

PRODUCT CATALOGUE

2017



FAKRO



DEAR READERS

FAKRO not only ensures the highest quality products but also puts strong emphasis on their aesthetics. Our design is increasingly being recognized and rewarded. In 2015, we received Good Design Award, while last year we were given prestigious and acknowledged all over the world Red Dot Award for our DEF window. We are very proud that our design enjoys continuously growing recognition.

The changing construction market generates development of new products. FAKRO has introduced new flat roof windows and associated accessories.

Product Catalogue 2017 also includes additional product groups such as Solar Collectors and Roofing Membranes and Underlays. Loft Ladder product range is presented in a separate catalogue.

This edition of the Catalogue features extended list of products for which codes have been introduced. It will definitely improve the accurate identification of products in the course of trade and in the logistic process. Using this Catalogue will facilitate your work with customers and cooperation with FAKRO.

CONTENTS

Key to Symbols

		Sizes of Standard Window		
		55/78	55/98	66/98
width/height [cm]				
internal frame area [m ²]*		0.32	0.41	0.51
effective glazing area [m ²]*		0.22	0.29	0.38
roof window classes				
WINDOW SIZE CODE		01	02	03
Product Symbol	Description	PROFI	FTP-V U3	Window coated with cl
PRODUCT CODE		8726	+	+
<i>It should be completed with the symbol size (e.g. FTP-V U3 78x118 - code 872606).</i>				
not possible to produce				
possible to produce				

*Concerning roof windows

General Information

The material samples printed may differ in colour from the actual product. This is due to using different printing technology. FAKRO reserves the right to introduce design changes in products.

FAKRO reserves the right to change specifications and technical parameters of products without prior notice.

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ROOF WINDOWS

INTRODUCTION





MODERN LOFT

Rapidly developing technology, change of world perception and lifestyle have led to a new approach concerning the building industry. Technically advanced and ecologically friendly products offering fast and easy installation system have become very important. Durable, functional, safe and energy-efficient FAKRO roof windows gained great popularity and have become an integral part of newly constructed buildings.

Whilst FAKRO roof windows allow modern constructions to have an abundance of natural daylight, the unique design of the air inlet used in roof windows provides a constant inflow of fresh air, even when the window is closed. The glazing in the roof ensures a delightful view of the sky as well as the nearest surroundings. Windows equipped with a unique steel re-enforcement system offer safety and increased burglary resistance. FAKRO products are designed to provide a new quality of life.

ROOF WINDOWS VERSUS DORMER

When planning to develop the loft there are two options to allow light in: to incorporate a dormer (until recently a very popular solution) or install (becoming increasingly popular) modern roof windows.



Dormer

A dormer is a built-in wooden or brick structure. To build a dormer you will need to buy particular materials and carry out extra construction on the roof. The choice of the dormers when renovating or rebuilding the loft generally requires the assistance of the builder. When drawing the project all the various changes in the construction of the house have to be taken in account e.g. the weight of materials used, changes in the roof construction in respect to rafter spacing or additional trimmer beams being installed. There is also a need to submit the dormer project to the proper building authorities in order to obtain all the required planning permissions. When the construction of the dormer's walls is ready, they also have to be externally and internally insulated. The construction must be watertight, so there is an amount of finishing work to be done around the dormer as well. Of course all the above mentioned works should be done by professional craftsmen equipped with specialist tools.



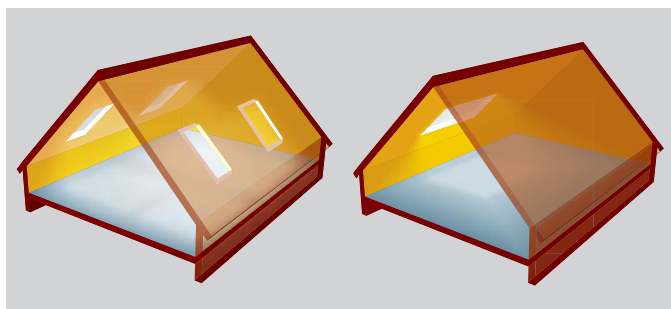
Roof Window

A roof window installation does not require any serious construction changes to the roof. The width of the window usually matches the space between the rafters and makes the installation quite simple. The window installation does not require the building of additional walls or buying additional building materials which will increase the construction weight and cost. There are special flashings offered, which are essential for the tight connection of the window to the roof with all kinds of roofing materials. In the package, there are window fitting instructions which enable you to install the window with the use of simple tools. Placing the window in the roof surface increases the angle of light entering the room and consequently enhances the level of illumination. Tests have proved that up to 50% more light enters the room than through a vertical window of the same size. To summarise, a roof window is a much more advantageous solution in comparison with the dormer because of:

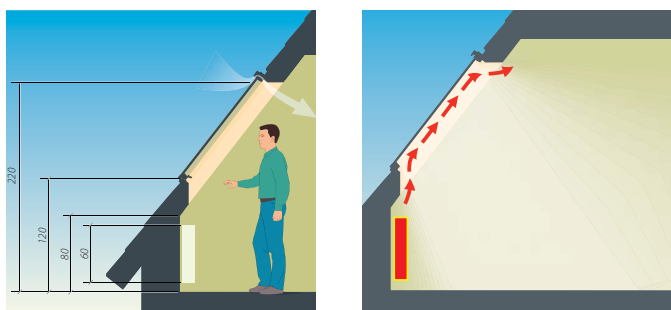
- smaller consumption of materials, is much lighter and cheaper: around 60- 70%;
- the roof window installation is fast (takes 2- 4 hours) and simple and does not require using complicated tools
- enhances room illumination by up to 50%;
- decreases heat loss of the building in comparison with the dormer's external construction walls.

It is much easier to secure water tightness when applying standard flashings with the roof window than when preparing and installing hand made and complicated dormer flashings. The roof window illuminates the room and should be situated in the best possible place. The roof window can be installed in places where the dormer installation because of its construction is not possible. The roof window can also be installed in various combinations gaining optimal illumination of the room, whereas in the case of a dormer this effect may be limited.

CHOOSING THE ROOF WINDOW



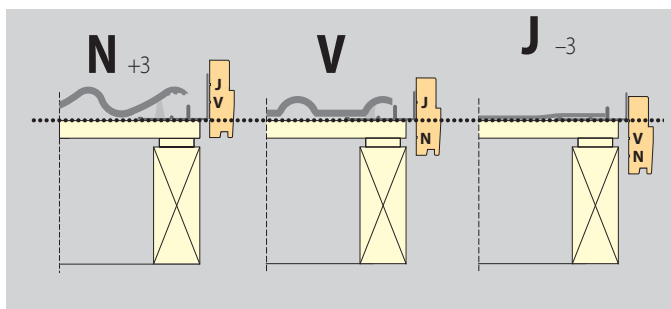
A number of smaller windows allows more light to enter than only one larger one.



Choosing the Correct Flashing

The installation system and a wide range of flashings which fit to various types of roofing materials, will ensure the correct choice of the flashing and correct installation depth of the window in the roof structure. Deeper roof window installation into the roofing material allows for better insulation around the window frame and enhances the aesthetics, especially when using flat roofing materials. Depending on the type of roofing material, roof structure and architectural requirements, FAKRO roof windows can be installed at three different depths:

- N (+3 cm) – window installed 3 cm above the roof slope;
- V (0 cm) – standard depth of installation;
- J (-3 cm) – window installed 3 cm deeper into the roof slope (only with centre pivot windows).



Window installation depths

The Right Windows

Roof windows are chosen depending on:

1. Intended use and height of the room.

The correct amount of natural light in the room is calculated by the proportion of the surface of the window's glass area to the total floor area. In a room for habitable purposes this proportion should be at least 1:8, and in special rooms where more natural light is required the ratio should be at least 1:12.

2. The pitch of the roof.

Height of the chosen window also depends on the roof pitch. The lower pitch of the roof, greater the height of the window should be.

The Window Placement

When deciding on the location of roof windows in the roof surface we should take into account an important principle, which states that the better illumination effects are accomplished by installing several windows in various parts of the roof than by fitting one large window.

Window Installation Height

A very important issue is the choice of window's installation height in the roof surface. Rules and instructions set out the place for mounting a roof window at a proper height above the floor level so as to optimally perform its functions.

It is recommended that in buildings where storeys are below 25m above ground level, the distance from the bottom edge of the opening window to the floor should be at least 0.85m. In buildings where storeys are more than 25m above ground level the aforementioned distance should be not less than 1.1m.

It should be noted that the higher the window is fitted, the more light enters the room. According to DIN 5034-1, section 4.2.2a "the upper window edge has to be situated at least 220cm above the floor level".

Another crucial aspect is the installation height of windows equipped with air inlets. Following instructions of Building Research Institute No. 343/96 it is recommended that "air inlets should be installed at height at least 200cm above the floor level, calculating from the bottom edge of the air inlet". In FAKRO windows, the air inlet is situated in the upper part of the frame. In order to follow regulations, the upper window edge should be placed minimum 220cm above the floor level. Recommended installation of FAKRO windows (bottom window edge) at level of 110 - 140cm above the floor complies with regulations as well as ensures excellent illumination and unrestricted view. Positioning the handle in the bottom section of the sash allows for convenient operation of properly installed windows. Installation of the window at this height allows the fixing of a standard radiator below the window and also allows proper lining construction. Thanks to this proper air circulation along the window glazing reduces the risk of condensation appearing on the window.

WHAT MAKES A FAKRO ROOF WINDOW BETTER?

THERMAL INSULATION

LOWER HEATING BILLS



Energy-efficient design

One of the top priorities when designing FAKRO roof windows is their energy-efficiency.

Special structure of the FTT U8 Thermo window featuring $U_w = 0,58 \text{ W/m}^2\text{K}$ makes it the most energy-efficient roof window with a single glazing unit in the world. Such structure allows the retention of thermal energy inside the room.

The application of the V40P air inlet in FAKRO windows ensures that the optimum level of fresh air is provided without unnecessary heat loss. The FAKRO roof window design allows for large thermal energy savings in the winter, which guarantees lower heating costs.



Ample natural light

The design of FAKRO roof windows provides appropriate illumination of the room within the loft space.

Specially shaped profiles of the frame and sash as well as an air inlet location in the upper part of the frame allows for the influx of high quantities of natural light.



Sustainable energy balance

In addition to providing an effective light source, roof windows also act as means of passive heating in winter. The larger glazed area provided by FAKRO windows is correspondingly more effective in this respect, with the free thermal energy being retained by virtue of their energy-efficient design.

Appropriate structure of FAKRO roof windows enables sustainable balance in terms of acquisition and loss of thermal energy.

SAFETY

HIGH SENSE OF SAFETY



Window reinforced structure – topSafe system

Roof windows have to ensure safety of use and protect against unauthorised access to the room from the roof. The patented system of the window structure reinforcement topSafe significantly improves resistance of roof windows to break-in attempts and protects against the sash opening under foot pressure if inadvertently stepped on. The topSafe system consists of:

- innovative installation system of specially shaped hinges
- metal element strengthening the locking system
- metal slat making break-in using tools much more difficult.

FUNCTIONALITY

EASE OF OPERATION



III safety class

Toughened glass together with the topSafe reinforced structure found on FAKRO roof windows enables them to meet the minimum class III safety as per EN 13049 for the whole window including glazing. FAKRO was the first company to introduce to the market a full range of windows achieving at least class III safety, setting a new standard in the roof window sector.



Anti-burglary protection

High level of anti-burglary protection is a crucial issue in FAKRO products. The standard window for pitched roofs – the FTP-V P2 Secure meets European 2nd anti-burglary class RC 2 N as per EN 1627. Installation of this type of windows in the roof considerably enhances safety and anti-burglary resistance of the building.



Handle in the base of the sash

Positioning the handle in the bottom section of the sash ensures easy operation of the window. Windows with the handle in the bottom section allow correct installation satisfying the requirements of DIN 5034-1* standard, according to which the upper window edge has to be situated 220cm above the floor level. With such installation system, the handle is always within easy reach. With higher installation of windows, even a tall person can freely approach open window with a pivot design. Advantages of the lower handle as an optimal solution have been recognized by other manufacturers and roof windows with the handle in the bottom have been introduced to their product range.

*standard effective on the German market



Automatic V40P air inlet

High functionality in FAKRO windows is also provided by the automatic V40P air inlet which optimally adjusts the amount of fresh air. Maintenance-free ventilation in FAKRO windows secures a healthy micro-climate in the loft and energy savings. Open air inlet features high watertightness, even during wind. It protects against dust and insects from the outside.



High window tightness

Using additional seals and a sash guiding system make the window feature high tightness. This groundbreaking system helps maintain the proper position of the sash in the frame and correct operation of seals during repeated opening and closing the sash. This solution ensures that the sash remains square within the frame.

ROOF WINDOW CONSTRUCTION

TYPES OF WINDOW PROFILES



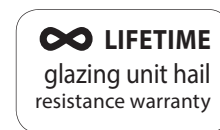
FAKRO products are constructed with a detailed analysis of their influence on nature. In this way, the company contributes to sustainable energy balance and protection of non-renewable resources of the Earth.

FAKRO obtains wood from forests with planned forestry economy and uses in the production process eco-friendly materials which do not contain harmful substances.



Sign of responsible forest management

FAKRO roof windows are products of the highest quality, manufactured from the best materials, based on the latest technologies, ensuring durability, safety, functionality and very good thermal insulation performance.

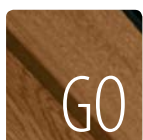


*details to be found in logistic card available at www.fakro.com and at Builders Merchants



The window durability is acquired by using specially selected high quality pinewood, vacuum impregnated and lacquered several times with eco-friendly acrylic lacquer in natural colour. Such windows find their destination in most of the rooms in the attic.

For windows with periodically elevated humidity levels (kitchens, bathrooms) we recommend wooden windows coated with three layers of white polyurethane lacquer to create durable and perfectly smooth surface. Visible parts of the window such as bolts or locking elements are made of plastic in white colour which add to its aesthetics.



Roof windows can also be manufactured in aluminium clad - plastic version. Multi-chamber PVC profiles are strengthened from the inside with galvanized steel. The plastic used in the window does not absorb any moisture and the window itself is durable and corrosion free.

The window is also available in golden oak and pine veneer. Intended for installation in rooms where elevated humidity levels stay for long time (wet rooms & shower rooms etc.).

AIR INLET CONSTRUCTION

The air inlet in roof windows ensures a constant and adjusted inflow of fresh air, even when the window is closed. Due to this feature, proper functioning of the natural ventilation in the loft is possible. The air inlet channel is made in such a way that its construction provides excellent thermal and acoustic performance. It also features very good filtering properties which prevent dust from entering the room.

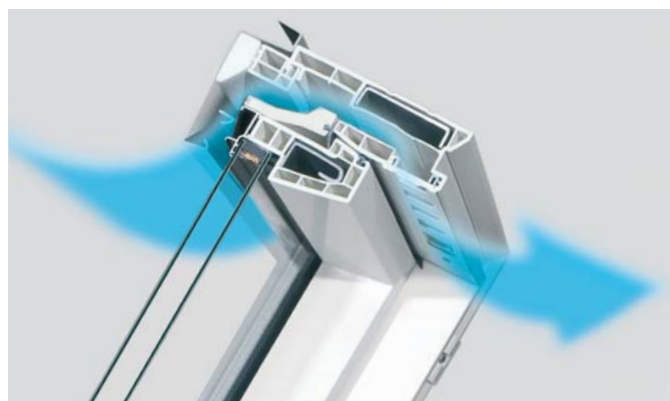
Situated in the window frame it does not diminish window's actual glazed surface.



Automatic V40P Air Inlet

Positioned in the top part of the frame. At a pressure difference of 10Pa air inlet capacity is up to 49m³/h depending on the window width. The capacity rises up to the point where the optimum value is achieved. If the pressure difference continues to grow, the airflow capacity stays on the same stable level. An elastic, pneumatic flap deflects, limiting the amount of inflowing air by reducing the air inlet duct area e.g. when strong gusts of wind appear and in the winter time. Used in the following windows:

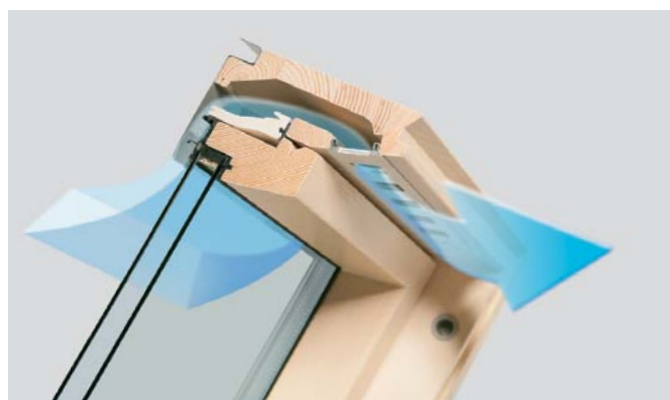
— FTP-V, FTU-V, FPP-V preSelect, FPU-V preSelect, FYP-V proSky, FDY-V Duet proSky, FGH-V Galeria.



Air Inlet V35

Positioned in the top part of the frame. When fully opened the air inlet ensures fresh air inflow up to 41m³/h at a pressure difference of 10Pa depending upon the window width. With increased capacity, air humidity inside the room is effectively decreased, thereby reducing condensation. The V35 air inlet can in part discharge air when natural ventilation is not working properly. Its excellent venting efficiency guarantees that a greater amount of stale and humid air is removed from the room.

Used in PTP-V, PPP -V preSelect, PYP-V proSky windows.



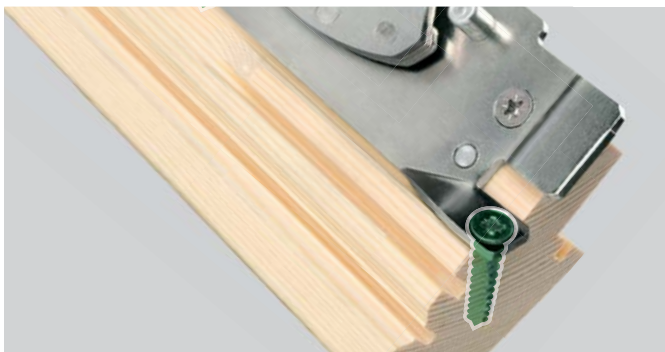
Air Inlet V22

Positioned in the top part of the frame. The air inlet is equipped with manual adjustable air flow regulator. When fully opened, this inlet supplies fresh air up to 31m³/h at a pressure difference of 10Pa. The inlet's construction provides excellent filtering and acoustic insulation. The air inlet V10 should be used solely in rooms where unassisted natural ventilation works well. Used in FTS-V windows.

topSafe SYSTEM



Roof windows have to ensure safety of use and protect against unauthorised access to the room from the roof. The special system of the window structure reinforcement topSafe significantly improves resistance of roof windows to break-in attempts and protects against the sash opening under foot pressure if inadvertently stepped on.

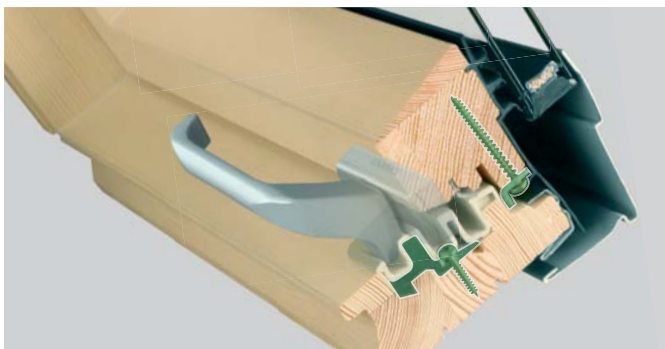


The topSafe system consists of:

- Innovative installation system of specially shaped hinges, which prevents wood cracks, pulling out hinges and pushing the sash inside. This solution is several times stronger than previously known and used.
- Metal element strengthening the locking system.
- Metal slat, making it difficult to break the window using tools.

Toughened glass and structure reinforcement make FAKRO windows achieve at least class III safety for the whole window, including glazing as per EN 13049.

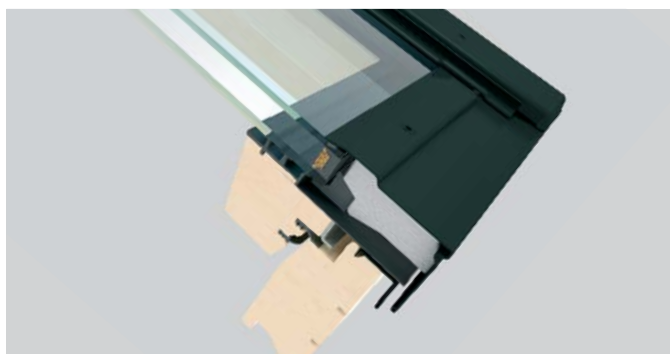
FAKRO was the first company to introduce to the market a full range of windows achieving at least class III safety, setting a new standard in the roof window sector.



thermoPro TECHNOLOGY

PROFI and LUX class roof windows are manufactured using **thermoPro** technology. The solutions introduced ensure improved quality and parameters of windows. **ThermoPro** technology increases energy-efficiency performance, provides greater durability, ensures excellent tightness and facilitates the installation process of roof windows.

thermoPro



BETTER THERMAL INSULATION OF WINDOWS

- Reduced heat loss and lower heating bills
- New version of low emission coating on the glass
- Introduction of insulation inserts in the bottom corners of the sash aimed at enhancing window's energy-efficiency performance



GREATER WOOD DURABILITY THANKS TO WATER DRAINAGE CHANNELS

Special water drainage channels are introduced in the lower corners of the frame to discharge water from condensation and potential leakage caused by, e.g. damaged external aluminium profiles. Wooden profiles are less exposed to the moisture, which adds to their durability.



EASIER INSTALLATION - GREATER COMFORT OF WORK

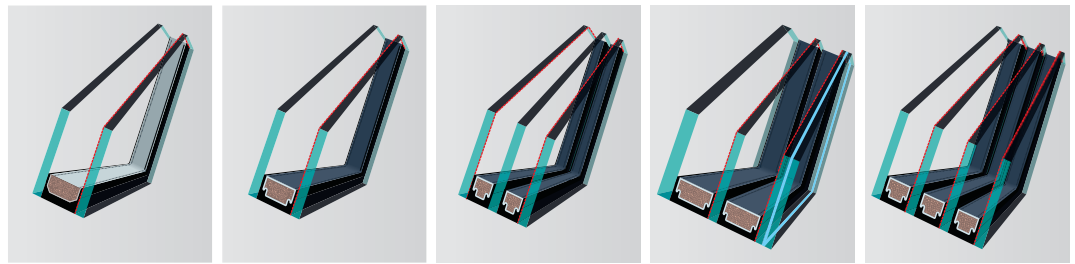
New brackets facilitate installation work and increase the ability to adjust roof windows during their installation. In addition, the use of Torx screws streamlines installation process of roof windows.



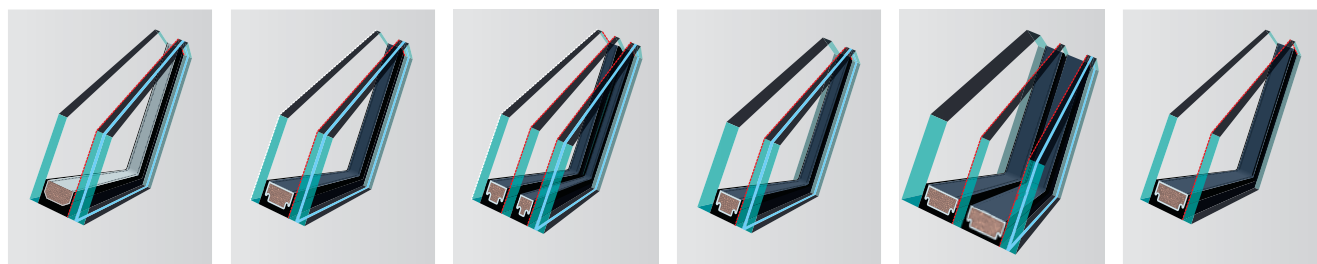
GREATER WINDOW TIGHTNESS IN TERMS OF AIR PERMEABILITY

Windows manufactured using thermoPro technology feature 3rd and 4th tightness class according to EN12207, thus reducing the amount of air penetrating into the room. It is particularly important for mechanical ventilation.

STANDARD GLAZING UNITS



GLAZING UNIT	U2	U3	U5	U6	U8
CHARACTERISTICS	Energy-efficient	Energy-efficient	Highly energy-efficient	Highly energy-efficient	Passive
U _g (EN 673)	1.1 W/m ² K	1.0 W/m ² K	0.5 W/m ² K	0.5 W/m ² K	0.3 W/m ² K
GLAZING STRUCTURE	4H-16-4T	4H-16-4T	4HT-10-4H-10-4HT	6H-18-4HT-18-33.2T	4H-12-4HT-12-4HT-12-4HT
CHAMBERS	ONE	ONE	TWO	TWO	THREE
TOUGHENED OUTER PANE	+	+	+	+	+
OUTER PANE WITH EASY MAINTENANCE LAYER	—	—	—	—	—
LAMINATED INNER PANE	—	—	—	+ (class P2A)	—
SPACER	STEEL	WARM TGI	WARM TGI	WARM TGI	WARM TGI
INERT GAS	ARGON	ARGON	KRYPTON	ARGON	KRYPTON
SUN RAYS TRANSMISSION (τ _v)	0.82	0.70	0.73	0.62	0.66
SUN ENERGY TRANSMISSION (SOLAR FACTOR g)	0.64	0.53	0.53	0.47	0.48
UV RAYS TRANSMISSION (τ _{UV})	63 %	74 %	72 %	99 %	99 %



P1	P2	P5	R1	R3	Z6
Anti-burglary	Anti-burglary	Anti-burglary	Acoustic	Acoustic	Energy-efficient
1.1 W/m ² K	1.0 W/m ² K	0.5 W/m ² K	1.0 W/m ² K	0.5 W/m ² K	1.1 W/m ² K
4H-14-33.2T	4H-15-33.2T	4HS-10-4HT-8-33.2T	6H-12-33.2SIT	8H-16-4HT-18-33.2SIT	4H-16-4HT
ONE	ONE	TWO	ONE	TWO	ONE
+	+	+	+	+	+
—	—	+	—	—	—
+ (class P2A)	+ (class P2A)	+ (class P2A)	+ (class P2A)	+ (class P2A)	—
STEEL	WARM TGI	WARM TGI	WARM TGI	WARM TGI	WARM TGI
ARGON	ARGON	KRYPTON	KRYPTON	ARGON	ARGON
0.70	0.70	0.63	0.69	0.62	0.81
0.52	0.52	0.48	0.52	0.46	0.64
99 %	99 %	99 %	99 %	99 %	57 %

In P5 glazing unit, the external pane is toughened and coated with an easy maintenance layer which prevents the build-up of dirt on the glass and helps to keep the window clean. In the first stage, the coating absorbs ultra-violet light from the sun causing a reaction on the glass surface which breaks down and loosens dirt. Secondly, the glass surface has a hydrophilic coating which, when rain or water flows across the window, causes it to do so evenly across the surface instead of forming water droplets, thereby taking dirt with it. In comparison with ordinary glass the water dries quickly without staining.

EXTERNAL CLADDING



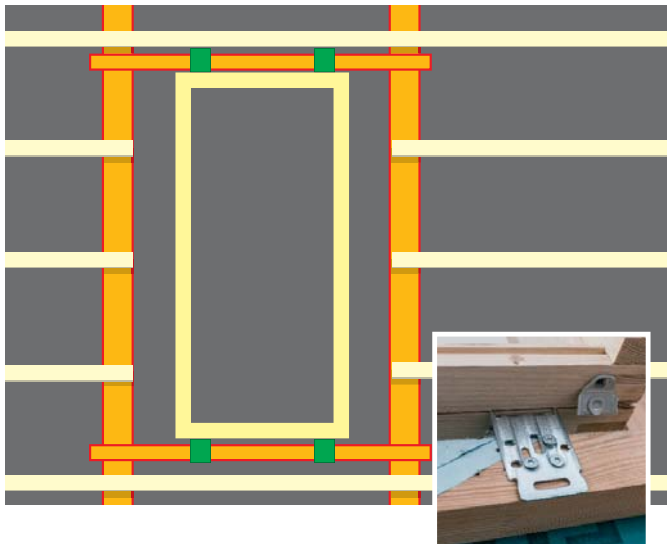
Externally, the window is covered with pressed profiles from aluminium sheet coated with modified polyester resistant to weather conditions and UV radiation. The basic colour is grey-brown RAL 7022. External cladding of the window perfectly matches standard flashings.

UNIVERSAL INSTALLATION SYSTEM



Installation Brackets

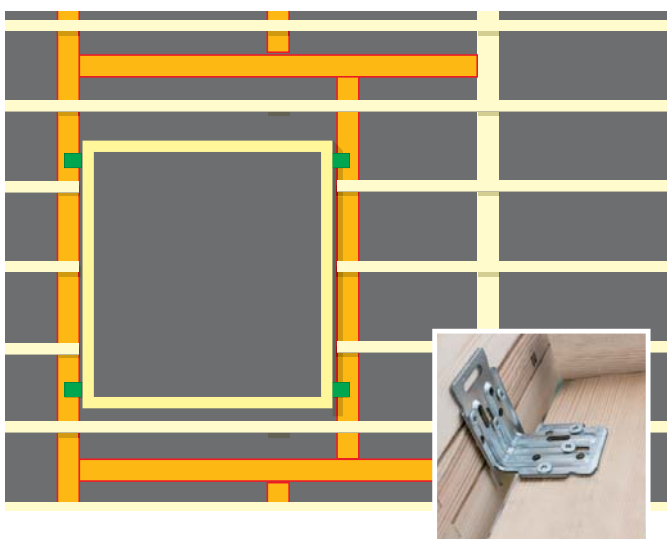
FAKRO roof windows are equipped with universal brackets, which allow installation either on trimmers or on rafters. Installation of the window at a chosen depth means that the milled groove marked with N, V, J letters is level with the top surface of the battens.



Installation on trimmers

Installation on trimmers

The roof window is installed on trimmers when the rafter spacing is much bigger than the window width. When installing on trimmers we can move the window horizontally to better adjust the place of installation in relation to the roofing material profile.



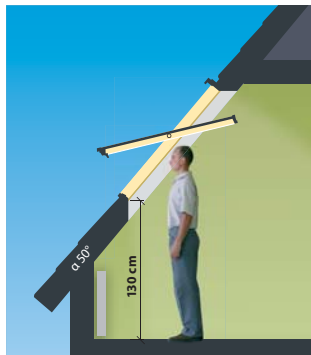
Installation on rafters

Installation on rafters

We install windows on rafters when the window width matches the spacing between rafters, hence it ensures stability of the construction and durability of the connection. Installation on rafters is recommended especially when we replace old windows (in already existing roofs) with new ones or when we install large windows. When the window's width is bigger than the spacing between rafters we use trimmers in the roof structure. Horizontal trimmer beams should be situated around 30-50 cm below the bottom and top edge of the window. It will allow proper lining construction of the window (bottom lining should be vertical to the floor and the head lining should be horizontal to the floor).

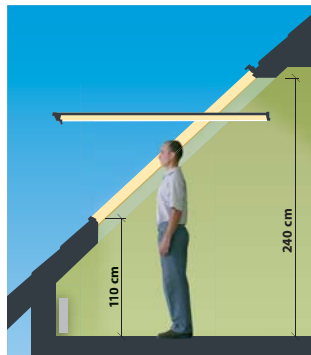
ROOF WINDOWS - TYPES

Pivot windows



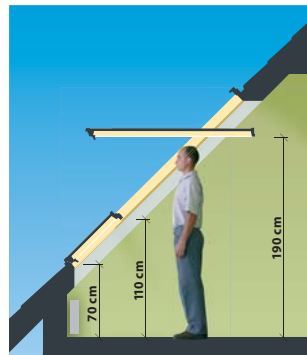
Pivot windows are the basic type of roof windows ensuring a flow of fresh air and allowing light into the room. These windows open only in a centre pivot method and can be rotated through 180° to clean the outer pane from within the loft and operate the awning blind. Centre pivot windows can be equipped with both external and internal accessories.

Windows with raised axis of rotation



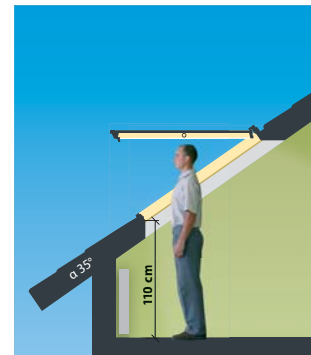
The axis of rotation is situated above the centre of the window, so even a tall person can easily walk up to the window edge. Window ensures a very good illumination, ventilation and provides a wide view to the outside. The lower part of the sash fulfils a top hung window function and the upper part of the sash is an additional source of daylight. The only roof windows on the market when installed in roofs with pitches 39°- 43° satisfy the requirements of DIN 5034-1 standard, according to which the bottom window edge has to be situated 95cm above the floor level and the top minimum 220 cm. Window with raised axis of rotation opens in centre pivot method and can be locked for cleaning at 160°. Windows can be equipped with both external and internal accessories.

Windows with raised axis of rotation with lower transom



There are two sashes placed in one frame of FDY-V window. The upper sash is opened like a pivot window but its axis of rotation is situated above the centre of the window. The lower sash is non-opening with external pane laminated. This window structure eliminates the need for traditional vertical combinations, hence offering a very good illumination, ventilation and a very wide view to the outside. The only roof windows on the market when installed in roofs with pitches 39°- 43° satisfy the requirements of DIN 5034-1 standard, according to which the bottom window edge has to be situated 95cm above the floor level and the top minimum 220 cm. The upper sash opens in centre pivot method and can be locked for cleaning at 160°. Windows can be equipped with both external and internal accessories.

Top hung and pivot windows

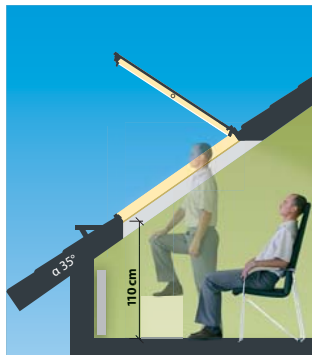


Top hung and pivot windows allow light and fresh air into the room, ensure unobstructed access to the window and a wide view to the outside through the open window. They can be opened in two ways:

- the outward opening function from 0° to 35° enables an easy approach to the window and a wide view
- the centre pivot function is used for cleaning the window and operating the awning blind.

Top hung and pivot windows can be equipped with external and internal accessories.

Panoramic top hung windows



Panoramic windows are distinguished with large dimensions allowing light and fresh air into the room. The window opens to a wide angle and allows for access to the roof.

These windows can be opened:

- outward opening function opens to 40°, enabling easy approach to the window and offering an unrestricted view
- outward opening function to 68°. The large dimensions of these windows and a big sash-opening angle enable you to easily access the roof as well as meet all emergency escape regulations.
- the centre pivot function is used for cleaning the window and operating the awning blind.

Panoramic windows can be equipped with external and internal accessories.

Balcony windows



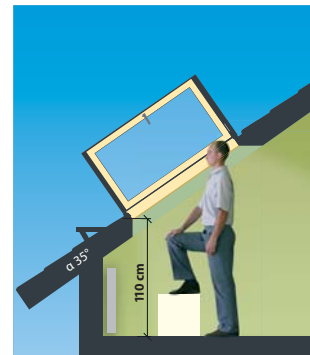
Balcony windows are innovative, large roof windows whose sashes when opened create a balcony. The upper sash opens without steps up to 45°. The lower sash can be tilted forward. In order to close the window, locks located by the rails of the frame have to be released. Side safety barriers are integrated into the bottom sash and slide out during opening. When closing the lower sash, balcony rails are hidden inside the window and are not visible above the roof surface. The window is operated by the handle located at the bottom of the upper sash. The window features a multi-point locking system, without a traditional locking assembly. After turning the handle, the sash is locked at two sides of the frame.

L-shaped combination windows



The L-shaped combination windows are installed in a vertical wall in combination with roof windows. This results in the amount of light entering the room, good ventilation and the field of view being greatly increased. The L-shaped combination windows can be opened in tilt and turn (BD_) and in tilt (BVP) mode. BXL is non-opening window. The L-shaped windows can be equipped with internal accessories.

Side hung escape windows



Access roof lights enable safe and easy access to the roof from habitable rooms. They also provide illumination and ventilation of the room. Windows feature a side hung structure, which opens through 90° to the right (FWR) or right side (FWL). Roof access windows can be equipped with the same internal accessories as for roof windows.



ROOF WINDOWS

TYPES





INTRODUCTION

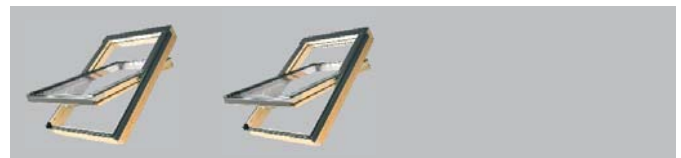
Roof windows are ideal solution for allowing daylight into the roof space. They let the light into the room, provide a view outside and allow ventilation to the attic. Depending on the type of the project as well as the customer's requirements, the correct type of the window can be selected for each room. Centre Pivot windows are still the most popular design throughout many countries due to their ease of use, relatively low maintenance and ability to suit many room types. Centre Pivot windows can be used in many different ways in such projects as a loft conversion, house extension or new build property. A wide choice of glazing options and thermal performance is available to ensure that the user can satisfy their build requirements to the maximum benefit. Wooden windows are fitted in standard rooms in the attic (bedrooms, children's rooms and corridors). In places with periodically elevated humidity levels (kitchens, bathrooms or laundries) we offer aluminium clad-plastic windows such as PTP-U3, PTP-V-U3, PYP-V proSky, PPP-V U3 preSelect. For those buildings which are designed as energy efficient houses (energy-efficient and passive buildings), the highly thermo-insulated FTT windows are recommended. Roof windows with increased antiburglary resistance FTP-V P2 Secure are particularly recommended for low pitched roof and multi-family buildings which are especially prone to burglary through a roof window. Windows with raised axis of rotation open in a pivot method, but the axis of rotation is situated above the centre of the window, so even a tall person can easily walk up to the window edge. Windows with raised axis of rotation with lower transom consist of two sashes. The upper sash with the axis of rotation and the lower non-opening with safe laminated pane. These windows are designed to allow larger sizes to be offered and allow even more natural daylight into the room. The top-hung and pivot roof windows are functional, comfortable in use and easy in maintenance. In addition to standard features, these roof windows allow easy access to the bottom edge of the window and provide a broad view when opened in the top-hung version. Galeria balcony windows are innovative, large roof windows whose sashes when opened create the effect of balcony and bring the outside to the inside. Windows for combinations constitute an 'extension' for roof windows. They can be combined with roof windows of any structure. Thanks to a universal installation system many types of windows can be combined together to allow more light into the room and enhance the living environment. The addition of triangular or arched type windows can add to the overall appearance of the installation to give an original and unique character to the design.

ROOF WINDOW CLASSES

Roof windows are visually similar to each other, however, they differ in many respects.

It is not only the thermal insulation and acoustic parameters that distinguish the various types. Not only should the design be taken into consideration but also the safety and security and ventilation capabilities of the window being used. All these elements influence and enhance the use of roof windows within the building construction. For easier identification, FAKRO roof windows are divided into three classes: STANDARD, PROFI and LUX.

STANDARD

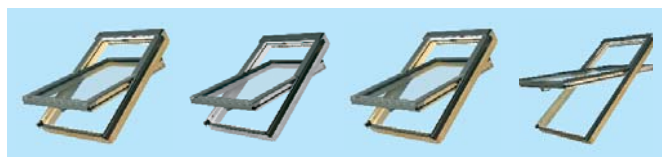


ROOF WINDOWS - STANDARD

Products in this class ensure the basic functions required from roof windows. They provide good illumination of the interior with natural daylight, ventilation of the attic and view to the outside. They feature good insulation and acoustic parameters as well as high quality which distinguish all FAKRO products. They are economically priced and widely used in construction.



PROFI

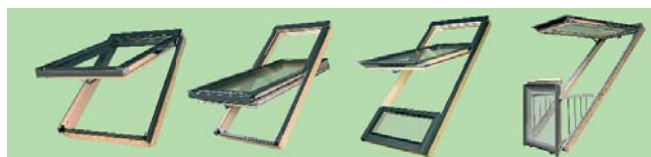


ROOF WINDOWS - PROFI

Increased parameters and higher functionality distinguish PROFI type windows. Greater thermal energy savings, improved anti-burglary safety and solutions enabling effective and optimum ventilation of the roof are only some of the characteristics specifying these products. PROFI windows are high quality product at a competitive price.



LUX



ROOF WINDOWS – LUX

The highest quality and unique functionality of products in terms of both design and functional aspects. Roof windows in this class feature special solutions which distinguish them in markets all over the world. Numerous solutions used in windows are protected by patents and have considerable influence on the functionality and comfort of roof window use. The best coefficients of insulation, high level of safety, impeccable aesthetics and ease of operation ensure that they are products of the highest quality which meet expectations of the most demanding customers. LUX class windows are unique and innovative products not offered by other manufacturers.



PIVOT WINDOWS

WINDOWS FTS U2, FTS-V U2



FEATURES:

- Popular design of roof windows.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- Handle 'Standard' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- **FTS-V U2** windows come with the V22 air inlet to secure air inflow, even when the window is tightly closed.
- Single chamber glazing unit.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FTS U2	FTS-V U2
window U-value	1.3 W/m ² K	1.3 W/m ² K
glazing U-value	1.1 W/m ² K	1.1 W/m ² K
acoustic insulation Rw	33 dB	32 dB
glazing unit	4H-16-4T	4H-16-4T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	—	V22
air inlet capacity	—	up to 31m ³ /h
air permeability class	class 3 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

STANDARD FTS U2 Window coated with clear lacquer

8724	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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STANDARD FTS-V U2 Window coated with clear lacquer, with V22 air inlet

8725	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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WINDOWS FTP-V U3, FTP-V U5, FTP-V P2, FTP R1



FEATURES:

- Richly equipped pivot windows.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- **FTP-V U3** windows equipped with energy-efficient single chamber glazing unit.
- **FTP-V U5** windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- **FTP-V P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- **FTP R1** windows are equipped with a special soundproof glazing unit. They do not come with the air inlet and as a result noise penetration into the room is effectively reduced.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FTP-V U3	FTP-V U5	FTP-V P2	FTP R1
window U-value	1.2 W/m ² K	0.97 W/m ² K	1.2 W/m ² K	1.2 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K	1.0 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	32 dB	33 dB	35 dB	39 dB
glazing unit	4H-16-4T	4HT-10-4H-10-4HT	4H-15-33.2T	6H-12-33.2SIT
inert gas filled panes	argon	krypton	argon	krypton
external glass toughened	+	+	+	+
internal glass anti-burglary	—	—	class P2A	class P2A
air inlet type	V40P	V40P	V40P	—
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h	up to 49m ³ /h	—
air permeability class	class 4 as per EN 1026, EN 12207			
impact resistance	class 3 (450mm) as per EN 13049			

FTP-V U5 + EHV AT Thermo, **Uw=0.86 W/m²K**

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

PROFI **FTP-V U3** Window coated with clear lacquer, with automatic V40P air inlet

8726	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX **FTP-V U5** Window coated with clear lacquer, with automatic V40P air inlet and highly energy-efficient glazing unit

8773	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI **FTP-V P2** Window coated with clear lacquer, with automatic V40P air inlet and internal glass anti-burglary class P2A

874W	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI **FTP R1** Window coated with clear lacquer, with soundproof glazing unit

871X	+	+	+	+	+	+	+	+	-	+	+	+	+	+
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P4 – anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 – obscure glass		+ 20 % to the price of window
Q4 – satin glass, Q5 – opaque glass		+ 20 % to the price of window
Non-standard FTP-V U3 window dimensions: a (width) = 50 – 134 [cm], b (height) = 78 – 160 [cm], Smax (a x b window surface) = 1.9 [m ²].		The price is calculated individually
Non-standard FTP-V U3 window dimensions: a (width) = 50 – 134 [cm], b (height) = 78 – 160 [cm], Smax (a x b window surface) = 1.9 [m ²].		The price is calculated individually
Non-standard shape		The price is calculated individually
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTP-V/C U3)		The price is calculated individually
FTP-V U3, FTP-V P2 without air inlet		+ 10 % to the price of window

Detailed information concerning non-standard windows on pages 66-69.



WINDOWS **FTU-V U3, FTU-V U5, FTU-V P2**



FEATURES:

- Richly equipped white pivot windows.
- Manufactured in specially prepared pine and vacuum impregnated.
- Coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- High moisture resistance. The window has a broad range of applications as it can be installed even in rooms with periodically elevated humidity levels such as kitchens or bathrooms.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- **FTU-V U3** windows equipped with energy-efficient single chamber glazing unit.
- **FTU-V U5** windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- **FTU-V P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FTU-V U3	FTU-V U5	FTU-V P2
window U-value	1.2 W/m ² K	0.97 W/m ² K	1.2 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	32 dB	33 dB	35 dB
glazing unit	4H-16-4T	4HT-10-4H-10-4HT	4H-15-33.2T
inert gas filled panes	argon	krypton	argon
external glass toughened	+	+	+
internal glass anti-burglary	—	—	class P2A
air inlet type	V40P	V40P	V40P
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h	up to 49m ³ /h
air permeability class	class 4 as per EN 1026, EN 12207		
impact resistance	class 3 (450mm) as per EN 13049		

FTU-V U5 + EHV AT Thermo, **Uw=0.86 W/m²K**

Available also in white acrylic version if required as **FTW-V**

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

PROFI FTU-V U3 White window with automatic V40P air inlet

875N	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTU-V U5* White window with automatic V40P air inlet and highly energy-efficient glazing unit

871M	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI FTU-V P2 White window with automatic V40P air inlet and internal glass anti-burglary class P2A

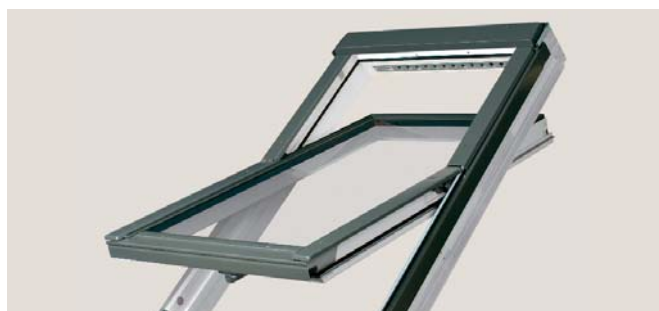
873H	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard windows

Description of available products		
Window with claddings		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	in metal covering – copper CU	+ 30 % to the price of window
	in metal covering – titanium-zinc TC	+ 20 % to the price of window
Window with glass		
	P4 – anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600	+ 30 % to the price of window
	R1 – soundproof glass Rw glazing = 41dB, Rw window = 39dB*	+ 30 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
	Q2 – obscure glass	+ 20 % to the price of window
	Q4 – satin glass, Q5 – opaque glass	+ 20 % to the price of window
Non-standard FTU-V U3 window dimensions: a (width) = 50 – 134 [cm], b (height) = 78 – 160 [cm], Smax (a x b window surface) = 1.9 [m ²].		The price is calculated individually
Non-standard FTU-V U5 window dimensions: a (width) = 50 – 134 [cm], b (height) = 78 – 140 [cm], Smax (a x b window surface) = 1.6 [m ²].		The price is calculated individually
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTU-V/C U3)		The price is calculated individually
FTU-V U3, FTU-V P2 without air inlet		+ 10 % to the price of window

*Window without air inlet.

Detailed information concerning non-standard windows on pages 66-69.



WINDOWS FTP-V U3 (U5, P2) Z-Wave, FTU-V U3 (U5, P2) Z-Wave



FEATURES:

- Electrically operated pivot roof windows equipped with the Z-Wave system as standard.
- Integrated window control mechanism (actuator and power supply) is situated under an aesthetic aluminium cover fitted in the lower part of the frame.
- Actuator with a reach of 24 cm makes it possible to open and close the sash.
- Built-in ZRD rain sensor automatically initiates the sash closing function when the first rain drops appear.
- Manufactured in specially prepared pine and vacuum impregnated.
- **FTP-V Z-Wave** coated with ecological acrylic varnish. Cover in silver colour.
- **FTU-V Z-Wave** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains. Cover in white colour.
- Turning the handle through 90° results in disconnecting the actuator from the sash in case of power failure or when the external pane requires cleaning.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- **FTP-V U3 Z-Wave** windows equipped with energy-efficient single chamber glazing unit.
- **FTP-V U5 Z-Wave** windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- **FTP-V P2 Z-Wave** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FT_V U3 Z-Wave	FT_V U5 Z-Wave	FT_V P2 Z-Wave
window U-value	1.2 W/m ² K	0.97 W/m ² K	1.2 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	32 dB	33 dB	35 dB
glazing unit	4H-16-4T	4HT-10-4H-10-4HT	4H-15-33.2T
inert gas filled panes	argon	krypton	argon
external glass toughened	+	+	+
internal glass anti-burglary	—	—	class P2A
air inlet type	V40P	V40P	V40P
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h	up to 49m ³ /h
air permeability class	class 4 as per EN 1026, EN 12207		
impact resistance	class 3 (450mm) as per EN 13049		

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware
- 2 years for electric control elements

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

LUX FTP-V U3 Z-Wave Window coated with clear lacquer, with automatic V40P air inlet

875P	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTU-V U3 Z-Wave White window with automatic V40P air inlet

875R	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTP-V U5 Z-Wave Window coated with clear lacquer, with automatic V40P air inlet and highly energy-efficient glazing unit

878F	+	+	+	+	+	+	+	+	+	+	+	+	-	+
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LUX FTU-V U5* Z-Wave White window with automatic V40P air inlet and highly energy-efficient glazing unit

878G	+	+	+	+	+	+	+	+	+	+	+	+	-	+
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LUX FTP-V P2 Z-Wave Window coated with clear lacquer, with automatic V40P air inlet and internal glass anti-burglary class P2A

876G	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTU-V P2 Z-Wave White window with automatic V40P air inlet and internal glass anti-burglary class P2A

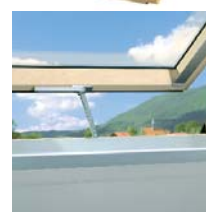
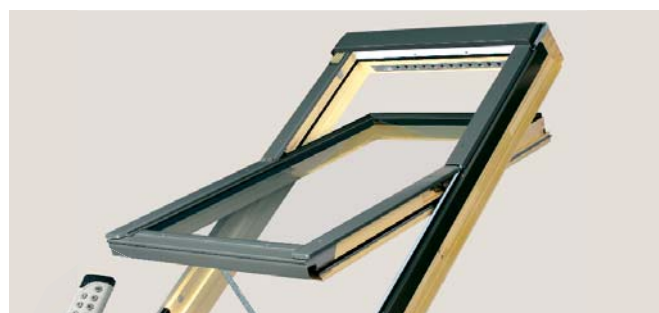
876H	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P4 - anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 - soundproof glass Rw glazing = 41dB, Rw window = 39dB*		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 - obscure glass		+ 20 % to the price of window
Q4 - satin glass, Q5 - opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTP-V/C U3 Z-Wave)		The price is calculated individually

* Window without air inlet.

Detailed information concerning non-standard windows on pages 66-69.



Silver cover



White cover

WINDOWS PTP U3, PTP-V U3, PTP/GO(PI) U3, PTP-V/GO(PI) U3, PTP-V U5



FEATURES:

- Pivot aluminium clad - plastic windows.
- Constructed of multi-chamber PVC profiles strengthened from the inside with galvanized steel which prevents their deformation. PVC profiles are made on the basis of calcium and zinc stabiliser available in the following colour:
 - white (RAL 9010),
 - golden oak veneer (GO),
 - pine veneer (PI).
 For windows in a veneer, profiles are dyed to improve their aesthetics.
- Designed for rooms with periodically elevated humidity levels (kitchens, bathrooms) and for premises where moist air stays for a longer period of time such as laundries, baths or drying rooms.
- The window is durable, resistant to corrosion and varying weather conditions, while its maintenance is reduced to an absolute minimum.
- The material used does not absorb moisture and features high resistance against acids and alcohols.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V35 air inlet which provides fresh air with the window tightly closed.
- PTP windows do not have the air inlet.
- PTP U3 and PTP-V U3 windows equipped with energy-efficient single chamber glazing unit.
- PTP-V U5 windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



thermoPro

Technical Specification	PTP U3	PTP-V U3	PTP-V U5
window U-value	1.3 W/m ² K	1.3 W/m ² K	0.95 W/m ² K
glazing U-value	1.0 W/m ² K	1.0 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	32 dB	32 dB	34 dB
glazing unit	4H-16-4T	4H-16-4T	4HT-10-4H-10-4HT
inert gas filled panes	argon	argon	krypton
external glass toughened	+	+	+
internal glass anti-burglary	—	—	—
air inlet type	—	V35	V35
air inlet capacity	—	up to 41m ³ /h	up to 41m ³ /h
air permeability class	class 3 as per EN 1026, EN 12207		
impact resistance	class 3 (450mm) as per EN 13049		

PTP-V U5 + EHV AT Thermo, $U_w=0.88 \text{ W/m}^2\text{K}$

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

STANDARD PTP U3 White aluminium clad - plastic window, resistant to moisture

8705	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI PTP-V U3 White aluminium clad - plastic window with V35 air inlet, resistant to moisture

8717	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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STANDARD PTP/GO U3 Aluminium clad - plastic window in golden oak veneer, resistant to moisture

871H	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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STANDARD PTP/PI U3 Aluminium clad - plastic window in pine veneer, resistant to moisture

871J	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI PTP-V/GO U3 Aluminium clad - plastic window in golden oak veneer with V35 air inlet, resistant to moisture

8777	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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PROFI PTP-V/PI U3 Aluminium clad - plastic window in pine veneer with V35 air inlet, resistant to moisture

8785	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX PTP-V U5 White aluminium clad - plastic window with V35 air inlet and highly energy-efficient glazing unit, resistant to moisture

871K	+	+	+	+	+	+	+	+	-	+	+	+	-	+
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Non-standard windows

Description of available products		
Window with claddings		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	in metal covering - copper CU	+ 30 % to the price of window
	in metal covering - titanium-zinc TC	+ 20 % to the price of window
Window with glass		
	P2 – laminated, anti-burglary (class P2A)	+ 10 % to the price of window
	P4 – anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600	+ 30 % to the price of window
	R1 – soundproof glass Rw glazing = 41dB, Rw window = 39dB*	+ 30 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
	Q2 – obscure glass	+ 20 % to the price of window
	Q4 – satin glass, Q5 – opaque glass	+ 20 % to the price of window
Non-standard window dimensions: a (width) = 54 – 134 [cm], b (height) = 78 – 160 [cm], Smax (a x b window surface) = 1.6 [m ²].		
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. PTP/C U3, PTP-V/C U3)		The price is calculated individually



Detailed information concerning non-standard windows on pages 66-69.

WINDOWS **FTT U8 Thermo, FTT U6, FTT R3**



FEATURES:

- Pivot windows featuring a specialist and innovatory design.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- Widened wooden profiles and specially designed frame of the sash.
- Handle 'Elegant' positioned in the base of the sash.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- Quintuple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- **FTT U8 Thermo** windows equipped with triple chamber glazing unit and designed to be widely used in passive construction which is confirmed by 'Passive House' certificate.
- The warmest roof window on the market with a single glazing unit.
- **FTT U6** windows equipped with double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- **FTT R3** windows equipped with double chamber glazing unit with a special soundproof glass which significantly reduces noise penetration into the room.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 70°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FTT U8 Thermo	FTT U6	FTT R3
window U-value	0.58 W/m ² K	0.8 W/m ² K	0.81 W/m ² K
glazing U-value	0.3 W/m ² K	0.5 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	36 dB	38 dB	42 dB
glazing unit	4H-12-4HT-124HT-12-4HT	6H-18-4HT-18-33.2T	8H-16-4HT-18-33.25IT
inert gas filled panes	krypton	argon	argon
external glass toughened	+	+	+
internal glass anti-burglary	—	—	class P2A
air inlet type	—	—	—
air inlet capacity	—	—	—
air permeability class	class 4 as per EN 1026, EN 12207		
impact resistance	class 5 (950mm) as per EN 13049		

FTT U6 + EHV AT Thermo, **Uw=0.71 W/m²K**

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

LUX FTT U6 Highly energy-efficient window coated with clear lacquer

8778	-	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTT U8 Thermo* Highly energy-efficient window coated with clear lacquer, installed with EHV-AT Thermo flashing and XDK set

871A	-	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FTT R3 Highly energy-efficient window coated with clear lacquer and soundproof glazing unit

871L	-	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard windows

Description of available products	
Window with wooden elements	
painted in colours from the RAL palette	+ 20 % to the price of window
painted with lazulite lacquer	+ 30 % to the price of window
in mahogany woodwork	+ 10 % to the price of window
Window with claddings	
painted in colours from the RAL palette	+ 20 % to the price of window
in metal covering - copper CU	+ 30 % to the price of window
in metal covering - titanium-zinc TC	+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTT/C U6, FTT/C U8 Thermo)	The price is calculated individually

*Window provided in a set with EHV-AT Thermo flashing and XDK insulation flashings to suit a single window.

Information concerning installation of Thermo windows in combination must be given when placing an order. In such case, the set with windows will include the appropriate EHV-AT Thermo modules used for combining windows.



WINDOWS **FTP-V P2 Secure, FTU-V P2 Secure**



Technical Specification	FTP-V P2 Secure	FTU-V P2 Secure
window U-value	1.2 W/m ² K	1.2 W/m ² K
glazing U-value	1.0 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	35 dB	35 dB
glazing unit	4H-15-33.2T	4H-15-33.2T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	class P2A	class P2A
air inlet type	V40P	V40P
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

FEATURES:

- Anti-burglary pivot windows meet European 2nd anti-burglary class RC 2 as per EN 1627.
- Equipped with a unique anti-burglary solutions - a system preventing glazing removal, anti-burglary internal glass laminated class P2A and handle with a lock.
- Manufactured in pine and vacuum impregnated.
- **FTP-V Secure** coated with ecological acrylic varnish.
- **FTU-V Secure** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- Windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

LUX FTP-V P2 Secure Window coated with clear lacquer, with automatic V40P air inlet and internal glass anti-burglary

8783	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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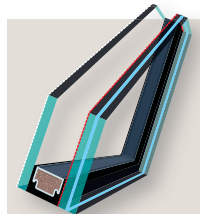
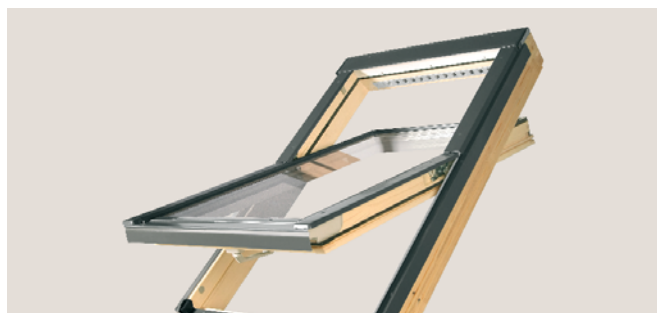
LUX FTU-V P2 Secure White window with automatic V40P air inlet and internal glass anti-burglary

8741	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard windows

Description of available products	
Window with wooden elements	
painted in colours from the RAL palette	+ 20 % to the price of window
painted with lazulite lacquer	+ 30 % to the price of window
in mahogany woodwork	+ 45 % to the price of window
Window with claddings	
painted in colours from the RAL palette	+ 20 % to the price of window
in metal covering - copper CU	+ 30 % to the price of window
in metal covering - titanium-zinc TC	+ 20 % to the price of window
Non-standard FTP-V P2 window dimensions: a (width) = 50 – 134 [cm], b (height) = 78 – 160 [cm], Smax (a x b window surface) = 1.9 [m ²].	The price is calculated individually
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTP-V/C P2)	The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



Laminated anti-burglary internal glass P2A class with easy maintenance layer



System protecting against glazing removal



Handle with lock

ARC WINDOWS FTP/B Z6



FEATURES:

- Arc window with design similar to standard pivot window.
- Top part of the window is curved giving the interior a remarkable character.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Installed in the roof using a special flashing which is ordered separately.
- Can be installed in prefabricated dormer.
- Can be installed in horizontal combinations.









Technical Specification	FTP/B Z6
window U-value	1.4 W/m ² K
glazing U-value	1.1 W/m ² K
acoustic insulation Rw	33 dB
glazing unit	4H-16-4HT
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	—
air inlet type	—
air inlet capacity	—
air permeability class	class 4 as per EN 1026, EN 12207
impact resistance	class 3 (450mm) as per EN 13049

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit
- 20 years for hardware

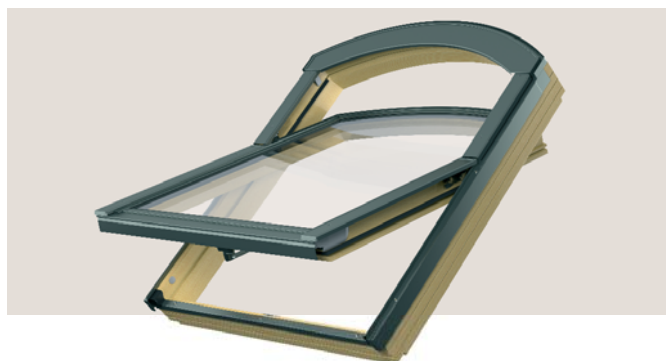
Sizes of Standard Windows

PRODUCT CODE	55/87 0.32	66/108 0.41	78/130 0.51	94/133 0.62	114/158 0.75	134/119 0.62														
																				
	AW	BX	CY	DZ	EQ	FV														

LUX **FTP/B Z6** Window coated with clear lacquer

870L	+	+	+	+	+	+														
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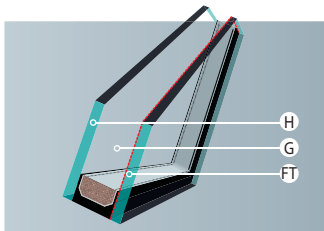
When ordering it is required to provide the flashing type used for manufacture with the window.



TECHNICAL PARAMETERS OF STANDARD PIVOT WINDOW TYPES

FTS U2, FTS-V U2

Window specification:
Window U-value = 1.3 W/m²K
Acoustic insulation Rw = 32dB.



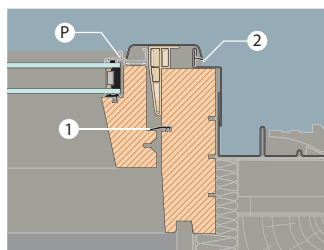
Energy-efficient glazing unit:
U-value = 1.1 W/m²K as per EN 673

H – toughened glass
G – glazing cavity filled with inert gas - argon
FT – glass float with low emission coating

Glazing unit: 4H – 16 – 4T

FTS-V U2 - V22 air inlet with air flow up to 31 m³/h

Pinewood, vacuum impregnated and coated with ecological acrylic varnish.



Seals:
1 – clinging seal
2 – side seal

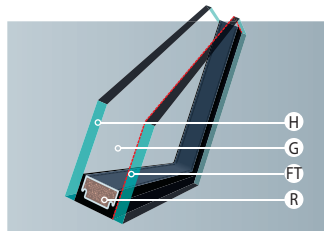
P – coated profile tightening the glazing



Coated handle 'Standard' with multi-point opening.

FTP-V U3

Window specification:
Window U-value = 1.2 W/m²K
Acoustic insulation Rw = 32dB.



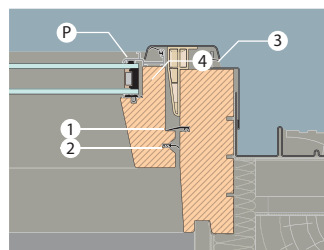
Energy-efficient glazing unit:
U-value = 1.0 W/m²K as per EN 673

H – toughened glass
G – glazing cavity filled with inert gas - argon
FT – glass float with low emission coating
R – warm spacer

Glazing unit: 4H – 16 – 4T

Automatic V40P air inlet with air flow up to 49 m³/h

Pinewood, vacuum impregnated and coated with two layers of ecological acrylic varnish.



Seals:
1 – clinging seal
2 – peripheral seal
3 – side seal
4 – glazing seal

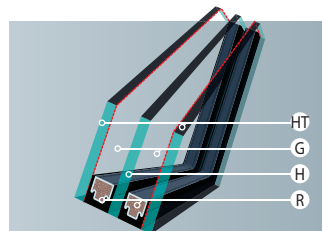
P – coated profile tightening the glazing



Anodised handle 'Elegant' with multi-point opening.

FTP-V U5

Window specification:
Window U-value = 0.97 W/m²K
Acoustic insulation Rw = 33dB.



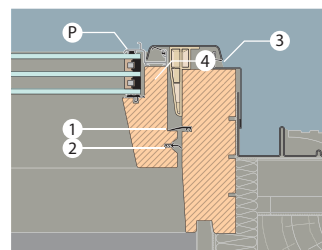
Energy-efficient glazing unit:
U-value = 0.5 W/m²K as per EN 673

HT – toughened glass with low emission coating
G – glazing cavity filled with inert gas - krypton
H – toughened glass
R – warm spacer

Glazing unit: 4HT – 10 – 4H – 10 – 4HT

Automatic V40P air inlet with air flow up to 49 m³/h

Pinewood, vacuum impregnated and coated with two layers of ecological acrylic varnish.



Seals:
1 – clinging seal
2 – peripheral seal
3 – side seal
4 – glazing seal

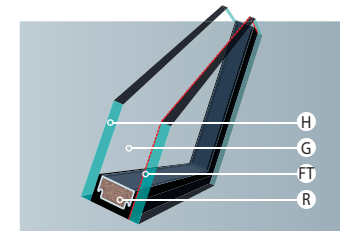
P – coated profile tightening the glazing



Anodised handle 'Elegant' with multi-point opening.

FTU-V U3

Window specification:
Window U-value = 1.2 W/m²K
Acoustic insulation Rw = 32dB.



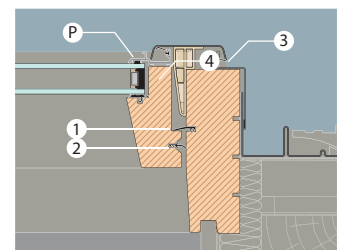
Energy-efficient glazing unit:
U-value = 1.0 W/m²K as per EN 673

H – toughened glass
G – glazing cavity filled with inert gas - argon
FT – glass float with low emission coating
R – warm spacer

Glazing unit: 4H – 16 – 4T

Automatic V40P air inlet with air flow up to 49 m³/h

Pinewood, vacuum impregnated and coated with three layers of white polyurethane lacquer.



Seals:
1 – clinging seal
2 – peripheral seal
3 – side seal
4 – glazing seal

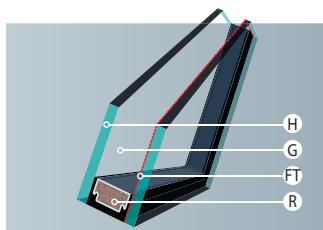
P – coated profile tightening the glazing



Anodised handle 'Elegant' with multi-point opening.

PTP-V U3

Window specification:
 Window U-value = 1.3 W/m²K
 Acoustic insulation Rw = 32dB.



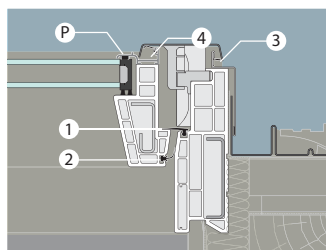
Highly energy-efficient glazing unit:
 U-value = 1.0 W/m²K as per EN 673

H – toughened glass
 G – glazing cavity filled with inert gas - argon
 FT – glass float with low emission coating
 R – warm spacer

Glazing unit: 4H – 16 – 4T

V35 air inlet with air flow up to 41 m³/h

Multi-chamber PVC profiles strengthened from the inside with galvanized steel profiles.



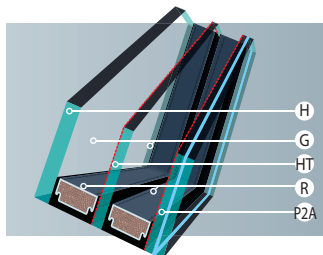
Seals:
 1 – clinging seal
 2 – peripheral seal
 3 – side seal
 4 – glazing seal
 P – coated profile tightening the glazing



White handle 'Elegant' with multi-point opening.

FTT U6

Window specification:
 Window U-value = 0.8 W/m²K
 Acoustic insulation Rw = 38dB.

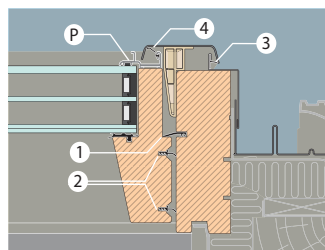


Highly energy-efficient glazing unit:
 U-value = 0.5 W/m²K as per EN 673

H – toughened glass
 G – glazing cavity filled with inert gas - argon
 HT – toughened glass with low emission coating
 R – warm spacer
 P2A – anti-burglary glass with low emission coating

Glazing unit: 6H-18-4HT-18-33.2T

Pinewood, vacuum impregnated and coated with two layers of ecological acrylic varnish.



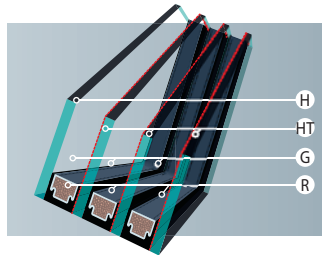
Seals:
 1 – clinging seal
 2 – peripheral seal
 3 – side seal
 4 – glazing seal
 P – coated profile tightening the glazing



Anodised handle 'Elegant'.

FTT U8 Thermo

Window specification:
 Window U-value = 0.58 W/m²K
 Acoustic insulation Rw = 36dB.

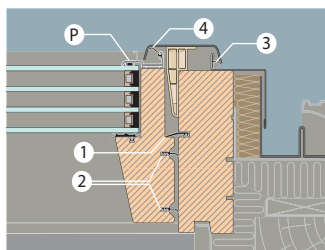


Passive glazing unit:
 U-value = 0.3 W/m²K as per EN 673

H – toughened glass
 HT – toughened glass with low emission coating
 G – glazing cavity filled with inert gas - krypton
 R – warm spacer

Glazing unit: 4H-12-4HT-12-4HT-12-4HT

Pinewood, vacuum impregnated and coated with two layers of ecological acrylic varnish.



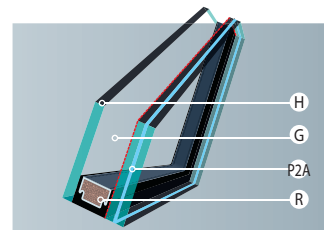
Seals:
 1 – clinging seal
 2 – peripheral seal
 3 – side seal
 4 – glazing seal
 P – coated profile tightening the glazing



Anodised handle 'Elegant'.

FTP-V P2 Secure

Window specification:
 Window U-value = 1.2 W/m²K
 Acoustic insulation Rw = 35dB.



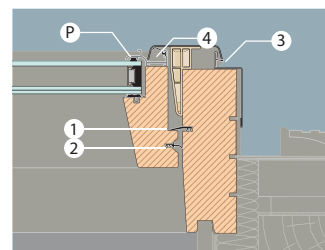
Highly energy-efficient glazing unit:
 U-value = 1.0 W/m²K as per EN 673

H – toughened glass
 G – glazing cavity filled with inert gas - argon
 R – warm spacer
 P2A – anti-burglary glass with low emission coating

Glazing unit: 4H – 15 – 33.2T

Automatic V40P air inlet with air flow up to 49 m³/h

Pinewood, vacuum impregnated and coated with two layers of ecological acrylic varnish.



Seals:
 1 – clinging seal
 2 – peripheral seal
 3 – side seal
 4 – glazing seal
 P – coated profile tightening the glazing



Anodised handle 'Elegant' with multi-point opening.

