

## Roto TSL

Twin cam security locking for outward opening windows

Installation, Maintenance and Operation instructions for PVC and timber profiles



## **Imprint**

Copyright: April 2015

## **Roto Frank AG Window and Door Technology**

Wilhelm-Frank-Platz 1  
70771 Leinfelden-Echterdingen  
Germany

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

**[www.roto-frank.com](http://www.roto-frank.com)**



<hr/>		
General information	<b>Information on these instructions</b> .....	5
	<b>Responsibility of the target groups</b> .....	6
	<b>Instruction obligation of the target groups</b> .....	7
	<b>Explanation of the safety instruction symbols</b> .....	8
	<b>Limitation of liability</b> .....	9
<hr/>		
Security	<b>Stipulated use</b> .....	10
	<b>Stipulated application for end-users</b> .....	11
	<b>Safety instructions</b> .....	12
	<b>Safety information for end-users</b> .....	13
	<b>Fabrication advice</b> .....	14
	<b>Screw fixing/Clamping</b> .....	15
<hr/>		
Information on the product	<b>General hardware characteristics</b> .....	16
<hr/>		
Hardware overview	<b>Explanation on the hardware overview chapter</b> .....	17
	<b>Roto TSL</b> .....	18
<hr/>		
Installation	<b>Sash</b> .....	20
	Drilling and routing dimensions .....	20
	Installing espagnolette .....	21
	Handle .....	22
	<b>Frame</b> .....	23
	Striker positions .....	23
	<b>Night vent function</b> .....	24
<hr/>		
Adjustment	<b>Explanation on the adjustment chapter</b> .....	26
	<b>Locking cam</b> .....	27
	Gasket compression adjustment .....	27





## Operation

<b>Operating information</b> .....	<b>28</b>
Handle positions of outward opening top hung and side hung hardware .	28
<b>Operation information for end-users</b> .....	<b>29</b>
Handle positions of outward opening top hung and side hung hardware .	29
<b>Troubleshooting</b> .....	<b>30</b>



## Maintenance

<b>Maintenance</b> .....	<b>32</b>
<b>Lubrication points</b> .....	<b>33</b>
<b>Inspection and care</b> .....	<b>34</b>
<b>Preservation of the surface finish</b> .....	<b>35</b>



## Transport

<b>Transport, packaging, storage</b> .....	<b>37</b>
<b>Transport inspection</b> .....	<b>38</b>



## Disposal

<b>Disposal of window hardware</b> .....	<b>39</b>
--	-----------

This manual contains important information as well as installation instructions regarding the further work of the hardware. Also, this manual contains binding guidelines to ensure the duty to instruct through to the end-user.

The information and instructions in this manual refer to the products of the Roto Outward Opening hardware system.

Apart from these installation, maintenance and operation instructions, the following documents apply:

- Catalogue
- Directives VHBH of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBH der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBE of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBE der Gütegemeinschaft Schlösser und Beschläge e. V.)

This manual should be stored in such a manner that it can be quickly used, if needed.

### Additional markings

To highlight handling directives, results, lists, references and other elements, the following markings are used in this document:

Symbols	Explanation
Material	
	Timber and PVC
Outward opening types	
	Outwards opening, side hung
	Outwards opening, top hung

Marking	Explanation
	Sash
	Frame
	Drill holes
	Hardware components
	Action sequence
	Action steps
	First level of the hierarchy in a list
	Unordered list (second level of the hierarchy)
	(Cross) reference in tables
Refer to page 12	(Cross) reference in the text

Abbreviation	Explanation
<b>FS</b>	Friction stay
<b>SH</b>	Side Hung
<b>TH</b>	Top Hung

All dimensions stated in mm unless otherwise specified.

### Protection of copyright

The contents of this document are protected by copyright. In the framework of the hardware manufacturing, the use of the contents is allowed. Any other or further use is not permitted without written permission of the manufacturer.

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

**Hardware dealers**

The “hardware dealers” target group includes all companies/persons who purchase hardware from the hardware manufacturer to resell it without the hardware being modified or subject to further work.

**Manufacturers of windows and balcony doors**

The “manufacturers of windows and balcony doors” target group includes all companies/persons who purchase hardware from the hardware manufacturer or the hardware dealer and build it into windows and balcony doors.

**Building element dealers/Installation company**

The “building element dealers” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors in order to sell these on and to install them into a building development, without the windows or balcony doors being modified.

The “installation company” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors, or from a building element dealer, in order to sell these and to install them into a building development, without the windows or balcony doors being modified.

**Builder**

The “builder” target group includes all companies/persons who order windows and/or balcony doors for installation into their building project.

**End-users**

The “end-users” target group includes all persons who operate the installed windows and/or balcony doors.

**NOTE!**

Every target group must fully comply with its instruction obligation. Unless defined otherwise in the following, the documents and information may be transmitted e.g. as printed documents, CD-ROM, or via Internet access.

**Responsibility of the hardware dealer**

The hardware dealer must transmit the following documents to the manufacturer of windows and balcony doors:

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

**Responsibility of the manufacturer of windows and balcony doors**

The manufacturer of windows and balcony doors must transmit the following documents to the building element dealer or to the builder, even when a subcontractor (installation operation) is acting as an intermediary:

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

He must ensure that the end-user is provided with the documents and information intended for him, in printed format.

**Responsibility of the building element dealer/installation company**

The building element dealer must transmit the following documents to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Maintenance and operating instructions (with the focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

**Responsibility of the builder**

The builder must transmit the following documents to the end-user:

- Maintenance and operating instructions (with the focus on hardware)
- Guidelines/advice for end-users (VHBE)

In this instructions, safety information is indicated by a symbol. The safety information is introduced by a key word that indicates the severity of the danger.



#### **DANGER!**

This symbol in conjunction with the signal word indicates an imminently hazardous situation, which could result in death or serious damage to health if it is not avoided.

---



#### **WARNING!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which could result in death or serious damage to health if it is not avoided.

---



#### **CAUTION!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to minor or light injuries if it is not avoided.

---



#### **NOTE!**

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to property or environmental damage if it is not avoided.

---

All details and instructions in this document were compiled taking into account the relevant standards and regulations, the state of the art, and also many years of knowledge and experience.

The hardware manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document and all product-specific documents and related applicable directives (refer to the chapter Security, Stipulated use).
- Operation other than that stipulated use / misuse (refer to the chapters Security, Stipulated use).
- Insufficient invitation to tender, failure to adhere to the installation instructions or application drawings.
- Increased soiling.

Claims by third parties against the hardware manufacturer on the ground of damages resulting from misuse or failure to follow the instruction obligation on the part of the hardware dealer, the manufacturer of windows and balcony doors, and of the building element dealer or the builder are transferred accordingly.

The undertakings agreed in the delivery contract, the general conditions of business and the delivery conditions of the hardware manufacturer, and the legal regulations applicable at the time of concluding a contract are effective.

The warranty covers only original Roto components.

The right to technical modifications for the improvement of performance characteristics and for further development is reserved.

Outward opening top hung and side hung hardware as covered by this definition is one-hand-operation hardware, outward opening top hung and side hung hardware for windows in building construction. This is used to enable windows sashes into a side hung or top hung outward opening position by operating a 'hand-lever' (handle). Outward opening top hung and side hung hardware is used on vertically installed windows made of timber, PVC, or aluminium. Outward opening top hung and side hung hardware as covered by this definition, locks window sashes or enables various ventilating positions. When closing, the gasket counter force must be overcome as a rule.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These Installation, Maintenance and Operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. light metal profiles etc.)
- The relevant directives VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- The valid national laws and directives as well as generally recognised codes of practice.

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.



**WARNING!**

**Danger from misuse!**

Misuse and incorrect installation of hardware can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
  - Never use accessories that are not original products or that have not been approved by the hardware manufacturer.
-



For windows with outward opening top hung and side hung hardware, window sashes can be brought into an opening position.

When a sash is closed and the hardware is locked, the resistance of a gasket usually needs to be overcome.

**WARNING!****Danger of injury and material damage from incorrect closing and opening the sash!**

Incorrect closing and opening of sashes can result in serious injuries and significant material damage.

Therefore:

- Ensure that when closing the sash, it does not collide with the frame or with another sash.
- Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully closed position, and that it is brought very slowly towards the frame.
- Ensure that the sash never slams closed or swings open in an uncontrolled manner.

---

Any use beyond or other than the stipulated application and installation of the products is deemed to be misuse and can result in dangerous circumstances.

**WARNING!****Danger from misuse!**

Misuse of windows can result in dangerous circumstances.






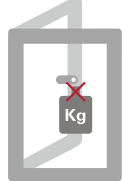




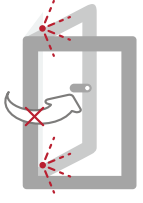
In particular, avoid the following applications:

- insertion of obstacles in the opening area between the frame and the window sashes.
- the deliberate or negligent application of excessive loads on windows.
- deliberate or uncontrolled slamming or pushing of windows against the window reveal. This can destroy the hardware, frame materials, or other individual components of the windows.

