



Roto Safe H

H650

Mechanical multipoint lockings for lever-handle-operated doors

Contact

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1 General information

1.1 Version history

Ver- sion	Date	Changes
v0	01/03/2022	Publication
v1	05/08/2024	Lever-operated espagnolette Standard added → <i>from page 79</i> Replacement main lock added → <i>from page 92</i>
v2	24/02/2026	Force-fit connections changed → <i>from page 27</i> Single-leaf doors → <i>from page 38</i> and double-leaf doors restructured → <i>from page 72</i> Operation of the lever-operated espagnolette Standard changed → <i>from page 106</i> H650 – Roto AL updated → <i>from page 43</i>

1.2 Instructions

This manual contains important information, instructions and assembly guidelines 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:

- Roto Safe catalogue: CTL_86
- Roto Eifel catalogue: CTL_87
- Roto Eifel installation instructions: IMO_423

Additional guidelines and directives

- Instructions and information issued by profile manufacturers (e.g. manufacturers of windows and balcony doors),
- 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
	Optional / alternative components seated in the sash
	Sash / components seated in the sash
	Optional / alternative components seated in the frame
	Frame / components seated in the frame
	Drill holes, routing, screw positions
	Unaffected components / indirectly affected components

Marking	Meaning
	Components, arrows or movements that have just been described
	Item number
	Legend
	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
	Numbered step
	Numbered second-level step
	Requirement

1.4 Pictographs

Symbol	Meaning
	Timber
	PVC
	Aluminium
	Door

1.5 Faceplates

Symbol	Meaning
 	Flat faceplate 16 mm
 	Flat faceplate 20 mm
 	Flat faceplate 24 mm

Symbol	Meaning
 4.5x20	U-shaped faceplate 4.5 x 20 mm
 6x24	U-shaped faceplate 6 x 24 mm

1.6 Abbreviations

Abbreviation	Meaning
C	Combination locks
CH	Power wedges
CB	Bolt
CTL	Catalogue
DIN L / R	DIN left / right
E	E cam
SRH	Sash/leaf rebate height
IMO	Installation instructions
kg	Kilograms
KO	Couplable at the top
KOKU	Couplable at the top and bottom
ZUOV	Toothing at the bottom and top and between the top two V cams
Max.	Maximum
Min.	Minimum
mm	Millimetres
Nm	Torque in newton metres
V	V cam
ZS	Additional locking device

Possible additional lock versions

Abbreviation	Meaning
2C	2 combination locks
2CZS	2 combination locks + additional locking device
3C	3 combination locks
4C	4 combination locks
2CB	2 bolts
2CB2V	2 bolts + 2 V cams
2CBZS	2 bolts + additional locking device
2CH	2 power wedges
2CH2V	2 power wedges + 2 V cams
2CHZS	2 power wedges + additional locking device
4CH	4 power wedges
4E	4 E cams
4V	4 V cams

Possible striker strip versions (combination locks)

Abbreviation	Meaning
2C	2 combination locks
4C	4 combination locks

1.7 Explanation of terms

Lock

The term "lock" refers to the deadbolt in the main lock and the additional locks, used to lock the door securely.

Door secured

The term “door secured” means that the door is secured using the latch in the main lock but is not locked. Actuating the door lever handle causes the latch to retract, allowing the door to be opened.

Door locked

The term “door locked” means that the door is secured by an unsprung rigid deadbolt that has been pushed out of the main lock, and also by other additional locks. All locking elements engage in corresponding recesses in the frame or frame components.

1.8 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.

Door manufacturers

The “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 doors.

Building element dealers or installation companies

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

Builders

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

End users

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

1.9 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 door manufacturer:

- Catalogue
- Installation, maintenance and operation instructions

Responsibility of the door manufacturer

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

- Installation, maintenance and operation instructions

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

Responsibility of building element dealers / the installation company

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

- Maintenance and operation instructions

Responsibility of the builder

The builder must hand over the following document to the end user:

- Maintenance and operation instructions

1.10 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.

1.11 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.

1.12 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.



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 multipoint lock described in these instructions is designed for installation in doors. The multipoint lock is only intended for further processing on doors for vertical installation made from the materials described in these instructions. The multipoint lock opens, closes and locks doors.

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 7.*

2.3.2 Usage restriction

Open and unlocked doors do not meet the requirements for:

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

2.4 Basic safety information

The following hazards may arise when handling the product.

2.4.1 Installation

Imminent risk of death or serious injuries due to incorrect installation!

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, as well as glass breakage.

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

Risk of injury due to heavy loads!

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).

Adverse health effects due to physical overexertion!

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.



2.4.2 Use

Potential of serious injuries due to trapping body parts in the opening between leaf and frame!

Gripping between the leaf and frame when closing doors poses the risk of crushing injuries.

- ▶ When closing doors, never grip between the leaf and frame and always exercise caution.
- ▶ Keep children and anyone unable to understand the risks away from the hazardous area.
- ▶ Refrain from slamming the door shut deliberately or uncontrollably.

Risk of injury and property damage due to opening and closing leaves incorrectly!

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

Risk of injury and property damage due to opening and closing leaves incorrectly!

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

- ▶ When moving the leaf, ensure that it will not slam against the frame or other leaves once fully opened or closed.
- ▶ Ensure that the leaf 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 leaf and locking the multipoint lock, the gasket counter force must be overcome.
- ▶ Do not use the extended deadbolt to keep the door open.
- ▶ Do not use any tools or aids which act as a lever to actuate the multipoint lock.
- ▶ Only use the designated locking mechanisms.
- ▶ Do not actuate the door lever handle and profile cylinder at the same time.
- ▶ Do not open double-leaf doors using the second opening leaf.

Potential risk of injury and property damage due to misuse!

Misuse can lead to hazardous situations and may destroy the hardware, profiles or other parts within the doors.

- Refrain from introducing obstacles into the opening area between the frame and leaf.
- Do not place heavy loads on the door lever handle; the maximum load is 15 kg.
- Do not place heavy loads on the cylinder key; the maximum load is 15 kg.
- Refrain from placing additional loads which act upon the leaf.

Potential risk of injury and property damage due to improper maintenance!

The doors, including the multipoint lock, require expert maintenance (care, cleaning, servicing and inspection) in order to guarantee their proper condition and safe use.

- ▶ Keep the multipoint lock free of deposits and contaminants.
- ▶ Refrain from performing after-treatment on the locking elements that would prevent them from working properly, e.g. by painting over them.
- ▶ 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.
- ▶ Refrain from performing work on the multipoint lock or striker plate that could impact the structure, mode of operation or correct functioning.

- ▶ Refrain from introducing foreign and unsuitable objects into the multi-point lock or striker plate.

2.4.3 Ambient conditions

Potential property damage due to physical and chemical influences!

In a saline, aggressive or corrosive environment, multipoint locks can be permanently damaged to the point that they can no longer function.

- ▶ Do not use multipoint locks 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.

Potential property damage due to moisture!

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

- ▶ Avoid preventing the circulation of air, e.g. due to deep reveals, curtains or unfavourable positioning of radiators 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.

2.5 Operation

The safety symbols and markings and the associated warnings explained below apply to the safe operation of leaves.

Safety symbols and markings



Symbol	Meaning
	Trapping body parts in the opening between leaf and frame may lead to serious injuries. When closing leaves, never grip between the leaf and frame and always exercise caution. Keep children and anyone unable to understand the risks away from the hazardous area.
	Placing additional loads on the leaf may lead to minor injuries and property damage. Avoid placing additional loads on the leaf.
	The impact of wind may lead to minor injuries and property damage. Ensure that the leaf is guided slowly by hand throughout its entire movement range, until it has been brought into a fully closed or opening position. Avoid exposing the open leaf to wind. Move the leaf to the closed position in windy and draughty conditions.
	Introducing obstacles into the opening between leaf and frame may result in minor injuries and property damage. Avoid introducing obstacles into the opening between leaf and frame.
	Pressing the leaf against the edge of an opening (reveal) may pose a risk of minor injuries and cause property damage. Avoid pressing the leaf against the edge of an opening (reveal).

3 Information on the product

3.1 Product characteristics

Efficiency

- Standardised locking patterns for reduced logistics and installation effort
- Profile-related frame components for efficient installation
- Latch can be turned around when installed for simple conversion on the construction site

Security

- Particularly robust main lock for a high level of functional safety
- E cams, V cams and bolts for basic burglary inhibition
- Power wedge and combination locking for a high level of burglary inhibition

Comfort

- Increased lever handle force for a high level of operating convenience
- Convenient locking using the door lever handle
- Sound-absorbing whisper latch for closing the door quietly

Design

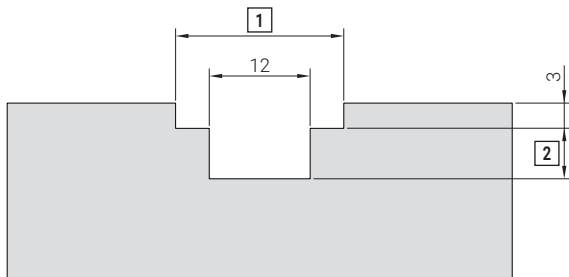
- Door designs up to 3000 mm for freedom of design
- Durable and scratch-resistant surfaces for a high-quality appearance in the long term
- Backsets from 25 to 65 mm for a high level of flexibility

Quality

- Certified continuous operation characteristics for permanent functional safety
- Corrosion-resistant surfaces for a safe investment

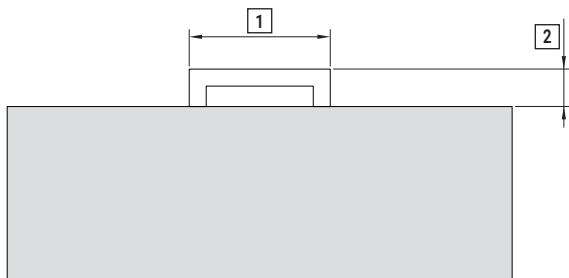
3.2 Faceplates

Flat faceplates



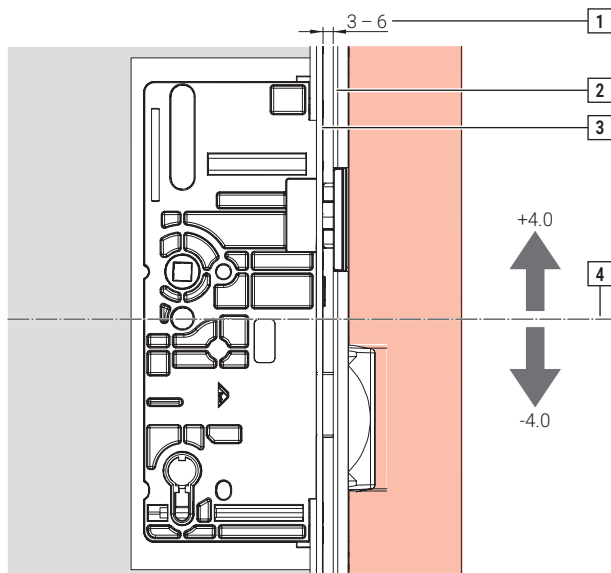
- [1] Faceplate width (16, 20, 24)
- [2] Connecting-rod depth (6 or 9)

U-shaped faceplates



- [1] Faceplate width (20, 24)
- [2] Faceplate depth (4.5 or 6)

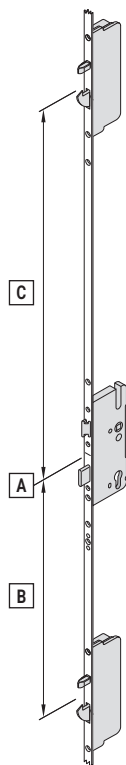
3.3 Tolerance – height offset



- [1] Functional clearance (distance between striker / front edge of striker strip and front edge of faceplate)
- [2] Striker / striker strip
- [3] Faceplate
- [4] Height offset between centre of lock and centre of striker (markings present)

3.4 Locking pattern

The locking pattern designates the dimensional position of the additional locking points on the faceplate. In this pattern, the first two numbers represent the distance(s) from the centre of the main lock down to the centre of the additional locking(s), while the last two numbers stand for the distance(s) from the centre of the main lock upwards.



Assignment	Meaning
[A]	Centre of main lock
[B]	Centre of main lock down to centre of additional locking
[C]	Centre of main lock up to centre of additional locking

Since the position of the additional locking also impacts the position of the frame components, the locking pattern also applies to these, especially for striker strips and lever-operated espagnolettes.

To ensure you choose the multipoint locking with the ideal level of security for your needs, the highest locking point should be lockable at the top where possible and the lowest locking point must be positioned as far down as possible according to the specific sash rebate height (SRH).

Locking pattern	Sash rebate height (SRH)
V02/01	1800 – 2200 mm
V02/03	1900 – 2200 mm
V02/05	1500 – 1900 mm
V02/07	2200 – 2400 mm
V02/17	1900 – 2200 mm
V08/17	1900 – 2200 mm
V18/25	1750 – 2800 mm
V22/25	1900 – 2200 mm
V52/53	1900 – 2200 mm



4 Brief instructions

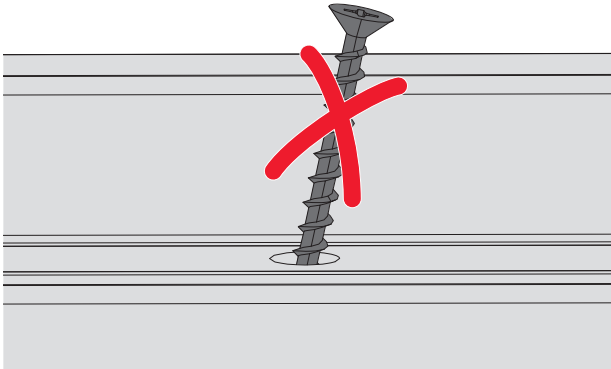
4.1 Installation sequence

	Step	Note	Page reference
Leaf	Route the profile.		→ from page 58
	Predrill the lever handle set.		→ from page 58
	Turn the latch around if required.		→ from page 61
	Install the multipoint lock or extendable multipoint lock.		→ from page 64
	Install the lever-operated espagnolette (Standard, Plus) on the second opening leaf.	Only for double-leaf doors	→ from page 83 → from page 88
	Install the lever handle set.		→ from page 65
	Carry out a performance test.		→ from page 67
Frame	Route the profile.		→ from page 69
	Install the striker strip or strikers and any electrical openers required.		→ from page 69
	Install the top shootbolt protrusion striker.	Only for double-leaf doors	→ from page 71
	Install the cover bridge at the bottom.	Only for double-leaf doors	See IMO_423
Final acceptance	Make the necessary adjustments.		→ from page 95
	Lubricate the hardware.		→ from page 111
	Carry out a performance test.		→ from page 67

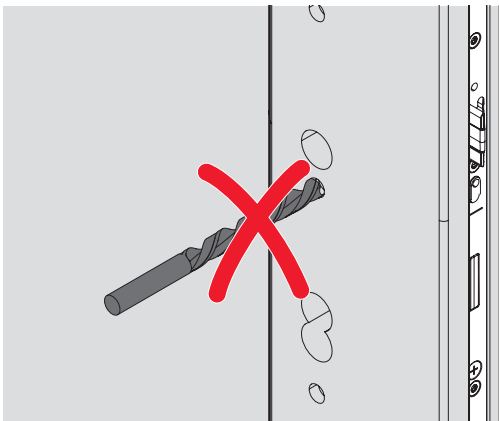
5 Installation

5.1 General information

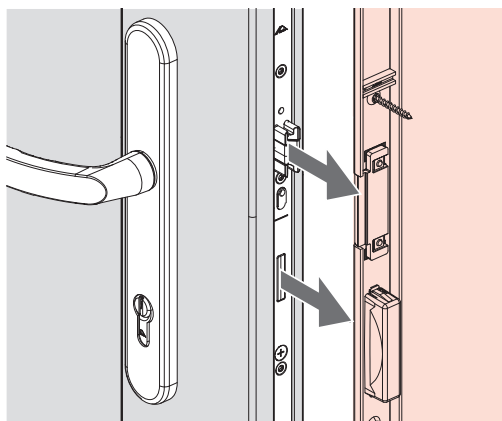
5.1.1 For the fabricator



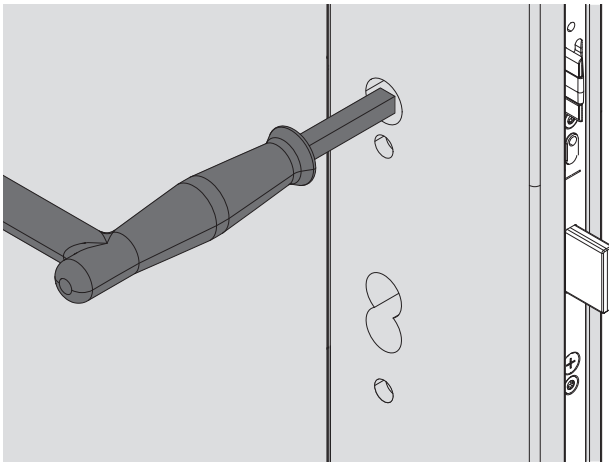
Turn the screws in straight so that they are not tensioned. Do not use stainless-steel screws on the Roto Sil surface. Use stainless-steel screws on stainless-steel components.



Do not drill through the lock area of the door leaf when the lock is installed (e.g. for protective hardware).

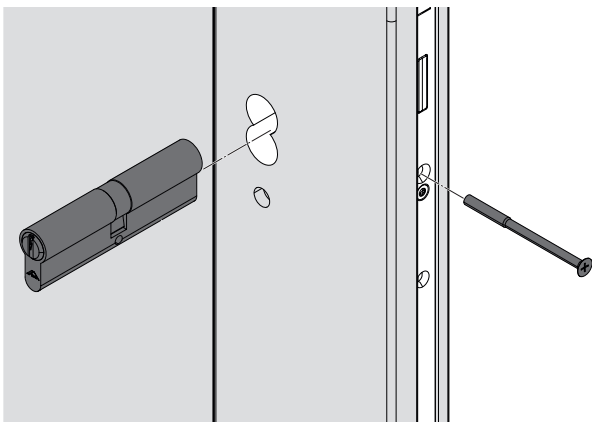


Manufacture door designs so that it is ensured that the locks always operate properly. Observe the axis dimension.



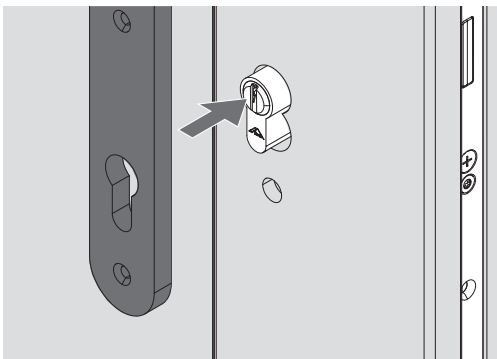
i **INFO**

If no door handle is installed, only lock and unlock the door using the pull handle.



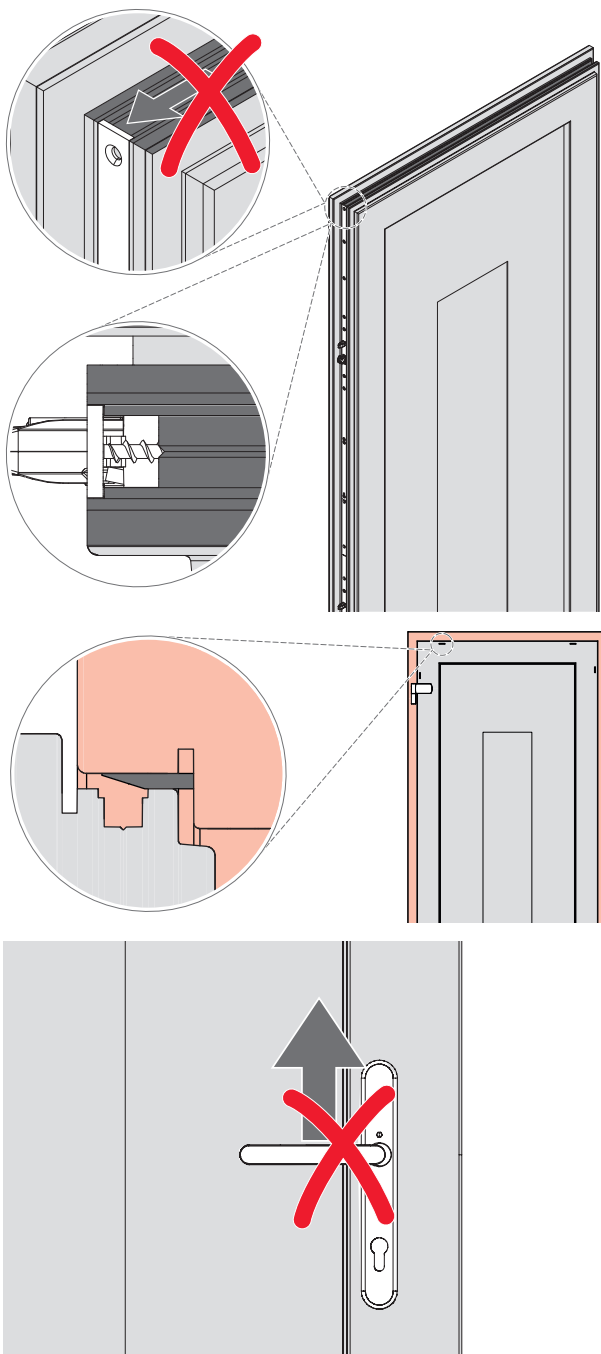
i **INFO**

Install the profile cylinder or round cylinder without subjecting it to stress (align it 90° to the leaf).



i **INFO**

Install the long plates and escutcheons without subjecting them to stress (align them 90° to the leaf).



ATTENTION

Contamination may cause property damage.

Contamination may get behind the floating mullion and block the multipoint locking system.

- ▶ Do not wipe contamination in the upper area of the sash (e.g. plaster, gypsum) towards the floating mullion.

During transport, secure the leaf against the frame using suitable supports (run-up blocks, wedges, etc.).

Do not remove the cylinder fixing, which is a transport safety mechanism, until you are about to install the profile cylinder.

Do not carry the leaf by the door lever handle.

5.2 Screw connections



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.



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.

General information

- 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.

5.2.1 Timber

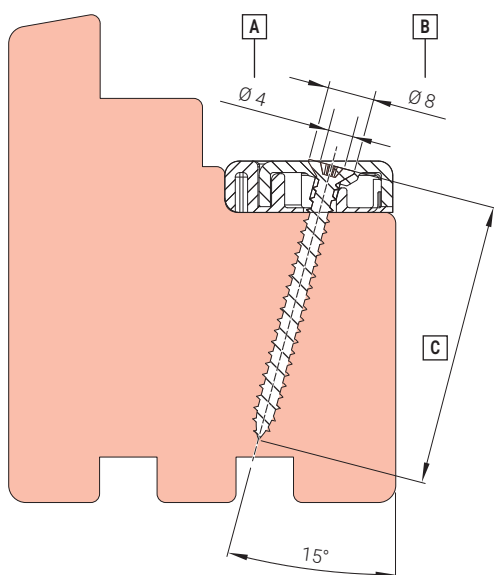
Fasten hardware components using electrogalvanised and passivated steel fixing screws. Use fixing screws with additional sealing in more challenging climatic conditions.

Fixing screws for timber strikers



INFO

It can be seen from each individual timber striker whether the fixing screws have to be turned in straight or at a 15° angle.



Choose screws for timber strikers with a 15° angle:

[A] Screw diameter

[B] Maximum possible head diameter

[C] Maximum possible screw length

5.2.2 PVC



ATTENTION

Incorrect screw connections may cause property damage.

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

The multipoint lock can be pulled out of the leaf if it is not screwed into the steel reinforcement.

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

Fasten hardware components using electrogalvanised and passivated steel fixing screws. Use fixing screws with additional sealing in more challenging climatic conditions.

5.2.3 Aluminium



ATTENTION

Improper screw connections may cause property damage.

The multipoint locking can be pulled out of the profile if it is not screwed down correctly.

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

If necessary, insert additional aluminium profiles or use rivet nuts.

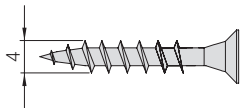


INFO

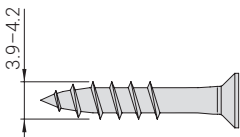
If rivet nuts are used instead of screws, use countersunk nuts.

5.2.4 Screwdriving recommendations

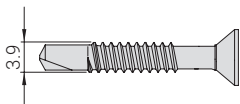
Timber



PVC



Aluminium





5.3 Force-fit connection



INFO

Force-fit connections are formed by screwing down components A and B so that forces and movements are transferred without loss.

Couplable hardware components always require a force-fit connection.

5.3.1 U-shaped faceplate



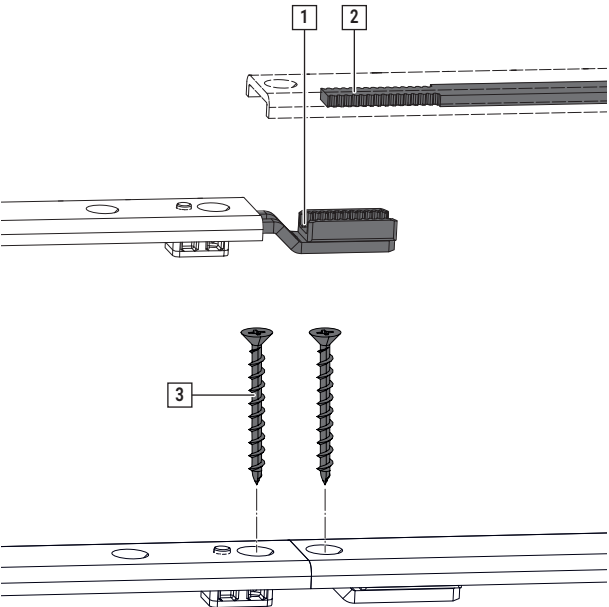
INFO

Route out the area for U-shaped faceplates. Request the routing drawing if required.



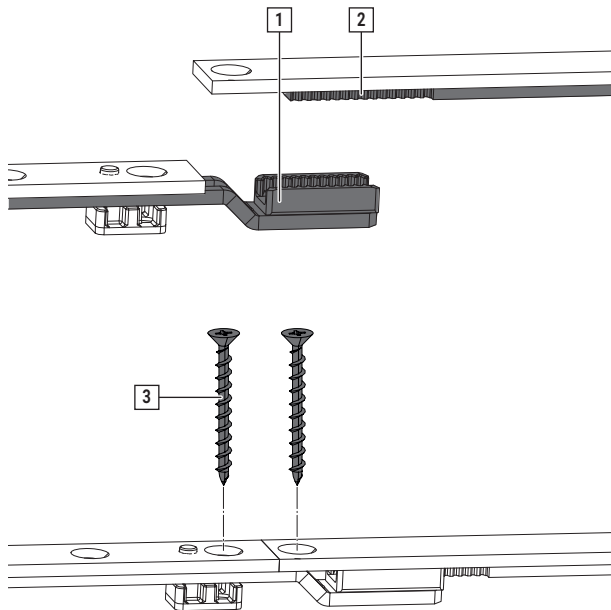
INFO

Use longer screws for aluminium profiles.



