Surface finishes for aluminium

Anodic oxidation

(of aluminium and its alloys)

By virtue of its property of reacting with the oxygen in the air, aluminium is protected against corrosion by a microscopically thin natural film of oxide(0.001 - 0.01 µm). If damaged, the oxide layer regenerates itself, hence the excellent weather−resistance of aluminium.

Instead of place of the unsightly, spotted appearance resulting from natural oxidisation, an electro−chemical process called anodising can be used to generate a considerably thicker, uniformly more dense and more corrosion−resistant oxide film. A decorative metallic surface finish

can only be achieved by using electrolytically oxidised (anodised) aluminium . An additional advantage of the wide variety of anodising processes is that, in addition to the possibility of colouring the oxide film, it is also possible to increase significantly the adhesive strength and resistance to corrosion.

1. Mechanical surface treatment

The purpose of the mechanical surface treatment E1 − E5 is to give the semi−finished product a decorative finish. It is also used to eliminate unavoidable unevenness, faults and scoring on the surface of the semi−finished product. Both theseeffects can be achieved with the aid of linishing or polishing belts, brushes and wheels. It is possible to do without mechanical pre−treatment (E0, E6).

2. Chemical surface treatment

This process involves pretreatment of the profiles and sheets for anodic oxidation. Etching (and possibly polishing and brightening) is used to remove the existing natural oxide film. This pretreatment is essential even in the case of prior machining.

3. Anodising

The technical conditions of supply for anodically oxidized aluminium products for the construction industry are specified DIN 17611. This standard specifies the coding for the surface treatment (E0, E6) and the minimum film thicknesses. A prerequisite for the decorative appearance is the use of anodization grade aluminium alloys. The alloy used primarily for anodized aluminium components in natural finish is AlMgSi 0.5 (profiles) and AlMg 1 (sheet). Special alloys are generally necessary for special anodizing processes.

Texture and appearance of anodized surface with surface treatment in accordance with DIN 17611.

E0 industrially anodised

The anodic oxidation is carried out after degreasing and etching (removal of the existing oxide film) without additional pretreatment. The surface finish resulting from manufacture and/or machining is retained. Scoring, scratches, abrasions, file marks, etc. remain visible. Signs of corrosion barely discernible or even indiscernible before etching may become visible as a result of this treatment.
Even when using anodisation−grade aluminium alloys, it is not possible to set the same standards of decorative appearance as is the case with processes E1 – E6.

E1 linished and anodised

Linishing produces a relatively uniform surface of rather dull appearance. Surface blemishes are, to a large extent, removed (no surface linishing). Depending on the abrasive grain size, coarse to fine linishing marks will be visible.

E2 brushed and anodised

Brushing produces a uniform, bright surface (in contrast to E1). The brush marks are visible. Scoring, scratches and rubbed areas will only be partially removed.

E3 polished and anodised

Polishing produces a glossy surface. Scoring, scratches, abrasions, file marks and other surface blemishes are only removed to a limited extent; extrusion marks may become clearly visible as a result of this treatment.

E4 linished, brushed and anodised

Linishing and brushing produce a uniform, bright surface. Scoring, scratches, abrasions, file marks and other surface blemishes – especially hidden signs of corrosion which may become visible with treatment in accordance with E0 or E6 – are removed (no surface linishing).

E5 linished, polished and anodised

Linishing and polishing produce a smooth, glossy surface finish. Scoring, scratches, abrasions, file marks and other surface blemishes – especially hidden signs of corrosion which may become visible with treatment in accordance with E0 or E6 – are removed (no surface linishing).

E6 chemically pretreated and anodised

After degreasing, a stain or matt surface finish is produced by treatment in special etching solutions. In the process, the permissible minor scoring and roughening caused by manufacture and/or machining cannot be completely removed, but can at most be smoothed out.

Any signs of corrosion impairing the decorative appearance which is barely discernible or indiscernible before etching may become visible as a result of this treatment. These signs of corrosion can, however, be removed by additional mechanical pretreatment.

General

Orders carried out using the same coding but in different treatment plants, may result in differing surface effects. Agreements on the required appearance must be reached on the basis of limit samples (particularly in the case of colouring).

Procedure for anodic oxidation

1. To produce colourless, transparent oxide films the standard processes include:

- **Direct current−sulphuric acid process**
- **Direct current−sulphuric acid−olaxic acid process**

2. To produce coloured oxide films there are the following processes:

AN11 - Anodisation (dip process)

Colouring on the surface and in the centre of the oxide film. Here, the initially colourless anodised aluminium is stained chemically with organic or inorganic dye solutions. This process has made it possible to extend the range of light−fast colours to include red, blue and yellow hues. A well−known brand is: SANODAL.

In the standard colour palette of the Anodisers Association, the following coding has been established for a number of colours:

EV 1 natural
EV 2 nickel silver
EV 3 gold
EV 4 light bronze
EV 5 dark bronze
EV 6 black

AN12 - Anodisation (two−stage colour anodisation)

Colouring at the base of the pores of the oxide film. Here, metals and metal compounds are incorporated elecrolytically into a previously produced colourless oxide film using single−phase DC. The range of light−fast and weather−resistant colours ranges from copper through bronze, reddish brown, brown, grey to black.

Some well−known brand names are:
ANOLOK, COLINAL, COLOROX, EURO−COLOR, KORUNDAL, METACOLOR.

AN 22 - Anodisation (single−stage colour anodisation)
Continuous colouoring such that a coloured oxide film is produced directly during anodisation. Here, the hue is created on the one hand by the composition of the electrolyte and the operating conditions, and the other hand by certain allow components in the aluminium material (special alloy necessary).

Some well−known brand names are:
ALCANODOX, COLODUR, DURANODIC, KALCOLOR, PERMALUX, PERMANODIC, REYNOCOLOR, VEROXAL.

General:
With all colour anodising processes, certain variations in hue are unavoidable. When a contract is concluded it is advisable to specify the colour tolerances with the aid of limit value samples.
Suspension and contact areas will be determined by the process. In the case of profiles, it will generally be necessary to allow 30 mm per profile end for suspension and contact areas.

3. Densification of anodically produced oxide films
Freshly produced oxide films must be compressed on account of their numerous fine pours. This is carried out in demineralised boiling water at approximately 98°C or in steam. Only perfectly compressed oxide films possess adhesive strength and optimum weather resistance. Compressed occlusion is also of considerable importance for the permanence of the coloration.

4. Quality and test specifications
German and European anodising companies can, on application, be granted the quality mark “EURAS−EWAA”. Supervision of such companies and their anodising plants, including random sample material checks, is carried out in Germany by a state recognised, impartial research institution. The EURAS quality characteristics are largely identical with those specificed in DIN 17611.

5. Surface protection and cleaning of aluminium
The surfaces of anodised components are very sensitive to the action of unset mortar and cement.

As a result of alkaline reactions, spots and whitish discoloration occur after a short time, which cannot then be removed. Scratches due to mechanical damage can also not be rectified.

As the protection of metal curtain walls can be relatively costly, this work should be detailed in the specifiation as a special item. Metal façades should be cleaned regularly. The protection and cleaning agents available from Schüco have proved extremely satisfactory over many years.

See also “Cleaning of anodised aluminium curtain wall elements”.

Aluminium, even when anodised, can be heavily attacked by chlorides. These may be contained in anti−freeze agents added to the mortar in low temperatures.

There must be no direct contact between the mortar and the aluminium, for example, when laying floors or window sills or during plastering.

Synthetic coating for aluminium construction components

The coating of aluminium with organic substances offers almost unlimited possibilities for the colour schemes of aluminium curtain walls. Sensitivity of the surface to particularly pronounced corrosion influences such as marine and industrial atmospheres as well as to aggresive media during construction (e.g. lime, cement) will, to a very considerable extent, be eliminated. In addition, mechanical damage to the colour coating can with most coating systems be removed satisfactorily by hand on site. Choice of a suitable coating material is determined mainly by the influences to which it will subsequently be subjected. In the case of exposure to outfoor weather conditions, a prerequisite of the coating material will be that it must be capable of withstanding the climatic stresses imposed on it, such as rain, wind and sunshine. In addition, it must be capable of withstanding the pollution from the surrounding atmosphere from dirt, dust and deleterious accumulations of chemical compounds. The long term behaviour of a plastic coating exposed to outdoor weather conditions will depend not only on appropriate expert application, but also to a large extent on resin systems, the colour pigments and any matting and filler additives which are used.

1. Pretreatment

To achieve optimum coating adhesion and reliable corrosion protection on all coating systems, very careful pretreatment of the aluminium surface is of vital importance. The chromizing of aluminium described in DIN 50 939 has proved eminently suitable for this purpose.

1.1 Cleaning

First of all, the surface should be cleaned to remove dirt, oil, grease and corrosion products so that it is metallically bare.
Alkaline or acidic cleaning agents which also remove the top oxide skin at the same time are mainly used for this purpose. This is effected by precisely controlled sequences of operations which generally take place as follows:
Cleaning and degreasing, washing with water, neutralizing or descaling or etching (according to process), and rinsing.

1.2 Chromating

The aluminium surface is transformed chemically by subsequent chromating. A corrosion−inhibiting film is produced which forms an excellent base coat for subsequent coating. A distinction is drawn between green chromating and yellow chromating and, in special cases, transparent chromating. Chromating is carried out in baths or by a spray process. After chromating, the aluminium components are washed thoroughly in demineralized water and dried. Lacquering or coating must be carried out immediately afterwards.

1.3 Chrome−free pretreatment

For this pretreatment, chrome is replaced by combinations, e.g. of titanium with polymers. It offers the same protection against corrosion and provides a primed surface for subsequent synthetic coating such as yellow or green chromating, provided the chrome−free pretreatment has been given approval by the Gütegemeinschaft für die Stückbeschichtung von Bauteilen e.V. (GSB).

As a rule, chrome−free pretreatment is the last process to be carried out, i.e. there is no last wash process. Painting or coating must then follow immediately afterwards.

2. Colour coating

A distinction is drawn between
2.1 Wet colour coating
2.2 Powder coating

2.1 Wet colour coating

The best known resin systems for outside use in construction applications are:

- Acrylic resins — AC
- Polyurethane resins — PU
- Polyvinylidenfluoride resins — PVDF
- Fluorpolymer resins — Duraflon

Acrylic resin lacquers

Thermosetting acrylic resins are generally used. These contain functional groups which react chemically with one another or with partners at curing temperature and time and thus produce cross linkages. Cross linkingtakes place at temperatures 180 and 200°C. The curing time is approximately 20 minutes. Acrylic resins are applied in either one or two coats. The dry film thickness on the side exposed to the weather should be at least 30 µm. In the case of air−dried acrylic resins, the solvent evaporates and the coating sets at normal temperature. Thermosetting lacquers, however, are considerably harder than air−dried coatings.

The properties of acrylic resin lacquers are:
Adequate resistance to chalking; satisfactory retention of gloss and hue; good weather resistance.

For most insulating structures, coating with thermosetting acrylic resin lacquers is unsuitable on account of the high baking temperatures.

Polyurethane lacquers

These lacquers are based on polyurethane and are also called DD or PUR lacquers. Generally, a self−setting two−component lacquer is used, i.e. when basic lacquer and hardener are mixed, a chemical reaction takes place which produces a film which sets to optimum hardness after several days. Crosslinking of the two components takes place at normal temperature. It will generally, however, be accelerated by heat at 80 to 100°C.
Polyurethane lacquers can be applied in one thick film or in two coats. The dry film thickness on the side exposed to the weather should be at least 50 µm.

The properties of poyurethane lacquers are:
Outstanding resistance to chalking; retention of hue and gloss for many years; very good weather resistance.

Polyurethane lacquers are particularly suitable for insulation constructions with low thermal tolerance, due to the aforementioned ease of drying.

PVDF lacquers

Polyvinylidene fluoride or fluorocarbon is the basic material used in this lacquer system. PVDF lacquers containing fluorocarbon may be regarded as the most weather−resistant resin system currently available. Increased resistance to scratching as well as the anti−adhesive (dirt−repellent) action of the top surface may be viewed as further advantages.
In addition to a chemical pretreatment in accordance with DIN 50 939, a so−called primer must be applied as an adhesive to bond the protecting lacquer. It is also customary to seal this protecting lacquer with a coat of clear lacquer. The protecting and clear lacquers need a curing temperature of 240°C. The above description of the multi−layered nature of the PVDF lacquer coating shows that any micropores in one coat will be covered up by the coat underneath or on top, which in turn improves resistance to corrosion. The high curing temperature for the PVDF lacquers is well above the loading capacity of our fibreglass reinforced polyamide isolator bars.

The profile components of the thermally insulated Royal S profiles should, therefore, only be joined, i.e. rolled together, after surface treatment has been carried out. As well as the very high curing temperature, the subsequent significant increase in coating costs should also be pointed out. A further disadvantage can also be seen in the limited choice of colours. The dry film thickness of the multi−layered lacquer must be at least 40 µm on the side exposed to the weather.

Properties of PVDF resins:
Superior chalk resistance, retention of hue and gloss over many years, extremely weather resistant, with stay clean properties.

Fluoropolymers

The basis of this type of coating is fluorocarbon resin, which is also sold under the trade name Duraflon. After PVDF paints, fluoropolymers are considered to be some of the most weather resistant systems, except without the restrictions in colour range usually typical of such a system. As a rule, they are used as single component paints.
The thickness of the dry layer should be at least 35 µm on the surface exposed to the weather. Unlike PVDF systems, however, fluoropolymers can be applied directly onto surfaces containing chrome or which have had a chrome−free pretreatment. The oven temperatures are max. 180 degrees, so that Royal S profiles rolled together by the fabricator can also be coated.

Properties of fluoropolymers:
Superior chalk resistance, retention of hue and gloss over many years, extremely weather resistant, with stay clean properties.

2.2 Powder coating

Colour coating powders may be classified as a two component lacquer system. Due to the nature of the process the hardener component is added to the coating powder before extrusion of the resin granulates. On fusion of the electrostatically−applied coating powder, the integrated hardener component is activated and effects cross linking of the lacquer film.

