

Roto Inline

Hardware systems for basic sliding windows and sliding doors

Installation, maintenance and operation instructions
for timber, PVC and aluminium profiles



Contact

Roto Frank
Fenster- und Türtechnologie GmbH
Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany
Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com
www.roto-frank.com

	1	General information.....	8
	1.1	Version history.....	8
	1.2	Instructions.....	8
	1.3	Symbols.....	9
	1.4	Pictographs.....	9
	1.5	Product features.....	9
	1.6	Abbreviations.....	11
	1.7	Target groups.....	11
	1.8	Target groups' obligation to give instructions.....	12
	1.9	Copyright protection.....	13
	1.10	Limitation of liability.....	13
	1.11	Preserving the surface finish.....	13
	1.12	Certifications.....	15
	1.12.1	Environmental management.....	15
	1.12.2	Quality management.....	16
	1.12.3	International Technology Centre (ITC).....	17
	2	Security.....	18
	2.1	Presentation and structure of warning instructions.....	18
	2.2	Security levels of warning instructions.....	18
	2.3	Stipulated use.....	18
	2.3.1	Misuse.....	19
	2.3.2	Usage restriction.....	19
	2.4	Stipulated use for end users.....	19
	2.4.1	Misuse.....	20
	2.5	Basic safety information.....	20
	2.5.1	Installation.....	20
	2.5.2	Use.....	21
	2.5.3	Ambient conditions.....	22
	2.6	Operation.....	22
	3	Information on the product.....	24
	3.1	General hardware characteristics.....	24
	3.2	Application ranges.....	24

3.3	Descriptions on the sliding element and recommendation for the profile dimensioning.....	25
3.4	Profile cross sections.....	25
3.4.1	Horizontal cross section.....	26
3.4.1.1	Timber / PVC.....	26
3.4.1.2	Aluminium.....	26
3.4.2	Vertical cross section.....	28
3.4.2.1	Timber / PVC.....	28
3.4.2.2	Aluminium.....	30
3.5	Profile assessment.....	31
3.6	Design variants.....	31
3.6.1	Note regarding the design variants.....	31
3.6.2	Diagram A.....	31
3.7	Dimensions of the roller track.....	32



4	Hardware overviews.....	34
4.1	Diagram A.....	36
4.1.1	Single-action espagnolettes.....	36
4.1.2	Reverse-action espagnolettes.....	38



5	Espagnolettes.....	40
5.1	Single-action.....	40
5.1.1	with hook.....	40
5.1.2	with cam.....	40
5.1.3	Single-point locking.....	41
5.1.4	Travel restrictor.....	41
5.1.5	Extensions.....	41
5.1.5.1	with cam.....	41
5.1.6	Detailed dimensions.....	42
5.1.6.1	Single-action espagnolette with hook.....	42
5.1.6.2	Single-action espagnolette with cam.....	43
5.1.6.3	Single-action espagnolette with single-point locking.....	43
5.2	Reverse-action.....	44
5.2.1	Gearboxes.....	44
5.2.1.1	Not lockable.....	44

5.2.1.2	Lockable.....	44
5.2.2	Extensions.....	45
5.2.2.1	with hook.....	45
5.2.2.2	with claw.....	46
5.2.3	Detailed dimensions.....	47
5.2.3.1	Gearbox, not lockable.....	47
5.2.3.2	Gearbox, lockable.....	49
	6 Roller unit.....	50
6.1	Single – fixed height.....	50
6.2	Tandem – adjustable height.....	50
6.3	Packer set.....	51
6.3.1	Variable width.....	51
6.3.2	Fixed width.....	52
	7 Locking components.....	53
7.1	Strikers.....	53
7.1.1	Individual part.....	53
7.1.2	Striker set.....	54
7.2	Striker strips.....	55
7.2.1	One-part.....	55
7.2.2	Two-part.....	55
	8 Accessories.....	56
8.1	Mishandling device.....	56
8.2	Spacer set.....	56
8.3	Stops.....	57
8.4	Info clip.....	59
	9 Jigs / tools.....	60
9.1	Striker positioning jig.....	60
9.2	Hex key.....	60
10	Profile systems.....	61
10.1	PVC.....	61

	11	Installation.....	63
	11.1	Processing instructions.....	63
	11.2	Screw connections.....	64
	11.2.1	Overview.....	65
	11.3	Drilling and routing dimensions.....	66
	11.3.1	Single-action espagnolettes.....	66
	11.3.2	Single-point locking.....	68
	11.3.3	Reverse-action espagnolettes.....	69
	11.3.4	Tandem roller unit.....	69
	11.4	Sash.....	70
	11.4.1	Roller unit.....	70
	11.4.2	Spacer set.....	72
	11.4.3	Single-action espagnolette.....	75
	11.4.4	Travel restrictor.....	76
	11.4.5	Reverse-action espagnolette.....	77
	11.4.5.1	Not lockable.....	77
	11.4.5.2	Lockable.....	78
	11.5	Frame.....	79
	11.5.1	Locking components.....	79
	11.5.1.1	Striker positions for single-action espagnolettes.....	79
	11.5.1.2	Striker positions for reverse-action espagnolettes.....	82
	11.5.1.3	Striker strips.....	84
	11.6	Joining the sash and frame.....	85
	11.6.1	Inserting the sash.....	86
	11.6.2	Striker with positioning jig.....	87
	11.6.3	Stop part set.....	89
	11.6.4	Buffer.....	89
	11.6.4.1	Installing the buffer.....	89
	11.6.5	Notes on handle installation.....	90
	11.6.6	Notes on final assembly.....	91
	12	Adjustment.....	92
	12.1	Roller unit.....	92

	12.2	Mishandling device.....	92
	13	Operation.....	93
	13.1	Operating information.....	93
	13.1.1	Roto Patio Inline.....	93
	13.2	Fault assistance.....	93
	14	Maintenance.....	94
	14.1	Maintenance intervals.....	94
	14.2	Cleaning.....	95
	14.3	Care.....	95
	14.3.1	Roto Inline.....	96
	14.4	Repair.....	96
	15	Dismantling.....	98
	15.1	Hardware components.....	98
	15.2	Unhinging the sash.....	98
	16	Transport.....	100
	16.1	Transporting elements and hardware.....	100
	16.2	Storing the hardware.....	101
	17	Disposal.....	102
	17.1	Disposing of packaging.....	102
	17.2	Disposing of hardware.....	102

1 General information

1.1 Version history

Version	Date	Changes
v0	xx/xx/xxxx	Publication

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:

- 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
	Components, arrows or movements that have just been described
	Item number
[1]	Legend
[A]	Steps



INFO

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



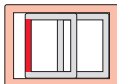
INFO

Figures are provided in the left-hand version (DIN 107). 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
	Timber, PVC and aluminium
	Left sash

1.5 Product features

Symbol	Meaning
	Cropping range
	Lockable

Symbol	Meaning
	Description
	Component width
	DIN left / right
	Backset
	Colour code, standard
	Colour code, Roto
	Colour
	T / PVC: sash rebate width A: sash width
	T / PVC: sash rebate height A: sash height
	Sash weight
	Component height
	Information
	Length
	Component length
	Material
	Material number
	Number of locking hooks
	Installation type
	Height of locking hook

Symbol	Meaning
	Number of locking cams
	Packaging

1.6 Abbreviations

Abbreviation	Meaning
Lock.	Lockable
CTL	Catalogue
T&T	Tilt&Turn
BS	Backset
SW	Sash width
SRW	Sash rebate width
SRH	Sash rebate height
S.kg	Sash weight
SH	Sash height
IMO	Installation instructions
kg	Kilograms
Max.	Maximum
Min.	Minimum
mm	Millimetres
Nm	Torque
Not sh.	Not shown
WAF	Width across flats (wrench size)
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, carboic 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.

1.12 Certifications

1.12.1 Environmental management

Roto Frank Fenster- und Türtechnologie GmbH, based in Leinfelden, provides proof of environmental awareness with certification in accordance with DIN EN ISO 14001.

Roto takes into consideration the environmental compatibility of products and procedures which conserve resources right from the beginning, during development, design, planning, production and logistics.

The certification underlines the environmental awareness at Roto:

- Roto works towards health and safety at the workplace, accident prevention and system safety as its fundamental goal when it comes to occupational safety.
- Roto views environmental protection as an integral part of all its business activities and decisions. The company is shaped by its environmentally conscious behaviour, the environmental compatibility of its products and procedures, as well as the preservation of existing resources.
- The long service life of Roto products also contributes to the preservation of existing resources.

  	<div><h1>ZERTIFIKAT</h1></div> <p>Hiermit wird bescheinigt, dass</p> <div>Roto Frank Fenster- und Türtechnologie GmbH Zentrale Wilhelm-Frank-Platz 1 70771 Leinfelden-Echterdingen Deutschland</div> <p>mit den im Anhang gelisteten Standorten</p> <p>ein Umweltmanagementsystem eingeführt hat und anwendet.</p> <p>Geltungsbereich: Entwicklung/Konstruktion, Herstellung und Vertrieb von Fenster- und Türtechnologie</p> <p>Durch ein Audit, dokumentiert in einem Bericht, wurde der Nachweis erbracht, dass das Managementsystem die Forderungen des folgenden Regelwerks erfüllt:</p> <h2>ISO 14001 : 2015</h2> <table><tr><td>Zertifikat-Registrier-Nr.</td><td>059808 UM15</td></tr><tr><td>Revisionsdatum</td><td>2019-06-11</td></tr><tr><td>Gültig ab</td><td>2018-04-14</td></tr><tr><td>Gültig bis</td><td>2021-04-13</td></tr><tr><td>Zertifizierungsdatum</td><td>2019-06-11</td></tr></table> <div> </div> <div>DQS GmbH  Markus Bleher Geschäftsführer</div> <p>Akkreditierte Stelle: DQS GmbH, August-Schanz-Straße 21, 60433 Frankfurt am Main</p> <p>1 / 2</p>	Zertifikat-Registrier-Nr.	059808 UM15	Revisionsdatum	2019-06-11	Gültig ab	2018-04-14	Gültig bis	2021-04-13	Zertifizierungsdatum	2019-06-11
Zertifikat-Registrier-Nr.	059808 UM15										
Revisionsdatum	2019-06-11										
Gültig ab	2018-04-14										
Gültig bis	2021-04-13										
Zertifizierungsdatum	2019-06-11										

1.12.2 Quality management

The certification in accordance with the international standard DIN EN ISO 9001 certifies that Roto plans, documents and appropriately implements the entire development, production and sales process systematically. Starting with development and design through to quality planning, production and assembly right through to sales and customer service.

The certification is an external indication of the quality awareness practised at Roto:

- Roto's objective is to ensure continuous product and service improvements for the benefit of its customers.
- Roto offers its customers innovative, environmentally friendly and technically sophisticated architectural hardware technology.
- Roto products are supplied punctually worldwide with constant guaranteed quality.
- Roto's comprehensive view regards all business activities – including all the activities within the company – to be the key to achieving long-term corporate success.
- Roto employees are supported in their personal development and fulfil Roto's high quality requirements in their day-to-day work. Their work is performance and goal-oriented.

  	<h1>ZERTIFIKAT</h1>		
	Hiermit wird bescheinigt, dass		
		Roto Frank Fenster- und Türtechnologie GmbH Zentrale Wilhelm-Frank-Platz 1 70771 Leinfelden-Echterdingen Deutschland	
	mit den im Anhang gelisteten Standorten		
	ein Qualitätsmanagementsystem eingeführt hat und anwendet.		
	Geltungsbereich: Entwicklung/Konstruktion, Herstellung und Vertrieb von Fenster- und Türtechnologie		
	Durch ein Audit, dokumentiert in einem Bericht, wurde der Nachweis erbracht, dass das Managementsystem die Forderungen des folgenden Regelwerks erfüllt:		
	ISO 9001 : 2015		
	Zertifikat-Registrier-Nr.	059808 QM15	 
	Revisionsdatum	2019-06-11	
Gültig ab	2018-05-18		
Gültig bis	2021-05-17		
Zertifizierungsdatum	2019-06-11		
DQS GmbH			
			
Markus Bleher Geschäftsführer			
Akkreditierte Stelle: DQS GmbH, August-Schanz-Straße 21, 60433 Frankfurt am Main			

1.12.3 International Technology Centre (ITC)

Roto has owned a modern International Technology Centre (ITC) at its Leinfelden headquarters since October 1996. This facility is available for both our own material and product testing as well as for inspecting finished products made by Roto market partners.



The ITC is accredited in accordance with DIN EN ISO / IEC 17025 and has the expertise required to perform tests in areas including mechanical technological testing of facade elements such as windows, doors and hardware, as well as metallic materials.

Achieving accreditation in accordance with DIN EN ISO / IEC 17025 represents the highest distinction for a test institute in the private sector. The requirements for this are an extensive quality management system, trained personnel, high-quality test rigs and measuring instruments, as well as continuous external monitoring by the accreditation authorities.

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 fatal injury!

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.
- ▶ Ensure that the sash coverage at the top is so large that the sash is prevented from falling out, even if the window or hardware components is / are operated incorrectly.



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 of any kind can be made on account of damage resulting from failure to comply with the stipulated use.

2.4.1 Misuse

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



WARNING

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.
- ▶ Only use hardware components with the required materials and track shapes.
- ▶ Always have installation performed by a specialist company.



- ▶ Through sufficient sash coverage, the window manufacturer must ensure that the sash cannot fall out, even if the window or hardware components is / are operated incorrectly.

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.

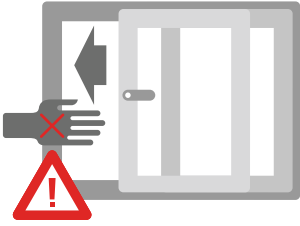
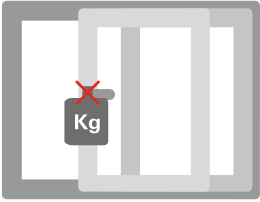
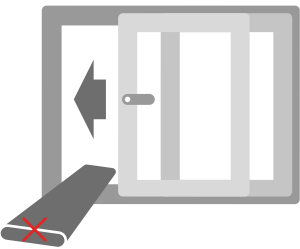
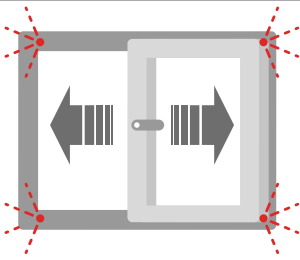
- ▶ Avoid preventing the circulation of air (e.g. due to deep reveals, curtains and unfavourable positioning of heaters or the like).
- ▶ Intensively air out the room several times per day.
Open all windows and balcony doors for approximately 15 minutes so that the air in the room can be completely replaced.
- ▶ 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
	<p>Falls from open windows and balcony doors present an immediate risk of death and pose the risk of serious injuries.</p> <p>Take care when in the vicinity of open windows and balcony doors.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Trapping body parts in the opening between sash and frame may lead to serious injuries.</p> <p>When closing windows and balcony doors, never grip between the sash and frame and always exercise caution.</p> <p>Keep children and anyone unable to understand the risks away from the hazardous area.</p>
	<p>Placing additional loads on the sash may lead to minor injuries and property damage.</p> <p>Do not place additional loads on windows and balcony door sashes.</p>
	<p>Introducing obstacles into the opening between sash and frame may result in minor injuries and property damage.</p> <p>Do not introduce any obstacles in the opening area between the frame and window or balcony door sashes.</p>
	<p>Opening and closing the sash in an uncontrolled manner may result in minor injuries and property damage.</p> <p>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.</p>

3 Information on the product

3.1 General hardware characteristics

- Narrow profile views possible.
- Modular sliding system for all profile materials.
- Profiled faceplate for greater stability and an attractive appearance.
- Precise design of the internal components reliably ensures outstanding running properties.
- All surfaces are treated with Roto Sil – a silver-coloured coating.

Single-action espagnolettes

- Anti-jemmy device integrated as standard.
- Simple installation thanks to the one-part assembly and centre fixing.

Reverse-action espagnolettes

- Reverse-action multipoint locking system for additional security.
- Extensions with centre fixing.

