



FLAT ROOF 2015
SYSTEM PRODUCTS



invite the **light** inside



FLAT ROOFS-WAYS OF ILLUMINATION

The benefits of natural illumination of buildings are unquestionable but in buildings with flat roofs it is not always possible to install additional vertical windows.

Type F



In order for each room to be a comfortable living space there should be a source of natural light. The ideal solution for providing light is the installation of specially designed products for flat roofs.

Type C



EF_



EFR



Fakro offers a choice of products for flat roofs that illuminate the interior with natural light, ventilate and combine high functionality with excellent thermal insulation parameters. The range includes flat roof windows with or without domes (type C and type F), a system for windows with an elevated installation angle (type EF) and a flat roof gable system (type EFR).

WINDOW STRUCTURE

The frame of the flat roof window is manufactured with multi-chamber PVC profiles.

The internal surface of the frame is white (RAL 9010). The material from which profiles are made have a high resistance against acids and very low moisture absorption, therefore the window can be installed in every room. Profiles are filled inside with insulating material, thus additionally improving the energy saving parameters of the product. The specially profiled covering material under the frame drip cap facilitates the finishing of the window connection with the roofing material.



Window type F (with innovative glazing unit)



Window type C (with a dome)

The type F flat roof window is equipped with an innovative glazing unit featuring excellent thermal insulation parameters and modern design. The window can be manufactured in any size. The type C window is equipped with a glazing unit and a polycarbonate dome. Flat roof windows are available in three versions:

DEF - electrically opened
DMF - manually opened
DXF - non-opening

DEC - electrically opened
DMC - manually opened
DXC - non-opening

The servo-motor in electrically opened windows is positioned in the sash and is protected against adverse weather conditions such as rain and snow. This ensures trouble free operation of the servo-motor and all control elements.



The electrically operated windows (type F and type C) have a built-in sensor that automatically activates the sash closing function when it rains.



MAIN ADVANTAGES OF FLAT ROOF WINDOWS

High energy-efficiency

Window type C

The special structure of FAKRO flat roof windows provides excellent thermal insulation parameters. The DEC U8 window with a passive, quadruple U8 glazing unit is characterised by a heat transmittance co-efficient for the whole window of **U=0.55** W/m²K (to EN1873). This result is for a 120x120cm window including frame with a sash and a dome.

Window type F

The type F window is available with a quadruple DU8 glazing unit. The heat transmittance co-efficient for the whole window is **U=0.76** W/m²K (to EN 12567-2) and makes the window suitable for use in energy-efficient and passive buildings.



Available in any size

In addition to standard sizes, the type F window can be manufactured in any size. The thermal insulation standards of buildings have been significantly increased and old skylights in flat roofs do not meet current requirements. The specification of the type F window allows for the easy and accurate replacement of existing often non-standard size skylights. This provides an improvement of the thermal insulation properties for the whole building.

Installation in green roofs

The flat roof window can be also mounted on an additional XRD base with a height of 15cm, which raises the window and allows its installation in green or living roofs.



Ample natural light

The specially designed shapes of the flat roof window profiles gives a glazing area that is up to 16% greater when compared with other manufacturer's windows of a similar size.





DEF
DMF
DXF

Flat roof windows **type F:**

- Comply with the European II anti-burglary class RC 2 according to EN 1627 (windows DMF DU6 Secure, DXF DU6 Secure),
- Have a very high, B class reaction to fire in accordance with EN 13501-1. It means that they are able to withstand the flame action during essential amount of time without spreading it,
- Characterized by the highest impact resistance class SB1200 according to EN 1873.



FLAT ROOF WINDOWS **TYPE F**



- A large amount of natural light. The specially designed shapes of the flat roof window profiles give a glazing area that is up to 16% greater when compared with other competitors' solutions.



- Windows frame is made of multichamber PVC profiles filled with insulating material. The upper part of the window is equipped with an innovative flat glazing unit.



- High energy efficiency. The construction of the window ensures very high thermal insulation parameters, which allows the use of the window in energy-efficient and passive buildings.

Window D_F DU8 - U for the whole window $U = 0.76 \text{ W/m}^2\text{K}$, according to EN 12567-2.



- In addition to the standard size, type F windows can be made in any size (ranging from 60x60 - 120x220cm). This allows for the replacement of existing windows, often with non-standard dimensions, which do not meet current thermal insulation requirements.