---


Claims for damages of any type whatsoever resulting of operation other than that stipulated are excluded.

Comply with the following symbols and their meanings in order to avoid accidents, injuries and material damage.






Symbol	Side hung	Meaning
		<p><b>DANGER!</b>  <b>Danger of injury from falling through open windows.</b></p> <ul style="list-style-type: none"> <li>– Behave with care near to open windows.</li> <li>– Keep children and people who cannot estimate the dangers away from the point of danger.</li> </ul>
		<p><b>WARNING!</b>  <b>Danger of injury through trapping of body parts in the opening gap between sash and frame.</b></p> <ul style="list-style-type: none"> <li>– When closing windows, never reach between sash and frame, and always act with care.</li> <li>– Keep children and people who cannot estimate the dangers away from the point of danger.</li> </ul>
		<p><b>WARNING!</b>  <b>Danger of injury and material damage from overloading the sash</b></p> <ul style="list-style-type: none"> <li>– Do not overload the sash.</li> </ul>
		<p><b>CAUTION!</b>  <b>Danger of injury from the effect of wind</b></p> <ul style="list-style-type: none"> <li>– Prevent wind from acting on the open sash.</li> <li>– During wind and drafts, close and lock windows and balcony door sashes.</li> </ul>
		<p><b>CAUTION!</b>  <b>Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame</b></p> <ul style="list-style-type: none"> <li>– Do not insert obstructions into the opening gap between sash and frame.</li> </ul>
		<p><b>CAUTION!</b>  <b>Danger of injury and material damage from pressing the sash against the opening edge (reveal).</b></p> <ul style="list-style-type: none"> <li>– Do not press the sash against the opening edge (reveal).</li> </ul>



The following symbols can be used on top hung windows (OPR\_37\_DE-EN) or side hung windows (OPR\_38\_DE-EN) to protect the end-user. Always keep these symbols in a clearly legible state. Please order stickers separately.

 Roto

**Sicherheitshinweis**  
Security advice



01/2015 OPR\_37\_DE-EN\_v0

 Roto

**Sicherheitshinweis**  
Security advice



01/2015 OPR\_38\_DE-EN\_v0

### **Maximum sash sizes and weights**

The technical data, application diagrams, and component classifications in the product-specific documentation of the hardware manufacturer give instructions on the maximum permitted sash sizes and weights. Here, the component with the smallest permitted load bearing capacity decides the maximum permitted sash weight.

- Check compliance of the technical data, application diagrams, and component classifications before the use of electronic data sets, and especially their use in fenestration programmes.
- The maximum permitted sash sizes and weights must never be exceeded. In the case of uncertainty contact the hardware manufacturer.

### **Guidelines from the profile manufacturer**

The manufacturer of windows and/or balcony doors must comply with all specified system-related dimensions (e.g. gasket gap dimensions or locking-point distances). Furthermore, he must check these regularly and make certain of them, especially on the first use of new hardware components, during manufacture, in an ongoing manner up to and including the window installation.



#### **NOTE!**

The hardware components are designed in such a manner, that the system-related dimensions can be adjusted, provided the hardware can have an effect on these. If a deviation from these dimensions is noticed only after the installation of the windows, the hardware manufacturer is not responsible for any possible additional work arising.

---

### **Composition of hardware**

Burglary inhibiting windows require hardware which fulfils particular requirements.

Windows for damp rooms, and those for use in environments with aggressive and corrosive air components require hardware which fulfils particular requirements.

The resistance of windows to wind loads when closed and locked depends on the actual designs and locations of the windows.

The hardware combinations and installations appropriate for windows in the previously mentioned areas should be specifically selected and agreed with the hardware manufacturer and the profile manufacturer.



#### **NOTE!**

The guidelines of the hardware manufacturer relating to the combination of the hardware (e.g. the use of additional stay arms, the design of hardware for burglary-inhibiting sashes for windows, etc.) are binding.

---



---

**DANGER!**

**Danger to life from incorrectly installed and threaded hardware components!**

Incorrect installation and threading of hardware components can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- For installation and especially for threaded components, observe the product-specific documentation of the hardware manufacturer, the information from the profile manufacturer.
- 

This danger note shall apply to all screwable hardware components. Generally, the kind and quality of the screw fixing depends on the profile of the profile manufacturer and has to be tested before use (system check).

During installation, specific tightening torques must be observed. For this, it is imperative to observe the information provided in the installation chapter.

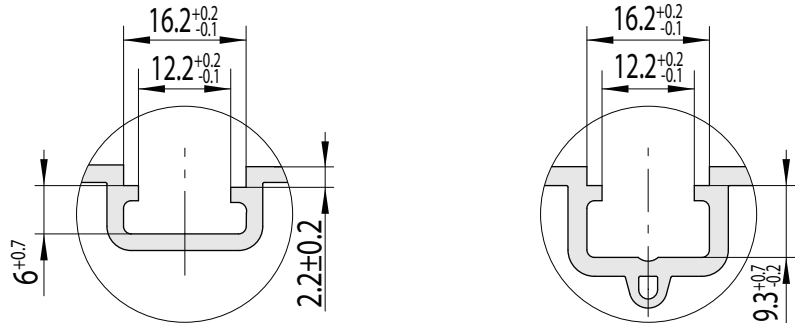
Do not use any acid cross-linked sealing compounds that could lead to corrosion of the hardware components. The glazing spacer-block regulations for the glazing method are to be adhered to.

**Clearance**

- 12 mm

**Euro-groove**

- Permissible groove dimensions:



Min. 6 mm euro groove

Standard euro groove

**Hardware functional safety**

- In order to warrant continuous hardware functional safety, the following is to be adhered:
  - Professional installation of the hardware components in accordance with these installation instructions.
  - Professional installation of the elements throughout the window installation process.
  - The window fabricator is obliged to give the maintenance and operation instructions and where appropriate, the product liability guidelines to the user.
  - The entire hardware may consist of only original Roto system components. The use of non-Roto components excludes any liability on our part.
  - Professional storage to avoid mechanical damage.
  - PVC: Use zinc-plated steel fenestration-screws 3.9/4.1 x ... for fixing the hardware components.
  - Timber: Use zinc-plated silver-chromated steel fenestration-screws 3.5/4.9 x ... for fixing the hardware components.

**Product liability –  
Liability exclusion**

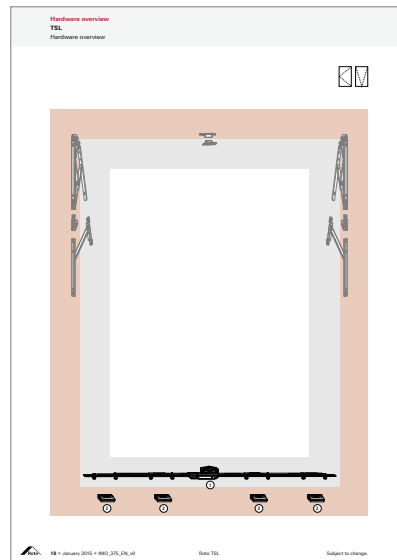
- The hardware manufacturer is not liable for malfunctions or damage to the hardware and to the windows equipped with the hardware, if any such malfunctions or damage have been caused by inadequate tendering procedures, failure to adhere to the installation instructions or application drawings, or if they were exposed to stringent soiling. The warranty covers only original Roto components.



### Explanation on the hardware overview chapter

The hardware overviews on the following pages are recommendations of Roto Frank AG.

The hardware overview chapter shows on the left page the single hardware components of the opening type in the overview and on the right page the respective parts list. Position numbers allow the allocation between overview and parts list.



**Hardware overview**  
**TSL**  
Parts list

**Application range**  
Sash Rebate width **SW** (top hung) .....305-1600mm  
Sash Rebate height **SH** (top hung) depends on hinge configuration.  
Sash Rebate width **SW** (side hung) .....305-1600mm  
Sash Rebate height **SH** (side hung) depends on hinge configuration.

