Window and Door Technology

Roto Patio Inowa

Intelligent hardware
for tightly sealed sliding systems

Installation, maintenance and operating instructions
for aluminium profiles

Contact

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1 General information

1.1 Version history

Version	Date	Changes
v0	08.05.2014	
v1	21.01.2015	
v2	10.06.2015	
v3	03.12.2015	
v4	03.03.2016	
v5	20.09.2016	
v6	06.05.2019	Handles deleted, reference to CTL_1 All information on the mishandling device deleted. All information on the stop part deleted. Hardware overviews and parts lists changed. Brief instructions added → *from page 61*. Installation sequence changed. → *from page 72* Installation of roller unit, control unit and centre closer; assignment of drilling jig to diagram amended. Installation of MUL striker changed. Installation instructions for inserting sash changed. Installation of flush-encased gearbox fixing added → *from page 84*. Installation of anti-pushback function added. Installation of operating sequence control added. Installation of guide track added. Installation of guide track stopper added. Notes on final assembly added → *from page 115*. Installation drawings changed and added. → *116*
v7	17.01.2020	Hardware overviews and parts lists changed. Drilling and routing dimensions for flush-encased gearbox with profile cylinder length 525 changed → *from page 66*. Guide track stopper position amended → *from page 114*. Position of striker to prevent incorrect operation in hardware overviews and installation drawings amended. Position of anti-pushback function in hardware overviews amended.
v8	15.04.2021	Application range changed → *from page 23*. Component drawings changed → *from page 26*. Centre fixing is undone by being screwed down. Changed for roller unit, control unit and centre closer. Roller unit, control unit and centre closer changed. Installation drawings changed → *from page 116*. Components with Soft function added → *from page 57*. MUL locking cam added – is now also adjustable. Adjustment of adjustable components added → *from page 127*. Operation changed → *from page 129*.

1.2 Instructions

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

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

All steps must be completed in sequence.

The following documents apply in addition to these instructions:

- Handles catalogue: CTL_1

The following guidelines also apply:

Gütegemeinschaft Schlösser und Beschläge e.V.

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

VFF (German Window and Facade Association)

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

Additional guidelines

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

Storing the instructions

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

Explanation of the markings

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

Marking	Meaning
	Sash
	Frame
	Drill holes, routing or screw positions
	Unaffected components Indirectly affected components

Marking	Meaning
	Components that have just been described Arrows or movements
1	Item number
[1]	Legend
[A]	Steps

INFO

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

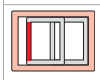
INFO

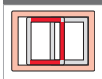
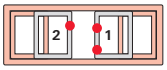
Figures are provided in the left-hand version. The process for the right-hand version is mirror-inverted.

1.3 Symbols

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

1.4 Pictographs

Symbol	Meaning
	Aluminium
	Sash width
	Sash height
	Handle position vertically upwards
	Handle position vertically downwards
	Sash handle height (centre-left)
	Left of sash
	Top of sash
	Top right and bottom right of sash

Symbol	Meaning
	Top, bottom, right of sash
	Top left and right and bottom left of sash
	Top left and right and bottom left and right of sash
	Right of sash
	Bottom of sash
	Sash diagram C,position of operating sequence control
	Left of frame
	Top right of frame
	Top and bottom right of frame
	Bottom left of frame

1.5 Product features

Symbol	Meaning
	Width
	Description
	Call-out
	Installation DIN left / right
	Colour
	Colour code, Roto
	Sash width
	Sash weight
	Information

Symbol	Meaning
	Adjustment
	Length
	Material
	Material number
	Installation type
	Position
	Number of locking cams
	Type of locking cams
	Piece(s)
	Packaging unit

1.6 Abbreviations

Abbreviation	Meaning
approx.	approximately
CTL	Catalogue
DIN	DIN
BS	Backset
IMO	Installation instructions
SW	Sash width
SH	Sash height
S.kg	Sash weight
HH	Handle height
kg	Kilograms
L	Left
Max.	Maximum
MUL	Mullion
Min.	At least
mm	Millimetres
Not sh.	Not shown
R	Right
RC	Resistance class
SW	Key size
CR	Connecting rod
e.g.	For example

1.7 Target groups

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

Hardware dealers

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

Window and balcony door manufacturers

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

Building element dealers or installation companies

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

Builders

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

End users

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

1.8 Target groups’ obligation to give instructions

INFO

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

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

Responsibility of hardware dealers

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

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

Responsibility of the window and balcony door manufacturer

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

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

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

Responsibility of building element dealers and the installation company

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

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

Responsibility of the builder

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

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

1.9 Copyright protection

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

1.10 Limitation of liability

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

The hardware manufacturer assumes no liability for damage caused by:

- Failure to comply with this document and all product-specific documents and other applicable directives (see the chapters entitled “Security” and “Stipulated use”).
- Improper use / misuse (see the chapters entitled “Security” and “Stipulated use”).
- Insufficient invitation to tender, non-compliance with installation specifications and non-compliance with the application diagrams (where available).
- Increased contamination.

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

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

The warranty only covers original Roto components.

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

1.11 Preserving the surface finish

ATTENTION

Surface treatments may cause property damage.

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

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

ATTENTION

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

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

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

ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

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

ATTENTION

(Permanently) damp room air may cause property damage.

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

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

2 Security

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

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

2.1 Presentation and structure of warning instructions

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

DANGER

Nature and source of the danger.

Explanation and description of the danger and the implications.

- Measures to take to avert the danger.

2.2 Security levels of warning instructions

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

DANGER

Immediate risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.

WARNING

Potential risk of death or serious injuries.

- Observe these warning instructions to avoid personal injuries.

CAUTION

Risk of injuries

- Observe these warning instructions to avoid personal injuries.

ATTENTION

Reference to property or environmental damage.

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

2.3 Stipulated use

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

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

2.3.1 Misuse

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

WARNING

Misuse may pose a risk of death!

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

- Only use hardware combinations that have been approved by the hardware manufacturer.
- Only use original accessories or those that have been approved by the hardware manufacturer.
- Note the product-related documentation → *from page 8*.

2.3.2 Usage restriction

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

- Joint sealing
- Driving rain impermeability
- Sound insulation
- Thermal insulation
- Burglary inhibition

2.4 Stipulated use for end users

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

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

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

WARNING

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

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

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

ATTENTION

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

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

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

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

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

2.4.1 Misuse

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

WARNING

Misuse may pose a risk of death!

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

- Only use hardware combinations that have been approved by the hardware manufacturer.
- Only use original accessories or those that have been approved by the hardware manufacturer.
- Note the product-related documentation → *from page 8*.

2.5 Basic safety information

The following hazards may arise when handling the product:

2.5.1 Installation

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

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

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

Heavy loads pose a risk of injury.

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

- Note the applicable accident prevention regulations.

- Transport heavy loads with two people and use suitable transportation means (such as an industrial truck).

Physical strain may cause damage to health.

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

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

2.5.2 Use

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

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

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

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

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

- When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.
- Keep children and anyone unable to understand the risks away from the hazardous area.

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

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

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

Misuse poses a risk of injury and property damage.

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

- Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.
- Do not place additional loads on windows and balcony door sashes.

- Refrain from intentionally or uncontrollably slamming or pushing the window or balcony door sash against the window reveal.

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

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

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

2.5.3 Ambient conditions

Physical and chemical influences may result in property damage.

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

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

Moisture may cause property damage.

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

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

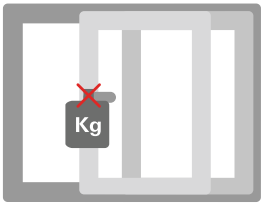
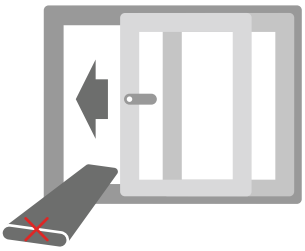
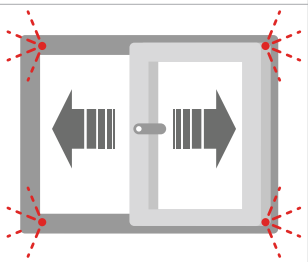
  Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- Provide adequate ventilation during holiday periods as well.
- Create a ventilation plan for construction projects if necessary.

2.6 Operation

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

Safety symbols and markings

Symbol	Meaning
	**Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.** Take care when in the vicinity of open windows and balcony doors. Keep children and anyone unable to understand the risks away from the hazardous area.

Symbol	Meaning
	**Trapping body parts in the opening between sash and frame may lead to serious injuries.** When closing windows and balcony doors, never grip between the sash and frame and always exercise caution. Keep children and anyone unable to understand the risks away from the hazardous area.
	**Placing additional loads on the sash poses a risk of injury and property damage.** Do not attach additional loads to windows and balcony door sashes.
	**Introducing obstacles into the opening between sash and frame poses a risk of injury and property damage.** Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.
	**Opening and closing the sash in an uncontrolled manner poses a risk of injury and property damage.** Ensure that the sash is slowly guided by hand throughout its entire movement range, until it has been brought into a fully closed or opening position.

3 Information on the product

3.1 General hardware characteristics

- Circumferential gasket
- Concealed hardware
- Intuitive, simple operation
- Even heavy sashes can be opened with less effort because the handle is easy to use.
- Ease of closing thanks to the smooth automatic retraction of the sash into the frame.
- Innovative closing movement perpendicular to the frame profile.
- Active locking points including in the mullion.
- Control unit with soft function:
  - SoftClose (damped closing)
  - SoftOpen (damped opening)

3.2 Application ranges

- The sash runs within the frame profile with a retracting distance of 8 mm.
- Narrow profile views possible
- SW 600 mm – 2000 mm

  SW differs for one control unit with Soft function 620 mm – 2000 mm

  SW differs for two control units with Soft function 880 mm – 2000 mm
- SH 1000 mm – 2500 mm
- S.kg max. 200 kg
- Opening diagrams:

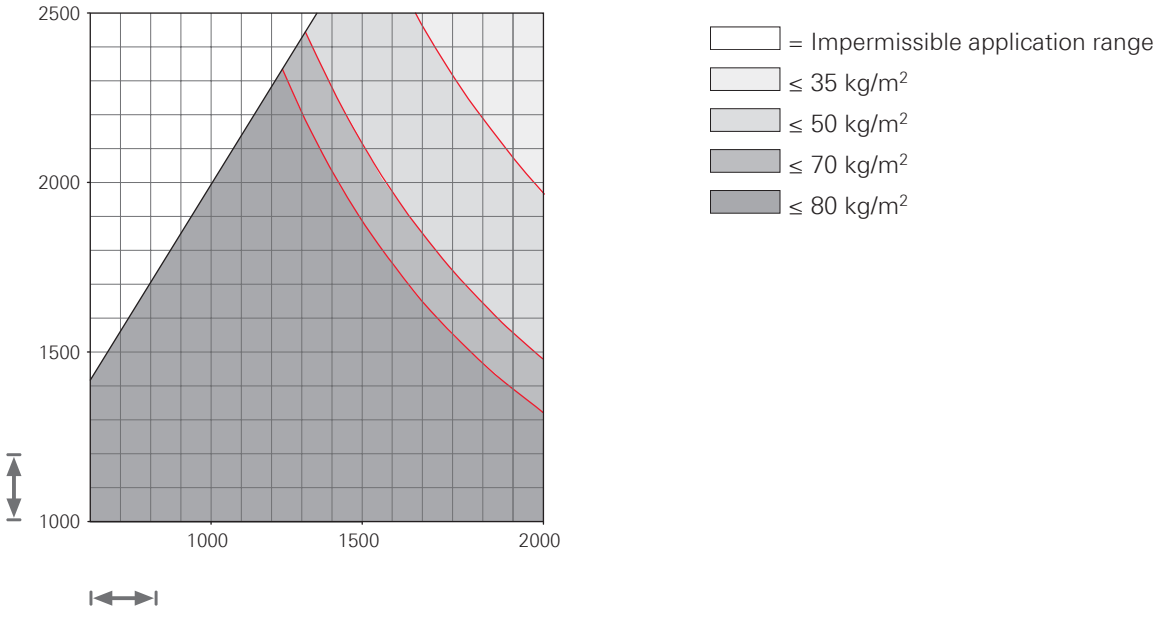
  A and A' (running inward or outward)

  K and K' (running inward or outward)

  C and C' (running inward or outward)
- Resistance class basic security and RC 2 / RC 2 N
- Profile depth ≥ 52 mm
- Operating range: -20 °C to +80 °C

3.3 Application diagrams

3.3.1 200 kg



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

1 mm/m² glass thickness ≙ 2.5 kg

SH : SW = max. 2 : 1

			Application range
	Sash width (SW)	Control unit without Soft function	600 – 2000 mm
		1 control unit with Soft function	620 – 2000 mm
		2 control units with Soft function	880 – 2000 mm
	Sash height (SH)		1000 – 2500 mm
	Sash weight (S.kg)		Max. 200 kg
–	Glass weight		Max. 80 kg/m²

INFO
When using control units with soft function:

S.kg > 20 kg

3.4 Design variants

3.4.1 Overview

Diagram A

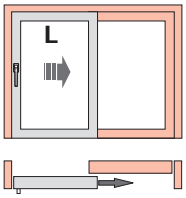
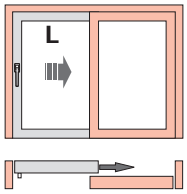
Diagram A (running on the inside)	Diagram A' (running on the outside)
	
1 sliding sash (left or right) 1 fixed glazing element	1 sliding sash (left or right) 1 fixed glazing element

Diagram C

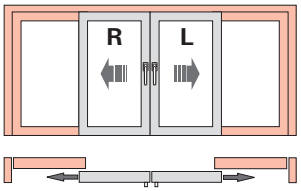
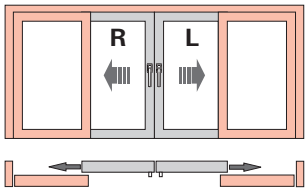
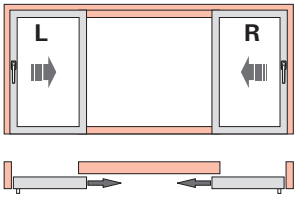
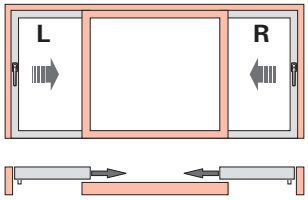
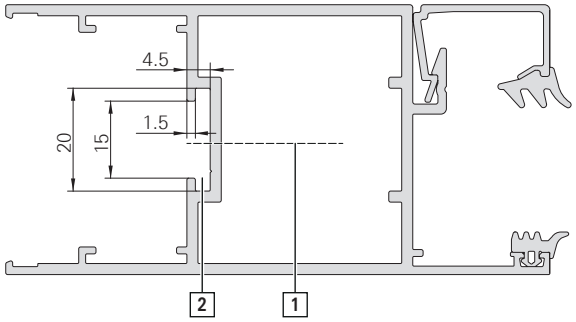
Diagram C (running on the inside)	Diagram C' (running on the outside)
	
2 sliding sashes (left and right) 2 fixed glazing elements	2 sliding sashes (left and right) 2 fixed glazing elements

Diagram K

Diagram K (running on the inside)	Diagram K' (running on the outside)
	
2 sliding sashes (left and right) 1 fixed glazing element	2 sliding sashes (left and right) 1 fixed glazing element

3.5 Hardware groove dimensions

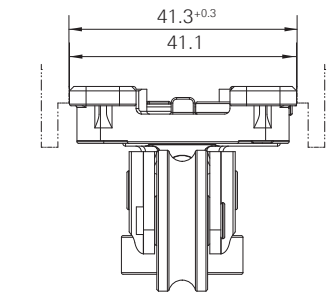
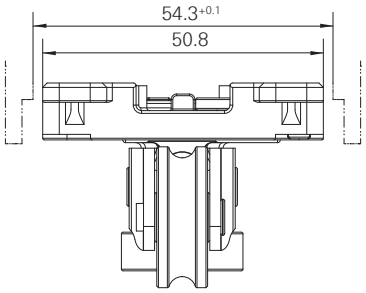


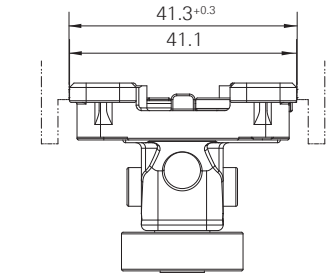
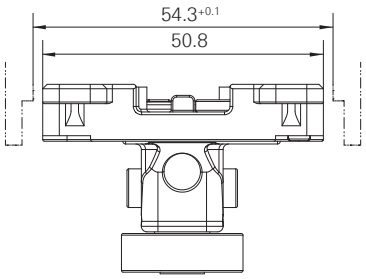
Sash profile cross section

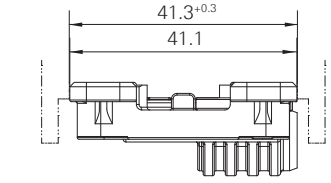
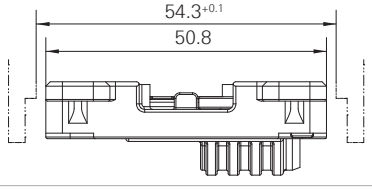
[1] Hardware axis

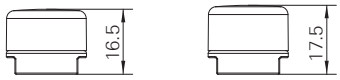
[2] Hardware groove

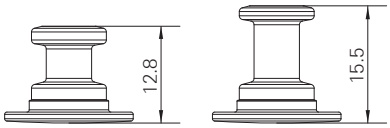
3.6 Component dimensions

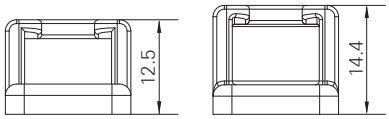
Roller unit	Description
	Size 41
	Size 51

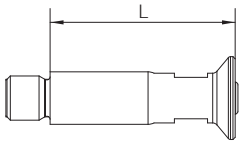
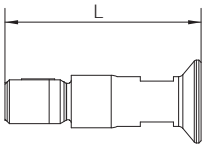
Control unit	Description
	Size 41
	Size 51

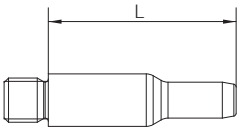
Centre closer	Description
	Size 41
	Size 51

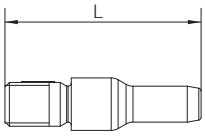
Rubber buffer	Description
	Size 16.5 Size 17.5

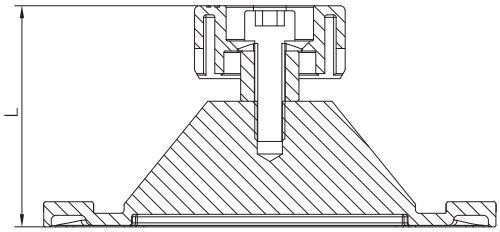
SEC locking cam	Description
	Size 12.8 Size 15.5

SEC striker	Description
	Size 12.5 Size 14.4

MUL locking cam	Description
	L = 17.4 - 62.4
	Adjustable L = 19.8 - 53.5

Pin for anti-pushback function	Description
	L = 20.0 - 46.5

Pin for anti-pushback function	Description
	Adjustable L = 35.5 - 53.5

Operating sequence control set	Description
	Distance 40.0 - 50.0

4 Hardware overviews

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

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

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

The actual composition of the hardware depends on:

INFO

Security classes

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

INFO

Note the profile system assessment.

Recommended handles can be found in the handles catalogue.

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

INFO

Roto Con Orders

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

www.roto-frank.com

4.1 Diagram A, K

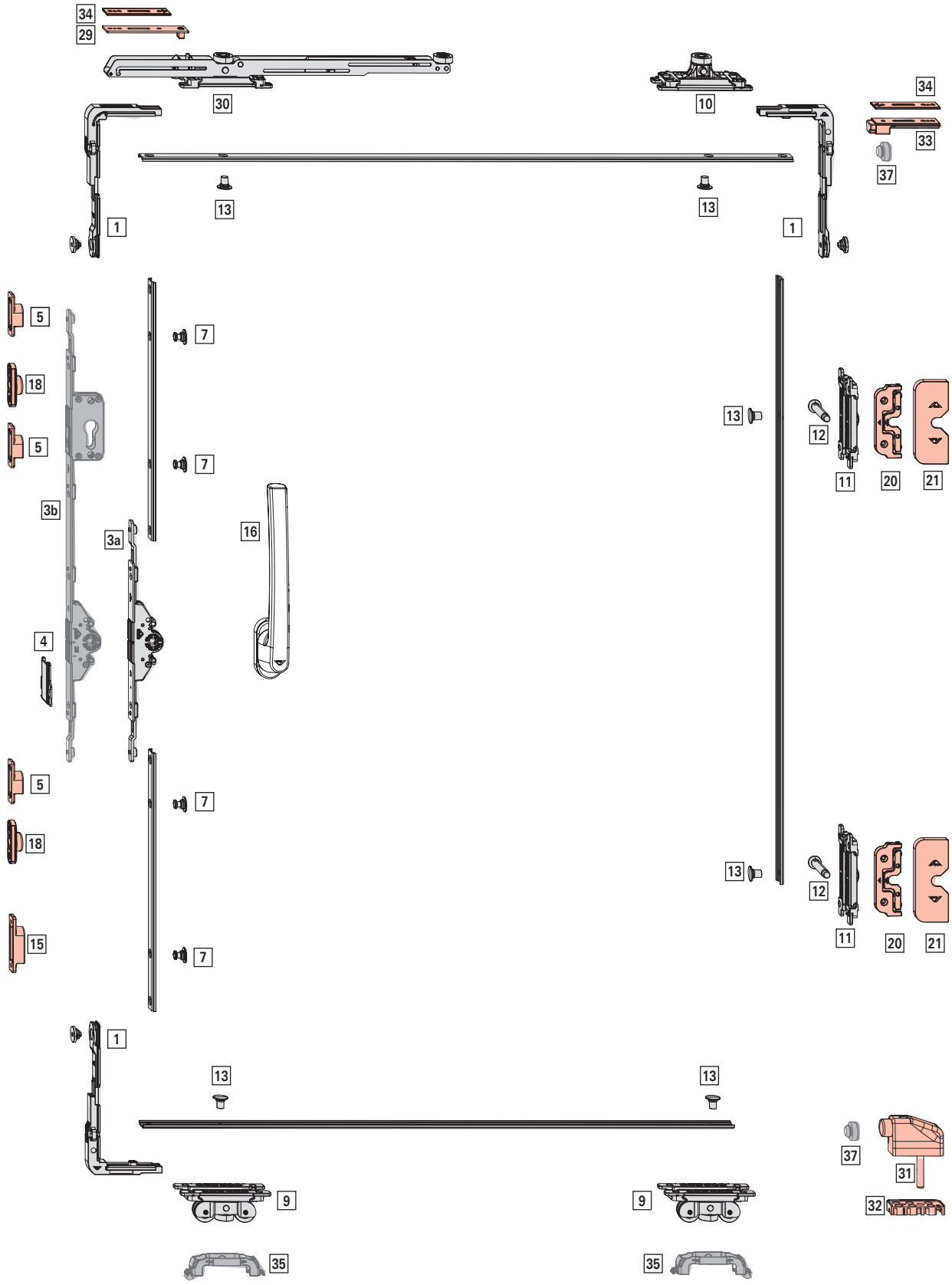


Fig. 4.1: Shown: DIN left version; SW 900 mm; SH 1900 mm; espagnolette BS 25; S.kg 150 kg; control unit with SoftClose

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive

		№
–	–	781822

[3a] Flush-encased gearbox — Standard
Alternatively:
[3b] Lockable flush-encased gearbox — Security

				№
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

				№
Lockable flush-encased gearbox	25	475	1 Piece(s)	625438
	30	475	1 Piece(s)	625439
	35	475	1 Piece(s)	625440
	40	475	1 Piece(s)	625441
	25	525	1 Piece(s)	811483
	30	525	1 Piece(s)	811484
	35	525	1 Piece(s)	811495
	40	525	1 Piece(s)	811496

[4] Flush-encased gearbox fixing [1]

	№
Fixing for flush-encased gearbox	809700

[5] Striker

	№
Striker, 12.5 mm	482260
Striker, 14.4 mm	744684

[7] Locking cam

	№
12.8	639931
15.5	757585

[9] Roller unit [2]

		№
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

[10] Control unit [3]
Alternatively:
Control unit with SoftOpen → *from page 57*

		№
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with SoftClose; SW ≥ 620 mm
Alternatively:
[10] Control unit

				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[1] Not compatible with flush-encased gearbox BS 15

[2] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[3] For SW > 1100 mm, a third control unit is required.

[13] Control cam

	№
Control cam D8	835324

[15] Striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822788

[16] **Handle** (200 mm handle length) → CTL_1 **Recessed grip** (43 mm distance), not sh. → CTL_1

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] MUL striker

		№
Timber PVC Aluminium	Screw-on	793493

[21] Cover cap for MUL striker

		№
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

[31] **End stop**, depending on the profile system

	№
End stop	349600

[32] **End stop packer**, depending on the profile system

	№
Packer	477263

[33] Stopper [4]

	№
Stopper	800196

[34] **Packer**; quantity depends on the profile [5]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

[4] Cannot be used in conjunction with a control unit with SoftOpen.

[5] Only use the number of packers that is specified in the profile assessment.

4.2 Diagram A, K – RC 2 / RC 2 N

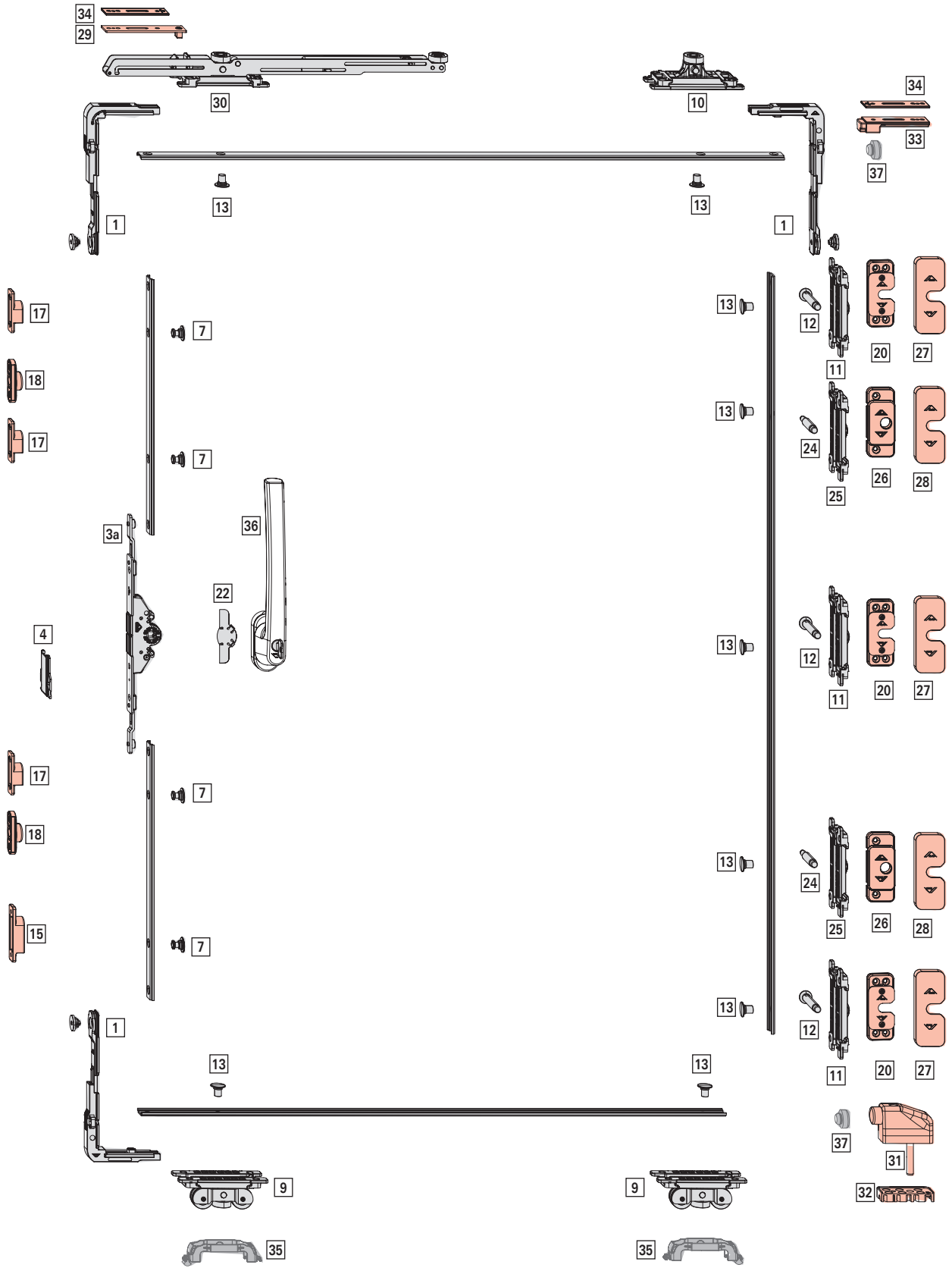


Fig. 4.2: Shown: DIN left version; SW 900 mm; SH 1900 mm; espagnolette BS 25; RC 2

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive

		№
–	–	781822

[3a] Flush-encased gearbox — Standard

				№
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

[4] Flush-encased gearbox fixing [6]

	№
Fixing for flush-encased gearbox	809700

[7] Locking cam

	№
12.8	639931
15.5	757585

[9] Roller unit[7]

		№
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

[10] Control unit[8]

Alternatively:
Control unit with SoftOpen → *from page 57*

		№
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with SoftClose; SW ≥ 620 mm

Alternatively:
[10] Control unit

				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[13] Control cam

	№
Control cam D8	835324

[15] SEC striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822795

[16] **Handle**, lockable (200 mm handle length) → CTL_1

Recessed grip (43 mm distance), not sh. → CTL_1

[17] SEC striker

	№
Striker, 12.5 mm	757695
Striker, 14.4 mm	793242

[6] Not compatible with flush-encased gearbox BS 15

[7] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[8] For SW > 1100 mm, a third control unit is required.

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] SEC MUL striker

	№
SEC MUL striker	833688

[22] Drilling protection

	№
Drilling protection	770965

[24] Pin for anti-pushback function

	№
20	816147
33	835372
34	822393
37.5	837714
38	820048
46.5	833594

[25] Centre closer for anti-pushback function

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

INFO
DIN L: order right components.
DIN R: order left components.

[26] Striker for anti-pushback function

	№
Striker for anti-pushback function	810279

[27] Cover cap for SEC MUL striker
[28] Cover cap for anti-pushback function

		№
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[31] End stop, depending on the profile system

	№
End stop	349600

[32] End stop packer, depending on the profile system

	№
Packer	477263

[33] Stopper [9]

	№
Stopper	800196

[34] Packer; quantity depends on the profile [10]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

[25] Centre closer, adjustable, for anti-pushback function

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

INFO
DIN L: order right components.
DIN R: order left components.

[24] Pin, adjustable, for anti-pushback function

		№
Gasket compression adjustable	25 mm	895977

[9] Cannot be used in conjunction with a control unit with SoftOpen.