Coating powders are generally applied in a single film. The dry, completely solvent−free coating powder film is fused and cured, depending on lacquer type, at a temperature in the range of 160 to 210°C. The average minimum coating thickness on the side exposed to the weather should be 60µm. Because the chemical reaction of coating powders is complete after the aluminium work−pieces leave the curing i.e. after they have cooled, they can be packed and despatched immediately afterwards.

There are no significant subsequent reactions. On account of the high curing temperatures, we would recommend that our Royal S profiles are not rolled together until afterr they are colour coated. Excellent results may be obtained with the following resin systems:

Polyester resin

Properties: high degree of hardness; high degree of elasticity and impact deformability; high retention of hue and gloss and excellent weather resistance. It should be noted, however, that a large variety of types of coating powder with admixtures of other resins are being marketed under the generic name polyester. We therefore recommend that only GSB tested lacquer types be used. The dry film thickness should be 60 to 80 µm.

Polyurethane

Properties: outstanding retention of hue and gloss; excellent adhesion properties; excellent corrosion protection; excellent weather resistance. The dry film thickness should be 60-80 µm.

These two coating powder systems are suitable for outdoor applications. Epoxy resins are not suitable for outdoor use.

3. Quality standard and DIN standards

The “Gütegemeinschaft für die Stückbeschichtung von Bauteilen e.V.” in Schwäbisch Gemünd, founded in 1976, has formulated an all−encompassing quality standard for this purpose with its quality and test requirements in line with the quality assurance regulation RAL-RG 631. As the quality and test requirements of the GSB incorporate practically all the quality features of our binding Schüco Technical Conditions of Supply for colour coated aluminium components, the quality features involved and their standardized test procedures do not need to be repeated here. The quality and test requirements can be obtained from the following address:

RAL Deutsches Institut für Gütesicherung
und Kennzeichnung e.V.
Bornheimer Str. 180, D-53119 Bonn
or
Beuth Verlag GmbH
Postfach, D-10772 Berlin

Fabrication guidelines for colour coated profiles

1. Storage and delivery instructions for fixed profile lengths before coating

It is important to ensure that the fixed profile lengths (bars) are free from grease, cutting oil, drilling oil and similar substances after machining is completed.

If the size−cut lengths are to be stored after machining, there must be no swarf or machining debris on the surface of the profiles. This debris will be pressed by the weight of the profiles into their surface and can only be removed again by mechanical refinishing.

It is also necessary to ensure that there are no scratches or dents in the profile surface, as these defects cannot be rectified.

Rough debris will not be removed during pretreatment and will consequently result in quality deficiencies. It is the fabricator's responsibility to deliver the profiles in a clean condition.

All cut edges, milled out recesses and drilled holes should be deburred before coating.

2. Machining of coated profiles

The instructions given below should be observed for all machining operations such as sawing, milling, drilling, punching etc.

2.1 Cutting

Only carbide tipped saw blades which have been newly ground (max. 20 operating hours) should be used. The saw blade should operate at high speed (1500 rpm to 3000 rpm) and low feedrate. The work table should be free from swarf and foreign debris so as not to damage the coated surface.

2.2 Milling cutters

Milling procedures should be as for sawing where applicable.

2.3 Drills

Ensure that sharp drills are used at all times. Otherwise proceed as for sawing.

2.4 Punching

Only newly sharpened tools should be used for punching purposes. Profile support and pressure pads must be completely free from debris.

The tools should be lubricated with machine oil to prevent premature blunting.

2.5 Adequate cooling and lubrication must be provided during all operations. Whebn using Schüco drilling oil (Art. No. 298 153), no change can be detected on the coating.

3. Storage of coated profiles

The coated profiles must not be stacked directly on top of one another after machining. Between each layer there must be a packing layer of soft wood (poplar) or stiff cardboard of the same thickness, in sufficient quantity, minimum 4 pieces per 6 m length.

Intermediate layers of plastic or foam plastic should not be used because of possible undesirable effects on the coating due to evaporation of plasticizers or other volatile components. Before storage, the surface of the profiles should be carefully cleaned to remove processing residues (swarf, adhesive residues etc.).

4. Degreasing, bonding, cleaning

4.1 Degreasing

Schüco cleaning agent Art. No. 298 611 should be used for degreasing and cleaning. The profiles should not be in contact with the cleaning agent for more than 3 minutes (dip process).

4.2 Bonding

The most suitable material for bonding corner and T−joints is our new solvent−free two−component product (metal adhesive Art. No. 298 388 and 298 354). Note description in chapter R3 of the Royal S order manual.

4.3 Cleaning after bonding

Adhesive residues should be removed with a soft cloth or brush and cleaning agent 298 611, exerting gentle pressure. The adhesive must be removed before it has hardened.

Note: The cleaning agent 298 611 should first be tested for suitability on a non−visible area.

5. Touching up

5.1 Scratches and small areas which do not extend down to the metal surface can be touched up with a special lacquer. This lacquer should be obtained from Schüco to avoid raw material incompatibility and to obtain proper adhesion and matching colour.

5.2 Larger areas and damage extending down to the metal surface should always be touched up by the coating plant, because the surface must be specially pretreated to achieve proper adhesion.

6. Surface protection on site

On site, the coated surface can be protected with protective film (Art. No. 298 086, 298 087, 298 112, 298 338).

7. Care of installed profiles

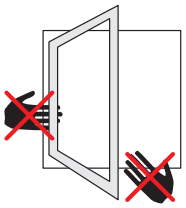
The coated aluminium components should be cleaned at least once a year − more frequently if necessary − with generous quantities of hot water containing a mild detergent, using a sponge or soft cloth. Rinse the sponge or cloth frequently to prevent the absorbed dirt leaving streaks. Acidic or alkaline agents and scouring agents (e.g. scouring sand) are not suitable.

Note: see "Operation and maintenance / Point 6.0" and chapter "General accessories"

Contents

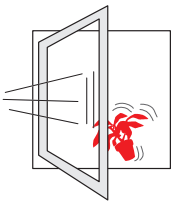
1.0 Safety information

When using aluminium units, please take note of the dangers listed below.

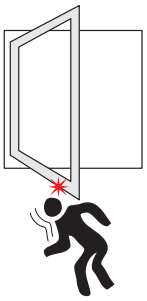


Danger of trapped fingers
Be careful not to trap fingers between the vent or door leaf and the outer frame when using windows, patio and entrance doors.

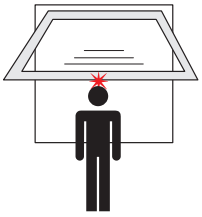
Danger of falling
There is a risk of falling out of open units.
Do not leave open units unattended.



Danger of knocking items over from units slamming shut
Slamming of open units can cause a draught which knocks over adjacent objects.



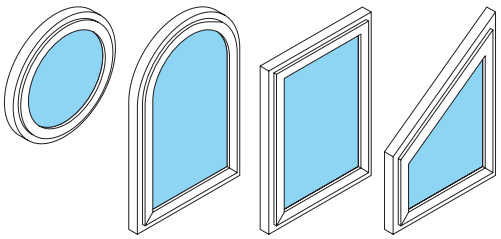
Danger of injury from inward opening units
There is a high risk of injury when working underneath open vents.
Shut open windows before working underneath them and before children enter the room.



Danger of injury from outward opening units
Tilt units can unintentionally swing open when the stays are disengaged.
There is a risk of injury from horizontal and vertical pivot windows swinging wide open during opening and closing.

This symbol denotes further safety information.

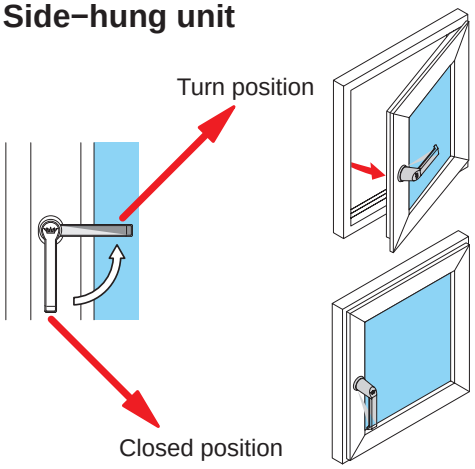
2.0 Operation: Windows and window doors



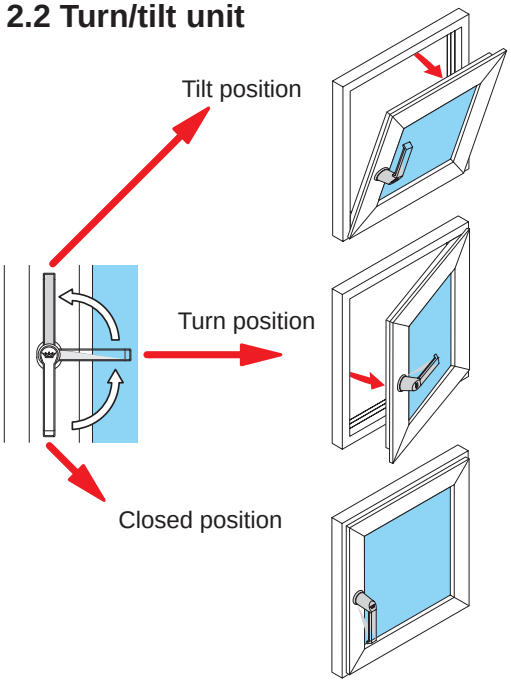
The operating instructions apply to all types of unit.

Schüco units are characterised by their smooth operation.

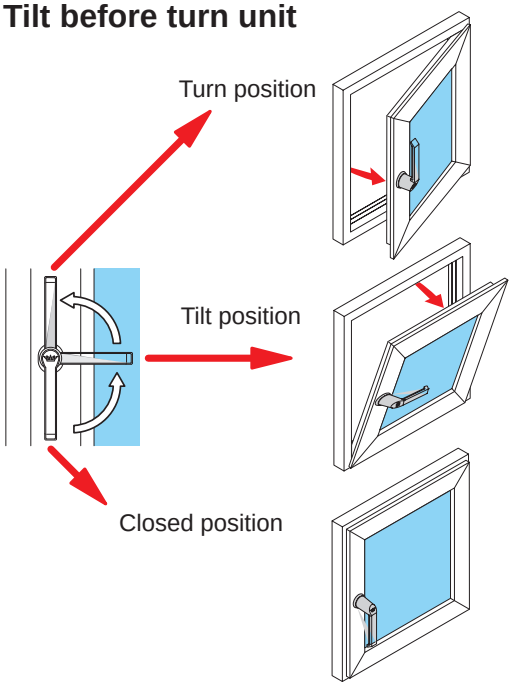
2.1 Side−hung unit



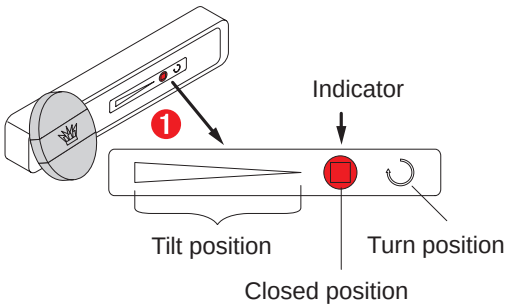
2.2 Turn/tilt unit



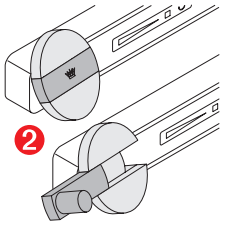
2.3 Tilt before turn unit



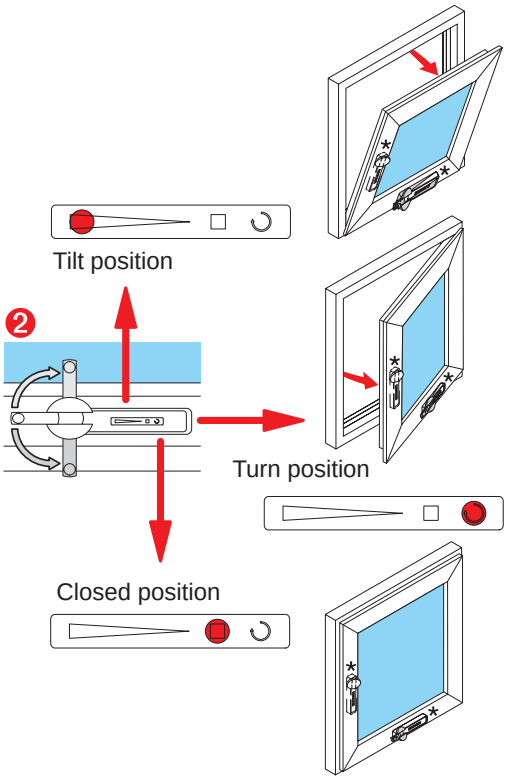
2.4 Crank-operated turn/tilt unit



The crank housing has a position indicator (1).
The red indicator shows the position of the fittings.



To open in the tilt position
- Pull out the crank handle (2) from its base.
- Turn the crank handle to the left until the desired opening angle is reached. The opening angle is infinitely adjustable. The red indicator shows the tilt position.



To close from the tilt position
- Turn the crank handle to the right until the red indicator shows the closed position.

To open in the side−hung position
- Pull out the crank handle (2) from its base.
- Turn the crank handle to the right until the red indicator shows the closed position.

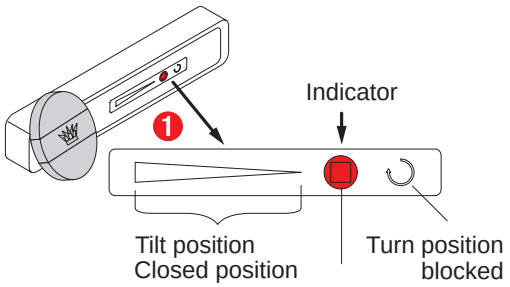
- Open the vent.

