Window and Door Technology

Roto NX

The Tilt&Turn hardware system for windows and balcony doors
shaping the industry once again

Hinge side A16

Installation, maintenance and operation instructions
for aluminium profiles

Contact

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1 General information

1.1 Version history

Version	Date	Changes
v0	23.10.2020	Publication

1.2 Additional information to be noted

For other mandatory components (locking side, frame components, etc.) and information (target groups, security, maintenance, transport, disposal), see the other applicable document.

INFO

These instructions are incomplete.

The other applicable document for these instructions is:

- IMO_146
- IMO_455

Failure to observe this documentation discharges the hardware manufacturer from their liability.

1.3 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 guidelines also apply:

- Guideline TBDK issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Attachment of supporting fitting components for turn-only and tilt&turn fittings),
- Directive VHBE issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice for end-users),
- Directive VHBH issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Hardware for windows and balcony doors – Guidelines / advice on the product and on liability),
- Directive FPKF issued by the Gütegemeinschaft Schlösser und Beschläge e. V. quality assurance association (Restrictor and cleaning stays for Tilt-Only sashes and Tilt-Only fanlights),
- Instructions and information issued by profile manufacturers (e.g. manufacturers of windows and balcony doors),
- The applicable regulations, directives and national laws.

Compliance with the following guidelines is additionally recommended:

- TLE.01 by the VFF (German Window and Facade Association) Correct handling of ready-to-install windows and external doors during transport, storage and installation,

- WP.01 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Information for sales,
- WP.02 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Measures and documents,
- WP.03 by the VFF (German Window and Facade Association) Maintenance of windows, facades and external doors – Maintenance, care and inspection – Maintenance agreement.

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

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

INFO
Figures are provided in the right-hand version (DIN 107).

1.4 Symbols

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

1.5 Pictographs

Symbol	Meaning
	Aluminium

1.6 Product features

Symbol	Meaning
	Cropping range
	Description
	Supporting pin
	Drill hole for supporting pin
	DIN left / right
	Integrated corner drive
	Colour code, Roto
	Colour
	Sash rebate width
	Sash rebate height
	Sash weight
	Fixed handle height
	Centred / variable handle height
	Size
	Information
	Couplable

Symbol	Meaning
	Length
	Material number
	Lifting mishandling device
	Surface
	Number of locking cams
	Type of locking cams
	Bullet catch
	Security class
	Integrated night ventilation
	Blocking device
	System
	Adjustment

1.7 Abbreviations

Abbreviation	Meaning
approx.	approximately
TR	Turn restrictor
SW	Sash width
S.kg	Sash weight
SH	Sash height
Si.	Size
IMO	Installation instructions
kg	Kilograms
m	Metres
m^2	Square metres
Max.	Maximum
mm	Millimetres
CL	Centre lock
N	Newtons
Nm	Newton metres
SW	Key size
HS	Hexalobular socket
CR1	Connecting rod designation, e.g. connecting rod 1

Abbreviation	Meaning
e.g.	For example

1.8 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.

1.9 Preserving the surface finish

ATTENTION

Surface treatments may cause property damage.

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

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

ATTENTION

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

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

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

ATTENTION

Contamination may cause property damage.

Contamination prevents components working properly.

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

ATTENTION

(Permanently) damp room air may cause property damage.

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

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

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.

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 for end users

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

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

WARNING

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

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

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

ATTENTION

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

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

- Ensure that the sash does not collide with the frame, opening restrictor (buffer), reveal 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.

2.3.1 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.

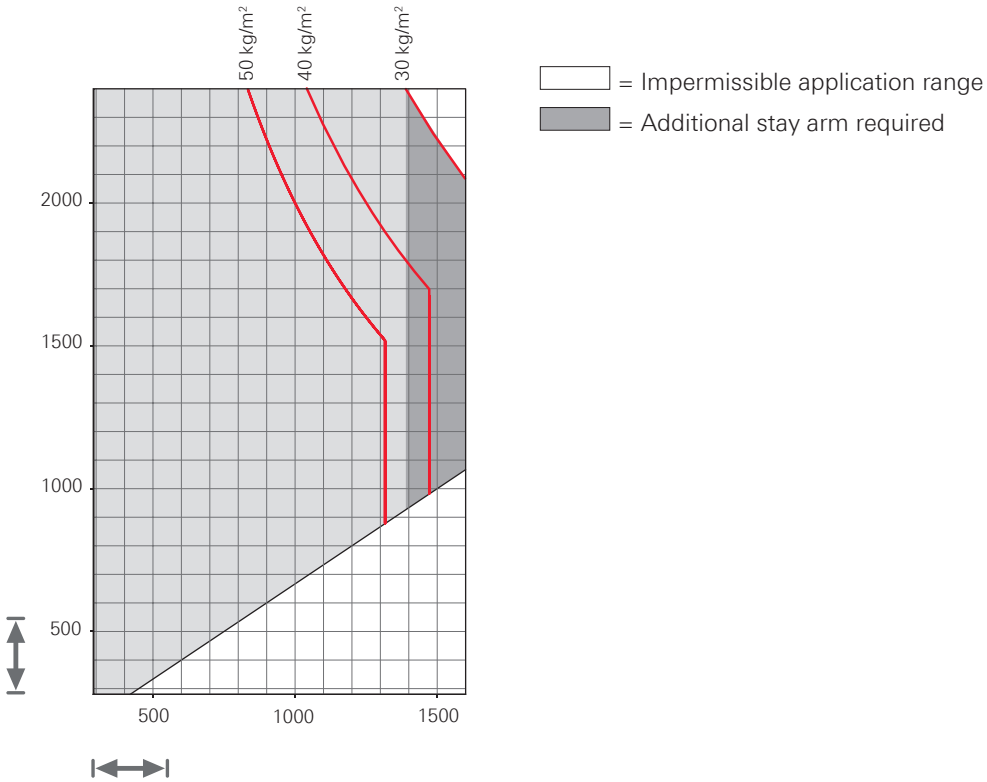
- Only use hardware combinations that have been approved by the hardware manufacturer.
- Only use original accessories or those that have been approved by the hardware manufacturer.
- Note the product-related documentation → *from page 6*.

3 Information on the product

3.1 Application diagrams

3.1.1 Tilt&Turn hardware

3.1.1.1 100 kg



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

1 mm/m² glass thickness ≙ 2.5 kg

Application range

		Basic security
↔	Sash rebate width	290 – 1600 mm
↕	Sash rebate height	280 – 2400 mm
⚖	Sash weight	Max. 100 kg

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.

Additional combinations of hardware components can be found in the catalogue.

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

The actual composition of the hardware depends on:

- the height of the element
- the width of the element
- the weight of the element
- security class
- the profile system

INFO

Security classes

- The RC 1 N, RC 2, RC 2 N and RC 3 security classes refer to the entire system.
- The hardware combinations shown in the hardware overviews are recommendations.
- The hardware complies with the corresponding security classes in the required system tests.
- However, the security classes are only complied with if all of the other components in the system (e.g. profile system, reinforcement, glass, etc.) are also designed for this.
- Steel security locking components must generally be used in systems with a 9 mm hardware axis.

Profile-related frame components and general sets are listed in additional chapters.

Recommended handles can be found in the handles catalogue.