**Application range TSL 200mm basket**

Application range	Part	Qty	Part number
305 - 600	4	305	Z18044
601 - 900	4	600	Z18045
901 - 1200	4	900	Z18046
1201 - 1500	4	1200	Z18047
1501 - 1800	4	1500	Z18048
1801 - 1900	4	1800	Z18049

**Application range TSL 250mm basket**

Application range	Part	Qty	Part number
305 - 600	4	305	Z18050
601 - 900	4	600	Z18051
901 - 1200	4	900	Z18052
1201 - 1500	4	1200	Z18053
1501 - 1800	4	1500	Z18054
1801 - 1900	4	1800	Z18055

**Application range TSL 300mm basket**

Application range	Part	Qty	Part number
305 - 600	4	305	Z18056
601 - 900	4	600	Z18057
901 - 1200	4	900	Z18058
1201 - 1500	4	1200	Z18059
1501 - 1800	4	1500	Z18060
1801 - 1900	4	1800	Z18061

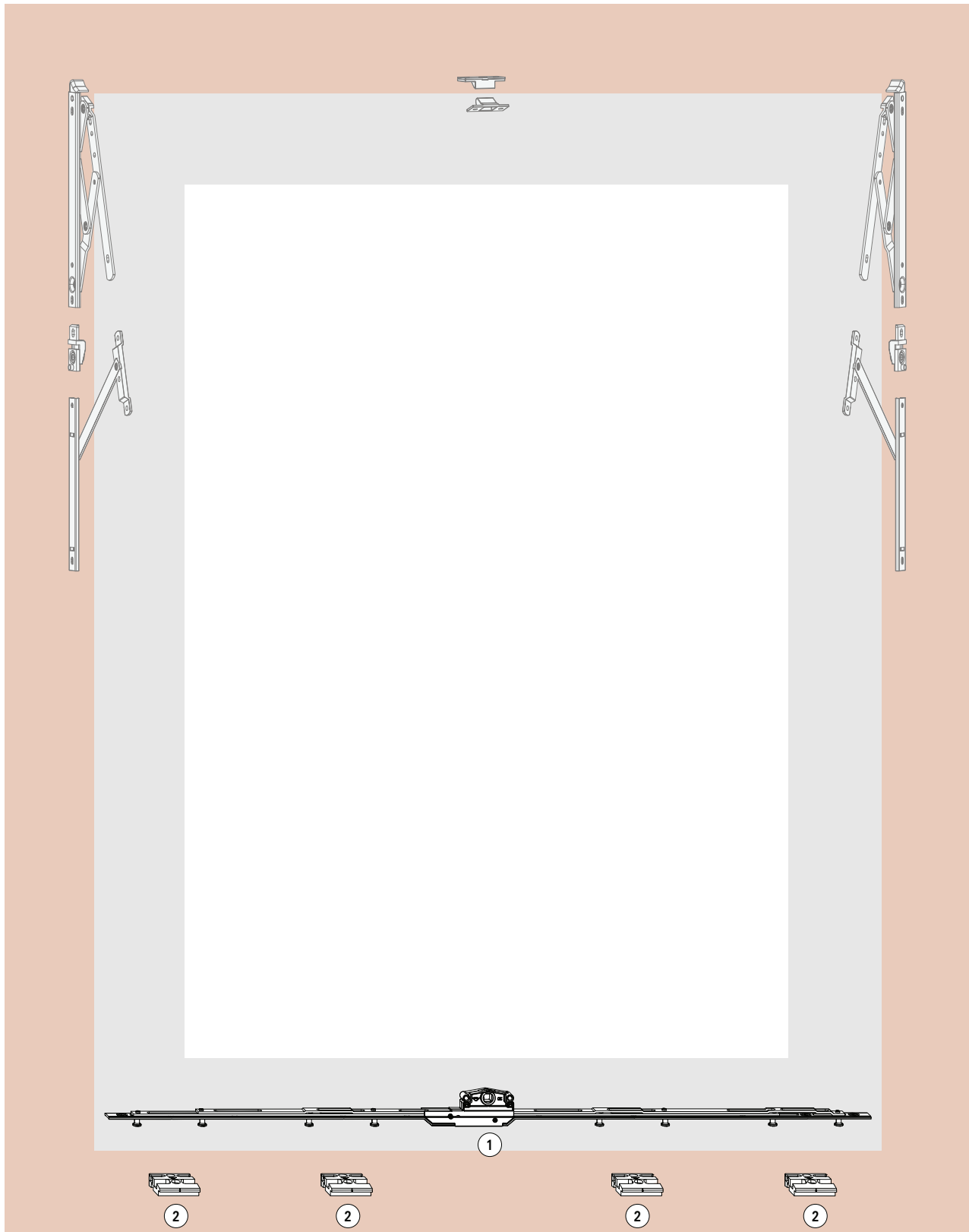
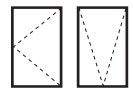
**Application range TSL 350mm basket**

Application range	Part	Qty	Part number
305 - 600	4	305	Z18062
601 - 900	4	600	Z18063
901 - 1200	4	900	Z18064
1201 - 1500	4	1200	Z18065
1501 - 1800	4	1500	Z18066
1801 - 1900	4	1800	Z18067

**NOTES**  
For Roto FS Kempton friction stays and accessories please see CTJ\_17 and MMS\_378

The parts list includes all profile related versions of the Roto TSL hardware system. Technical details, special groove and clearance version information available upon request.

The actual scope of delivery depends on the ordered hardware configuration (height and width of the window). Handles have to be ordered separately.





### Application range

Sash Rebate width **SW** (top hung) .....305–1600 mm  
 Sash Rebate height **SH** (top hung) depends on hinge configuration.

Sash Rebate height **SH** (side hung) .....305–1600 mm  
 Sash Rebate height **SH** (side hung) depends on hinge configuration.

#### 1 Espagnolette TSL, 20 mm backset

##### 20 mm backset, 8 mm cam height

Application range	No. of Cams	Rail length	Material no.
305 – 400	4	305	<b>738741</b>
401 – 550	4	400	<b>738742</b>
551 – 750	4	550	<b>738743</b>
751 – 850	8	750	<b>738744</b>
851 – 950	8	850	<b>738785</b>
951 – 1050	8	950	<b>738786</b>
1051 – 1150	8	1050	<b>738787</b>
1151 – 1600	8	1150	<b>738788</b>

##### 20 mm backset, 9,5 mm cam height

Application range	No. of Cams	Rail length	Material no.
305 – 400	4	305	<b>738789</b>
401 – 550	4	400	<b>738790</b>
551 – 750	4	550	<b>738791</b>
751 – 850	8	750	<b>738792</b>
851 – 950	8	850	<b>738793</b>
951 – 1050	8	950	<b>738794</b>
1051 – 1150	8	1050	<b>738795</b>
1151 – 1600	8	1150	<b>738796</b>

#### 1 Espagnolette TSL, 22 mm backset

##### 22 mm backset, 8 mm cam height

Application range	No. of Cams	Rail length	Material no.
305 – 400	4	305	<b>738797</b>
401 – 550	4	400	<b>738798</b>
551 – 750	4	550	<b>738799</b>
751 – 850	8	750	<b>738800</b>
851 – 950	8	850	<b>738801</b>
951 – 1050	8	950	<b>738802</b>
1051 – 1150	8	1050	<b>738803</b>
1151 – 1600	8	1150	<b>738804</b>

##### 22 mm backset, 9,5 mm cam height

Application range	No. of Cams	Rail length	Material no.
305 – 400	4	305	<b>738805</b>
401 – 550	4	400	<b>738806</b>
551 – 750	4	550	<b>738807</b>
751 – 850	8	750	<b>738808</b>
851 – 950	8	850	<b>738809</b>
951 – 1050	8	950	<b>738810</b>
1051 – 1150	8	1050	<b>738811</b>
1151 – 1600	8	1150	<b>738812</b>



#### NOTE!

For Roto FS Kempton friction stays and accessories please see CTL\_77 and IMO\_378.

#### 2 Striker

System	Profile	Axis	Clearance	Material no.
<b>Aluplast</b>	Ideal 70	22.5	12	o. request
<b>Deceuninck</b>	3000	20.5	12	<b>623115</b>
<b>Ebwin Group</b>	Profile 22	22.0	12	<b>367147</b>
	Spectus Elite 70	19.7	12	o. request
	Spectus Elite 70	37.0	12	<b>387943</b>
<b>Eurocell</b>	Ultimate 70	32.9	12	<b>367153</b>
	Eurologik 70	22.4	12	<b>623115</b>
	Modus	25.3	12	o. request
<b>Kömmerling</b>	C 70 Gold	20.5	12	o. request
<b>LB Plastics</b>	8000	21.5	12	o. request
<b>Rehau</b>	S706 Co Ex (Total 70)	42,5	12	o. request
	Tritec	20.2	12	o. request
<b>Selecta</b>	Advanced 70	40.8	12	o. request
<b>Synseal</b>	Shield	33.75	12	<b>367155</b>
	Synerji	30.25	12	<b>492783</b>
<b>Timber</b>	Flat 30	21.0	12	<b>502049</b>
<b>Veka</b>	Matrix 58	21.4	12	o. request
	Matrix 70	29.4	12	<b>387946</b>
	Matrix FS 70	21.5	12	<b>502047</b>
	New Matrix 70	21.5	12	o. request
<b>WHS Halo</b>	System 10	22.0	12	<b>389683</b>
	Rustique 2	22.0	12	o. request
	Eclipse	42.7	12	<b>367154</b>
	Esthetique	32.7	12	<b>367154</b>