*) Location of crank depends on window design

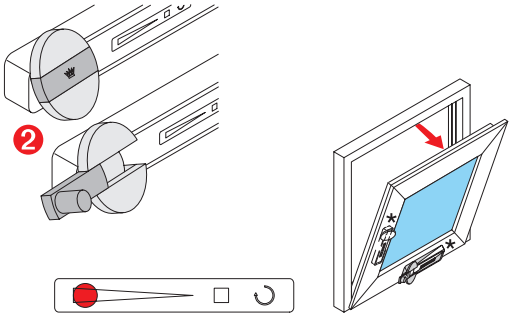
To close from the side−hung position
- Close the vent.
- Turn the crank handle to the right until the red indicator shows the closed position.

Stop turning before the red indicator moves beyond the end position.

2.5 Crank-operated tilt unit

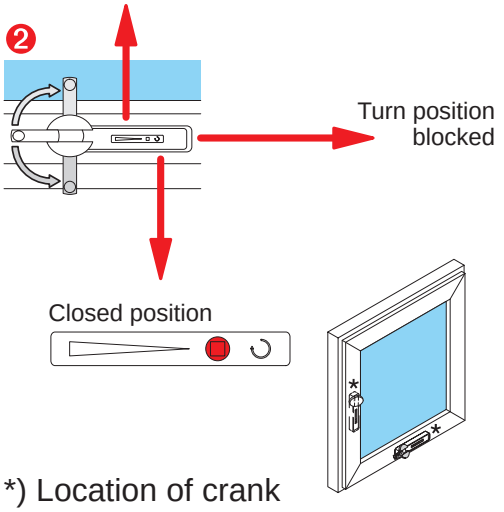


The crank housing has a position indicator (1).
The red indicator shows the position of the fittings.



To open in the tilt position

- Pull out the crank handle (2) from its base.
- Turn the crank handle to the left until the desired opening angle is reached. The opening angle is infinitely adjustable.
  The red indicator shows the tilt position.



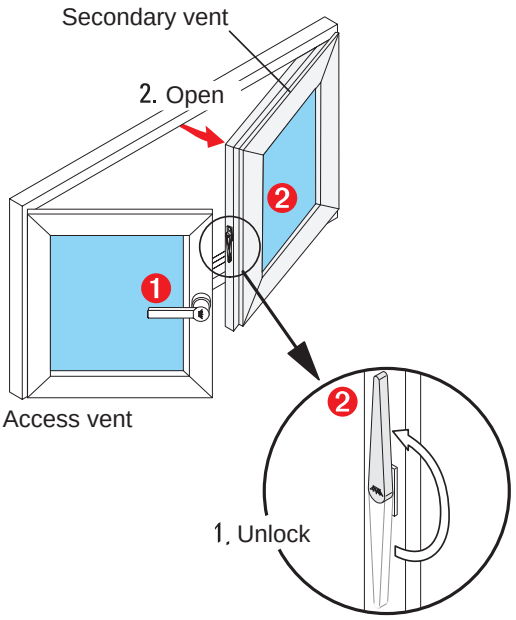
To close from the tilt position

- Turn the crank handle to the right until the red indicator shows the closed position.

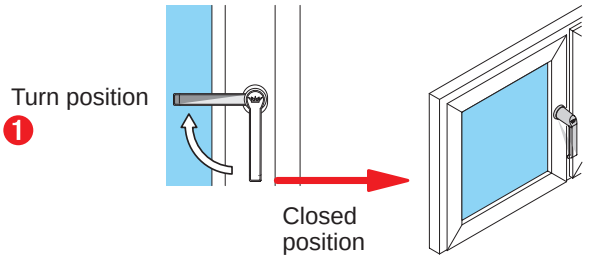
Stop turning before the red indicator moves beyond the end position.

2.6 Double vent unit

a) Access and secondary vents with turn function



To open the access vent

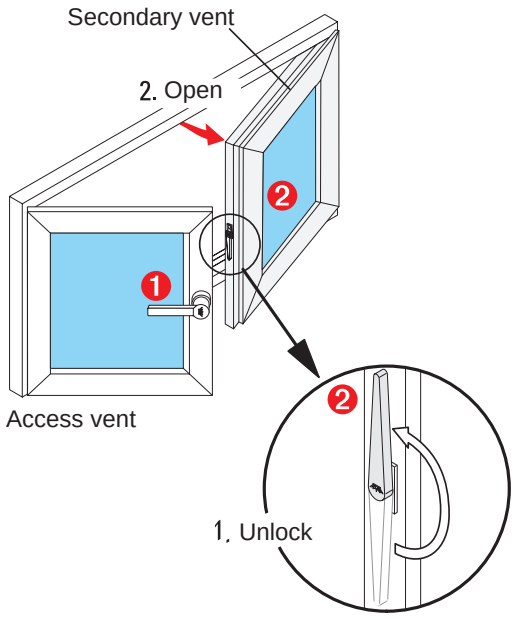


To open the secondary vent

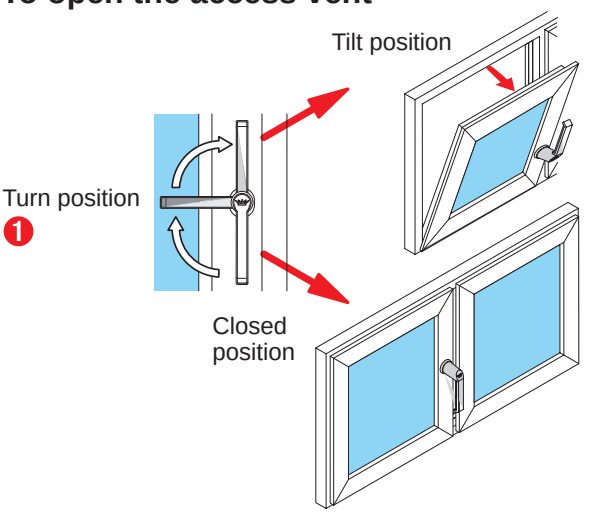
- Open access vent (1) in turn position.
- Release lever (2) in the rebate (1.).
- Open secondary vent (2.).

To close ⇒ reverse order.

b.) Access vent with turn/tilt function and secondary vent with turn function



To open the access vent

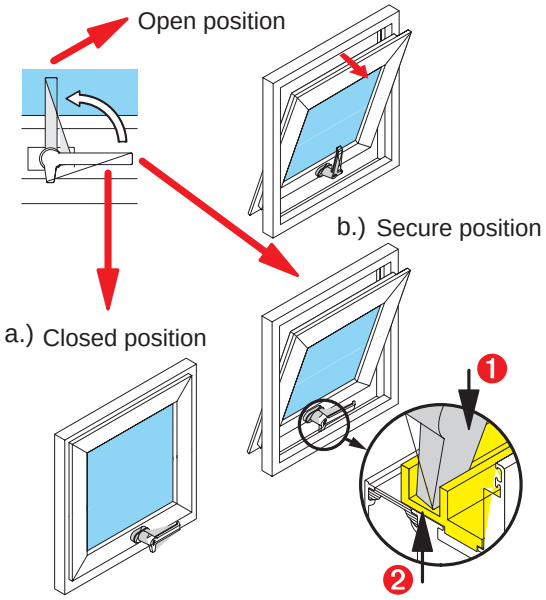


To open the secondary vent

- Open access vent (1) in turn position.
- Release lever (2) in the rebate (1.).
- Open secondary vent (2.).

To close ⇒ reverse order.

2.7 Vertical pivot windows



The pivots of the vertical pivot windows are fitted with brakes to hold the unit open.
The horizontal position of the turn handle has two functions.
a.) Closing the horizontal pivot window.
b) Securing the horizontal pivot window in the night ventilation position.

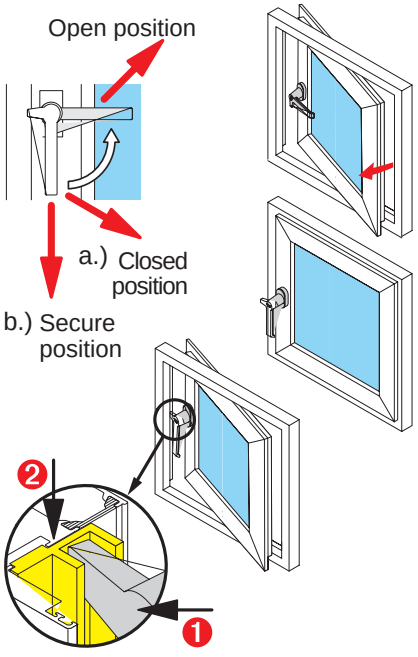
Securing the horizontal pivot window with a catch

- Open horizontal pivot window.
- Turn the handle to the horizontal position until the spur (1) on the handle fits into the groove (2) in the window outer frame.

If the vent moves too easily, the brake in the window fittings must be adjusted by a qualified technician.

Danger of accident
Do not lubricate or oil the pivot.

2.8 Vertical pivot window



The vertical position of the turn handle has two functions.
a.) Closing the horizontal pivot window.
b.) Securing the horizontal pivot window (in the night ventilation position).

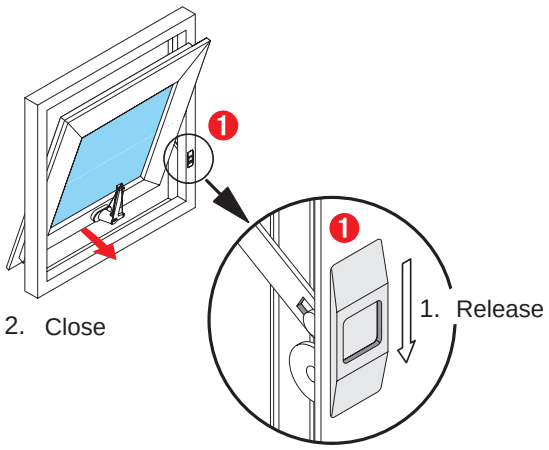
Securing the horizontal pivot window with a catch

- Open horizontal pivot window.
- Turn the handle to the horizontal position until the spur (1) on the handle fits into the groove (2) in the window outer frame.

If the vent moves too easily, the brake in the window fittings must be adjusted by a qualified technician.

Danger of accident
Do not lubricate or oil the pivot.

2.9 Limiting stay for horizontal and vertical pivot windows (optional)



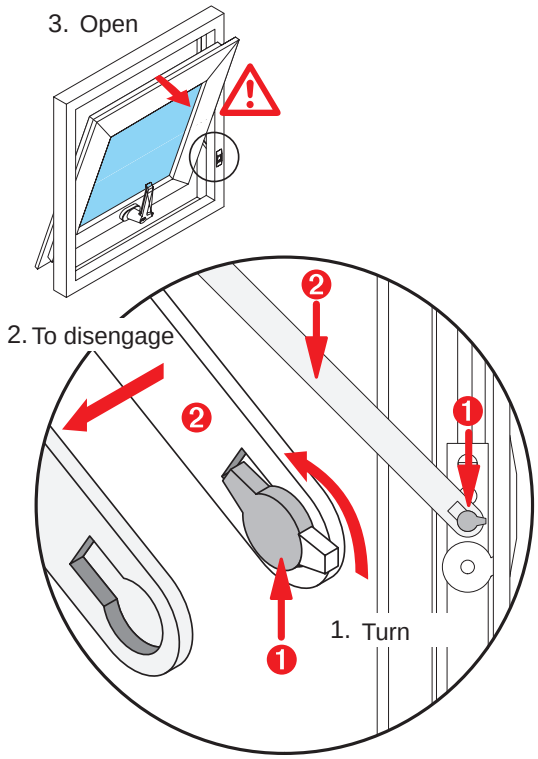
The limiting stay restricts the opening angle of the vent and holds the vent open.

To open the window
- Open the window until the limiting stay engages.
  For correct opening, see points 2.7 and 2.8.

To close the window
- Release the limiting stay by sliding the securing catch (1) (1.).
- Close the window (2.).

2.10 Disengaging limiting stay (cleaning position)

Danger of accident
Support the vent before disengaging from the fitting.
Take care that the entire weight of the vent is supported. Supporting the vent will prevent it swinging open freely.
Ensure that there are no people or objects within the opening arc of the window.

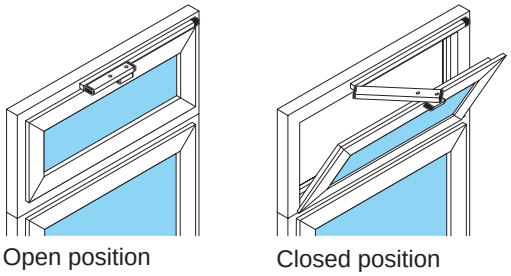


In order to open the window wide for cleaning, the limiting stay must be disengaged.

- Open the vent.
  For correct opening, see points 2.7 and 2.8.
- Turn safety catch (1) (1.), until it is aligned with the recess.
- Disengage the main arm (2) (2.).
- Open the vent wider (3).

To re−engage ⇒ reverse order.

2.11 Tilt toplight with concealed fittings or OL 90 toplight fitting

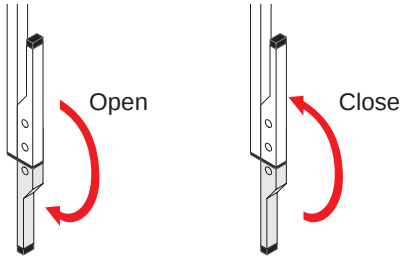


❶ Lever handle

❷ Crank handle

❸ Electric opener

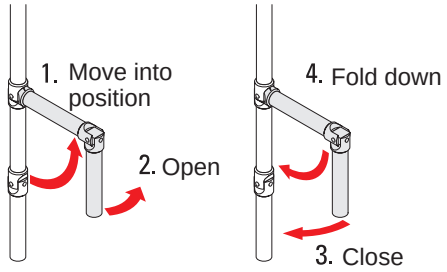
❶



To open:

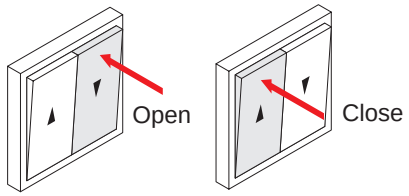
– Using handle (❶)
- Open the toplight by pulling down the handle.