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

INFO

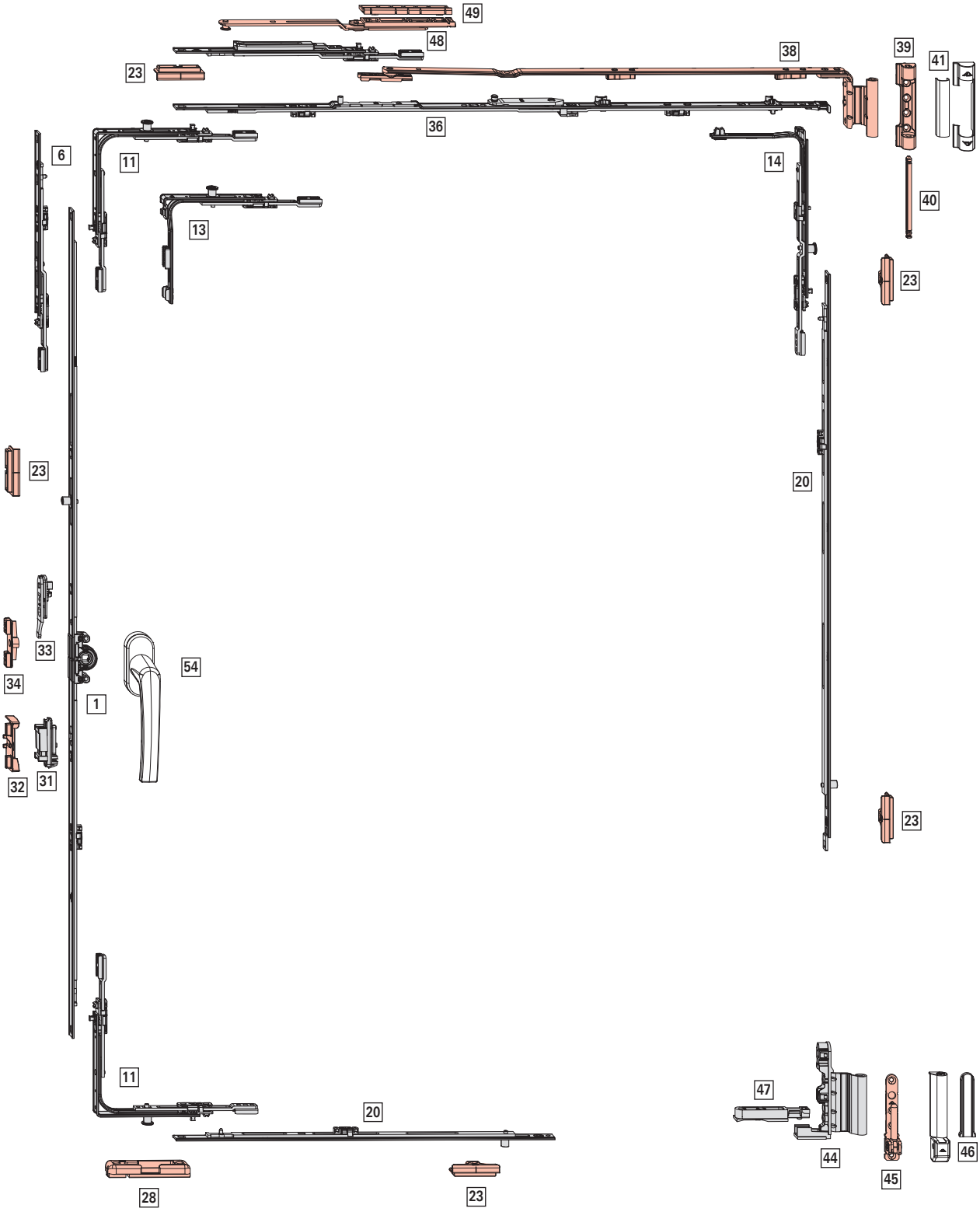
Roto Con Orders

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 Tilt&Turn hardware

4.1.1 Basic security



Application range

Sash rebate width **SRW**: 290 - 1600 mm

Sash rebate height **SRH**: 280 - 2400 mm

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

[1] T&T espagnolette, VT – fixed handle height, backset 15 mm

							Nº
280 – 570	120	460	Y	N	–	–	742199
511 – 710	170	600	Y	Y	–	–	795324
601 – 800	263	690	N	Y	–	–	619591
801 – 1000	413	890	N	Y	1	E	619592
1001 – 1200	513	1090	N	Y	1	E	619593
1201 – 1400	563	1290	N	Y	1	E	619594
1401 – 1600	563	1490	N	Y	2	E	619595
1601 – 1800	563	1690	N	Y	2	E	619596
1601 – 1800	1000	1690	N	Y	2	E	838345
1801 – 2000	1000	1890	N	Y	2	E	794637
2001 – 2200	1000	2090	N	Y	3	E	794638
2201 – 2400	1000	2290	N	Y	3	E	794639

INFO

At an SRH of 280 - 290 mm, the screw guide must be removed (e.g. using pliers).

[6] Espagnolette extension

				Nº
200	Y	–	–	308267
400	Y	1	E	280346

[11] Standard corner drive

		Nº
1	E	260275
1	P	260277

[13] Special short corner drive

		Nº
1	E	260280
1	P	260282

For use with:

SRH ≤ 370 mm

[14] Sash stay corner drive

		Nº
1	P	260286

[20] Multipart centre lock – standard, horizontal and vertical

				Nº
400	N	1	E	255280
600	N	1	E	255281
600	Y	1	E	255282

Size-specific combinations:

					Nº
801 – 1200	801 – 1200	400	1	E	255280
1201 – 1400	1201 – 1400	600	1	E	255281
1401 – 1600	1401 – 1800	600 KU	1	E	255282
		400	1	E	255280
	1801 – 2000	600 KU	1	E	255282
		600	1	E	255281
	2001 – 2400	600 KU	1	E	255282
		600 KU	1	E	255282
		400	1	E	255280

[23] Striker

[28] Tilt striker

[31] Bullet catch sash component (optional SRH ≥ 1601 mm)

	Nº
Bullet catch sash component	788363

[32] Bullet catch (optional SRH ≥ 1601 mm)

[33] Lifting mishandling device sash component

	Nº
Sash component for lifting mishandling device	795927

[34] Lifting mishandling device frame component

[36] Stay guide – basic security

					Nº
290 – 410	150	300	–	–	787345
411 – 600	250	490	–	–	787346
601 – 800	350	690	–	–	787347
801 – 1000	500	890	1	E	788617
1001 – 1200	500	1090	1	E	787349
1201 – 1400	500	1290	1	E	787351

[38] Stay arm, system 12/20-13

			Nº
290 – 410	150	Left	787233
290 – 410	150	Right	787234
411 – 600	250	Left	787235
411 – 600	250	Right	787236
601 – 800	350	Left	787237
601 – 800	350	Right	787238
801 – 1400	500	Left	787239
801 – 1400	500	Right	787240

INFO

With SRH < 500 mm, set the tilt distance to 80 mm (with sash stay from size 250 and above).

[39] Stay bearing

		Nº
P 3/130	2 x Ø 3 mm	836146
P 6/130	2 x Ø 6 mm	836147

[40] Stay-bearing pin

		Nº
Stay-bearing pin	86	834705

[41] Sash stay cover caps → CTL

[44] Rebate corner hinge

		Nº
12/20-13	Left	616371
12/20-13	Right	616372

[45] Pivot rest

					Nº
K 3/100	max. 100 kg	Y	2 x Ø 3 mm	Laterally adjustable	258590
K 6/100	max. 100 kg	Y	2 x Ø 6 mm	Laterally adjustable	258592

[46] Corner hinge / pivot rest cover caps → CTL

[48] Additional stay arm (SRW ≥ 1401 mm)