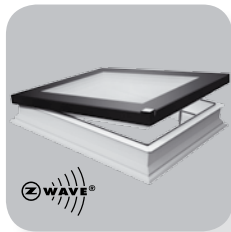
- Window can be mounted on an additional 15cm high base (XRD), e.g. for installation on a green roof.



- Mounted on roofs with a slope of 2-15 degrees.

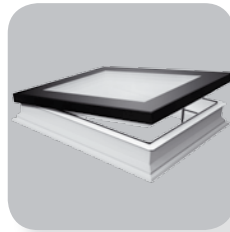


- The design of the window allows mounting of accessories both internal and external.



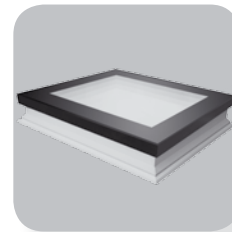
DEF

- opened electrically in the Z-Wave system,
- Included in kit: AC adapter, remote control, rain sensor,
- sash tilts 15cm



DMF

- opened manually by use of opening rod ZSD,
- sash tilts 30cm.



DXF

- non-opening

FLAT ROOF WINDOWS											
window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DEF DU6 Electrically opened											
DEF DU8 Electrically opened											
DMF DU6 Manually opened with ZSD rod.											
DMF DU6 Secure Manually opened with ZSD rod.											
DMF DU8 Manually opened with ZSD rod.											
DXF DU6 Non-opening											
DXF DU6 Secure Non-opening											
DXF DU8 Non-opening											

ZSD Control rod has to be bought separately

* according to EN 12567-2

Order processing time 8 15 25



DEC
DMC
DXC

Flat roof windows **type C:**

- Comply with the European II anti-burglary class RC 2 according to EN 1627 (windows DMC P4 Secure, DXF P4 Secure),
- Have a very high B class of reaction to fire in accordance with EN 13501-1. It means that they are able to withstand the flame action during essential amount of time without spreading it,
- Characterized by the highest impact resistance class SB1200 according to EN 1873.



FLAT ROOF WINDOWS **TYPE C**



- A large amount of natural light. The specially designed shapes of the flat roof window profiles give a glazing area that is up to 16% greater when compared with other competitors' solutions.



- Window frame is made of multi-chamber PVC profiles filled with insulating material. The upper part of the window is equipped with anti-burglary glazing P2 and dome (transparent D_C - C or opaque D_C - M).



- High energy efficiency. The construction of the window ensures very high thermal insulation parameters, which allows the use of the window in energy-efficient and passive buildings.



Window DEC-C U8 - co-efficient for the whole window $U = 0.72 \text{ W/m}^2\text{K}$ according to EN 12567-2 ($U = 0.55 \text{ W/m}^2\text{K}$ according to EN1873 frame with sash and dome for the size of 120x120cm).



Window DEC-C P2 - co-efficient for the whole window $U = 1.2 \text{ W/m}^2\text{K}$ according to EN 12567-2, which constitutes 14% better result than competitive solution.

- A wide range of standard sizes.



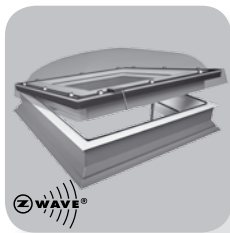
- Window can be mounted on an additional 15cm high base (XRD), e.g. for installation on a green roof.



- Mounted on roofs with a slope of 0-15 degrees.

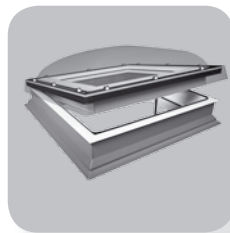


- The design of the windows allows mounting of accessories both internal and external.



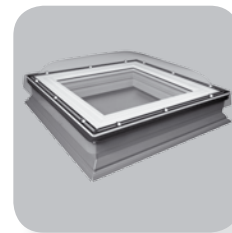
DEC

- opened electrically in the Z-Wave system,
- Included in kit: AC adapter, remote control, rain sensor,
- the sash tilts 15cm



DMC

- opened manually by use of opening rod ZS
- the sash tilts 30cm.