❷



– Using crank handle (❷)
- Remove crank handle from holder and pull down into the turn position (1.).
- Open the toplight by turning the crank handle to the left (2.).

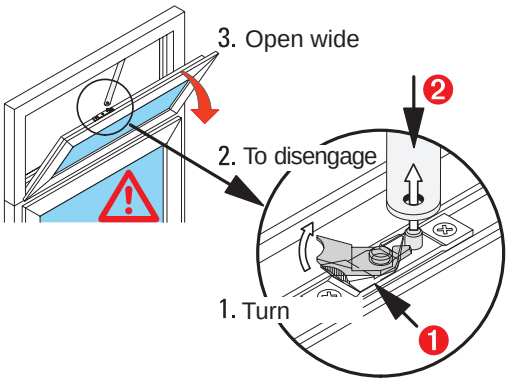
❸



– Using electric opener (❸)
- Press the button on the electric opener until the toplight is opened to the desired width.

Danger of accident
Support the vent before disengaging from the fittings.
Take care that the entire weight of the vent is supported. Supporting the vent will prevent it swinging open freely.
Ensure that there are no people or objects within the opening arc of the window.

2.12 Disengaging concealed toplight fitting (cleaning position)

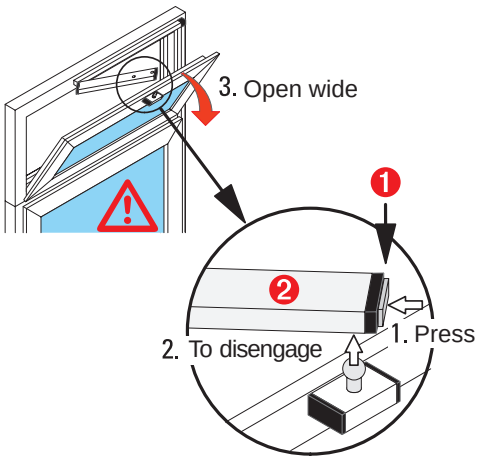


In order to open the window wide for cleaning, the toplight fitting must be disengaged.

- Open the vent.
- Support the open vent and turn the safety catch (1) (1.).
- Disengage the main arm (2) (2.).
- Slowly open the vent wide (3.).

To re−engage ⇒ reverse order.

2.13 Disengaging OL 90 toplight fitting (cleaning position)

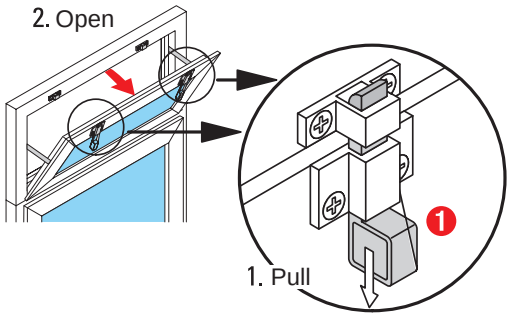


In order to open the window wide for cleaning, the toplight fitting must be disengaged.

- Open the vent.
- Support the open vent.
- Press the locking button (1) (1.) and disengage the main arm (2) (2.).
- Slowly open the vent wide (3.).

To re−engage ⇒ reverse order.

2.14 Bottom hung toplight with catch



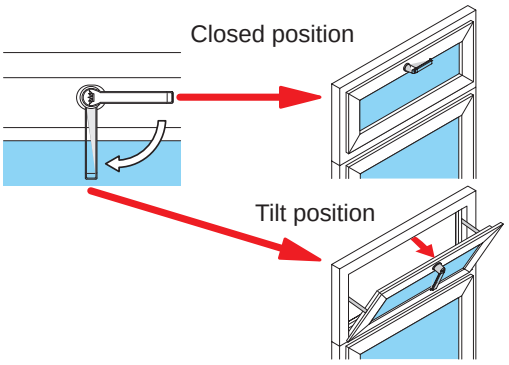
To open
- Release both catches by pulling the loops(1) (1.).
- Open vent (2.).

To close ⇒ To close, push toplight until the catches engage.

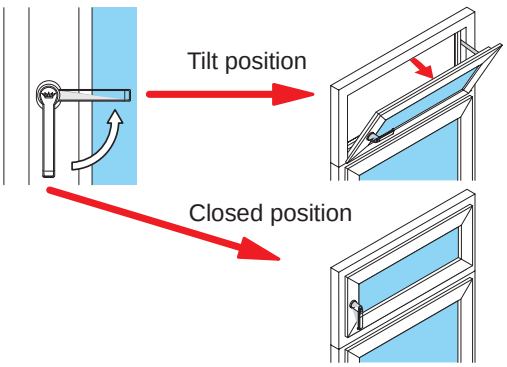
2.15 Bottom hung toplight with window handle

The toplight is prevented from opening onto the unit below by a rebate or security stay.

Window handle at the top

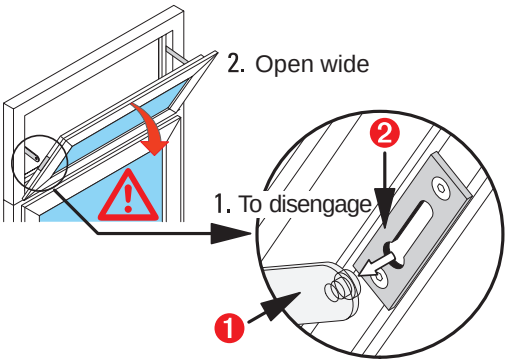


Window handle at the side



2.16 Disengaging rebate stay (cleaning position)

Danger of accident
Support the vent before disengaging the rebate stay.
Take care that the entire weight of the vent is supported. Supporting the vent will prevent it swinging open freely.
Ensure that there are no people or objects within the opening arc of the window.



In order to open the window wide for cleaning, the rebate stays at the sides must be disengaged.

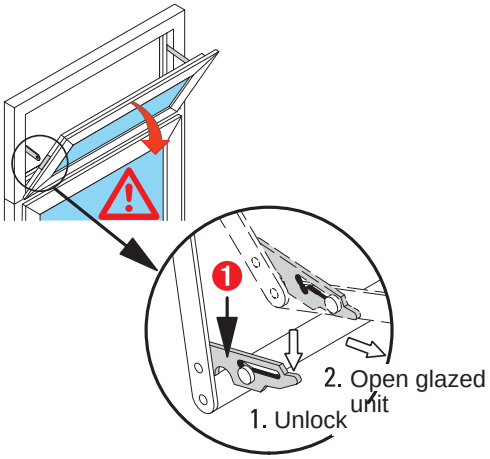
Take care when opening the bottom hung vent that the surface mounted fittings (window handles) do not damage the unit below.

- Open the vent.
- Push the open vent so far out that the stay arm (1) can be removed from its guide (2) (1.).
- Slowly open the vent wide (2.).

To re−engage ⇒ reverse order.

2.17 Disengaging security stay (cleaning position)

Danger of accident
Support the vent before disengaging the security stay.
Take care that the entire weight of the vent is supported. Supporting the vent will prevent it
swinging open freely. Ensure that there are no people or objects within the opening arc of the window.



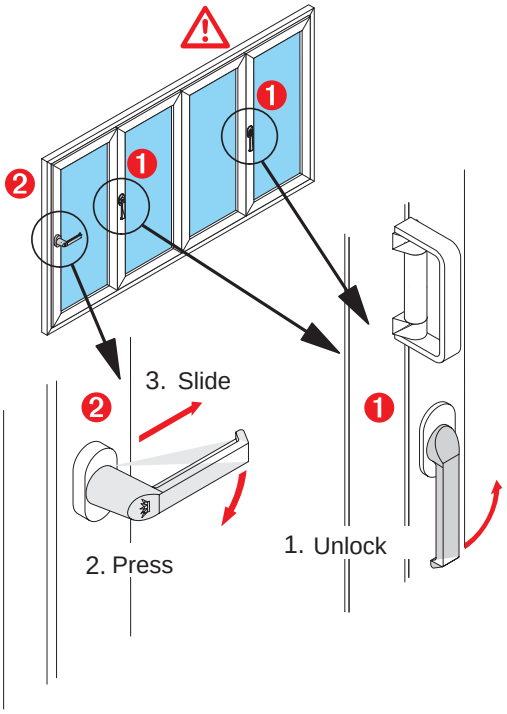
In order to open the window wider for cleaning, disengage the cleaning stays at the sides.
adjusted.
The bottom hung vent is held by the stay in the cleaning position.
This prevents the vent swinging open onto the vent below.

- Open the vent.
- Support the open vent and release from the ratchet (1) (1.).
- Slowly open the vent (2.).

To re−engage ⇒ After closing the vent, the security stay re−engages automatically.

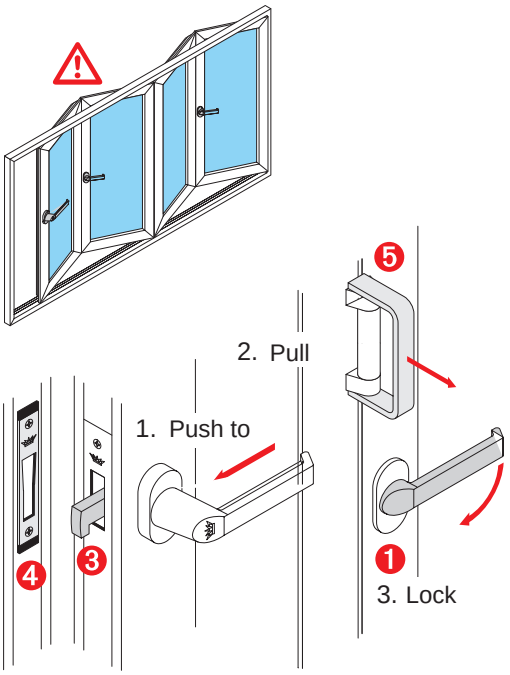
2.18 Folding sliding unit

a.) Folding sliding unit <u>without</u> side−hung door



Danger of accident
During opening and closing, do not touch the unit
unit at the folds.

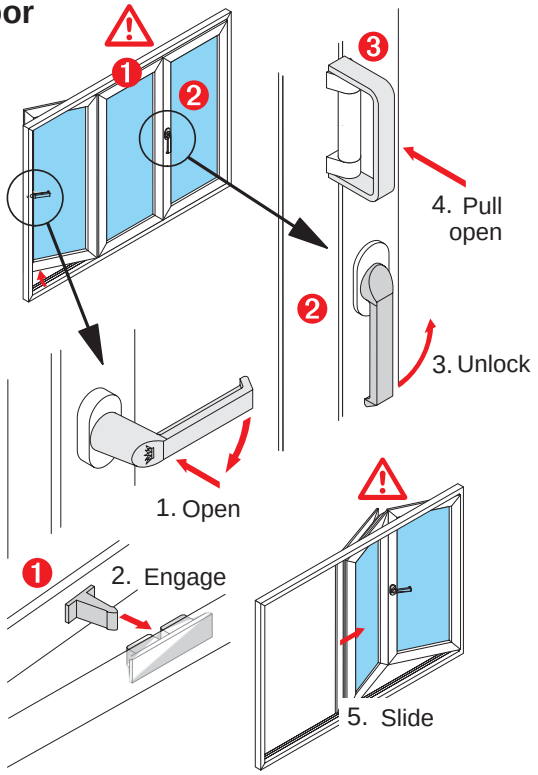
To open
- Release the locking points (1) on the folding units by turning the lever handle upwards (1.).
- Press door handle (2) down (2.) and push sliding unit open (3.).



To close
- Push the sliding unit to (1.) until the bolt (3) engages in the strike plate (4).
- Pull the units into the frame using the door pulls (5) (2.) and lock the folding units (3.).

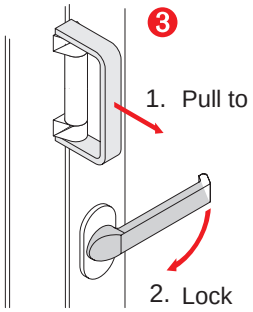
To close units divided at the centre
- Close the sliding unit with the strike plate first (4).
- Pull the unit into the frame using the door pulls (5) and lock the folding units (3.).
- Push the second sliding unit to until the bolt (3) engages in the strike plate.
- Lock (3.) the folding units (1).

b.) Folding sliding unit <u>with</u> side−hung door



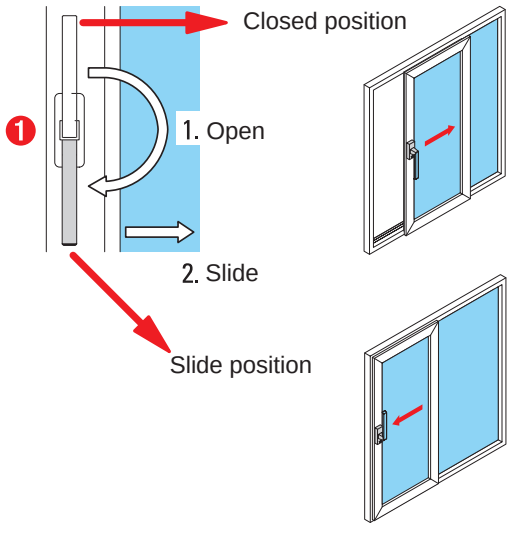
Danger of accident
During opening and closing, do not touch the unit at the folds.

To open
- Open the side−hung door 180° (1.) and engage in the catch (1) of the adjacent leaf (2.).
- Release the locking points (2) on the folding units by turning the lever handle upwards (3.).
- Pull (4.) the sliding leaves open using the door pulls (3)
- Slide the unit open (5.).



To close
- Pull the sliding units to using the door pulls (3) (1.)
- Lock the folding units (2.).
- Close the side−hung door.