		Nº
Frame and sash component	200	255237

[49] Packer

[54] Handle → CTL_1

Optional

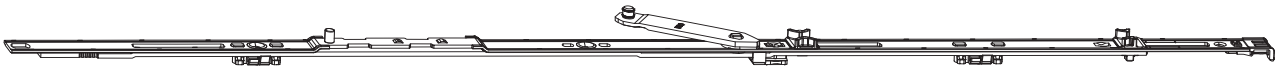
[47] Rebate corner hinge extension

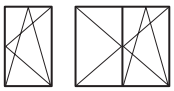
	Nº
Extension	624462

5 Extract from catalogue

5.1 Stay guide

5.1.1 Basic security – RC 1 N



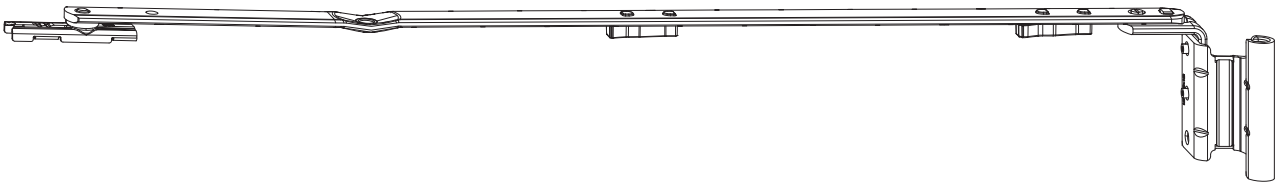


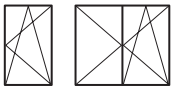
Y	Y	290 – 410	300	120	150	–	–	Roto Sil	787345
		411 – 600	490	190	250	–	–	Roto Sil	787346
		601 – 800	690	200	350	–	–	Roto Sil	787347
		801 – 1000	890	200	500	–	–	Roto Sil	787348
			890	200	500	1	E	Roto Sil	788617
		1001 – 1200	1090	200	500	–	–	Roto Sil	787350
			1090	200	500	1	E	Roto Sil	787349
		1201 – 1400	1290	200	500	1	E	Roto Sil	787351

INFO
Additional stay arm required from SRW 1400 mm.

5.2 Stay arm

5.2.1 Standard





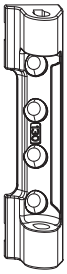
12/18-9	290 – 410	150	Roto Sil	Left	787217
	290 – 410	150	Roto Sil	Right	787218
	411 – 600	250	Roto Sil	Left	787219
	411 – 600	250	Roto Sil	Right	787220
	601 – 800	350	Roto Sil	Left	787221
	601 – 800	350	Roto Sil	Right	787222
	801 – 1400	500	Roto Sil	Left	787223
	801 – 1400	500	Roto Sil	Right	787224

					Nº
12/20-9	290 – 410	150	Roto Sil	Left	787225
	290 – 410	150	Roto Sil	Right	787226
	411 – 600	250	Roto Sil	Left	787227
	411 – 600	250	Roto Sil	Right	787228
	601 – 800	350	Roto Sil	Left	787229
	601 – 800	350	Roto Sil	Right	787230
	801 – 1400	500	Roto Sil	Left	787231
	801 – 1400	500	Roto Sil	Right	787232
12/20-13	290 – 410	150	Roto Sil	Left	787233
	290 – 410	150	Roto Sil	Right	787234
	411 – 600	250	Roto Sil	Left	787235
	411 – 600	250	Roto Sil	Right	787236
	601 – 800	350	Roto Sil	Left	787237
	601 – 800	350	Roto Sil	Right	787238
	801 – 1400	500	Roto Sil	Left	787239
	801 – 1400	500	Roto Sil	Right	787240
12/21-13	290 – 410	150	Roto Sil	Left	795132
	290 – 410	150	Roto Sil	Right	795133
	411 – 600	250	Roto Sil	Left	795134
	411 – 600	250	Roto Sil	Right	795135
	601 – 800	350	Roto Sil	Left	795136
	601 – 800	350	Roto Sil	Right	795137
	801 – 1400	500	Roto Sil	Left	795138
	801 – 1400	500	Roto Sil	Right	795139
12/22-13	290 – 410	150	Roto Sil	Left	787241
	290 – 410	150	Roto Sil	Right	787242
	411 – 600	250	Roto Sil	Left	787243
	411 – 600	250	Roto Sil	Right	787244
	601 – 800	350	Roto Sil	Left	787245
	601 – 800	350	Roto Sil	Right	787246
	801 – 1400	500	Roto Sil	Left	787247
	801 – 1400	500	Roto Sil	Right	787248

INFO
With SRH < 500 mm, set the tilt distance to 80 mm (with sash stay from size 250 and above).

5.3 Stay bearing

5.3.1 Standard – P 3/130



P 3/130	max. 130 kg	Y	2 x Ø 3 mm	Roto Sil	836146

One stay-bearing pin is required for every stay bearing.

5.3.2 Stay-bearing pins

Stay-bearing pin	86	Roto Sil	834705

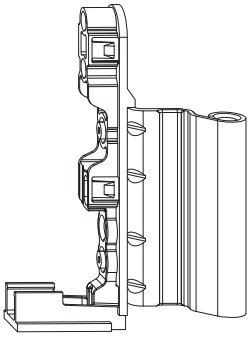
5.4 Pivot rests

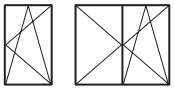
5.4.1 K 3/100

K 3/100	max. 100 kg	Y	2 x Ø 3 mm	Roto Sil	258590

5.5 Rebate corner hinge

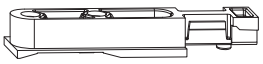
5.5.1 Rebate corner hinge A16





12/18-9	max. 100 kg	Left	Roto Sil	616324
		Right	Roto Sil	616366
12/18-13		Left	Roto Sil	616367
		Right	Roto Sil	616368
12/20-9		Left	Roto Sil	616369
		Right	Roto Sil	616370
12/20-13		Left	Roto Sil	616371
		Right	Roto Sil	616372

5.5.2 Extension for rebate corner hinge A16



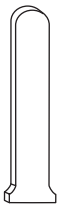
Extension	624462

5.6 Cover caps

5.6.1 Pivot rest – standard

K 3/100 K 6/100	R01.1	Natural silver	258545
	R01.3	Titanium	329190
	R03.1	Brass matt	258919
	R03.2	Brass, polished	258920
	R04.4	Black brown	258922
	R06.2	Jet black	492347
	R07.2	Traffic white	258926
	SF	Special colour	258928

5.6.2 Pivot rest – tab



K 3/100 K 6/100 K 6/130	R01.1	Natural silver	230416
	R01.3	Titanium	329189
	R03.1	Brass matt	230420
	R03.2	Brass, polished	230419
	R04.4	Black brown	230421
	R06.2	Jet black	492346
	R07.2	Traffic white	230426
	SF	Special colour	230427

5.6.3 Rebate corner hinge – standard

R01.1	Natural silver	Left	389407
R01.1	Natural silver	Right	389408
R01.3	Titanium	Left	374978

Roto			№
R01.3	Titanium	Right	374979
R03.1	Brass matt	Left	374976
R03.1	Brass matt	Right	374977
R03.2	Brass, polished	Left	449992
R03.2	Brass, polished	Right	449993
R04.4	Black brown	Left	374974
R04.4	Black brown	Right	374975
R06.2	Jet black	Left	493505
R06.2	Jet black	Right	493507
R07.2	Traffic white	Left	341154
R07.2	Traffic white	Right	341155
SF	Special colour	Left	494948
SF	Special colour	Right	494949

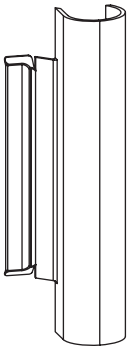
5.6.4 Stay bearing – standard

Cover caps

	Roto		№
P 3/130 P 6/130	R01.1	Natural silver	788379
	R01.3	Titanium	788380
	R03.1	Brass matt	788381
	R03.2	Brass, polished	795975
	R04.4	Black brown	788383
	R07.2	Traffic white	788386
	SF	Special colour	840745

5.6.5 Stay arm – standard

With tab



12/18-9 12/20-9 12/20-13 12/21-13 12/22-13	R01.1	Natural silver	788403
	R01.3	Titanium	788404
	R03.1	Brass matt	788405
	R03.2	Brass, polished	810817
	R04.4	Black brown	788407
	R07.2	Traffic white	788410
	SF	Special colour	840752