[10] Only use the number of packers that is specified in the profile assessment.

		№
	27 mm	895989
	32 mm	895994
	36 mm	858629
	36 mm	895999
	40 mm	839049
	44 mm	896002
	49 mm	896005
	54 mm	839048

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

4.3 Diagram A', K'

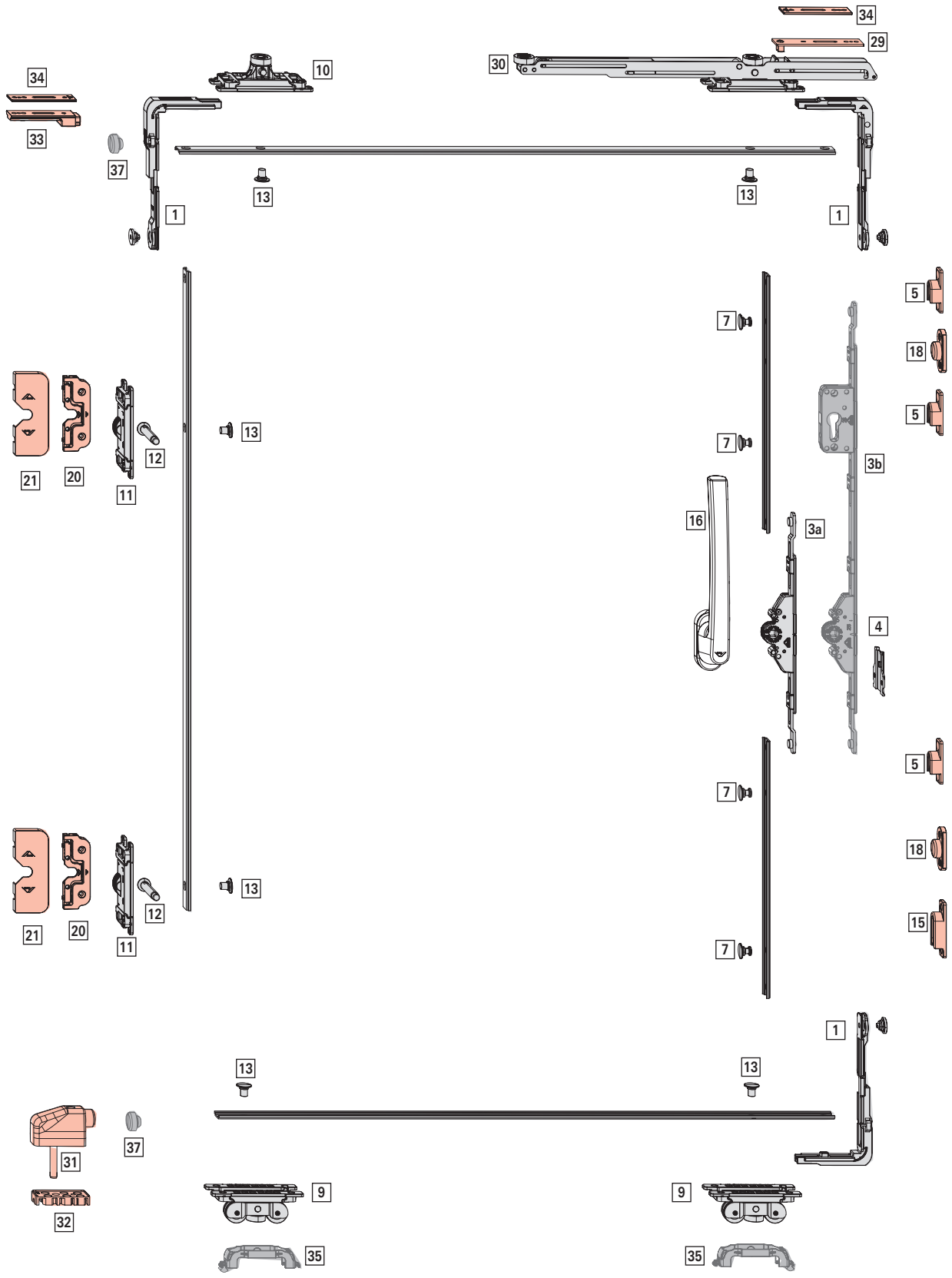


Fig. 4.3: Shown: DIN left version; SW 900 mm; SH 1900 mm; espagnolette BS 25

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive		
#		Nº
–	–	781822

[3a] Flush-encased gearbox Standard Alternatively: [3b] Lockable flush-encased gearbox Security				
				Nº
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

				Nº
Lockable flush-encased gearbox	25	475	1 Piece(s)	625438
	30	475	1 Piece(s)	625439
	35	475	1 Piece(s)	625440
	40	475	1 Piece(s)	625441
	25	525	1 Piece(s)	811483
	30	525	1 Piece(s)	811484
	35	525	1 Piece(s)	811495
	40	525	1 Piece(s)	811496

[4] Flush-encased gearbox fixing [11]	
	Nº
Fixing for flush-encased gearbox	809700

[5] Striker	
	Nº
Striker, 12.5 mm	482260
Striker, 14.4 mm	744684

[7] Locking cam	
	Nº
12.8	639931
15.5	757585

	Nº
12.8	639931
15.5	757585

[9] Roller unit[12]		
		Nº
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

INFO
DIN L: order right components.
DIN R: order left components.

[10] Control unit[13] Alternatively: Control unit with SoftOpen → *from page 57*		
		Nº
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

INFO
DIN L: order right components.
DIN R: order left components.

[*] Control unit set with SoftClose; SW ≥ 620 mm Alternatively: [10] Control unit				
				Nº
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

INFO
DIN L: order right components.
DIN R: order left components.

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer		
		Nº
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[11] Not compatible with flush-encased gearbox BS 15

[12] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[13] For SW > 1100 mm, a third control unit is required.

INFO
DIN L: order right components.
DIN R: order left components.

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[13] Control cam

	№
Control cam D8	835324

[15] Striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822788

[16] **Handle** (200 mm handle length) → CTL_1 **Recessed grip** (43 mm distance), not sh. → CTL_1

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] MUL striker

		№
Timber PVC Aluminium	Screw-on	793493

[21] Cover cap for MUL striker

		№
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

[14] Cannot be used in conjunction with a control unit with SoftOpen.

[15] Only use the number of packers that is specified in the profile assessment.

[31] **End stop**, depending on the profile system

	№
End stop	349600

[32] **End stop packer**, depending on the profile system

	№
Packer	477263

[33] Stopper [14]

	№
Stopper	800196

[34] **Packer**; quantity depends on the profile [15]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

4.4 Diagram A', K' – RC 2 / RC 2 N

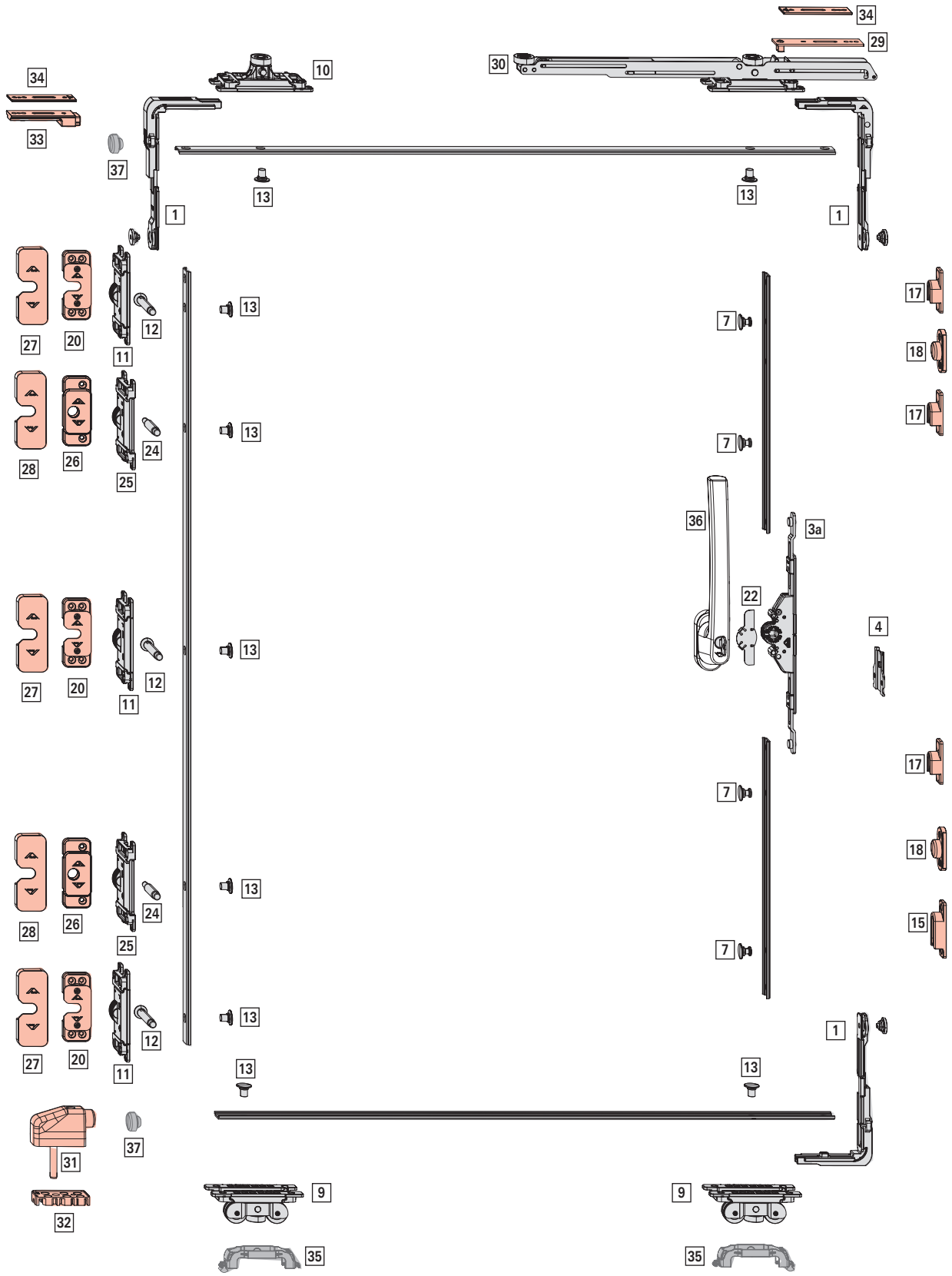


Fig. 4.4: Shown: DIN left version; SW 900 mm; SH 1900 mm; espagnolette BS 25; RC 2

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive

		№
–	–	781822

[3a] Flush-encased gearbox Standard

				№
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

[4] Flush-encased gearbox fixing [16]

	№
Fixing for flush-encased gearbox	809700

[7] Locking cam

	№
12.8	639931
15.5	757585

[9] Roller unit[17]

		№
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

INFO
DIN L: order right components.
DIN R: order left components.

[10] Control unit[18]
Alternatively:
Control unit with SoftOpen → *from page 57*

		№
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

INFO
DIN L: order right components.
DIN R: order left components.

[*] Control unit set with SoftClose; SW ≥ 620 mm
Alternatively:
[10] Control unit

				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

INFO
DIN L: order right components.
DIN R: order left components.

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

INFO
DIN L: order right components.
DIN R: order left components.

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[16] Not compatible with flush-encased gearbox BS 15

[17] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[18] For SW > 1100 mm, a third control unit is required.

[13] Control cam

	№
Control cam D8	835324

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[15] SEC striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822795

[16] **Handle**, lockable (200 mm handle length) → CTL_1
Recessed grip (43 mm distance), not sh. → CTL_1

[17] SEC striker

	№
Striker, 12.5 mm	757695
Striker, 14.4 mm	793242

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] SEC MUL striker

	№
SEC MUL striker	833688

[22] Drilling protection

	№
Drilling protection	770965

[24] Pin for anti-pushback function

	№
20	816147
33	835372
34	822393
37.5	837714
38	820048
46.5	833594

[25] Centre closer for anti-pushback function

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[19] Cannot be used in conjunction with a control unit with SoftOpen.

[20] Only use the number of packers that is specified in the profile assessment.

INFO
DIN L: order left components.
DIN R: order right components.

[26] Striker for anti-pushback function

	№
Striker for anti-pushback function	810279

[27] Cover cap for SEC MUL striker
[28] Cover cap for anti-pushback function

		№
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[31] **End stop**, depending on the profile system

	№
End stop	349600

[32] **End stop packer**, depending on the profile system

	№
Packer	477263

[33] Stopper [19]

	№
Stopper	800196

[34] **Packer**; quantity depends on the profile [20]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972

		№
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

[25] Centre closer, adjustable, for anti-pushback function

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

INFO

DIN L: order right components.

DIN R: order left components.

[24] Pin, adjustable, for anti-pushback function

		№
Gasket compression adjustable	25 mm	895977
	27 mm	895989
	32 mm	895994
	36 mm	858629
	36 mm	895999
	40 mm	839049
	44 mm	896002
	49 mm	896005
	54 mm	839048

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

4.5 Diagram C

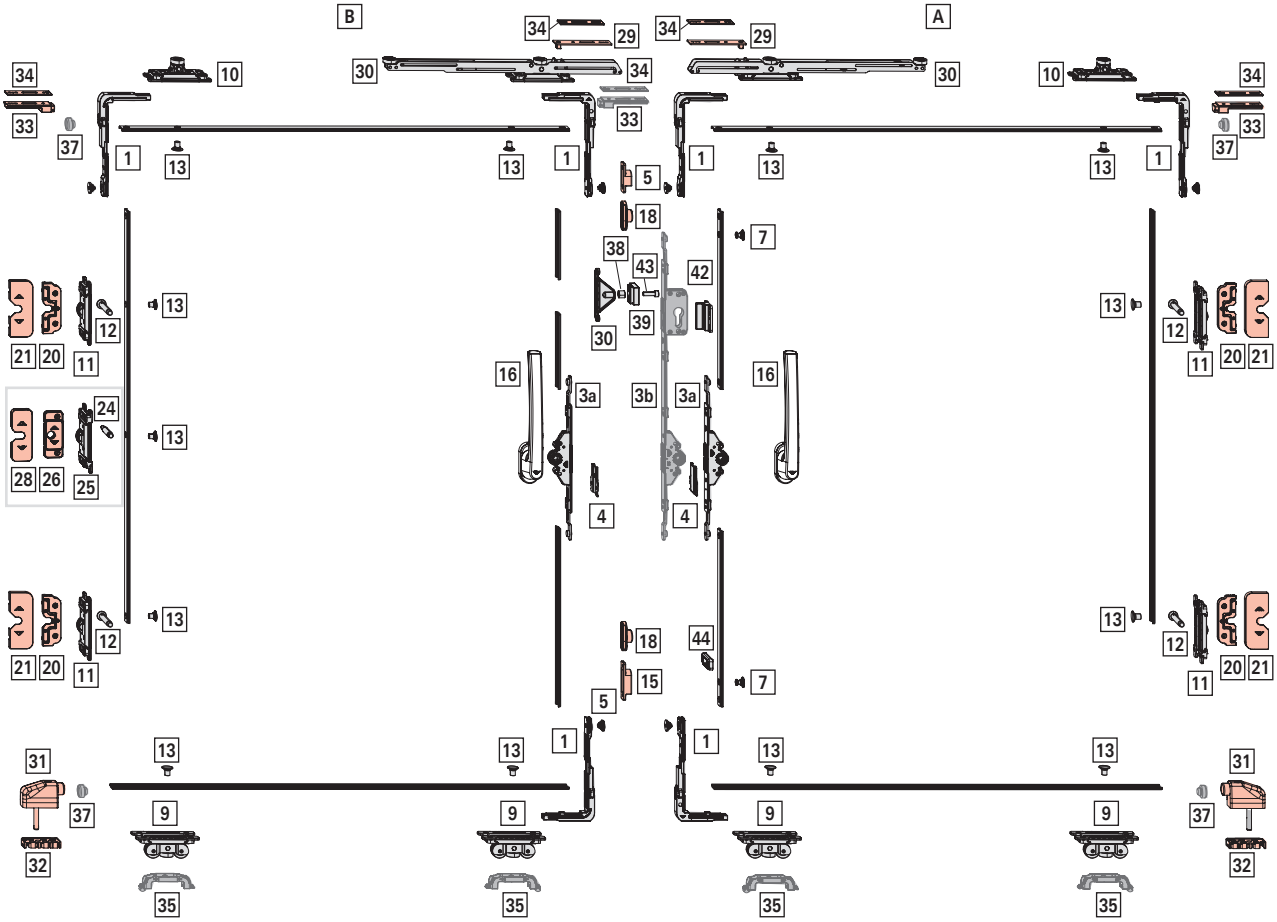


Fig. 4.5: Shown: version: [A] First opening sash DIN L, [B] second opening sash DIN R; SW 900 mm; SH 1300 mm; espagnolette BS 25

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive

		№
–	–	781822

[3a] Flush-encased gearbox — Standard
Alternatively:
[3b] Lockable flush-encased gearbox — Security

				№
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

				№
Lockable flush-encased gearbox	25	475	1 Piece(s)	625438
	30	475	1 Piece(s)	625439
	35	475	1 Piece(s)	625440
	40	475	1 Piece(s)	625441
	25	525	1 Piece(s)	811483
	30	525	1 Piece(s)	811484
	35	525	1 Piece(s)	811495
	40	525	1 Piece(s)	811496

[4] Flush-encased gearbox fixing [21]

	№
Fixing for flush-encased gearbox	809700

[5] Striker

	№
Striker, 12.5 mm	482260
Striker, 14.4 mm	744684

[7] Locking cam

	№
12.8	639931
15.5	757585

[9] Roller unit [22]

		№
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

[10] Control unit [23]

Alternatively:
Control unit with SoftOpen → *from page 57*

		№
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

[*] Control unit set with SoftClose; SW ≥ 620 mm
Alternatively:
[10] Control unit

				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[21] Not compatible with flush-encased gearbox BS 15

[22] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[23] For SW > 1100 mm, a third control unit is required.

[13] Control cam

	№
Control cam D8	835324

[15] Striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822788

[16] **Handle** (200 mm handle length) → CTL_1 **Recessed grip** (43 mm distance), not sh. → CTL_1

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] MUL striker

		№
Timber PVC Aluminium	Screw-on	793493

[21] Cover cap for MUL striker

		№
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

[28] Cover cap for anti-pushback function

		№
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[*] Operating sequence control set SH ≥1200 mm, depending on the profile system

	№
40.5	834699
44	895828
50	821508

Contents:

[*]		#
[30]	Coupling, depending on the profile system	1
[38]	Sleeve, depending on the profile system	1
[39]	Stop, second opening sash	1
[42]	Stop, first opening sash	1
[43]	Cylinder screw, depending on the profile system	1
[44]	Anti-jemmy device	1

[24] Pin for anti-pushback function

	№
20	816147
33	835372
34	822393
37.5	837714
38	820048
46.5	833594

[25] Centre closer for anti-pushback function

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

INFO

DIN L: order right components.

DIN R: order left components.

[26] Striker for anti-pushback function

	№
Striker for anti-pushback function	810279

[31] **End stop**, depending on the profile system

	№
End stop	349600

[32] **End stop packer**, depending on the profile system

	№
Packer	477263

[33] **Stopper** [24]

	№
Stopper	800196

[34] **Packer**; quantity depends on the profile [25]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[24] Cannot be used in conjunction with a control unit with SoftOpen.

[25] Only use the number of packers that is specified in the profile assessment.

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

[25] Centre closer, adjustable, for anti-pushback function

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

INFO

DIN L: order right components.

DIN R: order left components.

[24] Pin, adjustable, for anti-pushback function

		№
Gasket compression adjustable	25 mm	895977
	27 mm	895989
	32 mm	895994
	36 mm	858629
	36 mm	895999
	40 mm	839049
	44 mm	896002
	49 mm	896005
	54 mm	839048

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

4.6 Diagram C'

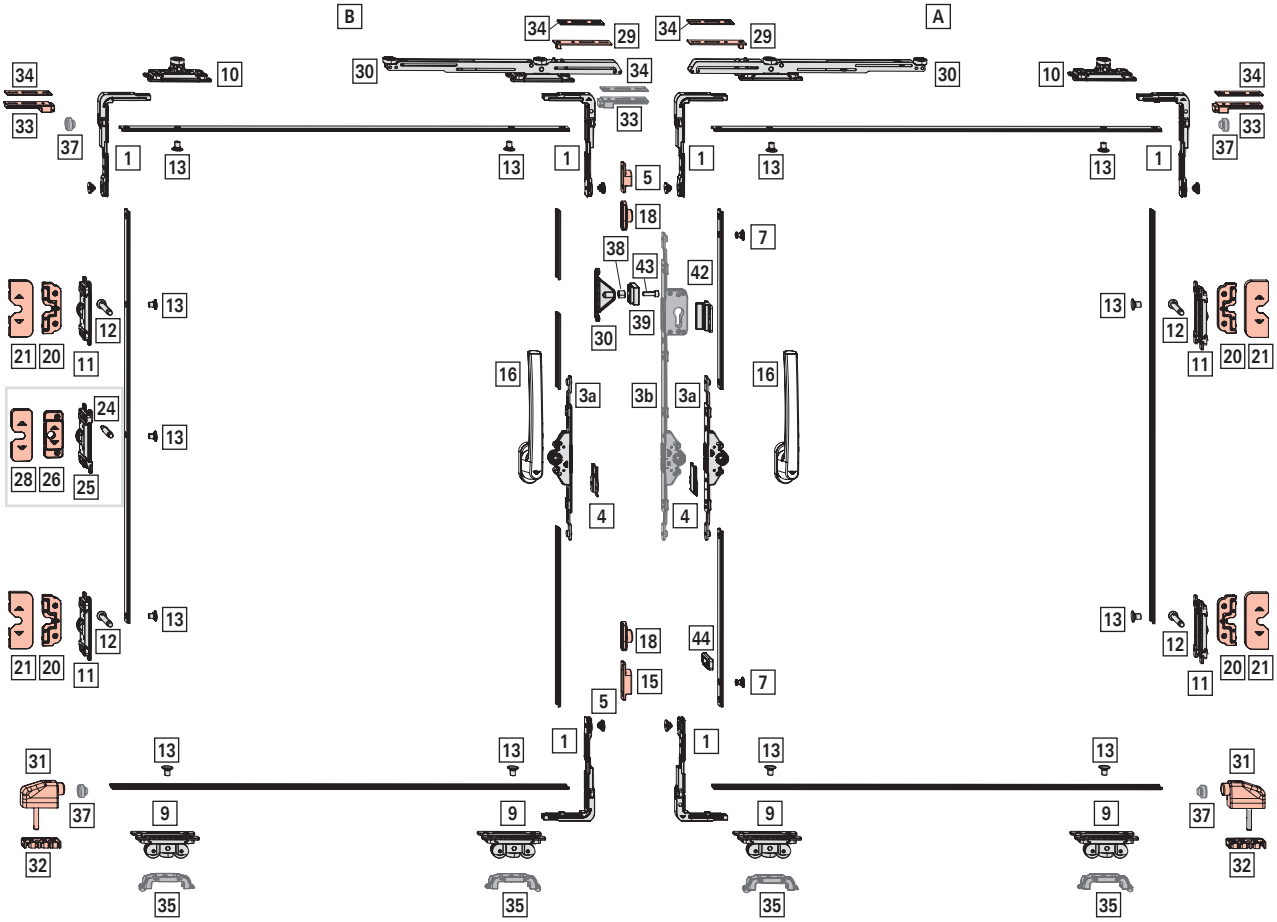


Fig. 4.6: Shown: version: [A] First opening sash DIN L, [B] second opening sash DIN R; SW 900 mm; SH 1300 mm; espagnolette BS 25

Application range

SW: 600 - 2000 mm

SH: 1000 - 2500 mm

S.kg: max. 200 kg

[1] Reinforced corner drive		
#		№
–	–	781822

[3a] Flush-encased gearbox			Standard
Alternatively:			
[3b] Lockable flush-encased gearbox			Security

				№
Flush-encased gearbox	15	280	1 Piece(s)	817163
	25	280	1 Piece(s)	625430
	30	280	1 Piece(s)	625431
	35	280	1 Piece(s)	625432
	40	280	1 Piece(s)	625433

				№
Lockable flush-encased gearbox	25	475	1 Piece(s)	625438
	30	475	1 Piece(s)	625439
	35	475	1 Piece(s)	625440
	40	475	1 Piece(s)	625441
	25	525	1 Piece(s)	811483
	30	525	1 Piece(s)	811484
	35	525	1 Piece(s)	811495
	40	525	1 Piece(s)	811496

[4] Flush-encased gearbox fixing [26]	
	№
Fixing for flush-encased gearbox	809700

[5] Striker	
	№
Striker, 12.5 mm	482260
Striker, 14.4 mm	744684

[7] Locking cam	
	№
12.8	639931
15.5	757585

[9] Roller unit[27]		
		№
41	Left	821686
	Right	823733
51	Left	823734
	Right	823735

INFO
DIN L: order right components.
DIN R: order left components.

[10] Control unit[28]		
Alternatively:		
Control unit with SoftOpen → *from page 57*		
		№
41	Left	821685
	Right	823730
51	Left	823731
	Right	823732

INFO
DIN L: order right components.
DIN R: order left components.

[*] **Control unit set with SoftClose**; SW ≥ 620 mm				
Alternatively:				
[10] Control unit				
				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

INFO
DIN L: order right components.
DIN R: order left components.

Contents:

[*]		#
[40]	Control unit with SoftClose	1
[41]	Activator for control units with soft function	1

[11] Centre closer		
		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[26] Not compatible with flush-encased gearbox BS 15

[27] For SW > 1100 mm, a third roller unit is required. No spacer blocking for load transfer via the roller unit in this area.

[28] For SW > 1100 mm, a third control unit is required.

INFO
DIN L: order right components.
DIN R: order left components.

[12] MUL locking cam

	№
17.4	809611
20	808632
21.9	809613
23.9	794770
24.6	775929
30	814786
31.5	809772
32.8	809612
33.5	819884
34.4	771375
37.5	836782
38.4	809614
41.4	798976
46	817228
47.5	806839
62.4	809625

[13] Control cam

	№
Control cam D8	835324

[15] Striker to prevent incorrect operation

	№
Striker to prevent incorrect operation	822788

[16] **Handle** (200 mm handle length) → CTL_1 **Recessed grip** (43 mm distance), not sh. → CTL_1

[18] Stop

	№
14	635307
16.5	757701
17.5	757587

[20] MUL striker

		№
Timber PVC Aluminium	Screw-on	793493

[21] Cover cap for MUL striker

		№
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

[*] Operating sequence control set SH ≥1200 mm, depending on the profile system

	№
40.5	834699
44	895828
50	821508

Contents:

[*]		#
[30]	Coupling, depending on the profile system	1
[38]	Sleeve, depending on the profile system	1
[39]	Stop, second opening sash	1
[42]	Stop, first opening sash	1
[43]	Cylinder screw, depending on the profile system	1
[44]	Anti-jemmy device	1

[24] Pin for anti-pushback function

	№
20	816147
33	835372
34	822393
37.5	837714
38	820048
46.5	833594

[25] Centre closer for anti-pushback function

		№
41	Left	821687
	Right	823736
51	Left	823737
	Right	823738

[26] Striker for anti-pushback function

	№
Striker for anti-pushback function	810279

[21] Cover cap for MUL striker

		№
R01.1	Natural silver	819632
R05.3	Medium bronze	819631
R06.2	Jet black	798979
R07.2	Traffic white	808054

[28] Cover cap for anti-pushback function

		№
R01.1	Natural silver	828482
R05.3	Medium bronze	828483
R06.2	Jet black	809717
R07.2	Traffic white	819351

[31] **End stop**, depending on the profile system

	№
End stop	349600

[32] End stop packer, depending on the profile system

	№
Packer	477263

[33] Stopper [29]

	№
Stopper	800196

[34] Packer; quantity depends on the profile [30]

	№
Packer	800197

Optional

[11] Centre closer, adjustable

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

[12] MUL locking cam, adjustable

		№
Gasket compression adjustable	19.8	786728
	25	895955
	26	895966
	27	895970
	35.5	858628
	36	895972
	37.5	895974
	39.5	839047
	44	895973
	45.8	791838
	47.8	788696
	53.5	839045

[25] Centre closer, adjustable, for anti-pushback function

		№
41	Left	823751
	Right	823752
51	Left	823753
	Right	823754

INFO

DIN L: order right components.

DIN R: order left components.

[24] Pin, adjustable, for anti-pushback function

		№
Gasket compression adjustable	25 mm	895977
	27 mm	895989
	32 mm	895994
	36 mm	858629
	36 mm	895999
	40 mm	839049
	44 mm	896002
	49 mm	896005
	54 mm	839048

Connecting rod for ECC-groove

			№
3 m connecting rod	ECC-groove	1 Piece(s)	735102
6 m connecting rod	ECC-groove	1 Piece(s)	334665

[35] Brush holder

	№
Brush holder	809520

[37] Rubber buffer

	№
16.5	780647
17.5	798249

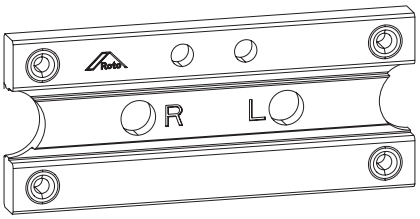
[29] Cannot be used in conjunction with a control unit with SoftOpen.

[30] Only use the number of packers that is specified in the profile assessment.

5 Jigs / tools

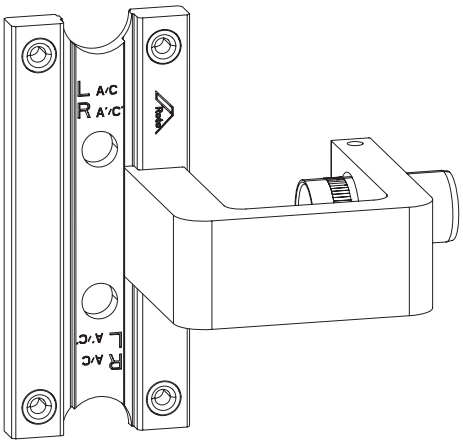
5.1 Drilling jigs

5.1.1 Roller unit / control unit



	№
41	836947
51	836945

5.1.2 Centre closer



INFO
Use of a drilling jig with Ø 14.0 is mandatory for the centre closer, adjustable.