3.2 Application ranges

- SRW / SW: max. 2000 mm
- SRH / SH: max. 2900 mm
- S.kg: max. 200 kg
- Faceplate width 16 mm
- Euro-groove depth at least 5 mm
- Backsets of 7, 17 or 22 mm are available.
- 2- to 4-point security
- Striker strip or individual strikers
- Striker strips can only be combined with hooks.
- Sash arrangement according to diagrams A, C and D
- For handles with 90° lock-in position
- Operating range -20 °C to +50 °C

Single-action espagnolettes

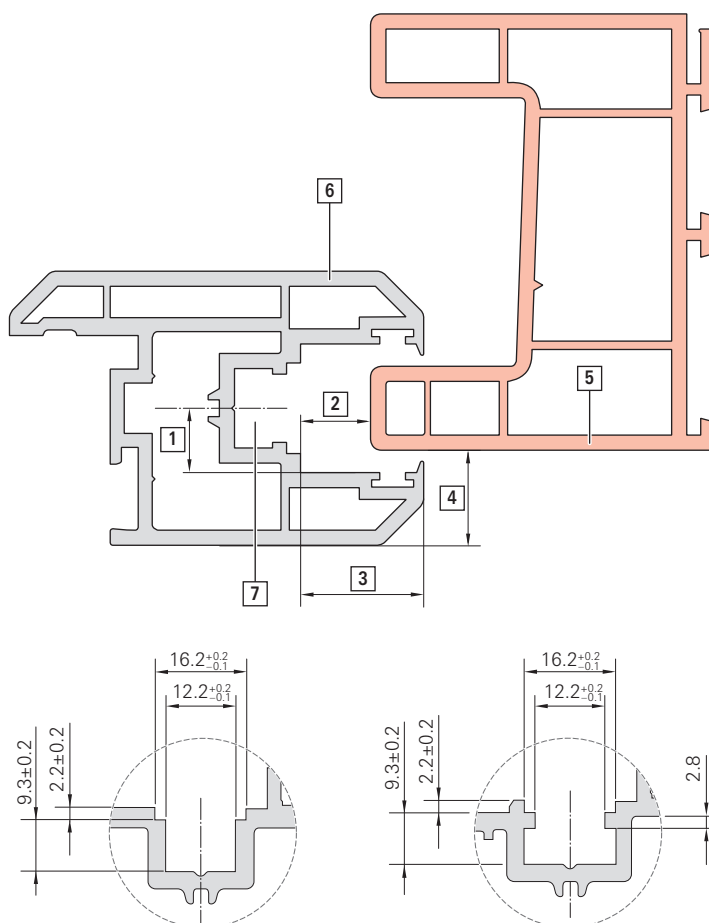
- Seven different espagnolette lengths from 240 to 1800 mm (not lockable and lockable)
- Various locking point options:
 - 8 mm cam (adjustable)
 - 5, 8, or 14 mm hook

Reverse-action espagnolettes

- All gearboxes can be combined with all extensions (three sizes).
- Various locking point options:
 - Claw
 - 5, 8, or 14 mm hook



3.3 Descriptions on the sliding element and recommendation for the profile dimensioning



- [1] Axis dimension
- [2] Rebate clearance
- [3] Overlap width
- [4] Overlap height
- [5] Frame
- [6] Sash
- [7] Sash groove

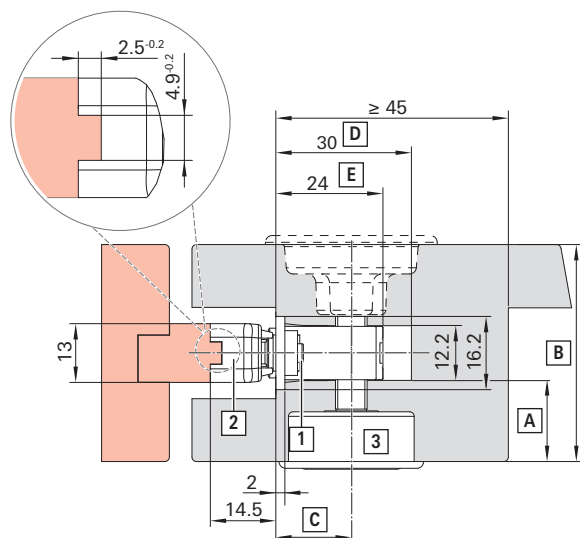
3.4 Profile cross sections

The following drawings show the fundamental requirements that a profile has to meet in order to be compatible with the Roto Inline hardware system.

3.4.1 Horizontal cross section

3.4.1.1 Timber / PVC

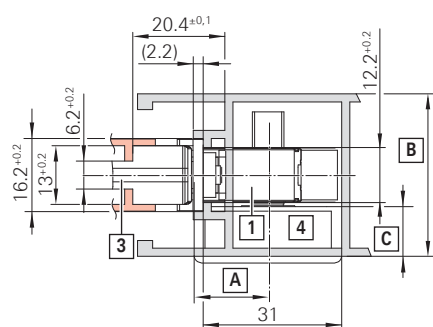
12 mm groove without spacer



Assignment	Meaning	
[1]	Single-action espagnolette with cam	→ from page 40
[2]	Striker / striker strip	→ from page 53
[3]	Pop-up handle / Roto Line sliding handle	→ CTL_1
[A]	Backset	
[B]	Space requirement for recessed grip > 48 mm	
[C]	Space requirement for pop-up handle > 8 mm	
[D]	Espagnolette, lockable	
[E]	Espagnolette, not lockable	

3.4.1.2 Aluminium

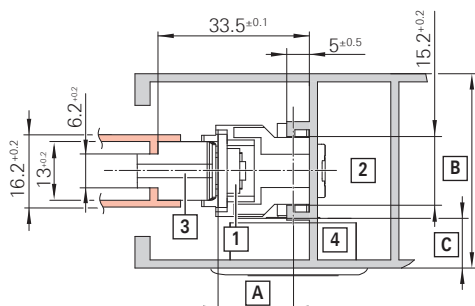
12 mm groove without spacer



Assignment	Meaning	
[1]	Single-action espagnolette with cam	→ from page 40
[3]	Striker / striker strip	→ from page 53
[4]	Pop-up handle / Roto Line sliding handle	→ CTL_1
[A]	Backset	
[B]	Profile width > 36 mm	

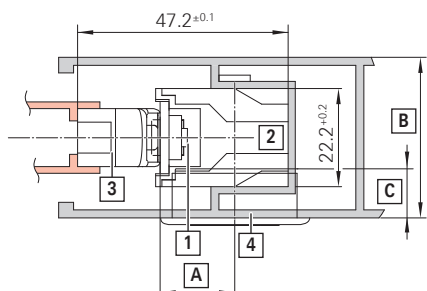
Assignment	Meaning
[C]	Space requirement for pop-up handle > 8 mm

15 mm groove with spacer



Assignment	Meaning	
[1]	Single-action espagnolette with cam	→ from page 40
[2]	Spacer set S006	→ from page 56
[3]	Striker / striker strip	→ from page 53
[4]	Pop-up handle / Roto Line sliding handle	→ CTL_1
[A]	Backset	
[B]	Profile width > 43 mm	
[C]	Space requirement for pop-up handle > 8 mm	

22 mm Lift&Slide standard groove with spacer

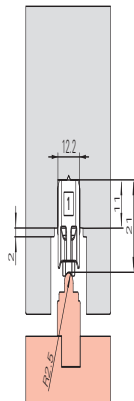


Assignment	Meaning	
[1]	Single-action espagnolette with cam	→ from page 40
[2]	Spacer set S008	→ from page 56
[3]	Striker / striker strip	→ from page 53
[4]	Pop-up handle / Roto Line sliding handle	→ CTL_1
[A]	Backset	
[B]	Profile width > 36 mm	
[C]	Space requirement for pop-up handle > 8 mm	

3.4.2 Vertical cross section

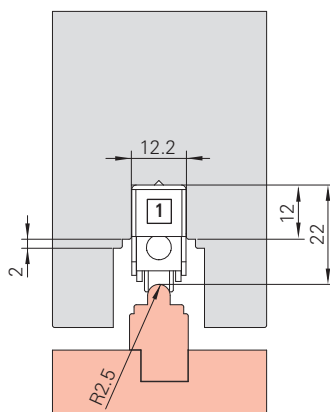
3.4.2.1 Timber / PVC

12 mm groove for single roller unit (50 kg)



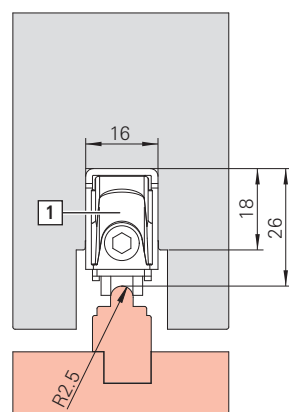
Assignment	Meaning	
[1]	50 kg single roller unit	→ from page 50

12 mm groove for tandem roller unit (120 kg)



Assignment	Meaning	
[1]	120 kg tandem roller unit	→ from page 50

16 mm groove for tandem roller unit (200 kg)

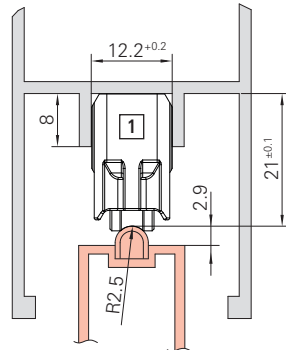




Assignment	Meaning	
[1]	200 kg tandem roller unit	→ from page 50

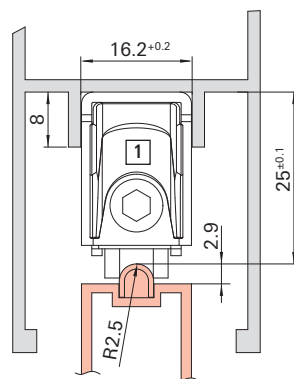
3.4.2.2 Aluminium

12 mm groove for single roller unit (50 kg) and tandem roller unit (120 kg)



Assignment	Meaning	
[1]	50 kg single roller unit	→ from page 50
	120 kg tandem roller unit	→ from page 50

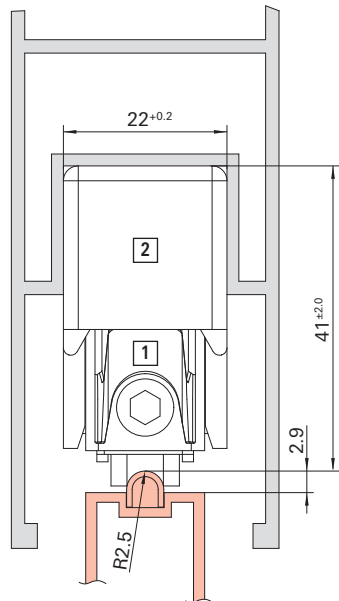
16 mm groove for tandem roller unit (200 kg)



Assignment	Meaning	
[1]	200 kg tandem roller unit	→ from page 50



22 mm Lift&Slide standard groove for tandem roller unit (200 kg)



Assignment	Meaning	
[1]	200 kg tandem roller unit	→ from page 50
[2]	Packers	→ from page 51

3.5 Profile assessment

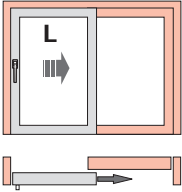
Roto generally recommends carrying out profile assessments in the form of theoretical and practical tests. Roto customer service can assist with this upon request.

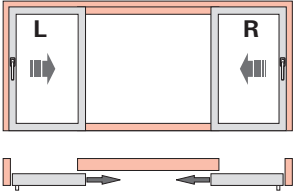
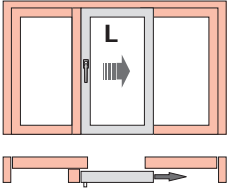
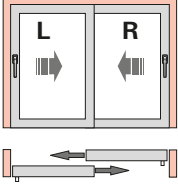
3.6 Design variants

3.6.1 Note regarding the design variants

Combinations for constructing the hardware are assigned to the following diagrams.
These combinations can be built in L and R.

3.6.2 Diagram A

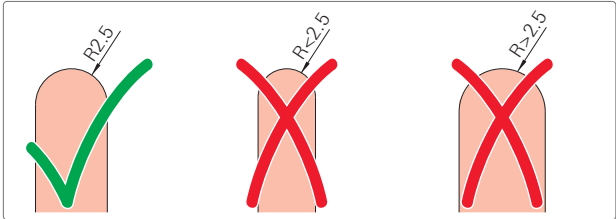
Combinations	Further description
 1 sliding sash (left or right) 1 fixed glazing element	Diagram A

Combinations	Further description
 <p>2 sliding sashes (left and right) 1 fixed glazing element</p>	Diagram K
 <p>1 sliding sash (left or right) 2 fixed glazing elements</p>	Diagram G
 <p>2 sliding sashes (left and right)</p>	Diagram D

3.7 Dimensions of the roller track



INFO
Roller track only made from stainless steel or anodised aluminium.



Roller track shape



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:

- the width of the element
- the height of the element
- the weight of the element
- the profile system
- the design variant



INFO

Profile properties

Design the profile optimally for the corresponding weights. Proper load transfer must be ensured by the profile manufacturer / fabricator.

Ensure that the rollers on the roller track run smoothly. Keep the roller track clean, do not powder coat or paint it.

The currently valid Roto profile assessment drawing for the specific profile and the applicable documents described in said drawing must be observed.

Please request these details from your responsible Roto sales representative.

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.