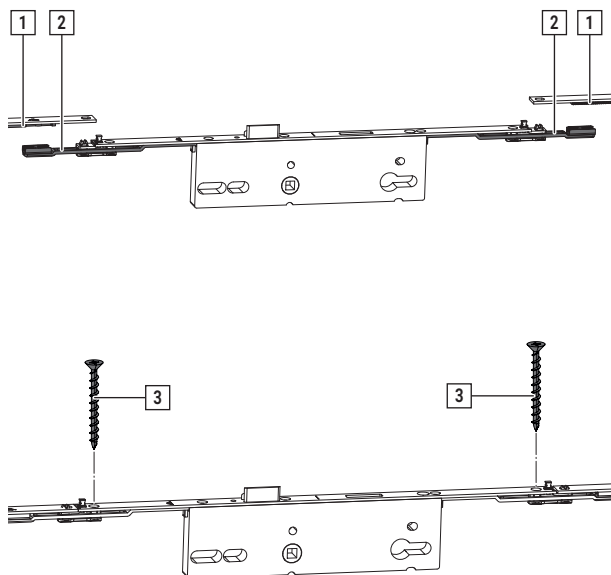
Assignment	Description
[1]	Coupling point of extension
[2]	Coupling point of multipoint lock
[3]	Screws

5.3.2 Flat faceplate



Assignment	Description
[1]	Coupling point of extension
[2]	Coupling point of multipoint lock
[3]	Screws

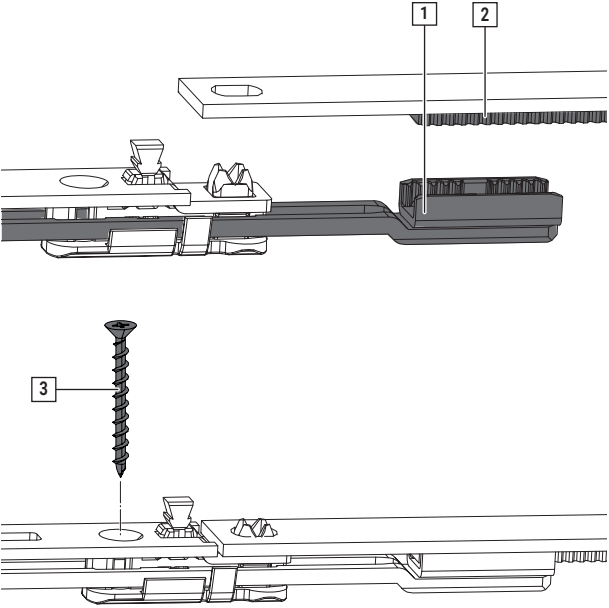
5.3.3 Flat faceplate – three-part – KOKU



Assignment	Description
[1]	Coupling point of extension
[2]	Coupling point of multipoint lock
[3]	Screws



5.3.4 Flat faceplate – ZUOV

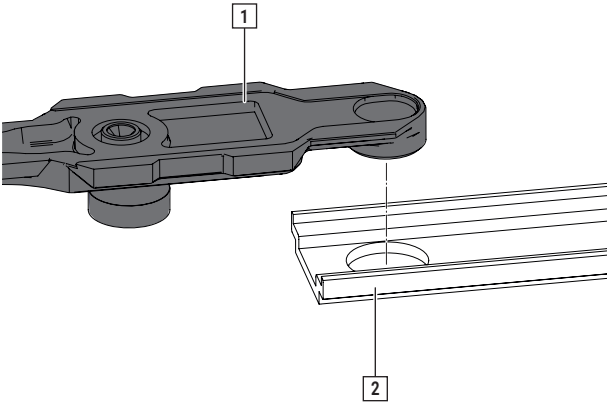


Assignment	Description
[1]	Coupling point of extension
[2]	Coupling point of multipoint lock
[3]	Screws

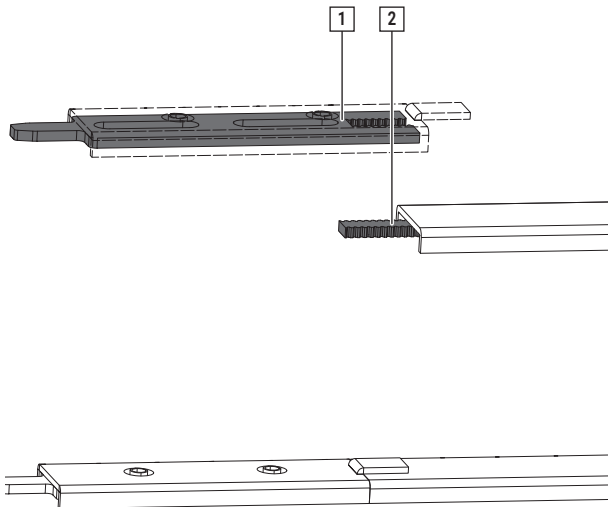
5.3.5 Roto AL

Connecting the corner drive to the connecting rod

1. Connect the corner drive [1] at the coupling point on the connecting rod [2].



5.3.6 Lever-operated espagnolette Standard



Assignment	Description
[1]	Coupling point of extension
[2]	Coupling point of lever-operated espagnolette Standard



INFO

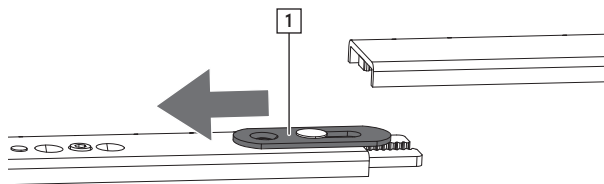
On PVC profiles with opposite hardware groove, cover the groove in the area of the coupling point in order to stabilise the connection.

For this purpose, use the Roto NX connecting link (material number 350401), for example.

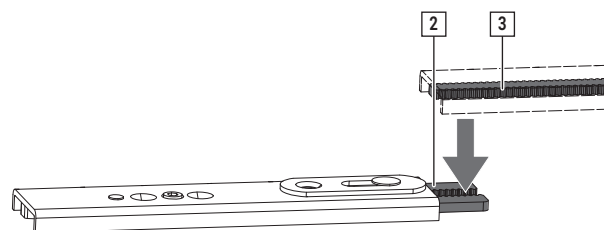


5.3.7 Lever-operated espagnolette Plus

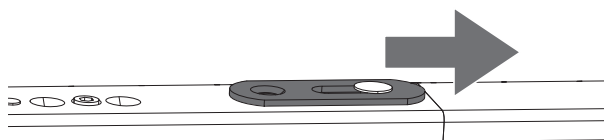
1. Move the faceplate link [1] to expose the coupling point.



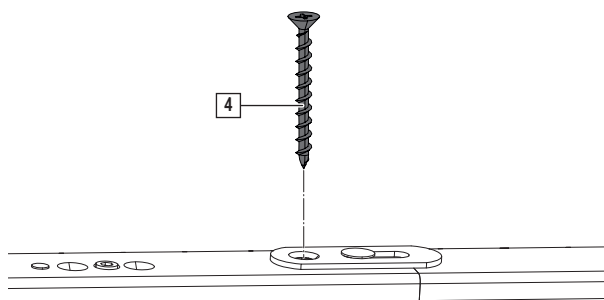
2. Connect the coupling points of the extension [2] and lever-operated espagnolette Plus [3].



3. Slide the faceplate link over the coupling point.



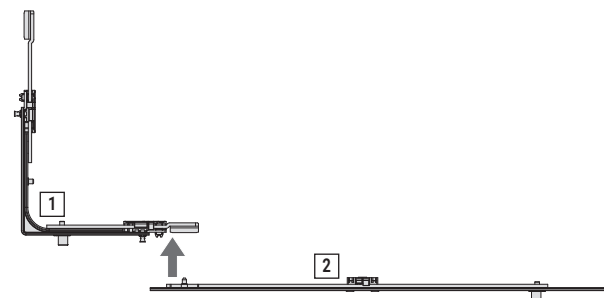
4. Fasten the coupling points with a screw [4].



5.4 Coupling with Roto NX components

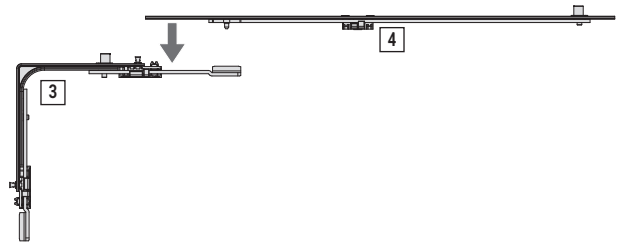
Installation sequence

1. Standard corner drive [1], bottom.



2. Centre lock, bottom horizontal [2].

3. Standard corner drive [3], top.



4. Centre lock, top horizontal [4].

5. Install the H650.

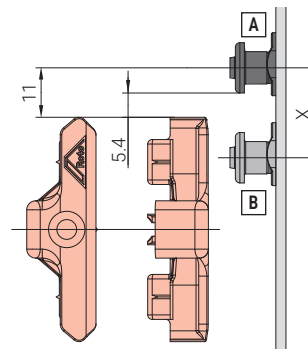
6. Position the strikers.

Tool: marking jig

X Travel = 19.5

[A] Centre of E / V cam in open position

[B] Centre of E / V cam in locked position



7. Check ease of movement:

Turn the key in the profile cylinder by one rotation in the locking direction and one rotation in the unlocking direction.

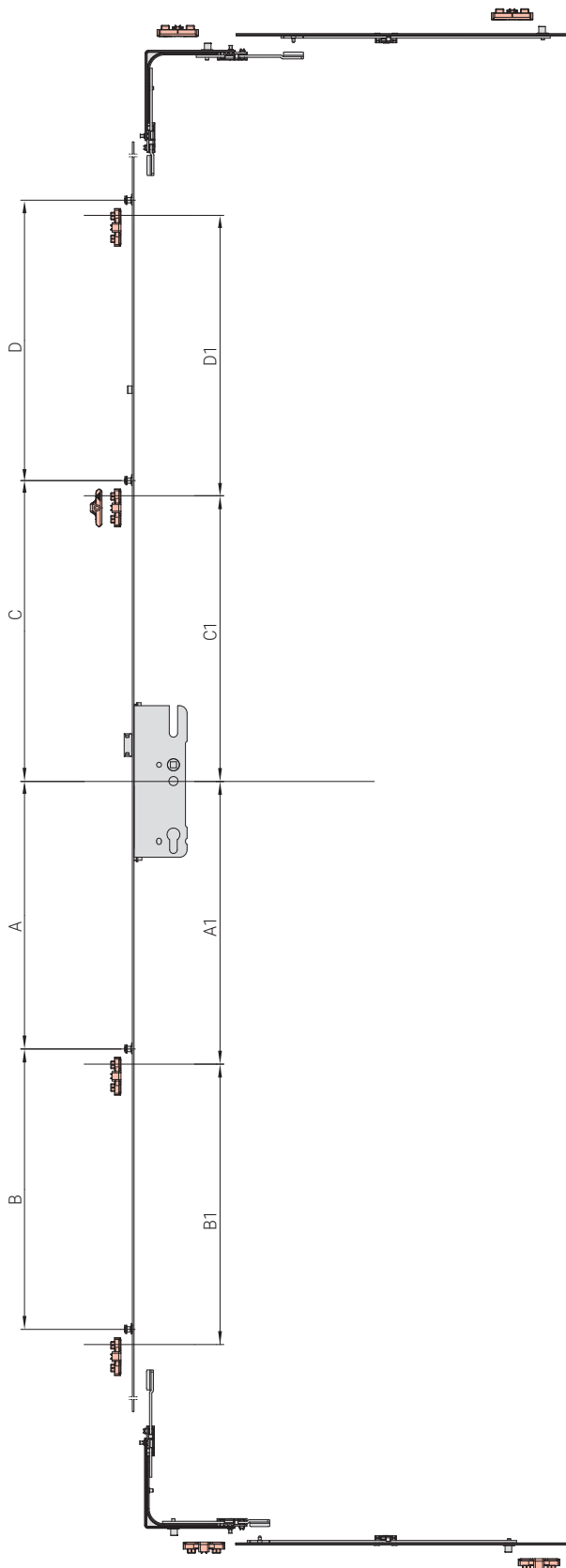


INFO

The key must be very easy to turn.



Overview and pattern



Pattern	Open position				Locked position			
	Cam centre dimension				Cam centre dimension			
	A	B	C	D	A1	B1	C1	D1
V22/25	353	370	397	370	373	370	377	370
V22/27	353	370	497	370	373	370	477	370
V18/25	353	525	497	370	373	525	477	370

5.5 Centre fixing



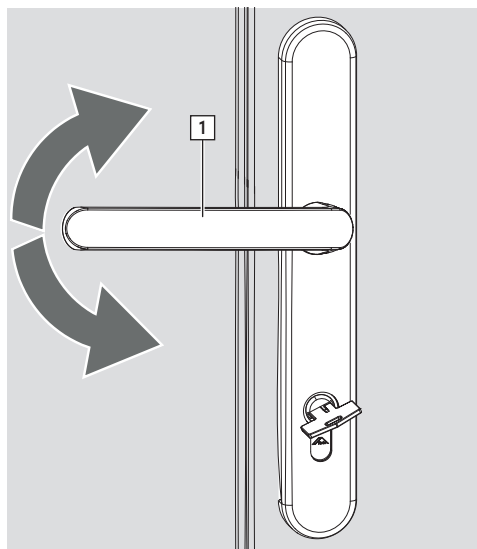
INFO

All couplable components are delivered attached in the centre.

Undoing the centre fixing

Turning the door lever handle undoes the centre fixing of the hardware components. Undo the centre fixing with the leaf open.

1. Turn the door lever handle [1] in one direction as far as it will go.
Audible cracking noise.



2. Turn the door lever handle in the opposite direction as far as it will go.
Audible cracking noise.
3. Turn the door lever handle in both directions again and check for ease of movement.

Check ease of movement



INFO

Turn the key in the profile cylinder by one rotation in the locking direction and one rotation in the unlocking direction.

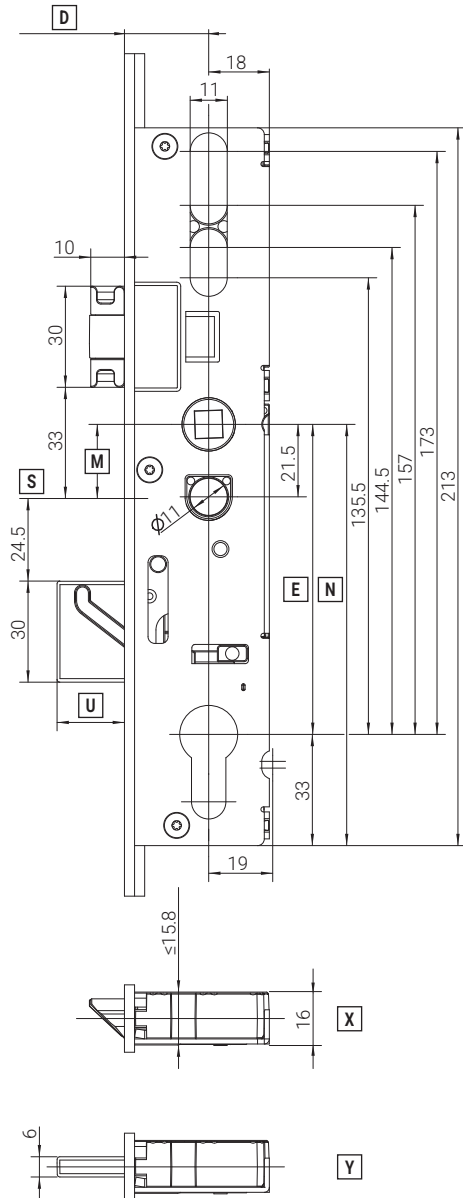
The key must be very easy to turn.



5.6 Main locks

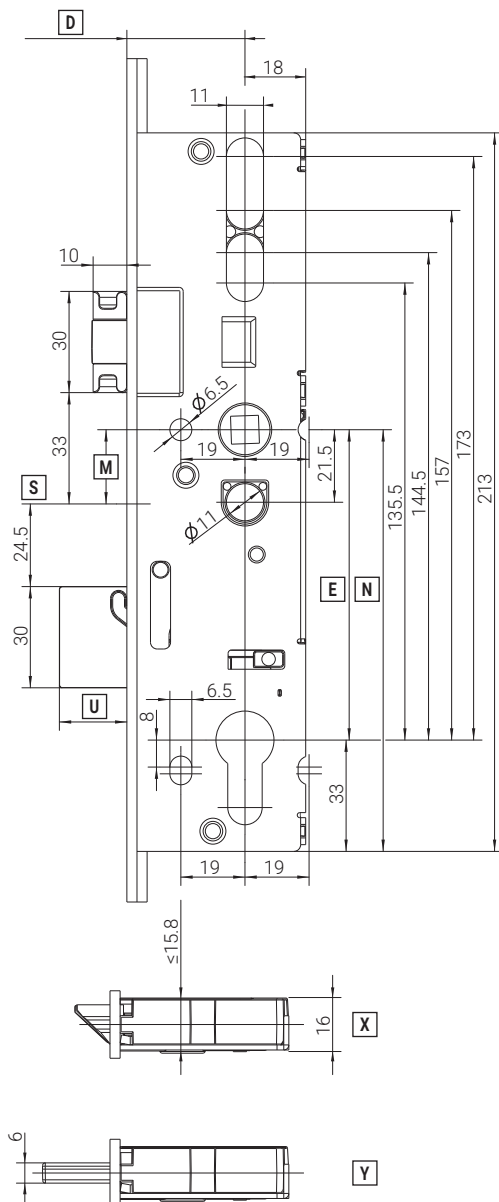
5.6.1 H650

H650 main lock | Backset 25, 28 mm



Assignment	Meaning	Value
[D]	Backset	25 and 28 mm
[E]	Distance	92 mm
[M]	Centre of spindle-receiver to centre of main lock	22 mm
[N]	Centre of spindle-receiver to lower edge of main lock	125 mm
[S]	Centre of main lock	–
[U]	Deadbolt protrusion	20 mm
[X]	Latch (can be turned around)	–
[Y]	Deadbolt	–

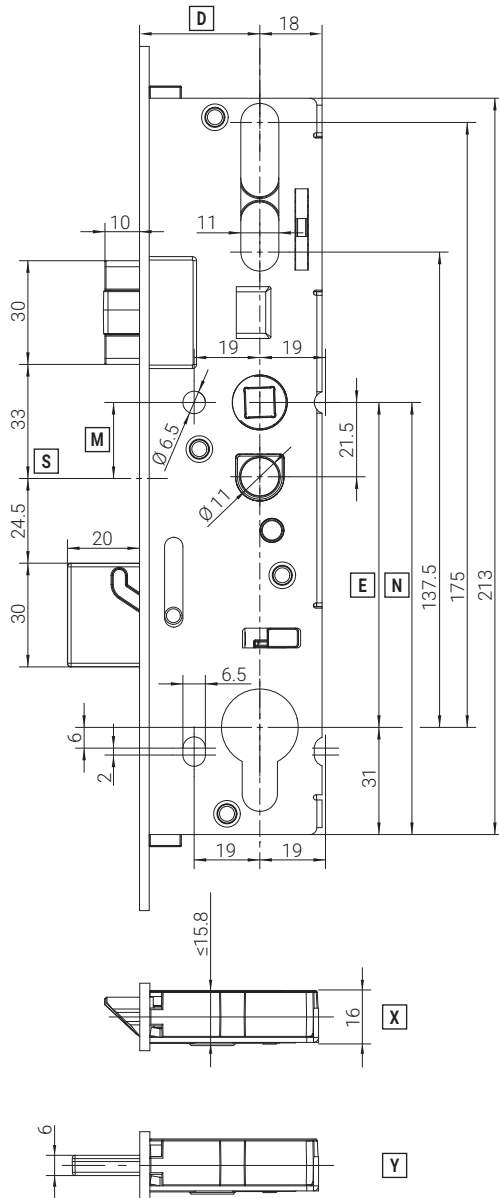
H650 main lock | Backset from 35 mm



Assignment	Meaning	Value
[D]	Backset	35 to 65 mm
[E]	Distance	92 mm
[M]	Centre of spindle-receiver to centre of main lock	22 mm
[N]	Centre of spindle-receiver to lower edge of main lock	125 mm
[S]	Centre of main lock	–
[U]	Deadbolt protrusion	20 mm
[X]	Latch (can be turned around)	–
[Y]	Deadbolt	–



H650 main lock | Backset from 35 mm (round cylinder)



Assignment	Meaning	Value
[D]	Backset	35 to 65 mm
[E]	Distance	94 mm
[M]	Centre of spindle-receiver to centre of main lock	22 mm
[N]	Centre of spindle-receiver to lower edge of main lock	125 mm
[S]	Centre of main lock	–
[U]	Deadbolt protrusion	20 mm
[X]	Latch (can be turned around)	–
[Y]	Deadbolt	–

5.7 Single-leaf doors

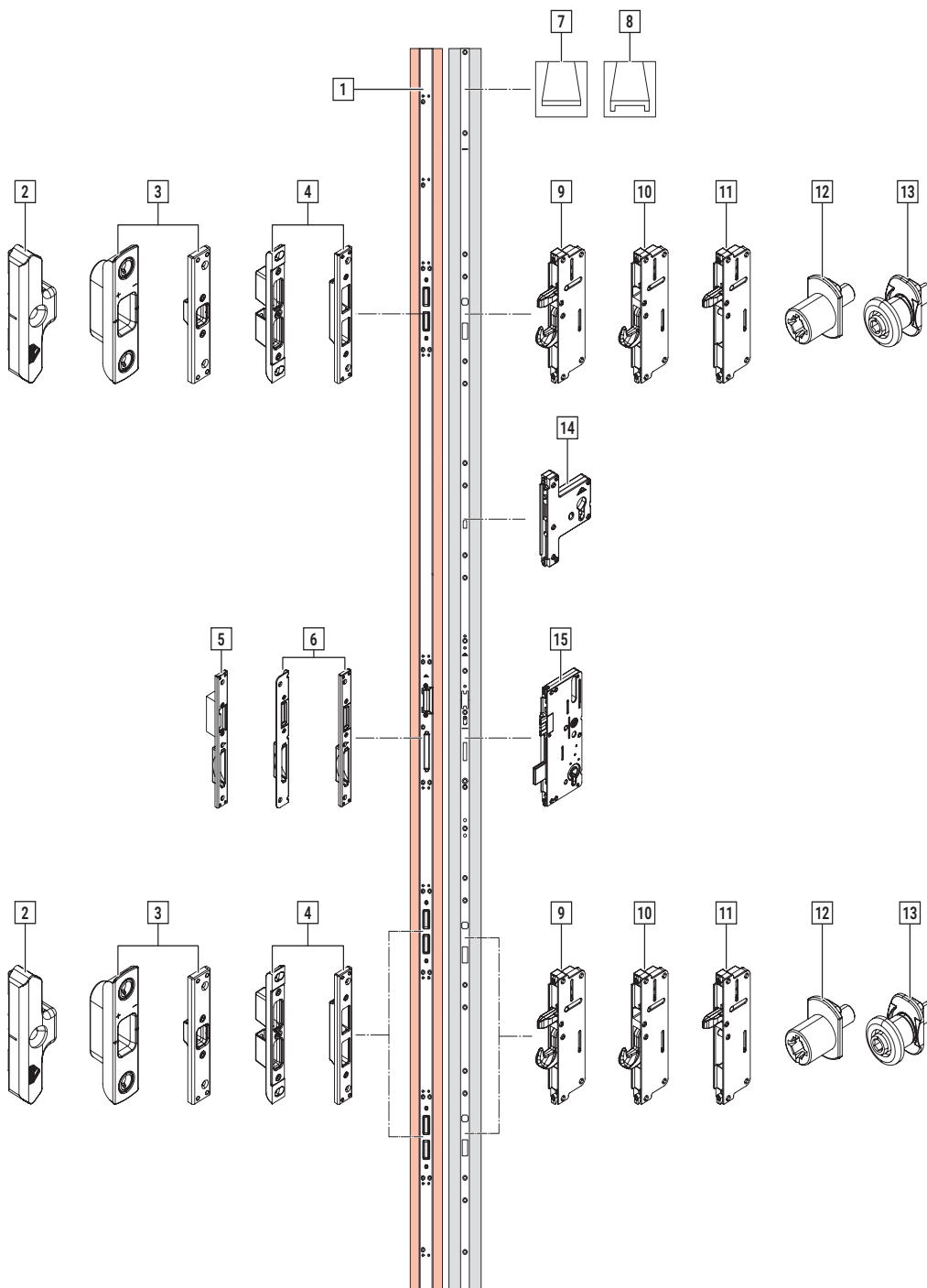
5.7.1 Overview of multipoint lockings

Possible additional locking versions

Abbreviation	Meaning
2C	2 combination lockings
2CZS	2 combination lockings + additional locking device
3C	3 combination lockings
4C	4 combination lockings
2CB	2 bolts
2CB2V	2 bolts + 2 V cams
2CBZS	2 bolts + additional locking device
2CH	2 power wedges
2CH2V	2 power wedges + 2 V cams
2CHZS	2 power wedges + additional locking device
4CH	4 power wedges
4E	4 E cams
4V	4 V cams

Possible striker strip versions (combination lockings)

Abbreviation	Meaning
2C	2 combination lockings
4C	4 combination lockings

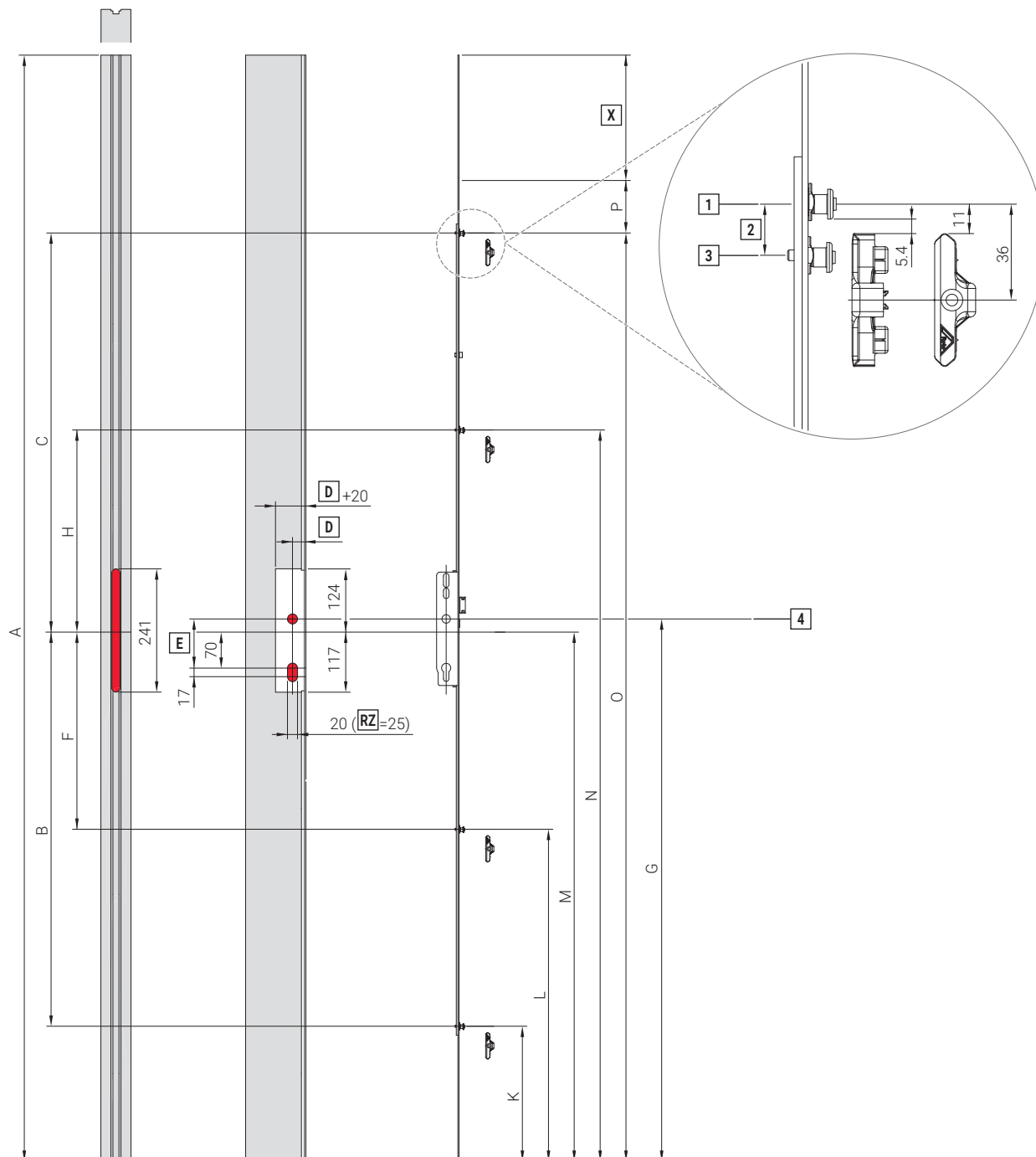


Frame		Leaf	
[1]	Striker strip	[7]	Flat faceplate
[2]	E / V cam striker	[8]	U-shaped faceplate
[3]	Bolt striker	[9]	Combination locking (C)
[4]	Combination striker	[10]	Power wedge (CH)
[5]	Electrical opener / deadbolt striker	[11]	Bolt (CB)
[6]	Latch / deadbolt striker	[12]	E cam (E)
		[13]	V cam (V)
		[14]	Additional locking device (ZS)
		[15]	H650 main lock