Without tab

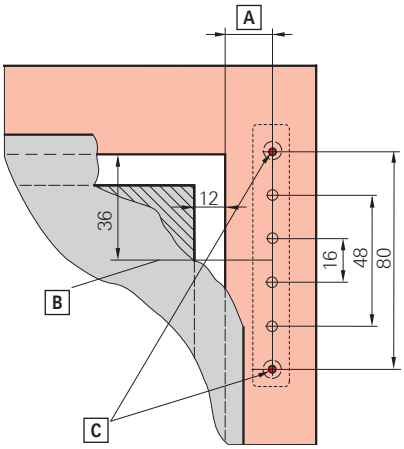
12/18-9 12/20-9 12/20-13 12/21-13 12/22-13	R01.1	Natural silver	788395
	R01.3	Titanium	788396
	R03.1	Brass matt	788397
	R03.2	Brass, polished	795974
	R04.4	Black brown	788399
	R07.2	Traffic white	788402
	SF	Special colour	840747

6 Installation

6.1 Drilling and routing dimensions

6.1.1 Stay bearing

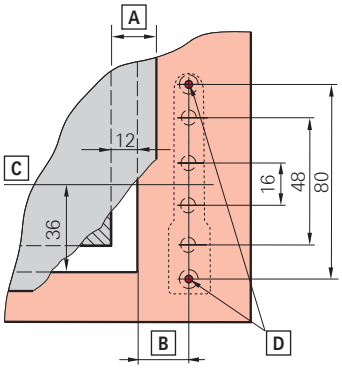
Standard – P 3/130



Assignment	Meaning	System
[A]	16.5 mm	12/18-9, 12/18-13
	18.5 mm	12/20-9, 12/20-13
	19.5 mm	12/21-13
	20.5 mm	12/22-13
[B]	Stay bearing centre	-
[C]	P 3/130 stay bearing, drill hole Ø 3 mm, 4 mm deep	-

6.1.2 Pivot rest

K 3/100



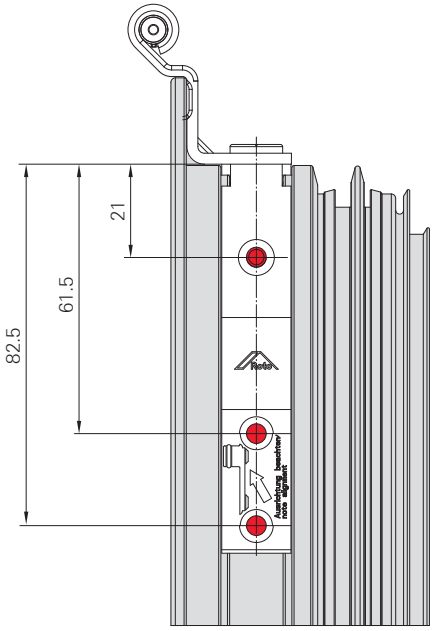
Assignment	Meaning	System
[A]	Overlap width	-
[B]	16.5 mm	12/18-9, 12/18-13
	18.5 mm	12/20-9, 12/20-13
	19.5 mm	12/21-13
	20.5 mm	12/22-13
[C]	Pivot rest centre	-
[D]	Pivot rest K 3/100, drill hole 3 mm deep	-

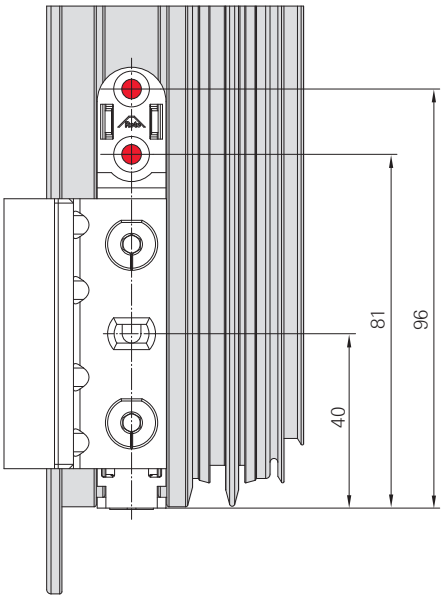
INFO

Observe directive TBDK for tractive force values as a function of the sash weights.

Further information can be found at www.beschlagindustrie.de.

6.1.3 Rebate corner hinge

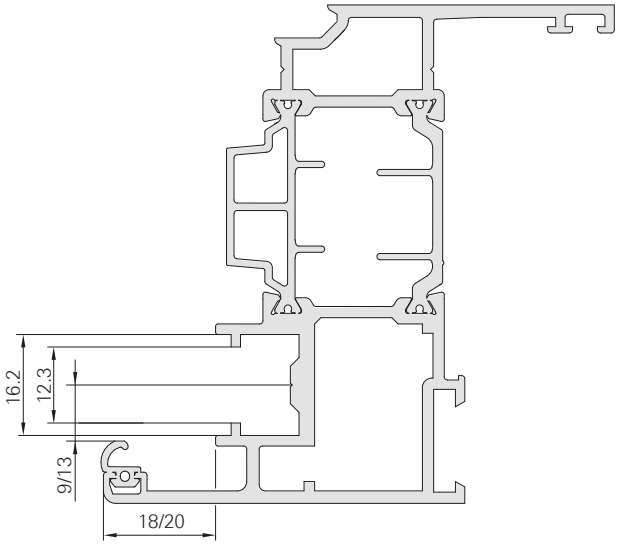




6.2 Sash

6.2.1 Sash profile

Euro-groove

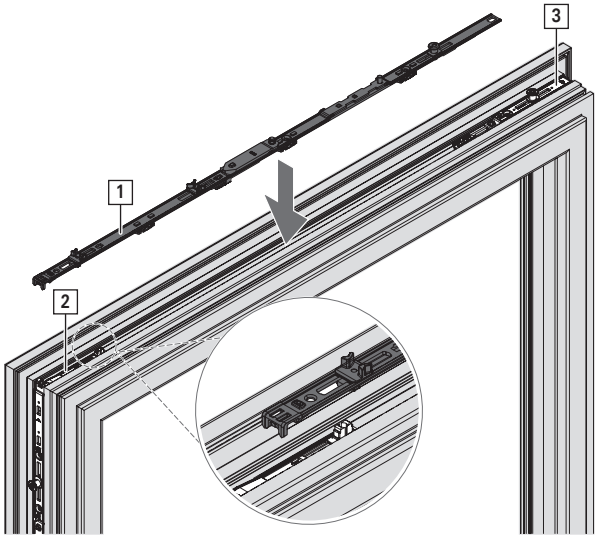


6.2.2 Stay guide

6.2.2.1 Installing the stay guide

INFO
With SRW < 310 mm, the assembly clip must be removed.

