



INVITE
THE LIGHT
INSIDE





FLAT ROOFS - MEANS OF ILLUMINATION

The benefits of 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.

The FAKRO product range includes flat roof windows with or without domes (type C, type F and type G), flat roof system (type EF_) and a gable system (type EFR).

FAKRO flat roof products bring the very highest standard of natural light to interiors. They also provide ventilation and offer exceptional functionality. In short, they can transform any room under a flat roof.



FLAT ROOF WINDOW STRUCTURE

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.

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.



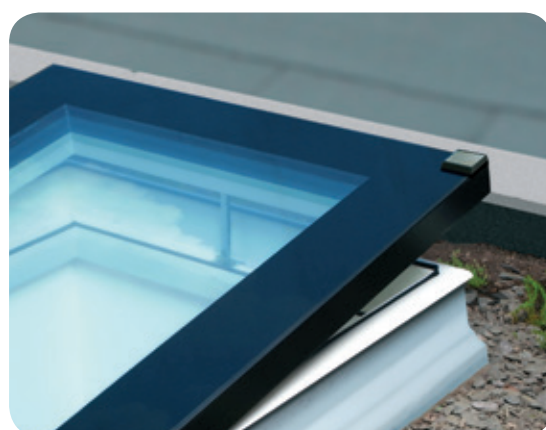
The servo-motor in electrically opened windows is positioned in the sash and is protected against adverse weather conditions such as rain and snow.

This ensures trouble free operation of the servo-motor and all control elements.



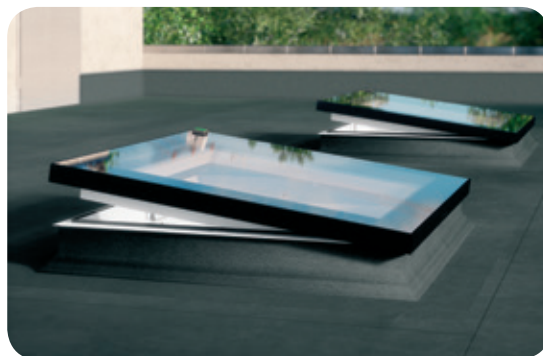
The electrically operated windows (type C, type F and type G) have a built-in sensor that automatically activates the sash closing function when it rains.

Electric actuator situated in the window sash allows for sash maximum micro-opening up to 150mm.



10 year
WARRANTY
for window

The type F flat roof window is equipped with an innovative glazing unit which offers excellent thermal insulation and is of contemporary design. The window can be manufactured to non-standard sizes within manufacturing tolerances or capability - please ask for further details. The type C window is equipped with a glazing unit and polycarbonate dome.



Window type F (with innovative glazing unit)

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

DEG - electrically opened
DMG - manually opened
DXG - non-opening



Window type C (with glazing unit and a dome)



Window type G (offered with a safety P2 glazing unit)



MAIN ADVANTAGES OF FLAT ROOF WINDOWS

HIGH ENERGY-EFFICIENCY

Window type C

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.

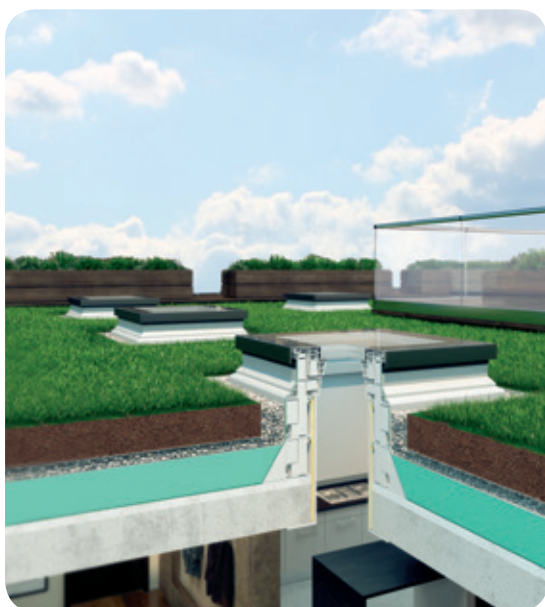
Window type F

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



INSTALLATION IN GREEN ROOFS

The flat roof window can be also mounted on an additional XRD base with a height of 15cm, for installation in green and living roofs.





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.

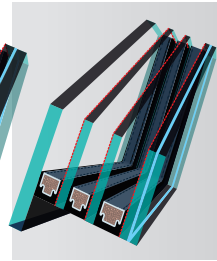
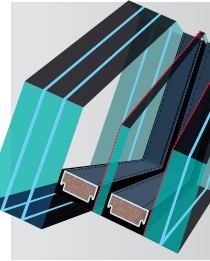
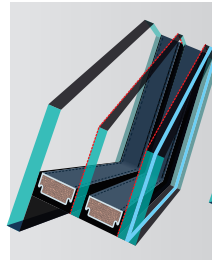
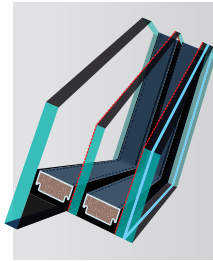


ACCESSORIES AND CONTROL



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.