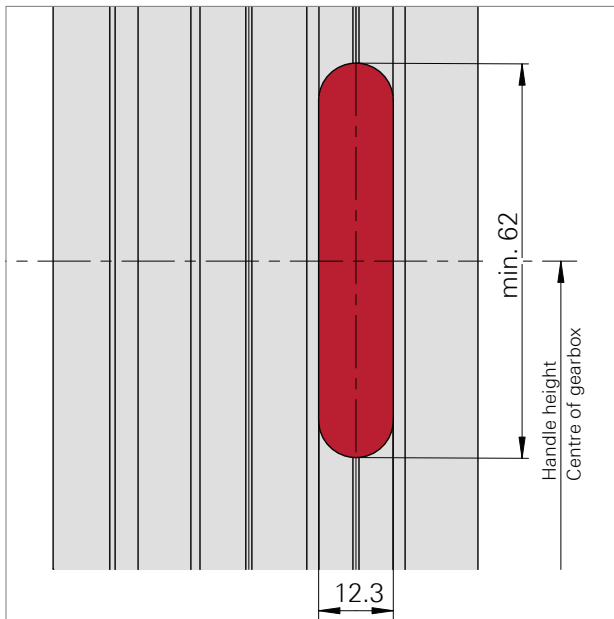
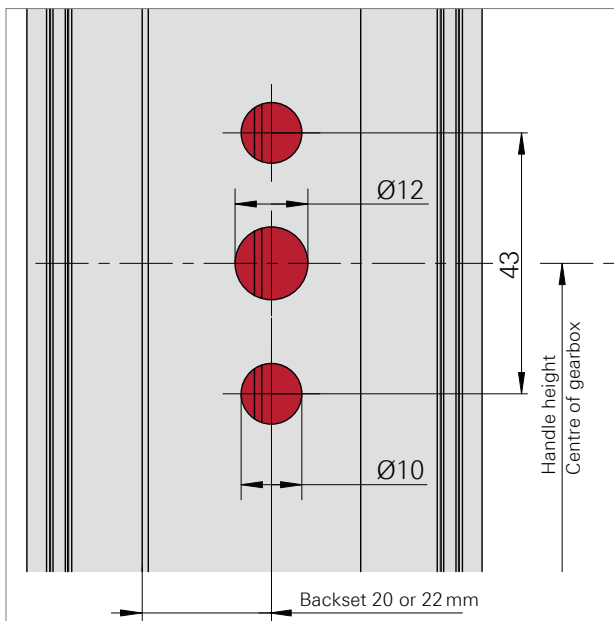
#### NOTE!

The information in the above listed table is based on a theoretical review of construction drawings which reflect the geometrical conformity of the strikers according to the listed profiles. An indication regarding the window characteristics cannot be derived, for the definition of any window characteristics is the obligation of the window manufacturer.

## Installation

### Sash

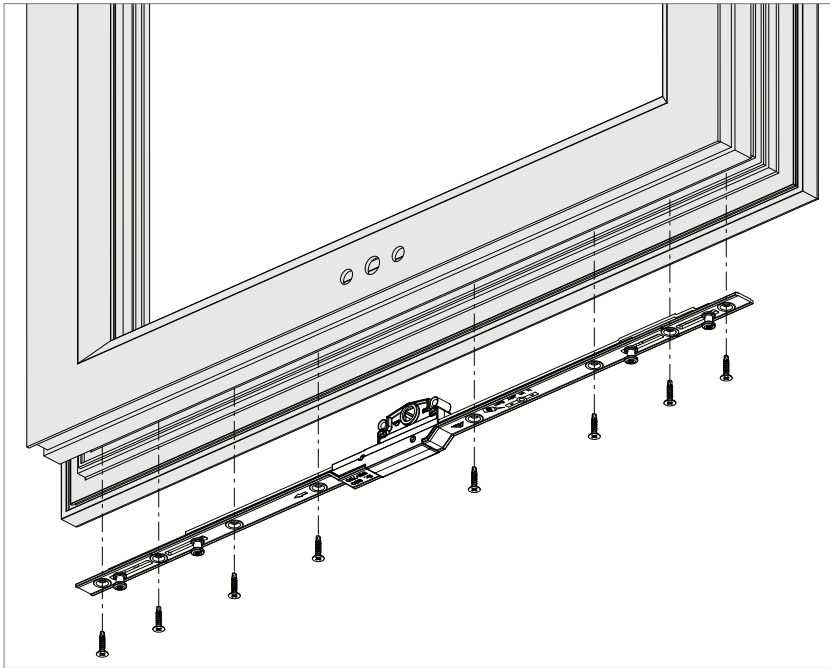
#### Drilling and routing dimensions



#### NOTE!

Espagnolette screw fitting!

Do not mill out larger, as otherwise the screws will no longer have any gripping surface!



1. Insert the gear into sash groove.
2. Screw-fix with screws 3.9 x ...



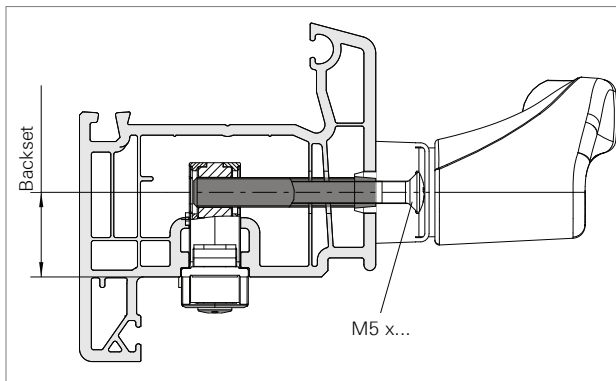
**NOTE!**

The illustration shows a TSL with 4 cams. Larger sash widths incorporate up to 8 cams.

## Installation

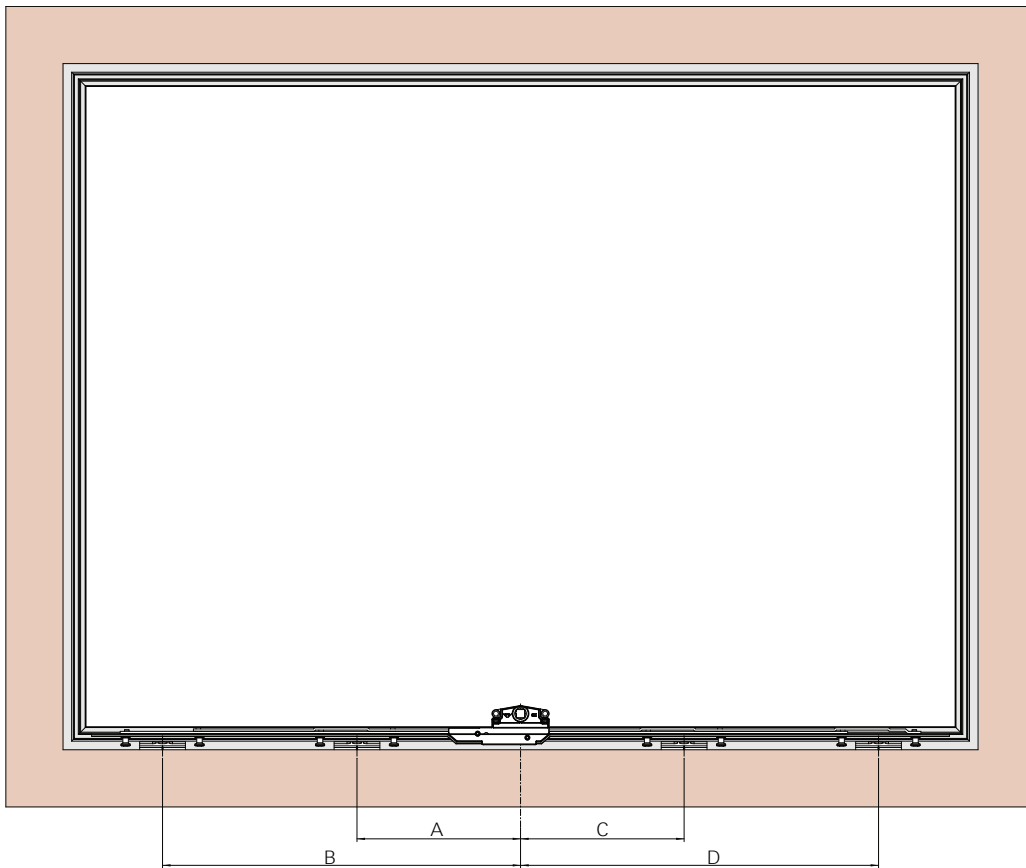
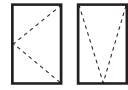
### Sash

### Handle



#### NOTES!

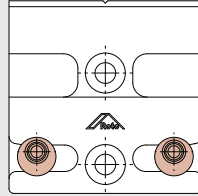
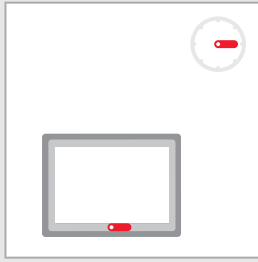
- Shorten the handle spindle for specific profile. The spindle has to pass through the whole espagnolette!
- Do not use an electric screwdriver for the screw. Only manual screw-fixing.



