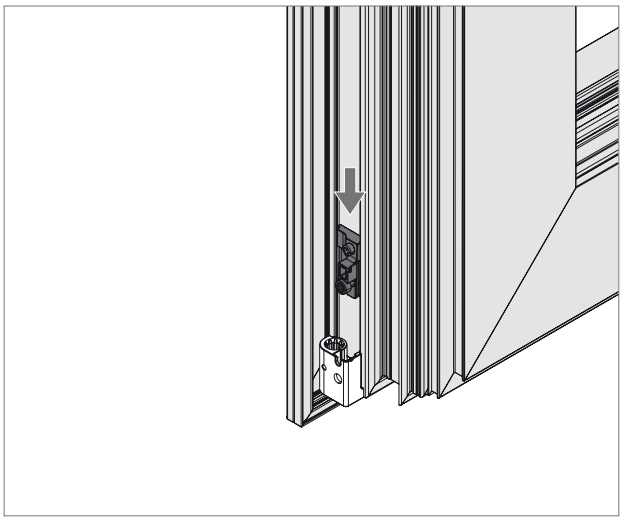


Installing the corner hinge

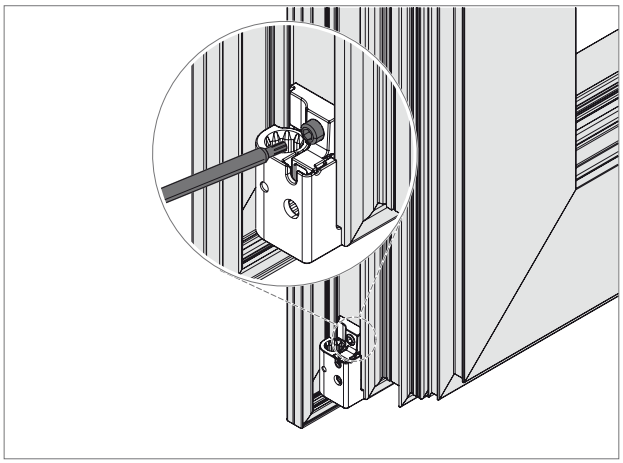
1. Insert the adjustment piece into the connecting rod groove.

NOTE!
The 180 kg adjustment piece does not feature lateral adjustment.

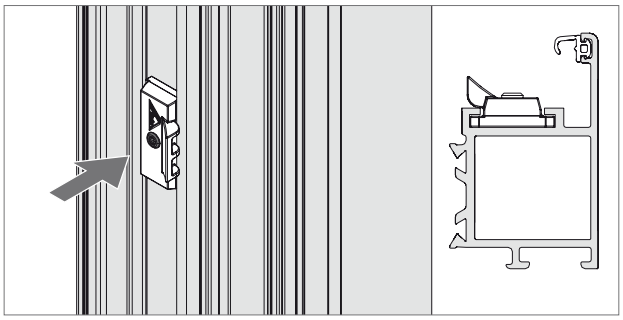
2. Insert the corner hinge into the connecting rod groove.



3. Push the adjustment piece into the corner hinge.



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

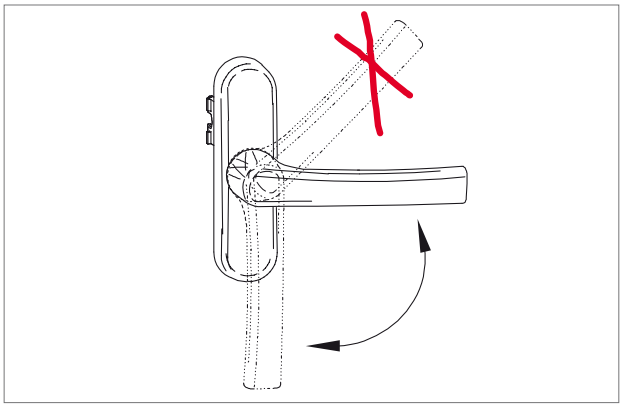


Installing the CL sash component

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.

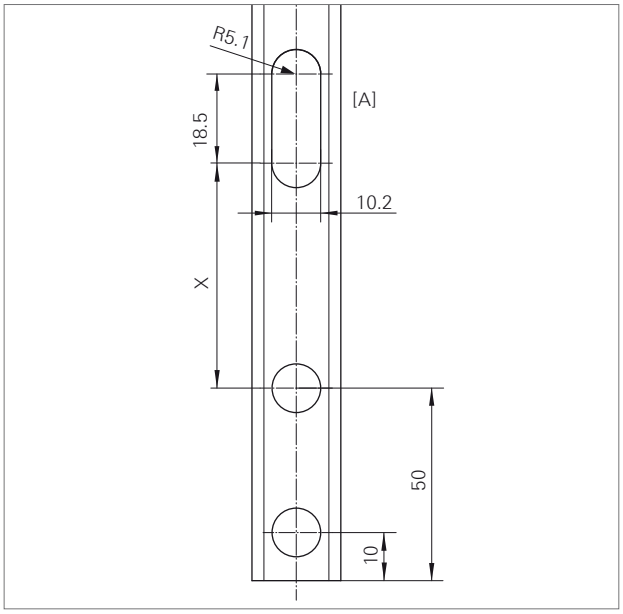
   Tool: T 10 hex key

   Torque: max. 2.5 Nm



Installing the espagnolette lock

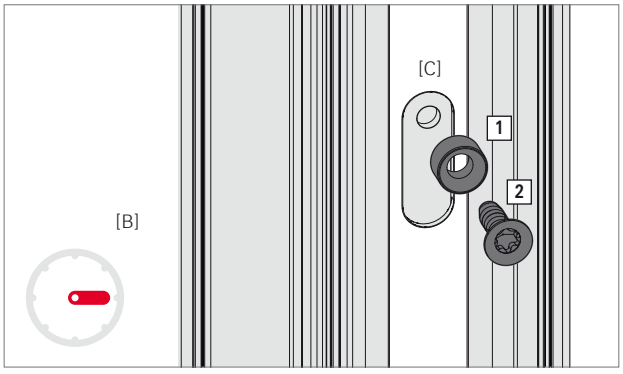
Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.



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

NOTE!

X = freely positionable (suggestion: 60 mm)



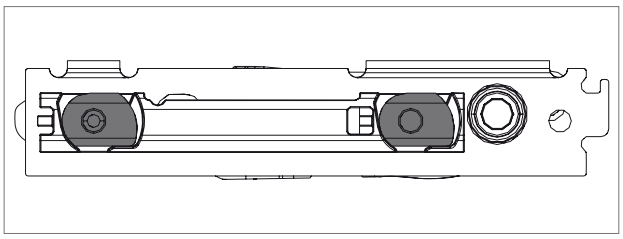
2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

   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.

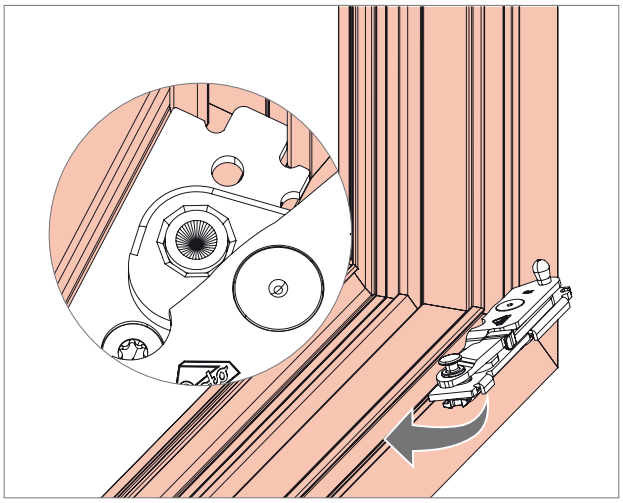


Installing the pivot rest

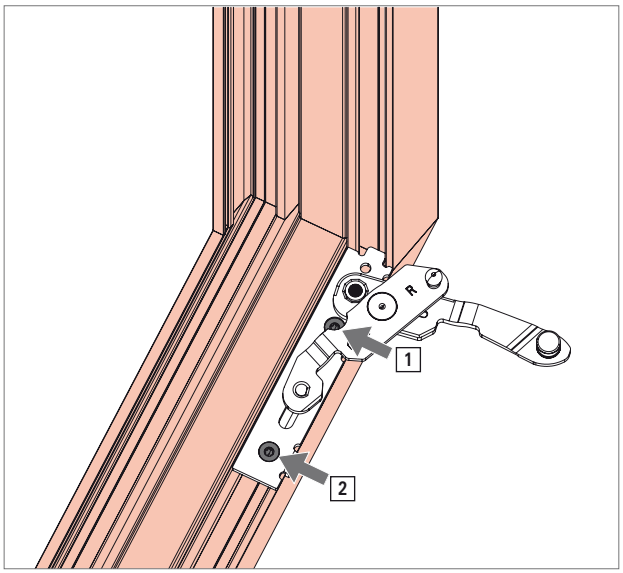
1. Align the clamping blocks.

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.

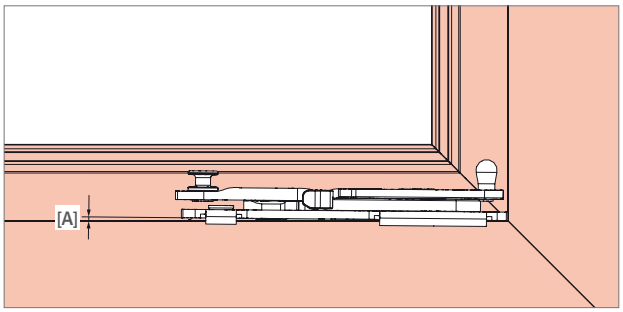
   Tighten the screw [2].

   Tool: T 20 hex key

   Torque: max. 5.5 Nm

NOTE!

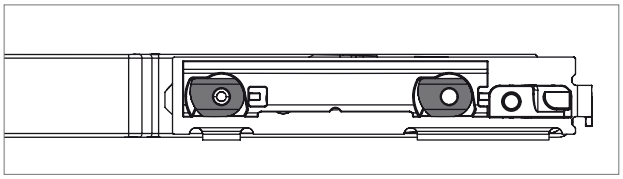
- Depending on the strength of the profile, or with a base groove thickness >2 mm, it may be necessary to predrill the area of the screw [2]. To do so, use the pivot rest / stay bearing jig or create the corresponding drilling pattern in mechanical production (see page 248).
- Note the screw sequence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

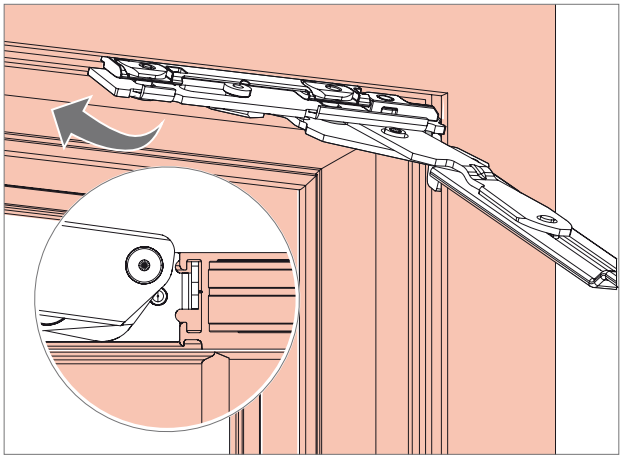


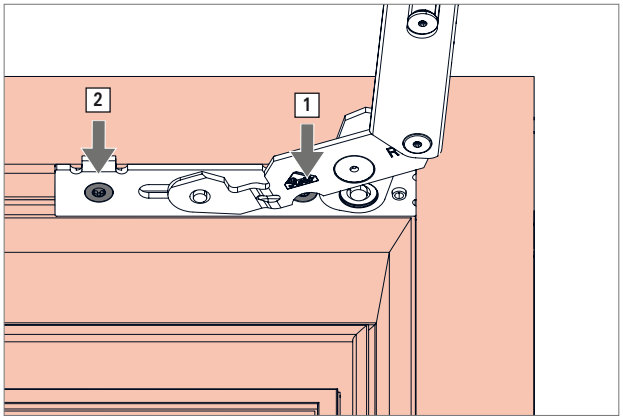
NOTE!

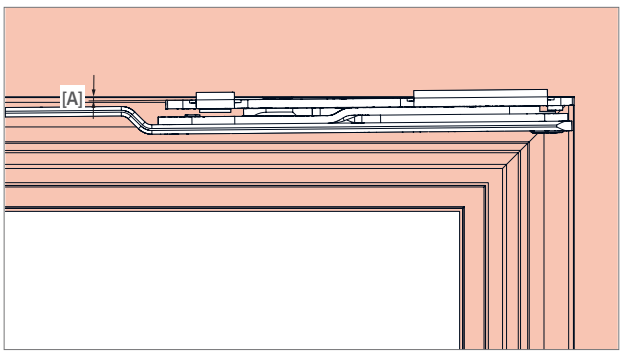
Do not leave a gap between the baseplate and profile [A].

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].

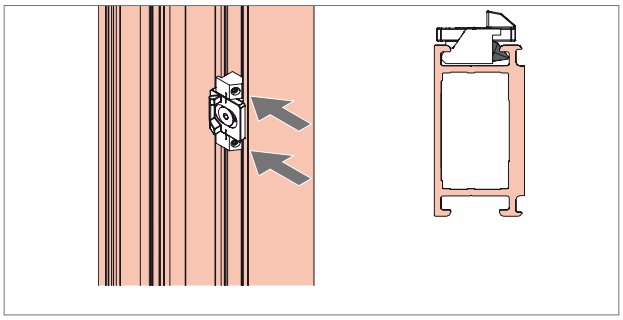
   Tool: T 20 hex key

   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.



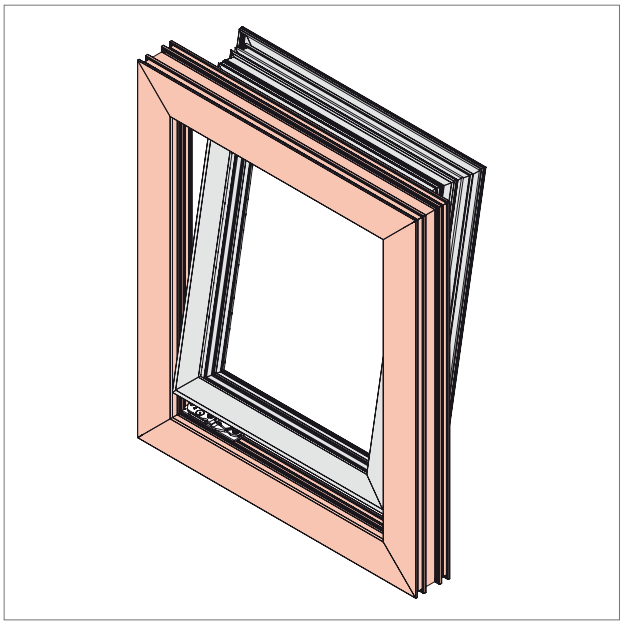
Installing the CL frame component

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

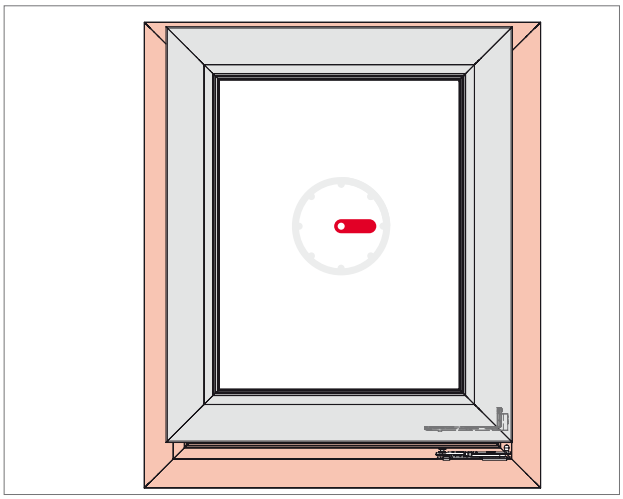
   Tool: T 10 hex key

   Torque: max. 2.5 Nm

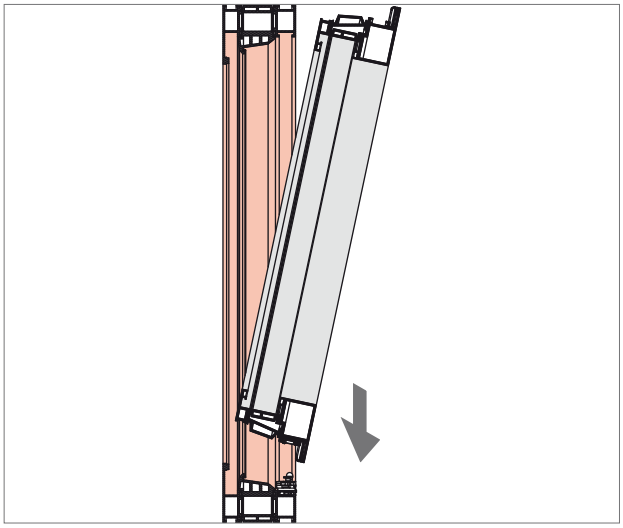
Connecting the pivot rest to the corner hinge



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



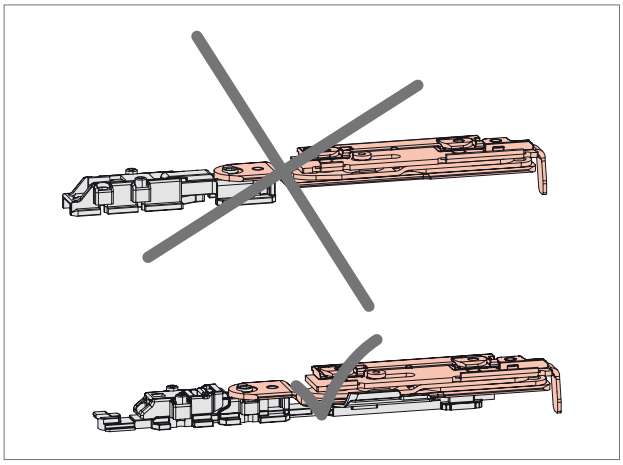
2. Move the handle to the turn position.



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

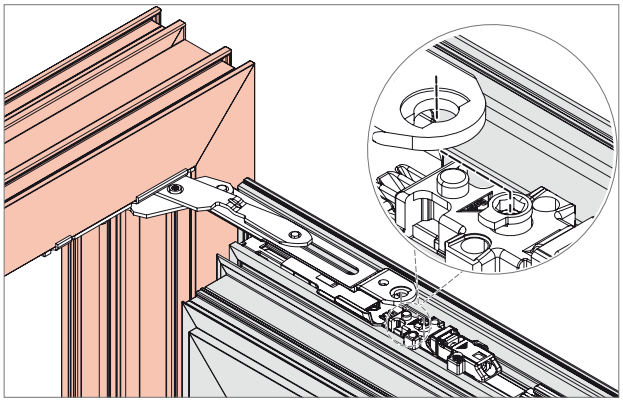
WARNING!

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.

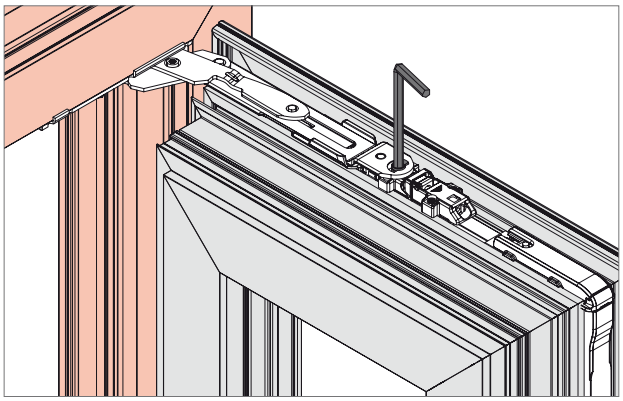
Only install the rebate sash stay, coupleable, in conjunction with the rebate stay hinge, coupleable.

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:

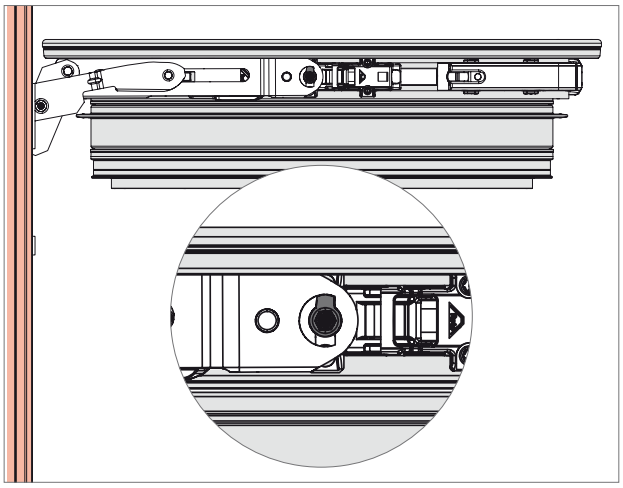
   Hex key size 4

WARNING!

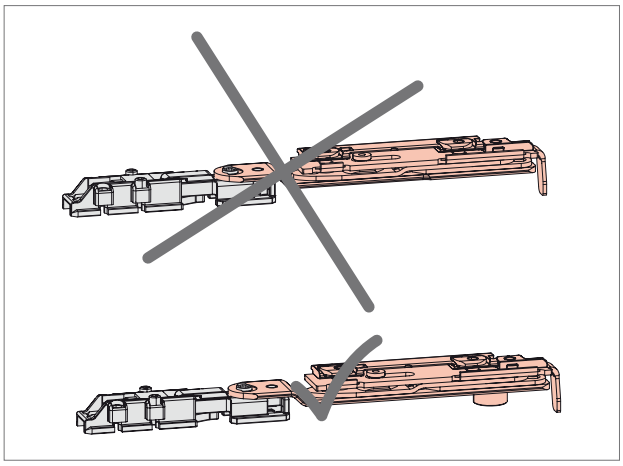
Danger in the event of prohibited installation!

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

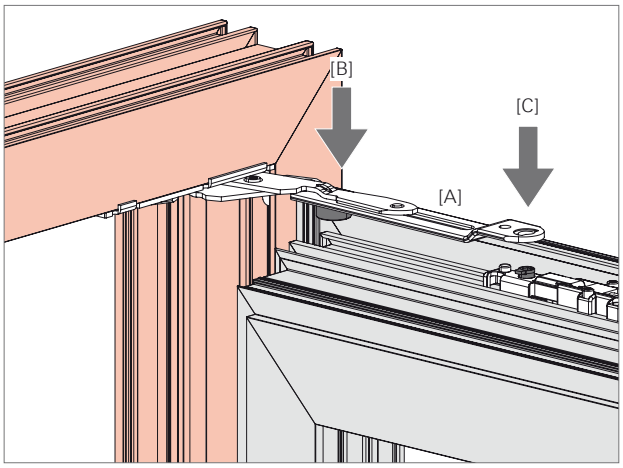
WARNING!

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.

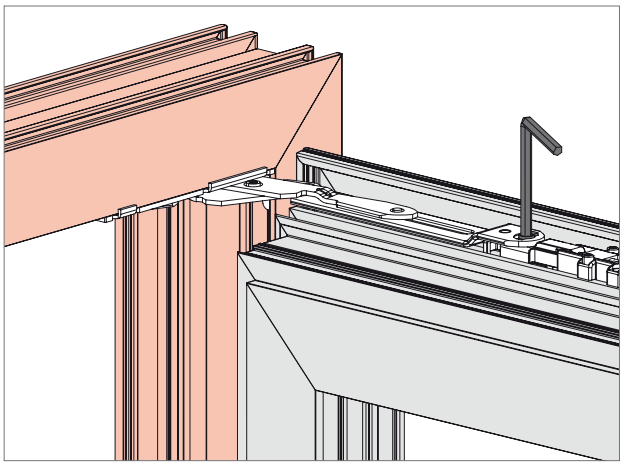
1. Connect the pivot rest to the corner hinge (see page 171).



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].



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

   Tool:

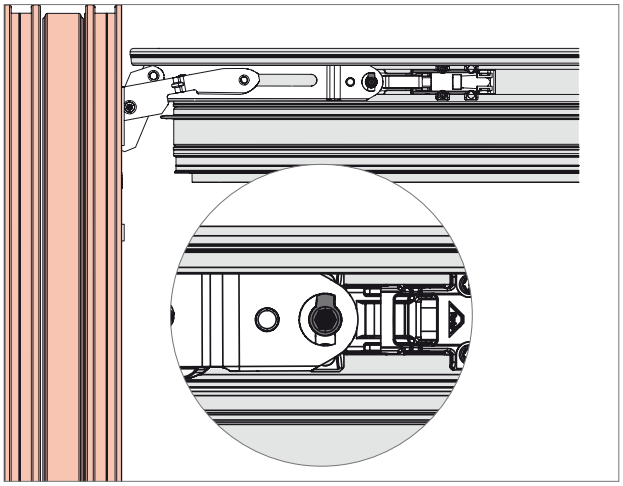
   Hex key size 4

WARNING!

Danger in the event of prohibited installation!

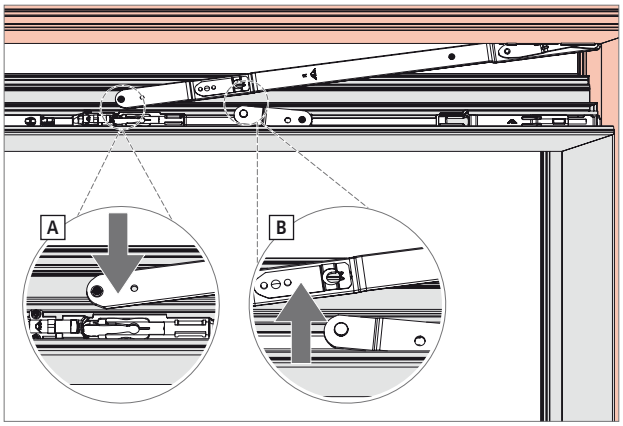
A missing connection can lead to hazardous situations or even cause the sash to fall.

Lock by turning the cam 180°.



6. View from above, after locking.

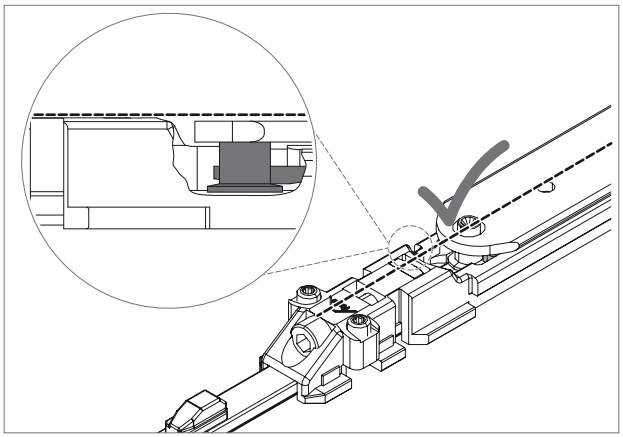
Mounting sash stay 735



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

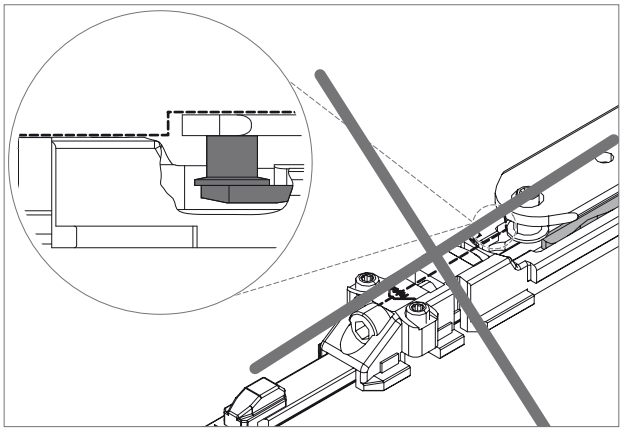
   A = Mount the sash stay in the guide groove on the scissor stay guide (see "Correct mounting")

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



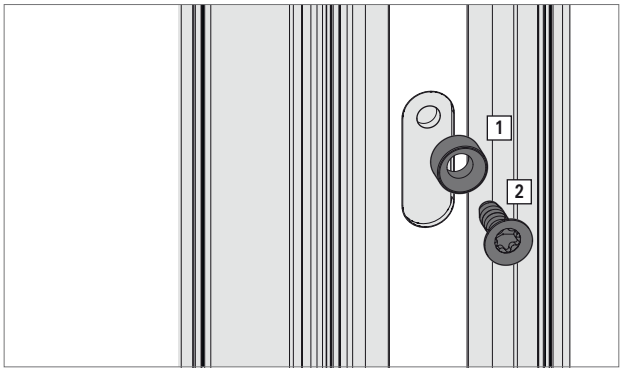
Correct mounting

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



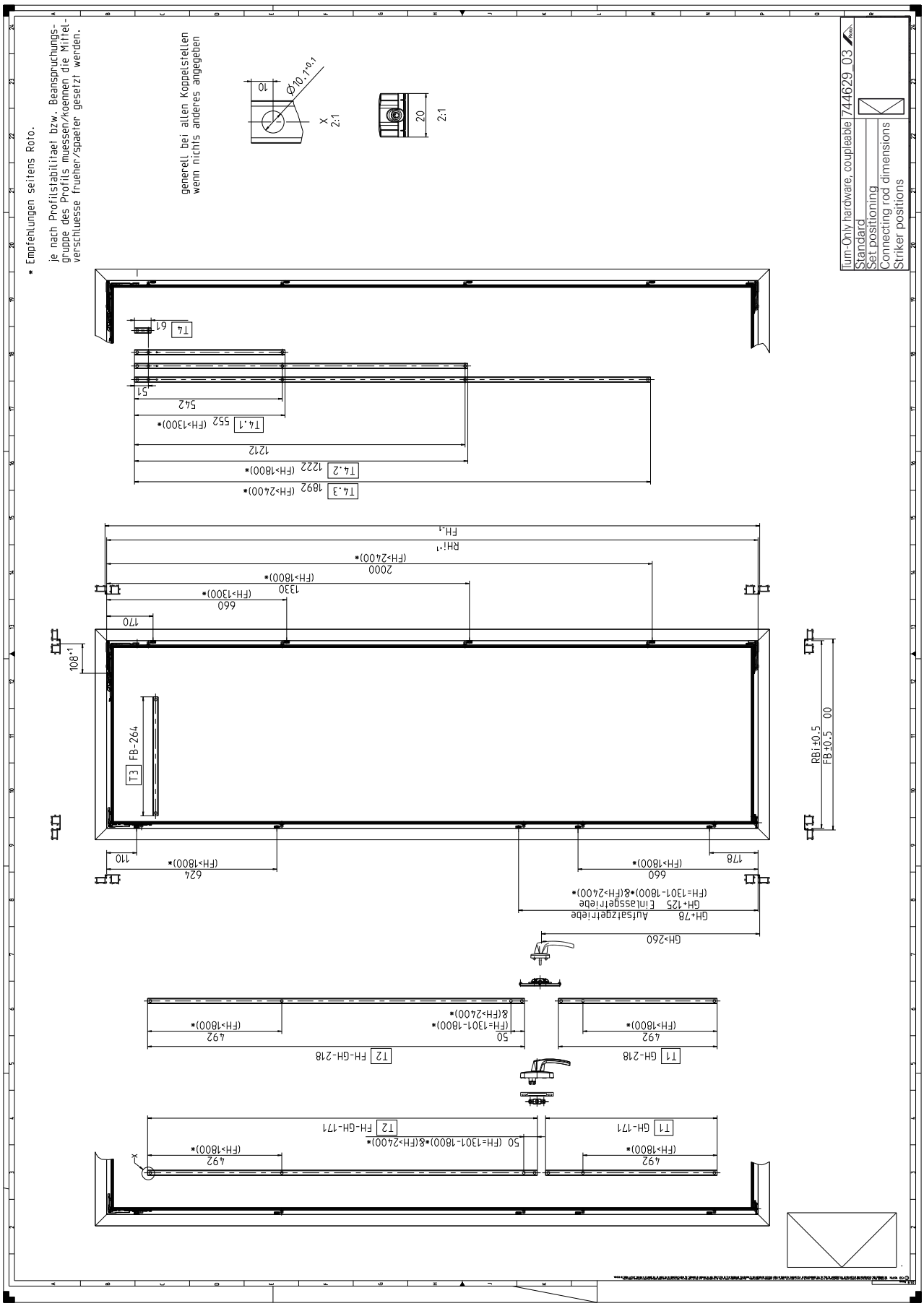
Incorrect mounting

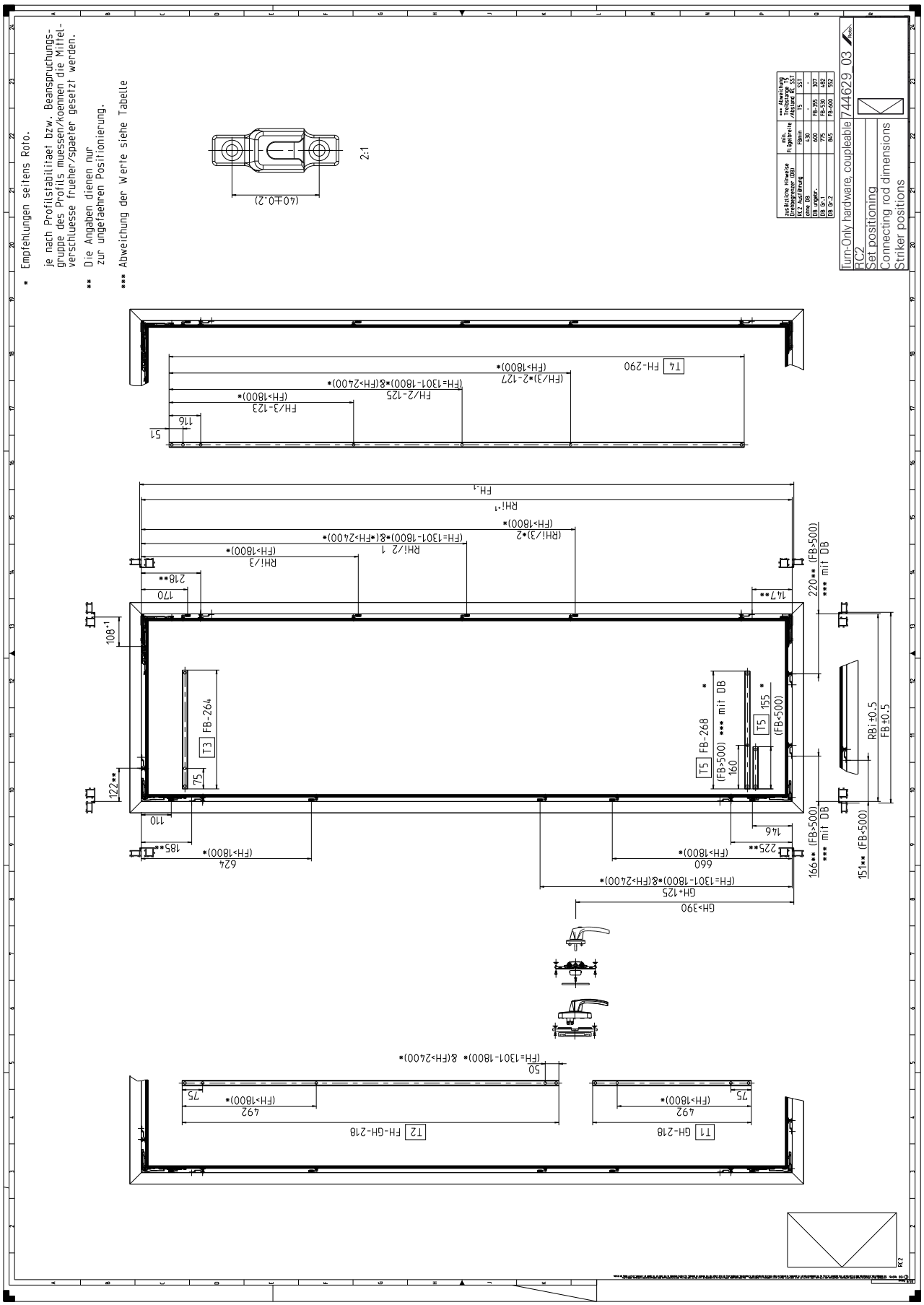
Projection from the sash stay to the scissor stay guide is not permissible.

