

# **fenster**



*Roof  
windows  
full of sun*

**Catalogue of products**

*Valid from 8.3.2007*

# Introduction of company

Manufacture of roof windows FENESTRA was started as early as 1986. The manufacturing plant is located in Štáhlavice (district Plzeň - south). About fifty workers do their best to ensure top quality and short delivery terms. The company FENESTRA střešní okna, s.r.o. is currently the leading manufacturer of roof windows in the Czech Republic.



The partner for foreign customers is the subsidiary, FENESTRA EXPORT, s.r.o. Surely, one of the most interesting references is 22 pieces of roof windows delivered for the Czech Embassy in Nairobi, Kenya. Here, in Africa, the FENESTRA roof windows have been resisting monsoon downpours and tropical rains. Another countries, when we can meet with FENESTRA roof windows are: Denmark, Greece, Israel, Palestine, Jordan, Austria, Germany and Slovakia.

## customer care • consultancy • service



FENESTRA roof windows are accompanied by a number of services provided free of charge. We will be happy to show you the roof windows, and recommend the best sizes and accessories. We will consult the most suitable layout of windows either over a project, or right on the building site. We will train workers of construction and assembling firms, and perform demonstration assemblies. We will provide architects and designers with a CD-ROM with electronic data for design programs.

Every year, hundreds interesting orders are implemented, such as the Czech Embassy in Nairobi, Kenya (Africa, 22 pcs), terraced houses in Bratislava (Slovakia, 64 pcs), Town Hall in České Budějovice (90 pieces), suburban village of Srnojedy (96 flats, 353 windows), a school for the disabled in Pržno (190 pieces), polyfunctional building Marjánka (SKANSKA, 100 pieces), elementary school Sušická (METROSTAV, Prague, 199 pieces), school for the deaf, Holečkova (GEOSAN GROUP, Praha, 140 pieces), apartment building Molákova (METROSTAV, Brno, 149 pcs), terraced houses in Větrní (VCES, Český Krumlov, 100 pcs) and others.



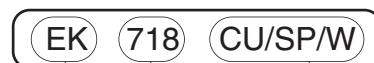
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- edging for welted roofing (F)		- snow stoppers	
- COMBI-edging			

## Dimensions of windows

Window height	66	506 OK EK TK	606 EF TF	706 EF TF	806 EF TF	906 EF TF	
	78	507 OK EK TK	607 EF TF SV	707 EF TF	807 EF TF	907 EF TF	
	98		609 EF TF	709 OK EK TK EF TF	809 EF TF	909 EF TF	
	118		618 OK EK TK	718 OK EK TK EV TV	818 OK EK TK EV TV		F18 OK
	140			740 OK EK TK EV TV	840 OK EK TK EV TV	940 OK EK TK	F40 OK
	160		Window code → 760 OK EK TK			960 OK	
Window width		55	66	78	86	94	114

The stated dimensions are outer frame dimensions (cm).

## Labelling of FENESTRA windows



### Product line and construction type

O - OPTIMAL product line  
E - EXCELLENT product line  
T - THERMICAL product line

K - swinging window  
V - tilting-swinging window  
F - facade window  
M - spatial window of a garret type

### Window code

7 - width (78 cm)  
18 - height (118 cm)  
see the table of window dimension

### Optional properties

CU - cooper flashing  
SP - lower lock  
W - white glazing

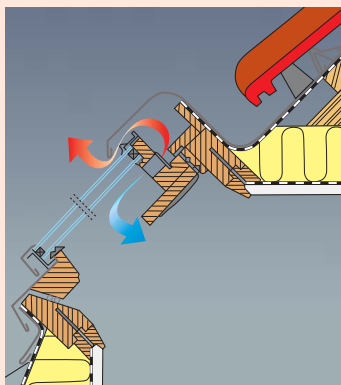


Swinging window



Tilting-swinging window

# Advantages of FENESTRA roof windows



## Vent flap (E,T)

The vent flap ensures permanent replacement of moist air inside the room by fresh air from the outside (20 m<sup>3</sup> per hour) with the window closed. The built-in filter removes dust and other dirt from the air. The filter can be cleaned or replaced. This way of ventilation is convenient during the so-called transition period when the outer temperature does not drop below 0° C.



## One-piece edging upper part

The unique manufacturing technology at automatic forming centre enables production of the upper part of edging from one piece. This secures drain of rainwater from the entire roof surface above the window, as well as absolute sureness of watertightness, even in winter, when snow often remains above the window, and thaws and freezes again repeatedly.



## Thermo strips (E,T)

Original thermo strips create additional space for strengthening of heat insulation at spots where the lining is at an acute angle with the roof gradient. Bigger amount of heat insulation eliminates thermal bridges above and below the window.



## Wood with clear top glazing

Wooden parts of the FENESTRA windows are made of first class pine. Basic preservation protects wood against blue-staining, moulds and dry-rot. Versatile top glazing develops final protection from water and UV radiation impact (basic preservation + 3 layers of glazing - 180 μ). It is not necessary to paint the windows after being assembled.

## Sealing

No less important part of the energy-saving system is the two-stage combined sealing between the window frame and leaf preventing heat leakage out of the room reliably.

## 3rd stage sealing

The third stage of sealing is fitted in the outer flashing. It presents another barrier to prevent heat dissipation from the room, and at the same time, it does not allow water mist and moist air to penetrate under the window flashing. This way, perfect anti-leakage protection is ensured, even with very small gradients of the roof structure.

## Al flashing

Flashing of FENESTRA roof windows is made of both-side painted aluminium sheet, which does not need any maintenance. The universal dun colour ensures aesthetic incorporation of windows into the roofing of all shades.

## Embedding in the roofing plane

Harmonic embedding in the roofing plane has been achieved by means of lowering the upper level of the window by 35 mm. Embedding of the window in the roofing has also improved the thermal insulation parameters.

## Cu flashing

We can manufacture copper-sheet flashing on request.

## Press-up lock

The upper lock with a modern design and a press-up function ensures comfortable control, not risking unpleasant contact of finger joints with the upper part of the window frame. For windows placed in higher positions, we offer a number of control elements (lower lock, control stick, cord control, and electric remote control).