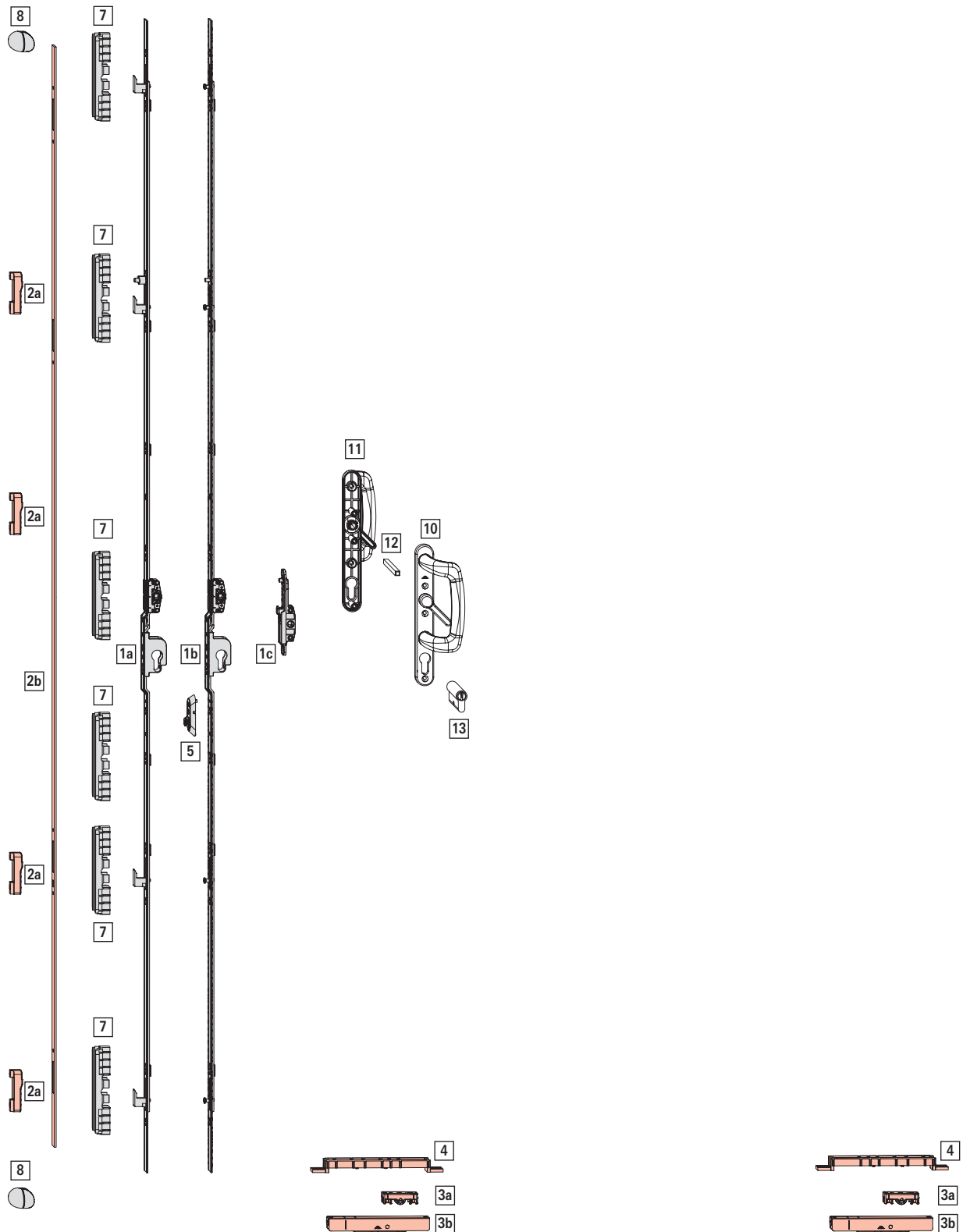


www.roto-frank.com



4.1 Diagram A

4.1.1 Single-action espagnolettes





Application range

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

Timber / PVC

Sash rebate width **SRW**: 500 - 2000 mm

Sash rebate height **SRH**: 1000 - 2500 mm

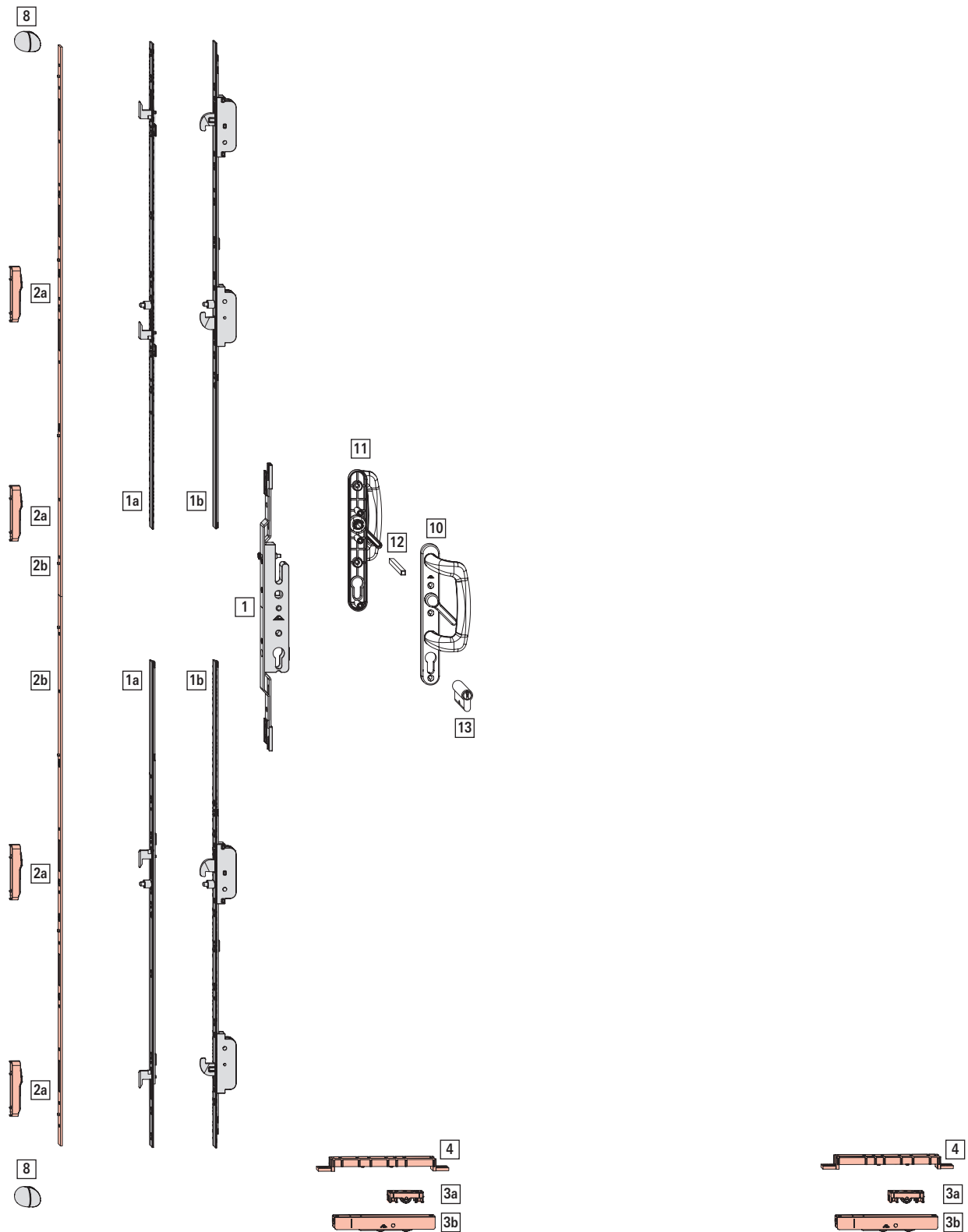
Aluminium

Sash width **SW**: 500 - 2000 mm

Sash height **SH**: 1000 - 2500 mm

Item	Description	
Espagnolette		
[1a]	with hook	→ from page 40
[1b]	with cam	→ from page 40
[1c]	with single-point locking	→ from page 41
Locking components		
[2a]	Strikers, smooth / with locating aid	→ from page 53
[2b]	Striker strip, one-part	→ from page 55
Roller unit		
[3a]	Single	→ from page 50
[3b]	Tandem	→ from page 50
[4]	Packer for roller unit	→ from page 51
Handles		
[10]	Interior handle: Roto Line sliding handle / Roto Freestyle pop-up	→ CTL_1
[11]	Exterior handle: Roto Line sliding handle	
[12]	Accessory box with square spindle	
[13]	Profile cylinder	→ CTL_86
Accessories		
[5]	Mishandling device	→ from page 56
[7]	Spacers for espagnolette	→ from page 56
[8]	Stop part set Alternatively: buffer	→ from page 57

4.1.2 Reverse-action espagnolettes





Application range

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

Timber / PVC

Sash rebate width **SRW**: 500 - 2000 mm

Sash rebate height **SRH**: 1000 - 2900 mm

Aluminium

Sash width **SW**: 500 - 2000 mm

Sash height **SH**: 1000 - 2900 mm

Item	Description	
Espagnolette		
[1]	Gearbox	→ from page 44
[1a]	Extension with hook	→ from page 45
[1b]	Extension with claw	→ from page 46
Locking components		
[2a]	Strikers with locating aid	→ from page 53
[2b]	Striker strip, one-part	→ from page 55
Roller unit		
[3a]	Single	→ from page 50
[3b]	Tandem	→ from page 50
[4]	Packer for roller unit	→ from page 51
Handles		
[10]	Interior handle: Roto Line sliding handle / Roto Freestyle pop-up	→ CTL_1
[11]	Exterior handle: Roto Line sliding handle	
[12]	Accessory box with square spindle	
[13]	Profile cylinder	→ CTL_86
Accessories		
[8]	Stop part set Alternatively: buffer	→ from page 57
Not sh.	Spacers for espagnolette	→ from page 56

5 Espagnolettes

5.1 Single-action

5.1.1 with hook

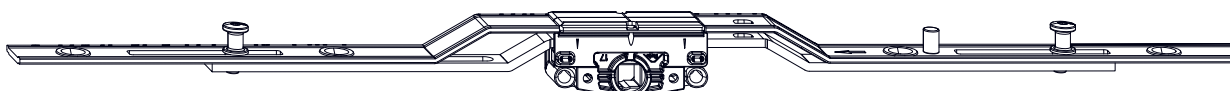
incl. anti-jemmy device



							Nº
17	600 – 1800	600	5	2	N	–	628500
	600 – 1800	600	8	2	N	–	2010017
	600 – 1800	600	14	2	N	–	628503
	1801 – 2500	1800	5	4	N	–	628501
	1801 – 2500	1800		4	Y	–	628502
	1801 – 2500	1800	8	4	N	–	2010015
	1801 – 2500	1800		4	Y	Cylinder below handle	2010016
	1801 – 2500	1800	14	4	N	–	628504
	1801 – 2500	1800		4	Y	Cylinder below handle	628505
22	600 – 1800	600	8	2	N	–	735173
	600 – 1800	600	14	2	N	–	628507
	1801 – 2500	1800	8	4	N	–	735174
	1801 – 2500	1800		4	Y	Cylinder below handle	735185
	1801 – 2500	1800	14	4	N	–	628508

5.1.2 with cam

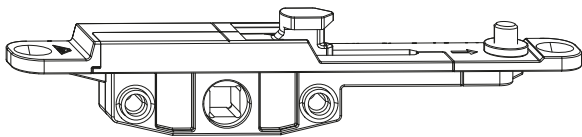
incl. anti-jemmy device



						Nº
7	400 – 600	400	2	N	–	628429
	601 – 800	600	2	N	–	628430
	801 – 1000	800	2	N	–	628431
	1001 – 1200	1000	3	N	–	628432
	1201 – 1800	1200	3	N	–	628433
	1801 – 2500	1800	4	N	–	628434
15	2181 – 2900	2180	4	N	–	782010
17	240 – 400	240	2	N	–	628482
	401 – 600	400	2	N	–	628483
	601 – 800	600	2	N	–	628484
	801 – 1000	800	2	N	–	628495
	1001 – 1200	1000	3	N	–	628496
	1201 – 1800	1200	3	N	–	628497
	1801 – 2500	1800	4	N	–	628498
			4	Y	Cylinder below handle	628499
			4	Y	Cylinder above handle	772745



5.1.3 Single-point locking



10	300 – 600	134	1	N	765437

5.1.4 Travel restrictor



INFO
Travel restrictor can only be combined with single-action espagnolettes with a BS 15 cam.

T&T espagnolette limited to 90°	Handle movement limited to 90°	RAL 7004	Signal grey	566832

5.1.5 Extensions

5.1.5.1 with cam

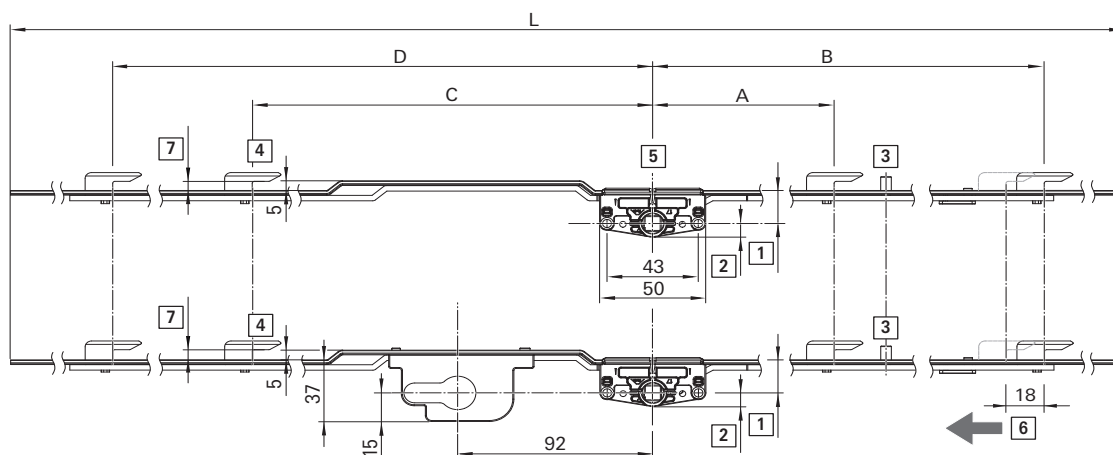


400	1	639957

5.1.6 Detailed dimensions

Locking points in closed position

5.1.6.1 Single-action espagnolette with hook

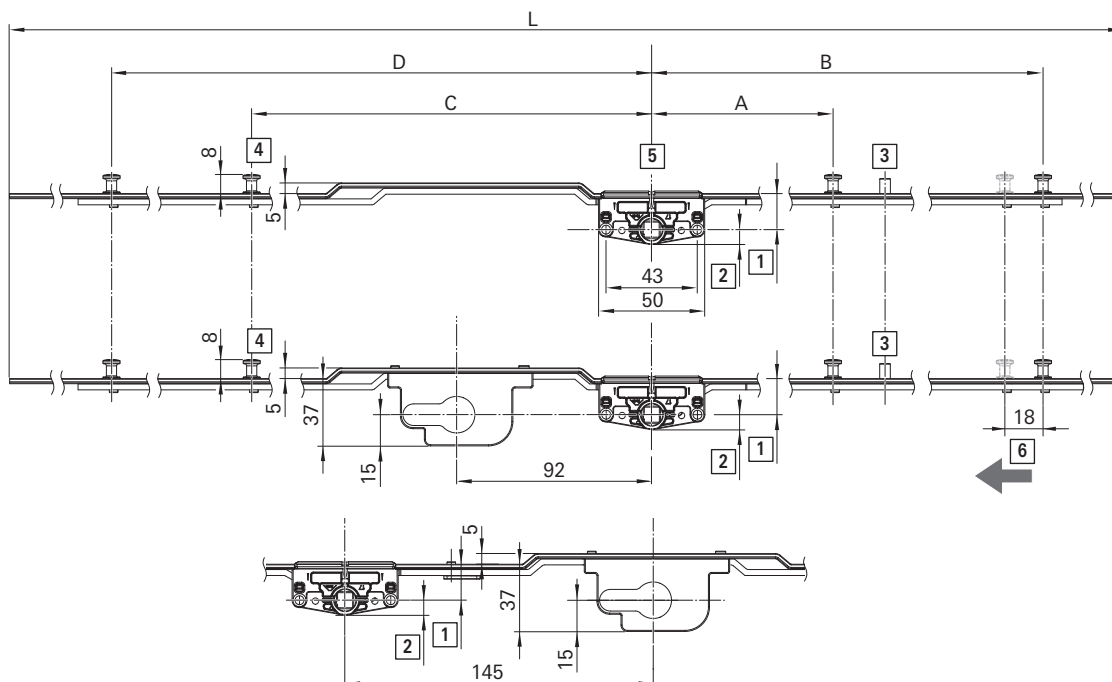


Assignment	Meaning
[1]	Backset (BS)
[2]	Rear backset
[3]	Anti-jemmy device
[4]	Hook
[5]	Centre of square spindle
[6]	Travel
[7]	Hook height

SRH	[L]	[A]	[B]	[C]	[D]
600 – 1800	600	–	250	–	220
1801 – 2500	1800	473	818	423	767



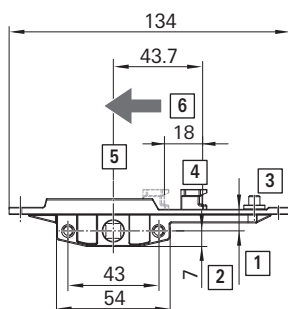
5.1.6.2 Single-action espagnolette with cam



Assignment	Meaning
[1]	Backset (BS)
[2]	Rear backset
[3]	Anti-jimmy device
[4]	Cam
[5]	Centre of square spindle
[6]	Travel ^[1]

SRH	[L]	[A]	[B]	[C]	[D]
240 – 400	240	–	91	–	69
400 – 600	400	–	146	–	124
601 – 800	600	–	246	–	224
801 – 1000	800	–	346	–	324
1001 – 1800	1000	131	446	–	424
1201 – 1800	1200	131	546	–	524
1801 – 2500	1800	469	814	427	771

5.1.6.3 Single-action espagnolette with single-point locking



Assignment	Meaning
[1]	Backset (BS)
[2]	Rear backset
[3]	Anti-jimmy device

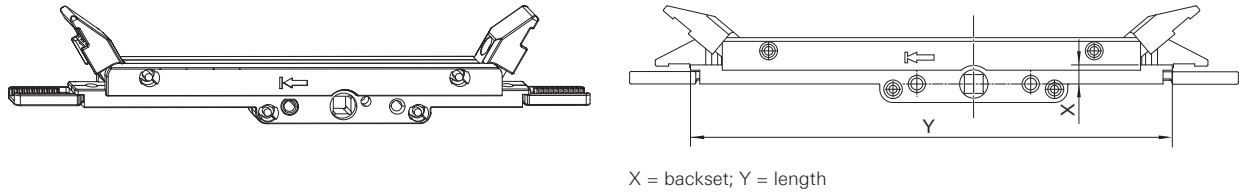
[1] 18 mm travel applies to all espagnolettes. Double the travel is possible for espagnolettes with BS 15 (180° handle rotation). Use a travel restrictor to limit the travel.