WINDOWS WITH RAISED AXIS OF ROTATION

WINDOWS FYP-V U3 proSky, FYU-V U3 proSky



FEATURES:

- Richly equipped pivot window with axis of rotation situated above the centre of the window, so even a tall person can easily walk up to the window edge.
- When installed in roofs with pitches 39°- 43° the window satisfies the requirements of DIN 5034-1 standard, according to which the bottom window edge has to be placed 95cm above the floor level and the top minimum 220cm.
- Manufactured in specially prepared pine and vacuum impregnated.
- **FYP-V** coated with ecological acrylic varnish.
- **FYU-V** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge enables the sash to be rotated and left open. The sash when opened in position from 0° to 45° is supported by innovative supporting mechanism.
- The sash can be rotated through 160° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- Energy-efficient single chamber glazing unit.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 20° - 65°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FYP-V U3 ProSky	FYU-V U3 ProSky
window U-value	1.3 W/m ² K	1.3 W/m ² K
glazing U-value	1.0 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	32 dB	32 dB
glazing unit	4H-16-4T	4H-16-4T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	V40P	V40P
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h
air permeability class	class 3 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	66/118	66/140	78/98	78/118	78/140	78/160	78/180	78/206	94/140	94/160	94/180	94/206	114/140
	0.62	0.75	0.62	0.75	0.91	1.04	1.18	1.36	1.12	1.29	1.46	1.68	1.38
	0.47	0.58	0.47	0.59	0.73	0.85	0.96	1.12	0.92	1.07	1.22	1.42	1.16
	04	14	05	06	07	13	40	42	09	80	41	43	11

PROFI FYP-V U3 proSky Window coated with clear lacquer, with automatic V40P air inlet

873M	+	+	+	+	+	+	+	+	+	+	+	+	+
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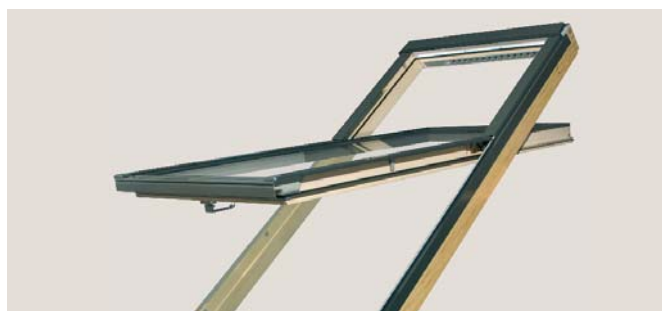
PROFI FYU-V U3 proSky White window with automatic V40P air inlet

873N	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P2 - laminated, safe (class B2B as per EN12600)		+ 10 % to the price of window
U5 - highly energy-efficient U=0.5W/m ² K (chosen sizes)		+ 50 % to the price of window
P4 - anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 - soundproof glass Rw window = 39dB (without air inlet)		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 - obscure glass		+ 20 % to the price of window
Q4 - satin glass, Q5 - opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (FYP-V/C U3)		The price is calculated individually
FY_V U3 without air inlet		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



WINDOWS PYP-V U3 proSky



FEATURES:

- Richly equipped pivot window with axis of rotation situated above the centre of the window, so even a tall person can easily walk up to the window edge.
- When installed in roofs with pitches 39°- 43° the window satisfies the requirements of DIN 5034-1 standard, according to which the bottom window edge has to be placed 95cm above the floor level and the top minimum 220cm.
- Constructed of multi-chamber PVC profiles strengthened from the inside with galvanized steel which prevents their deformation. PVC profiles are made on the basis of calcium and zinc stabiliser available in the following colour:
 - white (RAL 9010),
 - golden oak veneer (GO),
 - pine veneer (PI).
 For windows in a veneer, profiles are dyed to improve their aesthetics.
- Designed for rooms with periodically elevated humidity levels (kitchens, bathrooms) and for premises where moist air stays for a longer period of time such as laundries, baths or drying rooms.
- The window is durable, resistant to corrosion and varying weather conditions, while its maintenance is reduced to an absolute minimum.
- The material used does not absorb moisture and features high resistance against acids and alcohols.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge enables the sash to be rotated and left open. The sash when opened in position from 0° to 45° is supported by innovative supporting mechanism.
- The sash can be rotated through 160° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V35 air inlet which provides fresh air with the window tightly closed.
- Energy-efficient single chamber glazing unit.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 20° - 65°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit



Technical Specification	PYP-V U3 ProSky
window U-value	1.3 W/m ² K
glazing U-value	1.0 W/m ² K
acoustic insulation Rw	32 dB
glazing unit	4H-16-4T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	—
air inlet type	V35
air inlet capacity	up to 41m ³ /h
air permeability class	class 3 as per EN 1026, EN 12207
impact resistance	class 3 (450mm) as per EN 13049

Sizes of Standard Windows

PRODUCT CODE	66/118	66/140	78/98	78/118	78/140	78/160	78/180	94/140	94/160	94/180	114/140			
	0.62	0.75	0.62	0.75	0.91	1.04	1.18	1.12	1.29	1.46	1.38			
	0.47	0.58	0.47	0.59	0.73	0.85	0.96	0.92	1.07	1.22	1.16			
	04	14	05	06	07	13	40	09	80	41	11			

PYP-V U3 White aluminium clad - plastic window, resistant to moisture, with V35 air inlet

876J														
	+	+	+	+	+	+	+	+	+	+	+			

Non-standard windows

Description of available products		
Profiles in golden oak veneer (GO)		+ 15 % to the price of window
Profiles in pine veneer (PI)		+ 15 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P2 - laminated, safe (class B2B as per EN12600)		+ 10 % to the price of window
U5 - highly energy-efficient U=0.5W/m ² K (chosen sizes)		+ 50 % to the price of window
P4 - anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 - soundproof glass R _w window = 39dB (without air inlet)		+ 30 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
Q2 - obscure glass		+ 20 % to the price of window
Q4 - satin glass, Q5 - opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. PYP/C U3, PYP-V/C U3)		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



WINDOWS FDY-V U3 Duet proSky, FDY-V/U U3 Duet proSky



FEATURES:

- Richly equipped double sash window.
- The upper sash is opened like a pivot window but its axis of rotation is situated above the centre of the window, so even a tall person can easily walk up to the window edge.
- Duet proSky window eliminates the need for traditional vertical combinations, hence offering a greater illumination area.
- When installed in roofs with pitches 39° - 43° the window satisfies the requirements of DIN 5034-1 standard, according to which the bottom window edge has to be placed 95cm above the floor level and the top minimum 220cm.
- Manufactured in specially prepared pine and vacuum impregnated.
- **FDY-V** coated with ecological acrylic varnish.
- **FDY-V/U** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge enables the sash to be rotated and left open. The sash when opened in position from 0° to 45° is supported by innovative supporting mechanism.
- The sash can be rotated through 160° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- The upper sash is equipped with energy-efficient single chamber glazing unit.
- The lower sash is non-opening. It comes with the glazing unit which consists of external glass toughened and internal glass laminated, resulting in increased safety when operating the window.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 25° - 65°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



thermoPro

Technical Specification	FDY-V U3 Duet ProSky	FDY-V/U U3 Duet ProSky
window U-value	1.3 W/m ² K	1.3 W/m ² K
glazing U-value	1.0 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	32 dB	32 dB
glazing unit	4H-16-4T	4H-16-4T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	V40P	V40P
air permeability class	class 3 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/140	78/160	78/160	78/160	94/140	94/160	94/160	94/160				
	78/50	78/50	78/78	78/98	94/50	94/50	94/78	94/98				
	78/186	78/206	78/235	78/255	94/186	94/206	94/235	94/255				
	1.19	1.33	1.52	1.80	1.46	1.63	1.87	2.04				
	0.91	1.03	1.20	1.32	1.15	1.30	1.52	1.67				
	CA	CB	CC	CD	DA	DB	DC	DD				

top sash dimensions
bottom sash dimensions
frame dimensions

LUX FDY-V U3 Duet proSky Window coated with clear lacquer, with automatic V40P air inlet

874G	+	+	+	+	+	+	+	+				
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LUX FDY-V/U U3 Duet proSky White window with automatic V40P air inlet

874H	+	+	+	+	+	+	+	+				
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P2 – laminated, safe (class B2B as per EN12600)		+ 10 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
Q2 – obscure glass		+ 20 % to the price of window
Q4 – satin glass, Q5 – opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FDY-V/C U3)		The price is calculated individually
FDY-V U3, FDY-V/U U3 without air inlet		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



TOP HUNG AND PIVOT WINDOWS

WINDOWS FP_V U3 preSelect, FP_V U5 preSelect



FEATURES:

- A new generation top hung and pivot windows come with two independent opening mechanisms. The sash can be opened outwards from the top and via centre pivot.
- The outward opening function enables the sash to be opened in any position from 0° to 35° which allows an easy approach to the opened window. The pivot function enables the sash to be rotated through 180° and is used for cleaning the outer pane.
- Innovative hardware system guarantees complete sash stability in both opening functions.
- Opening method can be switched using preSelect sliding switch placed in the side part of the frame which is accessible after opening the window.
- Manufactured in specially prepared pine and vacuum impregnated.
- **FPP-V** coated with ecological acrylic varnish.
- **FPU-V** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- **FPW-V** coated with ecological white acrylic varnish (available at request).
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- **FP_V U3** windows equipped with energy-efficient single chamber glazing unit.
- **FP_V U5** windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 55°, window in a special version installed in pitches from 15° - 85°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



Technical Specification	FP_V U3 preSelect	FP_V U5 preSelect
window U-value	1.2 W/m ² K	0.97 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	32 dB	33 dB
glazing unit	4H-16-4T	4HT-10-4H-10-4HT
inert gas filled panes	argon	krypton
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	V40P	V40P
air inlet capacity	up to 49m ³ /h	up to 49m ³ /h
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

LUX FPP-V U3 preSelect Window coated with clear lacquer, with automatic V40P air inlet

8721	-	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FPU-V U3 preSelect White window with automatic V40P air inlet

8732	-	+	+	+	+	+	+	+	+	+	+	+	+	+
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LUX FPP-V U5 preSelect White window with automatic V40P air inlet and highly energy-efficient glazing unit

8774	-	+	+	+	+	+	+	+	-	+	+	-	-	-
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LUX FPU-V U5 preSelect White window with automatic V40P air inlet and highly energy-efficient glazing unit

8720	-	+	+	+	+	+	+	+	-	+	+	-	-	-
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P2 - laminated, safe (class B2B as per EN12600)*		+ 10 % to the price of window
P4 - anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 - soundproof glass Rw glazing = 41dB, Rw window = 39dB**		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 - obscure glass		+ 20 % to the price of window
Q4 - satin glass, Q5 - opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FPP-V/C U3)		The price is calculated individually
Special version of the window for extended installation. Intended for pitches from 15° - 85°.		The price is calculated individually
FP_V U3 without air inlet		The price is calculated individually

* Windows with anti burglary 'Secure' and soundproof glazings are available only in sizes 02 - 09.

** Windows with soundproof glazing available without air inlet.

Detailed information concerning non-standard windows on pages 66-69.



preSelect switch

WINDOWS PPP-V U3 (GO/PI) U3 preSelect, PPP-V U5 preSelect



FEATURES:

- A new generation top hung and pivot windows come with two independent opening mechanisms. The sash can be opened outwards from the top and via centre pivot.
- The outward opening function enables the sash to be opened in any position from 0° to 35° which allows an easy approach to the opened window. The pivot function enables the sash to be rotated through 180° and is used for cleaning the outer pane.
- Innovative hardware system guarantees complete sash stability in both opening functions.
- Opening method can be switched using preSelect sliding switch placed in the side part of the frame which is accessible after opening the window.
- Manufactured in specially prepared pine and vacuum impregnated.
- Constructed of multi-chamber PVC profiles strengthened from the inside with galvanized steel which prevents their deformation. PVC profiles are made on the basis of calcium and zinc stabiliser available in the following colour:
 - white (RAL 9010),
 - golden oak veneer (GO),
 - pine veneer (PI).
 For windows in a veneer, profiles are dyed to improve their aesthetics.
- Designed for rooms with periodically elevated humidity levels (kitchens, bathrooms) and for premises where moist air stays for a longer period of time such as laundries, baths or drying rooms.
- The window is durable, resistant to corrosion and varying weather conditions, while its maintenance is reduced to an absolute minimum.
- The material used does not absorb moisture and features high resistance against acids and alcohols.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V35 air inlet which provides fresh air with the window tightly closed.
- **PPP-V U3** - equipped with energy-efficient single chamber glazing unit.
- **PPP-V U5** windows equipped with highly energy-efficient double chamber glazing unit. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 55°, window in a special version installed in pitches from 15° - 85°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.



thermoPro

Technical Specification	PPP-V U3 preSelect	PPP-V U5 preSelect
window U-value	1.3 W/m ² K	1.1 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	32 dB	34 dB
glazing unit	4H-16-4T	4HT-10-4H-10-4HT
inert gas filled panes	argon	krypton
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	V35	V35
air inlet capacity	up to 41m ³ /h	up to 41m ³ /h
air permeability class	class 3 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

LUX PPP-V U3 preSelect White aluminium clad - plastic window, resistant to moisture, with V35 air inlet

8750	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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LUX PPP-V/GO U3 preSelect Aluminium clad - plastic window in golden oak veneer, resistant to moisture, with V35 air inlet

8735	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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LUX PPP-V/PI U3 preSelect Aluminium clad - plastic window in pine veneer, resistant to moisture, with V35 air inlet

8731	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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LUX PPP-V U5 preSelect White aluminium clad - plastic window, resistant to moisture, with V35 air inlet and highly energy-efficient glazing unit

8791	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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LUX PPP-V/GO U5 preSelect Aluminium clad - plastic window in golden oak veneer, resistant to moisture, with V35 air inlet and highly energy-efficient glazing unit

879L	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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LUX PPP-V/PI U5 preSelect Aluminium clad - plastic window in pine veneer, resistant to moisture, with V35 air inlet and highly energy-efficient glazing unit

879K	-	+	+	+	+	+	+	+	+	+	+	-	-	-
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Non-standard windows

Description of available products		
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
in metal covering - copper CU		+ 30 % to the price of window
in metal covering - titanium-zinc TC		+ 20 % to the price of window
Window with glass		
P2 - laminated, safe (class B2B as per EN12600)		+ 10 % to the price of window
P4 - anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 - soundproof glass Rw glazing = 41dB, Rw window = 39dB		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 - obscure glass		+ 20 % to the price of window
Q4 - satin glass, Q5 - opaque glass		+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (PPP-V/C U3), (PPP-V/GO/C U3), (PPP-V/PI/C U3)		The price is calculated individually
Special version of the window for extended installation. Intended for pitches from 15° - 85°.		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



preSelect switch

PANORAMIC WINDOW **FEP P2**



FEATURES:

- Roof window of top hung and pivot design featuring two opening systems:
 - outward opening function opens to 40°, and as much as 68° once the blockade is released. Large sash opening angle allows enables easy access to the window and offers an unrestricted view. Large window dimensions provide an access to the roof in order to carry out maintenance works or escape in case of emergency.
 - pivot which enables the sash to be rotated through 180° and used for cleaning the outer pane.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge in the middle of the window enables the sash to be rotated and left open.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- Equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories. Awning blinds and roller shutters adapted to FEP P2 windows feature a different design.
- Suitable for pitches from 15° - 55°.
- Wide range of flashings to ensure installation of the window in virtually all types of roof coverings.
- Can be installed in combinations.

















Technical Specification	FEP P2
window U-value	1.4 W/m ² K
glazing U-value	1.0 W/m ² K
acoustic insulation Rw	35 dB
glazing unit	4H-15-33.2T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	class P2A
air inlet type	—
air inlet capacity	—
air permeability class	class 4 as per EN 1026, EN 12207
impact resistance	class 3 (450mm) as per EN 13049

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
	0.32	0.41	0.51	0.62	0.75	0.62	0.75	0.91	1.04	0.93	1.12	1.15	1.38	1.11
	0.22	0.29	0.38	0.47	0.58	0.47	0.59	0.73	0.85	0.75	0.92	0.95	1.16	0.92
														
	01	02	03	04	14	05	06	07	13	08	09	10	11	12

PROFI FEP P2 Window coated with clear lacquer and internal glass anti-burglary

8747	-	-	-	-	-	-	-	+	-	-	+	-	+	-
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Non-standard windows

Description of available products		
Window with wooden elements		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	Painted with lazulite lacquer	+ 30 % to the price of window
	In mahogany woodwork	+ 45 % to the price of window
	Painted with polyurethane lacquer (white)	+ 10 % to the price of window
Window with claddings		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	In metal covering – copper CU	+ 30 % to the price of window
	In metal covering – titanium-zinc TC	+ 20 % to the price of window
Window with glass		
Tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
Reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
Stained glass	Single colour (outline)	+ 30 % to the price of window
	Multi colour	+ 55 % to the price of window
	02 – obscure glass	+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (FEP/C P2)		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



BALCONY WINDOW

WINDOWS FGH-V P2 Galeria, FGH-V P5 Galeria



FEATURES:

- An innovative, large roof window whose sashes when opened create a balcony.
- The upper top hung sash opens upwards, while the lower sash can be tilted forwards, allowing easy access to the balcony recess. The sash when rotated through 0° - 45° is supported by an innovative supporting mechanism which allows leaving the open sash in any position within this range.
- Side safety barriers are integrated into the bottom sash and slide out during opening. When closing the lower sash, balcony rails are hidden inside the window and are not visible above the roof surface. Concealed under the window flashing elements they do not collect dirt or spoil aesthetics of the roof. Once the balcony window is open, barriers are always dry and clean to secure trouble-free operation.
- The window features a multi-point locking system, without a traditional locking assembly. After turning the handle, the sash is locked at two sides of the frame.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane.
- Increased operational safety and burglary resistance – topSafe system.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- Equipped with the V40P air inlet which by automatic adjustment of the flow channel size provides an optimum amount of air into the room and ensures a healthy micro-climate in the attic and thermal energy savings.
- **FGH-V P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- **FGH-V P5** windows equipped with highly energy-efficient and anti-burglary double chamber glazing unit with easy maintenance layer. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings. Internal glass is laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 35° - 55° (FGH-V P5: 45° - 55°).
- Installed with special flashings.
- Can be installed in horizontal combinations.
- Combining FGH-V balcony window with other FAKRO windows, e.g. FDY-V can be carried out using K___/G flashings.
- Installation of the balcony window is performed by an authorised service. The price is determined individually.
- Recommended for installation in rooms without a knee wall and with properly working ventilation.



Technical Specification	FGH-V P2 Galeria	FGH-V P5 Galeria
window U-value	1.5 W/m ² K	1.1 W/m ² K
glazing U-value	1.1 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	35 dB	34 dB
glazing unit	4H-14-33.2T	4HS-10-4HT-8-33.2T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	class P2A	class P2A
air inlet type	V40P	V40P
air permeability class	class 3 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/160	94/160																		
	78/198	94/198																		
	78/255	94/255																		
	1.80	2.04																		
	1.32	1.67																		
	CD	DD																		

top sash dimensions
bottom sash dimensions
frame dimensions

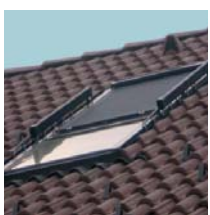
LUX FGH-V P2 Galeria Window coated with clear lacquer, with automatic V40P air inlet and internal glass anti-burglary

870C	+	+																		
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LUX FGH-V P5 Galeria Window coated with clear lacquer, with automatic V40P air inlet, internal glass anti-burglary and easy maintenance layer

	+	+																		
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When ordering FGH-V Galeria window it is required to fill in the form which is to be found at www.fakro.com



View from the outside

Other solutions

WINDOWS FOR COMBINATIONS

L-SHAPED COMBINATION WINDOWS **BD_ , BVP , BXP**



FEATURES:

- Designed for installation in a vertical wall within the loft space (knee wall) to extend the roof window into the wall.
- Improved illumination of the room and enhanced field of view.
- Can be combined with roof windows of any design.
- The internal as well as external L-shaped windows' profiles match perfectly with the rest of FAKRO roof windows, creating the same decorative pattern.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- The hardware applied enables a tilt and turn opening system – identical to the one used in vertical windows.
- **BD_** can be opened in tilt and turn. The sash can be tilted up to 11cm and opened up to 90°. Both opening methods are performed using one handle situated on the side of the sash.
This window type comes with a lock as standard. It can be opened to the right (**BDR**) or to the left (**BDL**).
- **BVP** in tilt opening function. The sash can be tilted up to 11cm
- Handle with a lock placed in the top part of the sash.
- **BXP** is non-opening.
- **B__ P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- **B__ P5** windows equipped with highly energy-efficient and anti-burglary double chamber glazing unit with easy maintenance layer. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings. Internal glass is laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 55° .
- Installed with special flashings.
- Can be installed in horizontal combinations.

Technical Specification	BD_ P2, BVP P2, BXP P2	BD_ P5, BVP P5, BXP P5
window U-value	1.3 W/m ² K	0.88 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	37 dB	38 dB
glazing unit	4H-14-33.2 T	4HS-10-4HT-8-33.2T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	class P2A	class P2A
air inlet type	—	—
air inlet capacity	—	—
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/60	78/75	78/95	78/115	78/137	94/60	94/75	94/95	94/115	114/60	114/75	114/95	114/115
	0.32	0.42	0.56	0.69	0.84	0.40	0.52	0.69	0.85	0.50	0.65	0.85	1.06
	0.25	0.33	0.45	0.57	0.71	0.31	0.42	0.58	0.73	0.40	0.53	0.73	0.92
	33	81	82	83	84	34	85	86	87	35	89	90	91

PROFI **BDL P2** Tilt and turn opening window with internal glass laminated

875F	+	+	+	+	+	-	+	+	+	-	-	+	+	
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PROFI **BDR P2** Tilt and turn opening window with internal glass laminated

875G	+	+	+	+	+	-	+	+	+	-	-	+	+	
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PROFI **BVP P2** Tilt opening window with internal glass laminated

875H	+	+	+	+	+	+	+	+	+	+	+	+	+	
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PROFI **BXP P2** Non-opening window with internal glass laminated

875J	+	+	+	+	+	+	+	+	+	+	+	+	+	
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LUX **BDL P5** (874N___), **BDR P5** (874P___) Tilt and turn opening window with highly energy-efficient glazing unit, internal glass laminated and external easy maintenance layer

	+	+	+	+	+	+	+	+	+	-	-	+	+	
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LUX **BVP P5** Tilt opening window with highly energy-efficient glazing unit, internal glass laminated and external easy maintenance layer

874R	+	+	+	+	+	+	+	+	+	+	+	+	+	
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LUX **BXP P5** Non-opening window with highly energy-efficient glazing unit, internal glass laminated and external easy maintenance layer

874S	+	+	+	+	+	+	+	+	+	+	+	+	+	
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of window
painted with lazulite lacquer		+ 30 % to the price of window
in mahogany woodwork		+ 45 % to the price of window
painted with polyurethane lacquer (white)		+ 10 % to the price of window
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of window
Window with glass		
P4 – anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600		+ 30 % to the price of window
R1 – soundproof glass Rw glazing = 41dB		+ 30 % to the price of window
tinted glass	Blue Brown Grey Green	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window + 30 % to the price of window
stained glass	single colour (outline) multi colour	+ 30 % to the price of window + 55 % to the price of window
Q2 – obscure glass		+ 20 % to the price of window
Q4 – satin glass, Q5 – opaque glass		+ 20 % to the price of window
Non-standard window dimensions: a (width) = 55 – 114 [cm], b (height) = 60 – 137 [cm], Smax = 1.6 [m ²].		The price is calculated individually



L-shaped combination window DBL (left-opening)

Detailed information concerning non-standard windows on pages 66-69.

WINDOWS FTP/D P2, FTU/D P2



Technical Specification	FTP/D P2	FTU/D P2
window U-value	1.2 W/m ² K	1.2 W/m ² K
glazing U-value	1.0 W/m ² K	1.0 W/m ² K
acoustic insulation Rw	36 dB	36 dB
glazing unit	4H-15-33.2T	4H-15-33.2T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	class P2A	class P2A
air inlet type	—	—
air inlet capacity	—	—
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

FEATURES:

- Pivot window designed for combinations.
- Installed typically beneath a standard roof window of any design, 'extending' the roof window down the roof. Windows for combinations can also be installed above other window.
- Improved illumination of the room and enhanced field of view.
- Manufactured in pine and vacuum impregnated.
- **FTP/D** coated with ecological acrylic varnish.
- **FTU/D** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- Handle 'Elegant' positioned in the base of the sash for easy operation and two-step micro-opening.
- Hinge enables the sash to be rotated and left open. The sash when opened in position.
- As standard equipped with opening restrictor ZBB which enables to lock the open sash. It also prevents the window from being completely opened by children.
- The sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- **FT_/D P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Installed with flashings for combinations.
- Can be installed in combinations.

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60						
	0.48	0.59	0.73	0.86	0.35	0.43	0.54	0.64						
	0.35	0.45	0.53	0.68	0.25	0.31	0.39	0.48						
	23	24	25	26	33	34	35	36						

PROFI FTP/D P2 Window coated with clear lacquer and internal glass laminated

8701	+	+	+	+	+	+	+	+						
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PROFI FTU/D P2 White window with internal glass laminated

8702	+	+	+	+	+	+	+	+						
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Non-standard windows

Description of available products		
Window with wooden elements		
	painted in colours from the RAL palette	+ 20 % to the price of window
	painted with lazulite lacquer	+ 30 % to the price of window
	in mahogany woodwork	+ 45 % to the price of window
Window with claddings		
	painted in colours from the RAL palette	+ 20 % to the price of window
	in metal covering – copper CU	+ 30 % to the price of window
	in metal covering – titanium-zinc TC	+ 20 % to the price of window
Window with glass		
	P5 – anti-burglary, highly energy-efficient U=0.5W/m ² K	+ 50 % to the price of window
	P4 – anti-burglary glass ‘SECURE’ class P4A as per EN356, class 1B1 as per EN12600	+ 30 % to the price of window
	R1 – soundproof glass Rw glazing = 41dB	+ 30 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
	Q2 – obscure glass	+ 20 % to the price of window
	Q4 – satin glass, Q5 – opaque glass	+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FTP-V/D/C P2, FTU-V/D/C P2)		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.



Ogranicznik ZBB

WINDOWS FXP P2, FXU P2, FXP P5, FXU P5



FEATURES:

- Non-opening window installed exclusively beneath a standard roof window.
- Designed for vertical combinations. It constitutes an additional element increasing field of view and securing ingress of natural light to the room.
- The window from the inside is butt joined with a roof window. A narrow connecting strip enhances aesthetics and does not limit illumination area. From the outside the window comes with a special cladding element which is screwed to the sash in the upper roof window.
- Manufactured in pine and vacuum impregnated.
- **FXP** coated with ecological acrylic varnish.
- **FXU** coated with three layers of polyurethane lacquer to form perfectly smooth and durable surface of the window profiles which is homogeneous without a trace of wood grains.
- Increased operational safety and burglary resistance – topSafe system.
- thermoPro technology - the solutions introduced ensure improved quality and parameters of roof windows, thus increasing their energy-efficiency performance, providing greater durability, ensuring excellent tightness and facilitating the installation process.
- Quadruple sealing system. Glazing seal provides additional tightness in extreme weather conditions and reduces micro vibrations of the cladding profiles during heavy rain.
- **FX_P2** windows equipped with safe single chamber glazing unit and internal glass laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- **FX_P5** windows equipped with highly energy-efficient and anti-burglary double chamber glazing unit with easy maintenance layer. The window is particularly recommended for buildings where special emphasis is put on thermal energy savings. Internal glass is laminated, anti-burglary class P2A. In case of any damage to laminated glass, the glass pieces remain stuck with the film.
- Toughened external glass with lifetime hail resistance warranty.
- Wide range of additional accessories.
- Suitable for pitches from 15° - 90°.
- Installed with special flashings. When choosing appropriate flashing it is required to add up the height of FX_ window and the upper window. Then choose the nearest flashing of greater height to proper roof covering type. In case of using Thermo flashing it is required to purchase KDV-XT module (code 8879__).
- Can be installed in horizontal combinations.





thermoPro

Technical Specification	FX_P2	FX_P5
window U-value	1.2 W/m ² K	0.97 W/m ² K
glazing U-value	1.0 W/m ² K	0.5 W/m ² K
acoustic insulation Rw	37 dB	37 dB
glazing unit	4H-15-33.2T	4HS-10-4HT-8-33.2T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	class P2A	class P2A
air inlet type	—	—
air inlet capacity	—	—
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/95	94/95										
	0.59	0.73										
	0.45	0.57										
												
	CU	DU										

PROFI FXP P2 Window coated with clear lacquer and internal glass laminated

870G	+	+										
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PROFI FXU P2 White window with internal glass laminated

870H	+	+										
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LUX FXP P5 Window coated with clear lacquer, highly energy-efficient glazing unit, internal glass laminated and external easy maintenance layer

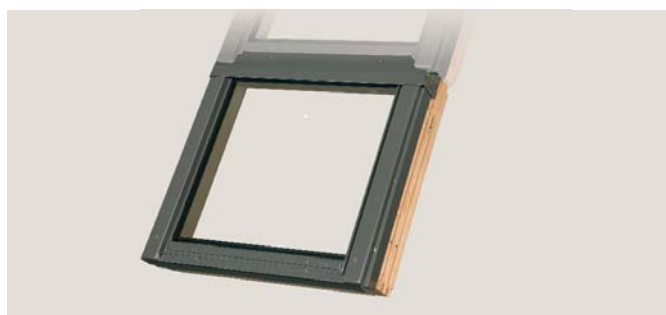
870J	+	+										
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LUX FXU P5 White window, highly energy-efficient glazing unit, internal glass laminated and external easy maintenance layer

870K	+	+										
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Non-standard windows

Description of available products		
Window with wooden elements		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	Painted with lazulite lacquer	+ 30 % to the price of window
	In mahogany woodwork	+ 45 % to the price of window
Window with claddings		
	Painted in colours from the RAL palette	+ 20 % to the price of window
	In metal covering - copper CU	+ 30 % to the price of window
	In metal covering - titanium-zinc TC	+ 20 % to the price of window
Window with glass		
	R1 - soundproof glass Rw glazing = 41dB	+ 30 % to the price of window
tinted glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
reflective glass	Blue	+ 30 % to the price of window
	Brown	+ 30 % to the price of window
	Grey	+ 30 % to the price of window
	Green	+ 30 % to the price of window
	Clear	+ 30 % to the price of window
stained glass	single colour (outline)	+ 30 % to the price of window
	multi colour	+ 55 % to the price of window
	Q2 - obscure glass	+ 20 % to the price of window
	Q4 - satin glass, Q5 - opaque glass	+ 20 % to the price of window
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (e.g. FXP/C, FXU/C)		The price is calculated individually



Detailed information concerning non-standard windows on pages 66-69.

TOP WINDOWS **FAP Z6, FBP Z6**



FEATURES:

- Triangular (**FAP**) or arched (**FBP**) windows.
- Installed in combinations over roof windows of any design.
- Using top windows gives buildings a strikingly distinctive character.
- Top windows are non-opening as they are made of special single wooden profile.
- Windows are made together with flashings to suit flat roofing material (type S) and for profiled (type Z). The flashing is integrated with top window.
- Manufactured in pine and vacuum impregnated.
- Coated with ecological acrylic varnish.
- **F_P Z6** windows with single chamber glazing unit with two toughened panes.
- Toughened external glass with lifetime hail resistance warranty.
- Suitable for pitches from 20° - 90° .
- Can be installed in horizontal combinations.

Technical Specification	FAP Z6	FBP Z6
window U-value	1.3 W/m ² K	1.3 W/m ² K
glazing U-value	1.1 W/m ² K	1.1 W/m ² K
acoustic insulation Rw	33 dB	33 dB
glazing unit	4H-16-4HT	4H-16-4HT
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	—	—
air inlet type	—	—
air inlet capacity	—	—
air permeability class	class 4 as per EN 1026, EN 12207	
impact resistance	class 3 (450mm) as per EN 13049	

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of Standard Windows

PRODUCT CODE	78/67	94/81	114/99	134/116															
																			
	C2	D3	EH	EJ															

PROFI **FAP Z6** Window coated with clear lacquer

870D	+	+	+	+															
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PRODUCT CODE	78/57	94/57	114/57	134/57															
																			
	CE	DE	EF	FE															

PROFI **FBP Z6** Window coated with clear lacquer

870E	+	+	+	+															
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When ordering it is required to provide the flashing type used for manufacture with the window.



FAP Z6



FBP Z6

NON-STANDARD SOLUTIONS



Various window shapes

FAKRO windows can be manufactured in any shape required. The glazing combination consists of a toughened outer and inner pane with a low emission coating on the inner pane 4H-16-4HT. These types of windows are all non-opening.

When ordering non-standard windows, please indicate the roof pitch and type of roof covering. A drawing of the window will be needed with all dimensions and internal angles. Any order should also indicate whether the window is to be installed on its own or in combination with other windows.



Curved window

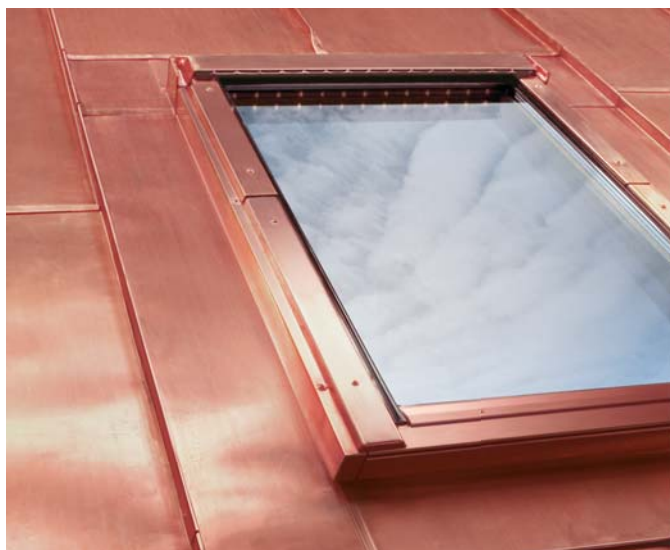
The curved window features a special structure with curved frame, sash and glazing unit. The steel covering profiles are also adjusted to the window's shape. It is a pivot type window with a handle situated in the base of the sash. The curved window is a non-standard product designed and manufactured to individual order.



Window with a mullion bar

The FAKRO window with a mullion bar is designed for historic or stylised buildings. Its characteristic feature is black vertical mullion bar in the middle of the glazing, cladding and flashing (colour RAL 9005) which suits traditional construction.

By using FAKRO windows with a mullion bar we can keep the unique, historic character of the building from the outside and create a comfortable and modern interior. Windows with a mullion bar feature all advantages of FAKRO roof windows. They are available in standard sizes in the following versions: pivot windows, top hung and pivot windows and roof access windows. The windows are manufactured to individual order.



Copper and titanium-zinc cladding

The outer cladding of the window and flashing can be made not only of aluminium but to suit specific customer needs can be made of copper CU or titanium zinc TC as well (bare rolled as standard, other available to individual order).



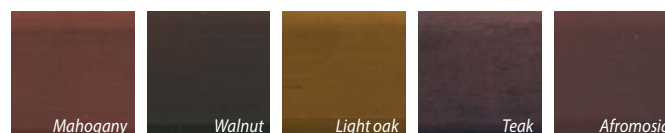
Colour palette

Wooden elements - RAL palette

To suit customer preference, wooden elements of the window can be painted in any colour chosen from the RAL palette. It ensures excellent interior finish and décor.

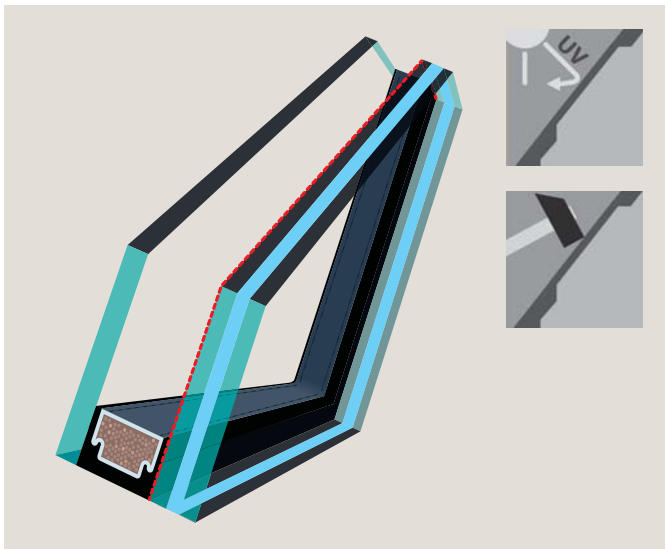
Wooden elements coated with Lazure lacquer

The window sash and frame can be also coated with Lazure lacquer in any of five chosen colours. The samples are available in FAKRO swatches. On request, FAKRO will send samples for acceptance.



Non-standard colours of the flashing

To suit customer preference, FAKRO offers exterior metal coverings for windows and flashings in any colour chosen from the RAL palette. All flashings and exterior metal coverings can be matched exactly to the most unusual roof colours.

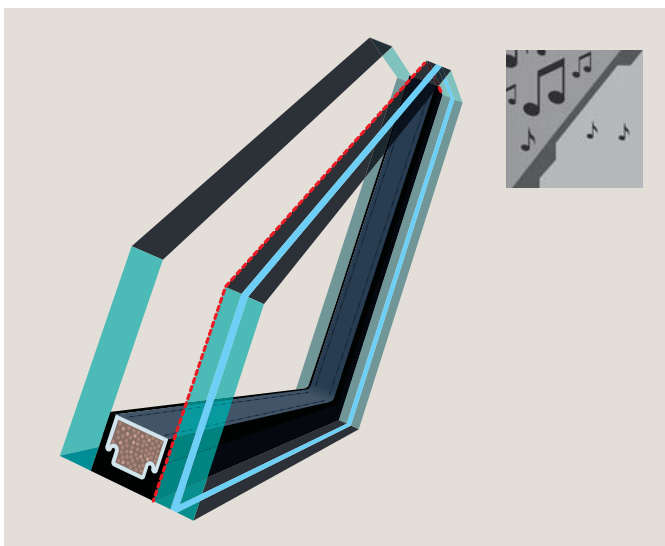


Glazing units

Anti-burglary P4

Anti-burglary glazing is known as protective glass. Security glazing offers increased resistance against breakage and puncture. It significantly reduces the possibility of break-ins through the roof window. The glazing unit consists of two sheets of glass with a layer of PVB in between. Anti-burglary glass is placed from the inside of the glazing unit. The glazing comes in a set with external toughened glass with easy maintenance layer. It also reduces the risk of injury in case of glass breakage as broken pieces remain on the film. Anti-burglary glazing reduces harmful effects of UV radiation by as much as 99% and features excellent soundproof properties.

Type	Structure	Anti-burglary glass (internal) parameters
P4	4H – Tg14Ar – 33.4T	class P4A as per EN 356, 1B1 as per EN 12600



Soundproof R1

It significantly reduces noise penetration into the room. The R1 glazing is constructed of toughened outer glass and special, laminated inner glass. The inner glass has a layer of sound reducing film, which additionally reduces noise penetration. The glazing cavity is filled with inert gas. The sound-proof glazing features an exceptionally high R_w performance. Additionally, the glass reduces penetration of UV rays by 98%.

Type	Structure	Anti-burglary glass (internal) parameters
R1	6H-Tg12Kr-33.2SIT	$R_w = 41dB$

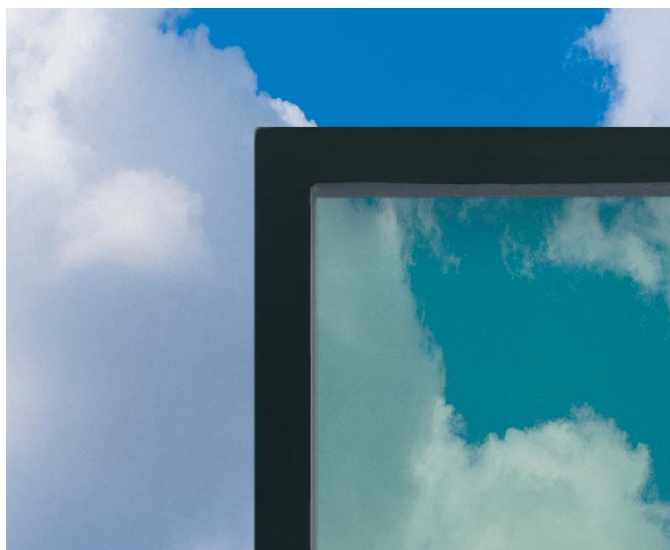


Stained glass

The stained-glass pane is a type of glazing unit with an individual and permanent pattern. It is obtained through super-imposition of a resin outline onto the pane's surface. The space between the lines is filled with coloured resin.

The resin outline is not transparent. The coloured space between the lines is partly transparent depending on the dye intensity. It is also possible to leave the sole outline on the pane. The stained-glass pattern for cleaning reasons and visual effects is placed on the inside of the glazing unit. It is possible to lay down on the pane any one of 200 patterns or to design a new one, suiting the customer's taste. Customers' own original designs are also welcome. The resulting window has got an individual and permanent pattern matching the distinct character of the room. A roof window with the stained-glass pane makes the interior look exceptional, adding originality to any loft arrangements.

The pictures of the possible stained glass patterns are to be found at www.fakro.com.



Tinted glazing – W

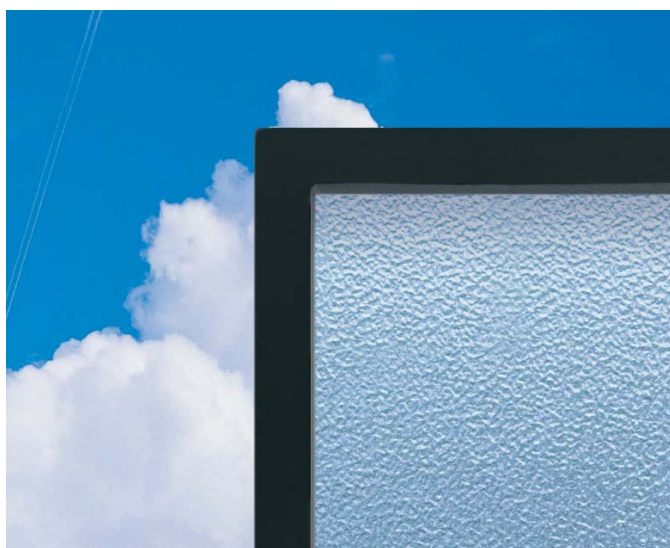
It limits penetration of sun into the room. This glass is available in a range of colours: blue, brown, grey and green. Tinted glass is toughened and placed on the outer pane of the double-glazing. The inside pane features a low emission coating.

W1	Blue	4H – Tg16Ar – 4T	$\tau_v = 57\%$	$\tau_{uv} = 12\%$	$g = 40\%$
W2		4H – Tg14Ar – 33.1T	$\tau_v = 50\%$	$\tau_{uv} = 1\%$	$g = 33\%$
W3	Brown	4H – Tg16Ar – 4T	$\tau_v = 54\%$	$\tau_{uv} = 10\%$	$g = 45\%$
W4		4H – Tg14Ar – 33.1T	$\tau_v = 48\%$	$\tau_{uv} = 0\%$	$g = 37\%$
W5	Grey	4H – Tg16Ar – 4T	$\tau_v = 49\%$	$\tau_{uv} = 11\%$	$g = 43\%$
W6		4H – Tg14Ar – 33.1T	$\tau_v = 44\%$	$\tau_{uv} = 0\%$	$g = 35\%$
W7	Green	4H – Tg16Ar – 4T	$\tau_v = 69\%$	$\tau_{uv} = 10\%$	$g = 44\%$
W8		4H – Tg14Ar – 33.1T	$\tau_v = 61\%$	$\tau_{uv} = 0\%$	$g = 38\%$

τ_v – sun's rays transmission

τ_{uv} – UV rays transmission

g – total transmission of solar energy (solar factor)



Obscure glass – O

Obscure glazing unit:

O1 – Outer glass of irregular shapes.

O2 – Outer glass of irregular shapes.

Inner laminated glass.

O4 – Smooth satin outer glass.

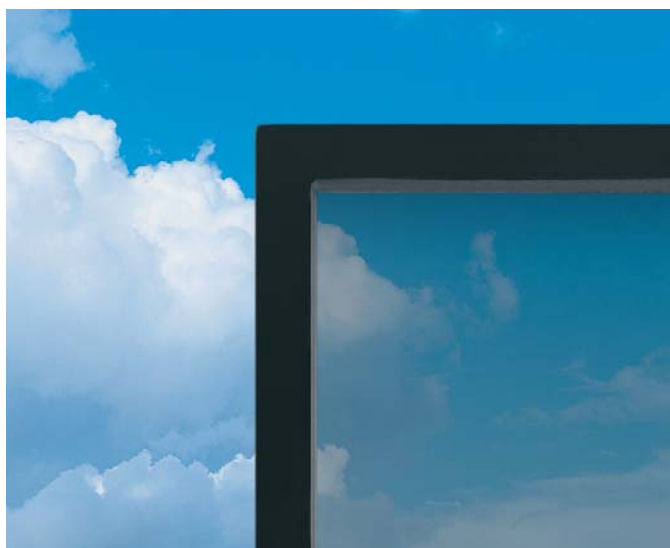
O5 – Smooth inner laminated glass with milky film.

O1		4HO – Tg16Ar – 4T	$\tau_v = 78\%$	$\tau_{uv} = 21\%$	$g = 60\%$
O2		4HO – Tg14Ar – 33.1T	$\tau_v = 69\%$	$\tau_{uv} = 0\%$	$g = 50\%$
O4		4H(satin) – Tg16Ar – 4T	$\tau_v = 44\%$		$g = 48\%$
O5		4HT – Tg15(14)Ar – 33.2(mat)	$\tau_v = 49\%$		$g = 57\%$

τ_v – sun's rays transmission

τ_{uv} – UV rays transmission

g – total transmission of solar energy (solar factor)



Reflective glass – H

It reflects solar radiation, acting from the outside like a mirror. Available in the following colours: blue, brown, graphite and green. It is also available as reflective glass in a clear version. Reflective glass is toughened and is used on the outer pane of the double glazing.

The inside pane features a low emission coating.

H0	Blue	4H – Tg16Ar – 4T	$\tau_v = 42\%$	$\tau_{uv} = 6\%$	$g = 30\%$
H1		4H – Tg14Ar – 33.1T	$\tau_v = 37\%$	$\tau_{uv} = 1\%$	$g = 25\%$
H2	Brown	4H – Tg16Ar – 4T	$\tau_v = 19\%$	$\tau_{uv} = 2\%$	$g = 22\%$
H3		4H – Tg14Ar – 33.1T	$\tau_v = 17\%$	$\tau_{uv} = 0\%$	$g = 18\%$
H4	Grey	4H – Tg16Ar – 4T	$\tau_v = 17\%$	$\tau_{uv} = 3\%$	$g = 20\%$
H5		4H – Tg14Ar – 33.1T	$\tau_v = 15\%$	$\tau_{uv} = 0\%$	$g = 17\%$
H6	Green	4H – Tg16Ar – 4T	$\tau_v = 27\%$	$\tau_{uv} = 2\%$	$g = 20\%$
H7		4H – Tg14Ar – 33.1T	$\tau_v = 25\%$	$\tau_{uv} = 0\%$	$g = 17\%$
H8	Colour	4H – Tg16Ar – 4T	$\tau_v = 56\%$	$\tau_{uv} = 14\%$	$g = 46\%$
H9		4H – Tg14Ar – 33.1T	$\tau_v = 51\%$	$\tau_{uv} = 0\%$	$g = 38\%$

τ_v – sun's rays transmission

τ_{uv} – UV rays transmission

g – total transmission of solar energy (solar factor)

WINDOW LOCK ACCESSORIES



Window lock ZBL

White and aesthetic ZBL window lock prevents accidental opening of the window. It is installed in the bottom part of the window. The lock can be installed in all opening windows, both wooden and aluminum clad - plastic, irrespective of their size.

62086

+



Opening restrictor ZBB

It enables safe and limited opening angle of the window. By using the restrictor, it is possible to leave the window ajar tilted by approximately 10cm (depending on the window type and size) without fear that strong wind will change the sash position. In low installed windows, the ZBL restrictor protects against undesired full opening of the window sash by children. When the window is closed, the restrictor cannot be seen and does not hinder window operation. Designed only for FAKRO wooden windows.

62073

+



Handle with lock ZBH

ZBH lock protects against undesired opening of the window. The lock is installed in the bottom part of the FAKRO window where the standard handle was previously installed. The lock enhances the feeling of safety, limiting access to the room from the outside. The handle is made in silver colour and in satin finish. The handle is designed to be used in FAKRO wooden windows: centre pivot FT, with raised axis of rotation FY, FDY, top hung and pivot FP, FE and FH.

62061

+

80AZ05 - For windows < 2006

80AZ06 - For FTT U6, FTT U8, FGH-V P2 GALERIA

When purchasing the handle it is required to provide a window version from the data plate.

ACTUAL DIMENSIONS OF WINDOWS

cm/cm	Window width FT, PTP, FP, FD, FY						
	55	66	78	94	114	134	
mm/mm	547mm	657mm	777mm	937mm	1137mm	1337mm	
Window height	255			CD	DD	ED	
	235			CC	DC		
	206	AB	BB	42/CB	43/DB		
186			CA	DA			
180	AP	BP	40	41	EP		
Window height	160	AN	BN	13	80		
	140	AM		07	09	11	17
	118	14	04	06	08	10	18
98	02	03	05	15		12	
78	01	22					
60							

window dimensions
 actual wooden window frame external dimensions
 actual aluminium clad plastic window frame external dimensions

cm/cm	Window width FT /D, BD, BV, BX				
	78	94	114	134	
mm/mm	(756)	(916)	(1116)	(1316)	
Window height FT /D, BD, BV, BX	137	84	88	92	96
	115	83	87	91	95
	95	82	86	90	94
75	81	85	89	93	
60	33	34	35	36	

window dimensions
 () rzeczywiste zewnętrzne wymiary okiennicy
 okien lub ramkowych okien drewnianych



FLAT ROOF

WINDOWS





INTRODUCTION

The benefits of the natural illumination of buildings are unquestionable but in those with flat roofs it is not always possible to install sufficient standard vertical windows. A source of natural light should be available in any living space to make its occupants feel comfortable. The ideal solution for providing light is the installation of specially designed products for flat roofs. FAKRO flat roof products bring the very highest standard of natural light to interiors. They also provide ventilation and offer exceptional thermal insulation performance. In short, they can transform any room under a flat roof.

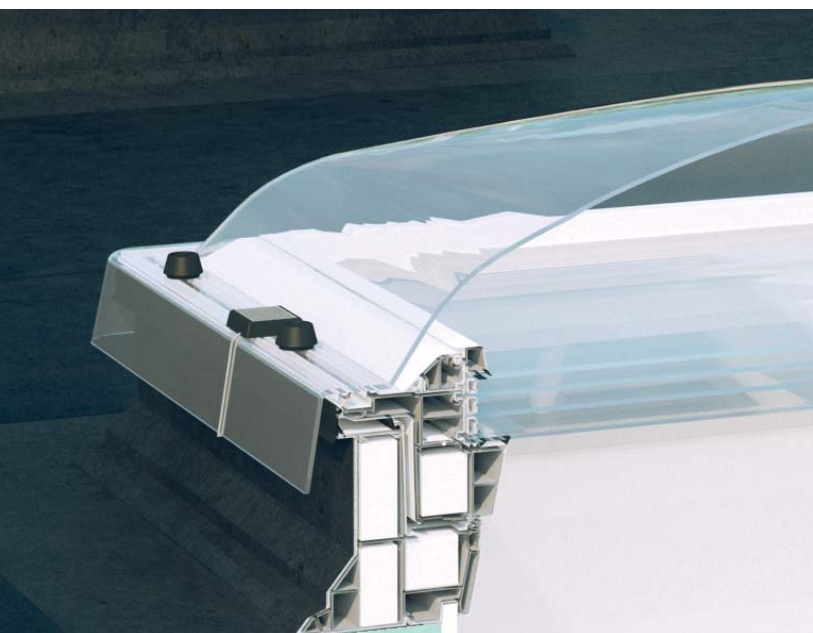
FLAT ROOF WINDOW STRUCTURE

THERMAL INSULATION

Flat roof windows are designed and constructed using the highest quality materials, innovative solutions and with impeccable aesthetics in mind. Excellent thermal performance, an abundance of natural light, ventilation of the room, easy operation of windows and a wide range of accessories make these products ideal and perfect for the comfort of living in rooms under a flat roof.

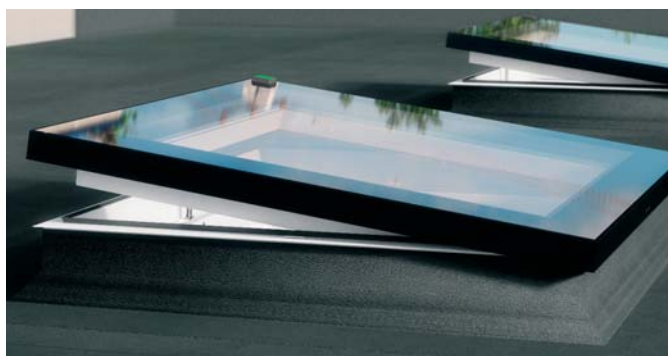
Flat roof windows are available in two versions:

- type F window with innovative flat glazing unit
- type C window with glazing unit and a dome



The flat roof window frame is constructed using reinforced multi-chamber PVC profiles. The internal surface of the frame is white (RAL 9010). The material used in the profile features high resistance against acids and has low moisture absorption. As a result, the window can be installed in every room type. Profiles are filled with insulation material, thus additionally improving the energy saving parameters of the product. The specially profiled covering material under the frame drip cap further improves the ultimate finish between the window and the roof covering.

10 year
WARRANTY
for window



The type F flat roof window is available with a passive, quadruple DU8 glazing unit characterised by a heat transfer coefficient with a rating of $U_w = 0.64 \text{ W/m}^2\text{K}$ (EN 14351-1) which makes the window suitable for use in energy-efficient and passive buildings.



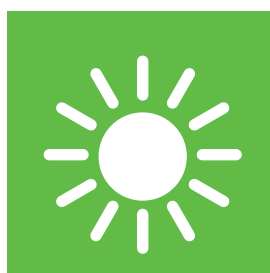
The special structure of FAKRO flat roof windows provides excellent thermal insulation. The DEC U8 (VSG) window with a passive, quadruple U8 (VSG) glazing unit is characterised by a heat transfer coefficient with a rating of $U = 0.55 \text{ W/m}^2\text{K}$ (EN 1873). This result is for a 120x120cm window with frame, sash and dome.

SAFETY & FUNCTIONALITY



High safety

Flat roof windows DMF DU6 Secure, DXF DU6 Secure, DMC P4 Secure and DXC P4 Secure comply with European anti-burglary class RC2 (EN 1627). They are also characterised by the highest impact resistance (Class SB 1200 - EN 1873). Installation of such windows in flat roofs increases operational safety and anti-burglary resistance of buildings.



Ample natural light

The basic function of the window is to provide an abundance of natural light in buildings with flat roofs. With specially designed shapes of the sash and frame profiles, flat roof windows feature up to 16% greater glazing area when compared with other manufacturer's windows of a similar size. With such solution interiors under a flat roof are full of daylight.



Non-standard sizes

In addition to standard sizes, type F windows can be manufactured in non-standard dimensions (in the range of 60x60cm - 120x220cm). Thermal insulation standards of buildings have been significantly increased and old skylights in flat roofs will not meet current requirements. The specification of a type F window enables existing, often non-standard skylights to be replaced with ease. Taking advantage of such opportunity provides high flexibility when designing or renovating buildings.

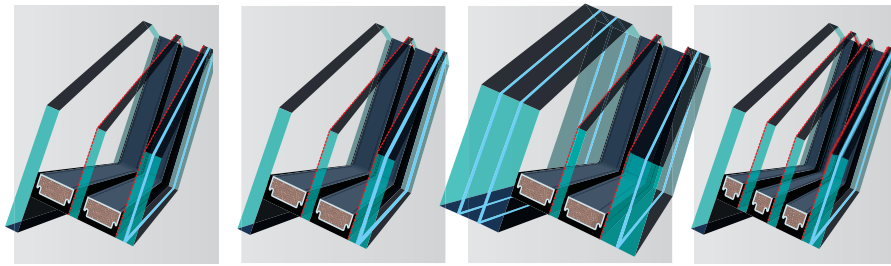


Accessories and control

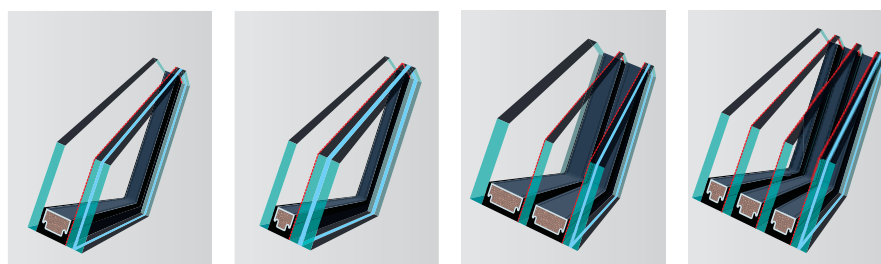
Installing the right internal and external accessories enhances functionality and aesthetic appearance of windows in the roof. Use of an external awning blind protects the room from overheating, while internal accessories provide protection from intense sunlight and enhance interior design.

The electrically operated flat roof windows are controlled by means of a remote control in the wireless Z-Wave system. The servo-motor is positioned in the sash and is protected against adverse weather conditions which results in its increased lifetime and trouble-free operation. Additionally, windows have a built-in sensor that automatically activates the sash closing function when it rains.

STANDARD GLAZING UNITS



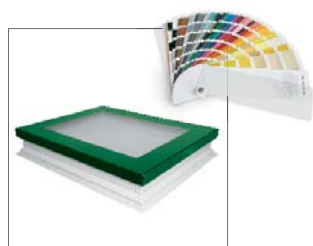
GLAZING UNIT	DU6	DU6 Secure	DW6	DU8
CHARACTERISTICS	Highly energy-efficient	Highly energy-efficient	Highly energy-efficient	Passive
U _g (EN 673)	0.5 W/m ² K	0.5 W/m ² K	0.5 W/m ² K	0.4 W/m ² K
GLAZING STRUCTURE	6H-18-4HT-18-44.2T <small>for the sizes 100x150,120x120,140x140,120x220:</small> 6H-16-4HT-18- 55.2T	6H-18-4HT-18-44.4T <small>for the sizes 100x150,120x120,140x140,120x220</small> 6H-16-4HT-18-55.4T	888.44(1xESG, 2xTVG) -16-4HT-18-66.2T	6H-10-4HT-10-4HT-12-44.2T
CHAMBERS	TWO	TWO	TWO	THREE
TOUGHENED OUTER PANE	+	+	+	+
LAMINATED INNER PANE	+(class P2A)	+(class P4A)	+(class P2A)	+(class P2A)
SPACER	WARM TGI	WARM TGI	WARM TGI	WARM TGI
INERT GAS	ARGON	ARGON	ARGON	KRYPTON
SUN RAYS TRANSMISSION (τ _v)	0.54	0.54	npd	0.49
SUN ENERGY TRANSMISSION (SOLAR FACTOR g)	0.43	0.43	0.35	0.38
UV RAYS TRANSMISSION (τ _{UV})	npd	npd	npd	npd



GLAZING UNIT	P2	P4	U6	U8 (VSG)
CHARACTERISTICS	Anti-burglary	Anti-burglary	Highly energy-efficient	Passive
U _g (EN 673)	1.1 W/m ² K	1.1 W/m ² K	0.5 W/m ² K	0.3 W/m ² K
GLAZING STRUCTURE	4H-14-33.2T	4H-14-33.4T	6H-18- 4HT-18-33.2T	4H-10-4HT-12-4HT-12-33.2T
CHAMBERS	ONE	ONE	TWO	THREE
TOUGHENED OUTER PANE	+	+	+	+
LAMINATED INNER PANE	+(class P2A)	+(class P4A)	+(class P2A)	+(class P2A)
SPACER	WARM TGI	WARM TGI	WARM TGI	WARM TGI
INERT GAS	ARGON	ARGON	ARGON	KRYPTON
SUN RAYS TRANSMISSION (τ _v)	0.70	0.70	0.62	0.57
SUN ENERGY TRANSMISSION (SOLAR FACTOR g)	0.52	0.50	0.47	0.43
UV RAYS TRANSMISSION (τ _{uv})	99 %	npd	99 %	99 %

FLAT ROOF WINDOWS

WINDOWS TYPE F DXF, DMF, DEF



D_F window in ColourLine version



reddot design award
winner 2016

FEATURES:

- Innovative type F flat roof window – excellent thermal insulation and modern design.
- An abundance of natural light. The specially designed shape of the window profiles has a glazing area up to 16% greater than those of competitors.
- The frame is constructed of multi-chamber PVC profiles filled with insulation material.
- The glazing unit is bonded using advanced manufacturing technologies to produce high durability and impeccable aesthetics.
- The external glass is toughened and reflects the sun rays while the internal pane is anti-burglary Class P2A. Should the pane crack, shards of glass do not pose a danger but remain on the laminate film.
- Windows are available with two glazing units.
- **DU6** - Energy-efficient, double-glazed with a whole window U-value of 0.70 W/m²K (EN 14351-1).
- **DU8** Passive, triple-glazed with a whole window U-value of 0.64 W/m²K (PN-EN 14351-1).
- A very high, class B fire resistance (PN-EN 13501-1). This confirms high performance in relation to spread of flame.
- The highest impact resistance (Class SB1200 - EN 1873).
- In addition to standard sizes, the D_F type windows can be manufactured in non-standard sizes (in the range of 60x60 - 120x220cm). This enables existing skylights which do not meet current thermal insulation requirements to be replaced with ease.
- Windows are available in three versions:
 - **DEF** - Electrically opened with wireless Z-Wave system. The kit includes AC adapter, remote control and rain sensor. Sash tilts 15cm.
 - **DMF** - Opened manually by means of ZSD control rod (included as standard). Sash tilts 30cm.
 - **DXF** - Non-opening.
- The D_F windows are available with the ColourLine option and so can be finished in any colour from the RAL classic palette. This wide range enables customers to customize their windows to suit their personal taste.
- Windows can be mounted on an additional XRD base with a height of 15cm for installation in green or living roofs.
- Suitable for pitches from 2-15°.
- The structure of the window enables installation of internal as well as external accessories.

Technical Specification	DXF DU6, DMF DU6, DEF DU6	DXF DU8, DMF DU8, DEF DU8
window U-value	0.70 W/m ² K	0.64 W/m ² K
glazing U-value	0.5 W/m ² K	0.4 W/m ² K
acoustic insulation R _w	34 dB	33 dB
glazing unit	6H-18-4HT-18-44.2T 6H-16-4HT-18-55.2T*	6H-10-4HT-10-4HT-12-44.2T
inert gas filled panes	argon	krypton
external glass toughened	+	+
internal glass anti-burglary	+	+
air permeability class	class 4 as per EN 14351-1	

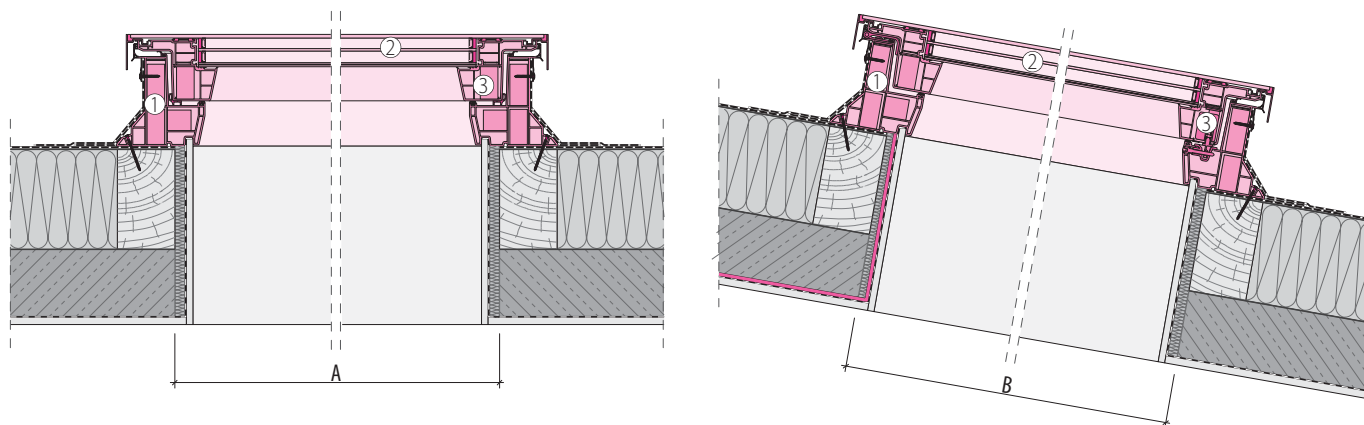
* Glazing structure for the sizes: 100x150, 120x120, 140x140, 120x220.

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 2 years for control elements in electric versions
- 2 years for gas springs

Cross-section of DEF flat roof windows

- 1 — multi-chamber PVC profile
- 2 — glazing unit
- 3 — sash



Sizes of standard windows

PRODUCT CODE	Window size [cm]											
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140 ¹	120/220 ¹	Roof opening [cm] AxB
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140	120/220	
	0.23	0.37	0.33	0.46	0.60	0.83	0.77	1.21	1.16	1.63	2.23	
	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K	

LUX DXF DU6 Non-opening

80CC	+	+	+	+	+	+	+	+	+	+	+	
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LUX DXF DU8 Non-opening with passive glazing unit

80CD	+	+	+	+	+	+	+	+	+	+	+	
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LUX DMF DU6 Opened manually by means of control rod (included as standard)

80CE	+	+	+	+	+	+	+	+	+	+	+	
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LUX DMF DU8 Opened manually by means of control rod (included as standard) with passive glazing unit

80CF	+	+	+	+	+	+	+	+	+	-	-	
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LUX DEF DU6 Electrically opened with wireless Z-Wave system

80CG	+	+	+	+	+	+	+	+	+	+	+	
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LUX DEF DU8 Electrically opened with wireless Z-Wave system and with passive glazing unit

80CH	+	+	+	+	+	+	+	+	+	-	-	
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Position of hinges and actuators in DEF and DMF opening windows.
¹For DMF windows two screw actuators are fitted in sizes 140x140cm and 120x220cm,

WINDOWS TYPE C DXC, DMC, DEC



FEATURES:

- Secure type flat roof windows are available and feature anti-burglary properties. They are equipped with a number of features aimed at enhancing both safety and security parameters.
- The type C flat roof window with a dome made of durable polycarbonate which is characterised by high impact resistance and adverse weather conditions such as rain or hail. Special coatings on the surface of the dome protect it against UV radiation. Available with a transparent dome D_C -C or an opaque dome D_C - M.
- An abundance of natural light. The specially designed shape of the window profiles has a glazing area up to 16% greater than those of competitors.
- The frame is constructed of multi-chamber PVC profiles filled with insulation material.
- Windows are available with two glazing units:
 - P2 – Anti-burglary, single-glazed with a whole window U-value of 1.2 W/m²K (EN 12567-2) which is as much as 14% better when compared with other manufacturer's products.
 - U8(VSG) – Passive, triple glazing unit with a whole window U-value of 0.72 W/m²K (EN 12567-2) or 0.55 W/m²K (EN 1873 for the size 120x120 cm).
- A very high, class B fire resistance (PN-EN 13501-1). This confirms high performance in relation to spread of flame.
- The highest impact resistance (Class SB1200 - EN 1873).
- Windows are available in three versions:
 - **DEC** - Electrically opened with wireless Z-Wave system. The kit includes AC adapter, remote control and rain sensor. Sash tilts 15cm.
 - **DMC** - Opened manually by means of ZSD control rod (included as standard). Sash tilts 30cm.
 - **DXC** – Non-opening.
- A wide range of sizes is adapted to the specification of flat roof skylights, hence existing skylights can be replaced for new windows with ease.
- Windows can be mounted on an additional XRD base with a height of 15cm for installation in green or living roofs.
- Suitable for pitches from 0-15°.
- The structure of the window enables installation of internal as well as external accessories.

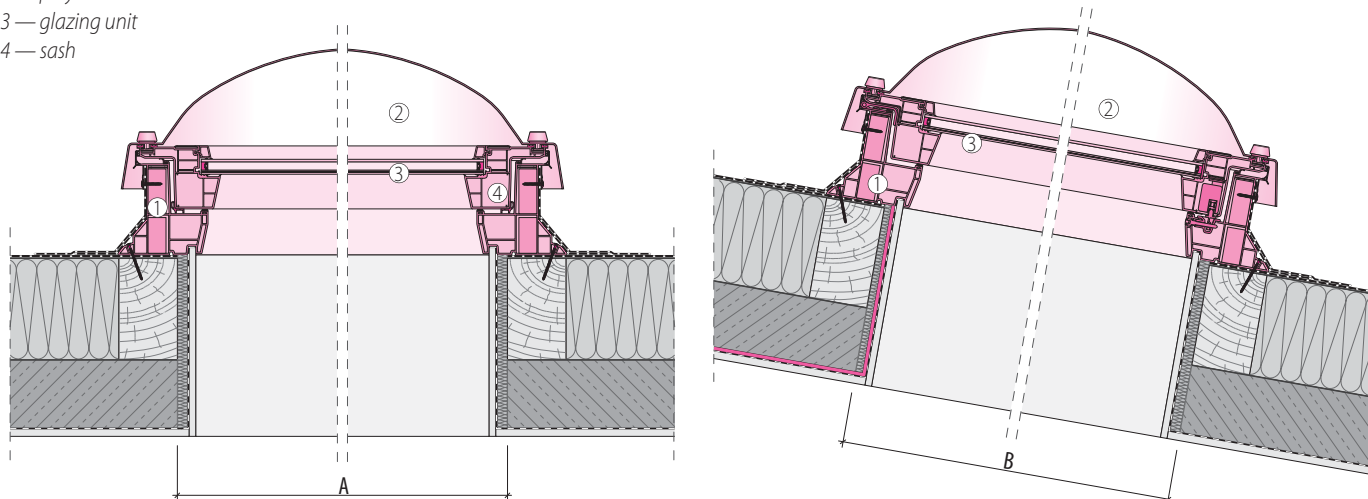
Technical Specification	DXC P2, DMC P2, DEC P2	DEC U8(VSG)
window U-value	1.2 W/m ² K	0.72 W/m ² K
glazing U-value	1.1 W/m ² K	0.3 W/m ² K
acoustic insulation R _w	35 dB	36 dB
glazing unit	4H-14-33.2T	4H-10-4HT-12-4HT-12-33.2T
inert gas filled panes	argon	krypton
external glass toughened	+	+
internal glass anti-burglary	+	+
air permeability class	class A3 as per EN 1873:2005 for DXC	
	class 4 as per EN 1873:2005 for DMC and DEC	

WARRANTY:

- 10 years for windows
- 2 years for control elements in electric versions
- 2 years for gas springs

Cross-section of DEC flat roof windows

- 1 — multi-chamber PVC profile
- 2 — polycarbonate dome
- 3 — glazing unit
- 4 — sash



Sizes of standard windows

PRODUCT CODE	60/60		60/90		70/70		80/80		90/90		90/120		100/100		100/150 ¹		120/120 ¹		140/140		120/220	
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140	120/220	120/220	120/220	120/220	120/220	120/220	120/220	120/220	120/220	120/220	120/220	120/220
	0.23	0.37	0.33	0.46	0.60	0.83	0.77	1.21	1.16	1.63	2.23											
	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K											

Window size [cm]
Roof opening [cm] Ax8

LUX **DXC-C P2** with transparent dome **DXC-M P2*** with opaque dome. Non-opening

80BC	+	+	+	+	+	+	+	+	+	+	+											
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LUX **DMC-C P2** with transparent dome **DMC-M P2**** with opaque dome. Opened manually by means of ZSD control (rod included as standard)

80BL	+	+	+	+	+	+	+	+	+	+	+											
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LUX **DEC-C P2** with transparent dome **DEC-M P2***** with opaque dome. Electrically opened with wireless Z-Wave system

80BW	+	+	+	+	+	+	+	+	+	+	+											
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LUX **DEC-C U8(VSG)** with transparent dome **DEC-M U8(VSG)** with opaque dome. Electrically opened with wireless Z-Wave system

80CA	+	+	+	+	+	+	+	+	+	-	-											
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* For DXC-M P2 code **80BD**
 ** For DMC-M P2 code **80BM**
 *** For DEC-M P2 code **80BX**



WINDOWS D_F Secure, D_C Secure



FEATURES:

- Secure type flat roof windows are available and feature anti-burglary properties. They are equipped with a number of features aimed at enhancing both safety and security parameters.
- The type F windows (DMF DU6 Secure, DXF DU6 Secure) as well as the type C windows (DXC P4 Secure, DMC P4 Secure) comply with European anti-burglary class RC2 (EN 1627).
- An abundance of natural light. The specially designed shape of the window profiles has a glazing area up to 16% greater than those of competitors.
- The frame is constructed of multi-chamber PVC profiles filled with insulating material.
- D_F Secure windows come with a highly energy-efficient, double chamber DU6 glazing unit with a Class P4A anti-burglary inner pane. The whole window U-value is 0.70 W/m²K (EN 14351-1).
- D_C Secure windows come with an energy-efficient, single chamber glazing unit with a Class P4A anti-burglary inner pane. The whole window U-value is 1.2 W/m²K (EN 12567-2).
- Available with a transparent dome D_C – C or an opaque dome D_C – M.
- Windows are available in versions:
 - DMF Secure / DMC Secure – Opened manually by means of ZSD control rod (rod included as standard). Sash tilts 30cm.
 - DXF Secure / DXC Secure – Non-opening.
- Windows can be mounted on an additional XRD base with a height of 15cm for installation in green or living roofs.
- The type F flat roof window is suitable for roof pitches between 2 and 15°, while the type F is designed for pitches between 0 and 15°.
- The structure of the window enables installation of internal as well as external accessories.