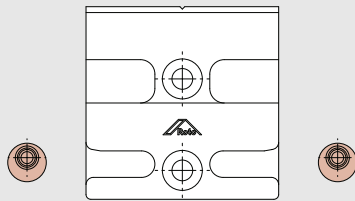
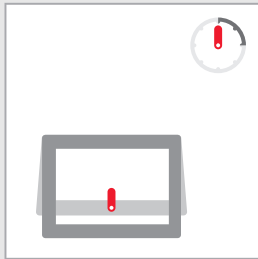
**Striker positions**

Application range	A	B	C	D
305 – 400	110	–	110	–
401 – 550	143	–	143	–
551 – 750	213	–	213	–
751 – 850	143	313	143	313
851 – 950	143	363	143	363
951 – 1050	143	413	143	413
1051 – 1150	143	463	143	463
1151 – 1600	143	513	143	513

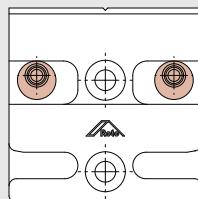
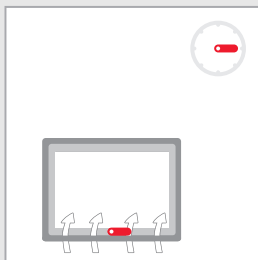
**Closed**

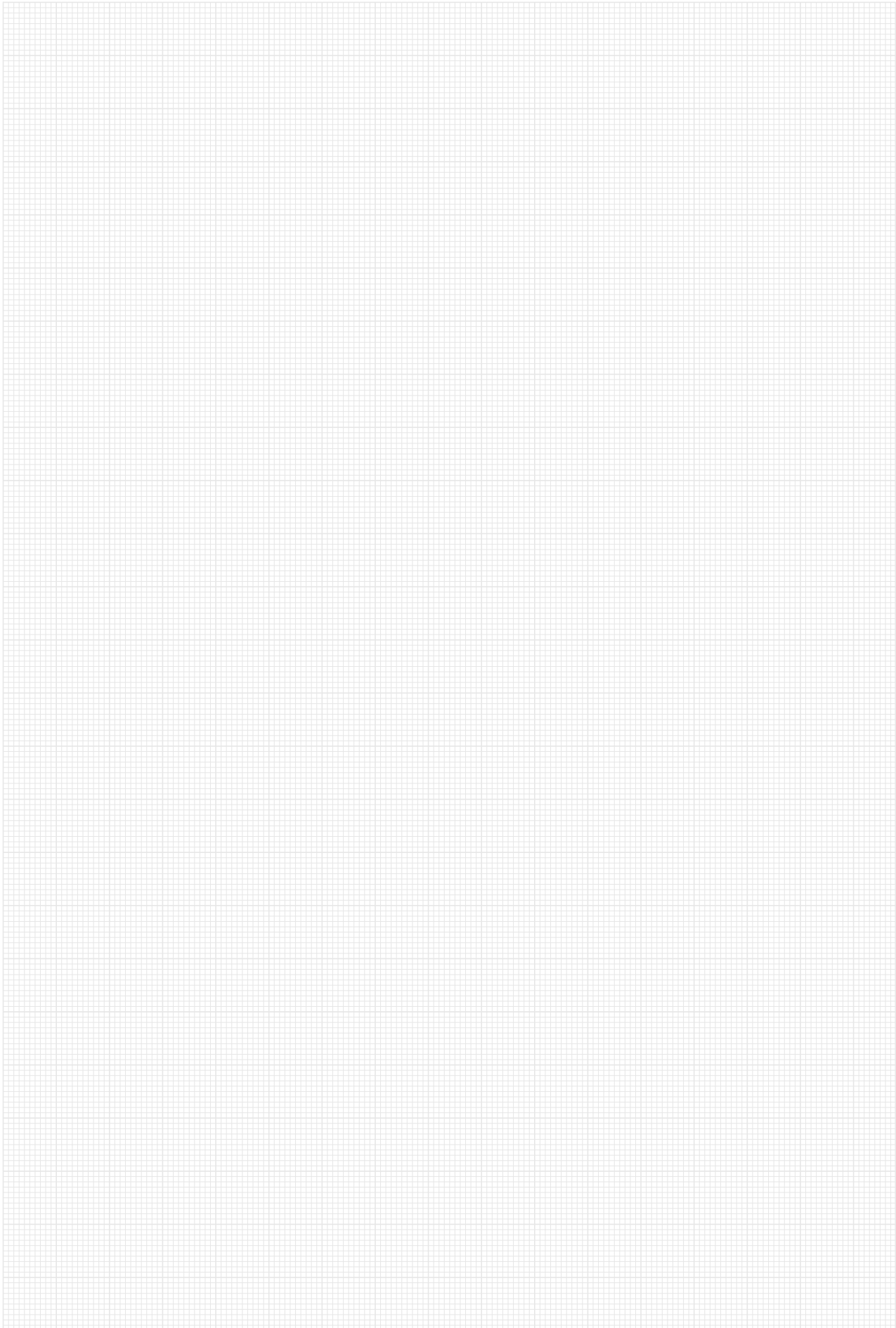


**Open**



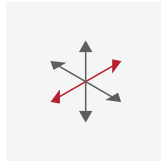
**Night ventilation**





#### Symbols for the sash adjustment when installed

These symbols facilitate the orientation while adjusting the window sashes after installation with the following steps. Use a 4 mm Allen key as tool.



**Gasket-compression adjustment**



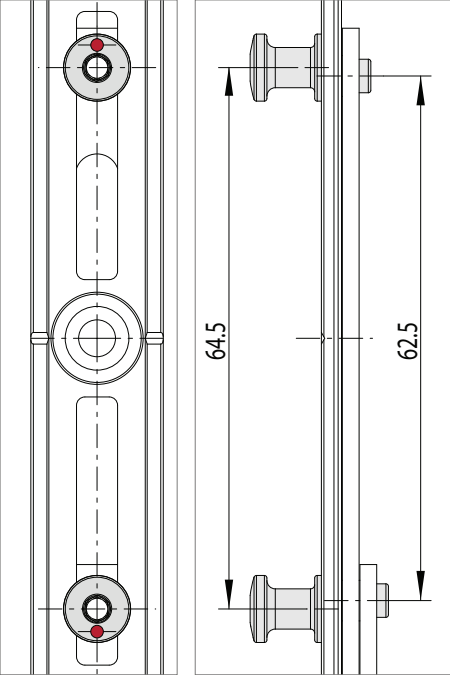


**NOTE!**

Adjusting Roto hardware components may only be carried out by authorised and qualified personnel.

---



Locking cam adjustment instructions		
Locking cam OO	Adjustment range in °	Gasket-compression adjustment/mm
	Original position 	-
	 180° 180°	± 1.0
		

Adjust the gasket compression with a 4 mm Allen key.

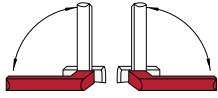


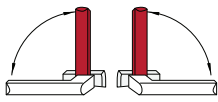


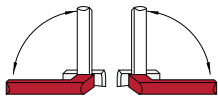
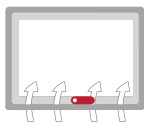

Increasing and reduction of the gasket compression possible.

## Operation

### Operating information

Handle positions of outward opening top hung and side hung hardware

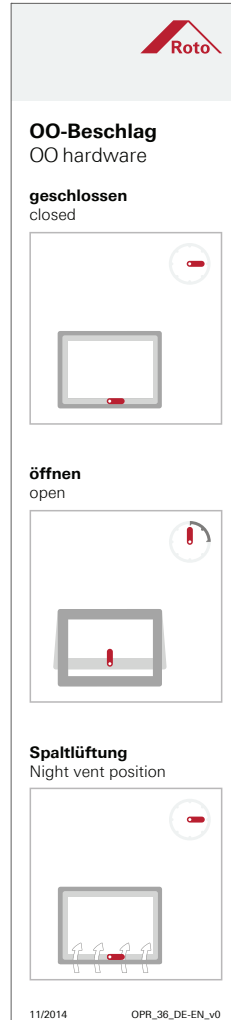
The following symbols show the different handle positions and the resulting sash positions of outward opening windows

Handle position	Sash position	Symbol	Meaning
			Closed position of the sash
			Outward opened position of the sash
			Night vent position of the sash



The following symbols and signs can be used on windows to protect the end-user.

Please order stickers separately (OPR\_14\_DE-EN, OPR\_15\_DE-EN).