DXC

- non-opening

FLAT ROOF WINDOWS											
window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DEC-C U8(VSG) Electrically opened											
U=0,72 W/m²K* U=0,55 W/m²K**											
DEC-C P2 Electrically opened											
U=1,2 W/m²K*											
DMC-C P2 Manually opened with ZSD rod.											
U=1,2 W/m²K*											
DMC-C P4 Secure Manually opened with ZSD rod.											
U=1,2 W/m²K*											
DXC-C P2 Non-opening											
U=1,2 W/m²K*											
DXC-C P4 Secure Non-opening											
U=1,2 W/m²K*											

* according to EN 12567-2

** according to EN 1873 for the size 120x120cm

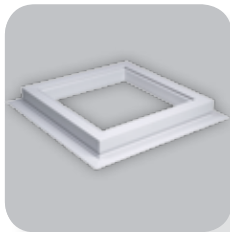
ZSD Control rod has to be bought separately



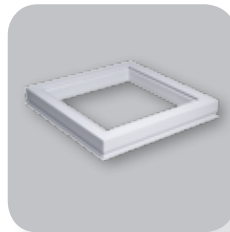
XRD

□ INSTALLATION BASE **XRD**

- The installation base makes it possible to raise the window above the flat roof by 15cm or multiple of this value allowing the installation in a "green roof". The installation base is designed for flat roof windows type C and type F.
- Reduces to minimum the time of window installation on flat roofs where raised windows are necessary (green roofs, shingles), It is adjusted to standard flat roof window sizes, but it is possible to make the XRD to measure for non-standard F type window size.
- Versatility of the XRD installation base allows for stacking two or more bases, in order to obtain a higher overall window base. The profile of the XRD installation base is made of recycled material (grey colour), and is environmentally friendly. The interior of the profile is filled with thermally insulating material (polystyrene) providing good insulating properties.



- extended element of the frame or "fin" allows for connection of the installation base with waterproofing insulation of the roof



- for a higher structure, the peripheral protruding "fin" is cut off and the bases are stacked.

INSTALLATION BASE XRD											
window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K

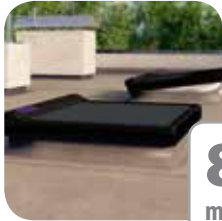
Order processing time 8 15 25

AMZ/F
AMZ/C



EXTERNAL ACCESSORIES - **AWNING BLINDS**

- The design of the flat roof window allows mounting of both internal and external accessories.
- Awning blind absorbs solar radiation before it reaches the glass and emits heat outside, thus on sunny days protects interior against burdensome heat.
- Awning blind- up to 8 times more effective protection against heat when compared with internal blackout blind.
- Effective shading of the interior whilst still allowing the view to the outside.
- Provides relief for our eyes, protecting them from the harmful effects of strong reflected light, which is especially important when working with computers.
- Protects from harmful UV radiation



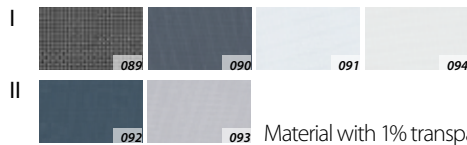
8 times
more effective

Solar awning blind AMZ/F Solar

- for roof windows type F,
- comfortable use, automatic operation of the awning blind (intelligent system controls the awning blind),
- the photovoltaic panel works as a sensor, which reacts to solar radiation,
- in bright sunlight the awning blind unrolls automatically and rolls up during the cloudy weather,
- powered by solar batteries.

Control :

- automatic operation or remote control,



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



Awning AMZ/C Z-Wave

- for roof windows type C,
- in wireless Z-Wave system,
- an innovative system enables installation of the awning blind below the window's dome,
- powered for the mains.

Control:

- remote control or wall switch,

Size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
Symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
AMZ/F I Solar (089, 090, 091 094)											
AMZ/F II Solar (092 093)											
Size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
Symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
AMZ/C I Z-Wave (089, 090, 091 094)											
AMZ/C II Z-Wave (092 093)											

When installing the AMZ/C Z-Wave on DXC and DMC windows, power supply and remote control have to be purchased additionally.

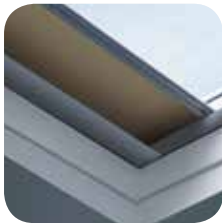
Order processing time 8 15 25



ARF/D

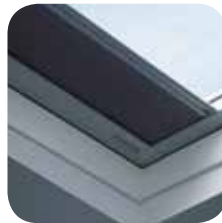
INTERNAL ACCESSORIES - **BLINDS**

- Internal roller blind protects against harsh sunlight and provides a decorative element.
- Provides a pleasant shaded interior on even the sunniest day.
- With the use of guides, the blind can be positioned at any point giving gradual reduction of incoming light, until the blackout.
- Available in two versions of control:



ARF/D

Control:
manual



ARF/D Z-Wave

- in wireless Z-Wave system,
- powered for the mains.
Control:
- remote control or wall switch.