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/m²K	0.5 W/m²K	0.5 W/m²K	0.4 W/m²K
GLAZING STRUCTURE	6H-18-4HT-18-44.2T for the sizes 100x150,120x120,140x140,120x220: 6H-16-4HT-18- 55.2T	6H-18-4HT-18-44.4T for the sizes 100x150,120x120,140x140,120x220 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

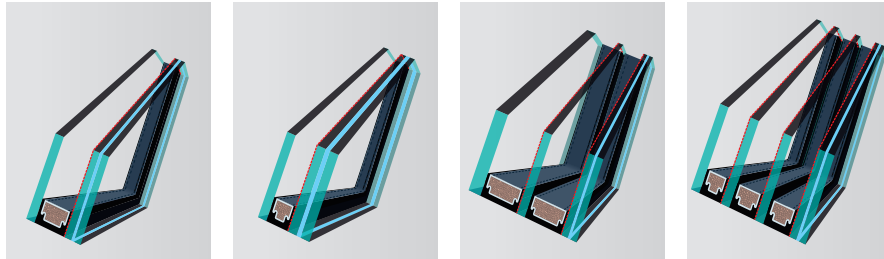
KEY TO SYMBOLS USED IN THE GLAZING STRUCTURE

6H - toughened glass
18 - glazing cavity filled with inert gas - argon
4HT - toughened glass with low emission coating
18 - glazing cavity filled with inert gas - argon
44.2T (55.2T) - anti-burglary glass with low emission coating

6H - toughened glass
18 - glazing cavity filled with inert gas - argon
4HT - toughened glass with low emission coating
18 - glazing cavity filled with inert gas - argon
44.4T (55.4T) - anti-burglary glass with low emission coating

888.44 - laminated glass with toughened safety glass on the outside pane and partially tempered safety glass on the middle and bottom pane
16 - glazing cavity filled with inert gas - krypton
4HT - toughened glass with low emission coating
18 - glazing cavity filled with inert gas - krypton
66.2 - anti-burglary glass with low emission coating

6H - toughened glass
10 - glazing cavity filled with inert gas - krypton
4HT - toughened glass with low emission coating
10 - glazing cavity filled with inert gas - krypton
4HT - toughened glass with low emission coating
12 - glazing cavity filled with inert gas - krypton
44.2T - anti-burglary glass with low emission coating



GLAZING UNIT

P2

P4

U6

U8 (VSG)

CHARACTERISTICS	Anti-burglary	Anti-burglary	Highly energy-efficient	Passive
U _g (EN 673)	1.1 W/m²K	1.1 W/m²K	0.5 W/m²K	0.3 W/m²K
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 %

KEY TO SYMBOLS USED IN THE GLAZING STRUCTURE

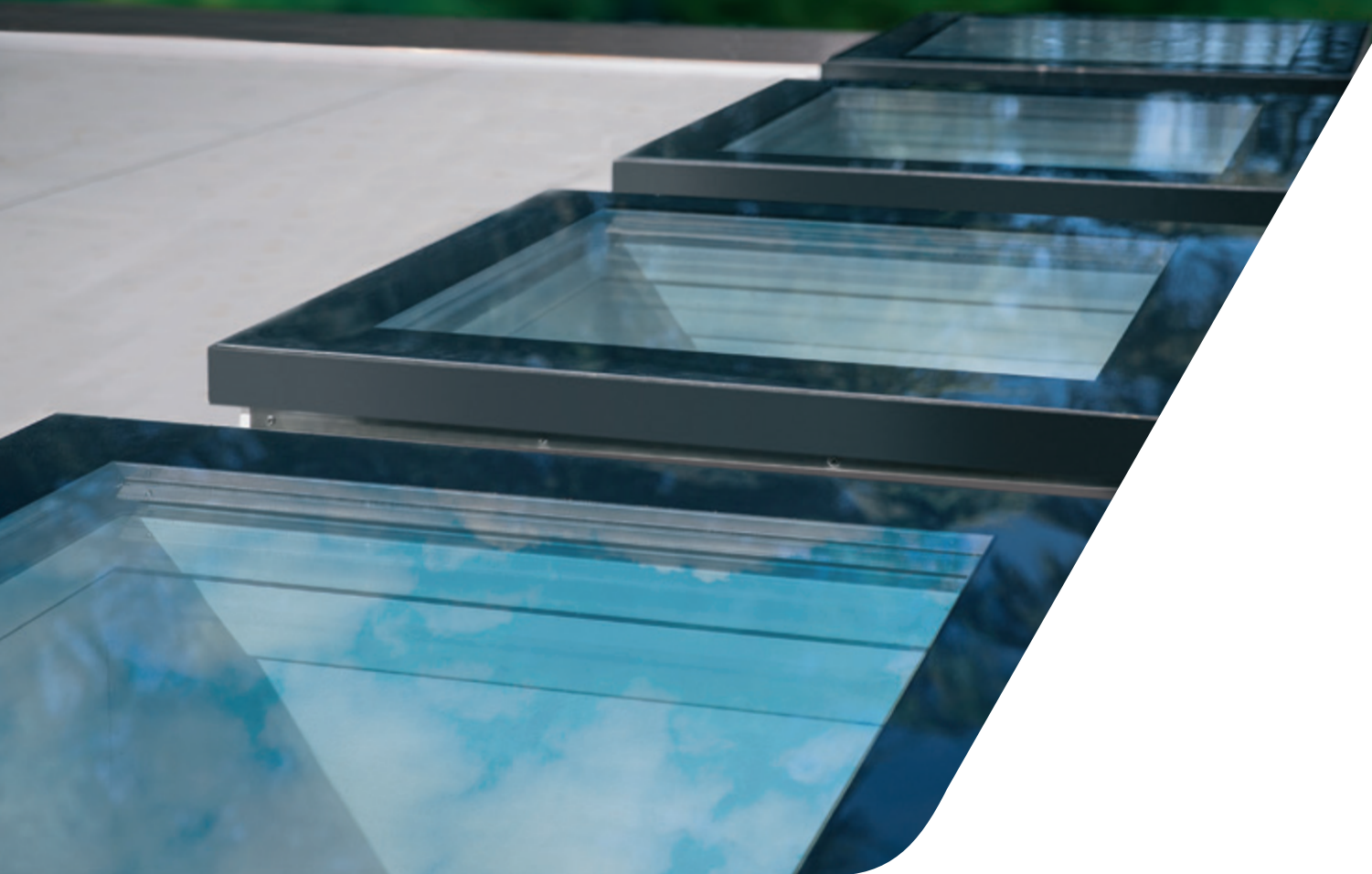
4H - toughened glass
14 - glazing cavity filled with inert gas - argon
33.2T - anti-burglary glass with low emission coating