5.7.2 Drilling and routing dimensions

5.7.2.1 Additional locks (E, V)

Leaf

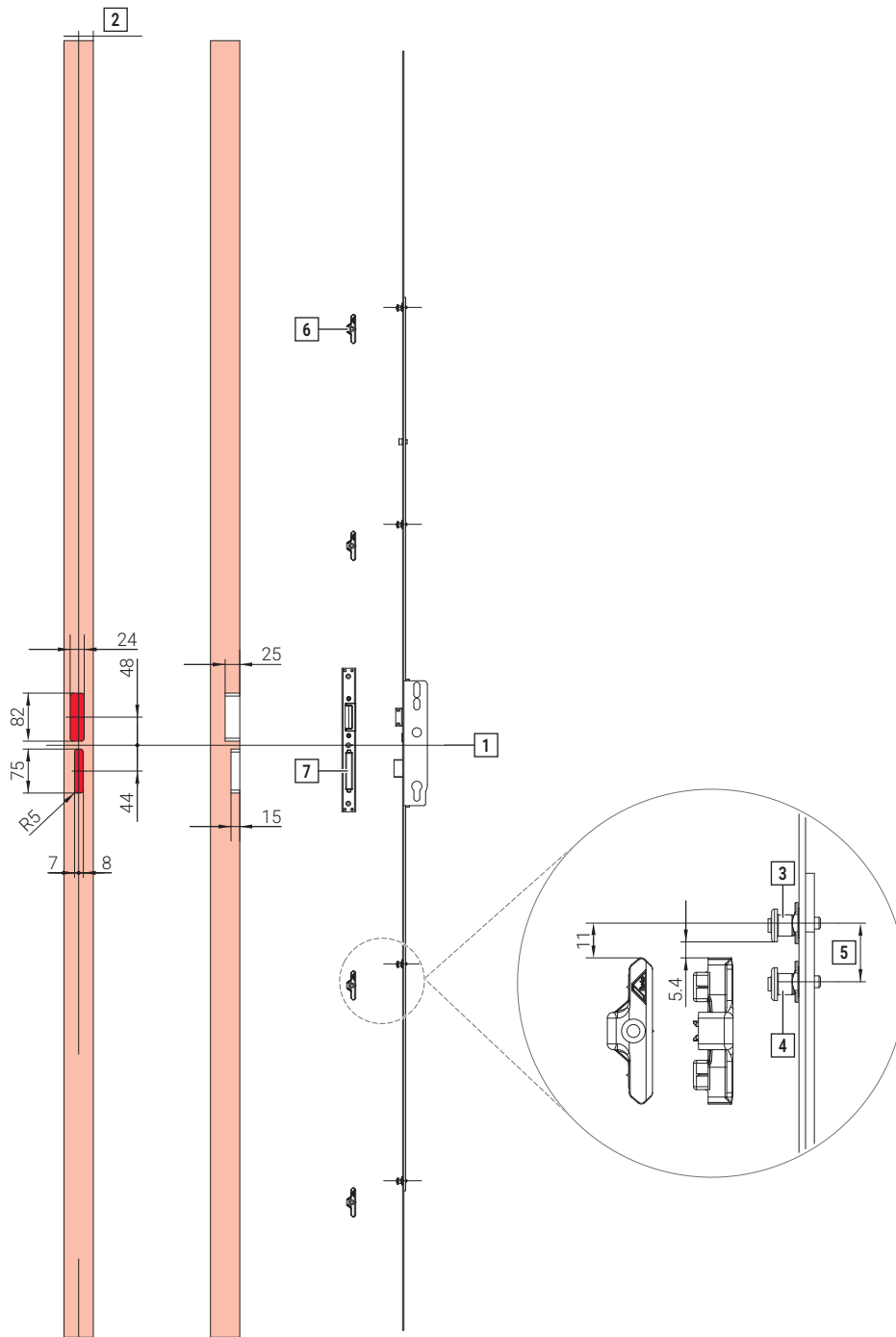


- | | |
|---|---------------------|
| [1] Centre of E / V cam open position | [D] Backset |
| [2] Travel 19.5 | [E] Distance |
| [3] Centre of E / V cam locked position | [RZ] Round cylinder |
| [4] Centre of spindle-receiver | [X] Cropping range |

Pattern	A	B	C	F	G	H	K	L	M	N	O	P	[X]
V18/25	2165	878	767	353	1020	397	120	645	998	1395	1765	–	–
V22/25	2200	723	767	353	1020	397	275	645	998	1395	1765	155	300



Frame



- | | |
|---|------------------------------|
| [1] Faceplate marking | [5] Travel 19.5 |
| [2] Routing axis | [6] E / V cam striker |
| [3] Centre of E / V cam open position | [7] Latch / deadbolt striker |
| [4] Centre of E / V cam locked position | |



INFO

Determine the position of the striker with the marking jig for locking cams.

Position the marking jig on the E or V cam. Determine the position of the locking component and mark it.

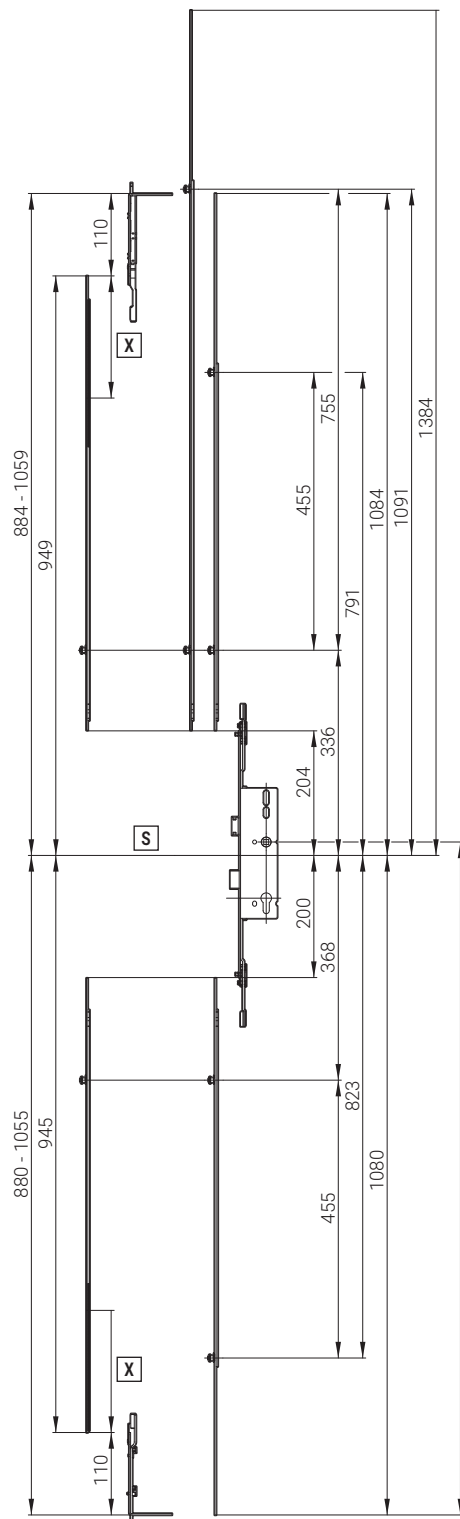


INFO

PVC strikers for a 4 E / V lock depend on the profile. No routing is required.

Request the routing drawings for timber strikers.

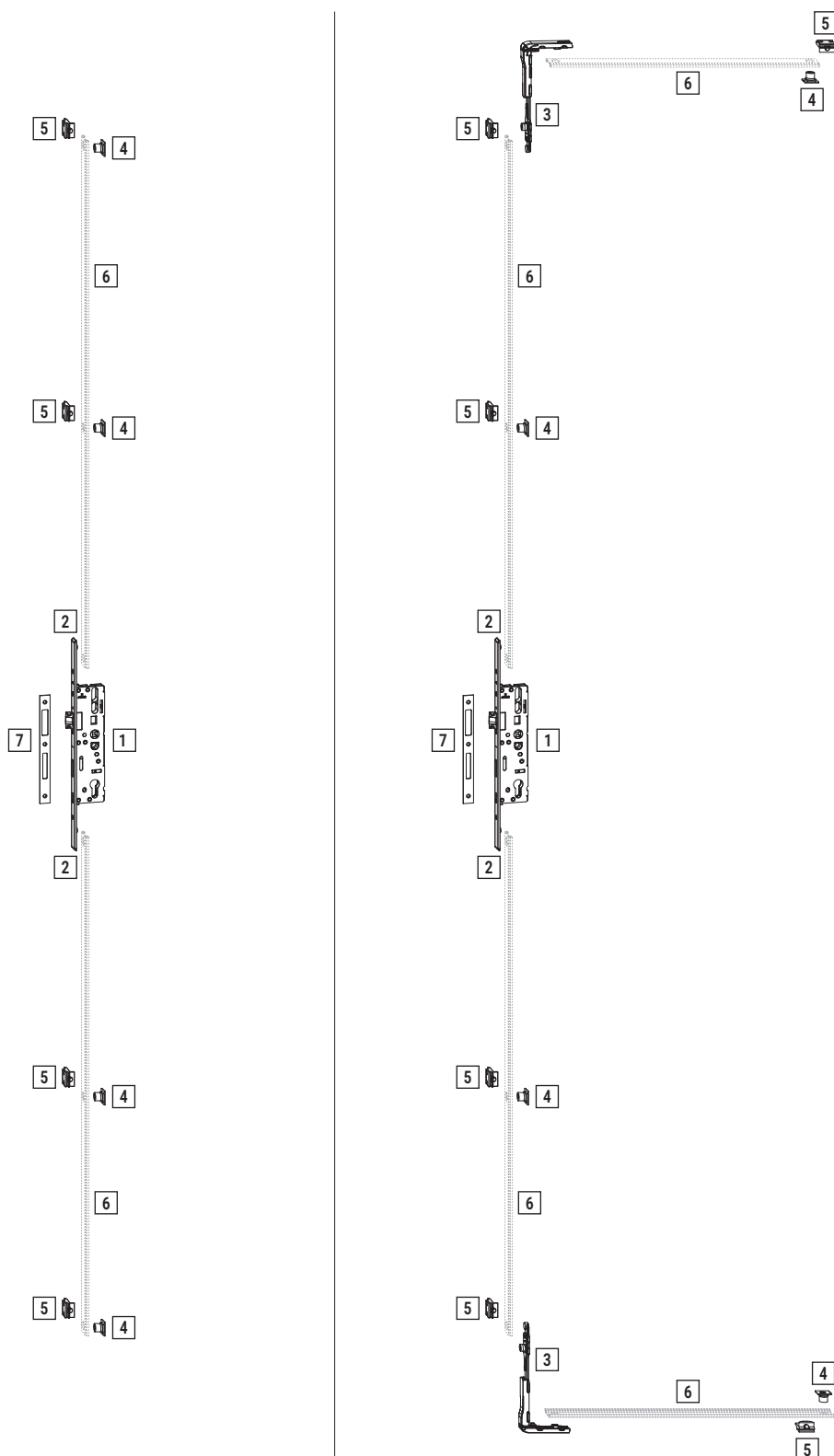
5.7.2.2 H650 – three-part



Assignment	Meaning	Value
[S]	Centre of main lock	–
[X]	Cropping range	200 mm



5.7.2.3 H650 – Roto AL



Installation

Single-leaf doors

Drilling and routing dimensions

Assignment	Meaning
[1]	H650 main lock – Roto AL
[2]	End cap
[3]	Corner drive
[4]	Cam
[5]	Cam striker
[6]	Connecting rod
[7]	Latch / deadbolt striker plate



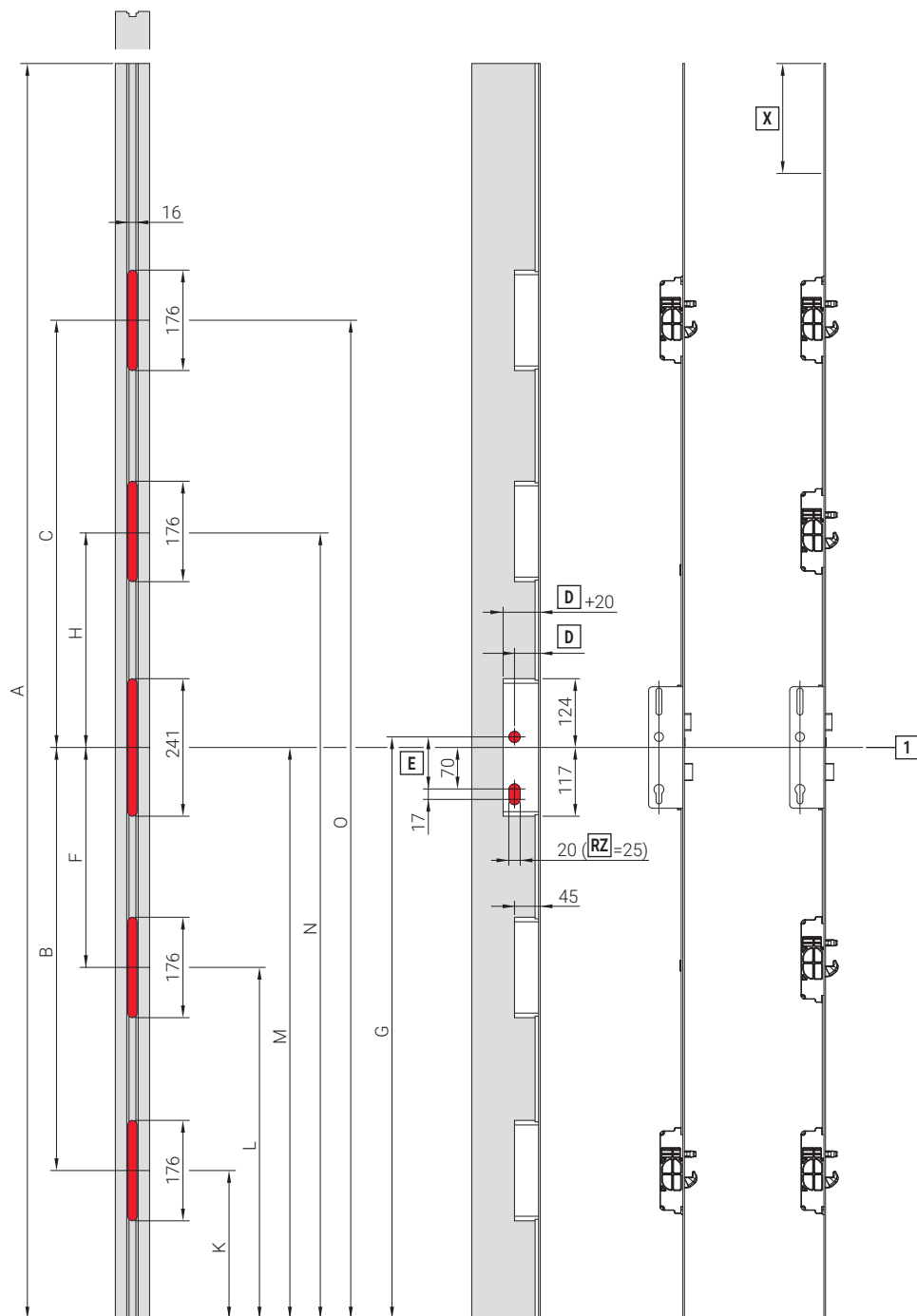
INFO

For complete hardware overviews and installation advice, see Roto AL IMO_332.



5.7.2.4 Additional locks (CB, CH, C)

Leaf



[1] Faceplate marking

[D] Backset

[E] Distance

[RZ] Round cylinder

[X] Cropping range

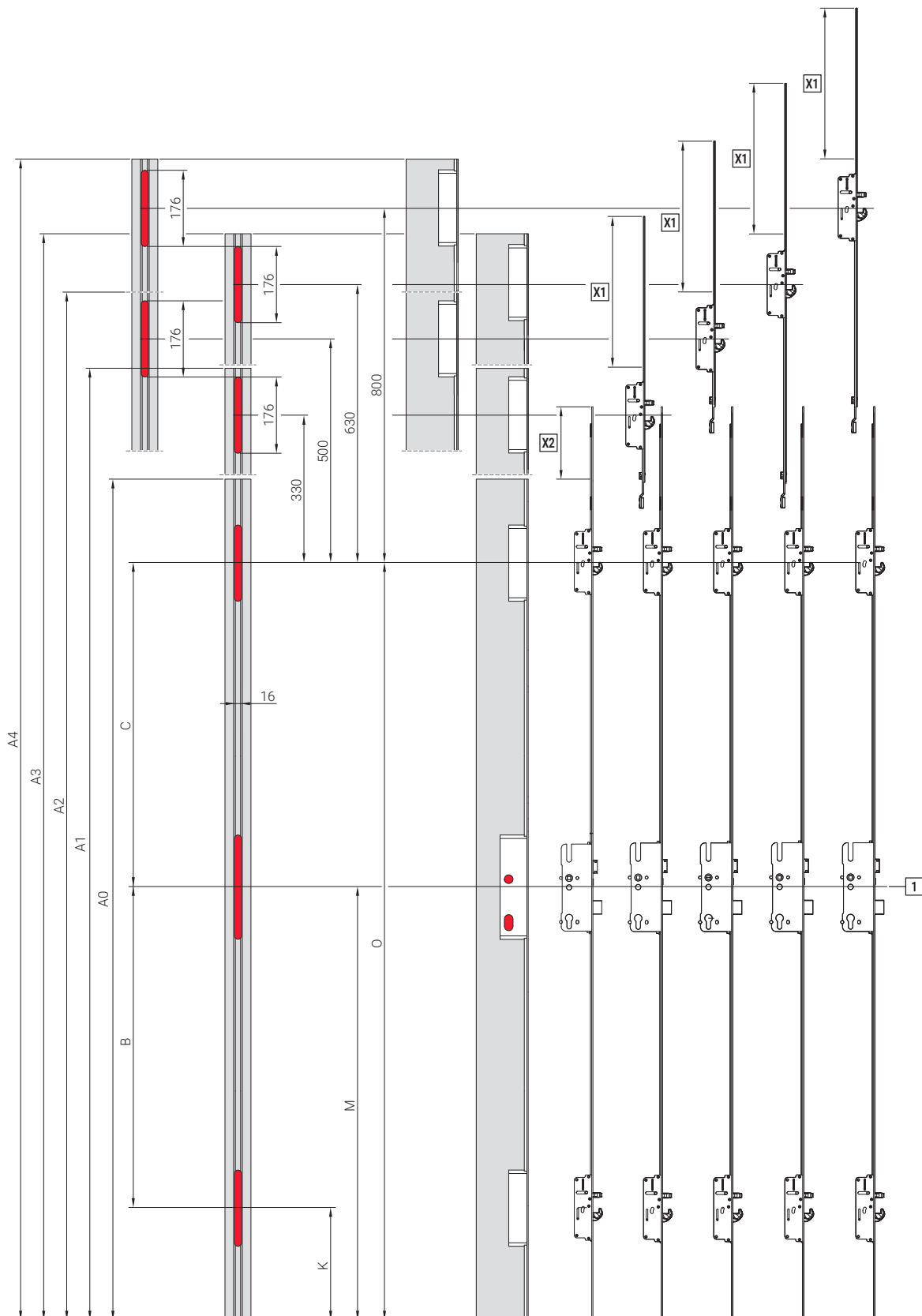
Pattern	A	B	C	F	G	H	K	L	M	N	O	[X]
V02/01	2200	738	632	–	1020	–	260	–	998	–	1630	400
V02/03	2200	738	752	–	1020	–	260	–	998	–	1750	300
V02/05	1900	738	382	–	1020	–	260	–	998	–	1380	400
V02/07	2400	738	982	–	1020	–	260	–	998	–	1980	200

Couplable multipoint locks (CB, CH, C)



INFO

Route out the area for U-shaped faceplates. Request the routing drawing if required.

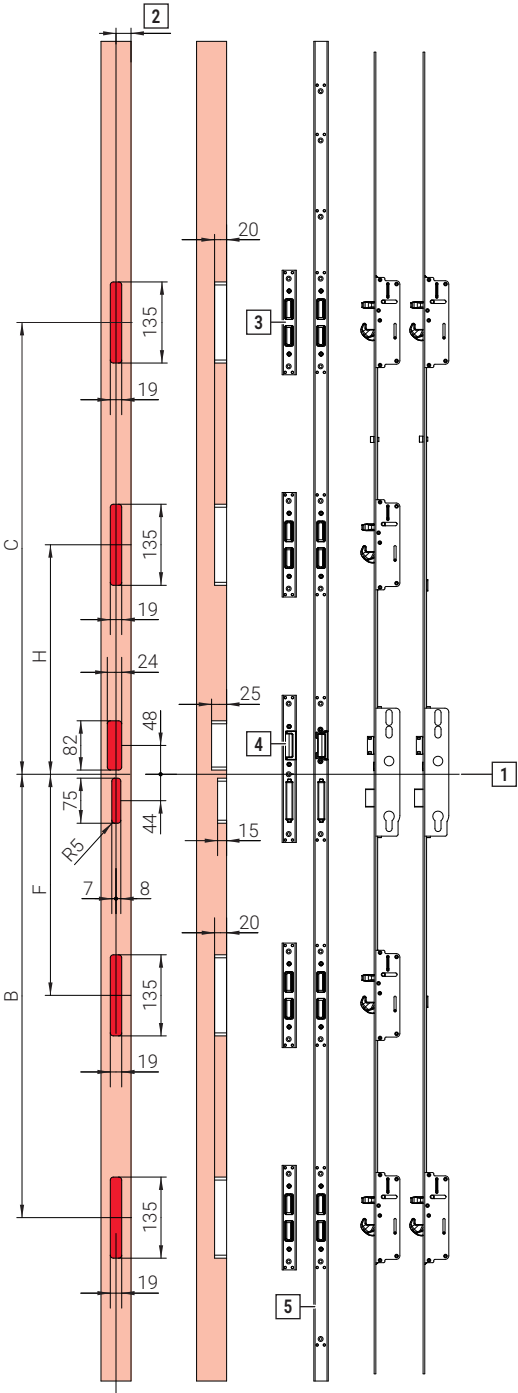




[1] Faceplate marking

Pattern	A0	A1	A2	A3	A4	B	C	K	M	O	[X1]	[X2]
V02/03	1900 – 2200	2400 – 2530	2530 – 2700	2700 – 2830	2830 – 3000	738	752	260	998	1750	Max. 200 depending on the leaf height	170

Frame



- [1] Faceplate marking
- [2] Routing axis
- [3] Combination striker
- [4] Latch / deadbolt striker
- [5] Striker strip

- Carry out the routing work as shown in the drawing.



INFO

The routing refers to PVC and aluminium strikers.

Request the routing drawing for timber strikers.



INFO

The routing depth depends on the leg height on the striker.

Example – combination striker:

- Striker height = 24.5 mm
- Leg height = 7 mm
- Min. routing depth = 17.5 mm



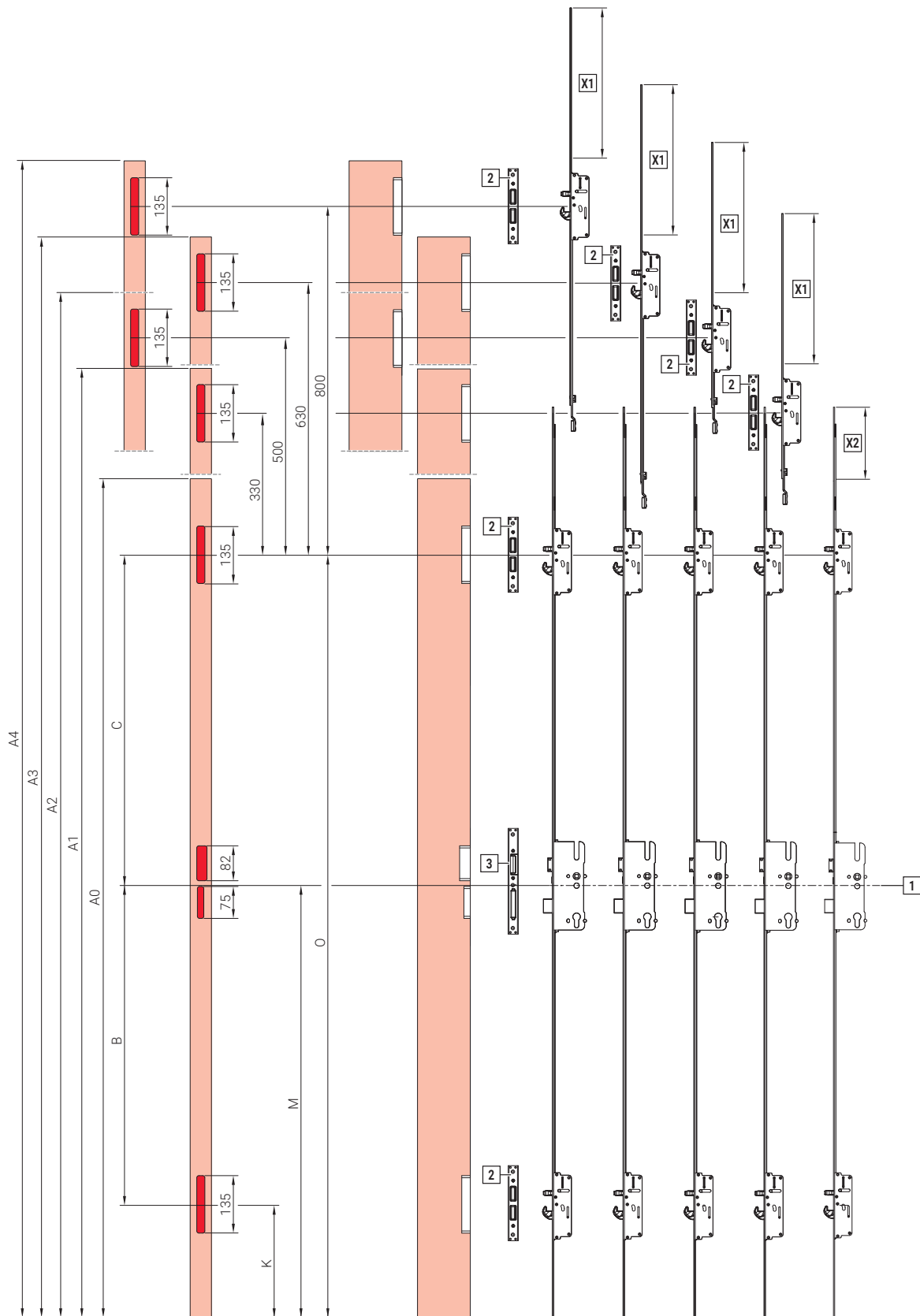
INFO

The routing axis depends on the profile.