1. Insert the stay guide [1] into the sash groove and clip it into the sash stay corner drive [2].

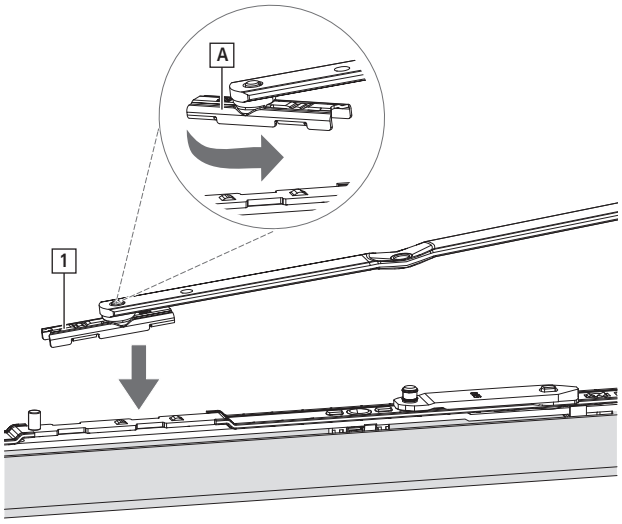


2. Connect the stay guide to the corner drive [3].
   Creating a force-fit connection

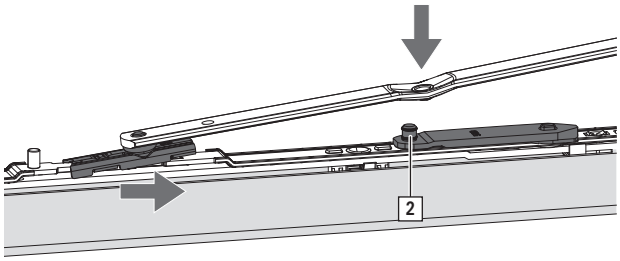
6.2.2.2 Mounting the stay arm

1. Position the slider [1] of the stay arm on the stay guide.

INFO
With SRH < 500 mm, the tilt distance must be limited to 80 mm. Turn the slider 180° to limit the tilt distance to 80 mm [A].

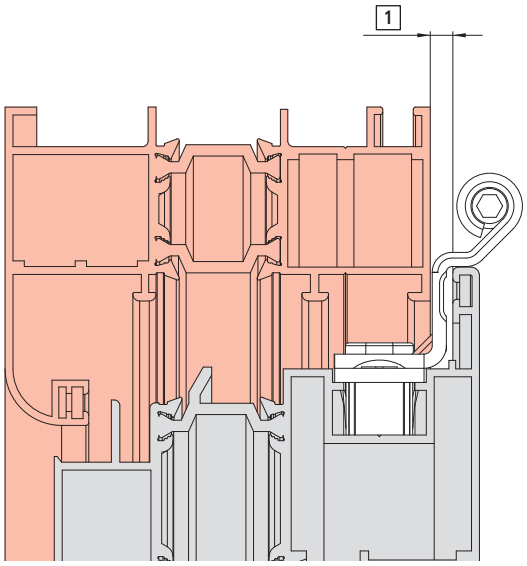


2. Move the stay arm and clip it onto the supporting arm bolt [2].



INFO
Anti-slam protection is achieved automatically by tilting the sash.

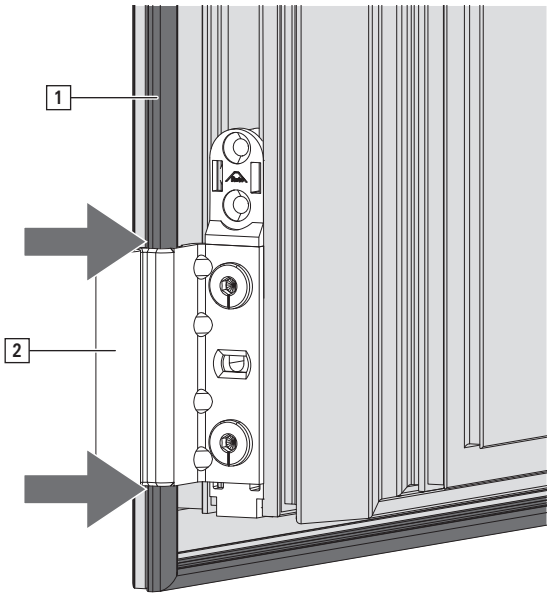
6.2.3 Hinge passage



[1] Hinge passage

3 - 4 mm	Cut out the gasket in the area of the hinge roller. Only partial gasket compression adjustment possible.
> 4 mm	Gasket does not have to be cut out. Complete gasket compression adjustment possible.

1. Cut out the gasket [1] in the area of the rebate corner hinge [2].

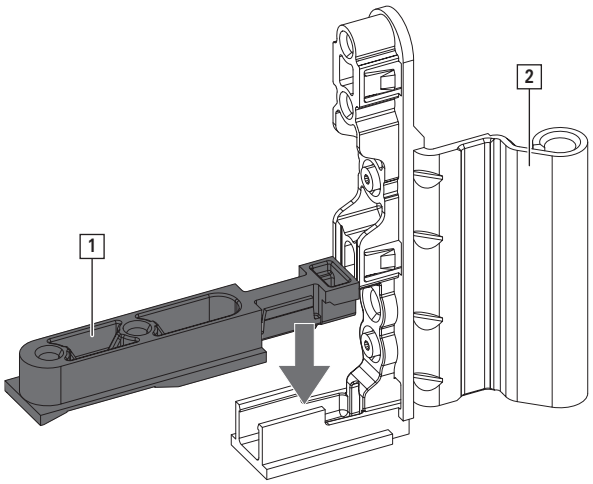


6.2.4 Rebate corner hinge

Rebate corner hinge extension

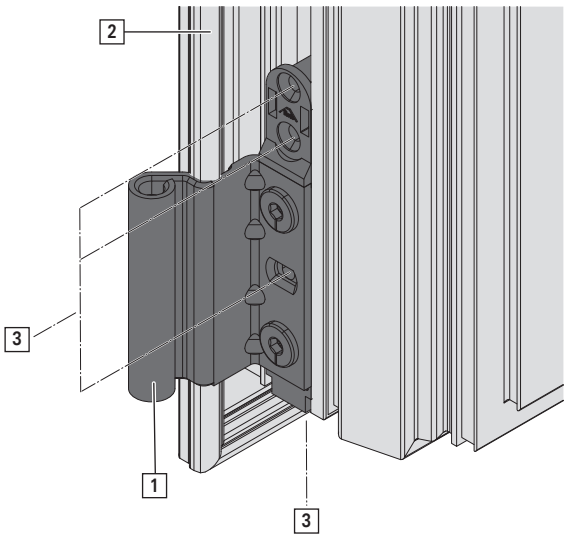
INFO
If the lower screw on the rebate corner hinge cannot be used, the extension is mandatory.

1. Fit the extension [1] on the rebate corner hinge [2].



Installing the rebate corner hinge

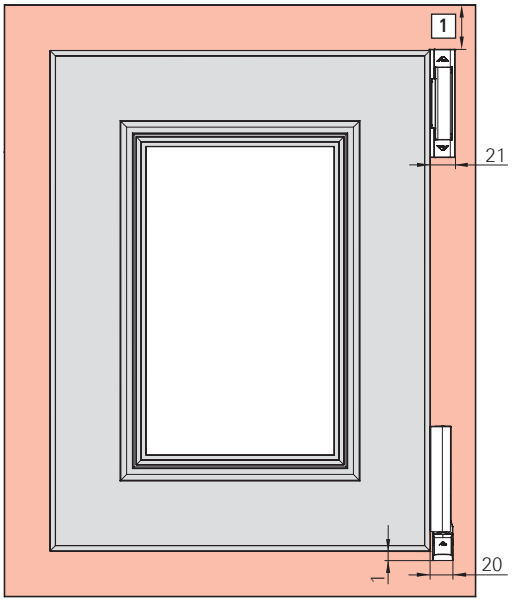
1. Place the corner hinge [1] on the sash [2].



2. Secure the corner hinge with four screws [3].

6.3 Frame

6.3.1 Frame clearances

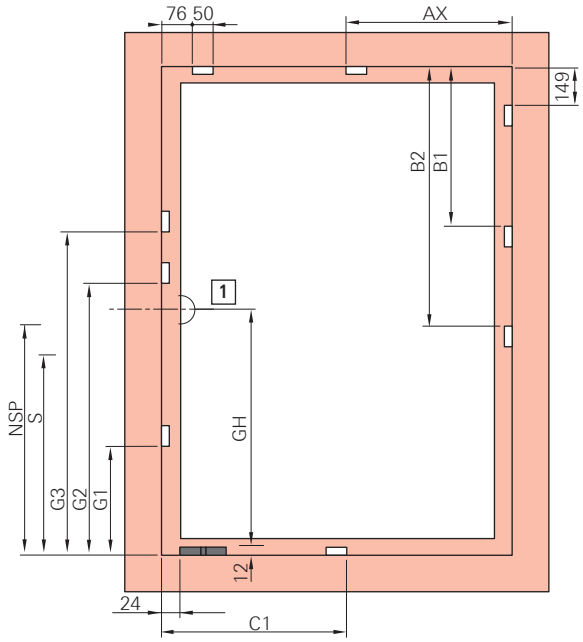


[1] For dismantling, leave at least 10 mm clearance between the stay-bearing pin and the reveal.