## Central fitting

When you open the window leaf, ventilation is very intensive. You can easily control the amount of air flowing into the room using the locking positions of the central fitting. The central fitting is made of corrosion-proof steel, which ensures flawless function all over the window life cycle, and eliminates damage or material fatigue caused by motion of the most stressed window part.

## Wood with white glazing

Windows of the WHITE finish with high resistant surface treatment are intended especially for rooms with high humidity (basic preservation + 7 layers of versatile white glazing - 300 μ).

## Watertight and elegant

Encased sheet window sheathing, the window embedded in the roofing plane, and the curved upper part of edging give the FENESTRA roof windows very elegant and modern look. Guardings integrated in the lower part of the window make tight all spaces between the window leaf, frame and flashing, which protects the interior living space from blowing snow or water mist inside, even on the windward side, and when the roof gradient is small.

## Insulation double glazing with "warm edge"

The basic element is insulation double glazing (4-16-4 mm) with a soft coating layer, which ensures reflection of heat energy that is normally lost back into the room. The spacer bar between the panes, made of low conductive material, creates so-called warm edge. Besides the improved value of heat passage index ( $U_{window} = 1.1 \text{ W.m}^2.K^{-1}$ ), it has major influence on reduced moisture condensate on the interior pane as well.

## Warranty

We provide up to 15-year warranty for the FENESTRA windows. Windows are certified by an accredited testing laboratory with permanent supervision by an authorized person.

## Price

Economic benefit is given by an excellent proportion of quality, utility properties, and the price, which will pleasantly surprise you not only at the moment of purchase, but for all the useful life, as prices of accessories and spare parts are lower by a class.

# THERMOS heat insulation set

A roof window with the THERMOS heat insulation set has substantially improved thermal-insulation properties. The entire window is lined with extruded polystyrene of 30 mm thickness along the whole frame perimeter, presenting an unrivalled  $U_{frame} = 0.5 \text{ W.m}^{-2}.\text{K}^{-1}$ . Thanks to the insulation, the indoor surface temperature of the window frame increases by 5.5 °C.

The polystyrene lining insulates all the frame of window over the roofing plane. A specially adapted edging enables insulation of a roof window.

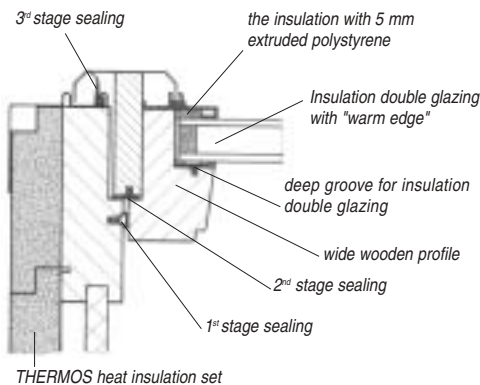


Construction and location of another heat insulation sets do not make thermal-isolation conditions and surface temperatures better, because they do not isolate roof window up the roof. On that part the window is not protected again the freezing.



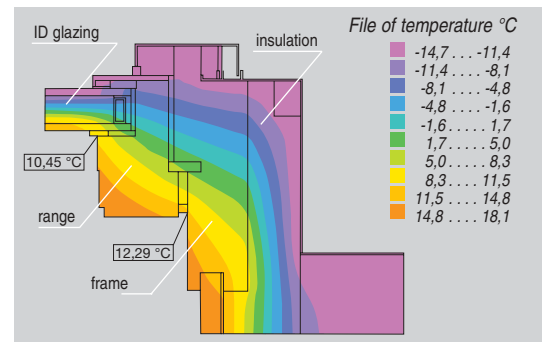
The assembly of roof windows with THERMOS heat insulation set is very easy, it doesn't take more time, because all insulation pieces are together with edging from the manufacture.

## Incision through roof window of line THERMICAL with THERMOS heat insulation set.

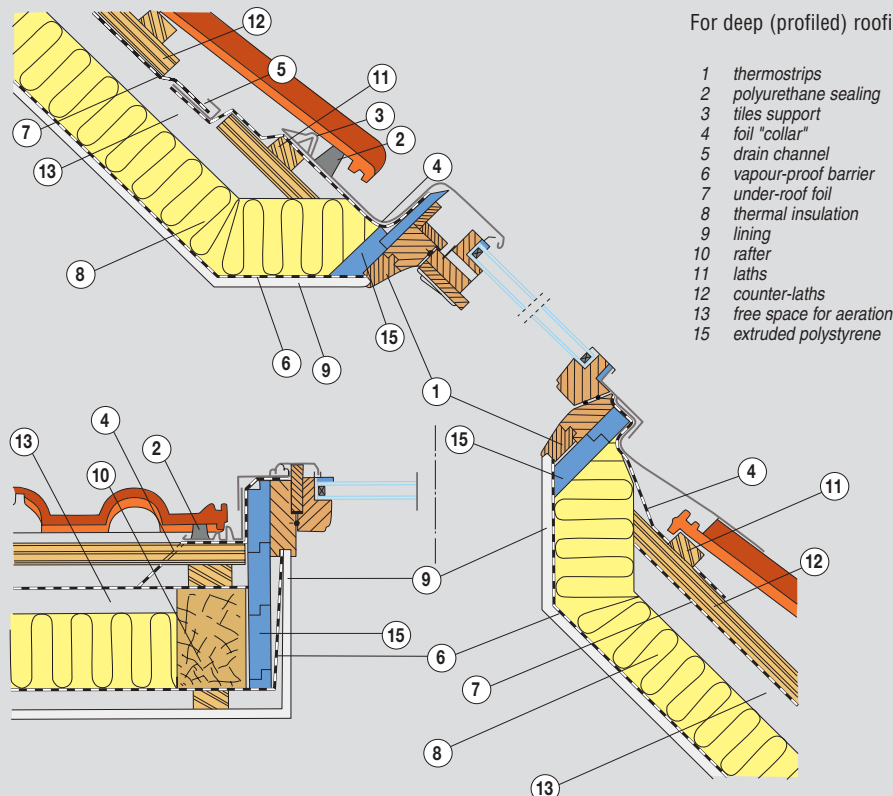


## The THERMICAL's file of temperature with application THERMOS heat insulation set

It was gauged for this conditions: outside temperature -15° C, inside temperature +21° C. This construction is only wone, which fulfils the Norm ČSN 730540. For extra thermal-isolation conditions was appreciate on the STRECHY 2007 exhibition in Prag.