Pattern	B	C	F	H
V02/01	738	632	–	–
V02/03	738	752	–	–
V02/05	738	382	–	–
V02/07	738	982	–	–
V08/17	738	752	368	382



Couplable multipoint lock (CB, CH, C)



- [1] Faceplate marking
- [2] Combination striker
- [3] Latch / deadbolt striker

[X] Cropping range

Installation

Single-leaf doors

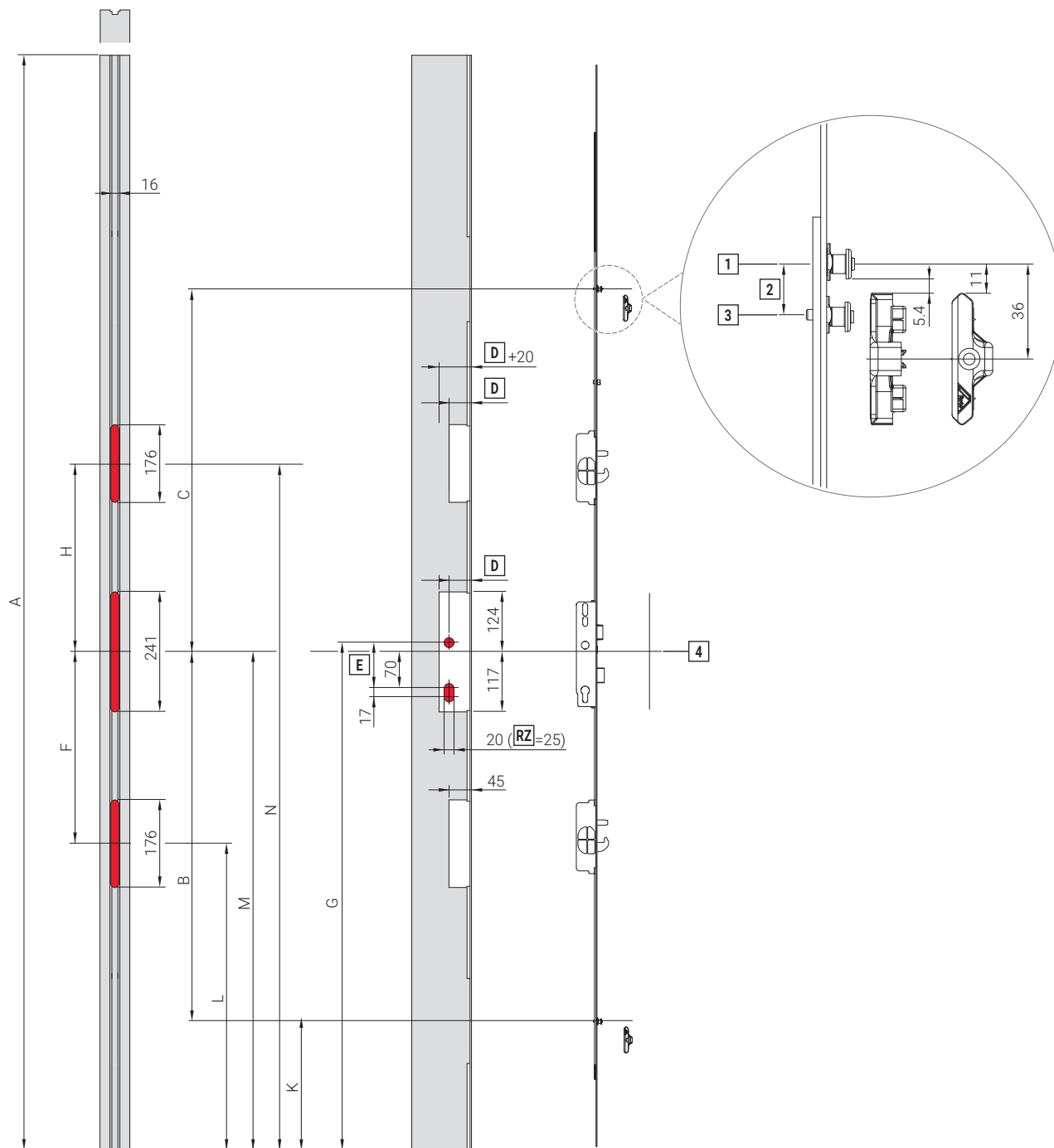
Drilling and routing dimensions

Pattern	A0	A1	A2	A3	A4	B	C	K	M	O	[X1]	[X2]
V02/03	1900 – 2200	2400 – 2530	2530 – 2700	2700 – 2830	2830 – 3000	738	752	260	998	1750	Max. 200 depending on the frame height	170



5.7.2.5 Additional locks and V cams (2CB2V, 2CH2V)

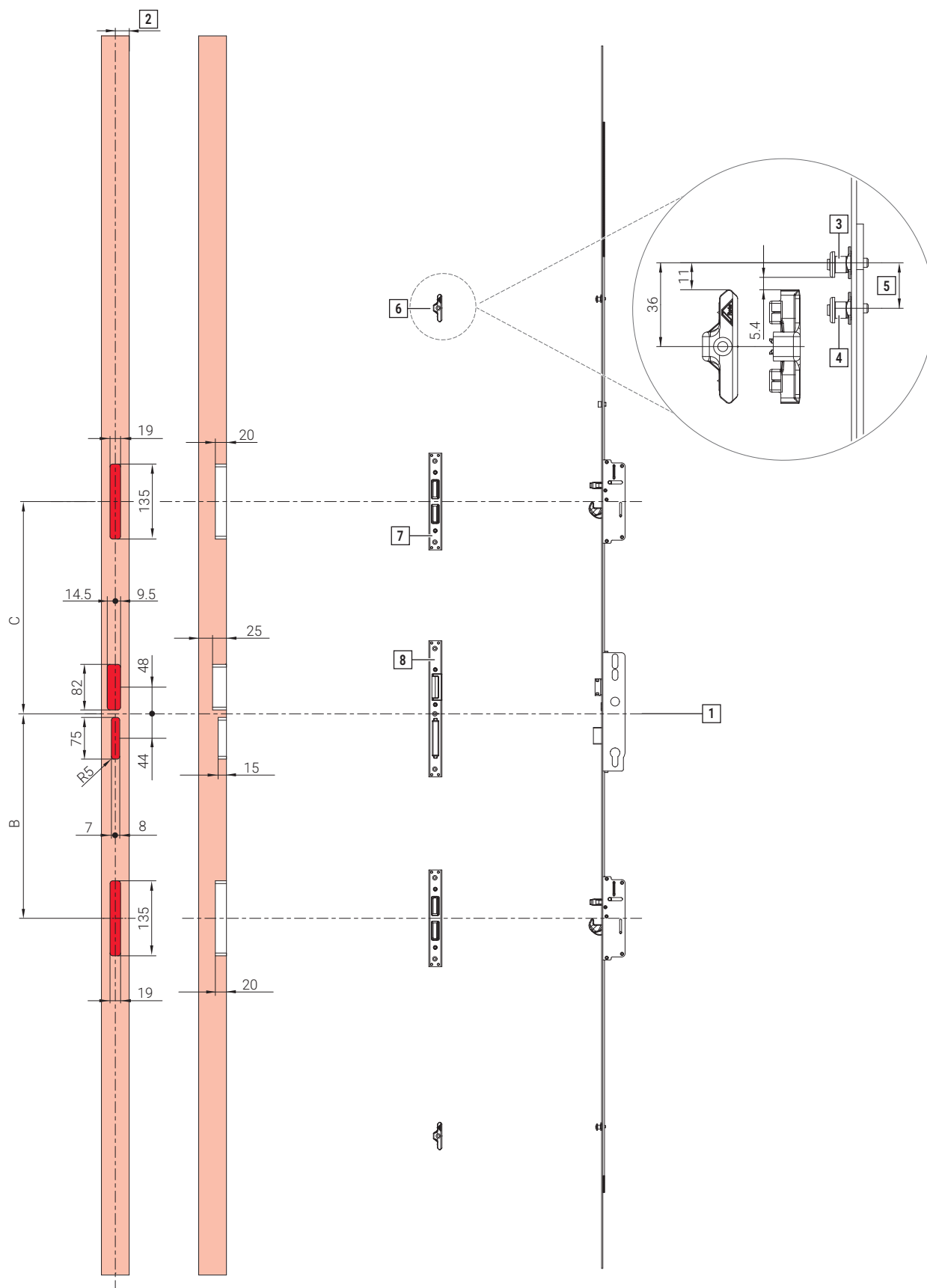
Leaf



- [1] Centre of E / V cam open position
- [2] Travel 19.5
- [3] Centre of E / V cam locked position
- [4] Centre of spindle-receiver
- [D] Backset
- [E] Distance
- [RZ] Round cylinder

Pattern	A	B	C	F	G	H	K	L	M	N
V52/53	2200	723	767	368	1000	382	275	630	998	1380

Frame





- | | |
|---|------------------------------|
| [1] Faceplate marking | [5] Travel 19.5 |
| [2] Routing axis | [6] E / V cam striker |
| [3] Centre of E / V cam open position | [7] Combination striker |
| [4] Centre of E / V cam locked position | [8] Latch / deadbolt striker |

- Carry out the routing work as shown in the drawing.



INFO

Determine the position of the striker with the marking jig for locking cams.

Position the marking jig on the E or V cam. Determine the position of the locking component and mark it.



INFO

The routing refers to PVC and aluminium strikers.

Request the routing drawing for timber strikers.



INFO

The routing depth depends on the leg height on the striker.

Example – combination striker:

- Striker height = 24.5 mm
- Leg height = 7 mm
- Min. routing depth = 17.5 mm

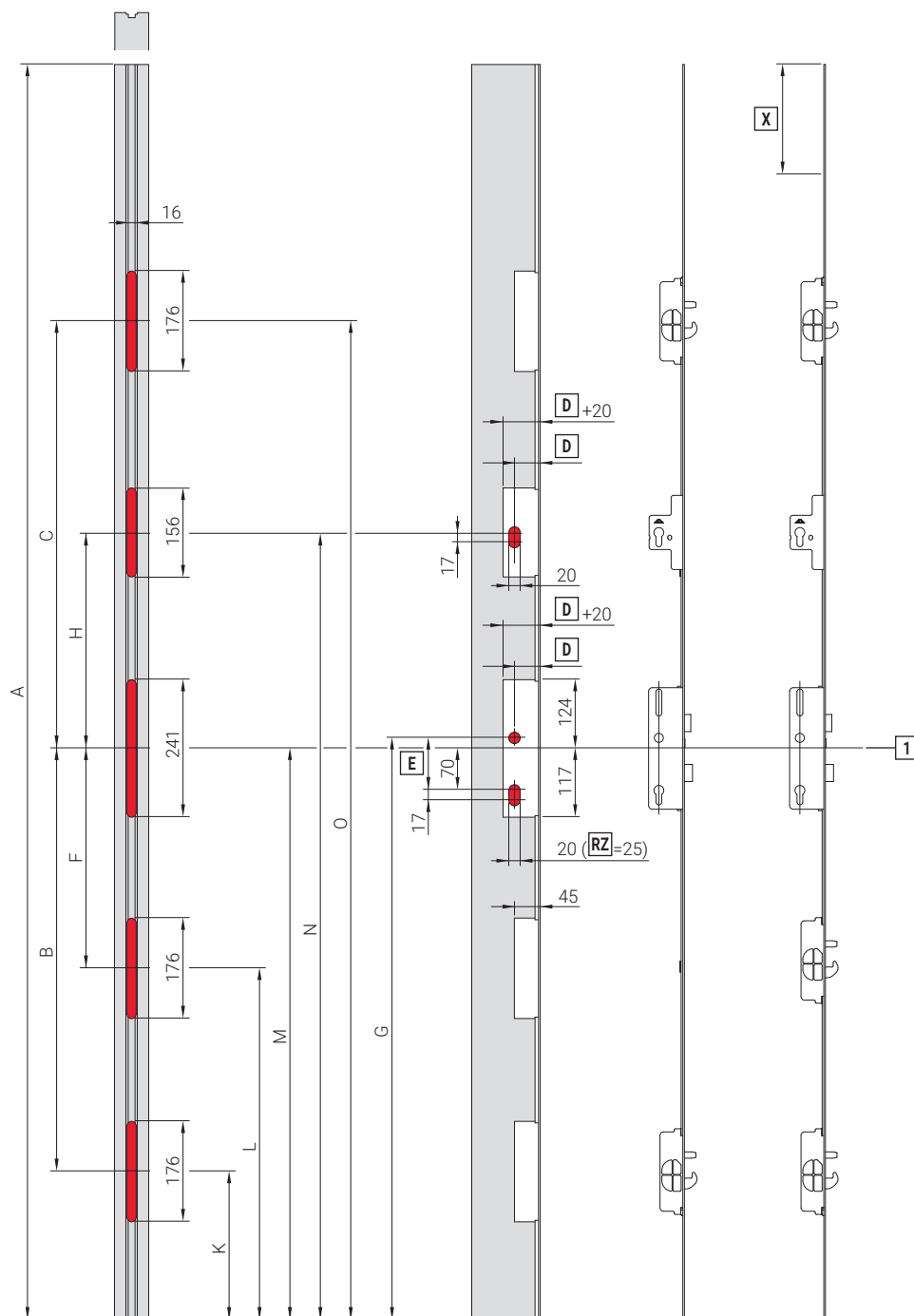


INFO

The routing axis depends on the profile.

Pattern	B	C
V52/53	368	382

Leaf

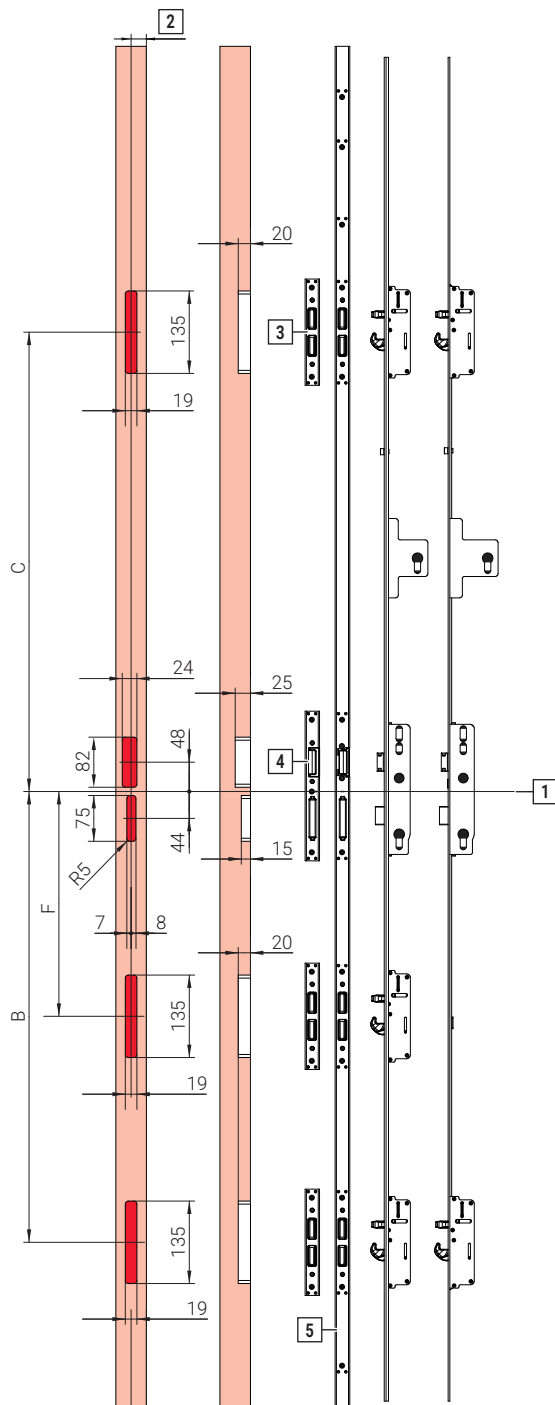


[X] Cropping range

Pattern	A	B	C	F	G	H	K	L	M	N	O	[X]
V02/17	2200	738	752	–	1020	382	260	–	998	1380	1750	300



Frame



- [1] Faceplate marking
- [2] Routing axis
- [3] Combination striker
- [4] Latch / deadbolt striker
- [5] Striker strip

► Carry out the routing work as shown in the drawing.



INFO

The routing refers to PVC and aluminium strikers.

Request the routing drawing for timber strikers.



INFO

The routing depth depends on the leg height on the striker.

Example – combination striker:

- Striker height = 24.5 mm
- Leg height = 7 mm
- Min. routing depth = 17.5 mm

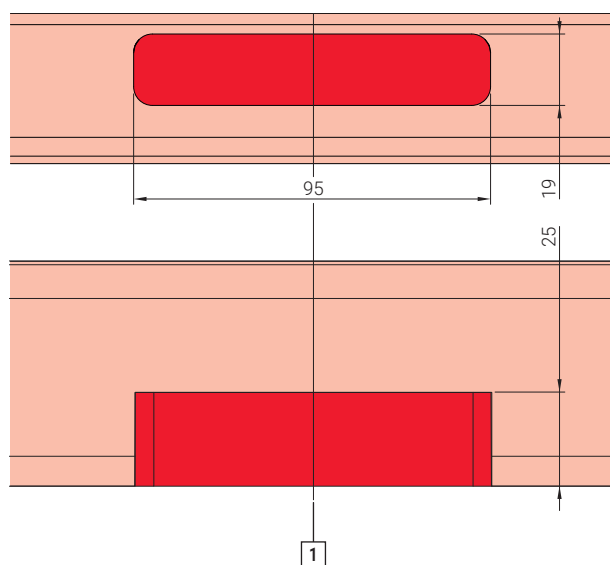


INFO

The routing axis depends on the profile.

Pattern	B	C	F
V02/17	738	752	–
V02/19	738	982	–

5.7.2.7 Top shootbolt protrusion

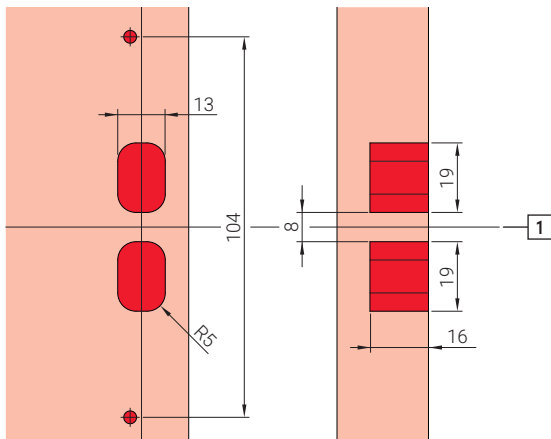


[1] Centre of shootbolt protrusion



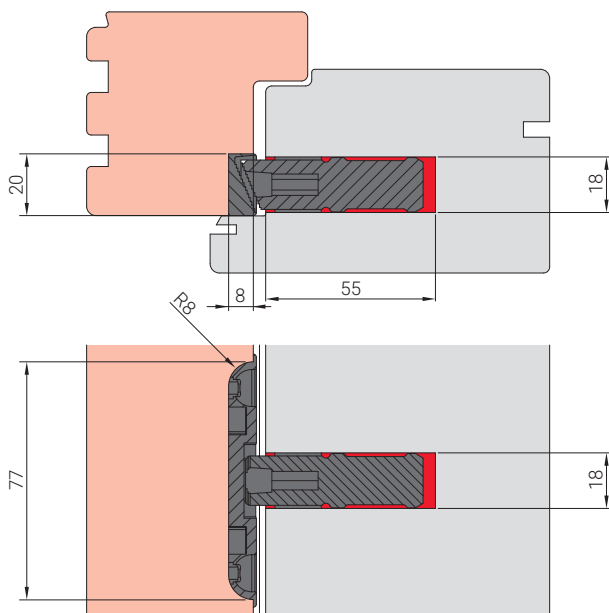
5.7.2.8 Hinge retaining mechanism

Hinge retaining mechanism cam



[1] Faceplate marking

Hinge retaining mechanism set



5.7.3 Sash

5.7.3.1 Predrilling the door lever handle set



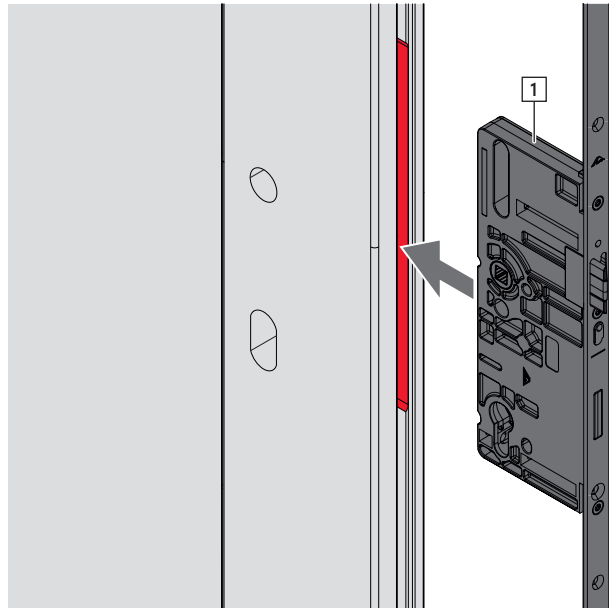
ATTENTION

Incorrect drilling methods may result in property damage.

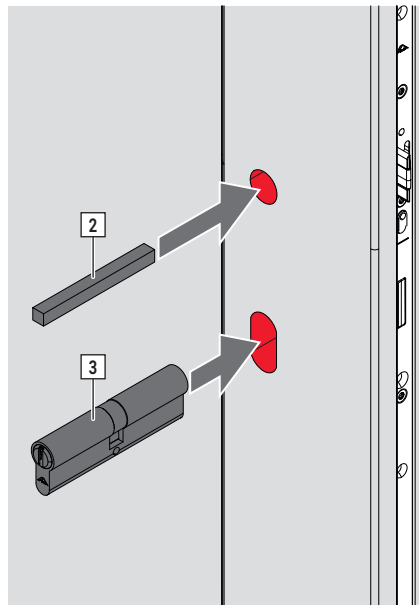
If holes are drilled in the lock area with the multipoint locking inserted, the lock may be damaged.

- Remove the multipoint locking before drilling.

1. Insert the multipoint locking [1] into the leaf.

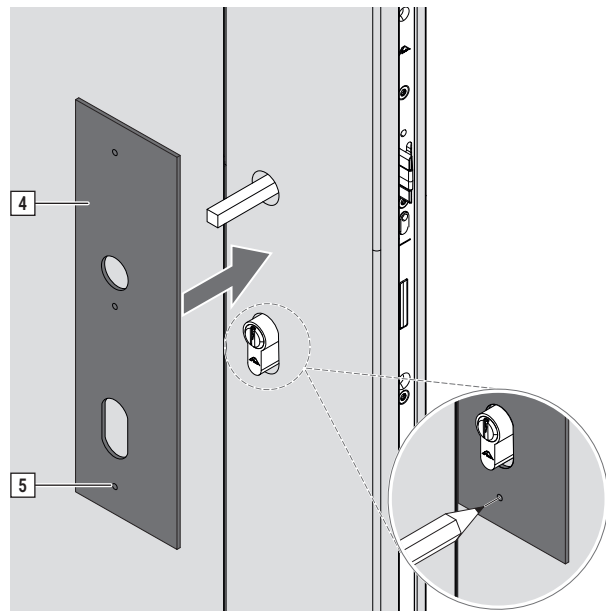


2. Insert the square spindle [2] and profile cylinder [3] in predrilled holes in the leaf.

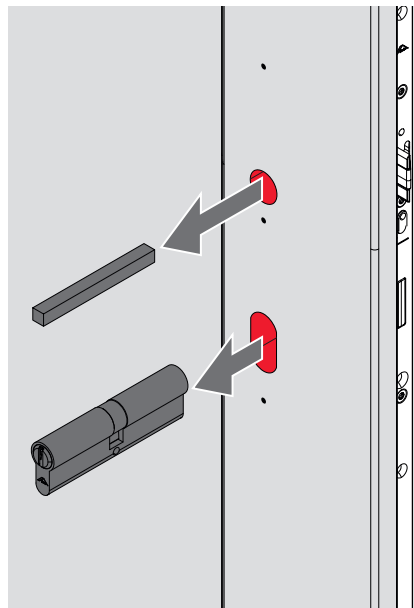




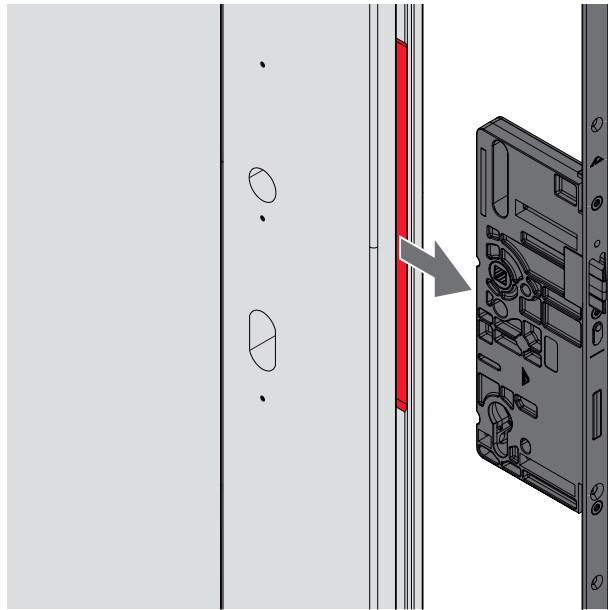
3. Position the drilling jig [4] from the relevant manufacturer and mark the drill holes [5].



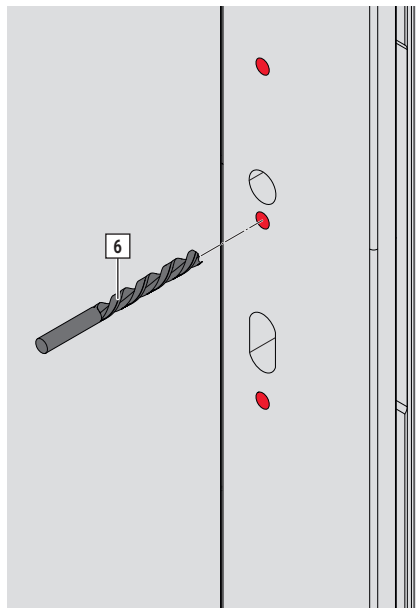
4. Remove the square spindle and profile cylinder.



5. Remove the multipoint locking.



6. Drill the holes [6].



7. If necessary, deburr the drill holes and remove chips.



INFO

A round escutcheon can be used from a backset of 35 mm.



5.7.3.2 Turning the latch around



ATTENTION

Property damage due to turning the latch around incorrectly!

If the latch is installed incorrectly, the lock may be damaged.

- ▶ Only turn the latch around in the vertical lock position.
- ▶ Do not use the door lever handle or key when turning the latch around.

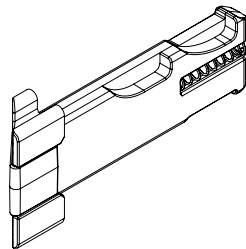
The latch can be turned around to use the main lock for DIN left or DIN right doors.



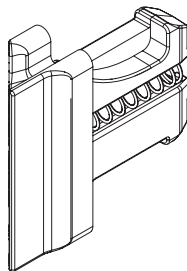
INFO

The latch can be replaced by a recessed latch if required.

Standard latch



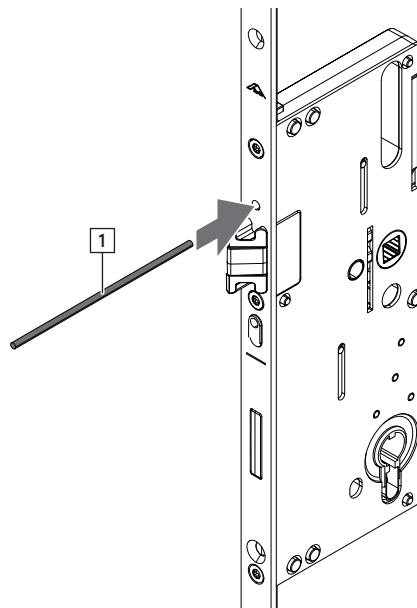
Recessed latch



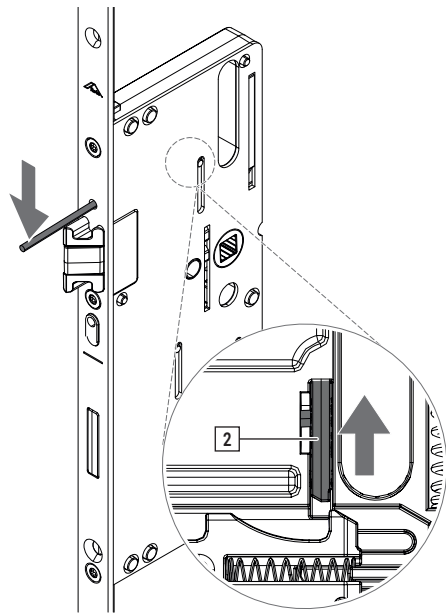
PRECONDITION

The lock is unlocked (possible when installed or removed).

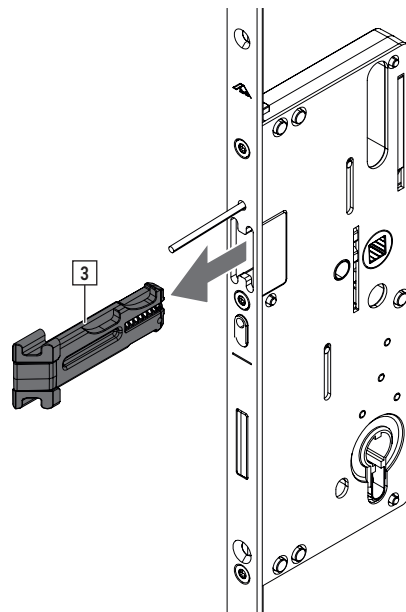
1. Push the pin [1] (Ø max. 3 mm) into the inspection opening.