Assignment	Meaning
[4]	Deadbolt
[5]	Centre of square spindle
[6]	Travel

5.2 Reverse-action

5.2.1 Gearboxes

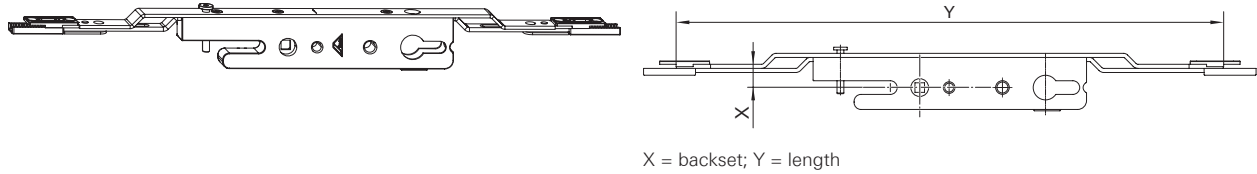
5.2.1.1 Not lockable



		Nº
7	182	334587
20	140	387923

5.2.1.2 Lockable

without mishandling device (tallow-drop screw – preassembled) or with mishandling device (flat-headed screw)



			Nº
17	400	Round cylinders	387934
22	400	Round cylinders	313930

Spacer for reverse-action espagnolette, lockable



		Nº
Spacer	for 9 mm Euro-groove	253341



5.2.2 Extensions

5.2.2.1 with hook

without anti-jemmy device



				Nº
5	1	390	129	629346
		560	129	637348
	2	560	129	629347
		760	129	629348
14	1	390	129	836484
	2	560	129	836585

Application range

depending on the gearbox length	Application range	Length of extension
		
140	660 – 999	390
	1000 – 1399	560
	1400 – 2500	760
182	702 – 1041	390
	1042 – 1441	560
	1442 – 2500	760
400	920 – 1259	390
	1260 – 1659	560
	1660 – 2500	760

incl. anti-jemmy device



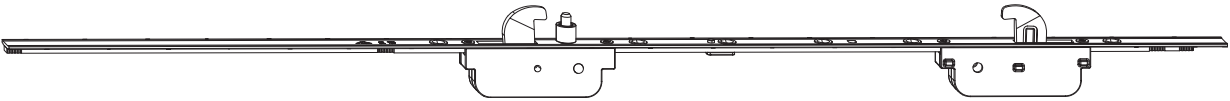
				Nº
5	2	760	129	738982
14	2			629304

Application range

depending on the gearbox length	Application range
	
140	1400 – 2500
182	1442 – 2500
400	1660 – 2500

5.2.2.2 with claw

incl. anti-jemmy device



			Nº
2 claws	760	217	629419

Application range

depending on the gearbox length	Application range
	
140	1226 – 2900
400	1468 – 2900



5.2.3 Detailed dimensions

Locking points in closed position

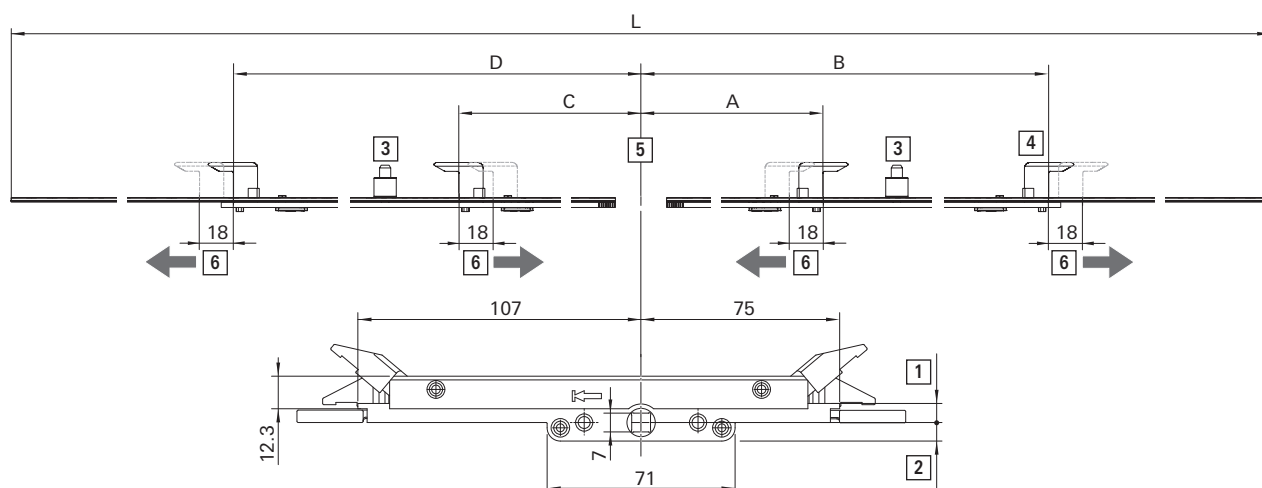
5.2.3.1 Gearbox, not lockable



INFO

The dimensions given refer to the original dimensions of the extensions → *from page 45*. If the extensions are cropped, the dimensions are reduced by the same value.

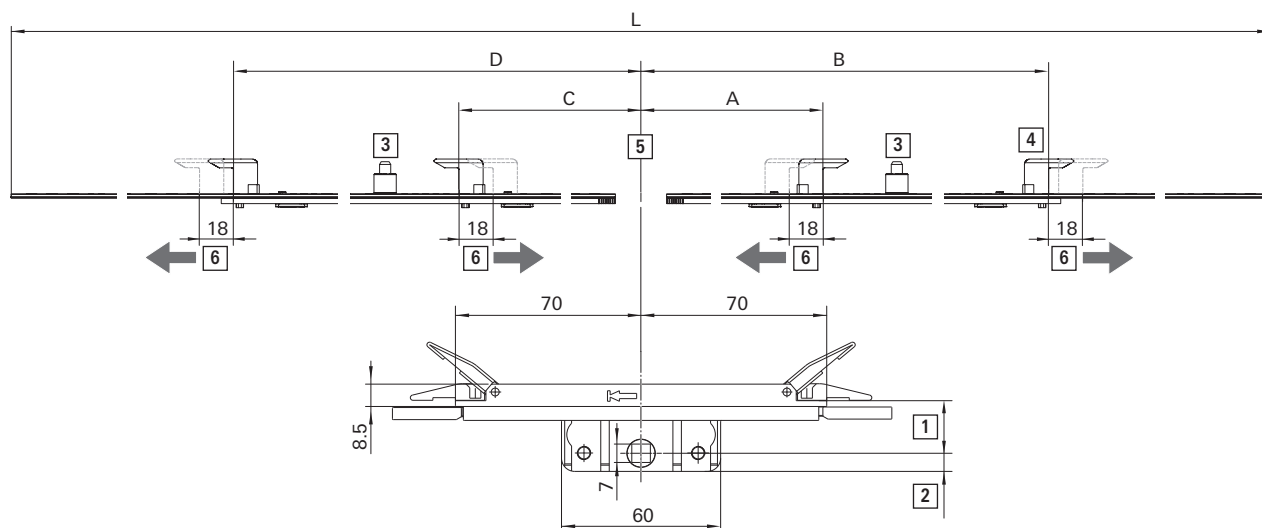
for BS 7



Assignment	Meaning
[1]	Backset (BS)
[2]	Rear backset
[3]	Anti-jimmy device
[4]	Hook
[5]	Centre of square spindle
[6]	Travel

Length of extension	[L]	[A]	[B]	[C]	[D]
390	960	402	–	434	–
560	1300	402	581	434	613
760	1700	402	747	434	779

for BS 20 and BS 22



Assignment	Meaning
[1]	Backset (BS)
[2]	Rear backset
[3]	Anti-jimmy device
[4]	Hook
[5]	Centre of square spindle
[6]	Travel

Length of extension	[L]	[A]	[B]	[C]	[D]
390	918	397	–	397	–
560	1258	397	576	397	576
760	1658	397	742	397	742



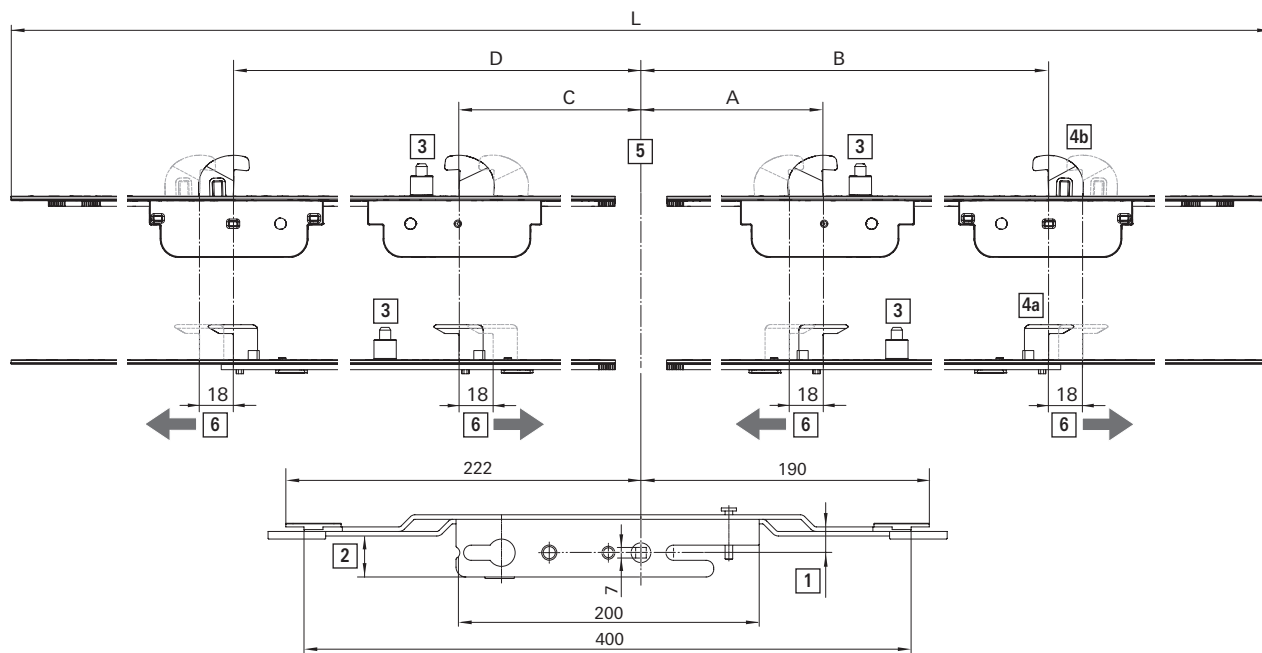
5.2.3.2 Gearbox, lockable



INFO

The dimensions given refer to the original dimensions of the extensions → *from page 45*. If the extensions are cropped, the dimensions are reduced by the same value.

for BS 17 and BS 22



Assignment	Meaning
[1]	Backset (BS)
[2]	Lock casing depth
[3]	Anti-jimmy device
[4a]	Hook
[4b]	Claw
[5]	Centre of square spindle
[6]	Travel

with hook

Length of extension	[L]	[A]	[B]	[C]	[D]
390	1178	529	–	529	–
560	1518	529	708	529	708
760	1918	529	874	529	874

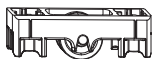
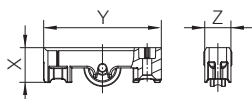
with claw

Length of extension	[L]	[A]	[B]	[C]	[D]
760	1920	530	830	530	830

6 Roller unit

6.1 Single – fixed height

PVC body with ball bearing



X = height

Y = length

Z = width

					Nº
17	54	12.8	For R2.5 round track	max. 50 kg	637616
21	54	12.8	For R2.5 round track	max. 50 kg	637617
21.3	124	19.4	For 170° V track	max. 40 kg	739954



INFO

Functional durability in accordance with DIN EN 13126 part 15: class H3.

Corrosion resistance in accordance with DIN EN 1670: class 4.

6.2 Tandem – adjustable height

Steel body with ball bearing



X = height

Y = length

Z = width

Height 17 to 19.5 mm (delivery state 17 mm)

				Nº
159	12	For R2.5 round track	100 kg	765294

Height 19.9 to 26 mm (delivery state 22.5 mm)

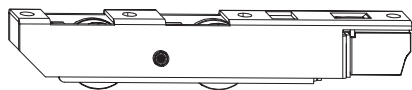
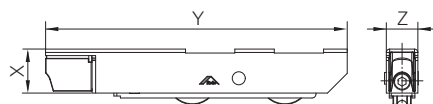
				Nº
134	19	For 170° V track	80 kg	740055
157	12	For R2.5 round track	120 kg	615951
		For 150° V track	120 kg	639325
	14	For R2.5 round track	120 kg	622876



INFO

Functional durability in accordance with DIN EN 13126 part 15: class H3.

Corrosion resistance in accordance with DIN EN 1670: class 4.



X = height
Y = length
Z = width

Height 23.5 to 28.5 mm (delivery state 26.0 mm)

				Nº
153	16	For 150° V track	200 kg	2021438
		For R2.5 round track	200 kg	603430

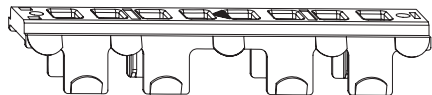
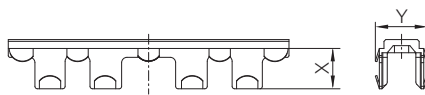


INFO

Functional durability in accordance with DIN EN 13126 part 15: class H3.
Corrosion resistance in accordance with DIN EN 1670: class 4.

6.3 Packer set

6.3.1 Variable width

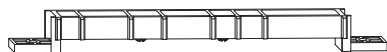
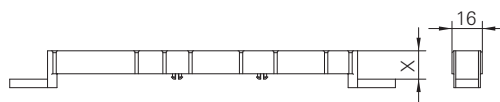


X = height
Y = width

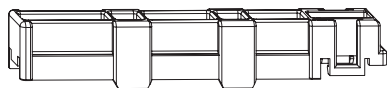
Packer set, consisting of: 2 packers

				Nº
27 – 29	23	For 50 kg single roller units / 120 kg tandem roller units	Aluminium	763249
		For 200 kg tandem roller units	Aluminium	2000154
	27	For 50 kg single roller units / 120 kg tandem roller units	Aluminium	642371
	28	For 200 kg tandem roller units	Aluminium	642370

6.3.2 Fixed width



X = height



Packer set, consisting of: 2 packers, 4 screws

				Nº
16	3	For 200 kg tandem roller units	Timber PVC	603535
	6.5	For 200 kg tandem roller units	Timber PVC	603434
	12.5	For 200 kg tandem roller units	Timber PVC	603431
	14.5	For 200 kg tandem roller units	Timber PVC	603433
	15.5	For 200 kg tandem roller units	Timber PVC	603432
	23	For 200 kg tandem roller units	Timber PVC	621100
	34	For 200 kg tandem roller units	Timber PVC	821320
22	8	For 200 kg tandem roller units	Timber PVC Aluminium	606569
	42	For 200 kg tandem roller units	Timber PVC Aluminium	634505

7 Locking components

7.1 Strikers

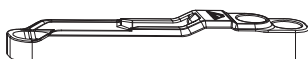
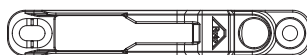
7.1.1 Individual part



INFO

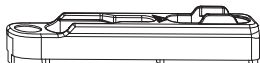
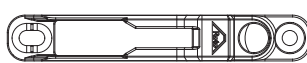
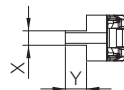
Order strikers depending on the profile used (see profile assessment).

Striker, smooth



					Nº
71.5	9.5	12	–	–	834431
	9.7	13	–	–	642223
	10.1	13	–	–	828192
	12.8	13	–	–	815086
	13.8	13	–	–	629561
	14.7	13	–	–	779513
	18	13	–	–	617133
86	12	12	–	–	629551
	12	13	–	–	629556
	12.7	12	–	–	771377
	13.3	11.6	–	–	634442
	13.9	13	–	–	823145
	18	13	–	–	629557
105	14	13	–	–	483605

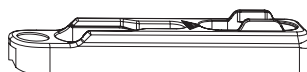
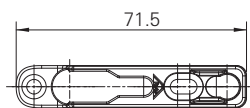
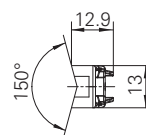
Striker with locating aid



					Nº
64	12.7	13	X = 3.0; Y = 6.0	–	771376
	13	13	X = 5.3; Y = 5.0	–	629552
		13	X = 6.2; Y = 5.0	–	629560
	15	13	X = 3.5; Y = 3.0	Left	629554
		13	X = 3.5; Y = 3.0	Right	629555
86	10	13	X = 5.8; Y = 4.0	–	630778
	10.3	13	X = 5.0; Y = 4.7	–	629558
	12	13	X = 4.1; Y = 6.0	–	629553
	12.9	13	X = 5.0; Y = 2.1	–	771532
	13.5	13	X = 3.6; Y = 3.5	Left	895005
		13	X = 3.6; Y = 3.5	Right	895004
	14	13	X = 4.0; Y = 4.0	–	798967
	15.5	13	X = 4.0; Y = 2.5	–	629559
	16	13	X = 5.0; Y = 2.0	–	641307

					Nº
105	8.6	13	X = 4.9; Y = 4.4	–	812574
	12	13	X = 3.0; Y = 6.0	–	491666
	12.8	13	X = 7.5; Y = 2.9	–	604563
	13	13	X = 5.3; Y = 2.7	–	794923

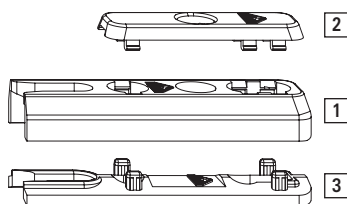
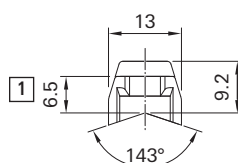
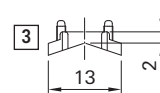
Striker for 150° V track



						Nº
71	13	12.7	without profile leg	Aluminium	–	2009995

7.1.2 Striker set

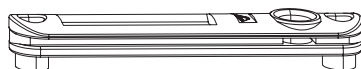
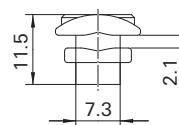
Striker set for 143° / 150° V track



Set consisting of: 2 strikers [1], 2 stop parts [2], 2 spacers [3], 4 screws (not sh.)

						Nº
55	13	8.5	without profile leg	Aluminium	–	478413

Striker set for narrow groove



Set consisting of: 2 strikers, 4 threaded pins (not sh.)

						Nº
80	14	7.9	Aluminium	Clampable	–	564311

7.2 Striker strips

7.2.1 One-part

for single-action espagnolettes



			Nº
9.9	600	without clamping support-strip; without locating aid	629563
	600	with clamping support-strip; without locating aid	629566
	1800	without clamping support-strip; without locating aid	629564
	1800	with clamping support-strip; without locating aid	629567
15.8	1800	without clamping support-strip; without locating aid	629565
19.6	132	without clamping support-strip; with locating aid	385191

7.2.2 Two-part

for reverse-action espagnolettes



INFO

Order two units per sash.