INFO
Clearances including cover caps.

6.3.2 Position of strikers and tilt strikers

6.3.2.1 Tilt&Turn hardware – basic security



[1] Handle centre

Striker e.g.

Tilt striker e.g.

T&T espagnolette, VT – fixed handle height

SRH / mm	GH	G1	G2	G3	NSP	S
280 – 570	120	–	–	–	–	–
511 – 600	170	–	–	–	262	–
601 – 800	263	–	–	–	350	–
801 – 1000	413	550	–	–	288	–
1001 – 1200	513	700	–	–	388	–
1201 – 1400	563	700	–	–	388	–
1401 – 1600	563	700	1170	–	388	–
1601 – 1800	563	700	1370	–	388	–
1601 – 1800	1000	700	1370	–	1121	807
1801 – 2000	1000	700	1370	–	1121	807
2001 – 2400	1000	700	1370	1770	1121	807

Stay guide

SRW / mm	AX	Size
1201 – 1400	750	500 / 1290
1401 – 1600	750	500 / 1290[1]

Centre lock, vertical

SRH / mm	B1	B2	Centre lock
1101 – 1800	746	–	CL 600 E
1801 – 2400	746	1346	CL 600 E KU + CL 600 E

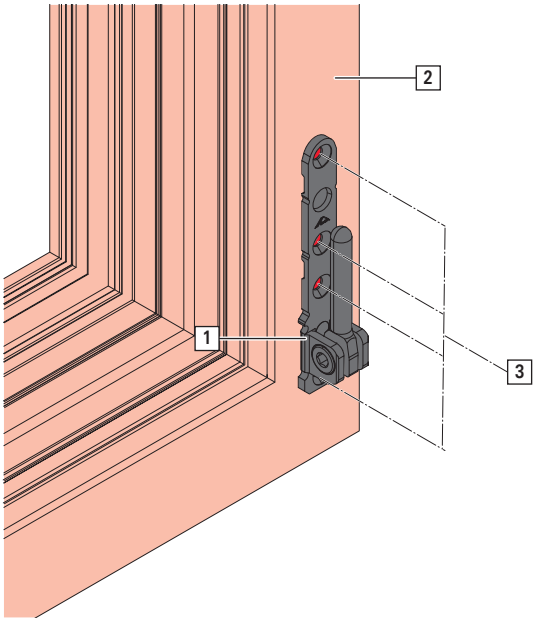
Centre lock, horizontal

SRW / mm	C1	Centre lock
1101 – 1600	658	CL 600 E

[1] with additional stay arm

6.3.3 Pivot rest

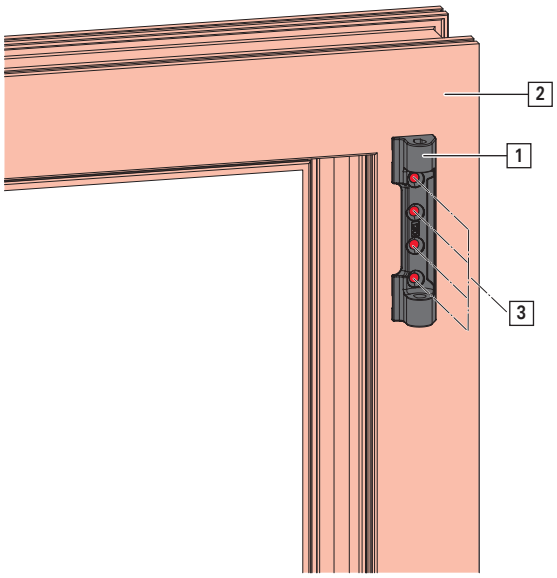
1. Place the pivot rest [1] on the frame [2].



2. Fasten with four screws [3].

6.3.4 Stay bearing

1. Place the stay bearing [1] on the frame [2].



2. Fasten with four screws [3].

6.4 Joining the sash and frame

WARNING

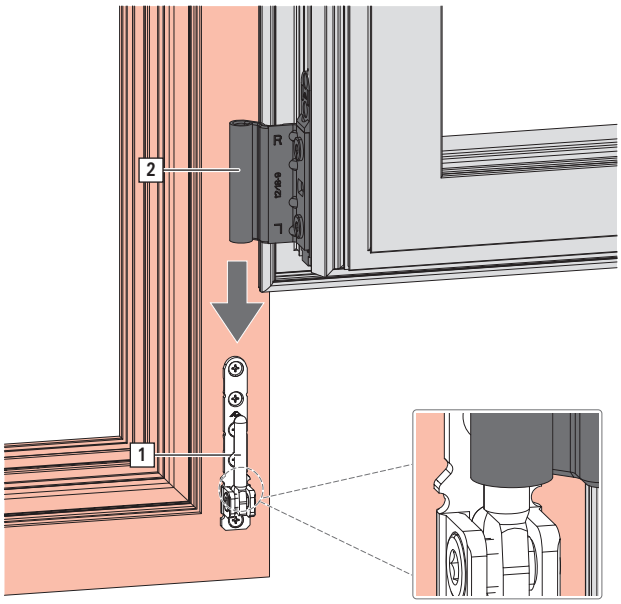
Heavy loads pose the risk of injury and property damage.

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

- Transport and installation must be carried out by at least two people.
- Use transportation means.

6.4.1 Connecting the corner hinge to the pivot rest

1. Handle in turn position.
2. With the sash slightly tilted inwards, guide it along the frame in a downwards direction until you feel the pivot-rest pin [1] engage in the corner hinge [2].

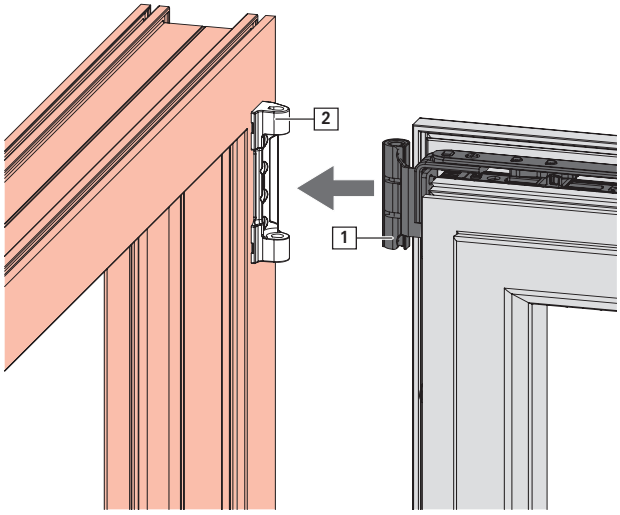


INFO

The frame grooves and sash grooves, as well as the components installed in them, must be free from construction materials.

6.4.2 Connecting the stay hinge to the stay bearing

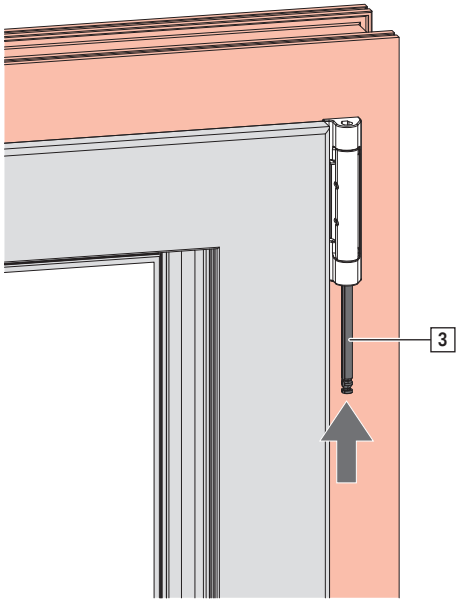
1. Insert the sash with stay hinge [1] into the stay bearing [2].