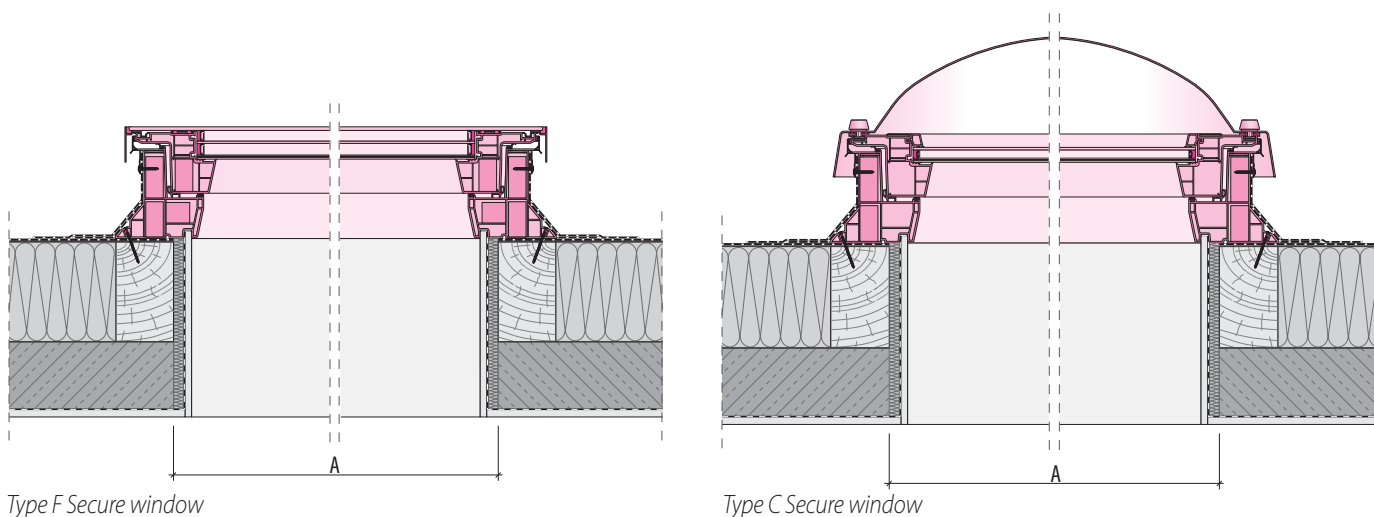
Technical Specification	D_F DU6 Secure	D_C P4 Secure
window U-value	0.70 W/m ² K	1.2 W/m ² K
glazing U-value	0.5 W/m ² K	1.1 W/m ² K
acoustic insulation R _w	34 dB	35 dB
glazing unit	6H-18-4HT-18-44.4T 6H-16-4HT-18-55.4T*	4H-14-33.4T
inert gas filled panes	argon	argon
external glass toughened	+	+
internal glass anti-burglary	+	+
air permeability class	class 4 as per EN 14351-1	A3 for DXC 4 for DMC as per EN 1873:2005

* Glazing structure for the sizes: 100x150, 120x120, 140x140, 120x220

WARRANTY:

- Lifetime against hail
- 10 years for windows

Cross-section of type Secure flat roof windows



Sizes of standard windows

PRODUCT CODE	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140 ¹	120/220 ¹	Window size [cm]
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140	120/220	Roof opening [cm] AxB
	0.23	0.37	0.33	0.46	0.60	0.83	0.77	1.21	1.16	1.63	2.23	
	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K	

LUX	DXF DU6 Secure Non-opening, anti-burglary											
80CX	+	+	+	+	+	+	+	+	+	+	+	
LUX	DMF DU6 Secure Opened manually by means of control rod (rod included as standard), anti-burglary											
80CY	+	+	+	+	+	+	+	+	+	+	+	
LUX	DXC-C P4 Secure with transparent dome DXC-M P4 Secure* with opaque dome, non-opening, anti-burglary											
80CK	+	+	+	+	+	+	+	+	+	+	+	
LUX	DMC-C P4 Secure with transparent dome DMC-M P4 Secure** with opaque dome, opened manually by means of ZSD control (rod included as standard)											
80CM	+	+	+	+	+	+	+	+	+	+	+	

* For DXC-M P4 Secure code **80CL**
 ** For DMC-M P4 Secure code **80CN**



FLAT ACCESS ROOF LIGHTS **DRF, DRC**



FEATURES:

- Insulated DR_ access roof lights are another FAKRO products expanding the range of solutions for flat roofs.
- They illuminate interiors as well as provide safe and convenient access to the flat roof.
- The use of special hinges and a simple method of operation enables the sash to be opened to 80°. Gas springs facilitate the operation of the sash, keep it stable in the open position and protect against accidental closure. Additionally, the access roof light incorporates increased operational safety through use of an anti-slip coating on its outer surface.
- The proven design of flat access roof lights ensures a high mechanical performance. When it comes to accessories, modern design ensures that they are no different from standard flat roof windows. It is possible to install both internal and external accessories which are used in flat roof windows.
- Access roof lights are available in two versions:
 - **DRF** – Innovative, DU6 glazing unit with a Class P2A anti-burglary inner pane. The whole window U-value is 0.74 W/m²K (EN 14351-1). As standard, equipped with ZBR lock which protects against accidental closure of the sash.
 - **DRC** – Available with a transparent dome D_C -C or an opaque dome D_C - M. P2 glazing unit and a whole window U-value of 0.88 W/m²K (EN1873:2014). Option to install is an additional ZBR lock which protects against accidental closure of the sash.
- Windows can be mounted on an additional XRD base with a height of 15cm for installation in green or living roofs.
- The type F access roof light is suitable for pitches between 2 and 15°, while the type C is designed for pitches between 0 and 15°.
- The structure of the access roof light enables installation of internal as well as external accessories.

Technical Specification	DRF DU6
window U-value	0.74 W/m ² K
glazing U-value	0.5 W/m ² K
acoustic insulation Rw	38 dB
glazing unit	6H-18-4HT-18-44.2T 6H-16-4HT-18-55.2T*
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	+
air permeability class	4
impact resistance	Class 5 - 950mm

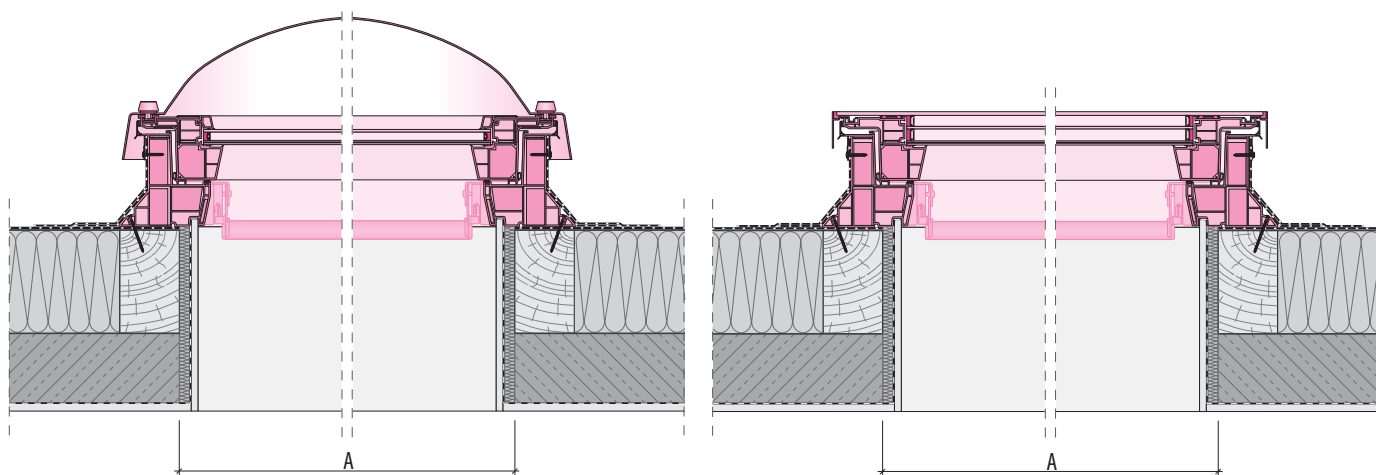
* Glazing structure for the size: 120x120

Technical Specification	DRC-C P2
window U-value	0.88 W/m ² K
glazing U-value	1.1 W/m ² K
acoustic insulation Rw	35 dB
glazing unit	4H-14-33.2T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	+
air permeability class	Ap 0.32
impact resistance - soft body	SB 1200

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 2 years for gas springs





Cross-section of flat access roof lights



Flat access roof light DRC

Flat access roof light DRF

Sizes of standard windows

PRODUCT CODE	Window size [cm]											Roof opening [cm] AxB	
	90/90	90/120	100/100	120/120									
	90/90	90/120	100/100	120/120									
	0.60	0.83	0.77	1.16									
													
	05K	06K	07K	08K									

LUX	DRF DU6 Flat access roof light												
80EL		+	+	+	+								

LUX	DRC-C P2 Access roof light with a dome												
80EK		+	+	+	+								

WINDOWS DXW



FEATURES:

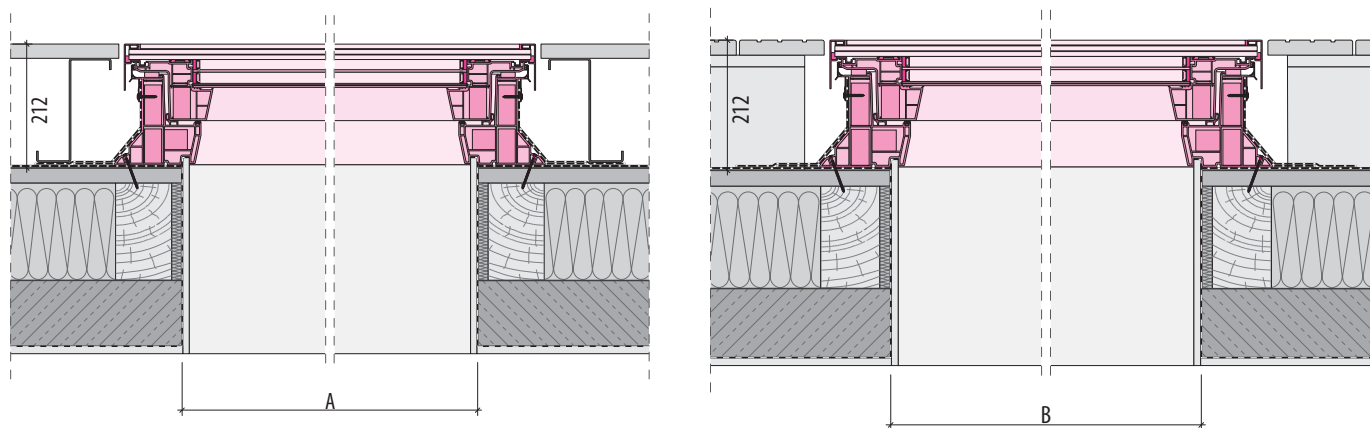
- The DXW flat roof window offers an absolutely new approach in the use of flat roofs.
- The window is an excellent solution for use with flat roof design. Its specially strengthened sash and frame enable it to be installed completely flush within the roofline.
- Unique design with enhanced load capacity, providing a surface level with the roof and a special non-slip coating to ensure complete safety when walking across the window.
- An abundance of natural light in buildings with flat roofs.
- The frame of the flat roof window is constructed of multi-chamber PVC profiles filled with insulation material. The upper part of the window comes with an innovative flat glazing unit with a non-slip surface. Profiles which clamp the covering material and facilitate finish of the window connection with the roofing material are included as standard.
- The window comes with passive, double-chamber glazing unit with a U-value of 0.70 W/m²K (EN 14351-1).
- Suitable for pitches from 0 - 15°.
- It is possible to install the same internal accessories which are used in all our type F flat roof windows.

Technical Specification	DXW DW6
window U-value	0.7 W/m ² K
glazing U-value	0.5 W/m ² K
acoustic insulation Rw	npd
glazing unit	888.44-16-4HT-18-66.2T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	+
air permeability class	4
impact resistance	class 5 - 950mm

WARRANTY:

- Lifetime against hail
- 10 years for windows

Cross-section of DXW flat roof window



Sizes of standard windows

PRODUCT CODE	60/60	60/90	70/70	80/80	90/90	90/120	100/100	120/120					Window size [cm] Roof opening [cm] AxB
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	120/120					
	0.23	0.37	0.33	0.46	0.60	0.83	0.77	1.16					
	01K	02K	03K	04K	05K	06K	07K	08K					

LUX DXW DW6 Non-opening

80EM	+	+	+	+	+	+	+	+				
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SMOKE VENTILATION FLAT ROOF WINDOWS **DSF, DSC**



FEATURES:

- DSF, DSC smoke ventilation flat roof windows are used for extraction of smoke and heat emitted in a building during a fire to allow people for quick evacuation.
- A perfect solution for stairwells where under normal operating conditions this window serves the purpose of room ventilation and lighting.
- Smoke ventilation windows combine the standard function of a roof window with that of automatic smoke evacuation in a single product. They feature excellent thermal insulation performance and proven design to ensure high operational and mechanical parameters.
- An abundance of natural light in buildings with flat roofs.
- The frame of the smoke ventilation is constructed of multi-chamber PVC profiles filled with insulation material.
- The sash raises to a height of 23cm when used for everyday ventilation, but in the event of fire it raises to 50cm. Elements of the sash lifting mechanism are not visible with the window closed.
- Opening mechanism and actuators ensure excellent operation. Removable inner lining ensures perfect control and service access to the opening mechanism and actuators of the window.
- Windows are available in the following versions:
 - **DSF** – Innovative, DU6 glazing unit with a Class P2A anti-burglary inner pane and a Ug value of 0.5W/m²K.
 - The size 105x105cm has a 1m² of geometric smoke ventilation area to meet varied standards required in different countries
 - **DSC** – Available with a transparent dome **DSC – C** or an opaque dome **DSC – M**.
 - P2 glazing unit with a Ug value of 1.1 W/m²K.
 - Suitable for pitches from 0 - 15°. When installing, windows must be level.

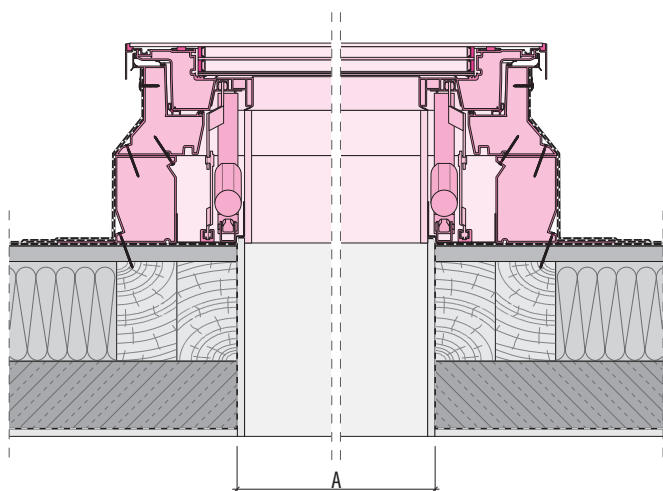
Technical Specification	DSF DU6	DSC-C4 P2	DSC-C2 P2
glazing U-value	0.5 W/m ² K	1.1 W/m ² K	1.1 W/m ² K
glazing unit	6H-16-4HT-18-55.2T	4H-14-33.2T	4H-14-33.2T
inert gas filled panes	argon	argon	argon
external glass toughened	+	+	+
internal glass anti-burglary	+	+	+
wind load resistance*	WL 3000	WL 2000	WL 2000
low ambient temperature*	T (-05)	T (-05)	T (-05)
high temperature resistance*	B 300	B 300	B 300
reliability*	RE 1000	RE 1000	RE 1000
snow load resistance	SL1200	SL1200	SL450

* As per EN 12101-2:2003

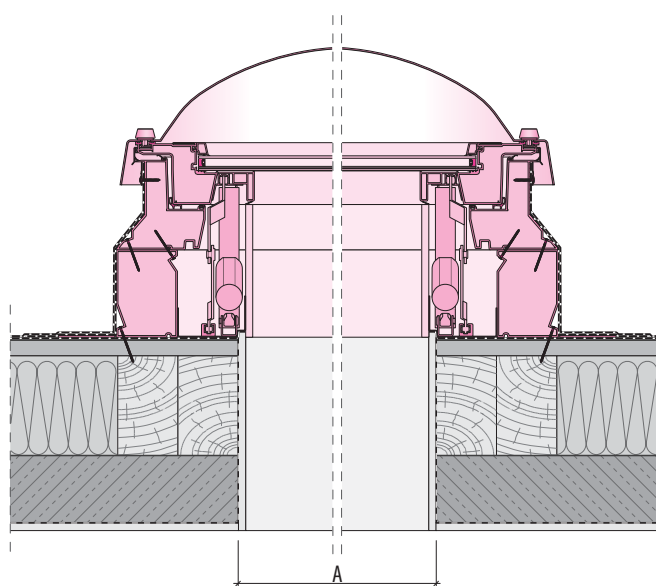
WARRANTY:

- Lifetime against hail
- 10 years for windows
- 2 years for actuators and control elements

Cross-section of smoke ventilation flat roof windows






Smoke ventilation window DSF



Smoke ventilation window DSC

Sizes of standard windows

PRODUCT CODE	100/100	105/105	120/120								
	100/100	105/105	120/120								
	0.77	1.00	1.16								
											
	07K	12K	08K								

Window size [cm]
Roof opening [cm] AxB

LUX DSF DU6 Flat smoke ventilation window

		+	+								
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LUX DSC-C2 P2 Smoke ventilation window with a dome

	+		+								
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LUX DSC-C4 P2 Smoke ventilation window with a dome

	+		+								
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FLAT ROOF ACCESS DOOR **DRL**



FEATURES:

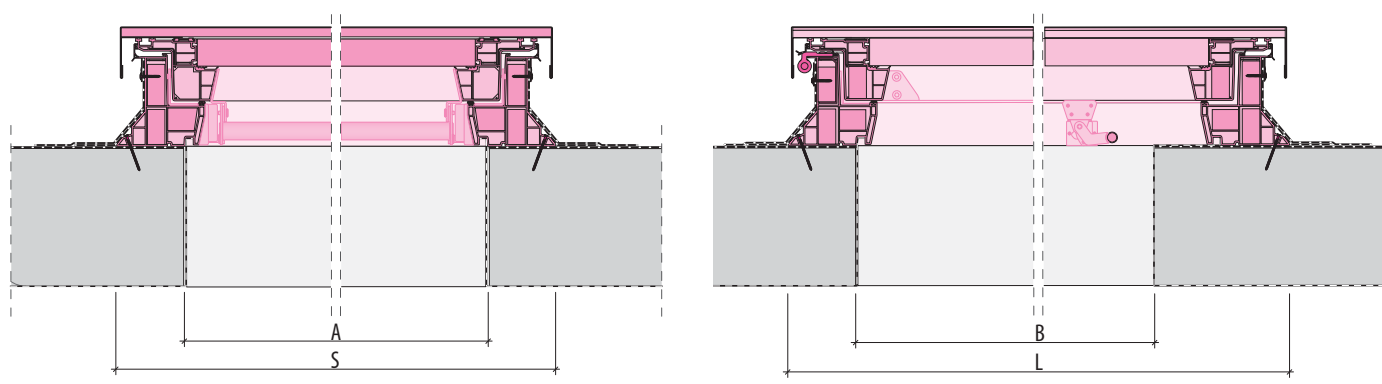
- The DRL roof access door is an innovative product providing safe and comfortable access to the flat roof.
- Structural durability and range of sizes provide the perfect combination with a loft ladder.
- The frame is constructed of multi-chamber PVC profiles filled with insulation material, while the whole structure is insulated, $U_w=0.67 \text{ W/m}^2\text{K}$ (EN 14351-1).
- Insulated sash equipped with a rubber seal ensures perfect thermal insulation performance.
- The sash can be opened up to 60°. Gas springs facilitate opening and closing and the sash can be left in open position.
- Anti-slip tape on the base ensures safe access to the flat roof.
- Sizes of the roof access door are compatible with the FAKRO standard range of loft ladders (loft ladders are sold separately).
- Can be mounted on an additional XRD base with a height of 15cm for installation in green or living rooms.
- Option to install an additional ZBR lock which protects against accidental closure of the sash.
- Suitable for pitches from 0 - 5°.
- The product is supplied fully assembled.

Technical Specification	DRL
roof access door U-value	0.67 W/m ² K
acoustic insulation R _w	30 dB
air permeability class	4
impact resistance	class 5 – 950 mm
wind load resistance	class C5/B5
watertightness, unshielded (A)	E900

WARRANTY:

- 10 years for roof access door
- 2 years for gas springs

Cross-section of DRL flat roof access door



Sizes of standard windows

PRODUCT CODE	60x120	70x120	70x130	70x140	86x130	92x130															Roof opening [cm]
	01	11	12	13	96	98															

DRL Flat roof access door

8695	+	+	+	+	+	+															
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LML loft ladder can be purchased to the flat roof access door.

INSTALLATION BASE **XRD**



FEATURES:

- Designed for flat roof windows type C and type F.
- It allows to raise the window above the flat roof by 15cm.
- It reduces to a minimum the time of window installation on flat roofs where an upstand to raise the window is required (e.g. green or gravel roof).
- Versatility of the XRD installation base enables a maximum of two bases to be stacked on top of one another to achieve greater height. The extended element of the frame, the so called 'fin' is used to connect the base and the roof waterproofing layer.
- The profile of the XRD insulation base is made of recycled material (grey colour) and is eco-friendly. The profile is filled with insulation material (polystyrene) to ensure a high standard of insulation.
- The base is adapted to standard sizes of flat roof windows. It is possible to manufacture non-standard size of the XRD installation base to suit non-standard size of the type F flat roof windows.

WARRANTY:

- 10 years



Sizes

PRODUCT CODE	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140	120/220
	60/60	60/90	70/70	80/80	90/90	90/120	100/100	100/150	120/120	140/140	120/220
	0.23	0.37	0.33	0.46	0.60	0.83	0.77	1.21	1.16	1.63	2.23
	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K

XRD installation base

80AF	+	+	+	+	+	+	+	+	+	+	+	
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CONTROL ROD **ZSD**



FEATURES:

- The ZSD telescopic rod used to operate DMF and DMC flat roof windows and ARF/D internal blinds.
- Standard rod length is 119 cm.
- Can be extended to 330 cm.

WARRANTY:

- 2 years

ZSD control rod

55093

+



FLASHINGS

FOR ROOF WINDOWS





THE PURPOSE OF FLASHING

Flashings are essential for tight connection of roof windows with roofing material. Precisely designed flashing details ensure a durable and neat fit with the roofing material used. The purpose of flashing is to ensure good drainage away from the window and to provide protection from the wind. Flashings can be used with all types of the centre-pivot windows (FT, PT), with raised axis of rotation (FYP, FDY), the top-hung windows (FPP, PPP, FEP), as well as windows for combinations (FX_, FT_/D, B__).(FT_/D, B__). These types of windows can be combined in various combinations. Thanks to the uniform design of flashing, different types of windows can be combined into groups. FAKRO offers a range of flashing solutions, manufactured in polyester powder coated aluminium to give high durability and resistance to atmospheric conditions. The standard colour is brown RAL 7022, which matches well with most roofing finishes.

Roof windows can be installed in the roof structure at three different levels: N (3cm), V (0cm) and J (-3cm). Flashings are categorised accordingly. The third letter of the flashing type code indicates the depth at which the roof window can be fitted. Flashings symbol have been extended to the fourth letter that indicates the type of material the apron is made of: P- lead apron, A- aluminium clad - plastic apron.

STANDARD FLASHINGS

FLASHINGS FOR THIN ROOF COVERINGS ESV, ESJ, ESV-T Thermo

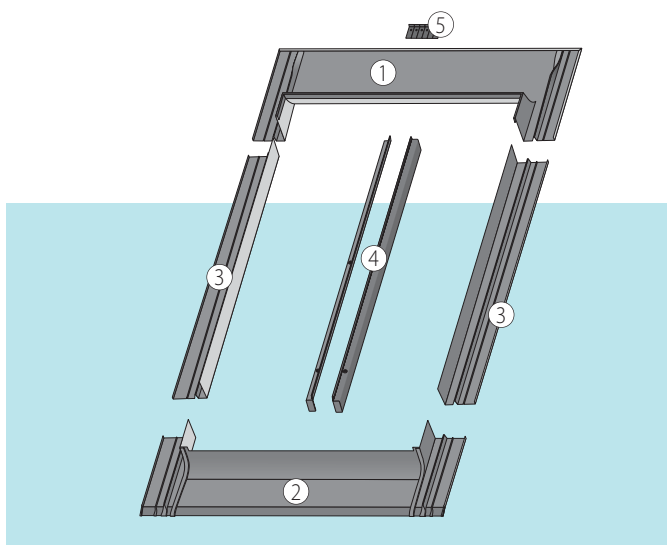


FEATURES:

- Allows for tight connection of the window with flat roof coverings such as: **roofing felt, shingles, flat metal panel sheet.**
- Applied as standard to individual windows in the slope of the roof. There is also a modular version to combine windows in groups:
 - for V depth in horizontal, vertical and block groups,
 - for J depth in horizontal combination.
- Standard distance between the windows installed horizontally and vertically is 10 cm.
- Available in various types allowing window to be installed at two different depths in the roof construction: V (0), J (-3cm).
- Standard installation depth of the window with the application of flashing ES is V - version ESV.
- Can be used in roofs with pitches:
 - from 15 ° to 90 ° for depth of V,
 - from 20 ° to 90 ° for depth of J.

CONSTITUENTS OF THE FLASHING:

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – gutter
 - 5 – aluminium strips to fix the flashing
- Lower flashing element has a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a neat fit.

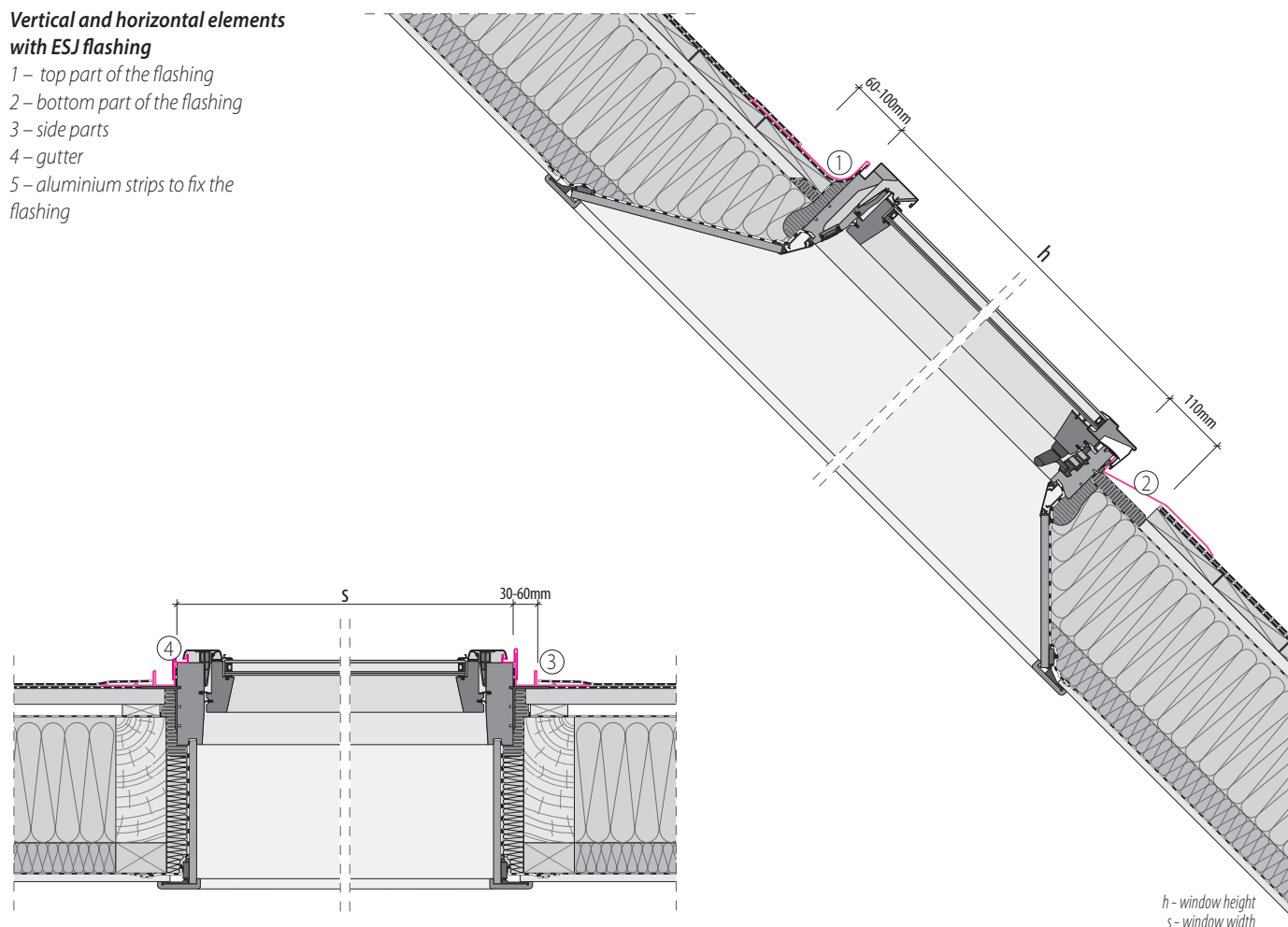


WARRANTY:

- 10 years

Vertical and horizontal elements with ESJ flashing

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – gutter
- 5 – aluminium strips to fix the flashing



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

ESV

842	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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ESV-T Thermo (Insulated Flashing Kit)

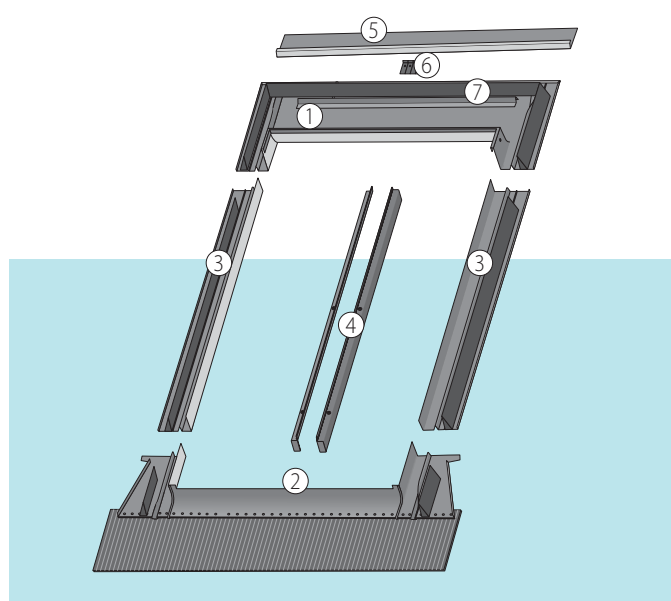
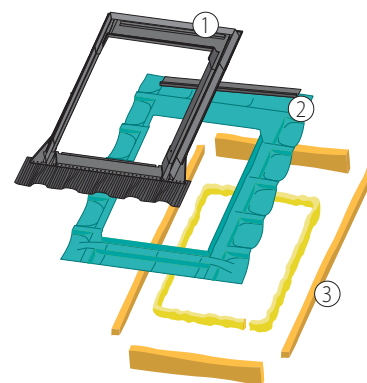
8863	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR TILED COVERINGS **EZN-A, EZV-A, EZV-A XDP**



FEATURES:

- Allows for neat fit with the **profiled roof coverings such as interlocking tile, profiled metal sheet.**
- Universal flashing, which **can be applied not only to corrugated coverings, but to all roof coverings with a profile depth of up to 45mm.**
- As standard is applied to individual windows in the slope of the roof. There is also a modular version to combine windows in groups:
 - for V depth in horizontal, vertical and block groups,
 - for J depth in horizontal combination.
- It is available in three types that allow windows to be installed at three different depths in the roof construction: N (3 cm), V (0), J (-3cm).
- Standard installation depth of the window using a flashing EZ is V - version EZV-A
- Can be used in roofs with pitches
 - from 15 ° to 90 ° for depths N and V,
 - from 20 ° to 90 ° for depth J.
- **EZV-A XDP** consists of standard **EZV-A (1)** and insulation set **XDP**. XDP consists of air-permeable collar (2) and insulation (3) which is made of specially impregnated sheep wool. Details on page 188.



CONSTITUENTS OF THE FLASHING:

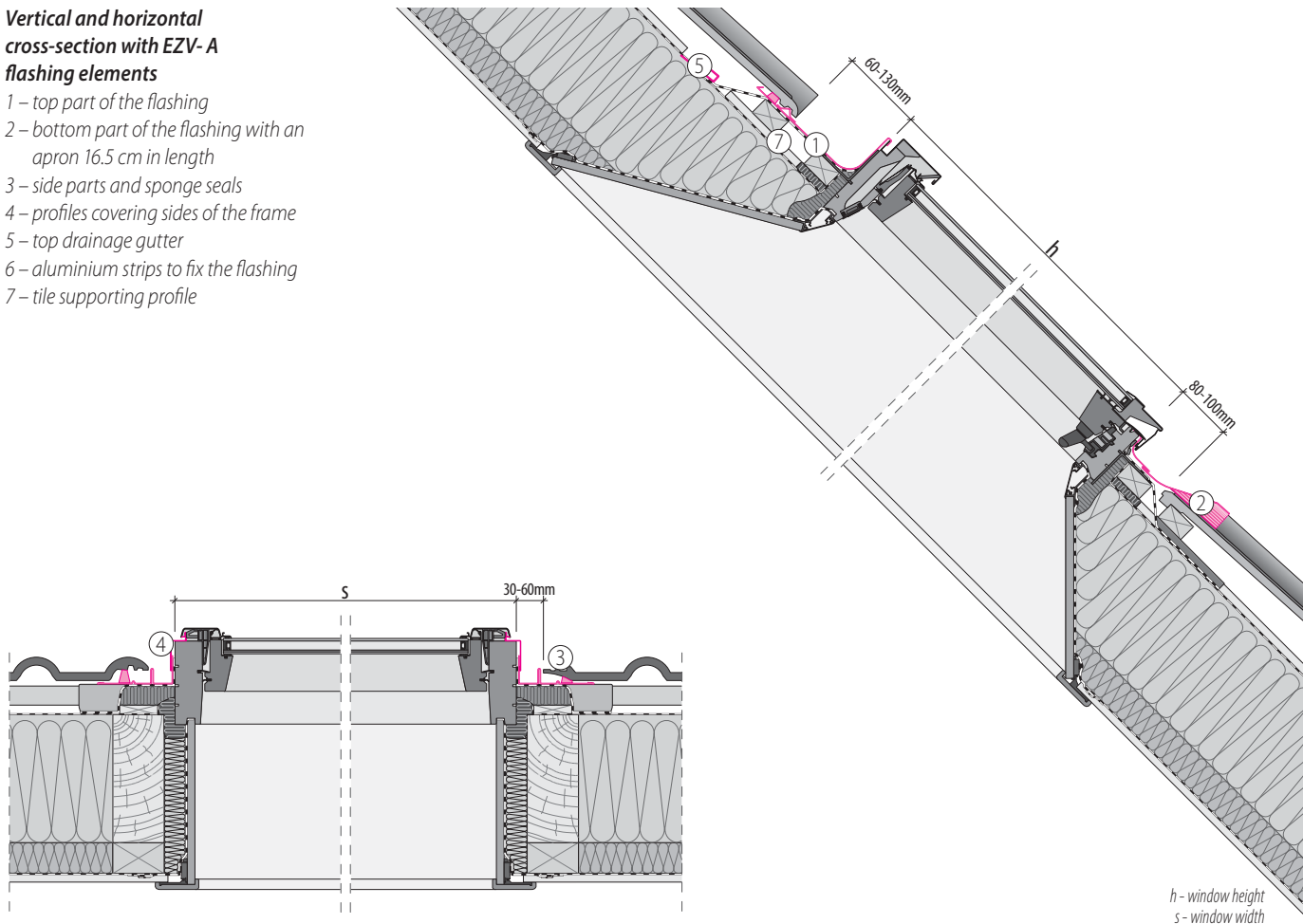
- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing with an apron 16.5 cm in length
 - 3 – side parts and sponge seals
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- The lower element is finished with an elastic apron which has a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a tight fit.
- The flashing has factory equipped sponge seals providing protection against wind blown dust, leaves, rain and snow.
- Equipped with a weep flap to allow condensation to drain away from the window.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EZV-A flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing with an apron 16.5 cm in length
- 3 – side parts and sponge seals
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EZV-A

872	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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EZV-A XDP

883	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-
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EZN-A

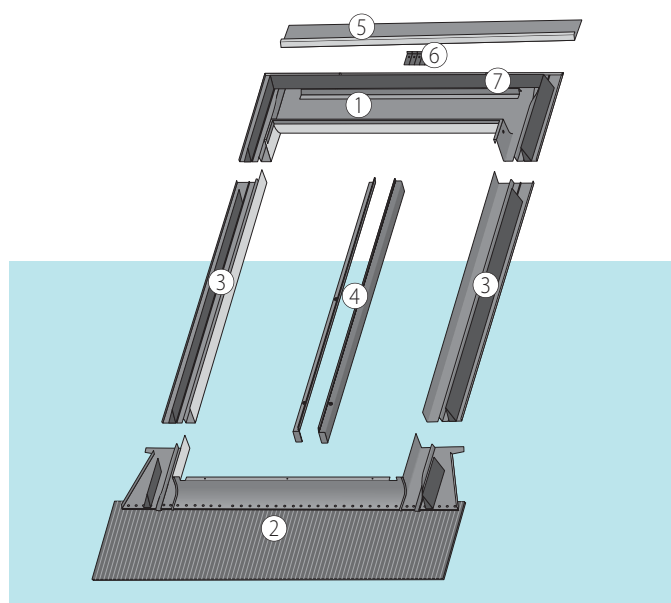
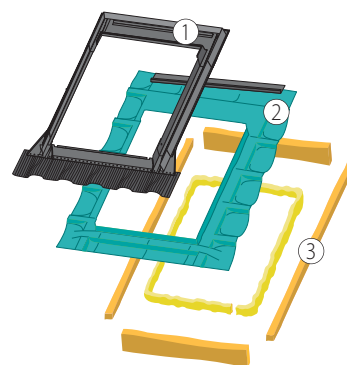
871	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHING FOR TILED COVERINGS **EHN-A, EHN-A XDP**



FEATURES:

- Allows for roof windows water tight connection with **corrugated roof coverings such as roof tiles and high profile metal sheeting**.
- It can be applied to roof coverings with a **profile depth of up to 90mm**.
- As standard applied to individual windows in the slope of the roof. It may also be used as module flashing for windows used in horizontal and vertical combinations or block groups.
- The flashing is available for one installation depth, allowing installation of windows at a level N (+3cm) - flashing EHN-A.
- Can be used on roofs with pitches between 15 and 90 degrees.
- **EHN-A XDP** consists of standard **EHN-A** (1) and insulation set **XDP**. XDP consists of air-permeable collar (2) and insulation (3) which is made of specially impregnated sheep wool. Details on page 188.



CONSTITUENTS OF THE FLASHING:

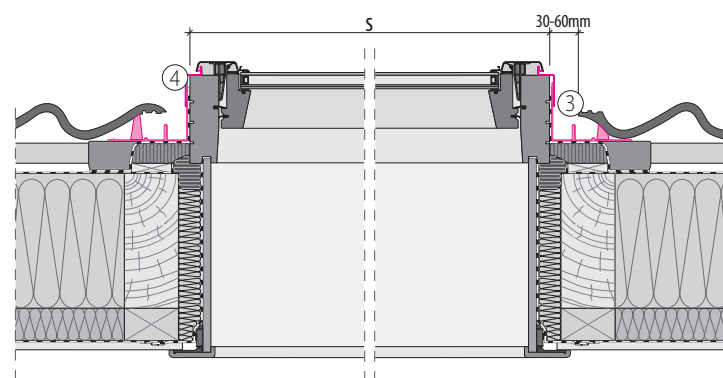
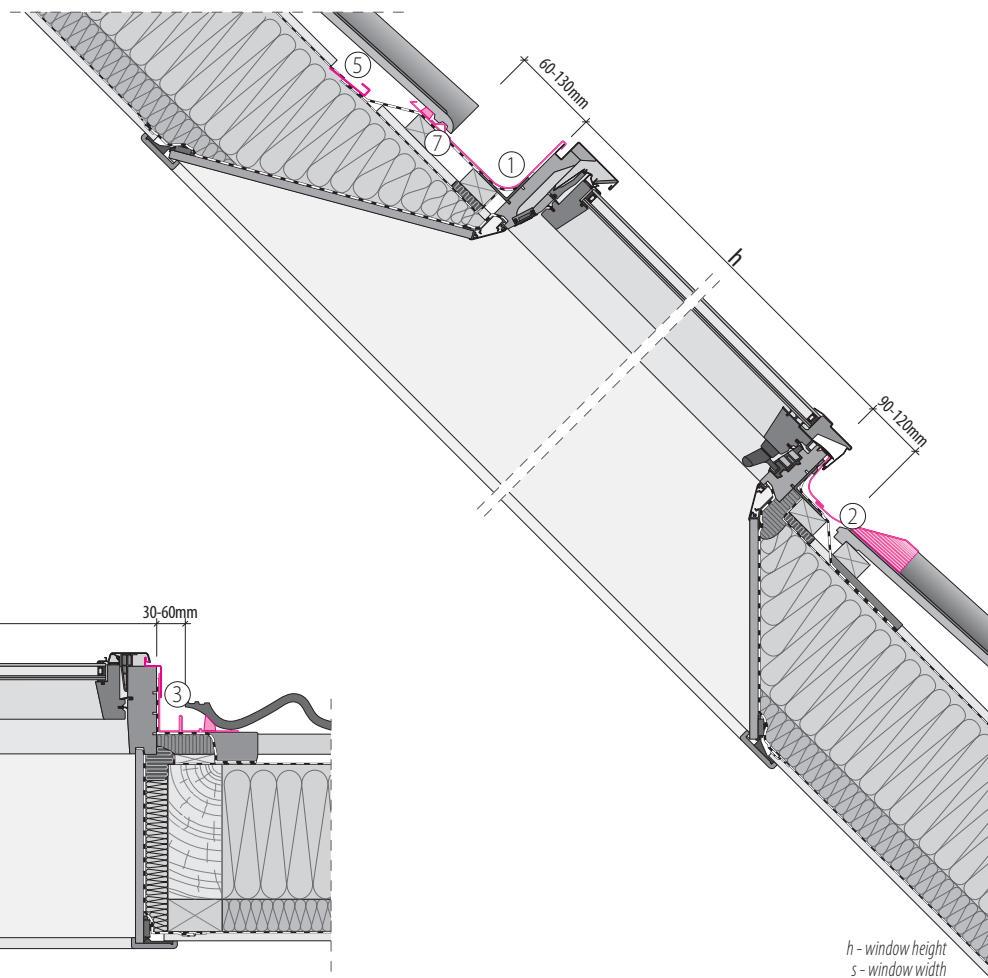
- Basic elements of the flashing:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing with an apron 16.5 cm in length
 - 3 – side parts and sponge seals
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- A long and wide elastic apron finishing is the lower element which allows easy connection with high profiled roof coverings. The lower element has a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a neat fit.
- The flashing side-sealing channels factory equipped with sponge seals provide protection against windblown dust, leaves, rain and snow.
- Equipped with a weep flap to allow condensation to drain away from the window.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EHN-A flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing with an apron 16.5 cm in length
- 3 – side parts and sponge seals
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EHN-A

870	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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EHN-A XDP

8824	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-
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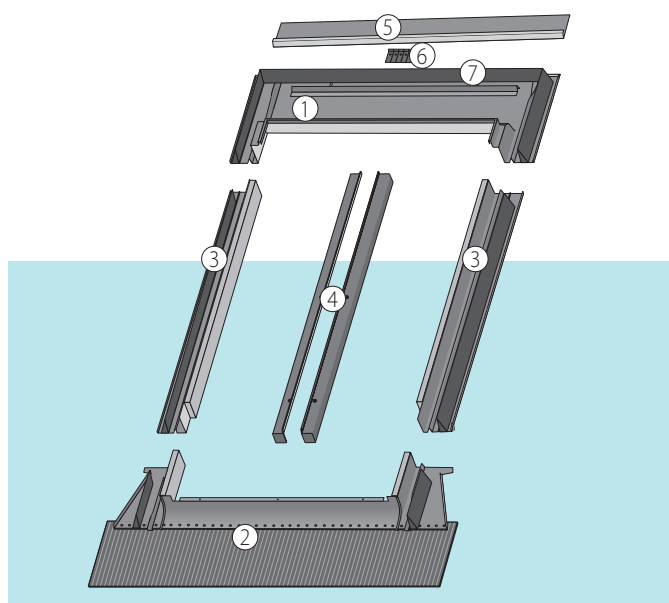
ADDITIONAL FLASHINGS

FLASHINGS WITH ADDITIONAL INSULATION **EHV-AT Thermo, EHN-AT Thermo**



FEATURES:

- Universal flashing EHT-AT Thermo with additional insulation is an ideal solution which guarantees tight and 'warm' connection of the window with the roof covering.
- Makes it possible to apply insulation of the window above the level of battens.
- On the inside of the flashing there is a glued flexible insulating material which adheres tightly to window frame constituting a thermo-insulated frame. Thermo-insulating material has excellent insulating values (coefficient λ). Below the level of the batten the window is insulated by a wool insulating kit XDP.
- Thermo flashing enhances U value of the window up to 15% depending on the window type and size.
- Reduces the presence of thermal bridging and heat loss.
- Designed for all wooden and aluminium-plastic roof windows.
- Applied as standard to individual windows in the slope of the roof. It can be used as single flashing kits or as part of a modular combination.
- Installation at a depth V (0 cm), on roofs with pitches between 15° to 90°.
- Universal flashing type and can be used with all types of roof coverings: **EHV-AT Thermo up to 90mm** profile depth and **EHN-AT Thermo up to 120mm** profile depth.



CONSTITUENTS OF THE FLASHING:

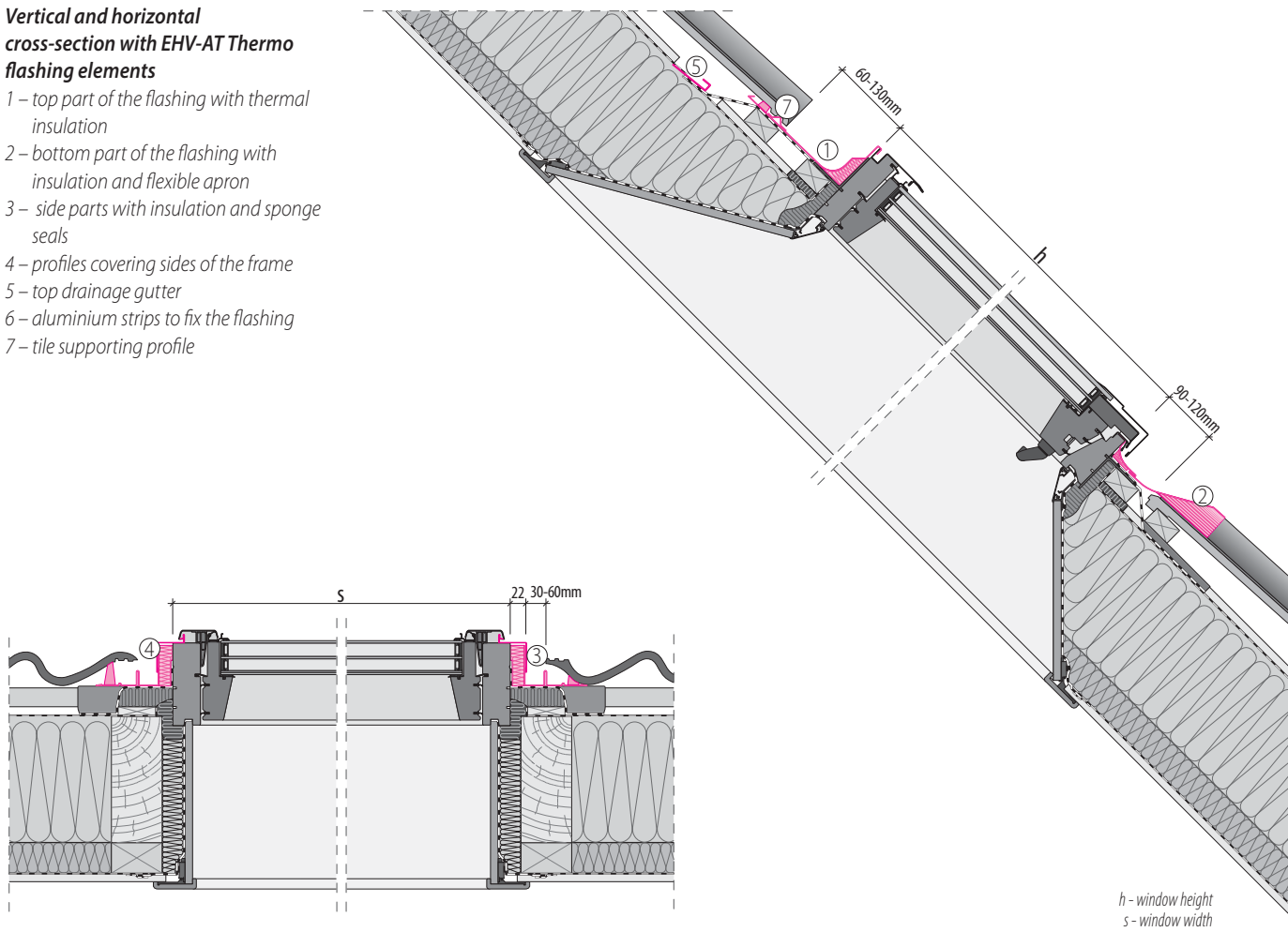
- The flashing is wider 4.4cm than the standard version.
The flashing consists of:
 - 1 – top part of the flashing with thermal insulation
 - 2 – bottom part of the flashing with insulation and flexible apron
 - 3 – side parts with insulation and sponge seals
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- The lower element has a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering.
- The flashing side-sealing channels factory equipped with sponge seals provide protection against windblown dust, leaves, rain and snow.
- Equipped with a weep flap to allow condensation to drain away from the window.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EHV-AT Thermo flashing elements

- 1 – top part of the flashing with thermal insulation
- 2 – bottom part of the flashing with insulation and flexible apron
- 3 – side parts with insulation and sponge seals
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EHV-AT Thermo

8825	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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EHN-AT Thermo

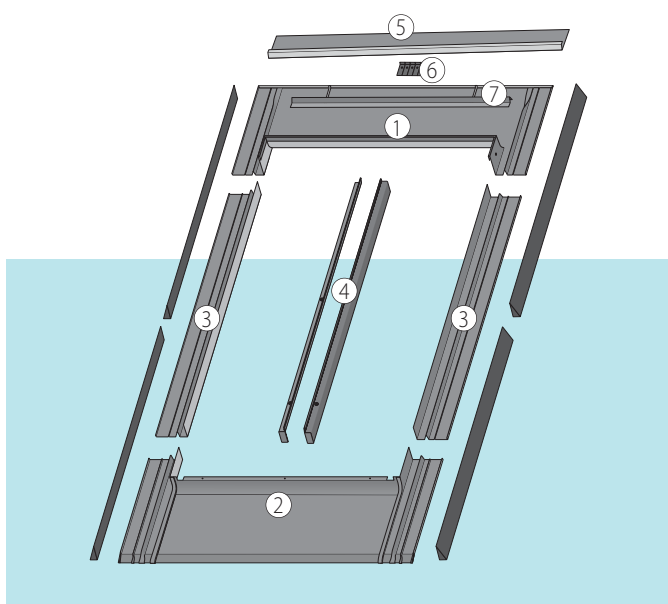
8842	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR FLAT TILES **EZV-F**



FEATURES:

- Enables tight connection of the roof window with **flat interlocking tiles**.
- Special design of flashing elements ensures fast and aesthetic installation of the roof window in this increasingly popular type of roofing material.
- Extending bottom part of the flashing significantly improves the aesthetics of installation in this roofing material and ensures excellent watertightness.
- Special design stiffens the lower part of the flashing and secures it against deformation e.g due to snow cover.
- As standard the flashing is applied to individual windows in the slope of the roof. It may also be used as module flashing for windows installed in horizontal, vertical and block groups.
- Can be used on roofs with pitches:
 - from 15 ° to 90 ° for depths N and V,
 - from 20 ° to 90 ° for depth J.
- The flashing for flat roof tile is also available in **EZS-F** for smoke vent window version and in **EZW-F** for side hung escape window.



CONSTITUENTS OF THE FLASHING:

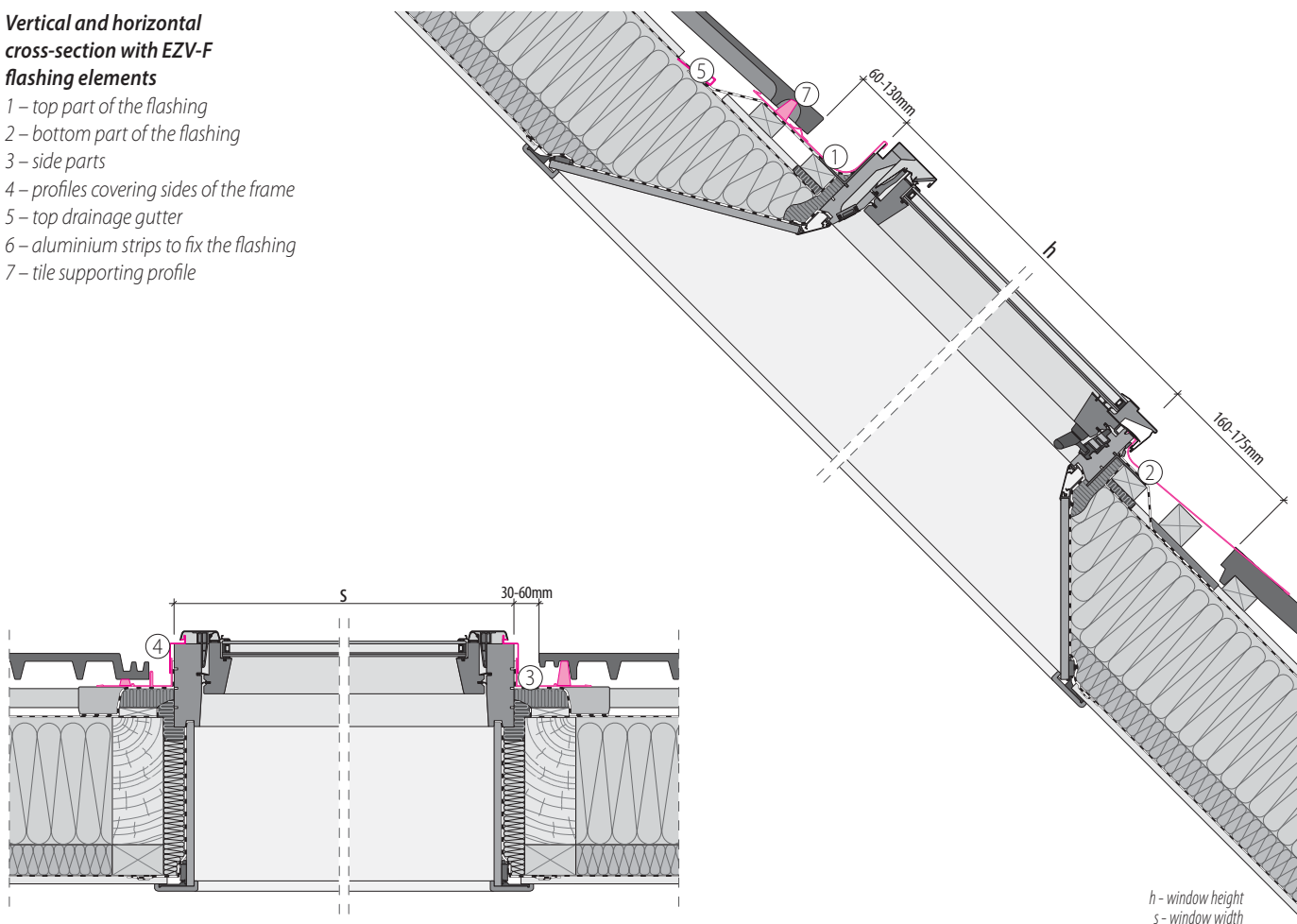
- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- The lower element of the flashing is finished with a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a tight fit.
- It incorporates a gutter installed above the window, which allows the condensation from the roofing membrane to drain away from the window.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EZV-F flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EZV-F

8877	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR SLATE ROOF COVERINGS **ELV, EUJ**

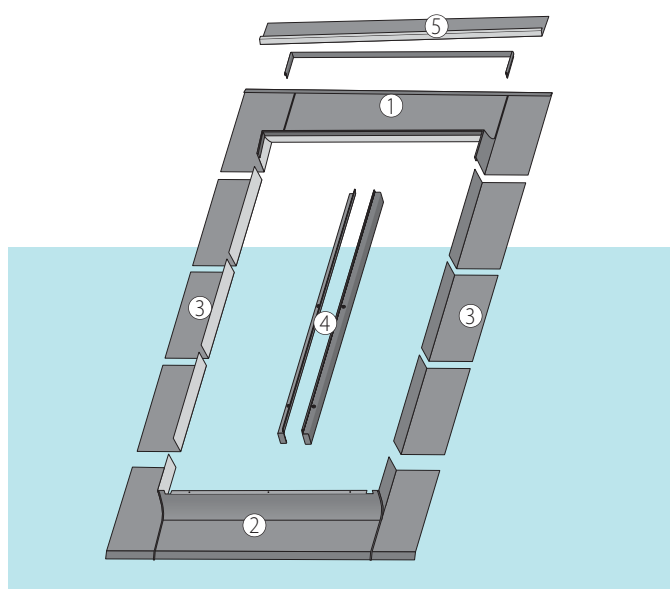


FEATURES:

- Ideal for a neat fit of a window with **slated roof covering up to 10mm thick**.
- Applied as standard to individual windows in the slope of the roof. A series of window units may also be combined:
 - for V depth in vertical, horizontal and block groups,
 - for J depth horizontal combination only.
- Available in two different types allowing windows to be installed at two different depths in the roof construction V (0) and J (-3cm).
- The standard installation depth of windows with the application of flashing EL is V-version ELV. ELJ used for applications where the window is required to sit lower in the roof line (recessed style). Note: does not sit flush with the roof.
- Can be used in roofs with pitches:
 - from 15° to 90° for depths N and V,
 - from 20° to 90° for depth J.

CONSTITUENTS OF THE FLASHING:

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
- The lower element of the flashing is finished with a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a tight fit.
- As standard there is top drainage gutter included in the package in case the roof structure allows its installation.

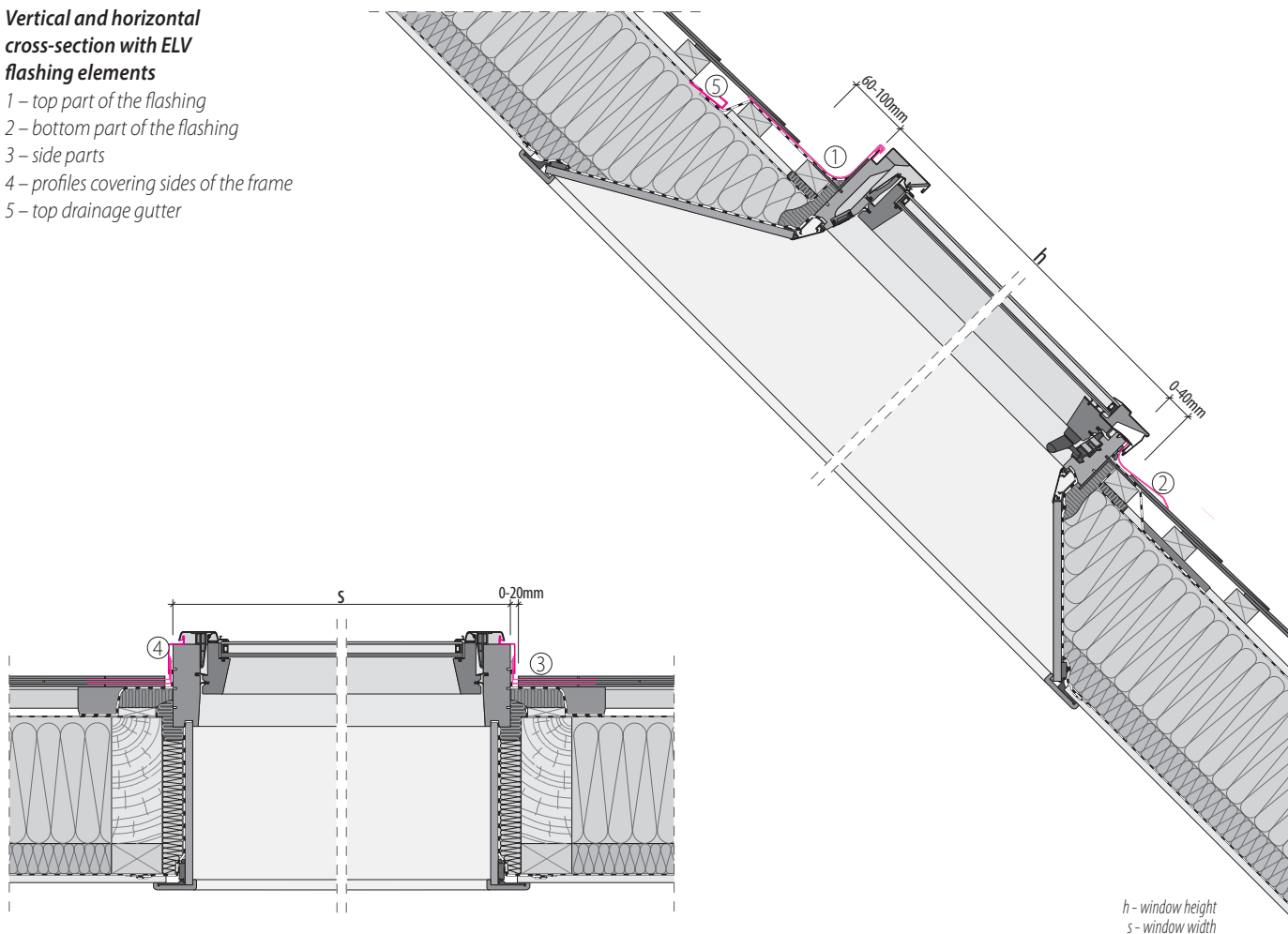


WARRANTY:

- 10 years

Vertical and horizontal cross-section with ELV flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

ELV

843	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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ELJ

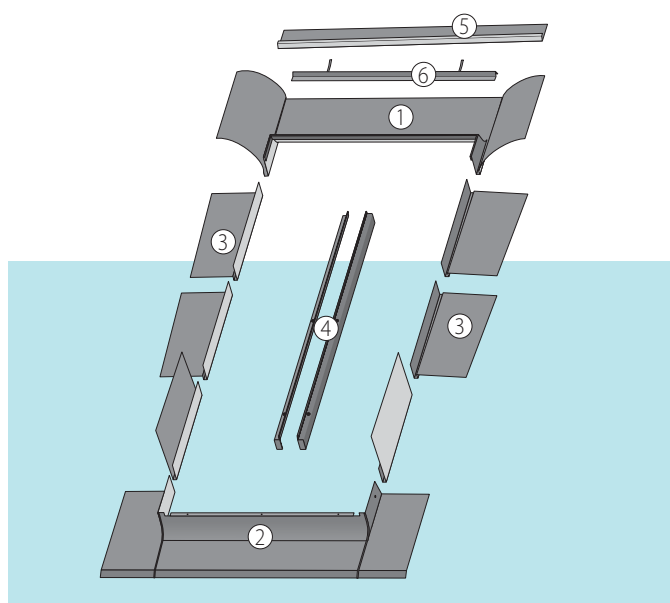
805	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR PLAIN TILE ROOF COVERINGS **EGV**



FEATURES:

- Allows for the neat fit of non interlocking **plain tiles up to a thickness of 16mm**. Individual side soakers form a neat drainage gutter to ensure a perfect connection to the roof covering.
- Applied as standard to individual windows in the slope of the roof. There is also a modular version to combine windows horizontally, vertically and in blocks in groups.
- Flashing available in the version allowing to install the window at V depth - EGV flashing version.
- Can be used on roofs with pitches from 25° to 90°.



CONSTITUENTS OF THE FLASHING:

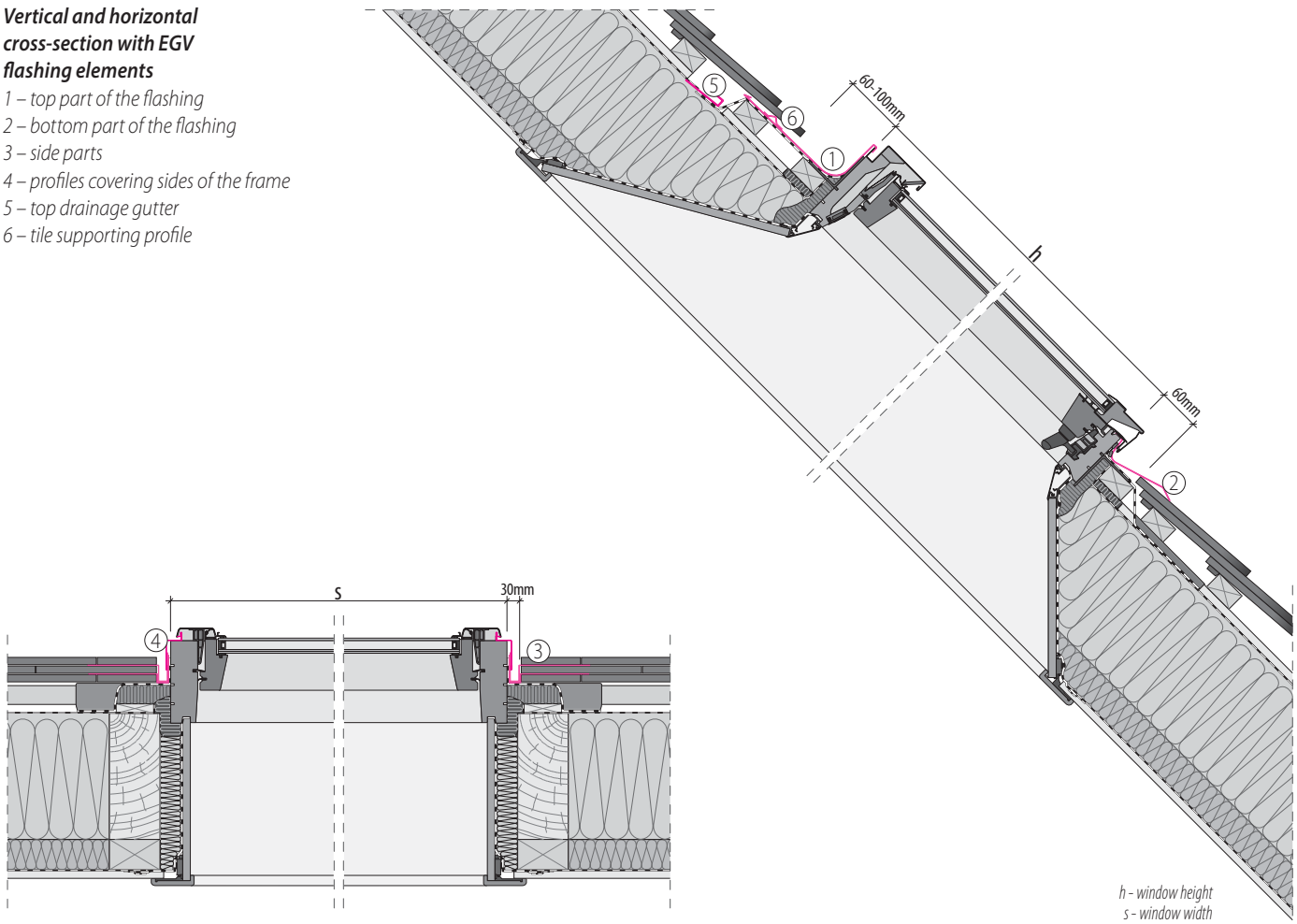
- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – tile supporting profile
- Profiled side elements of the flashing are arranged alternately with the roofing material, strictly adhering to the covering material. First two modular elements are made of soft sheet metal which allows for easy bending and very accurate fit to the roofing.
- The lower element of the flashing is finished with a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a tight fit.
- As standard there is top drainage gutter included in the package in case the roof structure allows its installation.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EGV flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EGV

877	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR METAL PANEL SHEET **EBV-A**

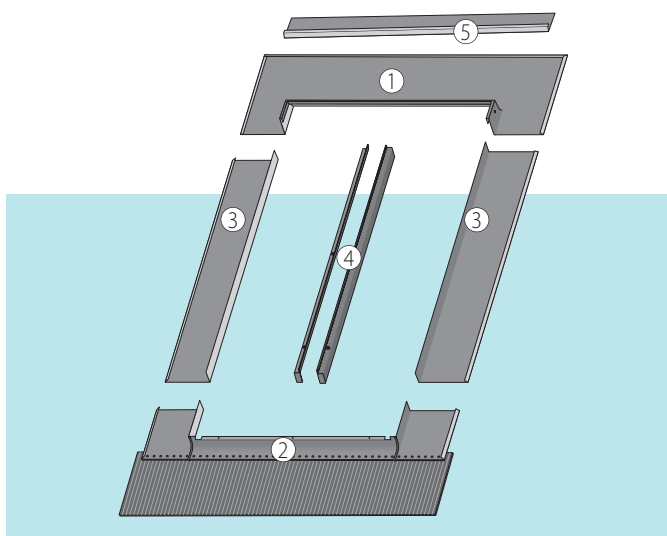


FEATURES:

- Enables tight connection of a roof window with the roofing material such as **panel sheet with prefabricated (system) joints**.
- Specially prepared elements of the EBV-A flashing allow quick fitting and aesthetically pleasing finish around the roof window. The need to perform complicated and time-consuming metal working around the roof window has been removed.
- The window installed at the installation depth V does not protrude significantly beyond the roof surface which greatly improves the aesthetics of the roof.
- Used in roofs with pitches 15° to 90° for V installation depth.
- Available in **EBS-A** version for smoke ventilation windows and in **EBW-A** for side hung escape windows.

CONSTITUENTS OF THE FLASHING:

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
- A bottom element of the flashing with 16.5cm long elastic apron has a plastic mat glued to the underside thus allowing the flashing to adhere to the roof covering for a neat fit.
- Equipped with a weep flap to allow condensation to drain away from the window.