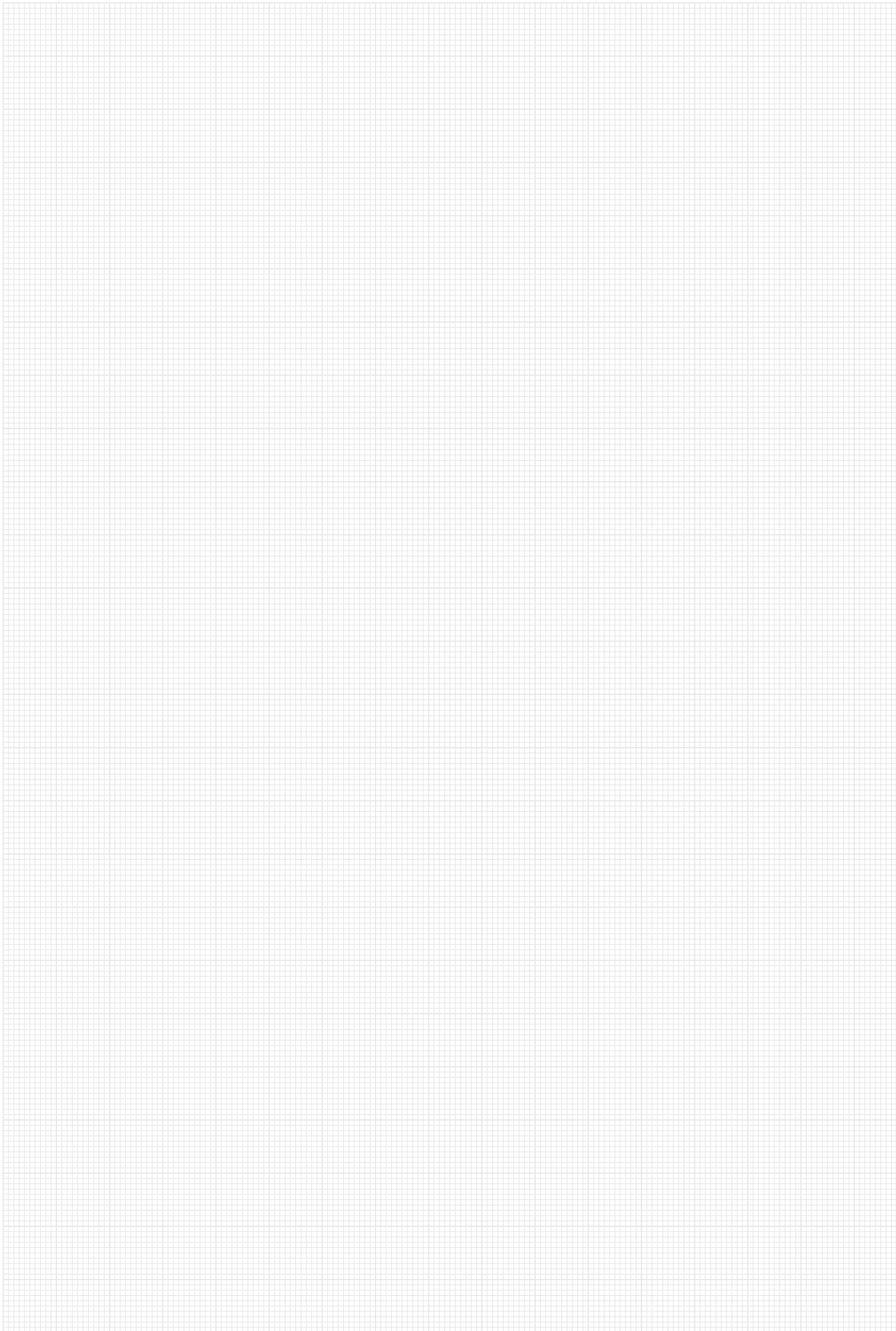
**Troubleshooting**

<b>Problem</b>	<b>Cause</b>	<b>Corrective action</b>	<b>Specialist company</b>	<b>End-users</b>
Handle is difficult to rotate.	▪ Frame parts are not properly greased.	▪ Grease frame parts.	☐	☐
	▪ Faulty handle.	▪ Replace the handle.	■	–
	▪ Handle screws are screwed in too strong.	▪ Slightly loosen the screws.	■	–
	▪ Oblique screws in the sash.	▪ Straight screw-fixing of the sash parts.	■	–
	▪ Faulty sash parts.	▪ Replace the sash parts.	■	–
	▪ Faulty striker locations.	▪ Adjust the striker locations.	■	–
	▪ Sash stay gasket compression too strong (accumulation of gaskets).	▪ Adjust or reduce the sash stay gasket compression.	■	–
Handle can not rotate 90°.	▪ Faulty hinging of sash parts.	▪ Check adjustment in outward position (if necessary, rehinge the sash proceeding from espagnolette).	■	–
Locking cams rubbing on the striker.	▪ Faulty hinging of the sash.	▪ Hinge the sash once again.	■	–
	▪ Faulty striker locations.	▪ Adjust the striker locations.	■	–

■ = To be carried out **only** by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

☐ = To be carried out either by a specialist company or by the end-user.



**Maintenance**



**WARNING!**

**Danger of injury through incorrectly conducted maintenance work!**

**Incorrect maintenance can result in serious personal injury or material damage.**

- Before starting work, ensure that there is sufficient installation room.
- Maintain order and cleanliness at the installation location.
- Ensure that the window is prevented from suddenly slamming during maintenance work.
- Get a specialist company to carry out adjustment work on hardware – especially of pivot rests and scissor stays – as well as replacement of parts and hinging and unhinging of sashes.
- Do not unhinge the sash for maintenance work.

**At least annually, every six months for school and hotel buildings:**

	Specialist company	End-users
If necessary, tighten fixing screws.	■	–
Replace damaged screws.	■	–
If necessary, replace components.	■	–
Lubricate all moving components with acid free and non resinous oil from a specialised dealer.	□	□
Lubricate steel strikers with acid free and non resinous grease from a specialised dealer.	□	□

■ = To be carried out **only** by a specialist company.

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.



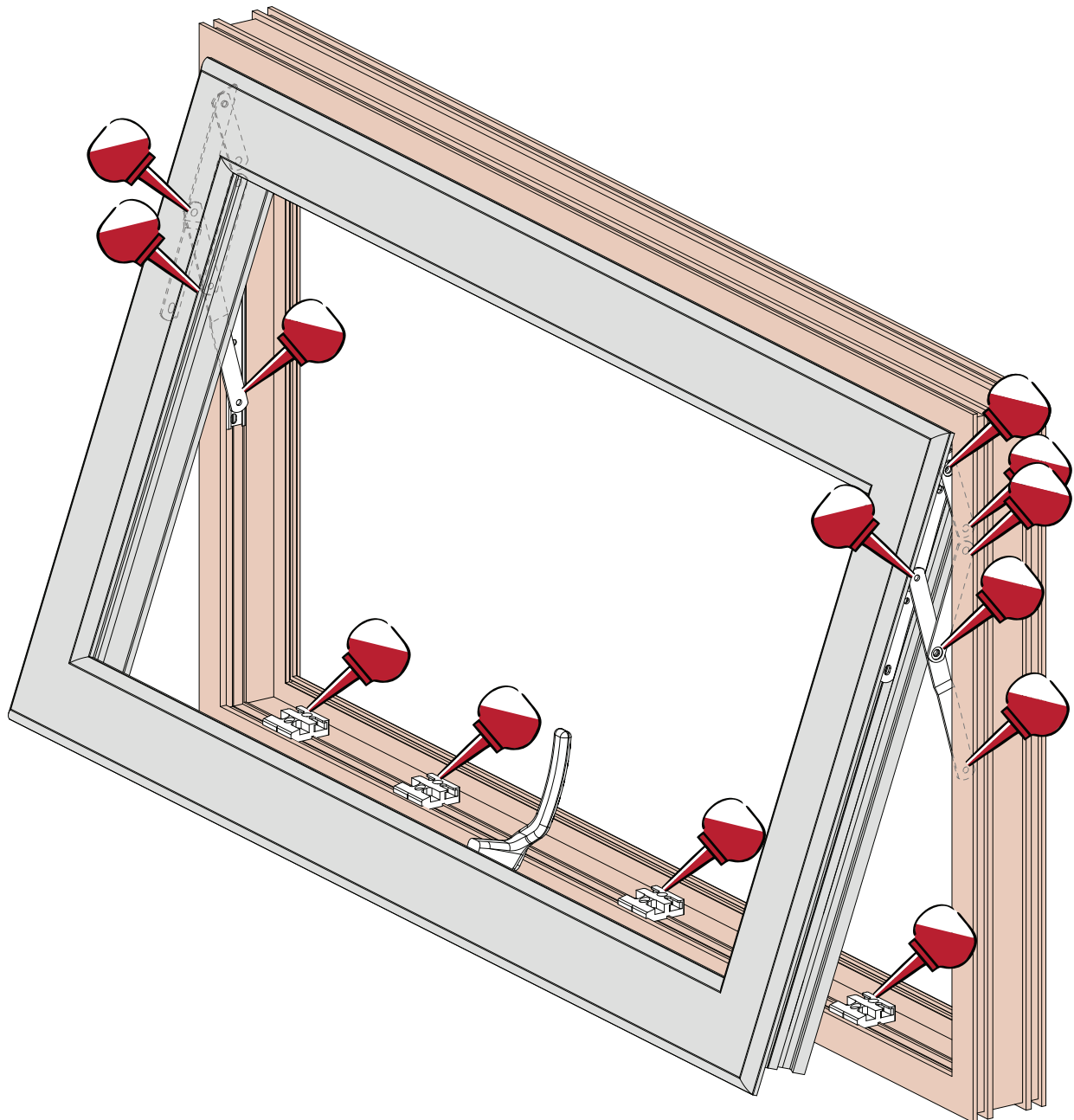
**NOTE!**

**Observe the following environmental protection notes during maintenance work:**

- Remove emerging or residual grease at the lubricating points and dispose of in accordance with the valid local regulations.
- Collect exchanged oil in suitable containers and dispose of in accordance with the environmental regulations.