2.19 Lift and slide unit

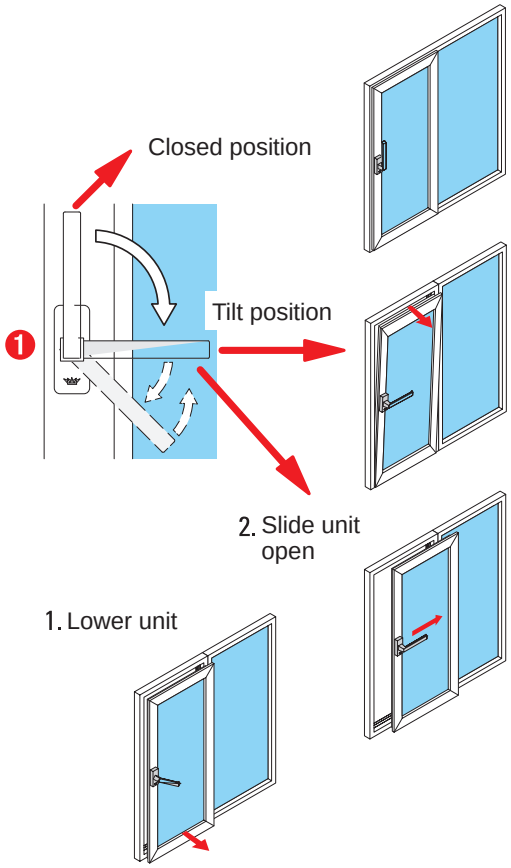


To open
- Place the sliding unit in the slide position by turning the crank handle (1) into the downward position (1.).
- Slide the unit open (2.).

To close
- Slide the units shut.
- Close the sliding units by turning the crank handle (1) into the upright position.

2.20 Tilt and slide unit (PASK)

a.) Fitting with engagement mechanism (mainly doors)

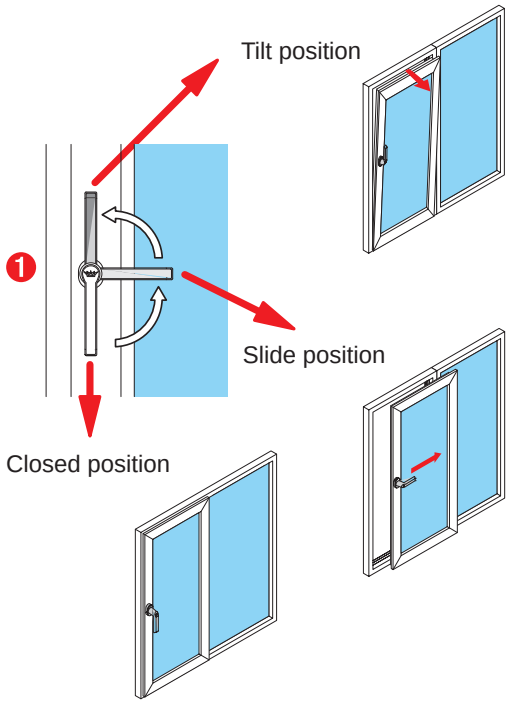


Tilt position
- Place the sliding unit into the tilt position by turning the handle (1) into the horizontal position (90°).

Slide position
- Apply further pressure on the handle to lower the sliding units (1.).
- Allow the handle to spring back and slide the unit open (2.).

To close
- Close the sliding units until the leaf automatically moves into the bottom locking point (tilt position).
- Close the sliding units by turning the crank handle (1) upwards.

b.) Fitting without engagement mechanism (mainly windows)



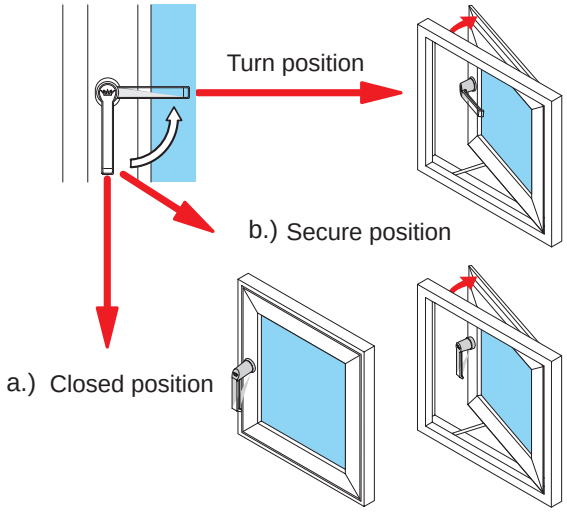
Tilt position
- With the unit closed, turn the handle (1) from the closed position through 180° into the upright position and tilt the unit.

To close from the tilt position
- Push the unit to and turn the handle (1) downwards through 180° to the closed position.

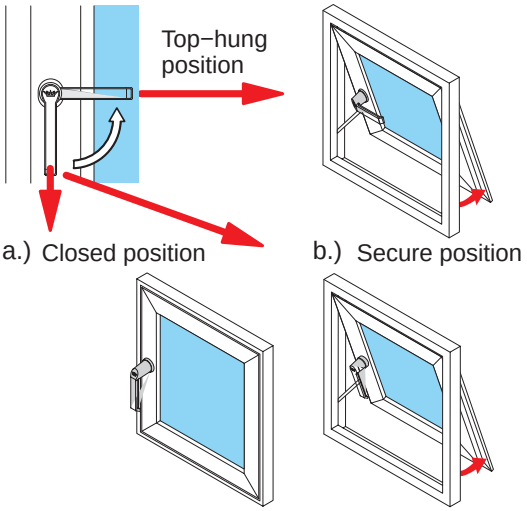
Slide position
- Turn the unit handle (1) to the horizontal position, pull the unit towards the room side and slide open.

To close from the sliding position
- Push the unit into the closed position, using two hands if necessary, and turn the handle (1) downwards.

2.21 Side−hung unit, outward opening



2.22 Top−hung unit, outward opening

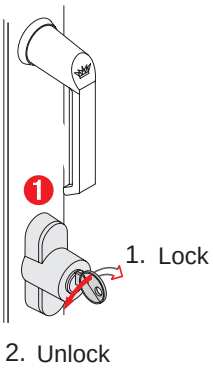


For both units, the vertical position of the turn handle has two functions:

a.) Closing the vent.
b.) Securing the vent in the night ventilation position.

To secure the vent
- Open the vent slightly.
- To secure, turn the handle vertically into the closed position.

2.23 Burglar-resistant window and balcony door units



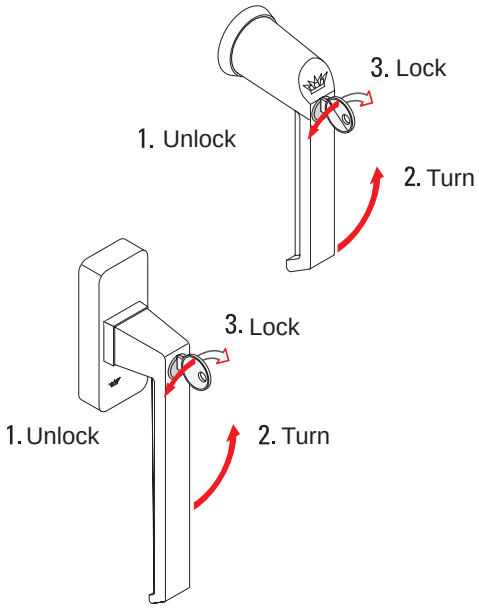
The full extent of burglar resistance is only guaranteed when the unit is locked.

In addition, these units are fitted with a lock in the handle.

To lock:
- Close the vent.
- Lock (1) by turning the key to the right (1.).

To unlock:
- Unlock (1) by turning the key to the left (2.).
- Move handle into the desired position (turn or turn/tilt).

2.24 Lockable window and balcony door handles



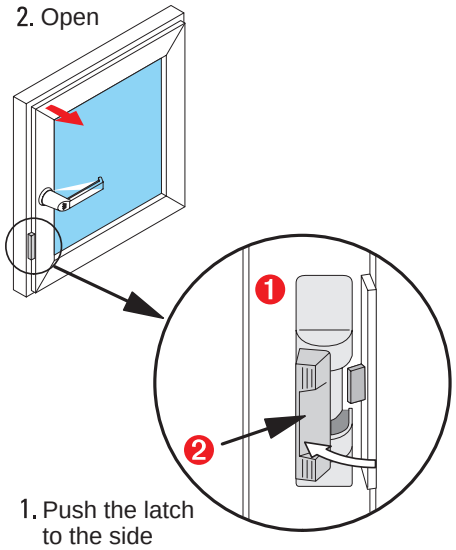
The lockable handle locks the window in the closed or tilt positions.

Operation:
- Unlock the handle by turning the key to the left (1.).
- Turn the handle to the desired position (2.).
- Lock the handle by turning the key to the right (3.).

The use of lockable handles alone does NOT provide adequate burglar resistance.

2.25 Night ventilation

a.) Surface-mounted night ventilation

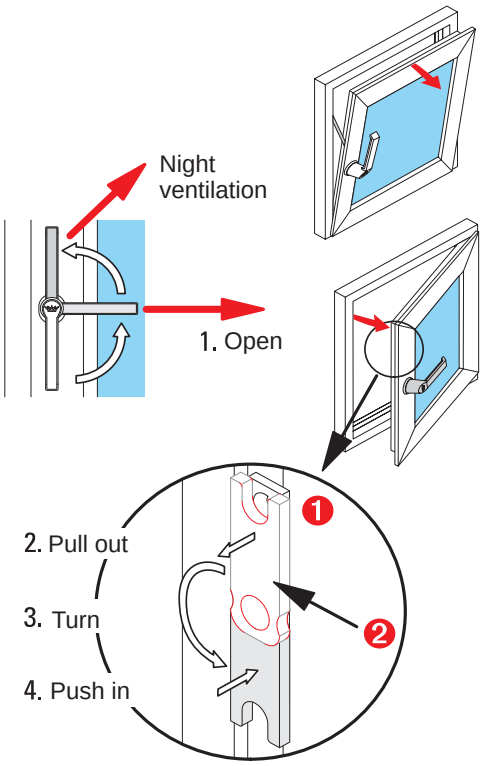


The surface-mounted night ventilation (1) limits the turn and tilt positions of the vent to a small opening.

<u>The night ventilator is always in operation</u>
After closing the vent the night ventilator engages automatically.

To open the window wide:
- Push the latch (2) to the side (1.).
- Open the vent (2.)

b.) Concealed night ventilation



The concealed night ventilator (1) limits the tilt position of the vent to a small opening width.
Disengage the night ventilator to open the vent completely.

To disengage the night ventilator:
- Open the vent in the turn position (1.).
- Pull out the latch (2) (2.), turn it to the bottom (3.) and push in again.

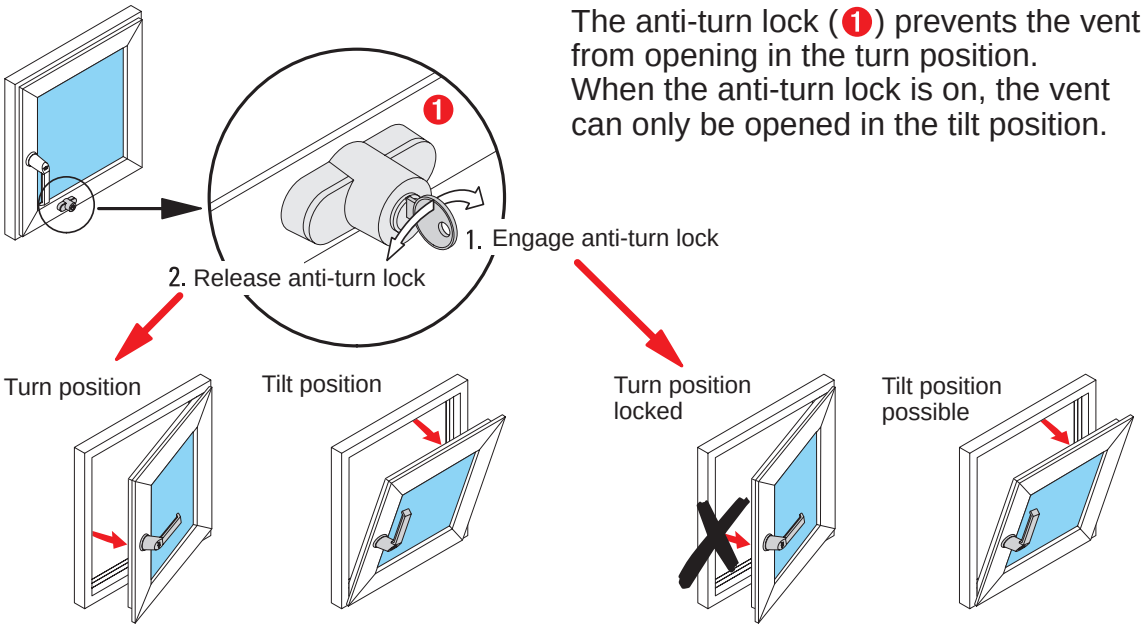
  The vent can now be opened to its fullest tilt position.

The night ventilator must be re−engaged manually.

To engage the night ventilator:
- Open the vent in the turn position (1.).
- Pull out the latch (2), turn it to the top and push in again.

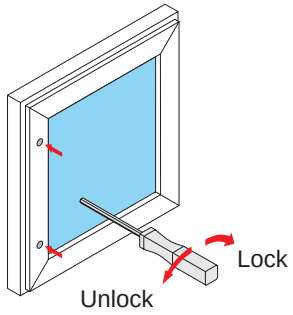
  The vent is limited to the night ventilation tilt position again.

2.26 Anti-turn lock



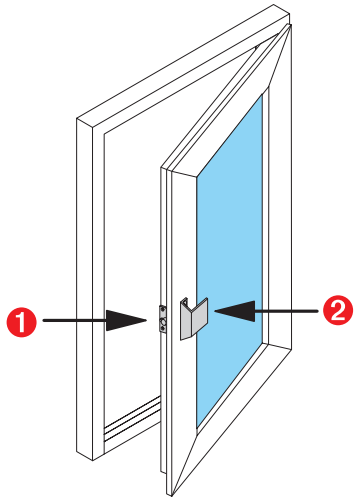
The anti-turn lock (1) prevents the vent from opening in the turn position.
When the anti-turn lock is on, the vent can only be opened in the tilt position.