For centre closer: 4 x Ø 3.5 / 1 x Ø 12.0

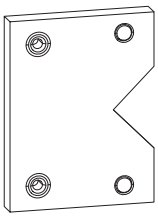
	№
41	893970
51	893743

For centre closer, adjustable: 4 x Ø 3.5 / 1 x Ø 14.0

	№
41	836942
51	836941

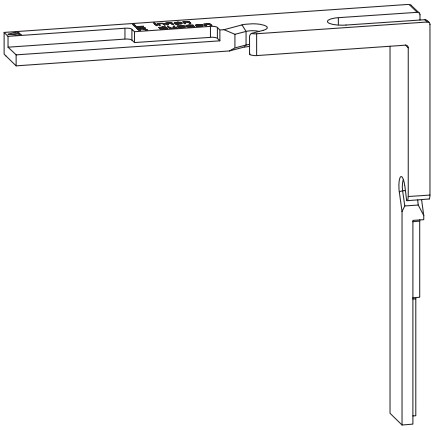
5.1.3 Strikers

MUL striker



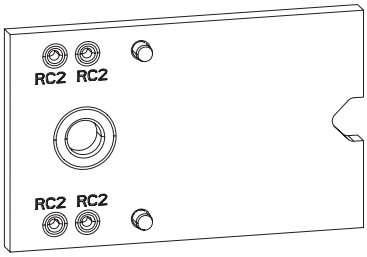
INFO
Order drilling jigs depending on the profile used (see system-specific profile assessment).

Striker



	№
Espagnolette side	840276

SEC MUL striker / striker for anti-pushback function

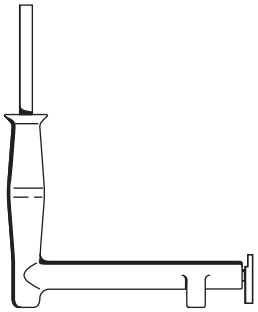


INFO
Order drilling jigs depending on the profile used (see system-specific profile assessment).

Other jigs are available upon request.

5.2 Tools

5.2.1 Extractor handle



	№
Extractor handle for stay-bearing pin	740068
Replacement blade	230765

5.2.2 Tensioning tool

For control unit with soft function

		№
Tensioning tool	For control unit with soft function	837763

6 Accessories

6.1 Activator spare part for control unit with soft function

The activator is included in the control unit set.

	№
Activator for soft function	837318

6.2 Control unit with Soft function

Control unit set with SoftClose (incl. activator)

SW ≥ 620 mm

Installation position: at the top of the espagnolette side

				№
Espagnolette side	41	100 kg	Left	837235
			Right	837152
		200 kg	Left	837236
			Right	837153
	51	100 kg	Left	837241
			Right	837238
		200 kg	Left	837242
			Right	837239

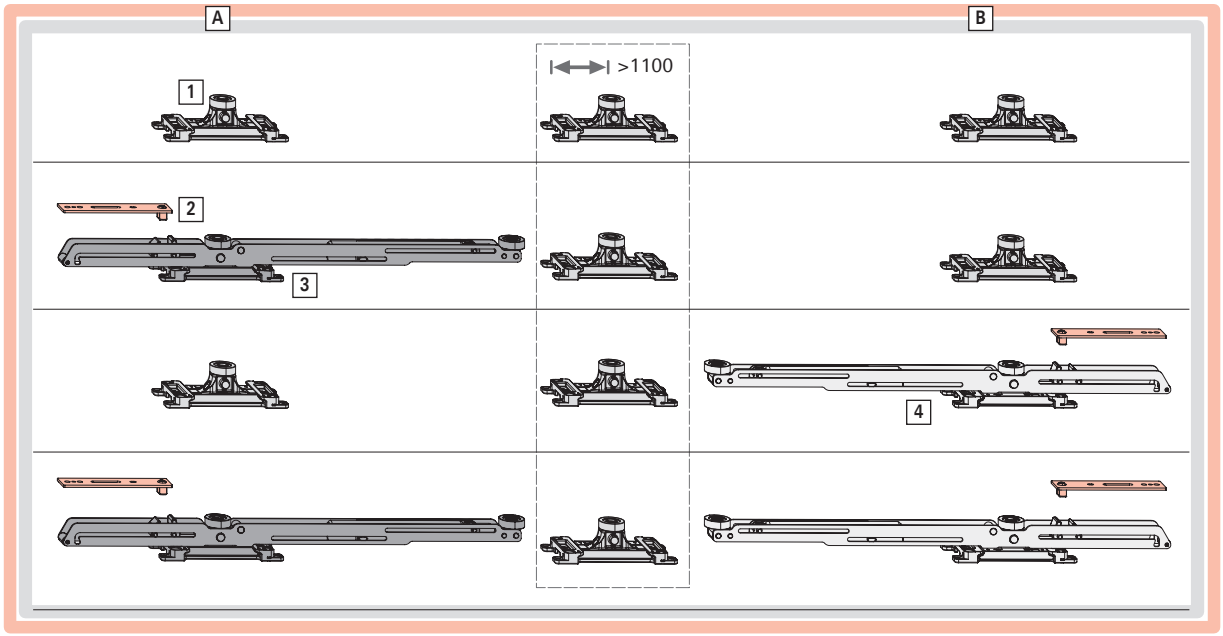
Control unit set with SoftOpen (incl. activator)

S.kg ≤ 200 kg

Installation: at the top of the mullion side

				№
Mullion side	41	100 kg	Left	838569
			Right	838566
		200 kg	Left	838570
			Right	838567
	51	100 kg	Left	838575
			Right	838572
		200 kg	Left	838576
			Right	838573

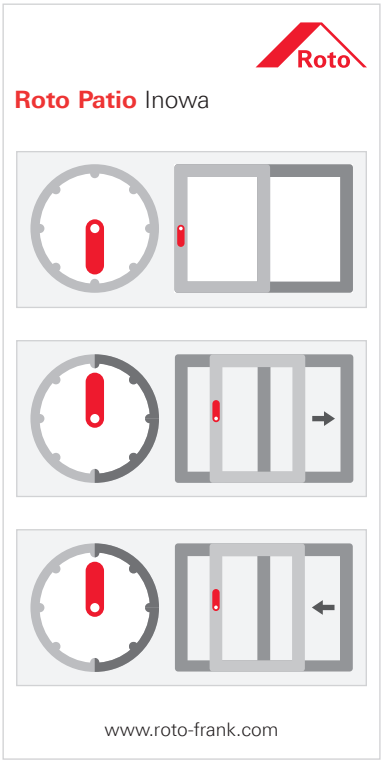
Positioning options for the control unit



[A] On the espagnolette side
[B] On the mullion side
[1] Control unit without Soft function
[2] Activator for control unit with Soft function
[3] Control unit with SoftClose
[4] Control unit with SoftOpen

Control unit	Min. SW	Alignment	Position	Function
Without Soft function	600	–	On the espagnolette side, on the mullion side	–
	1100	–	Centred	Supports the sash from SW > 1100
With SoftClose	620 / 880	Additional control roller faces towards the centre of the sash	On the espagnolette side	Damps the movement of the sash in the locking direction and draws it slowly closed.
With SoftOpen	620 / 880	Additional control roller faces towards the centre of the sash	On the mullion side	Damps the movement of the sash in the opening direction and draws it slowly into the final position.

6.3 Label



	№
Label indicating the operating sequence, diagram A	811486

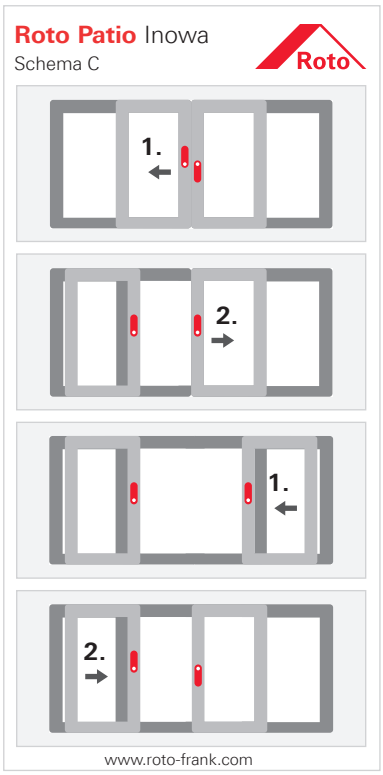


Fig. 6.1: Figure for installation DIN right

		№
Label indicating the operating sequence, diagram C	Left	823251
	Right	823250

7 Brief instructions

7.1 Diagram A, A', K, K'

Summary of IMO 282

	Installation sequence	Note	Page reference
Sash	Prepare the connecting rods.	Observe the installation sequence → *from page 72*.	
	Install the locking and control cams.	Observe the installation sequence → *from page 72*.	→ *from page 78*
	Install the corner drives.	Observe the installation sequence → *from page 72*.	→ *from page 79*
	Install the flush-encased gearbox.	Observe the installation sequence → *from page 72*.	→ *from page 81*
	Install the handle.		→ *from page 85*
	Install the roller unit.		→ *from page 86*
	Install the control units.	Alternatively: install the control unit with Soft function → *from page 57*.	→ *from page 88*
	Install the centre closer with MUL locking cam.		→ *from page 90*
	Install the stopper or rubber buffer.	Version 1: guide track stopper	→ *from page 114*
		Version 2: sash rubber buffer Place pressure-proof packers under the cover on the mullion side.	→ *from page 95*
Frame	Install strikers.		→ *from page 96*
	Install the striker to prevent incorrect operation.		→ *from page 98*
Joining the sash and frame	Insert the sash.	Move the handle to the open sliding position. Screw down the guide track.	→ *from page 100*
	Install the MUL strikers.		→ *from page 104*
	Install the activator.	Only when using a control unit with Soft function. Quantity of packers = (Y-38)/2 → *from page 108*. Tension the control unit with Soft function → *from page 110*.	→ *from page 108*
	Install the stop.		→ *from page 111*
	Install the end stop with packer.		→ *from page 113*
Final acceptance	Install the element.	Place supports under the threshold every 300 mm across its entire area. Max. permitted unevenness of the entire threshold: 3 mm. We recommended that you place packers under the threshold across its entire area.	→ *from page 115*
	Adjust the hardware.		→ *from page 127*
	Lubricate the hardware.		→ *from page 132*
	Check the handle operating force.	Operating force ≤ 10 Nm	
	Remove all protective films on aluminium profiles.		

8 Installation

8.1 Processing instructions

Maximum sash sizes and weights

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

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

Specifications from profile manufacturers

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

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

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

Combining hardware

Burglar inhibiting elements need hardware which meets special requirements.

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

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

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

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

Lubricating the hardware

ATTENTION
Using incorrect lubricants may cause property damage.
Substandard lubricants can prevent the hardware from working properly.
- ▸ Use high-quality lubricants.
- ▸ Only use resin-free and acid-free lubricants.

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

Recommended lubricants

- Roto NX / NT grease

For recommended lubrication points, see the “Maintenance” chapter → *12.3 “Care” from page 131*.

The number of screws for installation may vary.

8.2 Screw connections

DANGER

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

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

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

ATTENTION

Using incorrect screw material may cause property damage.

Using the wrong screws may damage the components.

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

ATTENTION

Improper screw fixings may cause property damage.

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

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

8.2.1 Overview

WARNING

Incorrect screw connections may pose a risk of death!

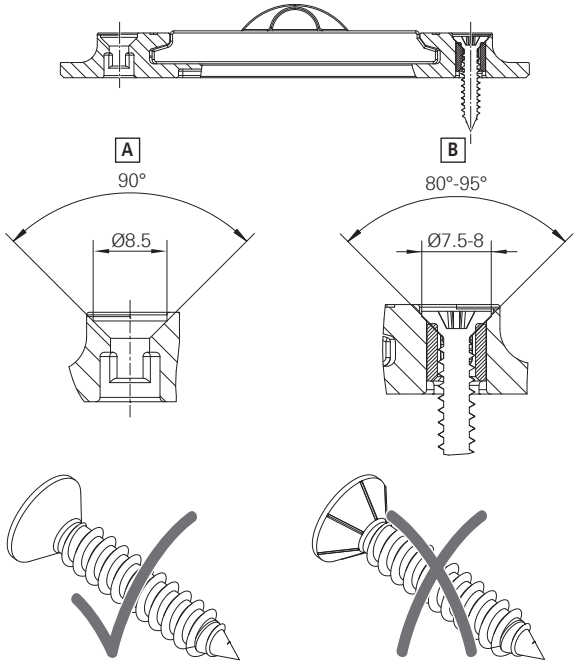
Hardware components can be pulled out of the sash if they are not screwed through a profile wall that is at least 6 mm thick in total or screwed down using rivet nuts.

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

Components	Quantity	Size	Diameter to be drilled	Drive
Roller unit	4	ST4.2 x ...	3.5	Cross-head
Control unit	4	ST4.2 x ...	3.5	Cross-head
Centre closer	4	ST4.2 x ...	3.5	Cross-head
MUL striker / striker for anti-pushback function	2	ST4.2 x ...	3.5	Cross-head
SEC MUL striker	4	ST4.2 x ...	3.5	Cross-head
Striker / stop	2	ST4.2 x ...	3.5	Not specified
SEC striker	2	ST4.2 x ...	3.5	Cross-head
Activator / stopper	3	ST4.2 x ...	3.5	Cross-head
Corner drive	2	ST4.2 x ...	3.5	Cross-head

Components	Quantity	Size	Diameter to be drilled	Drive
Roto Line handle	2	M5 x ...	10.0 / 12.0	Cross-head

Specifications for selecting screws



[A] Specifications relating to the countersink

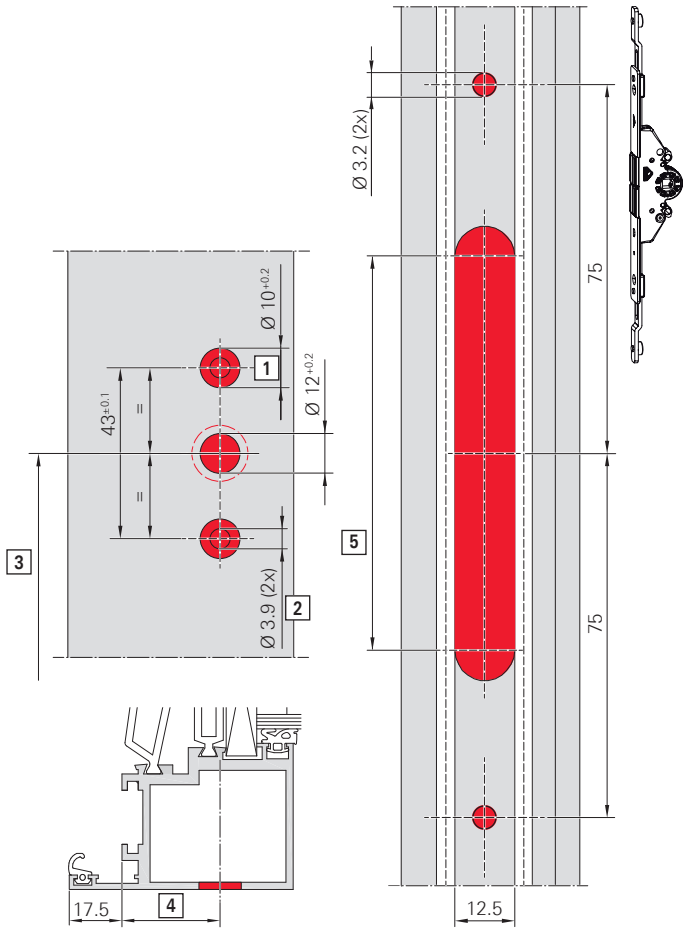
[B] Specifications relating to the screw head for selecting screws

INFO

Routing grooves or V-shaped grooves may damage the fixing when screwing it in and prevent it from releasing.

8.3 Drilling and routing dimensions

8.3.1 Flush-encased gearbox without profile cylinder



Drill holes for the handle's sprocket and lugs with SH ≥ 930

[1] Ø 10 + 0.2

only through the first profile wall

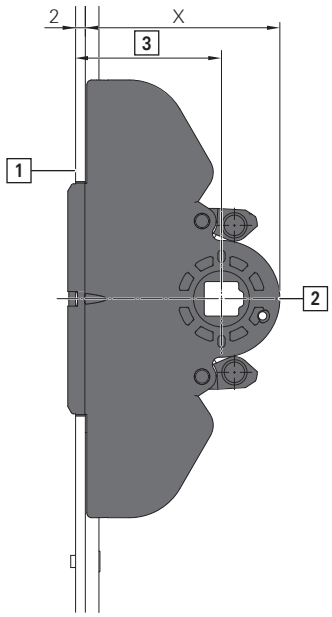
[2] Ø 3.9

only through the second profile wall or additional profile walls

[3] HH ≥ 260

[4] = Backset - 2

[5] 120 (BS 15) / 90 (BS 25 to BS 40)



Gearbox routing depth

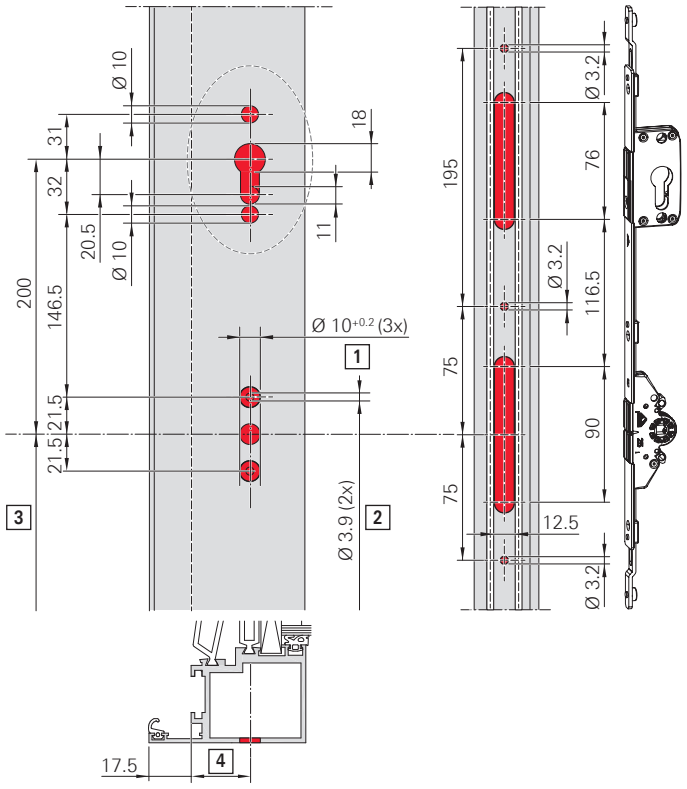
[1] Top edge of floating mullion

[2] Lower edge of espagnolette

[3] Backset

X = min. routing depth

8.3.2 Flush-encased gearbox with profile cylinder



Length 475

Drill holes for the handle's sprocket and lugs

[1] Ø 10 + 0.2

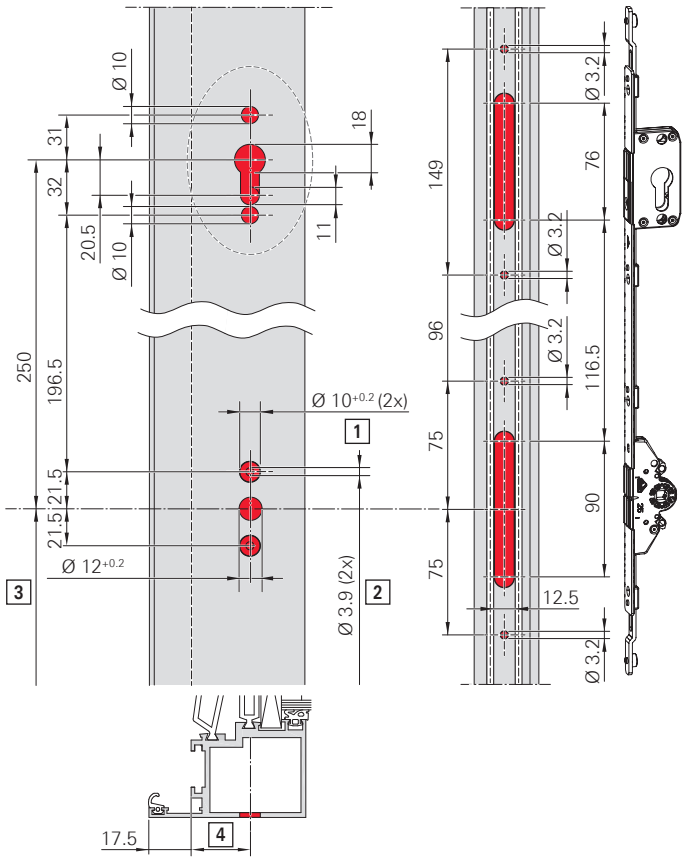
only through the first profile wall

[2] Ø 3.9

only through the second profile wall or additional profile walls

[3] Handle height HH = SH/2 (HH min. 600 mm)

[4] = Backset - 2



Length 525

Drill holes for the handle's sprocket and lugs

[1] Ø 10

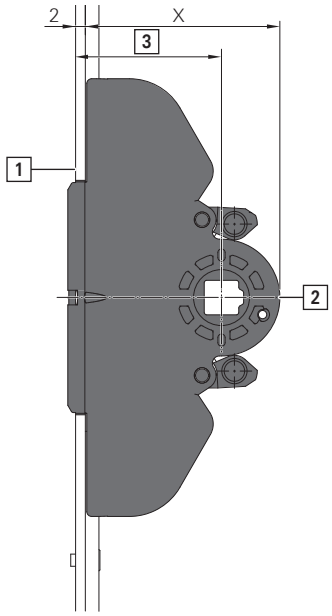
only through the first profile wall

[2] Ø 3.9

only through the second profile wall or additional profile walls

[3] Handle height HH = SH/2 (HH min. 600 mm)

[4] = Backset - 2



Gearbox routing depth

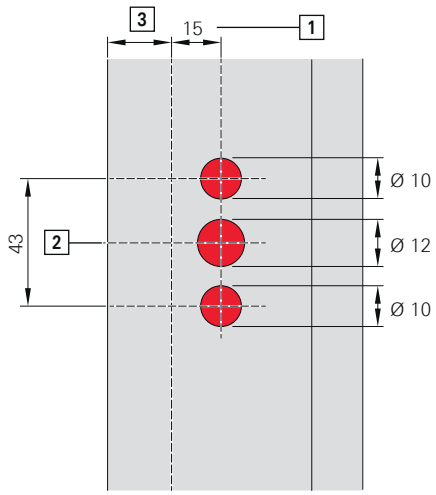
[1] Top edge of floating mullion

[2] Lower edge of espagnolette

[3] Backset

X = min. routing depth

8.3.3 Roto Line



Drill holes for the handle's sprocket and lugs

[1] Backset

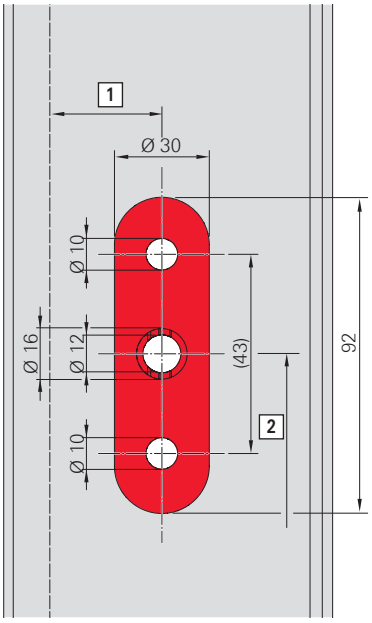
[2] Handle height

[3] Overlap width: 16 to 22 mm

Drill hole Ø 10: drilling depth = overlap height + 16 mm for countersunk screws (ISO 7046-1 M5 x …)

Drill hole Ø 12: drilling depth = overlap height + 16 mm for countersunk screws (ISO 7046-1 M5 x …)

8.3.4 External recessed grip



Recessed grip routing

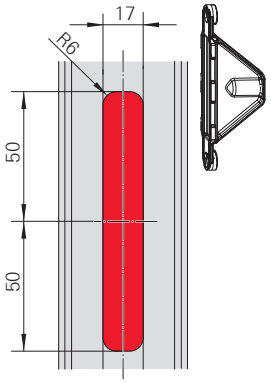
Routing depth = 10 mm

[1] Backset

[2] Handle height

8.3.5 Coupling

Diagram C



Routing for coupling in aluminium strip

INFO
Note the profile system assessment.

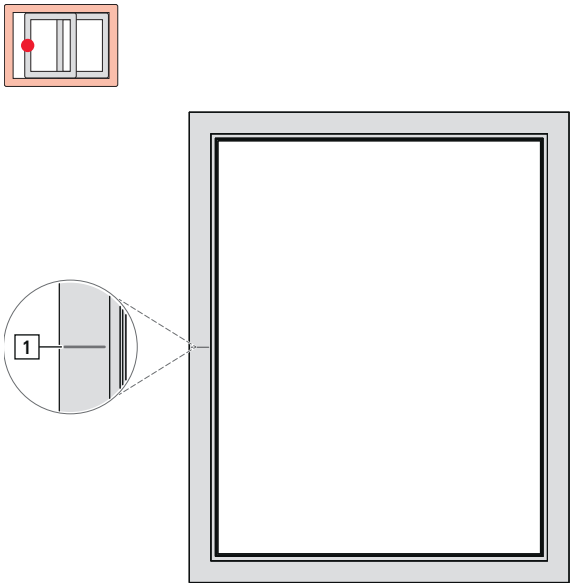
8.4 Sash

8.4.1 Preparing the sash for the flush-encased gearbox

8.4.1.1 Handle drillings

Creating the drillings for the handle

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



2. Create the drillings.
   Note any different drilling dimensions. → *8.3 "Drilling and routing dimensions" from page 65*

3. Deburr the drillings.

8.4.1.2 Gearbox cutout

Routing the gearbox cutout

1. Route the espagnolette cutout.
   Observe the routing dimensions. → *8.3 "Drilling and routing dimensions" from page 65*

2. Deburr the espagnolette cutout.

8.4.1.3 Gearbox cutout with lock casing

Routing the gearbox cutout with lock casing

1. Route the espagnolette cutout.
   Observe the routing dimensions. → *8.3 "Drilling and routing dimensions" from page 65*

2. Deburr the espagnolette cutout.

8.4.2 Preparing the connecting rods

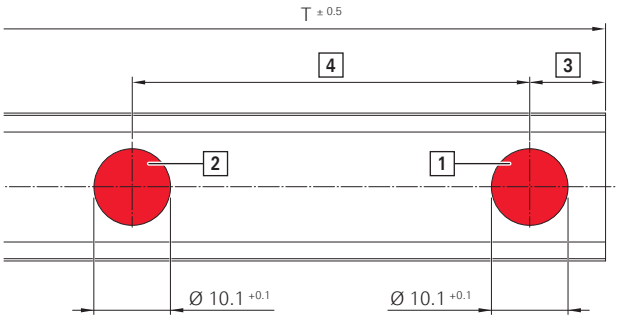
INFO
Comply with the installation sequence for the aluminium sash → *from page 72*.

Cropping

INFO
All connecting rod dimensions CR ±0.5 mm.

1. For the length of the connecting rods, see the installation drawing. → *from page 116*
2. Mark the length on the connecting rods.
3. Crop the connecting rods.

Drilling / punching



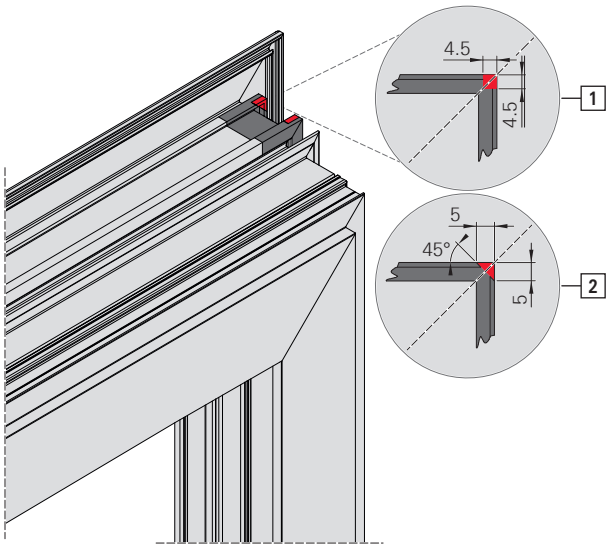
Position	Description
[1]	Drill hole for coupling point
[2]	Drill hole for locking cam / control cam
[3]	Position dimension for coupling point / control cam
[4]	Position dimension for locking cam / control cam

1. For the number and position of the coupling points / locking cams / control cams, see the installation drawing → *from page 116*.
2. Drill / punch holes.

8.4.3 Opening the sash corners

1. Open the connecting rod groove at all sash corners.

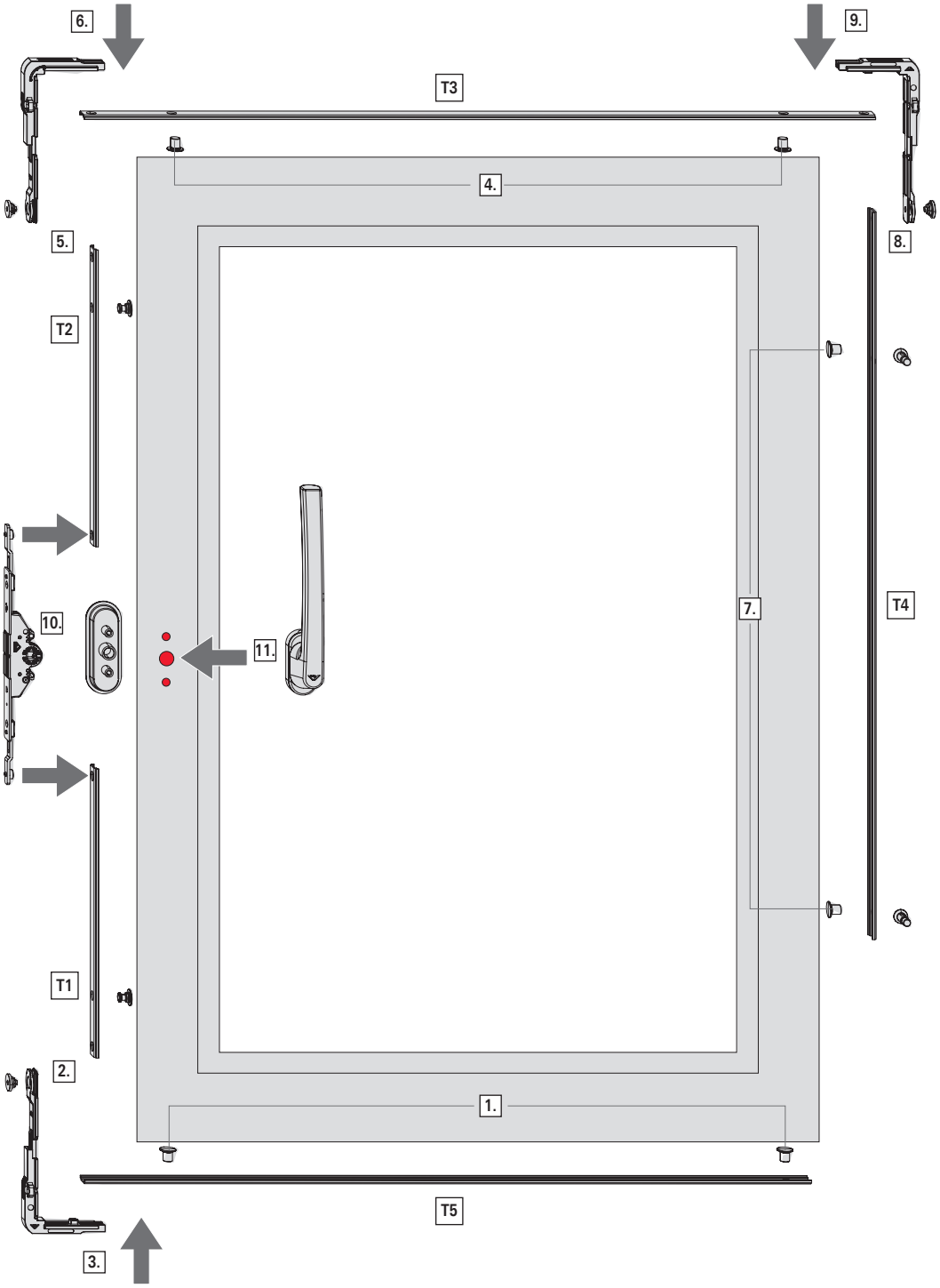
Position	Description
[1]	Connecting rod groove opening
[2]	Alternative connecting rod groove opening



2. Deburr the edges.

8.4.4 Installation sequence

8.4.4.1 Diagram A, A', K, K'



1. Insert the control cam into connecting rod CR5.
   Insert everything jointly into the connecting rod groove at the bottom.