## Diagram of FENESTRA roof window fitting with the THERMOS heat insulation set



For deep (profiled) roofing material

- 1 thermostrips
- 2 polyurethane sealing
- 3 tiles support
- 4 foil "collar"
- 5 drain channel
- 6 vapour-proof barrier
- 7 under-roof foil
- 8 thermal insulation
- 9 lining
- 10 rafter
- 11 laths
- 12 counter-laths
- 13 free space for aeration
- 15 extruded polystyrene

# Roof windows with vent flap

## OPTIMAL

### OPTIMAL roof window with ventilation

New product line with solid properties and extra low price



#### Technical specifications

- construction type
  - swinging window (OK) for roof gradients 15° to 85°
  - range of window leaf motion can be turned by 145° to clean the outer surface comfortably from the room
- control by handle in the upper part of the roof lower lock - optional (lower lock - optional)
- flashing painted aluminium sheet (copper flashing - optional)
- surface treatment versatile neutral glazing (1x basic + 1 layer of neutra glazing)
- wooden parts are made of neverending weld (coloured differences are possible)
- vent flaps (14 m<sup>3</sup> per hour)
- 1st stage of sealing between the frame and the window leaf groove for the 2nd stage of sealing (sealing - optional), 3rd stage of sealing in the flashing
- fixing bolt including
- glazing double glazing with a warm edge U=1.1 W.m<sup>2</sup>.K<sup>-1</sup>, acoustic insulation: 32 dB

- thermal-insulation properties whole window U=1.4 W.m<sup>2</sup>.K<sup>-1</sup>
- volume joint permeability iv: 0.24.10<sup>-4</sup> m<sup>2</sup>.S<sup>-1</sup>.Pa<sup>0.67</sup>
- joint leakage rate m<sub>v</sub> = 0.0 l.h<sup>-1</sup>.m<sup>-1</sup>
- warranty 5 years

## EXCELLENT

### EXCELLENT roof window with vent flap

product line with interesting proportion of properties and price.

#### Technical specifications

- construction types
  - swinging window (EK) for roof gradients 15° to 85°
  - range of window leaf motion can be turned by 145° to clean the outer surface comfortably from the room
  - control two-point press-up lock in the upper part of the window (lower lock - optional)
- tilting-swinging version (EV) for roof gradients 15° to 65°
  - range of window leaf motion can be turned by 145° to clean the outer surface comfortably from the room can be tilted by up to 45° out of the roof gradient, or you can carry out both motions simultaneously
  - control lower lock
- flashing painted aluminium sheet (copper flashing - optional)
- surface treatment versatile neutral glazing (3 layers, 180 μ), WHITE glazing - optional
- thermostrips including
- vent flap 20 m<sup>3</sup> per hour with a dust filter
- sealing 2 stages of sealing between the frame and the window leaf 3<sup>rd</sup> stage of sealing in the flashing

## construction types



Swinging window



Tilting-swinging window

# THERMICAL



- glazing double glazing with a warm edge  
 $U=1.1 \text{ W.m}^{-2}.\text{K}^{-1}$ , acoustic insulation: 32 dB
- thermal-insulation properties whole window  
 $U=1.4 \text{ W.m}^{-2}.\text{K}^{-1}$
- volume joint permeability iv:  
 $0.24.10^{-4} \text{ m}^2.\text{S}^{-1}.\text{Pa}^{0.67}$
- joint leakage rate  $m_v = 0.0 \text{ l.h}^{-1}.\text{m}^{-1}$
- warranty 10 years

## **THERMICAL roof window with vent flap**

*The best roof window in Czech Republic for extraordinary thermal-insulation properties Winner of prix „Zlatá taška 2007“*

### **Technical specifications:**

- construction types
  - swinging window (TK) for roof gradients  $15^\circ$  to  $85^\circ$
  - range of window leaf motion can be turned by  $145^\circ$  to clean the outer surface comfortably from the room
  - control two-point press-up lock in the upper part of the window (lower lock - optional)
- tilting-swinging version (TV) for roof gradients  $15^\circ$  to  $65^\circ$ 
  - range of window leaf motion can be turned by  $145^\circ$  to clean the outer surface comfortably from the room
  - can be tilted by up to  $45^\circ$  out of the roof gradient, or you can carry out both motions simultaneously
  - control lower lock
- flashing painted aluminium sheet (copper flashing - optional)
- surface treatment versatile neutral glazing (3 layers,  $180 \mu$ ), WHITE glazing - optional
- thermostrips including



- extra warm modification of window's range
- vent flap  $20 \text{ m}^3$  per hour with a dust filter
- sealing 2 stages of sealing between the frame and the window leaf, 3<sup>rd</sup> stage of sealing in the flashing
- glazing double glazing with a warm edge  
 $U=1.1 \text{ W.m}^{-2}.\text{K}^{-1}$ , acoustic insulation: 32 dB
- thermal-insulation properties whole window =  $1,2 \text{ W.m}^{-2}.\text{K}^{-1}$
- volume joint permeability  
 $iv = 0,24.10^{-4} \text{ m}^2.\text{S}^{-1}.\text{Pa}^{0.67}$
- joint leakage rate  $m_v = 0,0 \text{ l.h}^{-1}.\text{m}^{-1}$
- warranty 15 years (if installed with the THERMOS heat insulation set)

Roof windows with vent flap

## Facade window



**FENESTRA Facade windows** are designed to be assembled solely with roof windows. They are suitable for composition with windows in roofs ranging from  $20^\circ$  to  $50^\circ$ . The window leaf tilts round the lower axis, which enables ventilation even when raining. They provide a good view of the landscape even in buildings with high backing in the attic.

## Dormer

without thermal insulation (SV)



**The advantage of FENESTRA dormers** is their appearance - they look like roof windows. They are supplied in the aluminium or copper version for all kinds of roofing, with roof gradients between  $20^\circ$  and  $65^\circ$ . They are not intended for thermally insulated rooms.

Another types of roof windows

# Another types of roof windows

## Roof window of garret type



**Roof windows of garret type** combine the benefits of classical roof windows and dormer windows, eliminating their disadvantages at the same time. They are suitable for roofs of gradients between 35° and 60°.