2.27 Vent fastener



Window locking without handle/locking bar fittings. The windows are locked using a 4 mm allen key.

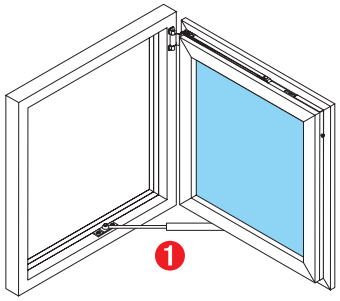
2.28 Roller catch (e.g. for balcony doors)



The roller catch (1) holds the vent in the closed position without locking using a handle or other fittings.
Units with spring catches can be fitted with a door pull (2) on the outside.

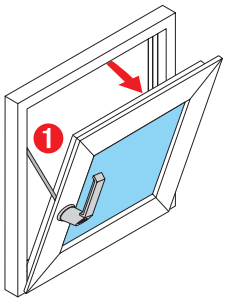
Operation:
- The vent is opened and closed with a light push or pull.

2.29 Limiting stay



The limiting stay (1) restricts the opening angle of the side−hung vent to 90°.
It prevents movement of the vent in a draught.
The limiting stay is maintenance free and should not be oiled.

2.30 Anti-slam device



The anti-slam fitting (1) prevents the vent from slamming shut in the tilt position.
Damage caused by draughts slamming or opening the vent is prevented.
The anti-slam device requires no maintenance.

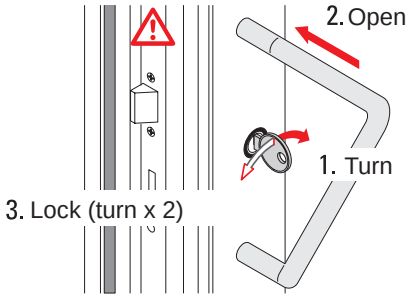
3.0 Operation: Doors

Danger of trapped fingers
Opening the door and using the key at the same time can lead to fingers being trapped between the frame and the door leaf. Do not use the key to open and close the door.

All locks are activated by one turn of the key.

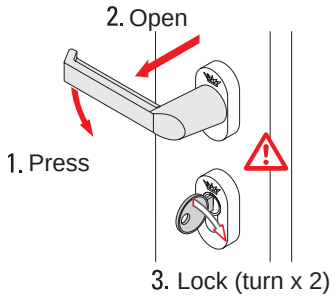
However, the burglar resistant function of the doors is only ensured by two full turns of the key.

3.1 Door locking from outside using handle



To open from outside:
- Turn the key against the spring to the panel side (1.) and hold for a short time.
- Open the door slightly (2.) and release the key immediately.
- Open the door wide.

To lock from outside:
- Close the door.
- Lock the door by two full turns of the key to the frame side (3.).

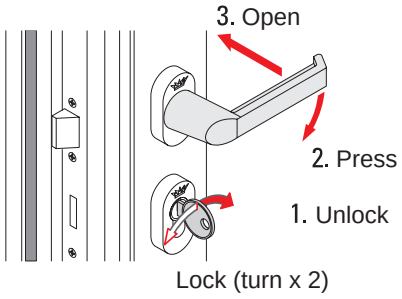


To open from inside:
- Press the door handle down (1.)
- To open the door (2.).

To lock from inside:
- Close the door.
- Lock the door by two full turns of the key to the frame side (3.).

3.2 Door lock fittings; external door with lever handle

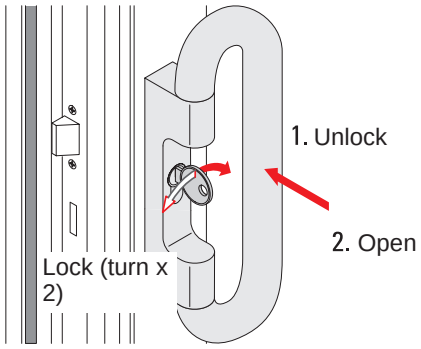
Outside



To open from inside/outside:
- Unlock the door by two full turns of the key to the panel side (1.).
- Press the door handle down (2.).
- To open the door (3.).

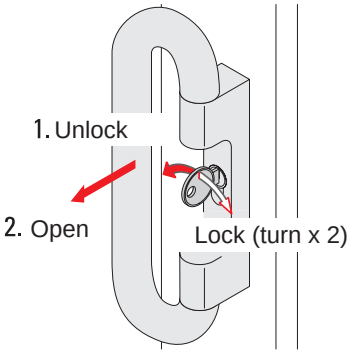
To lock: ⇒ reverse order.

3.3 Door lock fittings; inside and outside using push handle



To open from outside:
- Unlock the door by two full turns of the key to the panel side (1.).
- Open the door by pulling the push handle (2.).

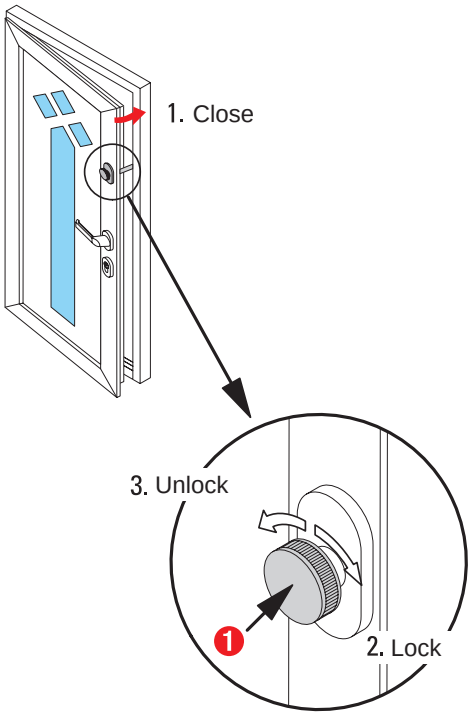
To lock: ⇒ reverse order.



To open from inside:
- Unlock the door by two full turns of the key to the panel side (1.).
- Open the door by pushing the push handle (2.).

To lock: ⇒ reverse order.

3.4 Door lock fittings; intruder catch



The intruder catch limits the opening angle of the door leaf to a small gap. The intruder catch must be re−engaged manually.

To engage the intruder catch:
- Close the door (1.).
- Engage the intruder catch by rotating the thumb turn (1) clockwise (2.).

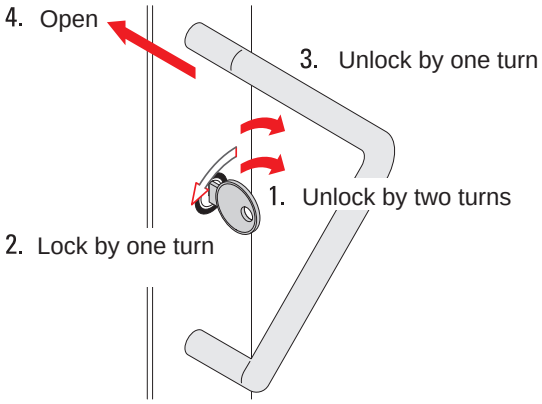
  The door leaf can only be opened as far as the catch allows.

To disengage the intruder catch from the <u>inside</u>:
- Disengage the intruder catch by rotating the thumb turn (1) anti−clockwise (3.).

  The door leaf can now be opened wide.

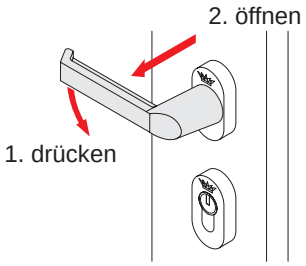
See points 3.1/3.2 for operation of the door handle and lock.

To disengage the intruder catch from <u>outside</u>:
The intruder catch can be disengaged from the outside by following a specific locking sequence.



Locking sequence:
- Unlock the door by **<u>two</u>** full turns of the key to the **<u>panel side</u>** (1.).
- Lock the door by **<u>one</u>** full turn of the key to the **<u>frame side</u>** (2.).
- Unlock the door by **<u>one</u>** full turn of the key to the **<u>panel side</u>** (3.).
- Turn the key against the spring to the panel side and open the door (4.).

3.5 Door lock fitting: door with accelerated opening function

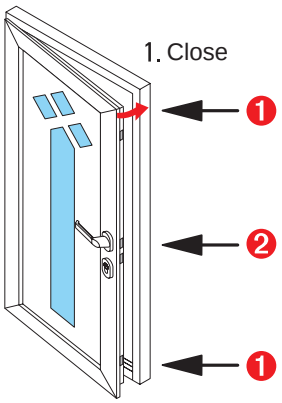


The locked door can be opened from, the inside without using the key.

To open the door:
- Press the door handle down (1.)
- Open the door (2.).

After opening, the door is unlocked. The key must be used to lock the door again.

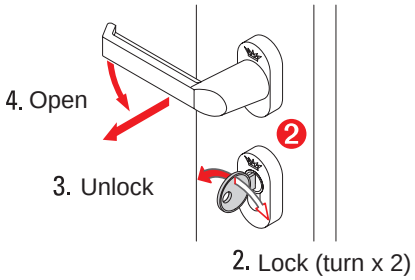
3.6 Door lock fittings; door with automatic locking



This type of lock fitting has additional latches (1) at the top and bottom of the door leaf.

- To close the door (1.).
  Operation:
  The top and bottom latches (1) lock the door automatically against being opened from outside.

- To open the door (4.).
  The door can be opened from the inside using the handle (see 3.4).



- To fully unlock the door (2.).
  Operation:
  Locking the door with the key (2) prevents it from being unlocked from the inside.

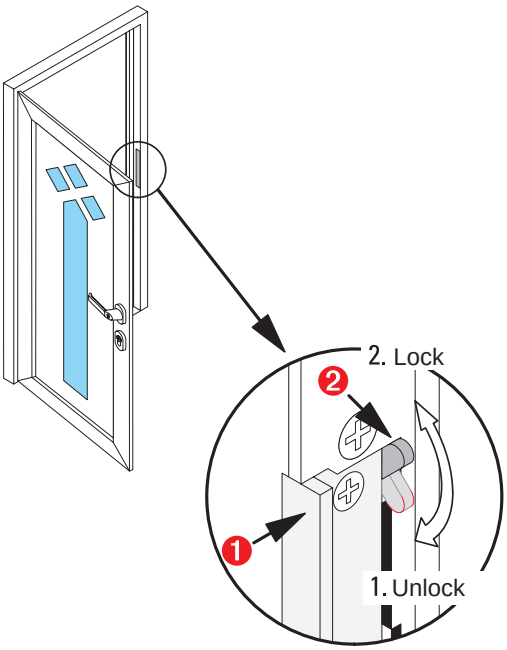
- To fully unlock the door (3.).
  Operation:
  The fully locked door can be opened from inside using the key (turn x 2) and the handle (4.).

3.7 Door lock fittings; door with motorised locking

Doors with motorised locking are opened and closed by a motor integrated into the door and are operated by the door handle or by remote control.

For further information, refer to the specific operating instructions.

3.8 Door lock fittings; door with electric opener



A separately mounted switch frees the closed door
for opening.
The door release allows the door to be opened for only as long as the switch is operated.

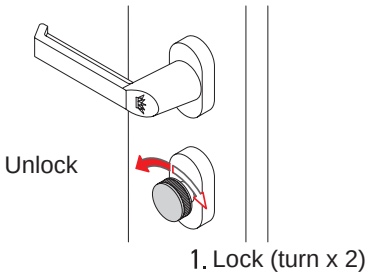
Day setting:
During the day, the latch on the electric opener can (1) be permanently disengaged.
The door can be opened at any time if the latch is disengaged.

To unlock:
- Disengage the latch (1) by moving the catch (2) to the bottom (1.).

To lock:
- Engage the electric opener by moving the catch (2) to the top (2.).

The electric opener will not release the door when it has been locked using the key.

3.9 Door lock fittings; cylinder lock with locking button

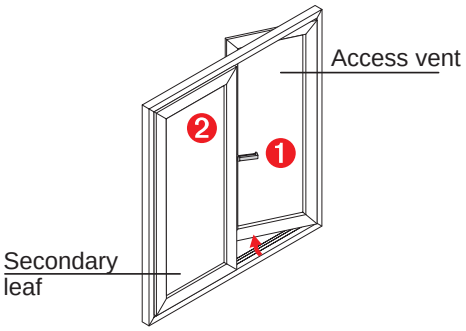


This cylinder lock is operated from the outside using a key and from the inside using the locking button.

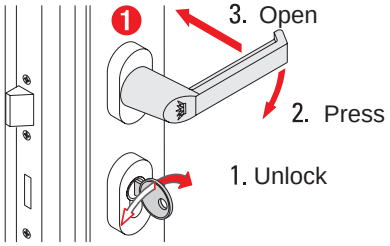
To lock:
- Close the door.
- Lock the door by two full turns of the locking button to the frame side (1.).

To unlock ⇒ reverse order.

3.10 Door lock fittings; double leaf doors



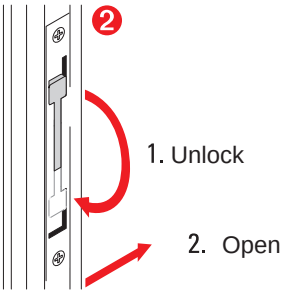
Access vent



To open the access leaf:
- Unlock the door by two full turns of the key to the panel side (1.).
- Press the door handle (1) down (2.).
- Open the door (3.).

To close ⇒ reverse order.

Secondary leaf

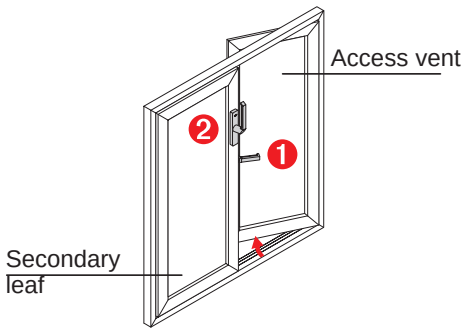


To open the secondary leaf:
- Open the access leaf.
- Release lever (2) in the rebate (1.).
- Open the secondary leaf (2.).