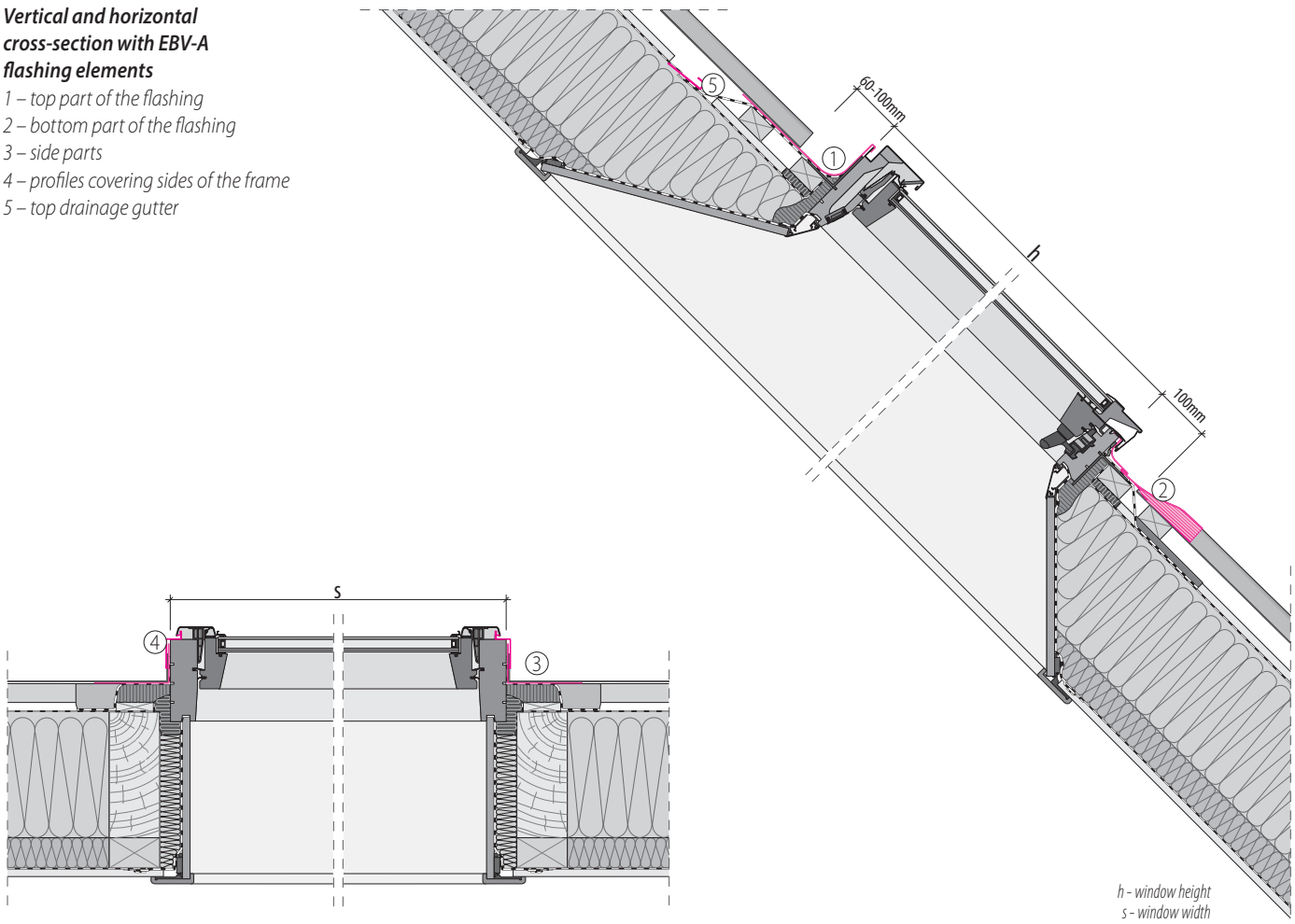


WARRANTY:

- 10 years

Vertical and horizontal cross-section with EBV-A flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EBV-A

8878	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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FLASHINGS FOR FLAT SHEETING **EEV/CU, EEV/TC, EEV/AL**

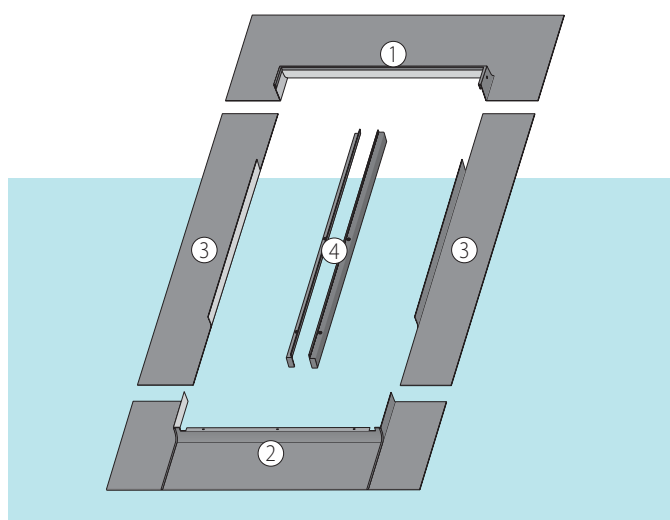


FEATURES:

- Suitable for window installation in **flat sheet roofs**. Designed to make the window fit neatly with the sheeting.
- **EEV/CU** flashing is made of **copper sheet**.
- **EEV/TC** flashing is made of **titanium-zinc (bare rolled, shiny) sheet**.
- **EEV/AL** flashing is made of **aluminum sheet**.
- As standard applied to individual windows in the slope of the roof. A series of window units may also be combined:
 - for installation at the depth V in horizontal, vertical and block groups,
 - for installation at the depth J in horizontal grouping only.
- Available in two different types allowing windows to be installed at two different depths in the roof construction V (0) and J (-3cm).
- Standard installation depth of windows with the application of EE is V-version flashing EEV.
- Can be used in roofs with pitches:
 - from 15° to 90° for depth V,
 - from 20° to 90° for depth J.
- Flashing for flat sheeting available in **EES/CU, EES/TC** versions for smoke ventilation windows and in **EEW/CU, EEW/TC** for side hung escape windows.
- Please consult your FAKRO Representative for details of other possible solutions for roofs with standing seam zinc or profiled steel coverings.

CONSTITUENTS OF THE FLASHING

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts
 - 4 – profiles covering sides of the frame
- All elements have side profiled finishing allowing for easy connection with flat sheeting. The elements are permanently fixed to the sheeting by folding seams.

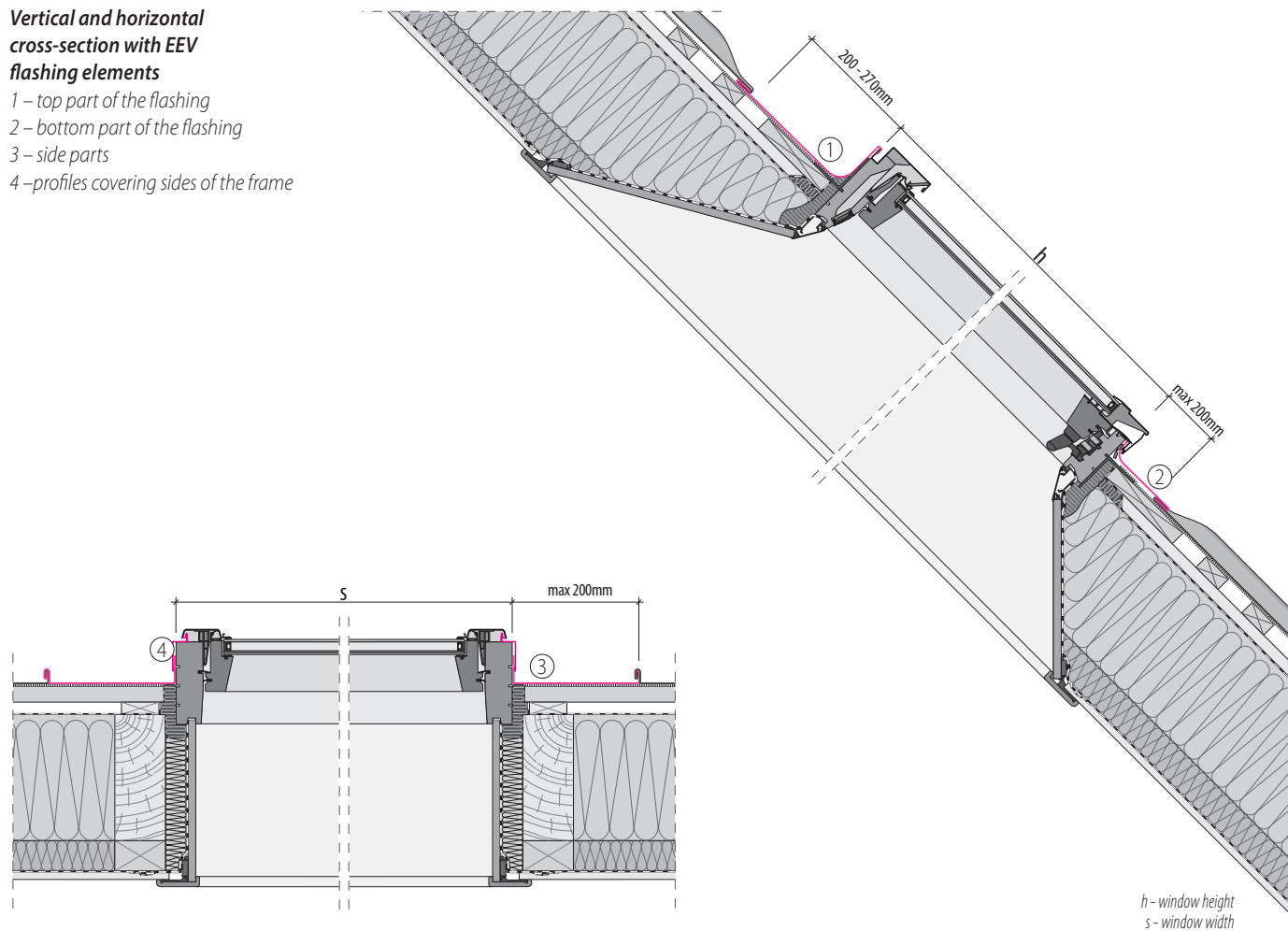


WARRANTY:

- 10 years

Vertical and horizontal cross-section with EEV flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts
- 4 – profiles covering sides of the frame



Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

EEV/TC

831	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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EEV/CU

832	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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EEV/AL

8884	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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SPECIAL APPLICATION FLASHINGS

FLASHINGS FOR CHANGING WINDOW INSTALLATION ANGLE **ESA, EZA-A, EHA-A**



FEATURES:

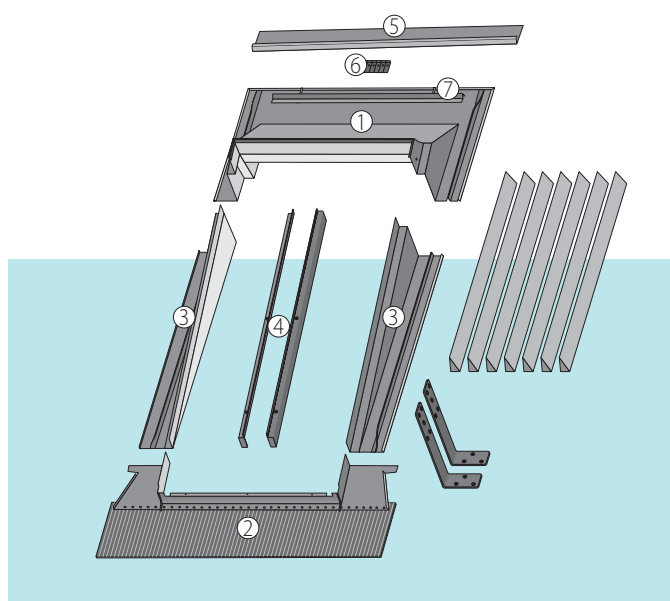
- Ideal for fit with the window with **low pitch roof coverings of 10°** or more.
- Enables the installation angle to be raised by an additional 10°.
- Used in mansard roofs, in extensions and adaptations of low pitched attics in order to extend space in the attic.
- Commonly used to install with single windows in roof slopes. The flashing is also used in modules for horizontal joining of the windows (in such combinations the distance of 20cm between the windows is required).
- There are three flashing types available, use of which is dependent on the roof covering:
 - **ESA** flashing – a flat covering with a profile with a thickness of **5mm**, for use with slates and similarly flat roof coverings;
 - **EZA-A** flashing – a profiled covering up to **45mm**, for use with roof tiles and profiled sheeting;
 - **EHA-A** flashing – a profiled covering up to **90mm**, for use with roof tiles, corrugated and deep profiled sheeting.
- Can be used on roofs with pitches between 10° and 75°.
- Please consult your FAKRO Representative for details of other possible solutions for roofs with standing seam zinc or profiled steel coverings.

CONSTITUENTS OF THE FLASHING

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts sponge seal
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- The bottom part of the flashing is matched to the roofing material type.
- The top and side parts of the flashing are factory equipped with glued insulating material.
- In set, there are special brackets. As a result we acquire window pitch change in relation to the roof.
- **EZA-A** and **EHA-A** flashings come with sponge seal glued to the side channels to protect against wind blown dust, leaves and snow. They are also equipped with a drainage gutter, to allow condensation to drain away from the window.

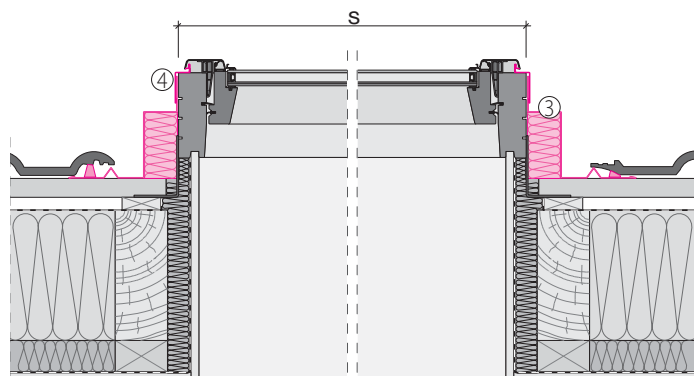
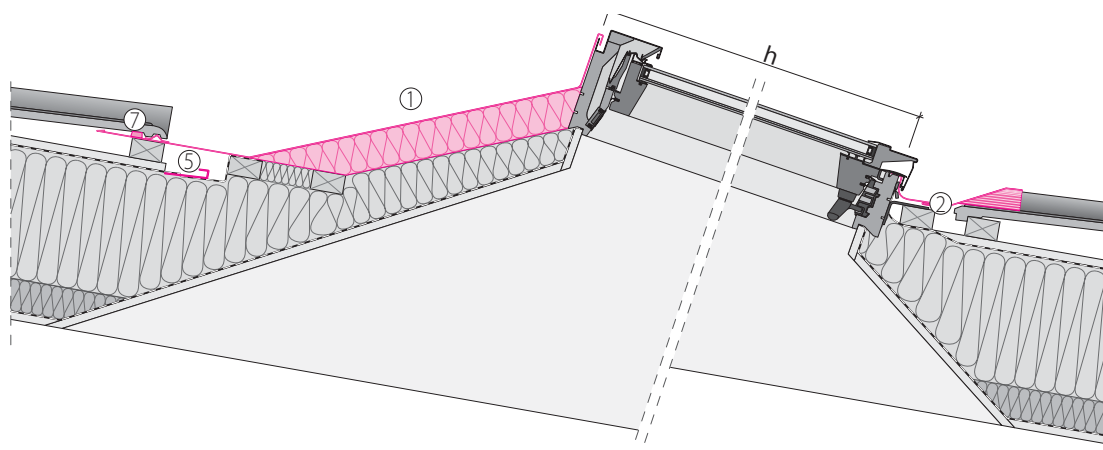
WARRANTY:

- 10 years



Vertical and horizontal cross-section with EZA flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts sponge seal
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



*h - window height
 s - window width*

Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

ESA

834	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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EZA-A

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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EHA-A

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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FLASHINGS FOR FDY-V WINDOWS IN COMBINATIONS WITH WINDOWS FX



FEATURES:

- Flashings are designed for FDY-V Duet proSky windows with raised axis of rotation and lower transom to be combined with FT_, FP_ and FY_ and fixed FX_ windows.
- Flashings ensure a tight connection of roof windows with roof covering in the roof pitch.
- There are flashings:
 - **ESV** for flat roof coverings up to 10 mm (2x5mm) thickness: roofing felt, shingles, slates,
 - **EZV-A** for roofing material with a profile depth of up to 45mm: tile, metal sheeting,
 - **EHN-A** for high profile roof coverings with a profile depth of up to 90mm: tile, high profile metal sheeting,
 - **EZV-F** for flat tile,
 - **ELV** for thin flat roof coverings such as: shingles, slates up to 10mm (2x5mm) thickness,
 - **EGV** for heavy tiled roof coverings such as: plain tiles. EG flashing can be used to roof coverings thickness of up to 24 to 32mm 2 x (12 ÷ 16mm),
 - **EBV-A** for metal panel sheet - with prefabricated (system) joints,
 - **EH-AT Thermo** - universal flashing with additional insulation designed to fit most of high profile roof coverings up to 90mm (EHV-AT Thermo) and 120mm (EHN-AT Thermo), suitable only for FDY-V Duet proSky windows. Flashings for fitting FX with top windows are available to special order.
- Installation in roof pitches 25° to 65° for V and N installation depths.
- FDY-V Duet proSky can be installed in horizontal combination.

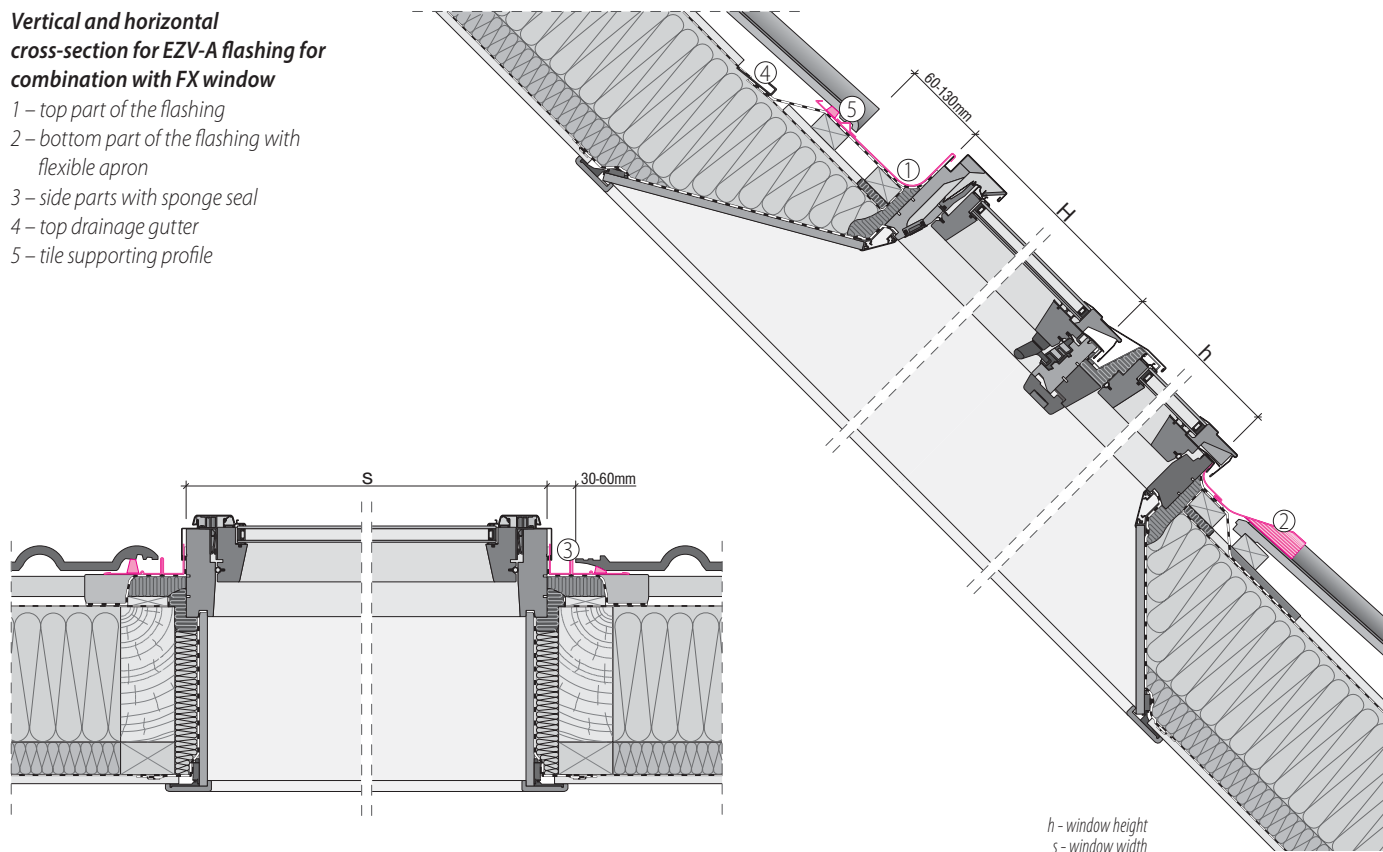
To choose the right flashing in order to combine FX with top window, one should sum the height of both windows then choose the nearest, bigger flashing height. Flashing should correspond to the roof covering kind. FX windows installed with top windows can also be combined horizontally. In combination of FX and top windows, the set of (EKB) profiles for upper windows has to be ordered additionally.

WARRANTY:

- 10 years

Vertical and horizontal cross-section for EZV-A flashing for combination with FX window

- 1 – top part of the flashing
- 2 – bottom part of the flashing with flexible apron
- 3 – side parts with sponge seal
- 4 – top drainage gutter
- 5 – tile supporting profile



Sizes of Standard Flashing

PRODUCT CODE	78/186	78/206	78/235	78/255	94/186	94/206	94/235	94/255
CA	+	+	+	+	+	+	+	+
CB	+	+	+	+	+	+	+	+
CC	+	+	+	+	+	+	+	+
CD	+	+	+	+	+	+	+	+
DA	+	+	+	+	+	+	+	+
DB	+	+	+	+	+	+	+	+
DC	+	+	+	+	+	+	+	+
DD	+	+	+	+	+	+	+	+

ESV

842	+	+	+	+	+	+	+	+
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ESV-T Thermo

8663	+	+	+	+	+	+	+	+
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EZV-A

872	+	+	+	+	+	+	+	+
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EZN-A

871	+	+	+	+	+	+	+	+
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EHN-A

870	+	+	+	+	+	+	+	+
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EZV-F

8877	+	+	+	+	+	+	+	+
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PRODUCT CODE	78/186	78/206	78/235	78/255	94/186	94/206	94/235	94/255
CA	+	+	+	+	+	+	+	+
CB	+	+	+	+	+	+	+	+
CC	+	+	+	+	+	+	+	+
CD	+	+	+	+	+	+	+	+
DA	+	+	+	+	+	+	+	+
DB	+	+	+	+	+	+	+	+
DC	+	+	+	+	+	+	+	+
DD	+	+	+	+	+	+	+	+

ELV

843	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---

EGV

877	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---

EBV-A

8878	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---

EHV-AT Thermo

8825	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---

EHN-AT Thermo

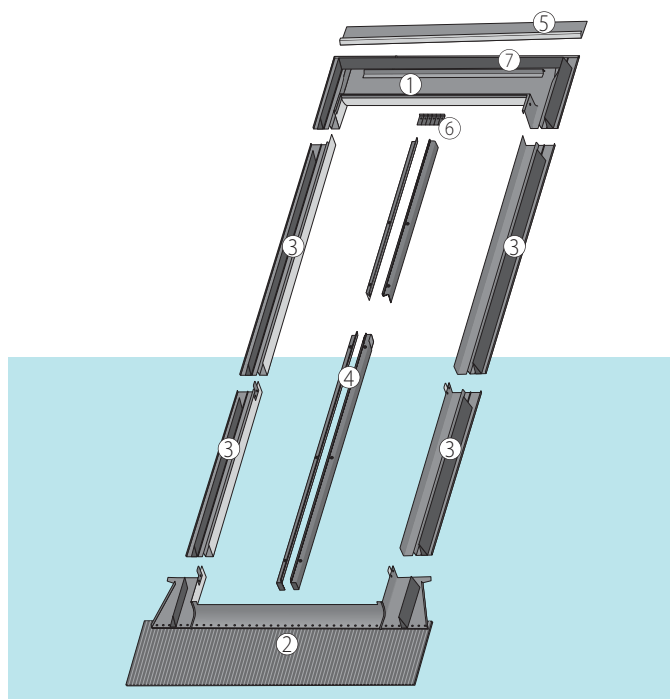
8842	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---

FLASHINGS FOR BALCONY WINDOW **ESV/G, EZV-A/G, EHN-A/G, EHN-AT/G Thermo**



FEATURES:

- Flashings E___ / G are designed for balcony windows FGH-V Galeria. Flashings ensure tight connection of roof window in the roof slope. They are additionally marked with the letter G.
- Available flashings:
 - **ESV/G** – for flat roof coverings up to 10mm thickness (2 x5mm): roofing felt, shingles, slate,
 - **EZV-A/G** – for profiled roof covering up to 45mm profile depth: tile, profiled metal sheeting,
 - **EHN-A/G** – for high profile roof coverings up to 90mm profile depth: tile, high profiled metal sheeting,
 - **EHN-AT/G Thermo** - universal flashing with an additional thermal insulation designed for the majority of roof coverings up to 120mm profile depth.
- Installation range in the roofs with pitches from 35 ° to 55 ° for installation depths V, N.
- Balcony window FGH-V Galeria can be combined horizontally with FDY-V windows with raised axis of rotation windows when installed with special flashings for combinations K___ / G. Both (FGH-V and FDY-V) windows have a lower sash of the same height of 98cm.



CONSTITUENTS OF THE FLASHING

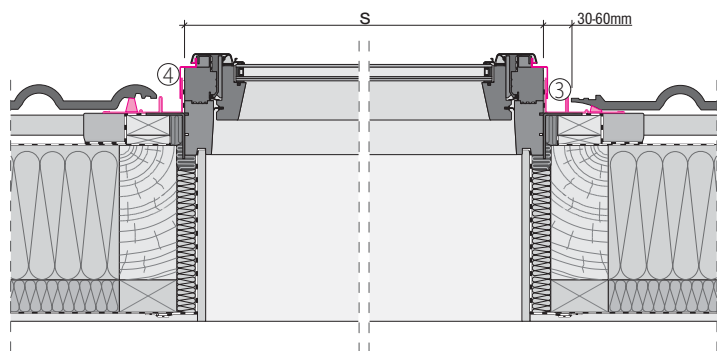
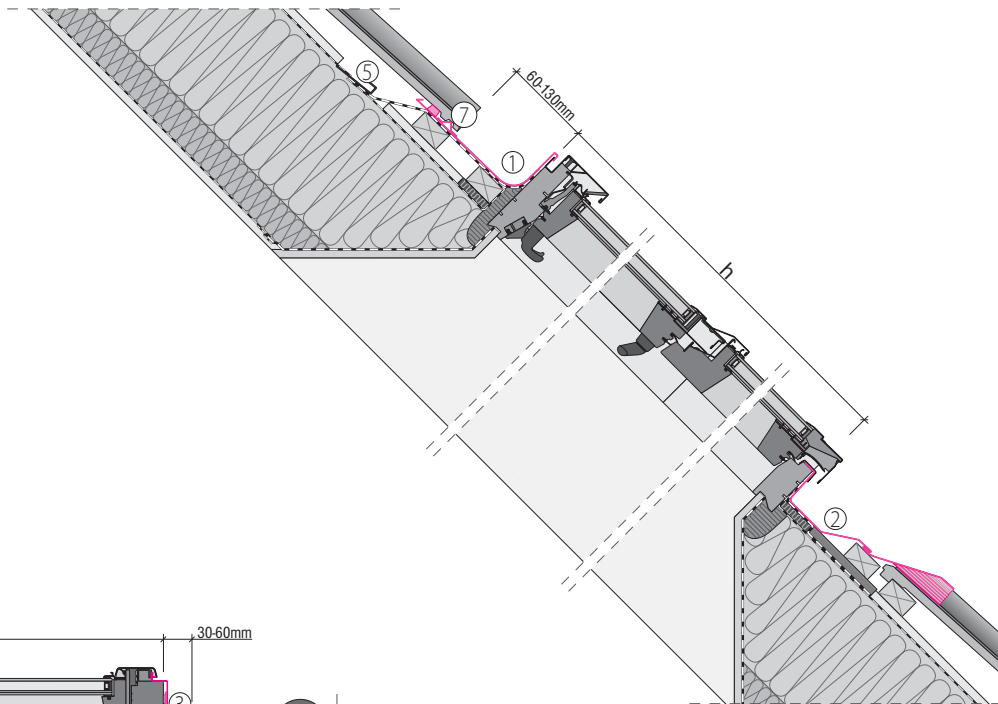
- The flashing consists of:
 - 1 – top part of the flashing with insulation
 - 2 – bottom part of the flashing with flexible apron
 - 3 – side parts sponge seal
 - 4 – profiles covering sides of the frame
 - 5 – top drainage gutter
 - 6 – aluminium strips to fix the flashing
 - 7 – tile supporting profile
- The lower element has a plastic mat glued to the underside, which allows easy and secure connection to roof covering.
- The flashing comes as standard (except for ESV/G) with gutter which allows condensation to drain away from the window.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with EZV-A/G flashing elements

- 1 – top part of the flashing with insulation
- 2 – bottom part of the flashing with flexible apron
- 3 – side parts sponge seal
- 4 – profiles covering sides of the frame
- 5 – top drainage gutter
- 6 – aluminium strips to fix the flashing
- 7 – tile supporting profile



*h - window height
s - window width*

Sizes of Standard Flashing

PRODUCT CODE	78/255	94/255							
CD									
DD									

ESV/G

	+	+							
--	---	---	--	--	--	--	--	--	--

EZV-A/G

880A	+	+							
------	---	---	--	--	--	--	--	--	--

EHN-A/G

880B	+	+							
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EHN-AT Thermo/G

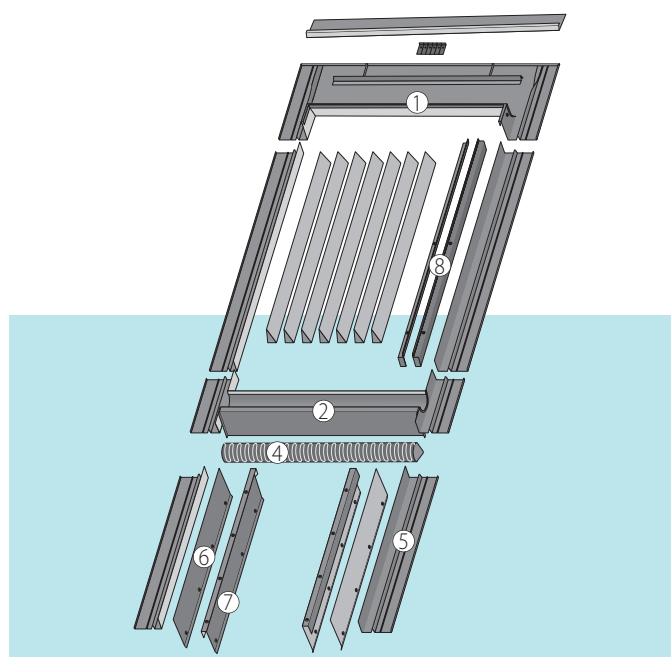
880C	+	+							
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FLASHINGS FOR L-SHAPED COMBINATION WINDOW **EUN/B, EUV/B, EUV-L/B**



FEATURES:

- The flashings EU_/B are intended to be used only with L-shaped B_L windows.
- The flashings enable a tight connection of any type of roof window with the window installed in a vertical wall.
- The flashings are available in three different depths of window installation into the roof structure: N (+3cm), V (0) and J (-3cm) to individual order. A standard depth of roof window installation with the use of flashing is depth V- version EUV/B.
- EUV/B is a universal type of flashing and enables roof window installation into various types of roofing materials (S, Z, H), whereas EUV-L/B flashing is used to install window into slate roofing coverings (up to 10mm thickness).
- The flashing EU_/B as a standard is designed to be installed in single L-shaped combination but is available in repeated modules enabling L-shaped horizontal combinations as well.
- L-shaped flashing type is chosen on the basis of the roof window's dimensions.
- The depths of flashings installation according to the roof pitches:
 - depths V, N for pitches between 15° and 55°
 - depth J for pitches between 30° and 55°. If fitting to the J (recessed depth) then the horizontal gutter will be flat and not run the water to the side.
- Bottom window sill is not supplied with this type of flashing kit. Detail should be finished on site as required.



CONSTITUENTS OF THE FLASHING:

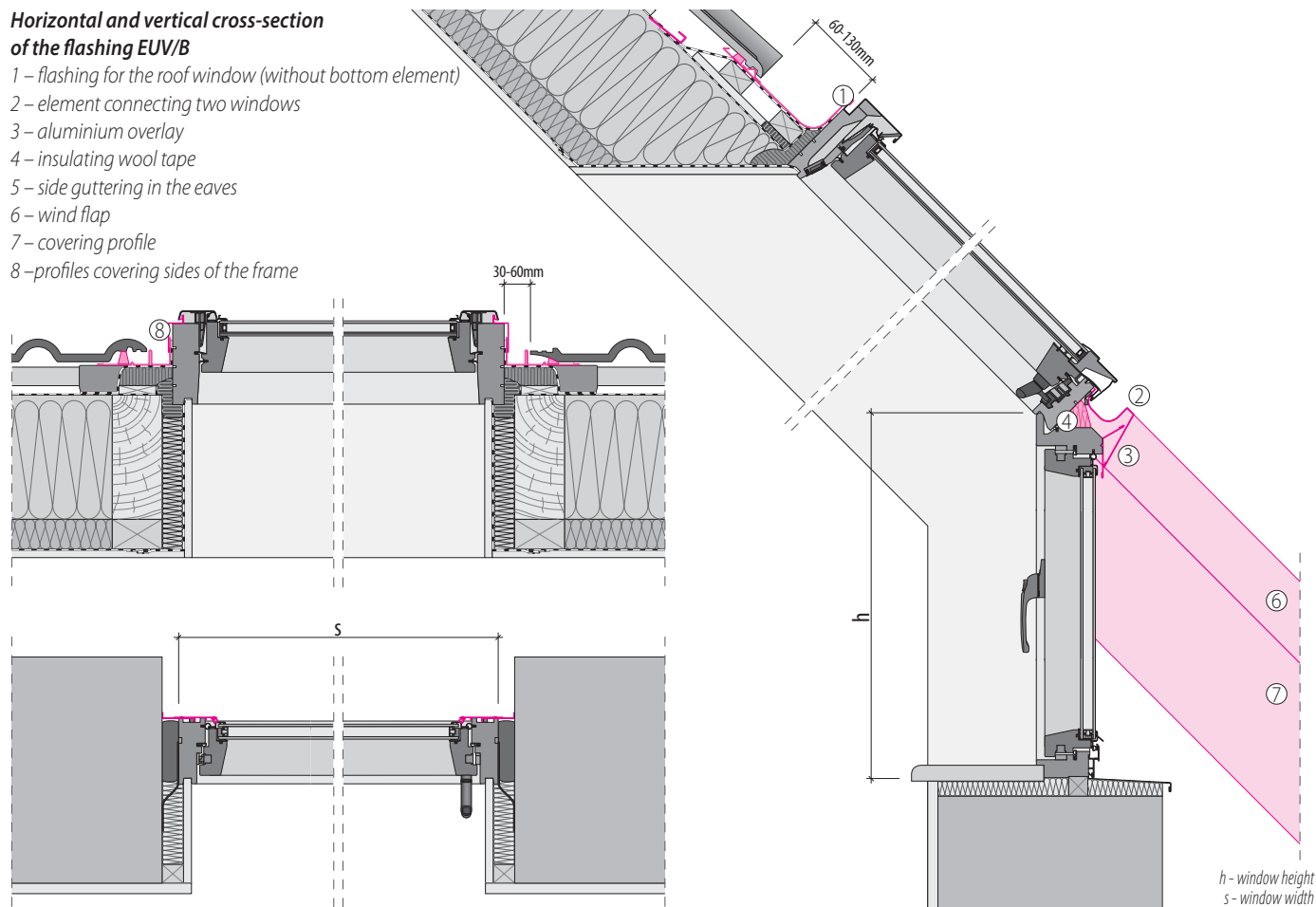
- The flashing for L-shaped window EUV/B consists of:
 - 1 – flashing for the roof window (without bottom element)
 - 2 – element connecting two windows
 - 3 – aluminium overlay
 - 4 – insulating wool tape
 - 5 – side guttering in the eaves
 - 6 – wind flap
 - 7 – covering profile
 - 8 – profiles covering sides of the frame

WARRANTY:

- 10 years

Horizontal and vertical cross-section of the flashing EUV/B

- 1 – flashing for the roof window (without bottom element)
- 2 – element connecting two windows
- 3 – aluminium overlay
- 4 – insulating wool tape
- 5 – side guttering in the eaves
- 6 – wind flap
- 7 – covering profile
- 8 – profiles covering sides of the frame



Sizes of Standard Flashing

PRODUCT CODE	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	05	06	07	13	08	09	10	11	12	40	CA	CB	80	41	DA	DB

EUN/B

8807	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

EUV/B

8801	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

EUV-L/B

8802	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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LOUVRE FOR L-SHAPED COMBINATION EAVES **XJZ**



FEATURES:

- Applying XJZ louvre - namely the external cover for L-shaped combination window contributes to reduction of direct solar radiation on the glass of the L-shaped window, effectively reducing room interior temperature during hot summer days. The louvre eliminates the blinding effect of sun without restricting view to the outside.
- Besides the protection against the solar radiation, the XJZ louvre ensures an aesthetically pleasing effect after installing roof guttering below the L-shaped window, thus the installation of additional stop end outlets is not necessary.
- The louvre ensures continuity of the roof line, which is particularly important when several L-shaped combinations are applied.
- Slats of the shutter are mounted to the side boards through masking profile of the L-shaped windows' flashing. The inclination angle of the slats is set permanently at the stage of assembly.



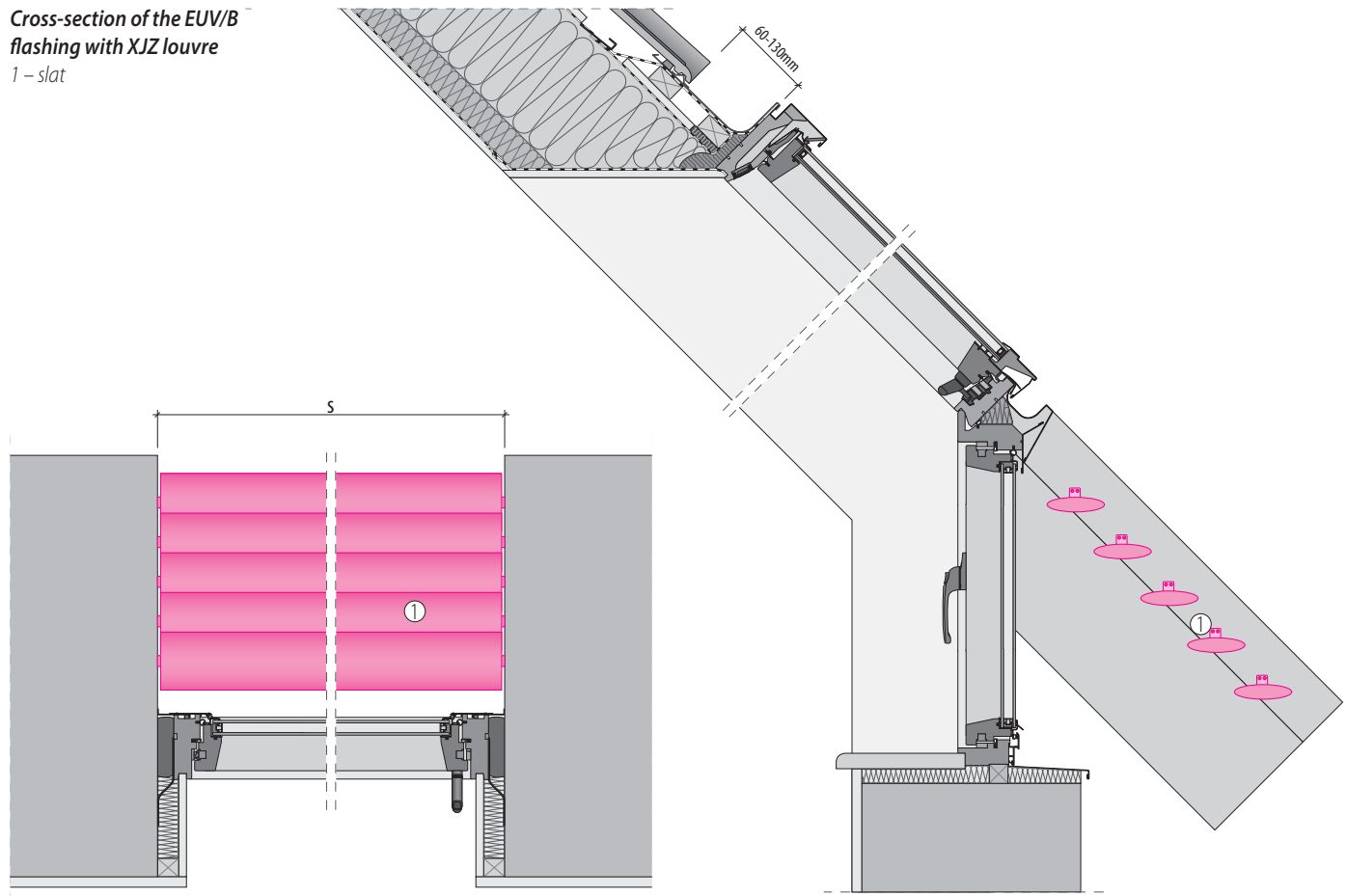
CONSTITUENTS OF THE LOUVRE:

- The XJZ louvre consists of six aluminium profiles painted in RAL 7022 (grey brown) the same as window profiles, and installation brackets. The cross-cut of the profile's shape is similar to the flattened ellipse (9 cm in width and maximum 2.5 cm in height). The profile's length as standard is adapted to a single window width. In case of L-shaped windows installation in combinations, the XJZ louvre is adapted to a given combination width.

WARRANTY:

- 10 years

Cross-section of the EUV/B flashing with XJZ louvre
1 – slat



Sizes of Louvre

PRODUCT CODE	78	94	114	134					
	76	77	78	79					

XJZ

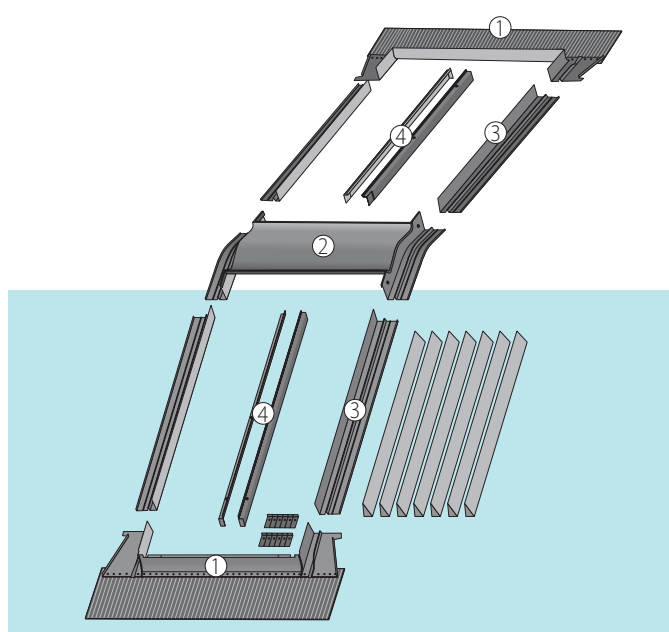
620	+	+	+	+					
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FLASHING FOR JOINING WINDOWS AT THE RIDGE **ERN-H, ERV-S, ERV-Z, ERV-L**



FEATURES:

- Allow the joining of windows on opposite sides of the ridge. Windows are linked together by the top element of the flashing.
- Combining windows in this way allows more natural light into the roof space. It creates a unique atmosphere, and provides an ideal skyward outlook.
- In cases where manual window operation is difficult or inconvenient, an electric control system can be installed.
- Because of their positioning at the ridge, PT-aluminium clad plastic windows, with their added moisture resistance, are recommended but any window type can be incorporated in this system.
- Windows joined at the ridge are fitted in roofs with pitches between 15° and 55°, though the internal roof angle should be between 70° and 150°.
- Ridge combination flashings can be manufactured from aluminium, copper or titanium-zinc.
- Two flashings are available, use of which depends upon the type of roof covering and depth of window installation:
 - for depth N (+3 cm): ERN-H;
 - for depth V (0): ERV-S, ERV-Z, ERV-L.



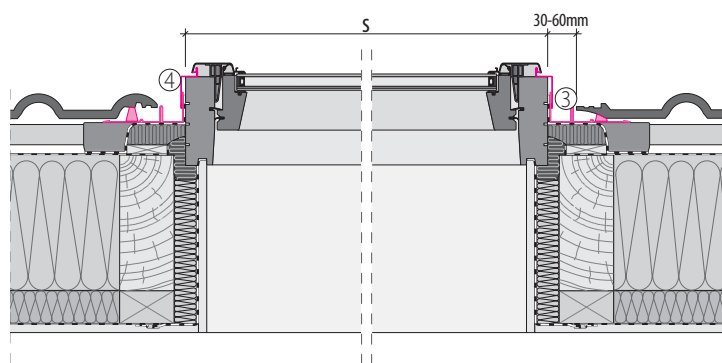
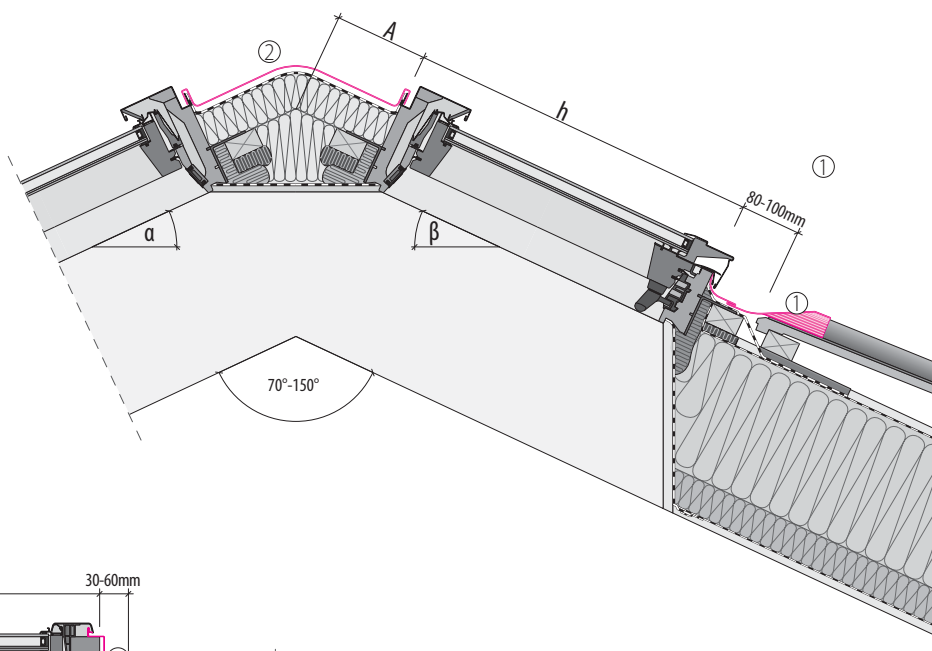
CONSTITUENTS OF THE FLASHING:

- The flashing consists of:
 - 1 – bottom parts of the flashing
 - 2 – elements joining two flashing
 - 3 – side parts of the flashing
 - 4 – profiles covering sides of the frame

WARRANTY:

- 10 years

Vertical and horizontal cross-section with ERV-Z flashing elements
 1 – bottom parts of the flashing
 2 – elements joining two flashing
 3 – side parts of the flashing
 4 – profiles covering sides of the frame



h – window height
s – window width

Sizes of Ridge Combination Flashing

Items are manufactured to order.

To produce ridge combination flashing, the following information must be provided:

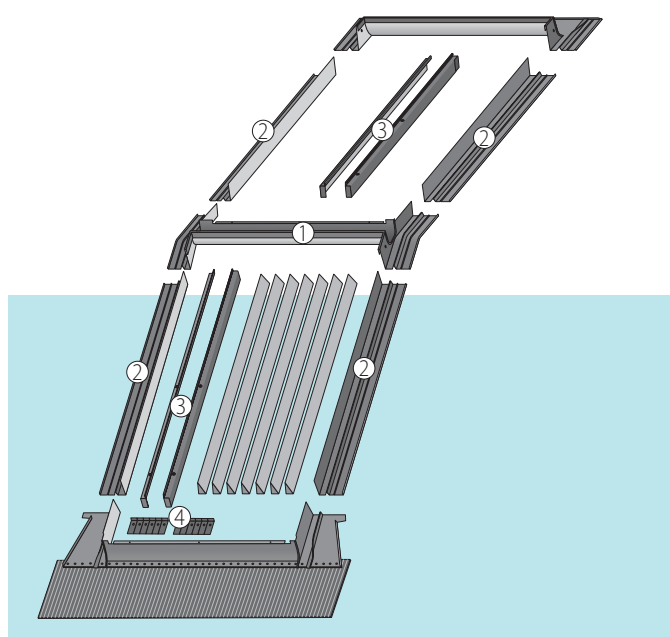
- 1 – the angle of both sides of the roof α and β
- 2 – dimensions of A between $100\text{mm} \leq A \leq 250\text{mm}$
- 3 – window size
- 4 – type of roof covering
- 5 – depth of window installation N or V

MODULES FOR MANSARD COMBINATION **KMV, KMV-L**



FEATURES:

- KM Modules are used for fitting roof windows in mansard roofs. Windows are positioned one above the other and joined with the mansard module.
- Only one type of module is available, allowing window installation at a depth V (0) in the roof construction.
- Module KM is available in two versions. Module KMV is a universal version, allowing roof windows to be fitted with most roof coverings (S, Z, H), whereas KMV-L is for installation on slated roof coverings only.
- The top window is installed at angles between 15° and 60°, and the lower window between 45° and 90°.
- The internal angle of the mansard roof should be between 105° and 150°.
- The mansard module can be manufactured in aluminium, copper or titanium-zinc.
- The KMV, KMV-L flashings for aluminium-plastic windows installed in mansard combination are available to individual order.



CONSTITUENTS OF THE FLASHING:

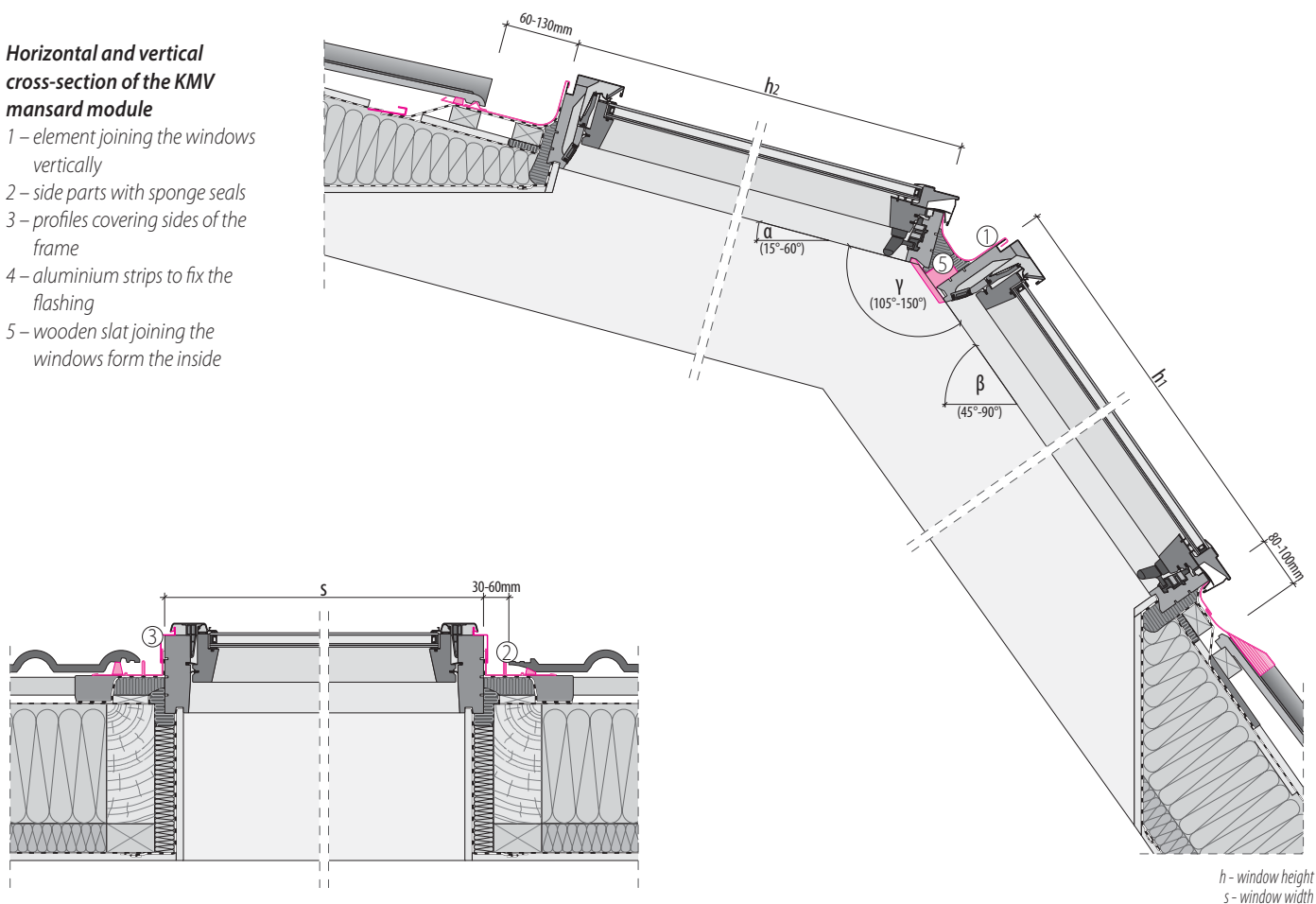
- The module consists of:
 - 1 – element joining the windows vertically
 - 2 – side parts with sponge seals
 - 3 – profiles covering sides of the frame
 - 4 – aluminium strips to fix the flashing

WARRANTY:

- 10 years

Horizontal and vertical cross-section of the KMV mansard module

- 1 – element joining the windows vertically
- 2 – side parts with sponge seals
- 3 – profiles covering sides of the frame
- 4 – aluminium strips to fix the flashing
- 5 – wooden slat joining the windows from the inside



Mansard Combination Flashing ordering:

To order, following information must be provided:

- 1 - internal angle of the mansard roof γ
- 2 - type and profile depth of roof covering
- 3 - size of the windows

DORMER **EDD**



FEATURES:

- Prefabricated dormer ED_ gives new possibilities in adopting loft space with the use of FAKRO roof windows.
- Mounted in sloped roofs increases the usable surface of the room and perfectly illuminates the interior with natural light.
- As standard available in version with two roof windows EDD (B2 / _). Dormers in version with three roof windows EDT (B3 / _) are available to order.
- Additionally, the design of the upper part of the dormers is available in 3 versions:
 - roof windows (same as in the bottom row) - ED_-W
 - one large, non-opening roof window - ED_-C
 - upper part covered with a metal sheet - ED_-E
- Dormers have been designed for windows in size 78x118 cm.
- As an option, there is EDD version available with roof windows in sizes 94x118 cm or 114x118 cm.

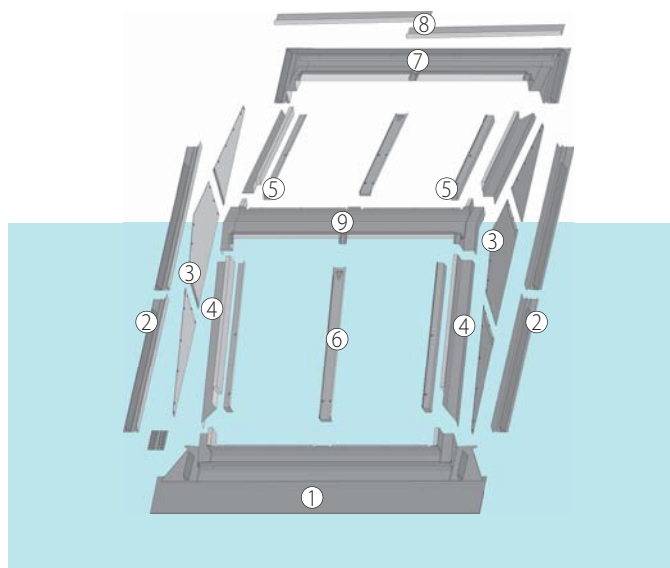
Roof windows are not part of the set, they have to be bought separately.

CONSTITUENTS OF THE DORMER:

- The dormer consists of:
 - 1 – lower element of the flashing
 - 2 – side gutters
 - 3 – side base element of the flashing
 - 4 – top base element of the flashing
 - 5 – profiles covering the sides of the frame
 - 6 – middle gutters
 - 7 – top flashing element
 - 8 – drainage gutter
 - 9 – ridge flashing element
- Insulated, wooden base provides excellent thermal insulation parameters.
- Versatility of dormers - the use of roof windows allows dormer's application in roof pitches from 35° to 70°.
- Easy installation (possibly to be installed by one person).
- No need to use a crane.
- Ability to use all the internal and external FAKRO roof window accessories.

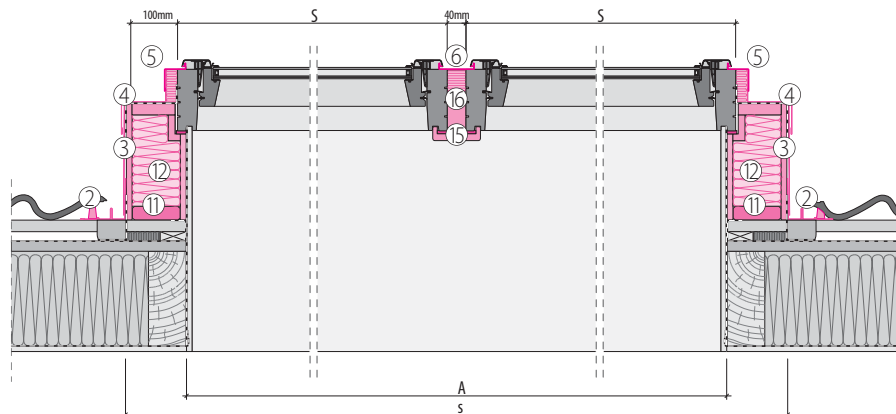
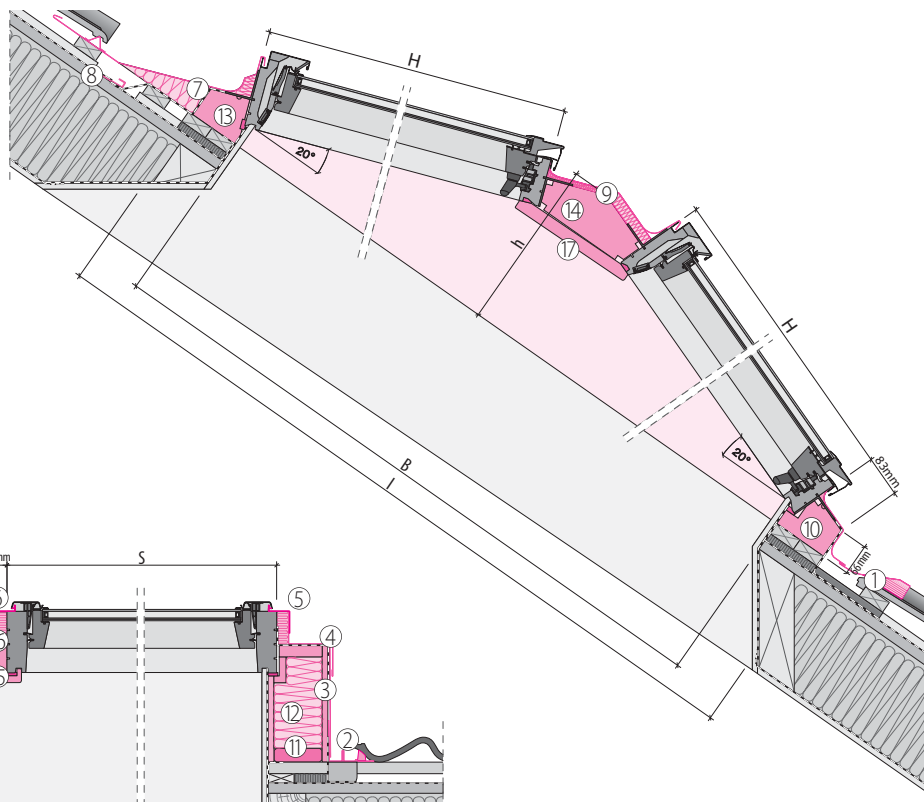
WARRANTY:

- 10 years



Horizontal and vertical cross-section of the EDD system

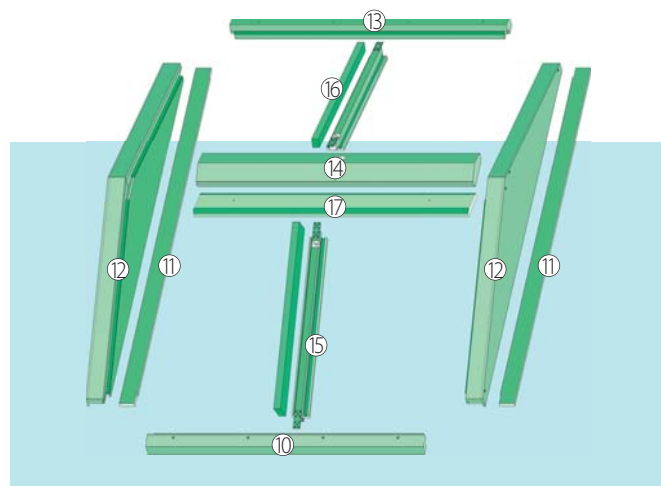
- 1 – lower element of the flashing
- 2 – side gutters
- 3 – side base element of the flashing
- 4 – top base element of the flashing
- 5 – profiles covering the sides of the frame
- 6 – middle gutters
- 7 – top flashing element
- 8 – drainage gutter
- 9 – ridge flashing element
- 10 – bottom base element
- 11 – installation battens for the side elements
- 12 – side element left / right
- 13 – base top element
- 14 – joining element
- 15 – auxiliary rafters
- 16 – insulation (foam)
- 17 – finishing slat



Sizes of Standard flashing

PRODUCT CODE	78/118 181x263x54 156-158x240-244	78/118 181x263x54 156-158x240-244	78/118 181x263x54 156-158x240-244
EDD-W	EDD-C	EDD-E	
80AL06	80AL06	80AH06	
+	+	+	
15	15	15	

Size [cm]
 Total size of the product [cm] - (S x L x h)
 Size of the roof in [cm] - (A x B)
 Glazing area B2/2 [m²]



FLASHING COMBINATIONS

FLASHINGS ESV DUO, EZV-A DUO



FEATURES:

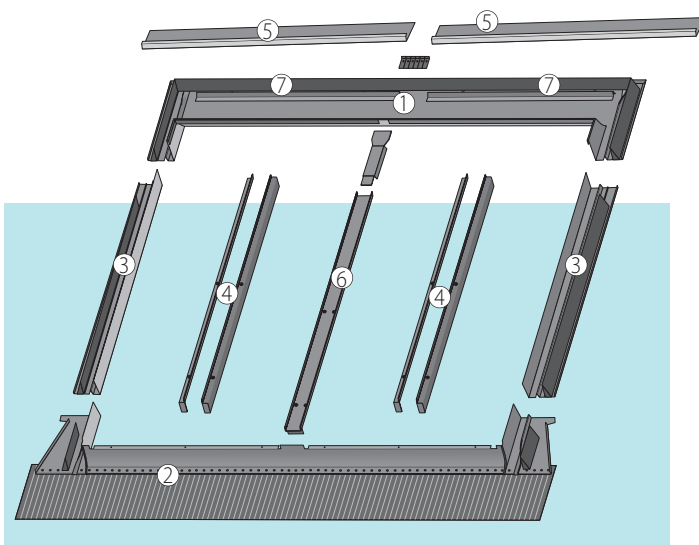
- DUO flashing is a special solution for connecting two horizontally positioned roof windows with the use of XRP/XRU supporting rafter. Information on supporting rafter available on page 192.
- Allows installation of windows at a minimum distance of 18mm in horizontal combination with use of XRP 18/XRU 18 supporting rafter.
- When using external roller shutters, the application of E_V 40 DUO flashing is advised where the distance of 40mm between the windows is maintained.
- The windows are connected from the inside with the use of supporting rafter XRP 40/XRU 40.
- DUO flashing at the top and bottom has one common element connecting two windows - the elements form a single integral part.
- DUO flashings are available for both for flat ESV DUO as well as for profiled roofing materials EZV-A DUO.

CONSTITUENTS OF THE FLASHING:

- The flashing consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing with flexible apron
 - 3 – side parts of the flashing with sponge seals
 - 4 – profiles covering the sides of the frame
 - 5 – top drainage gutter
 - 6 – profile connecting windows
 - 7 – tile supporting profile
- The lower part of the flashing completed with a flexible apron has a plastic mass glued to the underside thus allowing the flashing to adhere to the roof covering for a neat fit.
- The EZV DUO flashing factory equipped with sponge seals provide protection against wind blown dust, leaves, rain and snow.
- The flashing is also equipped with weep flaps to allow condensation to be drained away from the initial roofing layer and window.

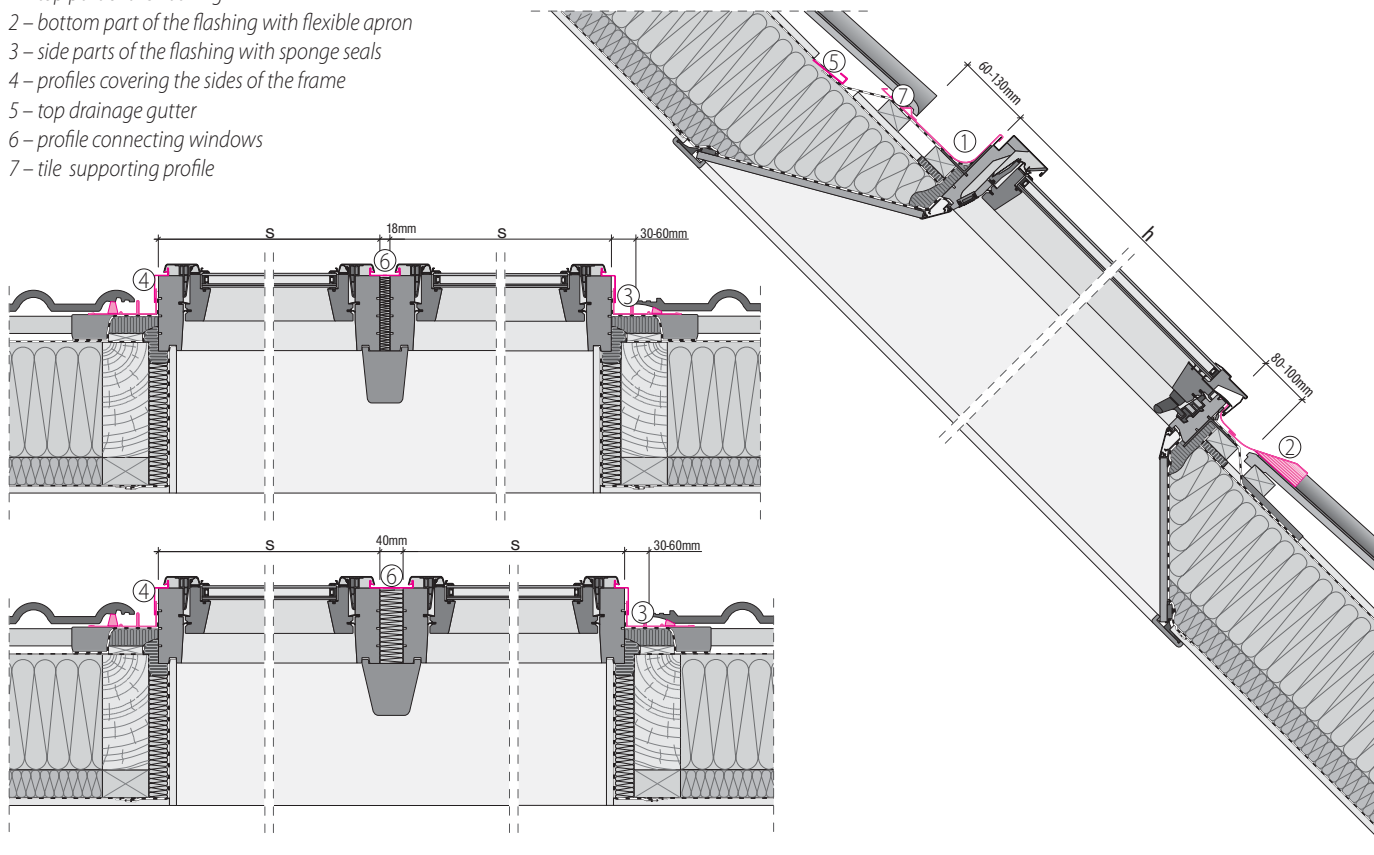
WARRANTY:

- 10 years



Horizontal and vertical cross-section of EZV-A DUO flashing elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing with flexible apron
- 3 – side parts of the flashing with sponge seals
- 4 – profiles covering the sides of the frame
- 5 – top drainage gutter
- 6 – profile connecting windows
- 7 – tile supporting profile



Sizes of Standard flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42/CB	80	41	43/DB

ESV DUO 18

8827	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

EZV-A DUO 18

8826	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ESV DUO 40

8836	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

EZV-A DUO 40

8835	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-
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BLOCK COMBINATION SYSTEM



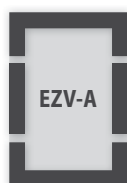
FEATURES:

- The combination flashing are ready made flashing systems for joining windows in groups: horizontally, vertically and in a block.
- The distance between windows joined horizontally and vertically is normally 10cm.
- If external shutters are installed on windows installed vertically, a gap of at least 20cm is required.
- FAKRO combination system enables to install all types of windows, top hung and pivot windows as well as centre pivot. Thanks to the uniform design of flashings, windows having different structures may be combined in groups.
- There are seven modules in the FAKRO combination system, to cater for any layout you may require. The "Module" is a single and properly marked element of the flashing and assigned to its specific place in combination.

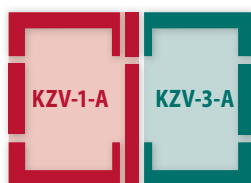
WARRANTY:

- 10 years

EXAMPLES OF COMBINATIONS

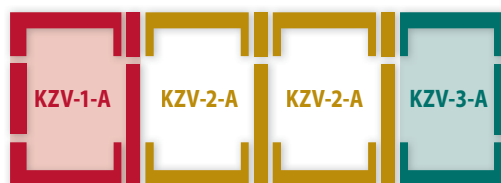


Single module



Horizontal combination

B2/1



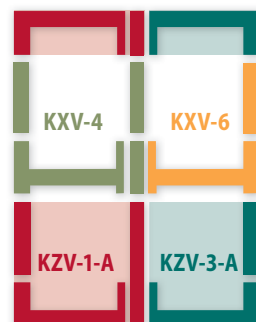
Horizontal combination

B4/1



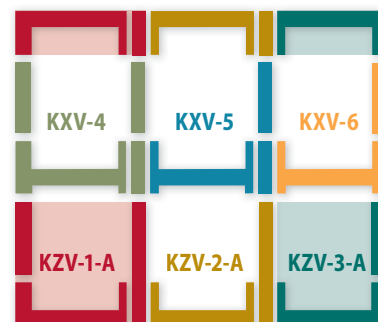
Vertical combination

B1/2



Block combination

B2/2

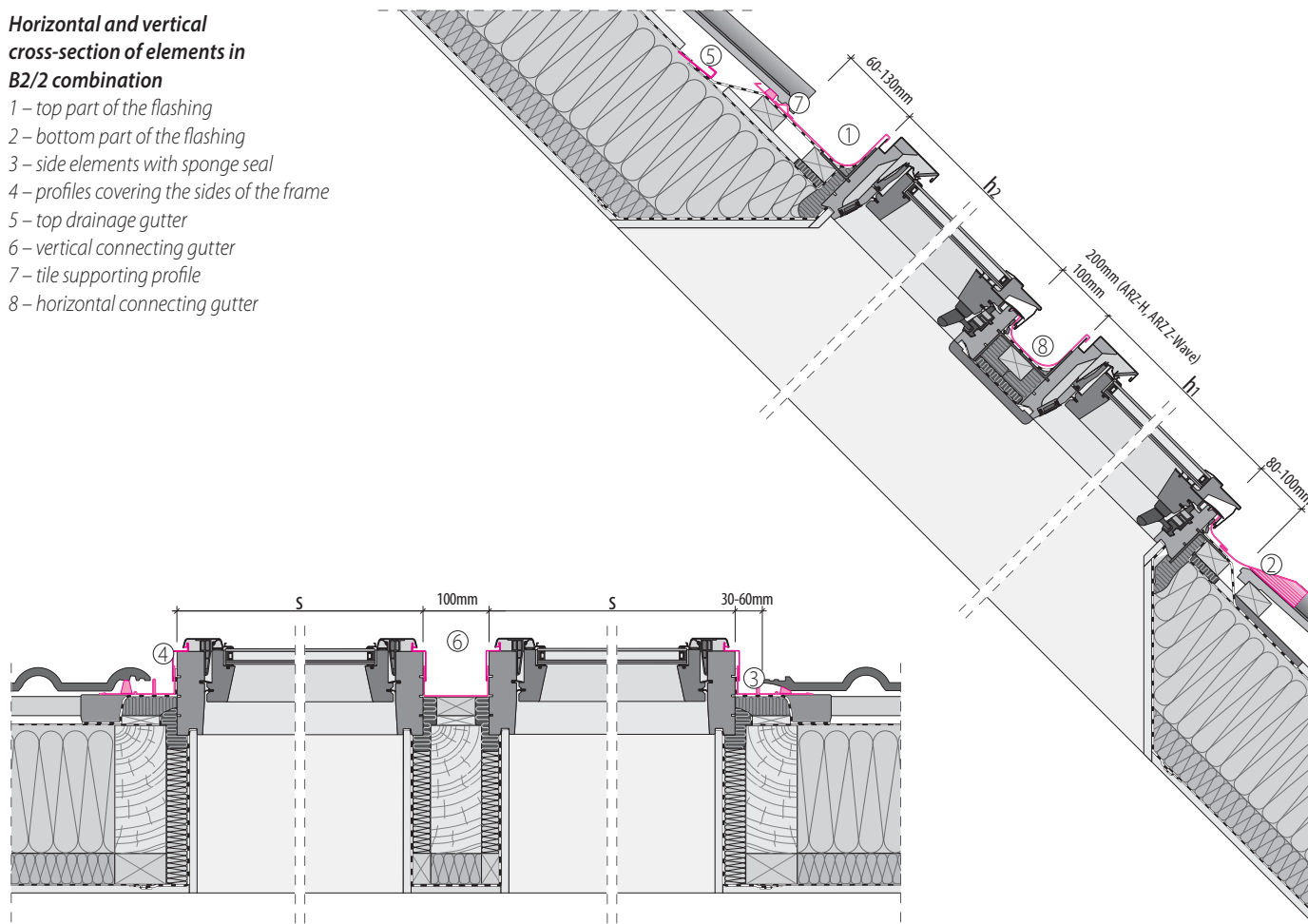


Block combination

B3/2








Horizontal and vertical cross-section of elements in B2/2 combination

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side elements with sponge seal
- 4 – profiles covering the sides of the frame
- 5 – top drainage gutter
- 6 – vertical connecting gutter
- 7 – tile supporting profile
- 8 – horizontal connecting gutter







MODULES:

These are examples of modules for profiled roofing materials, which are used when installing at a standard depth of V.