4H - toughened glass
14 - glazing cavity filled with inert gas - argon
33.4T - anti-burglary glass with low emission coating

6H - toughened glass
18 - glazing cavity filled with inert gas - argon
4HT - toughened glass with low emission coating
18 - glazing cavity filled with inert gas - argon
33.2T - anti-burglary glass with low emission coating

4H - toughened glass
10 - glazing cavity filled with inert gas - krypton
4HT - toughened glass with low emission coating
12 - glazing cavity filled with inert gas - krypton
4HT - toughened glass with low emission coating
12 - glazing cavity filled with inert gas - krypton
33.2T - anti-burglary glass with low emission coating

**DEF
DMF
DXF**



➤ FLAT ROOF WINDOWS **TYPE F**

Flat roof windows type F:

- Have a very high, Class B fire resistance (PN-EN 13501-1). This confirms their high performance in relation to spread of flame.
- Are characterized by the highest impact resistance (Class 5 according to EN 14351-1).



reddot design award
winner 2016

The design innovation of the DEF DU6 flat roof window has been acknowledged with a prestigious Red Dot Award.



- An abundance of natural light. The specially designed shape of the window profiles has a secure glazing area up to 16% greater than those of competitors.



- The frame of the flat roof window is constructed of multi-chamber PVC profiles filled with insulation material. The upper part of the window has an innovative flat glazing unit. 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:

1) Energy-efficient, DU6 triple-glazed unit with a whole window U-value of 0.70 W/m²K (EN 14351-1).

2) Quadruple glazing unit DU8 with a whole window U-value of 0.64 W/m²K (EN 14351-1). Such excellent performance makes the window suitable for use in passive buildings.



- In addition to standard sizes, type F windows can be manufactured in any size (in the range of 60x60 - 120x120cm). This enables existing skylights to be replaced with ease.



- 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.



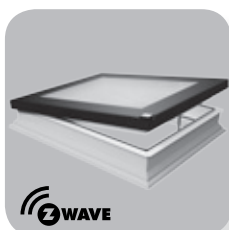
- In case there are three frames needed, the use of the XRD/W is advised; available as well in XRD/A version to be installed with D_F and D_G.



- The type F flat roof window is suitable for roof pitches between 2° and 15°.

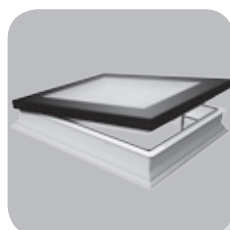


- The structure of the window enables installation of internal as well as external accessories.



