TRANSLATION OF THE ORIGINAL VERSION

Directive

Hardware for windows and balcony doors

Guidelines/advice on the product and on liability (VHBH)

Contents

Published by:

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Note

Technical details and recommendations in this directive are based on the state of knowledge at the time of going to press.

1 Area of application of this directive

This directive contains important information and binding instructions on handling the hardware during its installation. This directive further specifies binding guidelines on ensuring compliance with the instruction obligation all the way to the end user.

The information and instructions included in this directive are not based on specific products or product types, but are of general validity and go across products.

For particular products/product types, the following documents have precedence:

- Product catalogues
- Application diagrams (max. sash sizes and weights)
- Rebate instructions
- Operating/maintenance instructions

The following directives are also applicable:

- TBDK directive of the Quality Assurance Association: Locks and Hardware
  (Fixing load-bearing Tilt-Only and Tilt&Turn hardware components)
- VHBE directive of the Quality Assurance Association: Locks and Hardware
  (Window and balcony door hardware – Guidelines and advice for end-users)
- Gütegemeinschaft Schlösser und Beschläge FPKF directive
  (Restrictor and cleaning stays for Tilt-Only sashes and Tilt-Only fanlights
- Gütegemeinschaft Schlösser und Beschläge FBDF directive
  Casement stoppers for variable rotational position of window leafs

In addition, it is recommended to comply with the following directives:

- TLE.01 of the VFF (Association of Window and Facade Manufacturers of Frankfurt)
  The correct handling of ready-to-install windows and exterior doors during transport, storage and installation
- WP.01 of the VFF (Association of Window and Facade Manufacturers of Frankfurt)
  Maintenance of windows, facades, and external doors - maintenance, care, and inspection - information for distributors
- WP.02 of the VFF (Association of Window and Facade Manufacturers of Frankfurt)
  Maintenance of windows, facades, and external doors - maintenance, care, and inspection - measures and documentation
- WP.03 of the VFF (Association of Window and Facade Manufacturers of Frankfurt)
  Maintenance of windows, facades, and external doors - maintenance, care, and inspection - maintenance agreement

2 Explanation of symbols

2.1 Symbols in this directive

2.1.1 Safety information

In this directive, safety information is indicated by a symbol, and is introduced by a key word. Obey all safety instructions under all circumstances and act carefully in order to prevent accidents, personal injury, and material damage.

WARNING!

… indicates a potentially dangerous situation, which can result in death or serious injuries , if it is not avoided.

2.1.2 Tips and recommendations

NOTE!

... emphasises tips, recommendations, and information.

2.1.3 Descriptions of activities and lists

For descriptions of activities (handling directives) and lists, the following signs are used:

→ Handling directives

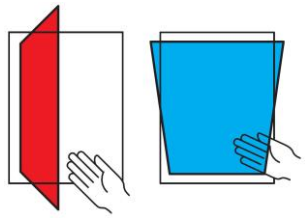
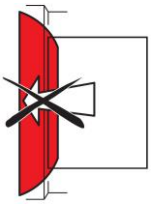
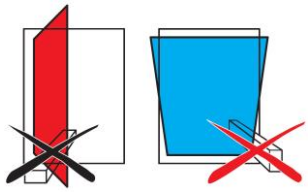
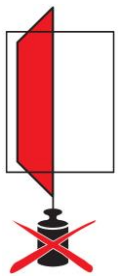
■ List without a specified sequence

2.2 Symbols on windows and balcony doors

The following symbols can be used on windows and balcony doors to protect the end user. Always keep these symbols in a clearly legible state. Comply with all symbols and their meanings in order to avoid accidents, injuries, and material damage.

2.2.1 Turn-Only and Tilt&Turn hardware

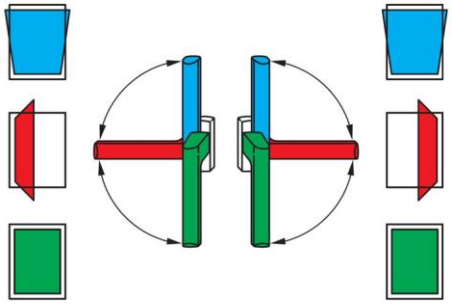
Safety relevant symbols

Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from pressing the sash against the opening edge (reveal)** → Do not press the sash against the opening edge (reveal).
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash.
	**Danger of injury from the effect of wind** → Prevent wind from acting on the open sash. → During wind and drafts, close and lock windows and balcony door sashes.