2. Push the pin down slightly so that the latch blocking device [2] disengages.

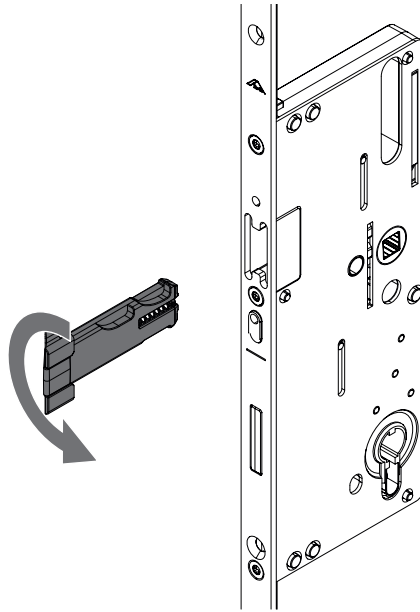


3. Remove the latch [3].

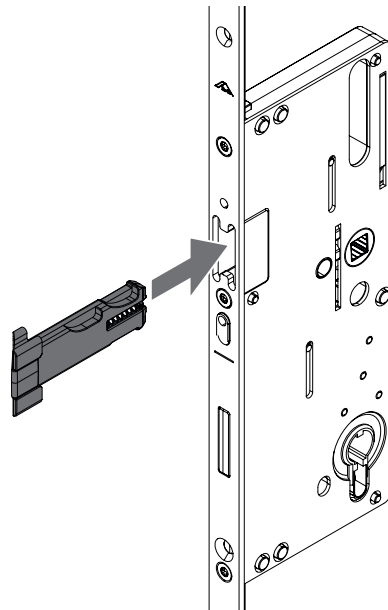




4. Turn the latch 180°.



5. Insert the latch straight into the shaft and push it in until it clicks into place.



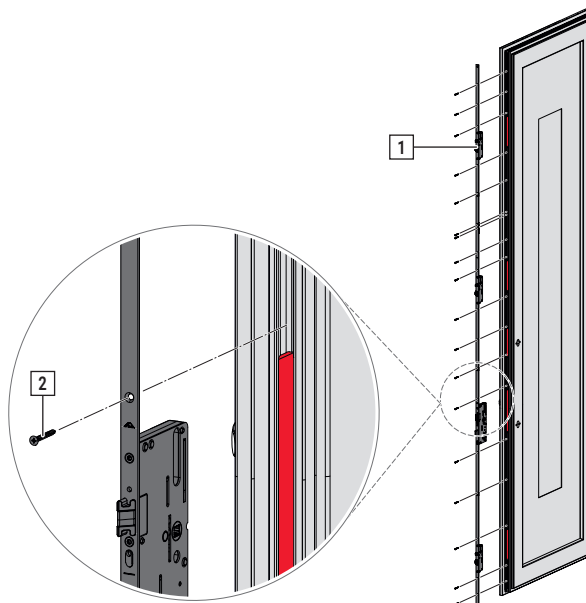
5.7.3.3 Multipoint locking

1. Insert the multipoint locking [1] into the leaf groove.
2. Fasten the multipoint locking with screws [2].



INFO

Fill every screw position. Turn in screws straight. → *from page 24*



5.7.3.4 Couplable multipoint locking



ATTENTION

Property damage is possible if no connector component is fitted.

If couplable multipoint lockings are fitted without a connector component, the connecting rod is not guided cleanly and can block.

- Only fit couplable multipoint lockings together with a connector component.

1. Connect the connector component to the coupling point on the multipoint locking. → *from page 27*
Alternatively: crop the connector component to 170 mm and connect it to the coupling point on the extendable multipoint locking.
2. Insert the multipoint locking with connector component into the leaf groove.
3. Fasten the multipoint locking and connector component with screws. → *from page 64*



INFO

Fill every screw position. Turn in screws straight. → *from page 24*

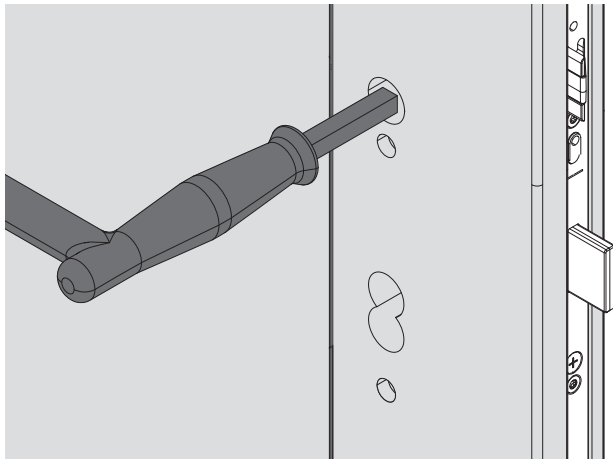


5.7.3.5 Door lever handle set



INFO

If no door handle is installed, only lock and unlock the door using the extractor handle.



INFO

Install the profile cylinder and / or round cylinder without subjecting it to stress and align at a right angle to the leaf.

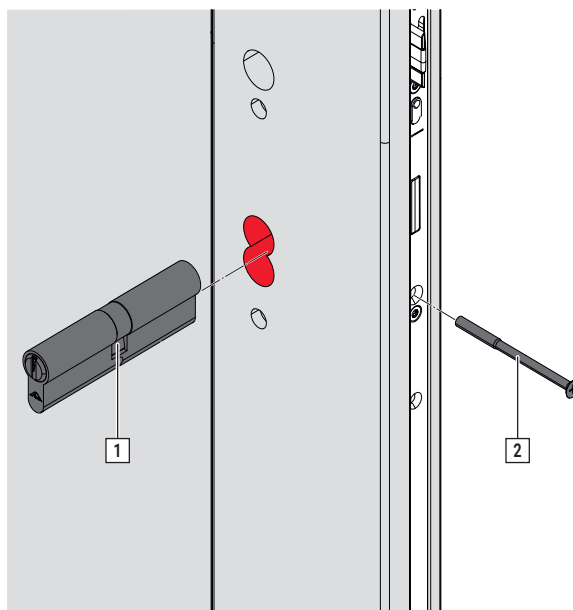


INFO

When changing the profile cylinder and / or round cylinder, choose a faceplate screw length based on the backset.

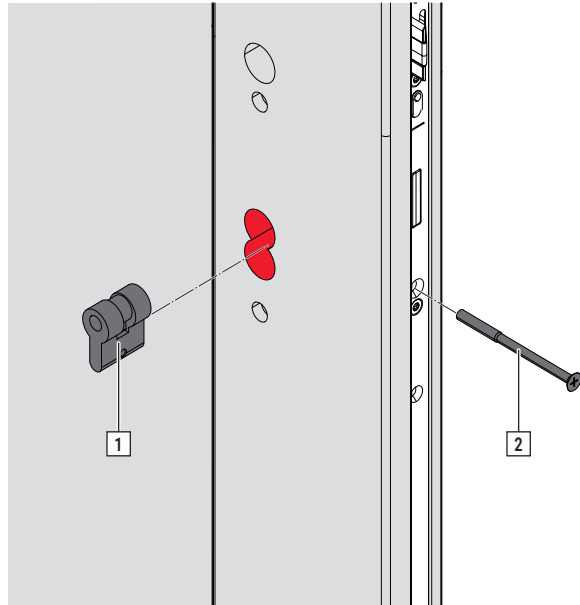
Profile cylinder

1. Insert the profile cylinder [1] and fasten with a screw [2].



Round cylinder

1. Position the lug of the round cylinder [1] so that it is vertical, insert the round cylinder and fasten it with a screw [2].



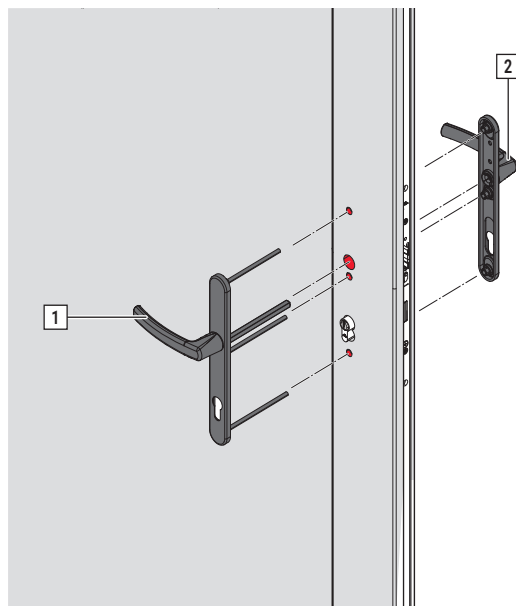
Door lever handle set with long plate



INFO

Fit long plates without subjecting them to stress.

1. Fit the door lever handle set according to the hardware manufacturer's specifications.
[1] Lever handle set internally
[2] Lever handle set externally





5.7.3.6 Performance test



PRECONDITION

The leaf and frame must be vertical in order to carry out the performance test.

When the door is open

Fixing screws



ATTENTION

Over-tightened screws may cause property damage!

Over-tightened screws lose their hold and no longer provide the necessary strength.

- ▶ Do not over-tighten screws. Note the torque.

Use a screwdriver to check that all fixing screws have been tightened.

Checking that the door lever handle is working properly

Push the door lever handle all the way down and release.

- ▶ The door lever handle must automatically return to the initial position.

Checking that the latch is working properly

1. Push the door lever handle all the way down.

- ▶ The latch must retract.
- ▶ When pushed down, the latch may protrude over the lock faceplate by a maximum of 2 mm.

2. Release the door lever handle.

- ▶ The latch must extend fully.

Checking locking by door lever handle

Push the door lever handle all the way up.

- ▶ The latch and deadbolt must be extended fully (11 mm and 20 mm).
- ▶ All additional locks must be in the locking position.

Checking blocking

Turn the key in the profile cylinder by one rotation in the locking direction.

- ▶ The key must be very easy to turn.
- ▶ The door lever handle blocks when moved down. The door lever handle can still be moved up.
- ▶ It must be possible to remove the key.

Checking unlocking

Turn the key in the profile cylinder by one rotation in the unlocking direction.

Push the door lever handle down.

- ▶ The latch and deadbolts must retract fully.
- ▶ All additional locks must be in the open position.

Have malfunctions remedied by a specialist company.

When the door is closed

Locking process

Close the door.

- ▷ The latch must run into the frame component and keep the door closed.

Opening using the door lever handle

With the door closed, push the door lever handle down.

- ▷ The latch must retract fully so that the door can be opened.

Locking using the door lever handle

Push the door lever handle all the way up.

- ▷ The deadbolts must extend fully and smoothly.
- ▷ All additional locks must be in the locking position.

Checking blocking

Turn the key in the profile cylinder by one rotation in the locking direction.

- ▷ The key must be easy to turn.
- ▷ The door lever handle blocks when moved down. The door lever handle can still be moved up.
- ▷ It must be possible to remove the key.

Checking unlocking

Turn the key in the profile cylinder by one rotation in the unlocking direction.

Push the door lever handle down.

- ▷ The latch and deadbolts must retract fully.
- ▷ All additional locks must be in the open position.

Have malfunctions remedied by a specialist company.



5.7.4 Frame

5.7.4.1 Striker strip / striker

1. Insert the striker strip [1] or striker [2] into the frame.
2. Fasten the striker strip or striker with the recommended screws [3] ($\varnothing 4$) → *from page 26*.



INFO

Fill every screw position. Turn in screws straight → *from page 24*.

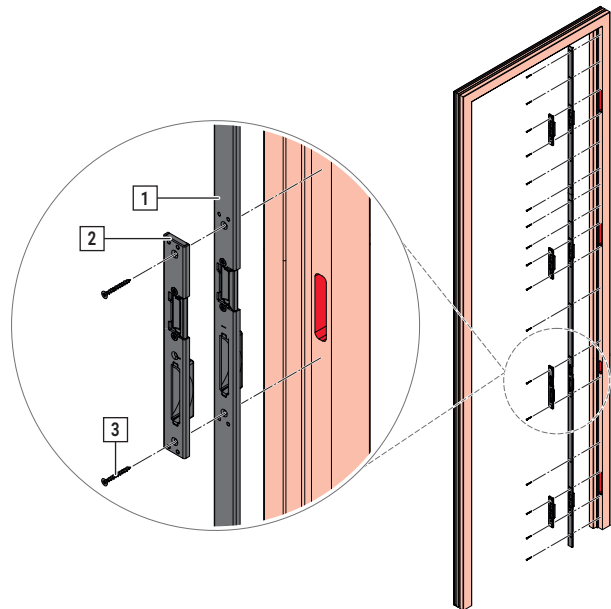
The screw length depends on the profile used.



INFO

Do not use stainless-steel screws on the Roto Sil surface.

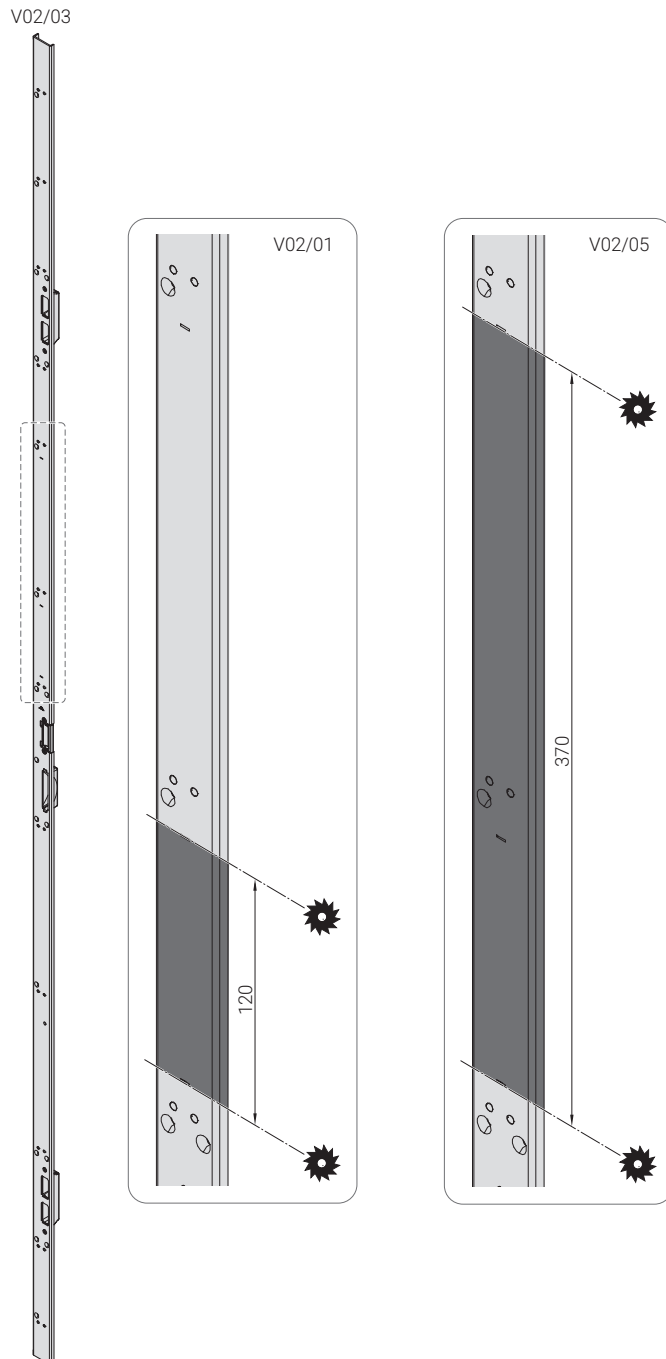
Use stainless-steel screws (type A2) on stainless-steel components.



5.7.4.2 Variable striker strips

Striker strips with locking pattern V02/03 are adaptable. The variable striker strip can be machined to adapt it to locking pattern V02/01 or V02/05.

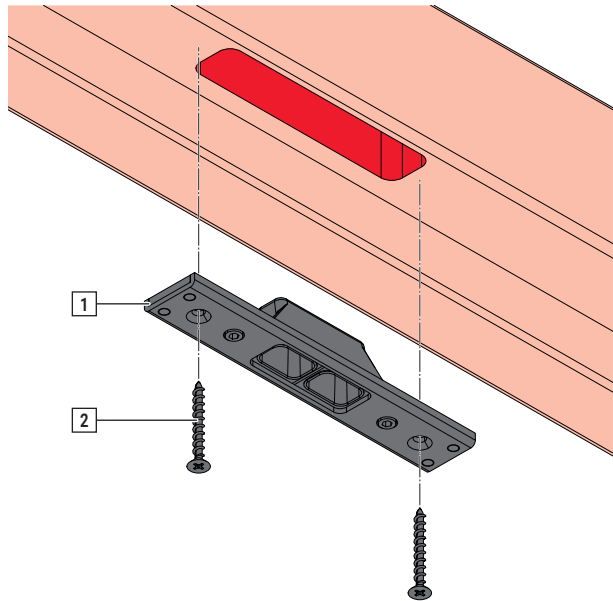
The diagram below shows the individual markings where the striker strip can be adapted.





5.7.4.3 Shootbolt protrusion striker

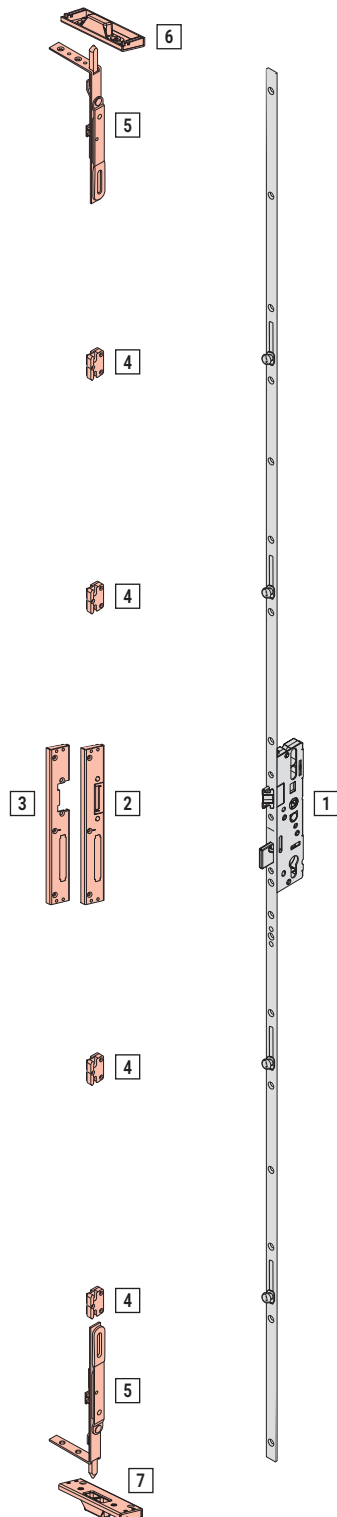
1. Fasten the shootbolt protrusion striker [1] with two screws [2].



5.8 Double-leaf doors

5.8.1 Shootbolt

5.8.1.1 E cams (4E) and V cams (4V)

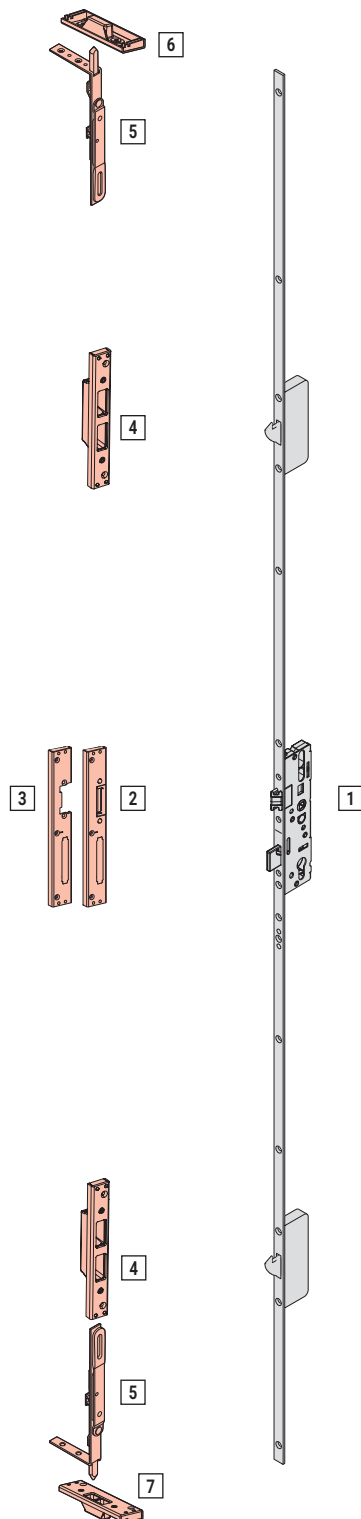


Assignment	Meaning
[1]	H650 multipoint locking
[2]	Latch / deadbolt striker
[3]	Electrical opener / deadbolt striker



Assignment	Meaning
[4]	V cam striker
[5]	Shootbolt 150
[6]	Shootbolt protrusion striker
[7]	Threshold frame component

5.8.1.2 Bolts (2CB), power wedges (2CH) and combination locks (2C)

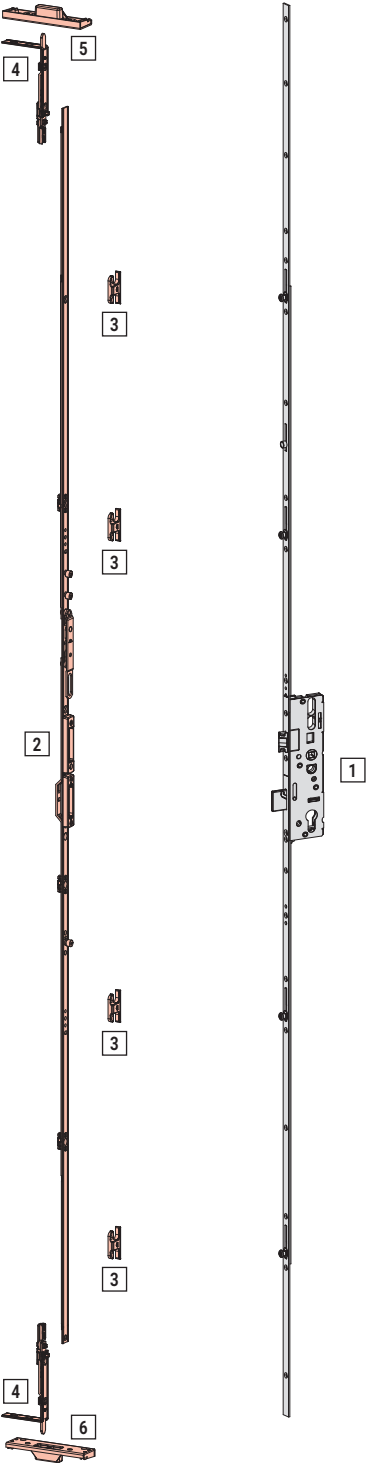


Assignment	Meaning
[1]	H650 multipoint lock
[2]	Latch / deadbolt striker
[3]	Electrical opener / deadbolt striker
[4]	Combination striker
[5]	Shootbolt 150
[6]	Shootbolt protrusion striker
[7]	Threshold frame component



5.8.2 Lever-operated espagnolette E cams (4E) and V cams (4V)

5.8.2.1 Overview



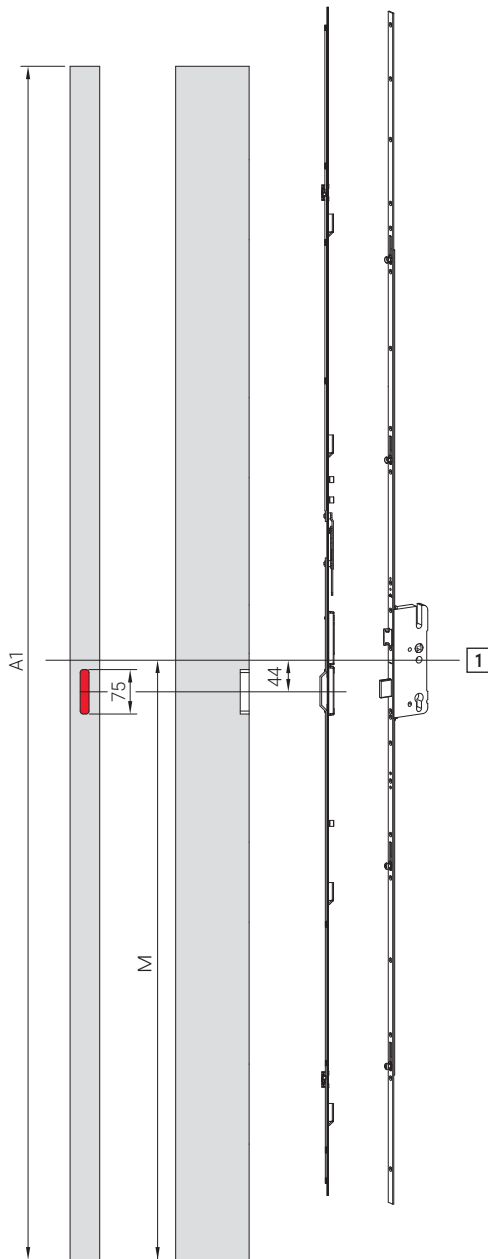
Assignment	Meaning
[1]	H650 multipoint lock
[2]	Lever-operated espagnolette
[3]	Screw-on striker for lever-operated espagnolette
[4]	Shootbolt protrusion 110 for NT16 faceplate
[5]	Shootbolt protrusion striker
[6]	Threshold frame component

Installation

Double-leaf doors

Lever-operated espagnolette E cams (4E) and V cams (4V)

5.8.2.2 Drilling and routing dimensions



[1] Faceplate marking

A1	M
2000 – 2200	998



5.8.3 Lever-operated espagnolette V cams (4V) – with toothing at the top and bottom (ZUOV)

5.8.3.1 Overview



Assignment	Meaning
[1]	H650 (special version: ZUOV)
[2]	Lever-operated espagnolette
[3]	Connector component

Installation

Double-leaf doors

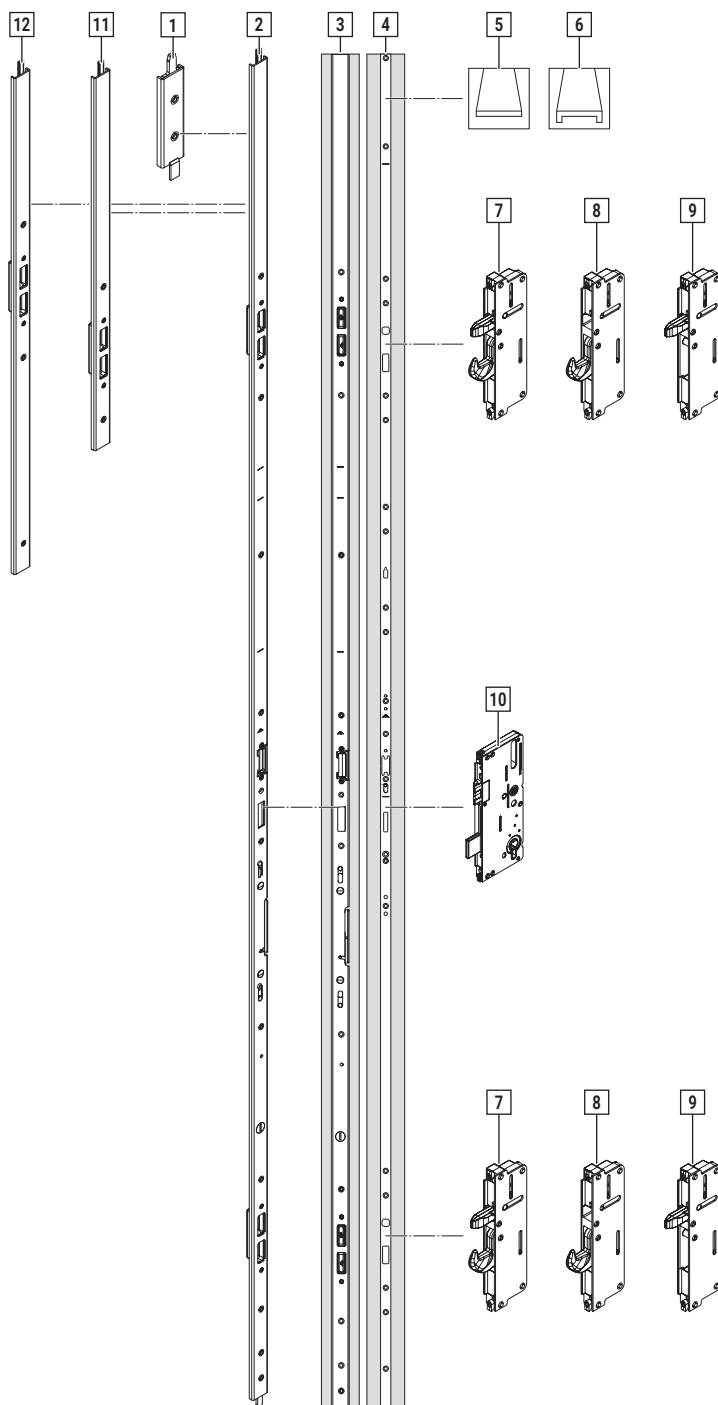
Lever-operated espagnolette V cams (4V) – with toothing at the top and bottom (ZUOV)