Size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140	120x220
[m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
Symbol of size	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
ARF/D I											
ARF/D II											
ARF/D III											
ARF/D I Z-Wave											
ARF/D II Z-Wave											
ARF/D III Z-Wave											

When installing the AMZ/C Z-Wave on DXC and DMC windows, power supply and remote control have to be purchased additionally.

ZSD ROD



ZSD

ZSD telescopic rod used to operate DXC and DMC windows and internal blind ARF/D. Standard rod length is 119cm (can be extended to 330cm).

Order processing time 8 15 25



EF_

□ FLAT ROOF SYSTEM **EF**_

- The system is designed for easy installation of flat roof windows with an elevation of the installation angle in relation to the roof slope. It is ideal for the illumination of lofts, industrial buildings, warehouses and office spaces while retaining the insulation of the roof.
- Consists of two main components: a specially designed wooden housing with insulating material bonded to it and aluminium flashing to join the window to the housing. The wooden housing after installation has to be properly sealed and fixed to the existing roof covering.
- Flat roof windows installed can be equipped with internal and external accessories to protect against sunlight and overheating of the room. The most suitable are electrically controlled accessories.
- System installed in roofs with pitches from 0° to 15°.
- Available in several variants. Each allows for illumination and ventilation of the room under the flat roof and depending on the applied solution can fulfil additional functions.



ILLUMINATION EFW



FTP-V Z-wave window with remote control is recommended

EXIT EFE



- with side hung escape window FW access to flat roof

SMOKE VENTILATION EFS



- with smoke ventilation window FSP system used to expel the smoke and heat during fire

Size [cm]	55/78	55/98	66/98	66/118	78/98	78/118	78/140	94/118	94/140	114/118	114/140	134/98	78/160
[m ²]													
Symbol of size	01	02	03	04	05	06	07	08	09	10	11	12	13

Flat roof system EFW

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Size [cm]	66/78	66/98	66/118	78/98	78/118	94/118	94/98
[m ²]							
Symbol of size	22	03	04	05	06	08	15

Side hung escape window FWR U3, FWL U3

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Flat roof system EFE

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Size [cm]	78/140	94/140	114/118	114/140	134/98
[m ²]					
Symbol of size	07	09	10	11	12

Smoke ventilation window FSP P1

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Flat roof system EFS

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EFR

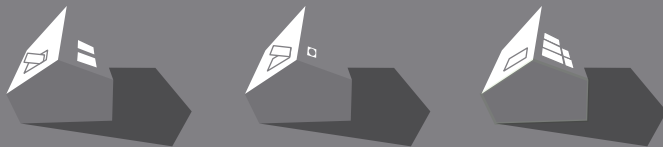
□ FLAT ROOF GABLE SYSTEM **EFR**

- The EFR system enables the installation of roof windows in combinations in flat roofs.
- Gabled, wooden structure with a set of flashings shortens the time it takes to create an effective and aesthetic solution that illuminates the room under a flat roof.
- Design allows for fitting of standard wooden roof windows and assures good thermal insulation.
- Consists of a wooden kerb made of plywood and EPS panels. The inner kerb walls are finished with plywood, which can be covered with the finishing lining. The minimum distance between adjacent windows is 40mm. Thermo flashing versions provide increased insulation.
- The product is supplied as a complete system consisting of kerb, flashing and auxiliary rafters. Windows must be purchased separately.
- Windows can be equipped with internal accessories protecting from the sunlight as well as exterior protecting against overheating of the room. We recommend the use of electrically operated accessories.
- Installation on roofs with pitches 0-15°.



- The basic version of the EFR system is offered for window widths of 78 and 114 cm in B2/2 combination. The standard height of the windows for this system is 118cm. The maximum flat roof opening is 228x250cm.
- Standard angle between the windows is 120° and the inclination to the plane of the roof is 30°.
- Other designs of EFR flat roof gable system are available to individual order. The total width of the combination can not exceed 250cm.

EFR B2/2						
Size [cm]	4 szt. 78x98	4 szt. 78x118	4 szt. 78x140	4 szt. 114x98	4 szt. 114x118	4 szt. 114x140
Overall product size [cm] -(SX Lxh)	196x217x73	196x252x83	196x290x94	268x217x73	268x252x83	268x290x94
Flat roof opening [cm]	156x177	156x212	156x250	228x177	228x212	228x250
 Effective glazing area B2/2 [m ²]	4,64	4,64	4,64	4,64	4,64	4,64
Product code	B2/2 05	B2/2 06	B2/2 07	B2/2 20	B2/2 10	B2/2 11



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