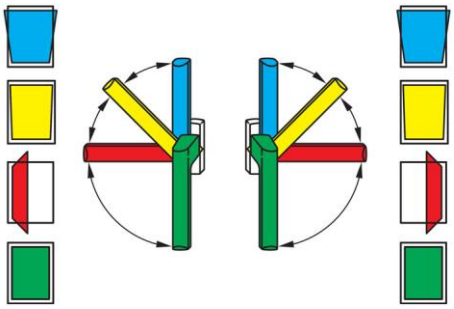
Illustrative symbols

The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

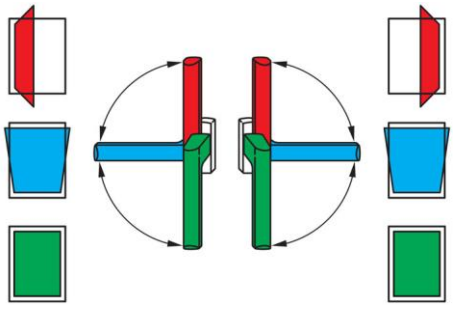
Tilt&Turn hardware

Handle/sash position	Meaning
	Opened tilt position of the sash
	Opened turn position of the sash
	Closed position of the sash

Tilt&Turn hardware with night ventilation opening

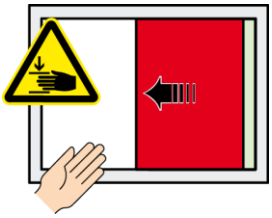
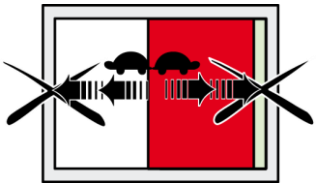
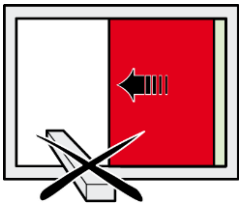
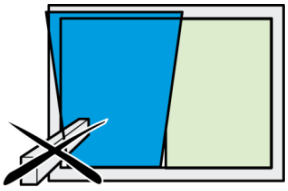
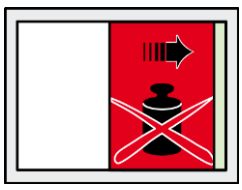
Handle/sash position	Meaning
	Opened tilt position of the sash
	Night ventilation position of the sash
	Opened turn position of the sash
	Closed position of the sash

Tilt-First hardware

Handle/sash position	Meaning
	Opened turn position of the sash
	Opened tilt position of the sash
	Closed position of the sash

2.2.2 Lift&Slide/Lift&Slide&Tilt hardware

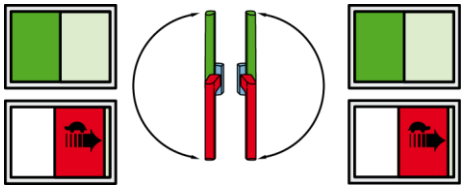
Safety relevant symbols

Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from uncontrolled closing and opening of the sash** → Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position ().
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash.

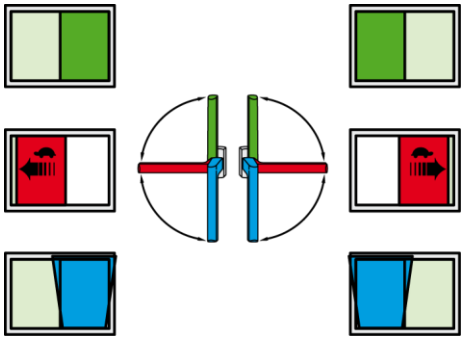
Illustrative symbols

The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

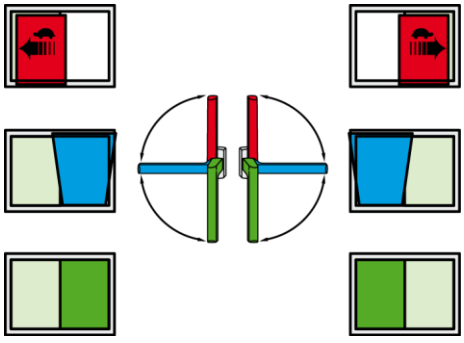
Lift&Slide hardware

Handle/sash position	Meaning
	Closed position of the sash
	Opened sliding position of the sash

Lift&Slide&Tilt hardware

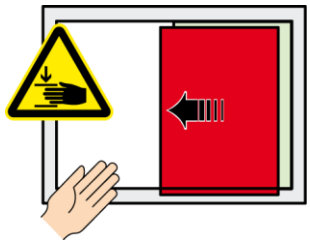
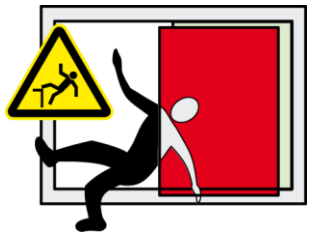
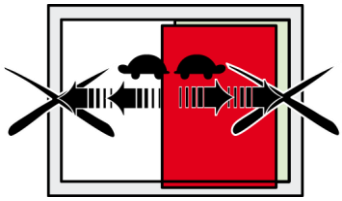
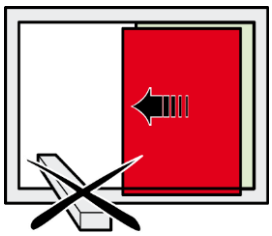
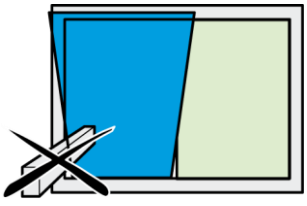
Handle/sash position	Meaning
	Closed position of the sash
	Opened sliding position of the sash
	Opened tilt position of the sash