- KZV-1-A**  extreme left module;
- KZV-2-A**  middle module;
- KZV-3-A**  extreme right;
- KXV-4**  extreme top left;
- KXV-5**  top middle;
- KXV-6**  top right;
- KDV**  for vertical combination.

COMBINATION:







When ordering typical combination flashings, simply use the codes for the whole combination, e.g. B3/2, where the first figure refers to the number of horizontally joined windows, and the second figure to the number joined vertically. A sketch of the external view is required when ordering.

- B2/1**  horizontal combination KZV-1-A + KZV-3-A;
- B1/2**  vertical combination EZV-A+ KDV;
- B2/2**  block combination KZV-1-A + KZV-3-A + KXV-4 + KXV-6;
- B3/2**  block combination KZV-1-A + KZV-2-A + KZV-3-A + KXV-4 + KXV-5 + KXV-6.



All typical combinations can be created when installing windows at a depth of N (+3 cm) and V (0cm). However, when installing at a depth of J (-3cm) only horizontal combinations can be used.

When the distance between the windows is not exactly 10cm, such a combination of flashings can be prepared to individual order.

Available modules for ESV flashing combinations:




PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36
KSV-1  extreme left module	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KSV-2  middle module	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KSV-3  extreme right	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-4  extreme top left	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-5  top middle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-6  top right	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Available individual flashings and modules for vertical combination







ESV  single flashing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KDV  module for vertical combination	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

ESV flashing and KDV module form **B1/2** vertical combination.



Available ESV combinations for flat roof coverings

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36
B2/1  KSV-1+ KSV-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
B2/2  KSV-1+ KSV-3 + KXV-4 + KXV-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
B3/2  KSV-1+ KSV-2+ KSV-3 + KXV-4 + KXV-5 + KXV-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-

Available modules for EZV-A flashing combinations:




PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60	
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36	
KZV-1-A  extreme left module	988	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KZV-2-A  middle module	989	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KZV-3-A  extreme right	990	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-4  extreme top left	964	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-5  top middle	965	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXV-6  top right	966	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Available individual flashings and modules for vertical combination







EZV-A  single flashing	872	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KDV  module for vertical combination	847	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

EZV flashing and KDV module form **B1/2** vertical combination.



Exemplary EZV-A combinations for profiled roof coverings

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60	
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36	
B2/1  KZV-1-A+ KZV-3-A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
B2/2  KZV-1-A+ KZV-3-A + KXV-4 + KXV-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
B3/2  KZV-1-A+ KZV-2-A+ KZV-3-A + KXV-4 + KXV-5 + KXV-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-

Available modules for EHN-A flashing combinations:




PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60	
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36	
KHN-1-A  extreme left module	991	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KHN-2-A  middle module	992	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KHN-3-A  extreme right	993	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXN-4  extreme top left	910	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXN-5  top middle	911	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KXN-6  top right	912	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Available individual flashings and modules for vertical combination

EHN-A  single flashing	870	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
KDN  module for vertical combination	821	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

EHN-A flashing and KDV module form **B1/2 vertical combination**.

Exemplary EHN-A combinations for high profiled roof coverings

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60	
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36	
B2/1  KHN-1-A + KHN-3-A		+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
B2/2  KHN-1-A + KHN-3-A + KXN-4 + KXN-6		+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
B3/2  KHN-1-A + KHN-2-A + KHN-3-A + KXN-4 + KXN-5 + KXN-6		+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-

Available modules for EHV-AT flashing combinations:

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36

KHV-1-AT Thermo extreme left module

8849	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

KHV-2-AT Thermo middle module

8850	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

KHV-3-AT Thermo extreme right

8851	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Exemplary EHV-AT Thermo combinations for high profiled roof coverings

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/78	94/78	114/78	134/78	78/60	94/60	114/60	134/60
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	23	24	25	26	33	34	35	36

B2/1 KHV-1-AT Thermo + KHV-3-AT Thermo

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

B3/1 KHV-1-AT Thermo + KHV-2-AT Thermo + KHV-3-AT Thermo

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



Non Standard Solutions

In such cases, when there is a desire to install windows side by side it is not possible to use typical flashing solutions, so special combination flashings will be appropriate and are available from FAKRO. Such combinations are designed and made individually bearing in mind all the relevant window size details. The price of non-standard flashings is calculated individually. When ordering, the window's drawing (outside outlook) — is required. Please contact your FAKRO representative for further information.




















Examples





















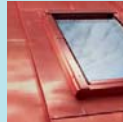




FLASHING TYPES

Standard flashings

	Type of roofing material	Flashing type	Available combinations	Maximum profile depth of roof material	Roof pitch
ES	 Flat roof coverings such as: - roofing felt - bitumen - flat sheet metal - slate	ESV	  	10 (2 x 5)	15° – 90°
		ESJ		10 (2 x 5)	20° – 90°
EZ	 Profiled roof coverings such as: - roof tiles - corrugated metal sheeting	EZN-A	  	up to 45	15° – 90°
		EZV-A	  	up to 45	15° – 90°
		EZJ-A		up to 45	20° – 90°
EH	 High profile roof coverings such as: - roof tiles - corrugated metal sheets	EHN-A	  	up to 90	15° – 90°

Additional flashings

EH_-AT Thermo	 High profile roof coverings such as: - roof tiles - corrugated metal sheeting	EHV-AT Thermo	  	up to 90	15° – 90°
		EHN-AT Thermo	  	up to 120	15° – 90°
EZ	 Flat roof coverings such as: - flat tiles	EZV-F	  	up to 50	15° – 90°
EL	 Flat roof coverings such as: - bitumen - slate	ELV	  	10 (2 x 5)	15° – 90°
		ELJ		10 (2 x 5)	20° – 90°
EG	 Slate roof coverings such as: - plain tiles	EGV	  	24 ÷ 32, 2 x (12 ÷ 16)	25° – 90°
EB	 Flat roof coverings such as: - panel sheet metal	EBV-A	  	—	15° – 90°
EE	 Flat roof coverings such as: - flat sheet metal	EEV	  	—	15° – 90°
		EEJ		20° – 90°	

Special flashings

E_A	 Flat roof coverings such as: - roofing felt - bitumen - corrugated metal sheeting Profiled roof coverings such as: - roof tiles - corrugated metal sheeting High profile roof coverings such as: - roof tiles - corrugated metal sheeting	ESA		10 (2 x 5)	10° – 75°
		EZA-A		up to 45	10° – 75°
		EHA-A		up to 90	10° – 75°

 horizontal combinations,  vertical combinations,  block combinations

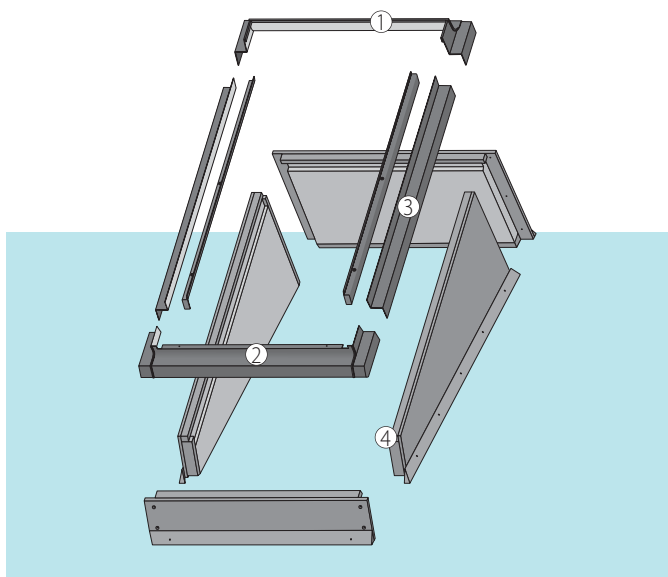
FLAT ROOF SOLUTIONS

FLAT ROOF SYSTEM **EFW**



FEATURES:

- EFW Flat Roof System makes it possible to install windows on flat or very low-pitched roofs.
- System elevates the installation angle of the window by 15° in relation to the roof pitch.
- Mainly used in order to provide some more natural light when adapting attic with low pitch roof to living space, in production halls and warehouses while at the same time maintaining good thermo-insulating properties.
- Normally used to install single windows in the roof. On special request, it is possible to carry out the system in which two windows are fitted next to each other. The total width of the combination should not exceed 250cm.
- Windows in the EFW system can be installed in horizontal combinations with a minimum distance of 30cm between them.
- Also available in **EFS** version to be used with smoke ventilation windows and **EFE** systems fit for FW side hung escape windows.
- Intended for roof pitches between 0° and 15°.



CONSTITUENTS OF THE SYSTEM:

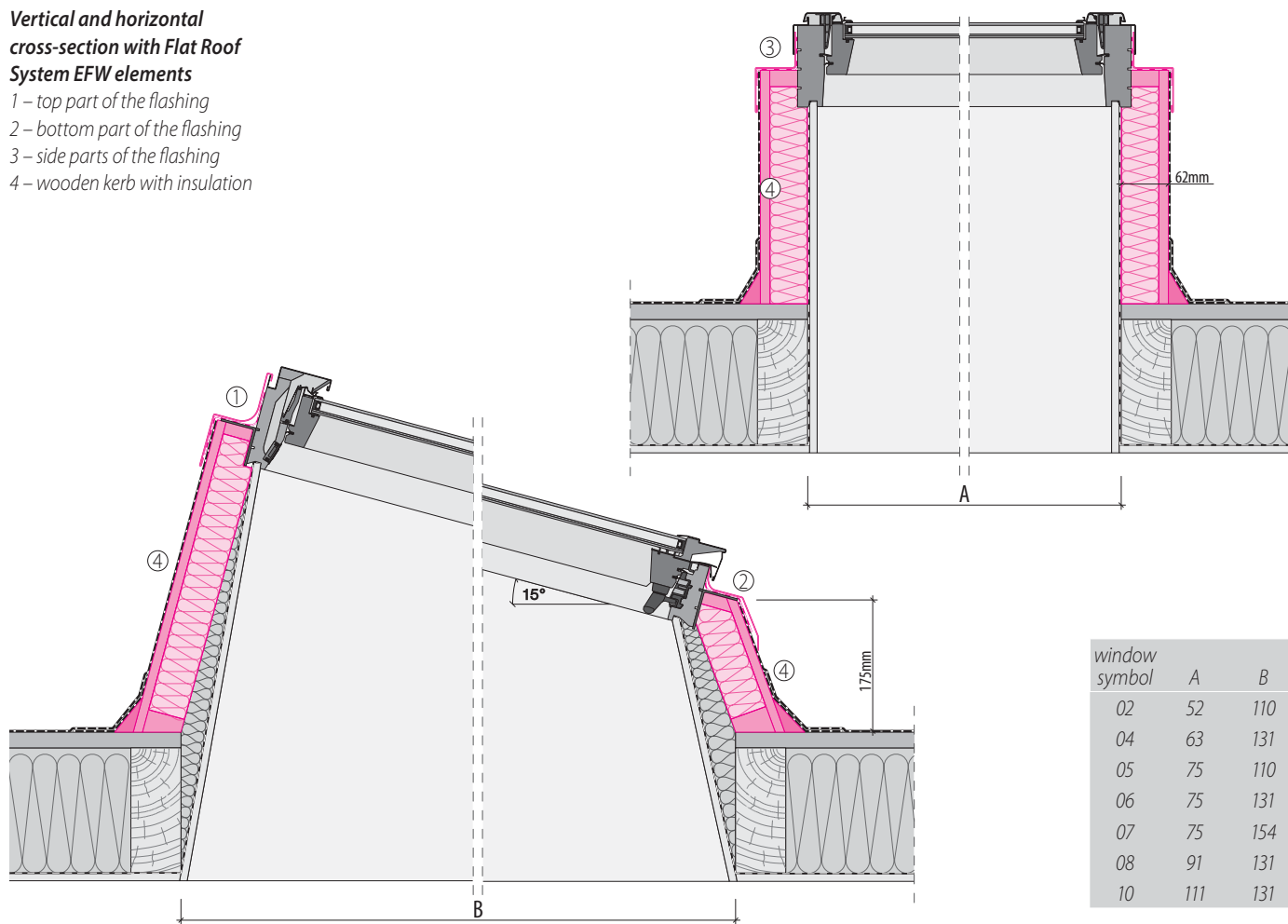
- The EFW system consists of:
 - 1 – top part of the flashing
 - 2 – bottom part of the flashing
 - 3 – side parts of the flashing
 - 4 – wooden kerb with insulation
- Brackets for installing the window are included in the package.
- Wooden housing, after installing should be properly sealed and fixed to the existing roof covering.

WARRANTY:

- 10 years

Vertical and horizontal cross-section with Flat Roof System EFW elements

- 1 – top part of the flashing
- 2 – bottom part of the flashing
- 3 – side parts of the flashing
- 4 – wooden kerb with insulation



window symbol	A	B
02	52	110
04	63	131
05	75	110
06	75	131
07	75	154
08	91	131
10	111	131

Sizes of Standard Flashing

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42	80	41	43	

EFW

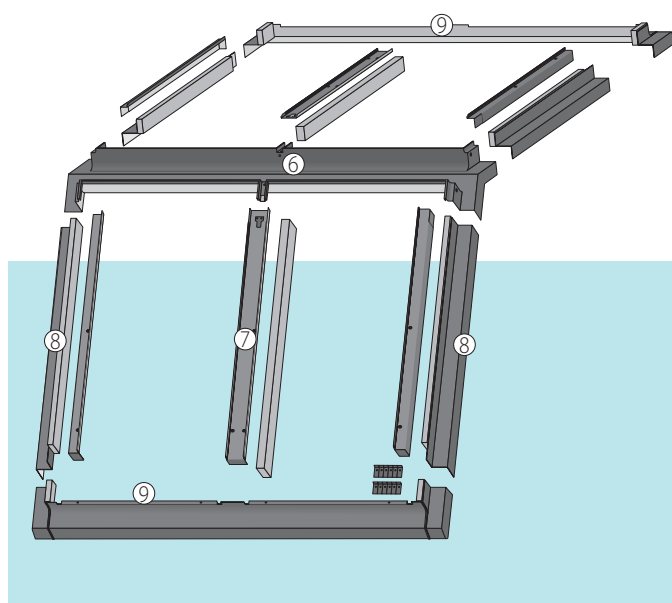
892	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-

FLAT ROOF GABLE SYSTEM **EFR**



FEATURES:

- EFR system enables combination of roof windows in flat roof structure.
- Wooden gable structure with complete set of flashings shortens to the minimum the installation time. Aesthetic and highly effective solution to illuminate rooms in buildings with low-angle roofs.
- Provides good thermo-insulating properties. Its design allows for the installation of standard roof windows, wooden as well as aluminium-plastic.
- As the windows are placed outside the direct reach of the user, it is recommended to use Z-Wave controlled by the remote control or by the wall switch windows.
- Windows can be equipped both with internal and external accessories.
- EFR system is used on roofs with pitches from 0° to 15°.



CONSTITUENTS OF THE SYSTEM:

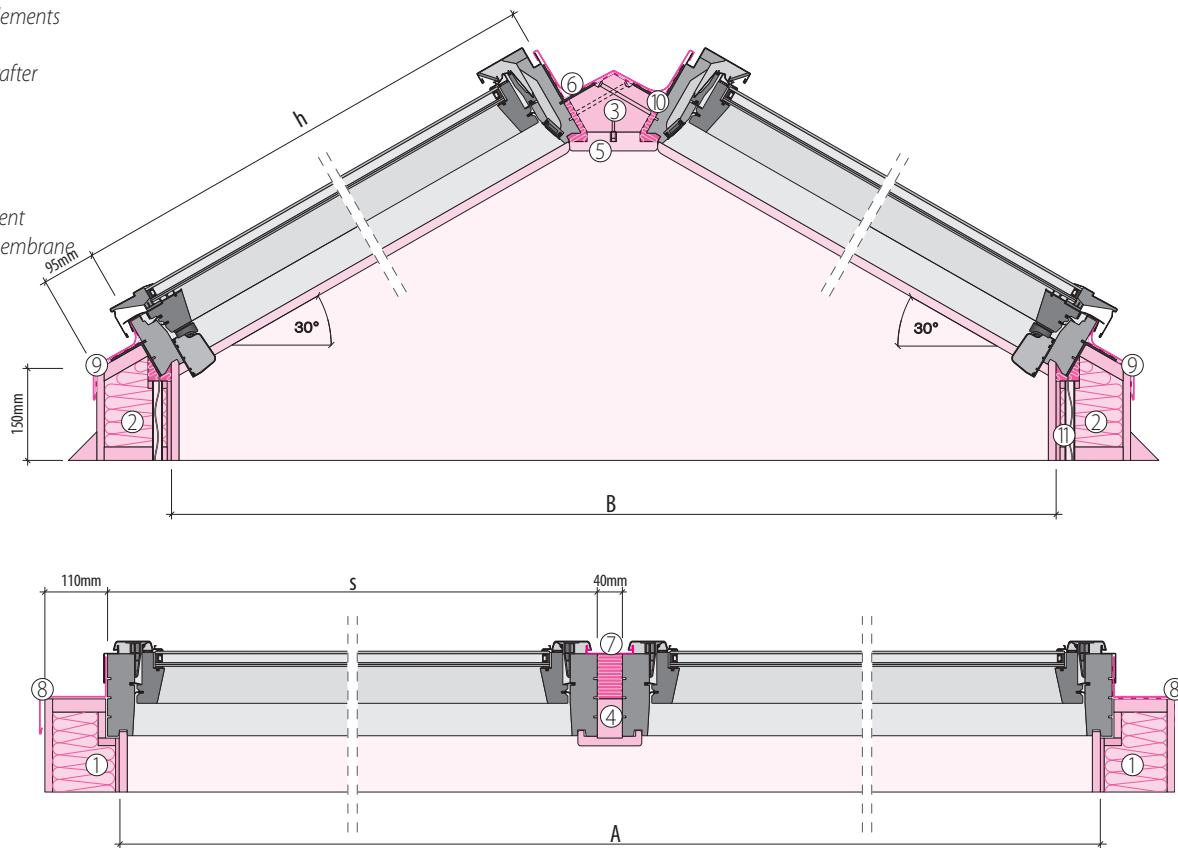
- The EFR flat roof gable system consists of the wooden kerb made of 12mm thick waterproof boards, insulated with 10cm thick OSB panels. From the inside the kerb walls are finished with plywood, which can be covered from the inside with the finishing lining. The distance between the adjacent windows is 40mm.
- The flashing is made of 0.6mm thick metal sheet, coated with RAL 7022 lacquer.

WARRANTY:

- 10 years

EFR flat roof gable system - vertical and horizontal cross-section with Electro windows

- 1 – Wooden kerb - side elements
- 2 – Wooden kerb - front elements
- 3 – Top joining beam
- 4 – Supporting, finishing rafter
- 5 – Finishing slat
- 6 – Top covering flashing
- 7 – Joining gutters
- 8 – Side flashing element
- 9 – Bottom flashing element
- 10 – Permeable roofing membrane
- 11 – Duct for cables



Standard Sizes of EFR system B2/2

PRODUCT CODE	4 szt.78/98	4 szt.78/118	4 szt.78/140	4 szt.114/98	4 szt.114/118	4 szt.114/140
	196x217x73	196x252x83	196x290x94	268x217x73	268x252x83	268x290x94
	156x177	156x212	156x250	228x177	228x212	228x250
	1,88	2,36	2,92	3,04	3,80	4,64
	B2/2 05	B2/2 06	B2/2 07	B2/2 20	B2/2 10	B2/2 11

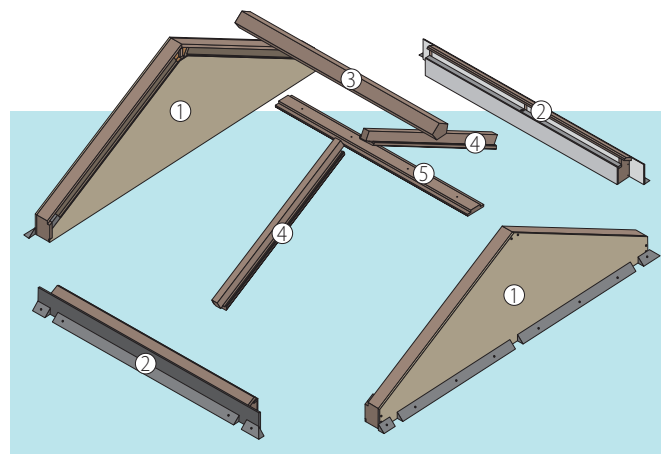
Size [cm]
 Total product size [cm] - (S x L x h)
 Roof opening size [cm] - (A x B)
 Glazing area B2/2 [m²]



Product code

EFR B2/2

890C	+	+	+	+	+	+
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ACCESSORIES

FOR ROOF WINDOWS





INTRODUCTION

FAKRO roof window accessories combine functional and operational features with attractive design. Accessories can be divided to internal and external by virtue of the place of their installation. A wide range of accessories increases functionality of the window and offers means to control the amount of light as well as heat and energy used.

Accessories are offered for most window types and for either internal or external applications as well a choice of manual or electric Z-Wave options.

WHY USE ROOF WINDOW ACCESSORIES?

Accessories for roof windows are designed to perform a specific function. This includes interior design, protection against heat or intense sunlight. To fully enjoy the benefits of living in the attic you must decide what is the most important for you and optimally choose the appropriate accessory for roof windows in line with your expectations.



INTERIOR DESIGN - AJP, ARS, ARP, ARF, APS, APF

Internal accessories can put the finishing touches on any roof window. The wide range of blind type, style and colour ensures complete harmony with your chosen décor and helps shape a room's character.

PROTECTION FROM OVERHEATING INSIDE - AMZ, ARZ

The external accessories (external awning blind, external roller blind) provide the ultimate protection against solar gain on hot, summer days. The use of external accessories does not limit window's glazing area.

CONTROL OF LIGHT - AJP, ARS, ARP, ARF, APS, APF, AMZ, ARZ

Regulate the amount and intensity of light entering the room. At one extreme, you can have total darkness, even on a sunny day when you need a rest while at the other you can simply use a blind to prevent light reflection on computer and TV screens.

PROTECTION FROM UV RAYS - AJP, ARS, ARP, ARF, APS, APF, AMZ, ARZ

Mounting the external and internal accessories effectively protects against UV rays, preventing the room furnishings from fading or yellowing.

PROTECTION OF PRIVACY - AJP, ARS, ARP, ARF, APS, APF, AMZ, ARZ

FAKRO roof window accessories protect your house interior against viewers and ensure a feeling of privacy.

EASE OF INSTALLATION - AJP, ARS, ARP, ARF, APS, APF, AMZ

All FAKRO accessories are designed for total ease of installation with our windows, something which is not always the case with blinds from some sources. Accessories combine the highest standard of quality, innovative solutions and design.

EASE OF USE - AJP Z-Wave, ARP Z-Wave, ARF Z-Wave, AMZ Z-Wave, AMZ Solar, ARZ Z-Wave, ARZ Solar

Our internal and external accessories are characterized by their ease of use. The FAKRO range also includes electrically operated accessories which are equipped with a Z-Wave module for control alongside appliances from some of the world's leading manufacturers via a remote, wireless touch keyboard, smartphone or tablet.

Internal and external accessories come with a 2-year warranty. The use of genuine FAKRO accessories will ensure correct installation and many years of trouble free use.

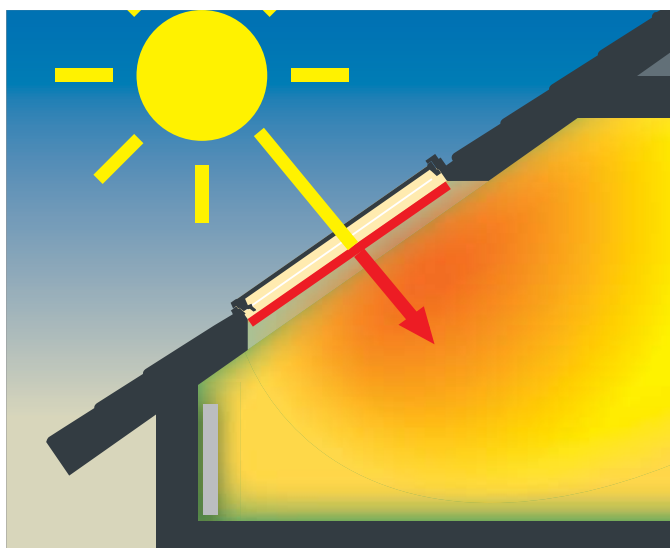


PROTECTION FROM OVERHEATING



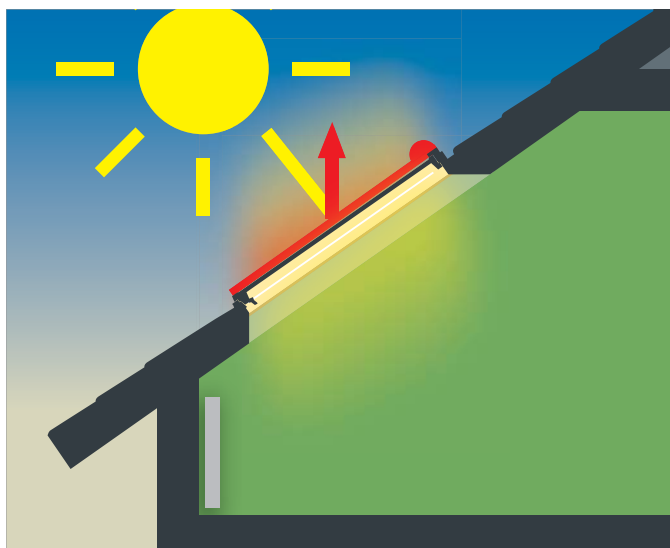
DIN 5034-1 covers the required levels of natural light which should be provided to interiors. It says that rooms should be protected from overheating through the use of external accessories (awning or shutter blinds) as they provide better protection than internal blinds.

'A room space should be protected from overheating in summer using external covers to reflect heat. Overheating as a result of absorption of radiation by objects within a room changes into long-wave infrared radiation. This cannot be dispelled and therefore causes an increase in temperature'. - DIN 5034-1



Thermal radiation which passes through the window pane is absorbed by an internal blind so the heat radiates to the interior in the form of long wave infrared radiation which is not transmitted through the glass back to the outside.

The blind acts as a radiator causing overheating, particularly on south-facing roofs.

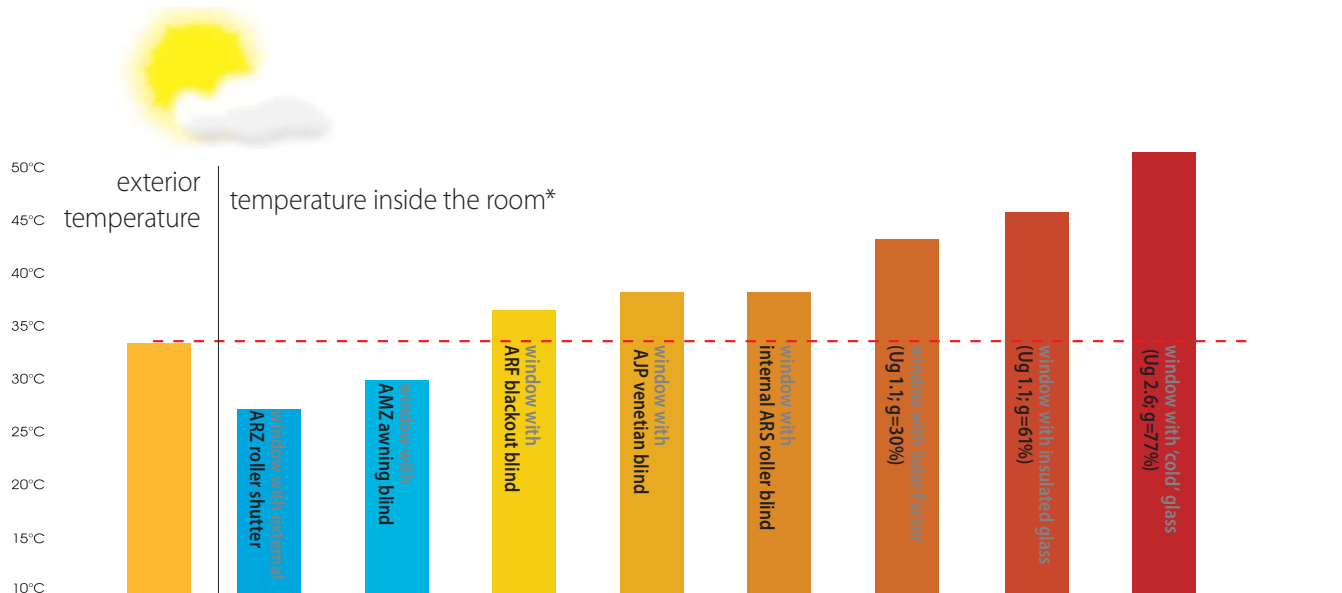


External accessories offer the best protection from high temperatures. They absorb UV radiation, protect the external glazing and keep warm air outside.

TESTS & RESEARCH

FAKRO continually analyses all accessories for their efficiency of protection against heat gain in order to improve their performance and enhance user comfort.

We have built eight identical room environments to enable us to carry out tests in relation to solar and UV exposure. Windows have been closed during the research and the temperature was constantly measured one metre above the floor at different points and it is these test results which are reflected in the graph below.



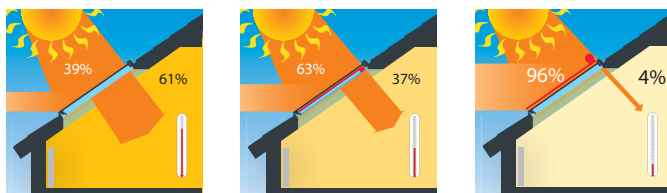
* Presented results and diagram are for illustrative purposes only - they relate to specific weather conditions during the test.

Maximum temperature inside the room on a hot summer day, depending on the type of accessory used.

Documented research clearly shows that external accessories (awning blinds and roller shutters) provide the best means of protection against burdensome heat as they absorb solar radiation before it reaches the glazing as well as significantly reduce heat flow and keep warm outside.

Internal blinds can also be used but are generally less effective, their main benefits being light reduction and internal decoration.

Awning blinds provide the best means of protection as well as being the most cost-effective and practical.



Sun energy transmittance %

Figure 1: Window without blinds

61 % ; g = 0.61 (as per EN 410)

Figure 2: Window with internal blackout blind

37 % ; g = 0.37 (as per EN13363-1)

Figure 3: Window with awning blind (depending on the fabric used)

4 - 20 % ; g = 0.04 - 0.20 (as per EN13363-1)

Solar radiation coefficient 'g' informs about the amount of solar energy reaching the glass which penetrates into the room. The higher value of 'g' coefficient, the room heats up faster. The external awning blind offers **up to 8 times more effective** protection in comparison with internal blackout blinds.



CHOOSING ACCESSORIES



type and size

Internal accessories are compatible with all FAKRO roof window types. The window type and dimensions which are provided on the identification label of the window sash have to be known in order to select the right size of accessories. FAKRO offers a wide range of external awning blinds and accessories adapted to different roof window designs. The external awning blind and internal accessory fitted on the same FAKRO roof window create a set of accessories providing a maximum comfort of living in the attic space. They protect the room against excessive heat and light, additionally enhancing interior design.

FAKRO accessories are available via:

- FAKRO roof windows sales chain
- dedicated online stores
- best stores offering accessories for windows.

Using original FAKRO accessories from this catalogue helps maintain the 10-year warranty of your roof windows.

Note: Colour swatches in this catalogue may differ from the actual fabric. Fabric swatches are available.

Internal accessories

	FTS, FTP, FTU	FTT US*, FPT US*	FTT U6, FTT U8 Thermo	PTP, PTP-V	FPP-V, FPU-V preSelect	PPP-V preSelect	FEP	FYP-V	PYP-V	FDY-V		FGH-V		BD_, BVP, BXP	FTP/D, FTU/D	FXP, FXU	FW_	
										top sash	bottom sash	top sash	bottom sash					
Venetian blind AJP	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ ⁴
Venetian blind AJP Z-Wave	+	+	—	+	+	+	+	+	+	+	—	+	—	—	+	—	+	+ ⁴
Roller blind ARS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Roller blind ARP ¹	+	+	+	+	+	+	+	+	+	+	+	—	+	+	+	+	+	+ ⁴
Roller blind ARP Z-Wave ¹	+	+	—	+	+	+	+	+	+	+	—	—	—	—	+	—	+	+ ⁴
Blackout blind ARF	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ ⁴
Blackout blind ARF Z-Wave	+	+	—	+	+	+	+	+	+	+	—	+	—	—	+	—	+	+ ⁴
Pleated blind APS	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ ⁴
Pleated blind APF	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+ ⁴
Insect screen AMS	+	+	+	+	+	+	+	+	+	+	+ ²	—	—	—	+ ²	+ ²	+	+

External accessories

Awning blind AMZ	+	+	+	+	+	+	—	+	+	+	+ ⁵	+	+ ⁵	—	+	+ ⁵	—
Awning blind AMZ Z-Wave, AMZ Solar	+	+	+	+	+	+	—	+	+	+ ⁵	+ ⁵	+ ⁵	+ ⁵	—	+	+ ⁵	—
Awning blind AME	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—
Awning blind AMB	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—
Roller shutter ARZ-H	+	—	—	—	+	—	—	+ ⁵	—	+ ⁵	—	+ ⁵	—	—	+ ³	—	—
Roller shutter ARZ Z-Wave, ARZ Solar	+	+	+	+	+	+	—	+ ⁵	+ ⁵	+ ⁵	+ ⁵	+ ⁵	—	—	+ ³	+ ⁵	—
Roller shutter ARK Z-Wave, ARK Solar	—	—	—	—	—	—	+	—	—	—	—	—	—	—	—	—	—

* - Internal accessories available to order, external accessories as standard

¹ - Window maximum height 140 cm

² - For linings for combinations with length up to 240 cm

³ - Securing 20cm distance between windows

⁴ - Service recommended to be performed by FAKRO service

⁵ - Available to special order, limited use

INTERNAL ACCESSORIES

VENETIAN BLINDS AJP, AJP Z-Wave



FEATURES:

- Reduction of heat gain in the room.
- Adjustment of slats to change the amount of light entering the room.
- Protects against overheating and can be used to enhance interior design.
- The blind is enclosed by an aluminium cassette which protects against airtight infiltration down the sides. The window sash can also be changed with the blind down.
- Window can be partially covered.
- Provision of privacy without significant reduction of natural light within the room.
- **AJP** blind is manually operated.
- **AJP Z-Wave** blind equipped with the electric drive controls the angle of slats. Operated by a wall switch or remote control. The operation of the standard AJP Z-Wave Venetian blind is possible only when the window is closed.
- Venetian blinds are available in two price groups:
 - Group I – available in 1 colour.
 - Group II – available in 28 colours.

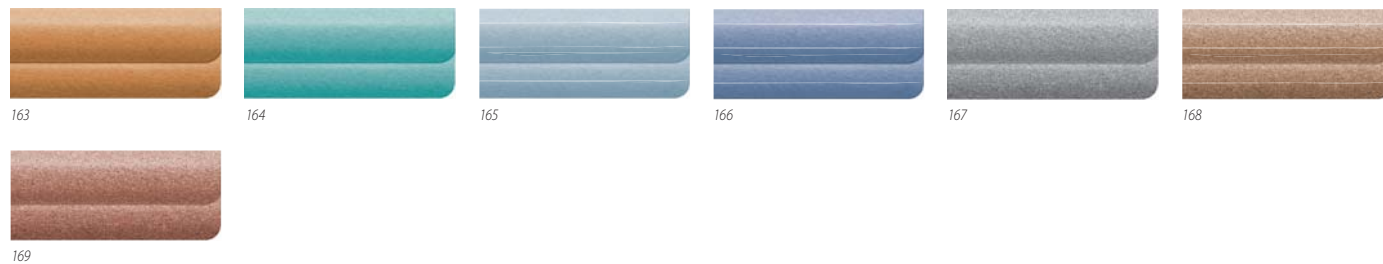
WARRANTY:

- 2 years

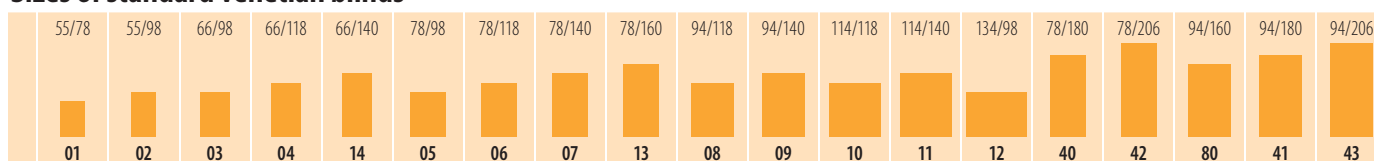


The material samples printed can differ in colour from the actual product.

Group II



Sizes of standard venetian blinds



AJP Group I

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

AJP Group II

	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

AJP Z-Wave Group I*

	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

AJP Z-Wave Group II*

	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Non-standard sized AJP venetian blind - additional charges

Product description	Additional charges
Special version AJP for window size range: width 48 – 134 [cm], height 78 – 206 [cm]	Price calculated individually
Special version AJP Z-Wave for window size range: width 66 – 134 [cm], height 98 – 206 [cm]	Price calculated individually

* If the blind is not mounted onto the FT_V Z-Wave window, power supply and control unit must be purchased separately (see: Electric Control chapter).

The material samples printed can differ in colour from the actual product.

ROLLER BLIND ARS

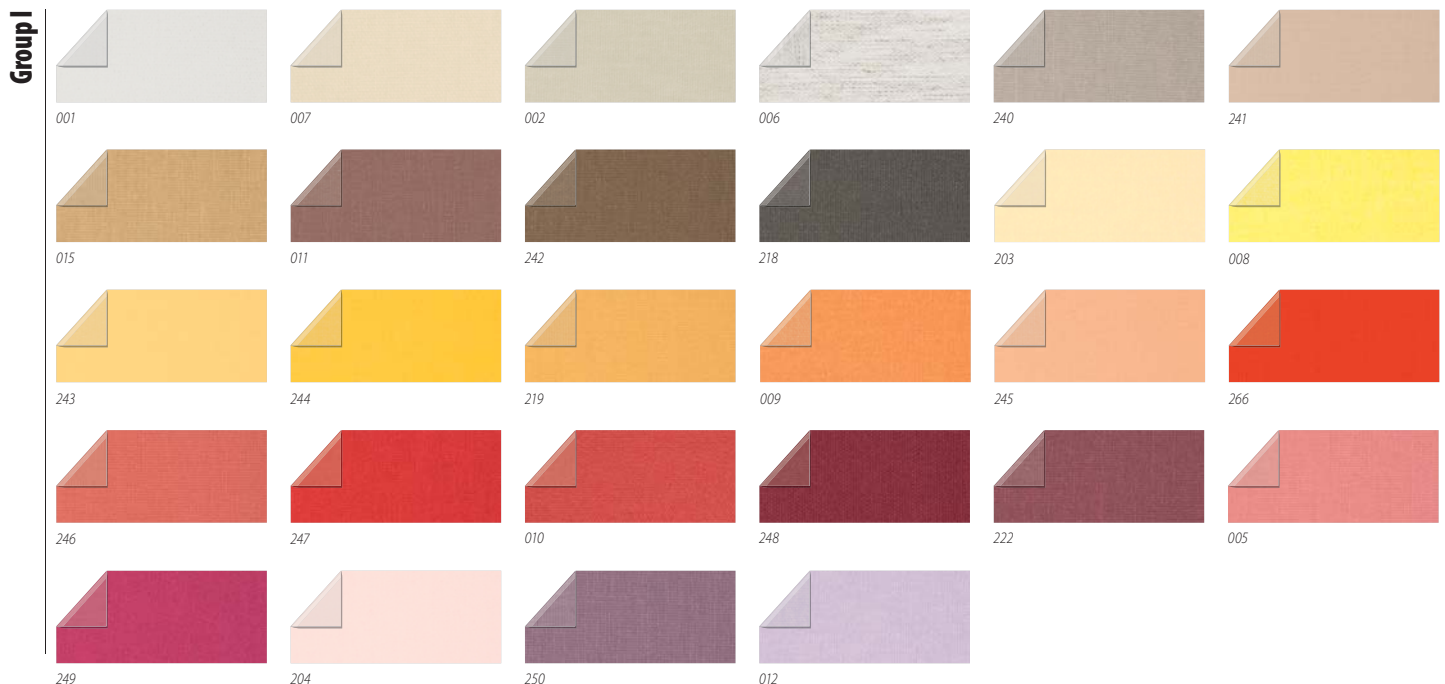


FEATURES:

- Variable reduction of incoming light.
- Effective protection from the sun.
- Enhanced room decor and design, while the wide range of fabric designs (plain, patterned) will help you match the blind with the interior.
- Provision of complete privacy when closed.
- The ARS roller blind is a fabric wound on a spring-loaded shaft.
- It comes with an attractive aluminium fascia which elegantly conceals the shaft.
- Three pairs of hooks placed in the sash enable the blind to be locked in these positions.
- Compatible with all FAKRO roof window types.
- Roller blinds are available in two price groups:
 - Group I – available in 44 colours.
 - Group II – available in 13 colours.
- -Properties of the blind fabric:
 - Low shrinkage and dimensionally stable even in damp environments.
 - High tear resistance.
 - Non-fray edges.
 - High resistance to UV radiation.
 - Long lasting colours.
 - Easy to wipe clean with a damp cloth or sponge.

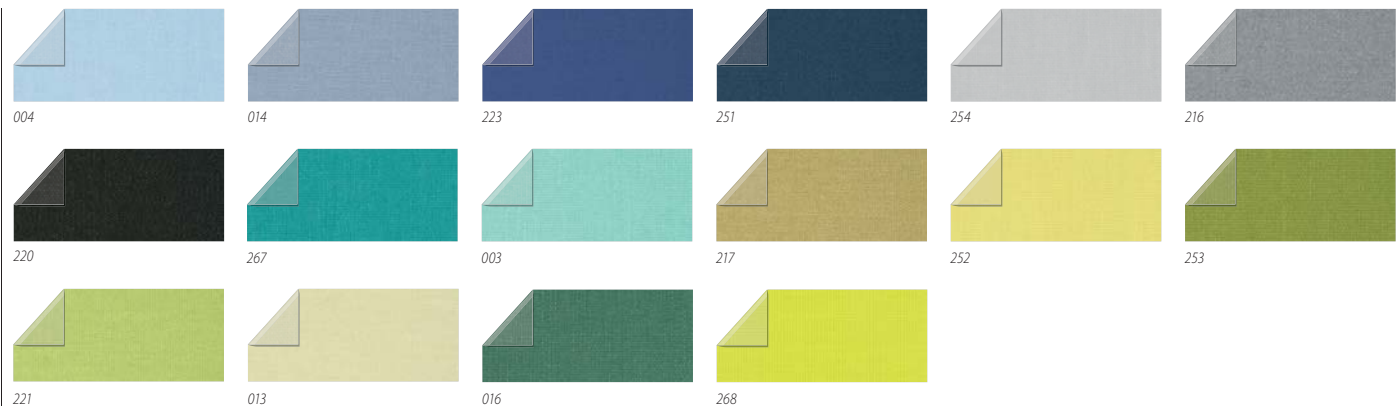
WARRANTY:

- 2 years

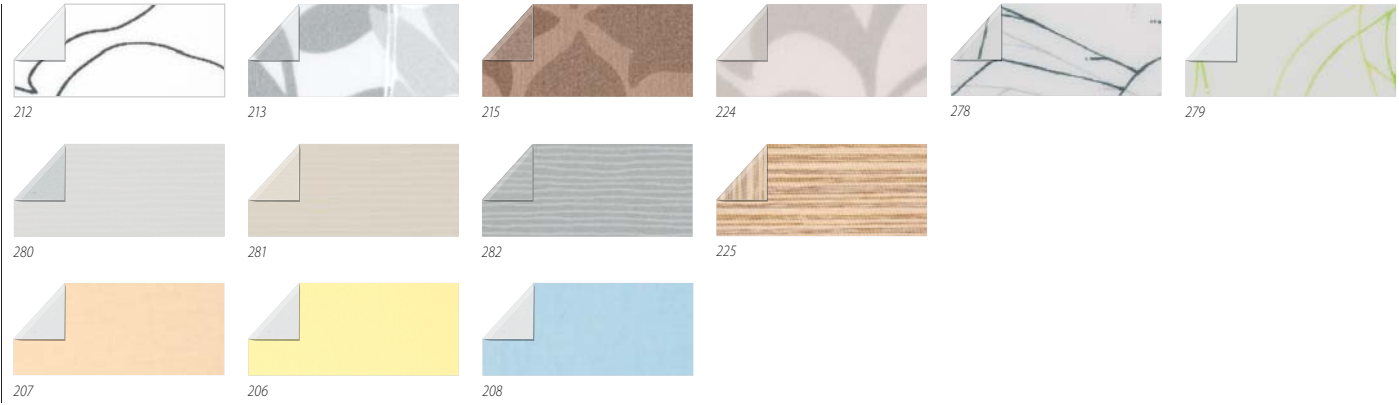


The material samples printed can differ in colour from the actual product.

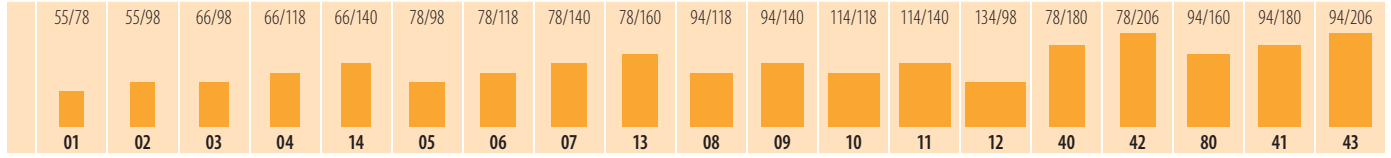
Group I



Group II



Sizes of standard roller blinds



ARS Group I

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARS Group II

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Non-standard sized roller blinds - additional charges

Product description	Additional charges
Special version ARS for window size range: width 48 – 134 [cm], height 78 – 206[cm]	Price calculated individually

The material samples printed can differ in colour from the actual product.

ROLLER BLINDS ARP, ARP Z-Wave

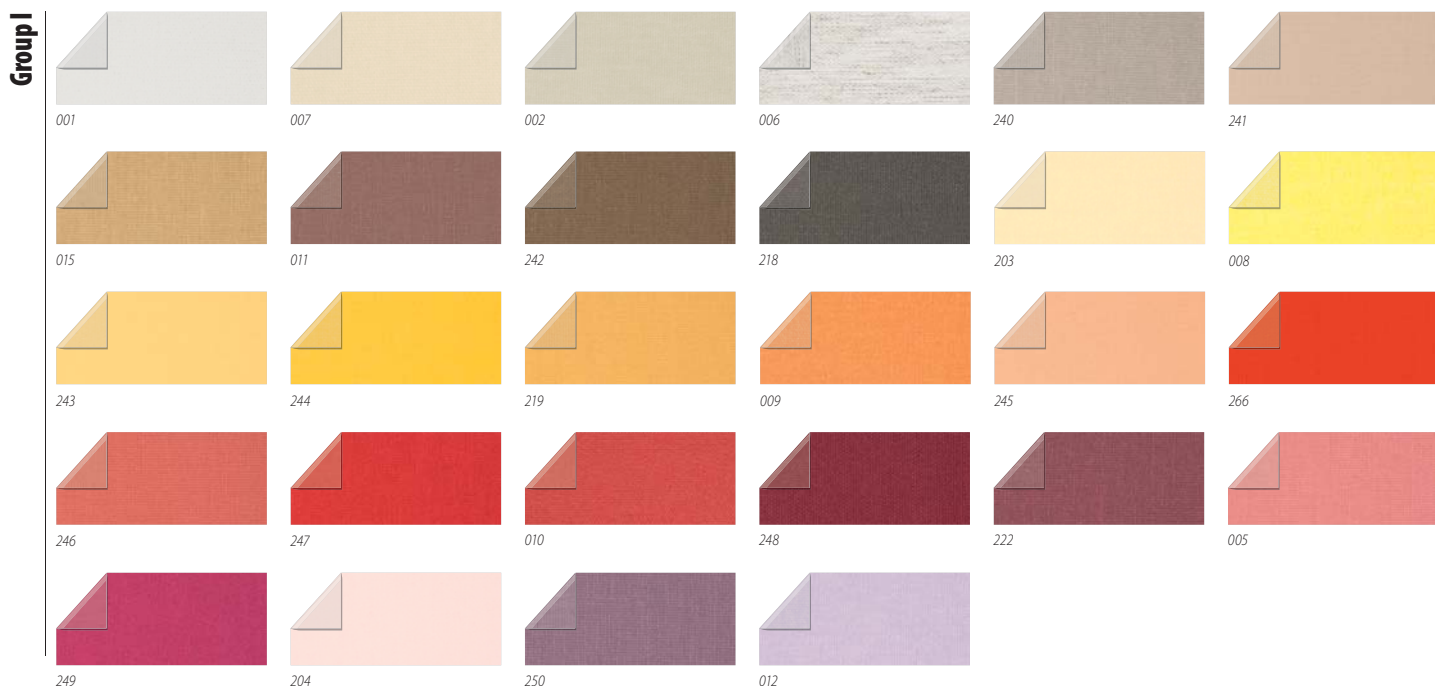


FEATURES:

- Used to reduce light entering a room while offering scope to be used as an intrinsic element of interior design.
- Provision of complete privacy when closed.
- Partial protection against heat of the sun.
- Protection against UV radiation.
- Wide range of colours and patterns greatly enhance the aesthetics of any room and suit individual tastes.
- Lockable in any position thanks to the side guides.
- Enhanced room decor and style.
- Aluminium guides cover the fabric edges and enable the blind to be set in any position.
- **ARP** blind is manually operated.
- **ARP Z-Wave** blind is electrically operated after connecting to one of FAKRO control devices.
- Operating ARP Z-Wave in the standard version is only possible when the roof window is closed.
- Electric roller blinds are also available to special order in version ARP-E KNX Ready – powered and operated by means of a 24V DC control unit.
- Roller blinds are available in three price groups:
 - Group I – available in 44 colours.
 - Group II – available in 5 colours.
 - Group III – available in 11 colours.

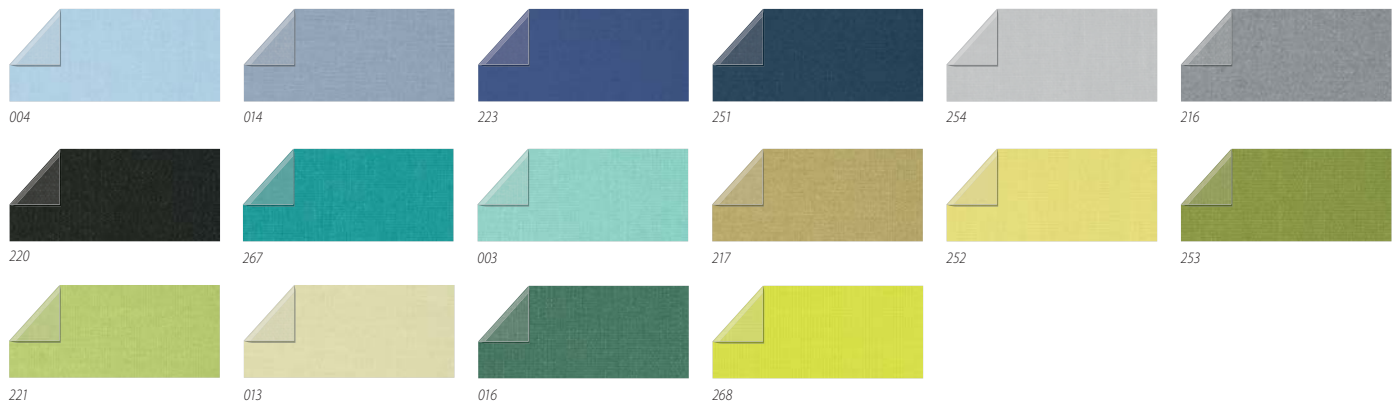
WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.

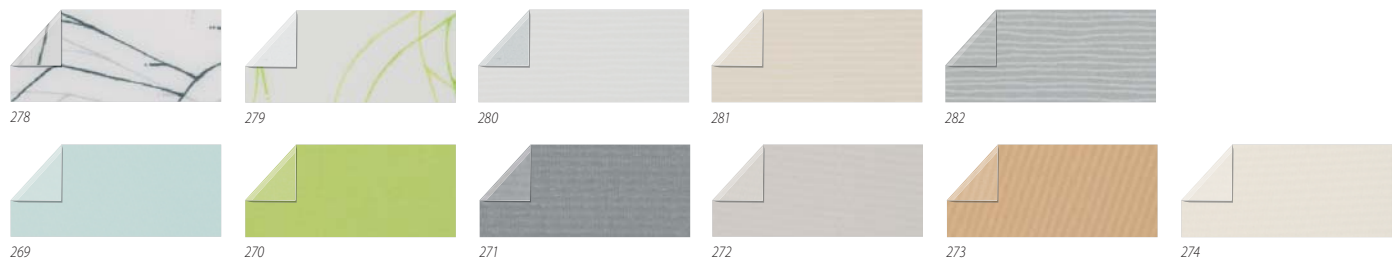
Group I



Group II



Group III



Sizes of standard roller blinds

55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/206	94/160	94/180	94/206
01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	42	80	41	43

ARP Group I

+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARP Group II

+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARP Group III

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARP Z-Wave Group I*

+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARP Z-Wave Group II*

+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	-	-	-	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARP Z-Wave Group III*

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Non-standard sized roller blinds - additional charges

Product description	Additional charges
Special version ARP for window size range: width 48 – 134 [cm], height 78 – 140 [cm]	Price calculated individually
Special version ARP Z-Wave for window size range: width 55 – 134 [cm], height 78 – 140 [cm]	Price calculated individually

* If the blind is not mounted onto the FT_V Z-Wave window, power supply and control unit must be purchased separately (see: Electric Control chapter).

The material samples printed can differ in colour from the actual product.

BLACKOUT BLINDS ARF, ARF Z-Wave

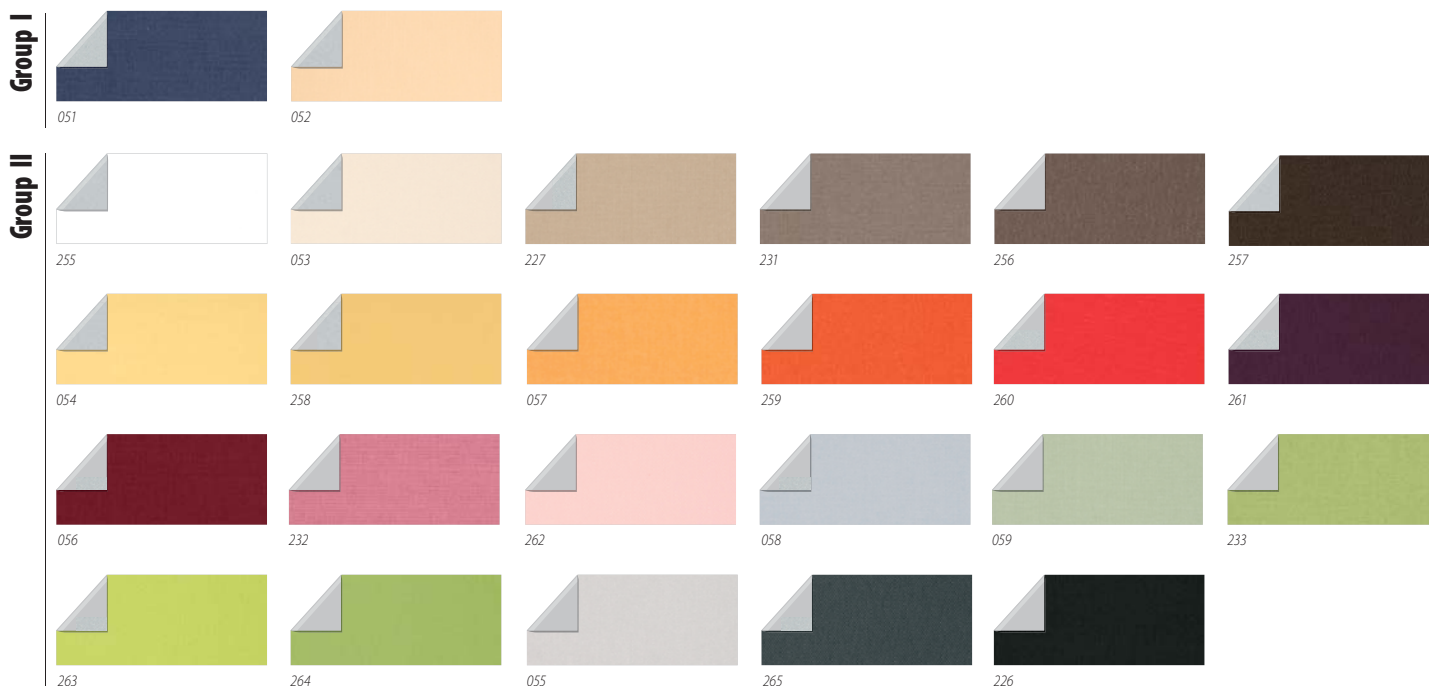


FEATURES:

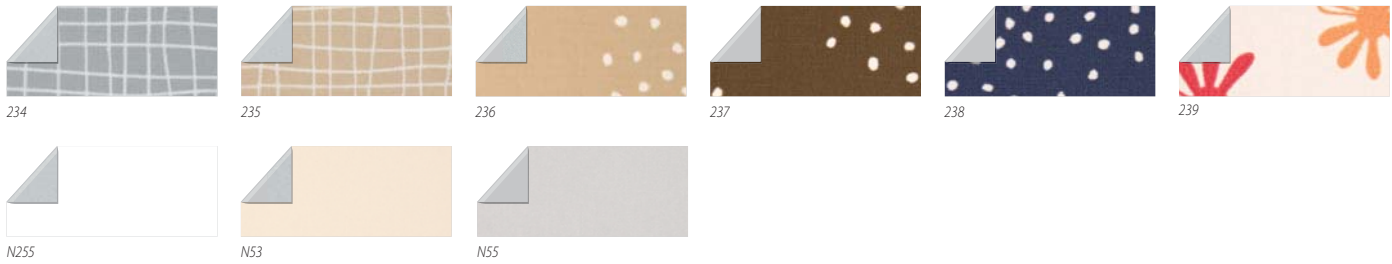
- The blind is made of an elegant and decorative fabric. It comes with side guides which allow to stop the blind in any position and ensure shading of the room.
- Variable reduction of incoming light.
- Aluminium guides cover the fabric edges and enable the blind to be set in any position.
- Provision of complete privacy.
- Special seal in the bottom aluminium fascia.
- The material covering the outer face of the fabric limits incoming light, reduces excessive heat in summer and prevent heat loss in winter. The fabric also protects against harmful UV radiation.
- Aesthetic aluminium fascia to conceal the mechanism of the blind.
- **ARF** blind is manually operated.
- **ARF Z-Wave** blind has built in 15V electric drive to enable operation of the blind using remote control or wall switch. Operating ARF Z-Wave blind in the standard version is only possible when the roof window is closed.
- Electric roller blinds are also available to special order in version ARF-E KNX Ready – powered and operated by means of a 24V DC control unit.
- Blackout blinds come in three price groups:
 - Group I – available in 2 colours.
 - Group II – available in 23 colours.
 - Group III – available in 9 colours, including 3 with flame resistant fabric (N255, N53, N55).

WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.



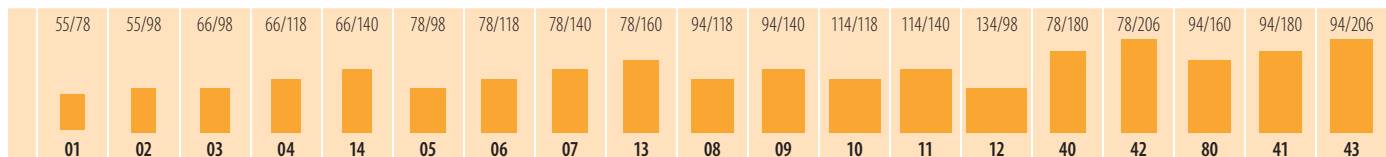
A children's room is a special place in every home which deserves a particular attention. It should not only be functional, but above all friendly to the youngest. Blackout blinds ensure harmony with the décor of any room and protect it from overheating, while your kids can enjoy comfortable conditions both for playing and learning.

Having children in mind, we have created a unique collection of DreamWorks&Fakro blinds. Characters from such movies as 'Trolls', 'How to Train Your Dragon', 'Kung Fu Panda' or 'Penguins of Madagascar' will make your children able to invite to the room their favourite heroes.

*DreamWorks Dragons © 2017 DreamWorks Animation LLC. All Rights Reserved.
 DreamWorks Kung Fu Panda © 2017 DreamWorks Animation LLC. All Rights Reserved.
 DreamWorks Trolls © 2017 DreamWorks Animation LLC. All Rights Reserved.
 DreamWorks Penguins of Madagascar © 2017 DreamWorks Animation LLC. All Rights Reserved.*

*Under approval process.
 Please consult your FAKRO representative for available motifs, sizes and order processing time.
 Photo presented for illustrative purposes only.
 Patterns and colours may differ from the actual product.*

Sizes of standard blackout blinds



ARF Group I

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARF Group II

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARF Group III

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARF Z-Wave Group I*

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARF Z-Wave Group II*

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ARF Z-Wave Group III*

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Non-standard sized ARF blackout blinds - additional charges

Product description	Additional charges
Special version ARF for window size range: width 48 – 134 [cm], height 78 – 206 [cm]	Price calculated individually
Special version ARF Z-Wave for window size range: width 55 – 134 [cm], height 78 – 180 [cm]	Price calculated individually

* If the blind is not mounted onto the FT_V Z-Wave window, power supply and control unit must be purchased separately (see: Electric Control chapter).

The material samples printed can differ in colour from the actual product.

PLEATED BLIND APS

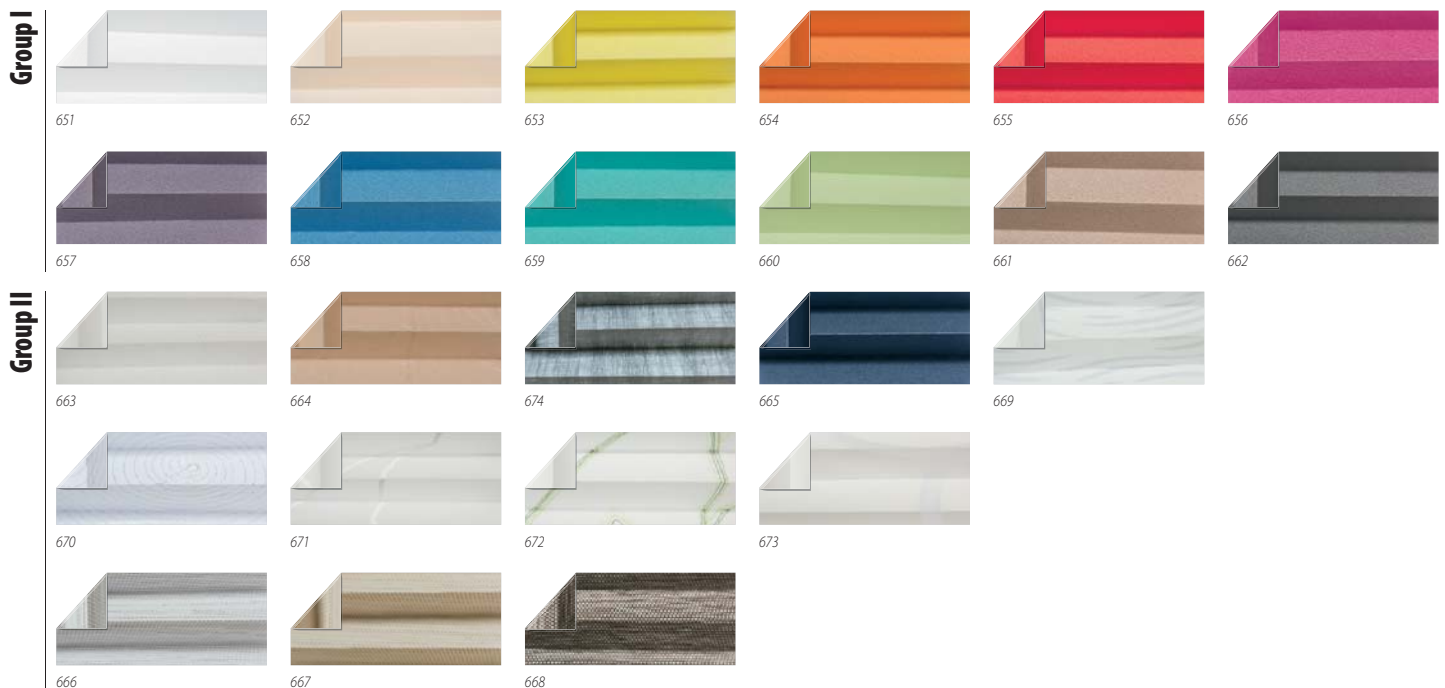


FEATURES:

- A stylish and decorative sun screening device to enhance any interior design.
- It provides a diffused lighting effect and harmony of colours to match interior design.
- Variable reduction of incoming light.
- Partial protection against heat gain.
- Lockable in any position thanks to the side guides.
- Top-down system – easy operation by means of an upper and lower bar.
- Aluminium guides are available in two colour versions – lacquered white and anodised silver.
- Compatible with all FAKRO roof window types.
- Pleated blinds come in two price groups:
 - Group I – available in 12 colours.
 - Group II – available in 12 colours.

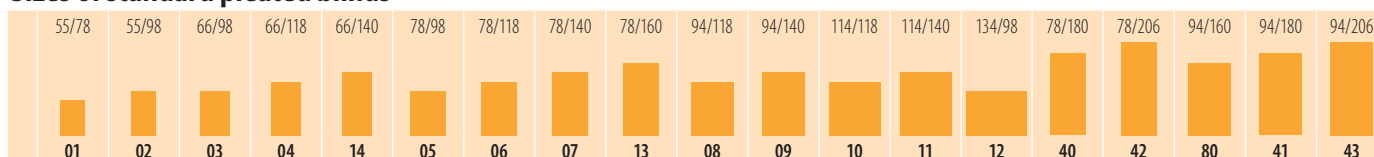
WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.

Sizes of standard pleated blinds



APS Group I

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

APS Group II

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Non-standard sized APS pleated blinds - additional charges

Product description	Additional charges
Special version APS for window size range: 48 – 134 [cm], height 78 – 206 [cm]	Price calculated individually

The material samples printed can differ in colour from the actual product.

PLEATED BLIND **APF**

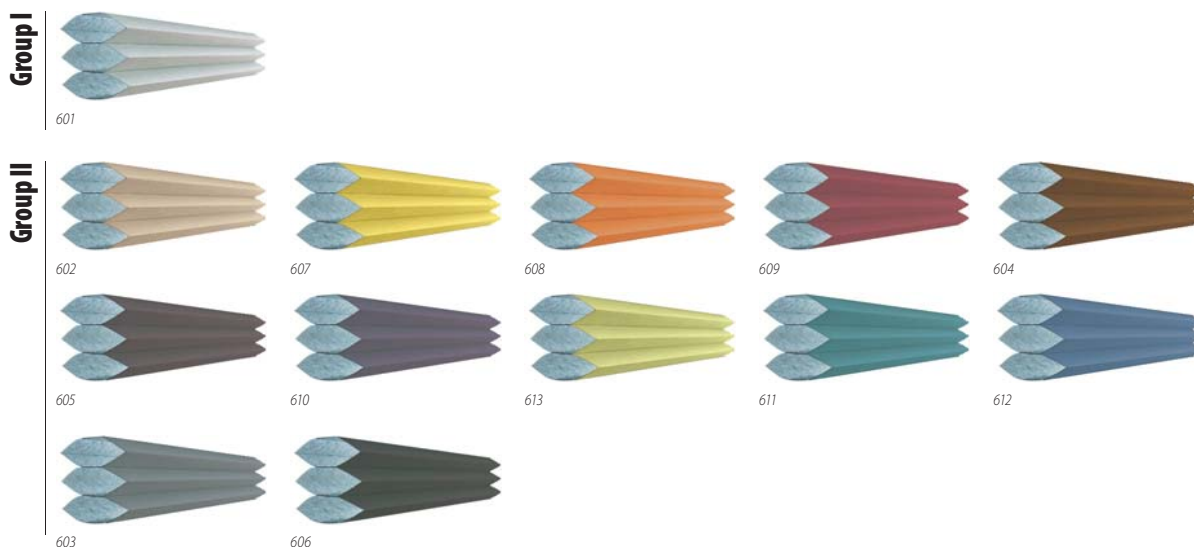


FEATURES:

- An ideal sun screening device for use with contemporary interiors.
- Variable reduction of incoming light.
- Partial protection against heat gain.
- Lockable in any position thanks to the side guides.
- Top-down system – easy operation by means of an upper and lower bar.
- Provision of complete privacy.
- The fabric has a honeycomb structure and an internal aluminium coating which provides blackout and good thermal performance.
- Aluminium guides are available in two colour versions – lacquered white and anodised silver.
- Compatible with all FAKRO roof window types.
- Pleated blinds come in two price groups:
 - Group I – available in 1 colour.
 - Group II – available in 12 colours.

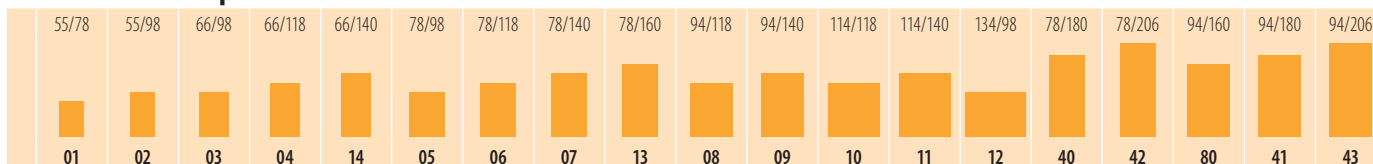
WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.

Sizes of standard pleated blinds



APF Group I

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

APF Group II

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Non-standard sized APS pleated blinds - additional charges

Product description	Additional charges
Special version APF for window size range: 48 – 134 [cm], height 78 – 206 [cm]	Price calculated individually

INSECT SCREEN AMS

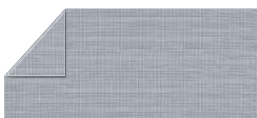


FEATURES:

- The only accessory mounted onto the face of the window reveal, not the window.
- Made of mesh coated with fibre glass.
- Equipped with aluminium guides in white or silver colour.
- Effective protection against mosquitoes and other insects.
- Minimal reduction of incoming light.
- Allows ventilation but protection from insect entry into the room.

WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.

Sizes of standard insect screens

55x170	55x200	66x200	66x240	78x200	78x240	94x200	94x240	114x200	114x240	134x200	134x240
48.5	48.5	59.5	59.5	71.5	71.5	87.5	87.5	107.5	107.5	127.5	127.5
170	200	200	240	200	240	200	240	200	240	200	240

AMS white RAL9010,

820BAA	820BAB	820BAC	820BAD	820BAE	820BAF	820BAG	820BAH	820BAJ	820BAK	820BAL	820BAM
+	+	+	+	+	+	+	+	+	+	+	+

AMS anodised silver

820BAN	820BAP	820BAR	820BAS	820BAT	820BAU	820BAW	820BAQ	820BAX	820BAY	820BAZ	820BAV
+	+	+	+	+	+	+	+	+	+	+	+

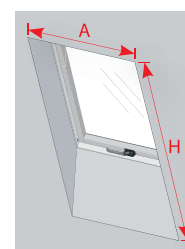
For proper selection of the insect screen to match FAKRO roof windows it is required to specify the window width (to be found on data plate) and measure internal lining height (H).

Insect Screens are designed for on site trimming and fitting to window reveal dimensions.