2. Connect the corner drive to connecting rod CR1 and the locking cam at the coupling point → *8.4.5 "Locking and control cams" from page 78*.

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

3. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

4. Insert the control cam into connecting rod CR3.
   Insert everything jointly into the connecting rod groove at the top.

5. Connect the corner drive to connecting rod CR2 and the locking cam at the coupling point → *8.4.5 "Locking and control cams" from page 78*.
   Insert everything jointly into the connecting rod groove from above on the locking side.

6. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

7. Insert the control cam into connecting rod CR4.

8. Connect the corner drive to connecting rod CR4 and the control cam at the coupling point.
   Insert everything jointly into the connecting rod groove at the top on the hinge side.

9. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

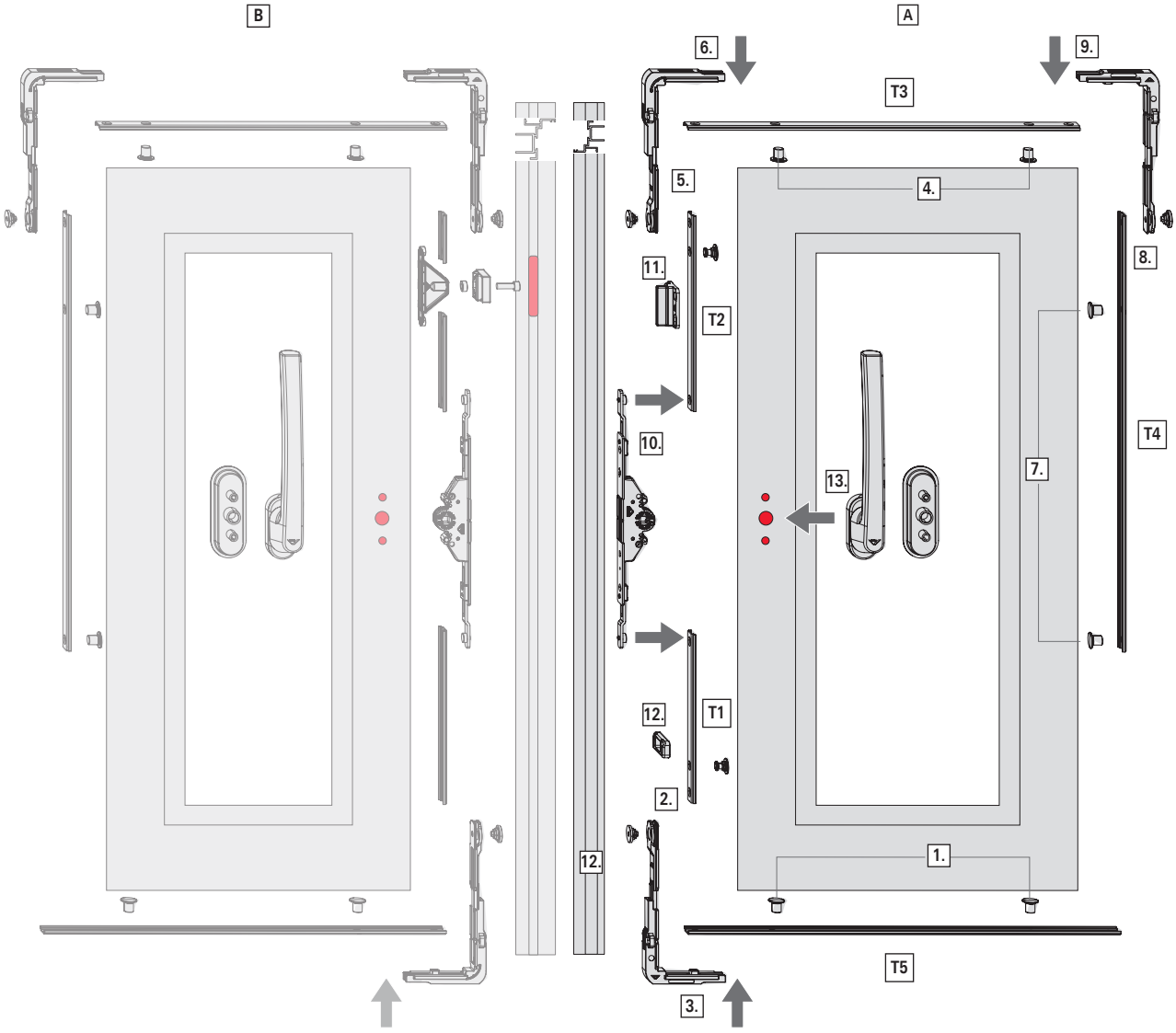
10. Place the flush-encased gearbox on connecting rods CR1 and CR2 on the locking side and connect it to the coupling points.
    Screw down the espagnolette using screws .

11. Install the handle and recessed grip → *8.4.10 "Handle and recessed grip" from page 85*.

INFO
After installation, break the centre fixing on the espagnolette by turning the handle 180°.
Turn the handle to the open sliding position.

8.4.4.2 Diagram C, C'

First opening sash



[A] First opening sash
[B] Second opening sash

1. Insert the control cam into connecting rod CR5.
   Insert everything jointly into the connecting rod groove at the bottom.

2. Connect the corner drive to connecting rod CR1 and the locking cam at the coupling point → *8.4.5 "Locking and control cams" from page 78*.
   Insert everything jointly into the connecting rod groove at the bottom on the locking side.

3. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

4. Insert the control cam into connecting rod CR3.
   Insert everything jointly into the connecting rod groove at the top.

5. Connect the corner drive to connecting rod CR2 and the locking cam at the coupling point. → *8.4.5 "Locking and control cams" from page 78*
   Insert everything jointly into the connecting rod groove from above on the locking side.

6. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

7. Insert the control cam into connecting rod CR4.

8. Connect the corner drive to connecting rod CR4 and the control cam at the coupling point.
   Insert everything jointly into the connecting rod groove at the top on the hinge side.

9. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

10. Place the flush-encased gearbox on connecting rods CR1 and CR2 on the locking side and connect it to the coupling points.
    Screw down the espagnolette using screws .

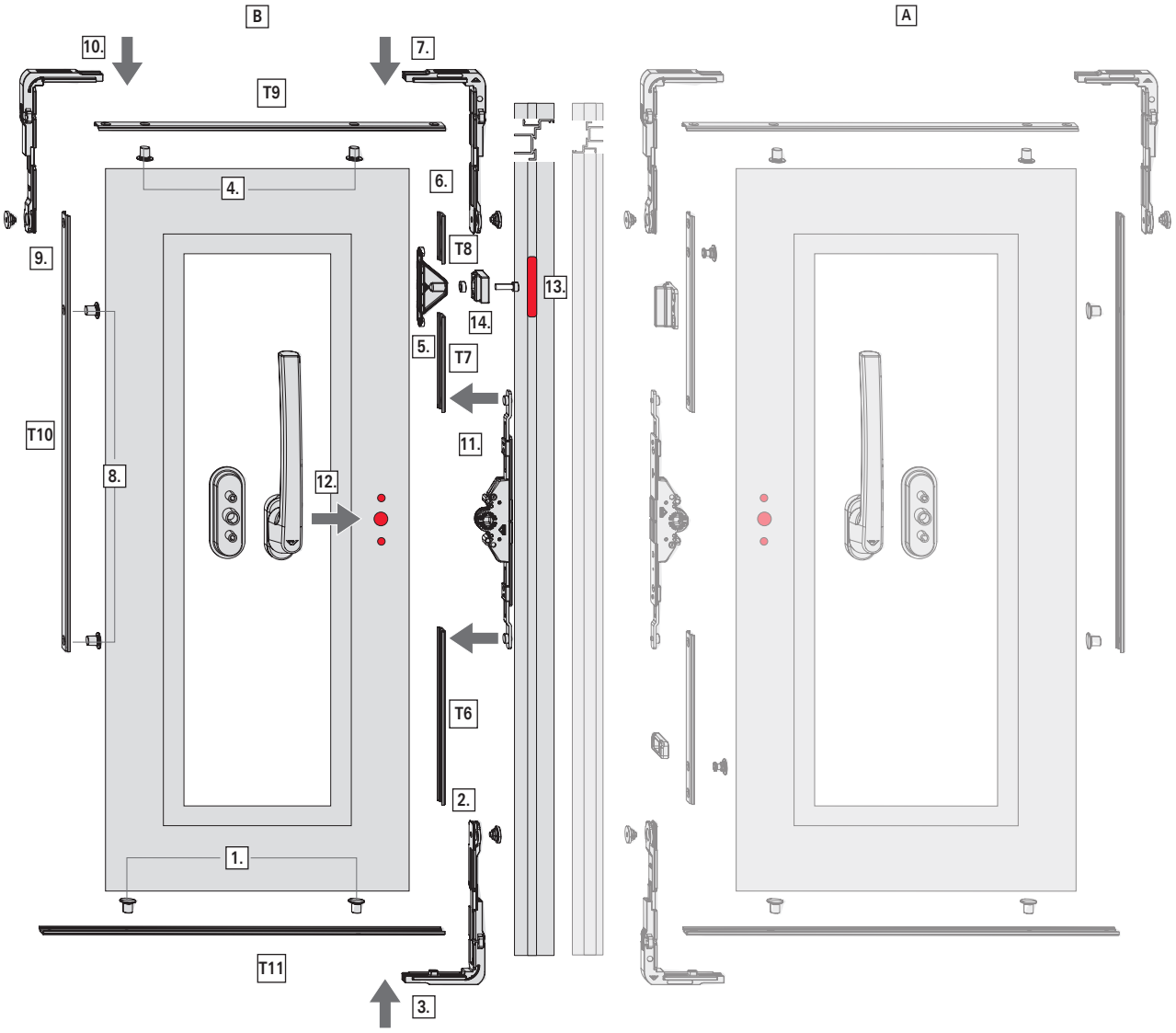
11. Position the stop, first opening sash (see installation drawing).
    Inward running sashes: arrow must point towards the handle.
    Outward running sashes: arrow must point away from the handle.
    Secure with four screws.

12. Position the anti-jemmy device (see installation drawing). The slope must be facing the handle.
    Fasten with two screws.

13. Install the handle and recessed grip → *8.4.10 "Handle and recessed grip" from page 85*.

INFO
After installation, break the centre fixing on the espagnolette by turning the handle 180°.
Turn the handle to the open sliding position.

Second opening sash



[A] First opening sash
[B] Second opening sash

1. Insert the control cam into connecting rod CR11.
   Insert everything jointly into the connecting rod groove at the bottom.

2. Connect the corner drive to connecting rod CR6 at the coupling point.
   Insert everything jointly into the connecting rod groove at the bottom on the locking side.

3. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

4. Insert the control cam into connecting rod CR9.
   Insert everything jointly into the connecting rod groove at the top.

5. Connect the coupling to connecting rods CR7 and CR8 at the coupling point.

6. Connect the corner drive to connecting rod CR8 at the coupling point.

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

7. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

8. Insert the control cam into connecting rod CR10.

9. Connect the corner drive to connecting rod CR10 and the control cam at the coupling point.
   Insert everything jointly into the connecting rod groove at the top on the hinge side.

10. Secure the corner drive to the sash with two screws → *8.4.6 "Reinforced corner drive" from page 79*.

11. Place the flush-encased gearbox on connecting rods CR6 and CR7 on the locking side and connect it at the coupling points.
    Screw down the espagnolette using screws .

12. Install the handle and recessed grip → *8.4.10 "Handle and recessed grip" from page 85*.

INFO
After installation, break the centre fixing on the espagnolette by turning the handle 180°.
Turn the handle to the open sliding position.

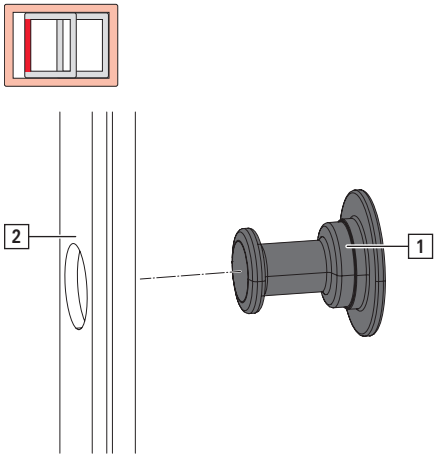
13. Attach the stop, second opening sash to the screw (from the scope of delivery).
    Attach the sleeve to the screw and sink it into the stop, second opening sash.
    Screw onto coupling.

8.4.5 Locking and control cams

Installing the locking cams

⇨ Connecting rods prepared → *from page 70*.

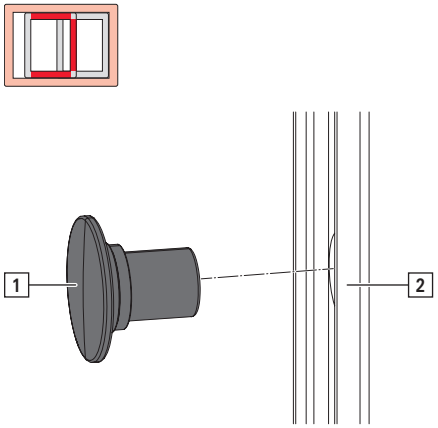
1. Insert the locking cams [1] into the connecting rods [2].



Installing the control cams

⇨ Connecting rods prepared → *from page 70*.

1. Insert the control cams [1] into the connecting rods [2].



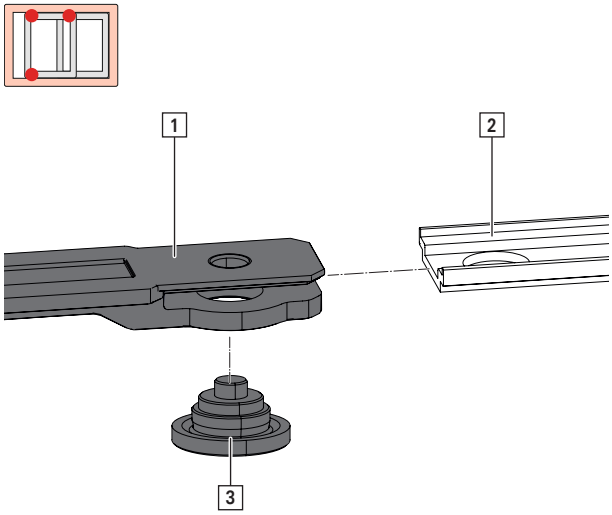
8.4.6 Reinforced corner drive

Installing reinforced corner drives

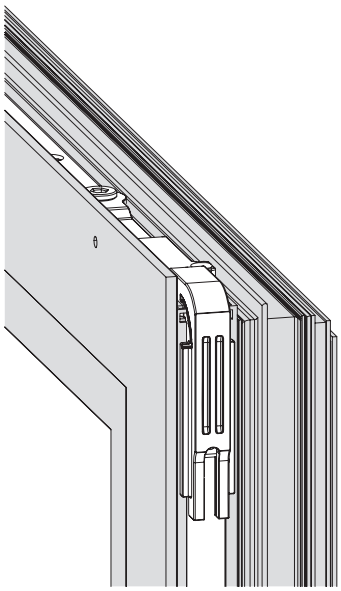
PRECONDITION

- Drill holes created in the handle → *from page 65*
- Espagnolette cutout routed → *from page 65*
- Sash corners opened → *from page 71*
- Connecting rods prepared
- Insertable cams installed → *from page 78*

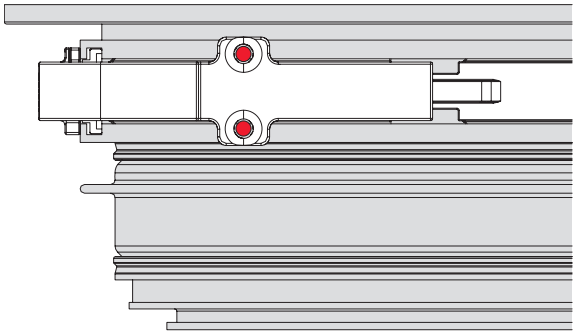
1. Connect the corner drive [1] to the connecting rod [2] and additional components at the coupling point using the special screw [3].



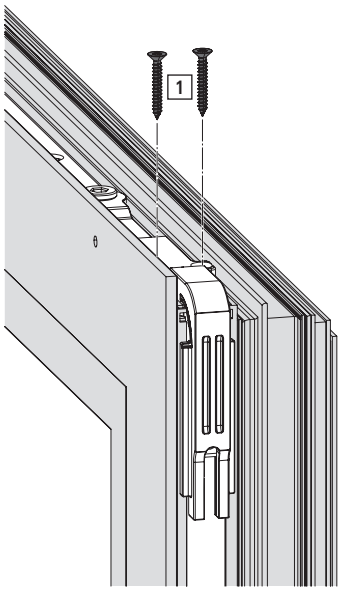
2. Insert everything jointly into the connecting rod groove.



3. Drill holes through the corner drive in the sash using a Ø 3.5 drill.



4. Secure the corner drive to the sash with two screws [1].



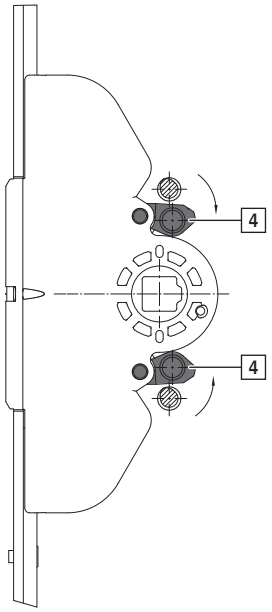
8.4.7 Flush-encased gearbox

Installing the flush-encased gearbox

INFO
Comply with the installation sequence for the aluminium sash → *from page 72*.

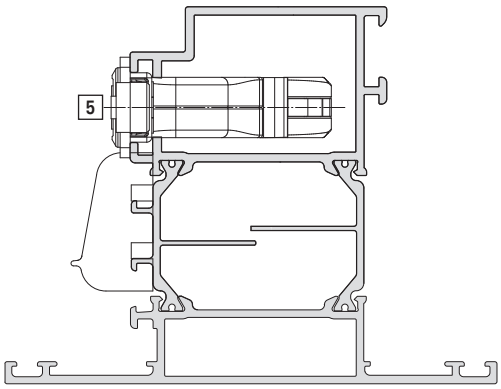
Connecting rods with corner drives are installed.

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



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

3. Screw down the espagnolette using screws [5].



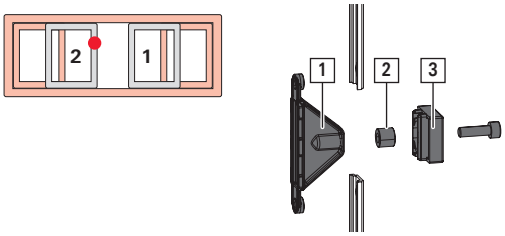
8.4.8 Operating sequence control

For the position of the components, see installation drawing diagram C → *from page 116*

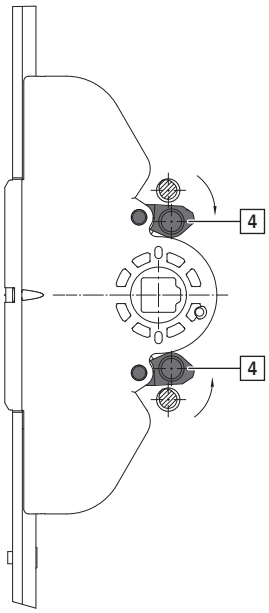
Second opening sash

1. Connect the reinforced corner drive to connecting rod CR8 at the coupling point .

2. Connect the coupling [1] to connecting rods CR7 and CR8. Insert the sleeve [2] into stop of the second opening sash [3] and screw to the coupling with a cylinder screw.



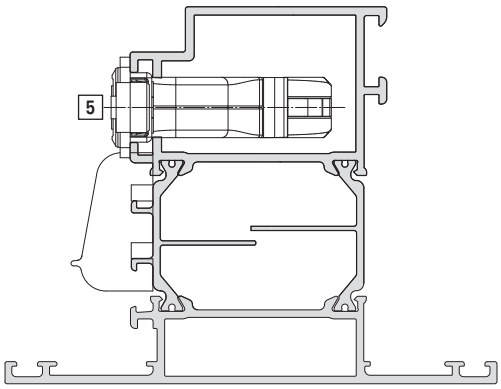
3. Swivel the threaded eyes [4] on the flush-encased gearbox inwards.



4. Place the flush-encased gearbox on connecting rods CR6 and CR7 on the locking side and connect it at the coupling points.

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

6. Screw the espagnolette to the floating mullion using screws [5].



First opening sash

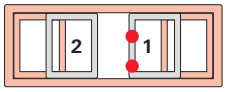
⇨ Strikers installed in the floating mullion.

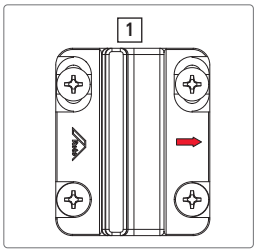
1. Push the first opening sash shut until the lower edge [A] of the stop for the second opening sash can be transferred to the first opening sash.

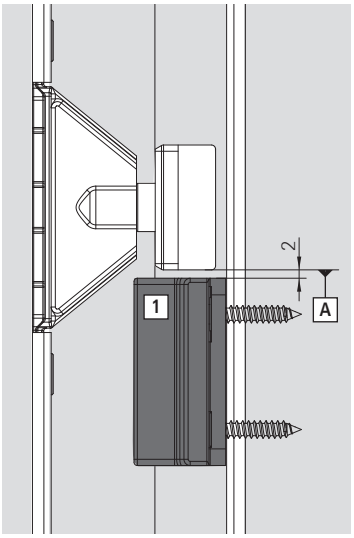
   Open the first opening sash again and position the stop for the first opening sash [1] on the first opening sash, at an offset of 2 mm from the lower edge of the stop for the second opening sash. While doing so, ensure that the arrow is pointing inwards. Secure with four screws.

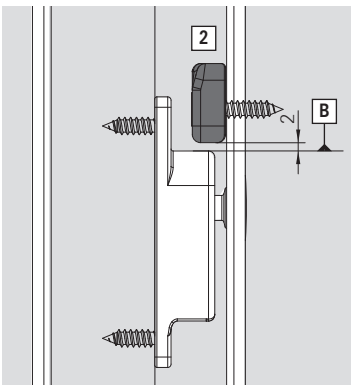
   Push the first opening sash shut until the top edge [B] of the first striker at the bottom can be transferred to the second opening sash.

   Open the first opening sash again and secure the anti-lifting device [2] to the second opening sash with two screws, at an offset of 2 mm from the top edge of the striker.



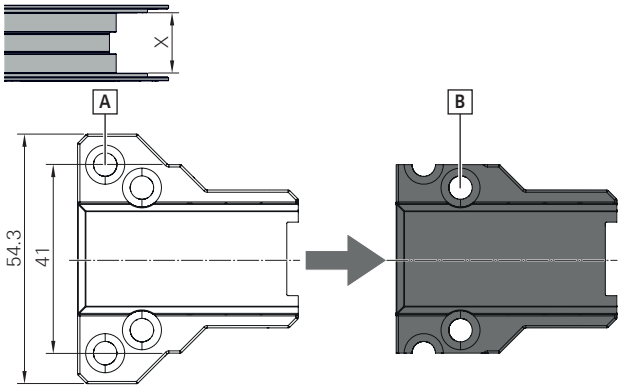






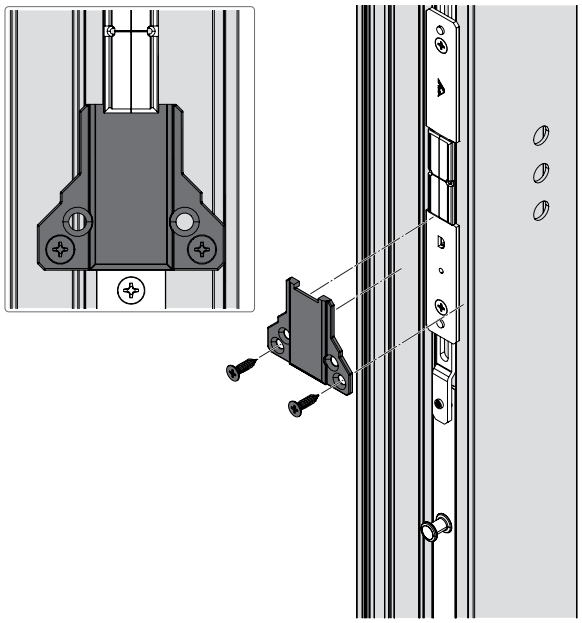
8.4.9 Flush-encased gearbox fixing

1. For sash profiles where X < 55 mm, crop the fixing to make it 41 mm wide.



[A] Drill holes where X ≥ 55 mm
[B] Drill holes where X < 55 mm

2. Place the fixing in the centre, above the gearbox of the flush-encased gearbox and position it so that the recess is on the gearbox.
   Fasten with two screws.

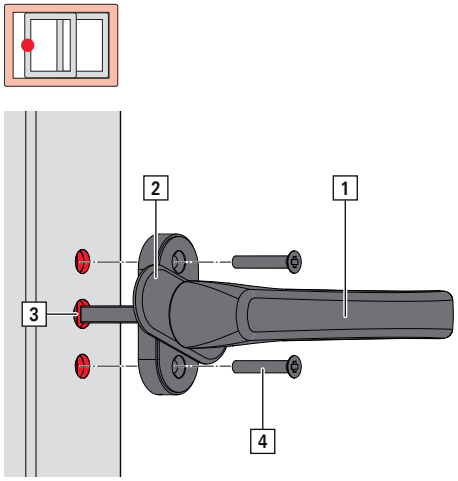


8.4.10 Handle and recessed grip

Installing the handle and recessed grip

1. Move the handle [1] to the 90° position → *11.1.1 "Roto Patio Inowa" from page 129*.

2. Turn the escutcheon cover [2] in order to expose the screw holes.



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

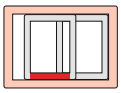
4. Insert the recessed grip into the sash on the opposite side.

5. Screw the recessed grip through the handle with two screws [4].

6. Turn the escutcheon cover in order to expose the screw holes.

8.4.11 Roller unit

Positioning the drilling jig



ATTENTION

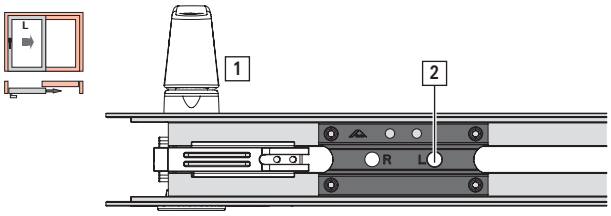
Improper drilling work may cause property damage.

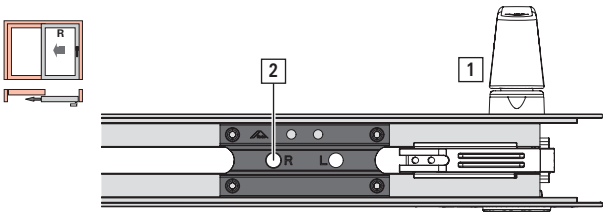
An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

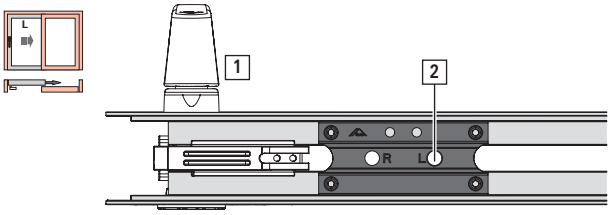
- The handle must be in the open sliding position [1].

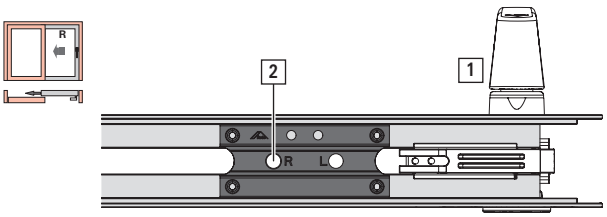
Attach the drilling jig to the control cam [2].

Refer to the installation drawing for the position → *from page 116*.



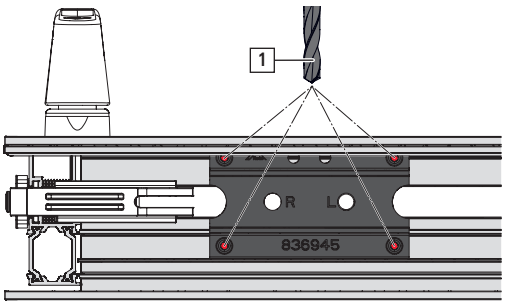




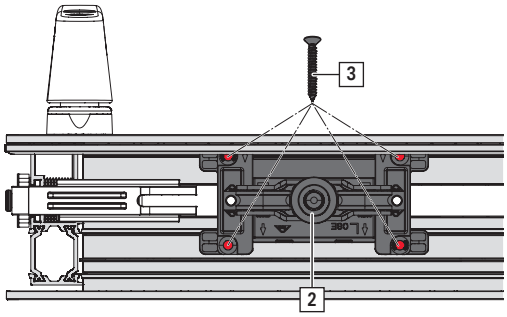


Installing roller units

1. Drill the holes [1].
   Drill: Ø 3.5
   Shown: diagram A, DIN L

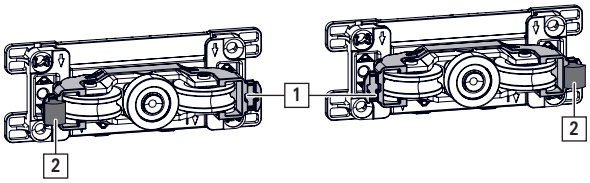


2. Insert the roller unit [2] and secure with screws [3].



Fitting the brush holder

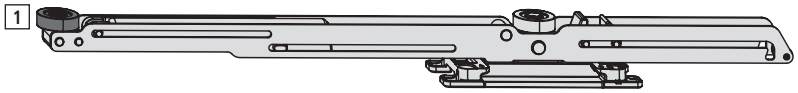
1. Attach the brush holder [1] on the roller unit, making sure to pay attention to the opposite alignment of the brushes [2].