The hardware overview shows the arrangement of the lubrication points, but does not necessarily correspond to the installed hardware. The number of lubrication points depends on the size and design of the window.



### Inspection

At least annually, every six months for school and hotel buildings:

	Specialist company	End-users
Check that safety-relevant hardware components are mounted securely.	<input type="checkbox"/>	<input type="checkbox"/>
Examine safety-relevant hardware components for wear and tear.	<input type="checkbox"/>	<input type="checkbox"/>
All movable parts are to be operation-tested.	<input type="checkbox"/>	<input type="checkbox"/>
All locking points are to be operation-tested.	<input type="checkbox"/>	<input type="checkbox"/>
The hardware's smooth operation can be checked by means of moving the window handle.		
<ul style="list-style-type: none"> <li>■ The locking and unlocking moment is max. 10 Nm.</li> <li>■ It can be checked using a torque wrench.</li> <li>■ The smooth operation can be improved by greasing/oiling or adjusting the hardware.</li> </ul>	<ul style="list-style-type: none"> <li>■</li> <li>■</li> <li>■</li> </ul>	<ul style="list-style-type: none"> <li>-</li> <li>-</li> <li>-</li> </ul>

■ = To be carried out only by a specialist company  
 - = **Not** to be carried out by the end-user; the end-user may not carry out installation work!  
 = To be carried out either by a specialist company or by the end-user.

### Care

	Specialist company	End-users
Keep the hardware free from deposits and soiling.	<input type="checkbox"/>	<input type="checkbox"/>
Never use aggressive, acidiferous cleaners or abrasive cleaning agents.	<input type="checkbox"/>	<input type="checkbox"/>
Only use mild, pH-neutral cleaning agents in diluted form.	<input type="checkbox"/>	<input type="checkbox"/>
Only use a soft cloth for cleaning.	<input type="checkbox"/>	<input type="checkbox"/>

■ = To be carried out only by a specialist company  
 - = **Not** to be carried out by the end-user; the end-user may not carry out installation work!  
 = To be carried out either by a specialist company or by the end-user.

No legal claims can be derived from these recommendations, the application is to be conveyed for each concrete individual case. The window and balcony door manufacturer must draw builders and end-user's particular attention to these maintenance instructions. Roto Frank AG recommends window-fabricators to make maintenance agreements with their end-users.



### Protection against corrosion

	Specialist company	End-users
Aggressive vapours (e.g. by means of formic acid or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid etc.) in the vicinity of the windows must be absolutely avoided.	■	–
Never use acetic-acid or crosslinked acidic sealing compounds or those with the above mentioned contents, since both the direct contact with the sealing compound and its vapourisation can attack the hardware's surface.	■	–
Due to the risk of salt deposits on the hardware, shorter maintenance and lubrication intervals are necessary in coastal areas (every three months).	■	–

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

### Protection against dirt

	Specialist company	End-users
Remove deposits and dirt from building materials (building dust, plaster, cement, etc.) or similar materials with water before it cures.	□	□
Keep the hardware free from deposits and soiling.	□	□
Never use aggressive, acidiferous cleaners or abrasive cleaning agents.	□	□
Only use mild, pH-neutral cleaning agents in diluted form.	□	□
Only use a soft cloth for cleaning.	□	□

■ = To be carried out only by a specialist company

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user.

**Protection against (permanent) moist interior air**

	Specialist company	End-users
Ventilate the hardware and the rebate areas – especially in the construction phase – so that they are neither exposed to direct contact with water nor to formation of condensation water.	<input type="checkbox"/>	<input type="checkbox"/>
<p>Ensure that (permanently) damp spatial air cannot condense in the hinge and rebate areas:</p> <ul style="list-style-type: none"> <li>■ Force ventilate several times each day (open all windows for approx. 15 minutes).</li> <li>■ Also ventilate during holidays and absences.</li> <li>■ For more complex construction projects, develop a ventilation plan if necessary.</li> </ul> <p>If described systematic ventilation is not possible, e.g. because fresh screed must not be traversed, or it cannot take draughts, put the windows into the open position and make them airtight by taping on the indoor side. Divert the moisture present in the room air to the outside by means of condensation dryers.</p>	<input type="checkbox"/>	<input type="checkbox"/>

■ = To be carried out only by a specialist company  
 – = **Not** to be carried out by the end-user; the end-user may not carry out installation work!  
 = To be carried out either by a specialist company or by the end-user.

**Protection against damages due to renovation work**

	Specialist company	End-users
When applying surface treatments of the windows, exclude all hardware components from this treatment, and thus protect against contamination.	<input type="checkbox"/>	<input type="checkbox"/>
Use only adhesive tapes which do not damage the varnish layers. In the case of doubt, ask the window fabricator.	<input type="checkbox"/>	<input type="checkbox"/>

■ = To be carried out only by a specialist company  
 – = **Not** to be carried out by the end-user; the end-user may not carry out installation work!  
 = To be carried out either by a specialist company or by the end-user.



## Transport/handling of the window elements

---



### **DANGER!**

#### **Danger to life from incorrect handling and transport!**

Incorrect handling and unsuitable transport of window elements can result in dangerous circumstances and cause severe accidents, even including death.

Therefore:

- During loading and unloading, select force application points which exclusively create reaction forces appropriate to the designed layout of the hardware components for the intended installation location.
  - During handling and transport, ensure that hardware is in the locked position, so as to prevent an uncontrolled opening of the window. During transport, use suitable means of securing, e.g. tensioning belts.
  - Use only transport protections designed for the respective clearance.
  - Wherever possible, undertake transport in the intended installation position – transport windows upright and glazed.
  - Prevent diagonal moving and slipping of the sash with respect to the frame (e.g. by using spacers).
  - If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the frame to which it belongs.
- 



### **NOTE!**

The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise. Especially when using auxiliaries such as suckers, transport nets, forklifts, or cranes, reaction forces may arise which result in damage or overloading to the installed hardware.

Therefore observe the following during all transport, loading, and unloading:

- Always choose the force application points so that the resulting reaction forces are dissipated appropriate to the designed layout of the hardware components for the intended installation location. This applies particularly for the hinge positions.
-

Check the delivery on receipt immediately for completeness and transport damage.