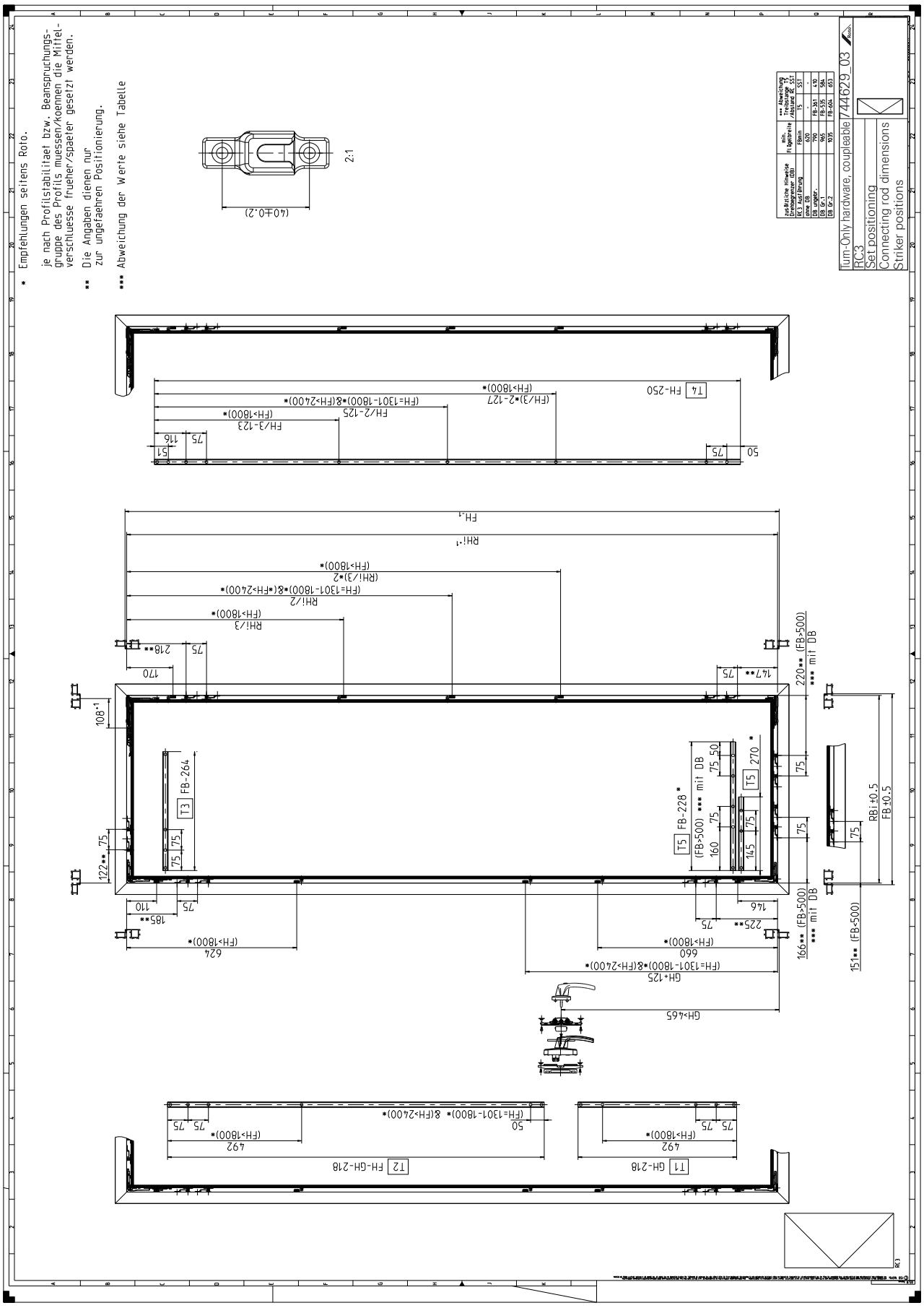


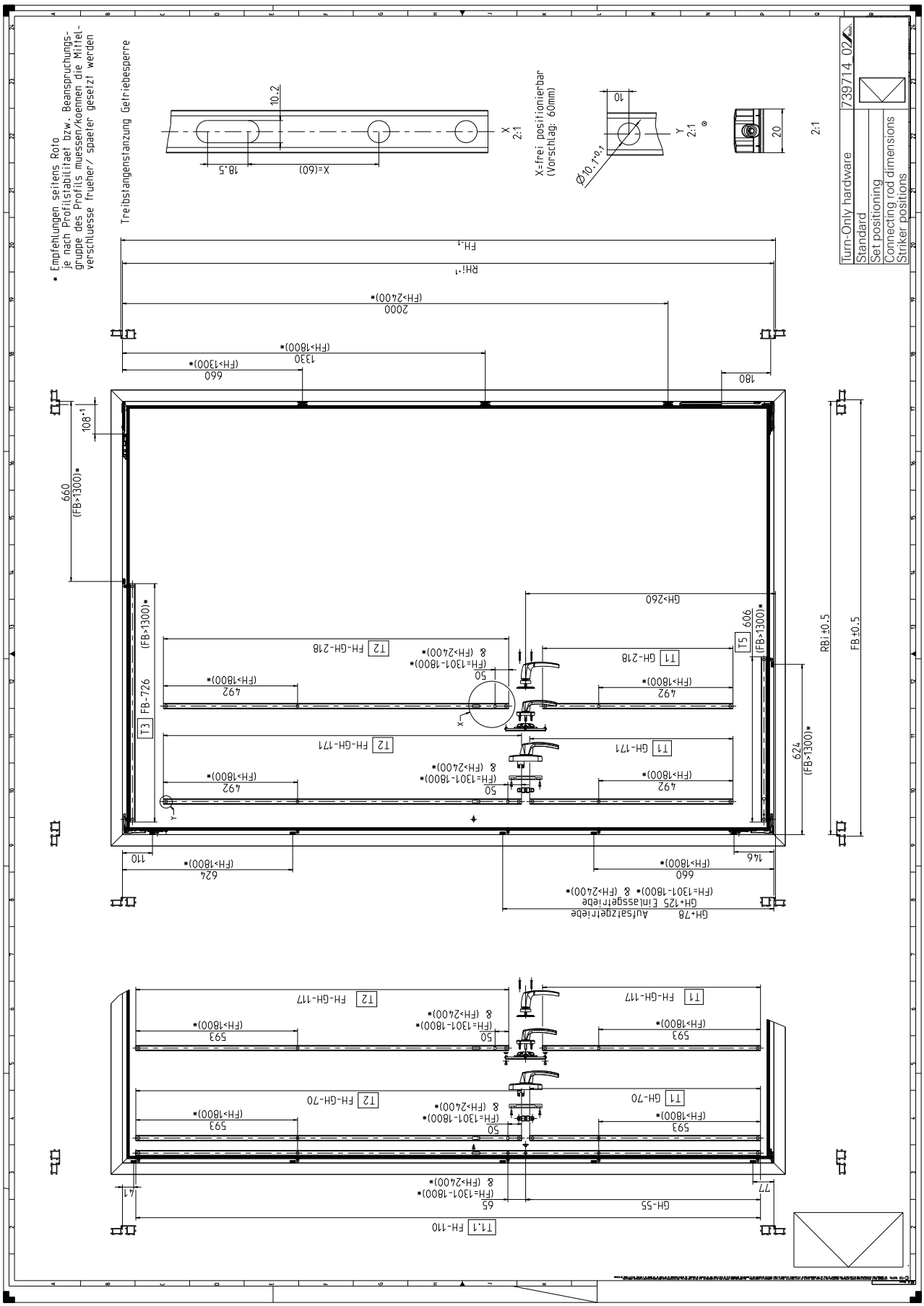
3. Screw down the locking sleeve [1] with the screw [2].
   Tool: T 25 hex key

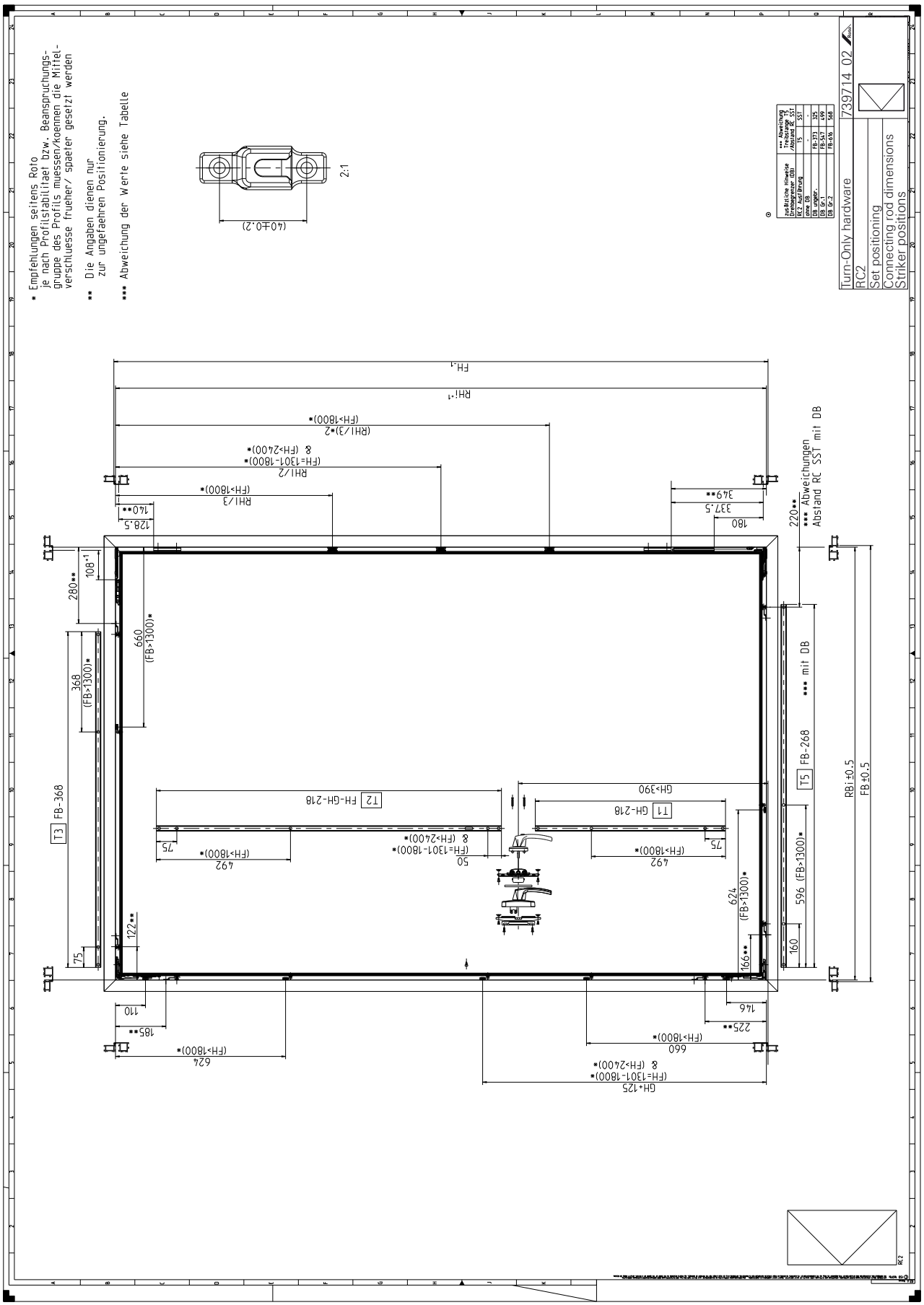
Text in the installation drawings	Translation
Aufsatzgetriebe	Geared-handle
Abweichung Abstand RC SST mit DB	Deviation from distance RC ST with TR
Abweichung der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichung Treibstange T5 / Abstand RC SST	Deviation from connecting rod 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)

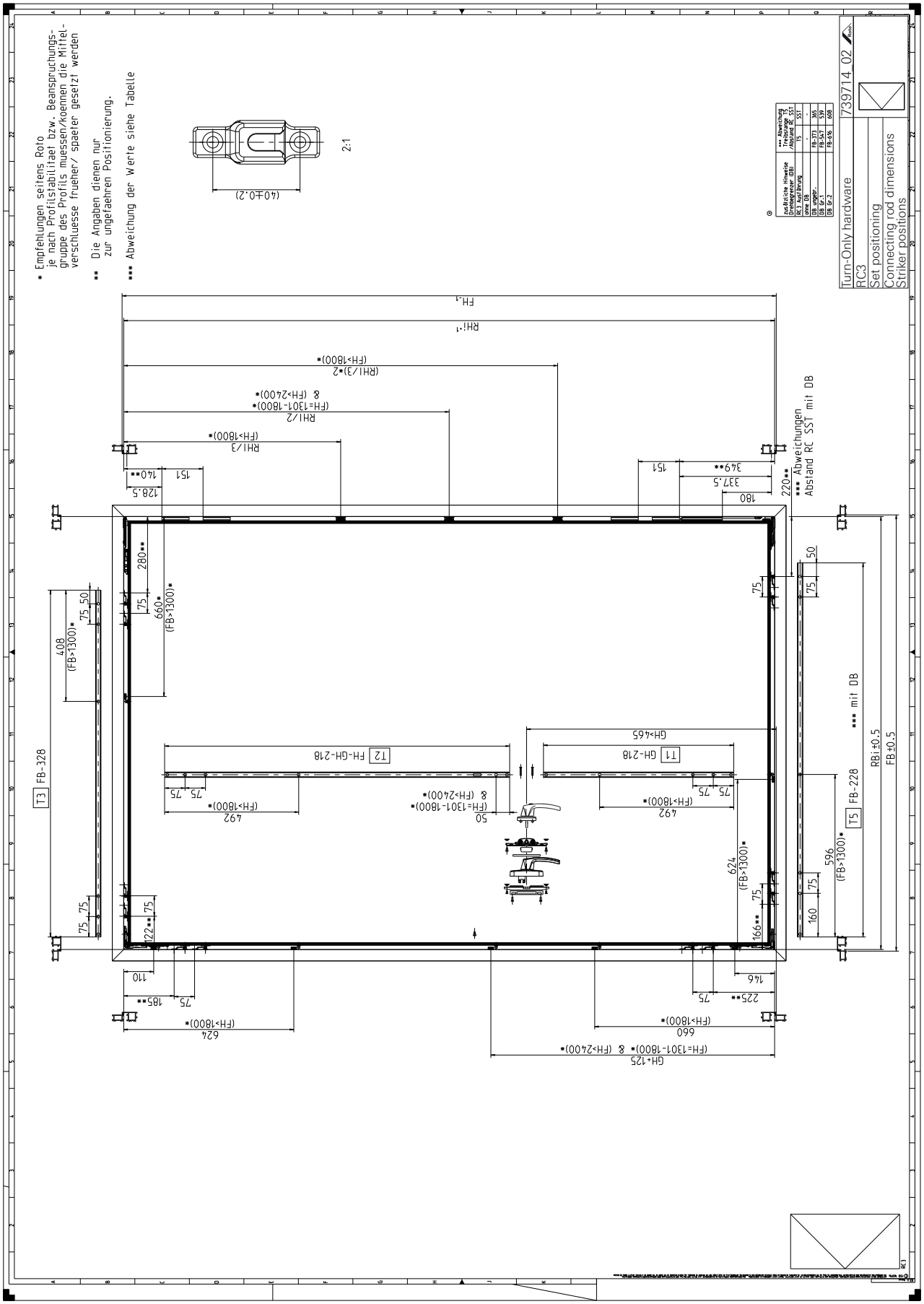

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-gruppe des Profils muessen/koennen die Mittel-verschluesse frueher/spaeter gesetzt werden.
generell bei allen Koppelstellen wenn nichts anderes angegeben
Ø10.1+0.1
10
2:1
20
2:1
Tum-Only hardware, coupleable
Standard
Set positioning
Connecting rod dimensions
Striker positions
744629_03
T4
61
51
542
T4.1 552 (FH>1300)*
1212
T4.2 1222 (FH>1800)*
T4.3 1892 (FH>2400)*
FH-1
RHi-1
2000 (FH>2400)*
1330 (FH>1800)*
660 (FH>1300)*
170
108-1
T3 FB-264
RBi±0.5
FB±0.5 00
110
624 (FH>1800)*
178
660 (FH>1800)*
GH+78 Aufsatzgetriebe
GH+125 Einlassgetriebe
(FH=1301-1800)*2(FH>2400)*
GH>260
492 (FH>1800)*
50 (FH=1301-1800)*
2(FH>2400)*
T2 FH-GH-218
T1 GH-218
T2 FH-GH-171
T1 GH-171

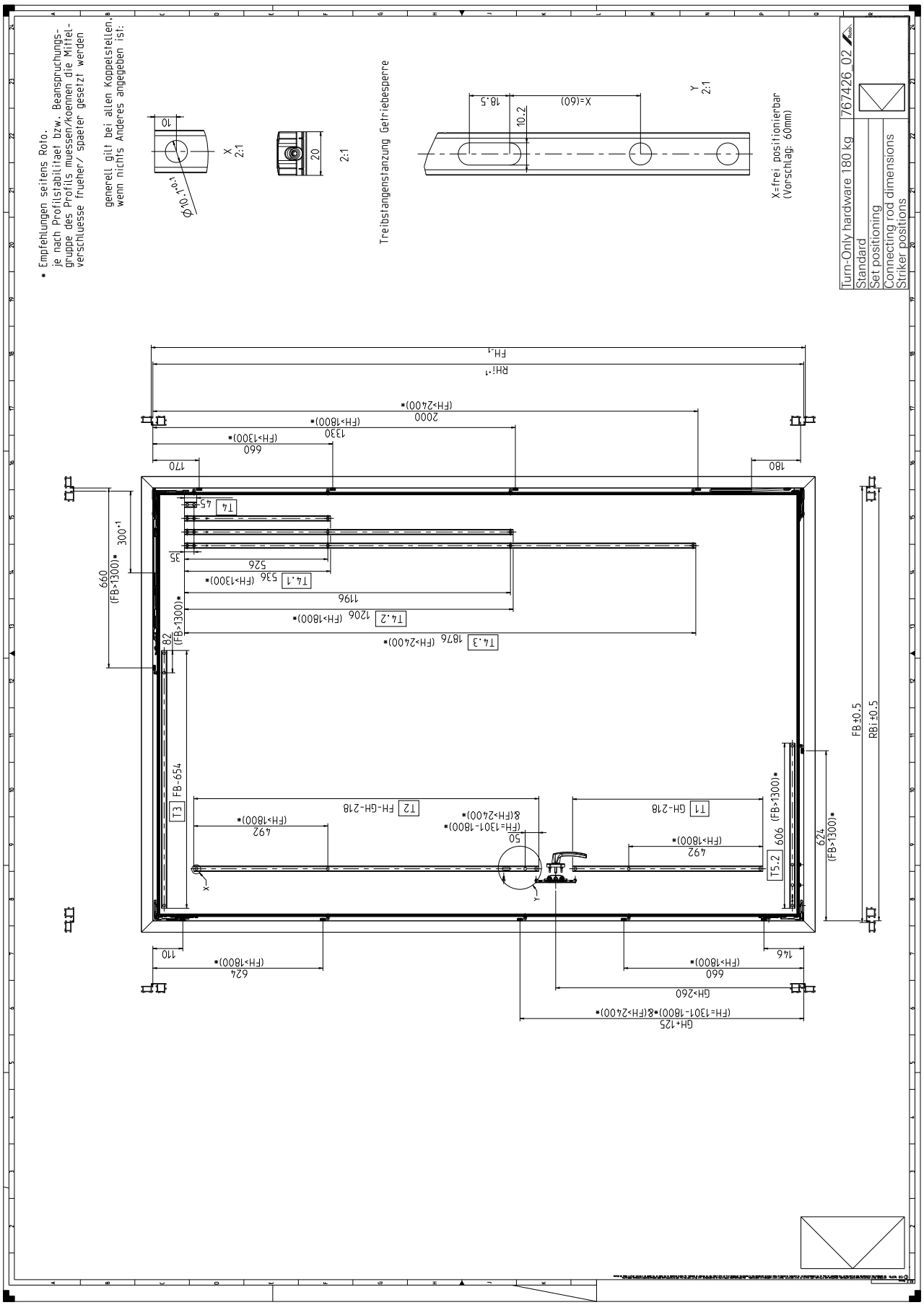

Turn-Only hardware, coupleable 744629_03
RC2
Set positioning
Connecting rod dimensions
Striker positions
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse fruehe/spaeter gesetzt werden.
** Die Angaben dienen nur zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
T4 FH-290
T5 FB-268
T3 FB-264
T2 FH-GH-218
T1 GH-218
RC2

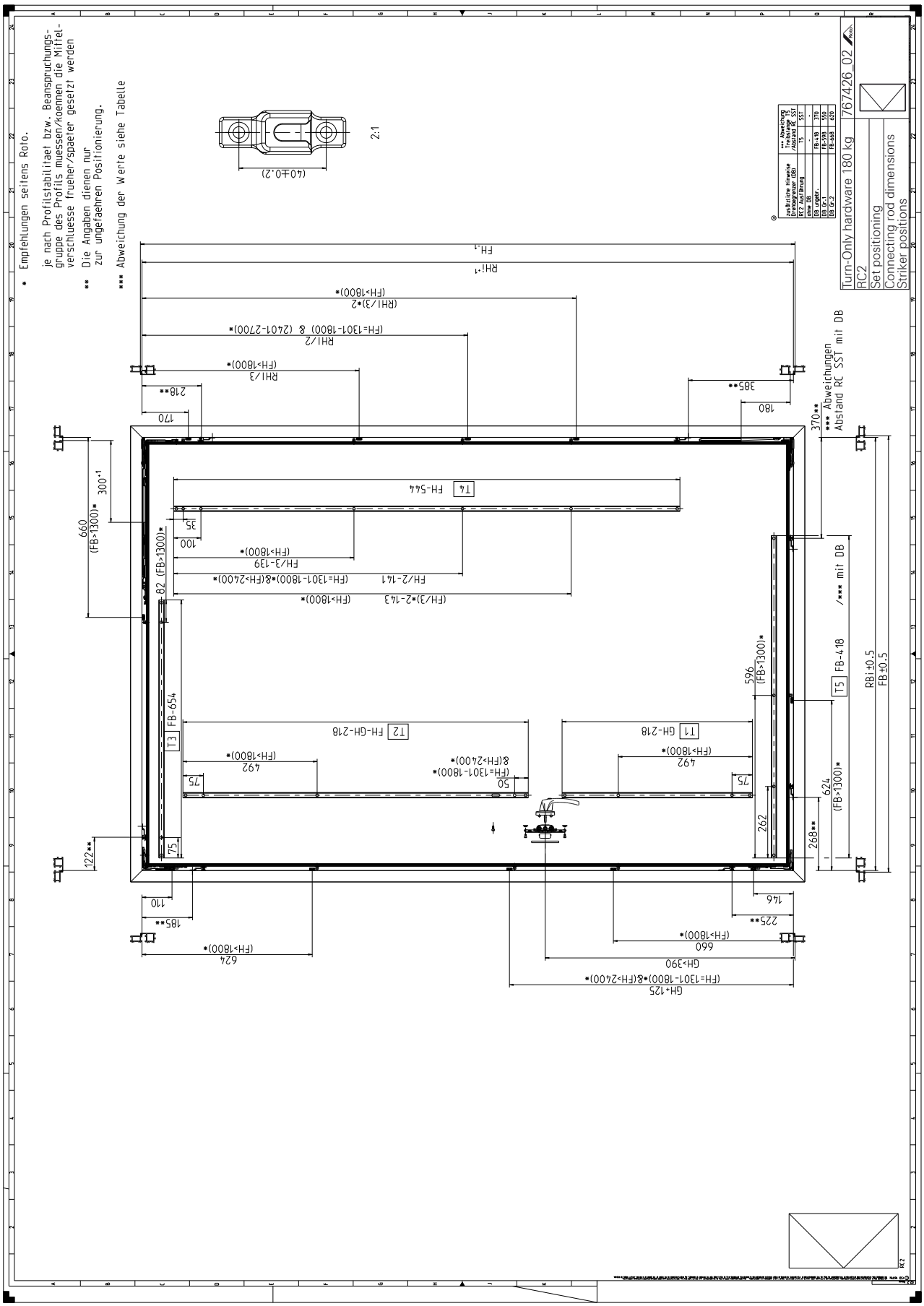

Tum-Only hardware, coupleable
744629_03
RC3
Set positioning
Connecting rod dimensions
Striker positions
Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-gruppe des Profils muessen/koennen die Mittel-verschluesse frueher/spaeter gesetzt werden.
Die Angaben dienen nur zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
(40±0.2)
2:1
T4 FH-250
T5 FB-228 *
T3 FB-264
T2 FH-GH-218
T1 GH-218
(FH>1800)*
(FH=1301-1800)*&(FH>2400)*
FH-1
RH!*1
FH>1800
FH=1301-1800 & FH>2400
GH>465
GH+125
660
624
492
147**
146
225**
185**
218**
170
122**
108*1
220** (FB>500) *** mit DB
166** (FB>500) *** mit DB
151** (FB>500)
RBi±0.5
FB±0.5

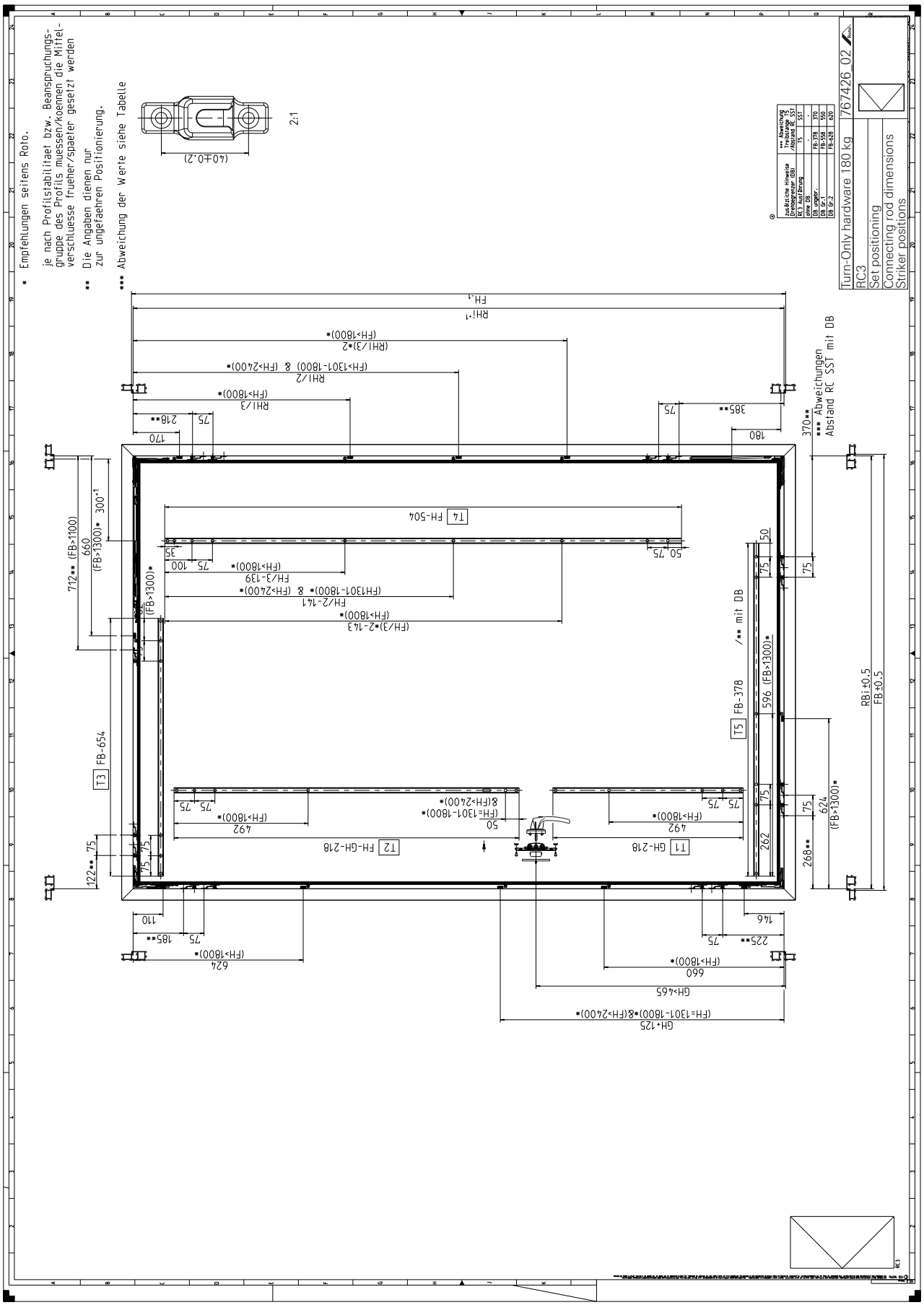

* Empfehlungen seitens Roto je nach Profilstabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse frueher/ spaeter gesetzt werden
Treibstangenstanzung Getriebesperre
X-frei positionierbar (Vorschlag: 60mm)
Turn-Only hardware
Standard
Set positioning
Connecting rod dimensions
Striker positions
739714 02
FH-1
RH1*1
2000 (FH>2400)*
1330 (FH>1800)*
660 (FH>1300)*
180
108+1
660 (FB>1300)*
T1 GH-218
T2 FH-GH-218
T1 GH-171
T2 FH-GH-171
T1 GH-70
T2 FH-GH-70
T1 FH-GH-117
T2 FH-GH-117
T1.1 FH-110
T3 FB-726
T5 606 (FB>1300)*
GH>260
492 (FH>1800)*
50 (FH=1301-1800)* & (FH>2400)*
624 (FB>1300)*
RBi±0.5
FB±0.5
110
624 (FH>1800)*
146
660 (FH>1800)*
GH+78 Aufsatzgetriebe
GH+125 Einlassgetriebe (FH=1301-1800)* & (FH>2400)*
593 (FH>1800)*
65 (FH=1301-1800)* & (FH>2400)*
GH-55
77
41


* Empfehlungen seitens Roto
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse fruehe r/ spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
Turn-Only hardware
RC2
Set positioning
Connecting rod dimensions
Striker positions
739714 02
FH-1
RH1*1
(RH1/3)*2
(FH>1800)*
RH1/2
(FH=1301-1800)*
& (FH>2400)*
RH1/3
(FH>1800)*
140**
128.5
349**
337.5
180
220**
*** Abweichungen
Abstand RC SST mit DB
280**
108*1
660
(FB>1300)*
368
(FB>1300)*
T3 FB-368
T2 FH-GH-218
T1 GH-218
GH>390
T5 FB-268
*** mit DB
RBI±0.5
FB±0.5
75
492
(FH>1800)*
50
(FH=1301-1800)*
& (FH>2400)*
624
(FB>1300)*
596 (FB>1300)*
122**
160
166**
75
110
185**
624
(FH>1800)*
146
225**
660
(FH>1800)*
GH+125
(FH=1301-1800)*
& (FH>2400)*


Turn-Only hardware
RC3
Set positioning
Connecting rod dimensions
Striker positions
739714_02
* Empfehlungen seitens Roto je nach Profilstabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse frueher/ spaeter gesetzt werden
** Die Angaben dienen nur zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
*** Abweichungen Abstand RC SSF mit DB
*** mit DB
T1 GH-218
T2 FH-GH-218
T3 FB-328
T5 FB-228
RBi±0.5
FB±0.5

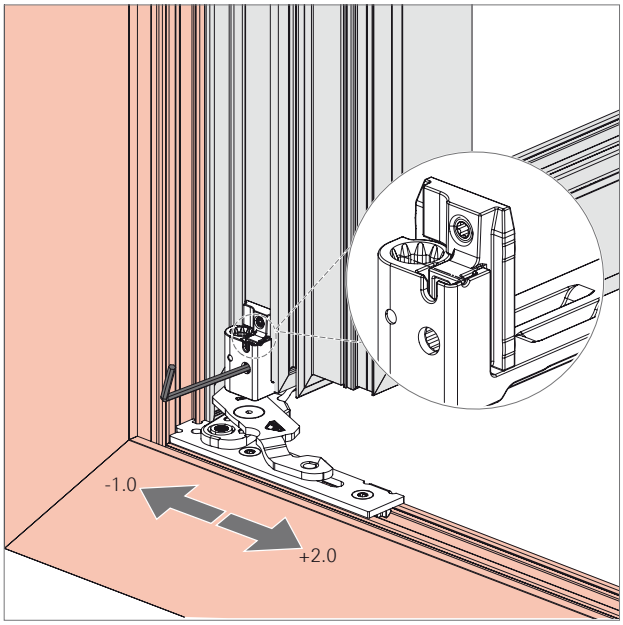

* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/ spaeter gesetzt werden
generell gilt bei allen Koppelstellen,
wenn nichts Anderes angegeben ist:
Treibstangenstanzung Getriebesperre
X=frei positionierbar
(Vorschlag: 60mm)
767426_02
Turn-Only hardware 180 kg
Standard
Set positioning
Connecting rod dimensions
Striker positions
FH-1
RH-1
(FH>2400)*
2000
(FH>1800)*
1330
(FH>1300)*
660
170
180
T4
T4.1
T4.2
T4.3
T1 GH-218
T2 FH-GH-218
T3 FB-654
T5.2
FB±0.5
RB1±0.5
624
(FB>1300)*
606
(FB>1300)*
492
(FH>1800)*
1876 (FH>2400)*
1206 (FH>1800)*
536 (FH>1300)*
526
1196
660
(FB>1300)*
300-1
660
(FB>1300)*
82
(FB>1300)*
624
(FH>1800)*
110
146
GH>260
GH+125
(FH=1301-1800)*8(FH>2400)*
(FH=1301-1800)*
8(FH>2400)*
50


Turn-Only hardware 180 kg
767426_02
RC2
Set positioning
Connecting rod dimensions
Striker positions
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
*** Abweichungen
Abstand RC SST mit DB
/*** mit DB
FB-654
FB-418
RB±0.5
FB±0.5


Turn-Only hardware 180 kg
767426_02
RC3
Set positioning
Connecting rod dimensions
Striker positions
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/spaeter gesetzt werden
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
2:1
(40±0.2)
*** Abweichungen
Abstand RC SST mit DB
T1 GH-218
T2 FH-GH-218
T3 FB-654
T4 FH-504
T5 FB-378
** mit DB

Note!

Roto hardware components may only be adjusted by authorised professionals.

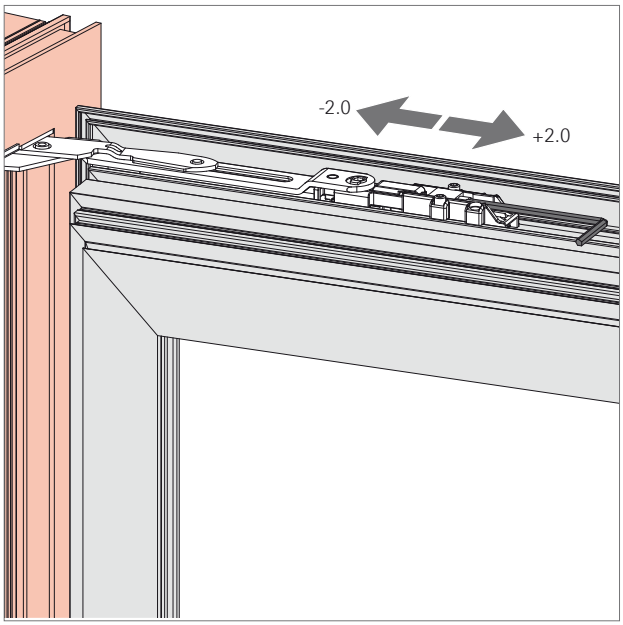


Corner hinge

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

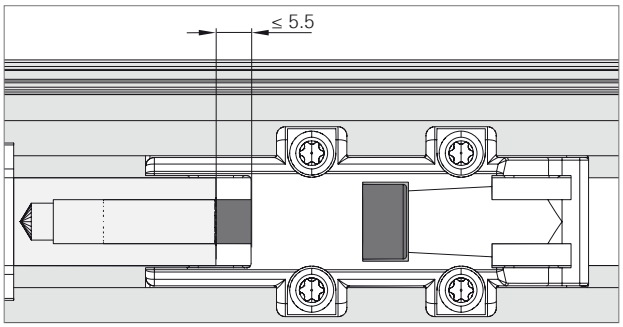
NOTE!