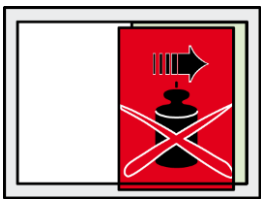
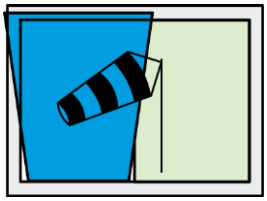
Alternative

Handle/sash position	Meaning
	Opened sliding position of the sash
	Opened tilt position of the sash
	Closed position of the sash

2.2.3 Tilt&Slide hardware

Safety relevant symbols

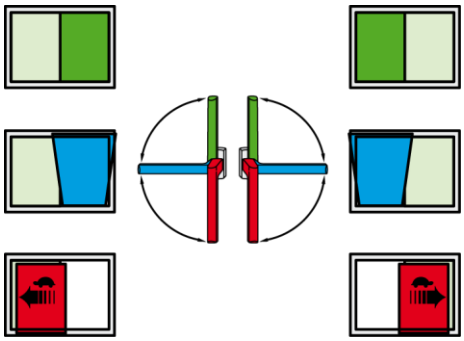
Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from uncontrolled closing and opening of the sash** → Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position (🚗).
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.

Symbol	Meaning
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash.
	**Danger of injury from the effect of wind** → Prevent wind from acting on the open sash. → During wind and drafts, close and lock windows and balcony door sashes.

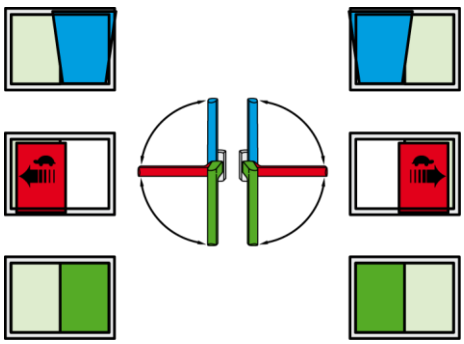
Illustrative symbols

The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

Tilt&Slide hardware

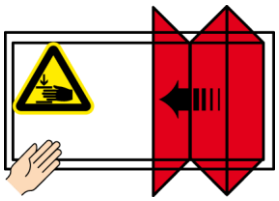
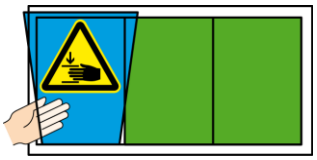
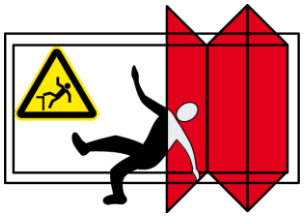
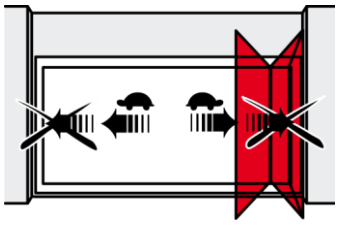
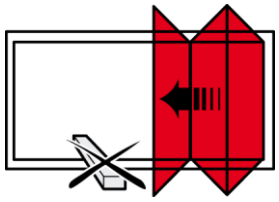
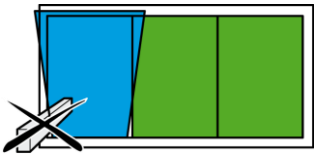
Handle/sash position	Meaning
	Closed position of the sash
	Opened tilt position of the sash
	Opened sliding position of the sash

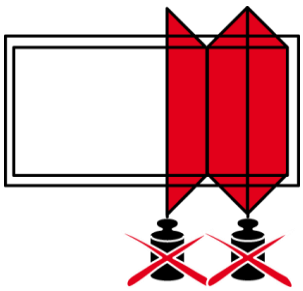
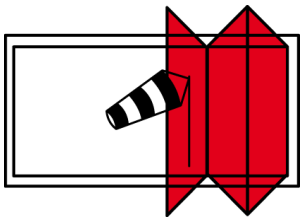
Alternative

Handle/sash position	Meaning
	Opened tilt position of the sash
	Opened sliding position of the sash
	Closed position of the sash

2.2.4 Fold&Slide hardware

Safety relevant symbols

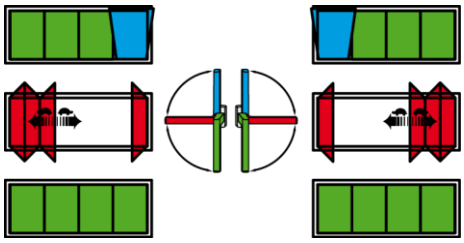
Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from pressing the sash against the opening edge (reveal) and uncontrolled closing and opening of the sash** → Do not press the sash against the opening edge (reveal). → Ensure that the sash is guided slowly by hand throughout the entire range of movement as far as the fully opened or closed position (🚗).
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.

Symbol	Meaning
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash.
	**Danger of injury from the effect of wind** → Prevent wind from acting on the open sash. → During wind and drafts, close and lock windows and balcony door sashes.