Assignment	Meaning
[4]	Connector component with V cam
[5]	Shootbolt protrusion 110 with reverse-action travel
[6]	Faceplate cover
[7]	Shootbolt protrusion 110
[8]	Shootbolt protrusion 110 for NT16 faceplate
[9]	Espagnolette connector with protrusion
[10]	Espagnolette connector
[11]	Shootbolt protrusion striker
[12]	Threshold frame component
[A]	Version without locking point
[B]	Version with additional locking point
[C]	Version of espagnolette connector with built-in protrusion
[D]	Version of espagnolette connector without built-in protrusion



5.8.4 Lever-operated espagnolette Standard

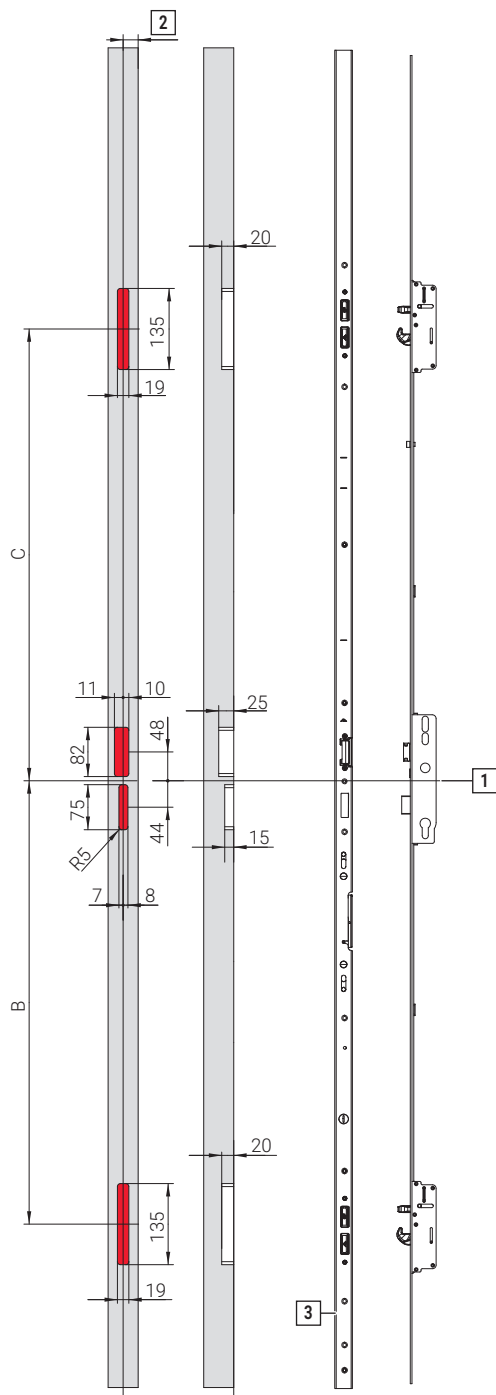
5.8.4.1 Overview



Assignment	Meaning
[1]	Connector component for lever-operated espagnolette Standard
[2]	Lever-operated espagnolette Standard
[3]	Second opening leaf
[4]	First opening leaf
[5]	Flat faceplate
[6]	U-shaped faceplate
[7]	Combination lock (C)
[8]	Power wedge (CH)
[9]	Bolt (CB)
[10]	H650 main lock

Assignment	Meaning
[11]	Extension 600
[12]	Extension 800

5.8.4.2 Drilling and routing dimensions (CB, CH, C)

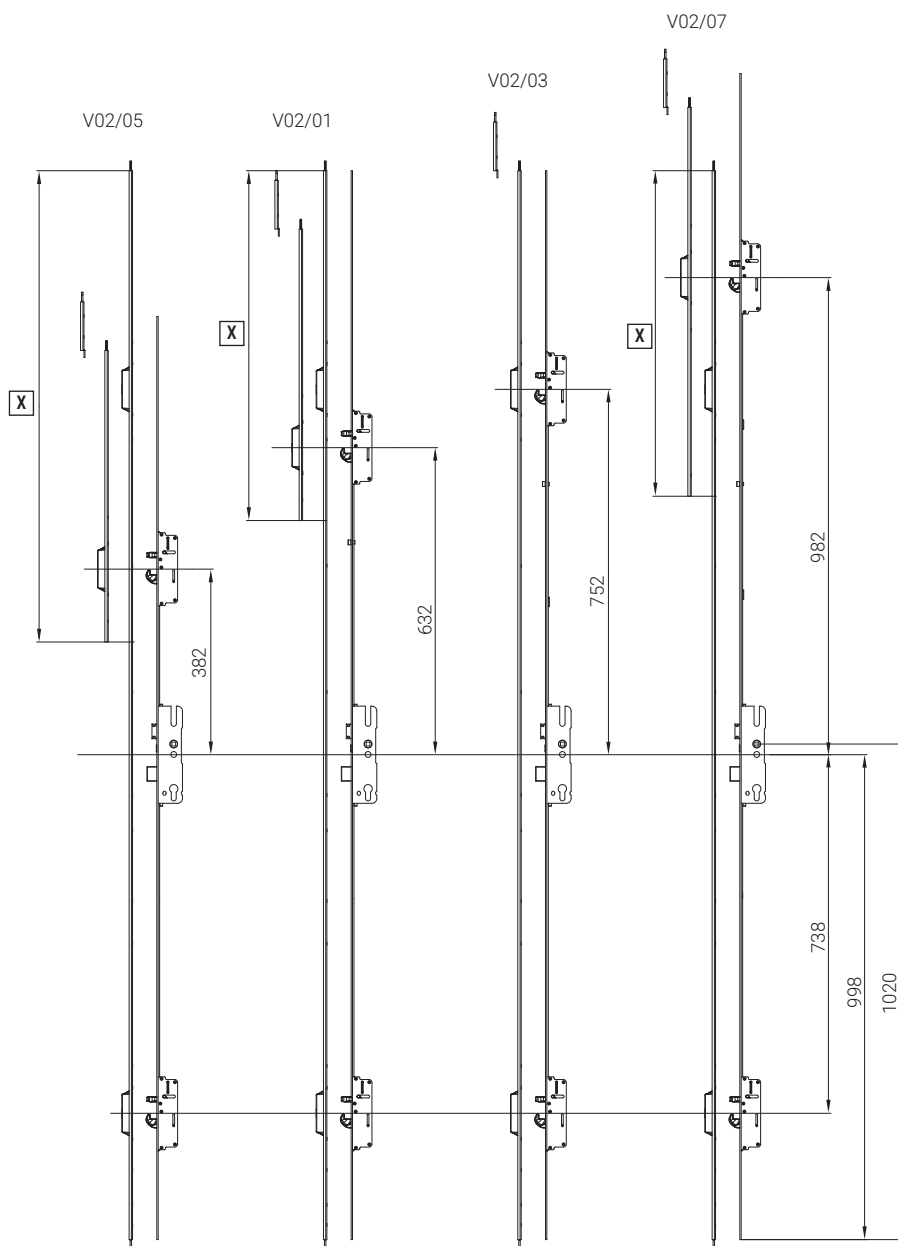


- [1] Faceplate marking
- [2] Routing axis
- [3] Lever-operated espagnolette Standard

Pattern	B	C
V02/01	738	632
V02/03	738	752
V02/05	738	382
V02/07	738	982



5.8.4.3 Locking pattern



[X] Cropping range

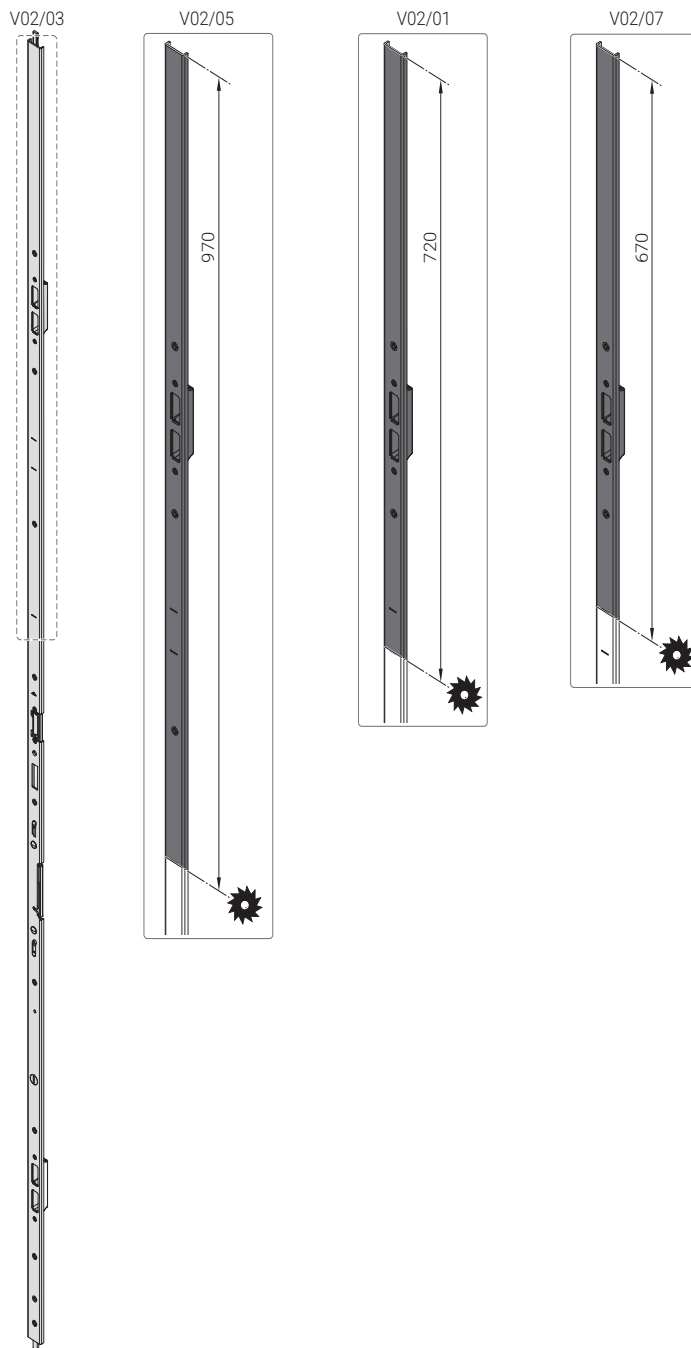
■ Combination

Pattern	Min. SRH	Max. SRH	[X]	Lever-operated espagnolette	Extension 600	Extension 800	Connector component
V02/01	1931	1974	720	■	■	—	■
V02/03	1975	2214	—	■	—	—	■
V02/05	1615	1930	970	■	■	—	■
V02/07	2215	2430	670	■	—	■	■

5.8.4.4 Variable locking pattern

The lever-operated espagnolette, standard with locking pattern V02/03 is adaptable. The lever-operated espagnolette, standard can be machined to adapt it to locking patterns V02/01, V02/05 and V02/07.

The diagram below shows the individual markings where the lever-operated espagnolette, standard can be adapted.





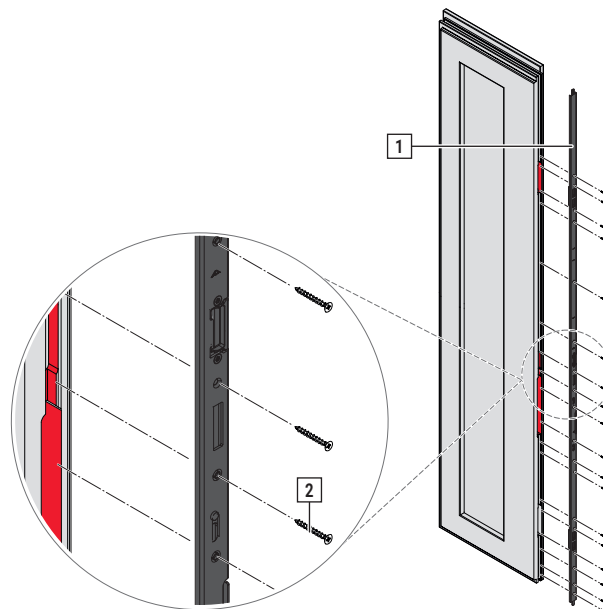
5.8.4.5 Installation

1. Insert the lever-operated espagnolette Standard [1] into the leaf groove.
2. Fasten the lever-operated espagnolette Standard with screws [2].



INFO

Fill every screw position. Turn in screws straight → *from page 24.*



3. Create a force-fit connection for coupling points → *from page 30.*



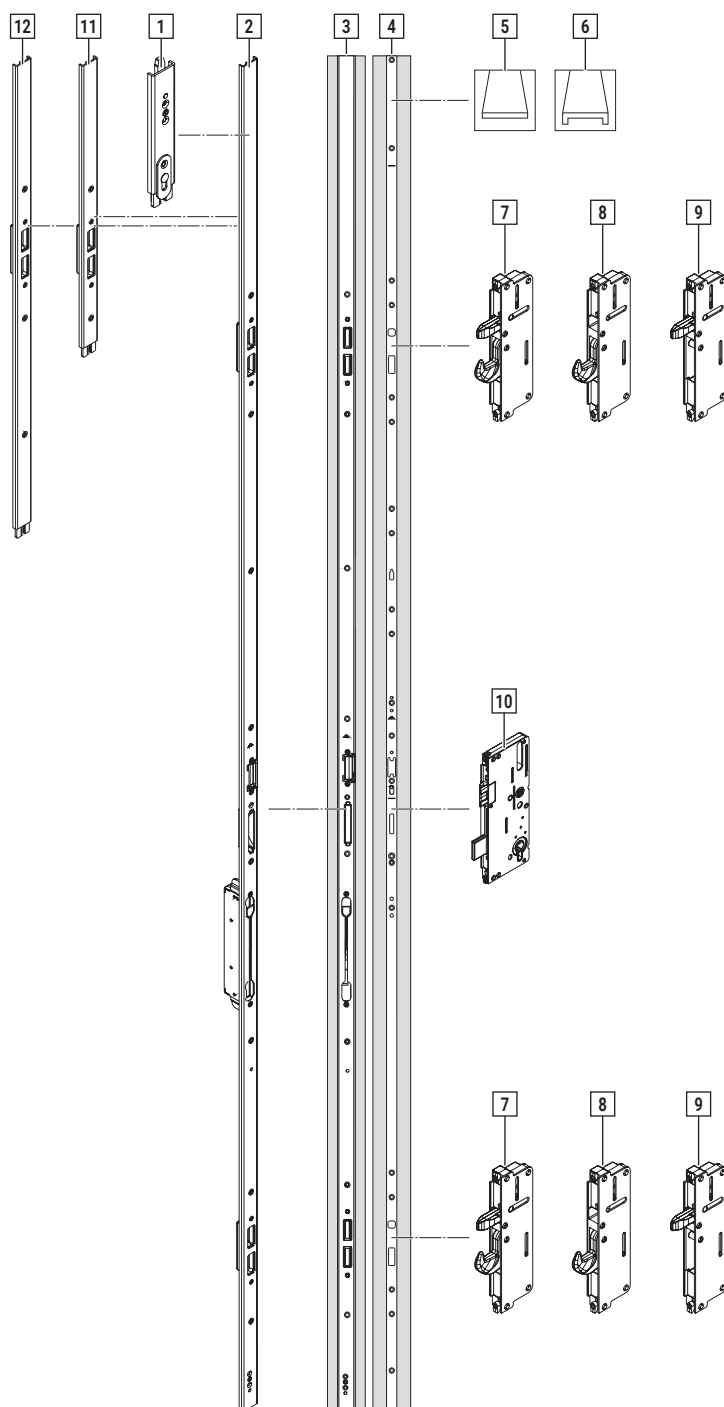
INFO

On PVC profiles with opposite hardware groove, cover the groove in the area of the coupling point in order to stabilise the connection.

For this purpose, use the Roto NX connecting link (material number 350401), for example.

5.8.5 Lever-operated espagnolette Plus

5.8.5.1 Overview

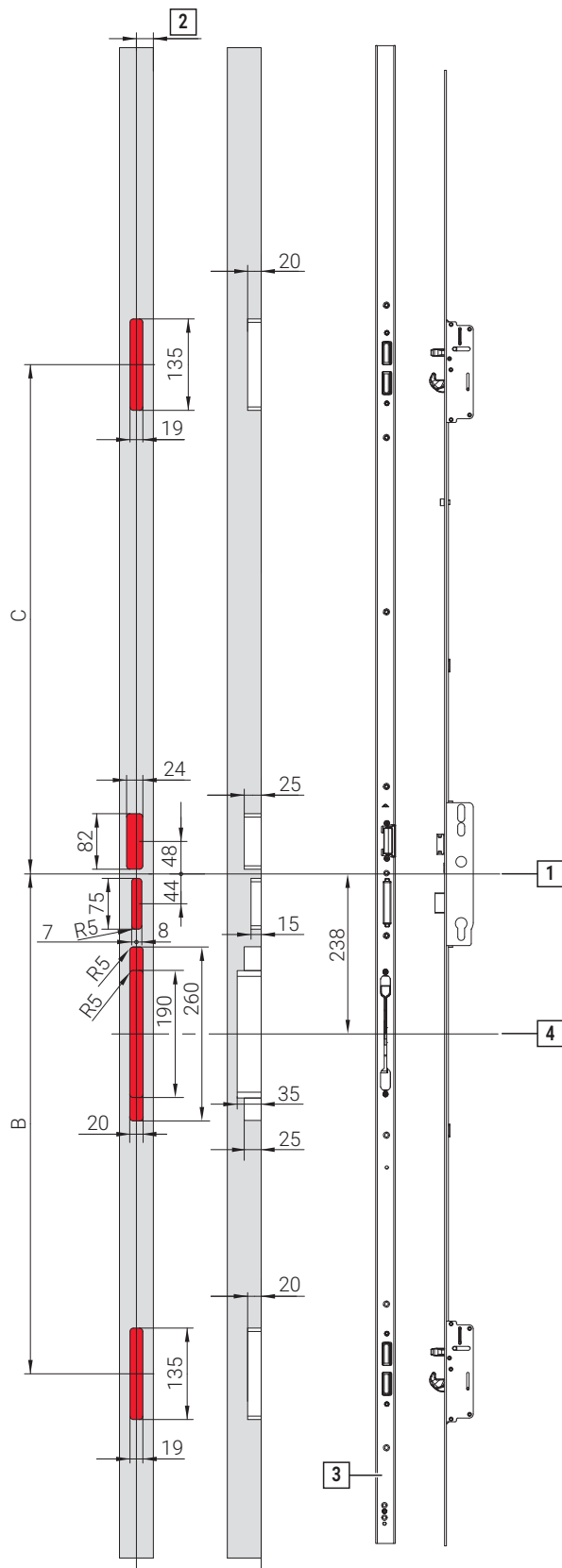


Assignment	Meaning
[1]	Connector component for lever-operated espagnolette Plus
[2]	Lever-operated espagnolette Plus
[3]	Second opening leaf
[4]	First opening leaf
[5]	Flat faceplate
[6]	U-shaped faceplate
[7]	Combination lock (C)
[8]	Power wedge (CH)
[9]	Bolt (CB)



Assignment	Meaning
[10]	H650 main lock
[11]	Extension 468
[12]	Extension 768

5.8.5.2 Drilling and routing dimensions (CB, CH, C)

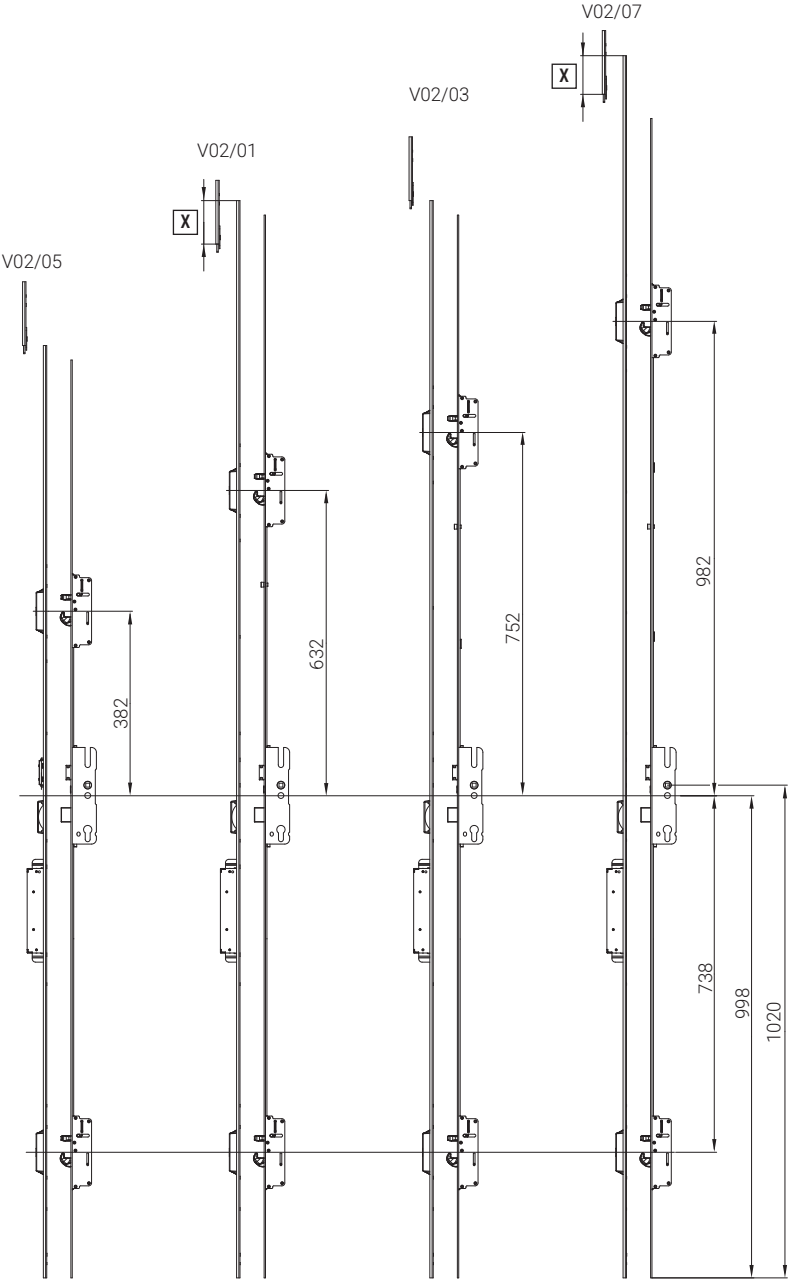


- [1] Faceplate marking
- [2] Routing axis
- [3] Lever-operated espagnolette Plus
- [4] Centre of routing



Pattern	B	C
V02/01	738	632
V02/03	738	752
V02/05	738	382
V02/07	738	982

5.8.5.3 Locking pattern



[X] Cropping range

Pattern	Min. SRH	Max. SRH	[X]
V02/01	1901	2070	90
V02/03	2071	2270	–
V02/05	1760	1900	–
V02/07	2271	2590	80

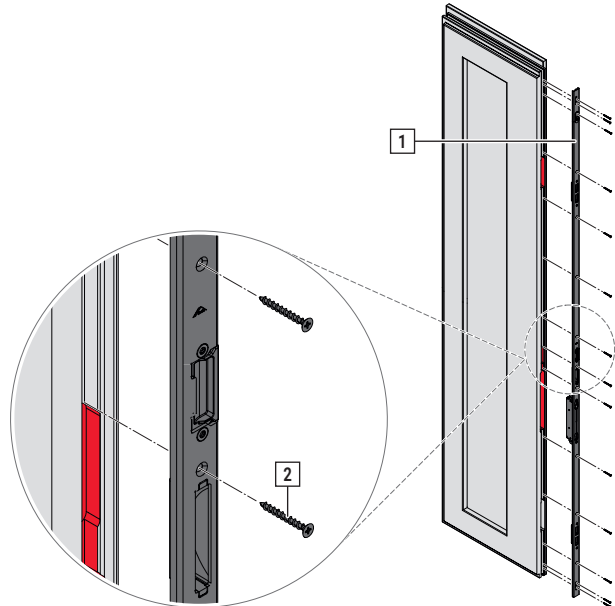
5.8.5.4 Installation

1. Insert the lever-operated espagnolette Plus [1] into the leaf groove.
2. Fasten the lever-operated espagnolette Plus with screws [2].



INFO

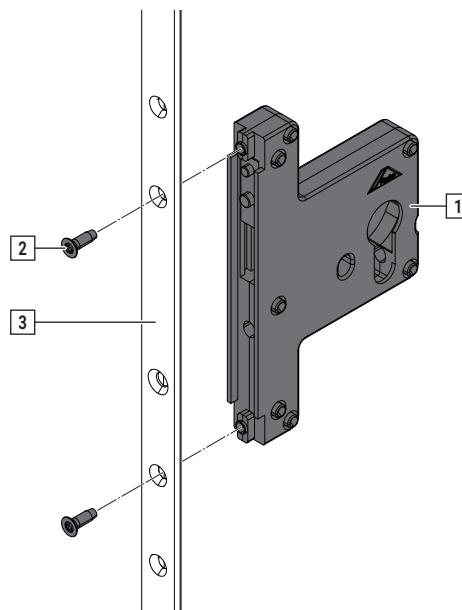
Fill every screw position. Turn in screws straight. → *from page 24*



5.9 Accessories

5.9.1 Additional locking device

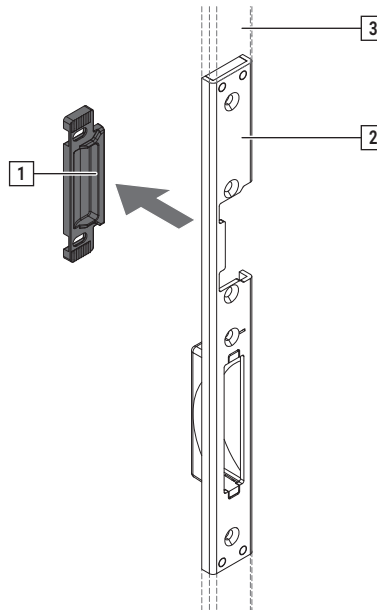
1. Fasten the additional locking device [1] to the faceplate [3] with M4 x 12 thread-rolling screws with countersunk head [2].



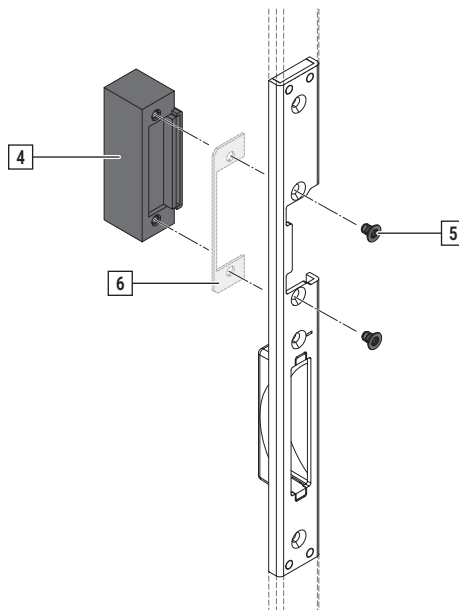


5.9.2 Electrical opener

1. Remove the replaceable part [1] from the striker [2] or from the striker strip [3].



2. Fasten the electrical opener [4] to the striker or striker strip with two screws [5].
Optional: install the packer [6].