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.

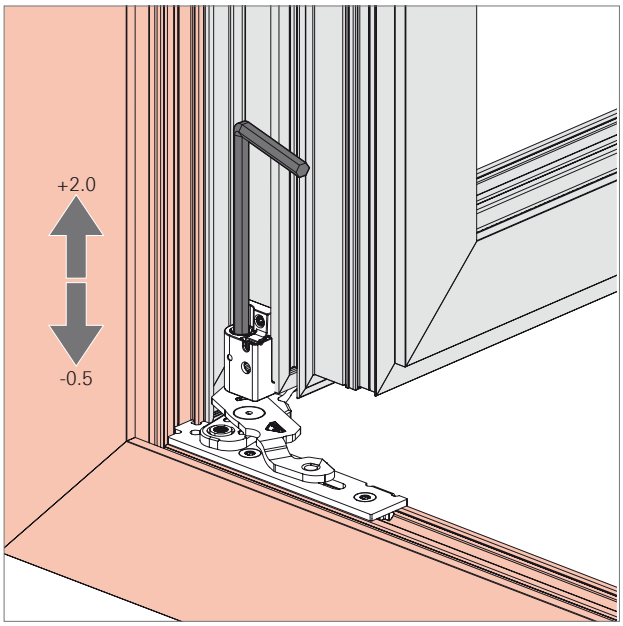


Danger!
Proceed with caution before unhinging the sash.

- 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.



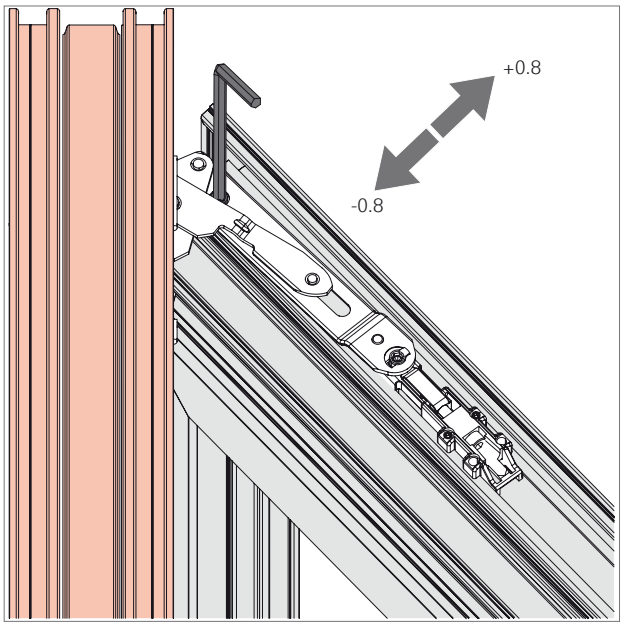
Corner hinge

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

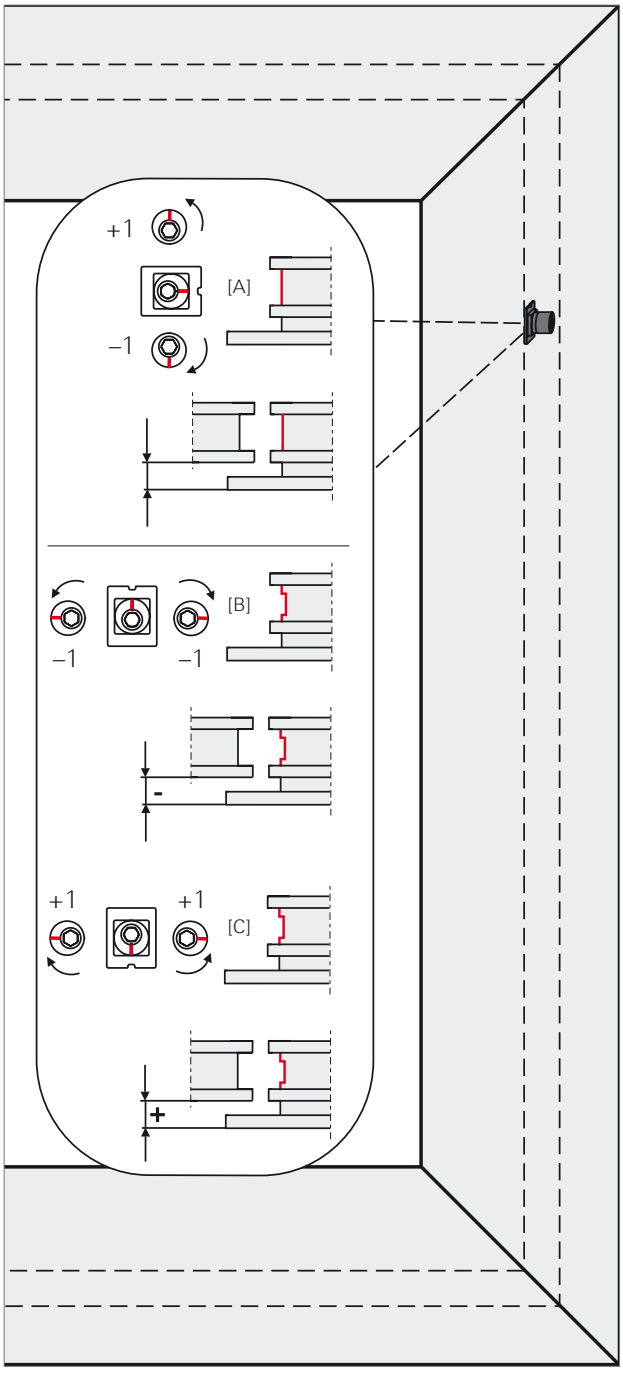
1. Move the window sash to the tilt position.

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

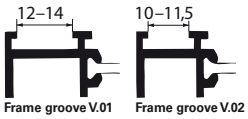
TiSt installation

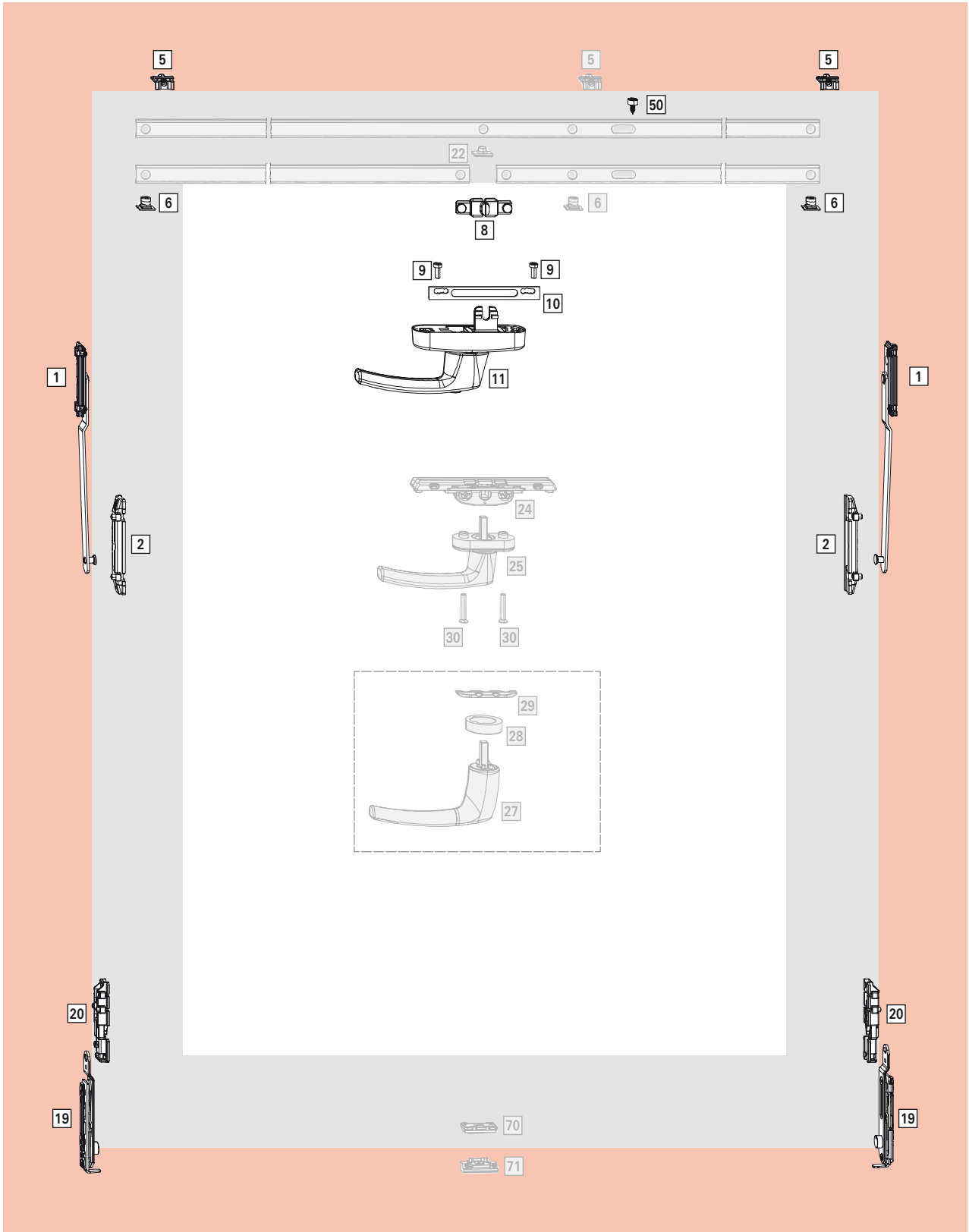
TiSt installation drawings

TiSt adjustment

Hardware overview and parts list

TiSt | 100 kg





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**		

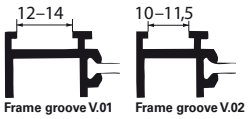
Alternative espagnolettes and connectors

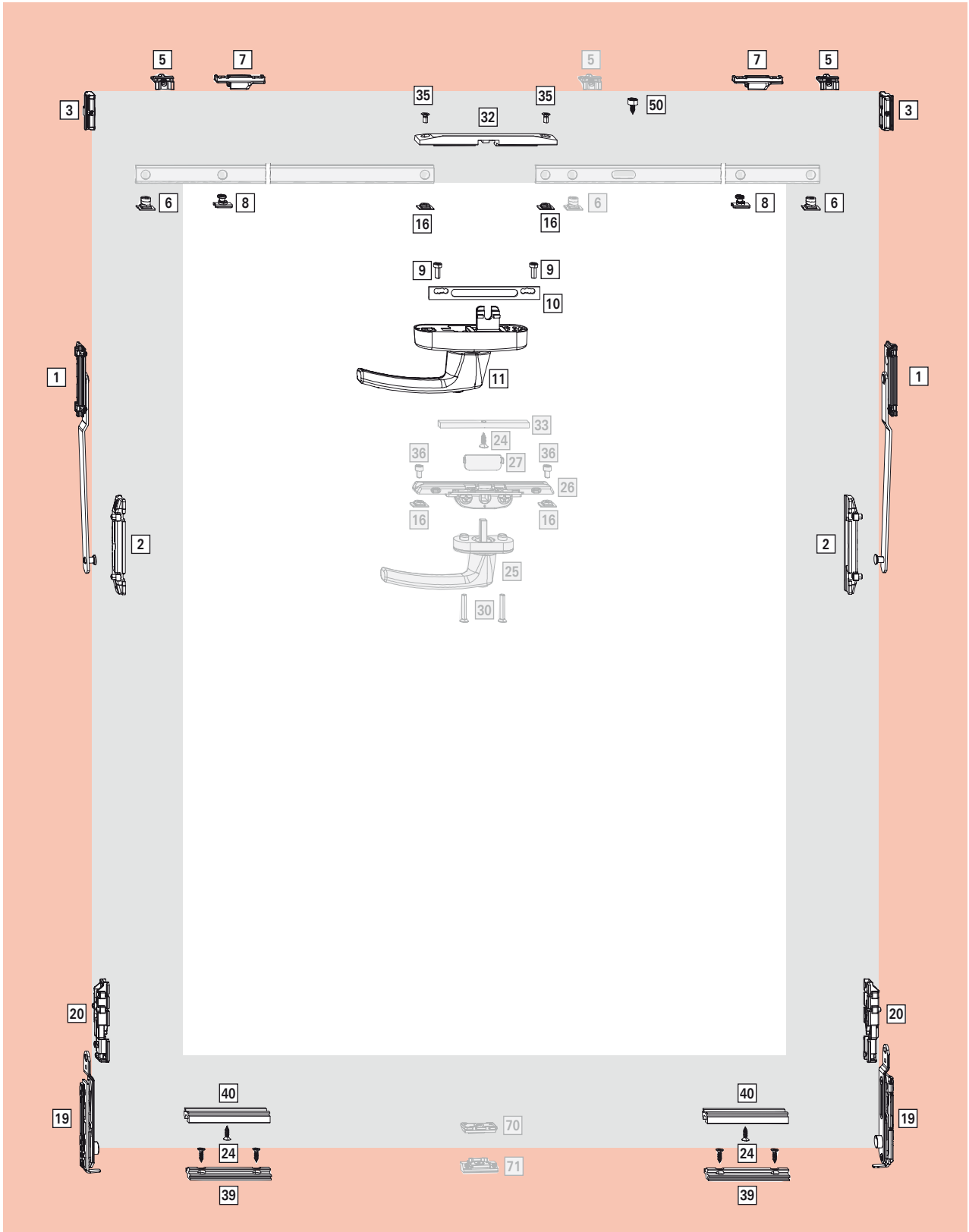
Pos.	Pc(s)	Description	PU	Material no.
[11]	1	**Roto Line AL geared-handle**		→ CTL 1
[22]	1	**Connector bolt, insertable**	100	**254601**
[10]	1	**Espagnolette support**	100	**331937**
[9]	2	**Flat-headed screw M5 x 12**	100	**728925**
[25]	1	**Handle**		→ CTL 1
[24]	1	**Flush-encased gearbox without 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.

Hardware overview and parts list

TiSt RC2 | 100 kg





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**		

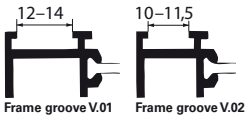
Alternative espagnolettes and connectors

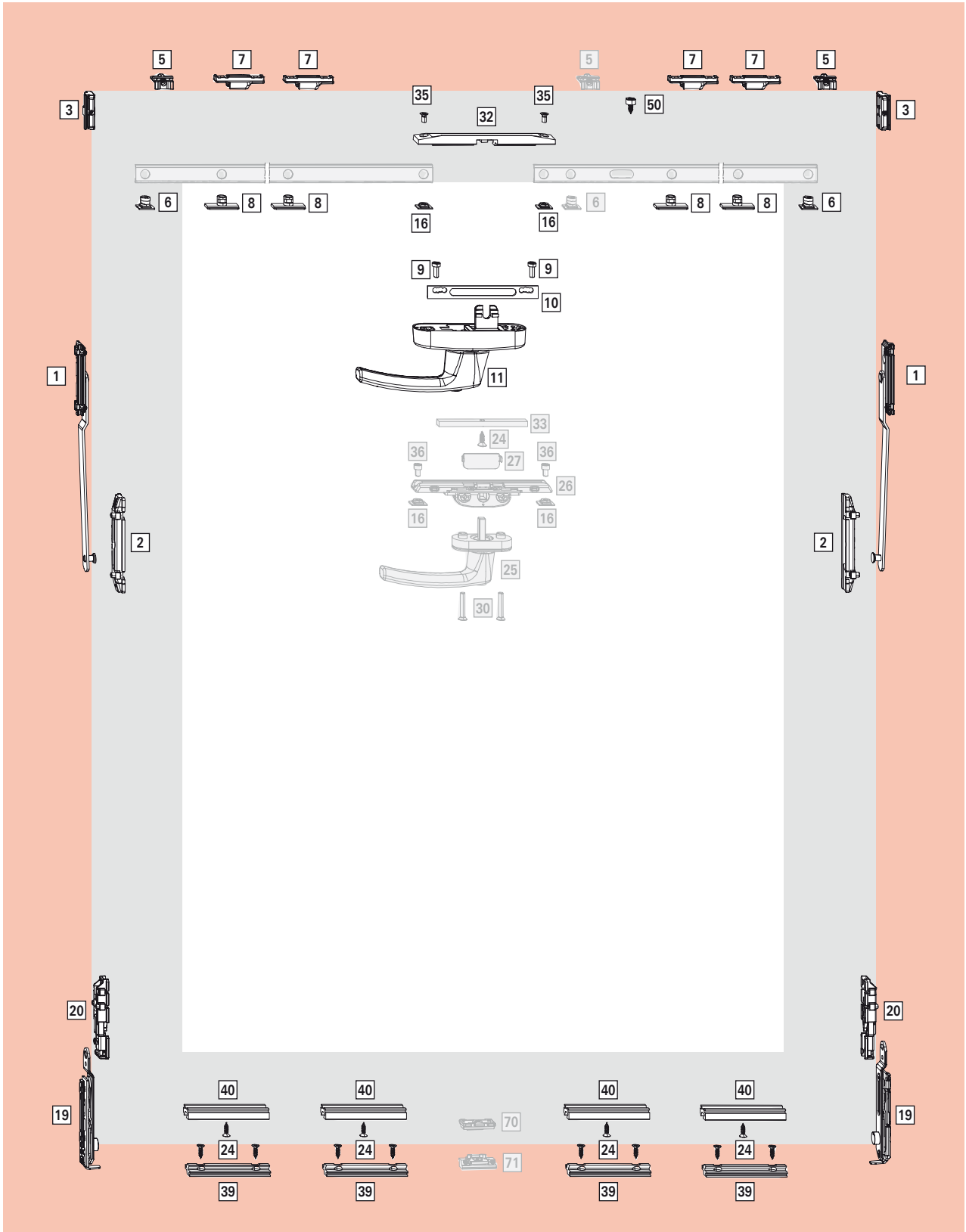
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	**Handle, lockable**		→ CTL 1
[12]	2	**Countersunk screw (stainless steel) M5x30**	100	**212501**
	1	**SEC flush-encased gearbox set**	10	**728947**
		consisting of:		
[15]	1	**SEC flush-encased gearbox without MD** [1]		
[16]	2	**SEC connector**		
[24]	1	**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.

Hardware overview and parts list

TiSt RC3 | 100 kg





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

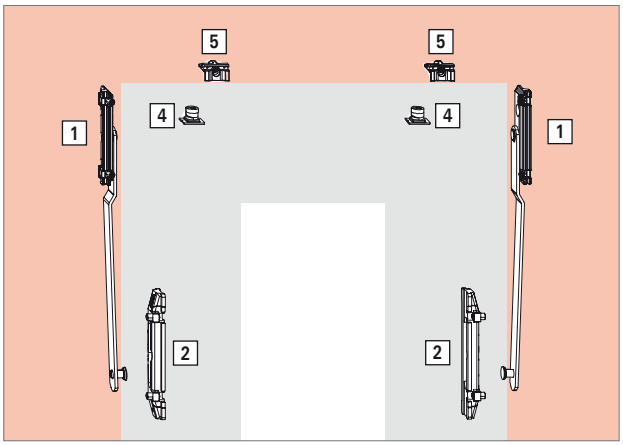
Additional components, size-dependent

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

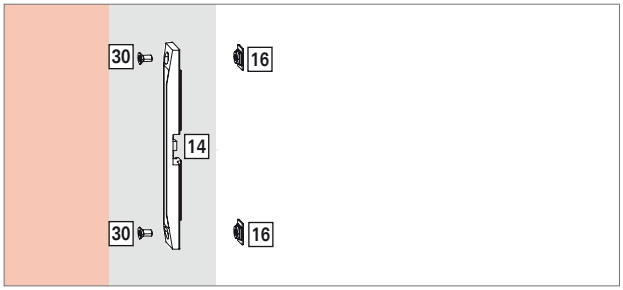
Pos.	Pc(s)	Description	PU	Material no.
[13]	1	**Handle, lockable**		→ CTL 1
[12]	2	**Countersunk screw (stainless steel) M5x30**	100	**212501**
	1	**SEC flush-encased gearbox set**	10	**728947**
		consisting of:		
[15]	1	**SEC flush-encased gearbox without MD** [1]		
[16]	2	**SEC connector**		
[24]	1	**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.



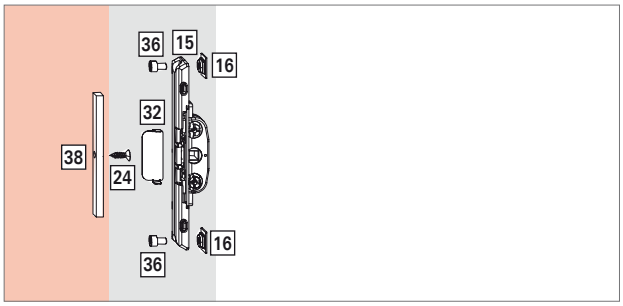
TiSt locking components

Pos.	Pc(s)	Description	PU	Material no.
	1	**Tilt-Only stay arm, compl. V.01**	20	**728862**
		Tilt-Only stay arm, compl. V.02	20	**728863**
		consisting of:		
[1]		**Tilt-Only stay arm, compl. V.01/V.02**		
[2]		**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**



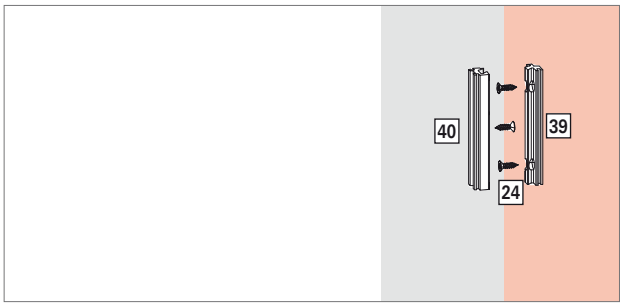
SEC espagnolette protection set

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



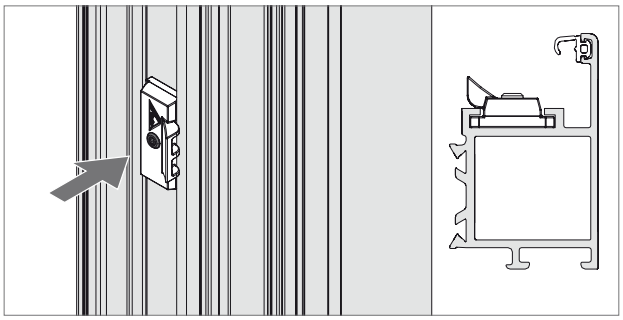
SEC flush-encased gearbox set

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**

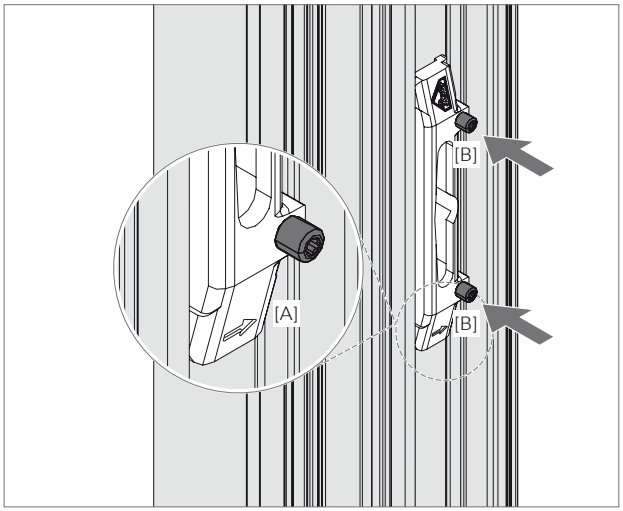


Installing the CL sash component

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!

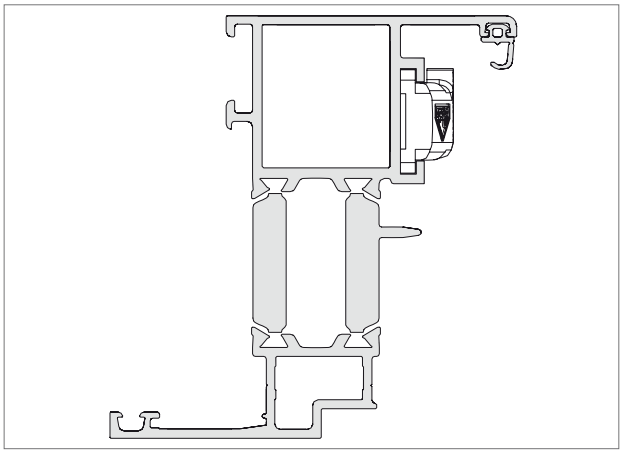
Pay attention to the installation direction of the slide bar. The arrow [A] must point towards the sash overlap.

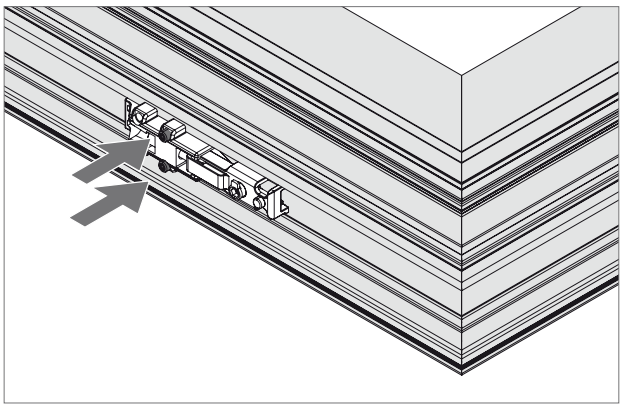
2. Screw down the slide bar with 2 preinstalled piercing screws [B].

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

   Tool: T 10 hex key

   Torque: 2–2.5 Nm



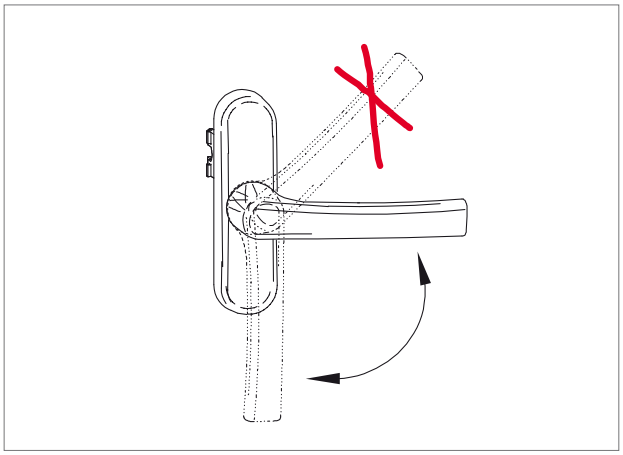


Installing the rebate stay hinge

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.

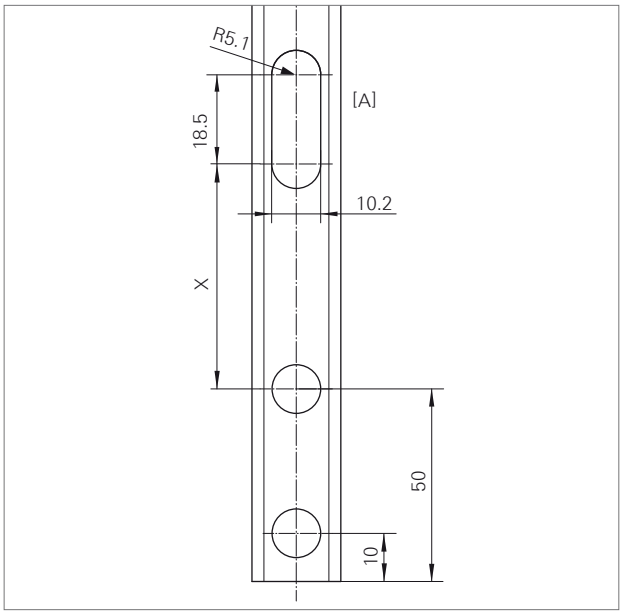
   Tool: T 10 hex key

   Torque max. 2.5 Nm



Installing the espagnolette lock

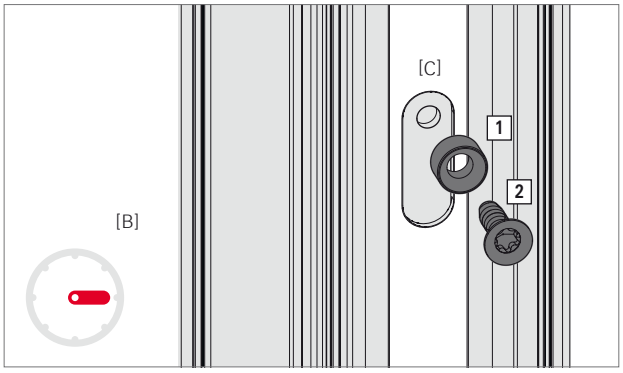
Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.



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

NOTE!

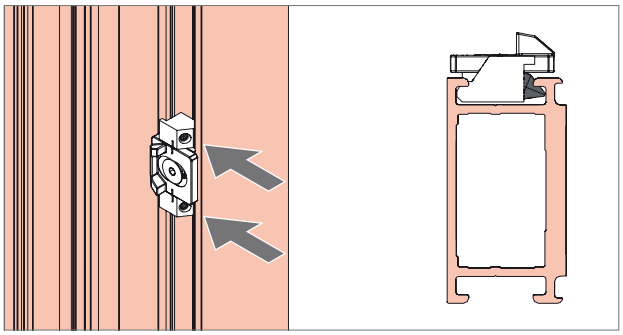
X = freely positionable (suggestion: 60 mm)



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

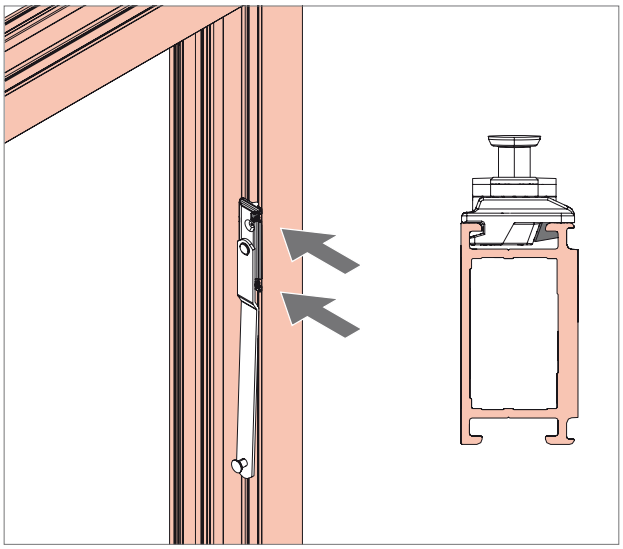


Installing the CL frame component

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

   Tool: T 10 hex key

   Torque: max. 2.5 Nm

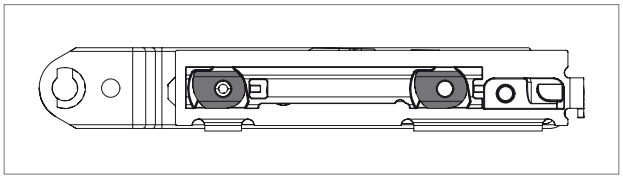


Installing the Tilt-Only stay arm

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 preinstalled threaded pins.

   Tool: T 10 hex key

   Torque: max. 2.5 Nm

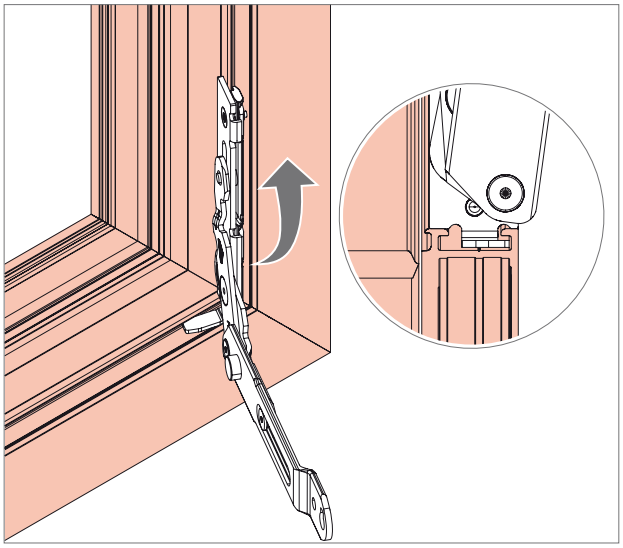


Installing the rebate sash stay

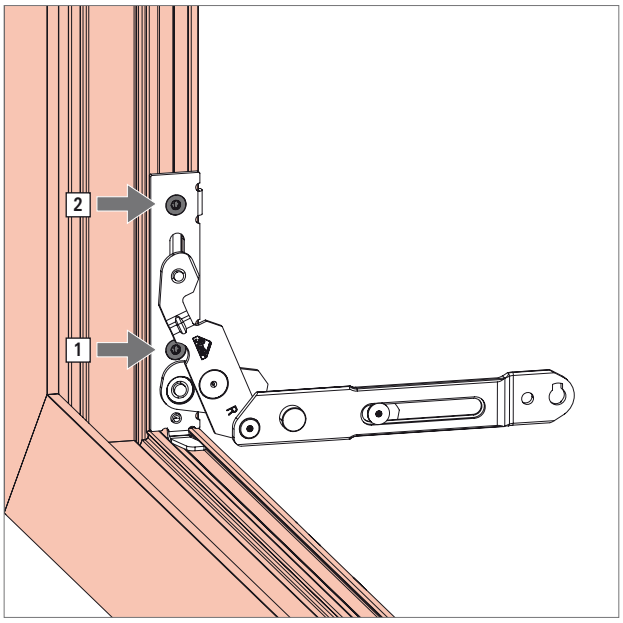
1. Align the clamping blocks (see image).

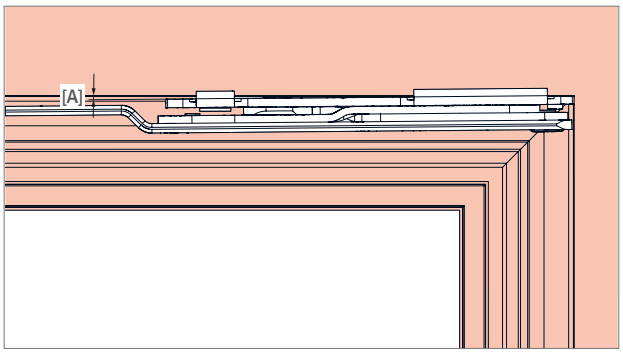
NOTE!

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.





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

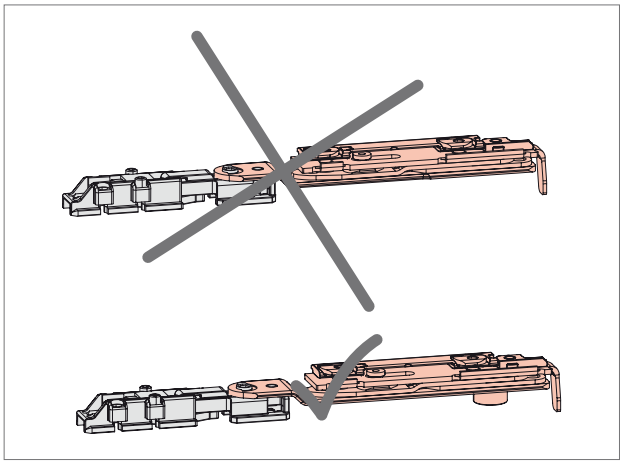
NOTE!

- 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.