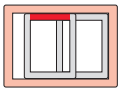
8.4.12 Control unit

INFO

For control units with Soft function, ensure that the additional control roller [1] is facing towards the centre of the sash when installed .



Positioning the drilling jig



ATTENTION

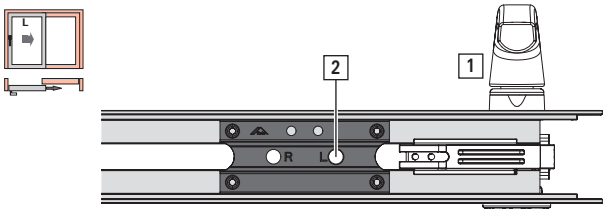
Improper drilling work may cause property damage.

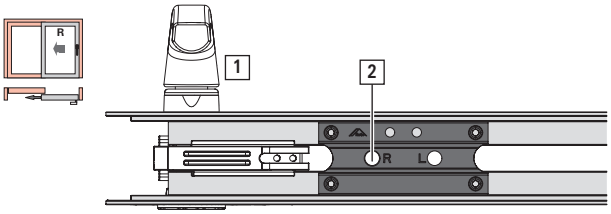
An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

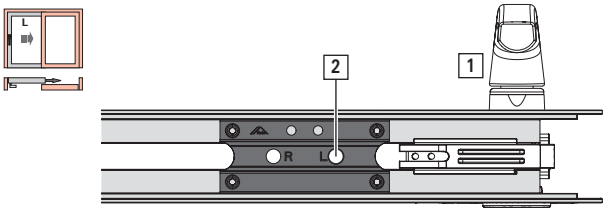
- The handle must be in the open sliding position [1].

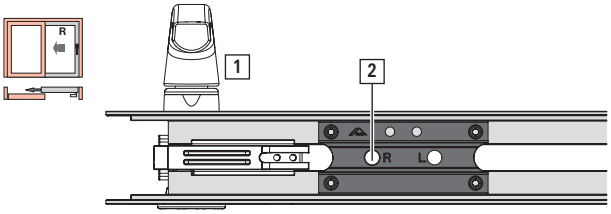
Attach the drilling jig to the control cam [2].

Refer to the installation drawing for the position → *from page 116*.



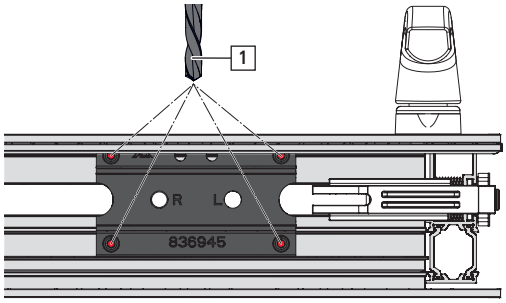




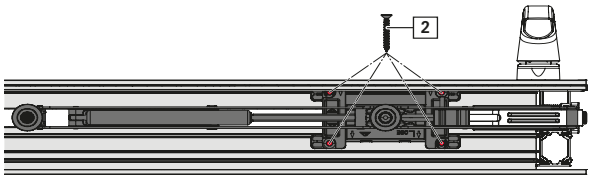


Installing the control unit

1. Drill the holes [1].
   Drill: Ø 3.5
   Shown: diagram A, DIN L



2. Insert the control unit and secure with screws [2].



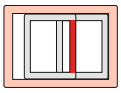
8.4.13 Centre closer

INFO

Drilling with a drilling jig with Ø 14.0 is mandatory for the centre closer, adjustable.

Figures: installation of the non-adjustable version.

Positioning the drilling jig



ATTENTION

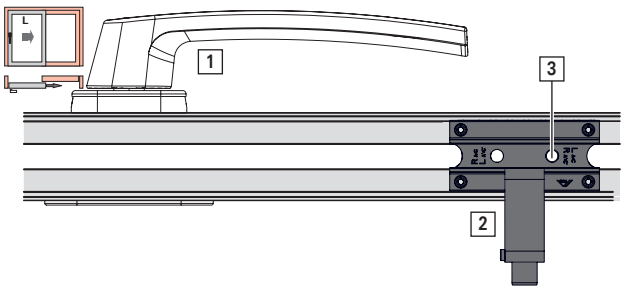
Improper drilling work may cause property damage.

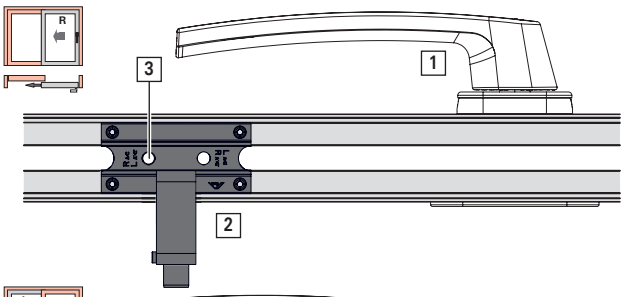
An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

- The handle must be in the open sliding position [1].
- **Inward running sashes**: position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [2] is **facing away** from the handle.
- **Outward running sashes**: position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [2] is **facing** the handle.

Attach the drilling jig to the control cam [3].

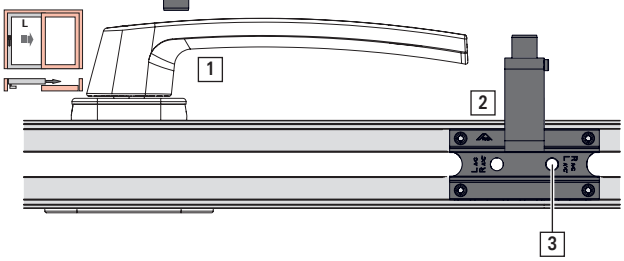
Refer to the installation drawing for the position → *from page 116*.

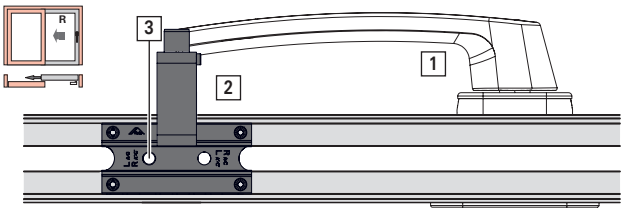




INFO

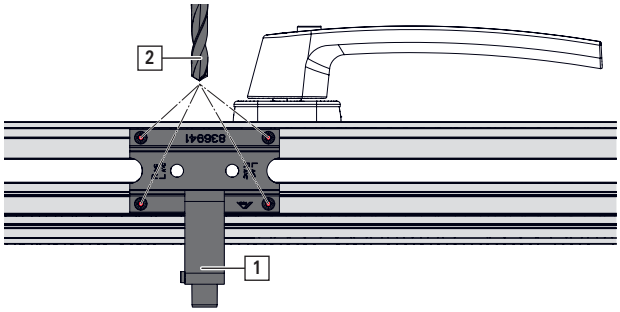
For both RC 2 and diagram C, drill the holes for the centre closers for anti-pushback function → *from page 92*.



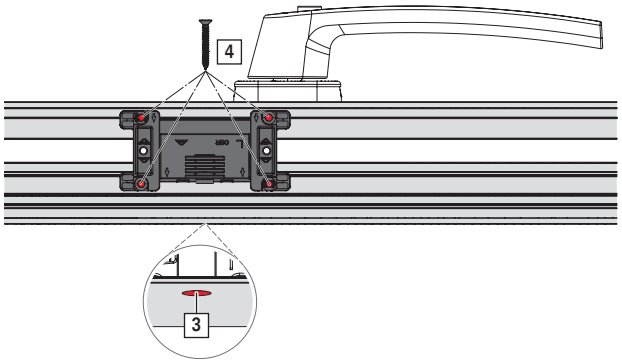


Installing centre closers

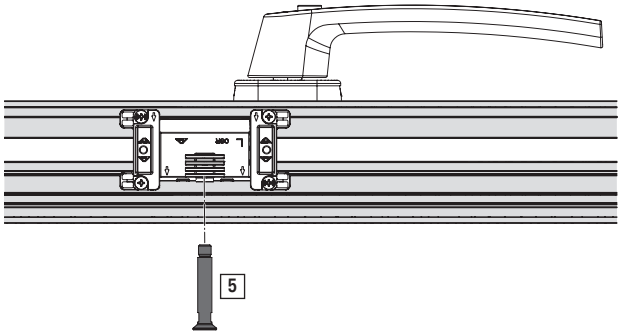
1. Drill holes.
   Drill [1]: Ø 12.0 / 14.0
   Drill [2]: Ø 3.5
   Shown: diagram A, DIN L



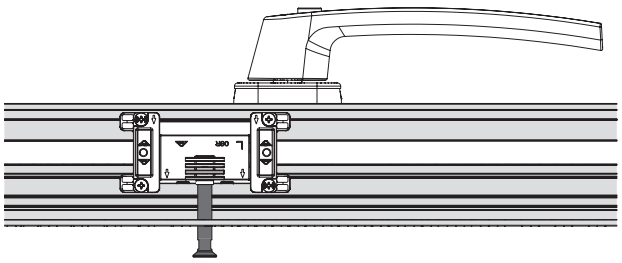
2. Insert the centre closer so that the MUL locking cam mount is facing the drill hole [3] on the outer side of the sash.
   Secure with four screws [4].



3. Insert the MUL locking cam [5] into the cam guide.



4. Screw down the MUL locking cam.
   Tool: size 8 open-end spanner / size 4 hex key



INFO
Tighten the MUL locking cam hand-tight.

8.4.14 Centre closer for anti-pushback function

INFO

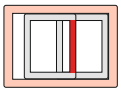
Diagram A / C: install right components for DIN L; install left components for DIN R.

Diagram A' / C': install left components for DIN L; install right components for DIN R.

Drilling with a drilling jig with Ø 14.0 is mandatory for the centre closer, adjustable.

Figures: installation of the non-adjustable version.

Positioning the drilling jig

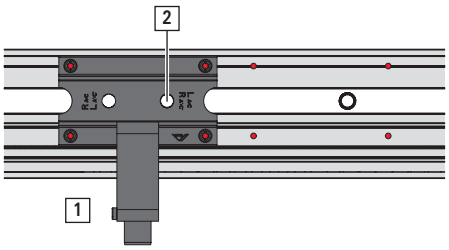


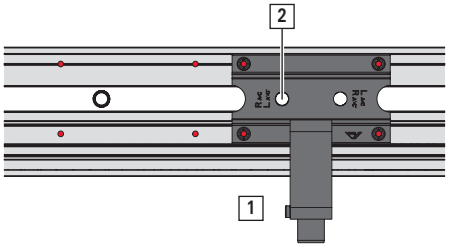
ATTENTION

Improper drilling work may cause property damage.

An incorrect handle position and incorrect alignment of the drilling jig damage the sash during drilling.

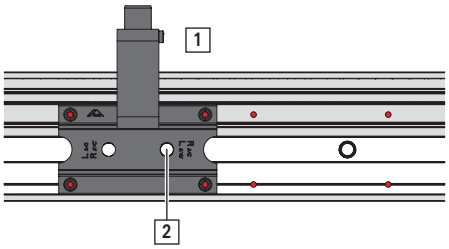
- The handle must be in the open sliding position.
- **Inward running sashes**: position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [1] is **facing away** from the handle.
- **Outward running sashes**: position the drilling jig so that the side with the Ø 12.0 / 14.0 drill hole [1] is **facing** the handle.

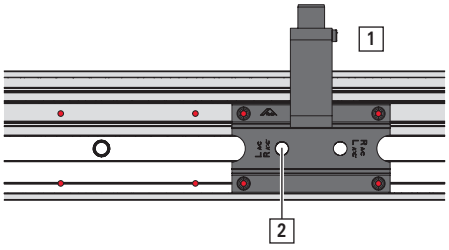




Attach the drilling jig to the control cam [2].

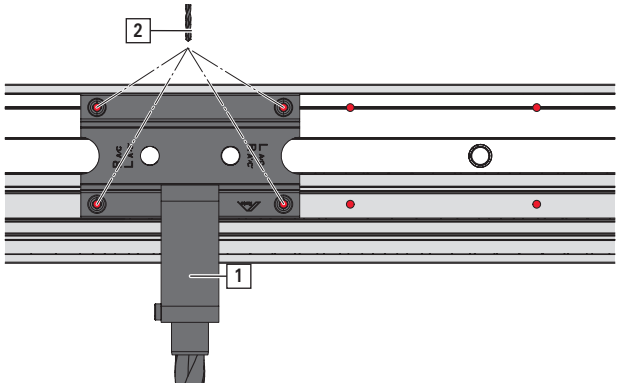
Refer to the installation drawing RC or diagram C for the position → *from page 116*.



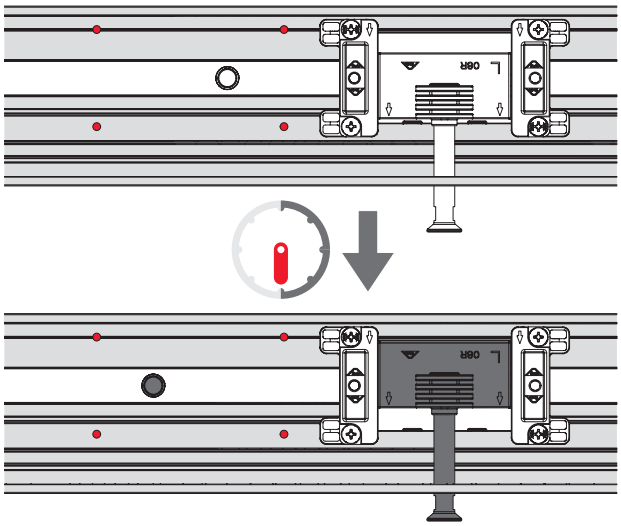


Installing the centre closer for anti-pushback function

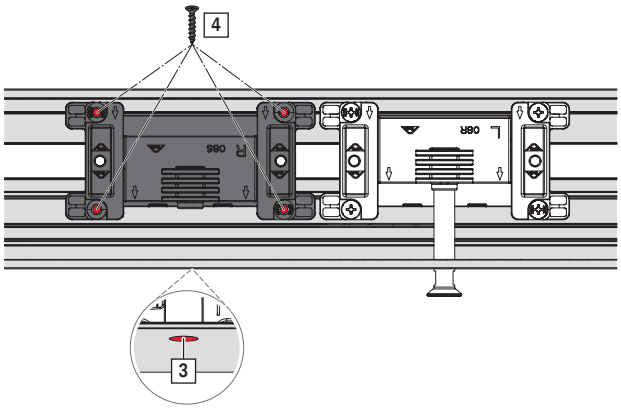
1. Drill holes.
   Drill [1]: Ø 12.0 / 14.0
   Drill [2]: Ø 3.5
   Shown: diagram A, DIN L



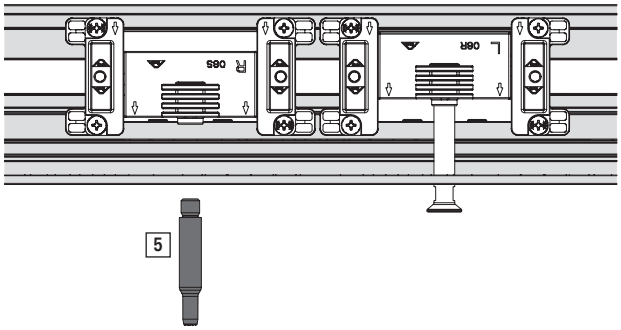
2. Install the centre closer → *from page 90*.
   Move the handle to the closed position.



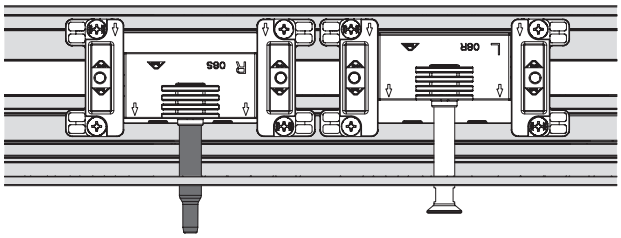
3. Insert the centre closer so that the MUL locking cam mount is facing the drill hole [3] on the outer side of the sash.
   Secure with four screws [4].



4. Insert the pin for anti-pushback function [5] into the cam guide.



5. Secure the pin for anti-pushback function.
   Tool: size 3 hex key.



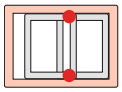
INFO
Tighten the pin for anti-pushback function hand-tight.

8.4.15 Rubber buffer

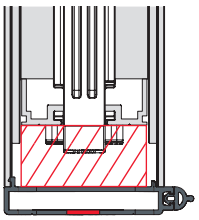
Alternatively: install the rubber buffer in the frame .

Installing rubber buffers

1. Install the profile-specific cover on the mullion. Ensure that the guide track and roller track are running smoothly.

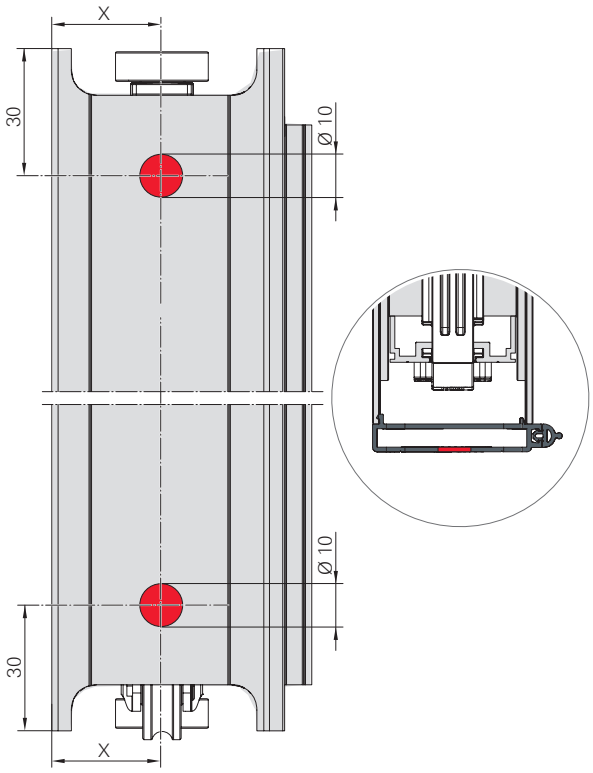


INFO
Place pressure-proof packers underneath the cover at the top and bottom in the hatched area for installing the rubber buffers. Ensure that the cam on the corner drive is running smoothly.

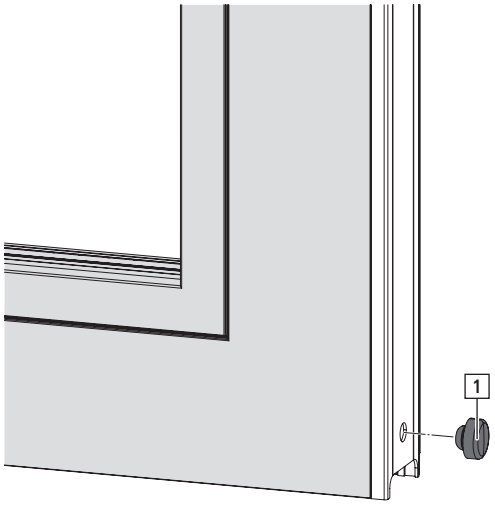


2. Drill two holes Ø 10 mm for rubber buffers at the top and bottom of the cover.

INFO
The dimensions X for the drill hole position depend on the profile.



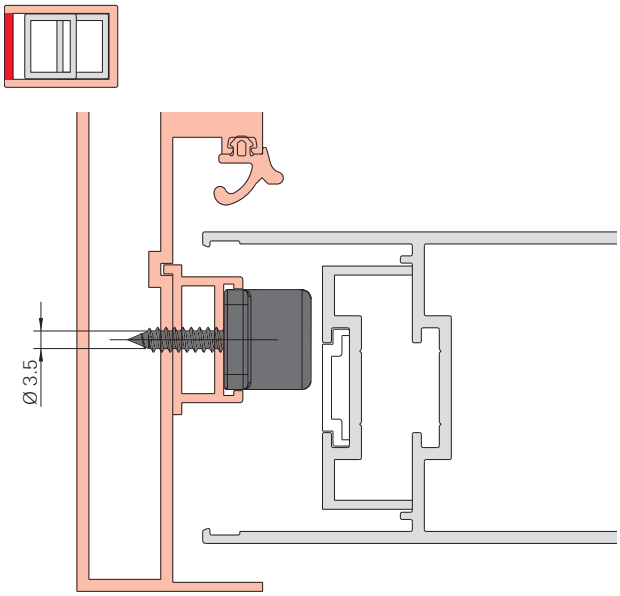
3. Insert the rubber buffer [1].



8.5 Frame

8.5.1 Strikers

1. For the position of the strikers, see the installation drawing → *from page 116*. Alternatively: with marking jig.
   Drill holes.
   Drill: 2 x Ø 3.5



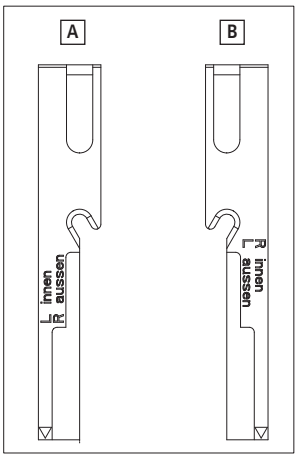
2. Fasten the striker with two screws.

Positioning with marking jig

⇨ Join the sash and frame.

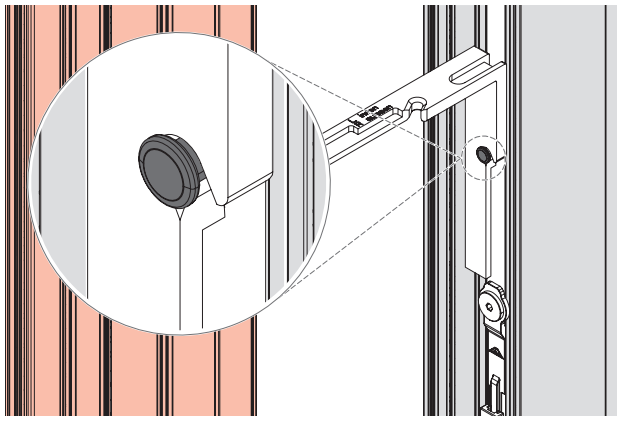
1. Move the handle to the open sliding position.

2. Fit the marking jig on the locking cam, aligned depending on the design variant.



[A] For inward running DIN L and outward running DIN R
[B] For inward running DIN R and outward running DIN L

3. Push the sash shut until the jig is resting on the frame.
4. Transfer the edge marked with the arrow to the frame.
5. Position the striker with its top edge at the marking.



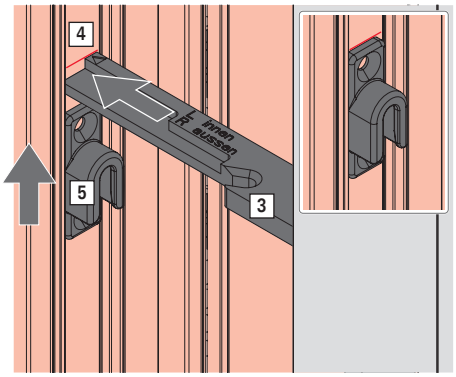
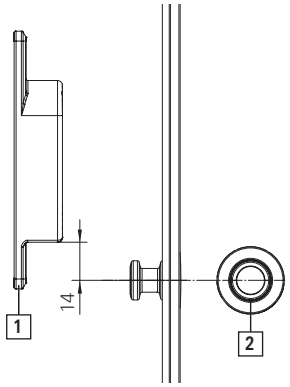


Figure: inward running DIN R

8.5.2 Striker to prevent incorrect operation

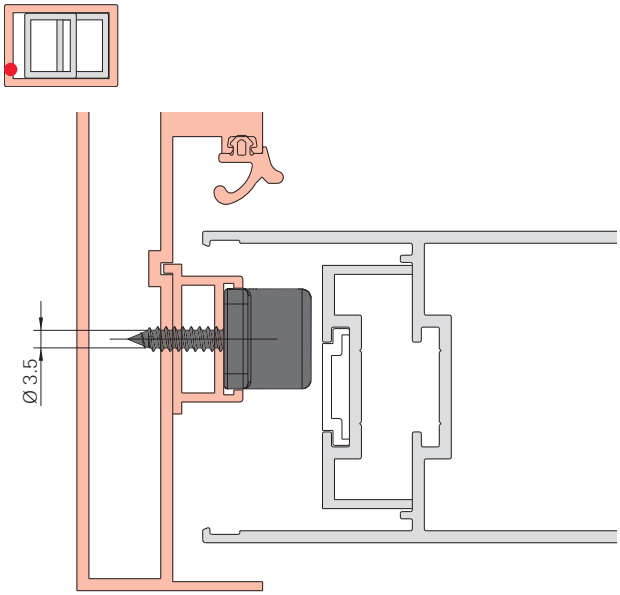
8.5.2.1 Drilling the holes for the striker to prevent incorrect operation

Dimensional drawing in open sliding position



[1] Striker to prevent incorrect operation
[2] Locking cam

1. For the position of the striker to prevent incorrect operation, see the installation drawing.
   Drill holes.
   Drill: 2 x Ø 3.5

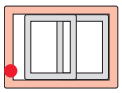


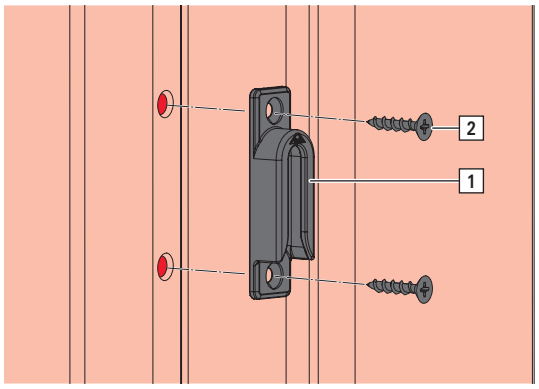
8.5.2.2 Installing the striker to prevent incorrect operation

1. Secure the striker to prevent incorrect operation [1] with two screws [2].

INFO

Note the drilling specifications → *8.5.2.1 "Drilling the holes for the striker to prevent incorrect operation" from page 98*.





8.6 Joining the sash and frame

CAUTION

Heavy loads pose a risk of injury.

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

- Transport and installation must be carried out by at least two people.
- Use transportation means. → *14 "Transport" from page 137*
- Note the applicable accident prevention regulations.

ATTENTION

Heavy loads may cause property damage.

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

- Transport and installation must be carried out by at least two people.
- Use transportation means. → *14 "Transport" from page 137*
- Do not rest sashes on the bogies.

8.6.1 Inserting the sash

WARNING

An unsecured sash may pose a risk of death!

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

- ▶ Secure the sash to prevent it from falling, e.g. by using two people.

INFO

- Pay attention to the system-specific profile assessment.
- Seal the guide track properly under your own responsibility. Prevent water from entering underneath the guide track.
- Ensure that the guide track is securely attached.

  Adhere to a screw spacing of max. 300 mm.

Version with split guide track, inserting the sash at the bottom

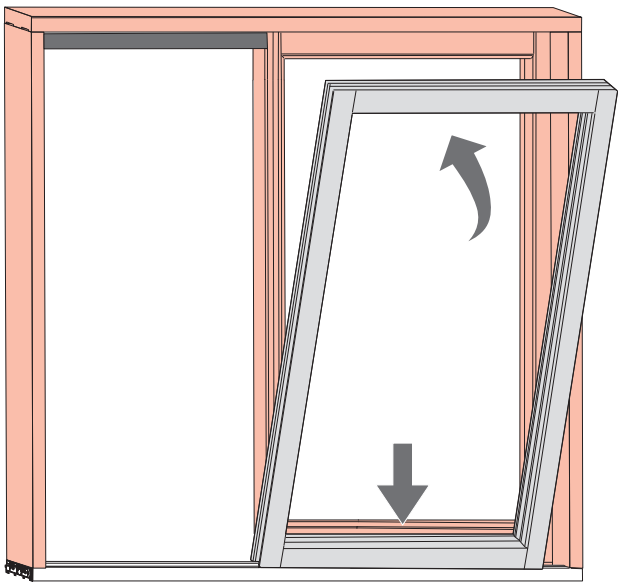
The guide track is installed in the access area.

The guide track for the fixed glazing area is prepared .

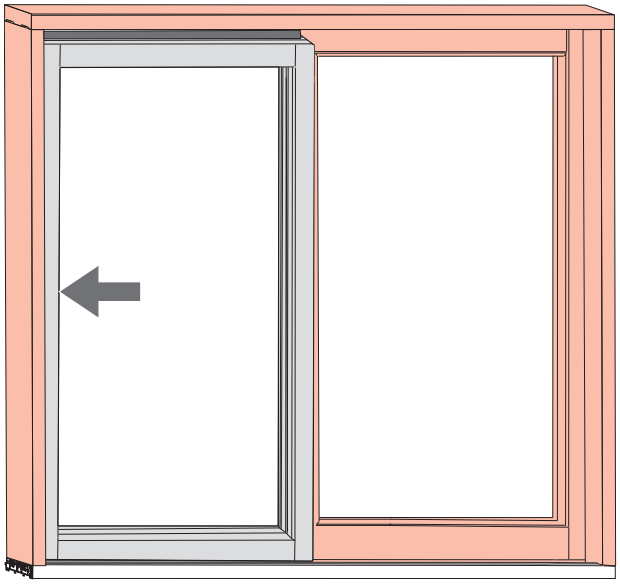
1. Move the handle to the open sliding position

.

2. In front of the fixed glazing area, insert the sash at the bottom of the frame until the roller unit is positioned vertically on the roller track.

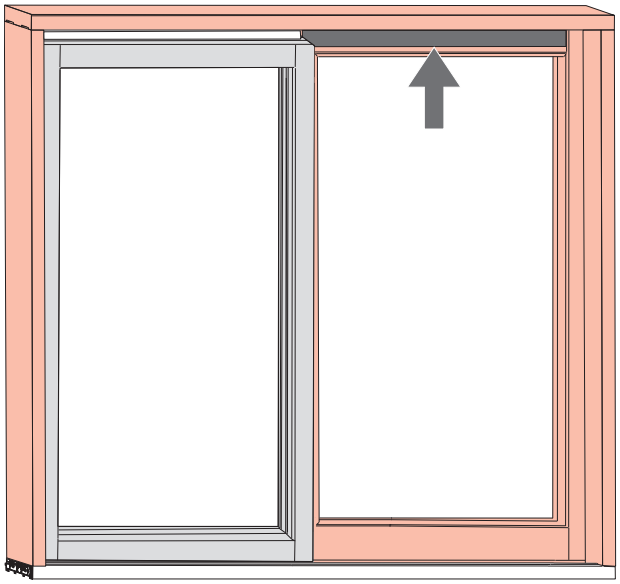


3. Push the sash onto the roller track in front of the access area in a controlled manner until all control units are located in the guide track that is already installed.