To close ⇒ reverse order.

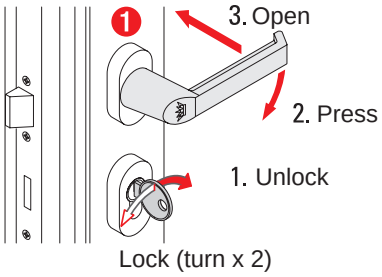
3.11 Door locks; double leaf doors with emergency lever bolt

a.) Secondary leaf locking via turn handle



When the door is locked, both leaves can be opened in an emergency using the emergency lever bolt

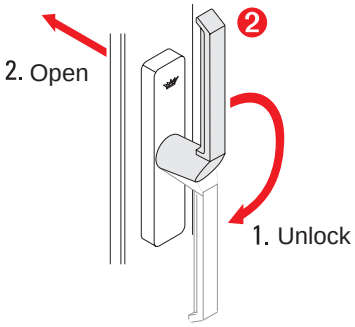
Access vent



To open the access leaf:
- Unlock the access leaf by one full turn of the key to the panel side (1.).
- Press the door handle (1) down (2.).
- Open the access leaf (3.).

To close ⇒ reverse order.

Secondary leaf



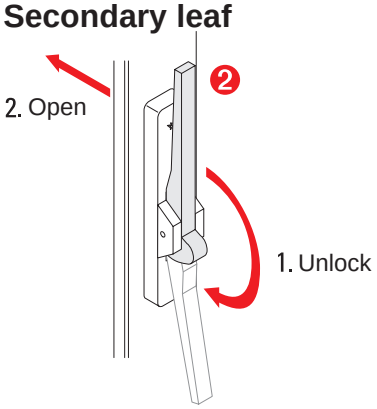
To open the secondary leaf:
- Open the access leaf.
- Release the emergency lever bolt (2) (1.).
- Open the secondary leaf (2.).

To close ⇒ reverse order.

Operation in an emergency:
- Release the emergency lever bolt (2) (1.).
- Open both access and secondary leaf (2.).

b.) Secondary leaf locking via swivel handle

Secondary leaf

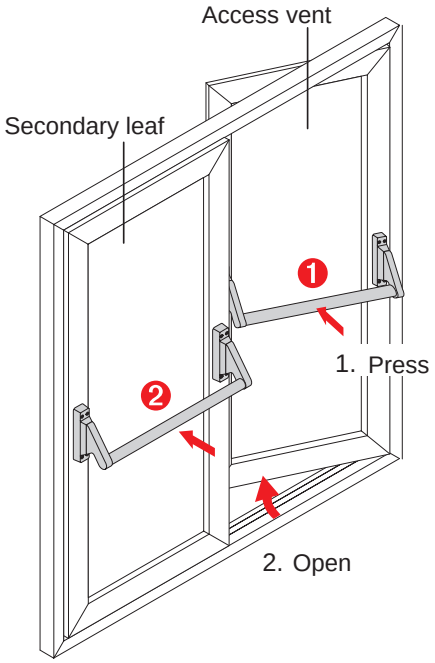


To open the secondary leaf:
- Open the access leaf (see point 3.11a.).
- Release the emergency lever bolt (2) (1.).
- Open the secondary leaf (2.).

To close ⇒ reverse order.

Operation in an emergency:
- Release the emergency lever bolt (2) (1.).
- Open both access and secondary leaf (2.).

c.) Secondary leaf locking via emergency rod handle

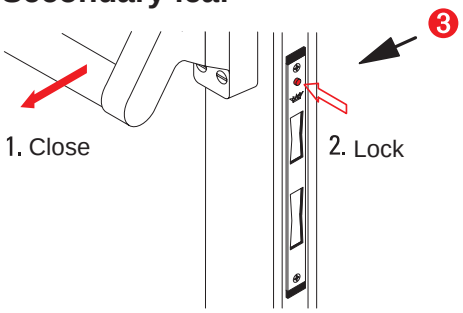


When the door is locked it can be opened in an emergency using the emergency rod handle.

To open the access leaf:
- Press the emergency rod handle (1) (1.).
- Push open the access leaf (2.).

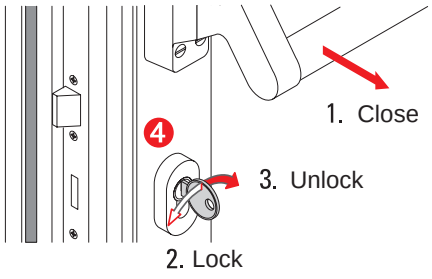
To open the secondary leaf:
- Press the emergency rod handle (2) (1.).
- Push open the secondary leaf (2.).

Secondary leaf



To lock the secondary leaf:
- Close the secondary leaf (1.).
- Lock the fittings by pressing the locking button (3) (2.).

Access vent



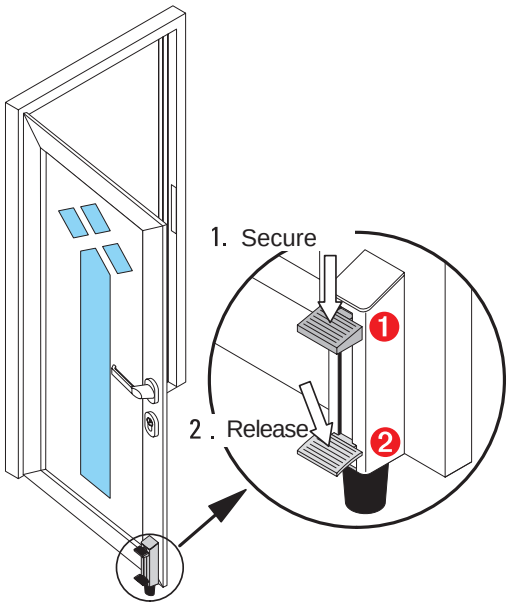
To lock the access leaf:
- Close the access leaf (1.) and lock by one full turn of the key (4) to the secondary leaf side (2.).

To unlock secondary and access leaves:
Both door leaves are opened by operating the emergency rod handle on the secondary leaf (2).

- The access leaf (1) alone can be opened using the rod handle by one full turn of the key to the panel side (3.).

First lock the secondary leaf, followed by the access leaf.

3.12 Door stop

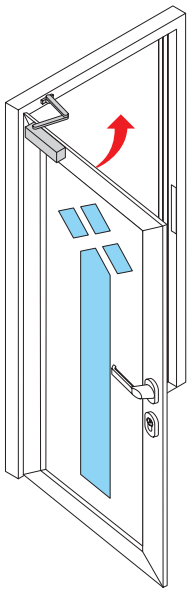


The door leaf can be fixed open using the door stop.

To fix open:
- Secure the doorstop by operating the pedal (1) (1.).

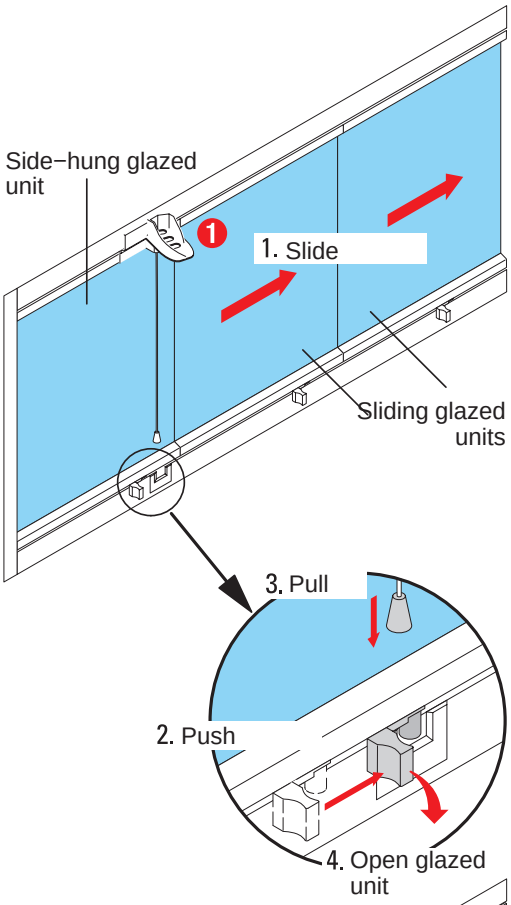
To release:
- Release the doorstop by operating the release pedal (2) (2.).

3.13 Door closer



The door closer automatically returns the door leaf to the closed position.
Some door closers hold the door leaf in the wide open position.
To close the door, it must be pulled once in the closing direction,
and thereafter it will close automatically.

4.0 Operation: Schüco balcony glazing, System LUMON

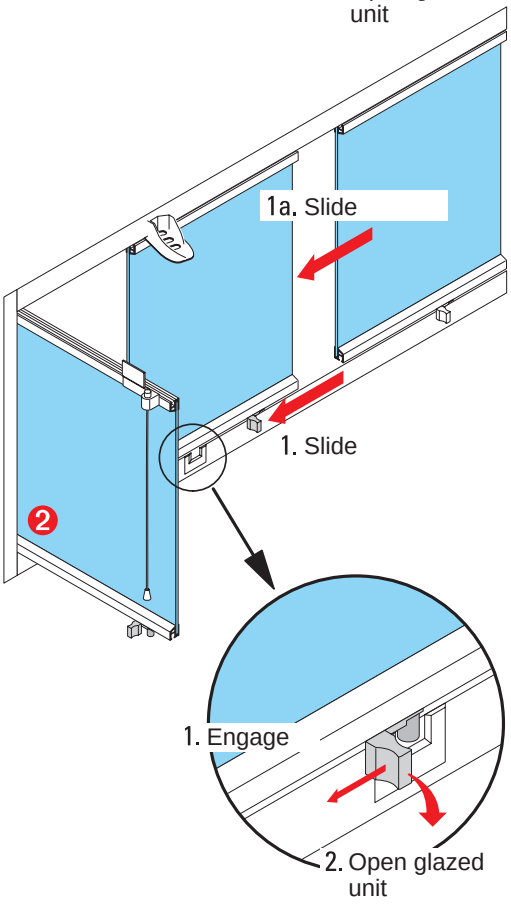


Balcony glazing is opened by pushing the glazed units in the direction of the side−hung glazed unit.
The side−hung glazed unit can be recognised by the position of the ventilation arm (1).

To open the side−hung glazed unit:

- Push the sliding glazed units away from the side−hung glazed unit (1.), leaving a small air gap.
- Push the bottom lock into the recess (2.)
- Release the top lock by pulling the cord (3.) and open the side−hung unit wide using the pull handle on the bottom lock (4.).

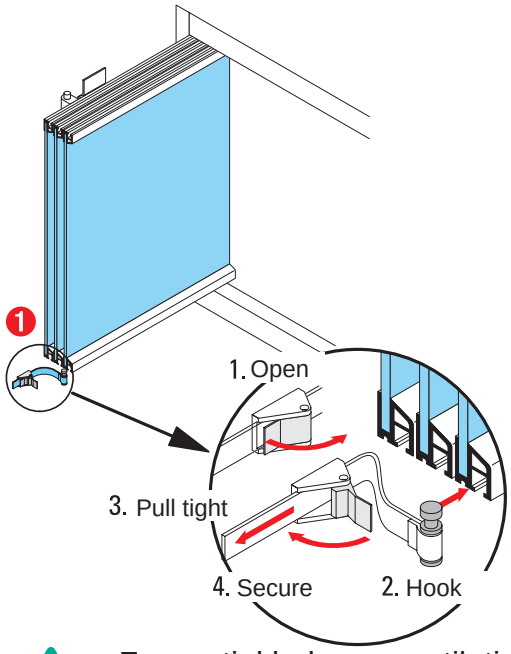
To close ⇒ reverse order.



To open the sliding glazed units:
The end position of the sliding glass units to the side−hung units is fixed by an end stop (2).
The sliding glass unit must engage properly into the end stop (the sliding glass unit locks into the side−hung glass unit).

- Slide the sliding glazed units up to the side−hung unit using the pull handle and engage (1.).
  During sliding, support the centre of the sliding glazed unit with a free hand (1a.).
- Open the sliding glazed unit wide using the pull handle on the bottom lock (2.).
- Open all other sliding glazed units as described above..

To close ⇒ reverse order.

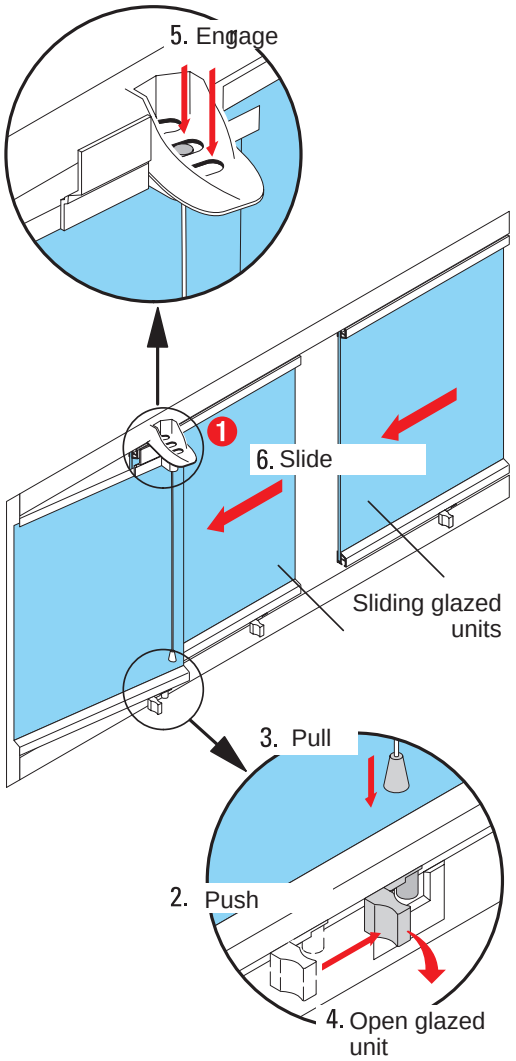


To secure the glazed units:
To secure the glass units in the open position, a securing tape (1) must be mounted on the connecting wall.