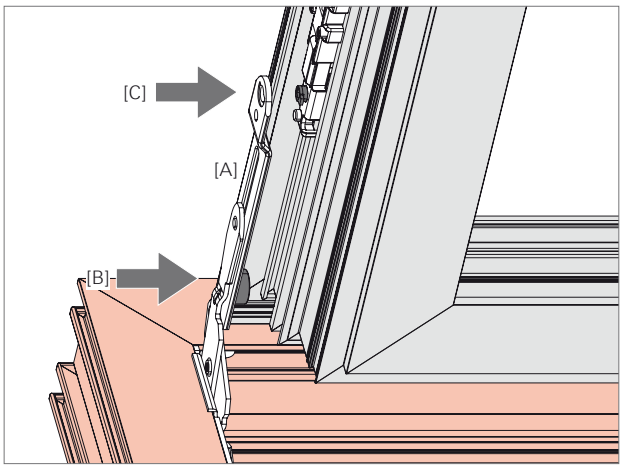
Mounting the rebate sash stay

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.

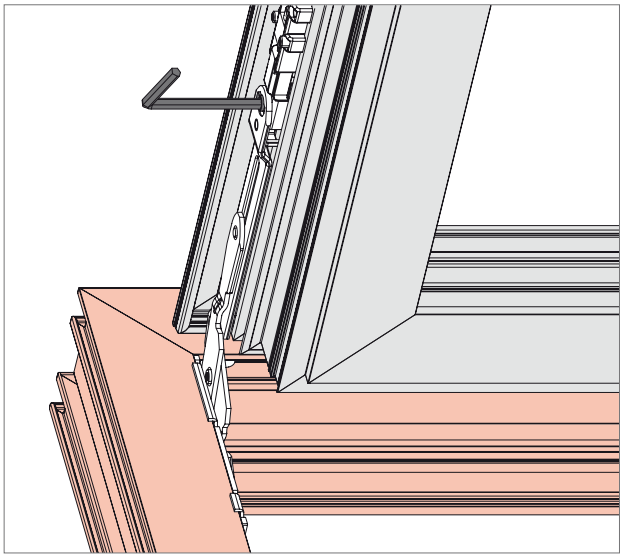
Only install the rebate sash stay in conjunction with the rebate stay hinge.



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°.

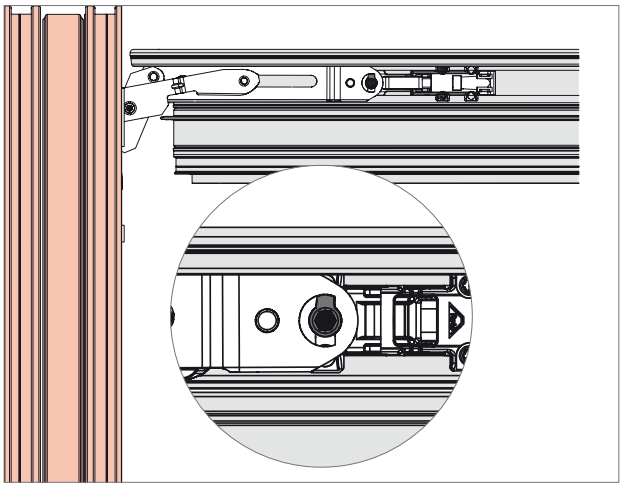
   Tool: hex key size 4

WARNING!

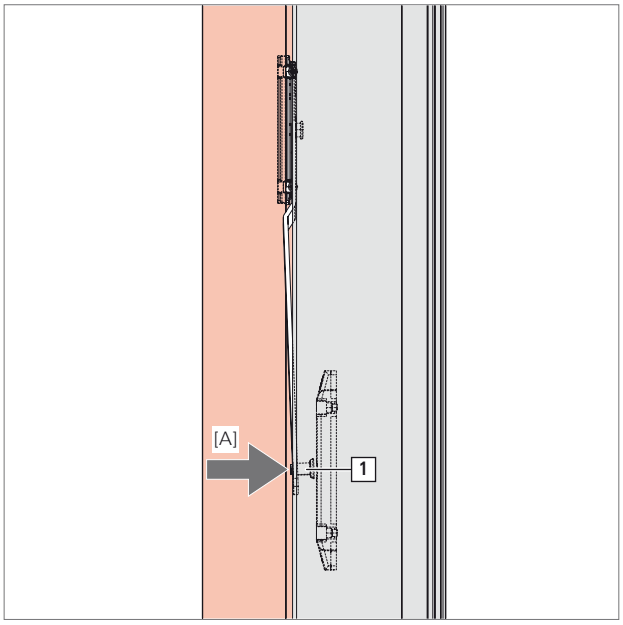
Danger in the event of prohibited installation!

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.

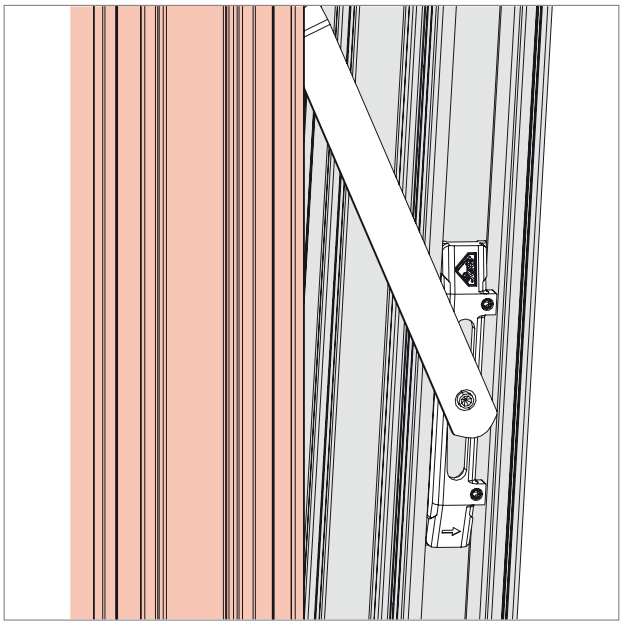


Connecting the Tilt-Only stay arm to the slide bar

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.

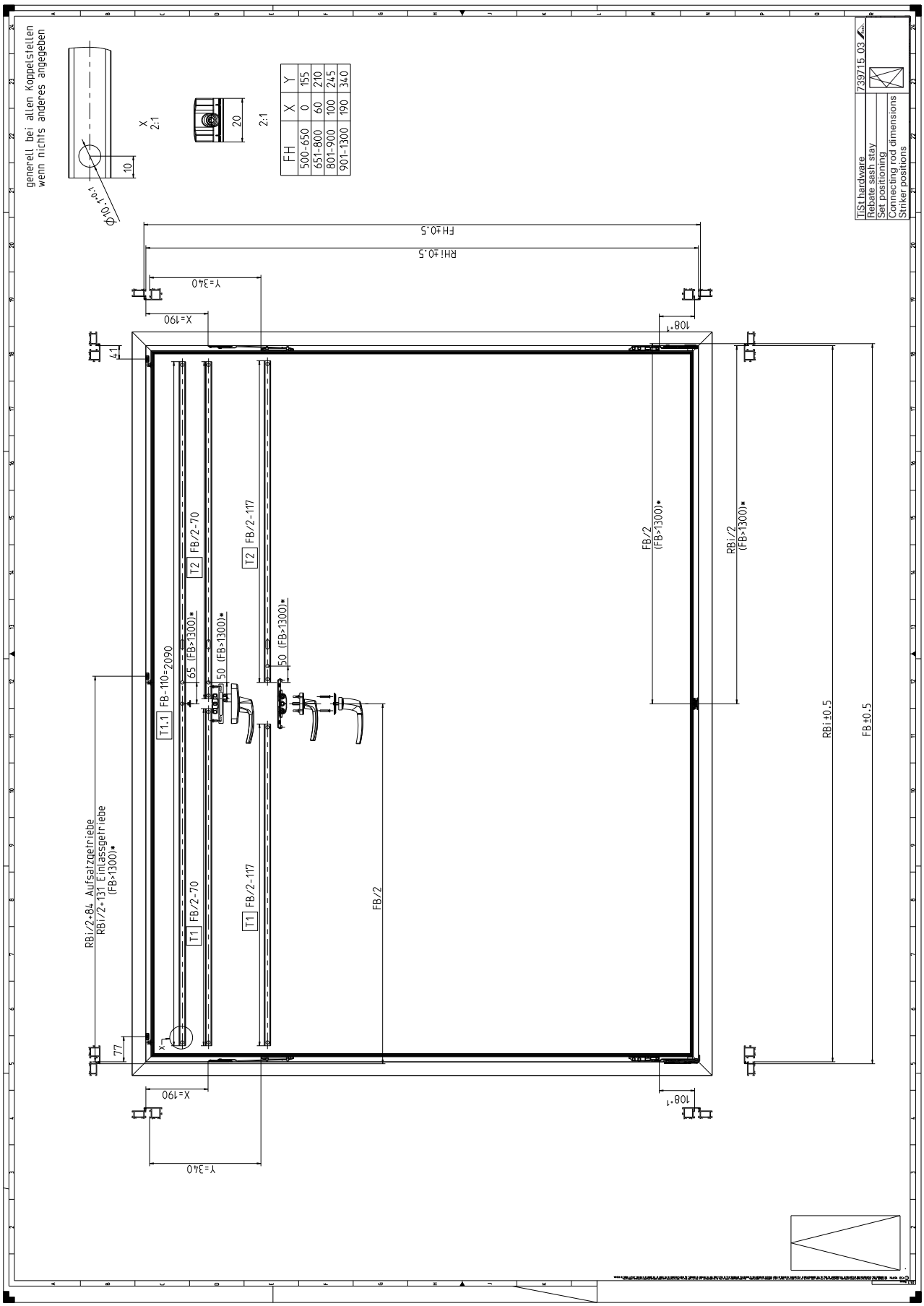


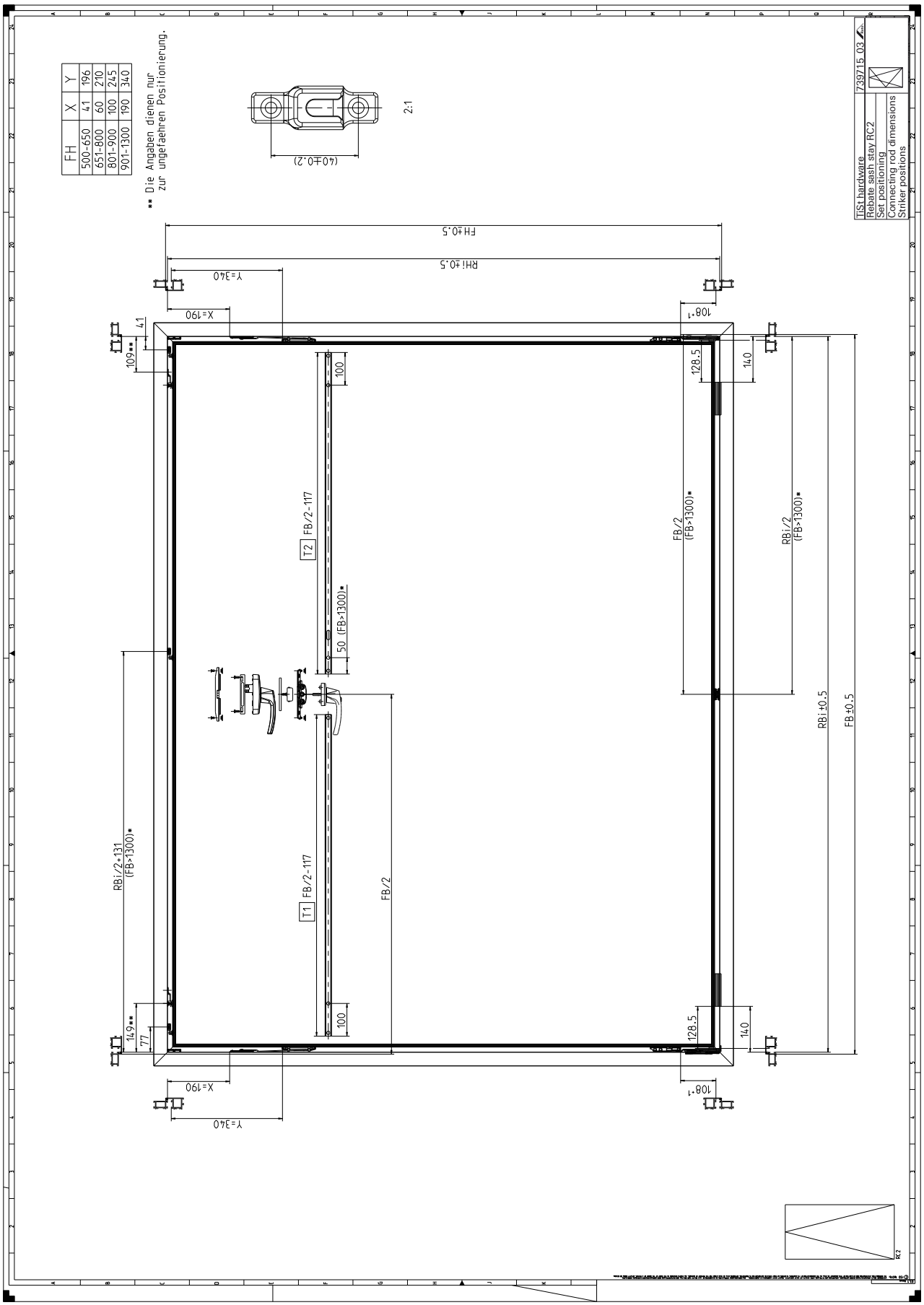
2. Insert the mounting pin in the slide bar and close the sash.

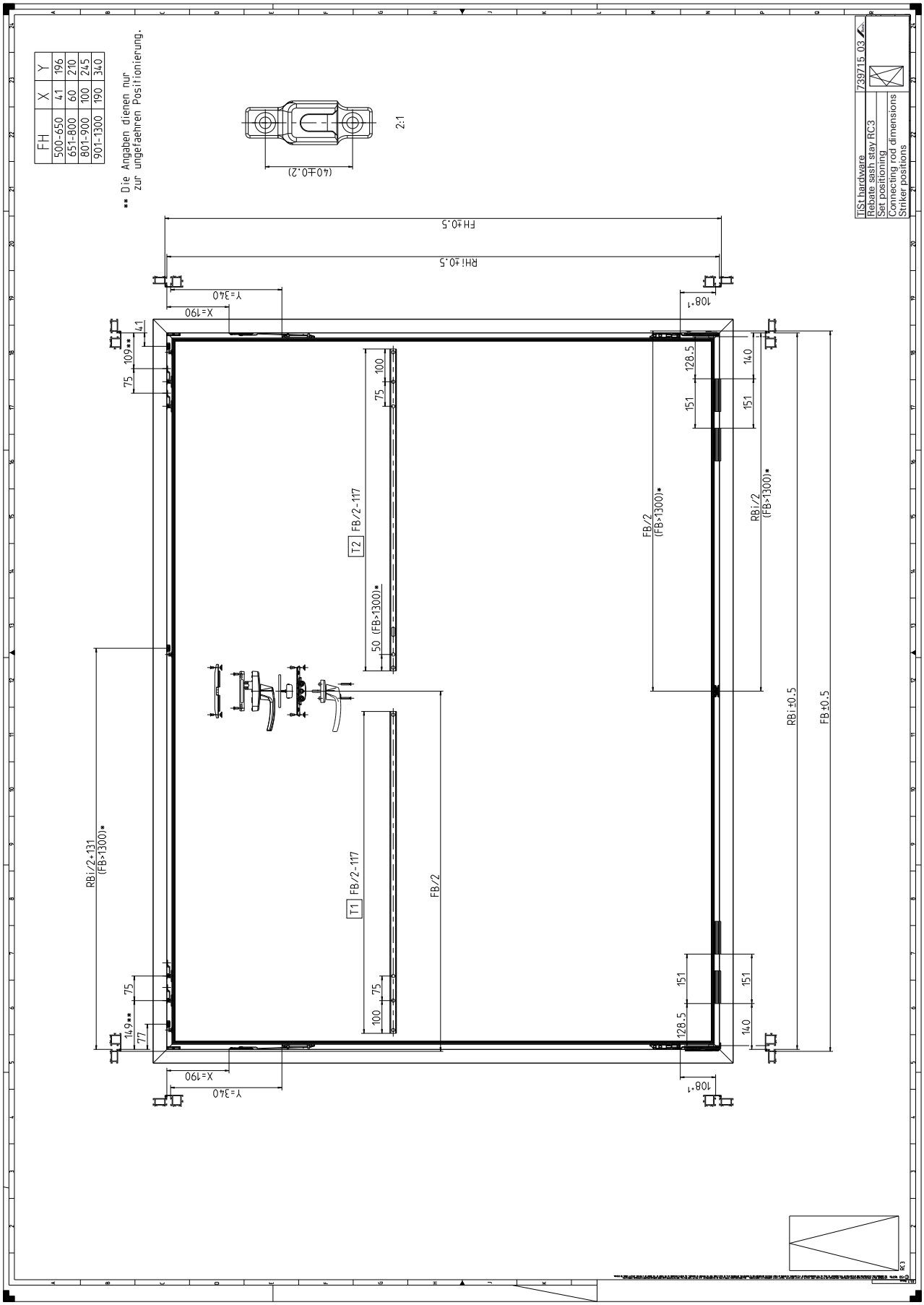
NOTE!

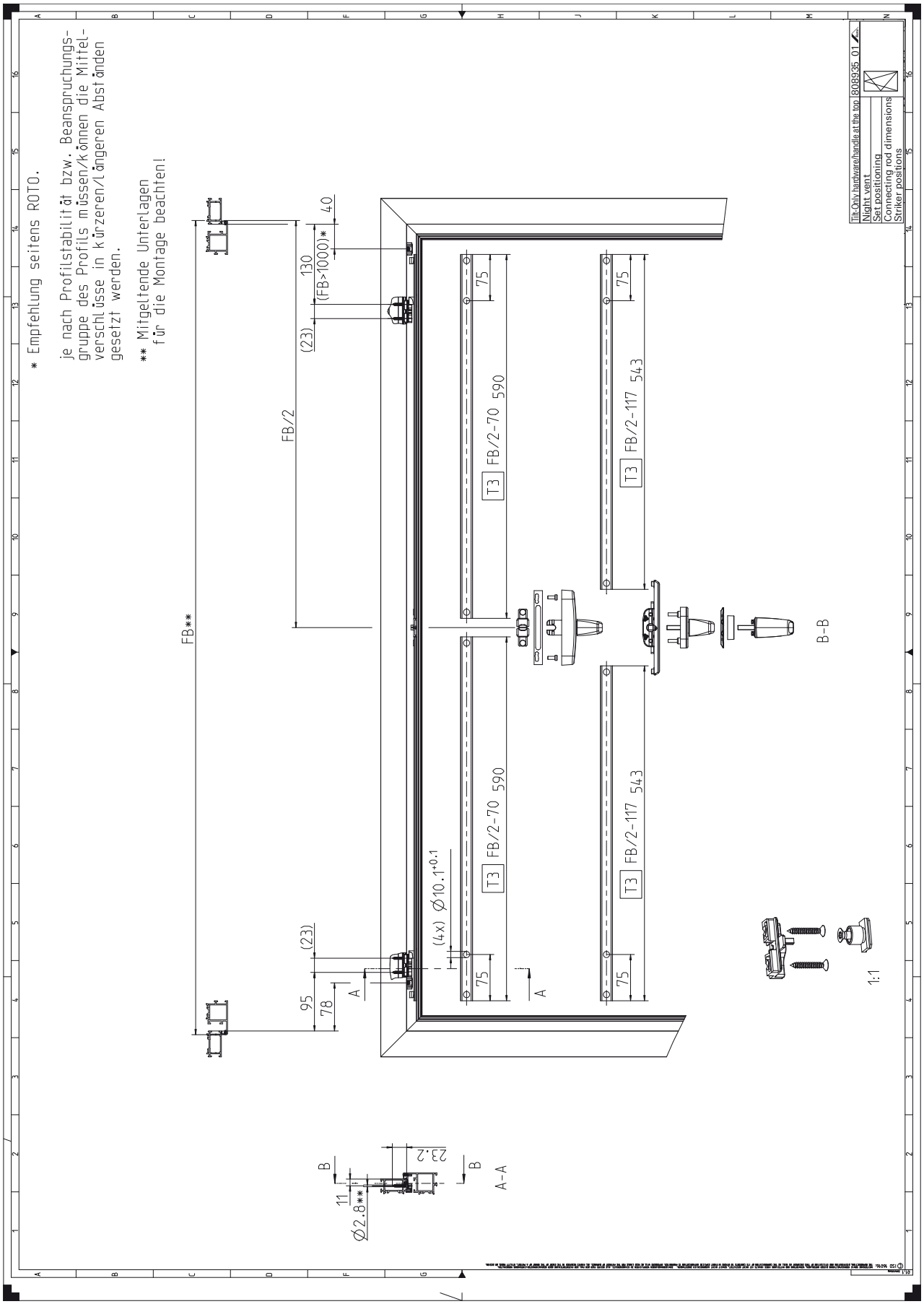
Dismantling is performed in reverse order.

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
Mitgeltende Unterlagen für die Montage beachten!	Comply with the other applicable documents for installation.
RBi	FWi
RHi	FHi


generell bei allen Koppelstellen
wenn nichts anderes angegeben
X
2:1
20
2:1
FH | X | Y
500-650 | 0 | 155
651-800 | 60 | 210
801-900 | 100 | 245
901-1300 | 190 | 340
10
Ø10.1
FH±0.5
RHi±0.5
Y=340
X=190
108*1
41
T1.1 FB-110=2090
T1 FB/2-70
T2 FB/2-70
T1 FB/2-117
T2 FB/2-117
65 (FB>1300)*
50 (FB>1300)*
50 (FB>1300)*
FB/2
FB/2 (FB>1300)*
RBi/2 (FB>1300)*
RBi±0.5
FB±0.5
RBi/2+84 Aufsatzgetriebe
RBi/2+131 Einlassgetriebe
(FB>1300)*
77
TiSt hardware
Rebate sash stay
Set positioning
Connecting rod dimensions
Striker positions
7397715 03

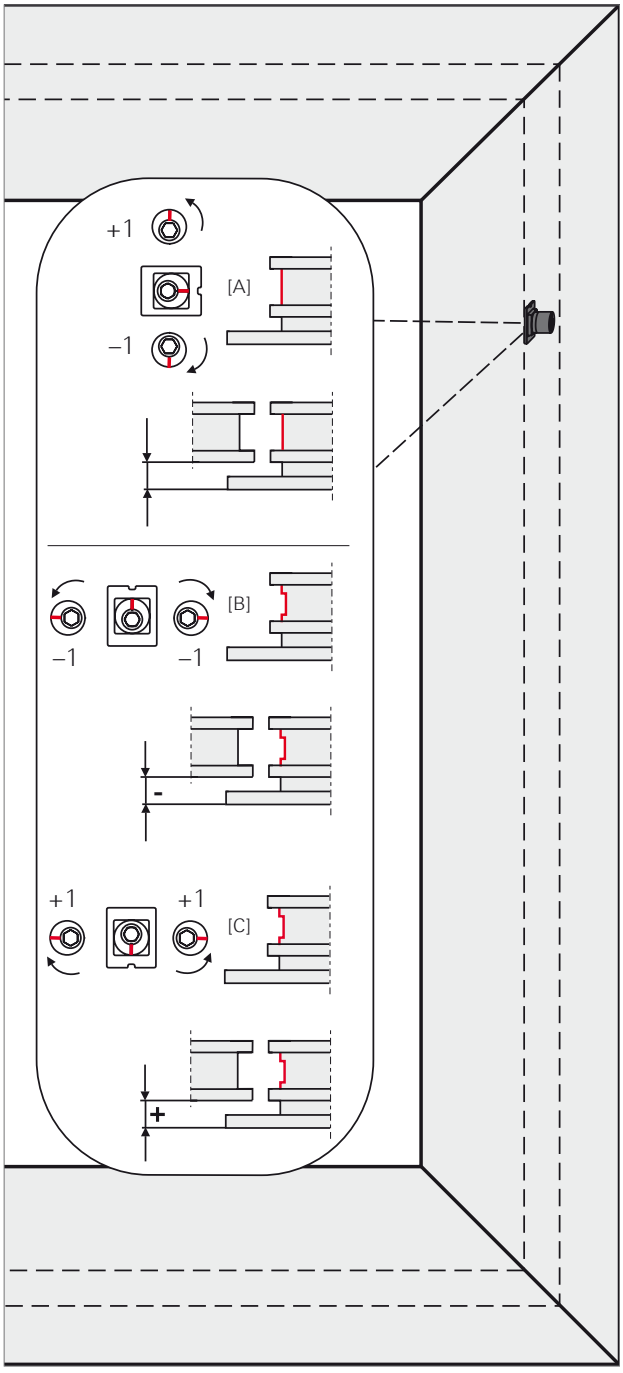

FH | X | Y
500-650 | 41 | 196
651-800 | 60 | 210
801-900 | 100 | 245
901-1300 | 190 | 340
** Die Angaben dienen nur zur ungefähren Positionierung.
2:1
(40±0.2)
739715_03
TiSt hardware
Rebate sash stay RC2
Set positioning
Connecting rod dimensions
Striker positions
FH±0.5
RH±0.5
Y=340
X=190
108*1
41
109**
100
128.5
140
T2 FB/2-117
50 (FB>1300)*
FB/2
(FB>1300)*
RBi/2
(FB>1300)*
RBi±0.5
FB±0.5
RBi/2+131
(FB>1300)*
T1 FB/2-117
FB/2
149**
177


FH
X
Y
500-650 41 196
651-800 60 210
801-900 100 245
901-1300 190 340
** Die Angaben dienen nur zur ungefähren Positionierung.
2:1
(40±0.2)
TiSt hardware
Rebate sash stay RC3
Set positioning
Connecting rod dimensions
Striker positions
739715_03
FH±0.5
RHi±0.5
Y=340
X=190
108*1
41
109**
75
100
75
T2 FB/2-117
50 (FB>1300)*
128.5
14.0
151
151
FB/2 (FB>1300)*
RBi/2 (FB>1300)*
RBi±0.5
FB±0.5
RBi/2-131 (FB>1300)*
T1 FB/2-117
FB/2
14.9**
77
RC3


* Empfehlung seitens ROTO.
je nach Profilstabilität bzw. Beanspruchungsgruppe des Profils müssen/können die Mittelverschlüsse in kürzeren/längeren Abständen gesetzt werden.
** Mitgeltende Unterlagen für die Montage beachten!
Tilt-Only hardware/handle at the top 8089335 01
Night vent
Set positioning
Connecting rod dimensions
Striker positions
FB**
FB/2
130
(FB>1000)*
40
(23)
95
78
A
(4x) Ø10.1+0.1
T3 FB/2-70 590
T3 FB/2-117 543
75
B-B
1:1
A-A
B
11
Ø2.8**
23.2

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.

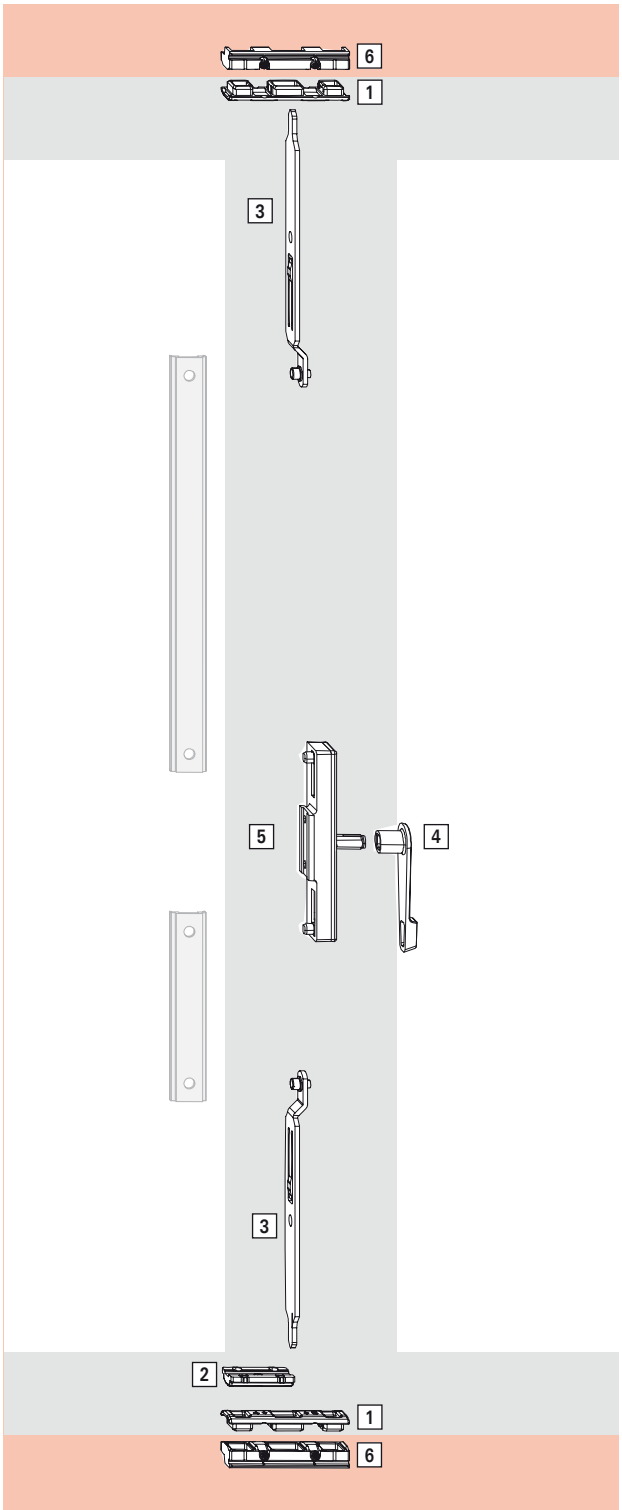
FM hardware overview

FM installation

FM installation drawings

Application range

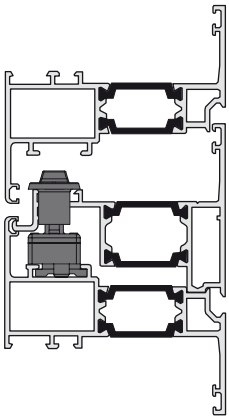
Sash width **SW** (passive sash: TuS) ..... 250 – 1600 mm
Sash height **SH** ..... max. 2700 mm
Rebate clearance **RC** ..... 11.5 – 12 mm
Overlap width **OW** ..... 21.5 – 22 mm



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**			

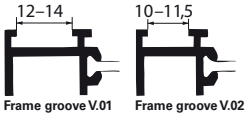


Grey components (optional) are not included in the basic set.

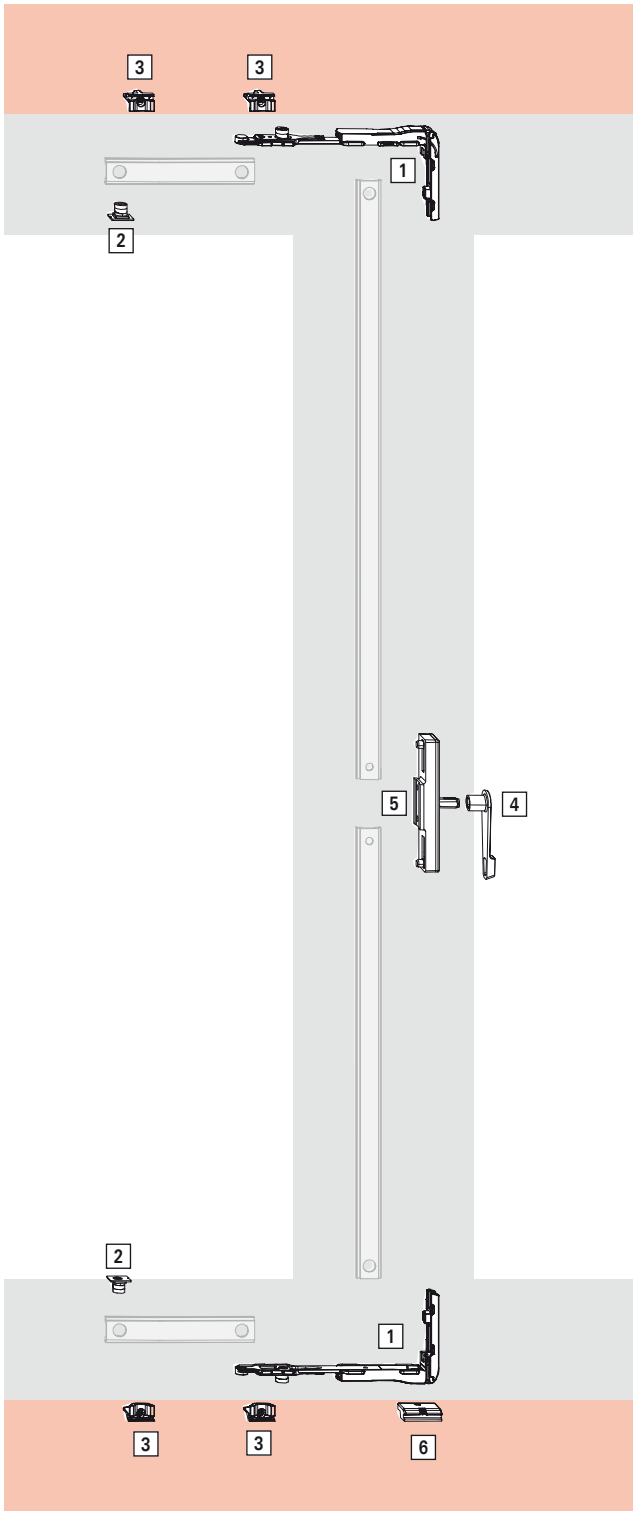
Application range

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



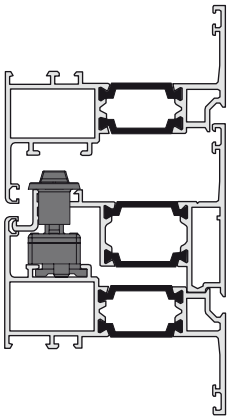
Frame groove V.01 Frame groove V.02



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

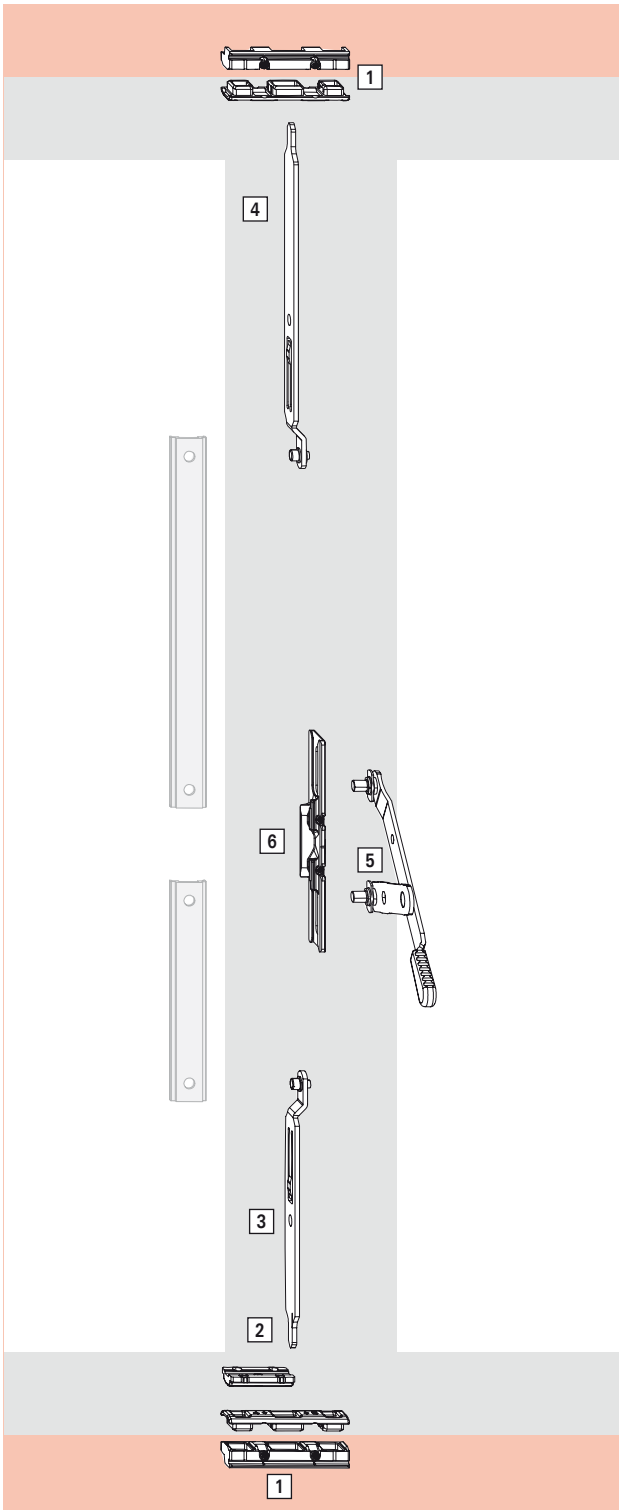


Grey components (optional) are not included in the basic set.