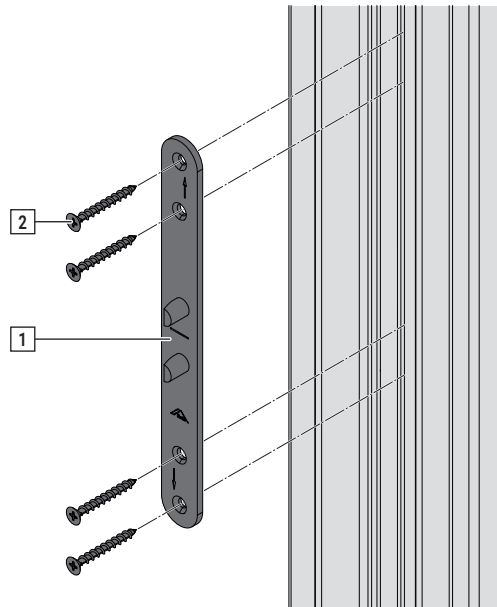


5.9.3 Hinge retaining mechanisms

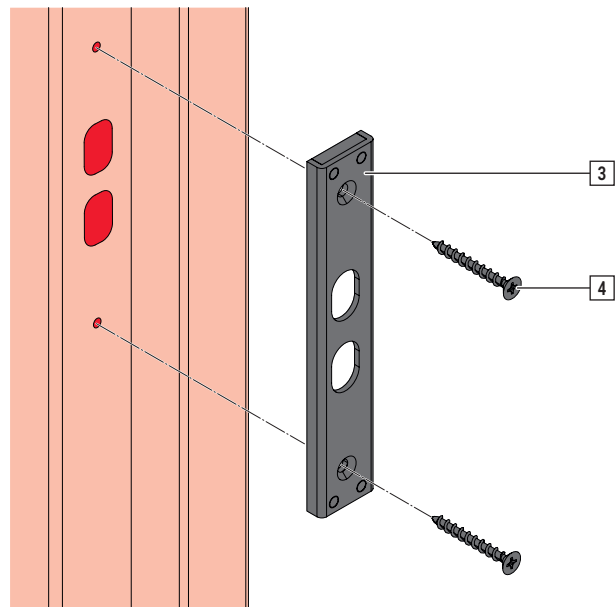
5.9.3.1 Hinge retaining mechanism cam: leaf and frame



1. Fasten the hinge retaining mechanism cam [1] with four screws [2] on the leaf side.



2. Fasten the hinge retaining mechanism striker [3] on the frame side with two screws [4].





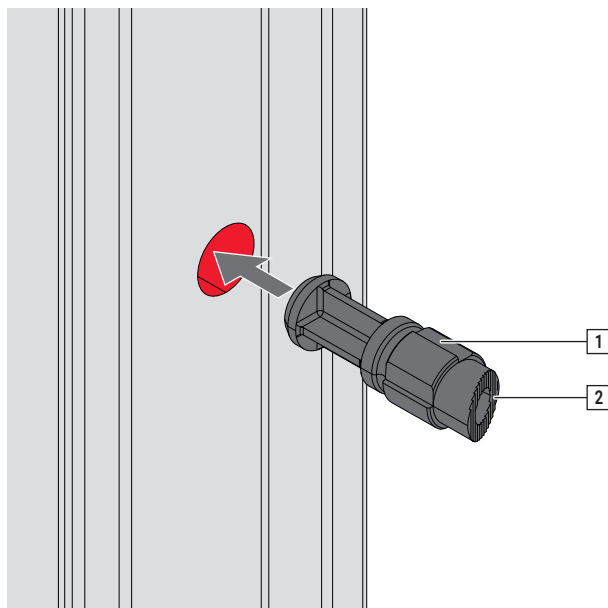
5.9.3.2 Hinge retaining mechanism set: leaf and frame



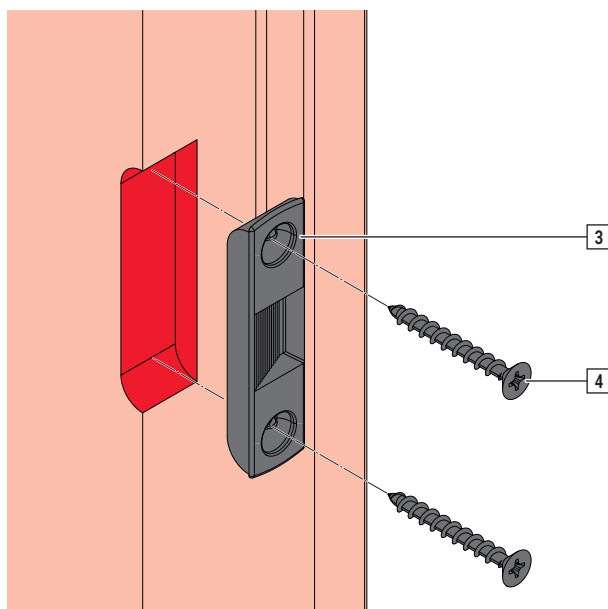
PRECONDITION

Align the hinge retaining mechanism set on the leaf with the frame as appropriate.

1. Turn in the sash component of the hinge retaining mechanism set [2] with thread [1].



2. Fasten the frame component of the hinge retaining mechanism set [3] with two screws [4].



5.9.4 Replacement main lock

5.9.4.1 H650

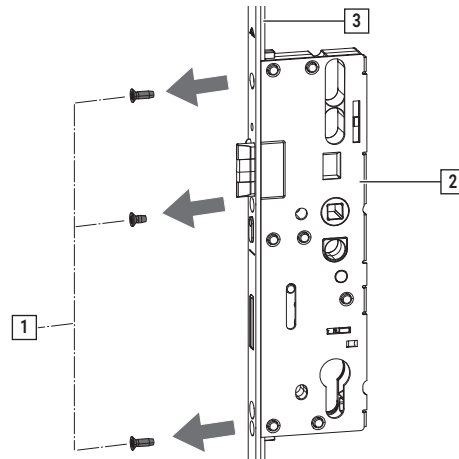


INFO

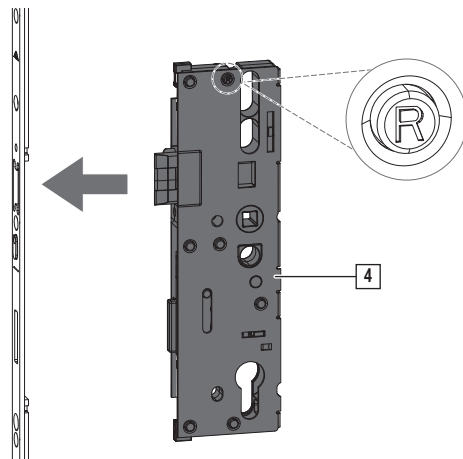
The system certificate and warranty become void when the replacement main lock is installed.

Replacement when removed

1. Undo three screws [1].
Tool: T20 hexalobular socket



2. Remove the main lock [2] from the faceplate [3].
3. Insert the replacement main lock [4] marked with "R" into the faceplate.



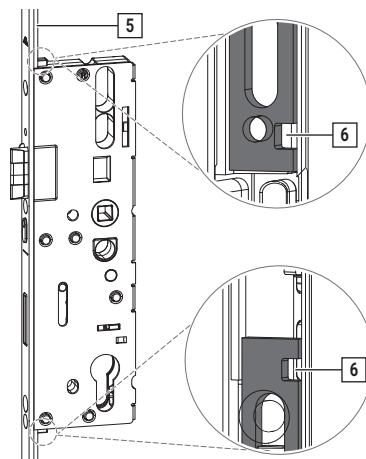


4. Mount the connecting rod [5] in the connector [6] of the replacement main lock.

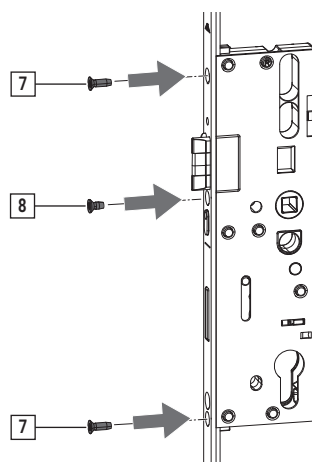


INFO

Position the replacement main lock so that it is flush with the connecting rod and faceplate.

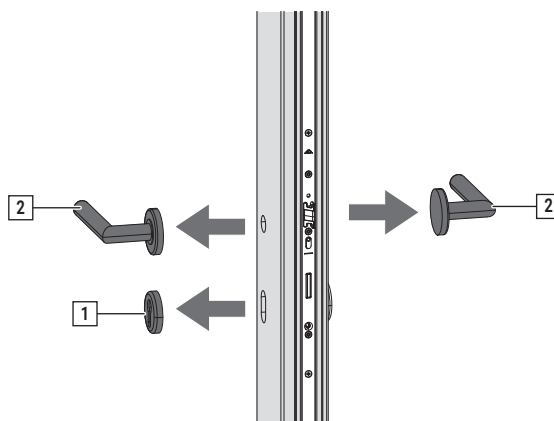


5. Fit it with three screws.
[7] M4 x 12
[8] M4 x 8
Torque: max. 4 Nm



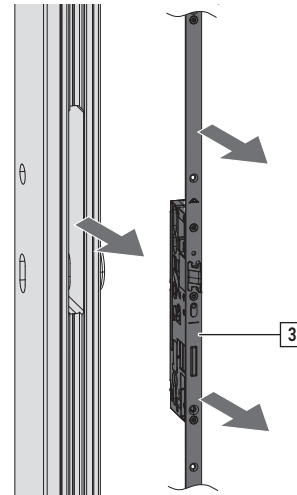
Replacement when installed

1. Remove the profile cylinder [1] and door lever handle [2].

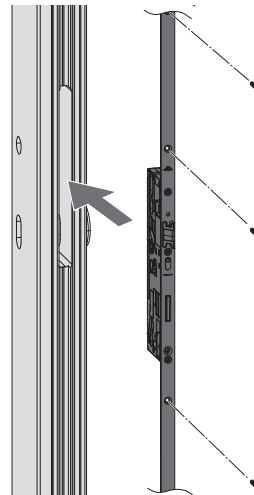


Installation
Accessories
Replacement main lock

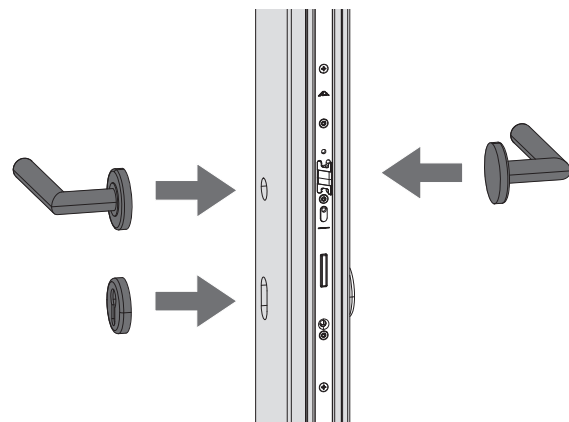
2. Undo all screws on the multipoint lock [3] and remove the entire faceplate from the door profile.



3. Perform steps 1 to 5 from "when removed".
4. Insert the faceplate into the door profile. Ensure that it is flush.
5. Fasten all screws on the multipoint lock.



6. Install the profile cylinder and door lever handle.





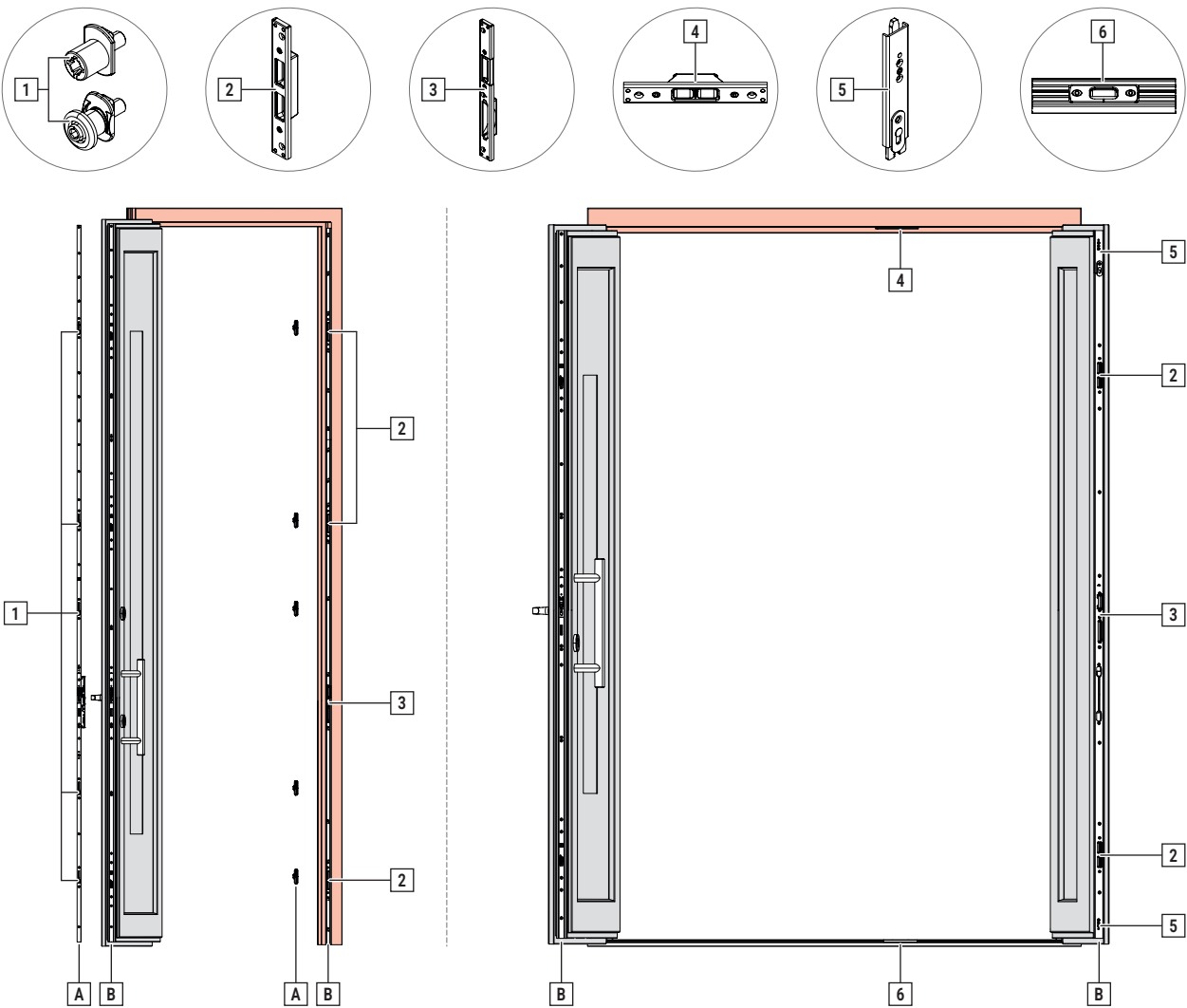
6 Adjustment



INFO

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

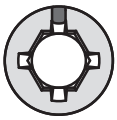
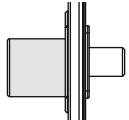
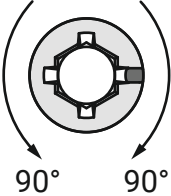
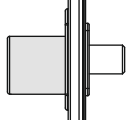
6.1 Overview



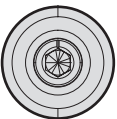
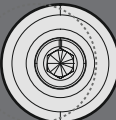
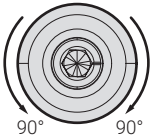
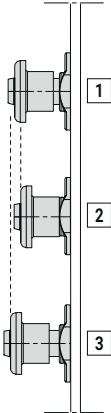
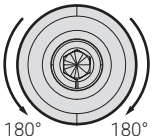
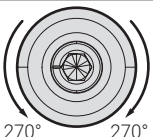
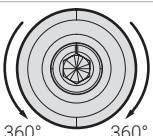
Assignment	Description	
[A]	Version with E / V cam	
[B]	Version with additional locks	
[1]	E / V cam	→ from page 96
[2]	Striker for additional lock	→ from page 96
[3]	Latch / deadbolt striker	→ from page 96
[4]	Shootbolt protrusion striker	→ from page 96
[5]	Connector component for lever-operated espagnolette Plus	→ from page 102
[6]	Cover bridge	

6.2 Locking cam

6.2.1 E cam

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

6.2.2 V cam

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

6.3 Strikers



INFO

The adjustment principles are shown here by way of example. The component shown may differ from the figure depending on the type (latch / deadbolt, combination, automatic, etc.) and profile system (timber / PVC / aluminium). The adjustment principles remain the same.

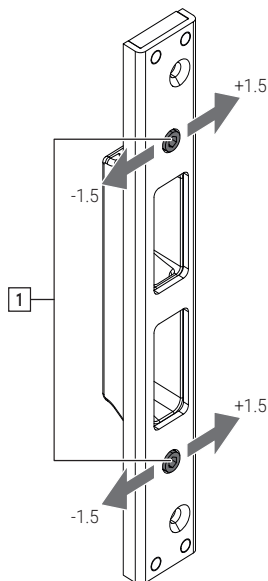


6.3.1 Lateral adjustment

Eccentric adjustment

1. Perform lateral adjustment ± 1.5 mm via the adjustment eccentric [1] at the top and bottom.

Tool: size 3 hex key



INFO

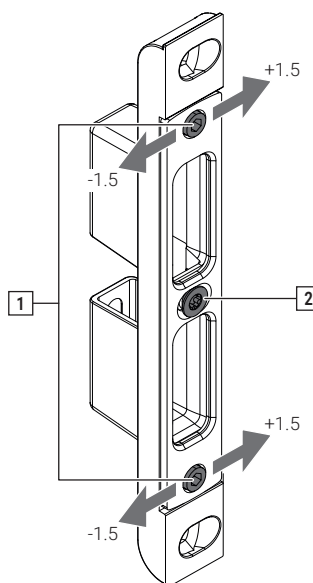
The adjustment distance of 1.5 mm is reached after a 90° turn:

- 90° turn = 1.5 mm
- 180° turn = initial position
- 270° turn = -1.5 mm
- 360° turn = initial position

Eccentric adjustment (with a retaining screw in the centre)

1. Undo the retaining screw [2].
Tool: T20 hexalobular socket screwdriver
2. Perform lateral adjustment ± 1.5 mm via the adjustment eccentric [1] at the top and bottom.

Tool: size 3 hex key





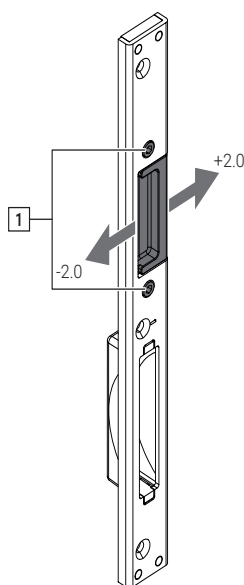
INFO

The adjustment distance of 1.5 mm is reached after a 90° turn:

- 90° turn = 1.5 mm
- 180° turn = initial position
- 270° turn = -1.5 mm
- 360° turn = initial position

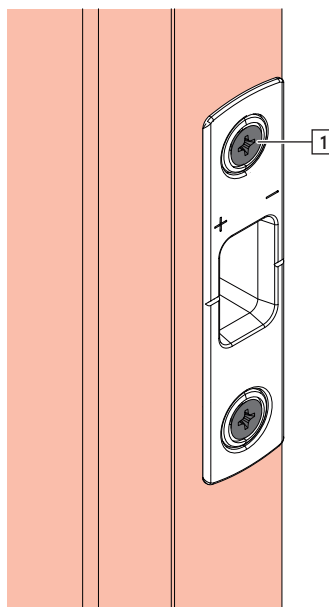
Adjustment of lock-in position (manually using two retaining screws)

1. Undo the retaining screws [1].
Tool: T20 hexalobular socket screwdriver
2. Perform lateral adjustment ± 2 mm by hand.
Lock-in position integrated in component.



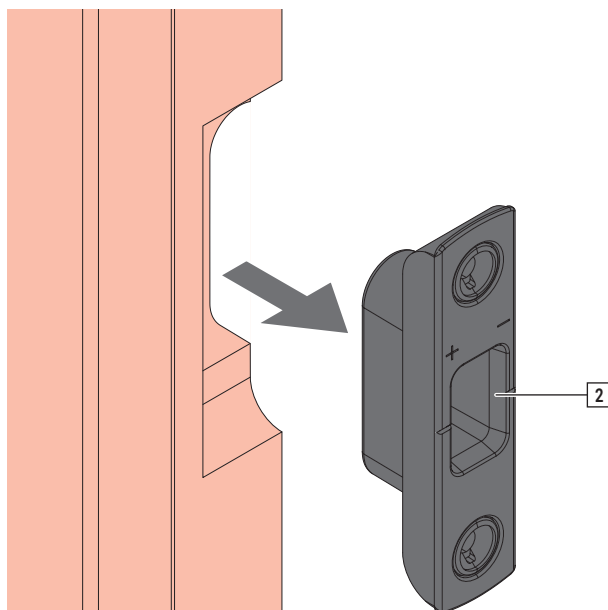
Turning the component

1. Undo the screws [1].

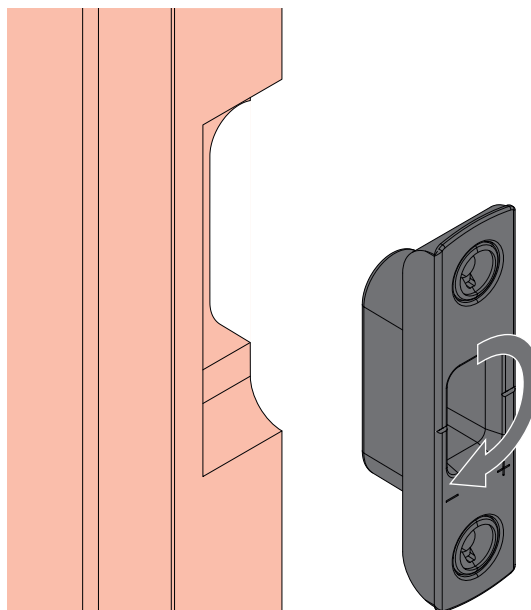




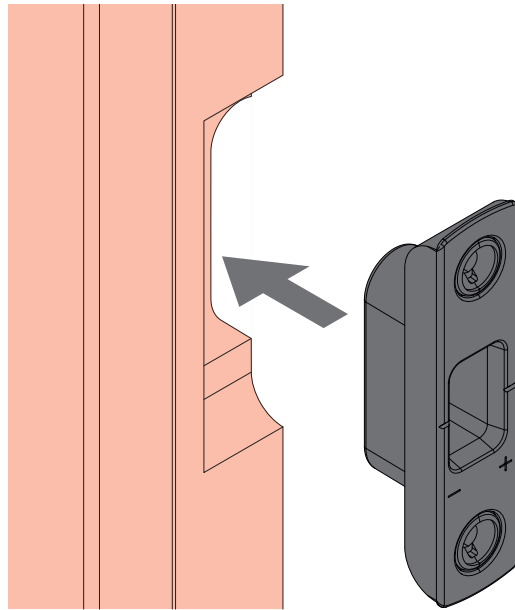
2. Remove the striker [2] from the frame.



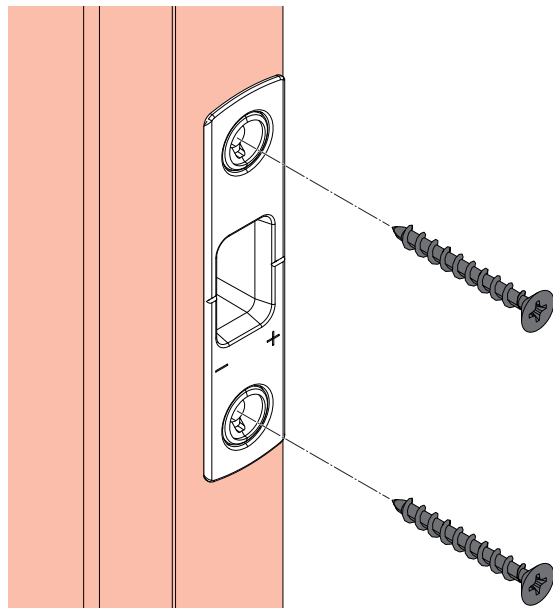
3. Turn the striker 180°.



4. Insert the striker.

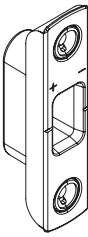


5. Fasten the striker with two screws.

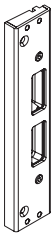
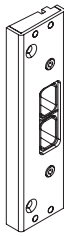
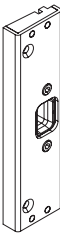




6.3.2 Timber

	Latch / deadbolt	Combination	Shootbolt protrusion	Bolt
Adjustment of lock-in position ± 2 mm		-	-	-
Eccentric adjustment ± 1.5 mm				
Eccentric adjustment (with a retaining screw in the centre) ± 1.5 mm	-		-	-
Turning the component	-	-	-	

6.3.3 PVC

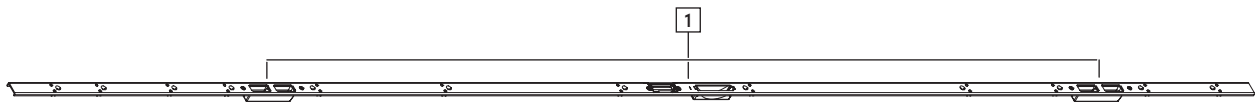
	Latch / deadbolt	Combination	Shootbolt protrusion	Bolt
Eccentric adjustment ± 1.5 mm				

6.3.4 Aluminium

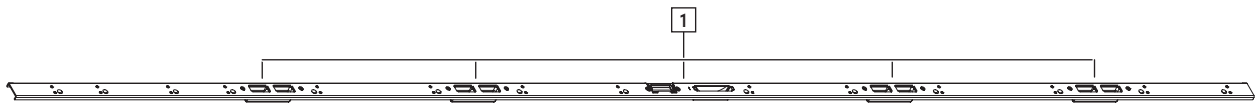
	Latch / deadbolt	Combination	Shootbolt protrusion	Bolt
Eccentric adjustment ± 1.5 mm				

6.4 Striker strips

2 combination lockings (2C)

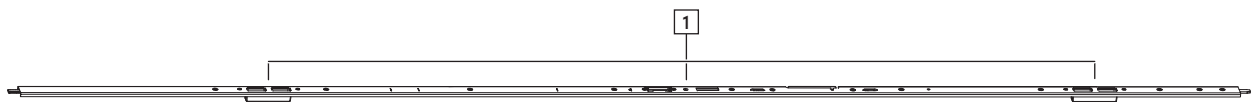


4 combination lockings (4C)



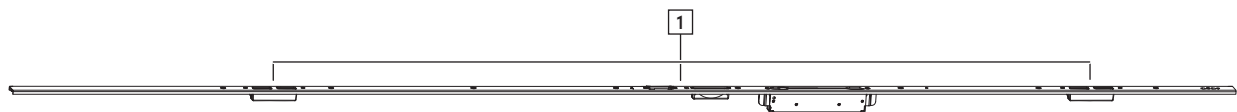
[1] Eccentric adjustment
 $\pm 1.5 \text{ mm}$

6.5 Lever-operated espagnolette, standard



[1] Eccentric adjustment
 $\pm 1.5 \text{ mm}$

6.6 Lever-operated espagnolette Plus

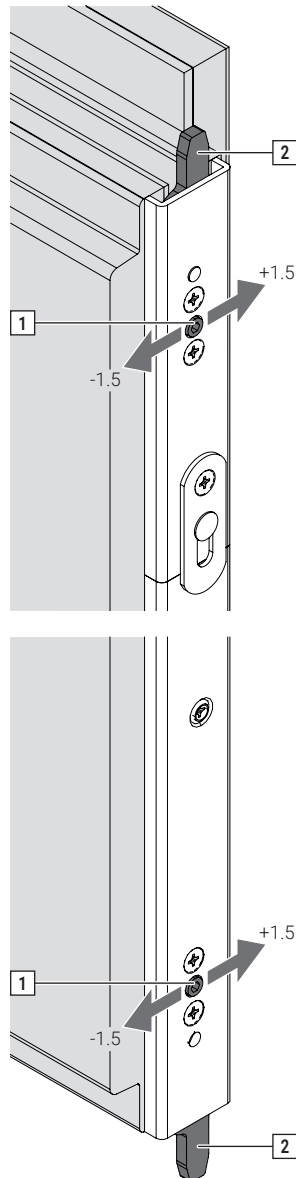


[1] Eccentric adjustment
 $\pm 1.5 \text{ mm}$



Shootbolt protrusion

1. Adjust the adjusting screw [1] for shootbolt protrusion [2] at the top and bottom.
Adjustment distance ± 1.5 mm
Tool: size 3 hex key



INFO

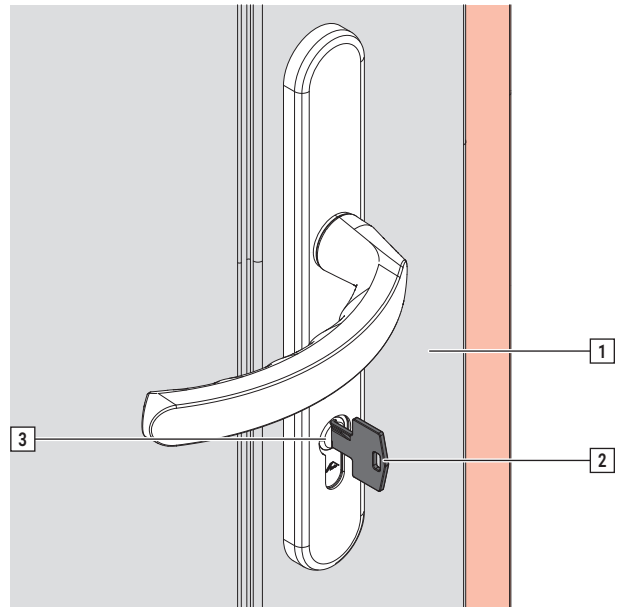
For information about integrating a threshold, refer to [IMO_423](#) (Roto Eifel).