Window width [cm]	55	55	66	66	78	78	94	94	114	114	134	134
Internal lining width [cm]	48.5	48.5	59.5	59.5	71.5	71.5	87.5	87.5	107.5	107.5	127.5	127.5
Max. lining internal height [cm]	170	200	200	240	200	240	200	240	200	240	200	240

Another way of selecting the insect screen to the lining is to measure the internal lining width (A) and height (H) (picture).

Having A and H details we can produce non-standard insect screen or adjust it to standard dimensions of the AMS insect screens specified in the table above.



When placing an order the client must specify whether the screen is to be installed on FAKRO lining or the lining made of plasterboard.

Non-standard sized AMS insect screens - additional charges

Product description	Additional charges
Special version AMS for window size range: width 48 – 134 [cm], height 200, 240 [cm]	Price calculated individually

EXTERNAL ACCESSORIES

AWNING BLINDS AMZ, AME



8 times
more
effective

FEATURES:

- They absorb solar radiation before it reaches the glazing and emit the heat to the outside of the room, hence ensure much better protection from tiresome heat on the sunny days.
- Recommended by FAKRO as the most optimal protection against excessive heat gain in the room. Research carried out by FAKRO shows that the awning blind offers up to 8 more effective protection against heat gain compared with internal blinds.
- Protection against UV radiation.
- Protection against light reflection on computer and TV screens.
- When rolled up, it does not limit the glazing surface.
- A wider fabric area to shade the interior more effectively.
- Easy installation from the inside of the roof (by simply unscrewing four screws, mounting the blind and then reusing the same holes).
- When pulled down during rain, the blind reduces sound of falling raindrops.
- Made of durable, weather-resistant fabric which is rolled up on a spring-loaded shaft and inserted into an aluminium cassette mounted above the window. The design ensures ease of operation.
- Correct tension of the spring in the shaft ensures proper tension of the fabric and ventilation space between the glass and the blind. This allows for air circulation and prevents potential glass cracks caused by thermal shock.
- The AMZ awning blind can be used with centre pivot windows, top hung and pivot windows preSelect in standard and non-standard sizes, where the FE Panoramic window is used the AME awning blind should be selected.
- Awning blinds come in three groups:
 - Group I – available in 1 colour (fabric with 10% relative open area).
 - Group II – available in 5 colours (fabric with 10% relative open area).
 - Group III – available in 2 colours (fabric with 1% relative open area).
- Awning blinds in grey colour absorb heat much better than white ones. Looking out the window covered with the awning blind in grey colour does not produce dazzling effect as it is the case with awning blinds in white. In addition, grey awning blinds are more resistant to dirt.

WARRANTY:

- 2 years



Fabric with 10% relative open area, awning blinds from group I and II.



Fabric with 1% relative open area, awning blinds from group III.

Group I fabric with 10% relative open area



reduction of the amount of incoming light



089

Group II fabric with 10% relative open area



reduction of the amount of incoming light



088



reduction of the amount of incoming light



090



reduction of the amount of incoming light



097



reduction of the amount of incoming light



091



reduction of the amount of incoming light



094

Group III fabric with 1% relative open area



reduction of the amount of incoming light



092



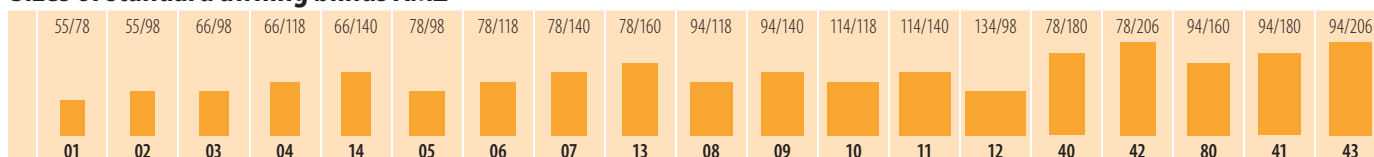
reduction of the amount of incoming light



093

The material samples printed can differ in colour from the actual product.

Sizes of standard awning blinds AMZ



AMZ Group I fabric with 10% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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AMZ Group II fabric with 10% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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AMZ Group III fabric with 1% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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AMZ **NEW LINE** Group I fabric with 10% relative open area

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AMZ **NEW LINE** Group II fabric with 10% relative open area

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AMZ **NEW LINE** Group III fabric with 1% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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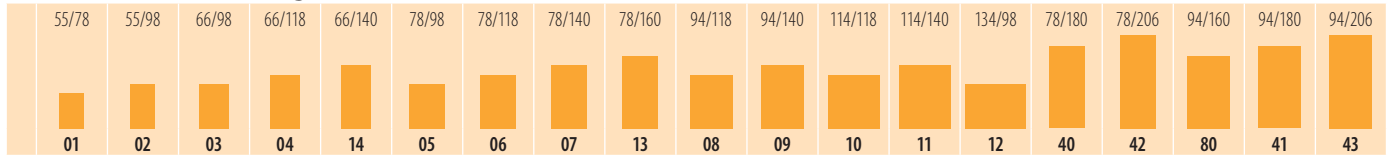
AMZ NewLine awning blinds are compatible with FAKRO windows manufactured after 2007.

Non-standard sized AMZ awning blinds - additional charges

Product description	Additional charges
Special version AMZ*	for window size range: width 41 – 140 [cm], height 78 – 206 [cm] Price calculated individually
Special version AMZ New Line*	for window size range: width 41 – 140 [cm], height 78 – 206 [cm] Price calculated individually
Special version	elements of the AMZ casing made of CU/TC +35% to the standard product
Special version	elements of the AMZ, AMZ NewLine casing made in RAL colours +35% to the standard product

*Possibility to produce non-standard products must be confirmed by a Technical Advisor or FAKRO hotline.

Sizes of standard awning blinds AME



AME Group I fabric with 10% relative open area

-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-
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AME Group II fabric with 10% relative open area

-	-	-	-	-	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-
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AME Group III fabric with 1% relative open area

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AWNING BLINDS AMZ Z-Wave, AMZ Solar



8 times
more
effective

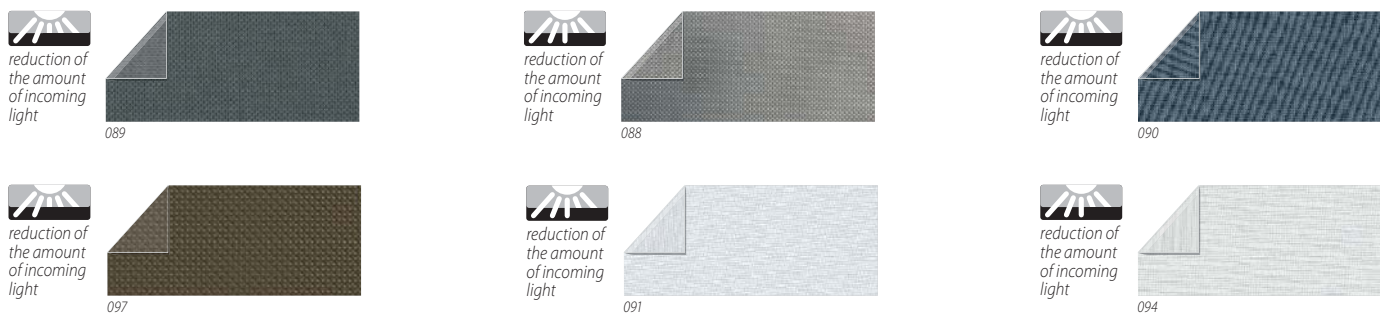
FEATURES:

- They absorb solar radiation before it reaches the glazing and emit the heat to the outside of the room, hence ensure much better protection from tiresome heat on the sunny days.
- Recommended by FAKRO as the most optimal protection against excessive heat gain in the room. Research carried out by FAKRO shows that the awning blind offers up to 8 more effective protection against heat gain compared with internal blinds.
- Protection against light reflection on computer and TV screens.
- When rolled up, it does not limit the glazing surface.
- A wider fabric area to shade the interior more effectively.
- When pulled down during rain, the blind reduces sound of falling rain-drops.
- The electric awning blind provides exceptional comfort of use. Once the blind is installed, simply use the remote control or wall switch to open and close the blind. The blind can be stopped at any position.
- Awning blinds are available in two versions:
 - **AMZ Z-Wave** powered by 15V mains supply and operated by means of a wall switch in wireless Z-Wave system.
 - **AMZ SOLAR** powered by solar battery pack and operated by means of a remote control.
- Made of durable, weather-resistant fibreglass material coated with PVC. The fabric is rolled up on a spring-loaded shaft with motor and inserted into an aluminium cassette mounted above the window. There is a special tape in the fabric's edges that keeps appropriate fabric tension between guides and prevents the fabric falling out of them.
- Such fabric and profile connection increases its resistance against wind. This solution withstands wind gusts of up to 120 km/h, and side wind speed of up to 220km/h.
- Awning blinds come in two groups:
 - Group I – available in 6 colours (fabric with 10% relative open area).
 - Group II – available in 2 colours (fabric with 1% relative open area).
- Electric awning blinds are also available to special order in the following versions:
 - AMZ KNX Ready – powered and operated by means of a 24V DC control unit.
 - AMZ Electro 230 – connected to the mains and operated by means of a wall switch.
 - AMZ Electro 12 – connected to the mains via 15V DC power supply and operated by means of a wall switch.
 - AMZ Electro Solar – powered by solar panels and operated by means of a wall switch.

WARRANTY:

- 2 years

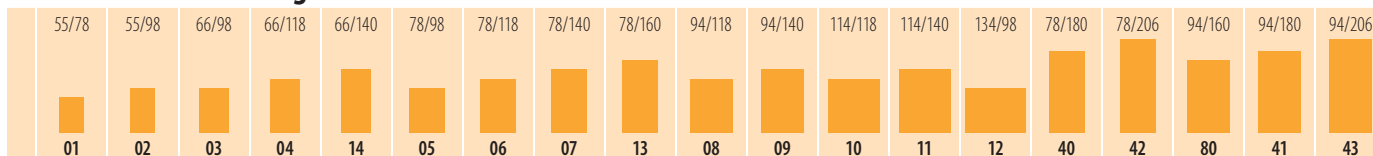
Group I fabric with 10% relative open area



Group II fabric with 1% relative open area



Sizes of standard awning blinds



AMZ Z-Wave¹ Group I fabric with 10% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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AMZ Z-Wave¹ Group II fabric with 1% relative open area

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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AMZ Solar² Group I fabric with 10% relative open area

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AMZ Solar² Group II fabric with 1% relative open area

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Non-standard sized AMZ awning blinds - additional charges

Product description	Additional charges
Special version AMZ Z-Wave*	for window size range: width 55 – 140 [cm], height 40 – 260 [cm] Price calculated individually
Special version AMZ Solar*	for window size range: width 55 – 140 [cm], height 40 – 260 [cm] Price calculated individually
Special version	elements of the AMZ casing made in RAL colours +35% to the standard product

¹ If the blind is not mounted onto the FT_V Z-Wave window, power supply and control unit must be purchased separately (see: Electric Control chapter).

² The set includes a control unit with remote control and accumulator.

* Possibility to produce non-standard products must be confirmed by a Technical Advisor or FAKRO hotline.

The material samples printed can differ in colour from the actual product.

ROLLER SHUTTERS ARZ-H, ARZ-Z-Wave, ARZ Solar, ARK Z-Wave



FEATURES:

- Total comfort when using the attic space.
- Reduces heat loss in winter.
- Protection against UV radiation.
- Reduces noise from the outside and ensures a sense of privacy in the attic.
- Ensures complete darkness in the room on the sunniest days.
- Burglary protection.
- Installed on the outside, the shutter offers protection against undesired heat gain.
- Shutters are available in two colours: dark grey and light grey.
- The **ARZ-H** is operated manually by means of crank handle supplied as standard.
- The **ARZ Z-Wave**, **ARK Z-Wave** roller shutters are equipped with electric drive and operated by means of a wall switch or remote control.
- The **ARZ Solar** roller shutter can be installed in places where there is no mains supply as it is powered by solar battery pack.
- Universal **ARZ Z-Wave** and **ARZ Solar** roller shutters are designed for centre pivot FT_ and PT_ as well as FP_ and PPP-V preSelect top hung windows.
- The **ARZ-H** shutter is intended for FT_ centre pivot and FP_ preSelect FAKRO advises to use **ARZ Z-Wave** and **ARZ Solar** when mounted on FP_ preSelect windows.
- Electric roller shutters are also available to special order in the following versions:
 - ARZ KNX Ready – powered and operated by means of a 24V DC control unit.
 - ARZ Electro 230 – connected to the mains and operated by means of a wall switch.
 - ARZ Electro 12 – connected to the mains via 15V DC power supply and operated by means of wall a switch.
- ARZ Electro Solar – powered by solar panels and operated by means of a wall switch.
- The ARK Z-Wave shutter is designed for top-hung FK_ windows and FE_ panoramic windows.
- Roller shutters can be installed on windows in vertical combinations with a distance of minimum 20cm between windows and in horizontal combinations maintaining 10cm between windows.

WARRANTY:

- 2 years



reduction of the amount of incoming light



101 (RAL 7035);
ARZ-H: 8294, ARZ Z-Wave: ARZBAAA101,
ARZ Solar: AROBAAA101



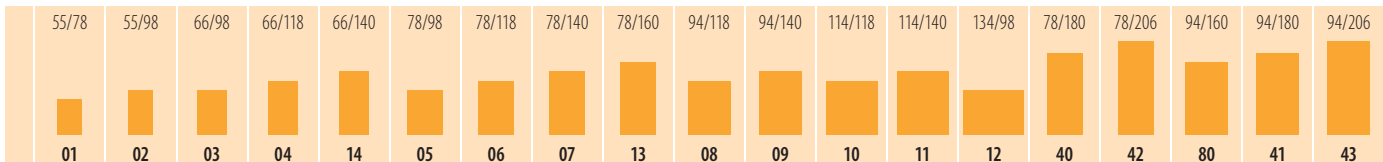
reduction of the amount of incoming light



102 (RAL 7022);
ARZ-H: 8295, ARZ Z-Wave: ARZBAAA102,
ARZ Solar: AROBAAA102

Colour of slats only for the shutter's armour.

Sizes of standard roller shutters



ARZ-H

+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	-
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ARZ Z-Wave*

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ARZ Solar**

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ARK Z-Wave*

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Non-standard sized roller shutters - additional charges

Product description	Additional charges
Special version ARZ-H*** for window size range: width 48 – 134 [cm], height 60 – 180 [cm]	Price calculated individually
Special version ARZ Z-Wave*** for window size range: width 48 – 134 [cm], height 60 – 180 [cm]	Price calculated individually
Special version ARZ Solar*** for window size range: width 48 – 134 [cm], height 60 – 180 [cm]	Price calculated individually
Special version ARZ, ARK casing made in RAL colours	+80% to the standard product

* If the blind is not mounted onto the FT_V Z-Wave window, power supply and control unit must be purchased separately (see: Electric Control chapter).

** The set includes a control unit with remote control and accumulator.

*** Possibility to produce non-standard products must be confirmed by a Technical Advisor or FAKRO hotline.

Roller shutters for windows with increased axis of rotation feature a special design. Available to special order.

The material samples printed can differ in colour from the actual product.

MANUAL CONTROL WINDOW ACCESSORIES

CONTROL ROD



For operating windows installed in out of reach locations, FAKRO provides practical and useful control rods. They facilitate opening and closing inaccessible windows and can be used to operate blinds which may be out of reach.

Note: it is recommended that window reveals are formed vertically at the bottom to facilitate easy use of the control rod.



Control rod ZST

The universal ZST telescopic control rod enables the user to open and close windows and blinds at high level. It can be used with the ARS, ARP, ARF, APS and AJP blinds and AMS insect screen.

The standard rod length is 119cm but this can be extended to 134, 162, 190 or 218cm. Using an additional ZSP extension can further extend this to 246, 274, 302 or 330cm.

Control rod ZST

55045

+

Extension ZSP

55046

+



Rod ZSZ

The ZSZ is a round-shaped aluminium bar for opening and closing the AMZ and AMK awning blinds installed in out-of-reach positions. The AMZ awning blind is supplied with an 80cm rod. The standard length of the ZSZ is 150cm.

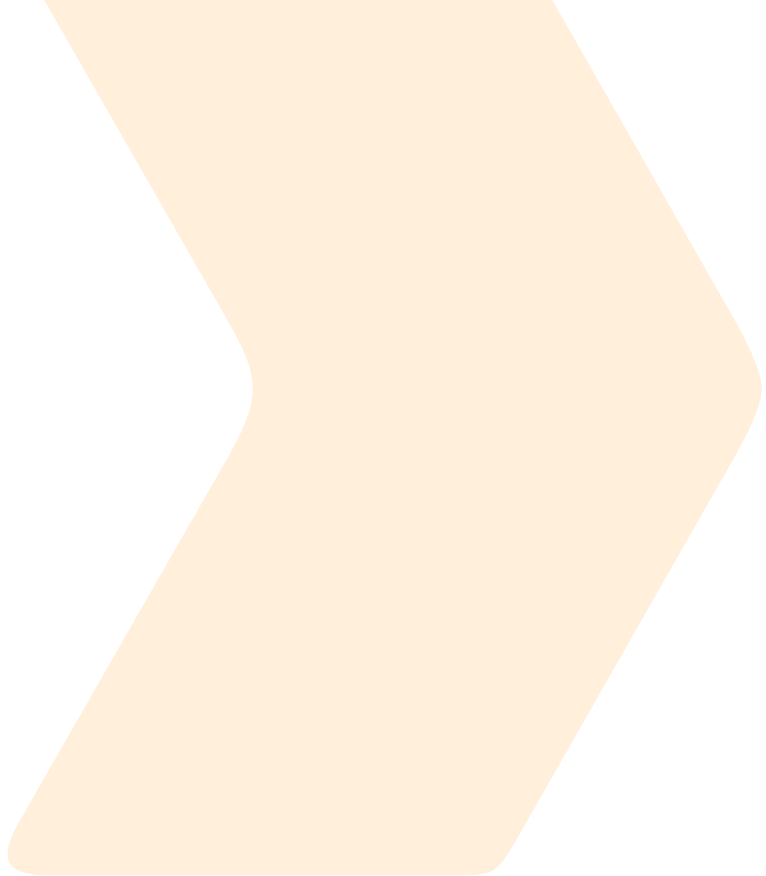
Rod ZSZ 150 cm

55009 +



ACCESSORIES

FOR FLAT ROOF WINDOWS



INTRODUCTION

Accessories for FAKRO flat roof windows combine high functionality with impeccable aesthetics. Due to the installation place, they can be divided into internal and external ones, and are available for both internal and external applications. When using accessories for flat roof windows you have control over the amount of natural light let inside, while the space within the room is protected against excessive heat gain.

PROPERTIES

Accessories for flat roof windows fulfill the same functions as accessories for FAKRO roof windows. Roller shutters and awning blinds are manufactured using the same fabrics and retain similar characteristics:

- Control of light - ARF/D, ARF/D Z-Wave, APF/D, AMZ/F Solar, AMZ/C Z-Wave
Accessories regulate the amount and intensity of light entering the room. At one extreme, you can have total darkness, even on a sunny day when you need a rest while at the other you can simply use a blind to prevent light reflection on computer and TV screens.

- Interior design - ARF/D, ARF/D Z-Wave, APF/D

The wide range of blind type, style and colour ensures complete harmony with your chosen decor and helps shape a room's character.

- Protection from overheating inside - AMZ/F Solar, AMZ/C Z-Wave

The external awning blind provides the ultimate protection against solar gain on hot, summer days. It offers up to 8 times more effective protection when compared to internal blinds.

- Protection against UV radiation - ARF/D, ARF/D Z-Wave, APF/D
AMZ/F Solar, AMZ/C Z-Wave

Mounting the external and internal accessories effectively protects against UV rays, preventing the room furnishings from fading or yellowing.

- Ease of use - ARF/D Z-Wave, AMZ/C Z-Wave, AMZ/F Solar

The FAKRO range also includes electrically operated accessories which are equipped with a Z-Wave module for control alongside appliances from some of the world's leading manufacturers via remote, wireless touch keyboard, smartphone or tablet.

INTERNAL ACCESSORIES

BLACKOUT BLINDS ARF/D, ARF/D Z-Wave

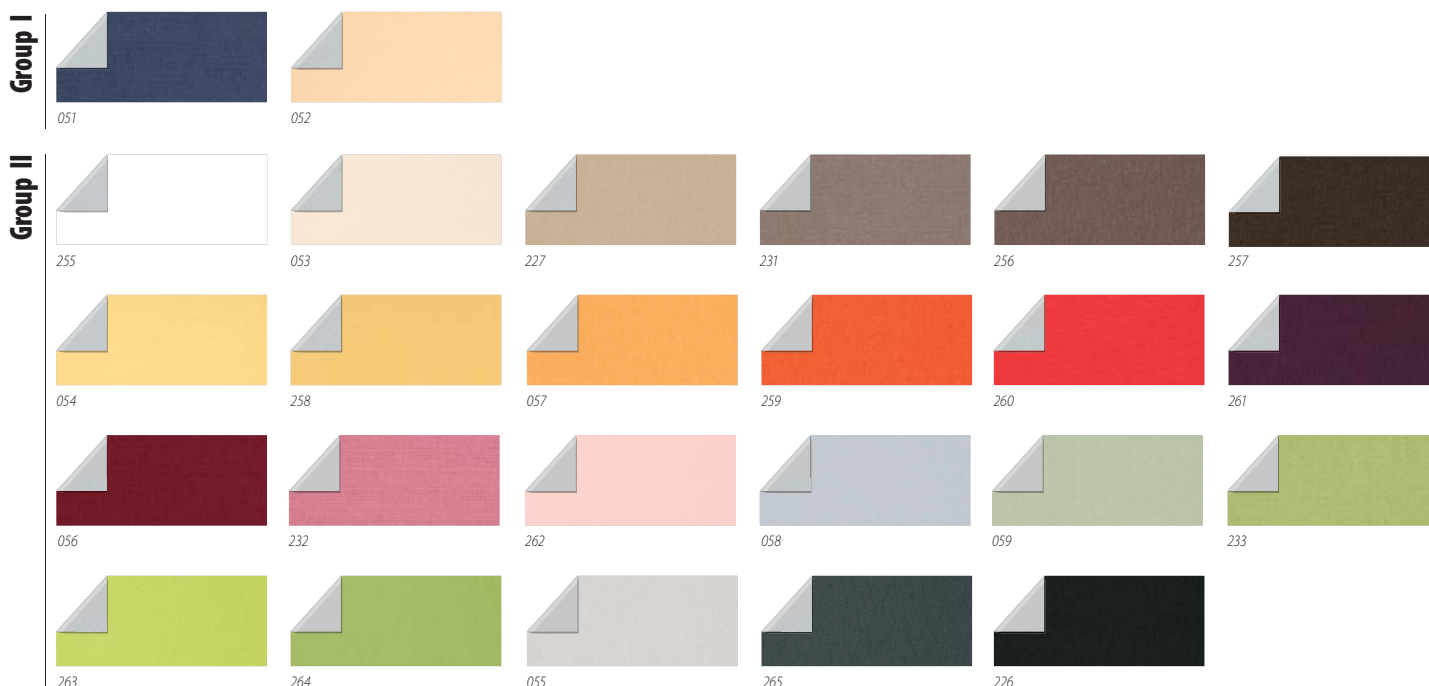


FEATURES:

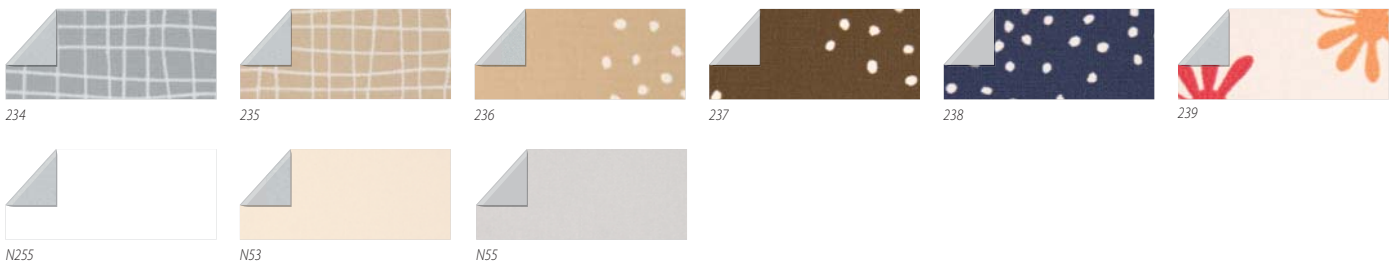
- Variable reduction of incoming light.
- Lockable in any position thanks to the side guides.
- Aesthetic aluminium fascia to conceal the shaft of the blind.
- Protection from high temperatures.
- Reduced heat loss during winter.
- Resistant to moisture.
- Blinds designed for both type F and type C flat roof windows.
- **ARF/D** – operated by means of ZSD control rod.
- **ARF/D Z-Wave** – operated in wireless Z-Wave system.
Powered by mains and operated by a wall switch or remote control. When installing ARF/D Z-Wave blackout blinds in DM_, DX_ windows, power supply and control unit must be purchased separately.
- Blackout blinds come in three price groups:
 - Group I – available in 2 colours.
 - Group II – available in 23 colours.
 - Group III – available in 9 colours, including 3 with flame resistant fabric (N255, N53, N55).

WARRANTY:

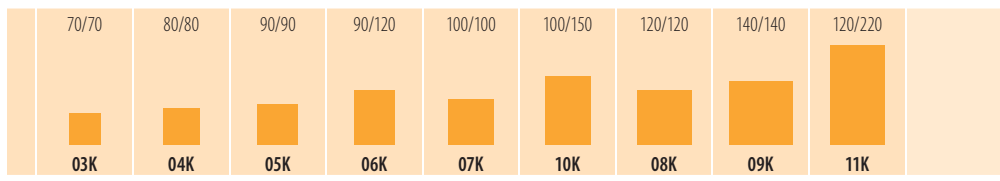
- 2 years



Group III



Sizes of standard blackout blinds



ARF/D Group I

+	+	+	+	+	-	+	+	-	
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ARF/D Group II

+	+	+	+	+	-	+	+	-	
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ARF/D Group III

+	+	+	+	+	-	+	+	-	
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ARF/D Z-Wave Group I*

+	+	+	+	+	+	+	-	-	
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ARF/D Z-Wave Group II*

+	+	+	+	+	+	+	-	-	
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ARF/D Z-Wave Group III*

+	+	+	+	+	+	+	-	-	
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* When installing electric Z-Wave blackout blinds in DXC and DMC windows, power supply and remote control must be purchased separately (see: Electric Control chapter).

The material samples printed can differ in colour from the actual product.

PLEATED BLIND APF/D

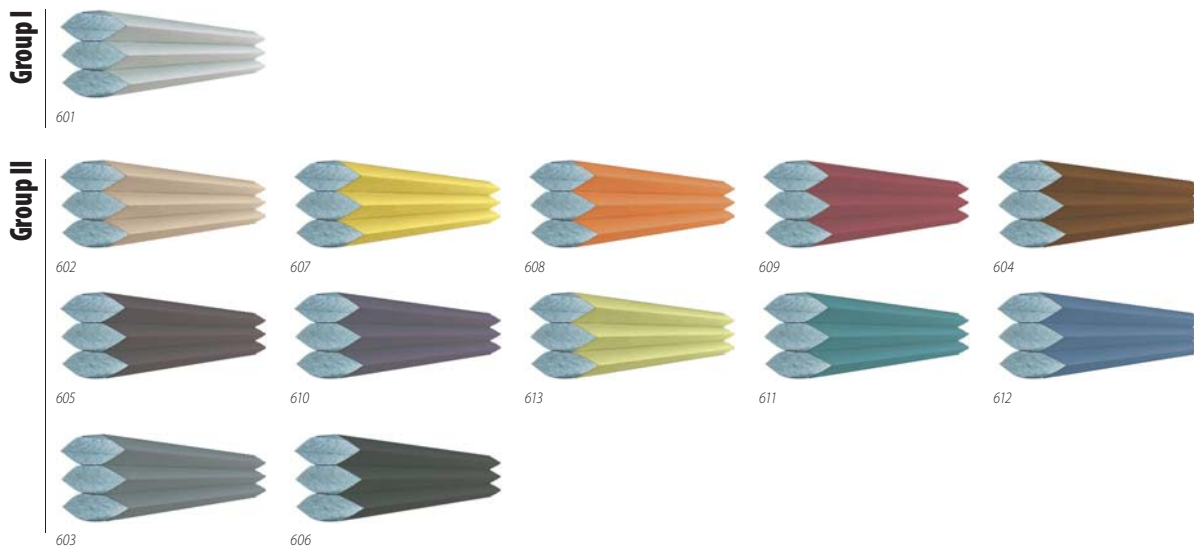


FEATURES:

- Used to protect against intense sunlight and enhance interior design. Its application makes it possible to achieve pleasant shade of the room when you need a rest.
- Partial protection against heat gain.
- Lockable in any position thanks to the side guides.
- The fabric has a honeycomb structure and an internal aluminium coating which
 - provides blackout and good thermal performance.
- Aluminium guides are available in two colour versions – lacquered white and anodised silver.
- Top-down system – easy operation by means of an upper and lower bar.
- Provision of complete privacy.
- Blinds designed for both type F and type C flat roof windows.
- APF/D – manually operated by means of ZSD or ZST control rod.
- Pleated blinds come in two price groups:
 - Group I – available in 1 colour.
 - Group II – available in 12 colours.

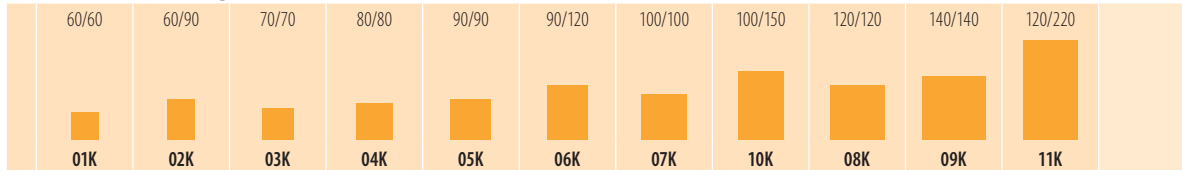
WARRANTY:

- 2 years



The material samples printed can differ in colour from the actual product.

Sizes of standard pleated blinds



APF/D Group I

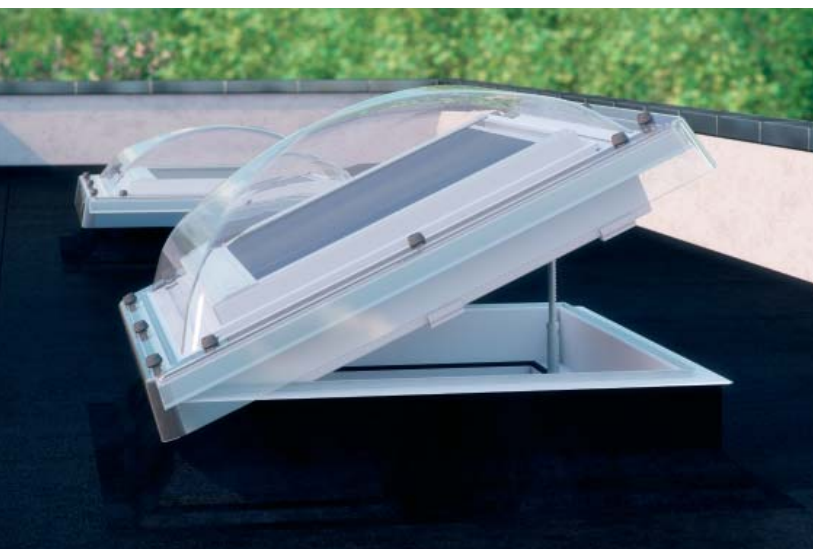
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APF/D Group II

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EXTERNAL ACCESSORIES

AWNING BLINDS AMZ/F Solar, AMZ/C Z-Wave,



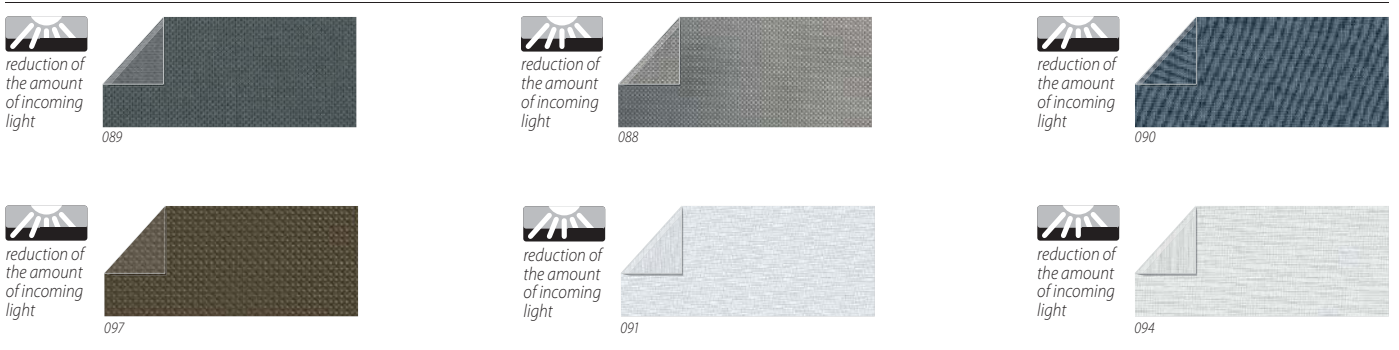
FEATURES:

- Excellent protection against heat gain.
- Effective shading without restricting views to the outside.
- Protection against UV radiation.
- Protection against light reflection on computer and TV screens.
- When rolled up, it does not limit the glazing surface.
- High wind load resistance.
- When pulled down during rain, the blind reduces sound of falling rain-drops.
- **AMZ/F Solar** for type F flat roof windows.
 - Automatic operation of the blind depending on the insolation level. Photovoltaic panel acts as a sensor which reacts to solar radiation.
 - High insolation level requirement triggers the blind to unroll automatically.
 - Blind rolls open automatically in cloudy weather.
 - Can be operated in one of three control modes:
 - Automatic (automatically unrolls and rolls up depending on the insolation level).
 - Semi-automatic (automatically unrolls, it is rolled up using a remote control).
 - Operated by means of included remote control.
 - The awning blind does not need a connection to the mains as it is powered by solar battery pack.
- **AMZ/C Z-Wave** for type C flat roof windows.
 - Innovative profile system enables the blind to be installed under a dome of the light tunnel. Operated by means of a wall switch or remote control in wireless Z-Wave system.
 - Powered by 15V mains supply. When installing AMZ/C Z-Wave awning blinds in DMC and DXC windows, power supply and control unit must be purchased separately.

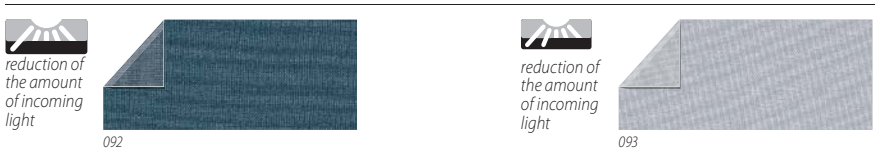
WARRANTY:

- 2 years

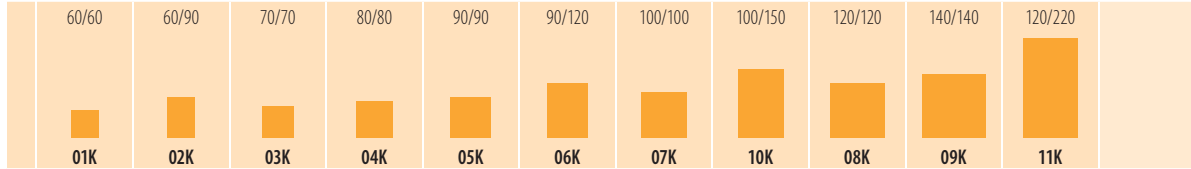
Group I fabric with 10% relative open area



Group II fabric with 1% relative open area



Sizes of standard awning blinds



AMZ/F Solar* Group I fabric with 10% relative open area

+	+	+	+	+	+	+	+	+	+	+	
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AMZ/F Solar* Group II fabric with 1% relative open area

+	+	+	+	+	+	+	+	+	+	+	
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AMZ/C Z-Wave Group I** fabric with 10% relative open area

+	+	+	+	+	+	+	+	+	+	+	
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AMZ/C Z-Wave Group II** fabric with 1% relative open area

+	+	+	+	+	+	+	+	+	+	+	
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The AMZ/C Z-Wave group I comes in colours: 088, 090, 091, 094, 097

* The set includes a control unit with remote control and accumulator.

** When installing electric Z-Wave awning blinds in DXC and DMC windows, power supply and remote control must be purchased separately (see: Electric Control chapter).

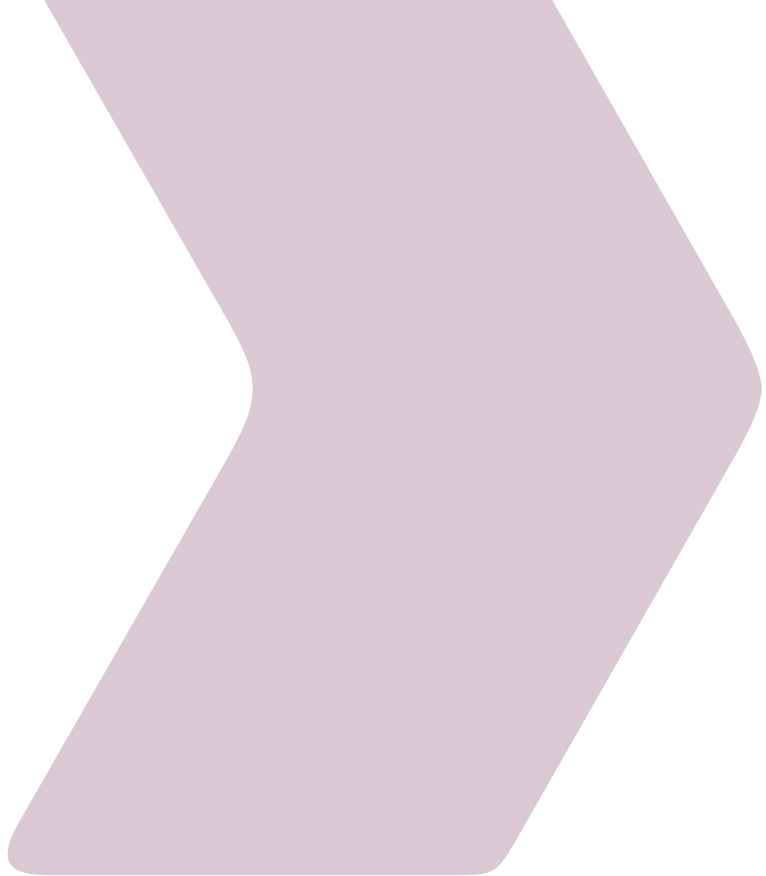
The material samples printed can differ in colour from the actual product.



INSTALLATION

ACCESSORIES





▶ INTRODUCTION

FAKRO installation accessories provide an enhanced connection between the roof window and the roof construction. Using the under felt collar with thermo-insulation and air-tight flashing ensures the complete protection of a fitted roof window. Using FAKRO original accessories will allow the proper use of the windows for many years.

The installation accessories reduce the risk of thermal bridging and guarantee the proper draining of any moisture around the FAKRO window. The fast finishing around the window from inside can be made thanks to the FAKRO original linings.

The proper shaping and forming of the window reveals (horizontal at the top and vertical at the bottom) is an important design consideration as it allows the maximum amount of natural daylight into the room and an efficient circulation of air around the window.

INTERNAL LININGS XLW-F, XLW-P



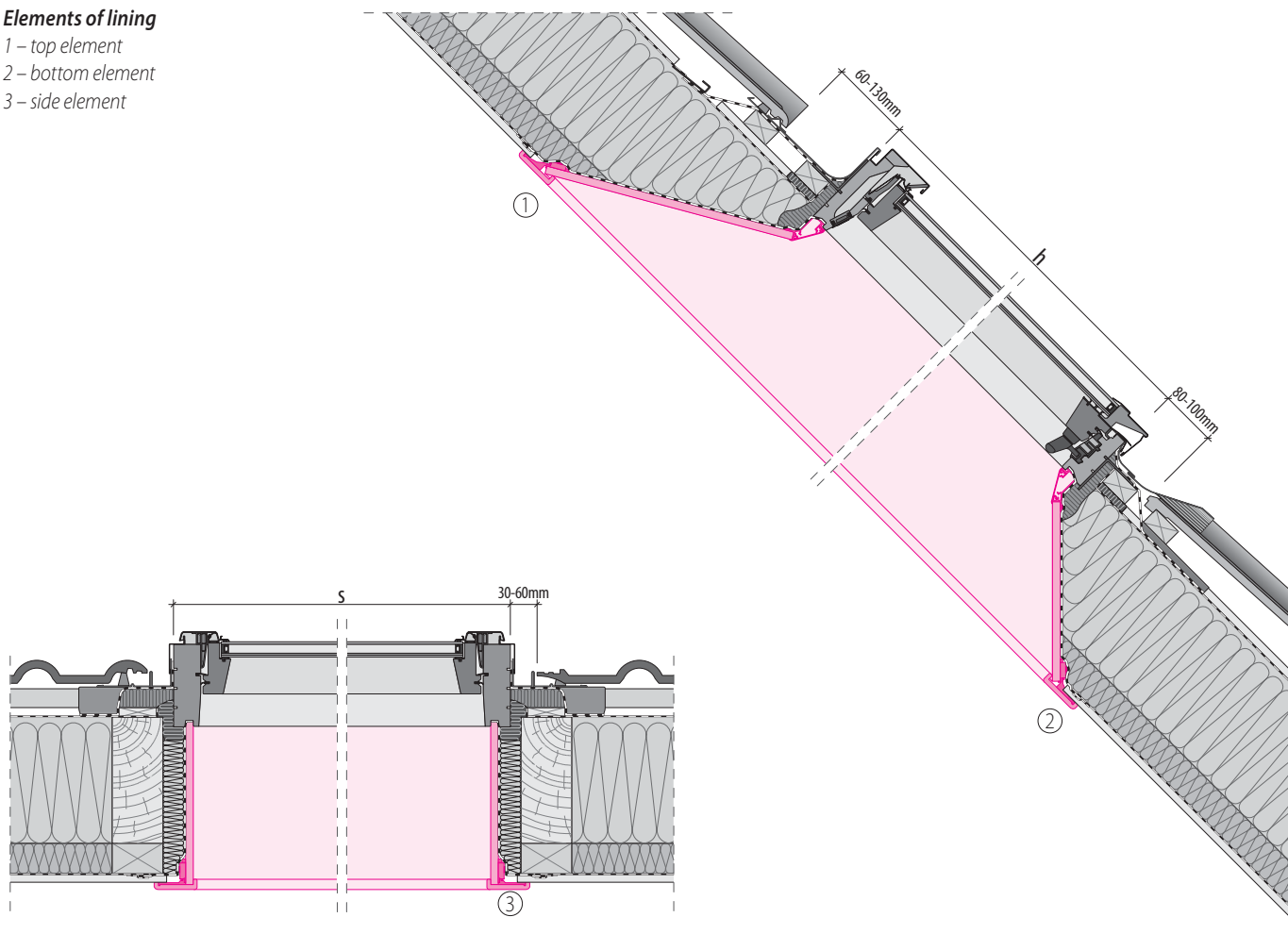
FEATURES:

- The internal lining is designed to ensure proper finish around the window from the inside of the room.
- It improves thermal insulation around windows without restricting light.
- Specially profiled slats are used to fix the lining to the wall and guarantee a neat finish.
- Guarantees proper air circulation over the surface of the glass.
- The XLW lining is made of white waterproof laminated sheets, which make it durable and easy to keep clean.
- The white surface reflects light efficiently, improving the overall light in the room.
- Available in two reveal depths (30cm & 40cm). These dimensions are for the vertical side elements of the lining. Actual sizes of particular linings will depend on the angle of the roof and its thickness. These linings are designed to allow for fitting and trimming to size on site.
- **XLW-F** is designed to be installed solely with wooden windows, whereas **XLW-P** with aluminium clad plastic windows.
- XLW-FD internal linings for FYP-Y proSky and FDY-V Duet proSky windows – available to individual order.



Elements of lining

- 1 – top element
- 2 – bottom element
- 3 – side element



Standard Sizes

55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

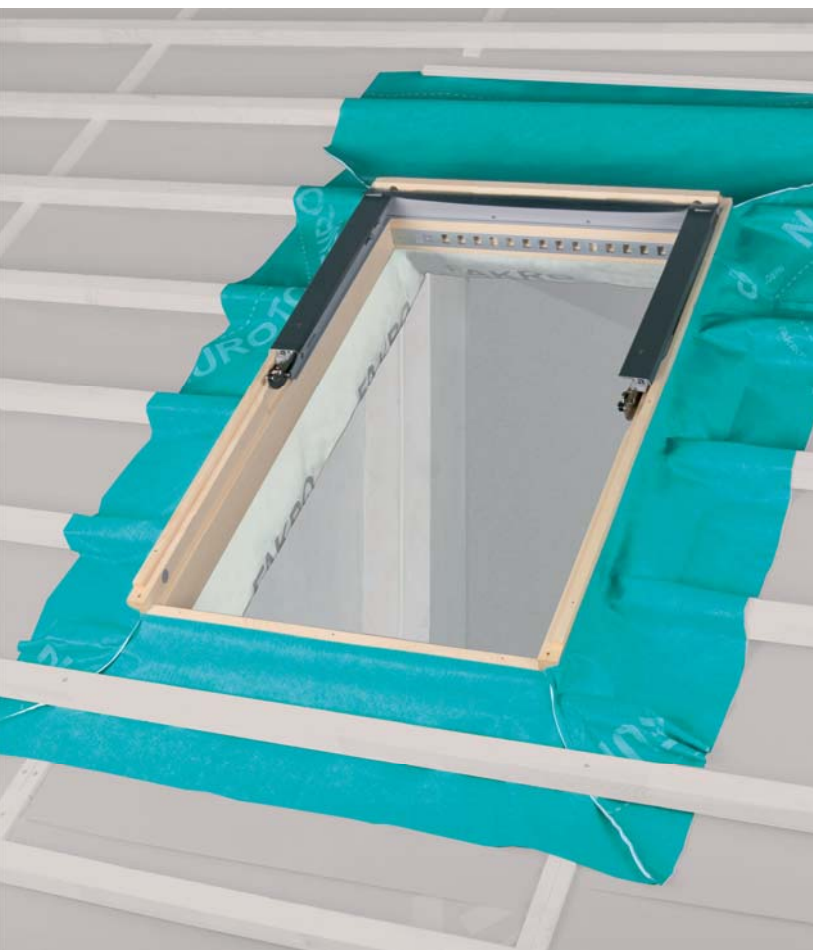
XLW-F 30 (8382 __), **XLW-P 30** (8384 __) White, width 30cm

+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
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XLW-F 40 (8383 __), **XLW-P 40** (8385 __) White, width 40cm

+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-
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SET OF INSULATING COLLARS **XDK**



FEATURES:

- The insulating set is designed to enable fast thermal, air-permeable and air tight insulation around the roof window.
- The set consists of:
 - **air-permeable collar**
 - **thermo-insulating material**
 - **air-tight flashing**
- The XDK flashing should be chosen in accordance with the size of the window

Features of air-permeable collar

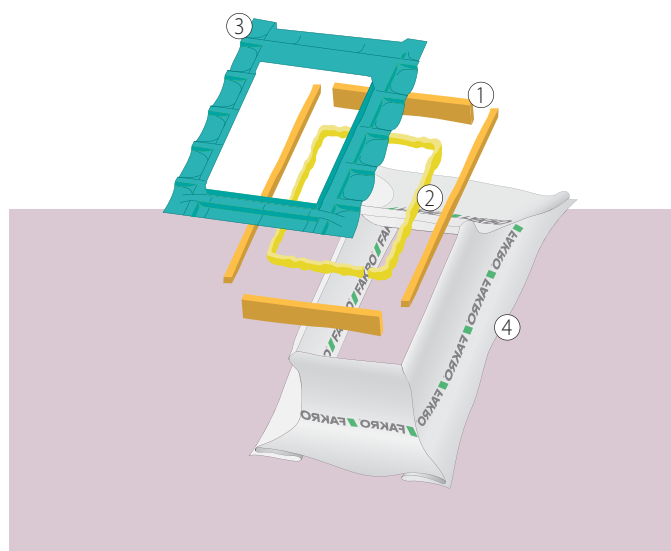
- Protects the insulation material from unwanted contact by moisture.
- Enhances the air tightness of the installation.
- Requires no cutting of battens and counter battens.
- Can be used with all window sizes.
- Enables various options of insulation depending on the type of installation.
- Ensures easy connection of roof membrane with window.

Features of thermal-insulation made of natural sheep wool

- It has appropriate density and high elasticity which enables ideal adjustment of the material to the space it fills. Universal way of insulation enables roof window insulation irrespective of the roof opening size.
- Enables placement of thermal insulation around the window reducing thermal bridging and ensures additional window insulation.
- Material is easy to cut and form.
- Natural and ecological product, smell free, does not cause eye irritation.
- Thermo-insulating material enables various options of insulation depending on the type of installation.

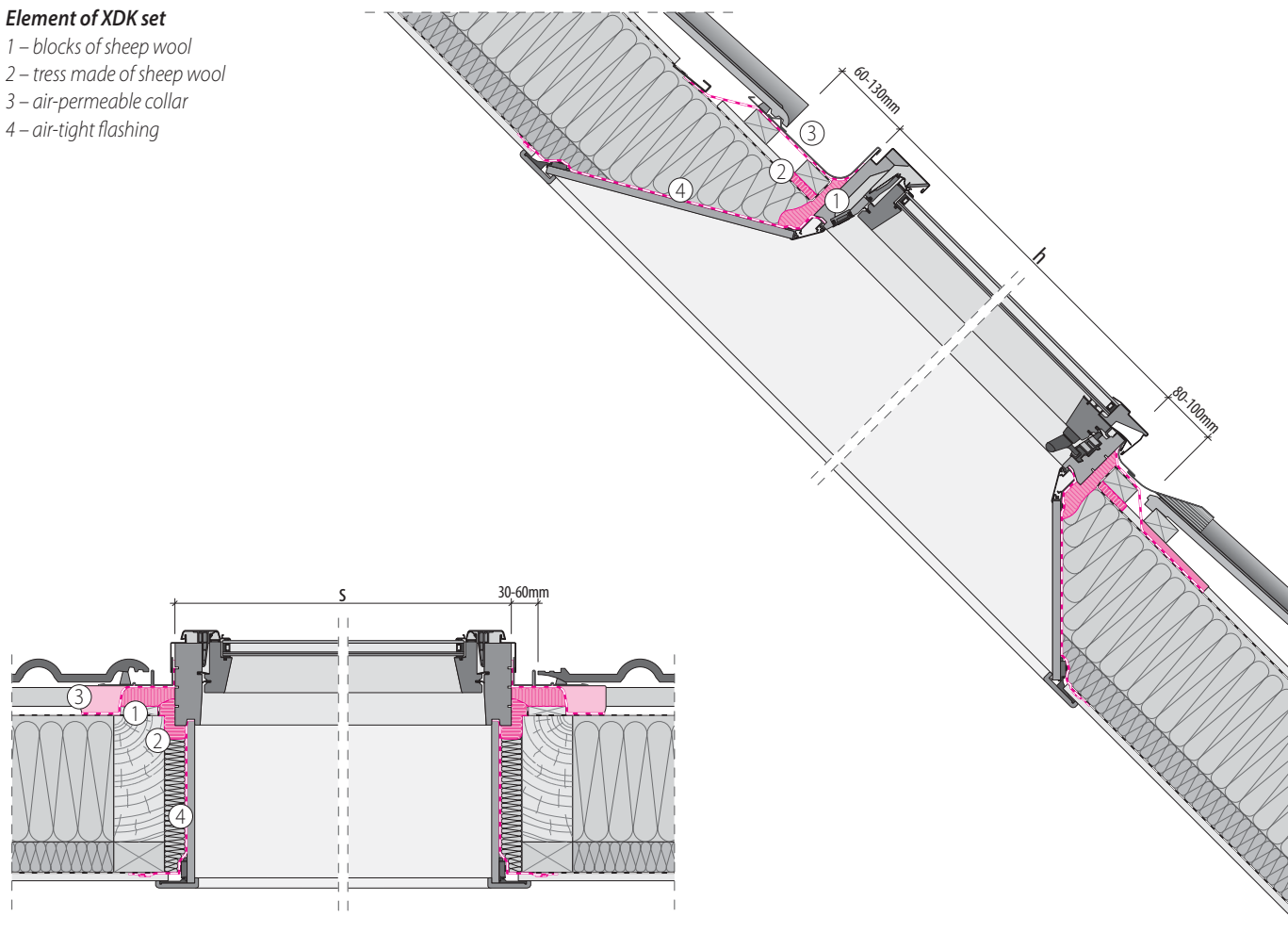
Features of air-tight collar

- Protection of thermo-insulating material against moisture.
- Tightness guarantee.
- Quick and easy installation.



Element of XDK set

- 1 – blocks of sheep wool
- 2 – tress made of sheep wool
- 3 – air-permeable collar
- 4 – air-tight flashing



Standard Sizes

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XDK

8386	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Products in sizes 78x235, 78x255, 94x235, 94x255 available on request.

INSULATING SET XDP



FEATURES:

- XDP insulating set is designed to enable fast and tight air-permeable and thermal insulation around the window to be installed. The set consists of air-permeable membrane and thermo-insulating material made of natural wool in shape of:
 - wool cubes 150x50mm and 70x50mm,
 - wool tress 50mm in diameter.
- Air-permeable collar is used to connect window with roof membrane. It is made of high quality and high vapour permeability membrane which protects thermo-insulating material from moisture. The sides of the collar are prepared in such a way, so that they can be placed directly onto roof battens, irrespective of the spacing between them or their thickness. Collars should be chosen according to window size.
- The thermo-insulating material is made of specially impregnated sheep wool. Its appropriate density and high elasticity enables ideal adjustment of the material to the space it fills. Universal way of insulating enables roof window insulation irrespective of the roof opening size.

Standard Sizes

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XDP

298	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Products in sizes 78x235, 78x255, 94x235, 94x255 available on request.

AIR TIGHT FLASHING **XDS**



FEATURES:

- Air-tight flashing should be secured internally to form a barrier against warm and humid air as any moisture on the surface of the insulation greatly reduces its thermal insulation properties.
- Ensures a tight fit between roof window and sheeting. The sheeting is pushed into a groove specifically made into the window's frame.
- Air-tight flashing should be chosen in accordance with the size of the window.
- The package contains: the air tight flashing made of polythene film; double adhesive butyl tape to join the air tight flashing with the window frame; single sided (resistant to moisture and aging process) gluing tape to join the air tight flashing with vapour resistant membrane.

Standard Sizes

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XDS

299	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Products in sizes 78x235, 78x255, 94x235, 94x255 available on request.

INSULATION TRESS XWW



FEATURES:

- The tress is used to fill the space between the frame and roof.
- Ensures proper, easy and fast insulation around the window or to carry out additional thermal insulation of roof window.
- When applied, the tress reduces thermal bridging.
- The tress is made of specially impregnated sheep wool: 50mm in diameter and 5m long. This is natural, environment friendly, free of smell, gentle on skin and no eye irritation product.
- When installed, the tress can be easily cut and formed. Thanks to its elasticity it fills properly the space between the window and roof construction elements, perfectly insulating the installed window.

65062

+

INSULATION BAND **XWT**



FEATURES:

- The XWT insulation is a polyethylene tape with a self-adhesive backing. It is used when installing windows at a depth of V.
- The tape acts as a filler of the narrow gap between the window frame and the roof.
- XWT insulation makes an effective insulation of FAKRO windows easy and reduces the possibility of thermal bridging.
- During installation, the tape is pulled over the window frame.
- Specially profiled rim prevents it from being pulled too far over the window frame.
- The insulation tape should be chosen according to window size.

Standard Sizes

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XWT

297	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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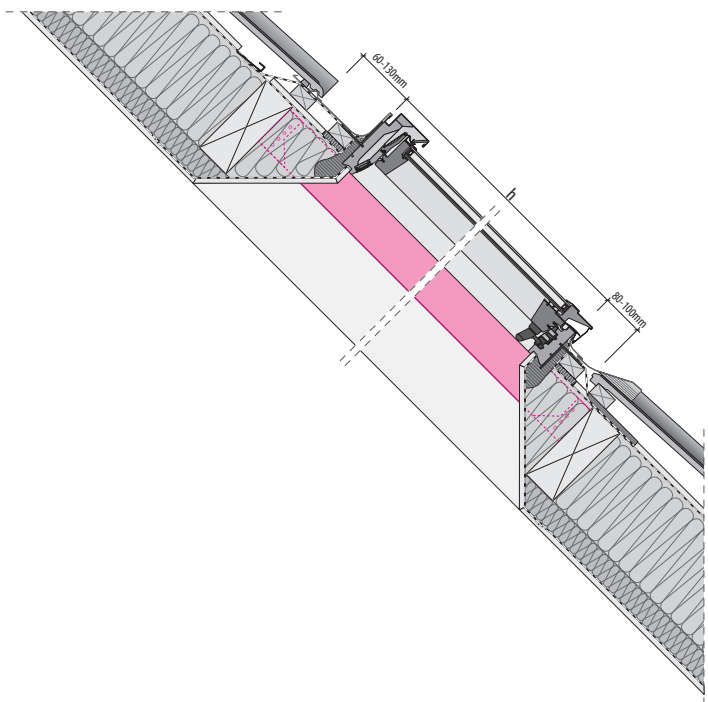
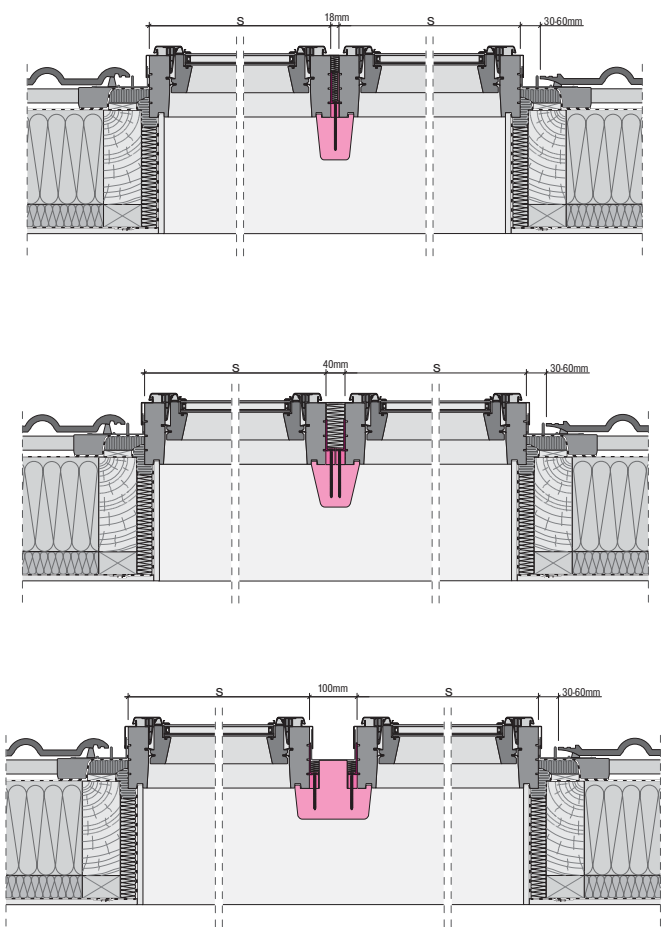
Products in sizes 78x235, 78x255, 94x235, 94x255 available on request.

SUPPORT TRIMMER **XRP, XRU**



FEATURES:

- XR_ support trimmer enables horizontal connection of the windows from the inside when installed side by side at a minimum distance of 18mm, 40mm or greater - 100mm.
- The use of support trimmers provides more natural light in the room and is less time consuming when installing windows in combinations.
- Support trimmer made of the same material as the window frame, constitutes an aesthetic element connecting the windows substituting traditional cardboard gypsum boards.
- Support trimmers available in two colours allow you to match with the window colour:
 - Natural pine (**XRP**)
 - White (**XRU**).
- Support trimmers are available in lengths of 200cm, 270cm, 350cm.
- The choice of the support trimmer's lengths depends on:
 - roof structure (support trimmer should be cut depending on the roof pitch and roof thickness)
 - height of the window with which the support trimmer is to be installed,
- When using XR_18 support trimmers or XR_40 in B2 / 1 combination, the windows from the outside are connected with special flashing for corrugated metal sheets (EZV-A 18 DUO EZV-A 40 DUO) or for plain roofing materials (ESV 18 DUO, ESV 40 DUO). It is a specially designed solution used with 18mm or 40mm support trimmers. The upper and lower part of DUO flashing consists of common element connecting two windows together.
- With 100mm support trimmer there are used standard flashings for combinations such as KZV-1-A and KZV-3-A.
- The frames of the windows which are installed side by side and with use of support trimmers (18mm, 40mm, 100mm) can be insulated with XDP insulating set or wool tress XWW.



Standard Sizes

CODE	200	270	350
	49	50	51

XRP 18 Pine

551	+	+	+
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CODE	200	270	350
	52	53	54

XRU 18 White

551	+	+	+
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CODE	200	270	350
	55	56	57

XRP 40 Pine

551	+	+	+
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CODE	200	270	350
	58	59	60

XRU 40 White

551	+	+	+
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CODE	200	270	350
	61	62	63

XRP 100 Pine

551	+	+	+
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CODE	200	270	350
	64	65	66

XRU 100 White

551	+	+	+
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FRAME DEPTH EXTENSION KIT **XGP, XGW, XGK**

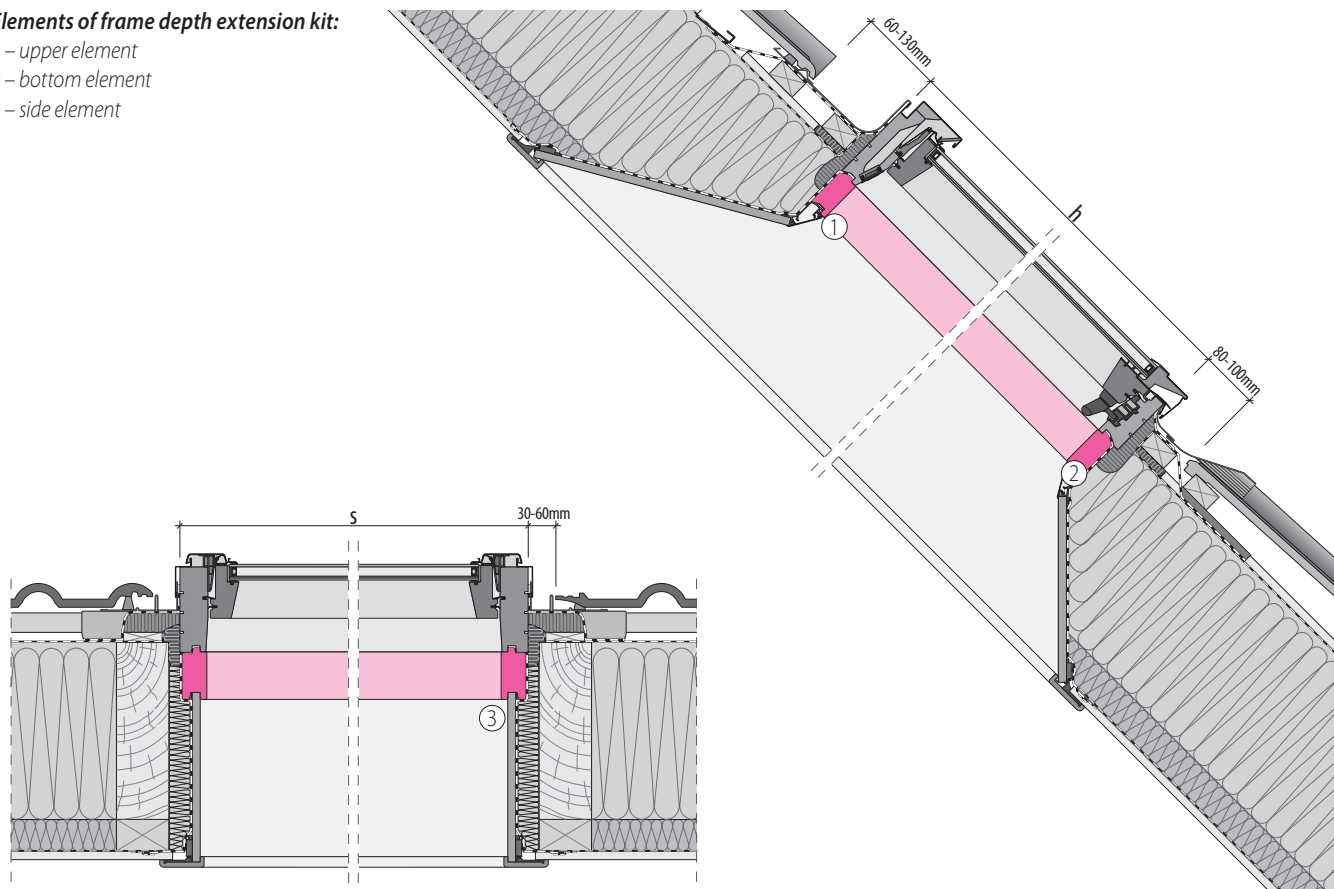


FEATURES:

- Frame depth extension kit is designed to create around the window an extra space to the inside of the room.
- Enables extra insulating material to be installed around the window.
- Perfect solution for the windows which are installed deep into the roof.
- Frame depth extension kit extends the frame to the room inside by additional 6cm.
- Compatible with lining slats.
- Frame depth extension kits are made of high quality pine wood.
 - **XGP** is in natural colour.
 - **XGW** frame depth extension kit is coated with a white polyurethane varnish NCS S0502-Y (similar to RAL 9010). To the frame depth extension, the internal lining XLW can still be fitted.
- Frame depth extension kit **XGK** is made of PVC profile in white colour (RAL 9010) and is used with aluminium clad plastic windows.
- Frame consists of four elements which are assembled during installation.
- Frame depth extension kit is fitted to the window frame by the use of screws.

Elements of frame depth extension kit:

- 1 – upper element
- 2 – bottom element
- 3 – side element



Standard Sizes

PRODUCT CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XGP

8495	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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XGW

8496	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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XGK

8497	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	-
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Products in sizes 78x235, 78x255, 94x235, 94x255 available on request.

DUET SLATS XSP, XSW



FEATURES:

- Installed from the inside of the room.
- Designed for easy and neat finishing of the joints between vertically positioned windows. Easy and quick assembly.
- Duet slat height is 17cm and the width is adapted to the window size.
- To order available in heights 6 and 20cm.
- Made of a high quality pine in natural colour XSP on white XSW.

Standard Sizes

CODE	55/78	55/98	66/98	66/118	66/140	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98	78/180	78/186	78/206	94/160	94/180	94/186	94/206
	01	02	03	04	14	05	06	07	13	08	09	10	11	12	40	CA	42/CB	80	41	DA	43/DB

XSP Pine

	01	01	02	02	02	03	03	03	03	04	04	05	05	06	03	03	03	04	04	04	04
55T	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

XSW White

	11	11	12	12	12	13	13	13	13	14	14	15	15	16	13	13	13	14	14	14	14
55T	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

MAINTENANCE KITS XMP, XMU



FEATURES:

- Allows the restoration or repair of window's paint layers, as well as maintenance and lubrication of the window's hinges.
- Extends the window design life and ensures its proper operation.
- Repair kits are prepared to be used in maintenance, repair and painting works depending on the roof window type:
 - **XMP** kit - for pine colour wooden windows,
 - **XMU** kit - for white wooden windows.
- Easy and convenient in use.
- In order to maintain an adequate level of aesthetics and durability, the roof windows should be properly cared of according to the user's manual.

XMP

80AZ02 +

XMU

80AZ03 +

LIQUID GREASE XMS



FEATURES:

- Meant to be used for maintenance and lubrication of hinges, fittings, moving and rotating parts of FPP-V preSelect and FGH balcony windows.
- Lubricates and reduces friction between the cooperating window mechanisms.
- Owing to its unique features it reaches difficult to access elements, eliminates creaks and squeaks, which may occur due to lack of lubrication between the friction elements.
- Extends the window design life and ensures its proper operation.

XMS

80AZ07 +



ELECTRIC

CONTROL





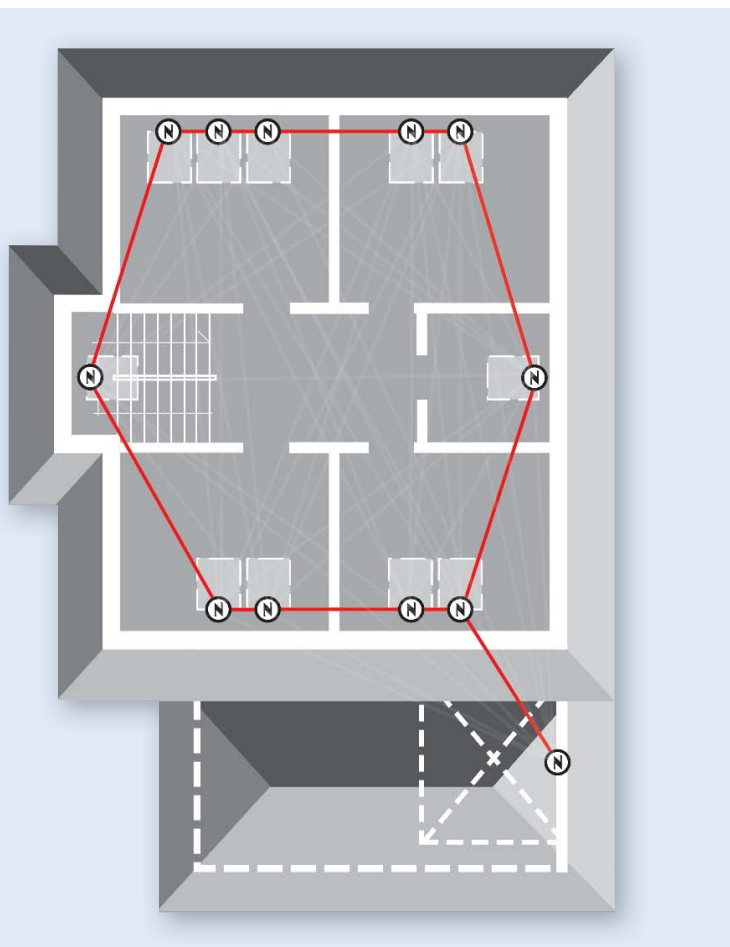
INTRODUCTION

In order to adapt products to the current needs of the market and client's capabilities, FAKRO has developed three families of products depending on the control method:

1. **Z-Wave - radio control** - complete wireless radio system controlled by a remote control, wall keyboard or wall switch. A weather module in cooperation with rain, wind and smoke detectors controls the operation of roof windows as well as internal and external accessories depending on weather conditions or in case of fire hazard. A bridge module allows the user to operate roof windows and both internal and external accessories by means of another control system. The range of Z-Wave products also includes external accessories in the Solar version which are excellent solution to be applied in places where providing power supply is problematic.
2. **KNX Ready - wired control 24V DC** - roof windows as well as internal and external accessories in this version are adapted for the operation using another control system, e.g. KNX. KNX Ready devices are equipped with 24V DC motor, overload module and mechanical limit switches protecting products against damage. KNX Ready roof window comes with a reed switch sensor to adapt the product to the alarm system.
3. **Electro 230, Electro 12 - wired control**
 - Electro 230 products are windows equipped with 230V AC actuator and external accessories fitted with 230V AV motor operated by means of the ZKP or ZKN wall switch or shutter switch with alternating voltage.
 - Electro 12 are external accessories powered by means of 12V DC, operated via LP1, LP2, LP3 potential-free wall switches or other system offering the same possibility.