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



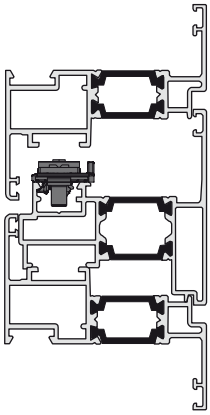
Basic set

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** consisting of:		20	**728964**
[5]	1	**Toggle lever, compl.**			
[6]	1	**Guide rail, compl.**			
[2]	1	**Run-up block**		100	**212008**

Note

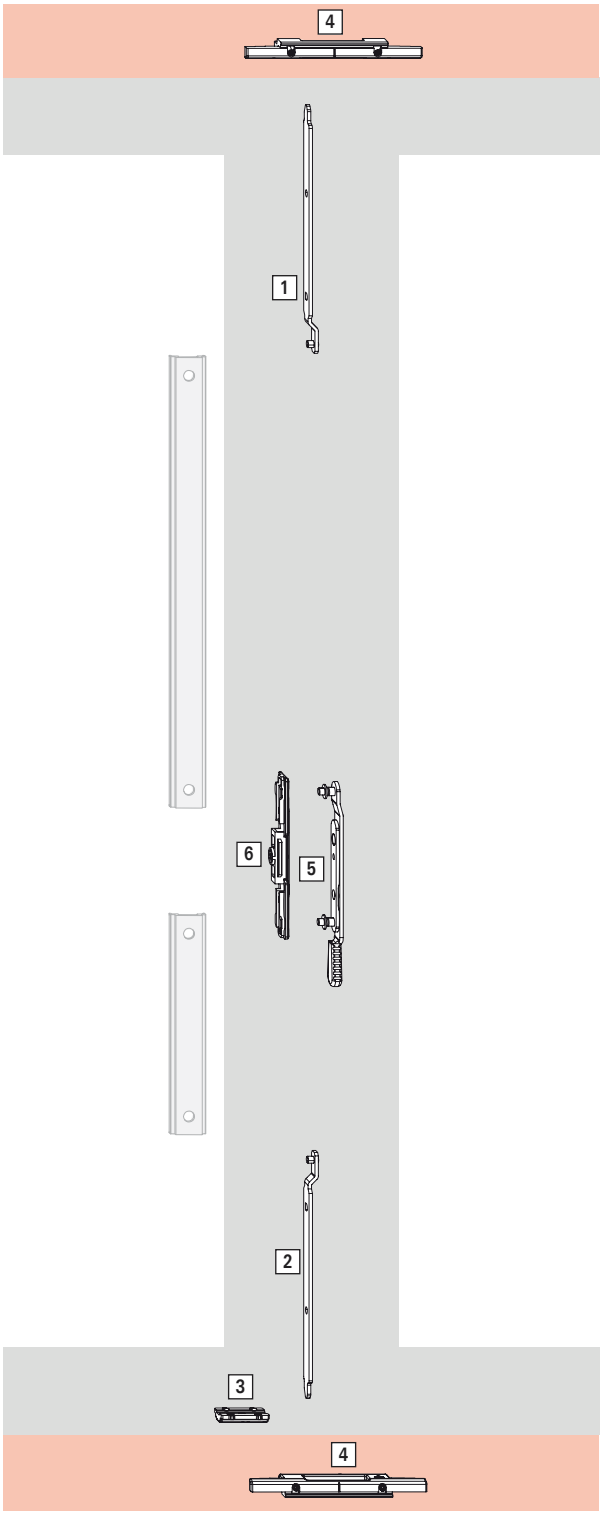
- FM-Su floating-mullion hardware can only be used in profiles with a double-C-groove.
- Roto assists with choosing the right components by means of a profile assessment.



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



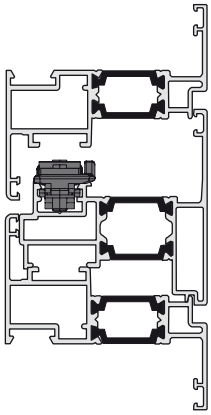
Basic set

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

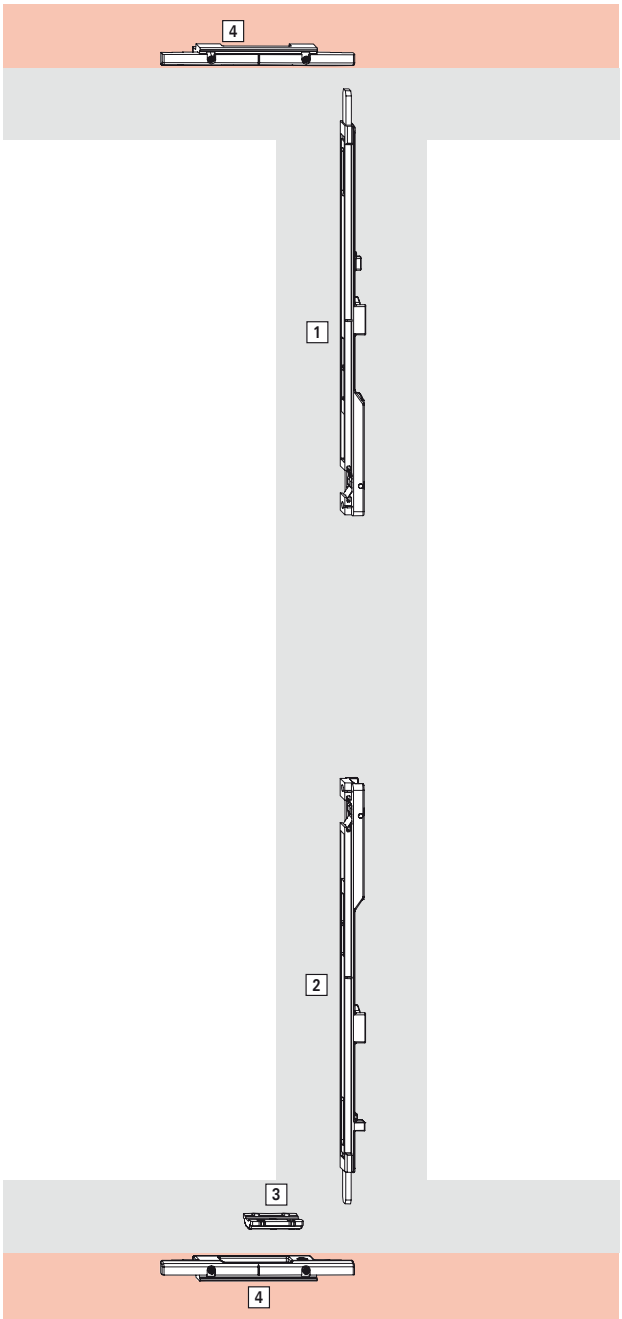
FM-SuN floating-mullion hardware can only be used in profiles with a double-C-groove.



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

Application range

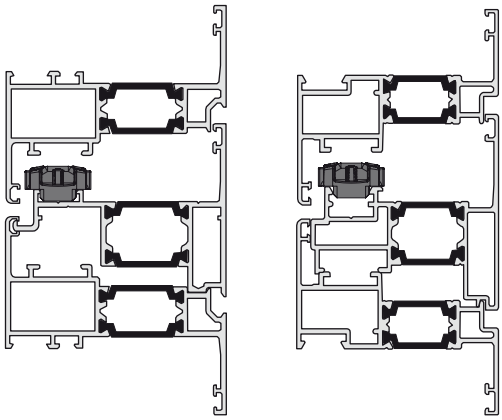
Sash width **SW** (passive sash: TuS) ..... 250 – 1600 mm
Sash height **SH** ..... max. 2700 mm
Rebate clearance **RC** ..... 11.5 – 12 mm
Overlap width **OW** ..... 21.5 – 22 mm



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)**		

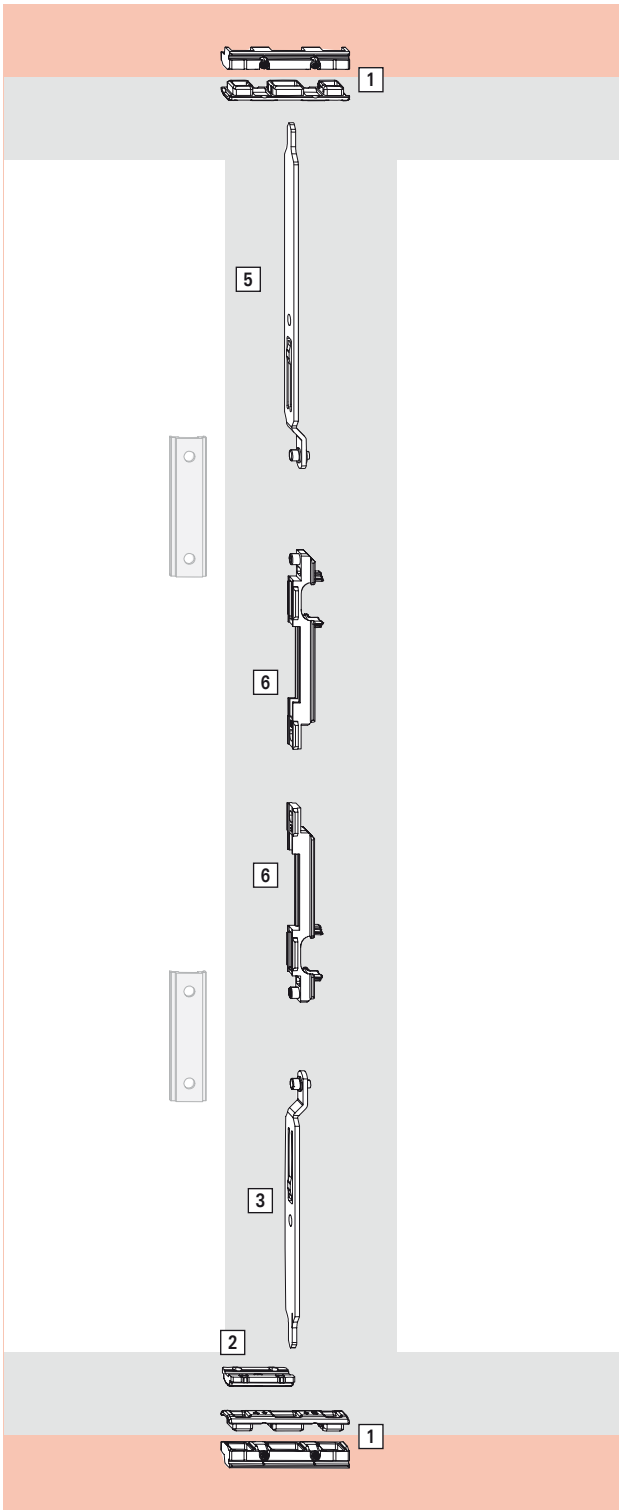


Grey components (optional) are not included in the basic set.

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



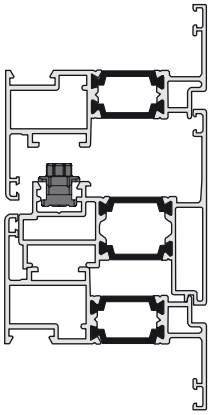
Basic set

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

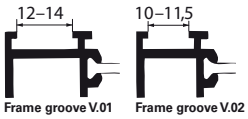
- FM-R floating-mullion hardware can only be used in profiles with a double-C-groove.
- Roto assists with choosing the right components by means of a profile assessment.

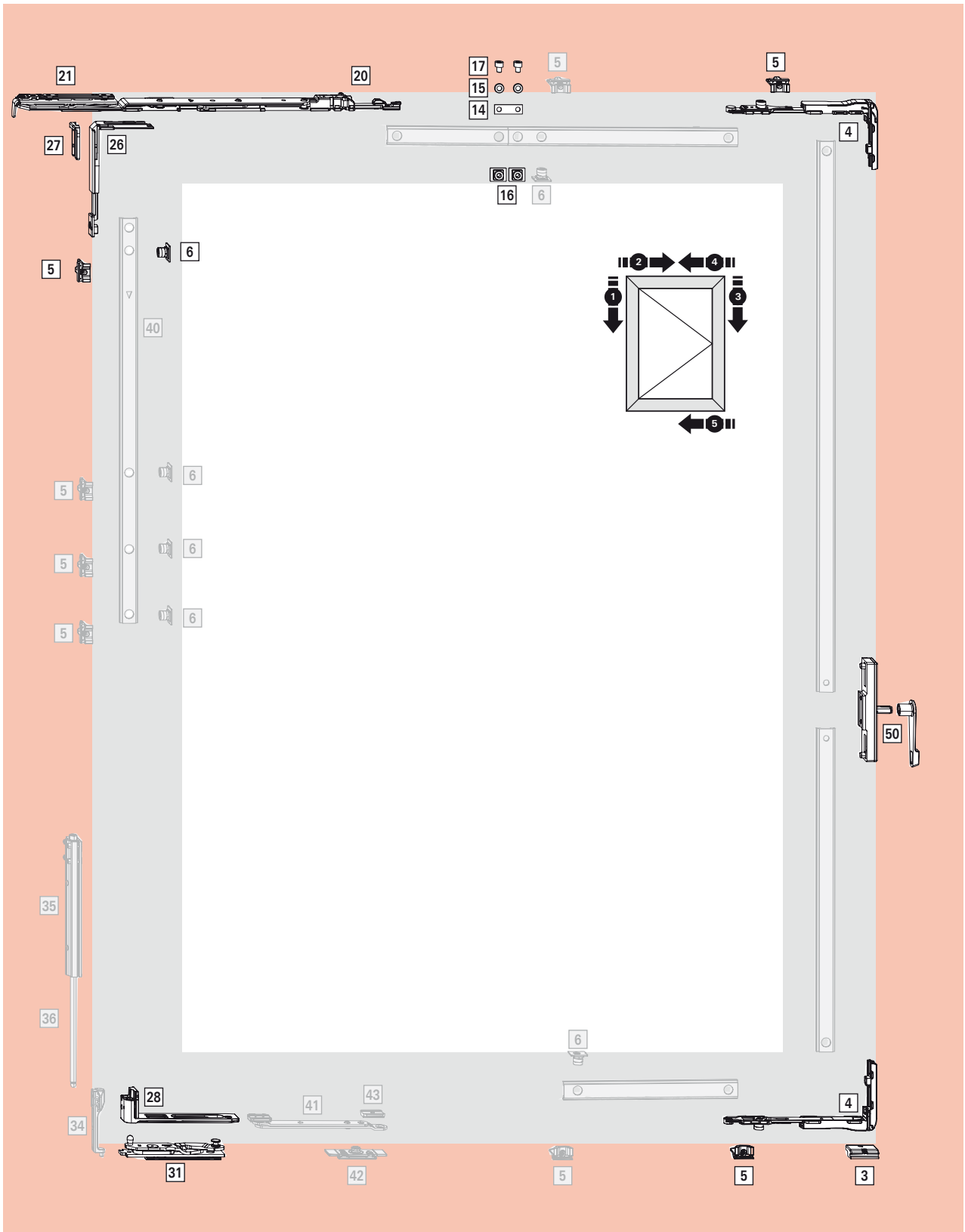


Grey components (optional) are not included in the basic set.

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

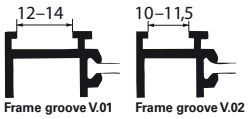
Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	**Load transfer set V.01**	L	10	**739694**
			R	10	**739693**
		Load transfer set V.02	L	10	**739696**
			R	10	**739695**
		consisting of:			
[35]	1	**Sash component**			
[36]	1	**Support rod**			
[34]	1	**Frame bearing**			

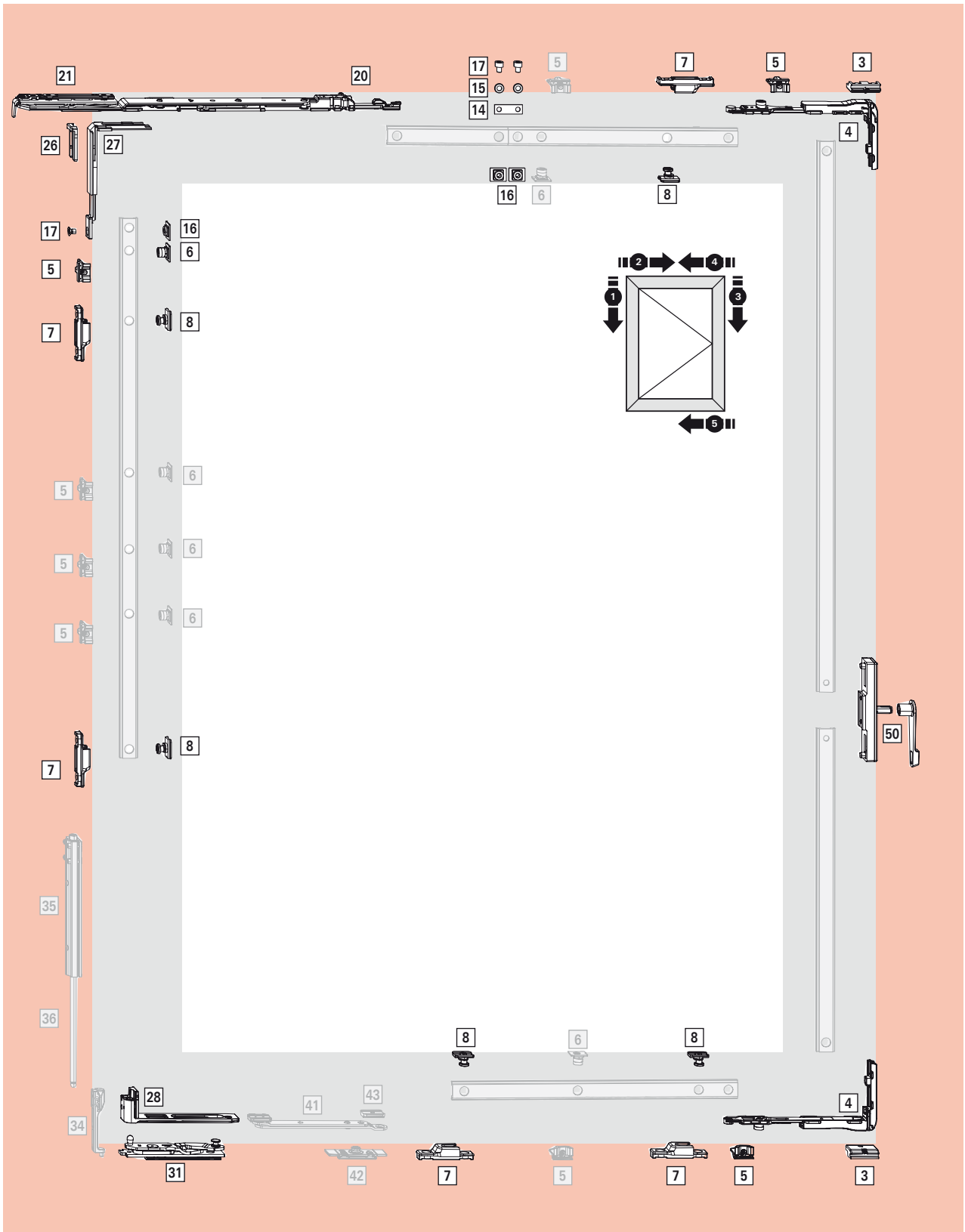
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) S.kg ≥ 80 kg with load transfer.

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 M5x7**		
[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

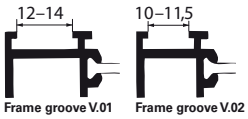
Pos.	Pc(s)	Description	DIN	PU	Material no.
	1	**Load transfer set V.01**	L	10	**739694**
			R	10	**739693**
		Load transfer set V.02	L	10	**739696**
			R	10	**739695**
		consisting of:			
[35]	1	**Sash component**			
[36]	1	**Support rod**			
[34]	1	**Frame bearing**			

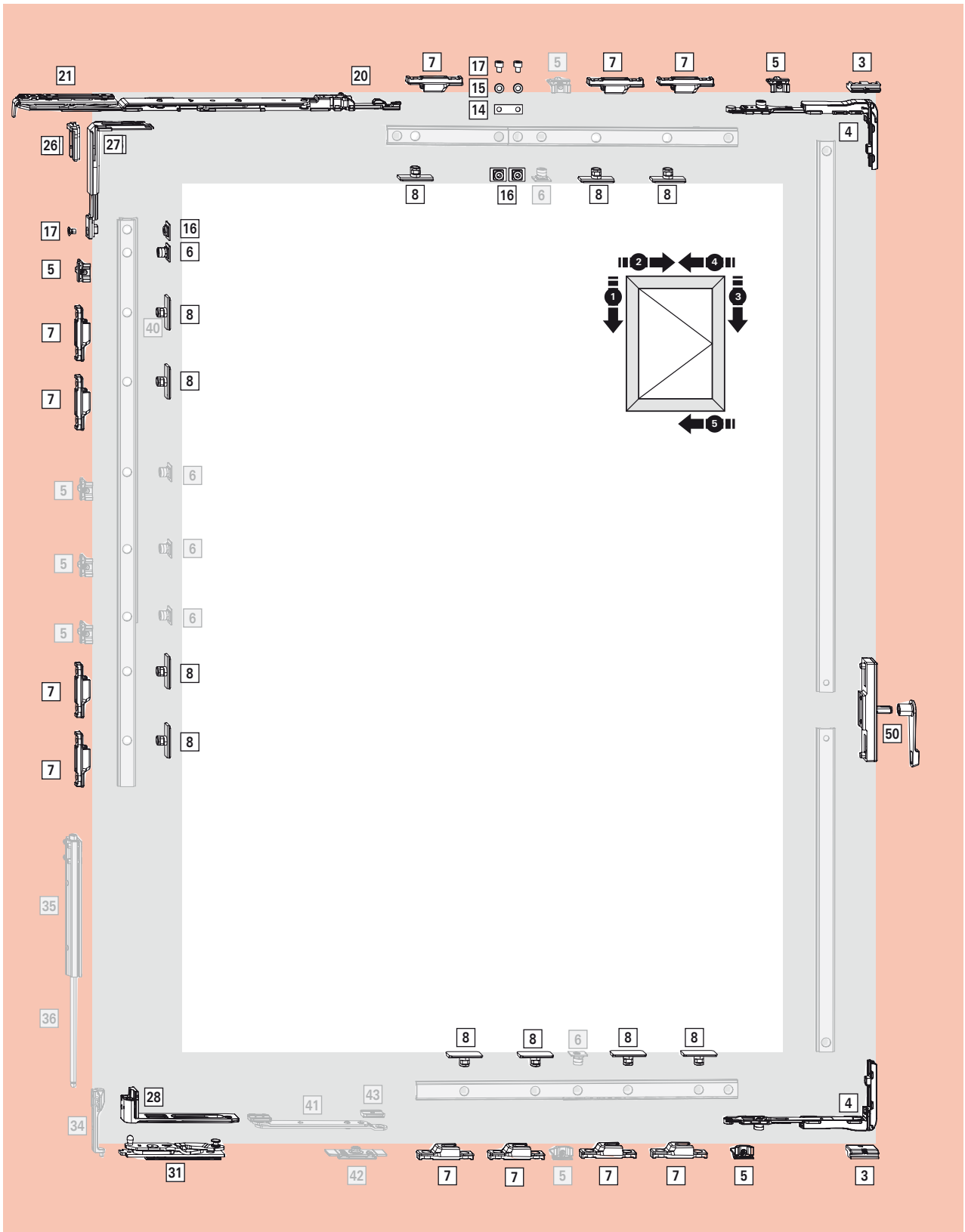
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) S.kg ≥ 80 kg with load transfer.

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 M5x7**		
[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

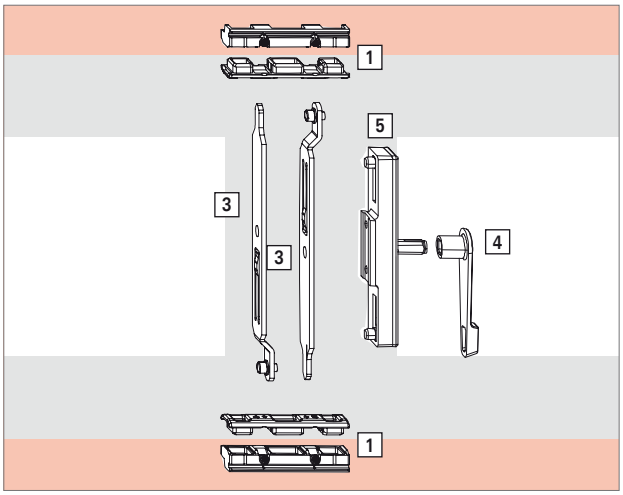
Pos.	Pc(s)	Description	PU	Material no.
[5]	1-2	**Striker V.01**	100	**728918**
		Striker V.02	100	**728920**
[6]	1-2	**Cam, insertable**	100	**334671**
	1	**Turn restrictor set V.01** [1)]	10	**740814**
		Turn restrictor set V.02 [1)]	10	**740835**
		consisting of:		
[41]	1	**Scissor stay, compl.**		
[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**			

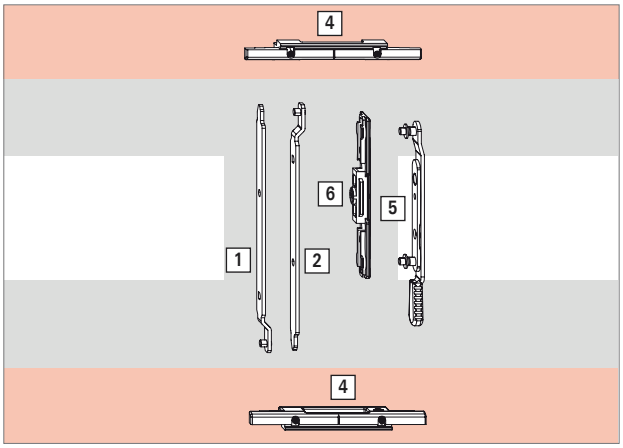
1) Turn restrictor can be used from SW > 1200 mm; for the damped, braked turn restrictor, see page 239.

2) S.kg ≥ 80 kg with load transfer.



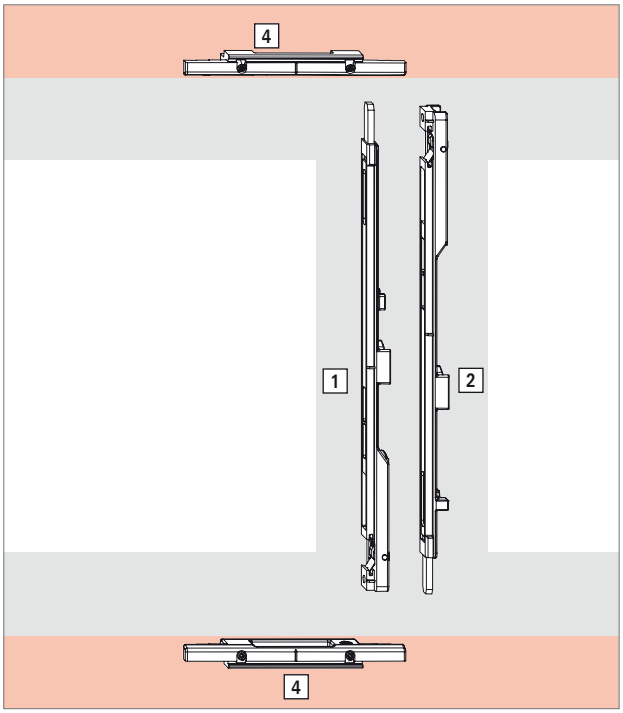
FM locking components

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] [5]	1	**FM espagnolette, internal**		20	**728965**



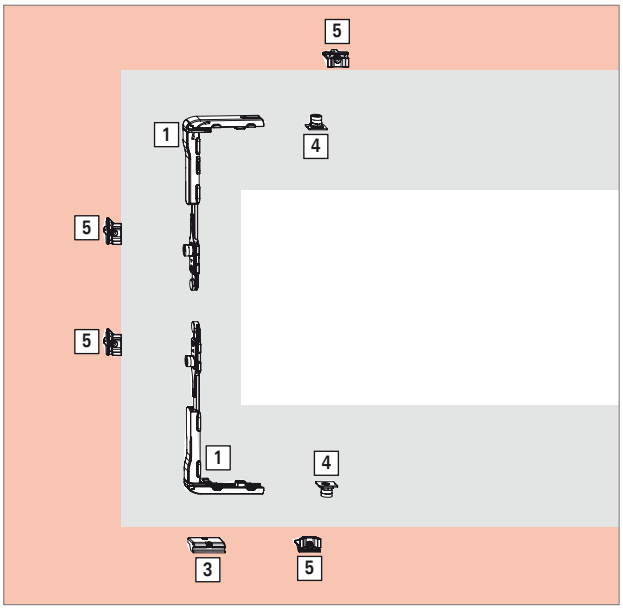
FM-SuN locking components

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**

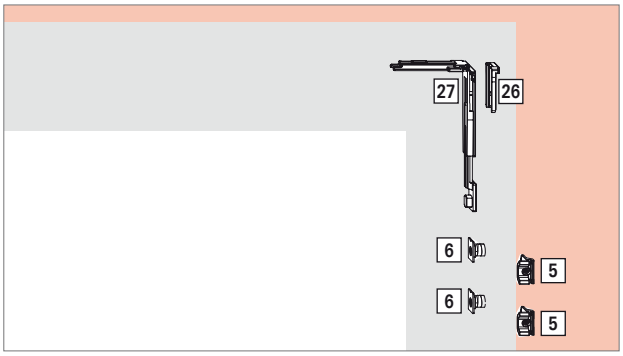


FM-Sh locking components set

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)**		

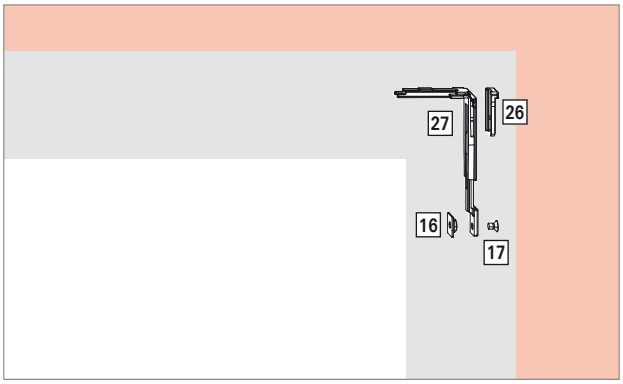
Run-up block

Pos.	Pc(s)	Description	PU	Material no.
[2]	1	**Run-up block**	100	**212008**



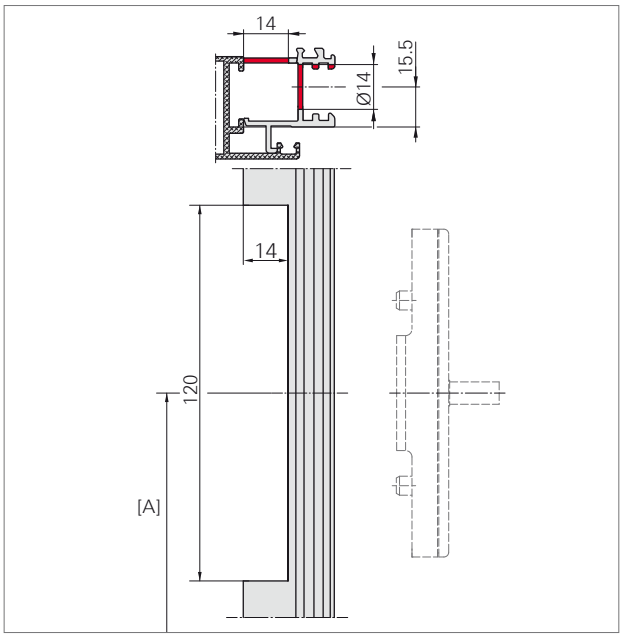
Corner drive CL set

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**

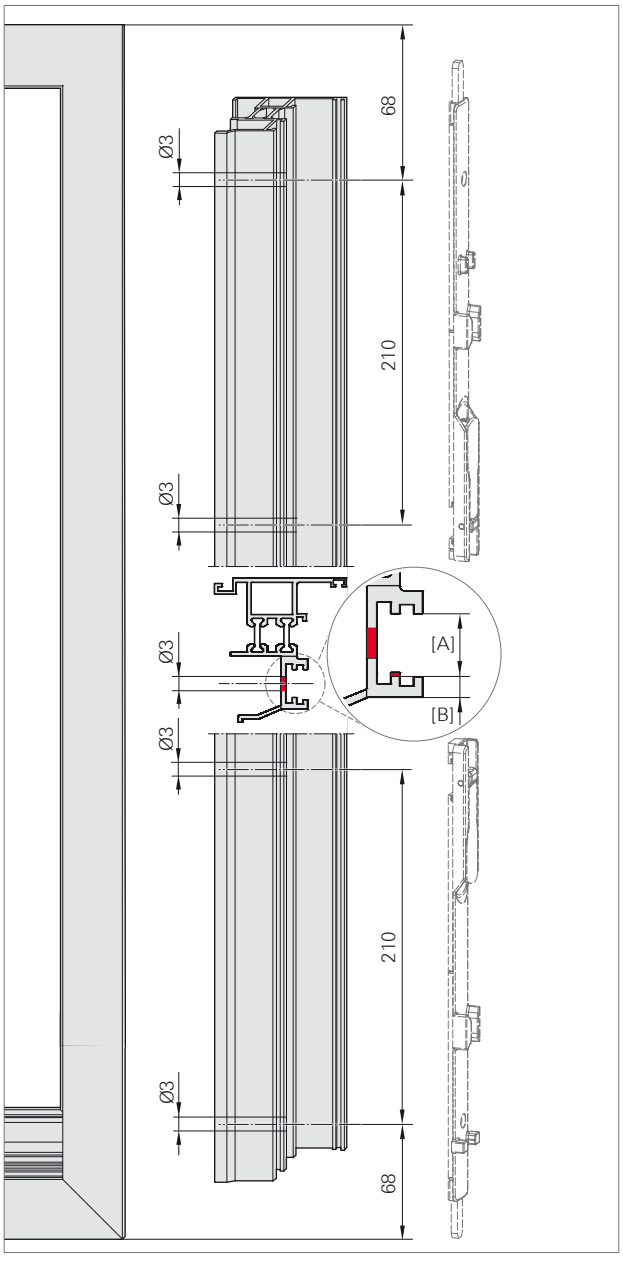


FM espagnolette, internal

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

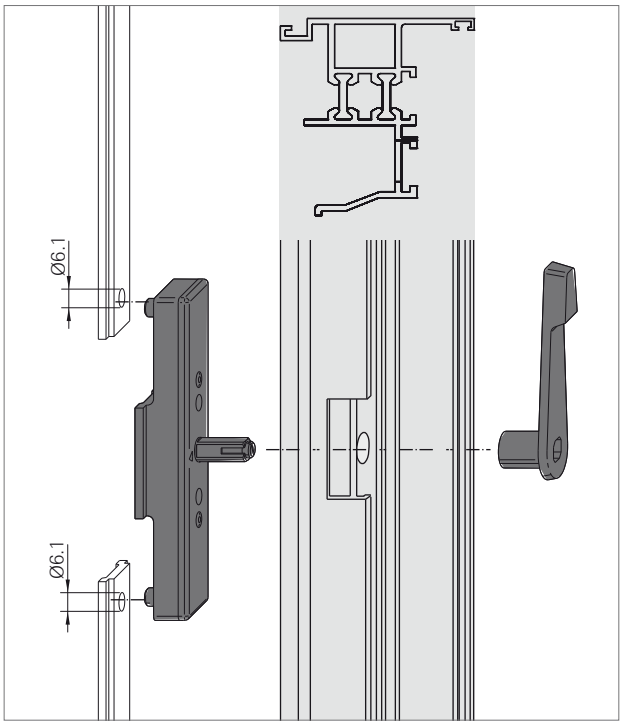


FM-Sh espagnolette

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

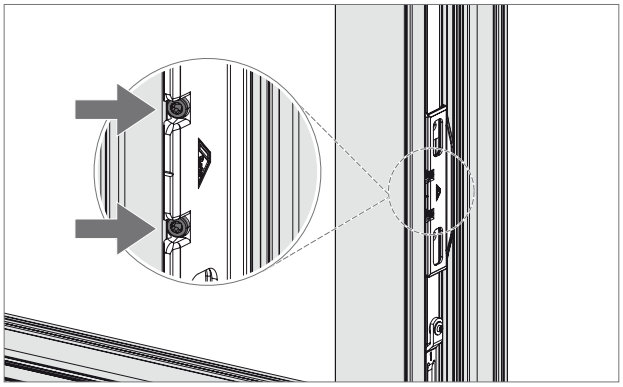
   Torque: max. 2.5 Nm

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



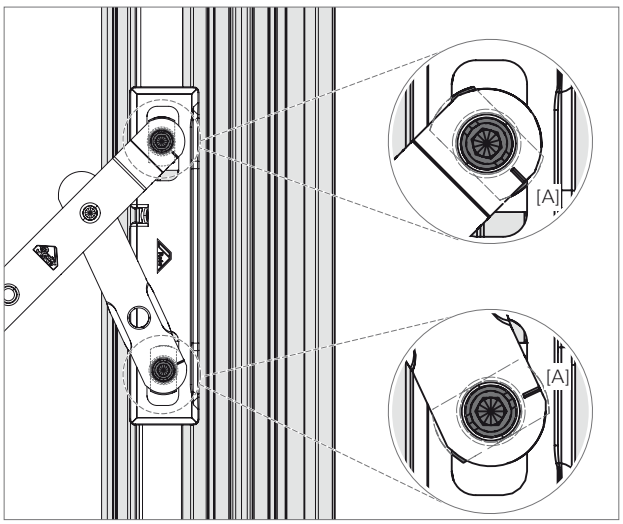
Installing the FM-Su espagnolette

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

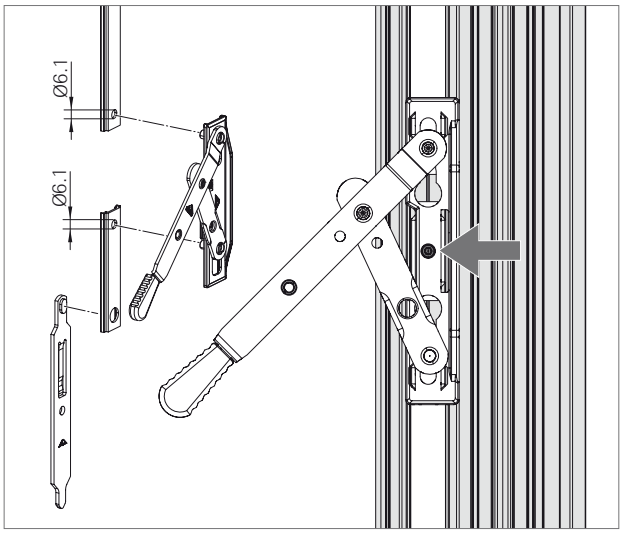
   Torque: max. 2.5 Nm



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.