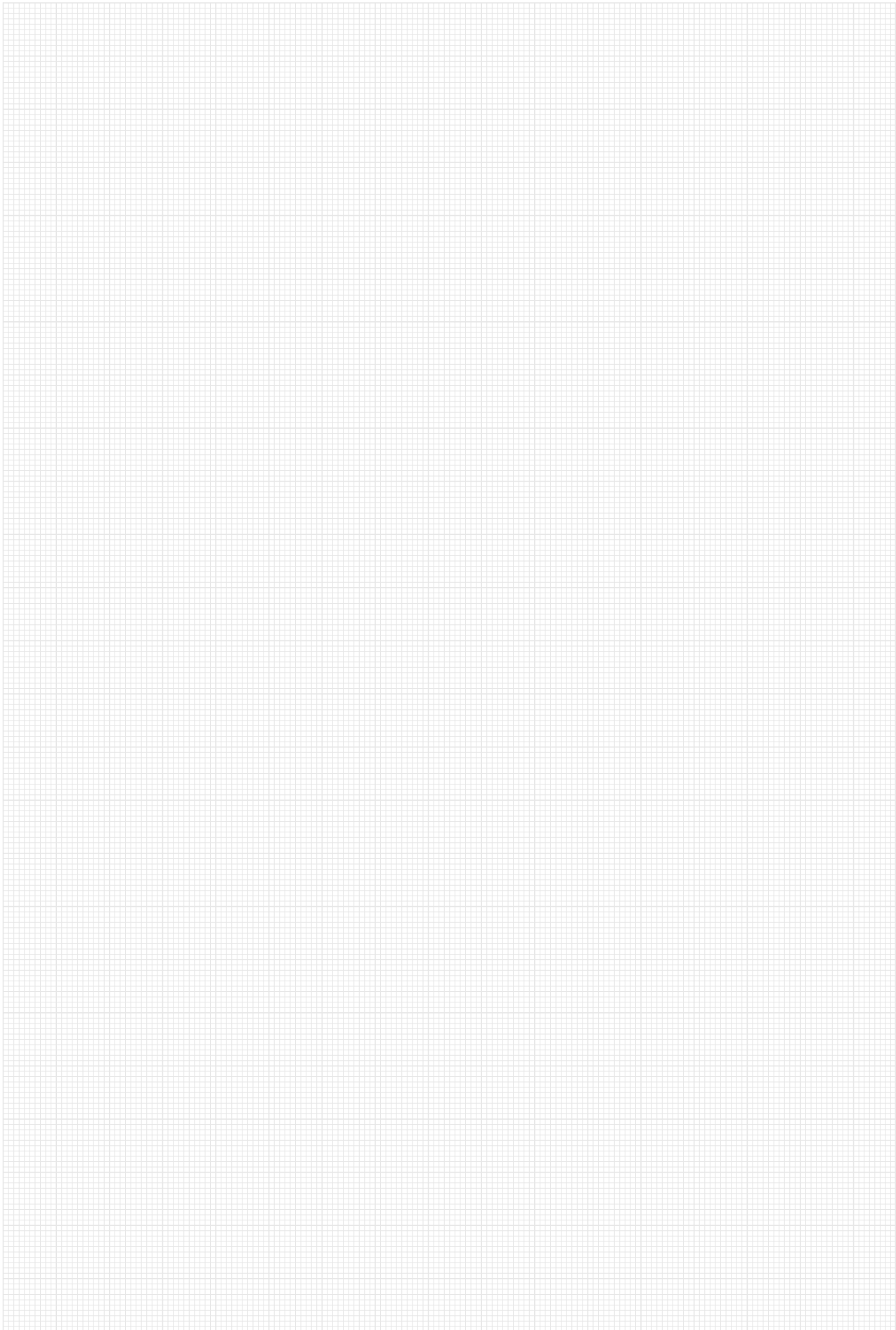
**NOTE!**

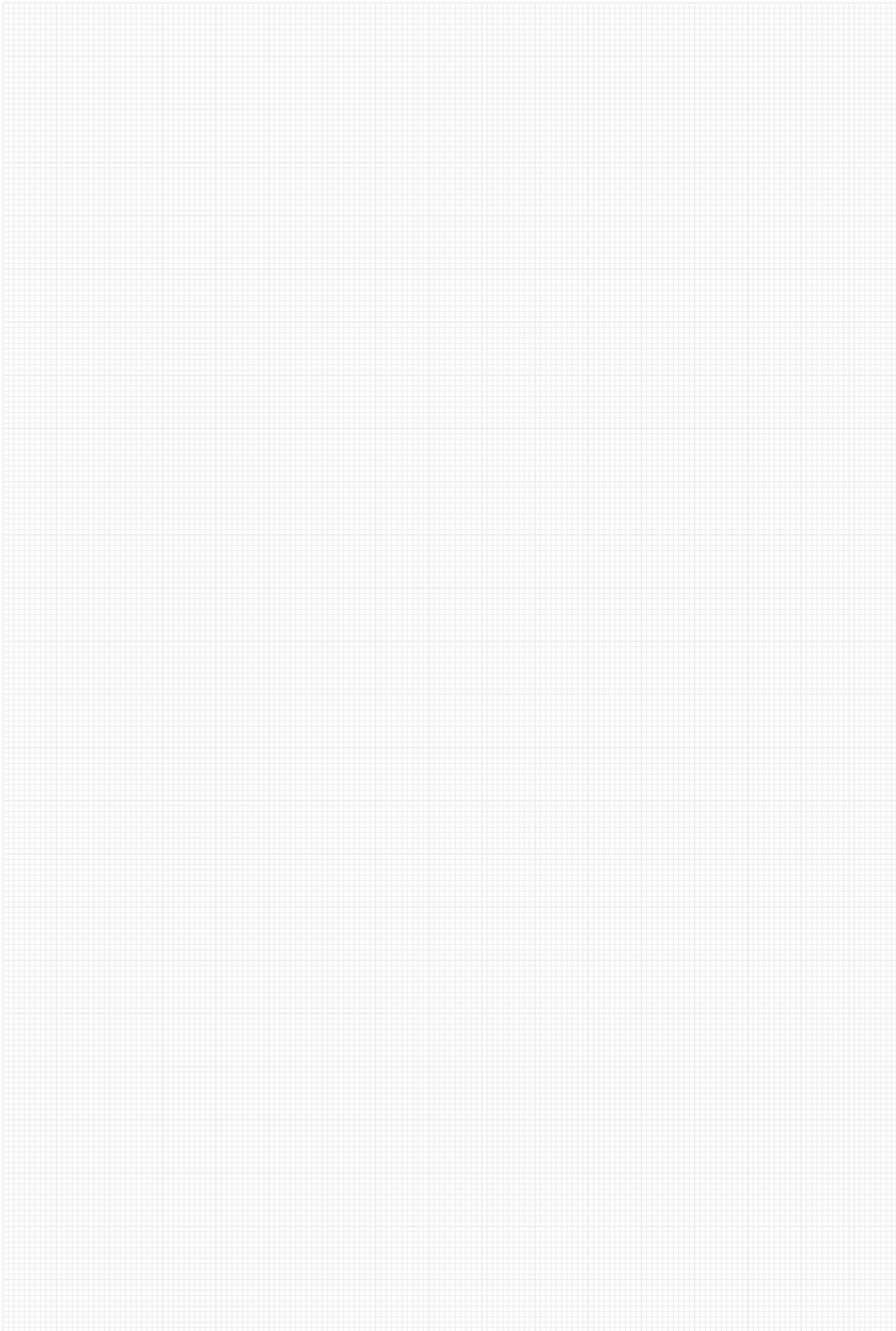
Claim any damage as soon as it is detected. Claims for damage can only be invoked within the statutory reclamation period.

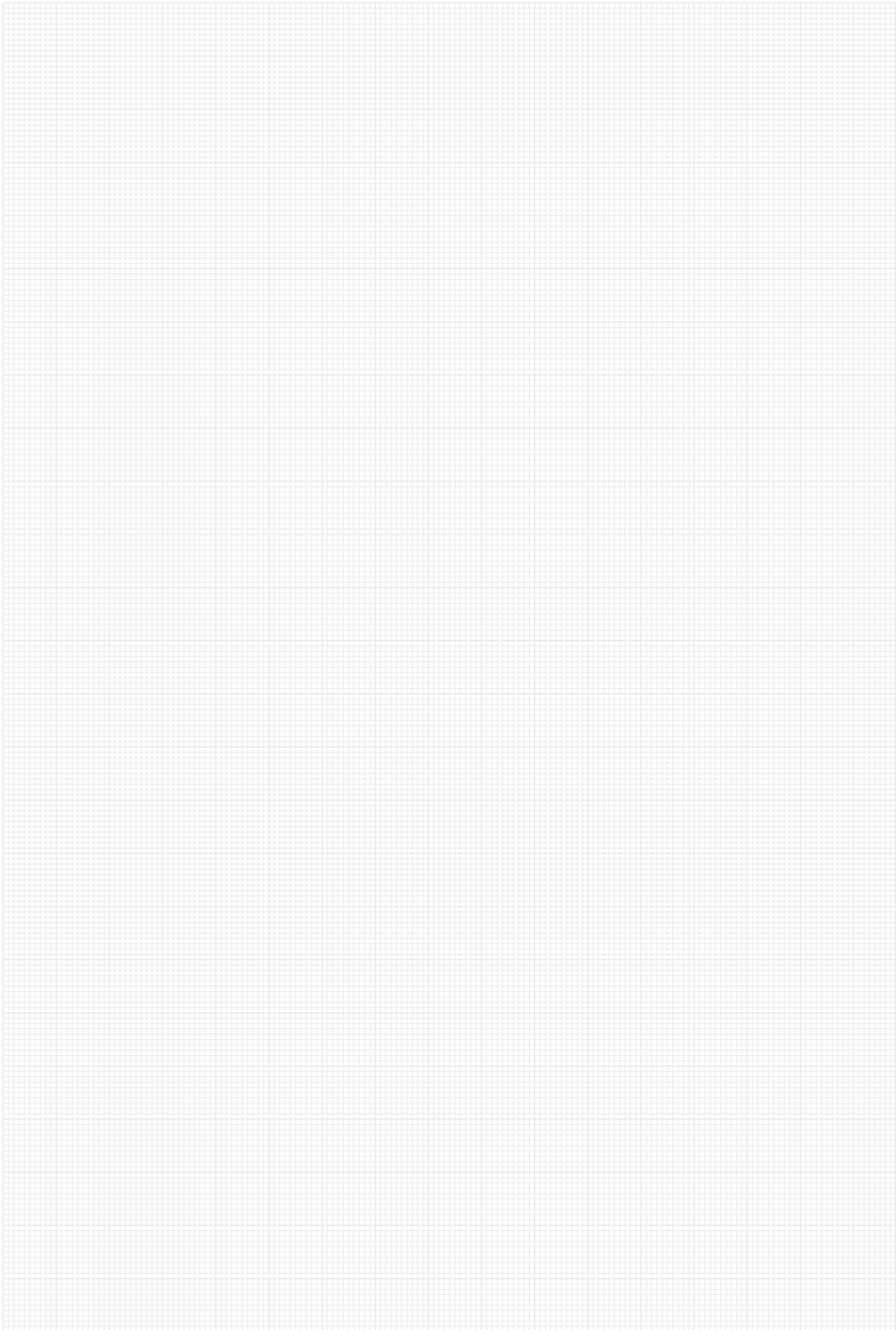
---



Separate the hardware components from the window and dispose of as metal scrap.









**Roto Frank AG**  
**Window and Door Technology**

Wilhelm-Frank-Platz 1  
70771 Leinfelden-Echterdingen  
Germany

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

**www.roto-frank.com**



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

- Roto Tilt&Turn** | The Tilt&Turn hardware system for windows and balcony doors
- Roto Sliding** | Hardware systems for large sliding windows and doors
- Roto Door** | Matching hardware technology “everything about doors”
- Roto Equipment** | Additional technology for windows and doors