Z-WAVE SYSTEM

DESCRIPTION



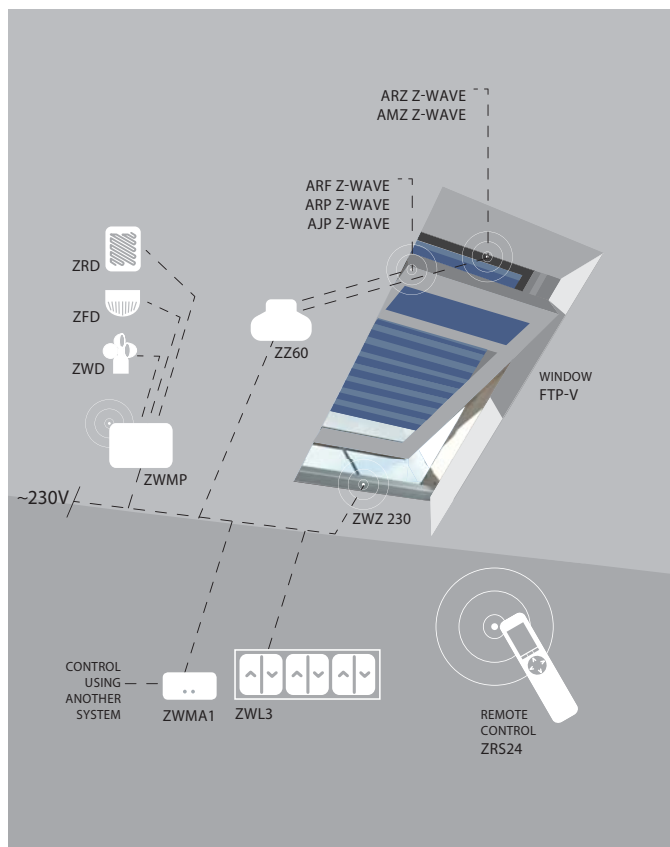
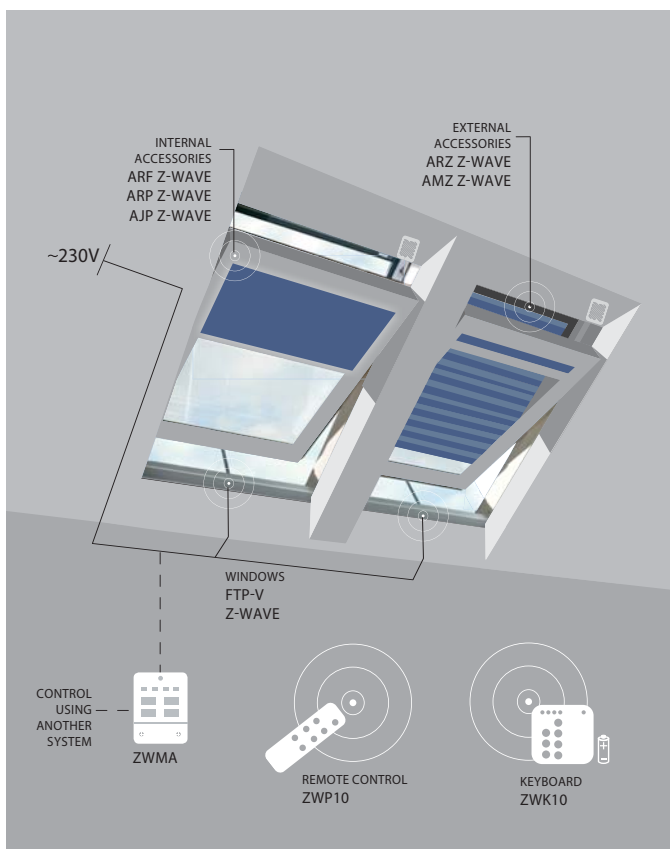
FAKRO has equipped its products with a radio communication system Z-Wave. It serves the purpose of combining into a single network such electrical devices as lighting, thermostats, alarms, air conditioning and electric roof windows and blinds. Nowadays, there are over 300 manufacturers of electric household devices associated in the Z-Wave system all over the world.

This system also finds its application in products used in the construction sector such as FAKRO roof windows, garage doors, Danfoss heating systems or Osram lighting devices, therefore the Z-Wave system can be used even at the stage of house construction.

Every single electrical device produced by FAKRO contains its own electronic module incorporating the Z-Wave chip. This allows the installer to create a wireless network and control devices equipped with the Z-Wave module using wireless keyboard, remote control, mobile apps and internet.

Numerous FAKRO products can be connected to the Z-Wave network, including FTP-V Z-Wave windows, standard roof windows with actuators having built-in Z-Wave module, ARZ Z-Wave external roller shutters or internal accessories such as AJP Z-Wave, ARF Z-Wave and ARP Z-Wave. The Z-Wave system is easy to install, expand and manage at every stage of building use. Installation of this system does not require any control units or fitting wires between electrical devices, hence considerably reducing costs, installation time and ensuring the highest comfort of use.

USE OF FAKRO PRODUCTS WITH Z-WAVE



The FTP-V/FTU-V Z-Wave window is equipped as standard with the ZWP10 remote control, 15VDC chain actuator, 60W power supply, rain sensor and electric system which allows to connect internal and external Z-Wave accessories. In addition to the actuator, the power supply can easily supply both accessories. The Z-Wave devices can be operated individually or in groups by means of different controllers such as ZRS24 remote control, ZWK10 wall keyboard, etc.

It is also possible to control using another system by means of ZWMA bridge module to which 4 independent groups of products can be assigned.

Each Z-Wave window and accessory can be controlled with the use of mobile app after the application of the Z-Wave gateway.

Manually operated roof windows can be equipped with the ZWS12, ZWS230 actuators or ZWZ230 automation sets. The ZWZ230 set comes with multi-functional ZWP10 remote control, 15V DC actuator, 60W power supply and aesthetic cover with manual operating panel. The ZWMP weather module in cooperation with rain, wind and smoke sensors controls operation of roof windows as well as internal and external accessories depending on weather conditions or in case of fire. The ZWMA1 bridge module makes it possible to operate roof windows and internal and external accessories using another control system. A good alternative for the remote control included in the set are ZWL1, ZWL2 or ZWL3 controllers which make it possible to adjust the Z-Wave devices.

All products equipped with the Z-Wave module can also be operated by means of multi-functional ZRS24 remote control with a display once they are programmed into one network. In addition to standard control functions, the remote control makes it possible to create scenes which can be freely activated.

CONTROLLED DEVICES

Z-Wave roof windows

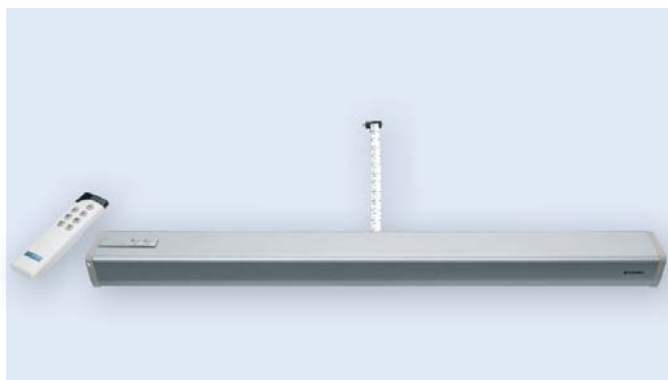
The Z-Wave roof windows are crucial and integral element of any intelligent house in the wireless Z-Wave system. Roof windows can be easily operated from any place inside the room using a remote control. The Z-Wave windows are particularly recommended for rooms in which they are installed high above user's head and their direct operation is difficult. See more details on page 32.

Z-Wave internal accessories

The ARF Z-Wave blackout blinds, ARP Z-Wave roller blinds as well as AJP Z-Wave Venetian blinds protect against light entering the room and pleasantly dim the interior. They also enhance room décor and style. Accessories with the Z-Wave module can be fitted in standard window by connecting via power supply (ZZ60 or ZZ60h) and operated using one of the chosen controllers. Internal accessories will only operate when the window is in the closed position. More information can be found in Accessories Chapter.

Z-Wave external accessories

External accessories protect the room space against excessive heat gain in summer. The Z-Wave awning blind and Z-Wave roller shutter can be fitted to standard window by connecting via power supply (ZZ60 or ZZ60h) and operated using one of the chosen controllers. More information can be found in Accessories Chapter.



Actuators ZWS12, ZWS230

With their small dimensions and suitable force output, the ZWS12 and ZWS230 chain actuators are ideal for operating roof windows and are compatible with the Z-Wave system. Actuators can be applied in centre pivot, top hung and pivot as well as windows of non-standard dimensions. The maximum chain reach is 24cm for ZWS12 and 36cm for ZWS230. Actuators are equipped with built-in overload protection which acts as a sensor of correct window closing.

Technical specification	Actuator ZWS12	Actuator ZWS230
chain reach	240mm	360mm
power voltage	15V DC	230V AC
rated current	0,36A	0,12A
power output	9W	15W
chain pushing force	300N	300N
chain speed	4,25mm/s	9,7mm/s
working temperature	(-9°C) to (+50°C)	(-9°C) to (+50°C)
power cable	2x0,75mm ² (0,4mb)	3x0,75mm ² (1,5mb)
dimensions	262x47x33,5	362x47x33,5

ZWS12

850036* +

ZWS230

850037 +

Special version of actuators is used for FDY-V, FTT U6 and FTT U8 Thermo windows. Installing actuators in FTT U6 and FTT U8 Thermo windows requires use of XG_ frame depth extension kit.

**Exemplary code. When ordering the product please contact your FAKRO Representative for more details as codes may differ depending on the frequency and country.*

ZWZ 230

The ZWZ230 set is intended for operating roof windows. The ZWZ230 includes power cable (6m), 15VDC chain actuator with a reach of 24cm, 60W hermetic power supply, ZWP10 remote control and aesthetic cover with manual operating panel. The set is equipped with built-in overload protection which acts as a sensor of correct window closing.

ZWZ 230

850086 55 / ... + 850087 66 / ... + 850088 78 / ... + 850089 94 / ... + 850090 114 / ... + 850091 134 / ... +

Cover in silver colour, also available in white at request.

CONTROLLING DEVICES



Remote Control ZRS24

The ZRS24 remote control is a multi-functional Z-Wave controller which allows to configure and operate all devices integrated within the Z-Wave network (up to 231 devices). In order to improve comfort of use devices can be grouped and freely placed in 24 groups. Each group can include up to 24 devices which can be controlled simultaneously. Devices can also be assigned to a specific place in the house so that their finding on a list is easy and they can be run by means of scenes configured by the user, e.g. „I'm leaving the house“. The controller's memory can save up to 24 places and 24 scenes.

Technical specification

radio protocol	Z-Wave
screen	240x320px
power supply	3x1.2V AAA AKU
working temperature	(+5°C) to (40°C)
dimensions	52x20x180mm

white
850083

+

black
850092

+



Remote Control ZWP10

The ZWP10 remote control is designed to control electric devices compatible with the Z-Wave system, e.g. Z-Wave window, ZWS230 or ZWS12 actuators, ARZ Z-Wave external roller shutters, Z-Wave awning blinds, ARF Z-Wave internal blackout blinds, ARP Z-Wave roller blinds or AJP Z-Wave Venetian blinds. The remote control can adjust several devices simultaneously (up to 231) in 10 separate groups. It comes with a magnetic holder fitted onto the wall.

Technical specification

radio protocol	Z-Wave
power supply	2x1.5V, battery AAA
working temperature	(+5°C) to (40°C)
dimensions	170 x 40 x 20 mm

850051

+



Wireless Wall Keyboard ZWK10

The ZWK10 keyboard enables remote control of electric devices compatible with the Z-Wave system such as Z-Wave windows, ZWS230 or ZWS12 actuators, ARZ Z-Wave external roller shutters, AMZ Z-Wave awning blinds, ARF Z-Wave internal blackout blinds, ARP Z-Wave roller blinds or AJP Z-Wave Venetian blinds. The keyboard can adjust several devices simultaneously (up to 231) in 10 separate groups.

Technical specification

radio protocol	Z-Wave
power supply	2x1.5V, battery AAA
working temperature	(+5°C) to (40°C)
dimensions	80 x 80 x 35 mm

850052

+



Single Radio Controller Z-Wave ZWL1

The ZWL1 consists of a wall switch and radio module placed in a flush-mounted box. It is used for the remote control of a single Z-Wave device or a group of up to 231 devices, including the ZWS230 or ZWS12 actuators, ARZ Z-Wave external roller shutter, AMZ Z-Wave awning blind, ARF Z-Wave internal blackout blind, ARP Z-Wave roller blinds or AJP Z-Wave Venetian blinds.

Technical specification	
power supply	230V AC
radio protocol	Z-Wave
working temperature	(+5°C) to (40°C)
dimensions	84/84/41 [mm]
radio module dimensions	42/42/26 [mm]

white	850073	+
black	850079	+



Double Radio Controller Z-Wave ZWL2

The ZWL2 consists of a double wall switch and radio module placed in a flush-mounted box. It is used for the remote control of two Z-Wave devices independently or a group of up to 231 devices, including the ZWS230 or ZWS12 actuators, ARZ Z-Wave external roller shutter, AMZ Z-Wave awning blind, VMZ Z-Wave vertical awning blind, VMB Z-Wave roll-up awning, ARF Z-Wave internal blackout blind, ARP Z-Wave roller blinds or AJP Z-Wave Venetian blinds.

Technical specification	
power supply	230V AC
radio protocol	Z-Wave
working temperature	(+5°C) to (40°C)
dimensions	155/84/41 [mm]
radio module dimensions	42/42/26 [mm]

white	850074	+
black	850080	+



Triple Radio Controller Z-Wave ZWL3

The ZWL3 consists of a triple wall switch and radio module placed in a flush-mounted box. It is used for the remote control of three Z-Wave devices independently or a group of up to 231 devices, including the ZWS230 or ZWS12 actuators, ARZ Z-Wave external roller shutter, AMZ Z-Wave awning blind, VMZ Z-Wave vertical awning blind, VMB Z-Wave roll-up awning, ARF Z-Wave internal blackout blind, ARP Z-Wave roller blinds or AJP Z-Wave Venetian blinds.

Technical specification	
power supply	230V AC
radio protocol	Z-Wave
working temperature	(+5°C) to (40°C)
dimensions	226/84/41 [mm]
radio module dimensions	42/42/26 [mm]

white	850075	+
black	850081	+

MODULES



Weather Module ZWMP

The ZWMP automatically closes windows compatible with the Z-Wave system in case of changing weather conditions signalled by sensors connected to the device: ZRD rain sensor or ZWD wind sensor. ZRD rain sensor and/or ZWD wind sensor is purchased separately. One module can support up to 231 devices in groups.

Technical specification

radio protocol	Z-Wave
power supply	230V AC
working temperature	(5°C) to (40°C)
dimensions	160x120x70 mm

850039

+



Bridge Module ZWMA

The ZWMA allows remote control of FAKRO electrical devices fitted with the Z-Wave module, e.g. Z-Wave windows or ARZ Z-Wave roller shutters by means of another control system. The module has four double (open - stop - close) digital inputs, which can receive potential-free signals from various external devices such as LP1, LP2, LP3 switches, timer switches, KNX/EIB system, etc. The module can support up to 231 devices simultaneously or in up to four groups.

Technical specification

radio protocol	Z-Wave
power supply	230V AC
working temperature	(5°C) to (40°C)
dimensions	120 x 80 x 45 mm

850045

+



Bridge Module ZWMA1

The ZWMA1 is a radio controller compatible with the Z-Wave communication module designed to control a single device or a group of devices by means of potential-free contacts. These contacts can be operated by means of a wall switch, e.g. LP1 or contactor of another control system, e.g. KNX, RTS. In addition, the module can cooperate with the Z-Wave controllers of other manufacturers as an additional controller.

Technical specification

radio protocol	Z-Wave
power supply	230V AC
working temperature	(5°C) to (40°C)
dimensions	42 x 42 x 26 mm

850040

+

SENSORS



Wind Sensor ZWD

In cooperation with the ZWMP weather module, the sensor in case of strong gusts of wind provides the facility of automatic closing the windows equipped with actuators compatible with the Z-Wave system. The sensor is designed to be mounted on the roof in unshielded places which are directly exposed to weather conditions. The wind speed triggering window closing procedure by the sensor is 40km/h and higher.

Technical specification	
dimensions	80x85 mm
power cable	2x0.25mm ² (5m in the box)

55036

+



Rain Sensor ZRD

In cooperation with the ZWMP weather module, the rain sensor allows the closing of the windows in the event of rain - chain actuator must be compatible with the Z-Wave system. The sensor can also be used in conjunction with smoke ventilation systems. Rain sensor signal is taken into account when the smoke ventilation window is opened for ventilation. In case of emergency opening, signal from the sensor is ignored. The sensor is designed to be mounted on the roof in unshielded places which are directly exposed to weather conditions.

Technical specification	
power supply	8-32V DC
dimensions	50x35x15mm
power cable	3x0.25mm ² (5m in the box)

55035

+



Smoke Detector ZFD

In cooperation with the ZWMP weather module, the ZFD detector automatically opens the Z-Wave windows upon detecting visible smoke. The detector is powered by 12V DC by means of the ZWMP module. One smoke detector supports 40m² room. The smoke detector with the ZWMP weather module is an additional element which protects the attic in case of fire.

Technical specification	
power supply	12V DC
dimensions	ø107x63mm

850053

+

POWER SUPPLY UNITS



Power supply units for electrical accessories 15V DC

Except for the ZWS230 actuator, electrical accessories fitted to FAKRO roof windows require 15V DC power supply. FAKRO offers two power supply units:

1. ZZ60 - ventilated and to be installed on DIN T35 rail in the distribution box.
2. ZZ60h - hermetic and to be installed outside the distribution box.

A maximum number of products connected to the ZZ60 or ZZ60h power supply units:

- ARZ Z-Wave 2 items
- AMZ Z-Wave 2 items
- ARF Z-Wave 8 items
- ARP Z-Wave 8 items
- AJP Z-Wave 6 items
- ZWS 12 5 items

Technical specification	ZZ60	ZZ60h
nominal power	60W	60W
power voltage	100 - 240V AC	100 - 240V AC
output voltage	15V DC+/-10%	15V DC
working temperature	(0 °C) - (+50 °C)	(0 °C) - (+50 °C)
dimensions	78 x 93 x 56 mm	160 x 40 x 30 mm

ZZ60

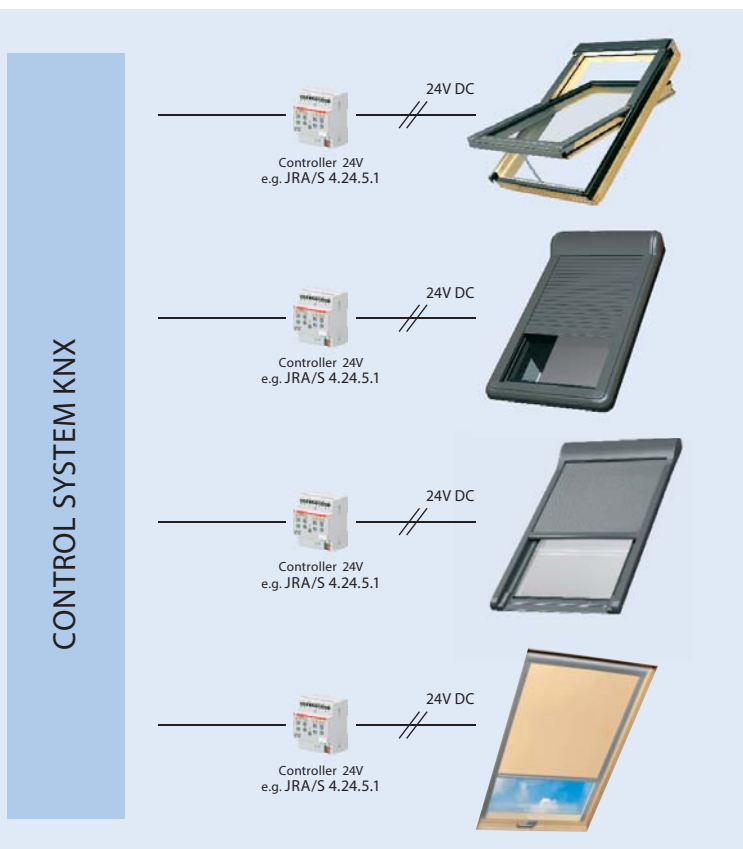
850038 +

ZZ60H

850041 +

WIRED CONTROL KNX READY

DESCRIPTION



Wire-controlled products using KNX Ready system are particularly intended for places where own control system with 24V DC safety voltage is applied.

Control consists in providing 24V DC power supply from any control system to the actuator (in case of windows) or to the motor (in case of shutters). Changing operation direction is carried out by changing the polarity. Additionally, the KNX Ready window is equipped with a reed switch which informs about window's state of opening or closing. Each product comes with a current protection, which protects the motor from damage in case of increase in power consumption at low temperatures or obstruction left on the window.

The ideal solution to control KNX Ready products is KNX controller with automatic determination of traffic time JRA/S 4.24.5.1, which can control independently from each other four 24V DC actuators. The controller is operated by means of i-busR KNX. Traffic time of actuators is determined individually by recognizing the end positions. Panel buttons are used for manual control of outputs directly from the device.

The controller is to be installed in DIN rail. Rated voltage of the controller is 24V DC while its rated current stands at 6A.

Controller KNX - JRA/S 4.24.5.1

Technical specification	
Rated voltage	24V DC
Rated current	6A

850093	+
--------	---

Roof Windows FTP-V KNX Ready

	55/78 01	55/98 02	66/98 03	66/118 04	66/140 14	78/98 05	78/118 06	78/140 07	78/160 13	94/118 08	94/140 09	114/118 10	114/140 11	134/98 12
LUX FTP-V U3 KNX Ready Window coated with clear lacquer, with automatic V40P air inlet	+	+	+	+	+	+	+	+	+	+	+	+	+	+
LUX FTU-V U3 KNX Ready White window with automatic V40P air inlet	+	+	+	+	+	+	+	+	+	+	+	+	+	+

PRODUCTS & PARAMETERS



FTP-V KNX Ready

The FTP-V KNX Ready roof windows ensure maximum comfort of living in the attic. Pivot windows are factory equipped with the actuator with a reach of 24cm controlled by means of any system with a power voltage of 24V DC. Additionally, the window is equipped with a reed switch which sends the information to the control or security system about window's state of opening or closing.

Technical specification

Rated voltage	24V DC
Rated current	0.36A
Chain reach	24cm



ARZ-E KNX Ready

The ARZ-E KNX Ready external roller shutter protects against excessive heat gain in the summer, reduces heat loss in the winter, pleasantly dims the interior and protects against noise. The shutter comes with the motor with 24V DC and overload module.

The shutter can be controlled by means of any system with a power voltage of 24V DC by changing the polarity.

Technical specification

Rated voltage	24V DC
Rated current	0.9A



AMZ-E KNX Ready

The AMZ-E KNX Ready external awning blind protects against excessive heat gain in the summer whilst also providing an unrestricted view. The blind comes with the motor with 24V DC and overload module.

The blind can be controlled by means of any system with a power voltage of 24V DC by changing the polarity.

Technical specification

Rated voltage	24V DC
Rated current	0.9A



ARF-E KNX Ready, ARP-E KNX Ready

The ARF-E KNX Ready internal blackout blind and ARP-E KNX Ready internal roller blind protect against excessive heat gain and intense sunlight, particularly in the summer. They come with the motor with 24V DC and overload module.

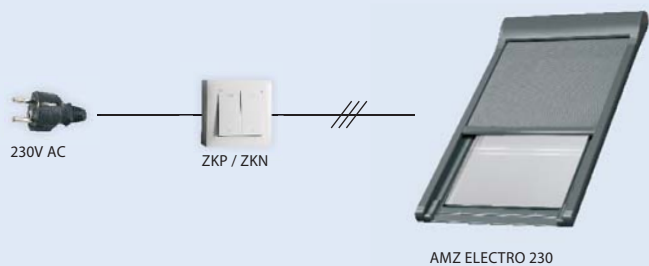
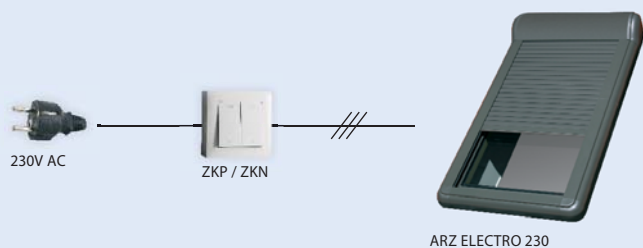
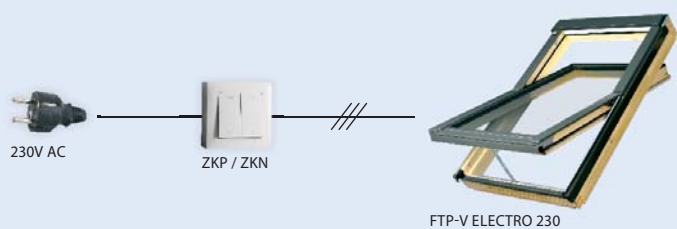
They can be controlled by means of any system with a power voltage of 24V DC by changing the polarity.

Technical specification

Rated voltage	24V DC
Rated current	0.45A

WIRED CONTROL ELECTRO

DESCRIPTION

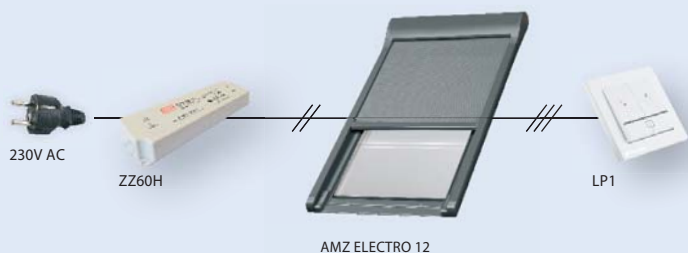
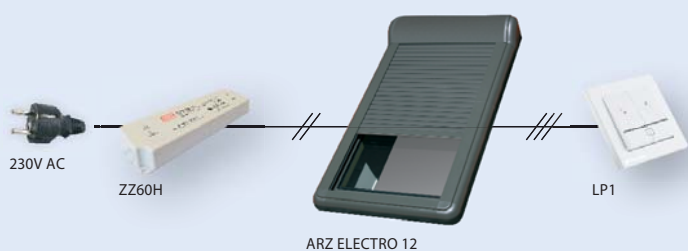


Electro 230 - Wired Control

The Electro 230 products include the FTP-V Electro windows equipped with the 230V AC actuator and external accessories such as the ARZ Electro 230 roller shutter or Electro 230 awning blind with built-in 230V AC motor. These products can be operated by means of the ZKP wall switch (flush-mounted) or ZKN (surface-mounted).

Instead of the switch, one can use the shutter switch with 230V AC. It is also possible to order these products controlled via Bluetooth or mobile apps.

Technical specification	FTP-V Electro 230	ARZ Electro 230	AMZ Electro 230
Rated voltage	230V DC	230V DC	230V DC
Rated current	0.4A	0.4A	0.4A



Electro 12 - Wired Control

The ARZ Electro 12 roller shutter and Electro 12 awning blind protect against excessive heat gain in the room. They are equipped with the 12V DC motor and controller. Products come with five input wires: two for the ZZ60 and ZZ60h stabilized power supply and three used for the control. Controlling is carried out by giving the signal through potential-free LP1, LP2, LP3 wall switch or other control system featuring the same function.

It is possible to order products in Solar version (Electro Solar).

Technical specification	ARZ Electro 12	AMZ Electro 12
Rated voltage	12V DC	12V DC
Rated current	1.4 A	1.4 A

OTHER CONTROLLING DEVICES



Single Wall Switch LP1

A single wall switch allows free control of a single device such as the AMZ Electro 12, AMZ Electro Solar or inputs of ZWMA or ZWMA1 conversion modules.

Technical specification		white	
colour *	white	850070	+
working temperature	(+5°C) to (40°C)		
frame dimensions	84 x 84 x 41 mm	black	+
		850076	

*other colours available at request: white glass, black glass, wood, stone



Double Wall Switch LP2

A double wall switch allows free control of two devices independently such as the AMZ Electro 12, AMZ Electro Solar or inputs of ZWMA or ZWMA1 conversion modules.

Technical specification		white	
colour *	white	850071	+
working temperature	(+5°C) to (40°C)		
frame dimensions	155 x 84 x 41 mm	black	+
		850077	

*other colours available at request: white glass, black glass, wood, stone



Triple Wall Switch LP3

A triple wall switch allows free control of three devices independently such as the AMZ Electro 12, AMZ Electro Solar or inputs of ZWMA or ZWMA1 conversion modules.

Technical specification		white	
colour *	white	850072	+
working temperature	(+5°C) to (40°C)		
frame dimensions	226 x 84 x 41 mm	black	+
		850078	

*other colours available at request: white glass, black glass, wood, stone



Single Flush-Mounted Wall Switch ZKP

A single flush-mounted wall switch with backup enables the control of a single device such as the AMZ Electro 230.

Single Surface-Mounted Wall Switch ZKN

A single surface-mounted wall switch with backup enables the control of a single device such as the AMZ Electro 230.


Technical specification	ZKP	ZKN	ZKP	
frame colour	white	white	850066	+
button colour	white	white		
working temperature	(-20°C) to (45°C)	(-20°C) to (45°C)	ZKN	
dimensions	85 x 85 x 35 mm	90 x 90 x 55 mm	850067	+



SMOKE

VENTILATION





INTRODUCTION

Smoke along with fire pose a serious threat to human life and health. Contrary to popular belief, 90% of fire-related deaths are a result of smoke suffocation, and not high temperatures or burning.

Smoke also causes considerable damage to property. Applying appropriate smoke and heat escape systems can provide a significant help in preventing dangers caused by high concentrations of smoke and heat. Together with smoke sensors and smoke vent alarm buttons, the FSP window forms the so called gravitational system for smoke and heat extraction.

The system is applied in public utility buildings (especially in stairwells, multi-family buildings, hotels, etc.).

SMOKE VENTILATION WINDOW **FSP P1**



FEATURES:

- The window is a part of gravitational smoke ventilation system and is used for extraction of smoke and heat emitted in a building during a fire.
- Under normal operating conditions the window can serve the purpose of room ventilation and lighting.
- Made of pinewood, vacuum impregnated and coated with two layers of acrylic varnish.
- Equipped with two electric actuators (24V), which open the sash after receiving electric signal from the control unit.
- Open sash protects the ventilation opening against lateral wind. The window is installed in such a way that all its edges are below the roof ridge level.
- The window is manufactured and certified according to harmonized EN 12101-2:2003. The most common area for their use are stairwells.
- Compliant with requirements of EN 12101-2: RE 1000(+10000), SL 500, WL1500, T(-05), B300.
- Maximum sash opening pitch: 75° in 51 seconds when fully loaded.
- Suitable for pitches from 20° - 60° with special flashings type: ESS, EZS-P, EHS-P and EGS (flashings for pivot windows do not fit smoke ventilation windows). The EFS system is used for installing the window in flat roofs.

Technical specification	Window FSP P1
glazing U-value	1.0 W/m ² K
glazing unit	4H-14-33.2T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	+
Wind load resistance	WL 1500 as per EN 12101-2:2003
Low ambient temperature	T (-05) as per EN 12101-2:2003
Resistance to high temperature	B 300 as per EN 12101-2:2003
Reliability	RE 1000 as per EN 12101-2:2003
Snow load resistance	SL 500 as per EN 12101-2:2003*

Technical specification	Actuator SP8
chain reach	350 mm
power voltage	24 V DC
rated current	2x1A
chain pushing force	800 N
chain retraction force	400 N
chain speed	7 mm/s
working temperature	(-5°C) to (75°C)
power cable	2x2x0.75 m ² (2x1m)

*SL depending on the window size and installation pitch. Please contact your FAKRO Representative for more details.

WARRANTY:

- 5 years

Sizes of standard windows

PRODUCT CODE	78/140	94/140	114/118	114/140	134/98
	0.53	0.65	0.67	0.80	0.65
	0.91	1.12	1.15	1.38	1.11
	07	09	10	11	12

window frame external dimensions
maximum effective smoke ventilation area [m²]
frame internal area [m²]

LUX **FSP P1** Window coated with clear lacquer

8736	+	+	+	+	+					
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LUX **FSU P1** White window

875K	+	+	+	+	+					
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of FTP-V U3/FTU-V U3
painted with lazulite lacquer		+ 30 % to the price of FTP-V U3/FTU-V U3
in mahogany woodwork		+ 45 % to the price of FTP-V U3/FTU-V U3
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of FTP-V U3/FTU-V U3
in metal covering - copper CU		+ 30 % to the price of FTP-V U3/FTU-V U3
in metal covering - titanium-zinc TC		+ 20 % to the price of FTP-V U3/FTU-V U3



Sizes of standard flashings

PRODUCT CODE	78/140	94/140	114/118	114/140	134/98
	07	09	10	11	12

ESS for flat roof coverings

8811	+	+	+	+	+
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EZS-P for corrugated roof coverings

898	+	+	+	+	+
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EHS-P for high profile roof coverings

899	+	+	+	+	+
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PRODUCT CODE	78/140	94/140	114/118	114/140	134/98
	07	09	10	11	12

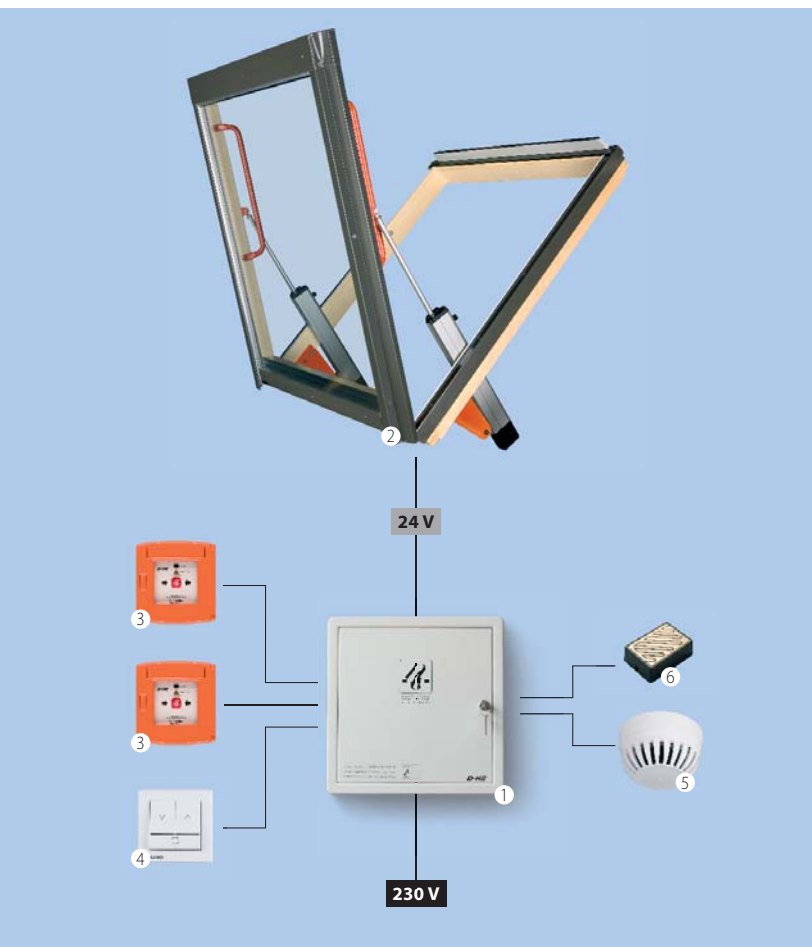
EGS for thick slate roof coverings

	+	+	+	+	+
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EFS flat roof system

8837	+	+	+	+	+
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GRAVITATIONAL SYSTEM FOR SMOKE AND HEAT EXTRACTION



The system enables automatic or manual opening of the smoke ventilation window in order to remove the excess of heat, smoke and toxic gases emitted during a fire. Applying this system increases the safety of inhabitants as it allows to keep smoke-free evacuation area in a building, helps locate the source of fire and allows faster fire extinguishing. Once the smoke is detected, the sensor sends the signal to the control unit which subsequently runs automatically electric actuators opening the window. If the fire is observed before the sensor reacts, the smoke ventilation window can be opened using the RT 45 smoke vent alarm button. In addition, the system enables daily ventilation of the room by opening the window with the use of the LP1 ventilation period is over. The system is closed automatically once programmed ventilation period is over. The system can be connected to the ZRD rain sensor which closes the window during rain. In case of fire the rain sensor signal does not affect operation of the window. Effective smoke ventilation area is to be found in detailed description of the FSP window.

Installation

Installation of the system is carried out by connecting 230V AC power supply to the smoke control unit and then using suitable cables to other elements of the system (cross-sections of cables are to be found in the table together with names of elements). The length of required cables depends on the arrangement of individual elements of the system. The wiring diagram is included with the fitting instructions. The smoke ventilation system should be installed by a qualified individual holding a certificate of operation of equipment (electrical licence up to 1 kV).

The inspection of the system should be carried out every 6 months. All elements of the system offered by FAKRO have certificates and are approved to be used in the construction industry.

Elements of the set

1	RZN 4402K	Control unit with emergency back-up power for 1 window, electric cable (2 x 1mm ²)
1	RZN 4404K	Control unit with emergency back-up power for 2 windows, electric cable (2 x 1.5mm ²)
1	RZN 4408K	Control unit with emergency back-up power for 4 windows, electric cable (3 x 2.5mm ²)
2	FSP P1	Smoke ventilation window, electric cable (3 x 1 mm ²)
3	RT 45	Smoke vent alarm buttons, electric cable (5 x 1 mm ²)
4	LP1	Ventilation switch, electric cable (3 x 1 mm ²)
5	OSD 23	Smoke sensor, electric cable (2 x 1 mm ²)
6	ZRD	Rain sensor, electric cable (2 x 1 mm ²)

COMPONENTS FOR SMOKE VENTILATION



Control Units RZN 4402-K, RZN 4404-K, RZN 4408-K

Designed to control actuators in case of fire as well as for daily ventilation. Such elements as the OSD 23 smoke sensor, ZRD rain sensor, RT 45 smoke vent alarm buttons and LT 84U ventilation switch can be connected to the control unit. The unit normally operates in the monitoring mode and is powered by 230V mains. In case of fire, the smoke sensor sends a signal to the unit, which in turn automatically activates actuators in the window. For safety reasons, the control unit comes with its own emergency power source (battery power back up) which allows it to operate in the monitoring mode for 72 hours.

Technical specification	RZN 4402-K	RZN 4404-K	RZN 4408-K
power voltage	230 V AC/50 Hz	230 V AC/50 Hz	230 V AC/50 Hz
output power	up to 60 W	up to 120 W	up to 240 W
rated current	2 A	4 A	8 A
output voltage	24 V DC	24 V DC	24 V DC
working temperature	(-5°C) to (40°C)	(-5°C) to (40°C)	(-5°C) to (40°C)
dimensions	250/250/91 mm	250/250/91 mm	341/341/91 mm
weight with batteries	4.12 kg	5.3 kg	11 kg
battery capacity	2x12 V/1.3 Ah	2x12 V/2.1 Ah	2x12 V/3.4 Ah

RZN 4402-K

850015 +

RZN 4404-K

850027 +

RZN 4408-K

850028 +



Ventilation Switch LP1

The switch is utilized in the smoke ventilation systems. It is used for daily opening and closing windows equipped with actuators connected to the RZN 440_-K control unit. It is designed as a flat two-button switch mounted flush with the wall. The switch is available in white.

Technical specification

dimensions	80/80 mm
weight	0.11 kg

white	850070	+
black	850076	+



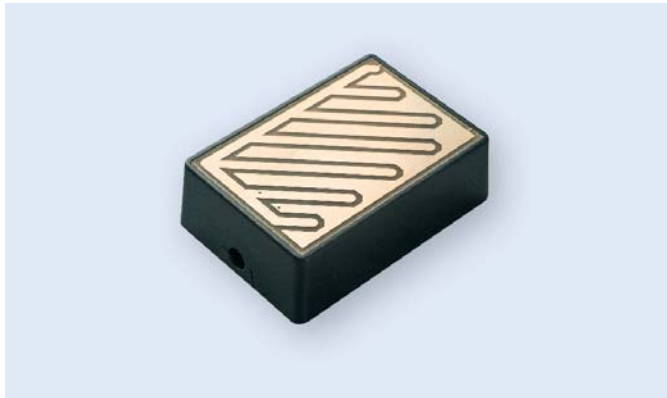
Smoke Vent Alarm Button RT 45

It is used for manually activating the smoke ventilation system in case of fire. The button is equipped with LEDs indicating operation status and system malfunctions.

Technical specification

power voltage	24 V DC
alarm current	20 mA
working temperature	(- 10° C) to (50° C)
dimensions	124 x 124 x 35 mm
weight	0.3 kg

55069	+
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Rain Sensor ZRD

It ensures automatic closure of windows in case of rain and can cooperate with RZN 440_-K control units. The sensor is equipped with a heating system, therefore it is insensitive to such interferences as fog, dew, etc. It is mounted in the unshielded areas of the roof directly exposed to weather conditions. The rain sensor signal is not taken into account unless is working in the monitoring mode. In case of fire the rain sensor does not influence operation of the window.

Technical specification

power voltage	8 – 32 V DC
dimensions	50/35/15 mm
power cable	3/0.25 mm ² (5 m)

55035

+



Smoke Sensor OSD 23

The OSD 23 smoke sensor is designed to detect visible smoke, emitted in the initial stages of fire when a material is smouldering, usually long before the appearance of an open flame and a noticeable increase in temperature. The sensor is intended to work in confined spaces where normally there is no smoke, dust or condensation. However, with the introduction of an analogue compensation of changes in the environment, it features enhanced protection against changes in pressure, temperature and condensation. One sensor supports 40m² room.

Technical specification

power voltage	18 – 28 V
alarm current	20 mA
working temperature	(– 25° C) to (55° C)
maximum relative humidity	95 % at 40° C
dimensions	115/54 mm
weight	0.15 kg
power cable	2x1m ²

55010

+



ACCESS ROOF LIGHTS

AND ROOF ACCESSORIES





INTRODUCTION

Roof access windows provide fast, safe and easy access to the roof for conservation and required maintenance work. Depending on the room type in the attic (inhabited or uninhabited) a range of access windows can be used.

ROOF ACCESS WINDOW

The product is a combination of a roof window and a roof access window. As the roof access window it ensures safe and easy access to the roof and as the window it lets sunlight and fresh air into the room. It is intended for use in inhabited spaces.

STANDARD ACCESS ROOF LIGHT

The main function of the standard access roof light is to secure access to the roof. It illuminates the space as well as provides good ventilation by means of slightly opened dome. The product is designed solely for uninhabited lofts with the interior temperature similar to the outdoor temperature.

SIDE HUNG ESCAPE WINDOW

WINDOWS FWR U3, FWL U3



FEATURES:

- The FW_U3 escape window is side-hung and therefore side-opening. Once unlocked, the sash can be opened to 90°.
- Gas piston fitted in the top part of the window makes opening easier, holds the sash stable when opened and prevents against accidental closure.
- The escape window is available in two versions, right opening **FWR** or left opening **FWL** (view from the outside).
- Large size of the escape window enables safe and easy access to the roof.
- Sizes of the escape window 94x98 and 94x118 comply with technical conditions to be met by buildings and their location (depending on the requirements of local building regulations).
- The FW window combines advantages of roof window and roof access window.
- By applying safe insulated glazing units these windows are recommended for all heated rooms.
- Made of pinewood, vacuum impregnated with two coats of acrylic lacquer.
- Handle positioned in the middle of the sash allows opening or micro-opening.
- Wide range of internal accessories similar to that available for roof windows.
- Suitable for pitches from 15° - 55° and used with special flashings: ESW, EZW, EHW and ELW (flashings used with roof windows are not suitable for escape windows).
- As standard equipped with brackets fixed to the frame to facilitate installation.

Technical Specification	FWL U3, FWR U3
window U-value	1.3 W/m ² k
glazing U-value	1.0 W/m ² k
acoustic insulation Rw	34 dB
glazing unit	4H-16-4T
inert gas filled panes	argon
external glass toughened	+
internal glass anti-burglary	-
air permeability class	class 3 as per EN1026, EN12207
impact resistance	class 4 (700mm) as per EN13049

WARRANTY:

- Lifetime against hail
- 10 years for windows
- 20 years for glazing unit

Sizes of standard windows

PRODUCT CODE	66/78	66/98	66/118	78/98	78/118	78/140	94/98*	94/118*	94/140										
	0.39	0.51	0.62	0.62	0.75	0.91	0.76	0.93	1.12										
	0.28	0.38	0.47	0.47	0.59	0.73	0.60	0.75	0.92										
	22	03	04	05	06	07	15	08	09										

PROFI **FWR U3** Right window coated with clear acrylic lacquer

876C	+	+	+	+	+	+	+	+	+										
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PROFI **FWL U3** Left window coated with clear acrylic lacquer

876D	+	+	+	+	+	+	+	+	+										
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Non-standard windows

Description of available products		
Window with wooden elements		
painted in colours from the RAL palette		+ 20 % to the price of FWR U3
painted in lazulite lacquer		+ 30 % to the price of FWR U3
painted in polyurethane lacquer (white)		+ 10 % to the price of FWR U3
in mahogany woodwork		+ 45 % to the price of FWR U3
Window with claddings		
painted in colours from the RAL palette		+ 20 % to the price of FWR U3
in metal covering - copper CU		+ 30 % to the price of FWR U3
in metal covering - titanium-zinc TC		+ 20 % to the price of FWR U3
Window with glass		
P2 – laminated, anti-burglary (class P2A)		+ 10 % to the price of FWR U3
P4 – anti-burglary glass 'SECURE' class P4A as per EN356, class 1B1 as per EN12600*		+ 30 % to the price of FWR U3
R1 – soundproof glass Rw window = 41dB		+ 30 % to the price of FWR U3
tinted glass	Blue Brown Grey Green	+ 30 % to the price of FWR U3 + 30 % to the price of FWR U3 + 30 % to the price of FWR U3 + 30 % to the price of FWR U3
reflective glass	Blue Brown Grey Green Clear	+ 30 % to the price of FWR U3 + 30 % to the price of FWR U3 + 30 % to the price of FWR U3 + 30 % to the price of FWR U3 + 30 % to the price of FWR U3
stained glass	single colour (outline) multi colour	+ 30 % to the price of FWR U3 + 55 % to the price of FWR U3
Q1 – obscure glass		+ 10 % to the price of FWR U3
Q4 – satin glass, Q5 – opaque glass		+ 20 % to the price of FWR U3
Conservation window with a mullion bar and metal cladding in black designed for historic or stylised buildings (FWR/C U3, FWL/C U3)		The price is calculated individually

Detailed information concerning non-standard windows on pages 66-69.

*Windows with R1 soundproof glass and P4 anti-burglary are available in sizes 22, 03, 05, 15.



FWL (left)

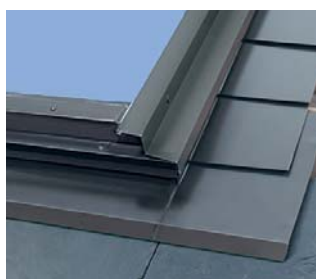
FWR (right)

FLASHINGS FOR SIDE HUNG ESCAPE WINDOWS



FEATURES:

- In order to connect side hung escape windows with the roofing material there are special flashings designed exclusively for installation of FW windows.
- There are numerous versions of flashings available: ESW, EZW-P, EHW-P, ELW, EGW and EFW.
- Windows can be combined in horizontal groups.
- They can also be combined horizontally with wooden centre pivot windows (FT) and top hung and pivot (FP) at installation depth of N (+3 cm).
- Standard distance between windows in combination with side hung escape windows is 10 cm.
- Standard distance between frames of side hung escape windows opened towards each other is 15cm.



STRUCTURE:

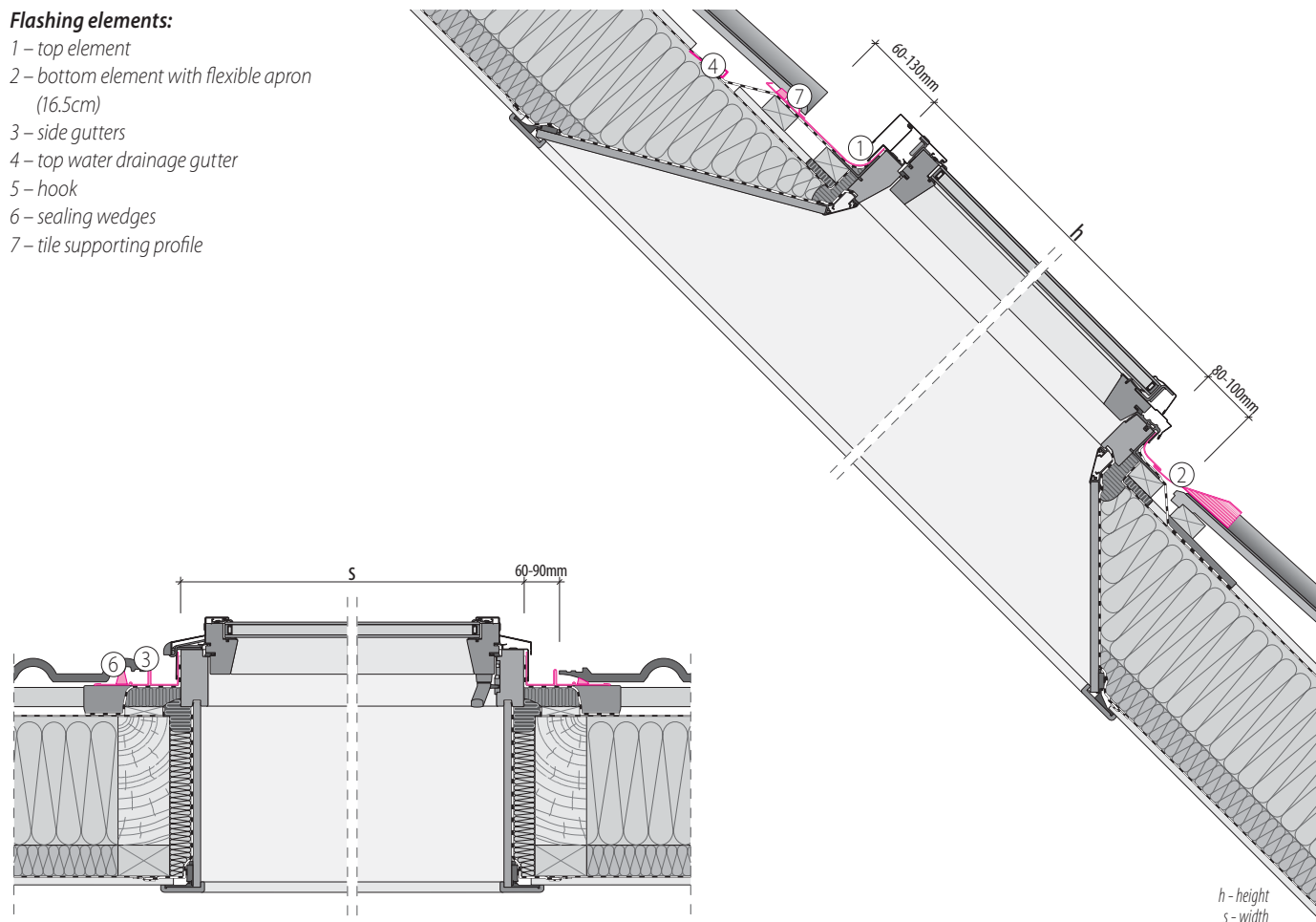
- Flashings for side hung escape windows are similar in structure to those used for roof windows.
- The flashing consists of basic elements:
 - bottom part,
 - side parts,
 - top part.

WARRANTY:

- 10 years

Flashing elements:

- 1 – top element
- 2 – bottom element with flexible apron (16.5cm)
- 3 – side gutters
- 4 – top water drainage gutter
- 5 – hook
- 6 – sealing wedges
- 7 – tile supporting profile



Sizes of standard side hung escape windows

PRODUCT CODE	66/78	66/98	66/118	78/98	78/118	78/140	94/98*	94/118*	94/140
	22	03	04	05	06	07	15	08	09

ESW for flat roof coverings

882	+	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---	---

EZW-A for tiles up to 45mm profile

881	+	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---	---

EHW-A for tiles up to 90mm profile

883	+	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---	---

PRODUCT CODE	66/78	66/98	66/118	78/98	78/118	78/140	94/98*	94/118*	94/140
	22	03	04	05	06	07	15	08	09

ELW for plain tile roof coverings

884	+	+	+	+	+	+	+	+	+
-----	---	---	---	---	---	---	---	---	---

EGW for non interlocking plain tiles

	+	+	+	+	+	+	+	+	+
--	---	---	---	---	---	---	---	---	---

EFE flat roof system

8867	+	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---	---

Non-standard flashings

Description of available flashings

Flashing painted in colours from the RAL palette

Flashing in metal covering – copper (CU) or titanium-zinc (TC)

Modules for combination flashings are available on request. Prices of modules for combination flashings are the same as for other roof windows.

Prices of modules for side hung windows in combination with roof windows are calculated individually.

STANDARD ACCESS ROOF LIGHTS

ACCESS ROOF LIGHT WLI



FEATURES:

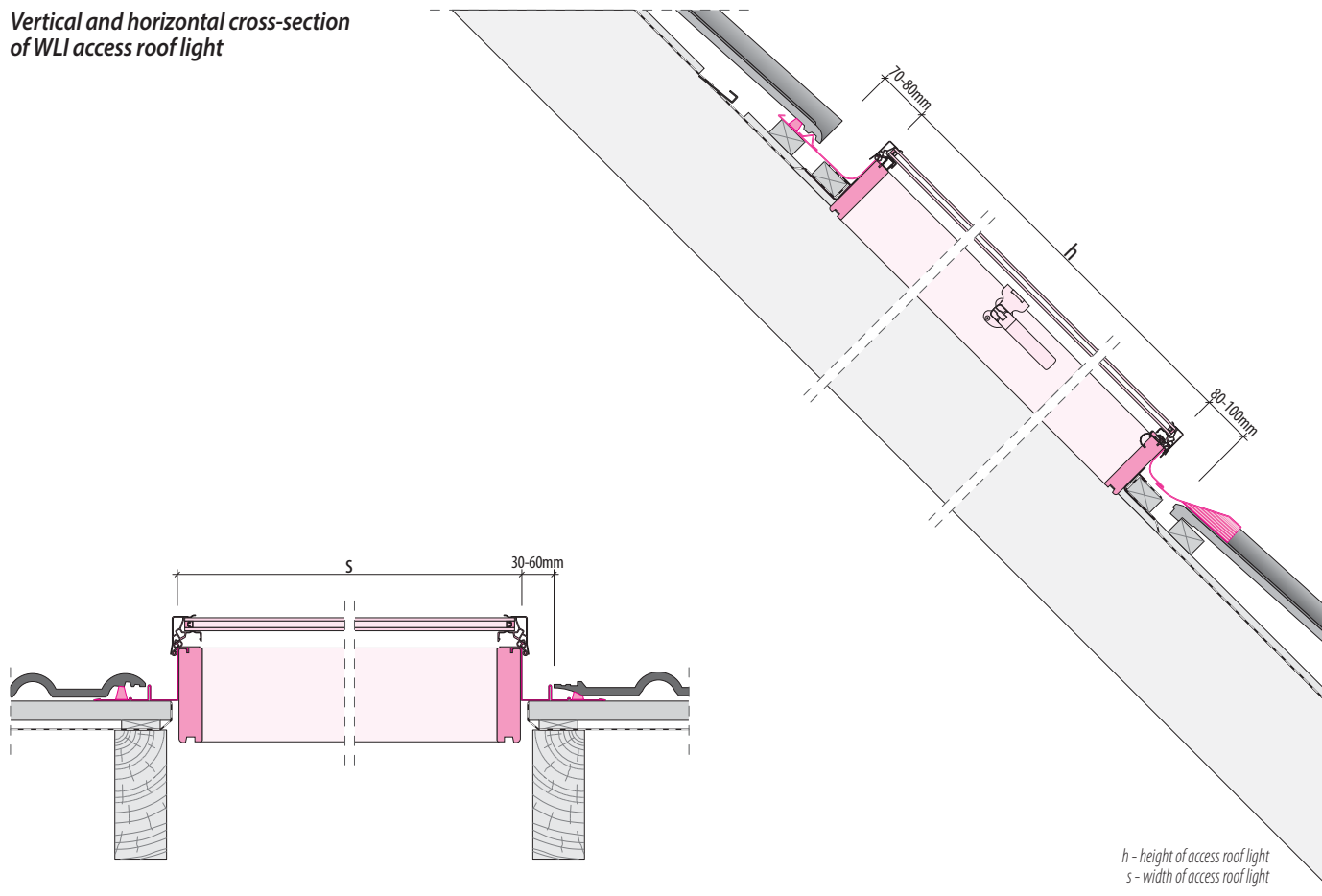
- Designed for uninhabited lofts with the interior temperature similar to the outdoor temperature.
- Compliant with technical requirements to be met by buildings and their location.
- It enables fast, safe and easy access to the roof to carry out repair and maintenance works. Large dimensions ensure convenient operation of the access roof light as well as provide illumination of the interior with natural daylight.
- Frame made of vacuum impregnated wood.
- The sash made of powder coated aluminium profile.
- It comes with integrated toughened glass 4H-8-4H.
- Toughened glass features increased resistance to hailstones and mechanical damage.
- WLI is a side hung window.
- It can be installed in left or right opening version.
- It comes complete with a turn limiter to hold the sash stable and prevent accidental closure.
- The lower part of the access roof light comes with a specially shaped profile which covers the frame and prevents slipping while getting onto the roof.
- Special closing system enables to lock the sash in three positions, hence allowing space ventilation.
- Suitable for pitches from 15° - 70°.
- Equipped with universal flashing.
- Easy installation on trimmers.
- The access roof light can be moved horizontally during the installation in order to better adjust it to the roofing material.



WARRANTY:

- 5 years

Vertical and horizontal cross-section of WLI access roof light



Sizes of standard access roof light

CODE	54/83	86/87				internal dimensions [cm]
	48x77	80x81				

STANDARD	WLI toughened glazing unit					
	56198	56199				
	+	+				

Non-standard access roof lights

Description of available products	Additional charges
Flashing painted in colours of RAL palette	+60% to the standard access roof light type



ACCESS ROOF LIGHTS **WGT, WGI**



FEATURES:

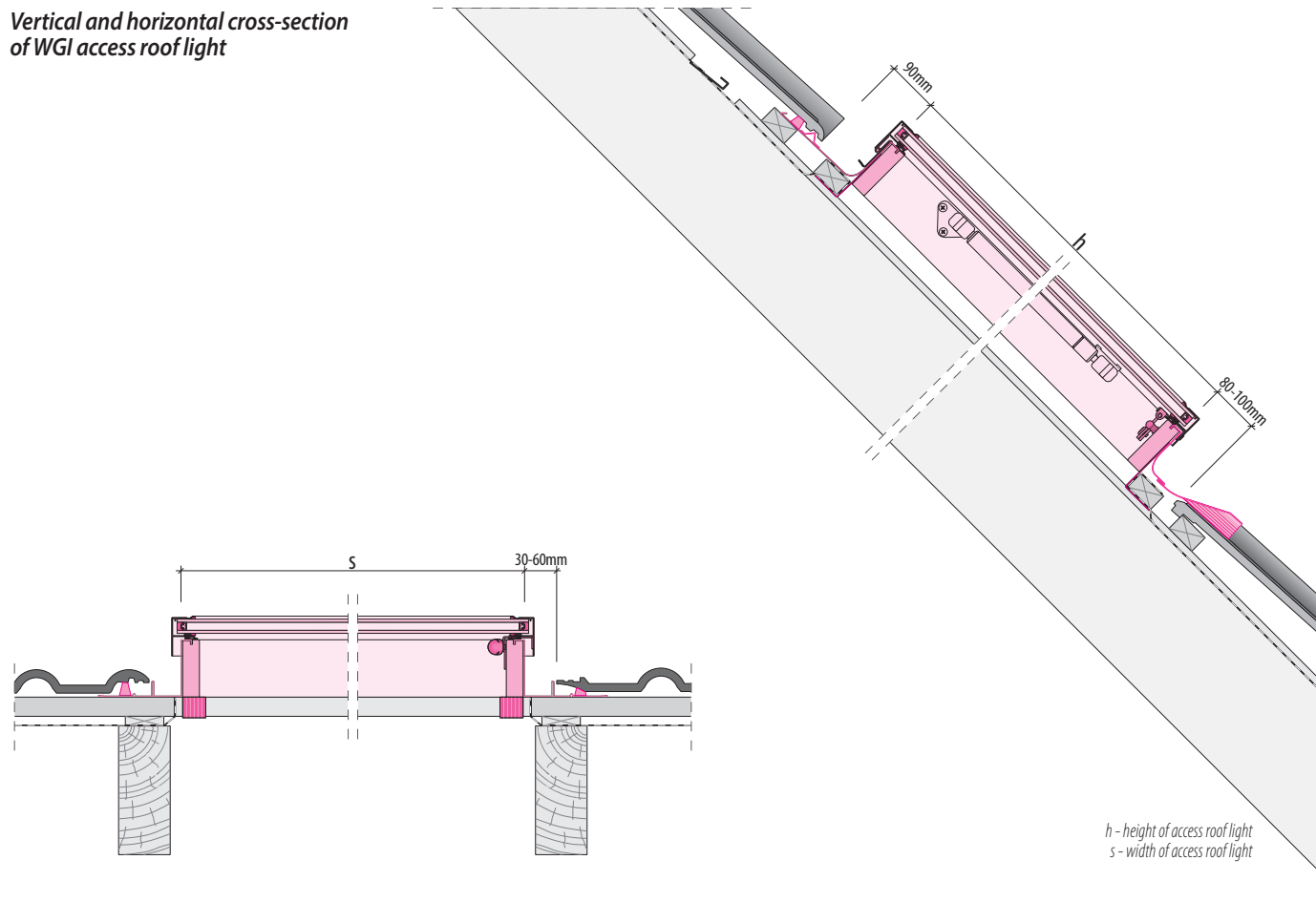
- Designed solely for uninhabited lofts with the interior temperature similar to the outdoor temperature.
- It enables easy access to the roof as well as provides illumination of the interior with natural daylight.
- The WG_ access roof light has a top hung design and the sash opens outwards.
- Toughened glass features increased resistance to hailstones and mechanical damage.
- Specially rounded locking bolts eliminate the risk of injuries.
- Available in two versions:
 - WGT with single toughened glass 4H,
 - WGI with glazing unit 4H-9-4H. Both panes (internal and external) are toughened, therefore it is characterized by increased resistance to hailstones and mechanical damage, thus enhancing operational safety.
- WGI is equipped with a gas spring which makes opening easier, holds the sash stable and prevents it against accidental closure.
- The frame is made of vacuum impregnated wood.
- The sash is constructed using powder painted aluminium profile, fitted inside with a peripheral seal.
- Equipped with a handle that allows the sash to be secured in three positions to ventilate the room.
- Suitable for pitches from 15° - 60°.
- Integrated with universal flashing.
- Easy installation on battens so does not require additional trimmers and allows the movement of the window horizontally to better adjust the place of installation in relation to the roofing material profile.
- Installation kit supplied as standard with the access roof light facilitates its fitting.



WARRANTY:

- 5 years

Vertical and horizontal cross-section of WGI access roof light



h - height of access roof light
s - width of access roof light

Sizes of standard access roof light

CODE	46/55	46/75							
	42/51	42/71							

internal dimensions [cm]

STANDARD	WGT	single toughened glass							
	56182	56183							
	+	+							

STANDARD	WGI*	toughened glazing unit							
	56184	56185							
	+	+							

CODE	46/55	46/75							
	42/51	42/71							

internal dimensions [cm]

CHEAPER IN PACKAGE	WGI*+RSB	access roof light with chimney sweep bench in RAL 7022							
	56239	56240							
	+	+							

CHEAPER IN PACKAGE	WGI*+RSB	access roof light with chimney sweep bench in RAL 8004							
	56241	56242							
	+	+							

Non-standard access roof lights

Description of available products	Additional charges
Flashing painted in colours of RAL palette	+60% to the standard access roof light type



ACCESS ROOF LIGHTS WSS, WSZ, WSH



FEATURES:

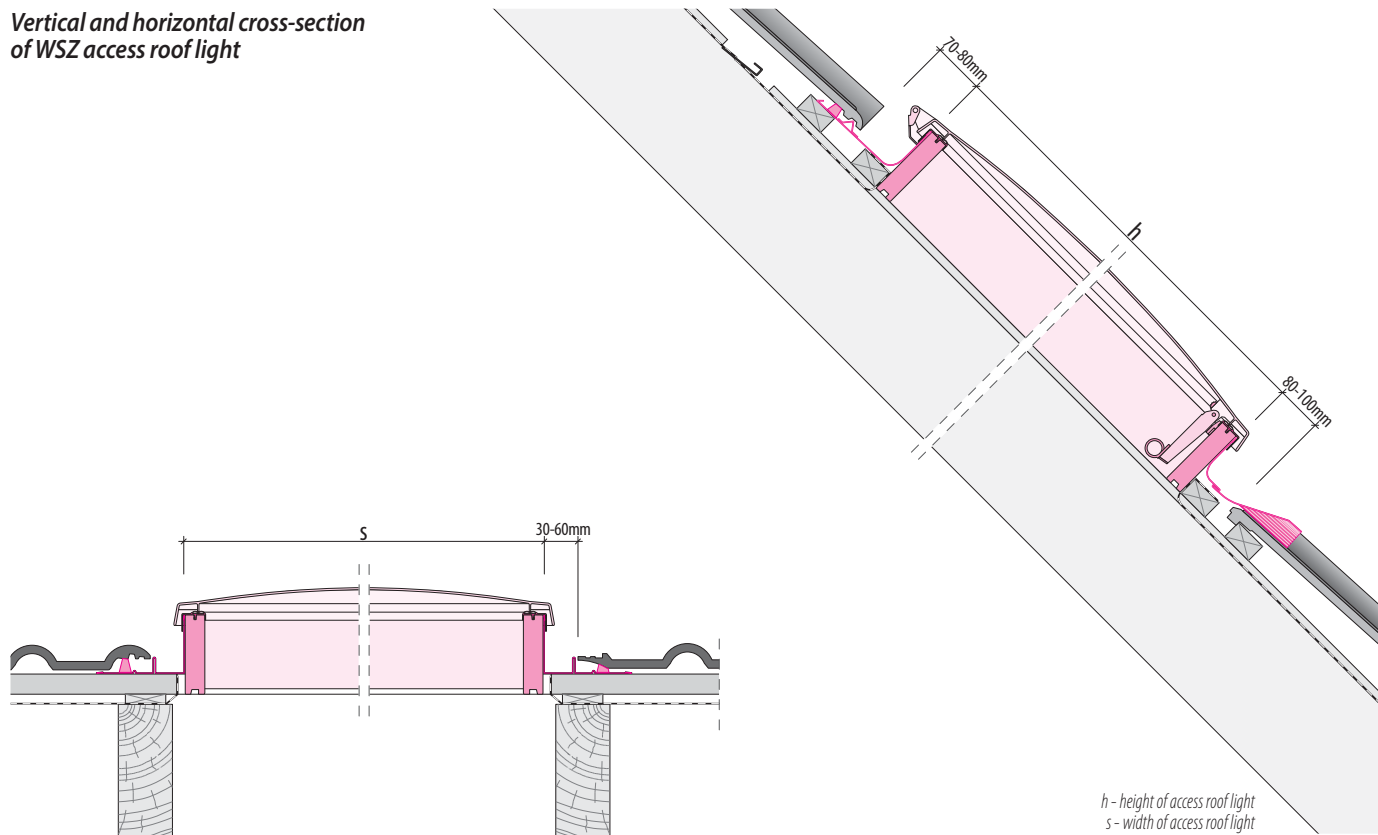
- Due to low thermal insulation, it is intended solely for non-habitable interiors, where the inside and outside temperatures are similar.
- It enables easy access to the roof to carry out repair and maintenance works.
- WS_ access roof lights meet technical conditions to be met by buildings and their location.
- It has a top hung structure. Semi-circular polycarbonate dome opens upwards up to an angle of 180°, ensuring easy access to the roof and effective room illumination. The material used features increased resistance to weather conditions and provides protection against UV radiation.
- Metal handle at the bottom of the window enables the dome to be opened slightly to allow ventilation.
- The frame made of vacuum impregnated wood.
- Equipped with a handle that allows the sash to be secured in three positions to ventilate the room.
- Access roof lights are available in three different types, depending on the roofing material applied:
 - WSS with flashing for flat roofing material,
 - WSZ with flashing for corrugated roofing material;
 - WSH with flashing for high-profile roofing material.Flashing is an integral part of the access roof light.
- Suitable for pitches from 15°- 60°.
- Easy installation on battens does not require additional trimmers and allows the movement of the window horizontally to better adjust the place of installation in relation to the roofing material profile.
- Installation kit supplied as standard with the access roof light facilitates its fitting.



WARRANTY:

- 5 years

Vertical and horizontal cross-section of WSZ access roof light



Sizes of standard access roof light

CODE	54/75	86/86								
	48/69	80/80								

internal dimensions [cm]

STANDARD WSS for flat roofing material

56202	56062				
+	+				

STANDARD WSZ for corrugated roofing material

56201	56061				
+	+				

STANDARD WSH for high-profile roofing material

56233	56075				
+	+				

Non-standard access roof lights

Description of available products	Additional charges
Access roof light with flashing	
painted in colours of RAL palette	+60% to the standard access roof light type
in CU	+80% to the standard access roof light type
in TC	+80% to the standard access roof light type



CHIMNEY SWEEP BENCH **RSB**



FEATURES:

- Enables safe and easy access to the roof surface, providing a convenient step for people working on the roof, e.g. chimney sweep, roofer or fitter.
- Design solutions ensure high stability of the bench and user's safety.
- Universal product. With its unique design, it can be used with different types of roof coverings, irrespective of their shapes and types.
- Wide range of adjustable handles enables adapting the bench to different modules, profiles and corrugations of roof coverings.
- Available with 45cm long platform, in eight most popular colours of roof coverings.
- Bench platform is made of galvanised steel and has non-slip corrugations.
- It is powder coated and characterised by high durability and resistance to weather conditions.
- Compliant with the requirements of PN-EN 516 European standard concerning roof access products.
- Suitable for pitches from 15° - 60°.

Chimney sweep benches - available colours

CODE	RAL 7022 A01	RAL 3011 A02	RAL 8004 A03	RAL 9005 A04	RAL8019 A05	RAL 5010 A06	RAL 6029 A07	RAL 3005 A08						

RSB chimney sweep bench

80A	+	+	+	+	+	+	+	+						
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Chimney sweep bench also available with the WGI access roof light (page 229)

Non-standard access roof lights

Description of available products	Additional charges
Chimney sweep bench in other RAL colour	+60% to the price of chimney sweep bench

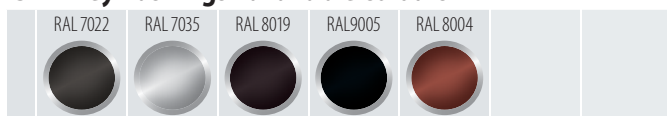
CHIMNEY FLASHING **GZK**



FEATURES:

- A flashing system which with specially designed and precisely made components ensures tight and aesthetic connection between the chimney and roofing and significantly reduces installation time.
- Suitable for pitches from 15° - 70°.
- Flexible apron in the bottom of the flashing enables connection of the chimney flashing with all types of roofing materials.
- Flashings are made of aluminium sheet metal protected with modified polyester of high durability and resistance to weather conditions.
- The **GZK** chimney flashing comes in two versions:
 - Universal **GZK-AV** chimney flashing - it allows to carry out the chimney flashing with maximum width of 95cm and length up to 180cm (dimensions measured along the roof slope). This is possible thanks to the application of adjustable flashing elements. When the chimney is smaller in size, the flashing elements can be easily cut to suit on site.
 - **GZK-AS** fixed chimney flashing - available in two fixed sizes to match the most popular chimney dimensions on the market. The **GZK-AS 38** chimney flashing enables the installation on the chimney with a fixed width of 38cm. Maximum chimney length measured along the roof cannot exceed 100cm.
 - The **GZK-AS 51** chimney flashing enables the installation to a chimney with a width of 51cm. Maximum chimney length measured along the roof cannot exceed 100cm.
- **GZM extension module**
In case of longer chimneys, it is necessary to apply an additional GZM extension module. It makes possible to increase the length of GZK-AS chimney flashing by 1m or its multiples. The GZM module can be applied in GZK-AV universal flashings, which allows using the chimney claddings with chimneys longer than 180cm.

Chimney flashings - available colours



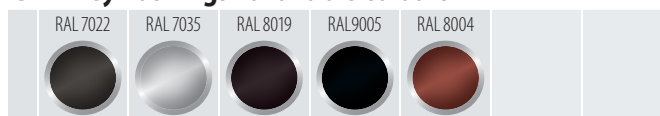
GZK-AV Universal chimney flashing

+	+	+	+	+		
---	---	---	---	---	--	--

GZM Extension module

+	+	+	+	+		
---	---	---	---	---	--	--

Chimney flashings - available colours



GZK-AS 38 With fixed width of 38cm

+	+	+	+	+		
---	---	---	---	---	--	--

GZK-AS 51 With fixed width of 51cm

+	+	+	+	+		
---	---	---	---	---	--	--

LIGHT

TUNNELS





INTRODUCTION

A source of natural daylight should be available in any living space. It often happens that there are interiors in which the use of vertical or even roof windows is not feasible.

To ensure illumination in such places, installing a light tunnel will channel natural light to the centre.

Light tunnels enhance the user's comfort and save energy. They can also be used in the evenings and at night when equipped with light fitting which acts as a lamp.

The offer of light tunnels has been expanded with flat light tunnels.

Flat light tunnels have elements which are mounted low in the roof and do not protrude beyond its structure and go perfectly well with a uniform roof surface.

FAKRO has also introduced light tunnels with a dome designed for flat roofs.