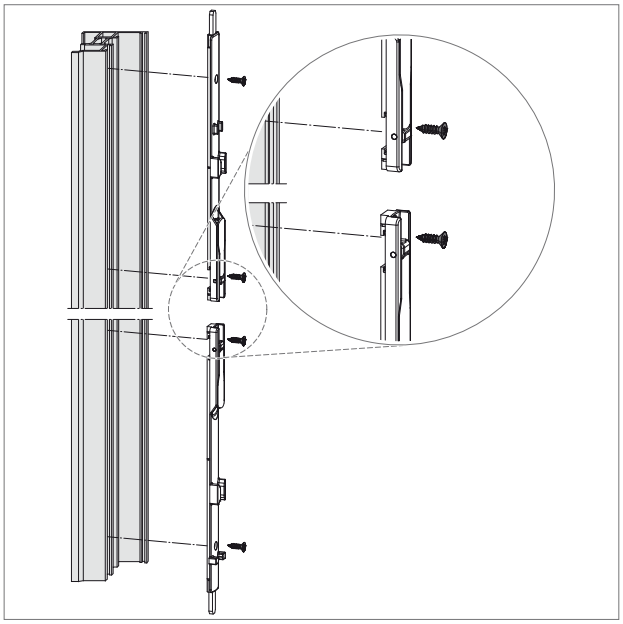


Installing the FM-SuN espagnolette

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

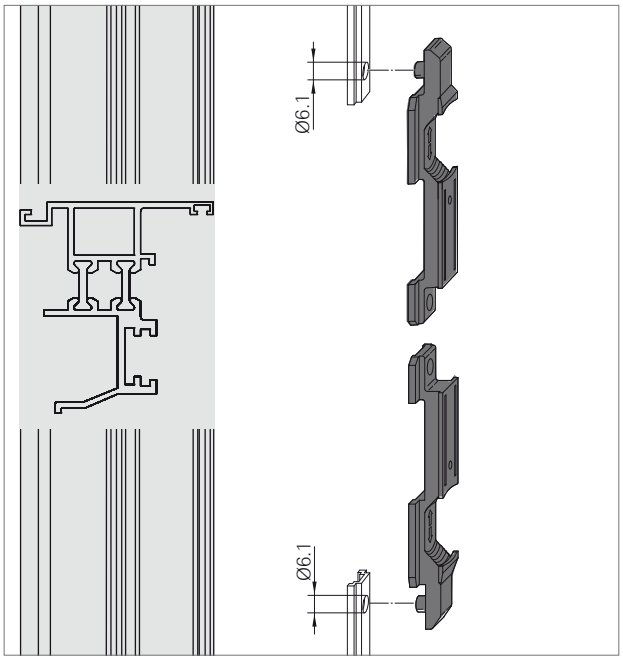
   Torque: max. 2.5 Nm
3. Insert the toggle lever when it is open and fix in position in the guide rail by closing it.



Installing the FM-Sh espagnolette

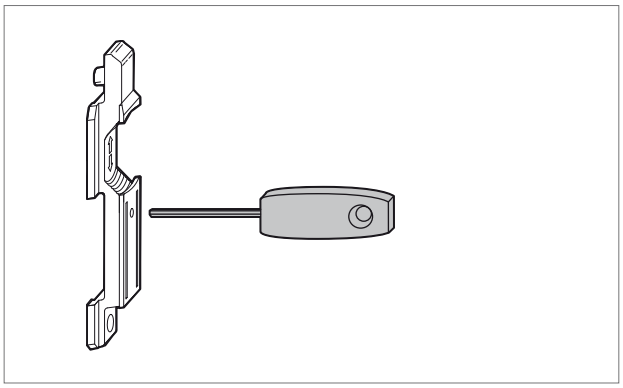
1. Insert the shootbolt into the sash profile.
2. Screw the shootbolt down when locked.

   Tool: T 15 hex key



Installing the FM-R espagnolette

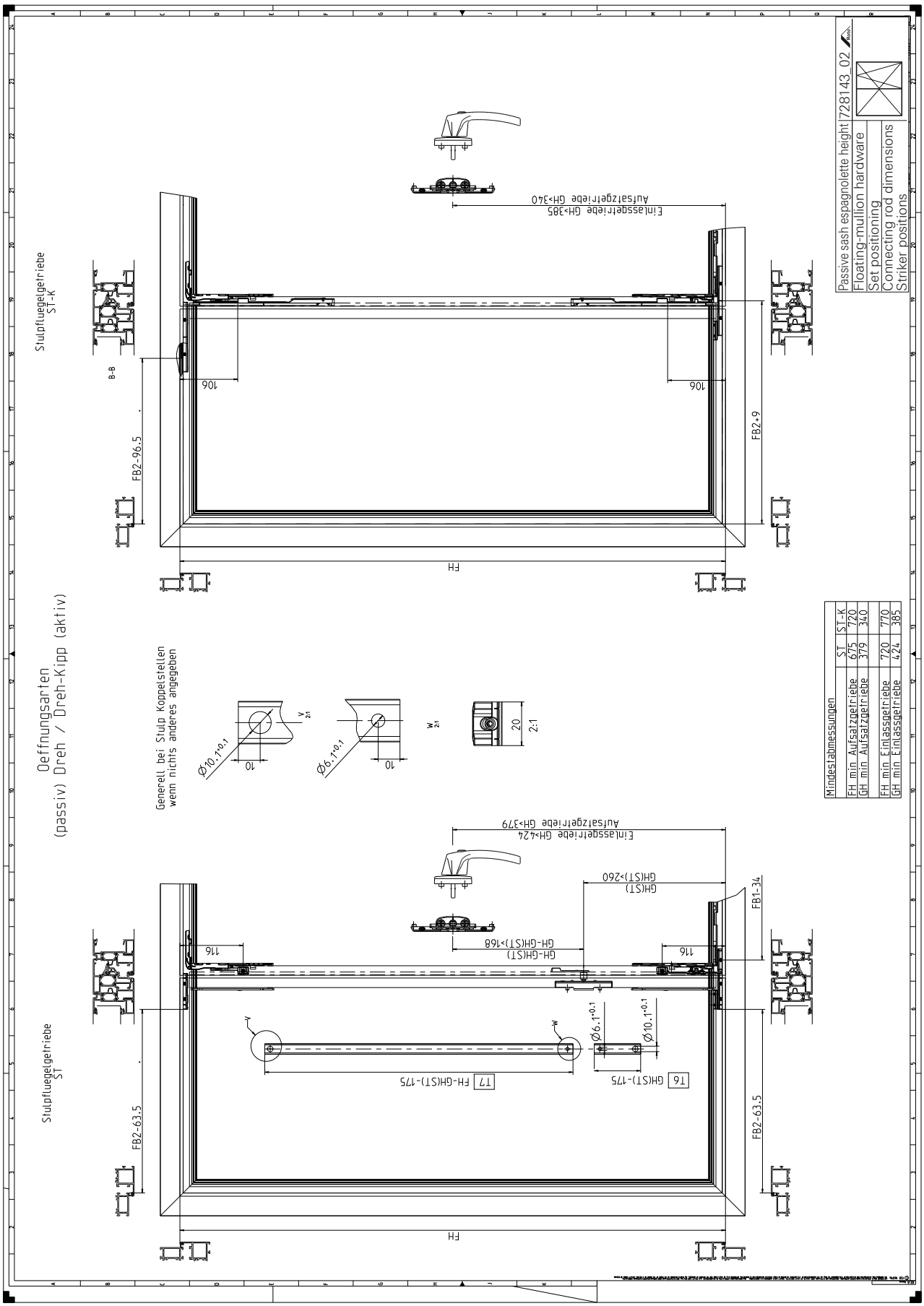
1. Connect the slider to the sash components and insert into the sash profile.

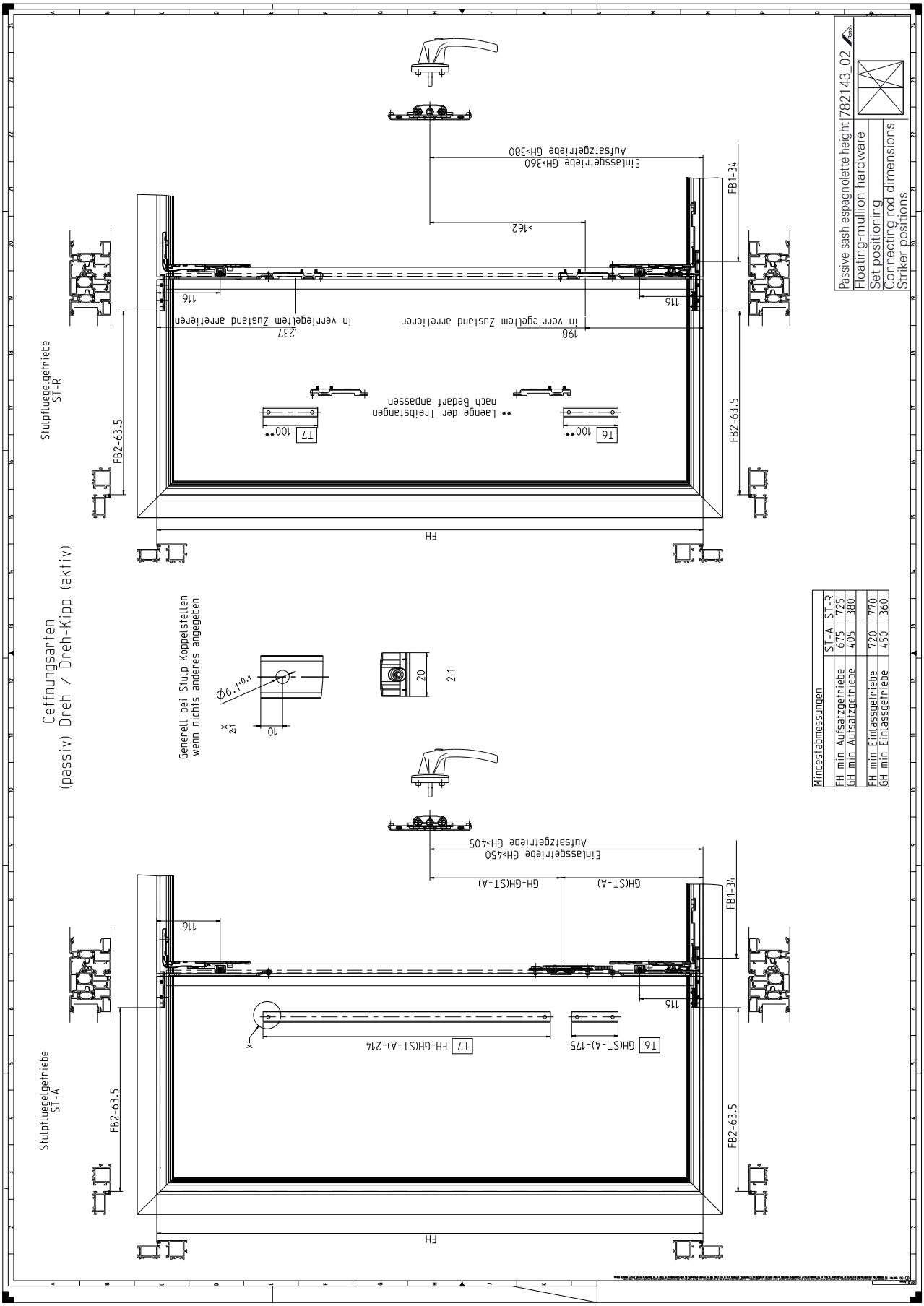


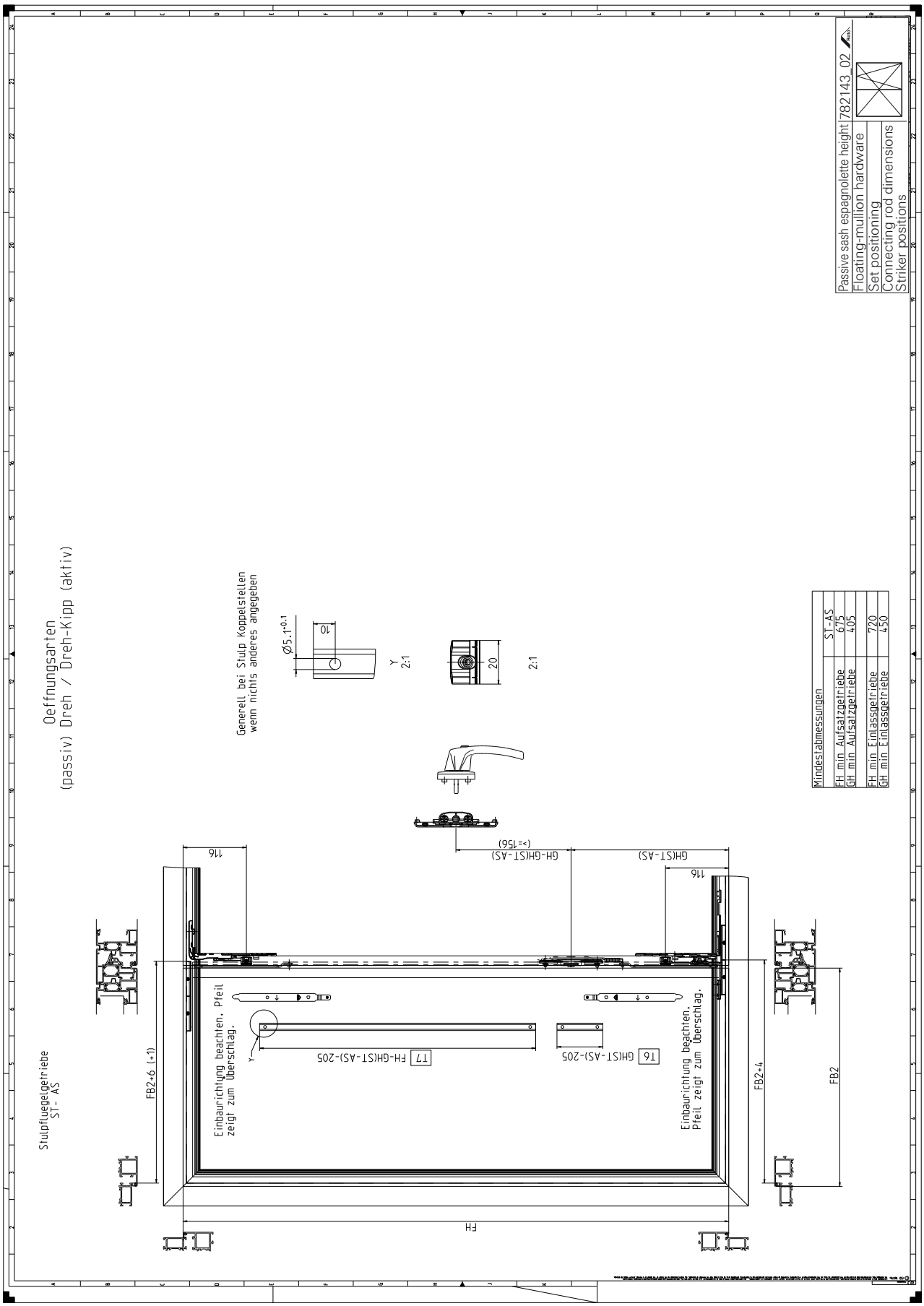
2. Stop the slider when locked.

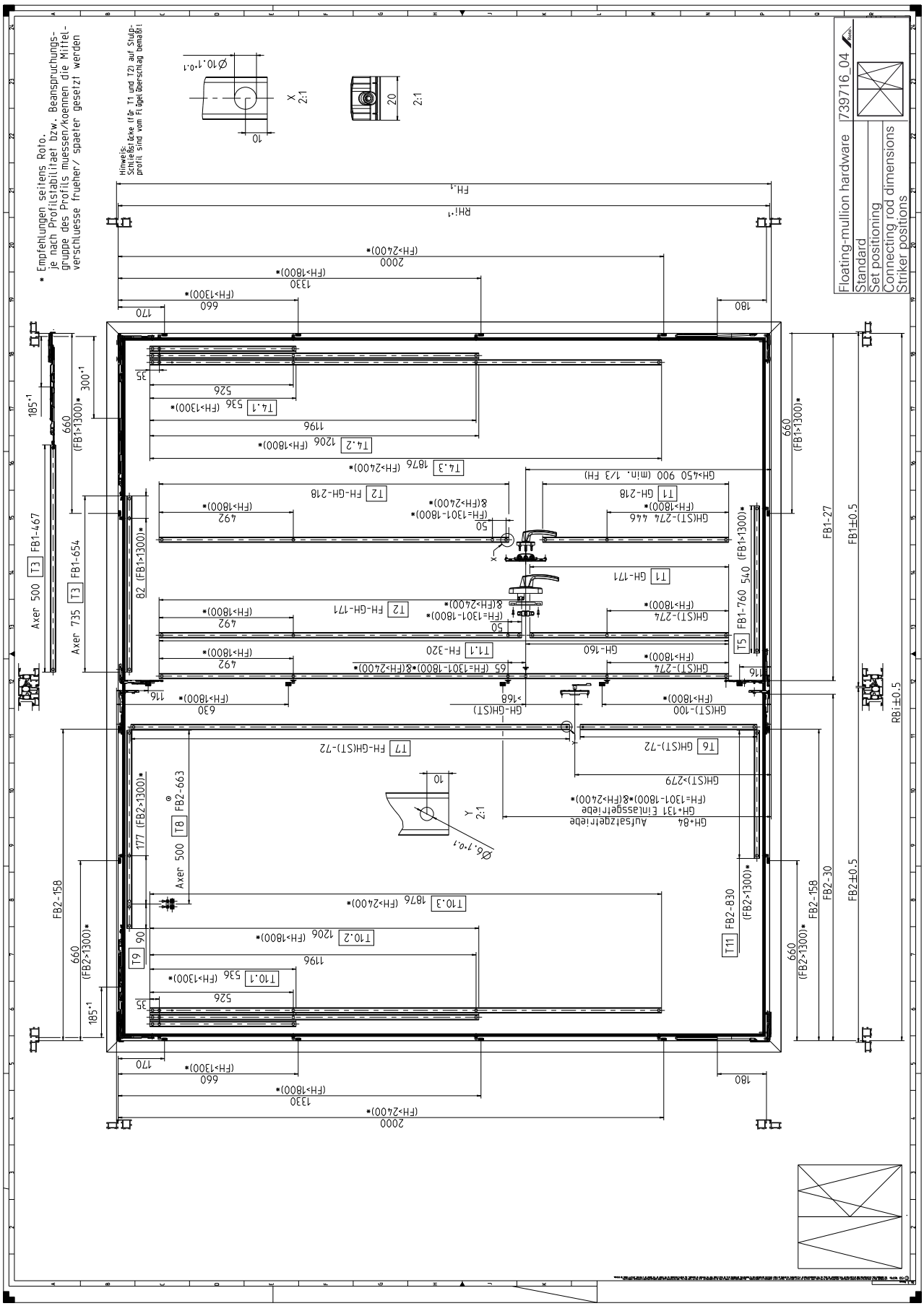
   Tool: hex key size 2.5

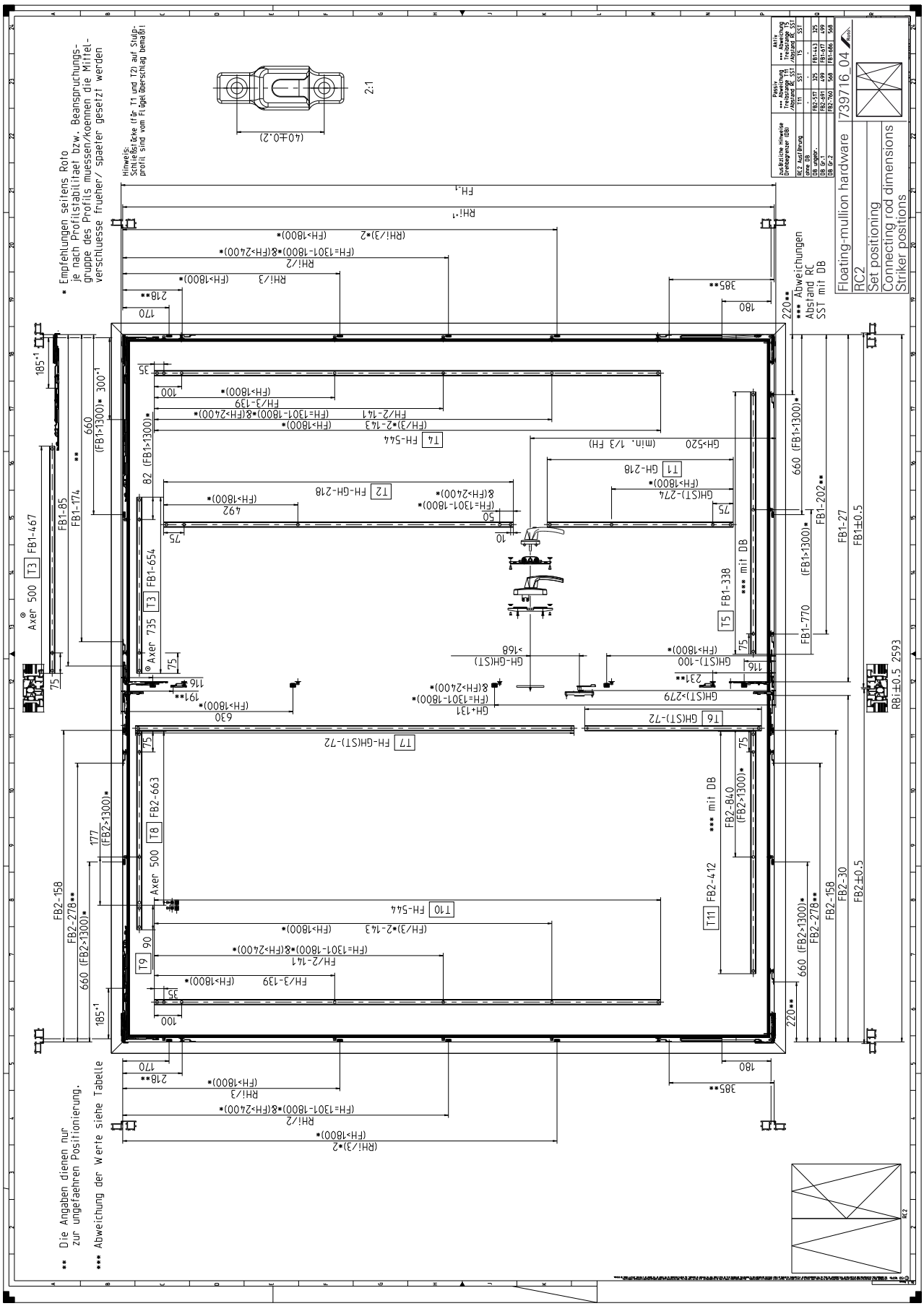
Text in the installation drawings	Translation
Abweichungen der Werte siehe Tabelle	Refer to the table for deviations in the values
Abweichungen Abstand RC SST mit DB	Deviations from distance RC ST with TR
Aktiv *** Abweichung Treibstange T5 / Abstand RC SST	Active *** deviation from connecting rod CR5 / 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 Flügelüberschlag 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)

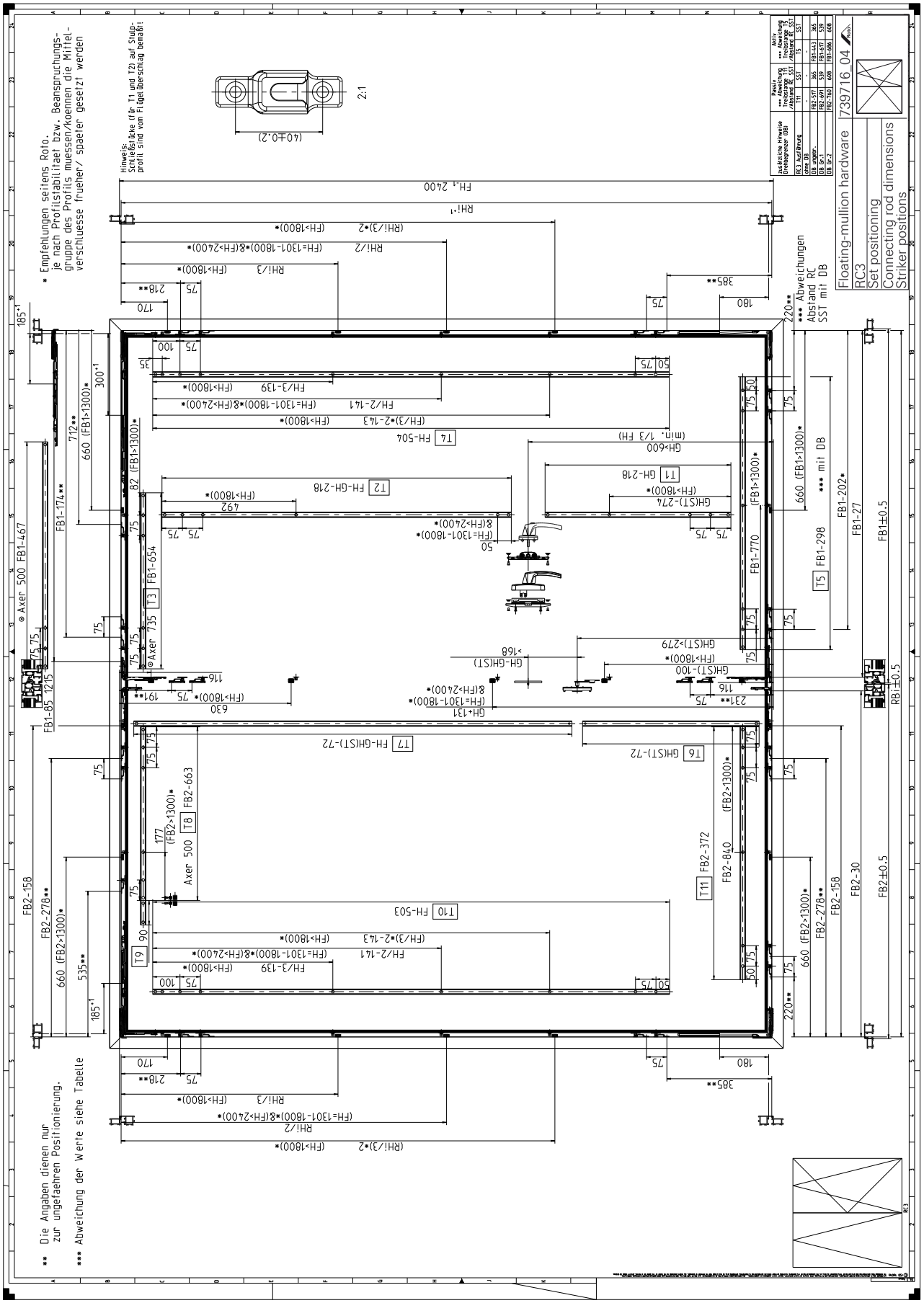

Passive sash espagnolette height 728143_02
Floating-mullion hardware
Set positioning
Connecting rod dimensions
Striker positions
Stulpfluegelgetriebe ST-K
Einlassgetriebe GH>385
Aufsatzgetriebe GH>340
B-B
106
106
FB2-96.5
FB2+9
FH
Mindestabmessungen
ST
ST-K
FH min Aufsatzgetriebe 675 720
GH min Aufsatzgetriebe 379 340
FH min Einlassgetriebe 720 770
GH min Einlassgetriebe 424 385
Oeffnungsarten
(passiv) Dreh / Dreh-Kipp (aktiv)
Generell bei Stulp Koppelstellen
wenn nichts anderes angegeben
Ø10.1+0.1
10
Ø6.1+0.1
10
V 2:1
W 2:1
20
2:1
Einlassgetriebe GH>424
Aufsatzgetriebe GH>379
GH(ST)>260
GH(ST)
GH-GH(ST)>168
GH-GH(ST)
116
116
FB1-34
Stulpfluegelgetriebe ST
FB2-63.5
FB2-63.5
T6 GH(ST)-175
T7 FH-GH(ST)-175
Ø6.1+0.1
Ø10.1+0.1
FH

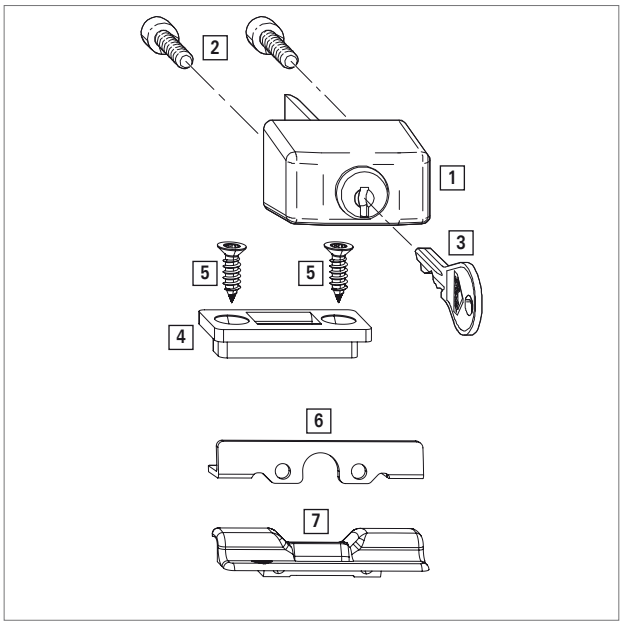

Passive sash espagnolette height 782143_02
Floating-mullion hardware
Set positioning
Connecting rod dimensions
Striker positions
Mindestabmessungen
ST-A ST-R
FH min Aufsatzgetriebe 675 725
GH min Aufsatzgetriebe 405 380
FH min Einlassgetriebe 720 770
GH min Einlassgetriebe 450 360
Öffnungsarten
(passiv) Dreh / Dreh-Kipp (aktiv)
Stulpfluegelgetriebe ST-R
Stulpfluegelgetriebe ST-A
Einlassgetriebe GH>360
Aufsatzgetriebe GH>380
Einlassgetriebe GH>450
Aufsatzgetriebe GH>405
FB1-34
FB2-63.5
FH
>162
116
198
237
in verriegeltem Zustand arretieren
** Laenge der Treibstangen nach Bedarf anpassen
T6 100**
T7 100**
GH(ST-A)
GH-GH(ST-A)
T6 GH(ST-A)-175
T7 FH-GH(ST-A)-214
Generell bei Stulp Koppelstellen wenn nichts anderes angegeben
Ø6.1+0.1
10
20
2:1


Passive sash espagnolette height 782143_02
Floating-mullion hardware
Set positioning
Connecting rod dimensions
Striker positions
Mindestabmessungen ST-AS
FH min Aufsatzgetriebe 675
GH min Aufsatzgetriebe 405
FH min Einlassgetriebe 720
GH min Einlassgetriebe 450
Oeffnungsarten
(passiv) Dreh / Dreh-Kipp (aktiv)
Generell bei Stulp Koppelstellen
wenn nichts anderes angegeben
Stulpfluegelgetriebe
ST- AS
FB2+6 (+1)
Einbaurichtung beachten. Pfeil
zeigt zum Überschlag.
T7 FH-GH(ST-AS)-205
T6 GH(ST-AS)-205
Einbaurichtung beachten.
Pfeil zeigt zum Überschlag.
FB2+4
FB2
FH
GH(ST-AS)
GH-GH(ST-AS)
(>=156)
116
116
Ø5,1+0,1
10
20
2:1
2:1


Floating-mullion hardware
Standard
Set positioning
Connecting rod dimensions
Striker positions
739716_04
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/ spaeter gesetzt werden
Hinweis:
Stulpabdeckbleche (für T1 und T2) auf Stulp-
profil sind vom Flügelüberschlag bemaßt
Axer 500 T3 FB1-467
Axer 735 T3 FB1-654
Axer 500 T8 FB2-663
FB1-760 540 T5
FB2-830 T11
FB1-27
FB1±0.5
FB2±0.5
FB2-158
FB2-30
RBi±0.5
T1 GH-218
T1 GH-171
T1.1 FH-320
T2 FH-GH-218
T2 FH-GH-171
T4.1 T4.2 T4.3
T6 GH(ST)-72
T7 FH-GH(ST)-72
T10.1 T10.2 T10.3
GH(ST)-274
GH(ST)-100
GH-160
GH-GH(ST)
GH+84 Aufsalzgetriebe
GH+131 Einlassgetriebe
(FH>1800)*
(FH>2400)*
(FH>1300)*


Floating-mullion hardware
RC2
Set positioning
Connecting rod dimensions
Striker positions
739716 04
* Empfehlungen seitens Roto je nach Profilstabilitaet bzw. Beanspruchungsgruppe des Profils muessen/koennen die Mittelverschluesse frueher/ spaeter gesetzt werden
Hinweis: Schließblechdicke (für T1 und T2) auf Stulpprofil sind vom Flügelüberschlag bemaßt
2:1
** Die Angaben dienen nur zur ungefaehren Positionierung.
*** Abweichung der Werte siehe Tabelle
*** Abweichungen Abstand RC SST mit DB
FB1-467
FB1-85
FB1-174
FB1-654
FB1-338
FB1-770
FB1-202**
FB1-27
FB1±0.5
FB2-663
FB2-940
FB2-412
FB2-158
FB2-278**
FB2-30
FB2±0.5
RBi±0.5 2593