				Nº
15.8	–	960	without clamping support-strip; without locating aid	629569
19.6	129		without clamping support-strip; with locating aid	385189

8 Accessories

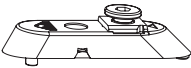
8.1 Mishandling device

for single-action espagnolettes / for extensions with 14 mm hook



INFO

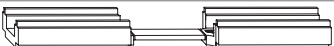
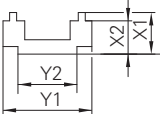
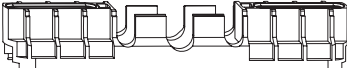
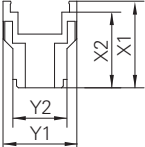
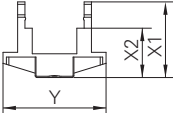
Prevents property damage as the handle cannot be moved to the closed position when the element is open. This prevents the strikers colliding with the hook or cam.



		Nº
Mishandling device	for single-action espagnolettes / for extensions with 14 mm hook	343733

8.2 Spacer set

for single-action espagnolettes

Type	Figure	Dimensional drawing	Set consisting of:
X1 = height; X2 = height up to supporting surface; Y1 = depth; Y2 = depth of offset surface			
Type A			2 spacers 2 screws
Type B			1 spacer 2 screws
Type C			1 spacer 2 screws

Spacer set, type A

							Nº
Type A	for espagnolettes with 7 / 17 backset	9	6.8	20	–	3 Set(s)	478410
		11	8.8	23.5	15.6	3 Set(s)	478411
		13.7	11.5	23.5	15.6	3 Set(s)	478412



Spacer set, type B

								Nº
Type B	for espagnolettes with 17 backset	20.7	18.2	20.2	14.8	3 Set(s)	564313	
		20.7	18.2	20.2	14.8	3 Set(s)	765293	
		23.4	20.9	20.2	14.8	3 Set(s)	564314	
		23.7	20.7	20.2	14.8	5 Set(s)	604566	
	for espagnolettes with 22 backset	29.7	26.7	22	–	5 Set(s)	600608	
	for espagnolettes with 17 / 22 backset	32.8	29.7	22	15.1	5 Set(s)	816840	
		37.6	34.5	22	15	3 Set(s)	765292	

Spacer set, type C

							Nº
Type C	for espagnolettes with 7 / 17 backset	20.7	13.5	28.2	–	5 Set(s)	604564
		22.5	15.3	28.2	–	5 Set(s)	604565

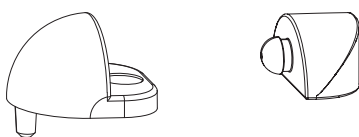
Accessories for spacer set, type A

Figure	Dimensional drawing	Set consisting of:
		1 spacer 1 screw

						Nº
Accessories, type A	5.5	2	28.3	–	6 Set(s)	491665

8.3 Stops

Stop part set



Set consisting of: 1 stop part, 1 rubber part

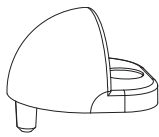


INFO

Screws are not included in the scope of delivery.

				Nº
R04.1	–		Grey brown	317251
R06.2	–		Jet black	335555
R07.2	–		Traffic white	317250
–	RAL 9006		White aluminium	449963
–	RAL 9005		Jet black	834258
R02.1	–		Iron grey	2003087

Stop part for users who intend to paint the component themselves



		Nº
R00.0	Uncoated	317249

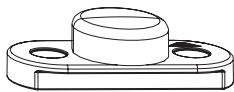
Rubber part



		Nº
R06.2	Jet black	317252

Alternatively

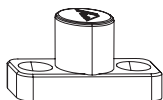
Buffer



	Nº
14	635307

Buffer set with mishandling device

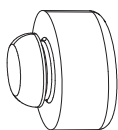
Only for installation in combination with mishandling device → *from page 56.*



Set consisting of: 1 buffer with mishandling device, 2 countersunk self-tapping screws ST3.9 x 19 (not sh.)

	Nº
17.6	600607

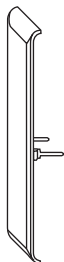
Rubber buffer





		Nº
	16.5	780647
	17.5	798249

8.4 Info clip



				Nº
Without print		R06.2	Jet black	230694
		R07.2	Traffic white	230696
Single-colour print		R06.2	Jet black	230692
		R07.2	Traffic white	230695
		SF	Special colour	230691
Two-colour print		R07.2	Traffic white	230697
		SF	Special colour	264629

For attaching information (e.g. company logo) to the lock casing.



INFO

The info clip is compatible with all single-action espagnolettes.

The following special colours are available:

Colour	RAL colour code
Green	6018
Yellow	1003
Red	2002
Blue	5015



INFO

Additional special colours are available upon request.

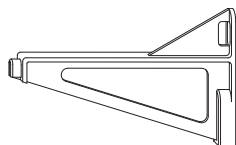


INFO

If an info clip with a single-colour or two-colour print is ordered, please attach the print template in a format of approximately 15 x 40 mm.

9 Jigs / tools

9.1 Striker positioning jig



	Nº
Striker positioning jig	631078

9.2 Hex key

for height adjustment on the roller unit on the espagnolette side

		Nº
Hex key: size 4	150	812337

10 Profile systems



INFO

The profiles shown in the overview are an excerpt from the profile assessments. Other profiles (including those for timber or aluminium) are available upon request.

Abbreviation	Meaning	Abbreviation	Meaning
B	Width	UH	Packer height
DM/VA	Espagnolette backset / locking version Z = with cam; H5/8/14 = with 5/8/14 mm hook	PX	Dimension X for locating aid
H	Height	S	Track R = round track R2.5; V = 150° V track
KS	Clamping support-strip oKS = without clamping support-strip; mKS = with clamping support-strip	■	Suitable
L	Length	–	Not suitable

10.1 PVC

Component selection

Profile system				Espagnolette	Roller unit		Locking components		
				Single-action	Single	Tandem	Strikers	Striker strip	
Manufacturer	Series	Frame profile no.	Sash profile no.	Sash profile no.	H/L/UH	L/B/S/UH	L/H/PX	One-part L/KS	Two-part L/KS
Alphacan	PFS MINI	E 4108	E 4109	7/Z 10/Z	21/54/–	157/12/R/–	71.5/9.5	–	–
aluplast	Duo-rail	100x70	100x72	17/Z	17/54/–	159/12/R/–	86/15.5/4	–	–
	easy-slide	100x69	100x72 100x74	17/Z	17/54/–	157/12/R/– 153/16/R/15.5	71.5/14.7	–	–
	Mono-rail	100x70	100x73	7/Z 10/Z 10/H5	17/54/–	159/12/R/–	71.5/14.7	–	–
	Multi-sliding	100x90 100x92 100x95 100x96 100x97	100x93	17/Z	–	157/12/R/– 153/16/R/12.5	86/14/4	–	–
	vario-slide	100x83	100x86	17/Z	21/54/–	157/12/R/– 153/16/R/15.5	86/14/4	–	–
Cortizo	C-70	14301	14201	17/Z	–	157/12/R/– 153/16/R/23	86/13.9	–	–
Deceuninck	Tecnorcor>2	3450	3460 3465	7/Z	–	159/12/R/– 153/16/R/15.5	105/14	–	–
	iSlide#neo	5483	5460 5461	10/Z 17/Z	–	159/12/R/– 153/16/R/3	105/14	–	–
				17/H14	–	159/12/R/–	–	9.9/oKS	–
	Elegant Monorail	3400	3190	17/H14	–	153/16/R/23	–	19.6/oKS	19.6/oKS
Gealan	Sliding system 48 / 74 mm	5802	5803 5805	7/Z 17/Z	21/54/–	157/12/R/– 159/12/R/– 153/16/R/15.5	86/13.5/3.6	–	–

Profile system				Espagnolette	Roller unit		Locking components		
				Single-action	Single	Tandem	Strikers	Striker strip	
								One-part	Two-part
Manufacturer	Series	Frame profile no.	Sash profile no.	Sash profile no.	H/L/UH	L/B/S/UH	L/H/PX	L/KS	L/KS
KBE Kömmerling Tropical	PremiLine	6052	6041	17/H14	–	157/12/R/–	64/15/3.5	15.8/oKS	–
		6052	6041	17/Z	–	157/12/R/–	64/15/3.5	–	–
		6054				153/16/R/15.5			
	PremiLine 58	2166	2173 2174	10/Z 17/Z	17/54/–	157/12/R/– 153/16/R/14.5	86/12/4.1	–	–
Profialis	Passio 3600	3600	3602	22/H8	–	153/16/R/42	–	9.9/oKS	–
Rehau	High Design Slide	1500086	1500486	17/Z	–	157/12/R/– 153/16/R/15.5	86/12	–	–
	Slinova	1575602	1575302	17/Z	21/54/–	157/12/R/– 153/16/R/–	105/13/5.3	–	–
Salamander	evolutionDrive 60	651020	651010	7/Z	17/54/–	157/12/R/–	71.5/9.5	–	–
		650030	651030	17/Z		159/12/R/–			
		651040				153/16/R/12.5			
		651050							
	evolutionDrive 76	600128	601128	7/Z	21/54/–	157/12/R/–	64/13/6.2	–	–
		600138	601138	17/Z		153/16/R/3			
Schüco	S 74	600128	601128	17/Z	21/54/–	157/12/R/–	–	–	–
		600138	601138						
		885600	885700	17/Z	21/54/–	157/12/R/–	86/12/4.1	–	–
		879900							
		7286	7263 7287	7/Z 17/Z	21/54/–	157/12/R/–	86/12/4.1	–	–
				17/Z	21/54/–	153/16/R/12.5	86/12/4.1	–	–
Tecnocom	Jumbo	11270	11032	17/Z	–	153/16/R/34	64/13/6.2	–	–
	Prime	11250	11031	7/Z	21/54/–	153/16/R/23	64/13/6.2	–	–
				17/Z					
	Advance	11242	11030	7/Z	21/54/–	157/12/R/–	86/12/4.1	–	–
				17/Z		153/16/R/23			
Veka	Ekosol 70	105.351	105.321	7/Z	21/54/–	157/12/R/–	64/13/6.2	–	–
			105.322	10/Z		153/16/R/23			
				17/Z					
	Ekosol 90	105.310	105.312	17/Z	–	157/12/R/– 153/16/R/23	64/13/6.2	–	–
	Softline 58 CD	105.373	105.370	7/Z	17/54/–	157/12/R/–	64/13/6.2	–	–



11 Installation

11.1 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.

Installation surfaces

The frame and sash grooves must be free from construction materials (such as plaster, gypsum). The sash groove must be free from welding residue to ensure an optimum supporting surface for the hardware components.

Specifications relating to installation and care



ATTENTION

Sealing compounds that contain silicone may cause property damage.

Sealing compounds that contain silicone may considerably reduce the sealing effect near the threshold after three to five years.

- Only use silicone-free sealing compounds to seal the threshold.

Remove excess sealing compound after installation.



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.

11.2 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.



11.2.1 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.



WARNING

Incorrect screw connections may pose a risk of death!

Short screws will not reach the steel reinforcement and will therefore not hold.

Hardware components can be pulled out of the sash if they are not screwed into the steel reinforcement.

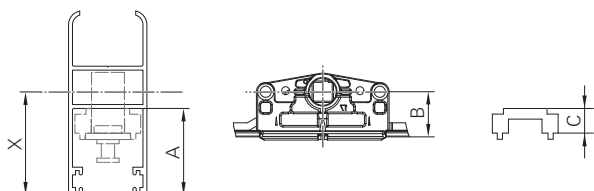
- Select the length of the screws so that they will hold in the steel reinforcement.

Components	Quantity	Size	Diameter to be drilled	Drive	Screw head diameter
Single roller unit	2	ST3.5 x ...	3.0	Not specified	Countersunk screw ≥ 6.9 to ≤ 8.0
Tandem roller unit	2	ST3.5 x ...	3.0	Not specified	≥ 6.9 to ≤ 8.0
Striker	2	ST4.0 x ...	3.0	Not specified	–
Striker strip	4 to 10	ST4.0 x ...	3.0	Not specified	–
Roto Line handle	2	M5 x ...	10.0 / 12.0	Cross-head	–

11.3 Drilling and routing dimensions

11.3.1 Single-action espagnolettes

Calculating the centre position of the square spindle



X = centre of square spindle

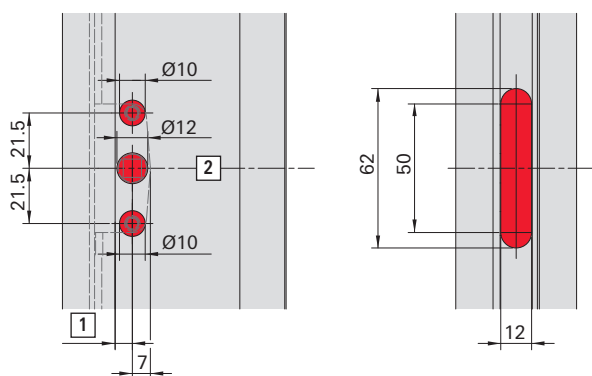
A = sash dimension

B = backset

C = spacer height

$$X = A + B - C$$

Not lockable

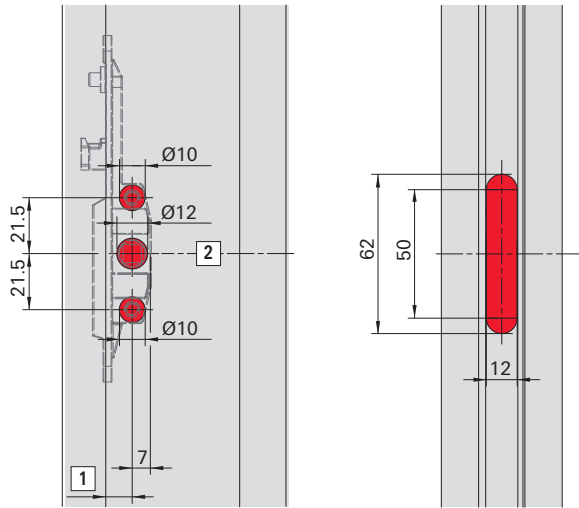


[1] Backset

[2] Centre of square spindle

11.3.2 Single-point locking

Not lockable



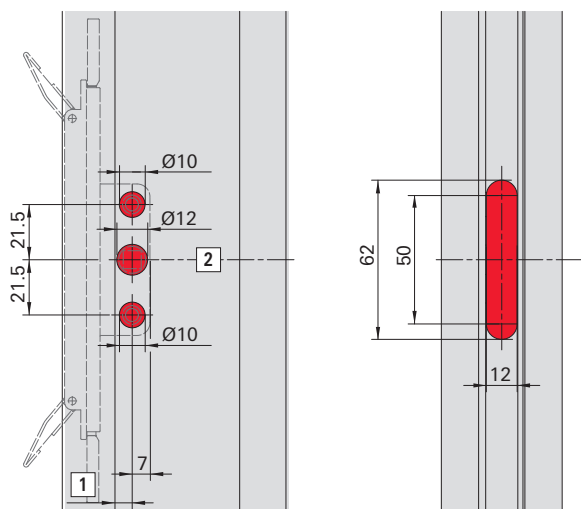
[1] Backset

[2] Centre of square spindle



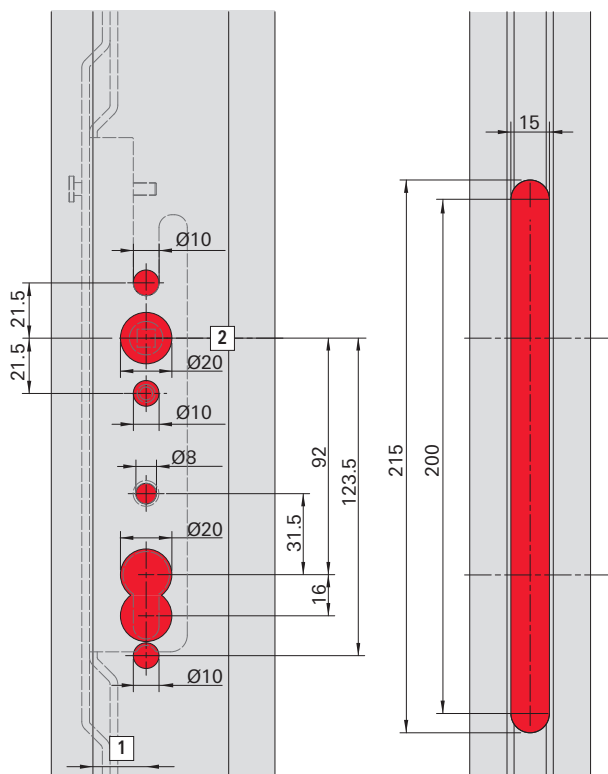
11.3.3 Reverse-action espagnolettes

Not lockable



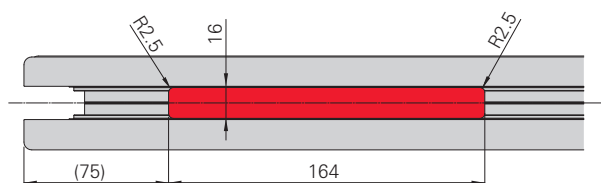
- [1] Backset
- [2] Centre of square spindle

Lockable



- [1] Backset
- [2] Centre of square spindle

11.3.4 Tandem roller unit



11.4 Sash

11.4.1 Roller unit

Positioning glazing blocks

1. Determine the glazing block position (= roller unit position):
 - for single roller unit [1]: $A = B + 132$
 - for tandem roller unit [2]: $A = B + 177$

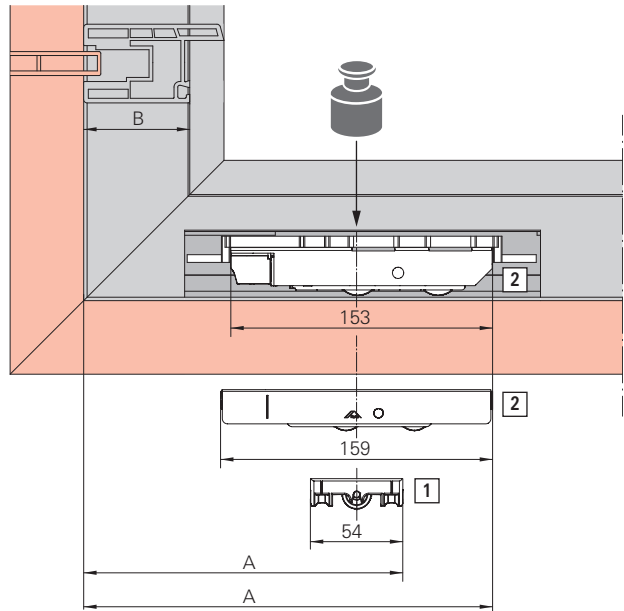
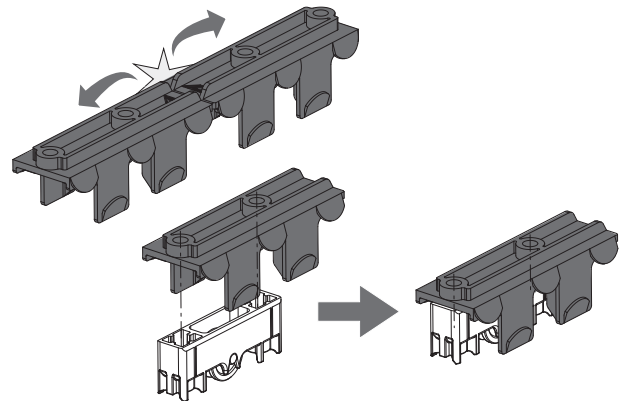


Fig. 11.1: The mullion side is a mirror image of the espagnolette side.