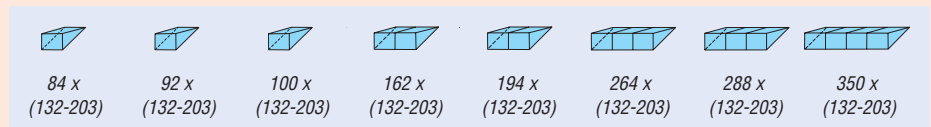
- they offer a wide range of layout solutions in a living attic
- no need of difficult interventions in the roof structure
- you can locate them anywhere in the ground plan
- they ensure extraordinary illumination of the room
- they enable you to use the living area better, achieving a better clearance height of the room near the roofing
- they give you a panoramic view of the countryside

**They eliminate the disadvantages of dormers:**

- high laboriousness
- small amount of light coming just through a vertical window
- no panoramic view out of the room
- when using a bigger number of dormers, technical or architectural issues may arise when designing the roof structure

**They eliminate the disadvantages of roof windows:**

- the living space utilized near the roofing is smaller
- no panoramic view out of the room

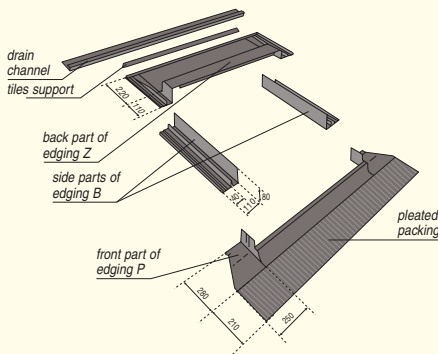


## Edging between the window and roofing

Edging of FENESTRA roof windows is made of the same material as the window flashing. It ensures watertightness with the roof gradient ranging from 15° to 85° regardless of the roofing type. It is made of both-side painted

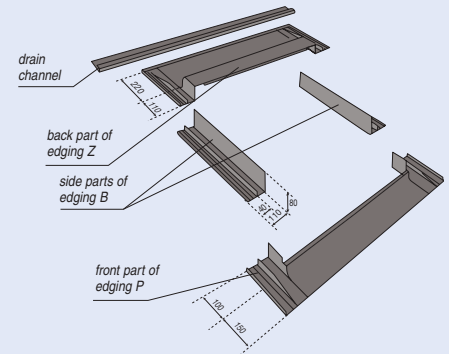
aluminium sheet, which does not need any maintenance. The universal dun colour ensures tasteful incorporation of windows into the roofing of all shades. We can produce copper-sheet edging on request.

### T edging



The lower part of the T edging is provided with pleated packing, which is easy to form according to the roofing profile. Foam sealing is installed onto the side and top parts to fill up the gap between the edging and roofing. The T edging includes a support of tiles to even the roof gradient above the window, and a drain channel to lead water from the under-roof foil away from the window.

### H edging



COMBI-edging of the roof windows FENESTRA is a construction kit system for flashing windows built in series. The entire system always

ensures absolute watertightness and a very simple assembly. Thanks to the COMBI-edging, the number of variants is almost unlimited.

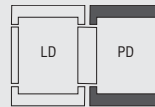
## System of labelling and content of package

The code labelling is described from the outside view  
(P = right, S = central, L = left, D = lower, N = above)

- T = separately fitted edging for profiled roofing materials (of total deep over 13 mm)
- H = separately fitted edging for smooth roofing materials (of total deep up to 13 mm)
- F = separately fitted edging for welted roofing materials
- KT = COMBI-edging for profiled roofing materials (of total deep over 13 mm)
- KH = COMBI-edging for smooth roofing materials (of total deep up to 13 mm)
- KF = COMBI-edging for welted roofing materials

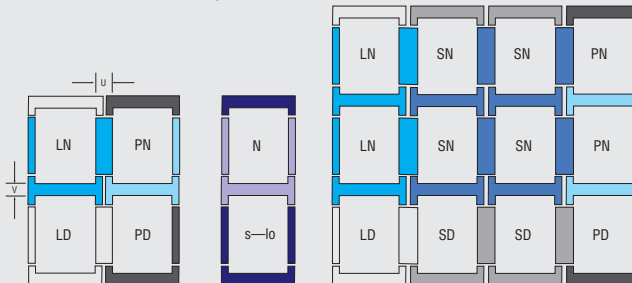
### U distance of window frames adjacent in line

- U = 14 cm standard, 11 - 21 cm on request (without thermal insulation)
- 20 cm standard, 17 - 27 cm on request
- (with THERMOS heat insulation set)



### V distance of window frames adjacent in column

- V = 10 cm (without thermal insulation)
- 15 cm (with THERMOS heat insulation set)



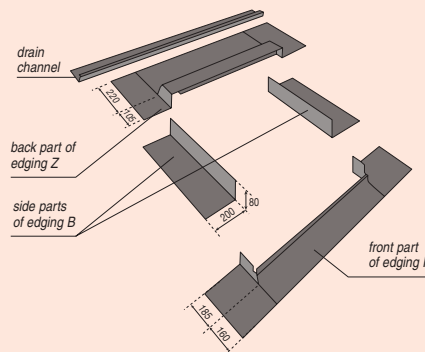
The unique manufacturing technology at automatic forming centre enables, apart from other things, production of the upper part of edging from one piece. This secures drain of rainwater from the entire roof surface above the window, as well as absolute sureness of watertightness, even in winter, when snow often remains above the window, and thaws and freezes again repeatedly.



Edging and combi-edging

It can be used for welted tin roofing materials as well. H edging includes a drain channel to lead water from the under-roof foil away from the window. Note: in case you use copper sheet roofing, it is not possible to have the window edging made of a different material.

## F edging



In case that copper-sheet roofing is used, it is not possible to have the window edging made of a different material.

# Accessories of windows



## Interior roller blind COL

They serve both to blank and decorate the window. Available in several colour shades, including a children's motif.



## Interior roller blind EXTRA

The EXTRA roller blinds are made of premium materials to satisfy the most discerning customers.