Floating-mullion hardware
RC3
Set positioning
Connecting rod dimensions
Striker positions
739716_04
* Empfehlungen seitens Roto.
je nach Profilstabilitaet bzw. Beanspruchungs-
gruppe des Profils muessen/koennen die Mittel-
verschluesse frueher/ spaeter gesetzt werden
Hinweis:
Schließstücke (Typ T1 und T2) auf Stulp-
profil sind vom Flügel überstellbar benutzbar!
2:1
** Die Angaben dienen nur
zur ungefaehren Positionierung.
*** Abweichung siehe Tabelle
*** Abweichungen
Abstand RC
SST mit DB
*** mit DB
FB1-27
FB1-202*
FB1-298
FB1-770
FB1-654
FB1-174**
FB1-467
FB2-158
FB2-278**
FB2-663
FB2-372
FB2-840
FB2-30
FB1±0.5
FB2±0.5
RB1±0.5
T1 GH-218
T2 FH-GH-218
T3 Axer 735
T4 FH-504
T5 FB1-298
T6 GH(ST1)-72
T7 FH-GH(ST)-72
T8 FB2-663
T9
T10 FH-503
T11 FB2-372
Axer 500 FB1-467
Axer 500 FB2-663
82 (FB1>1300)*
660 (FB1>1300)*
712**
300*1
185*1
660 (FB2>1300)*
535**
FH+1 2400
RH!*1
(RH!/3)*2 (FH>1800)*
RH!/2 (FH=1301-1800)*&(FH>2400)*
RH!/3 (FH>1800)*
FH/3-139 (FH>1800)*
FH/2-141 (FH=1301-1800)*&(FH>2400)*
(FH/3)*2-143 (FH>1800)*
FH-504
GH>600 (min. 1/3 FH)
GH(ST1)-274
GH(ST1)-100
GH(ST1)>279
GH-GH(ST) >168
GH+131
(FH=1301-1800)* &(FH>2400)*
(FH>1800)*
492
630
116
191**
231**
220**
180
385**
170
218**
75
100
35
50
90
185*1
300*1
Mit*** Abweichung Passiv Abstand RC
Passiv *** Abweichung Verriegelung Abstand RC
DB ungef.
DB Gr-1
DB Gr-2
FB2-597
FB2-691
FB2-760
FB1-443
FB1-517
FB1-686
365
539
608

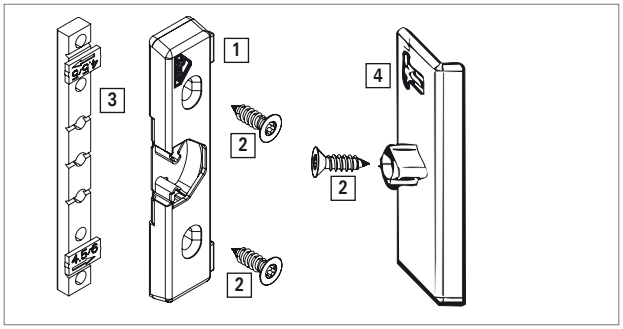


Turn lock with accessories

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**			

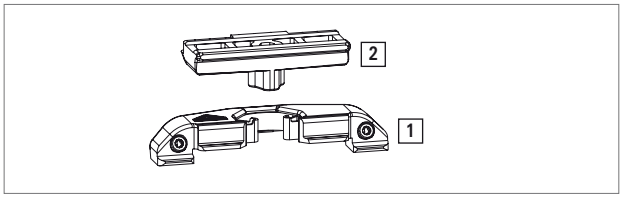
Additional parts bag for the anti-jemmy version

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.**		



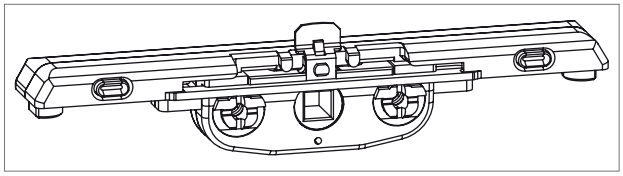
Balcony door bullet catch set

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)**		



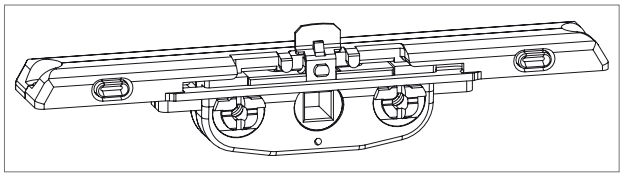
Bullet catch set

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.**		



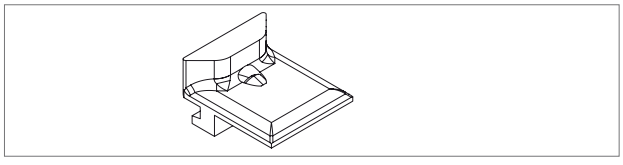
Corner drive, with blocking device

Description	PU	Material no.
Corner drive, with blocking device	10	**378337**



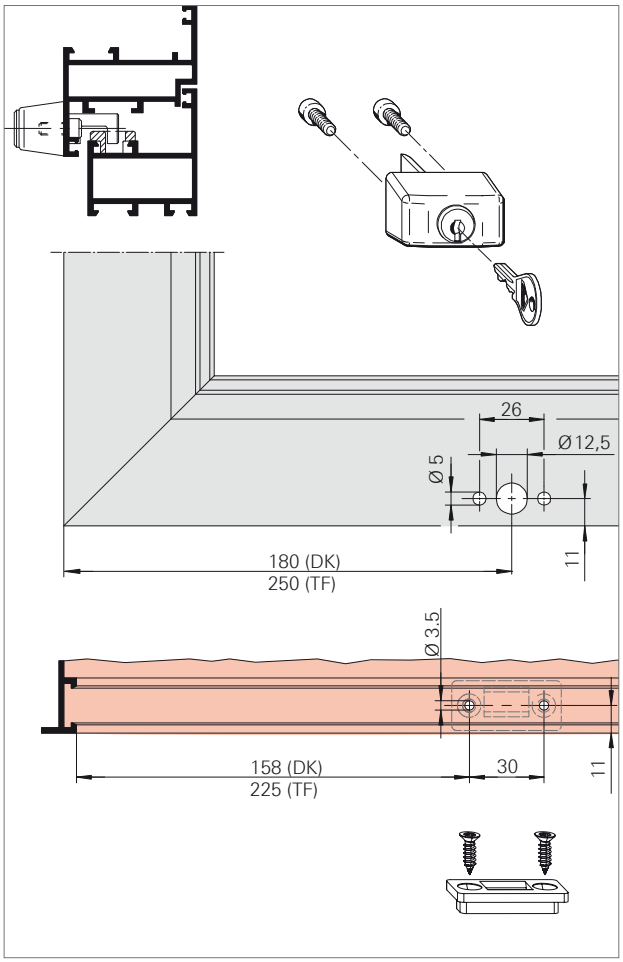
SEC corner drive, with blocking device

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**



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

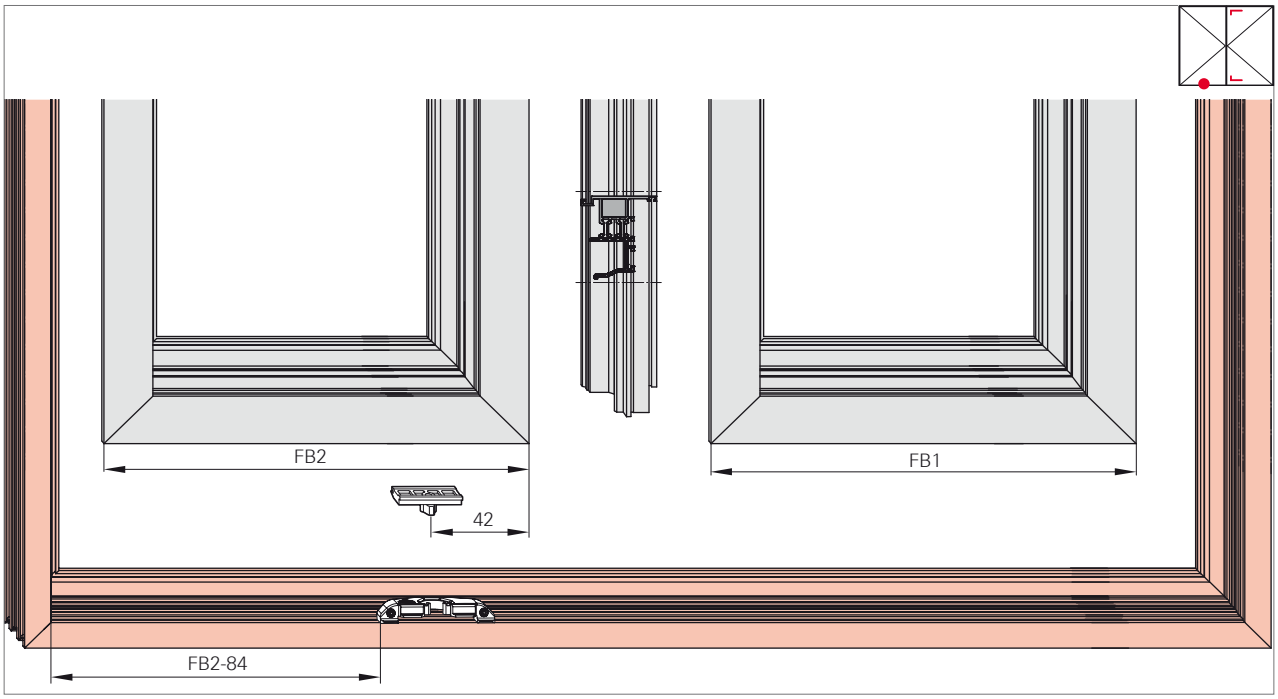
NOTE!

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.

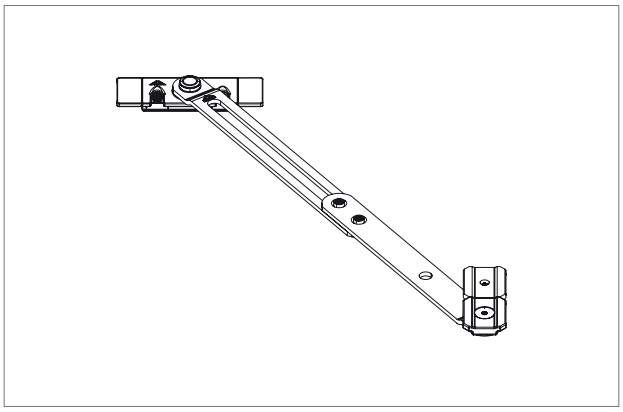
   Tool: T 25 hex key

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!

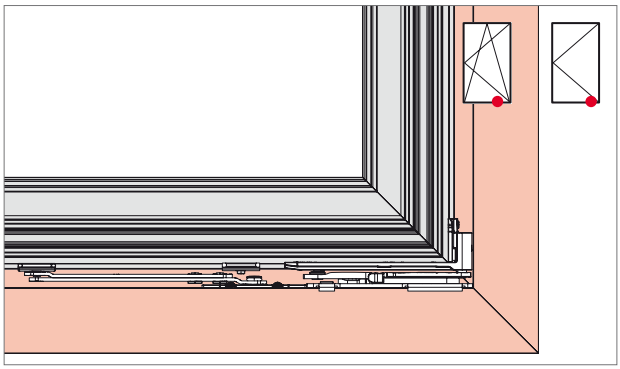
Application ranges from see page 19.

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.

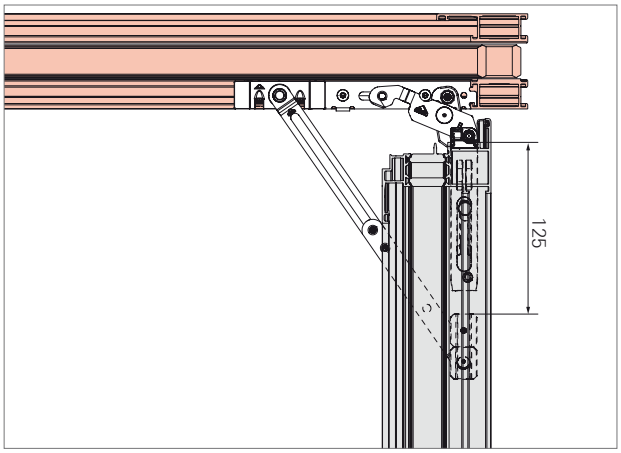


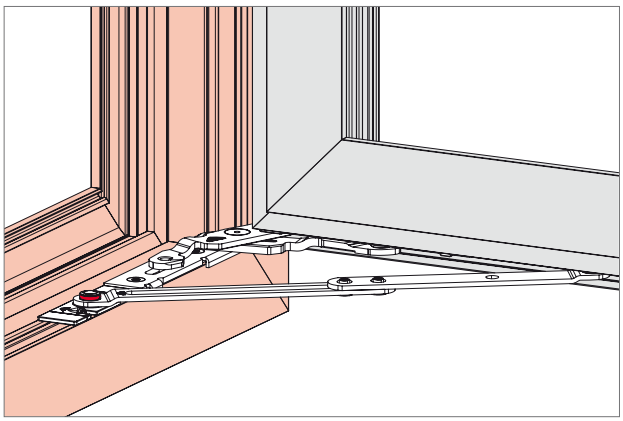
NOTE!
Not a security component in accordance with DIN EN 13126-5.

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

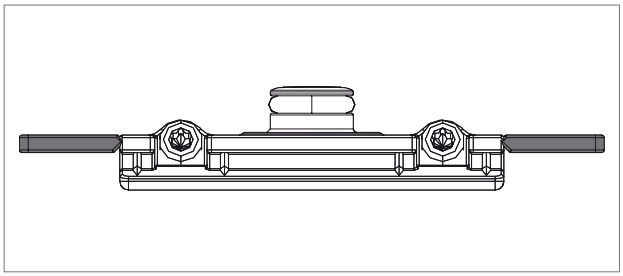
NOTE!
The maximum opening angle with the turn restrictor is 90°.



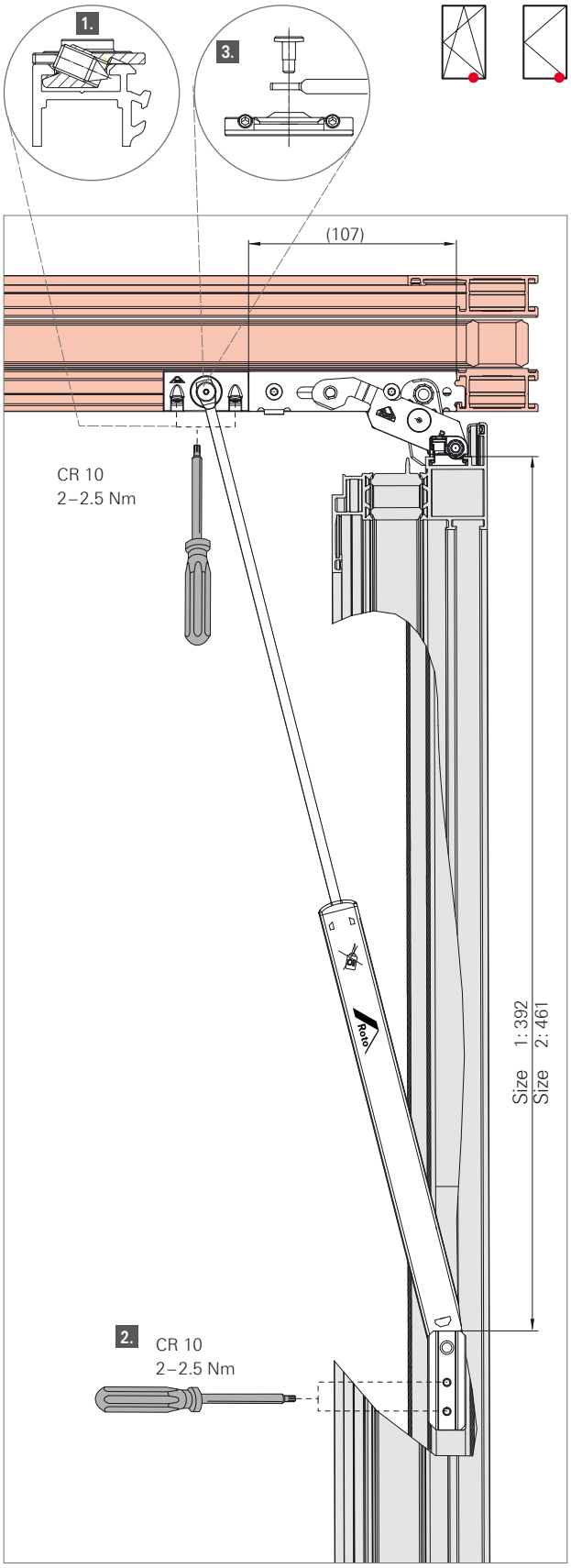


Push the hole in the end of the sash component over the rubber ring of the bolt on the frame component.

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.

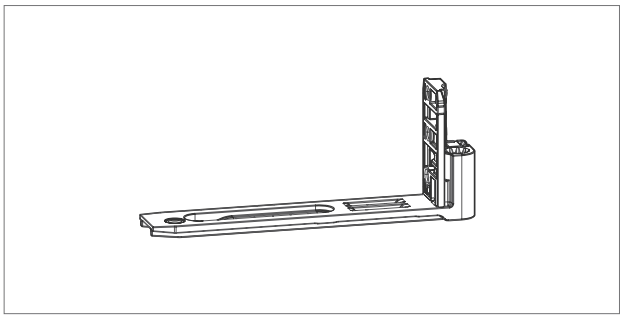


1. Screw down the frame bearing with two threaded pins.
   Tool: T 10 hex key
   Torque: 2–2.5 Nm
2. Insert the sash bearing in the sash groove and secure with screws.
   Tool: T 10 hex key
   Torque: 2–2.5 Nm
3. Screw the pull rod to the frame bearing using the M4 mushroom-head screw provided.
   Tool: T 10 hex key

NOTE!

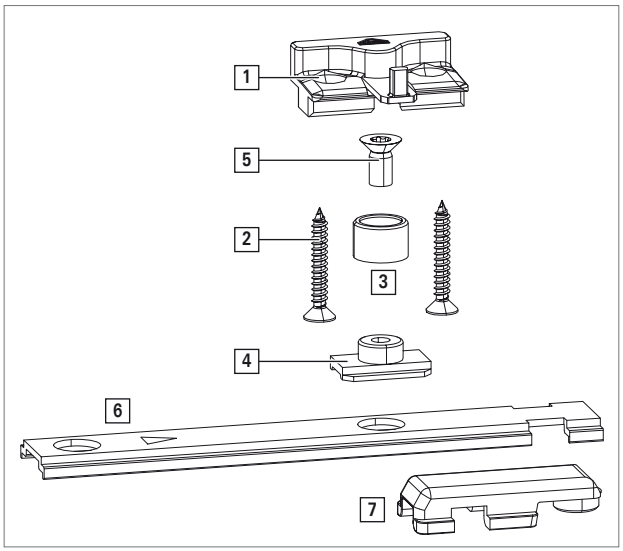
- Maximum opening width with the braked, damped opening restrictor:
  Size 1: approx. 63°
  Size 2: approx. 90°
- After installation, you must check the end position of the sash rotation and correct it if necessary by moving the sash component slightly.

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.



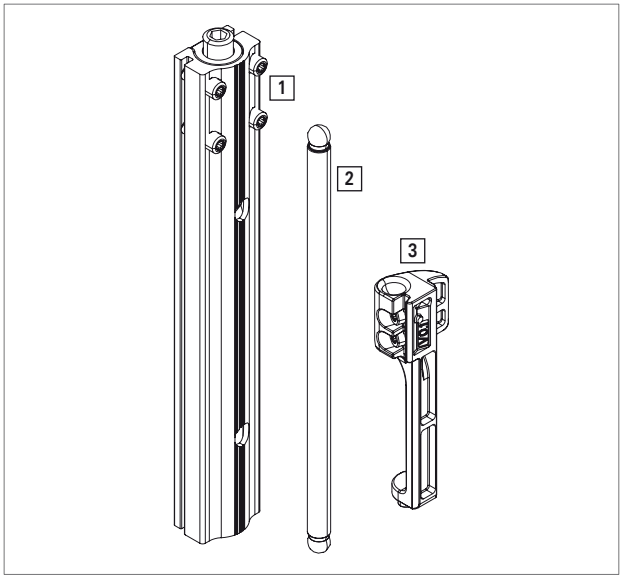
Corner hinge set with increased fixing

Pos.	Pc(s)	Description		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

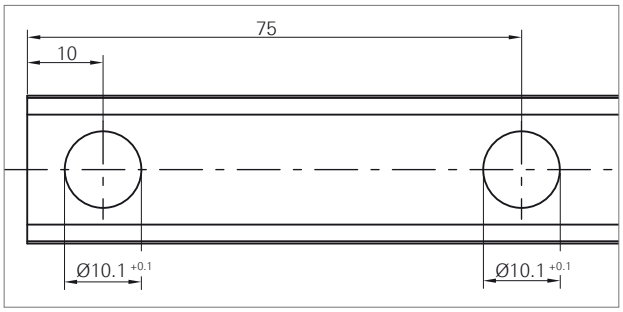
Pos.	Pc(s)	Description	PU	Material no.
	1	**Night vent set AL**	10	**728958**
		consisting of:		
[1]	1	**Night vent**		
[2]	2	**Self-tapping screw ST3.9 x 25**		
[3]	1	**Night vent locking cam**		
[4]	1	**Coupler component**		
[5]	1	**Countersunk screw M5 x 10**		
	1	**Night vent set AL for ASA**	10	**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**		

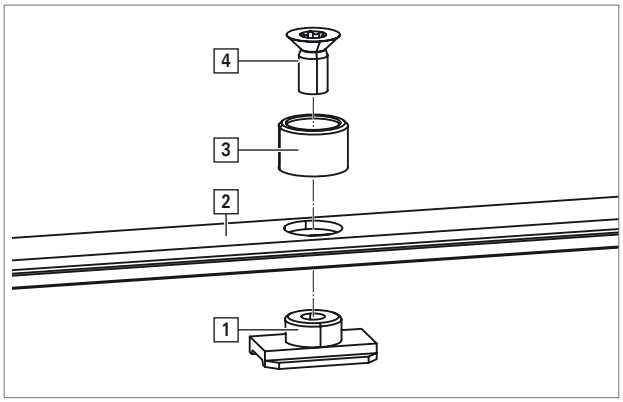


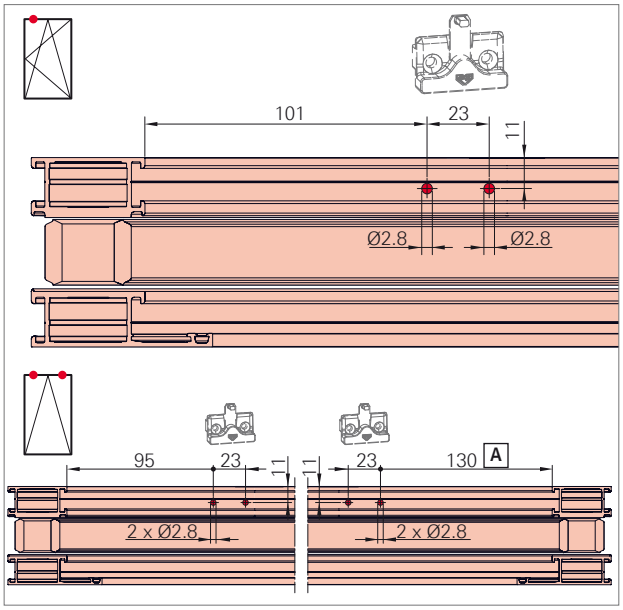
Load transfer set AL

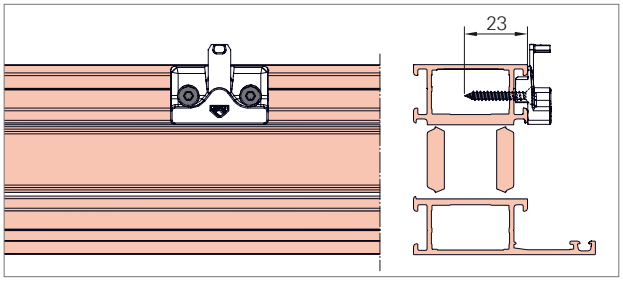
Pos.	Pc(s)	Description	DIN	PU	Material no.
		Load transfer set V.01	L	10	**739694**
			R	10	**739693**
		Load transfer set V.02	L	10	**739696**
			R	10	**739695**
		consisting of:			
[1]	1	**Sash component**			
[2]	1	**Support rod**			
[3]	1	**Frame bearing V.01/V.02**			

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.

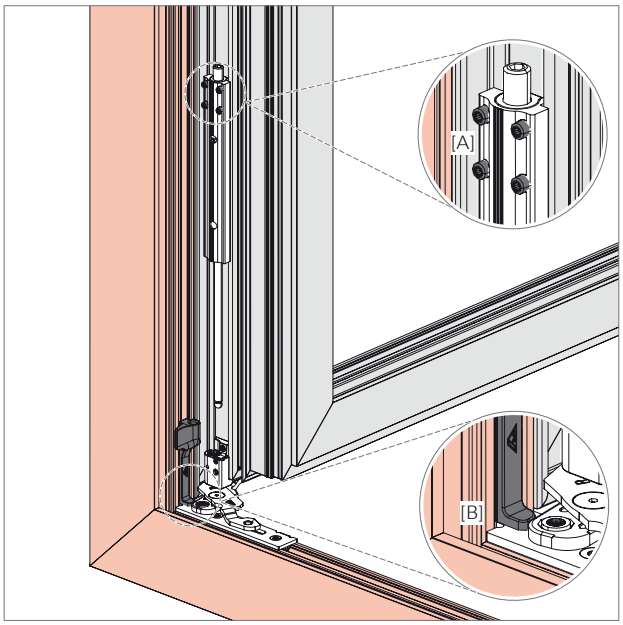
INFO
Note that the drill hole dimensions for T&T differ from those for TiSt.

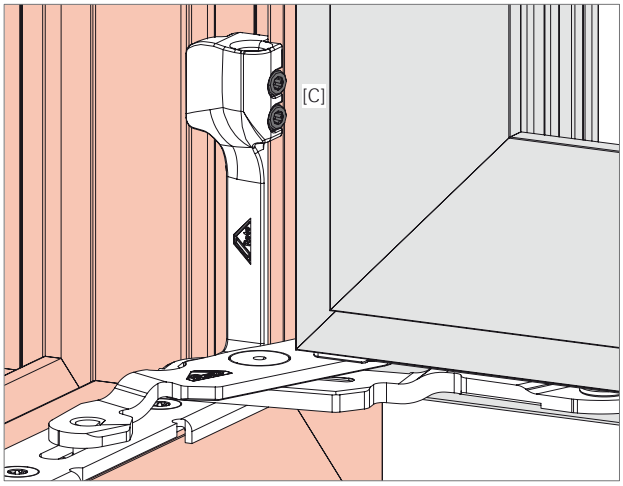
[A] An additional night vent is recommended with SW ≥ 1000 mm (for TiSt)

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.





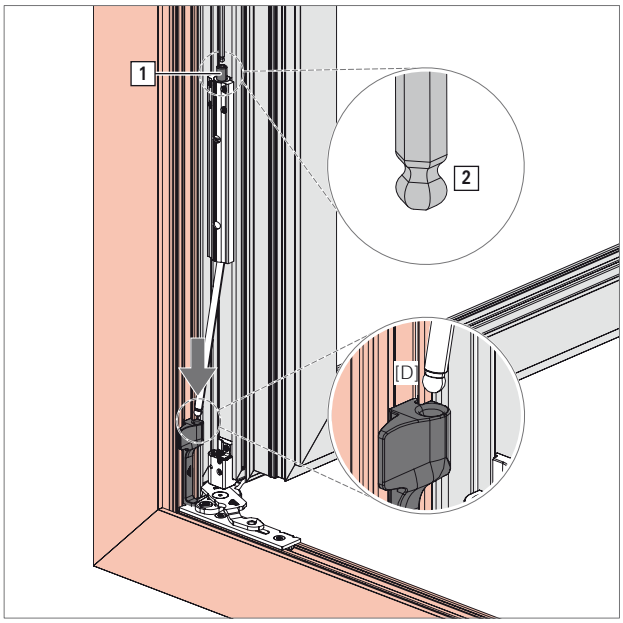
Installation

NOTE!
Sash installation with load transfer (sash weight 80 kg – 180 kg).
Do not use load transfer with sash weights ≤ 80 kg.

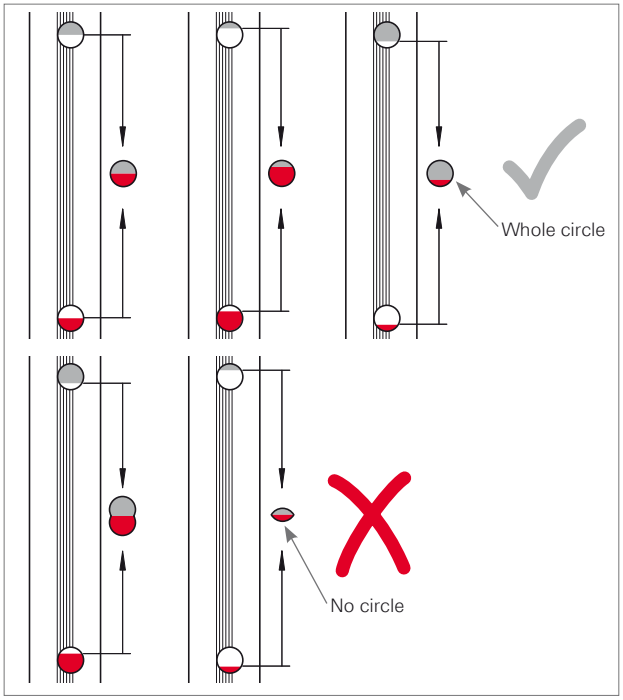
1. Insert the load transfer sash component into the sash groove as shown in the installation drawing and screw it down with four preinstalled threaded pins [A].
   Tool: T 10 hex key
   Torque: ≥2.5 Nm

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

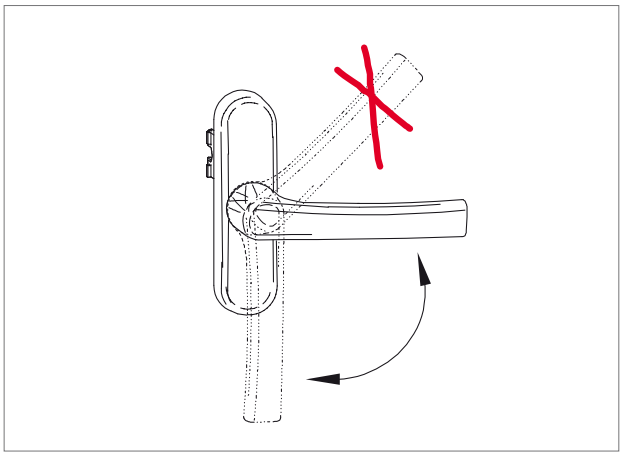


3. Position the load transfer support rod over the recess in the installed frame bearing [D].
4. Use the adjusting screw [1] to lower the support rod clockwise, until it is securely seated in the recess of the frame bearing.
   Tool: hex key (with ball-shaped head [2]) size 4

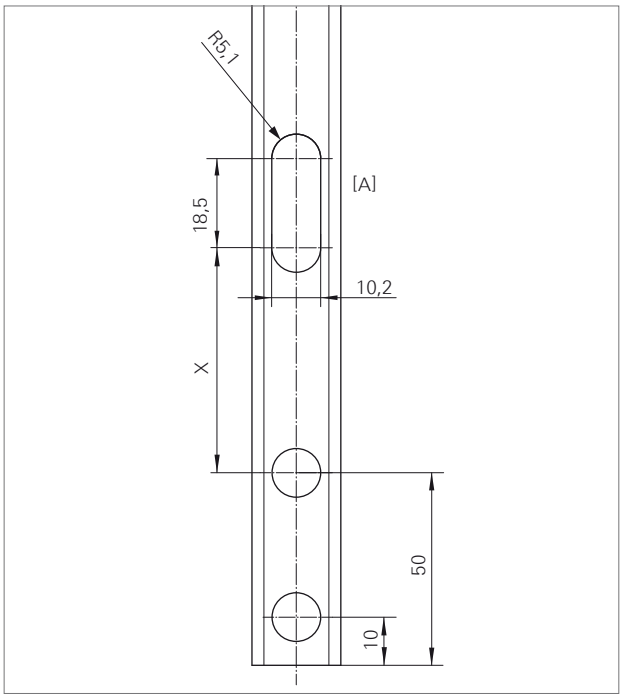


5. Adjust the load transfer pre-tensioning.
   To do so, use a 4 mm hex key to adjust the load transfer at the adjusting screw when the sash in the open position (90°). Adjust the adjusting screw so that a whole circle is produced by adding together the red and silver partial circles. Check at the view 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.



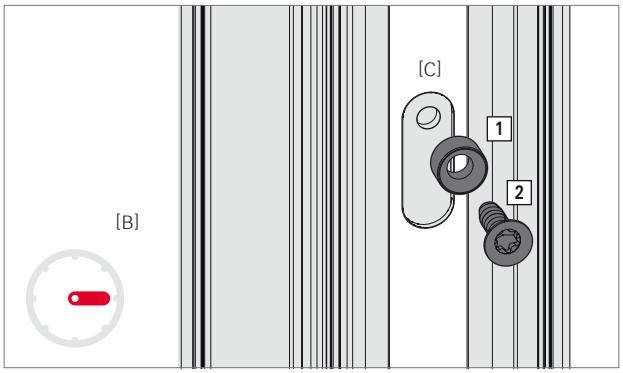
Produce the espagnolette lock by using a locking sleeve in the slot on connecting rod CR2.



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

NOTE!

X = freely positionable (suggestion: 60 mm)



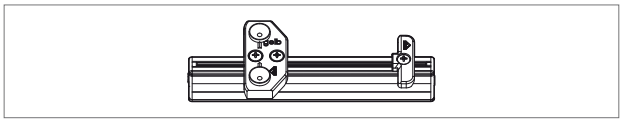
2. Drill out the sash in the 90° handle position [B] for locking sleeve with screw [C].

   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

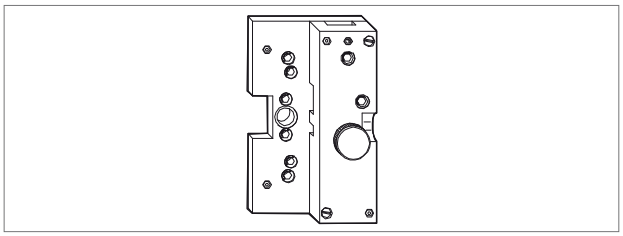
NOTE!