Connecting the packer from the packer set to the roller unit

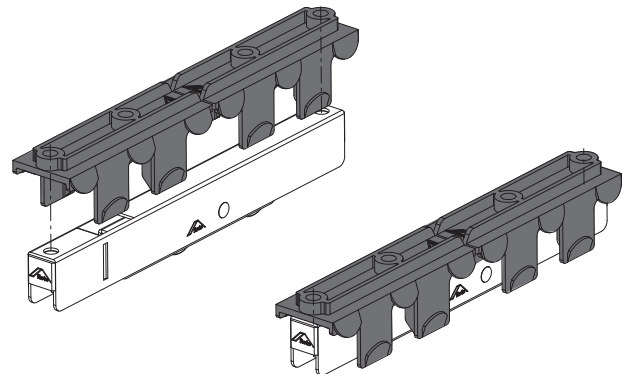
Packer set, variable depth for single roller unit:

1. Split the packer.
2. Place the packer on the roller unit.



Packer set, variable depth for tandem roller unit:

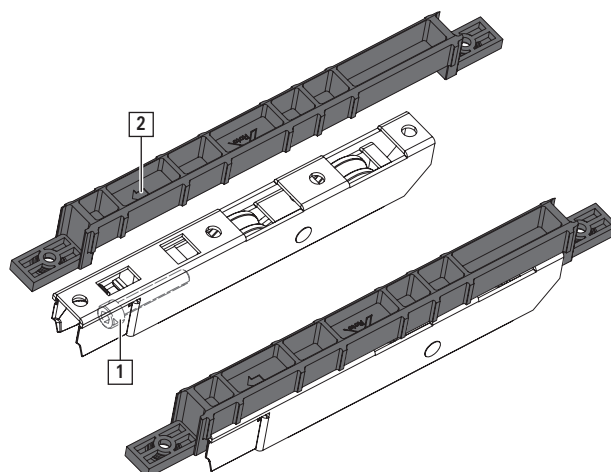
1. Place the packer on the roller unit.





Packer set, fixed depth for tandem roller unit:

Place the packer on the roller unit with the arrow [1] pointing towards the adjusting screw [2].



Installing the roller unit

⇒ If the sash groove has to be opened in order to install the roller unit, ensure that the roller unit and packer are on the steel reinforcement.

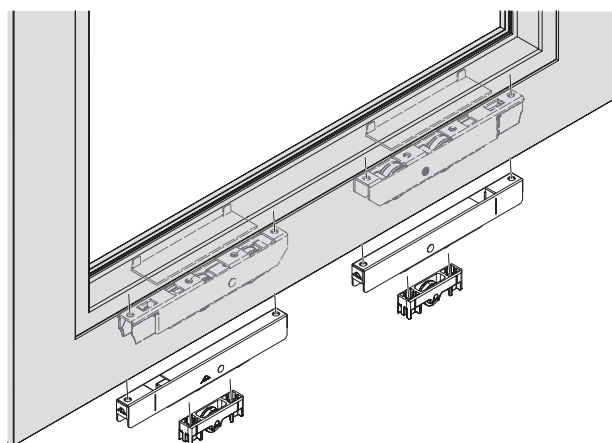
1. Position the roller unit in the centre, at the height of the glazing blocks. With a tandem roller unit, also pay attention to the alignment of the roller units.

Select the length of the screws so that they will hold in the profile.

Fasten each roller unit with two screws.

Tandem roller unit with packer set, fixed depth:
Fasten each roller unit with two supplied screws.

Fully countersink the screw head.



11.4.2 Spacer set

Recommended positions for spacer set for single-action espagnolettes

Spacer set, type A

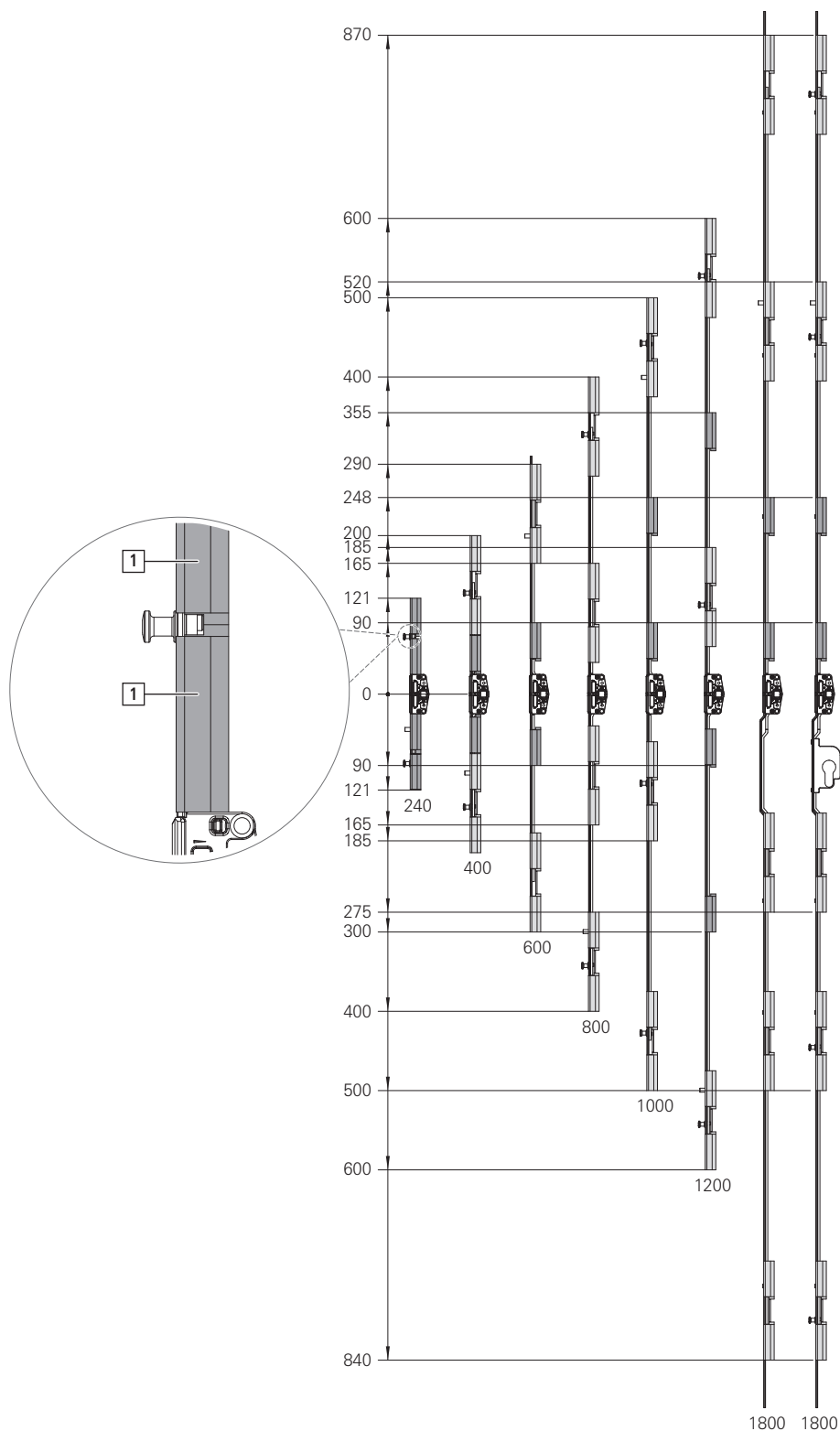


Fig. 11.2:  Split spacer [1];  non-split spacer



Spacer set, type B / C

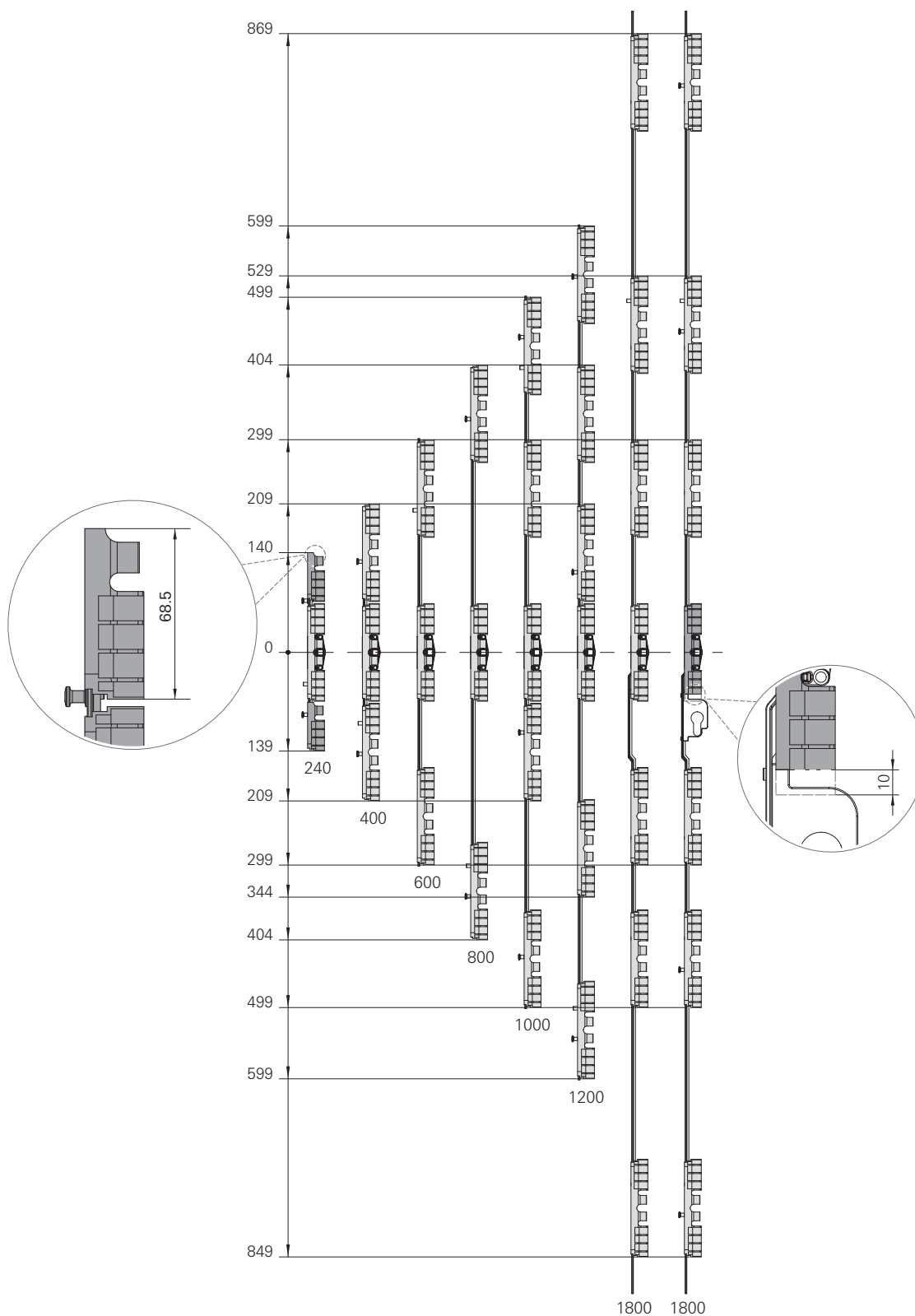


Fig. 11.3:  Cropped spacer;  non-cropped spacer

Preparing the sash

1. Determine the number of spacers depending on the espagnolette length.



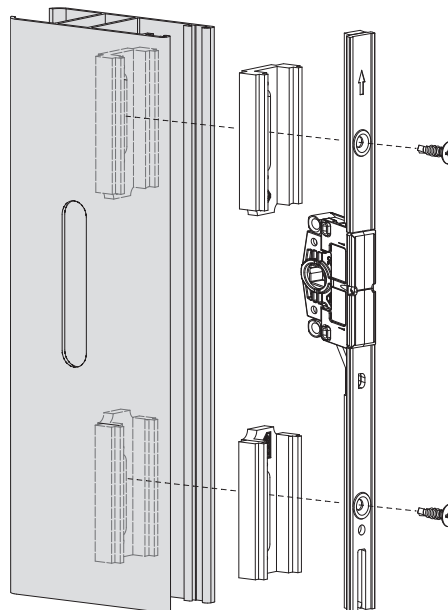
INFO

Distribute spacers, type A, on the gearbox.

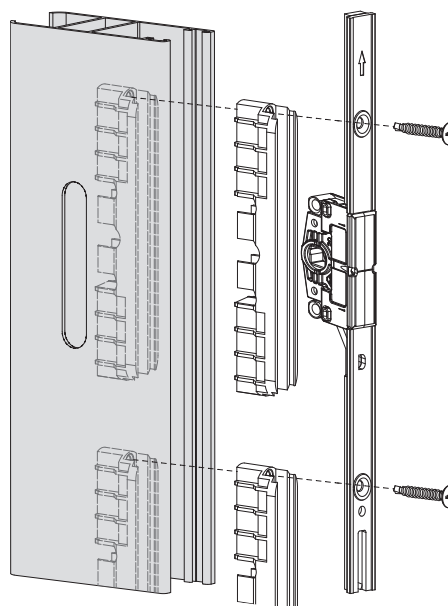
Crop spacers, type B / C, if necessary (see overview).

Insert spacers into the sash groove on the espagnolette side in the correct order and pre-position them.

Type A



Type B / C





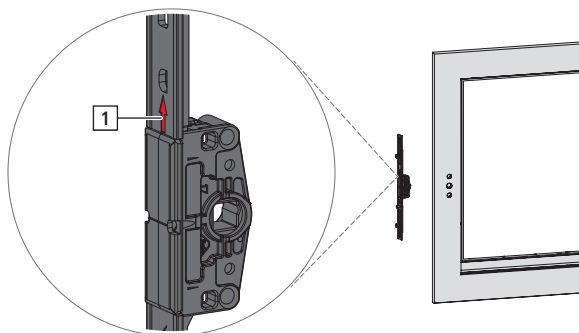
11.4.3 Single-action espagnolette

Installing the espagnolette

⇒ Drilling and routing work for single-action espagnolettes → *from page 66*

⇒ Spacers cropped if necessary and inserted into the sash at the correct position → *from page 72.*

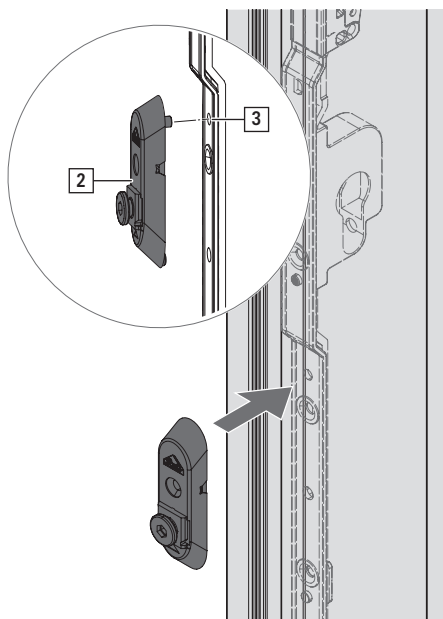
1. Insert the espagnolette. Ensure it is installed in the correct direction, with the arrow [1] pointing upwards.