Installing the stay-bearing pin

1. Close the sash.
2. Fully insert the stay-bearing pin [3] into the stay bearing from below.

INFO
Do not hit in the stay-bearing pin using a hammer.



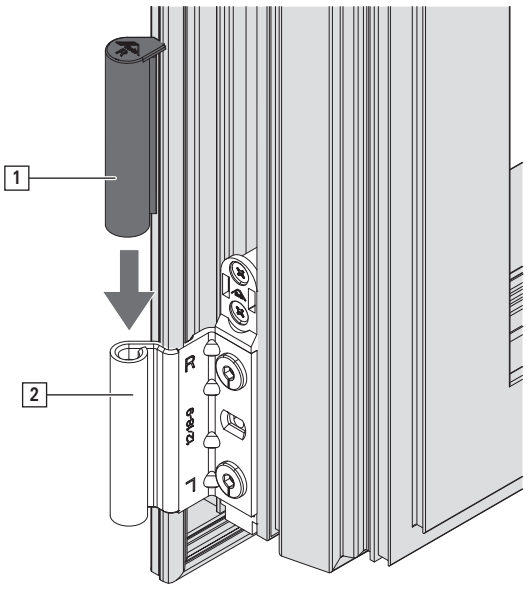
WARNING
An unsecured sash may pose a risk of death!
The sash may fall if the pin joining the bearing and the hinge is not secure.
- Install the correct pin (for the assignment, see the corresponding hardware overview → *from page 16*).
- Check that the pin is seated flush with the bearing.

6.4.3 Covers

6.4.3.1 Corner hinge cover

INFO
Carry out the necessary adjustments before installing the cover cap.

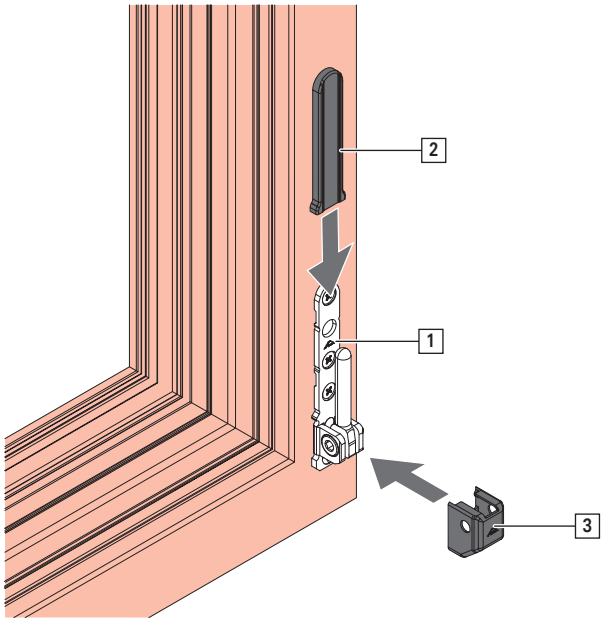
1. Slide the corner hinge cover cap [1] onto the corner hinge [2] as far as it will go.



6.4.3.2 Pivot rest cover

INFO
Carry out the necessary adjustments before installing the cover cap.

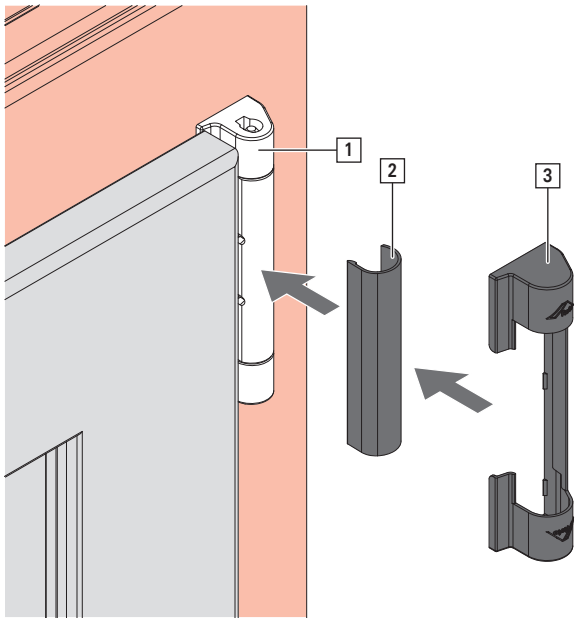
1. Secure the pivot rest cover cap [2] to the pivot rest [1].



2. Attach the pivot rest cover [3] to the front of the pivot rest.

6.4.3.3 Stay bearing cover

1. Secure the cover cap [2] to the sash stay [1].



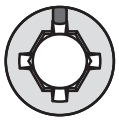
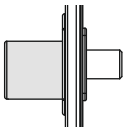
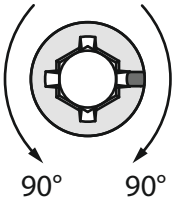
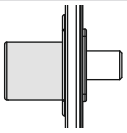
2. Secure the cover cap [3] to the stay bearing.

7 Adjustment

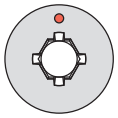
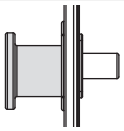
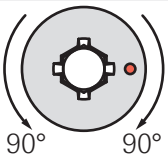
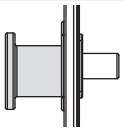
INFO
Roto hardware components may only be adjusted by authorised professionals when the element is installed.

7.1 Locking cam

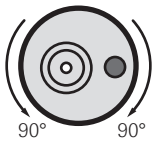
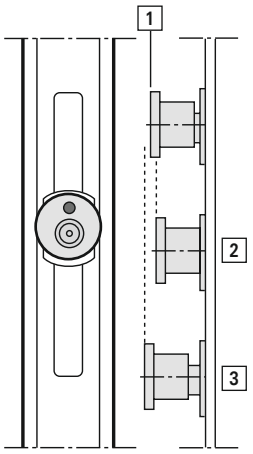
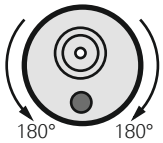
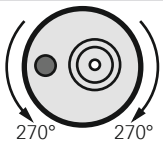
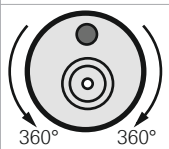
E cam

E cam	Adjustment distance	Gasket compression adjustment / mm	Height	Side view
				
		±0.8 mm		

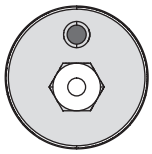
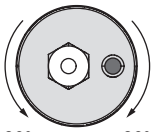
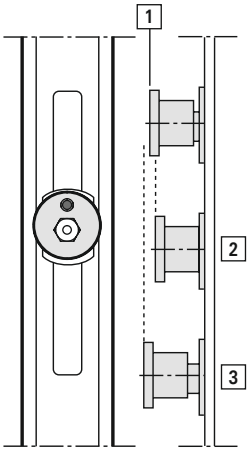
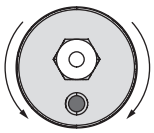
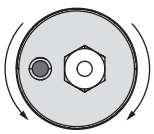
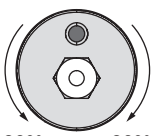
P cam