## Interior roller blind RL with side bars

They serve both to blank and decorate the window. They are lead in aluminium bars, which eliminates penetration of light on sides, and at the same time enable the blind to be locked in any position. We recommend them if you wish to blackout the room. Versions available: BLACK OUT, other shades (shading, decorative function).



## Interior Al-blind, type S

Aluminium lamella blind lead by a string. Thanks to a special self-locking mechanism, the blind can be locked in any position. Tilting the lamellas you can regulate penetration of sunrays. It ensures full function (especially when full closing of lamellas is required) starting from the roof gradient of 45°. (If blackout of the room is required, the RL BLACK OUT blind is the suitable one.)



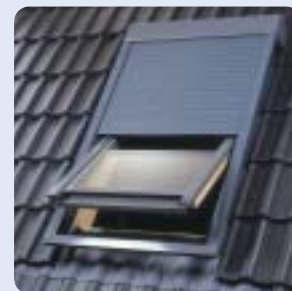
## Interior Al-blind, type L

Aluminium lamella blind lead in an Al-bar. Its function is the same as with the type S blind. S lamellas move along the side Al-bars; they can be fully closed even with smaller roof gradients. (If blackout of the room is required, the RL BLACK OUT blind is the suitable one.)



## Exterior awning MA

The exterior awning eliminates the incidence of solar radiation on the roof window, reducing the amount of heat to penetrate the room by up to 60 %. It is made of black PVC-netting, and it is always controlled from the inside of the room. The awning is fixed under the upper part of the roof window flashing.



## Exterior roller blind PRE

Electronically controlled aluminium lamellas filled with polyurethane hold back up to 90 % of heat solar energy. The outer roller blind provides pleasant shading even during the day, and it as well ensures additional protection of the insulation double glazing.

Exterior accessories protect the attic from solar heat energy. They are necessary complement of all north-oriented roof windows. All FENESTRA roof windows are supplied including built-in plastic carriers of an exterior awning.

## Labelling of FENESTRA accessories



Kind of accessory    Window dimension    Window specification    Colour shade

Wide range of shading and decorative accessories ensures protection against sunshine, and at the same time creates optimum conditions for living. Accessories of FENESTRA roof windows are designed to be easily and quickly installable. All the roof windows are delivered with built-in plastic brackets for the outer hood.



An identification plate on each roof window makes ordering much easier, and at the same time eliminates the possibility of delivering accessories of a wrong size.

## Sets of accesories CM a SM

If you buy a set of accesories (interior roller blinds COL 3326 or interior Al-blinds S 0872 together with an exterior awning), **you will save 15% cost.**



## Colour shade of Interior roller blinds

### Interior roller blinds COL and RL



COL 3326 COL 2135 COL 2869 COL 2082 COL 2147 CHILDREN'S MOTIF



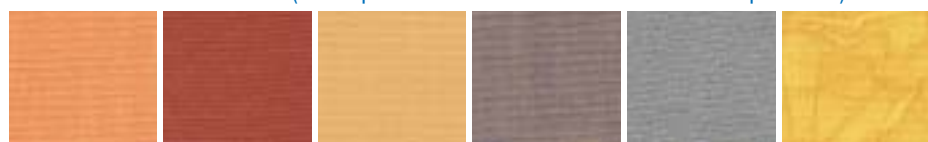
COL 4983 COL 204 COL 100 COL 4979 COL 3869 COL 5080

### Interior roller blinds RL BLACK OUT - to blackout the room



BLACKOUT 5123 BLACKOUT 5118 BLACKOUT 5121 BLACKOUT 5085 BLACKOUT 3322

### Interior roller blinds EXTRA (about price to contact FENESTRA Sales Department)



STARLET ROTA 5 STARLET PERL STARLET TERMO TERMO OREGON 1



CALIFORNIA 1 CALIFORNIA 2 CALIFORNIA 3 RIO CONSTELLO 3607 CONSTELLO 4567



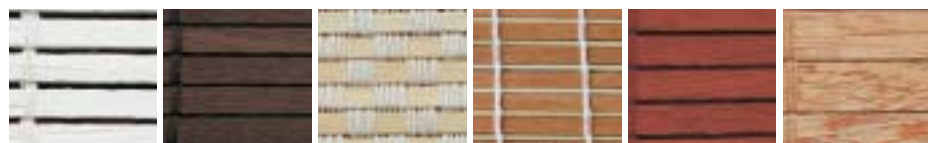
PARASOL OFFICE SFR 1229 VEROSAFE 144 VEROSAFE 3 BLOCKS 232 CONSTELLO 2751



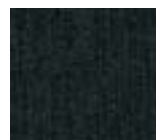
BLOCKS 2421 MEDLEY655 MARBLE 204 MARBLE 5756 IVY BLANCHE 222 VEROGLIM 117



VEROGLIM 113 VEROGLIM 112 ODYSSEY 556 LINTEX 328 DT 3641 DT 3506

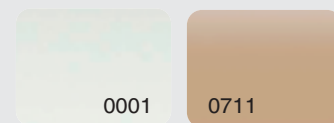


DT 660 DT 6905 DT 490 DT 7640 DT 3916 DT 10

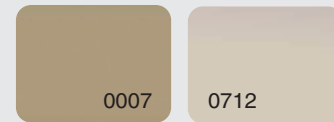


MONACO 453

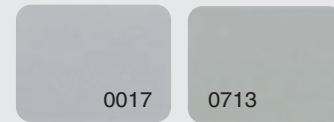
## Colour shade of Interior Al blinds



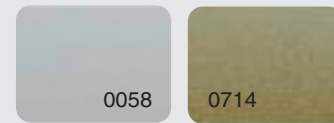
0001 0711



0007 0712



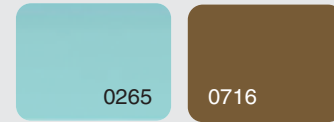
0017 0713



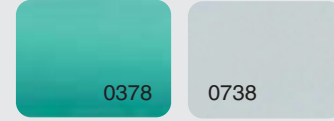
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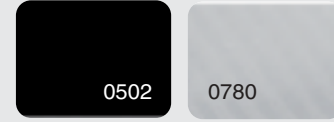
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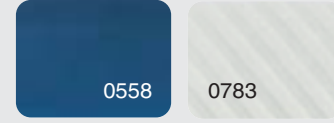
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0378 0738