2. Move the handle to the sliding position.
3. If required, mount the mishandling device [2] in the drill hole [3] below the gearbox (for non-lockable espagnolettes) or lock casing (for lockable espagnolettes).

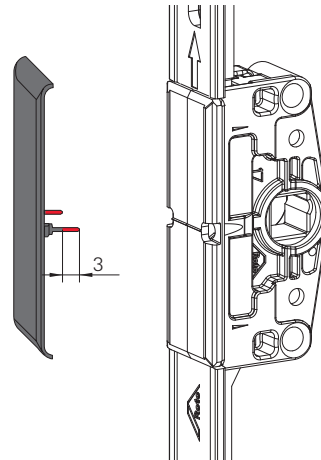
Fasten the espagnolette with screws.

On the mishandling device, use a screw that is 9 mm longer.



Installing the info clip

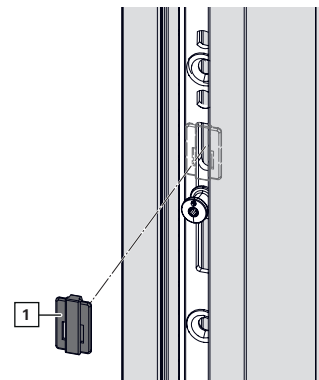
1. Crop the pins by 3 mm.
Place the info clip on the espagnolette.



11.4.4 Travel restrictor

▷ Single-action espagnolette with BS 15 cam installed.

1. Clip the travel restrictor [1] into the top locking cam groove.





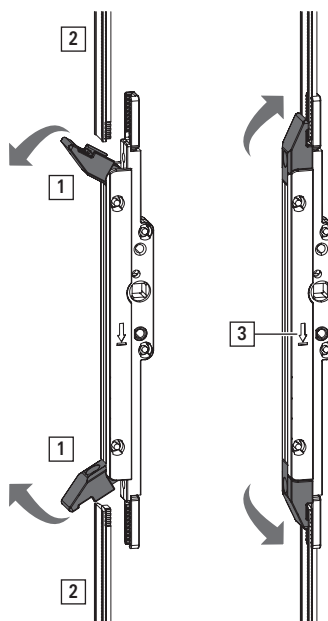
11.4.5 Reverse-action espagnolette

11.4.5.1 Not lockable

Installing the extension with espagnolette

▷ Extensions cropped.

1. Open the connecting-rod locks [1].
Insert the extensions [2] at the top and bottom to create a form-fitting connection. While doing so, ensure that the arrow [3] on the gearbox is pointing downwards.
Close the connecting-rod locks again.



Installing the gearbox with extension

▷ Drilling and routing work on the espagnolette carried out → *from page 69*.

1. Insert the gearbox and extension into the sash and fasten them with screws.

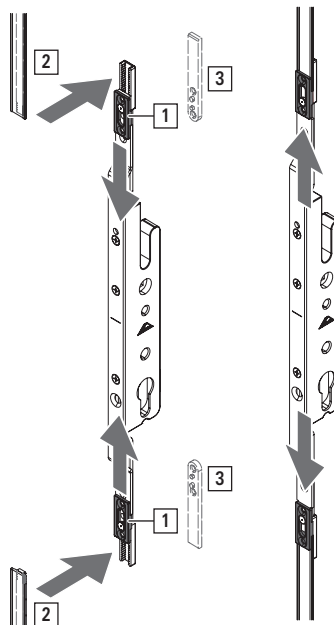
11.4.5.2 Lockable

Installing the extension with espagnolette

▷ Extensions cropped.

▷ Espagnolette in sliding position (delivery state).

1. Push the connecting-rod locks [1] towards the centre of the espagnolette as far as they will go.
Insert the extensions [2] at the top and bottom to create a form-fitting connection.
Push the connecting-rod locks back over the extensions as far as they will go.
Clip on the spacer [3] at the top and bottom if required.



Without mishandling device

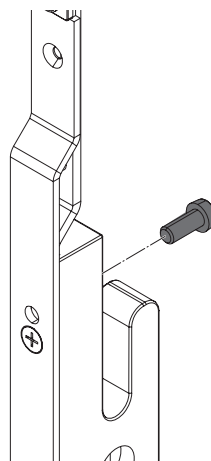
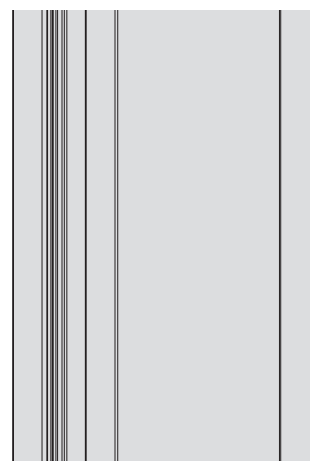
▷ Drilling and routing work on the espagnolette carried out → *from page 69*.

⇒ Espagnolette preassembled with extensions.

1. Insert the supplied tallow-drop screw into the drill hole in the gearbox from behind and tighten it as much as possible.

Tool: cross-head

Insert the espagnolette with extension into the sash and fasten it with screws.



▷ ▷ Mishandling device is deactivated.

With mishandling device

▷ Drilling and routing work on the espagnolette carried out → *from page 69*.

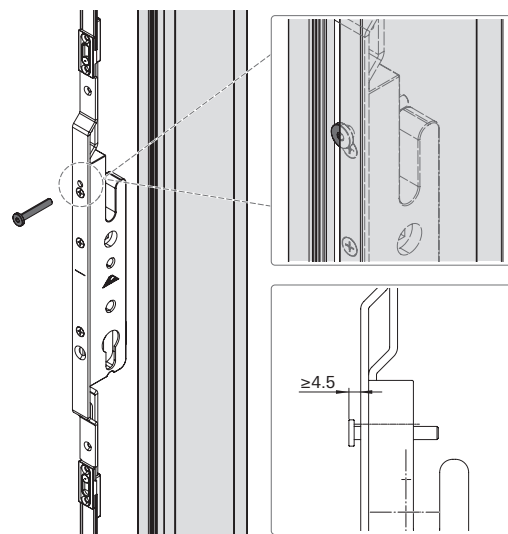
⇒ Mishandling device installed on the frame .

⇒ Espagnolette preassembled with extensions.

⇒ Tallow-drop screw removed from the rear of the espagnolette.



1. Insert the supplied flat-headed screw into the drill hole in the gearbox from the front.
Fasten the flat-headed screw at least 4.5 mm from the faceplate.
Tool: size 3 hex key
Insert the espagnolette with extension into the sash and fasten it with screws.



▷ ▷ Mishandling device is activated.

11.5 Frame

11.5.1 Locking components

11.5.1.1 Striker positions for single-action espagnolettes



INFO

The dimensions given refer to the position of the striker without cropped extension. If the extension is cropped, the position has to be recalculated accordingly.

for espagnolettes with hook / cam

Striker positions for single-action espagnolettes; with hook / cam	Striker positions for single-action espagnolettes; extension with cam
<p>[1] Locking direction [2] Handle centre □ Striker</p>	

Length of striker	Length of espagnolette	Number of hooks / cams (espagnolette)	Length of extension	Number of cams (extension)	A	B	C	D	E
55 [2]	240	2	–	–	–	81	–	79	–
	400	2	–	–	–	136	–	134	–
	600	2	–	–	–	236	–	234	–
	800	2	–	–	–	336	–	334	–
	1000	3	–	–	121	436	–	434	–
	1200	3	–	–	121	536	–	534	–
	1800	4	400	1	460	804	437	781	1364
64	240	2	–	–	–	57	–	103	–
	400	2	–	–	–	112	–	158	–
	600	2	–	–	–	212	–	258	–
	800	2	–	–	–	312	–	358	–
	1000	3	–	–	97	412	–	458	–
	1200	3	–	–	97	512	–	558	–
	1800	4	–	–	435	780	461	805	–
	2180	4	400	1	435	780	461	805	1340
71.5	240	2	–	–	–	54	–	106	–
	400	2	–	–	–	109	–	161	–
	600	2	–	–	–	329	–	261	–
	800	2	–	–	–	309	–	361	–
	1000	3	–	–	94	409	–	461	–
	1200	3	–	–	94	509	–	561	–
	1800	4	–	–	432	777	464	808	–
	2180	4	400	1	432	777	464	808	1337
80 [3]	240	2	–	–	–	25	–	119	–
	400	2	–	–	–	80	–	164	–
	600	2	–	–	–	180	–	264	–
	800	2	–	–	–	280	–	364	–
	1000	3	–	–	65	380	–	464	–
	1200	3	–	–	65	480	–	564	–
	1800	4	–	–	403	748	467	811	–
	2180	4	400	1	403	748	467	811	–
86	240	2	–	–	–	45	–	115	–
	400	2	–	–	–	100	–	170	–
	600	2	–	–	–	200	–	270	–
	800	2	–	–	–	300	–	370	–
	1000	3	–	–	85	400	–	470	–
	1200	3	–	–	85	500	–	570	–
	1800	4	–	–	423	768	473	817	–
	2180	4	400	1	423	768	473	817	1327
105	240	2	–	–	–	38	–	122	–
	400	2	–	–	–	93	–	177	–
	600	2	–	–	–	193	–	277	–
	800	2	–	–	–	293	–	377	–
	1000	3	–	–	78	393	–	477	–
	1200	3	–	–	78	493	–	577	–
	1800	4	–	–	416	761	480	824	–
	2180	4	400	1	416	761	480	824	1319

[2] Can only be used in aluminium profiles for espagnolettes with cam.

[3] Can only be used for espagnolettes with hook.



for espagnolettes with single-point locking

Striker positions; single-point locking

[1] Locking direction
[2] Handle centre
☐ Striker

Length of striker	A
55	33
64	9
71.5	3
86	-3 ^[4]
105	-

[4] The position is below the handle centre.

11.5.1.2 Striker positions for reverse-action espagnolettes



INFO

The overview shows the security classes from basic security to RC 2 / RC 2 N.

The dimensions given refer to the position of the striker without cropped extension. If the extension is cropped, the position has to be recalculated accordingly.

for extensions with hook with / without anti-jemmy device

Striker positions for reverse-action espagnolettes; extensions with hook							
[1] Locking direction							
[2] Handle centre							

Length of striker	Length of gearbox	Length of extension	Number of hooks	A	B	C	D
64	140	390	2	360	–	360	–
		560	4	360	539	360	539
		760	4	360	705	360	705
	182	390	2	365	–	397	–
		560	4	365	544	397	576
		760	4	365	710	397	742
	400	390	2	490	–	490	–
		560	4	490	669	490	669
		760	4	490	835	490	835
86	140	390	2	348	–	348	–
		560	4	348	527	348	527
		760	4	348	693	348	693
	182	390	2	353	–	385	–
		560	4	353	527	385	527
		760	4	353	693	385	693
	400	390	2	478	–	478	–
		560	4	478	657	478	657
		760	4	478	823	478	823
105	140	390	2	341	–	341	–
		560	4	341	520	341	520
		760	4	341	686	341	686
	182	390	2	346	–	378	–
		560	4	346	525	378	525
		760	4	346	691	378	691
	400	390	2	471	–	471	–
		560	4	471	650	471	650
		760	4	471	816	471	816



for extensions with claw

Striker positions for reverse-action espagnolettes; extensions with claw

[1] Locking direction
[2] Handle centre
☐ Striker

Length of striker	A	B
64	491	869
86	479	881
105	472	888

11.5.1.3 Striker strips

One-part striker strip with single-action espagnolette	Two-part striker strip with reverse-action espagnolette		
	Not lockable, BS 7	Not lockable, BS 20	Lockable, BS 17 and BS 22
Cannot be shortened.	$A = 126 + X$ $B = 94 + X$	$A = 131 + X$ $B = 131 + X$	$A = X$ $B = X$

1. Calculate the cropping dimension using the values in the table (depending on the espagnolette) and crop the striker strips if necessary.
2. Position one-part striker strips in the centre (relative to the square spindle recess) of the gearbox.
Fasten with screws.



3. Position two-part striker strips in the centre (relative to the square spindle recess) opposite the gearbox so that they abut.

Fasten with screws.

11.6 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. → 16 *“Transport” from page 100*
- ▶ 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. → 16 *“Transport” from page 100*
- ▶ Do not rest sashes on the rollers.

11.6.1 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.

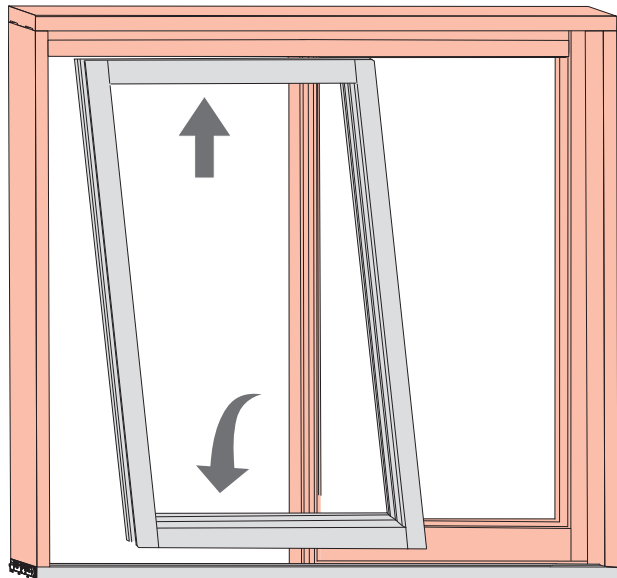
- Secure the sash to prevent it from falling, e.g. by using two people.



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.

1. Move the handle to the sliding position.
2. In front of the access area, insert the sash at the top of the frame until the sash outline engages in the operator track.
Tilt the sash inwards in a controlled manner at the bottom until the roller units are positioned vertically on the roller track.
For roller tracks with just one wall, ensure that the roller unit rollers are not set down next to the roller track.
Check that the roller unit rollers are correctly positioned on the roller track by pushing the sash.





11.6.2 Striker with positioning jig

for all strikers (except for lengths of 80 mm)

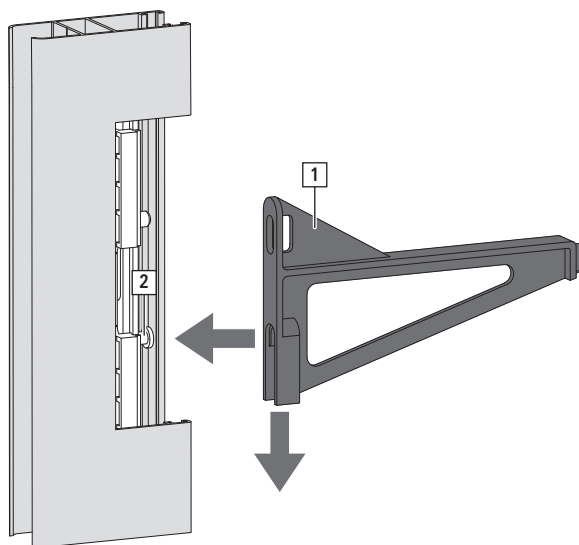
Installing the striker with positioning jig

⇒ Espagnolette or extension with cam in the open sash in the closed position.

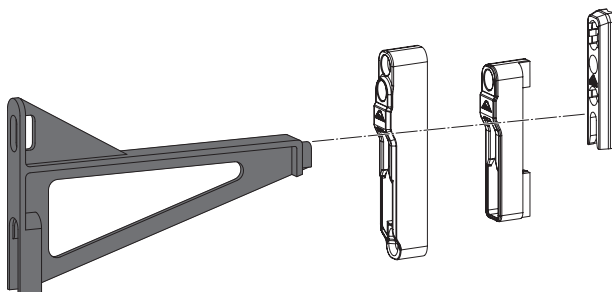
1. Move the handle to the closed position.



2. Position the jig [1] on the cam [2] on the espagnolette.



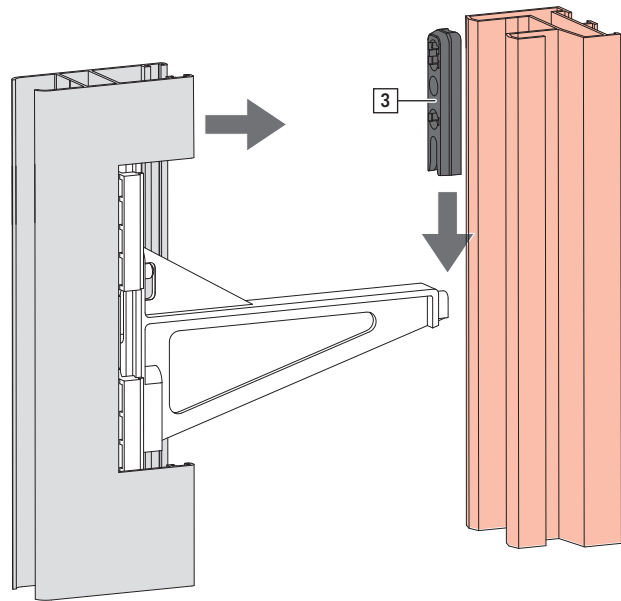
3. Place the striker [3] on the jig.