Illustrative symbols

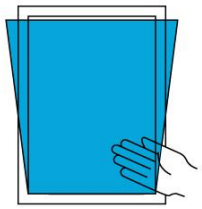
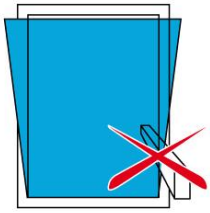
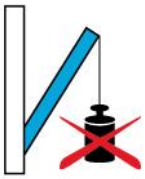
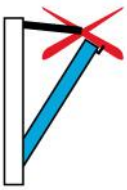
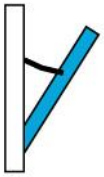
The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

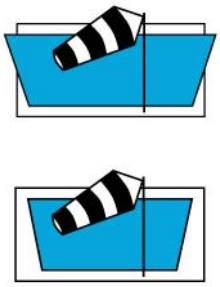
Fold&Slide hardware

Handle/sash position	Meaning
	Opened tilt position of the sash
	Fold&Slide and opened turn-position of the sash
	Closed position of the sash

2.2.5 Fanlight openers

Safety relevant symbols

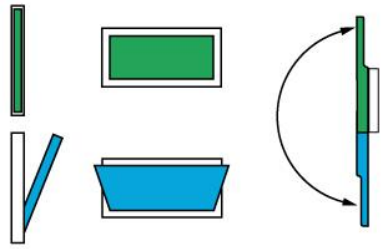
Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash.
	**Danger of injury through incorrect hingeing after cleaning** → After cleaning, carefully hinge and engage the sash according to the manufacturer's guidelines.
	**Danger of injury through disabling the safety stays** → Ensure that the safety stays are operating safely.

Symbol	Meaning
	**Danger of injury from the effect of wind** → Prevent wind from acting on the open sash. → During wind and drafts, close and lock windows.

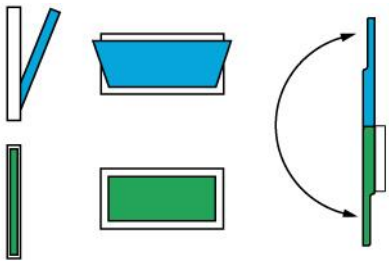
Illustrative symbols

The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

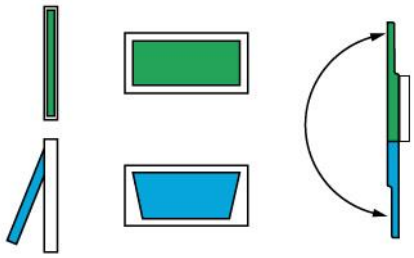
Tilting sashes

Handle/sash position	Meaning
	Closed position of the sash
	Opened tilt position of the sash

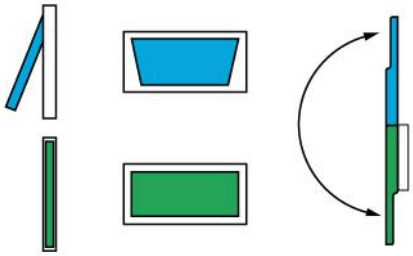
Alternative

Handle/sash position	Meaning
	Opened tilt position of the sash
	Closed position of the sash

Top-hung sashes

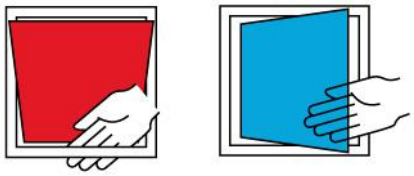
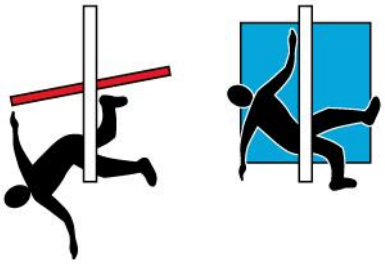
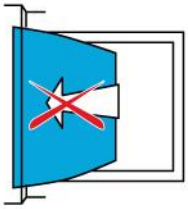
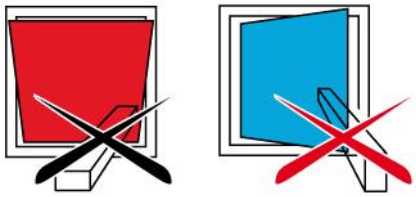
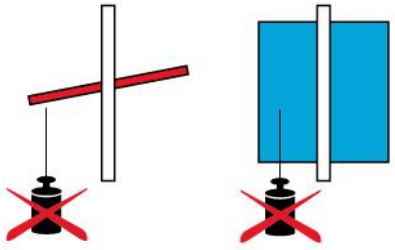
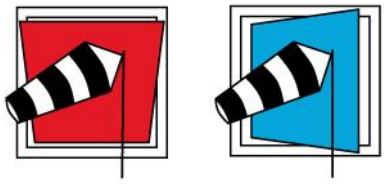
Handle/sash position	Meaning
	Closed position of the sash
	Opened top-hung position of the sash

Alternative

Handle/sash position	Meaning
	Opened top-hung position of the sash
	Closed position of the sash