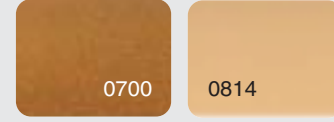
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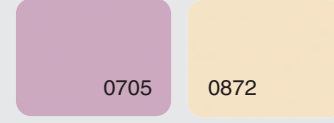
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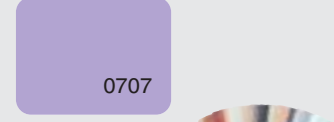
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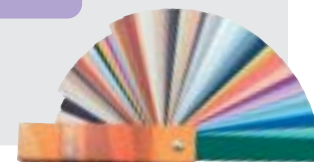
0700 0814



0705 0872



0707



Colour shades

# control elements

control elements



## Lower lock SP

In rooms where you can only reach the lower part of the window, we can supply a roof window with a lower handle (supply of tilting-swinging windows with lower lock is standard). A window with a lower lock cannot be controlled remotely.



## Telescopic control stick OT

The control stick can be lengthened up to 2 m and with it, you can control the window leaf of OK, EK, and TK product lines with an upper press-up lock positioned up to 4 meters above the floor level. Not available for windows with lower lock.



## Cord control PO

Cord control is used to control roof windows of OK, EK, and TK product lines positioned even higher than in the previous cases. It can be installed additionally onto an already fitted window with an upper press-up lock. Not available for windows with lower lock.



## Electric control EO

High-positioned roof windows of OK, EK, and TK product lines can be opened and closed with an electric remote control; the window leaf can be opened up to the distance of about 30 cm.



control unit



press button on the wall



unit of electric control including set of holders



remote control



heated sensor of rain and wind

## Fire ventilation

For buildings, where exhaust of smoke is required in case of fire, we will supply a fire ventilation system. The safety equipment for smoke exhaust can be used with windows of the OK, EK, and TK product lines. Concerning the price and use possibilities, please contact our Sales Department.

### ASSEMBLY

- carried out by a company authorized by the manufacturer, certified to implement system of fire ventilation (according to the Fire Protection Law).

### SERVICE

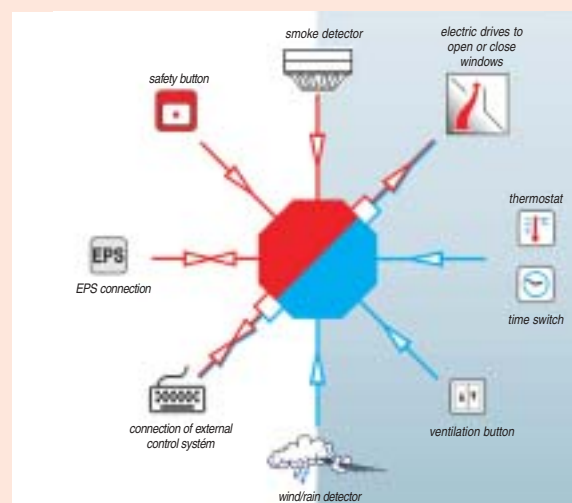
- warranty and after-warranty service carried out by an authorized company. According to the Regulation No. 246/2001, serviceability of the equipment has to be inspected at least once a year.

### CONTROL

- requirements are based on the fire protection report:  
 from several spots (floors)  
 several independent groups  
 combination with day ventilation

### BACKUP

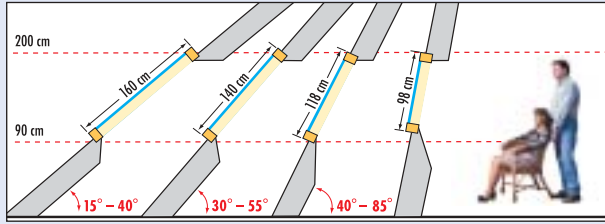
- entire system is back-upped for at least 48 hours.



**CERTIFICATION:** The company FK servis is certified to supply systems of automatic ventilation equipment Certificate No. TZUS 090-011 438

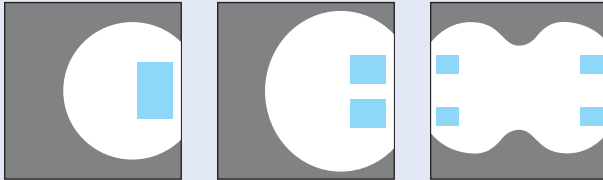
**DESIGN:** technical solutions designed the authorized company FK servis.

**PUTTING INTO OPERATION:** FK servis will carry out functional tests and issue a certificate of assembly and serviceability of the equipment.



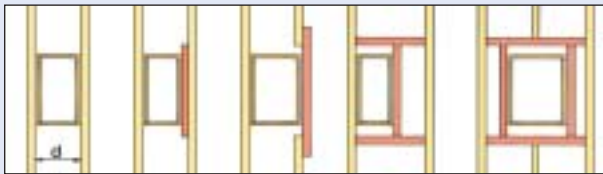
## Selection of placing height and optimum size of window

The selection of the window placing height is influenced by several factors - the roof structure gradient, quality of view, illumination of the future room, etc. Do not forget, however, that you must be able to control the window handle and the outer hood comfortably and clean both sides of the double glazing easily. Therefore, the upper edge should not be higher than 200 cm. According to the roof gradient, we choose such a window size that gives us a good view both in standing and sitting positions (the lower edge of the window frame should be about 90 cm from the floor).