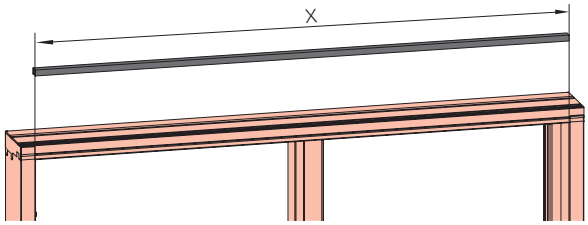
4. Move the handle to the closed position .

5. Insert the prepared guide track into the frame in the fixed glazing area and secure with screws (screws spaced max. 300 mm apart).



Version with continuous guide track, inserting the sash at the bottom

1. Cut the guide track to size.

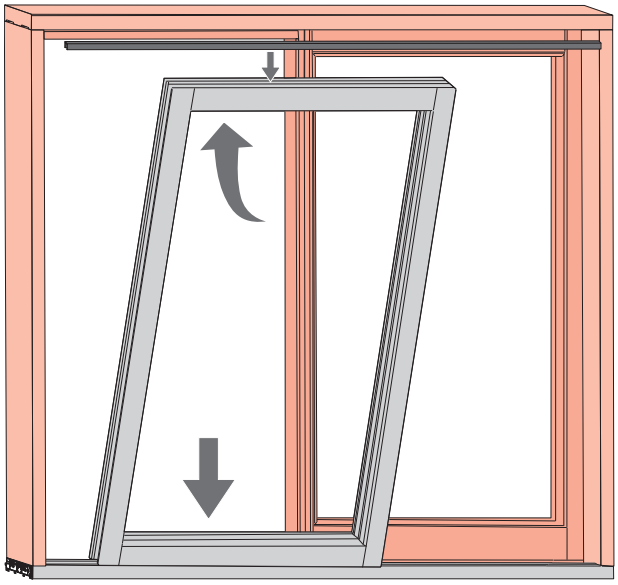


2. Move the handle to the open sliding position

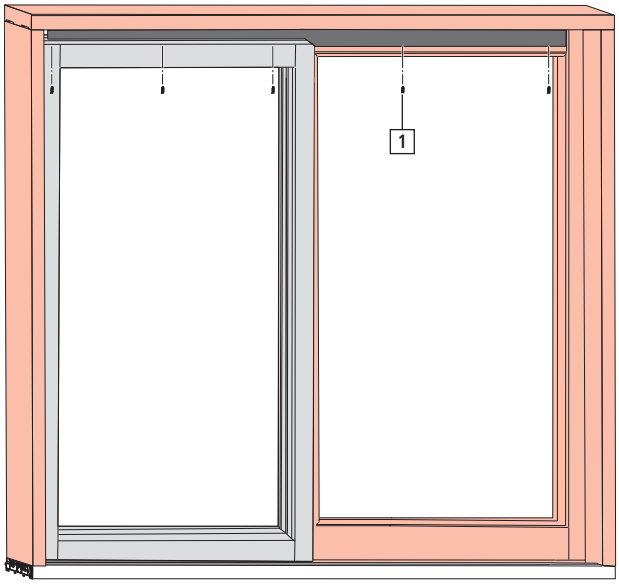
3. In front of the access area, insert the sash at the bottom of the frame until the roller unit is positioned vertically on the roller track.

   Position the guide track on the control units at the top.

   Tilt the sash with guide track fitted inwards in a controlled manner at the top until the guide track can be installed in the frame groove provided.

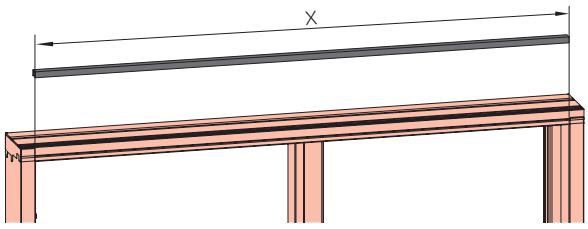


4. Secure the guide track with screws [1] (screws spaced max. 300 mm apart).



Version with continuous guide track, inserting the sash at the top

1. Cut the guide track to size.



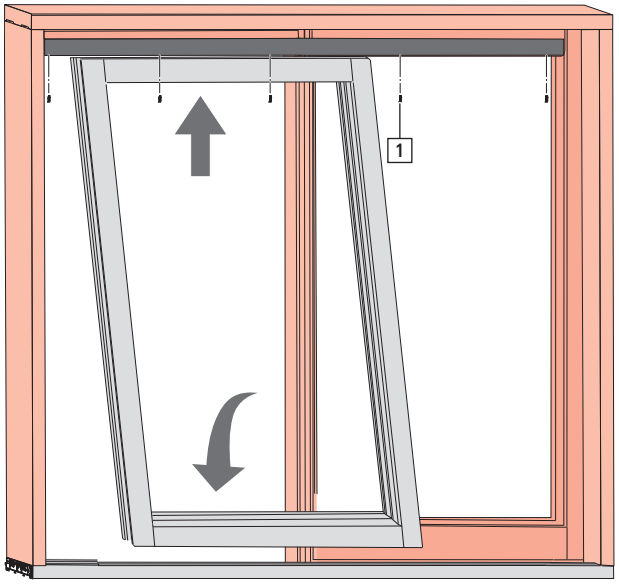
2. Secure the guide track with screws [1] (screws spaced max. 300 mm apart).

   Move the handle to the open sliding position

   .

   In front of the access area, insert the sash at the top of the frame until the control units engage in the guide track.

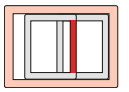


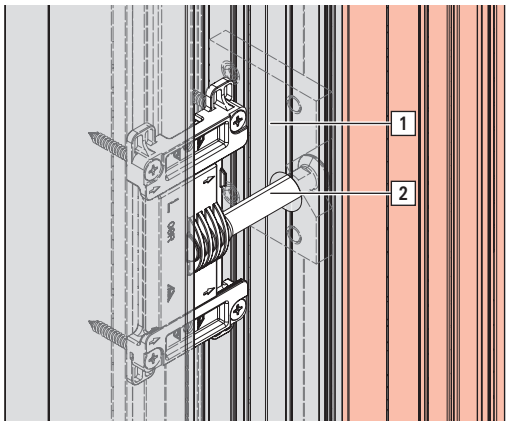
3. Tilt the sash inwards in a controlled manner at the bottom until the roller unit is positioned vertically on the roller track.

8.6.2 MUL striker

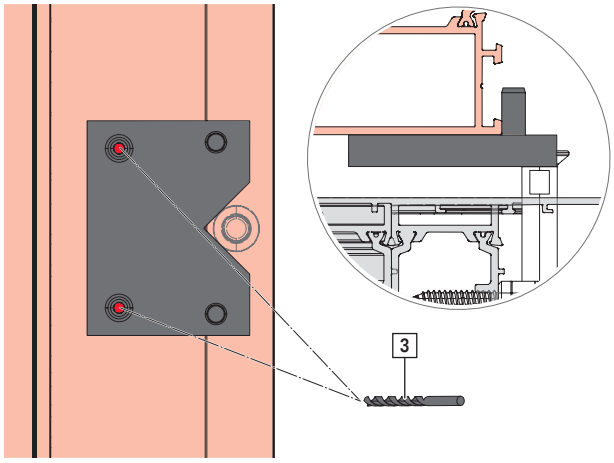
8.6.2.1 Drilling the holes for the MUL striker

1. Place the drilling jig for MUL striker [1] flush against the frame profile at the height of the locking cam [2]. Mark the position of the drilling jig.



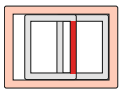


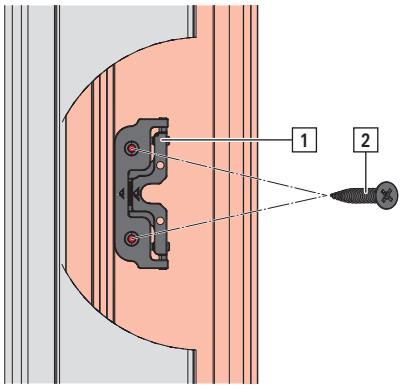
2. Drill the holes [3].
   Drill: Ø 3.5



8.6.2.2 Installing the MUL striker

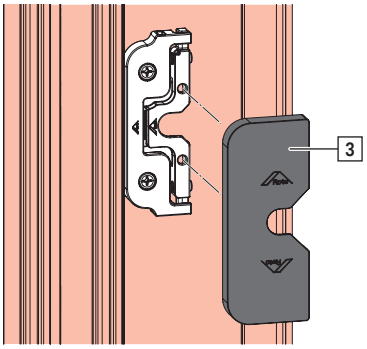
1. Secure the MUL striker [1] with two screws [2].





> **INFO**
> Note the drilling specifications → *8.6.2.1 "Drilling the holes for the MUL striker" from page 104*.

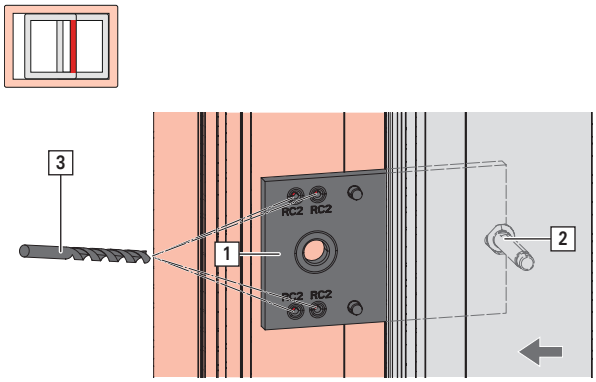
2. Clip the cover cap [3] onto the MUL striker.



8.6.3 SEC MUL striker

Drilling the holes for the SEC MUL striker

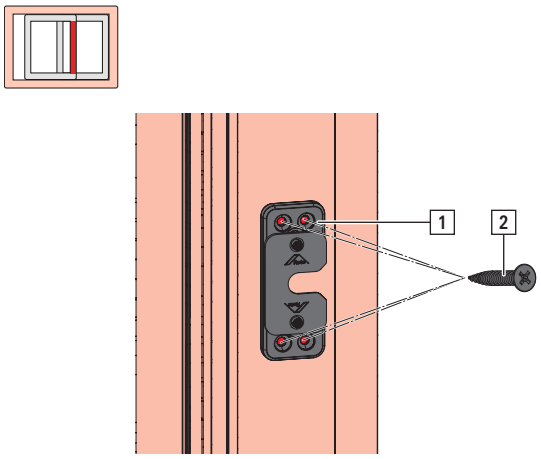
1. Place the drilling jig for SEC MUL striker [1] flush against the frame profile at the height of the locking cam [2]. Mark the position of the drilling jig. For better guidance, move the sash with locking cam fitted in the direction of the arrow.
   Drill the holes [3].
   Drill: 4 x Ø 3.5



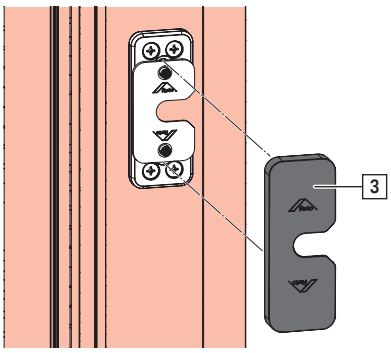
Installing the SEC MUL striker

1. Secure the SEC MUL striker [1] with four screws [2].

INFO
Note the drilling specifications → *from page 105*.



2. Clip the cover cap [3] onto the SEC MUL striker.



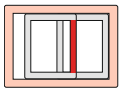
8.6.4 Striker for anti-pushback function

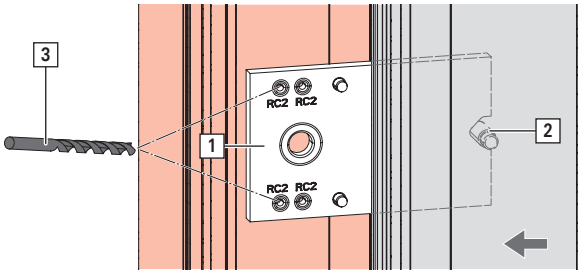
Installing the striker for anti-pushback function

1. Place the drilling jig for striker for anti-pushback function [1] flush against the frame profile at the height of the pin [2]. For better guidance, move the sash with pin fitted in the direction of the arrow.

   Drill the holes [3].

   Drill: Ø 3.5 mm

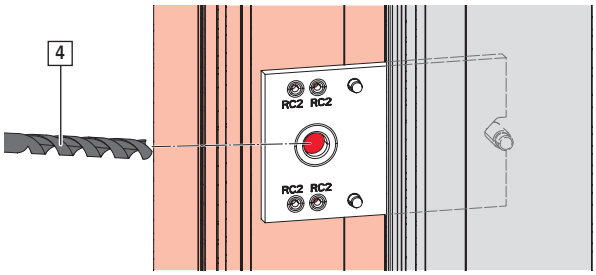




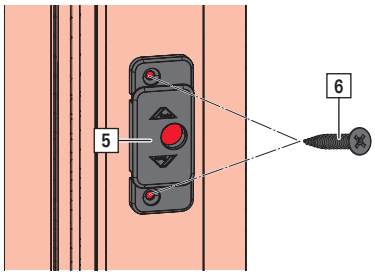
2. Drill the hole [4].

   Drill: Ø 12.5 mm

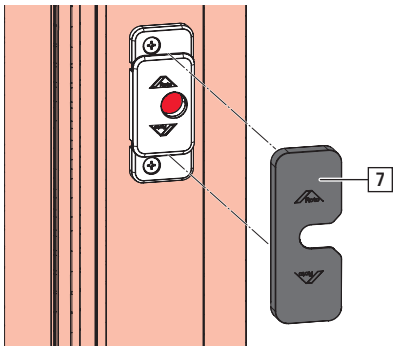
> **INFO**
> Refer to the system-specific profile assessment for the drilling depth.



3. Secure the striker for anti-pushback function [5] with two screws [6].



4. Clip the cover cap [7] onto the striker for anti-pushback function.



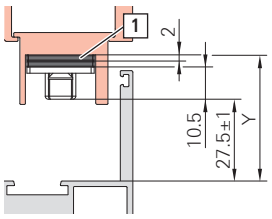
8.6.5 Activator and packer

⇨ The control unit with soft function comes assembled in its delivery state (= untensioned).

⇨ The element is glazed.

8.6.5.1 Determining the quantity of packers

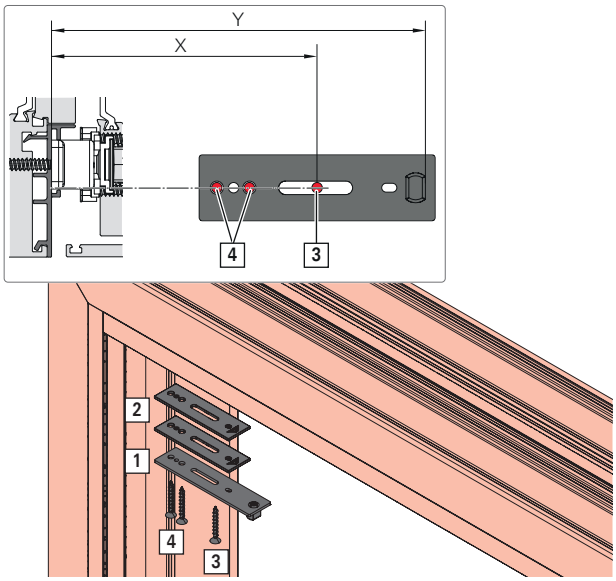
1. Calculate or refer to the profile assessment for the quantity of packers required [1].
   Quantity of packers = (Y-38)/2
   Maintain a distance of 27.5±1 mm between the highest point of the activator [2] and the control unit supporting surface.



8.6.5.2 Diagram A

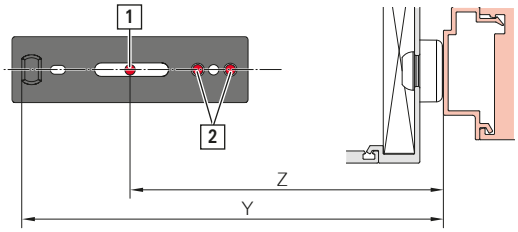
Installing the activator with / without packer(s) on the espagnolette side

1. Connect the packers to the activator using locating aids. Ensure that the slots are aligned.
   Predrill a hole for the screw [3] (for dimension X, see the profile assessment). Slightly tighten the activator with one screw to position it (for dimension Y, see the profile assessment) so that the activator can still be moved.
   Close the sash slowly and open it again to move the activator into the installation position.
   Predrill the holes for screws [4].
   Secure the activator with three screws.



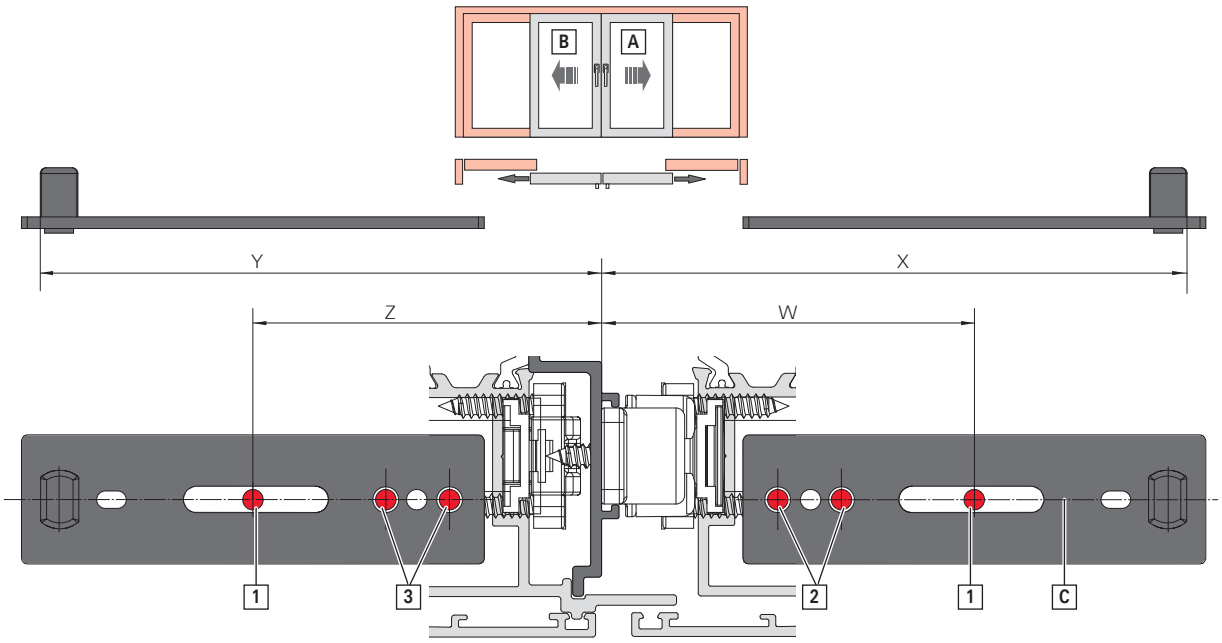
Installing the activator with / without packer(s) on the mullion side

1. Connect the packers to the activator using locating aids. Ensure that the slots are aligned.
   Predrill a hole for the screw [1] (for dimension Z, see the profile assessment). Slightly tighten the activator with one screw to position it (for dimension Y, see the profile assessment) so that the activator can still be moved.
   Open the sash fully and close it again to move the activator into the installation position.
   Predrill the holes for screws [2].
   Secure the activator with three screws.



INFO
Control unit with SoftOpen: if the sash does not come into contact with the buffer, move the activator screw position by at least 21 mm (Z + 21 and Y + 21).

8.6.5.3 Diagram C



[A] First opening sash
[B] Second opening sash
[C] Centre of guide groove in the guide track

1. Connect the packers to the activator using locating aids. Ensure that the slots are aligned.
   Predrill a hole for the screw [1] (for the first opening sash to dimension W, for the second opening sash to dimension Z, see profile assessment). Slightly tighten every activator with one screw each to position them (for dimensions X and Y, see the profile assessment) so that the activator can still be moved.
   Close the second opening sash [B] slowly and open it again to move the activator into the installation position.
   Predrill the holes for screws [2].
   Secure with three screws.
   Close the second opening sash and move the handle to the closed position.
   Close the first opening sash [A] slowly and open it again to move the activator into the installation position.
   Predrill the holes for screws [3].
   Secure with three screws.

8.6.6 Tensioning the control unit with soft function

CAUTION

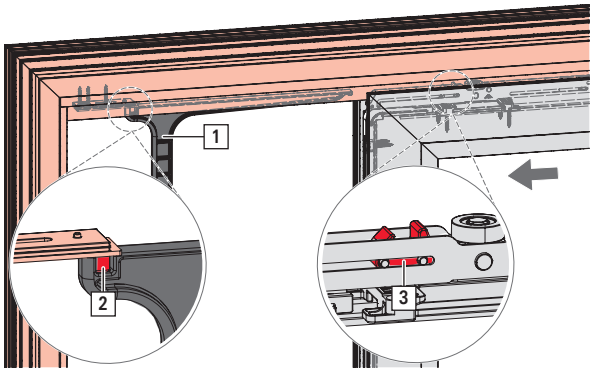
Risk of injury caused by tensioning the control unit with soft function by hand.

When installing the control unit with soft function, tensioning by hand may cause injuries due to sharp edges.

1. Only tension the control unit with soft function using a tensioning tool.

1. Mount the tensioning tool recess [1] in the activator bolt [2].

   Push the element shut slowly until the connector [3] on the tensioning tool engages in the control unit with soft function.

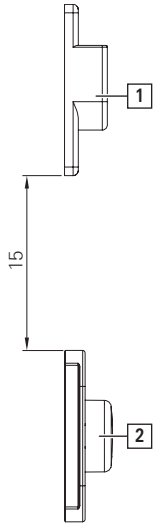


2. Open up the element slowly to activate the soft function. The connector on the tensioning tool will be released automatically.

8.6.7 Stop

8.6.7.1 Drilling the holes for the stop

Installation drawing in open sliding position

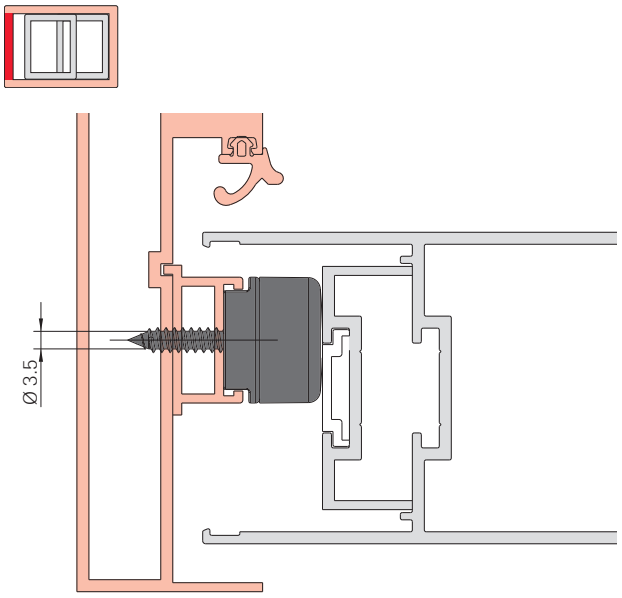


[1] Striker

[2] Stop

INFO
The version on the bottom is mirror-inverted.

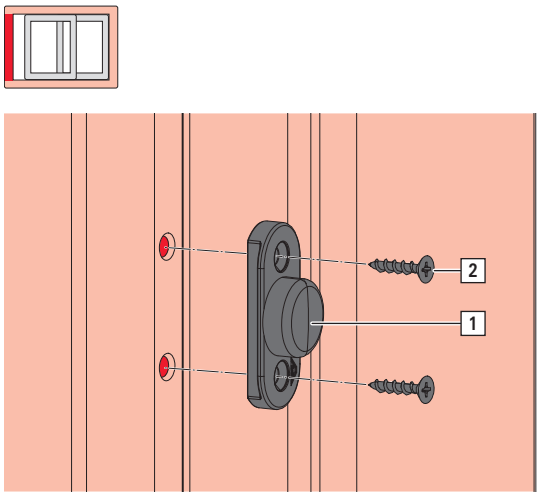
1. For the position of the run-up block, see the installation drawing. → *from page 116*
   Drill holes.
   Drill: 2 x Ø 3.5



8.6.7.2 Installing the stop

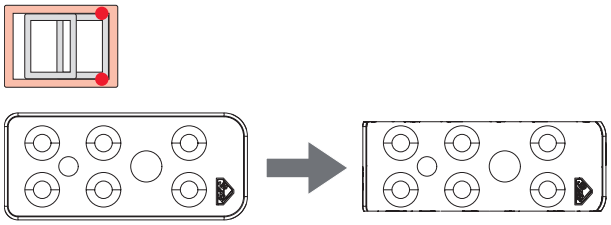
1. Align the stop [1] vertically and secure with two screws [2].

INFO
Note the drilling specifications → *8.6.7.1 "Drilling the holes for the stop" from page 111*.

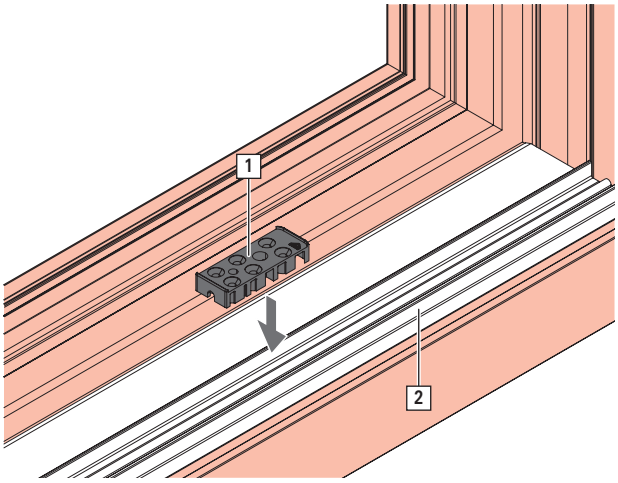


8.6.8 End stop with packer

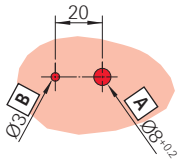
1. Adapt the end stop packer in line with the specific profile.



2. Place the end stop packer [1] on the roller track [2] or guide track and secure with screws.

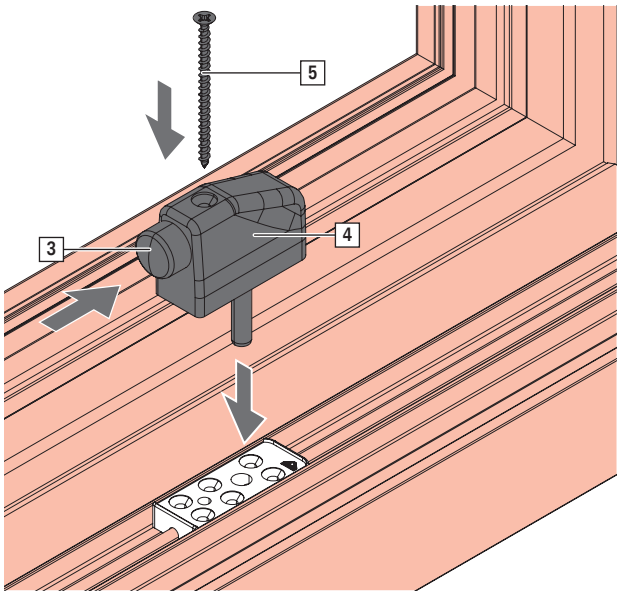


3. Drill the holes for the end stop.
   [A]: Ø 8.0+0.2 (1x)
   [B]: predrill Ø 3.0 (1x)



INFO
The specifications for drilling in aluminium and steel profiles must be adhered to.

4. Install the rubber buffer [3] in the end stop [4], position it on a packer, and secure with a screw [5].



8.6.9 Guide track stopper

INFO
Note the profile system assessment.

Installing the guide track stopper, diagram A

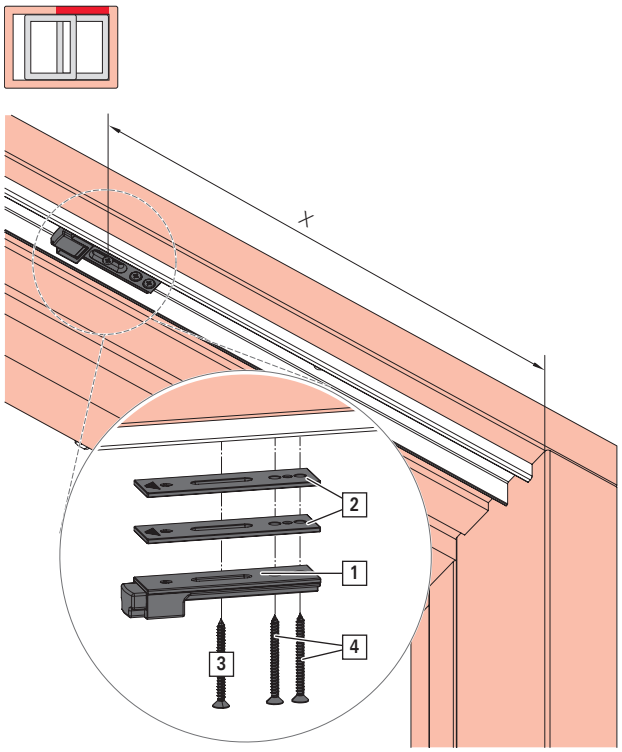
1. Insert the stopper [1] and, if required, packers [2] into the guide track.

   X = profile related

   Screw down loosely with one screw [3] but so that it is not yet secure.

   Check the stopper position and reposition if necessary.

   Secure the stopper with three screws(first [3], then [4]).

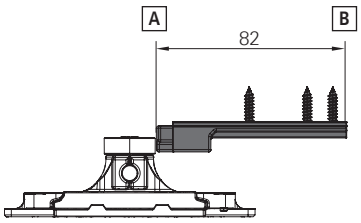


Installing the guide track stopper, diagram C

⇨ Second opening sash is on the bench: mark the position of the roller outer edge of the control unit on the espagnolette side [A].

1. Close the second opening sash.

   Transfer the marking for the “position of the roller outer edge of the control unit” from the sash to the frame and move it 82 mm towards the espagnolette side [B].



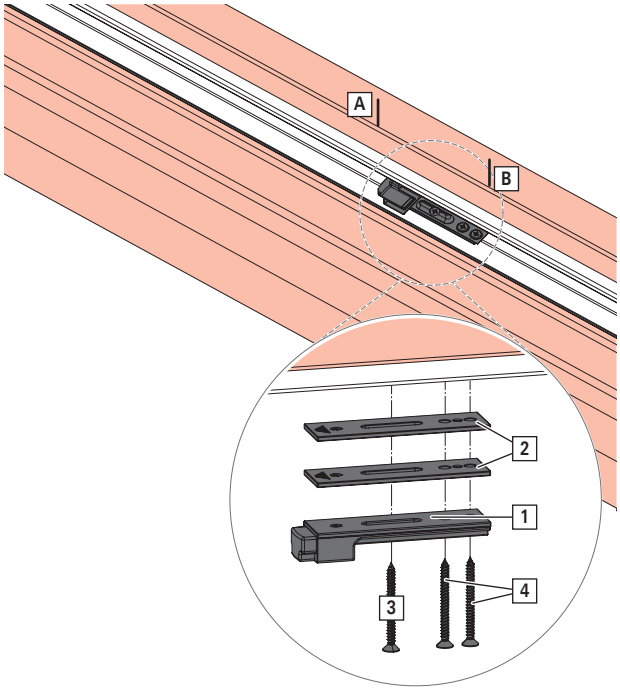
2. Insert the stopper [1] and, if required, packers [2] into the guide track.