2.2.6 Horizontal and vertical pivoting hardware

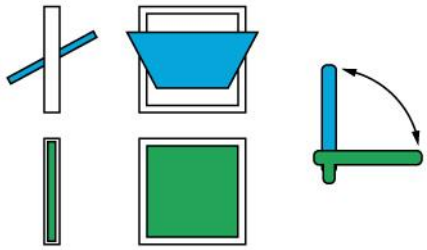
Safety relevant symbols

Symbol	Meaning
	**Danger of injury through trapping of body parts in the opening gap between sash and frame** → When closing windows and balcony doors, never reach between sash and frame, and always act with care. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury from falling through open windows and balcony doors** → Behave with care near to open windows and balcony doors. → Keep children and people who cannot estimate the dangers away from the point of danger.
	**Danger of injury and material damage from pressing the sash against the opening edge (reveal)** → Do not press the sash against the opening edge (reveal).
	**Danger of injury and material damage from insertion of obstructions into the opening gap between sash and frame** → Do not insert obstructions into the opening gap between sash and frame.
	**Danger of injury and material damage from overloading the sash** → Do not overload the sash. → Do not overload in restricted opening positions.
	**Danger of injury from the effect of wind** → Prevent wind from acting on the open sash. → During wind and drafts, close and lock windows and balcony door sashes.

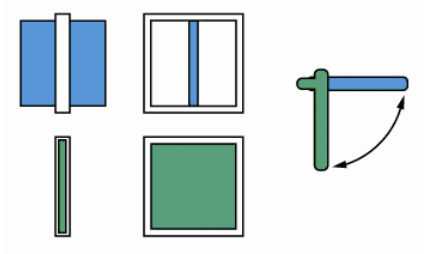
Illustrative symbols

The following symbols illustrate various handle positions and the resulting sash positions of the windows and balcony doors.

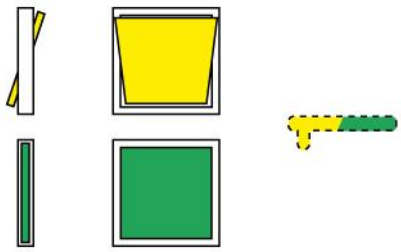
Horizontally pivoting sash hardware

Handle/sash position	Meaning
	Opened horizontal pivoting position of the sash
	Closed position of the sash

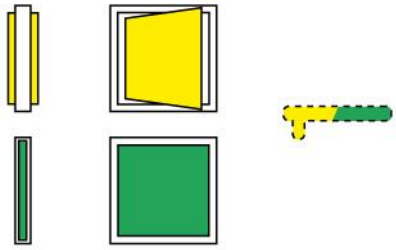
Vertically pivoting sash hardware

Handle/sash position	Meaning
	Opened vertical pivoting position of the sash
	Closed position of the sash

Horizontally pivoting sash hardware, night ventilation position

Handle/sash position	Meaning
	Night ventilation position of the sash
	Closed position of the sash

Night ventilation position for vertically pivoting sash hardware

Handle/sash position	Meaning
	Night ventilation position of the sash
	Closed position of the sash

3 Target groups description

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

3.1 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.

3.2 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.

3.3 Building element dealers/Installation company

The "dealers in building components" 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.

3.4 Builder

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

3.5 End-users

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

4 General functionality and application range of hardware

4.1 Turn-Only and Tilt&Turn hardware

Turn-Only and Tilt&Turn hardware is hardware for turnable and/or tiltable sashes of windows and balcony doors in building construction.

It is used to bring sashes of windows and balcony doors, by activation of a handle, into a turning position or into a tilting position restricted by means of the scissor stay version.

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

4.2 Sliding hardware

Sliding hardware is used for sliding sashes of windows and balcony doors which are principally used as barriers to the outside, and which are mostly glazed.

In combination with the sliding sashes, fixed fields and other sashes can be arranged in a window element.

Sliding hardware is equipped with a closure which locks the slidable sash. In addition, sliding hardware has running rollers which are generally positioned on the lower horizontal profile-piece of the sliding sash.

In addition, projecting scissor stays for tilting, and mechanisms for raising or parallel positioning of the sash may be provided. The hardware is used to lock the sash, bring it into the ventilation position, and push it to the side

4.3 Fanlight openers

Fanlight openers are hardware for opening and closing tilt or top-hung windows which open inwards or outwards.

Their purpose is to apply sufficient force, by operating a handle, to open and close window sashes which are outside a person's reach. The handle is connected by linkage bars to an opener stay and is positioned on the frame or on masonry.

The opener stay may be operated either by a crank mechanism or an electric motor.

For the various window opening types, and according to the various installation options for the construction, opener stays with various scissor stay systems are used. These can be adapted to the current circumstances. The opener stays bring the window sashes into the various ventilation positions, and close the sashes.

4.4 Horizontal and vertical pivoting hardware

Horizontal and vertical pivoting hardware refers to devices for opening and closing windows in building construction. Their purpose is to bring window sashes into a ventilation position though the operation of a handle. The ventilation position can be limited by the handle, by a stop in the horizontal or vertical pivoting bearing, or by additional hardware. When a sash is closed, and the hardware is locked, the resistance of a gasket usually needs to be overcome.