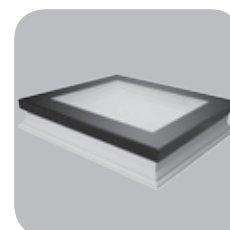
DEF

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



DMF

- opened manually by means of control rod
- sash tilts 30cm



DXF

- non-opening

FLAT ROOF WINDOWS

window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140 ¹	120x220 ¹
glazing area [m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
size symbol	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DEF DU6 Electrically opened	+	+	+	+	+	+	+	+	+	+	+
DEF DU8 Electrically opened	+	+	+	+	+	+	+	+	+	-	-
DMF DU6 Opened manually by means of control rod 2.2m long included	+	+	+	+	+	+	+	+	+	+	+
DMF DU8 Opened manually by means of control rod 2.2m long included	+	+	+	+	+	+	+	+	+	-	-
DXF DU6 Non-opening	+	+	+	+	+	+	+	+	+	+	+
DXF DU8 Non-opening	+	+	+	+	+	+	+	+	+	+	+

* according to EN 14351-1



Position of hinges and actuators in DEF and DMF opening windows.

¹ For DMF windows two screw actuators come only in sizes of 140x140cm and 120x220cm.

D_F ColourLine



Wide range of colours

► FLAT ROOF WINDOWS **TYPE F COLOURLINE**

Type F Colourline Flat roof windows are characterized by excellent thermal insulation parameters. The modern design and wide range of colour finishes enhance the aesthetics of flat roof designs.

RAL

- ColourLine F windows give the possibility of matching the external colour of the window to that of the roof covering being used.
- More than 200 colours from the RAL Classic palette make it easy to select the colour of the window for your design.
- Bright colour RAL 7024 of the standard windows in ColourLine series reduces the amount of heat from sun, so the windows in this colour are recommended for areas where the sun rays are very intensive.
- The qualities of the DEF DU6 flat roof window have been recognized by the prestigious Red Dot Design 2016 award. The minimalist, perfect style of the design decisively distinguishes the product.



- An abundance of the natural light. The specially designed shape of the window profiles has a glazing area of up to 16% greater than similar systems available on the market.



- The frame of our flat roof windows is constructed using multi-chamber PVC profiles that are insulated. The upper part of the window has an innovative flat glazing unit. The external glass is toughened and reflects the sun rays while the internal pane is anti-burglary Class P2. Should the pane crack, shards do not pose a danger but remain on the laminate film.



- Window is available in energy-efficient, DU6 triple glazed unit with a U-value for the whole window of 0,70 W/m²K wg (EN 14351-1). It is possible to manufacture the windows in ColourLine version of DU8 glazing or Secure.



- The F windows, in addition to the standard sizes, can be manufactured in any size (in the range of 60 x 60 to 120 x 220cm). This assists the replacement of existing skylights (often in non-standard dimensions) which fail to meet current Part L requirements.



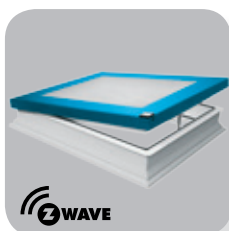
- Windows can be mounted on an additional XRD base with a height of 15cm, for installation in e.g. green roofs.
- In case there are three frames needed, the use of the XRD/W is advised; available as well in XRD/A version to be installed with D_F and D_G.



- The window is suitable for roof pitches between 2° and 15°.

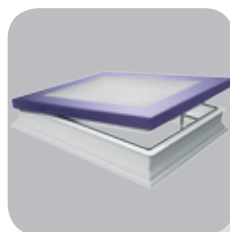


- The structure of the window allows the installation of both internal and external accessories.



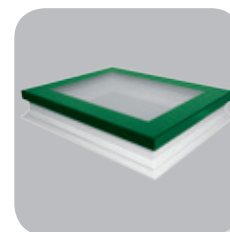
DEF ColourLine

- electrically opened with wireless Z-Wave system,
- included in the kit:
AC adaptor, remote control,
rain sensor
- sash tilts 15cm



DMF ColourLine

- opened manually by means of ZSD control rod 2.2m long included
- sash tilts 30cm.



DXF ColourLine

- non-opening

WINDOWS FOR FLAT ROOFS IN COLOURLINE VERSION RAL 7024

window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140 ¹	120x220 ¹
glazing area [m ²]	0,23	0,37	0,33	0,46	0,6	0,83	0,77	1,21	1,16	1,63	2,23
size symbol	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DEF DU6 ColourLine U=0,70 W/m ² K * electrically opened	+	+	+	+	+	+	+	+	+	+	+
DMF DU6 ColourLine U=0,70 W/m ² K * opened manually by means of ZSD control rod 2.2m long included	+	+	+	+	+	+	+	+	+	+	+
DXF DU6 ColourLine U=0,70 W/m ² K * non-opening	+	+	+	+	+	+	+	+	+	+	+

according to EN 14351-1:2006+A1:2010



Position of hinges and actuators in DEF and DMF opening windows.

¹ For DMF windows there are two screw actuators which come only in sizes of 140x140cm and 120x220cm.

**DEC
DMC
DXC**



➤ FLAT ROOF WINDOWS **TYPE C**

Flat roof windows type C:

- Have a very high, Class B fire resistance (PN-EN 13501-1). This confirms their high performance in relation to spread of flame.
- Are characterized by the highest impact resistance (Class SB 1200 - EN 1873).



- An abundance of natural light. The specially designed shape of the window profiles has a secure glazing area up to 16% greater than those of competitors.