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



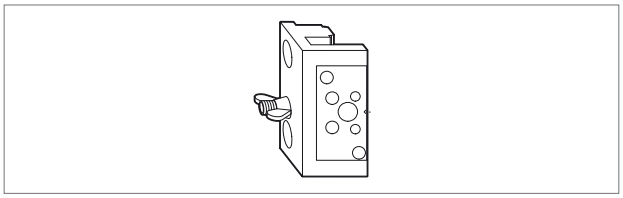
Jig for stay bearing and pivot rest

Description	Material no.
Jig for groove base thickness >2 mm	628534



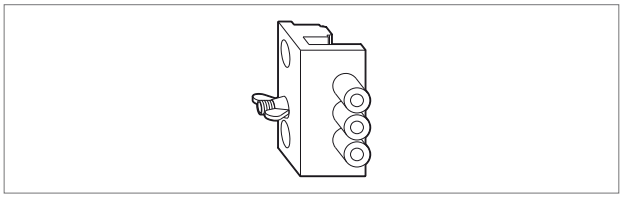
Jig for geared-handle

Description	Material no.
Jig for geared-handle, connecting rod, turn lock	212544



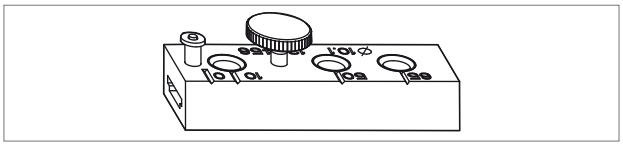
Jig for flush-encased gearbox

Description	Material no.
Jig for flush-encased gearbox and handle without escutcheon	365361



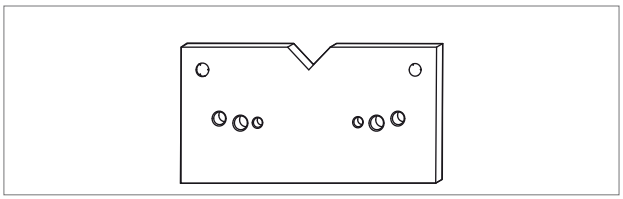
Jig for flush-encased gearbox

Description	Material no.
Jig for flush-encased gearbox and handle	212155



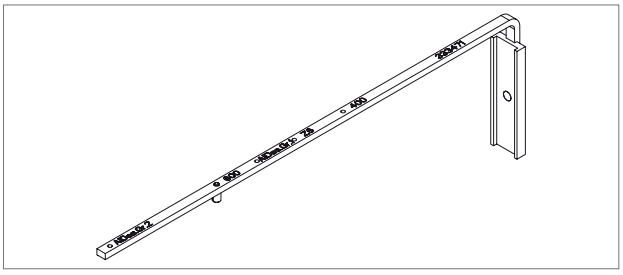
Jig for connecting rod

Description	Material no.
Jig for connecting rod	333472



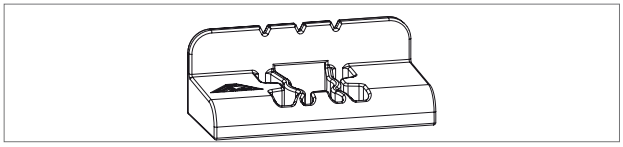
Jig for geared-handle

Description	Material no.
Jig for geared-handle	333473



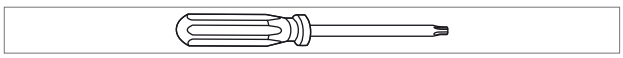
Jig for sash stay

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

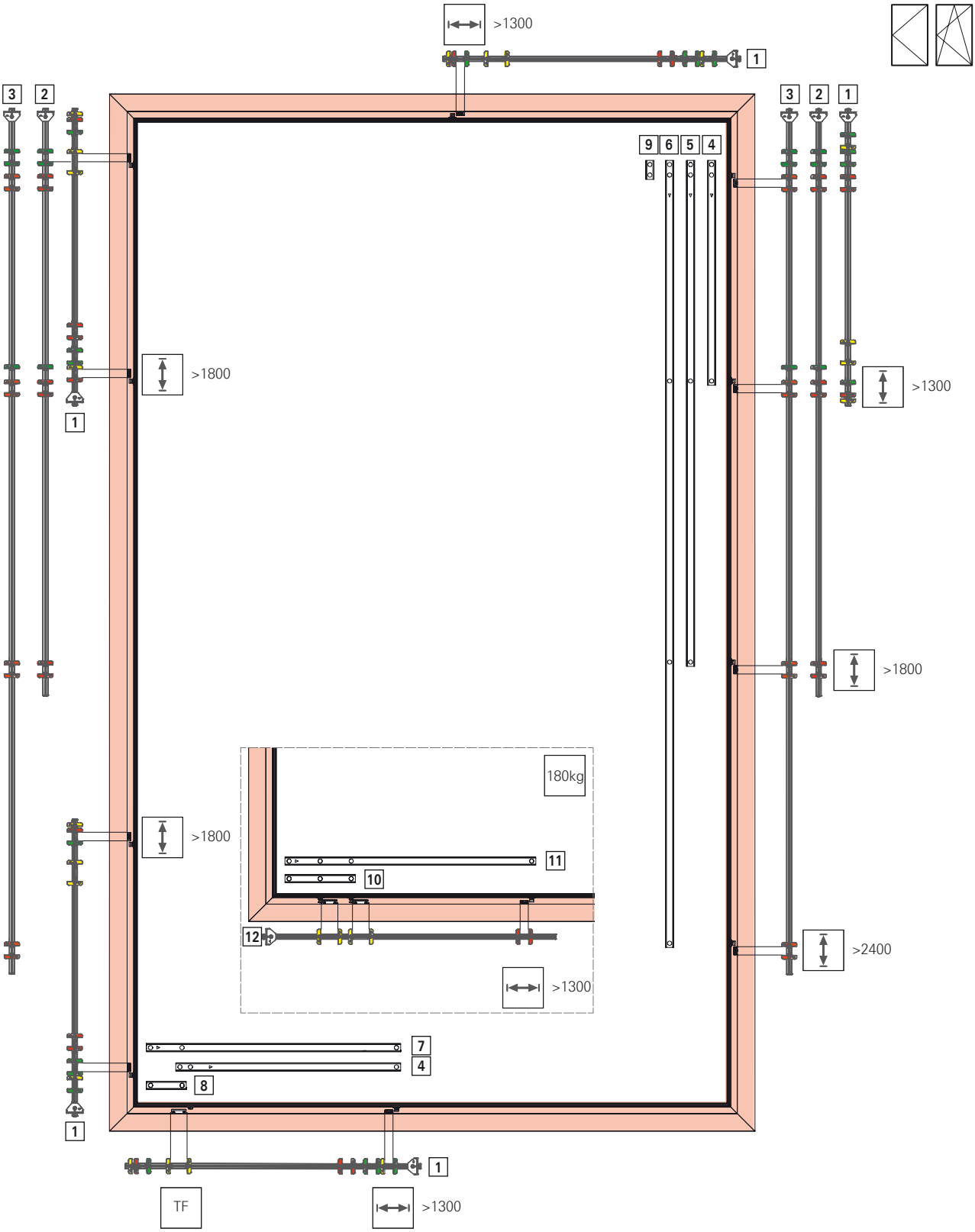


Mounting tools

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



Symbols	Explanation
	Sash width
	Sash height
TF	TiltFirst

NOTE!

You can find all possible uses for jigs and fixed connecting rods in the overview, regardless of the opening type.

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**

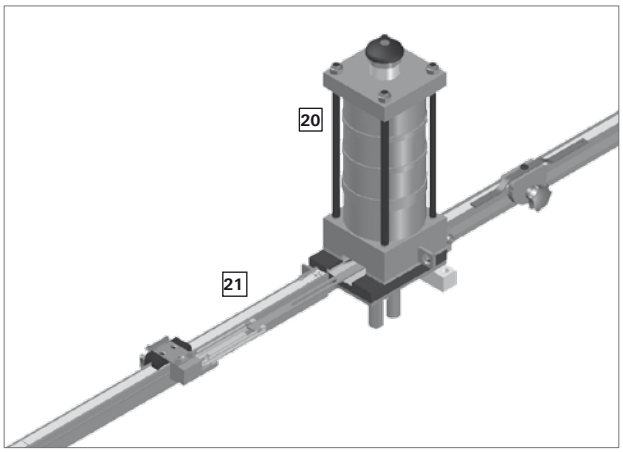
Connecting rods with fixed dimensions for figure, see page 250

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)

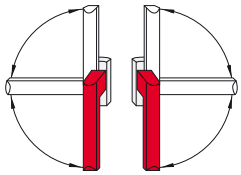
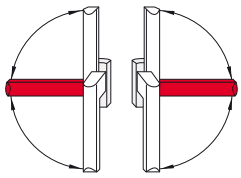
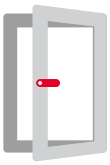
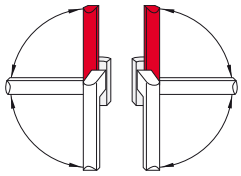
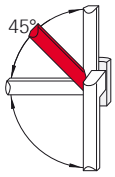
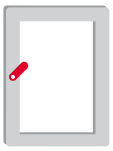
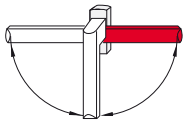
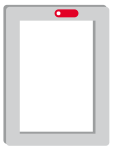
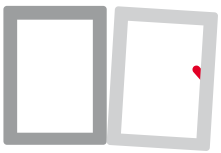
	Description	Length	PU	Material no.
	Connecting rod	3 m		735102
	Connecting rod	6 m		334665



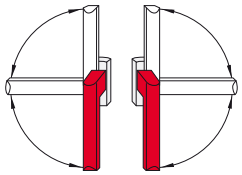
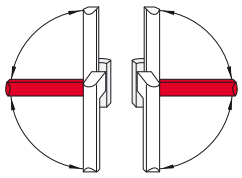
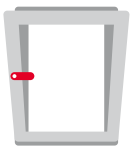
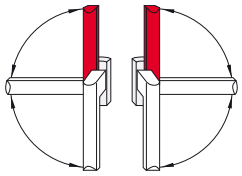
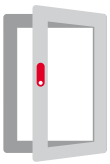
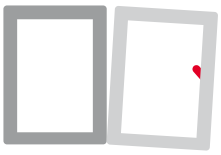
Punch
Pneumatic punch for cutting connecting rods to length and creating holes in them.

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.

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.	■ Grease the frame components.	□	□
	■ Handle is faulty.	■ Replace the handle.	■	–
	■ Handle screwed into place too tightly.	■ Undo the screw fixing slightly.	■	–
	■ Sash components with slanting screws.	■ Screw the sash components in straight.	■	–
	■ Sash components are faulty.	■ Replace the sash components.	■	–
	■ Incorrect striker positions.	■ Adapt the striker positions.	■	–
	■ Sash stay gasket compression is too strong (accumulation on gasket).	■ Adjust the sash stay gasket compression or clean the sash stay.	■	–
Handle cannot be turned 180°.	■ Sash components hinged incorrectly.	■ Check the setting in the turn position (rehang if necessary – start from the T&T espagnolette).	■	–
	■ Connecting rod dimensions not OK.	■ 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.	■ Replace the tilting component.	■	–
	■ Scissor stay inclusion not OK due to incorrect connecting rod dimensions.	■ 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.	■ Rehang the sash.	■	–
	■ Incorrect striker positions.	■ 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.	□	□

■ = Must be carried out by a specialist company

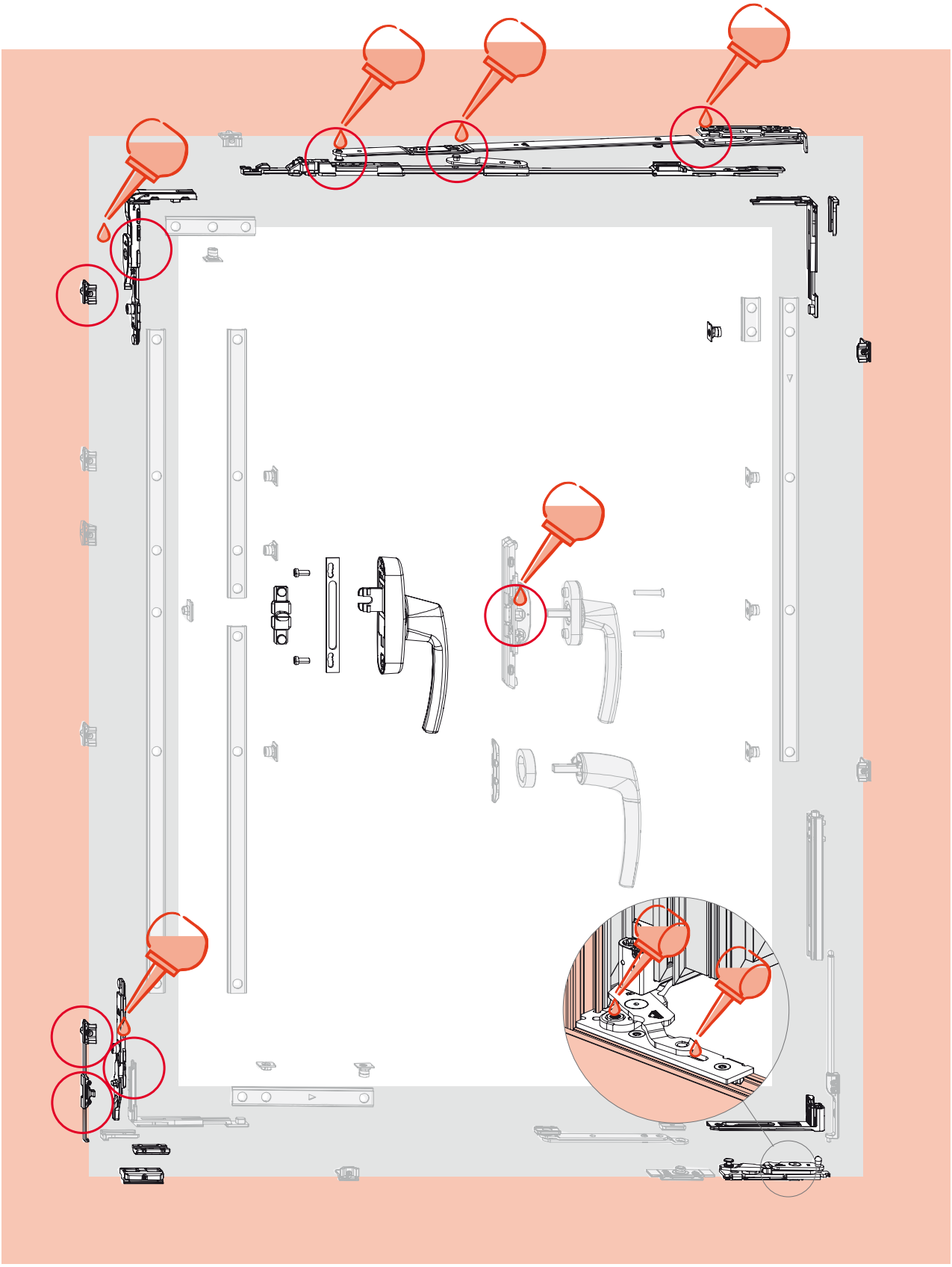
– = Must not be carried out by the end user; the end user must not perform any assembly work.

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

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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– = 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

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, carbolic 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.	■	–

■ = 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

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.	□	□

■ = 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

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.	☐	☐

■ = 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

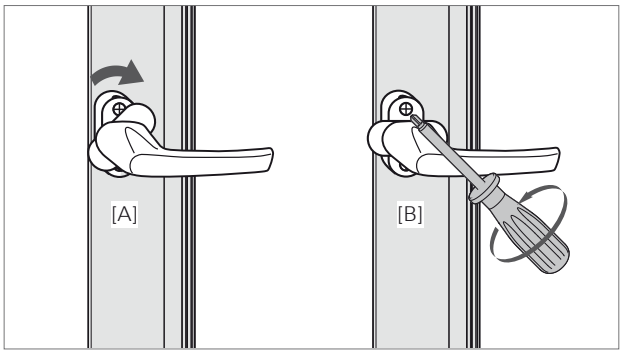
Protection against damage caused by renovation work

	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.

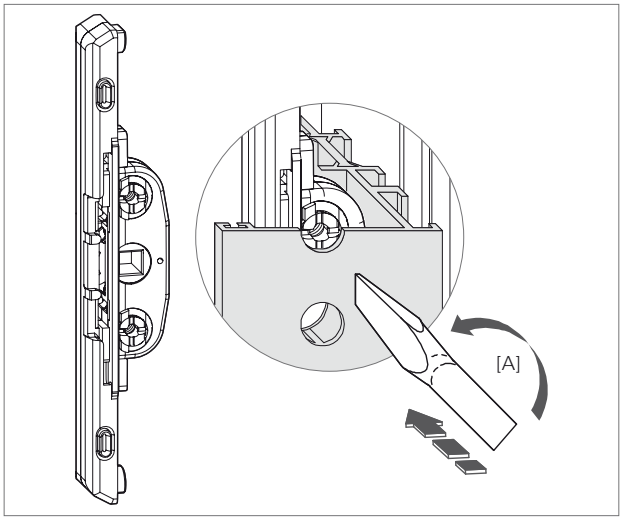
☐ = May be carried out by a specialist company or the end user



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].

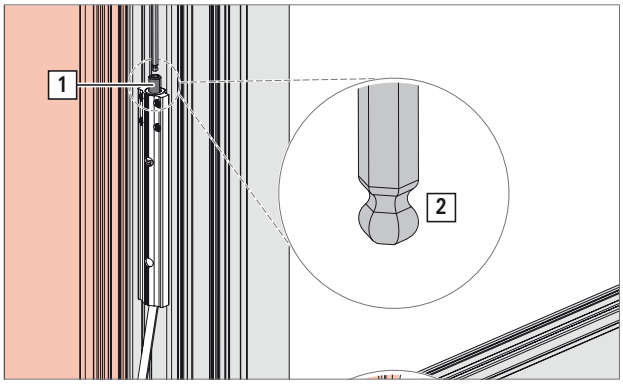
   Tool: Phillips screwdriver PH2
4. Remove the handle.



Flush-encased gearbox

1. Push the engaged clampable lugs towards the espagnolette and turn anticlockwise [A].

   Tool: flat-tip screwdriver 8 x 1.2 mm
2. Remove the flush-encased gearbox by pulling it to the side.

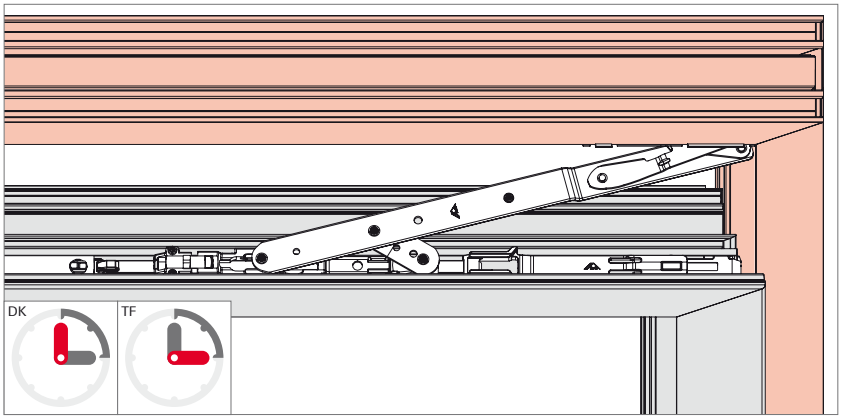


Load transfer

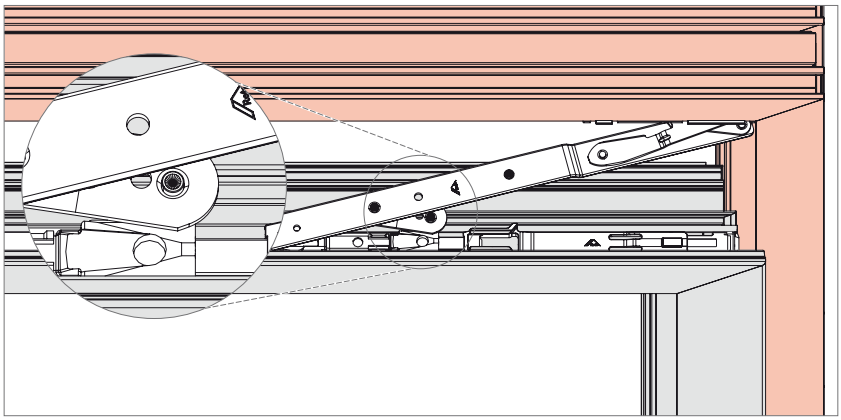
1. Use the adjusting screw [1] to fully unbend the load transfer spring.
   Tool: hex key (with ball-shaped head [2]) size 4
2. Unhinge the sash.

NOTE!
If the spring is not fully unbent, the sash cannot be rehinged.

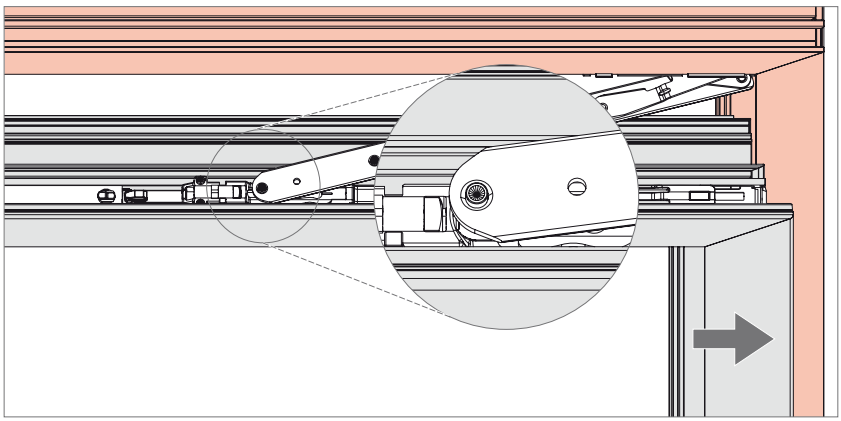
Sash stay 500



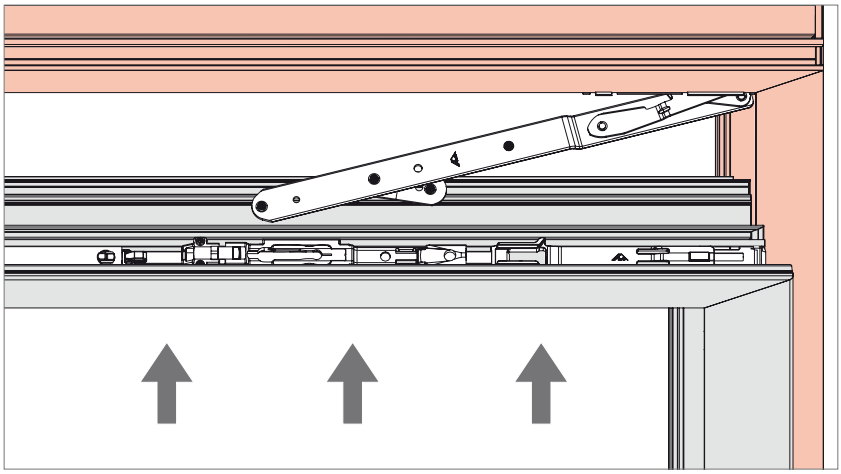
1. Move the handle to the turn position.
2. Open the sash approximately 10°.
3. Secure the sash to prevent it from falling.
4. Push the mishandling device. Move the handle to the tilt position (under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case).



5. Lift the supporting arm upwards out of its support.

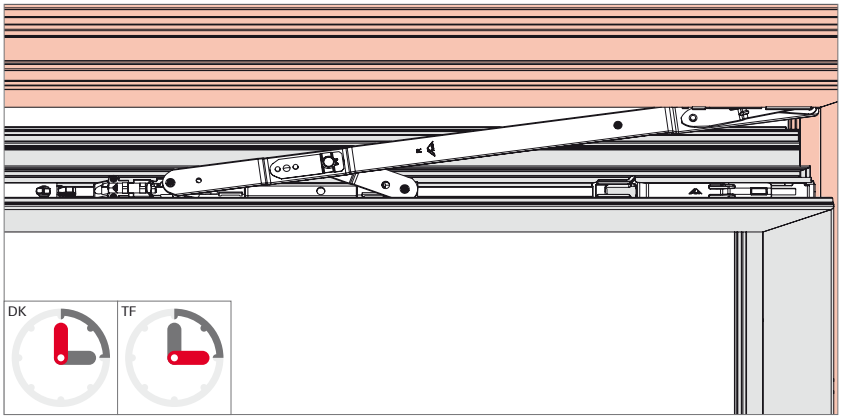


6. Push the sash towards the hinge side so that the stay arm cam in the scissor stay guide slides forward up to the recess.

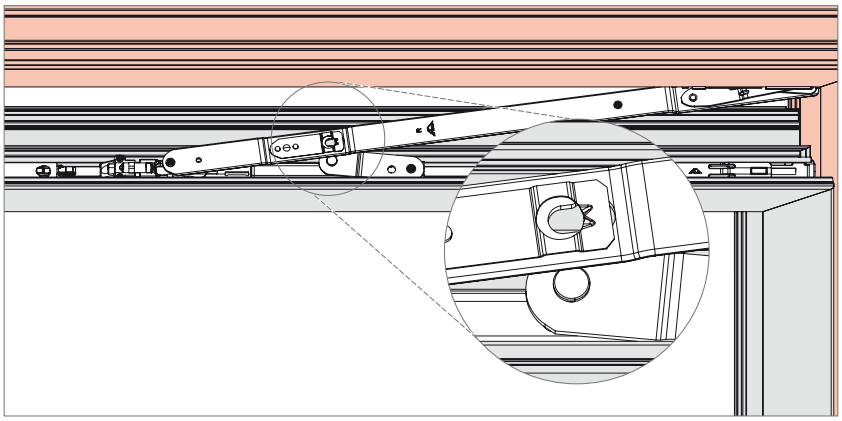


7. Unhinge the stay arm and raise the sash upwards, parallel to the frame, until the pivot rest cam is free. Then lift the sash carefully out of the frame.

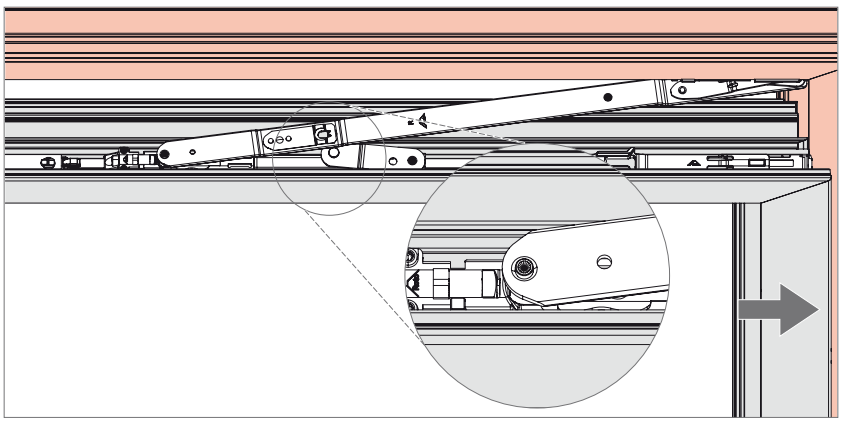
Sash stay 735



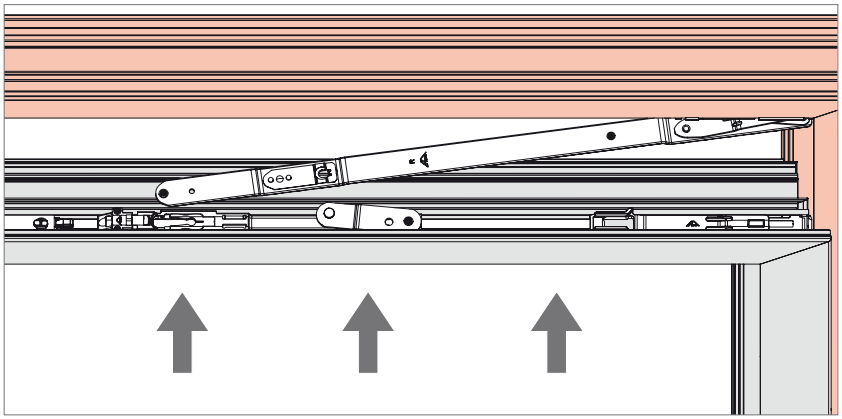
1. Move the handle to the turn position.
2. Open the sash approximately 10°.
3. Secure the sash to prevent it from falling.
4. Push the mishandling device. Move the handle to the tilt position. (Under normal circumstances, this constitutes incorrect operation of the hardware, but it is a necessary step in this case.)



5. Lift the spring clip using a screwdriver and push the supporting arm cam downwards.

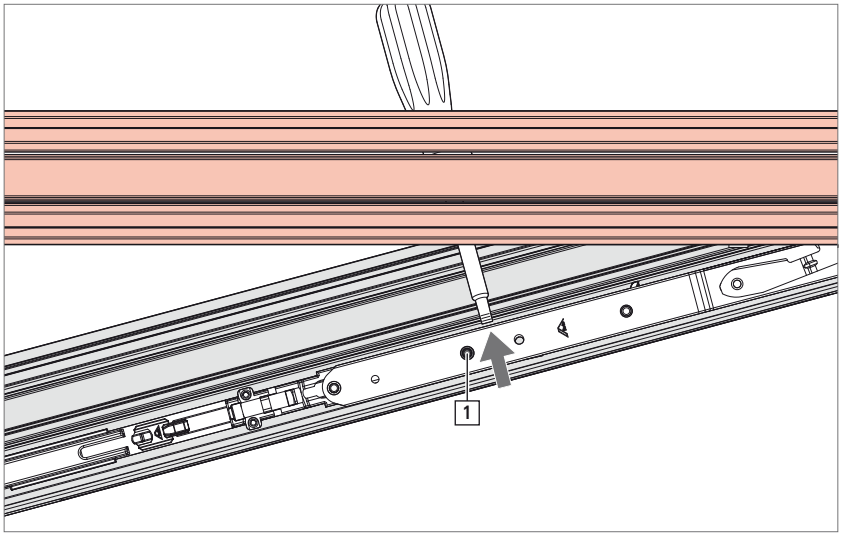


6. Push the sash towards the hinge side so that the stay arm cam in the scissor stay guide slides forward up to the recess.

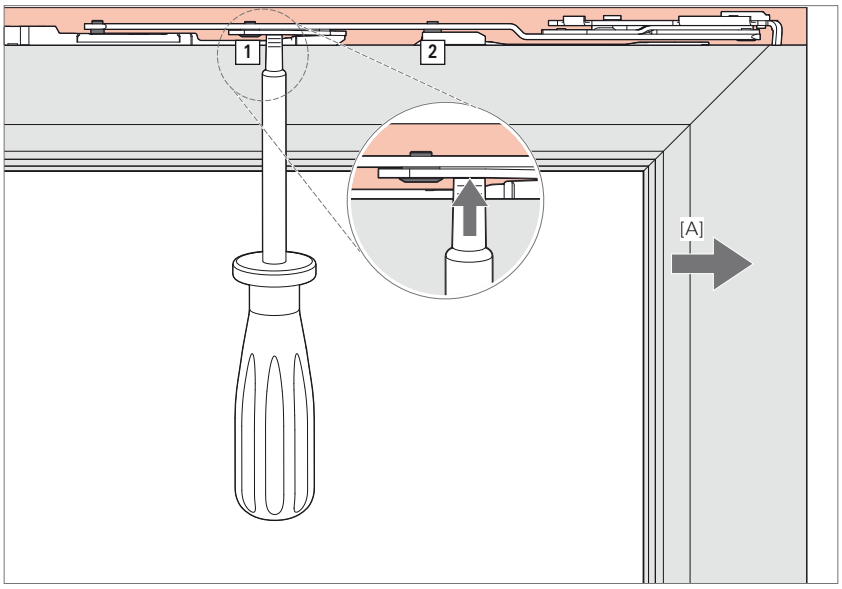


7. Unhinge the stay arm and raise the sash upwards, parallel to the frame, until the pivot rest cam is free. Then lift the sash carefully out of the frame.

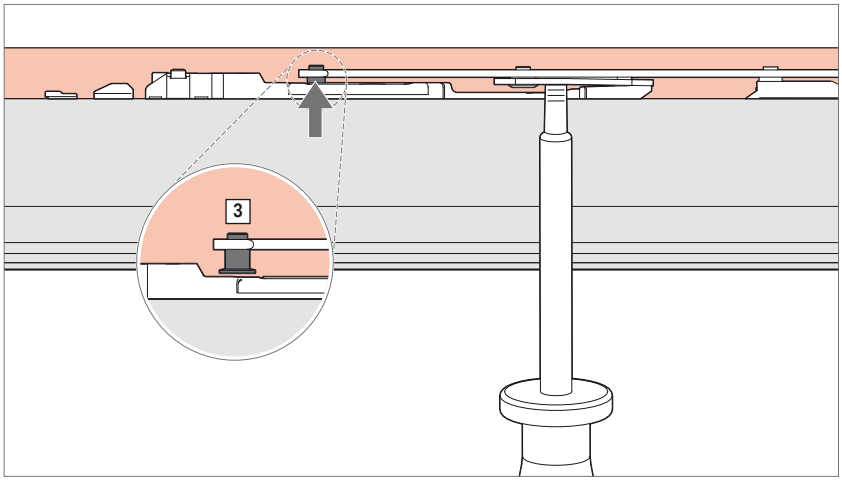
FM – passive sash



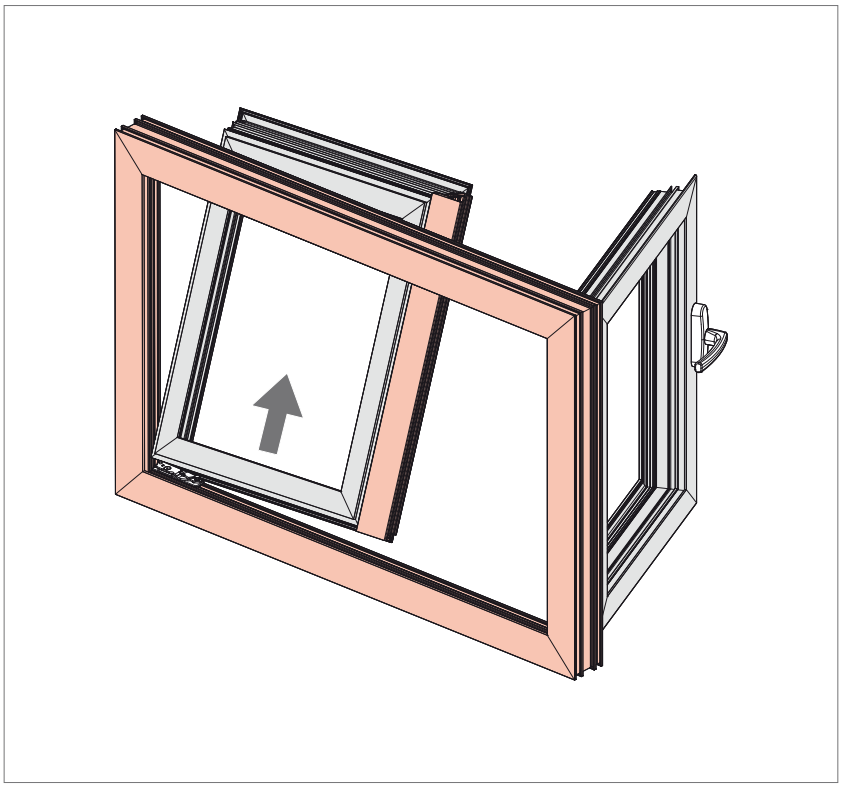
1. Open the active floating-mullion sash and prevent it from swinging closed unintentionally.
2. Move the FM espagnolette handle to the turn position.
3. Open the passive floating-mullion sash approximately 30°–50°.
4. Move the FM espagnolette handle to the locked position.
5. Secure the floating-mullion 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:

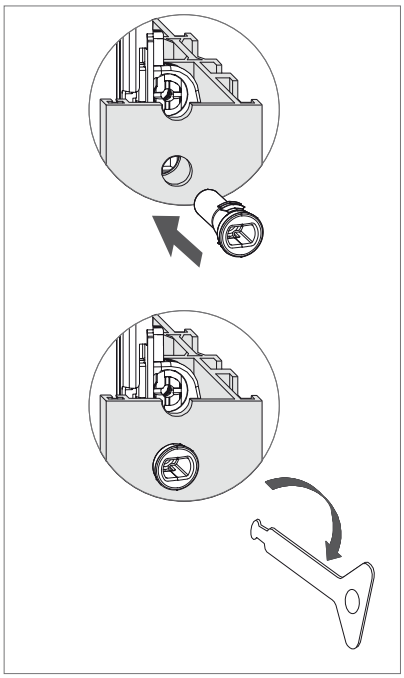
- Always choose force application points so that the resulting reaction forces are deflected as appropriate for the design of the hardware components for the intended installation position. This applies to the support points in particular.

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.

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