P cam	Adjustment distance	Gasket compression adjustment / mm	Height	Side view
				
		±0.8 mm		

V cam

V cam	Adjustment distance	Gasket compression adjustment / mm	Height adjustment / mm	Side view
			±0.8 mm	
		±0.8 mm	±0.2 mm	
			±0.4 mm	
		±0.8 mm	±0.6 mm	
			±0.8 mm	[1] 0 = initial position [2] -0.8 mm max. adjustment [3] +0.8 mm max. adjustment

V cam (from 2020)

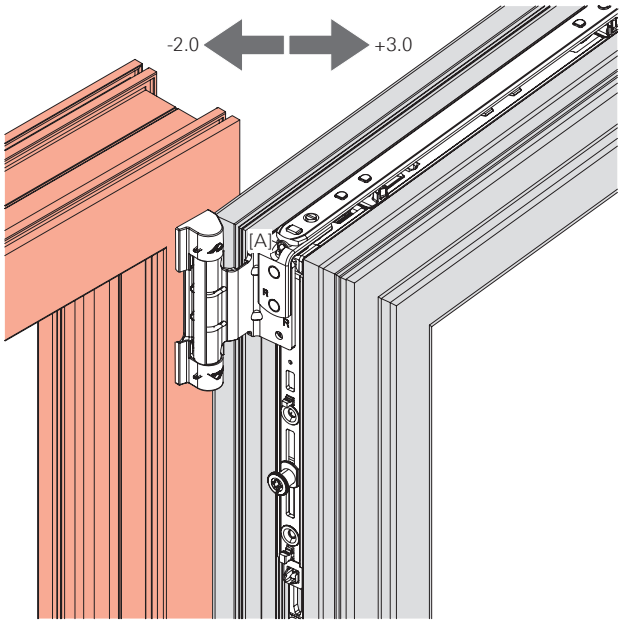
V cam	Adjustment distance	Gasket compression adjustment / mm	Height adjustment / mm	Side view
			+1.5 mm -0.8 mm	
		±0.8 mm	±0.125 mm	
			±0.25 mm	
		±0.8 mm	±0.375 mm	
			±0.5 mm	[1] 0 = initial position [2] -0.8 mm max. adjustment [3] +1.5 mm max. adjustment

7.2 Sash stay

Lateral adjustment

1. Open the sash.

2. Lateral adjustment -2.0 / +3.0 mm via screw in the sash stay [A].

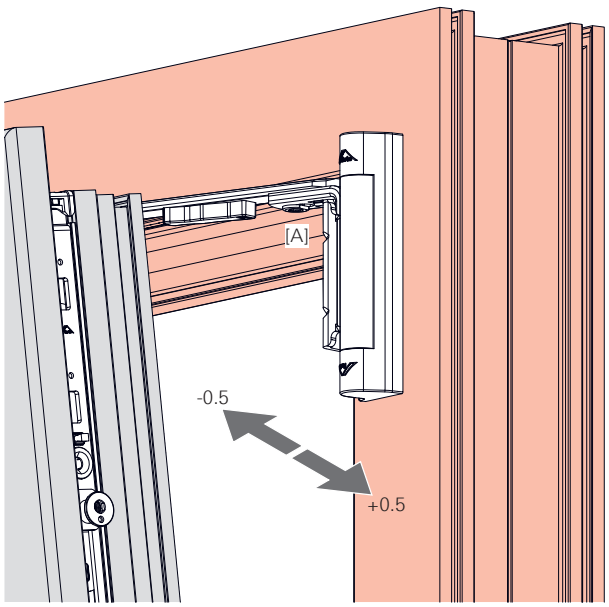


3. Lateral adjustment with size 4 hex key.

Gasket compression adjustment

1. Move the sash to the tilt position.

2. Gasket compression adjustment ±0.5 mm via screw in the sash stay [B].



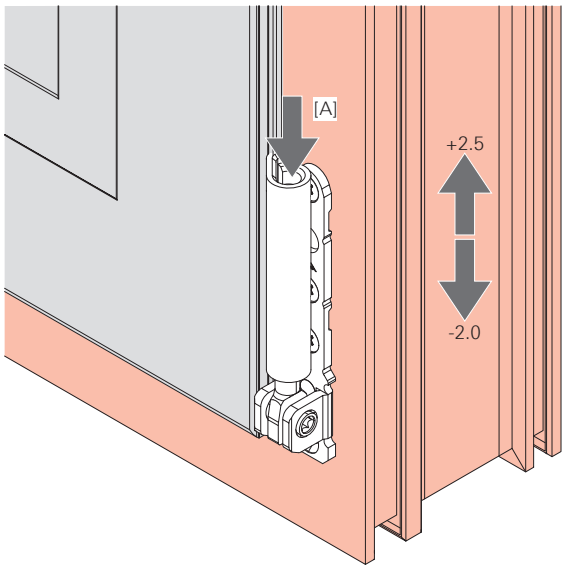
3. Gasket compression adjustment with size 4 hex key.

7.3 Pivot rest and corner hinge

Height adjustment

1. Remove the cover cap.
   Remove the load from the sash.

2. Height adjustment -2.0 / +2.5 mm via screw in the corner hinge [A].



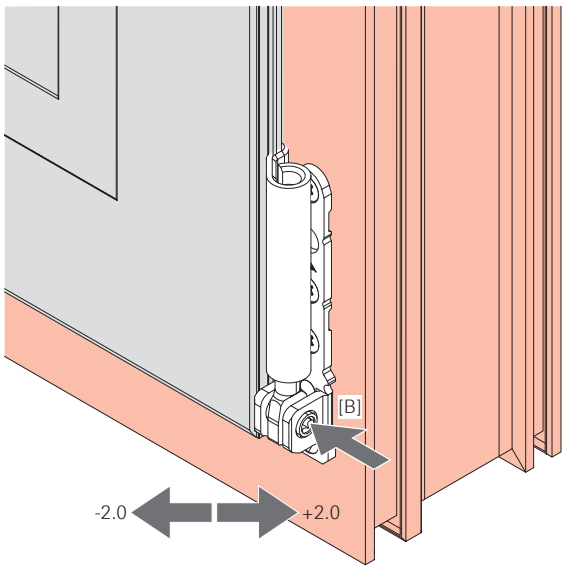
3. Adjustment with size 4 hex key.

4. Fit the cover cap.

Lateral adjustment

1. Remove the cover cap.

2. Lateral adjustment ±2.0 mm via screw in the pivot rest [B].



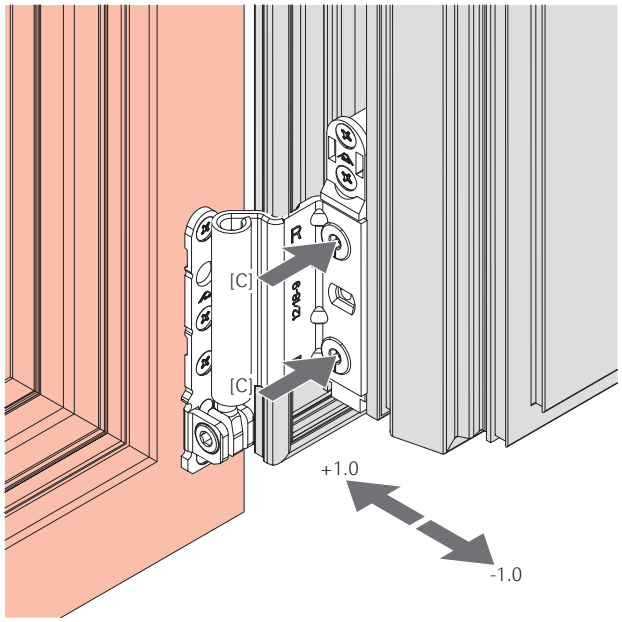
3. Adjustment with size 4 hex key.

4. Fit the cover cap.

Gasket compression adjustment

1. Open the window sash 180°.

2. Lateral adjustment ±1.0 mm via screws in the corner hinge [C].



3. Adjustment with T25 hex key.

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