- The frame of the flat roof window is constructed of multi-chamber PVC profiles filled with insulation material. The dome is made of durable polycarbonate which is characterised by high resistance to impact and adverse weather conditions such as rain or hail. Special coatings on the outer and inner surface of the dome protect it against UV radiation. Available with a transparent dome D_C-C or an opaque dome D_C-M.



- Windows are available with two glazing units:



1) Energy-efficient, DU6 triple-glazed unit with a whole window U-value of $U=1.2 \text{ W/m}^2\text{K}$ (EN 12567-2) which is as much as 14% better when compared with other manufacturer's products.

2) Quadruple glazing unit U8 (VSG) with a whole window U-value of $0.72 \text{ W/m}^2\text{K}$ (EN 12567-2) or $0.55 \text{ W/m}^2\text{K}$ (EN 1873 for the size 120x120cm). Such excellent parameters make the window suitable for use in passive buildings.



- A wide range of standard sizes.



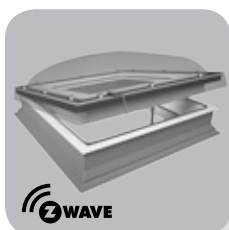
- Windows can be mounted on an additional XRD base with a height of 15cm, for installation in green or living roofs.



- The type C flat roof window is suitable for roof pitches between 0° and 15° .

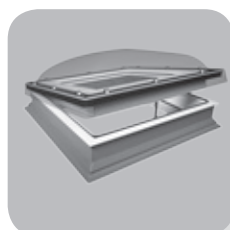


- The structure of the window enables installation of internal as well as external accessories.



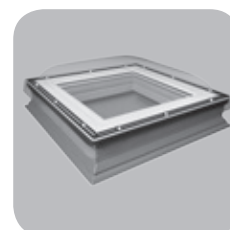
DEC

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



DMC

- opened manually by means of control rod
- sash tilts 30cm



DXC

- non-opening

FLAT ROOF WINDOWS

window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150 ¹	120x120 ¹	140x140	120x220
glazing area [m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
size symbol	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 Opened manually by means of control rod 2.2m long included U=1.2 W/m²K *	+	+	+	+	+	+	+	+	+	+	+
DXC-C P2 Non-opening U=1.2 W/m²K *	+	+	+	+	+	+	+	+	+	+	+

*according to EN 12567-2

**according to EN 1873 for the size 120x120cm



Position of hinges and actuators in DEC and DMC opening windows.

¹ DEC U8 (VSG) windows in sizes of 100x150cm and 120x120cm have two electric actuators.

D_F Secure
D_C Secure



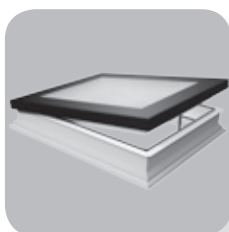
➤ FLAT ROOF WINDOWS **D_F Secure, D_C Secure**

Flat roof windows D_F Secure, D_C Secure:

- Comply with European anti-burglary class RC2 (EN 1627).
- Have a very high, Class B fire resistance (PN-EN 13501-1). This confirms their high performance in relation to spread of flame.
- Are characterized by the highest impact resistance (Class SB 1200 - EN 1873).

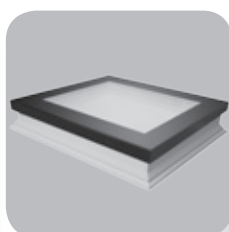


- An abundance of natural light. The specially designed shape of the window profiles has a secure glazing area up to 16% greater than those of competitors.
- The frame of the flat roof window is constructed of multi-chamber PVC profiles filled with insulation material. In the D_F Secure, the upper part of the window comes with an innovative flat glazing unit, while D_C Secure windows have a dome made of durable polycarbonate.
- Windows are available with two glazing units:
 - 1) D_F Secure windows with energy-efficient, DU6 Secure glazing with a Class P4A anti-burglary inner pane. The whole window U-value is 0.70 W/m²K (EN 14351-1).
 - 2) D_C Secure windows have a P4A anti-burglary inner pane and a whole window U-value of 1.2 W/m²K. Inner glass is anti-burglary and offers P4 A class.
- Windows can be mounted on an additional XRD base with a height of 15cm, for installation in green or living roofs.
- In case there are three frames needed, the use of the XRD/W is advised, available as well in XRD/A version to be installed with D_F and D_G.
- The type C flat roof window is suitable for roof pitches between 0° and 15°, while the type F is designed for pitches between 2° and 15°.
- The structure of the window enables installation of internal as well as external accessories.