LIGHT TUNNELS

LIGHT TUNNELS WITH FLEXIBLE TUBE **SLT** with dome, **SF_** flat



FEATURES:

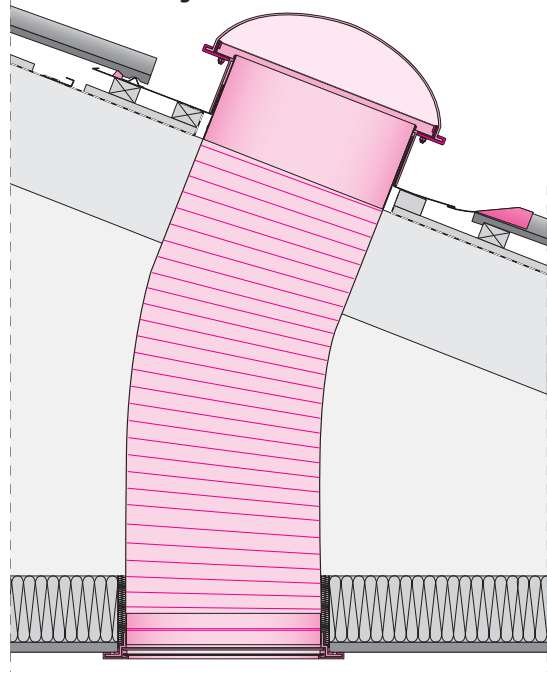
- The light tunnel enables illumination of all rooms in the building, even those which cannot be fitted with roof windows or vertical windows.
- Using light tunnels in rooms devoid of daylight lets natural light inside for better illumination. In other rooms, the light tunnel can constitute an additional light source, enhancing the user's comfort and saving energy.
- It carries daylight via the light transmitting tube. Sunlight is reflected from the walls of the flexible, reflective tube and is directed downwards to the diffuser. The diffuser which is fitted in the ceiling evenly distributes natural light, illuminating the room.
- The SLT light tunnel can also be used in the evenings and at night thanks to a light kit fitted inside which acts as a lamp.
- The light tunnel consists of light collecting element, flashing, light transmitting tube, diffuser and ceiling frame.
- The flexible light transmitting tube is ideal for installation in rooms with structural obstacles that have to be bypassed, thus significantly reducing installation costs and time.
- The advised maximum flexible tube length is 400cm for the 350mm diameter and 600cm for the 550mm diameter tube (for the lengths over 500cm hangers must be applied).
- The light tunnel with flexible light transmitting tube comes in two versions:
 - **SLT** - with the dome. An appropriate flashing must be chosen for the light tunnel. It is also possible to install the SLO light kit.
 - **SF_** - flat. Equipped with integrated flashing. It is also available in **SF_-L** version which illuminates with natural light the space directly below the installation of light tunnel's outer element e.g. attic or loft.
- Suitable for pitches from 15° – 60° and flat roofs.
- Special flashings ensure tightness and ease of installation.
- Three types of flashings are available: for flat, corrugated and high profile roof coverings.

Light tunnel type	SLT	SF_	SF_-L
Thermal insulation	≤ 2.2 W/m ² K - 350mm ≤ 2.1 W/m ² K - 550mm as per PN-EN 1873:2009	≤ 2.0 W/m ² K - 350mm ≤ 1.9 W/m ² K - 550mm as per PN-EN 1873:2009	
Air permeability	class 3 as per PN-EN 12207:2001	class 3 as per PN-EN 12207:2001	
Watertightness	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009	
Impact resistance - hard body	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009	
Impact resistance - soft body	SB 1200 as per PN-EN 1873:2009	SB 800 as per PN-EN 1873:2009	
Tearing out load resistance	UL 3000 as per PN-EN 1873:2009	UL 3000 as per PN-EN 1873:2009	
Clamping load resistance	DL 2500 as per PN-EN 1873:2009	DL 2500 as per PN-EN 1873:2009	

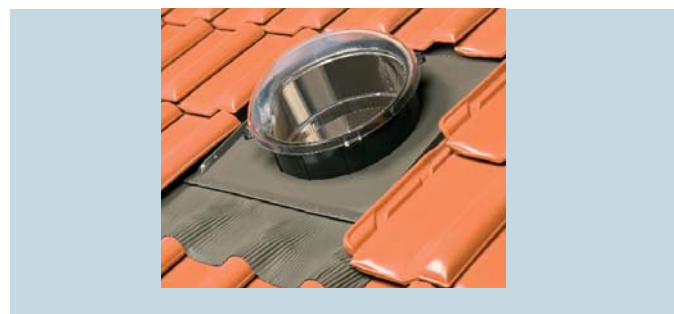
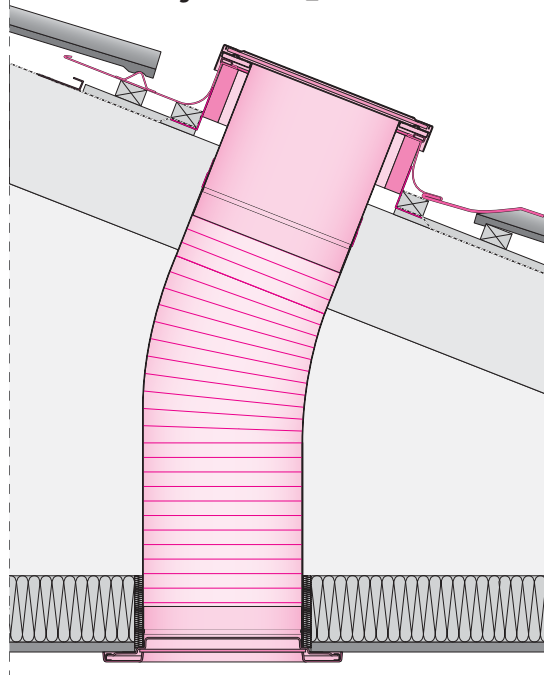
WARRANTY:

- 7 years

Cross-section of light tunnel SLT



Cross-section of light tunnel SF_



Sizes of light tunnels

SLT

CODE	350	550
	210	210

SLT

	46	47
650	+	+

The flashing must be purchased to the light tunnel (see p. 218-219).

SF_ (flat)

CODE	350	550
	210	210

SFS for flat roof coverings

	25	33
80DA	+	+

SFZ for corrugated roof coverings

	27	35
80DA	+	+

SFH for high profile roof coverings

	29	37
80DA	+	+

SFL for flat plain tile roof coverings

	31	39
80DA	+	+

SF_-L (flat with illumination function)

CODE	350	550
	210	210

light tunnel diameter [mm]
 tube length [cm]

SFS-L for flat roof coverings

	26	34
80DA	+	+

SFZ-L for corrugated roof coverings

	28	36
80DA	+	+

SFH-L for high profile roof coverings

	30	38
80DA	+	+

SFL-L for flat plain tile roof coverings

	32	40
80DA	+	+

LIGHT TUNNELS WITH RIGID TUBE **SRT** with dome, **SR** flat



FEATURES:

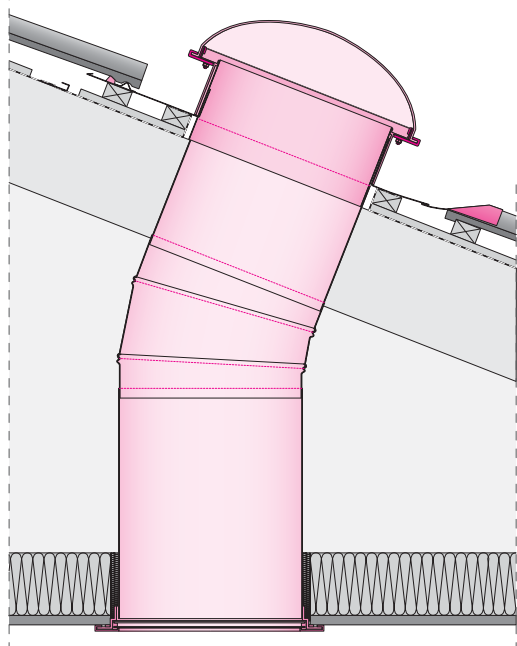
- It can be used in any room, but due to minimum light loss is recommended for special buildings in which natural light is transmitted over long distances (e.g. 12m). The SRT light tunnel can also be used in the evenings and at night thanks to light kit fitted inside which acts as a lamp.
- It comes with rigid light transmitting tube which is made of aluminium, covered with a reflective silver based layer reflecting light in 98% (the interior of the tube looks like a mirror). This design lets much more natural light inside the room.
- The light tunnel consists of light collecting element, flashing, rigid light transmitting tube, elbow, diffuser and ceiling frame.
- Reflective layer (using pure silver) applied in the production of elements of the light transmitting tube is characterized by one of the highest light reflective factors of over 98%.
- The advised maximum light transmitting tube length is 1200cm (for the lengths over 400cm hangers must be applied).
- The light tunnel comes in two versions:
 - **SRT** - with the dome. An appropriate flashing must be chosen for the light tunnel. It is also possible to install the SLO light kit.
 - **SR** - flat. Equipped with integrated flashing. It is also available in **SR-L** version which illuminates with natural light the space directly below the installation of light tunnel's outer element e.g. attic or loft.
- Suitable for pitches from 15° – 60° and flat roofs.
- Three types of flashings are available: for flat, corrugated and high profile roof coverings.

Light tunnel type	SRT	SR	SR-L
Thermal insulation	$\leq 2.3 \text{ W/m}^2\text{K} - 250\text{mm}$ $\leq 2.2 \text{ W/m}^2\text{K} - 350\text{mm}$ $\leq 2.1 \text{ W/m}^2\text{K} - 550\text{mm}$ as per PN-EN 1873:2009	$\leq 2.1 \text{ W/m}^2\text{K} - 250\text{mm}$ $\leq 2.0 \text{ W/m}^2\text{K} - 350\text{mm}$ $\leq 1.9 \text{ W/m}^2\text{K} - 550\text{mm}$ as per PN-EN 1873:2009	
Air permeability	class 3 as per PN-EN 12207:2001	class 3 as per PN-EN 12207:2001	
Watertightness	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009	
Impact resistance - hard body	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009	
Impact resistance - soft body	SB 1200 as per PN-EN 1873:2009	SB 800 as per PN-EN 1873:2009	
Tearing out load resistance	UL 3000 as per PN-EN 1873:2009	UL 3000 as per PN-EN 1873:2009	
Clamping load resistance	DL 2500 as per PN-EN 1873:2009	DL 2500 as per PN-EN 1873:2009	

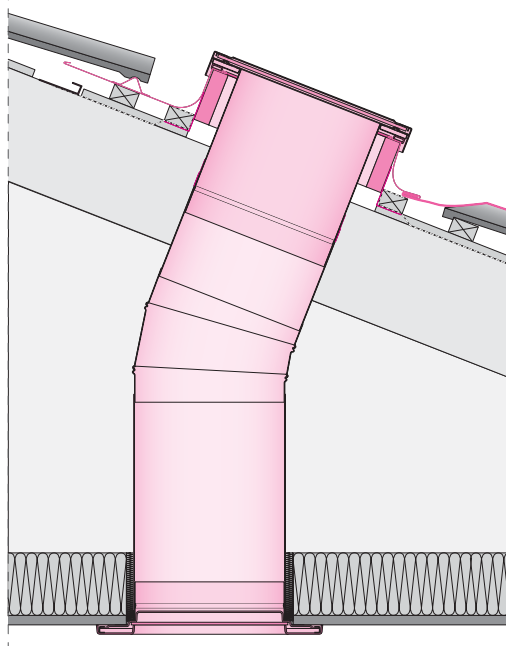
WARRANTY:

- 7 years
- 25 years for tube elements

Cross-section of light tunnel SRT



Cross-section of light tunnel SR_



Sizes of light tunnels

SRT

CODE	250 210	350 210	550* 180
	●	●	●

SRT

	50	51	52
650	+	+	+

The flashing must be purchased to the light tunnel (see p. 218-219).
 *SR_ 550, SR_-L 550 and SRT 550 sets do not come with elbow - available only as an option.

SR_ (flat)

CODE	250 210	350 210	550* 180
	●	●	●

SRS for flat roof coverings

	01	09	17
80DA	+	+	+

SRZ for corrugated roof coverings

	03	11	19
80DA	+	+	+

SRH for high profile roof coverings

	05	13	21
80DA	+	+	+

SRL for flat plain tile roof coverings

	07	15	23
80DA	+	+	+

SR_-L (flat with illumination function)

CODE	250 210	350 210	550* 180
	●	●	●

light tunnel diameter [mm]
 tube length [cm]

SRS-L for flat roof coverings

	02	10	18
80DA	+	+	+

SRZ-L for corrugated roof coverings

	04	12	20
80DA	+	+	+

SRH-L for high profile roof coverings

	06	14	22
80DA	+	+	+

SRL-L for flat plain tile roof coverings

	08	16	24
80DA	+	+	+

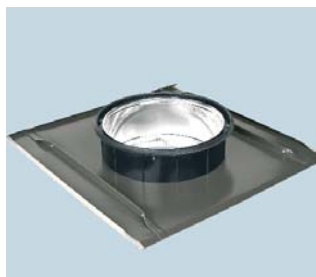
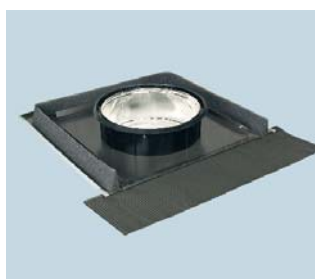
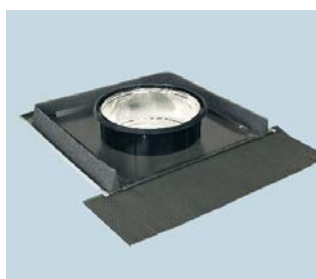
FLASHINGS FOR LIGHT TUNNELS WITH DOME

FLASHINGS SLS, SLZ, SLH



FEATURES:

- Flashings enable proper installation of light tunnels in the roof surface.
- They ensure durable and tight connection between light tunnels and roof covering.
- Three types of flashings are available which allow installation of light tunnels in most roof coverings.
 - **SLS** flashing designed for use with flat roof coverings with a thickness up to 10mm (2 layers, each of 5mm) such as roofing felt, shingles, slates.
 - **SLZ** flashing designed for use with roof coverings with a profile height up to 45mm such as tile, profiled metal sheet.
 - **SLH** flashing designed for use with roof coverings with a profile height up to 90mm such as tile, high profile metal sheet



Sizes of flashings for light tunnels

CODE	250	350	550	light tunnel diameter [mm]

SLS

	58	59	60
650	+	+	+

SLZ

	61	63	64
650	+	+	+

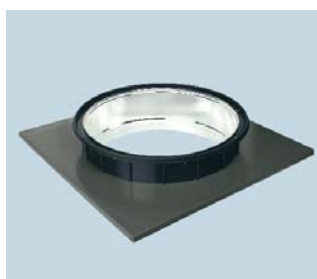
SLH

	65	66	67
650	+	+	+

WARRANTY:

- 7 years

FLAT ROOF SYSTEM SLP & SFP



FEATURES:

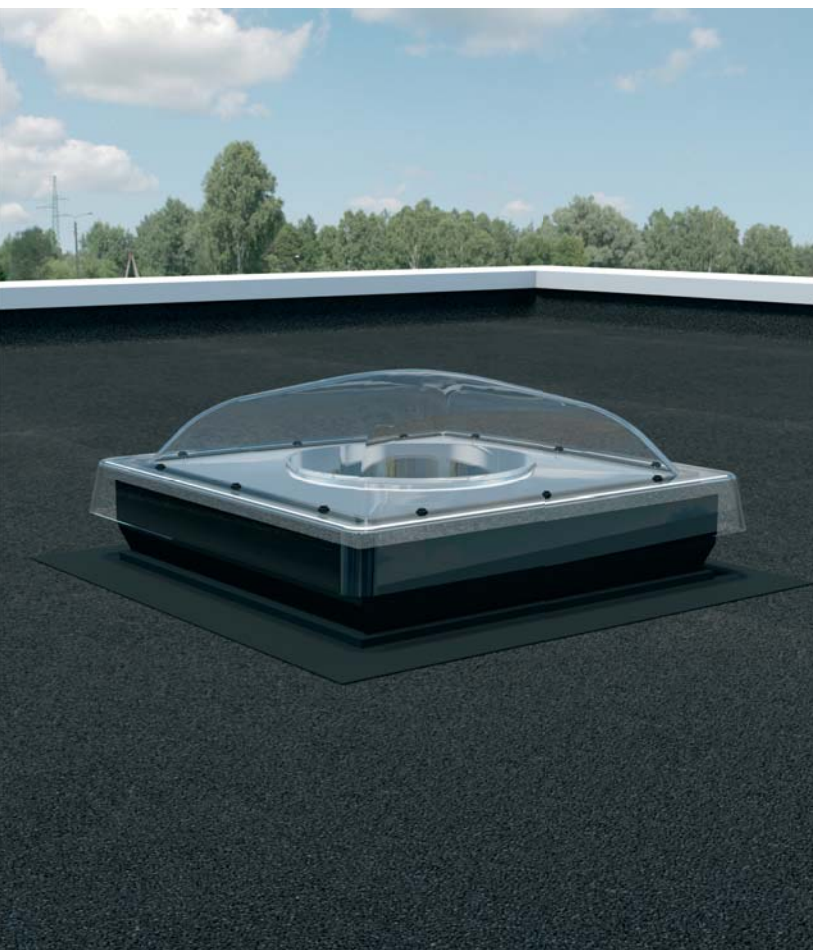
- Light tunnels can be used in buildings with flat roofs. It often happens that there are interiors in which the use of vertical or roof windows is not feasible. The ideal solution in such cases is the installation of specially designed flat roof system.
- For their proper installation, the set containing the SFP insulated base and SLP flashing should be used.
- The SFP base is made of galvanized steel and insulated inside with styro-foam.

Sizes of flat roof system

	250	350	550	light tunnel diameter [mm]
CODE				
SLP				
	71	72	73	
650	+	+	+	
SFP				
	39	40	41	
650	+	+	+	

FLAT ROOF LIGHT TUNNELS

LIGHT TUNNELS SRF, SFF



FEATURES:

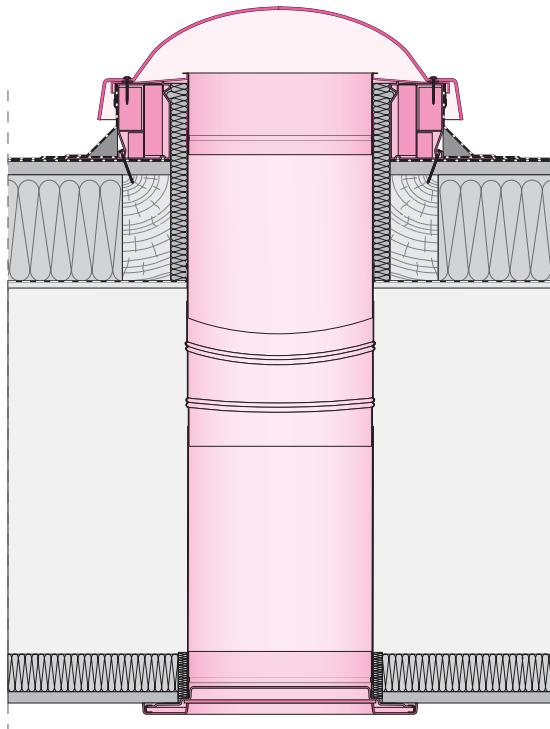
- Flat roof light tunnels make it possible to illuminate with natural light all rooms under flat roofs.
- Solution based on proven design of the type C flat roof window with a dome to ensure high durability and tightness.
- Application of light tunnels allows daylight to rooms under flat roofs. In other rooms light tunnels can constitute an additional light source, enhancing the user's comfort and saving energy.
- Base of the light tunnel is filled inside with insulation material to secure excellent thermal insulation performance.
- The base is made of recycled material, therefore the product is eco-friendly.
- The light tunnel carries daylight via the light transmitting tube. Sunlight is reflected from the walls of the tube and is directed downwards to the diffuser. The diffuser which is fitted in the ceiling evenly distributes natural light, illuminating the room.
- The light tunnel consists of installation frame, specially profiled aluminium cover and dome made of stabilized polycarbonate.
- The light tunnel is available in the following versions:
 - **SRF** - the light tunnel with rigid light transmitting tube with a length of 61cm. The tube can be extended using a special SRM extension kit.
 - **SFF** - the light tunnel with flexible light transmitting tube which allows to bypass potential structural obstacles. The tube length is 210cm.
- - Light tunnels are suitable for roofs with pitches from 0° – 15°.

Light tunnel type	SRF	SFF
Thermal insulation	≤ 2.0 W/m ² K - 350mm ≤ 1.9 W/m ² K - 550mm as per PN-EN 1873:2009	≤ 2.0 W/m ² K - 350mm ≤ 1.9 W/m ² K - 550mm as per PN-EN 1873:2009
Air permeability	class 3 as per PN-EN 12207:2001	class 3 as per PN-EN 12207:2001
Watertightness	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009
Impact resistance - hard body	compliant as per PN-EN 1873:2009	compliant as per PN-EN 1873:2009
Impact resistance - soft body	SB 1200 as per PN-EN 1873:2009	SB 1200 as per PN-EN 1873:2009
Tearing out load resistance	UL 3000 as per PN-EN 1873:2009	UL 3000 as per PN-EN 1873:2009
Clamping load resistance	DL 2500 as per PN-EN 1873:2009	DL 2500 as per PN-EN 1873:2009

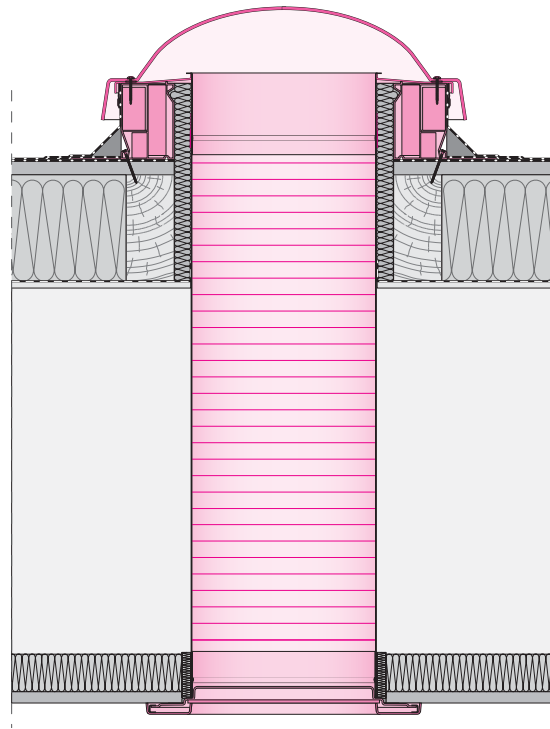
WARRANTY:

- 7 years

Cross-section of light tunnel SRF



Cross-section of light tunnel SFF



Sizes of light tunnels

INDEXES	350	550

SRF with rigid light transmitting tube 0.61m long

	41	42
80DA	+	+

* SRF 350 and SRF 550 sets do not come with elbow - available as an option.

SFF with flexible light transmitting tube 2.1m long

	44	45
80DA	+	+

ACCESSORIES FOR LIGHT TUNNELS



Flexible light transmitting tube extension kit SLM

The kit includes connecting ring, light transmitting tube - 120cm section, adhesive tape. It is possible to order the light transmitting tube in other lengths, but they have to be calculated as units of 30cm (e.g. 60cm, 90cm, 150cm).

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SLM

	65094	65095
-	+	+



Rigid light transmitting tube extension element SRM

Made of aluminium (single element length - 61cm), covered with a highly silver based layer.

The SRT light tunnel can be extended up to 12m. When installing the light transmitting tube, there is no need to cut to size the sections as the tube design is telescopic. Simply push one section deeper inside the other in order to attain the proper tube length.

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SRM

65087	65088	65089
+	+	+



Elbow SRK

It changes the angle of light transmitting tube in the range of 0 - 65°. For all SR_ 550 and SRF light tunnels, the SRK elbow is only available as an option.

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SRK

65090	65091	65092
+	+	+



Hanger SLC

Used when an overall light transmitting tube is longer than 5m. Hangers are applied in order to take part of the tube's weight and to prevent it from tearing away from the light tunnel flashing.

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SLC

	65096	65097
-	+	+



Hanger SRC

Used when rigid light transmitting tube length exceeds 4m. It takes part of the tube's weight.

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SRC

65093	65093	65093
+	+	+



Light Kit SLO

The light kit is designed exclusively for the SLT and SRT light tunnels and is applied as an alternative source of illumination at night. The kit is fitted inside the light tunnel.

Light bulb wattage: max 40W (E27).

Sizes

250	350	550	light tunnel diameter [mm]
-----	-----	-----	----------------------------

SLO

65086	65098	65099
+	+	+



SOLAR

COLLECTORS





INTRODUCTION

A man takes advantage of unimaginable power of the Sun in almost all processes of life. Solar radiation is an unlimited source of free energy, which thanks to the application of solar collectors can be easily converted into heat later on used for heating running water, water in swimming pools as well as for supporting building heating systems.

The FAKRO solar system is an innovative solution of solar collectors combined in the roof surface in order to capture energy from the Sun. Installing collectors in the roof, and not, as often happens above the covering or next to the building has many advantages. They include:

- providing the use of undeveloped area of the roof,
- going perfectly with the building structure,
- increasing the performance of solar collectors.

In addition, if the project takes into account the installation of FAKRO roof windows using standard flashings for FAKRO windows, it is possible to join them with collectors in the combination perfectly blending into the roof structure.

The high quality and durability of FAKRO solar collectors has been acknowledged by the European certificate Solar Keymark. This certificate also confirms that the product is compliant with the requirements of the European standard EN-12975. Solar Keymark is also a basic criterion for getting subsidy in most European countries.

The use of renewable energy contributes to reducing greenhouse gas emissions and fly ash generated in the combustion of conventional energy resources (wood, coal, fuel oil). Each of us can contribute to the protection of the environment by installing solar collectors.



SOLAR COLLECTORS

SOLAR COLLECTOR **SKW**



FEATURES:

- SKW solar collectors can be installed in combinations with FAKRO roof windows in any configuration.
- Standard flashings for FAKRO roof windows ensure easy, fast and tight connection with the roofing.
- Resistant to hail, the toughened solar pane (4mm thick) is characterized by high light transmittance, while its prismatic design lets through solar radiation even at a low angle.
- Absorber plate made of copper with selective coating with high solar radiation absorption efficiency (95%).
- Special arrangement of copper pipes and their proper connection with the absorber plate (ultrasonic welding) ensures perfect collection of the thermal energy from the whole absorber area.
- Rigid casing made of aluminium profiles guarantees strong and durable structure.
- Mineral wool insulation with a thickness of 20mm on side walls and 50mm beneath absorber.
- Collector bottom made of aluminium sheet metal with a special surface structure.
- Innovative system of sliding installation brackets to secure quick and easy adjustment of batten spacing.
- Installation angle: 15° – 90°. Recommended installation angle: 30° – 60°.

FLASHINGS:

- SKW solar collectors are installed with standard flashings as used with roof windows.
- The flashing kit choice is based on the same criteria as used with FAKRO roof windows.

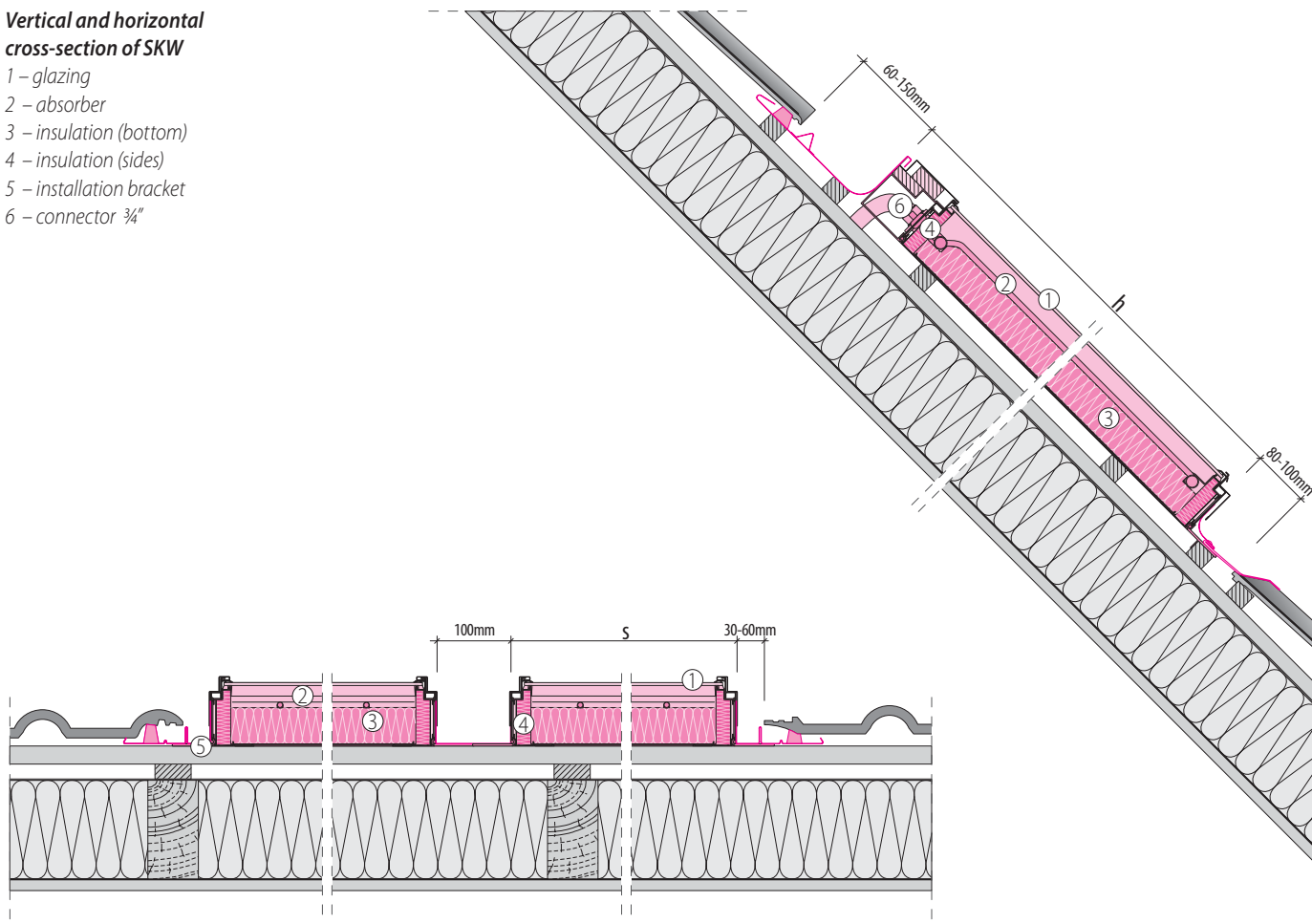
Solar collector size SKW	78x140	114x118	114x140	114x206
Size symbol	07	10	11	44
Actual collector size [mm]	777x1400	1137x1180	1137x1400	1137x2060
Gross area [m ²]	1.09	1.35	1.61	2.36
Absorber area [m ²]	0.91	1.13	1.36	2.07
Absorber liquid volume [l]	0.6	0.9	1.0	1.2
Optical efficiency η_0 [-]	0.747	0.764	0.780	0.775
Linear loss coefficient a_1 [W/m ² K]	4.44	4.42	4.37	3.82
Linear loss coefficient a_2 [W/m ² K ²]	0.0023	0.0027	0.0059	0.0035

WARRANTY:

- 5 years

Vertical and horizontal cross-section of SKW

- 1 – glazing
- 2 – absorber
- 3 – insulation (bottom)
- 4 – insulation (sides)
- 5 – installation bracket
- 6 – connector 3/4"



Sizes of solar collectors

PRODUCT CODE	78/140	114/118	114/140	114/206
	07	10	11	44

SKW

652	+	+	+	+
-----	---	---	---	---

Flashings

PRODUCT CODE	78/140	114/118	114/140	114/206
	07	10	11	44

ESV

842	+	+	+	+
-----	---	---	---	---

EZV-A

872	+	+	+	+
-----	---	---	---	---

EHV-A

8806	+	+	+	+
------	---	---	---	---

SOLAR COLLECTOR **SKC**



FEATURES:

- With the application of special flashings, SKW solar collectors can be installed in combinations retaining a distance of only 3mm between individual panels. Uniform surface achieved in this way goes perfectly with the roof structure.
- SKC solar collectors can be connected in horizontal combinations only: collector - collector. Quick and easy installation of collectors in the roof structure is ensured by special flashings designed for integration with the roofing material.
- Resistant to hail, toughened solar pane (4mm thick) is characterized by high light transmittance, while its prismatic design lets through solar radiation even at a low angle.
- Absorber plate made of copper with selective coating with high solar radiation absorption efficiency (95%).
- Special arrangement of copper pipes and their proper connection with the absorber plate (ultrasonic welding) ensures perfect collection of the thermal energy from the whole absorber area.
- Rigid casing made of aluminium profiles guarantees strong and durable structure.
- Mineral wool insulation with a thickness of 20mm on side walls and 50mm beneath absorber.
- Collector bottom made of aluminium sheet metal with a special surface structure.
- Innovative system of sliding installation brackets to secure quick and easy adjustment of batten spacing.
- Installation angle: 30° – 90°. Recommended installation angle: 30° – 60°.

FLASHINGS

- Flashing for the SKC solar collector consists of 2 modules:
 - CZV-A module used for opening and closing each combination of SKC collectors.
 - MZV-A modules used to expand the combination with new collectors.

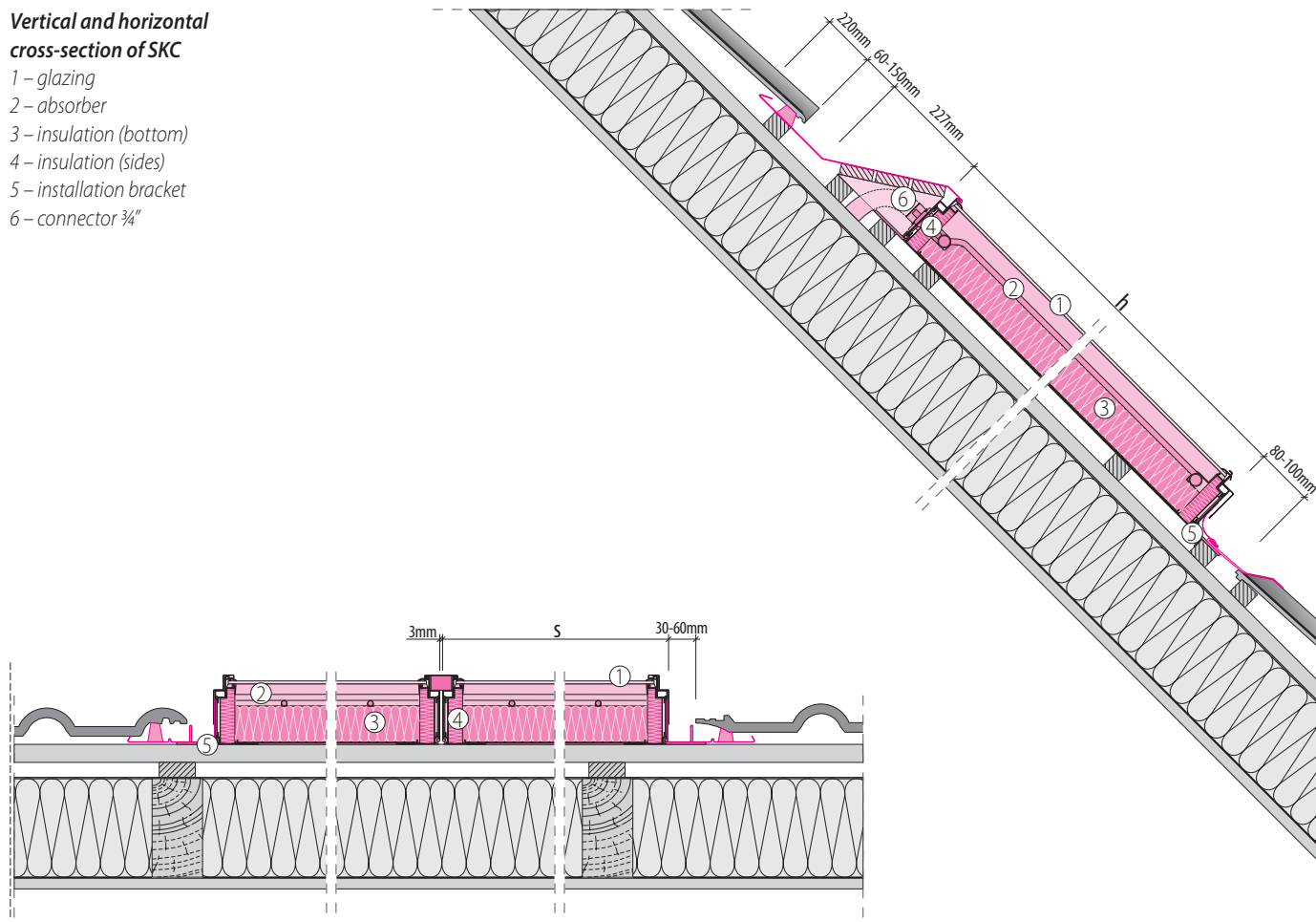
Solar collector size SKC	114x206
Size symbol	44
Actual collector size [mm]	1137x2220
Gross area [m ²]	2.54
Absorber area [m ²]	2.07
Absorber liquid volume [l]	1.2
Optical efficiency η_0 [-]	0.775
Linear loss coefficient a_1 [W/m ² K]	3.82
Linear loss coefficient a_2 [W/m ² K ²]	0.0035

WARRANTY:

- 5 years

Vertical and horizontal cross-section of SKC

- 1 – glazing
- 2 – absorber
- 3 – insulation (bottom)
- 4 – insulation (sides)
- 5 – installation bracket
- 6 – connector 3/4"



Sizes of solar collectors

PRODUCT CODE	114/206			
	44			

SKC

653	+			
-----	---	--	--	--

Flashings

PRODUCT CODE	114/206			
	44			

CZV-A

654	+			
-----	---	--	--	--

MZV-A

655	+			
-----	---	--	--	--

SOLAR SYSTEM ACCESSORIES*



Boiler SBW

The SBW boilers are used for heating water by virtue of the heat from solar collectors and central heating boiler. Boilers are made of high quality steel. They are equipped with two coils. The lower one is intended for the solar collector and the upper one for the central heating boiler.

SBW volume	SBW V20 192 l	SBW V3P* 295 l	SBW V40 380 l
product code	66006	66008	66009

SBW

	+	+	+
--	---	---	---

* Boiler for heating water integrated with pump unit.



Pump Unit SCB

The SCB pump unit forces solar liquid to circulate in the system to enable effective solar heat transfer. The pump unit is equipped with four temperature sensors as standard.

SCB volume	E18 18 l/min
product code	66016

SCB

	+
--	---



Expansion Vessel SBV

The SBV expansion vessel compensates for changes in glycol volume associated with variations in its temperature. For example, in case of an emergency situation in the solar system such as glycol boiling, the vessel takes the liquid pushed out from the solar system by the steam.

SBV volume	SBV 18L 18 l	SBV 24L 24 l	SBV 35L 35 l	SBV 50L 50 l
product code	66012	66013	66014	66015

SBV

	+	+	+	+
--	---	---	---	---



Glycol SGL

Glikor EKO liquid is a non solidifying mixture of propylene glycol, water and corrosion inhibitors aimed at carrying heat in the solar system.

SGL volume	SGL 05L 5 l	SGL 20L 20 l	SGL 30L 30 l
product code	6600D	6600E	6600F

SGL

	+	+	+
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Manual Pump SBF

The SBF solar pump is used for filling the system with glycol and creating required overpressure (max. 3 bars). Once the system is filled, it can be used as an overflow vessel for the safety valve.

66002 +



Electric Heater SEH

The SEH electric heater (2kW) is used as an auxiliary heater for bringing water to the required temperature in case of insufficient amount of solar energy.

6600H +



Air Separator SAS

The SAS air separator enables bleeding the solar system. Recommended for installation in systems consisting of many collectors.

66001 +



Mixing Valve SWM

The SWM mixing valve protects against scalding with hot water (in case of a cold water failure, hot water supply is blocked automatically). In addition, the valve maintains constant temperature at the output. Working temperature ranges from 30° C to 60° C. Installed in domestic hot water circulation system.

6600G +



Temperature Sensor STS

The STS temperature sensor is used for measuring the temperature (depending on the place of fitting) of collector, boiler or glycol. The sensor is connected directly to the pump unit controller.
Length: 3m.

66040	+
-------	---



Pipes SMK

The DN16 flexible pipes made of stainless steel, coated with 13x22 insulation resistant to UV rays ended with ¾ brass nuts are used for connecting individual elements of the system.

The SMK pipes are used for connections between collectors.
The ZKA pipe (0.21m) is designed to connect the SKC collectors only.

ZK_	ZKA	ZKB	ZKC	ZKD	ZKE
length	0.21 m	0.33 m	1.8 m	2.5 m	2.7 m
product code	66032	66033	66034	66035	66036
	+	+	+	+	+



Pipes SMB

The DN16 flexible pipes made of stainless steel, coated with 13x22 insulation resistant to UV rays ended with ¾ brass nuts are used for connecting individual elements of the system.

The SMB pipes are used for connections between collectors and the boiler.
The ZBC, ZBD and ZBE pipes are available in sets with cables for connecting the temperature sensor.

ZP_	ZPB	ZPC	ZPD	ZPE
length	5 m	10 m	15 m	20 m
product code	66026	66027	66028	66029
	+	+	+	+

ZB_	ZBC	ZBD	ZBE
length	10 m	15 m	20 m
product code	66022	66023	66024
	+	+	+

The ZBC, ZBD and ZBE pipes are available in sets with cables for connecting the temperature sensor.

Installation using genuine FAKRO parts is your guarantee of a reliable solar installation and performance. The use of non FAKRO parts can nullify the warranty of the collectors.

SOLAR SETS

SETS WITH SKC COLLECTORS	Collector	2 x SKC 114x206	3 x SKC 114x206
	Absorber area [m ²]	4,14	6,21
	Flashing combination	B 2/1	B 3/1
	Pipes	1 x ZKA, 2 x ZKC	1 x ZKA, 2 x ZKC
	Boiler recommended area [l]	300	400
	+	+	

SETS WITH SKW COLLECTORS 114x206	Collector	1 x SKW 114x206	2 x SKW 114x206	3 x SKW 114x206
	Absorber area [m ²]	2,07	4,14	6,21
	Flashing combination	-	B 2/1	B 3/1
	Pipes	2 x ZKC	1 x ZKB, 2 x ZKC	2 x ZKB, 2 x ZKC
	Boiler recommended area [l]	200	300	400
	+	+	+	

SETS WITH SKW COLLECTORS 114x140	Collector	2 x SKW 114x140	4 x SKW 114x140	4 x SKW 114x140
	Absorber area [m ²]	2,07	5,44	5,44
	Flashing combination	B 2/1	B 4/1	B 2/2
	Pipes	1 x ZKB, 2 x ZKC	3 x ZKB, 2 x ZKC	2 x ZKB, 3 x ZKC
	Boiler recommended area [l]	200	300	300
	+	+	+	

SETS WITH SKW COLLECTORS 114x118	Collector	2 x SKW 114x118	4 x SKW 114x118	4 x SKW 114x118	6 x SKW 114x118	6 x SKW 114x118
	Absorber area [m ²]	2,26	4,52	4,52	6,78	6,78
	Flashing combination	B 2/1	B 4/1	B 2/2	B 6/1	B 3/2
	Pipes	1 x ZKB, 2 x ZKC	3 x ZKB, 2 x ZKC	2 x ZKB, 3 x ZKC	4 x ZKB, 4 x ZKC	4 x ZKB, 4 x ZKC
	Boiler recommended area [l]	200	300	300	500	500
	+	+	+	+	+	

SETS WITH SKW COLLECTORS 78x140	Collector	3 x SKW 78x140	5 x SKW 78x140
	Absorber area [m ²]	2,73	4,55
	Flashing combination	B 3/1	B 5/1
	Pipes	2 x ZKB, 2 x ZKC	4 x ZKB, 2 x ZKC
	Boiler recommended area [l]	200	300
	+	+	



STOP



MEMBRANES

& UNDERLAYS



O



INTRODUCTION

FAKRO offers a wide range of membranes and underlays designed to function as primary roofing and protection of insulation against moisture and dust. Membranes available in FAKRO product range feature high resistance to temperature, therefore they are suitable for use in different roofing structures, even those covered with sheet metal.

In order to ensure the highest quality of products, FAKRO is continuously verifying the key parameters of membranes and underlays such as their tear resistance, nail shank tear resistance, watertightness, roll length and width, basis weight. This guarantees that the product distributed under the FAKRO brand always retains its declared technical parameters.

MEMBRANES & UNDERLAYS

ADVANTAGES



Roofing membranes act as an initial roofing layer. They enhance tightness of the roof, protect insulation against moisture and constitute an important element of insulation systems used in pitched roofs. Application of the EUROTOP roofing membrane in the roof structure brings many advantages. The most important include:

Energy efficiency

Roofing membranes do not require any vent gaps between themselves and insulation material. Insulation shifted towards the membrane allows for thicker insulation layer of the roof along the whole rafter height which contributes to improved roof insulation and ensures energy savings. High vapour-permeability and watertightness of the EUROTOP membranes guarantee that the insulation material remains dry and only as such it can ensure high insulation performance. Windproofness and no ventilation gap between insulation and membrane prevents extraction of heat from the insulation material and penetration of moisture present in the air.

Ease of installation

No need for any ventilation gap above the insulation vastly enhances the installation process. Easier membrane installation translates into time savings, lower costs and reduced risk of workmanship errors.

Increased roof longevity

Excessive moisture is evaporated from insulation thanks to the high vapour permeability of membranes. This adds to increased roof longevity.

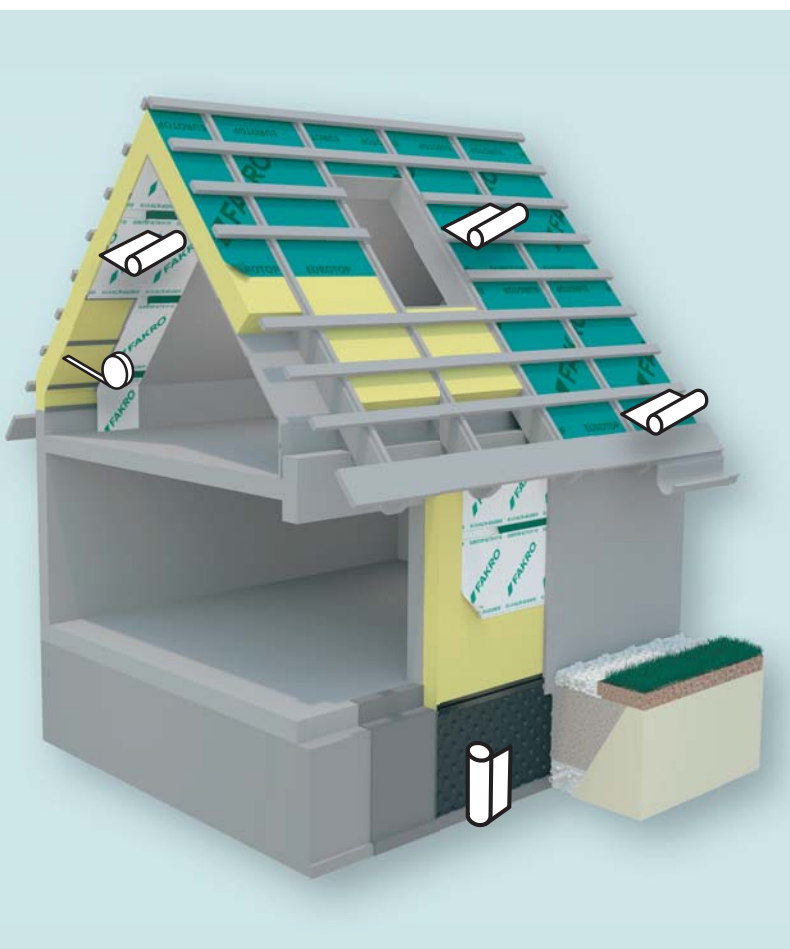
Healthy microclimate in the loft

Membranes provide protection against rain, snow, moisture and dust which penetrate through the primary roofing. This gives a guarantee that potential leaks, water from melting snow or condensation is emitted outside the roof and do not penetrate into the insulation layer. Membranes significantly influence a dry and pleasant climate in the roof space.

Wide application range

Roofing membranes offered by FAKRO are highly resistant to temperature, thus they can be installed in a number of roof structures, even those covered with sheet metal.

ON THE ROOF AND WALLS



High vapour permeable membranes

The EUROTOP membrane is a primary roofing layer which improves roofing tightness. It solves problems associated with condensation water accumulating in the insulation and roof structure. The EUROTOP membranes can be used as initial roofing in sloping roofs – in case of both habitable and non-habitable loft spaces, and in external walls as windproofing.

Low vapour permeable membranes

The low vapour permeable membranes are products used as initial roofing in sloping roofs. Their basic task is to seal the primary roofing and protect insulation fitted in the roof structure from moisture. Application of the low vapour permeable membrane as an initial roofing in case of buildings with habitable loft spaces requires the use of lower ventilation gaps between the membrane and insulation material in the roof structure.

Non-permeable underlay

The non-permeable roofing underlay is a material shielding insulation and roof structure from water vapour penetration from habitable spaces. It is laid between insulation and finishing elements – most often gypsum boards. It constitutes a barrier for water vapour forming inside the building, protecting, at the same time, wooden elements of the roof structure and insulation against moisture. The non-permeable underlay fulfils the function of an additional windproofing – prevents heat losses as a result of free air circulation and roof draughts.



Bands for roofing membranes and underlays

The correct installation of non-permeable roofing underlays requires application of proper joining bands or tapes to ensure correct functioning of the initial roofing layer and non-permeable layer. Any sealing work and damage repair in membranes or underlays should be performed with the use of purpose-built bands or tapes.



Foundation membrane

Foundation membrane is a moisture resistant membrane (dimpled membrane) used for walls of foundations, building and underground structures. It can also be used on external and internal surfaces of new and old structures, thus constituting excellent protection against aggressive action of water vapour, ground water and soil.

HIGH VAPOUR PERMEABLE MEMBRANES EUROTOP



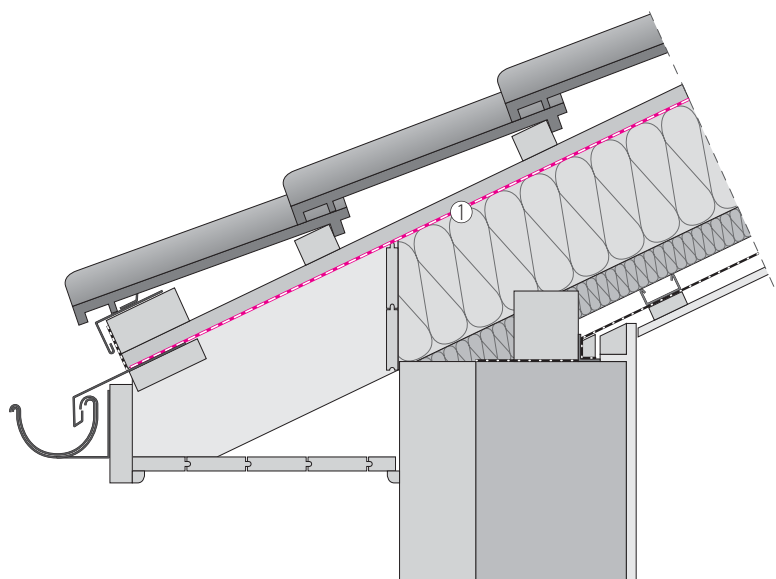
The EUROTOP membranes are characterised by a unique combination of such parameters as watertightness and water vapour diffusivity. High watertightness protects the roof structure from:





- leakages and water condensation under the roofing
- precipitation which is wind-driven under the primary roofing

High water vapour permeability offered by the EUROTOP membrane enables moving insulation towards the membrane surface without the need for any ventilation gaps in the roof or wall structures. This makes it possible to apply thicker layer of insulation which translates into energy savings. The EUROTOP membrane is laid directly onto rafters, insulation or boarding with turquoise printed side facing outwards.

Technical Specification	EUROTOP N15		EUROTOP N35		EUROTOP N50		EUROTOP T150		EUROTOP T180					
							1 adhesive strip	2 adhesive strips	1 adhesive strip	2 adhesive strips				
basis weight [g/m ²]	115		135		150		150		180					
layers	3		3		3		3		3					
vapour permeability coefficient Sd [m]	0.015		0.015		0.015		0.020		0.020					
water penetration resistance class before and after artificial ageing	CLASS W1		CLASS W1		CLASS W1		CLASS W1		CLASS W1					
resistance to tearing lengthwise [N/5cm] crosswise [N/5cm]	230 150		280 190		320 210		350 210		420 250					
application temperature range [°C]	from -40 to +120		from -40 to +120		from -40 to +120		from -40 to +80		from -40 to +80					
UV radiation resistance [month]	3		3		3		3		3					
material	polypropylene		polypropylene		polypropylene		polypropylene		polypropylene					
flammability class	Ed-2		E		E		E		E					
packing [roll/pallet]	36		36		36		27		27					
roll dimensions [m]	1.5 x 50		1.5 x 50		1.5 x 50		1.5 x 50		1.5 x 50					
use on full boarding	yes		yes		yes		yes		yes					
	62038	+	62035	+	80A502	+	62048	+	62054	+	62049	+	62055	+

Cross-section of the roofing with membrane
 1 – High vapour permeable membrane





Technical Specification									
	EUROTOP S4	EUROTOP S65	EUROTOP S215	EUROTOP S265					
basis weight [g/m ²]	155	165	215	265					
layers	4	3	3	3					
vapour permeability coefficient Sd [m]	0.015	0.015	0.015	0.020					
water penetration resistance class before and after artificial ageing	CLASS W1	CLASS W1	CLASS W1	CLASS W1					
resistance to tearing lengthwise [N/5cm] crosswise [N/5cm]	360 280	350 240	420 250	500 550					
application temperature range [°C]	from -40 to +120	from -40 to +120	from -40 to +120	from -40 to +120					
UV radiation resistance [month]	3	4	3	3					
material	polypropylene	polypropylene	polypropylene	polypropylene					
flammability class	E	E	E	F					
packing [roll/pallet]	25	25	25	25					
roll dimensions [m]	1.5 x 50	1.5 x 50	1.5 x 50	1.5 x 30					
use on full boarding	yes	yes	yes	yes					
	62036	+	62039	+	80AB44	+	80AB45	+	

LOW VAPOUR PERMEABLE MEMBRANES



The KF low vapour permeable membrane found its application as an initial roofing layer in buildings with habitable as well as non-habitable loft spaces. The low permeable membrane proves to be excellent insulation of walls in buildings featuring a skeleton structure of timber or metal. In buildings in which functions and simple roof shapes do not require application of membranes offering high vapour permeability and, at the same time, high strength and low material costs play major role, the low vapour permeable membrane can be applied.



Technical Specification	 				
	KF 96 SILVER	KF 110 STANDARD			
basis weight [g/m ²]	98	110			
vapour permeability coefficient Sd [m]	1	1			
water penetration resistance class before and after artificial ageing	CLASS W2	CLASS W2			
resistance to tearing lengthwise [N/5cm] crosswise [N/5cm]	600 500	430 350			
application temperature range [°C]	from -40°C to +80°C	from -40°C to +80°C			
UV radiation resistance [month]	2	2			
flammability class	F	F			
packing [roll/pallet]	50	50			
roll dimensions [m]	1.5 x 50	1.5 x 50			
	62002	+	62003	+	


FOUNDATION INSULATION AND PROTECTION SYSTEM



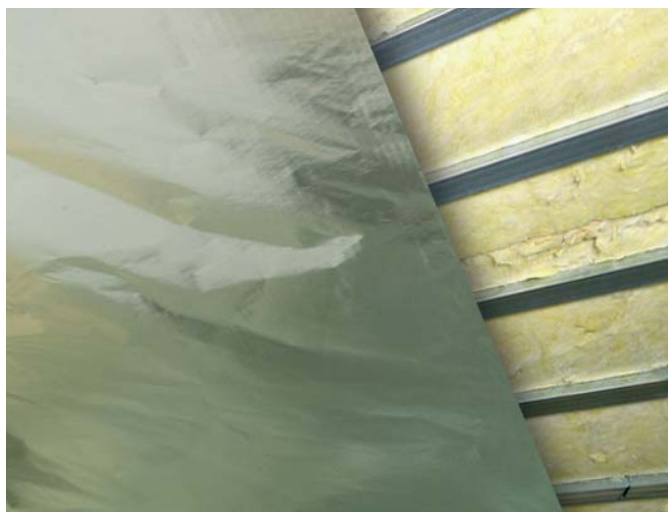
EUROFLEX systems are used for anti-moisture insulation of foundations, terraces, ceilings, roofs and floors. With special embossed areas, it forms a gap to allow additional ventilation of insulated surfaces. The system consists of:

- EUROFLEX 400 foundation dimpled membrane
- EUROSLAT finishing slats
- EUROFIX mounting connectors

Technical Specification		
	EUROSLAT	EUROFIX
dimensions [mm]	70 x 2000	3.5 x 40
number of pieces in packaging [pcs]	20	100
	80AZ07	80AZ08
	+	+

Technical Specification			
	EUROFLEX 400		
basis weight [g/m ²]	400		
resistance to tearing lengthwise [N/5cm] crosswise [N/5cm]	250 200		
flammability class	20		
roll dimensions [m]	1.0 x 20	1.5 x 20	2.0 x 20
	80AB24	80AB25	80AB26
	+	+	+

NON-PERMEABLE UNDERLAYS








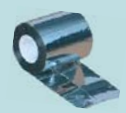
The non-permeable underlay used in conjunction with EUROTOP high vapour permeable membranes makes it possible to retain proper climatic conditions within the habitable loft spaces. This product range includes two types of non-permeable underlays: Termofol 90, 115 and Eurotop Activ V110. Termofol 90, 115 non-permeable underlay with a reflective layer provides very effective protection against water vapour penetration into insulation and, thanks to a thin layer of aluminium film used, it partially reflects the heat radiating from the loft. Eurotop Activ V110 is an active non-permeable underlay allowing vapour to flow inside and outside the room in controlled volumes, resulting in better drying of the roof. Eurotop Activ V110 can also be used as a wind insulation in ventilated walls when installed on the outer side of the partition.

Technical Specification						
	TERMOFOL 90		TERMOFOL 115 Top		EUROTOP ACTIV V 110	
basis weight [g/m ²]	90		115		110	
vapour permeability coefficient Sd [m]	>70		>80		>70	
water penetration resistance class before and after artificial ageing	3		3		3	
resistance to tearing						
lengthwise [N/5cm]	230		650		200	
crosswise [N/5cm]	120		600		130	
application temperature range [°C]	from -40°C to +80°C		from -40°C to +80°C		from -40°C to +120°C	
flammability class	E		F		E	
packing [roll/pallet]	50		50		36	
roll dimensions [m]	1.5 x 50		1.5 x 50		1.5 x 50	
	62042	+	80AB20	+	80AB07	

BANDS FOR ROOFING MEMBRANES AND UNDERLAYS



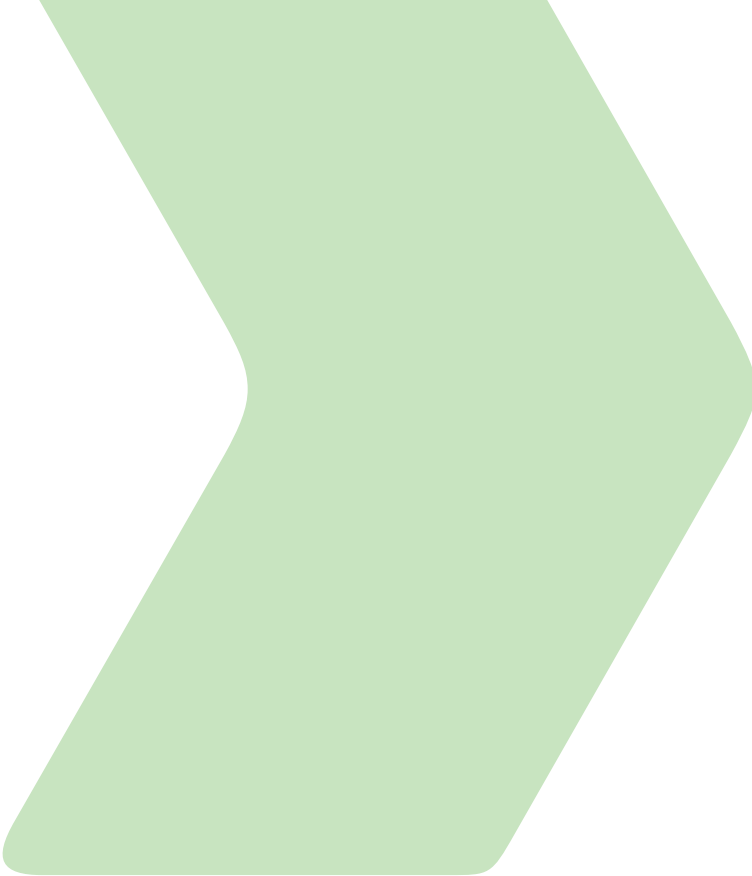
Bands or tapes offered by FAKRO are used for durable joining, sealing and repairing roofing membranes and non-permeable underlays. They eliminate the risk of water penetration into the insulation and rafters through holes formed as a result of puncturing the membrane with pliers and roofing nails. They are also recommended for attaching membranes and underlays to structural elements such as wood, wall or metal. They seal gaps around windows, light tunnels and chimneys.

Technical Specification												
	EUROBAND W	EUROBAND S	EUROBAND P	BUTYLBAND	EUROBAND	ALUFIX						
band type	one-sided adhesive	one-sided adhesive	one-sided adhesive	double-sided adhesive	one-sided adhesive	one-sided adhesive						
carrier type	polypropylene fibre	polyethylene film, PET net	non-absorbent polyethylene foam	butyl	butyl coated with aluminium film	BOPP film coated with aluminium						
adhesive	acrylic	acrylic	rubber-based	butyl	butyl	acrylic						
temperature resistance	from -40 to +120 °C	from -30 to +100 °C	from -30 to +80 °C	from -30 to +80 °C	from -30 to +80 °C	100 °C						
installation temperature	from +18 to +35 °C	from +18 to +35 °C	from +5 to +40 °C	from +5 to +40 °C	from +5 to +40 °C	from +5 to +40 °C						
colour	turquoise	green	dark grey	grey	silver, grey	grey						
roll dimensions	60 mm x 25m (200 mm x 25m)	60 mm x 25m (120 mm x 25m) (180 mm x 25m)	40 mm x 30 m	10 mm x 20 m	50 mm x 10 m	75 mm x 50 m						
packing [roll/cardboard]	24 rolls	20 rolls	12 rolls	24 rolls	12 rolls	64 rolls						
	80AB43	+	80AB40	+	62071	+	62029	+	62019	+	62018	+



USER GUIDE





▶ INTRODUCTION

FAKRO places a high value on close cooperation with professionals working in the construction industry. Therefore, the company puts a strong emphasis on developing good relations with all partners. For many years now, FAKRO has provided training for salesmen, roofers and architects. We strive to ensure that our partners have the appropriate product knowledge and high levels of skill to ensure that the homeowner has complete trust in them.

CUSTOMER SERVICE



Fakro Sales Department accept orders for roof windows and other products available in FAKRO's wide range of products. They are processed in accordance with the applicable general terms & conditions of purchase. In our Sales Department you can also place orders for non-standard products. When looking at non-standard solutions we are able to provide accurate estimating and costing details prior to the customer accepting the offer. The order processing time for non-standard orders is calculated from the date of receipt of advance payment (40%). Get more information about the products and purchasing options at www.fakro.com or your local distributor of FAKRO.



FAKRO also launched free helpline +48 800 100 052 where consultants can answer any question related to standard and non-standard company's products. The end customer can also get comprehensive information on the purchase and use of products.

SERVICE



Taking into account the quality of services associated with the installation of roof windows and accessories, FAKRO are able to organize training for roofing contractors on site as well as regular training sessions at the company's headquarters.

A comprehensive warranty and post-warranty service run by FAKRO ensures comfortable use of all products.

At the beginning of 2016, FAKRO introduced a four-page warranty card covering major products. It specifies detailed terms and conditions of the warranty and is issued at the customer's request. It is also available on the website www.fakro.com and in retail outlets.

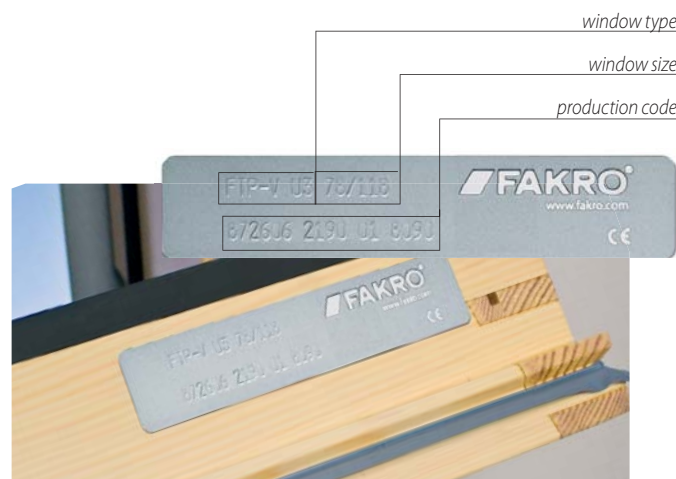
Each window comes with an identification label situated in the top corner of the sash. This label enables easy identification of the product details such as window type and size as well as production code.



Sample of first page of the warranty card



Old sample of the identification label



New identification label introduced in 2010

FAKRO PRODUCTS WORLDWIDE



Nowadays, just offering high quality products is not enough. Delivery time is equally important. Efficient and fast distribution is the basis for the company's development and we have always strived to offer this. Every day, several dozen trucks leave our warehouses to travel hundreds of thousands of kilometres. We deliver products to any place in Europe.

To North America, Asia and other continents our products are transported by sea.

Customers do not like to wait and we look to provide the service levels expected wherever possible.



FAKRO roof windows are sold not only in all European countries, but also on other continents.

We have our sales offices in countries such as USA, Germany, United Kingdom, France, Hungary, Netherlands, Spain, Italy, Russia, Slovakia, Czech Republic, Ukraine, Latvia, Austria and China.

Sales in other countries is carried out through companies cooperating with FAKRO on the principles of general importer, which secure full commercial support.

ROOF WINDOW OPERATION



Window Cleaning

With the hinge design applied in FAKRO roof windows, the sash can be rotated through 180° and locked allowing safe and easy cleaning of the outer pane:

- in FT, PT centre pivot windows,
- in FP, PPP and FE top hung and pivot windows.

A bolt fitted into the sash locks opened or pivoted window for cleaning and is useful when removing or inserting the sash.

In the proSky windows with raised axis of rotation the sash can be locked for cleaning at an angle of 160°.



Window Maintenance

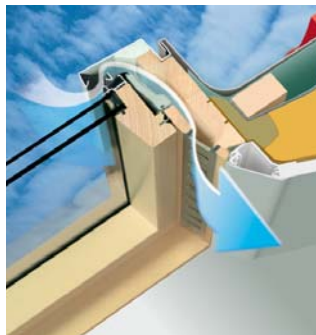
Roof windows should undergo a regular maintenance to ensure they work properly throughout their design life.

Hinges in roof windows should be lubricated every few years with a grease.

Windows are coated with ecological acrylic varnish. They should be repainted with acrylic varnish every 2-5 years depending on environmental conditions.

Leaves and other dirt should be removed from the flashing at least once a year in order to provide the proper water drainage. In areas with heavy winter, snow lingering for a long time should be removed. This reduces the risk of freezing of the melting snow on the bottom window part (and thus excludes the possibility of leaks).

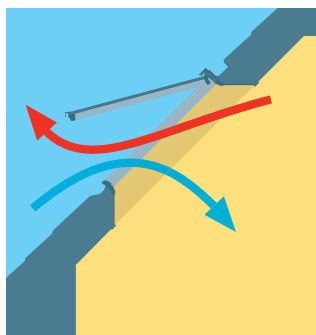




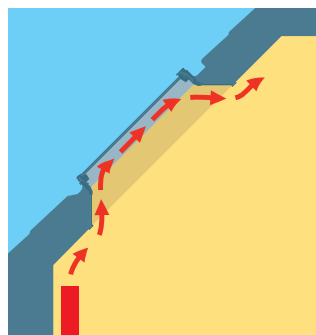
Automatic V40P air inlet



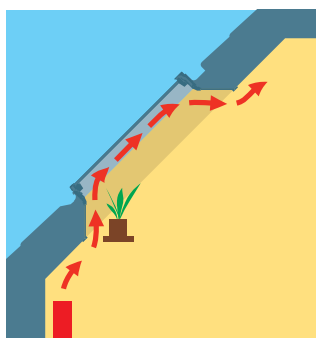
Multi-point opening handle



Air circulation



Warm air flow



Properly installed window sill

Room Ventilation

Water vapour is a product of every day life and is generated during cooking, washing, bathing, watering flowers, laundry drying, etc. Water vapour found in rooms should be extracted by existing means of ventilation such as ventilation ducts. A free flow of fresh air should also be maintained by an opened window or special vents installed in windows or external walls.

It is particularly important to ventilate new properties, which have a high water content as a result of construction works (plastering, wallpapering, brickwork and painting).

Depending on its temperature, air can absorb water in the form of water vapour, however absorption levels decrease at lower temperatures.

Condensation forms wherever warm and moist air comes into contact with cold surfaces. This phenomenon can be found on the inner car's windshield or on glasses when you enter a warm room. Due to its location and characteristics, the roof window is a place where condensation occurs quite often. It means that there is a high humidity level in the room. The best way to reduce condensation is to have a properly working ventilation system. Ventilation is the process of extraction and replacement of stale air. There must be an access for fresh air through windows and air inlets to ensure appropriate operation of the ventilation system.

Design of the handle in FAKRO roof windows enables them to be closed at three points, providing a gap to increase the level of fresh air entering the room. The top bolt allows the fixing of the window when opened. Air inlets installed in FAKRO windows guarantee a continuous and controlled flow of fresh air even when the window is closed.

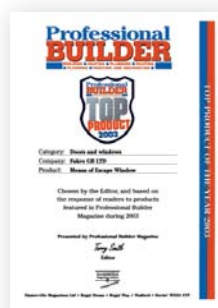
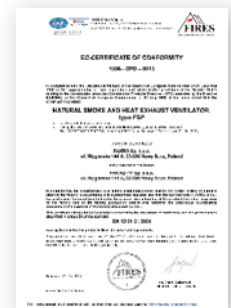
Condensation can also be limited by careful use of heaters (directly beneath the window) and by installing a lining shaped in vertical position beneath the window. Good air circulation around the window reduces condensation forming on the glazing. In cases with a window sill fitted beneath the window, a gap should be retained between the sill and the wall to secure proper ventilation. This gap is particularly important when flowers are kept on the sill.

FAKRO PRODUCTS QUALITY

FAKRO roof windows are made of prime quality raw materials and components with the use of the latest technologies and modern assembly lines. Following European standards, FAKRO products undergo meticulous quality control at every stage of production. It guarantees the highest quality of our products which are sold all over the world. FAKRO products have CE marking. The product marked with such symbol is in compliance with Directive 89/106/ECC on the construction products and meets technical requirements of the applicable harmonized European standard.

Certificates

Excellent technical parameters have been confirmed by many relevant safety and quality certificates issued by prestigious European institutes. FAKRO roof windows were first on the market to receive German TUV certificate.





Polish President's Economic Award, 2011



Polish President's Economic Award, 2003

Awards

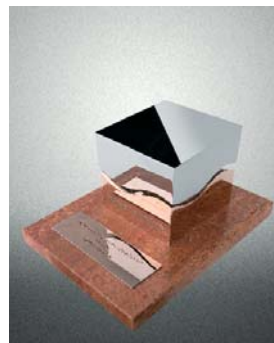
Both FAKRO and its products have been awarded numerous national and international awards and honours. Foremost among them is the Special Economic Award of the President of Poland given by Aleksander Kwaśniewski in 2003 for "Particular Contribution in Building the Prestige of Polish Business across European Union Markets". In 2011, FAKRO received another Economic Award of the President of Poland. This time from Bronisław Komorowski in the category "Presence in the Global Market". The list of prestigious awards also includes Promotional Emblem "Teraz Polska" (Poland Now), Building Brand of the Year or Entrepreneur of the 25th Anniversary of Freedom in Poland.



Good Design, 2015



Building Brand of the Year, 2014



Promotional Emblem "Teraz Polska" (Poland Now), 2016



Eagle of Polish Woodwork, 2016



Top Design, 2016



Medal of Poznań International Trade Fair, 2013



Top Builder, 2013



Entrepreneur of the 25th Anniversary of Freedom in Poland, 2016