7 Operation

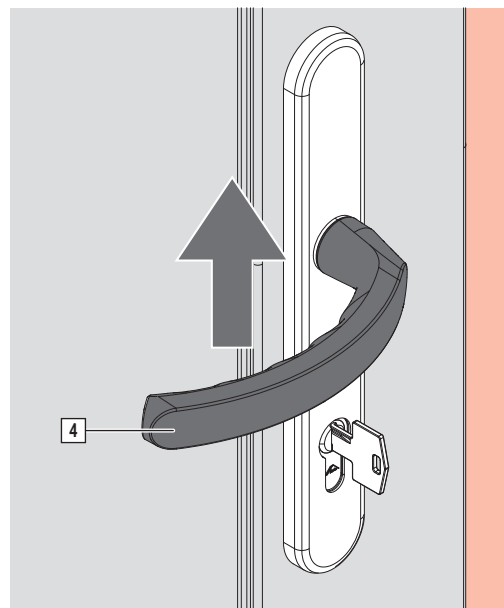
7.1 Lever handle-operated multipoint lock

Locking the door

1. Close the leaf [1] and insert the key [2] into the profile cylinder [3].

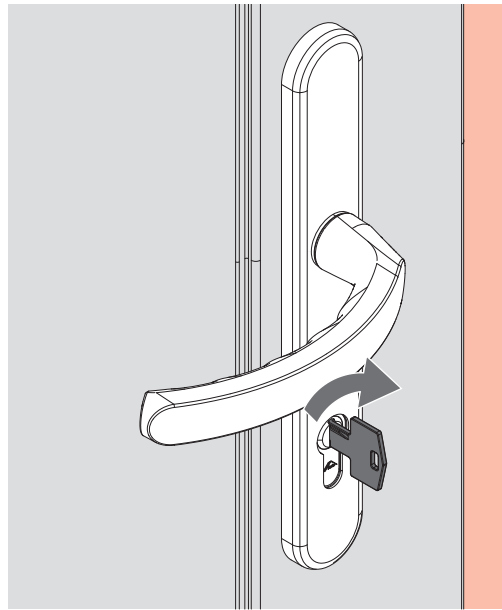


2. Pull the door lever handle [4] up.
▷ When the door lever handle is released, it automatically returns to its initial position.



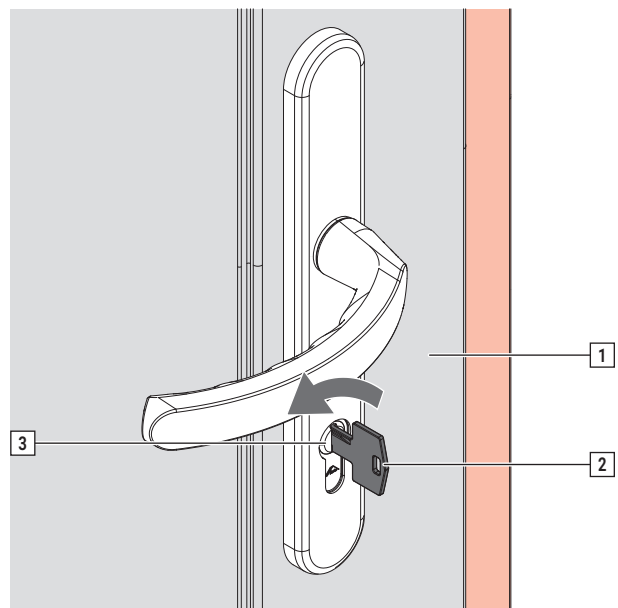


3. Turn the key once in the locking direction.

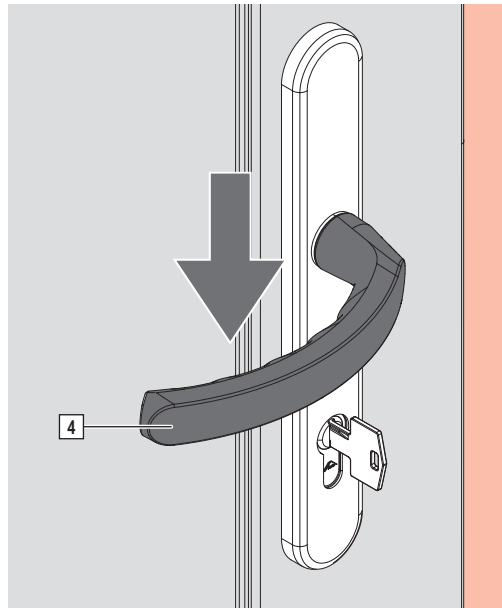


Unlocking the door

1. Insert the key [2] into the profile cylinder [3] of the door [1].
2. Turn the key once in the unlocking direction.



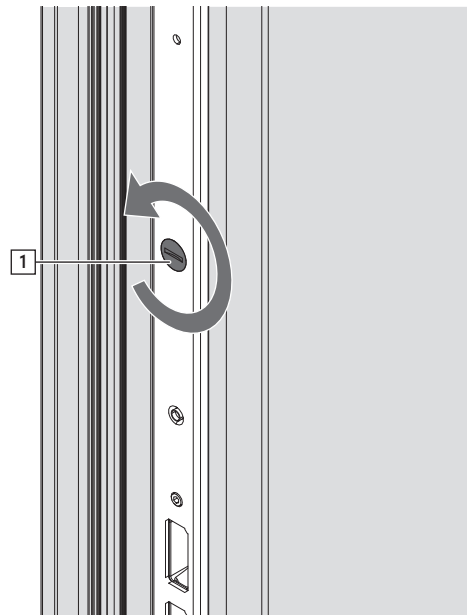
3. Push the door lever handle [4] down.
 - ▷ When the door lever handle is released, it automatically returns to its initial position.



7.2 Lever-operated espagnolette Standard

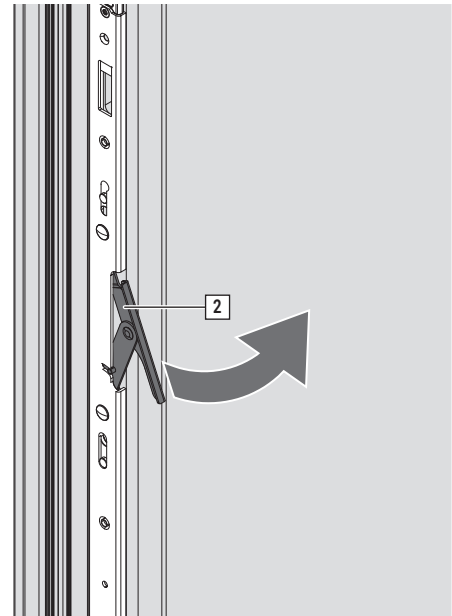
Unlocking the second opening leaf

1. Using a flat object (e.g. a coin), turn the blocking element [1] away from the lever and move it to a vertical position.
 - ▷ The connecting rod is released.





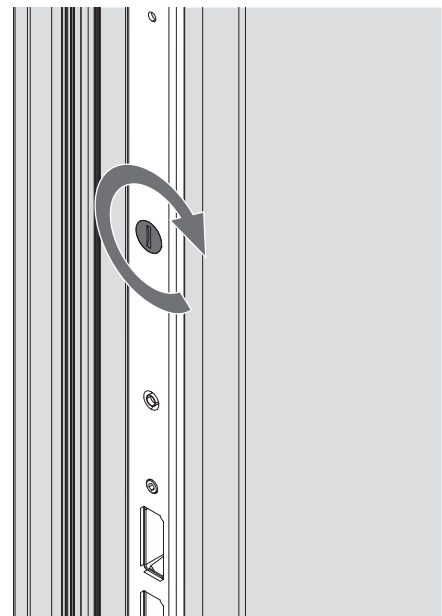
2. Pull the lever [2] forwards and upwards as far as the latching point.



3. Open the second opening leaf.

Locking the second opening leaf

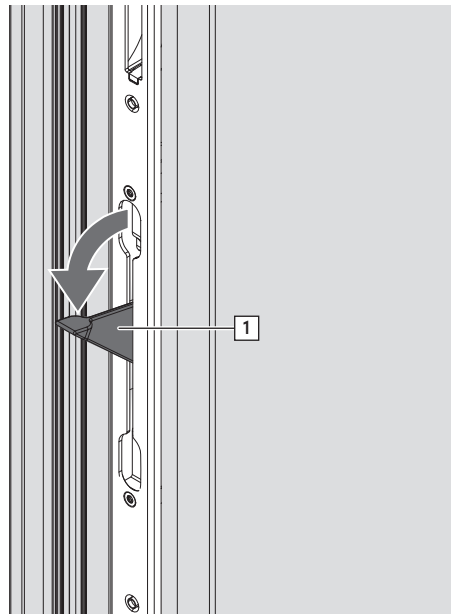
1. Close the second opening leaf.
2. Push the lever down and slide it towards the lever-operated espagnolette to fold it in.
3. Using a flat object, turn the blocking element towards the lever and move it to a horizontal position.



7.3 Lever-operated espagnolette Plus

Unlocking the second opening leaf

1. Fold out the lever [1].
2. Open the second opening leaf.



Locking the second opening leaf

1. Close the second opening leaf.
2. Fold in the lever.



7.4 Fault assistance

Check the tolerances and height offset on the element → *from page 19.*

Fault	Cause	Corrective action	To be carried out by
The door lever handle is not horizontal (hanging) when it is in the zero position (initial position).	Escutcheon fitted incorrectly (escutcheon not at the correct angle).	Remove the escutcheon and attach with drilling jig.	■
	Spindle-receiver holding spring worn / broken.	Replace the lock casing.	■
	Friction between door lever handle and long plate too high.	Lubricate.	□
The door lever handle is not horizontal when it is in the zero position (too high).	Square spindle bent.	Replace the entire square spindle or the entire door lever handle set.	■
The locking lug of the profile cylinder scrapes in the main lock casing.	Long plate / escutcheon and lever handle / lever handle not positioned correctly in relation to one another (axes and interaction on the inside and outside).	Remove the escutcheons and long plate and secure with drilling jig (drill new holes if required).	■
Screws scrape against the connecting rod.	Screws screwed into the door rebate at an angle.	Turn in screws straight or use screws with a partial thread (without a thread behind the screw head).	■
Lock moves stiffly.	Screws are too tight.	Loosen the screws.	■
Lock rattles in the door.	Screws are too loose.	Tighten the screws according to the specifications.	■
Locking cams brush against the striker.	Incorrect striker positions.	Adapt the striker positions.	■
Key blocks after the first turn.	Power wedges and/or bolts remain hanging from the point of entry of the frame components.	Adapt the frame component position.	■
	The door has dropped.	Adjust the door hinges and frame components, provide new spacer blocking for the door element if required (see Glazing Guide FLY_11).	■
The lock casing deadbolt scrapes in the striker plate.	Frame and frame components twisted in the vertical axis.	Free up space for the deadbolt by mechanically machining the striker plate.	■
The door does not stay closed.	The latch does not run in.	Adapt the frame component position.	■
	The door has dropped / warped.	Adjust the door hinges and frame components, provide new spacer blocking for the door element if required (see Glazing Guide FLY_11). Adjust the electrical openers.	■
The door cannot be closed.	The latch is not running into the lock casing.	Lubricate the latch with Roto NX grease.	□
	Contamination in the threshold area.	Clean the threshold area.	□

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

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

8 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

Property damage due to incorrect or improper testing!

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 110
Cleaning		→ from page 111
Clean hardware	□	
Care		→ from page 111
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 114
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

8.1 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.



8.2 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. → 8.3 "Care" from page 111
- ▶ Apply a thin protective film to the hardware, for example using a cloth soaked in oil.

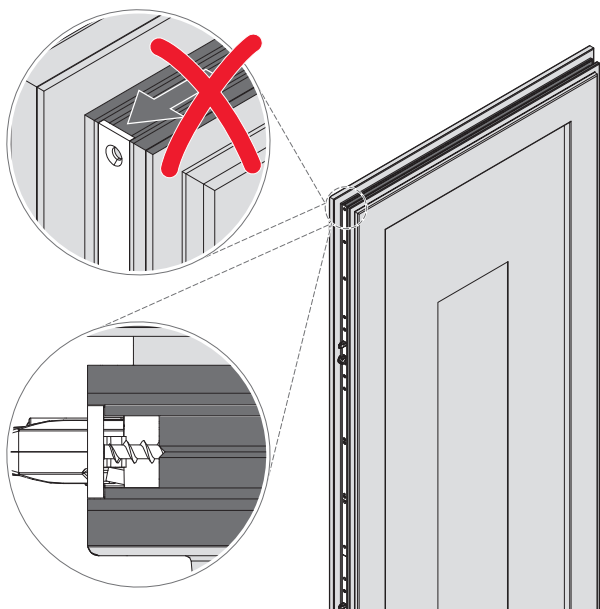


ATTENTION

Contamination may cause property damage.

Contamination may get behind the floating mullion and block the multipoint locking system.

- ▶ Do not wipe contamination in the upper area of the sash (e.g. plaster, gypsum) towards the floating mullion.



8.3 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 functionally relevant hardware components must be lubricated on a regular basis.

Recommended lubricants

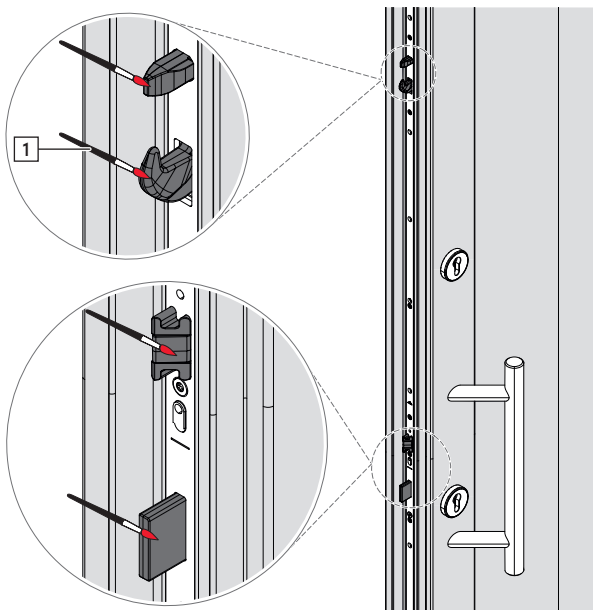
- Roto NX grease
Material number: 782881



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.

8.3.1 Lubrication points



[1] Grease

8.4 Performance test



PRECONDITION

The leaf and frame must be vertical in order to carry out the performance test.

When the door is open

Fixing screws



ATTENTION

Over-tightened screws may cause property damage!

Over-tightened screws lose their hold and no longer provide the necessary strength.

- ▶ Do not over-tighten screws. Note the torque.



Use a screwdriver to check that all fixing screws have been tightened.

Checking that the door lever handle is working properly

Push the door lever handle all the way down and release.

- ▷ The door lever handle must automatically return to the initial position.

Checking that the latch is working properly

1. Push the door lever handle all the way down.

- ▷ The latch must retract.
- ▷ When pushed down, the latch may protrude over the lock faceplate by a maximum of 2 mm.

2. Release the door lever handle.

- ▷ The latch must extend fully.

Checking locking by door lever handle

Push the door lever handle all the way up.

- ▷ The latch and deadbolt must be extended fully (11 mm and 20 mm).
- ▷ All additional locks must be in the locking position.

Checking blocking

Turn the key in the profile cylinder by one rotation in the locking direction.

- ▷ The key must be very easy to turn.
- ▷ The door lever handle blocks when moved down. The door lever handle can still be moved up.
- ▷ It must be possible to remove the key.

Checking unlocking

Turn the key in the profile cylinder by one rotation in the unlocking direction.

Push the door lever handle down.

- ▷ The latch and deadbolts must retract fully.
- ▷ All additional locks must be in the open position.

Have malfunctions remedied by a specialist company.

When the door is closed

Locking process

Close the door.

- ▷ The latch must run into the frame component and keep the door closed.

Opening using the door lever handle

With the door closed, push the door lever handle down.

- ▷ The latch must retract fully so that the door can be opened.

Locking using the door lever handle

Push the door lever handle all the way up.

- ▷ The deadbolts must extend fully and smoothly.
- ▷ All additional locks must be in the locking position.

Checking blocking

Turn the key in the profile cylinder by one rotation in the locking direction.

- ▷ The key must be easy to turn.
- ▷ The door lever handle blocks when moved down. The door lever handle can still be moved up.
- ▷ It must be possible to remove the key.

Checking unlocking

Turn the key in the profile cylinder by one rotation in the unlocking direction.

Push the door lever handle down.

- ▷ The latch and deadbolts must retract fully.
- ▷ All additional locks must be in the open position.

Have malfunctions remedied by a specialist company.

8.5 Repair



WARNING

Improper repair work may pose a risk of death!

Improper maintenance may prevent the element from working properly and make it less safe to use.

- ▶ Always have repairs performed by a specialist company.



ATTENTION

Improper screw fixings may cause property damage.

Loose or faulty screws can prevent the hardware from working properly.

- ▶ Check that the individual screws are secure and seated correctly.
- ▶ Tighten or replace loose or faulty screws.
- ▶ Use only the suggested screws.

Repair work includes replacing 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:

- Adjusting the hardware.
- Replacing the hardware or hardware components.
- Removing and reinstalling the elements.

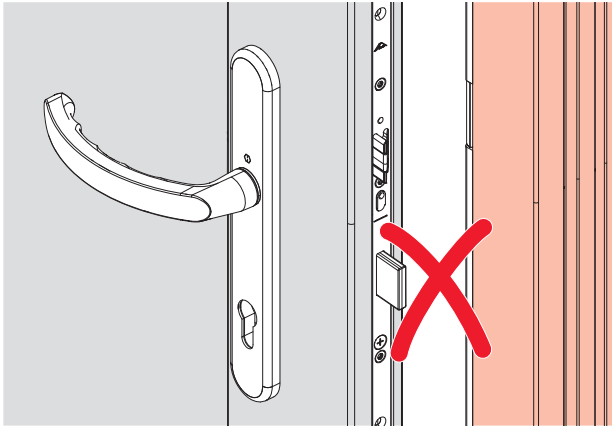
The specialist company must observe the following:

- 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 replacements.

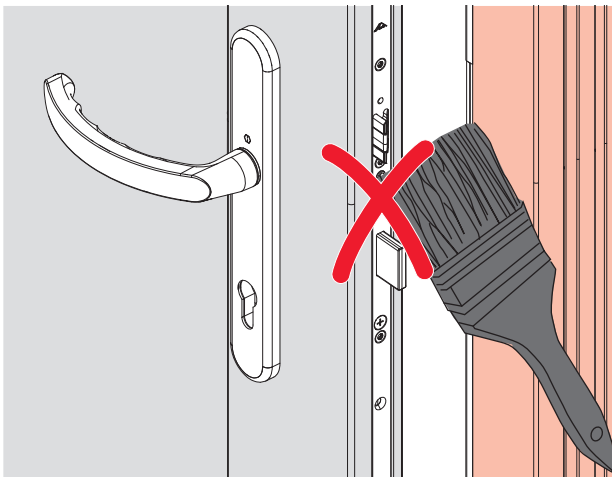


8.6 General information

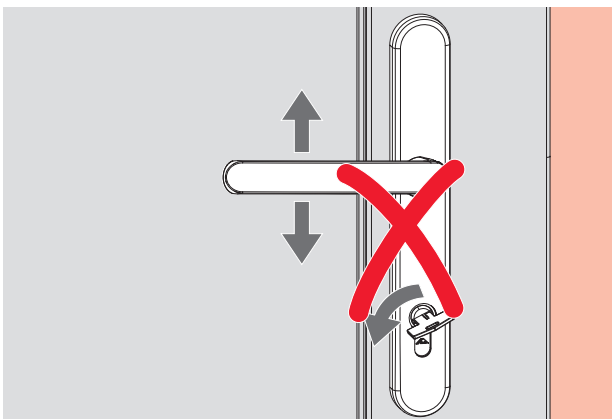
8.6.1 For the end customer



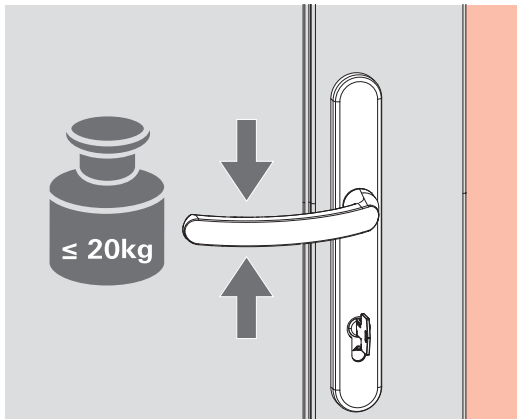
When the lock is extended, do not close the door or push it against the frame.



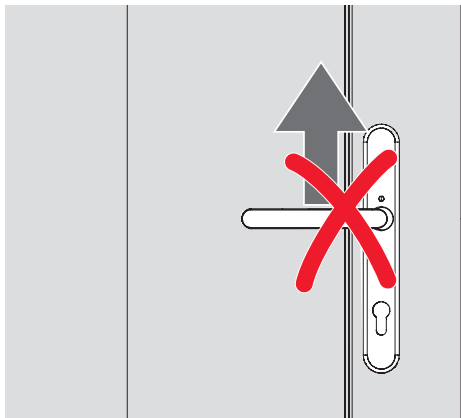
Do not paint over the lock or locking components (latch, deadbolt, additional lock, etc.).



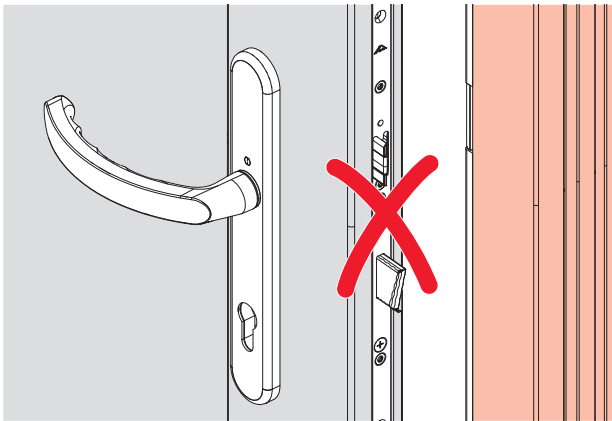
Do not actuate the door lever handle and profile cylinder at the same time.



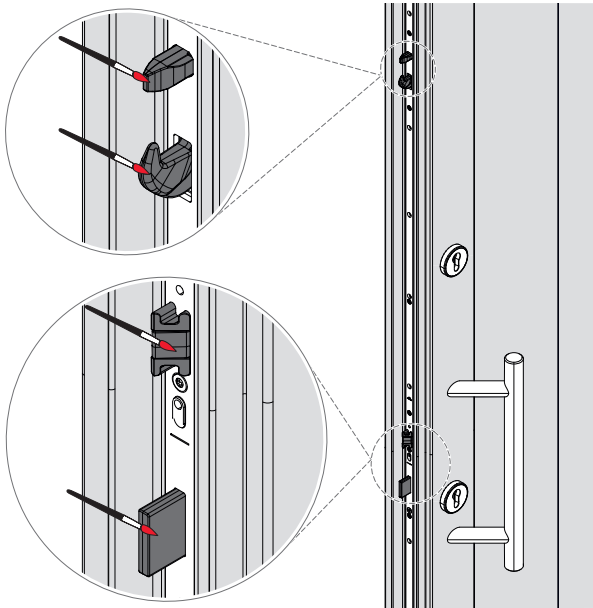
Do not place heavy loads on the door lever handle;
the maximum load is 20 kg.



Do not carry the leaf by the door lever handle.



Where there are visible signs that force has been used, arrange for the lock and/or lever handle set to be replaced by a specialist company.



Lubricate locking components (latch, deadbolt, additional lock) at least once per year.



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.

9 Dismantling



WARNING

Improper dismantling may pose a risk of death!

The leaf may fall during dismantling.

- ▶ Secure the leaf 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.

9.1 Hardware components

Removing hardware components

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



10 Transport

10.1 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 transport. 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.

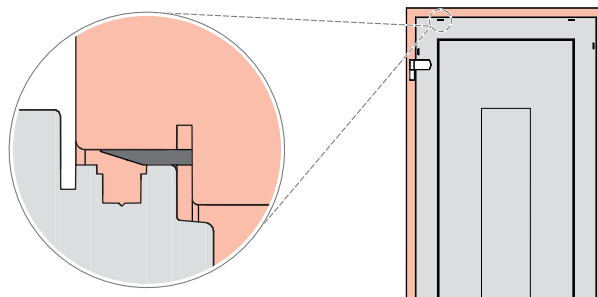


INFO

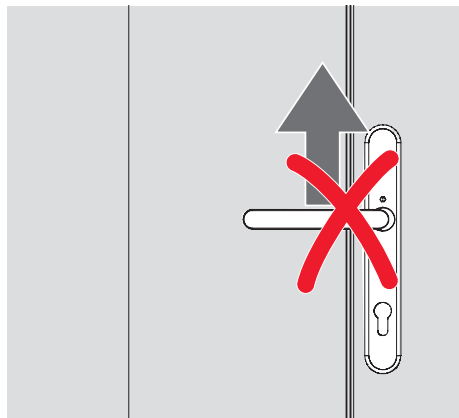
Lifting equipment and protective devices may only be used if they are in full working order.

10.2 Information on transport

- During transport, secure the leaf against the frame using suitable supports (run-up blocks, wedges, etc.).



- Do not remove the cylinder fixing, which is a transport safety mechanism, until you are about to install the profile cylinder.
- Do not carry the leaf by the door lever handle.



10.3 Storing the hardware

Store all hardware components as follows until they are installed:

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



11 Disposal



ATTENTION

Incorrect disposal may pollute the environment.

Pieces of hardware are raw materials.

- ▶ Dispose of hardware for environmentally friendly material re-utilisation as mixed scrap.

11.1 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.

11.2 Disposing of hardware

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

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

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



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