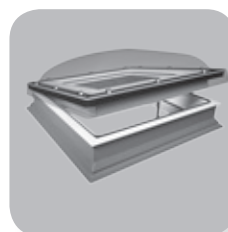
DMF Secure

- opened manually by means of control rod
- sash tilts 30cm



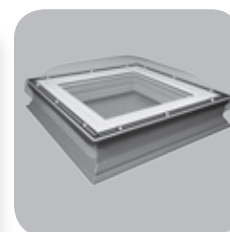
DXF Secure

- non-opening



DMC Secure

- opened manually by means of control rod
- sash tilts 30cm



DXC Secure

- non-opening

FLAT ROOF WINDOWS											
window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140 ¹	120x220 ¹
glazing area [m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
size symbol	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DMF DU6 Secure U=0.70 W/m ² K * Opened manually by means of control rod 2.2m long included	+	+	+	+	+	+	+	+	+	+	+
DXF DU6 Secure U=0.70 W/m ² K * Non-opening	+	+	+	+	+	+	+	+	+	+	+
DMC-C P4 Secure U=1.2 W/m ² K ** opened manually by means of control rod 2.2m long included	+	+	+	+	+	+	+	+	+	+	+
DXC-C P4 Secure U=1.2 W/m ² K ** Non-opening	+	+	+	+	+	+	+	+	+	+	+

* according to EN 14351-1

** according to EN 12567-2



Position of hinges and actuators in DMF Secure and DMC Secure opening windows.

¹ For DMF DU6 Secure windows two screw actuators come only in sizes of 140x140cm and 120x220cm.

**DEG
DMG
DXG**



➤ WINDOWS FOR FLAT ROOFS - **TYPE G**

The new range of technologically advanced G windows are based on the high performing C and F range, to give smart aesthetics and provide a alternative solution for bringing natural daylight into rooms below a flat roof.



- D_G window construction is based on the solutions available in our type C window range. The glazing system consisting of 4mm or 6mm toughened glass depending on the unit size combined with a unique aluminum black profile. The system is factory applied to the frame which substantially reduces the complete window installation time.
- The excellent thermal properties of these windows are attributed to the thermally broken multi-chamber PVC profiles complete with thermal insulation, the U_w heat transfer coefficient for the complete window is $0.92 \text{ W/m}^2\text{K}$, which far exceeds similar systems available on the market.



P2

- An abundance of the natural light. The specially designed shape of the window profiles provides a glazing area up to 16% greater than similar systems.



- Windows are offered with a safety P2 glazing unit equipped with internal laminated glass in P2A Class ensuring safety of use and protection against glass shards in case of damage. Optionally, there is also available anti-burglary glazing P4 in P4A Class.



- Windows are available in 9 standard sizes from 60x60cm to 120x120cm and 100x150cm. Available to special order are non-standard sizes ranging from 60x60 to 120x120cm. This assists in the replacement of existing skylights (often in non-standard dimensions) which fail to meet current Part L requirements.



- Windows can be mounted on an additional XRD base with a height of 15cm, in order to uplift the window for installation in e.g. green roofs.

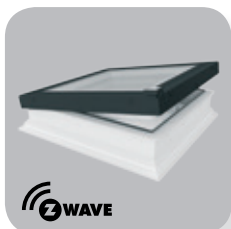


2-15°

- In case there are three frames needed, the use of the XRD/W is advised, available as well in XRD/A version to be installed with D_F and D_G.

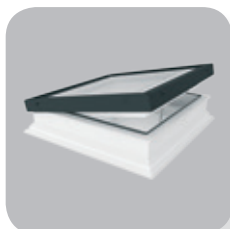


- The structure of the window enables installation of internal accessories.
- Suitable for roof pitches 2° to 15° .
- 10 year warranty.



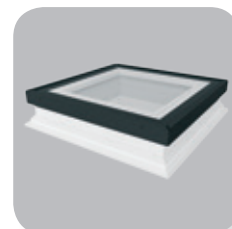
DEG

- electrically opened with wireless Z-Wave system,
- included in the kit: AC adaptor, remote control, rain sensor
- sash tilts 15cm



DMG

- opened manually by means of ZSD control rod 2.2m long included
- sash tilts 30cm.



DXG

- non-opening

FLAT ACCESS ROOF LIGHTS

window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	100x150	120x120	140x140 ¹	120x220 ¹
glazing area [m ²]	0.23	0.37	0.33	0.46	0.6	0.83	0.77	1.21	1.16	1.63	2.23
size symbol	01K	02K	03K	04K	05K	06K	07K	10K	08K	09K	11K
DEG P2 electrically opened	+	+	+	+	+	+	+	+	+	+	+
DMG P2 Opened manually by means of control rod 2.2m long included	+	+	+	+	+	+	+	+	+	+	+
DXG P2 non-opening	+	+	+	+	+	+	+	+	+	+	+