4.5 Related types of hardware

The information in this document applies correspondingly to related types of hardware.

5 Limitation of liability

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 (see section 6.1 on page 22)
- Operation other than that stipulated/misuse (see section 6.1.5 on page 23)

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

6 Safety

6.1 Stipulated application of hardware

Turn-Only and Tilt&Turn hardware, as well as sliding hardware, is designed and constructed exclusively for the stipulated application described below. Stipulated application includes compliance with all instructions in the product-specific documentation such as:

- Product catalogues
- Application diagrams (max. sash sizes and weights)
- Rebate instructions
- Operating/maintenance instructions
- Information/details of the profile manufacturers (e.g. for PVC or light metal profiles etc.)
- TBDK and VHBE directives of the Gütegemeinschaft Schlösser und Beschläge (Window and balcony door hardware)
- Applicable national laws and directives

6.1.1 Turn-Only and Tilt&Turn hardware

Turn-Only and Tilt&Turn hardware is used exclusively for installation in windows and balcony doors which are to be vertically installed, made from timber, PVC, aluminium, or steel, and their corresponding combinations.

6.1.2 Sliding hardware

Sliding hardware is used exclusively for installation in windows and balcony door sashes which are to be vertically installed, made from timber, PVC, aluminium, or steel, and their corresponding combinations.

NOTE!

Depending on the external temperature, relative humidity of the air, and application of the sliding element, temporary condensation water formation may occur on the aluminium tracks on the indoor side. This is encouraged particularly by impediments to air circulation, e.g. deep reveal, curtains, and poor positioning of radiators or similar.

6.1.3 Fanlight openers

Fanlight openers are used exclusively for installation in windows which are to be vertically installed, made from timber, PVC, aluminium, or steel, and their corresponding combinations.

6.1.4 Horizontal and vertical pivoting hardware

Horizontal and vertical pivoting hardware is used exclusively for installation in windows which are to be vertically installed, made from timber, PVC, or aluminium, and their corresponding combinations.

6.1.5 Misuse

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.

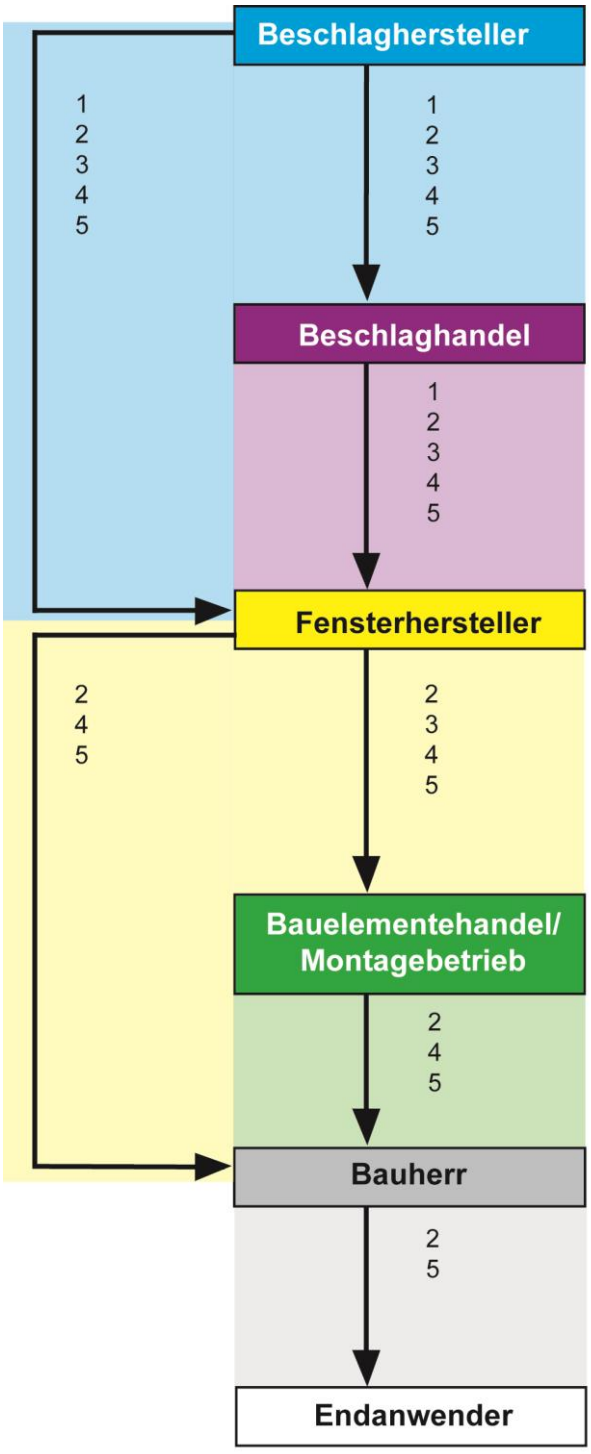
WARNING!