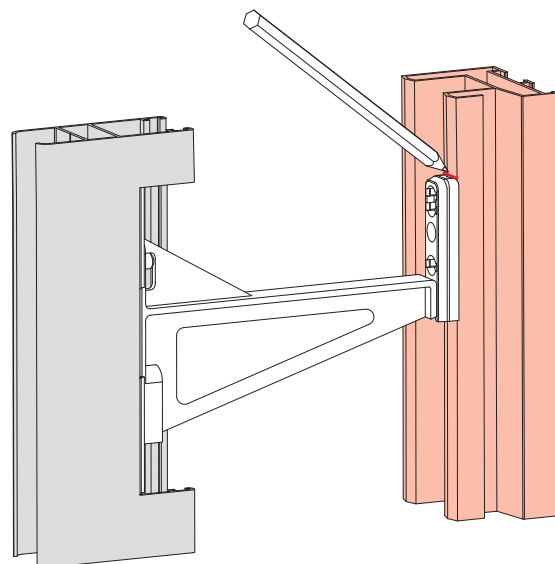
Installation

Joining the sash and frame

Striker with positioning jig



4. Mark the striker position on the frame.
Fasten the striker with two screws.
Torque: 1.5 – 2.0 Nm

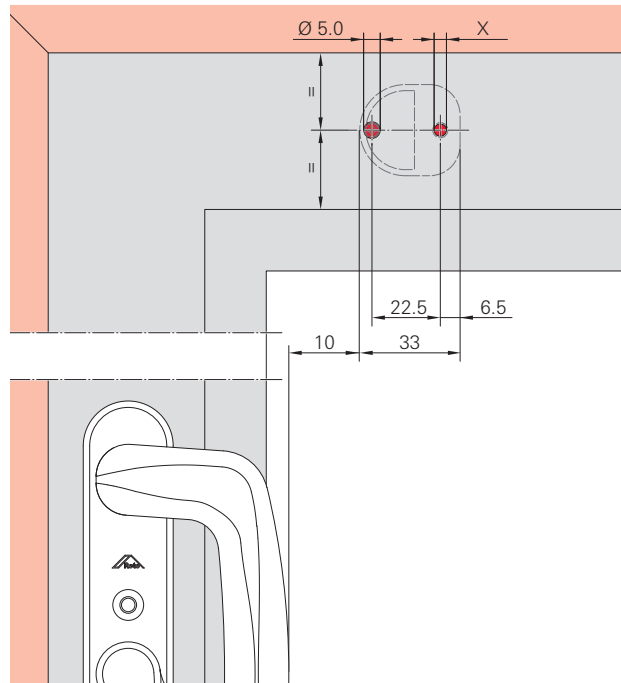




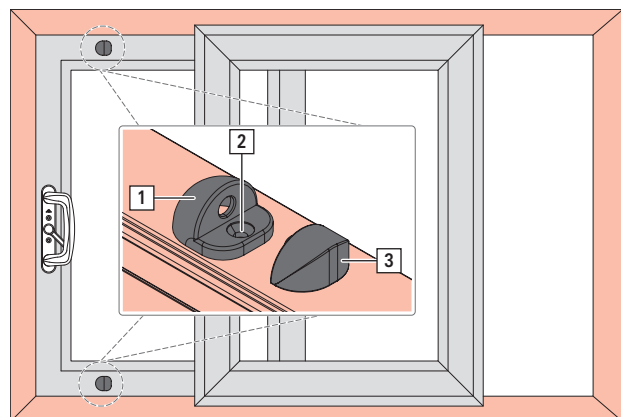
11.6.3 Stop part set

Installing the stop part set

1. Carry out drilling work at the top and bottom of the sash:
 For locating aid: 1 x Ø 5.0 mm, at least 9 mm deep.
 For screw (X):
 ■ Timber: 1 x Ø 3.0 mm, at least 9 mm deep.
 ■ PVC / aluminium: 1 x Ø 3.5 mm, at least 9 mm deep.

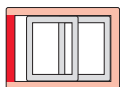


2. Position the stop part [1] in the area of the fixed glazing at the top and bottom.
 Fasten with one screw [2] each.
 Attach the rubber part [3].



11.6.4 Buffer

11.6.4.1 Installing the buffer



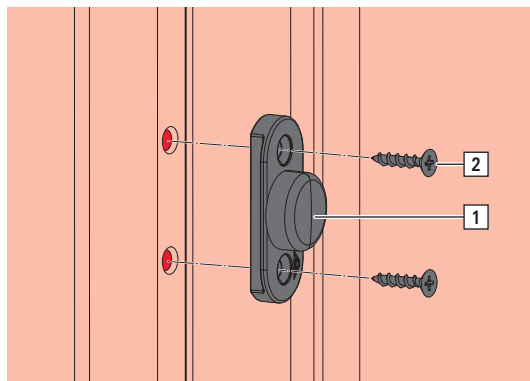
1. Position the buffer at least 15 mm from the striker and mark the drillings.
 Drill holes.
 Drill:
 Timber / PVC: 2 x Ø 3.5
 Aluminium: 2 x Ø 4.5 mm

**INFO**

Predrill the frame profile with steel core.

Drill: 2 x Ø 3.5 mm; depth = X

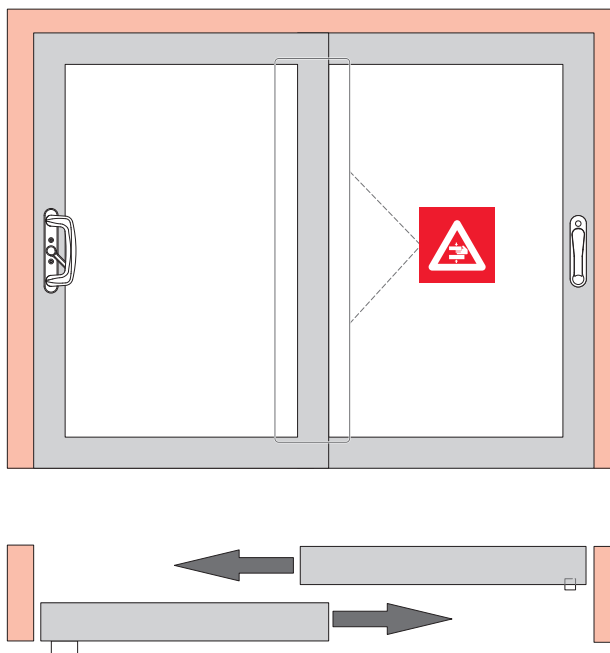
1. Fasten each buffer [1] with two screws [2].

**11.6.5 Notes on handle installation****CAUTION****Risk of crushing due to sliding the sash open as far as it will go!**

Opening the sash fully without using end stops at the top and bottom may lead to physical injury.

1. The use of end stops is mandatory in conjunction with a sliding handle on the outside for inward running sashes or on the inside for outward running sashes.
2. Ensure that there is enough space between the sliding handle / recessed grip and the faceplate when the sash is open.

1. Define the end stop position.





11.6.6 Notes on final assembly



DANGER

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

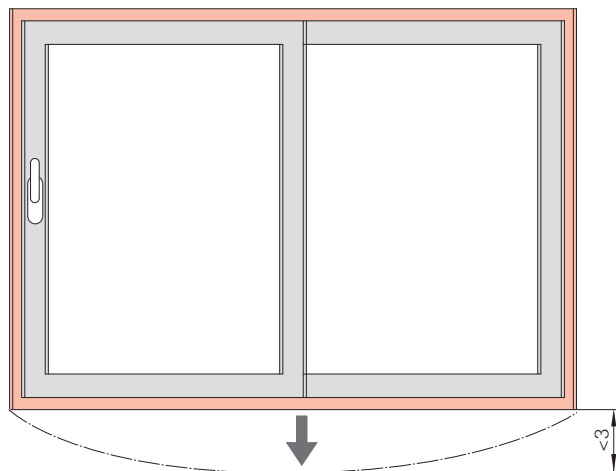
Incorrect installation of the sash in an element that bends by ≥ 3 mm may cause the sash to fall out.

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.



12 Adjustment



INFO

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

12.1 Roller unit



INFO

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

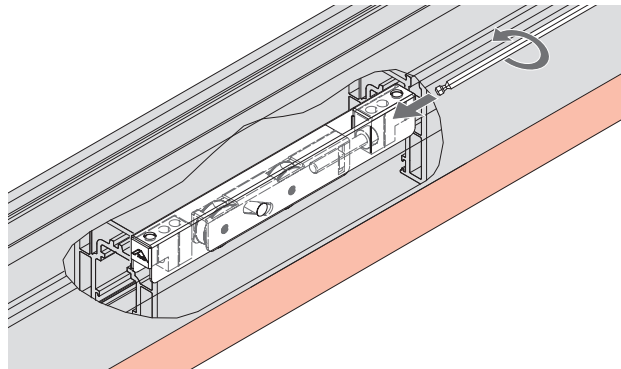
Height adjustment

1. Open the window sash in the sliding position.
2. Adjust the roller unit using the screw.
Tool: size 4 hex key



INFO

The screw has a defined final position. If you start to feel resistance, stop turning the screw.



12.2 Mishandling device

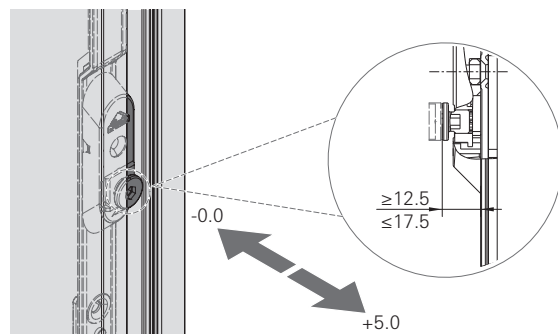


INFO

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

Gasket compression adjustment

1. Open the window sash in the sliding position.
2. Gasket compression adjustment +5 mm.
Adjust the mishandling device using the screw.
Tool: size 4 hex key





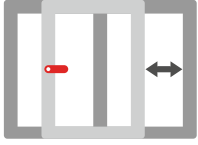
13 Operation

13.1 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.

13.1.1 Roto Patio Inline

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

13.2 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

14 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 94
Cleaning		→ from page 95
Clean hardware	☐	
Care		→ from page 95
Lubricate movable parts	☐	
Lubricate locking points	☐	
Performance test		
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 96
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

14.1 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.



14.2 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, carboic 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. → 14.3 "Care" from page 95
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

14.3 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.
- ▶ Use appropriate lubricant in more challenging climatic conditions. Note the manufacturer specifications.



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

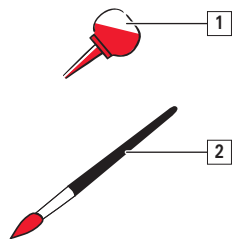
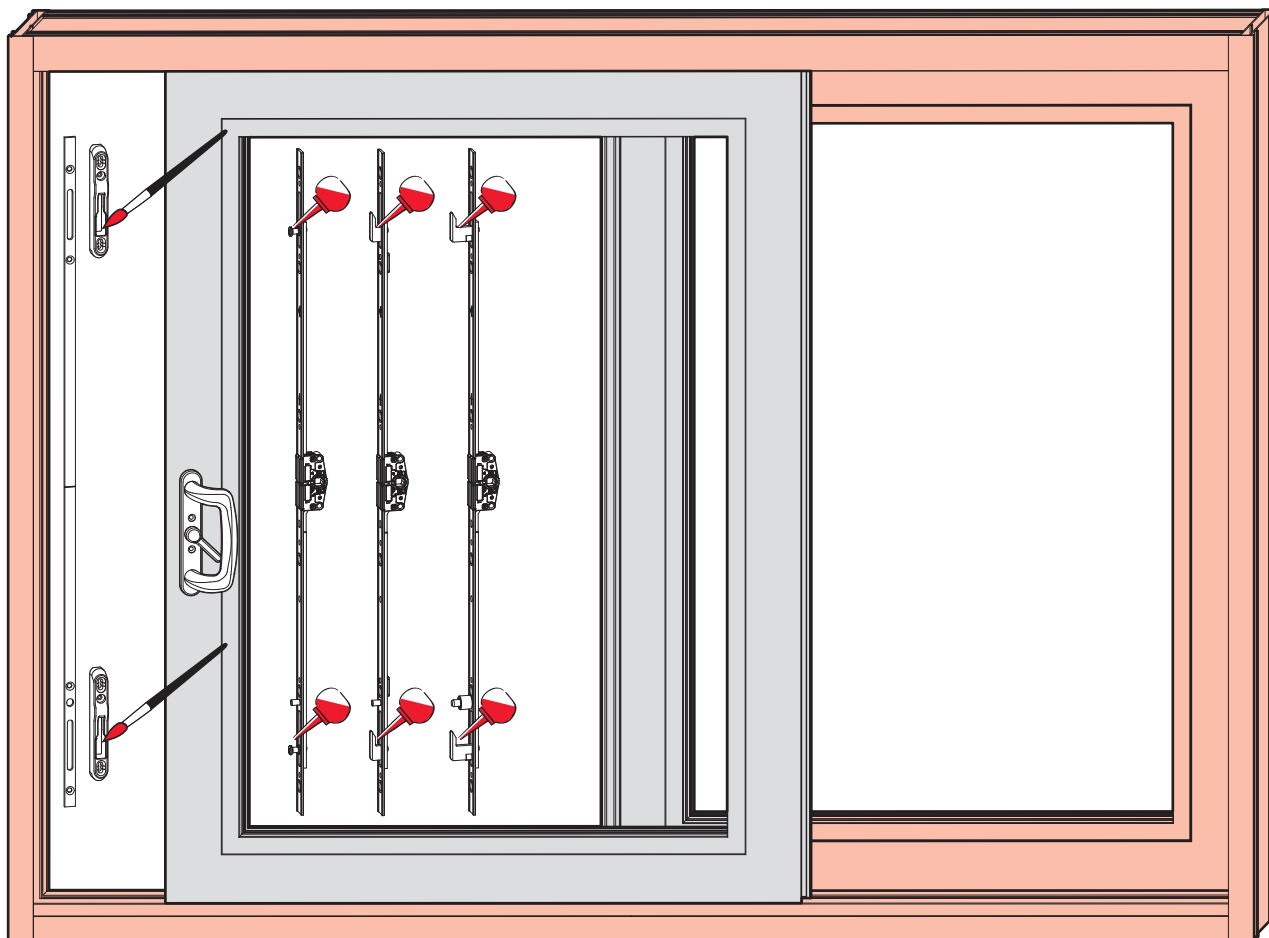
- Roto NX / NT grease



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.

14.3.1 Roto Inline



[1] Lubricant

[2] Grease

14.4 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.

15 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.

15.1 Hardware components

Removing hardware components

1. Undo all screw connections.
2. Remove the hardware components.
3. Dispose of the hardware components properly.

15.2 Unhinging the sash

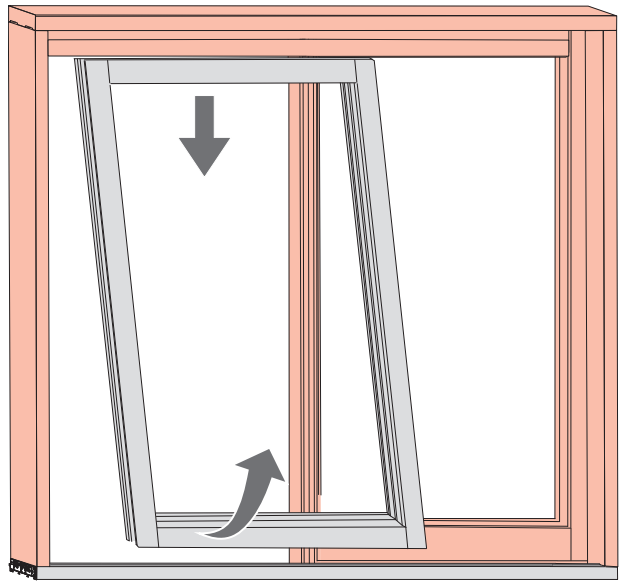
⇒ Specifications of the profile manufacturer complied with.

1. Move the handle to the sliding position.





2. Lift the sash and tilt it outwards at the bottom.
Lower the sash in a controlled manner until the frame no longer overlaps the sash.



3. Remove the sash parallel to the frame.

16 Transport

16.1 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 scope of delivery. 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.
- ▶ Ensure that the transport process is careful and appropriate for the material and that components are protected against dirt during transport.
- ▶ 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.

16.2 Storing the hardware

Store all hardware components as follows until they are installed:

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

17 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.

17.1 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.

17.2 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.



Roto Frank
Fenster- und Türtechnologie GmbH

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

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

www.roto-frank.com

From a single source: Optimum hardware systems to meet all challenges

Roto Window	Hardware systems for windows and balcony doors
Roto Sliding	Hardware systems for large sliding windows and doors
Roto Door	Matching hardware technology everything about doors
Roto Equipment	Additional technology for windows and doors