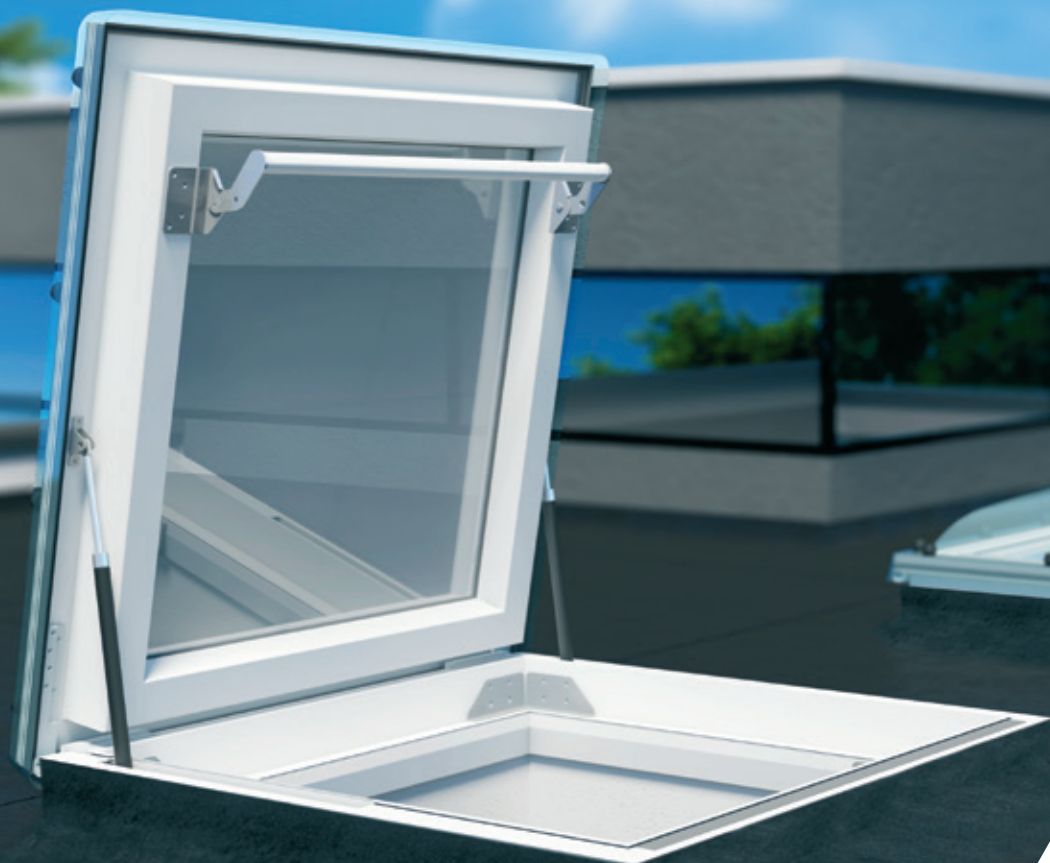
* according to EN 14351-1



Position of hinges and actuators in D_G opening windows.

¹ For D_G windows there are two screw actuators which come only in sizes of 140x140cm and 120x220cm.

DRC
DRF

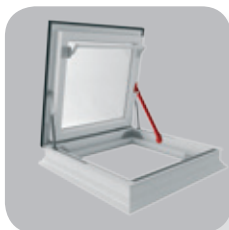


➤ FLAT ACCESS ROOF LIGHTS **DRF, DRC**

Insulated DRF, DRC access roof lights are another Fakro products expanding the range of solutions which provide safe and convenient access to the flat roof.

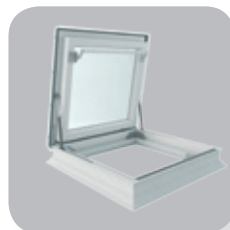


- They provide safe and convenient access to the flat roof. The use of special hinges and a simple method of operation enables the sash to be opened to 80°. Gas springs facilitate operation of the sash, keep it stable in the open position and protect against accidental closure. Additionally, the access roof light incorporates increased operational safety through use of an anti-slip coating on its outer surface.
- The frame of the flat roof window is constructed of multi-chamber PVC profiles filled with insulation material. In the DRF access roof light, the upper part of the window comes with an innovative flat glazing unit, while the DRC access roof light has a dome made of durable polycarbonate.
- Access roof lights are available with two glazing units:
 - 1) The DRF access roof light with energy-efficient, DU6 glazing unit with a Class P2A anti-burglary inner pane and a whole window U-value of 0.74 W/m²K (EN 14351-1).
 - 2) The DRC access roof light with P2 glazing unit and a whole window U-value of 0.88 W/m²K (EN 1873:2014).
- Windows can be mounted on an additional XRD base with a height of 15cm, for installation in green or living roofs.
- In case there are three frames needed, the use of the XRD/W is advised, available as well in XRD/A version to be installed with DRF.
- The type C flat access roof light is suitable for roof pitches between 0° and 15°, while the type F is designed for pitches between 2° and 15°.
- The structure of the access roof light enables installation of internal as well as external accessories. Use of an external awning blind protects the room from overheating, while internal accessories provide protection from intense sunlight and enhance interior design.
- As an option there is available the ZBL/D lock, which locks the DR_exit.