Misuse of hardware can result in dangerous circumstances. In particular, avoid the following applications:

– The use of combinations not approved by the hardware manufacturer and/or incorrect mounting of the hardware.
– The use of non-original accessories, or those not approved by the hardware manufacturer.

6.2 Instruction obligation

The following diagram shows which documents and information must be passed between the relevant target groups to comply with the instruction obligation.



1 Catalogue
2 Operating/maintenance instructions (emphasis on hardware)
3 Rebate instructions for the hardware (installation directives) + TBDK directive
4 Guidelines/advice on the product and on liability (VHBH)
5 Guidelines/advice for end-users (VHBE)

6.3 Responsibility of the target groups

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.

6.3.1 Responsibility of the hardware dealer

The hardware dealer must transmit the documents defined in the section "Instruction obligation" to the manufacturer of windows and balcony doors.

6.3.2 Responsibility of the manufacturer of windows and balcony doors

The manufacturer of windows and balcony doors must transmit the documents defined in the section "Instruction obligation" to the building element dealer or to the builder, even when a subcontractor (installation operation) is acting as an intermediary.

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

6.3.3 Responsibility of the building element dealer/installation company

The building element dealer must transmit the documents defined in the section "Instruction obligation" to the builder, even when a subcontractor (installation company) is acting as an intermediary.

6.3.4 Responsibility of the builder

The builder must transmit the documents defined in the section "Instruction obligation" to the end-user.

6.4 Fabrication advice

6.4.1 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 programs.
  - → The maximum permitted sash sizes and weights must never be exceeded.
    In the case of uncertainty contact the hardware manufacturer.

6.4.2 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 dimension or locking separations). Furthermore, he must check

these regularly and make certain of them, especially on the first use of new hardware components, during manufacture, and ongoingly up to and including window installation.

NOTE!

The hardware components should in principle be so designed that the system-related dimensions can be adjusted to the extent that they are affected by the hardware. 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.

6.4.3 Composition of hardware

- Burglary inhibiting windows and balcony doors require hardware which fulfils particular requirements.
- Windows and balcony doors 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 and balcony doors to wind loads when closed and locked depends on the actual designs of the windows and balcony doors. Wind loads prescribed by law and standards (e.g. as per EN 12210 – especially test pressure P3) can be dissipated by the hardware system.
- In general, the Turn-Only and Tilt&Turn hardware and sliding hardware defined in this document is able to fulfil legal and standard requirements for barrier-free habitations.

  → The hardware combinations and installations appropriate for windows and balcony doors 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 hinges, the design of hardware for burglary-inhibiting sashes for windows and balcony doors, etc) are binding.

6.4.4 Threaded fittings

WARNING!
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, and all contents of the TBDK directive of the Gütegemeinschaft Schlösser und Beschläge.

6.4.5 Storing the fittings

Store the fitting parts on a level surface in a safe and dry location until they are ready for installation. Protect the plastic components from solar radiation.

6.4.6 Transport/handling of window elements

WARNING!
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. Use suitable means of securing for this.
– Use only transport fastenings designed for the respective clearance.
– Wherever possible, undertake transport in the intended installation position. If transport in the intended installation position is not possible, unhinge the sash, and transport it separately from the frame to which it belongs.

During transport, loading, and unloading, especially when 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:

- The type and the force application points when transporting, loading, and unloading have a significant effect on the reaction forces which arise.
  → 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.
- When transporting window elements, quite large reaction forces result from the shaking motion, and these can also damage or overloading to the installed hardware.
  → Always use transport securing measures appropriate to the actual clearance (e.g. spacer blocks), in order to hold the sash in the intended position in the frame during transport, and thus to dissipate the resulting reaction forces directly from the sash via the frame.
  → Wherever possible, always transport window elements in the intended installation position, 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. If transport in the intended installation position is not possible, unhinge the sashes, and transport them separately from the frame to which they belong.

NOTE!

In addition, it is recommended to comply with the following directive:

TLE.01 of the VFF (Association of Window and Facade Manufacturers of Frankfurt) – The correct handling of ready-to-install windows and exterior doors during transport, storage and installation

7 Maintenance/care and inspection

NOTE!

Hardware, windows, and balcony doors require suitable systematic maintenance/care and inspection in order to ensure intrinsic value, fitness for use, and security. It is therefore recommended to conclude an appropriate maintenance agreement with the manufacturer of windows and balcony doors.

In addition, it is recommended to comply with the following directives:

- WP.01 of the VFF (Association of Window and Facade Manufacturers of Frankfurt) Maintenance of windows, facades, and external doors - maintenance, care, and inspection – Information for distributors
- WP.02 of the VFF (Association of Window and Facade Manufacturers of Frankfurt) Maintenance of windows, facades, and external doors - maintenance, care, and inspection – Measures and documentation
- WP.03 of the VFF (Association of Window and Facade Manufacturers of Frankfurt) Maintenance of windows, facades, and external doors - maintenance, care, and inspection – Maintenance agreement

7.1 Safety

Incorrectly conducted maintenance work

WARNING!
Danger of injury through incorrectly conducted maintenance work!