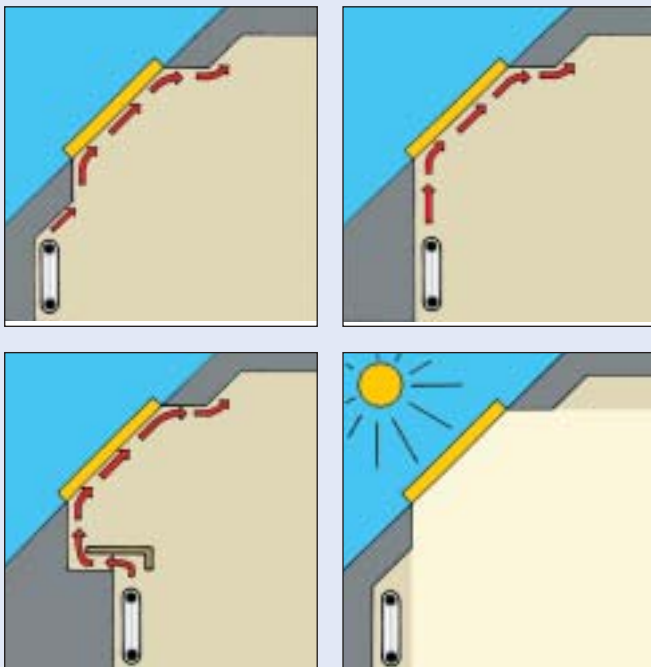
## Illumination

To illuminate a room optimally, the total glazing surface of windows should reach at least 10 % of the floor surface. The number and size of roof windows influence sufficient amount of light in the room, good space arrangement, as well as a good view. More roof windows enable more uniform illumination ratio than one large window (even with the same surface of glazing).



## Eventual adaptation of rafters

Adaptation of rafters is only necessary if the distance between rafters ( $d$ ) is smaller than the window width ( $w$ ) or bigger than the window width extended by 200 mm ( $d > w + 200$  mm). Adaptation above and below the window must be done in a sufficient distance from the window leaf to enable fitting of the lining horizontally above the window, and vertically below it.



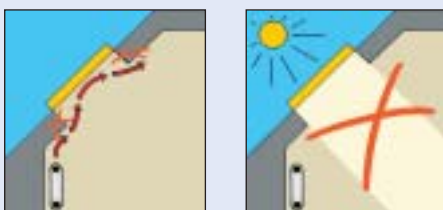
## Lining

To utilize all functions of a top-quality roof window fully, it is necessary to fit the window recess lining (facing) correctly. This will ensure maximum illumination of the room (30 - 40 % bigger amount of light than with a dormer window with the same glazing surface), not affecting the natural air circulation around the window pane. This way, the probability of condensation of the interior moisture on the surface of the insulating double-glazing will be considerably reduced.

*The following principles must be observed:*

- **It is optimal to locate heating elements directly below the roof windows.**
- **Warm air should flow round the lower part of the window.**
- **The lining must be vertical below the window, and horizontal above it.**