   Move the stopper up to the marking [B].

   Screw down loosely with one screw [3] but so that it is not yet secure.

   Check the stopper position and reposition if necessary.

   Secure the stopper with three screws(first [3], then [4]).



8.6.10 Notes on final assembly

DANGER

Risk of death caused by excessive bending of the running profile.

Incorrect installation of the sash in an element that bends by ≥ 3 mm may cause the sash to fall out.

1. Underlay the element so that it bends by < 3 mm.

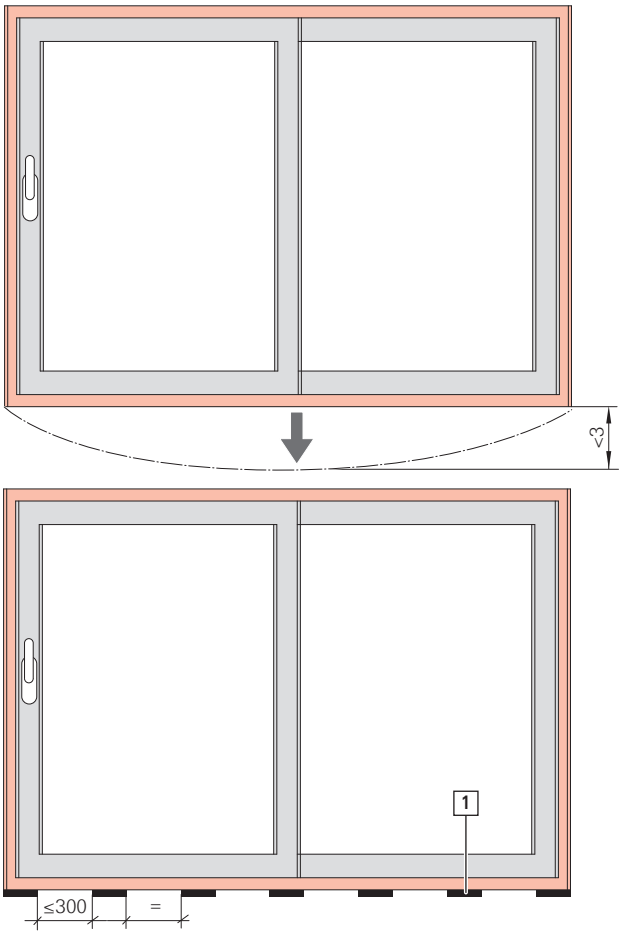
INFO

In order to ensure the proper functioning and security of the element, the bending of the frame must not exceed 3 mm.

INFO

Place supports under the threshold every 300 mm across its entire area.

[1] Packer



9 Installation drawings

9.1 Explanation

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

Marking	Meaning
abschlb.	Lockable
abschließbar	Lockable
aktiv	First opening sash
Artikel Nr.	Material number
aussenlaufend	Running outward
Beschlag	Hardware
Flügelaussenbreite	Sash external width
Flügelaussenhöhe	Sash external height
Fluegelbreite	Sash width
Fluegelhoehe	Sash height
FB	Sash width
FB(A)	Sash width of first opening sash
FB(P)	Sash width of second opening sash
FH	Sash height
Garnitur-Positionierung	Set positioning
geschlossen	Closed
Getriebe	Espagnolette
GH	Handle height
Griffhöhe	Handle height
Gtr.	Espagnolette
innenlaufend	Running inward
Links	Left
Masse ... sind profilabhängig	Dimensions ... are profile related
Mitte Fräsung	Centre of routing
mittig	Centred
n. abschließbar	Not lockable
offen	Open
optional	Optional
passiv	Second opening sash
Rechts	Right
Schema A	Diagram A
Schema C	Diagram C
Schließstücksitze	Striker positions
Schliesszapfenposition	Locking cam position
Standard	Standard
T	Connecting rod
Treibstange	Connecting rod
Treibstangenmaße	Connecting rod dimensions

INFO
All connecting rod dimensions CR ±0.5 mm.

9.2 Diagram A

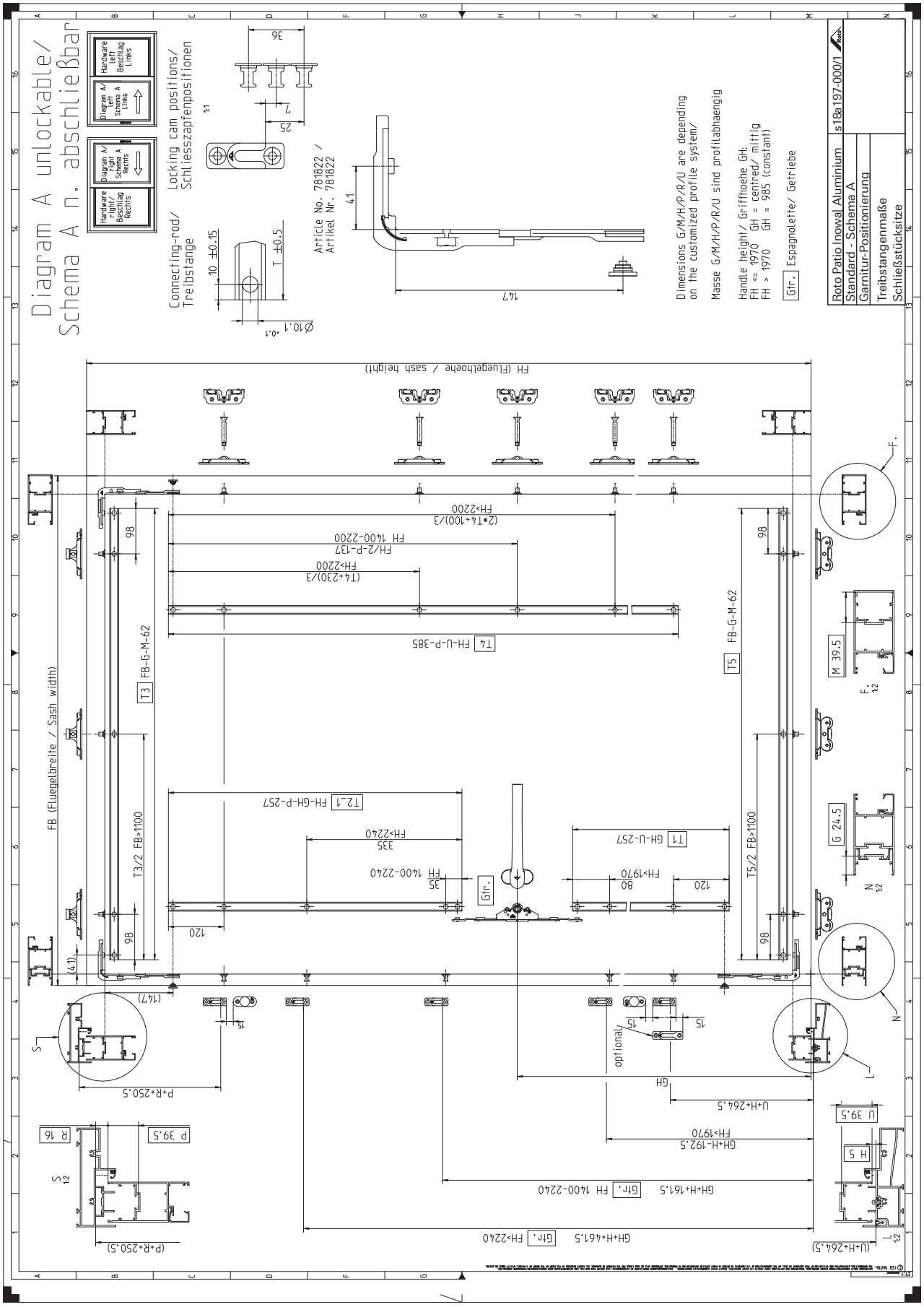
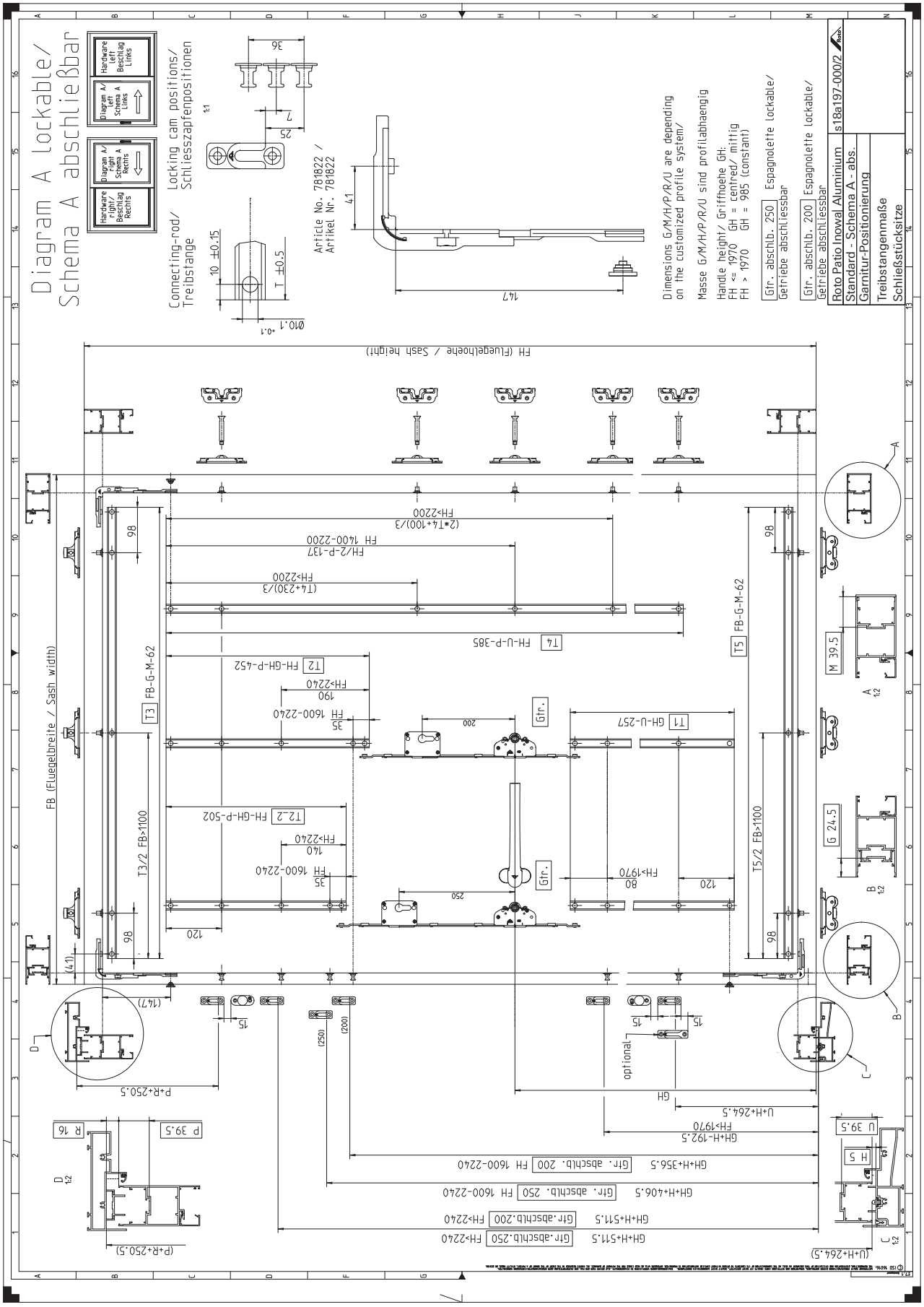
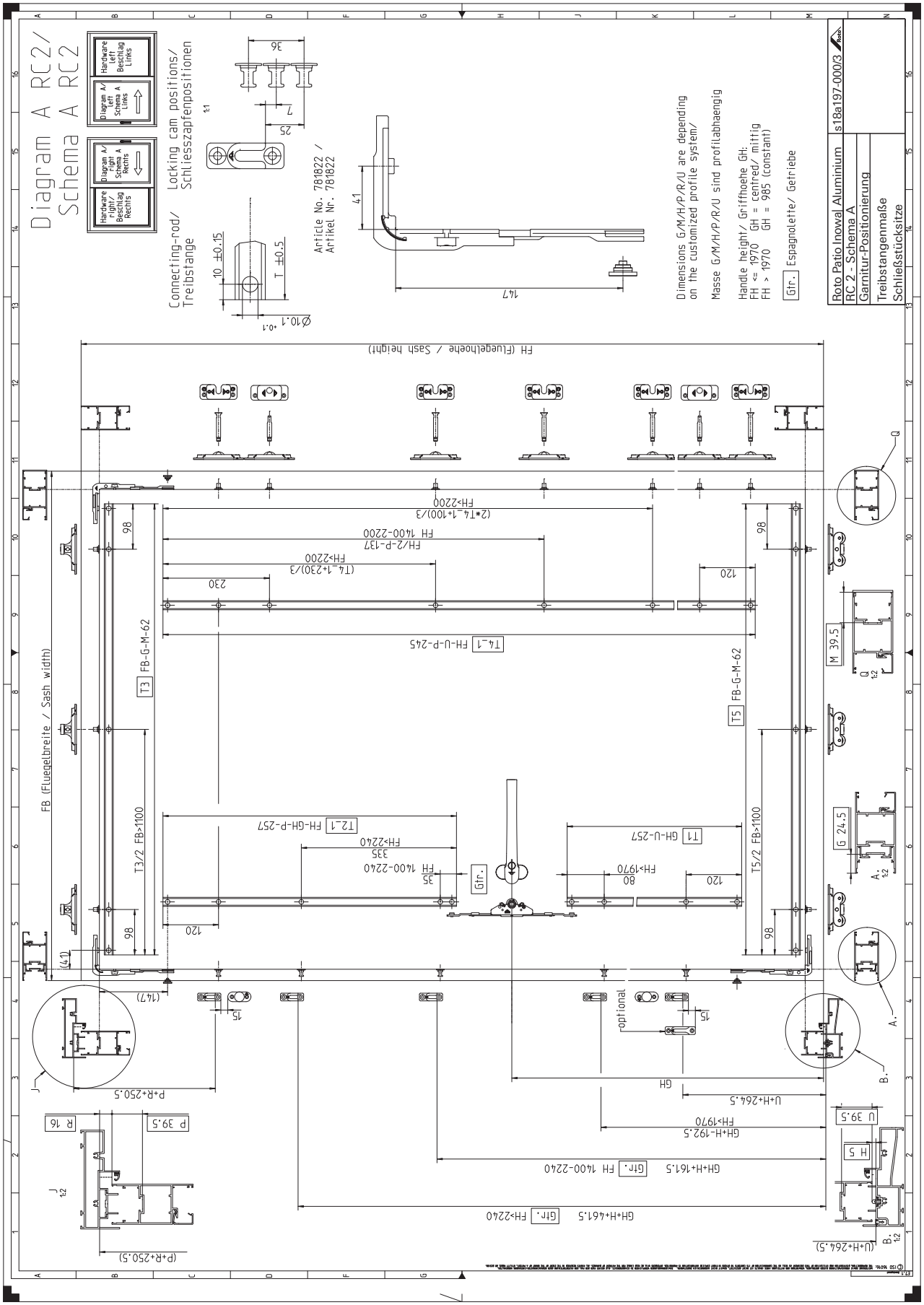


Diagram A unlockable/
Schema A n. abschließbar
Locking cam positions/
Schliesszapfenpositionen
Connecting-rod/
Treibstange
Article No. 781822 /
Artikel Nr. 781822
Dimensions G/M/H/P/R/U are depending on the customized profile system/
Masse G/M/H/P/R/U sind profilabhaengig
Handle height/ Griffhoehe GH:
FH <= 1970 GH = centred/ mittig
FH > 1970 GH = 985 (constant)
Gtr. Espagnolette/ Getriebe
Roto Patio Inowal Aluminium
Standard - Schema A
Garnitur-Positionierung
Treibstangenmaße
Schließstücksitze
FH (Fluegelhoehe / sash height)
FB (Fluegelbreite / Sash width)
T3 FB-G-M-62
T5 FB-G-M-62
T4 FH-U-P-385
T3/2 FB>1100
T5/2 FB>1100
T2_1 FH-GH-P-257
T1 GH-U-257
Gtr.
GH
optional
M 39.5
G 24.5
U 39.5
H 5
P 39.5
R 16

9.3 Diagram A – lockable



9.4 Diagram A – RC 2 / RC 2 N



9.5 Diagram A'

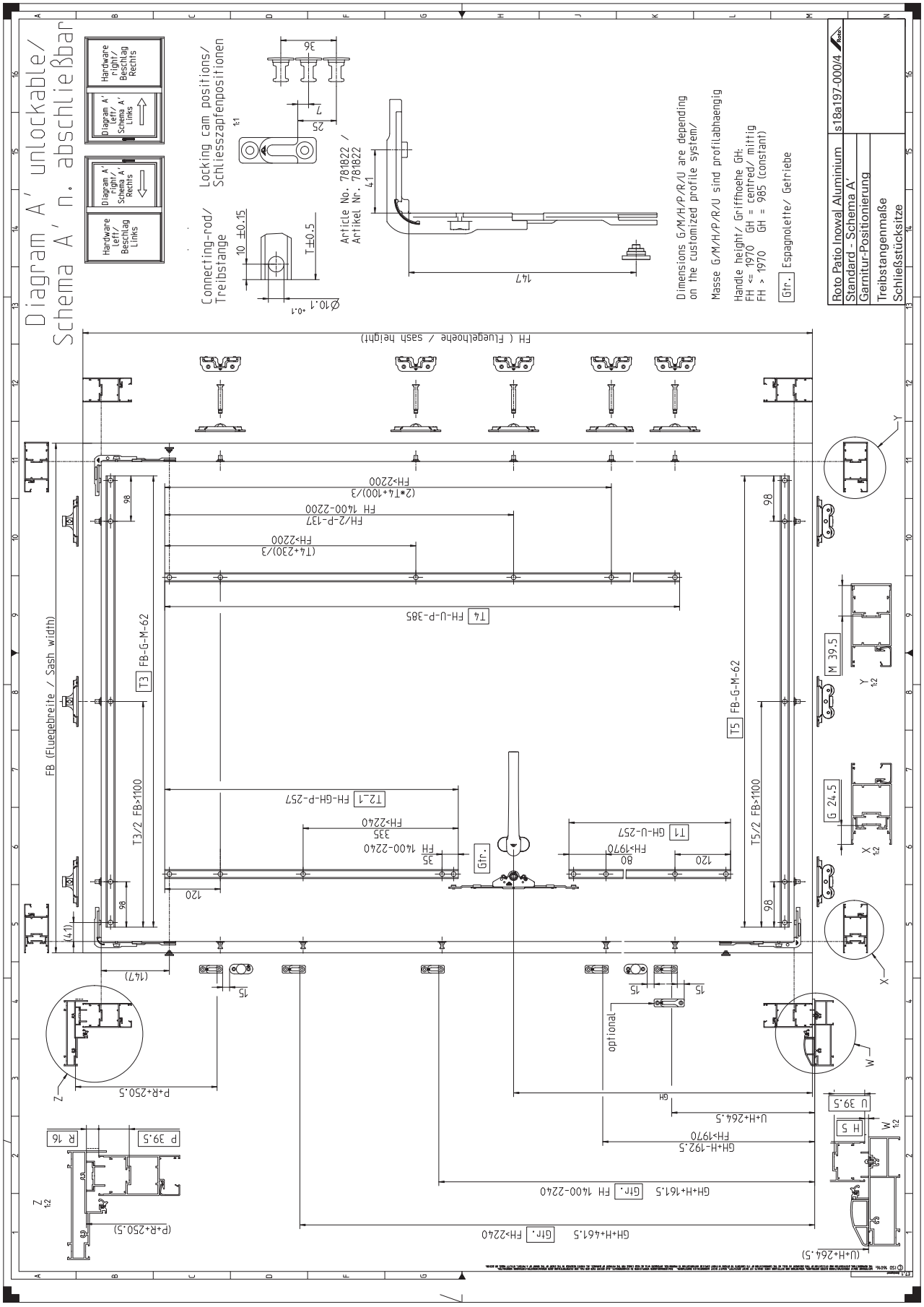
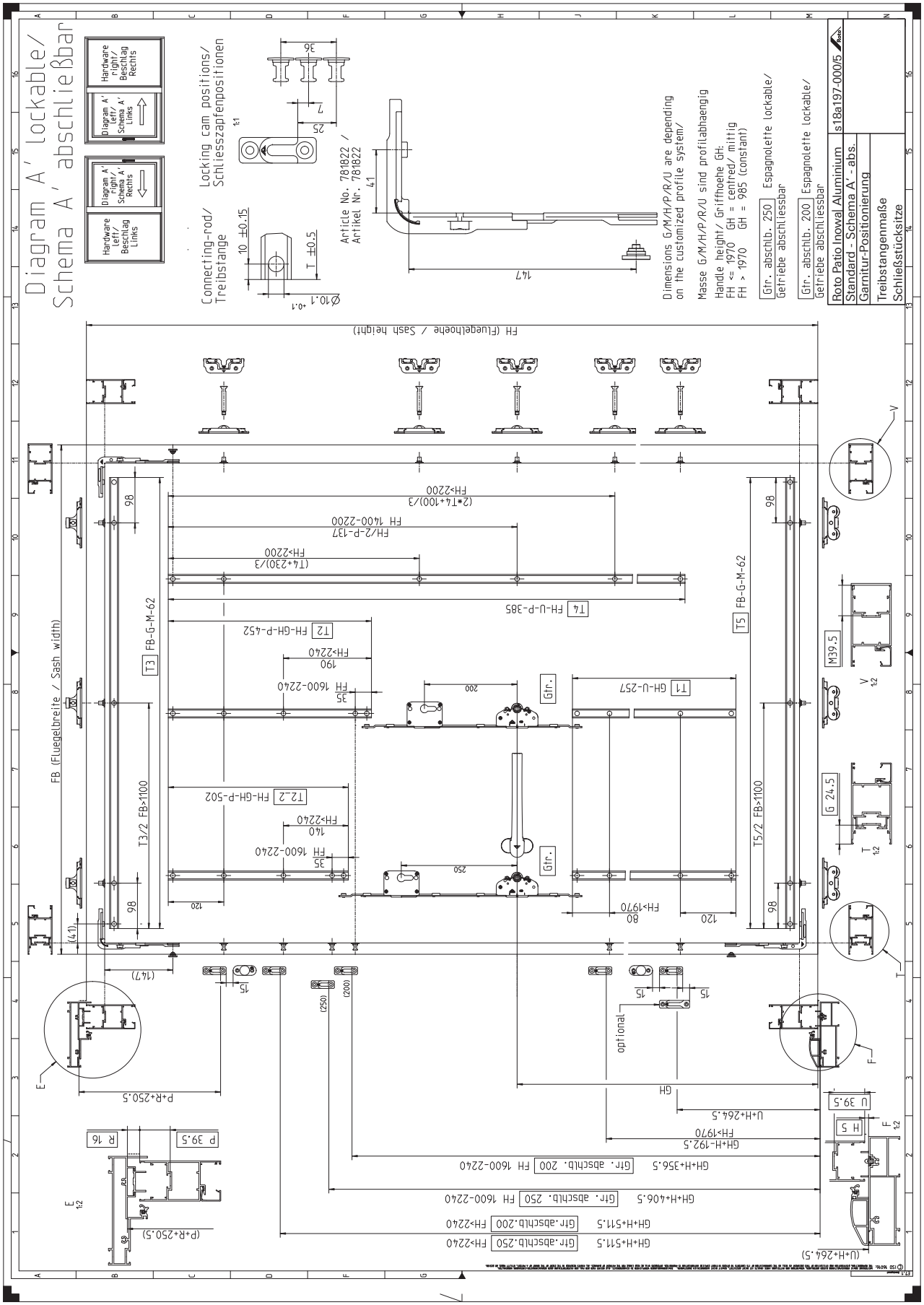
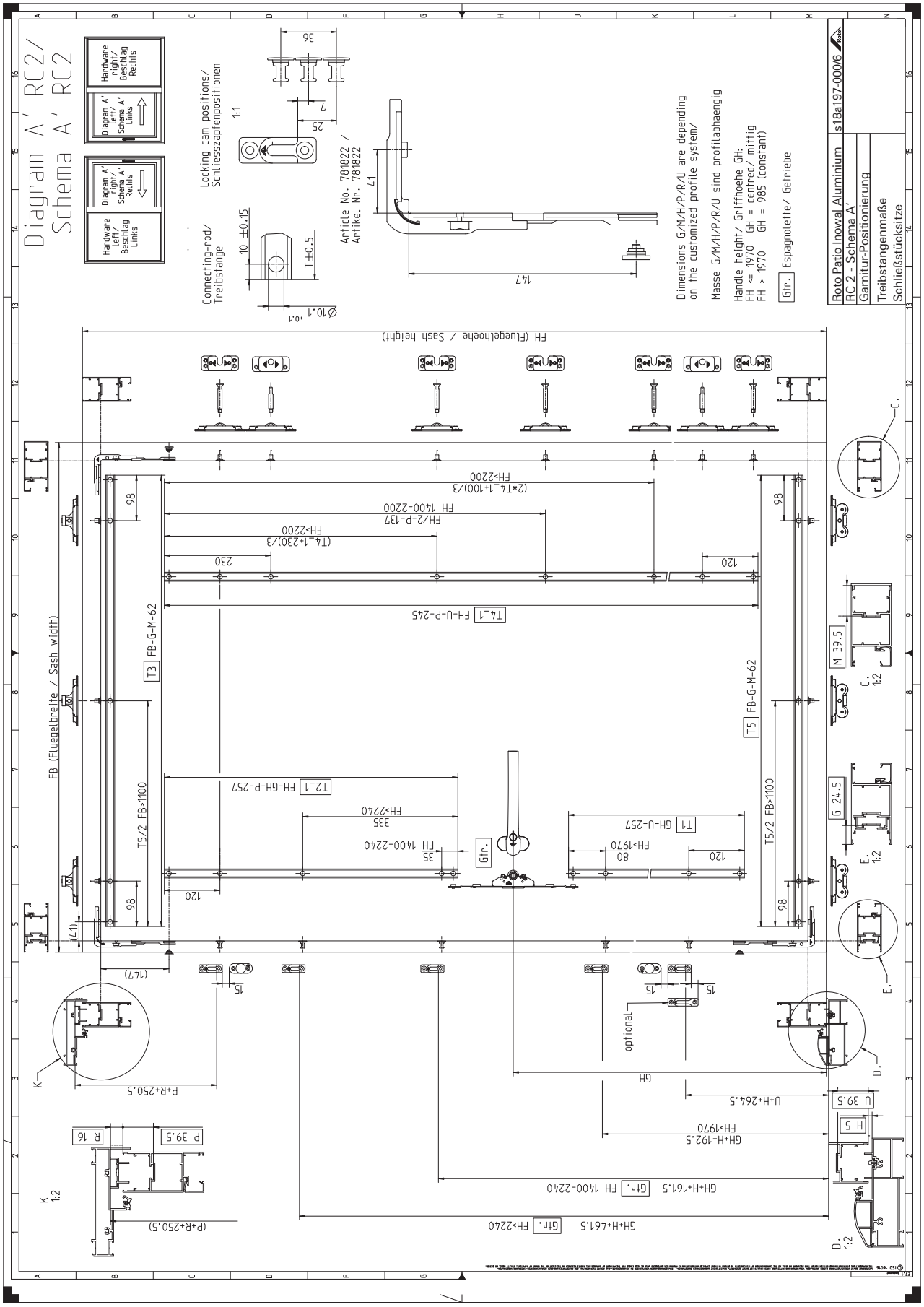


Diagram A' unlockable/
Schema A' n. abschließbar
Hardware right/ Beschlag Rechts
Diagram A' left/ Schema A' Links
Diagram A' right/ Schema A' Rechts
Hardware left/ Beschlag Links
Locking cam positions/
Schliesszapfenpositionen
Connecting-rod/
Treibstange
Article No. 781822 /
Artikel Nr. 781822
Dimensions G/M/H/P/R/U are depending on the customized profile system/
Masse G/M/H/P/R/U sind profilabhaengig
Handle height/ Griffhoehe GH:
FH <= 1970 GH = centred/ mittig
FH > 1970 GH = 985 (constant)
Gtr. Espagnolette/ Getriebe
Roto Patio Inowal Aluminium
Standard - Schema A'
Garnitur-Positionierung
Treibstangenmaße
Schließstücksitze
s18a197-000/4
FH (Fluegelhoehe / sash height)
FB (Fluegelbreite / Sash width)
T3 FB-G-M-62
T3/2 FB>1100
T5 FB-G-M-62
T5/2 FB>1100
T4 FH-U-P-385
T2_1 FH-GH-P-257
T1 GH-U-257
optional
M 39.5
G 24.5
U 39.5
H 5
R 16
P 39.5