- Release the fastening on the securing tape (1.).
- Hook the sliding metal component into the bottom glass retention profile of the outer glass pane (2.).
- Pull the securing tape tight (3.) and secure by closing the fastening (4.).

To release the fastening ⇒ reverse order.

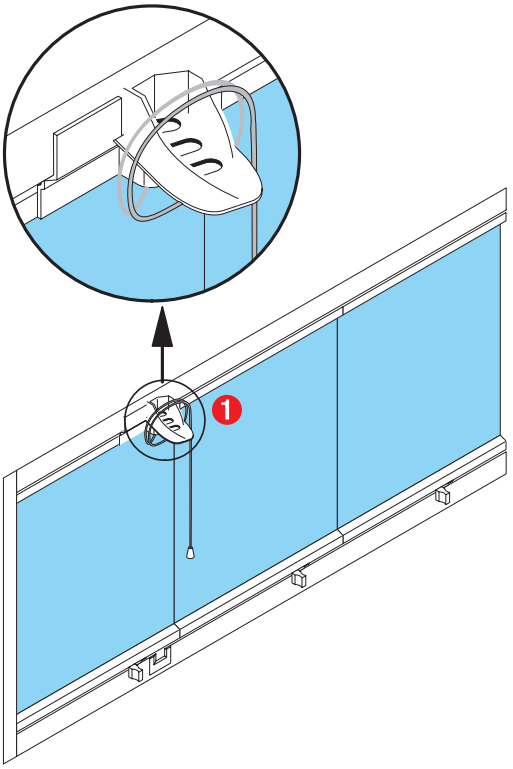
For partial balcony ventilation, the side−hung glazed unit can be opened in the night ventilation position and the sliding glazed units can be opened at the desired opening width.



To open in the night ventilation position:
The ventilation arm (1) can be engaged in either of two positions in the top catch mechanism.
This holds the side−hung glazed unit in the night ventilation position.

- Push the sliding glazed units away from the side−hung glazed unit, leaving a small air gap.
- Push the bottom lock into the recess (2.)
- Release the top lock by pulling the cord (3.)
- Open the side−hung glazed unit by the bottom lock (4) until the top catch mechanism engages into the desired position (5.).
- Push the sliding glazed units open to the required ventilation position (6.)

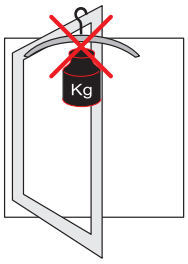
To close ⇒ reverse order.



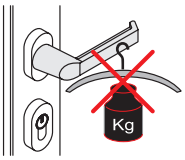
Child lock:
To prevent children opening the unit, shorten the cord for the top lock.
Wrap the cord around the top ventilation arm (1) a number of times until it can no longer be reached by children.

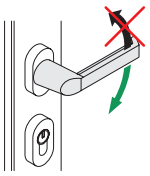
5.0 Misuse

Note the following advice to prevent damage to window and door units.

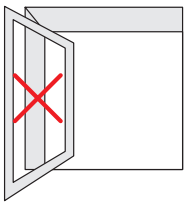


Do not load the frame or handles with extra weight.
The additional load can lead to deformation of the unit frame or damage to the handles.

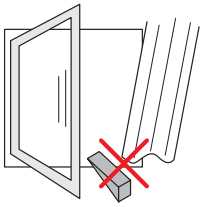




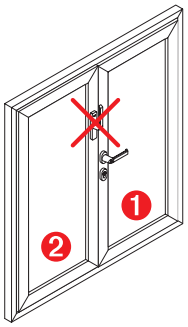
Operate the handle in the correct direction only and do not force beyond the anti−turn stop.
The additional load can lead to damage to the handles.



Do not rest the vent against projecting walls.
Damage can be caused by draughts slamming the vent open and shut.

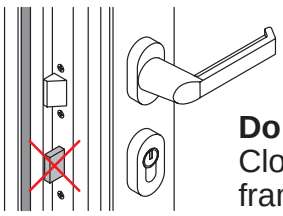


Do not wedge anything between the vent and the frame.
The additional load can lead to deformation of the frame.



Double leaf doors must NOT be opened using the secondary leaf (exception: emergency doors).
The additional load can lead to deformation of the unit frame or broken locks.

❶ Access leaf with door handle
❷ Secondary leaf



Do not turn the locks when the doors are open.
Closing the door when the lock is engaged can damage the door frame.

6.0 Cleaning and maintenance

6.1 General information

The following items must NOT be used for cleaning:

- Tools with sharp edges, e.g. knives, metal scrapers, steel wool, the scouring side of household sponges etc. damage surfaces.
- Aggressive cleaning fluids or solvents, e.g. cellulose thinner, nail polish remover etc., also cause irreversible damage to unit surfaces.

6.2 Cleaning fluids and maintenance materials

Cleaning fluids suitable for aluminium units are available from Schüco specialists.

Aluminium maintenance kit 298 672:

- Cleaners and preservatives
- Fittings spray
- Grease stick to maintain gaskets.
- Stainless steel cleaner

Maintenance materials for anodised aluminium units:

- Basic cleaner 298 181
  For initial and thorough cleaning. Cleans and conserves the aluminium surface.
- Metal polish 298 010
  This cleaner for anodised surfaces restores the matt finish to the aluminium and conserves the surface (can also be used on stainless steel).
- Universal aluminium cleaner 298 001
  Removes stubborn grime, minor scuff marks and scratches.

For cleaning colour−coated units, observe the instructions on the cleaning agent.

6.3 General cleaning information

For the best window care, clean the frames and gaskets every time the window panes are cleaned.
To do so, use our our cleaner and preservative 298 672.

Solid substances
Plaster, mortar or similar is best removed using a wooden or plastic spatula.

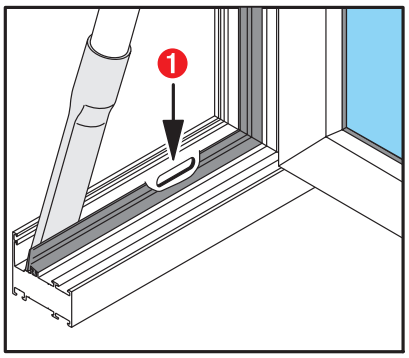
To prevent damage, observe the instructions for use of the specific cleaning agent

Stains
These can be removed safely and without residue using a cleaning agent from our range of cleaning products for aluminium units.

7.0 Maintenance

In addition to normal cleaning and maintenance, you should carry out an inspection of your aluminium units annually. This will extend the working life of the units and maintain ease of use.

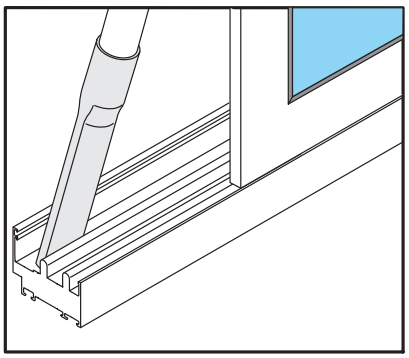
7.1 Cleaning the drainage slot



Remove dust and dirt from the space between the gaskets and the external side of the frame using a vacuum cleaner.

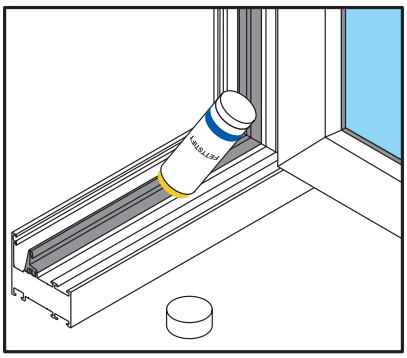
Blocked drainage slots (1) can be cleaned using, for example, a cocktail stick or cotton bud.

7.2 Cleaning the roller guides of sliding and folding units



Remove dust and dirt from the roller guides on the bottom side of the frame using a vacuum cleaner

7.3 Testing and lubrication of gaskets

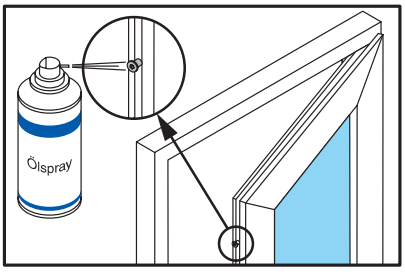


Rub all gaskets with the gasket maintenance material from 298 672.
This will maintain suppleness and prevent sticking.
At the same time, check all gaskets for damage.

Ask a Schüco specialist to replace all defective gaskets.

7.4 Maintenance of fittings components

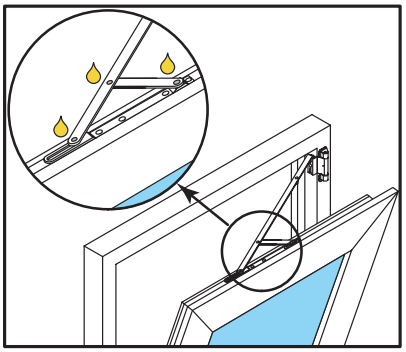
Lubricate all locking pins



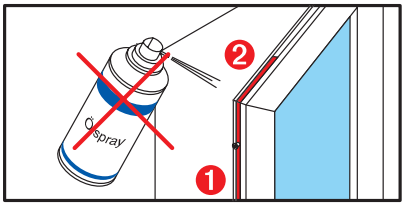
All moving parts of the fittings in your Schüco units are virtually maintenance free.
However, a small amount of acid−free oil and grease maintains the smooth running of the mechanics and ensures ease of use over a long time.

Spray the locking pins and the positioning points of the tilt stay with the fittings spray from the maintenance set 298 672.

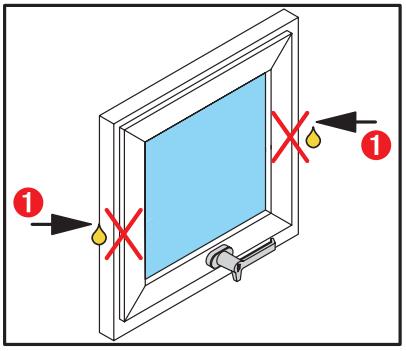
Lubricate the tilt stay



At all points, only a light application is required.
To prevent dirt accumulating, remove excess lubricant after use.



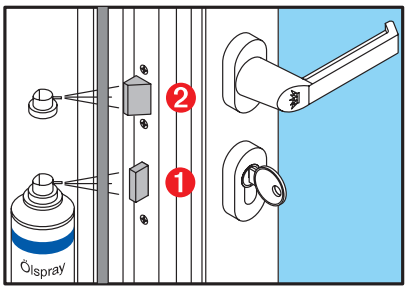
The locking bars (1), the locking bar guides and the corner drives (2) are lubricated during fabrication and do not require maintenance.



The pivots (1) of the vertical pivot windows are fitted with brakes to hold the unit open.

Do NOT oil or grease the pivots.

7.5 Doors

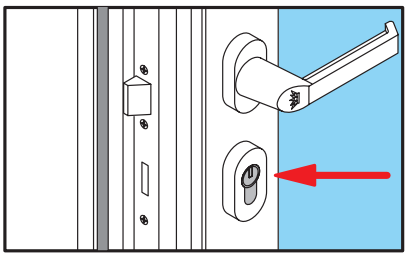


The bolt (1) and the latch (2) of door locks must be lubricated as necessary.

Prior to lubrication:
- Lock the door to expose the bolt.

After lubrication:
- Unlock the door to conceal the bolt.

7.6 Lubrication of cylinder lock

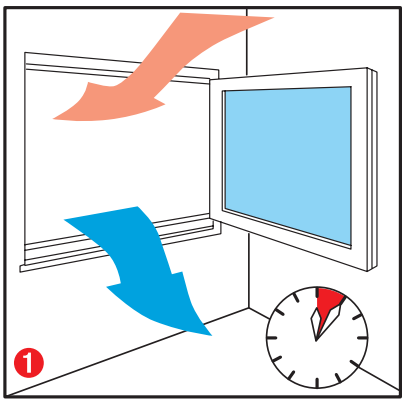


Use graphite powder only to lubricate the cylinder lock.

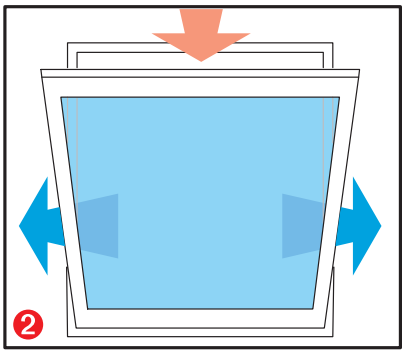
Schüco door hings are maintenance−free.

8.0 Correct ventilation

To prevent damage caused by damp:



Short blast ventilation



Prolonged ventilation only when heating is switched off

The weathertightness of your new Schüco window prevents air exchange between outside and inside.

In your home there are a number of sources of moisture:
- Steam from the kitchen and the bathroom.
- House plants and even people give off moisture constantly through their pores.

Humidity indoors causes condensation on the windows.
This moisture can lead to damp walls, patches of mildew, mould and deterioration of plaster.

- During the day, according to use of the room, ventilate as often as possible (1) [for at least 5 minutes].

- Avoid prolonged ventilation when the heating is on (2).

This short blast ventilation (1) loses relatively little heat, but replaces humid room air effectively. The air humidity returns to normal levels again.

9.0 Advice and repairs

If these operating instructions do not answer all your questions, please refer to your Schüco specialist for help.

In addition to providing expert advice, a specialist dealer can advise you on particular settings and repairs.

All repairs and settings should be undertaken by a Schüco specialist. Only repairs by a specialist using original parts guarantee the continued correct operation of your Schüco units.

9.1 Maintenance agreement

Schüco specialists can offer you the additional service of a maintenance agreement.
Under the terms of the maintenance agreement, the Schüco specialist will undertake all maintenance and repair work. Without a great investment, your aluminium units will be maintained at their optimum functional performance and value.

Index of key words