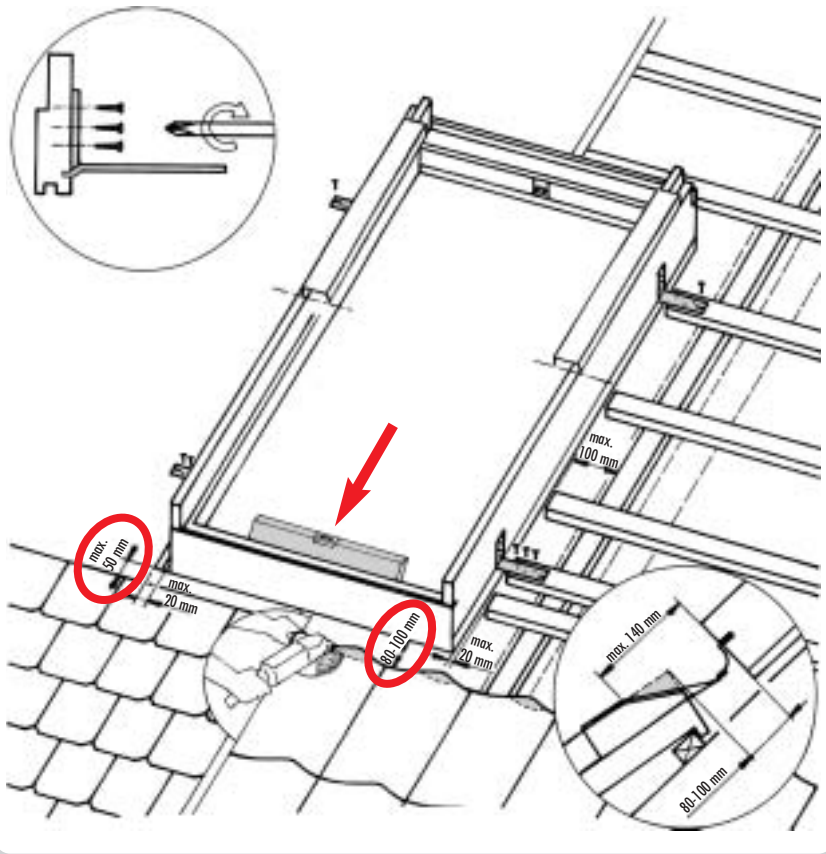
**WRONG FITTING**



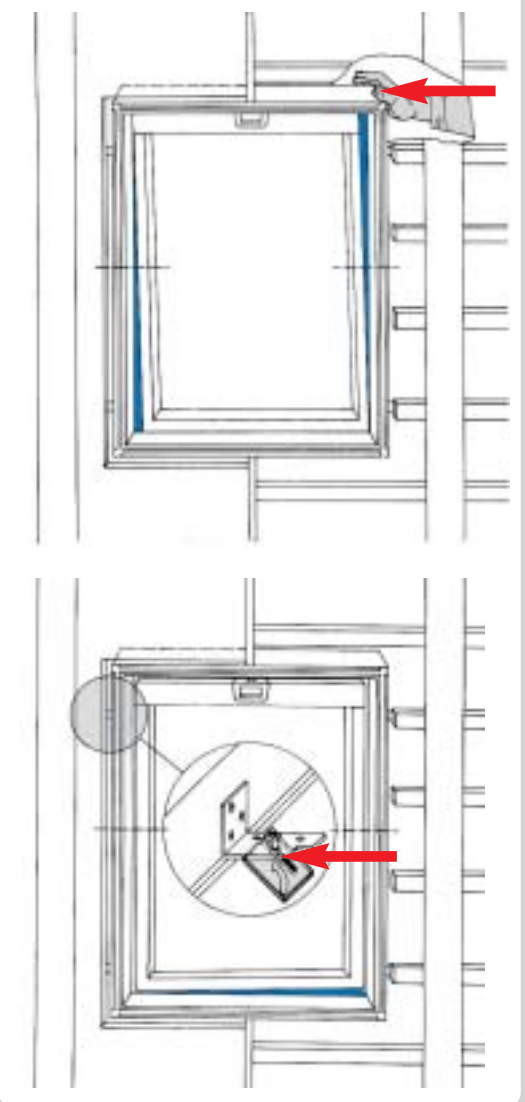
# Important things during installation

Important things during installation

observing of given distances



levelling of roof cracks



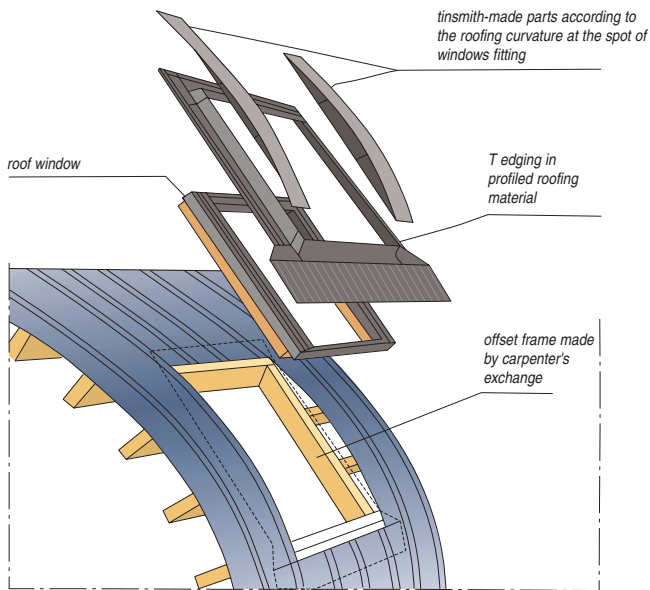
meeting of hydroisolation foil and placing of drain channel



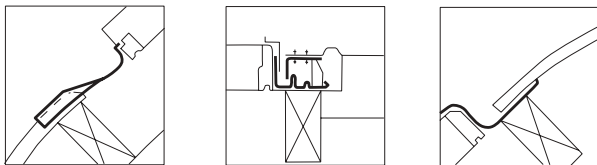
closing of roof covering to the high rib of edging



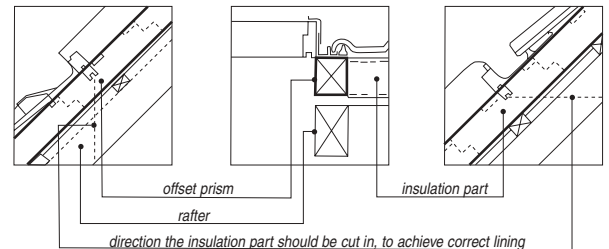
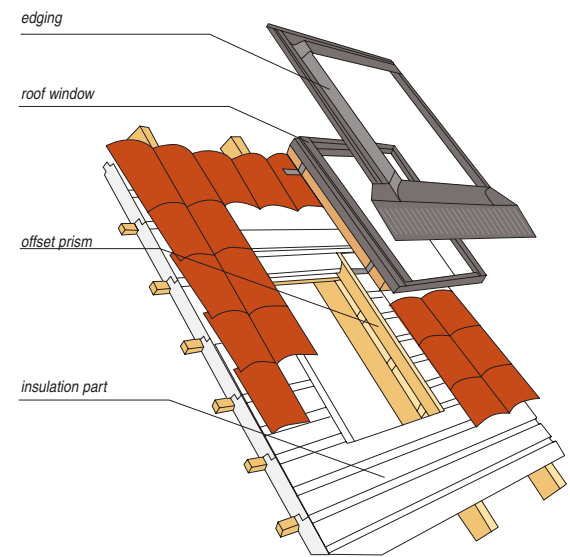
## Curved roofing



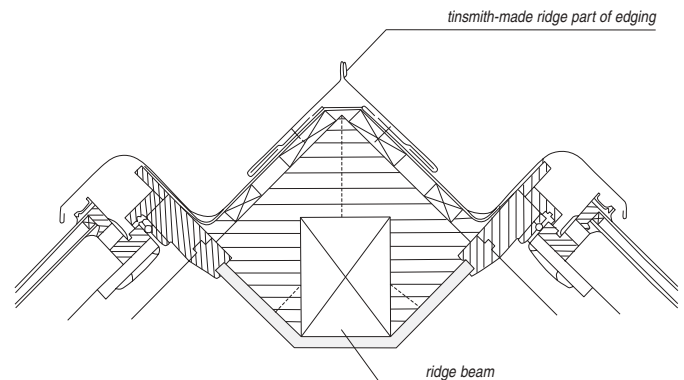
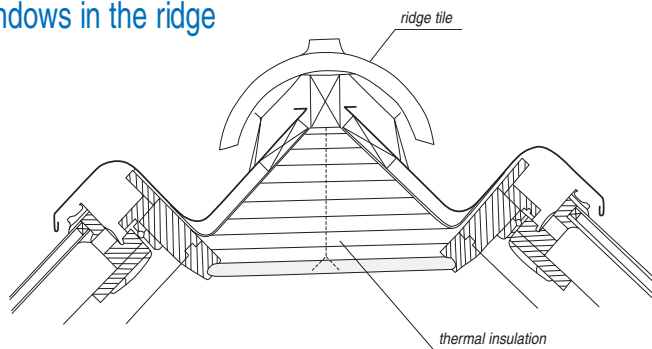
with horizontal rafters and profiled roofing material



## Insulation over the roof truss

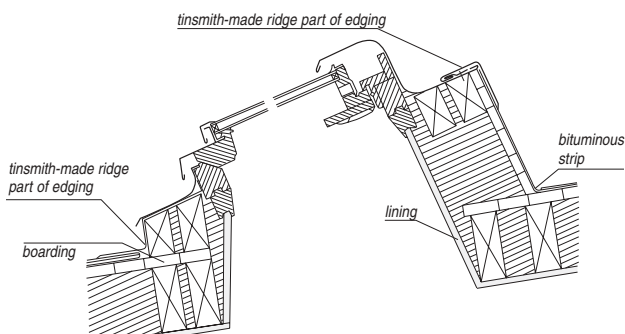


## Windows in the ridge



## Lifting frame

designed for roofs of gradient lower than 15°.



## Snow stoppers

In the mountains, we recommend to protect your roof windows against the sliding snow cover.