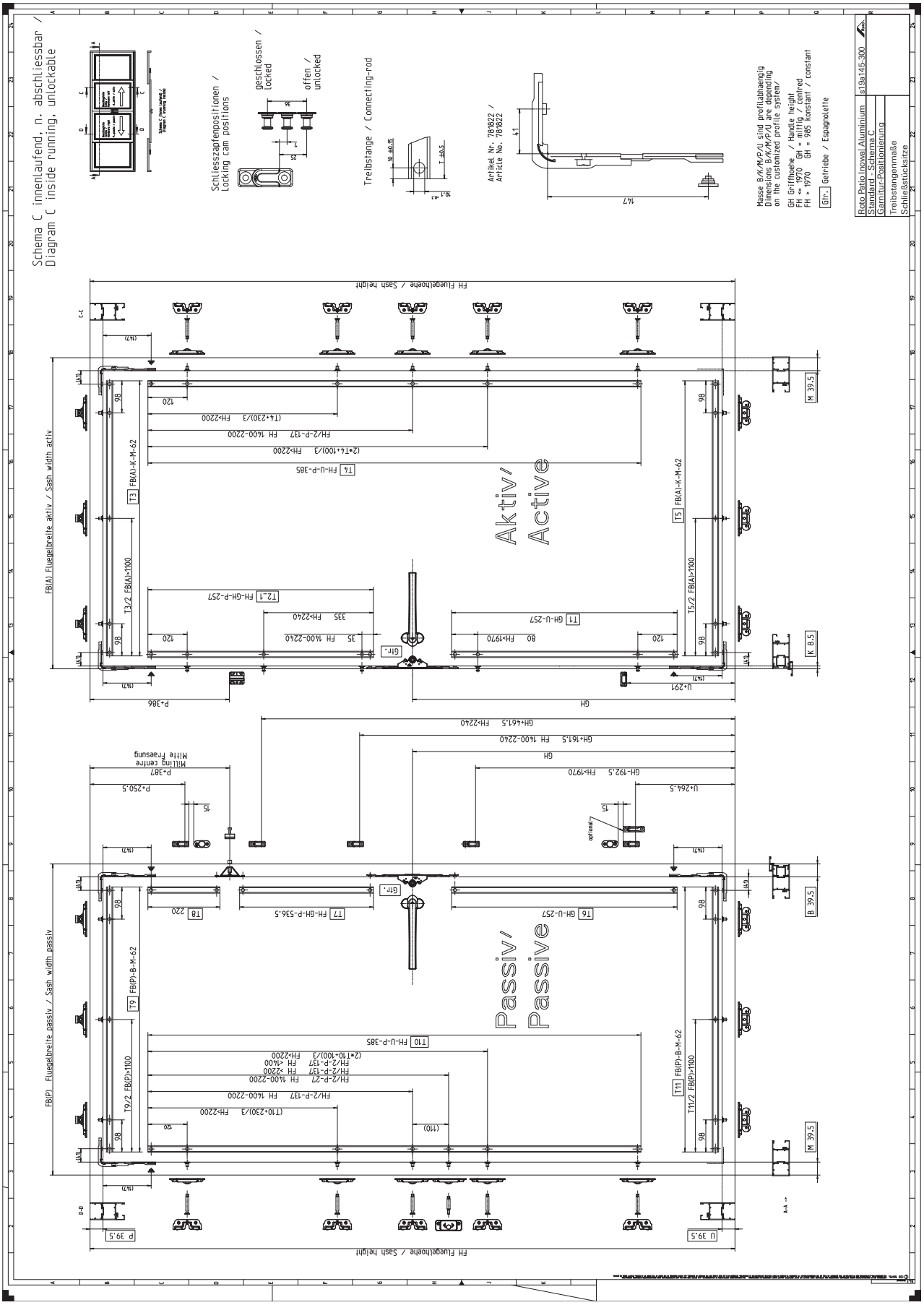
9.6 Diagram A' – lockable



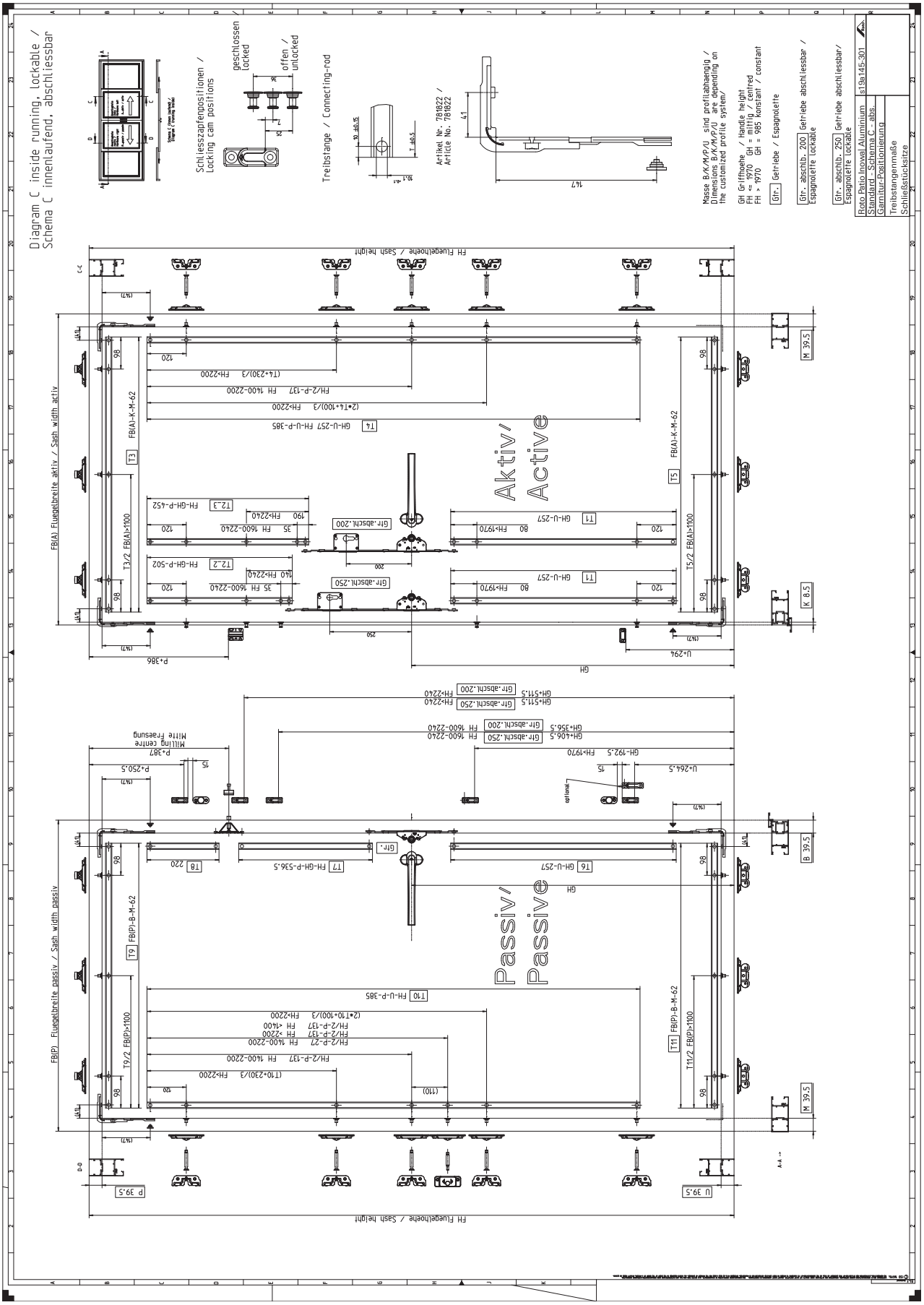
9.7 Diagram A' – RC 2 / RC 2 N



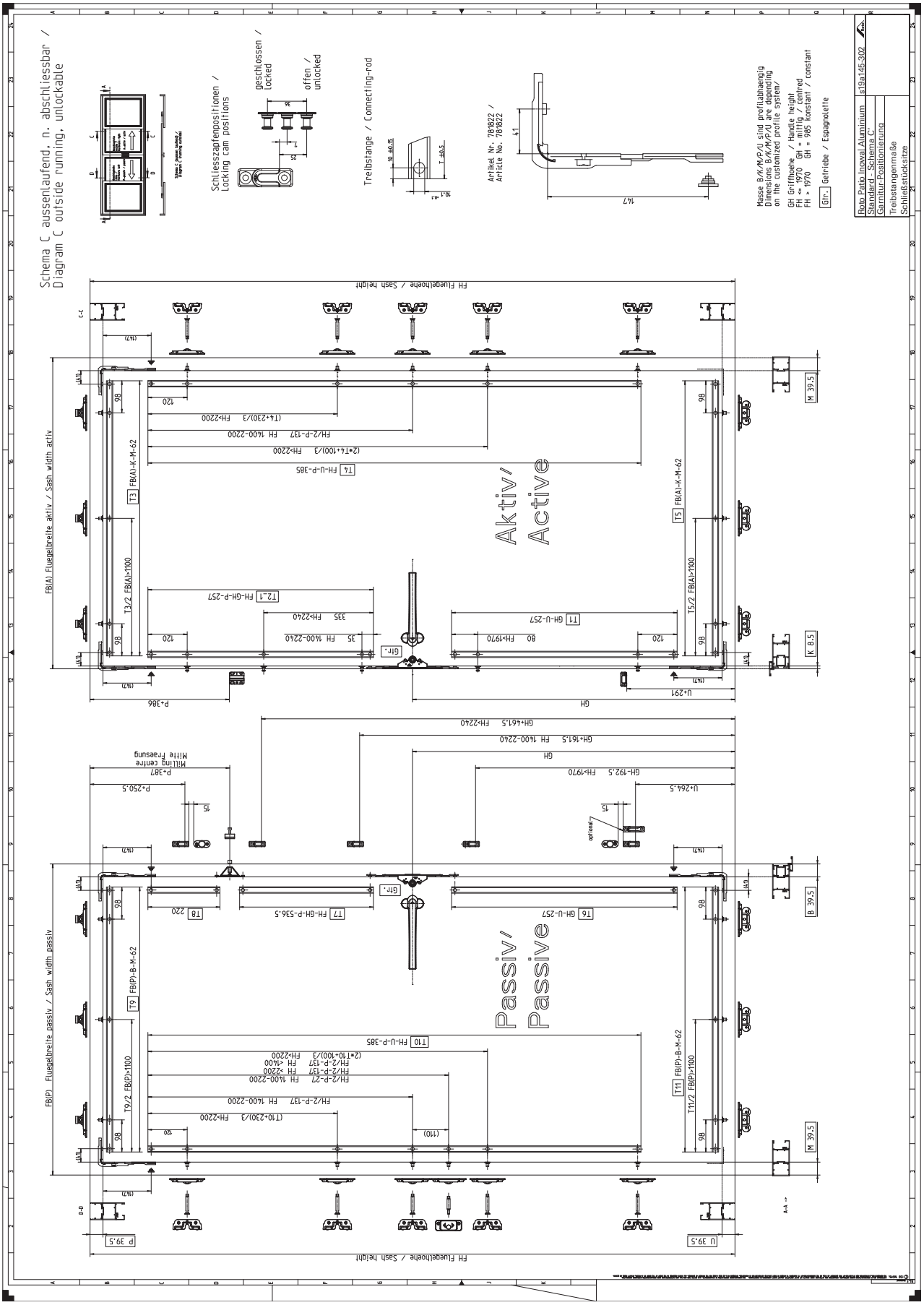
9.8 Diagram C


Schema C innenlaufend, n. abschliessbar /
Diagram C inside running, unlockable
Schliesszapfenpositionen /
Locking cam positions
geschlossen /
locked
offen /
unlocked
Treibstange / Connecting-rod
Artikel Nr. 781822 /
Article No. 781822
Masse B/K/M/P/U sind profilabhaengig
Dimensions B/K/M/P/U are depending
on the customized profile system/
GH Griffhoehe / Handle height
FH <1970 GH = mitte / centred
FH >1970 GH = 985 konstant / constant
Gtr. Getriebe / Espagnolette
Roto Patio Inowel Aluminium
Standard - Schema C
Garnitur-Positionierung
Treibstangenmaße
Schließstückesitze
Aktiv/
Active
Passiv/
Passive
FH Fluegelhoehe / Sash height
FB(A) Fluegelbreite aktiv / Sash width activ
FB(P) Fluegelbreite passiv / Sash width passiv
Gtr.
GH
Milling centre
Mittig Fraesung

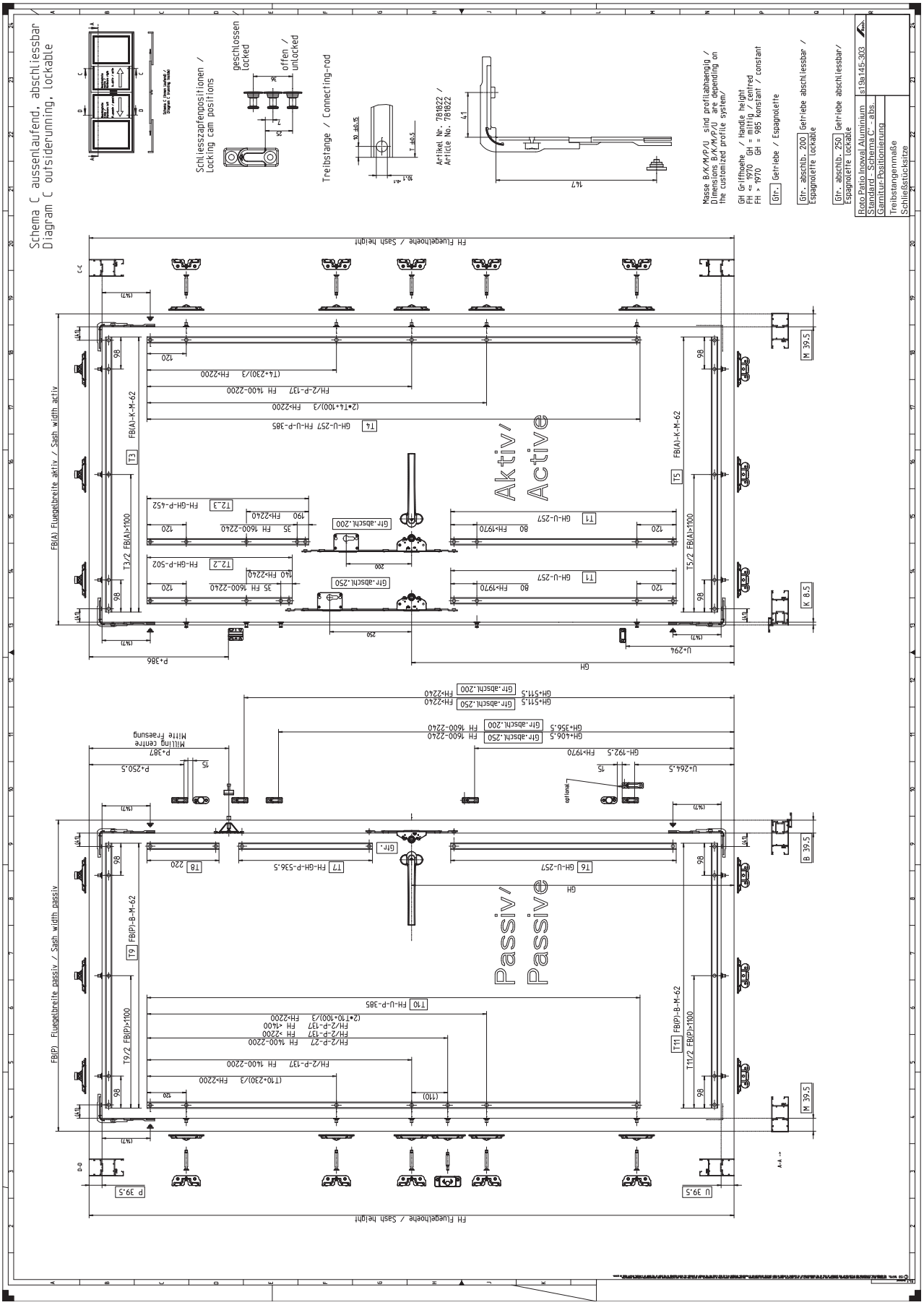
9.9 Diagram C – lockable



9.10 Diagram C'



9.11 Diagram C' – lockable



10 Adjustment

INFO
Roto hardware components may only be adjusted by authorised professionals when the element is installed.

10.1 Striker

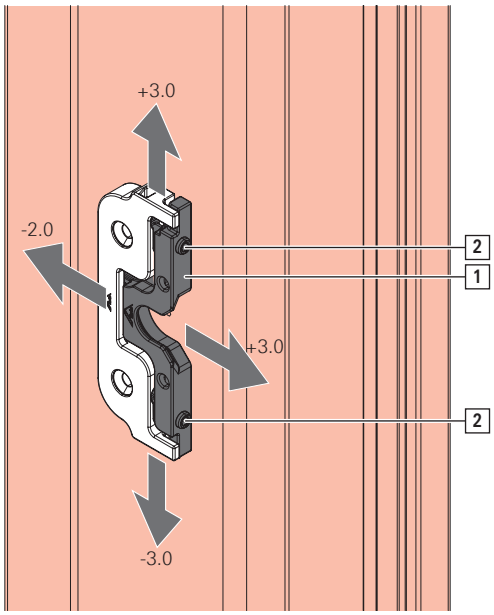
INFO
Roto hardware components may only be adjusted by authorised qualified personnel.

Lateral adjustment

1. Close the window sash (handle position open).

2. Adjust the striker [1] using two threaded pins [2] in the fastening plate.
   Tool: hex key size 2.5.

INFO
The striker has variable height adjustment, which permits an installation tolerance of ±3 mm for the locking cam.

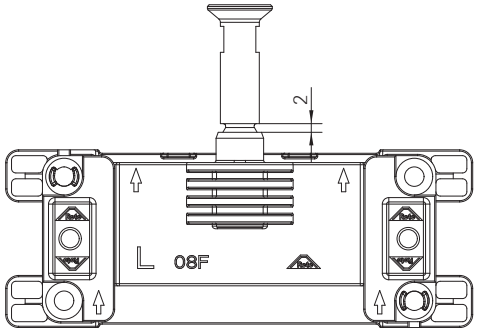


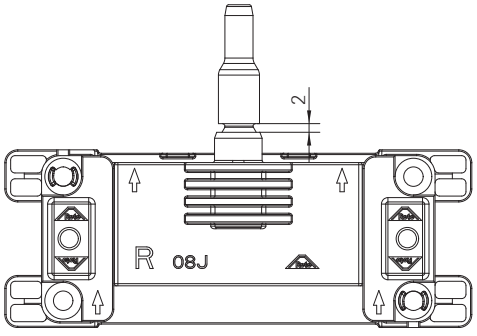
10.2 MUL locking cam / pin for anti-pushback function – adjustable

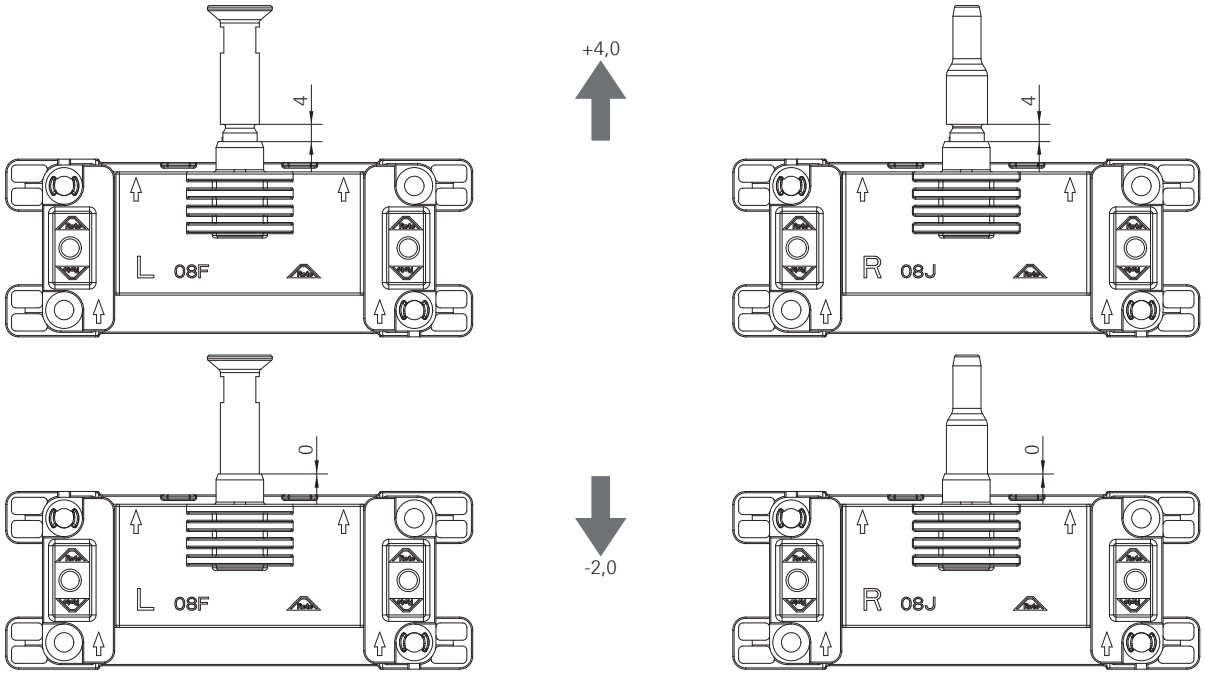
INFO
Roto hardware components may only be adjusted by authorised qualified personnel.

Gasket compression adjustment

Initial position






+4,0
4
L 08F
R 08J
0
-2,0

11 Operation

11.1 Operating information

The windows and balcony doors are operated using a handle.

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

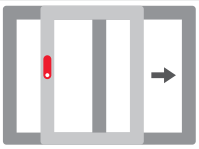
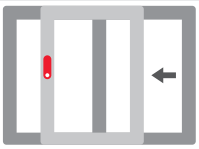
11.1.1 Roto Patio Inowa

ATTENTION

Risk of being accidentally locked out.

If the sash is in the sliding position and closes, the sash can engage and then be impossible to reopen from the outside.

- Secure the sash against accidentally engaging when in the sliding position.
- Ensure that access is possible if necessary.

Handle position	Sash position	Meaning
		Sash in closed position.
		Sash in open sliding position.
		Sash in closed sliding position.

11.2 Fault assistance

Fault	Cause	Corrective action	To be carried out by
Handle is difficult to turn.	Frame components have not been greased.	Grease the frame components.	☐
	Handle is damaged.	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 damaged.	Replace the sash components.	■
	Incorrect striker positions.	Adapt the striker positions.	■
Handle cannot be turned 180°.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette). Check the connecting rod and replace if necessary.	■
Locking cams brush against the striker.	Sash components hinged or installed incorrectly.	Check the setting in the turn position (potentially rehang – start from the T&T espagnolette).	■
	Incorrect striker positions.	Adapt the striker positions.	■

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

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

12 Maintenance

CAUTION

Performing maintenance work incorrectly can lead to injuries.

Performing maintenance incorrectly can lead to injuries.

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

ATTENTION

Incorrect or improper testing may cause property damage.

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

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

INFO

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

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

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

	Responsibility	
Maintenance interval	☐	→ *from page 130*
Cleaning		→ *from page 131*
Clean hardware	☐	
Care		→ *from page 131*
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		→ *from page 133*
Check that hardware components are fitted securely	☐	
Inspect hardware components for wear	☐	
Check that movable parts work properly	☐	
Check that locking points work properly	☐	
Check ease of movement	■	
Repair		→ *from page 133*
Retighten screws	■	
Replace damaged components	■	

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

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

12.1 Maintenance intervals

ATTENTION

Failure to adhere to maintenance intervals may cause property damage.

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

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

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

12.2 Cleaning

ATTENTION

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

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

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

Cleaning the hardware

- Clean deposits and contaminants off the hardware using a soft cloth.
- Lubricate movable parts and locking points after cleaning. → *12.3 "Care" from page 131*
- Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

12.3 Care

ATTENTION

Using incorrect lubricants may cause property damage.

Substandard lubricants can prevent the hardware from working properly.

- Use high-quality lubricants.
- Only use resin-free and acid-free lubricants.

ATTENTION

Cleaning agents and lubricants may pollute the environment.

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

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

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

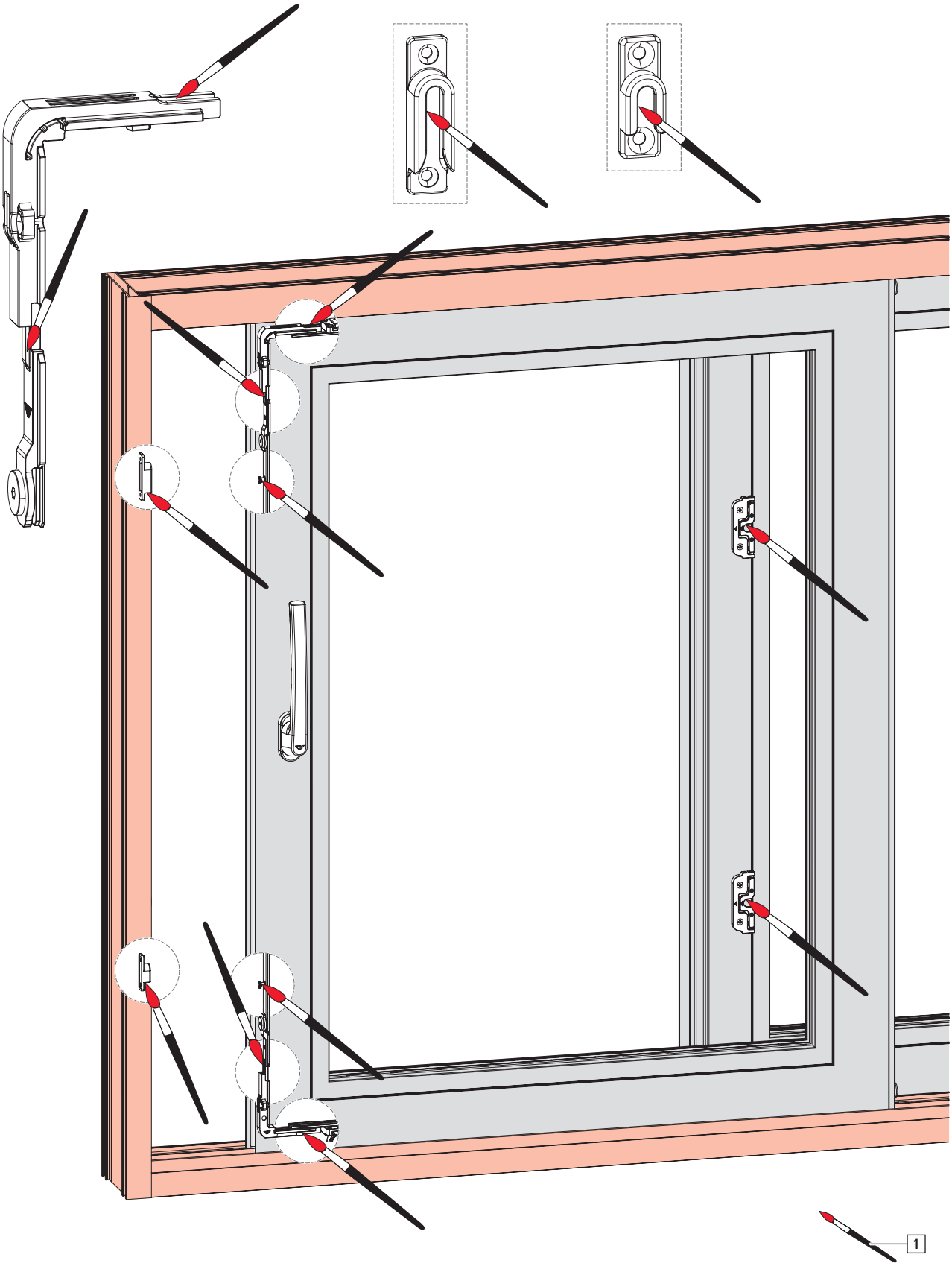
Recommended lubricants

- Roto NX / NT grease

INFO

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

12.3.1 Roto Patio Inowa



[1] Grease

12.4 Performance test

WARNING
Improper repair work may pose a risk of death!
Improper maintenance may prevent the element from working properly and make it less safe to use.
- Always have repairs performed by a specialist company.

Check for proper operation:

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

Have malfunctions remedied by a specialist company.

12.5 Repair

WARNING
Improper repair work may pose a risk of death!
Improper maintenance may prevent the element from working properly and make it less safe to use.
- Always have repairs performed by a specialist company.

ATTENTION
Improper screw fixings may cause property damage.
Loose or faulty screws can prevent the hardware from working properly.
- Check that the individual screws are secure and seated correctly.
- Tighten or replace loose or faulty screws.
- Use only the suggested screws.

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

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

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

The specialist company must observe the following:

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

12.6 Preventative measures

These measures are intended to preserve the surface finish and durability. They aim to prevent premature wear or contamination and thereby simplify maintenance.

Protection against corrosion

Cleaning agents can corrode the surface of the hardware.

Protect the hardware:

- Do not use aggressive or flammable liquids, acidic cleaners or abrasive cleaners.
- Only use mild, pH-neutral cleaning agents that have been diluted.

- Apply a thin protective film to the hardware, for example using a cloth soaked in oil.
- Only use high-quality components for repairs, such as stainless-steel screws.

Protection against dirt

Contamination prevents the hardware working properly.

Protect the hardware:

- Remove deposits and contaminants caused by construction materials before they bond with water, e.g. construction dust, plaster, stucco, mortar and cement.
- Always clean using a soft cloth.

Protection against (permanently) damp room air

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

Protect the hardware:

- Provide adequate ventilation for hardware, particularly during the construction phase.
- Intensively air out the room several times per day by opening all windows or balcony doors for approximately 15 minutes.

  If intensive airing is not an option, place the windows or balcony doors in the tilt position and provide airtight masking inside the room, e.g. if there is fresh screed that cannot be walked on or must not be exposed to drafts. Discharge any humidity present in the room air to the outside using condensation dryers.
- Establish a ventilation plan for more complex construction projects if necessary.
- Provide adequate ventilation during holiday periods as well.

13 Dismantling

WARNING

Improper dismantling may pose a risk of death!

The sash may fall during dismantling.

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

CAUTION

Physical strain may cause injury and damage to health.

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

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

INFO

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

13.1 Unhinging the sash

Version with continuous guide track

1. Move the handle to the open sliding position

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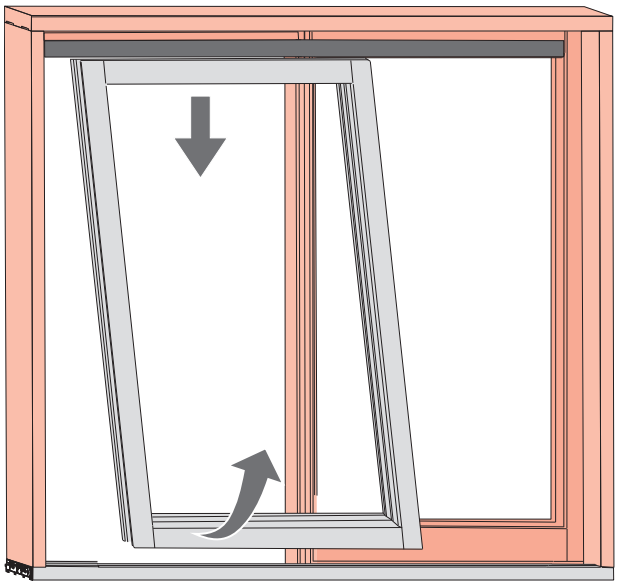
2. Lift the sash and tilt it outwards at the bottom.
   Lower the sash in a controlled manner until the control units are exposed.



3. Remove the sash parallel to the frame.

13.2 Hardware components

Removing hardware components

1. Undo all screw connections.

2. Remove the hardware components.

3. Dispose of the hardware components properly.

14 Transport

14.1 Transporting elements and hardware

DANGER

Improper transport poses a risk of death!

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

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

CAUTION

Trapped limbs may result in injuries.

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

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

CAUTION

Physical strain may cause injury and damage to health.

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

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

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

Observe the following basic instructions when transporting hardware:

- Transport larger scopes of delivery using appropriate transportation means (such as industrial trucks).
- Note the transport weight in order to select appropriate transportation means.
- Immediately check the delivery for completeness and transport damage on receipt.

INFO

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

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

- Industrial trucks, e.g. forklifts, telescopic handlers, pallet trucks

- Lifting equipment, e.g. transport nets, carry straps, round slings
- Protective devices, e.g. edge protection, spacer blocks

INFO

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

INFO

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

14.2 Storing the hardware

Store all hardware components as follows until they are installed:

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

15 Disposal

ATTENTION

Incorrect disposal may pollute the environment.

Pieces of hardware are raw materials.

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

15.1 Disposing of packaging

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

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

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

15.2 Disposing of hardware

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

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

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

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