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

Therefore:

– Before starting work, ensure that there is sufficient installation room.
– Maintain order and cleanliness at the installation location! Loose components and tools lying around or on top of each other are sources of accidents.
– Get a specialist company to carry out adjustment work on hardware - especially in the area of pivot rests or bogies and of hinges - as well as replacement of parts and hingeing, and removal of sashes.

7.2 Maintaining surface finish

To permanently maintain surface finish of hardware components, and to avoid damage, always observe the following points:

Corrosion protection

NOTE!

In a normal room climate – i.e. when no condensation water forms on the hardware components, or when condensation water which forms occasionally can quickly evaporate – the electrolytically applied zinc coating of the hardware is not attacked.

If the environmental conditions are too damp, and condensation water cannot evaporate, corrosion can occur which attacks the surface of the hardware.

If the environmental conditions are too damp, especially during the construction phase, mould may build up on timber windows, and warping may occur.

→ Ventilate the hardware and the rebate areas in the frames – especially in the storage and construction phases – so that they are neither exposed to direct contact with water nor to formation of condensation water.

→ Ensure that (permanently) damp spatial air cannot condense in the hinge and rebate areas.

NOTE!

To avoid the formation of condensation water especially during the construction phase:

- *Force ventilate several times each day (open all windows for approx. 15 minutes), so that a complete exchange of air can take place.*
- *Also ventilate during holidays and absences.*
- *For more complex construction projects, develop a ventilation plan if necessary.*

→ If systematic ventilation is not possible, e.g. because fresh screed must not be traversed, or it cannot take draughts, put the windows into the tilted 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.

→ When taping over, use only adhesive tapes which do not damage the varnish layers, especially of timber windows. In the case of doubt, ask the window fabricator.

Protection against dirt

→ Keep the hardware free from deposits and dirt from building materials (building dust, plaster, cement, etc). Use water to remove dirt arising from plaster, mortar, or similar, before it binds.

Protection from aggressive vapours

→ Even with a small amount of condensation, aggressive vapours (e.g. formic or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid, etc.) can result in rapid corrosion of the hardware components. Therefore under all circumstances, avoid such vapours around windows and balcony doors.

Protection from tannic and other acids

→ For windows and balcony doors made from oak or other timber types with a high content in tannic or other acids, ensure that these materials cannot escape from the wood.
Hardware must not come into contact with an untreated timber surface.

Protection from sealing compounds with sequestered acetic or other acids

→ Never use sealing compounds with sequestered acetic or other acids, or those with other aggressive contents (e.g. formic or acetic acid, ammonia, amine or ammonia compounds, aldehydes, phenols, chlorine, tannic acid, etc.), as direct contact with the sealing compound or with its vapours can attack the surface of the hardware.

NOTE!

To recognise suitable sealing compounds, pay attention to the instructions on the packaging:

– *Information on the packaging of suitable sealing compounds:*
"Binds without primer on steel, stainless steel, galvanised steel, aluminium, etc."

– *Information on the packaging of unsuitable sealing compounds:*
"Binds without primer on glass and glazed surfaces, as well as aluminium."
Information on galvanised steel is missing.

In the case of doubt, carry out an odour test. Suitable sealing compounds are almost all odour-free or smell slightly sweet; unsuitable sealing compounds smell strongly acid or of vinegar.

Protection from aggressive acidiferous cleaning materials

→ Clean hardware exclusively with mild, pH-neutral cleaning materials in diluted form. Never use aggressive acidiferous cleaning materials or scouring agents.

Protection from materials for surface treatment

→ When applying surface treatments – e.g. when varnishing or painting windows and balcony doors – exclude all hardware components from this treatment, and thus protect against contamination.

7.3 Maintenance work and care instructions

7.3.1 Maintenance

Interval	Maintenance work
at least annually*	→ Check that hardware components are firmly seated and examine them for appearances of wear and tear. If necessary, tighten fixing screws and get a specialist company to replace worn components.
	→ Lubricate all moving and locking points of the hardware, and check for faultless functioning.

* in schools, hotels and hospitals, every six months

7.3.2 Cleaning

→ Clean hardware exclusively with a soft cloth and mild, pH-neutral cleaning materials in diluted form. Never use aggressive acidiferous cleaning materials or scouring agents. These can cause damage to the hardware.

8 Removal and disposal

8.1 Removing the window

→ Windows may only be removed by trained specialists in window construction.

8.2 Disposal and recycling

8.2.1 Disposal of fittings

→ When disposing of fittings, recycle them as mixed scrap in an environmentally friendly manner.

8.2.2 Disposal of packaging material

→ Packaging materials are usually accepted free of charge for recycling by disposal partners (in Germany and other European countries, e.g. INTERSEROH, REMONDIS, etc.). Ask your fitting manufacturer about the disposal partner that they work with.

This directive was developed in cooperation with:

Fachverband Schloss- und Beschlagindustrie e.V. Velbert
Offerstrasse 12
D-42551 Velbert, Germany

Prüfinstitut Schlösser und Beschläge PIV Velbert
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