DRF

- flat access roof light without a dome,
- DRF goes with ZBR lock



DRC

- flat access roof light with a dome. The dome can be transparent (DRC-C) or opaque (DEC-M)

FLAT ACCESS ROOF LIGHTS

window size [cm]	90x90	90x120	100x100	120x120
glazing area [m²]	0,6	0,83	0,77	1,16
size symbol	05K	06K	07K	08K
DRF DU6 U=0.74 W/m²K *	+	+	+	+
Flat access roof light without a dome				
DRC-C P2 U=0.88 W/m²K **	+	+	+	+
Flat access roof light with a dome				

* according to EN 14351-1

** according to EN 1873 for the size of 120x120cm



DXW

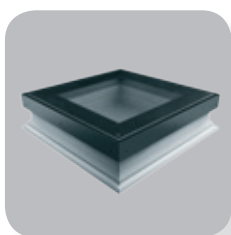
➤ FLAT ROOF WINDOW **DXW**

The DXW flat roof window offers a completely new approach to be taken with flat roof design. Its specially strengthened sash and frame enable it to be installed completely flush within the roofline.

With special design features such as enhanced load-bearing capacity and a lasting, non-slip coating you can walk across its surface freely.



- 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.
- The window comes with passive, double-chamber glazing unit with a U-value of 0.70 W/m²K.
- Suitable for roof pitches between 0° and 15°.
- It is possible to install the same internal accessories which are used in all our type F flat roof windows.
- Can be installed on XRD/W.



DXW

- providing a surface level with the roof and a special non-slip coating to ensure complete safety when walking across it
- enhanced load capacity
- high resistance to break-in attempts thanks to reinforced design
- reduced heat loss ($U_w=0.70 \text{ W/m}^2\text{K}$)
- modern design and high quality finish
- quick and easy installation
- profiles which clamp the covering material and facilitate the finish of the window connection with the roofing material included as standard

FLAT ROOF WINDOWS								
window size [cm]	60x60	60x90	70x70	80x80	90x90	90x120	100x100	120x120
glazing area [m²]	0,23	0,37	0,33	0,46	0,6	0,83	0,77	1,16
size symbol	01K	02K	03K	04K	05K	06K	07K	08K
DXW Non-opening	U=0.70 W/m²K *							
	+	+	+	+	+	+	+	+

* according to EN 14351-1

**DSF
DSC**



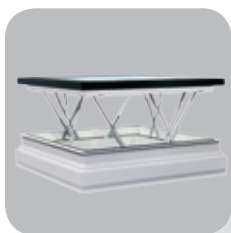
► SMOKE VENTILATION FLAT ROOF WINDOWS

DSF, DSC smoke ventilation flat roof windows are used for extraction of smoke and heat emitted in a building during a fire. This is a perfect solution for stairwells where under normal operating conditions this window serves the purpose of room ventilation and lighting.

FAKRO smoke ventilation windows combine the standard function of a roof window with that of automatic smoke evacuation in a single product.

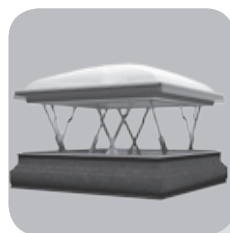


- An abundance of natural light in buildings with flat roofs.
- The frame of the smoke ventilation window is constructed of multi-chamber PVC profiles filled with insulation material.
- Easy opening to set the window in standard ventilation position (everyday flow of fresh air).
- The sash raises to 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 two or four 24V actuators ensure perfect operation and ease of access for maintenance purposes.
- Option of solar-operated external accessories.
- Suitable for roof pitches between 0° and 15°. When installing, windows must be level.



DSF

- smoke ventilation flat roof window without dome
- modern design - new smoke ventilation windows have the same profile as standard flat roof windows
- the upper part of the window comes with an innovative flat glazing unit DU6 $U_g=0.5 \text{ W/m}^2\text{K}$
- the size 105x105 has a 1m^2 of geometric smoke ventilation area to meet the varied standards required in different countries
- DSF windows can be painted in any colour chosen from the RAL Classic palette
- $U_w=0,79 \text{ W/m}^2\text{K}$ for DSF DU6 120x120 (EN 14351-1)



DSC-C

- smoke ventilation flat roof window with a dome made of durable polycarbonate. Dome made of durable polycarbonate which can be transparent (DSC-C) or opaque (DSC-M)
- equipped with P2 glazing unit ($U_g=1.1 \text{ W/m}^2\text{K}$)

SMOKE VENTILATION FLAT ROOF WINDOWS

window size [cm]		100x100	105x105	120x120
glazing area [m ²] size symbol		0,77	1,00	1,16
		07K		08K
DSF DU6	$U_g=0.5 \text{ W/m}^2\text{K}$	-	+	+
DSC-C2 P2	$U_g=1.2 \text{ W/m}^2\text{K}$	+	-	+



DRL

LML

➤ FLAT ROOF ACCESS DOOR

The DRL roof access door is an innovative product providing safe and comfortable access to the flat roof. Its structural durability and range of sizes provide the perfect combination with a loft ladder.



- Fully assembled product.



- The frame is constructed of multi-chamber PVC profiles filled with insulation material.

- 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 adjusted according to the size of loft ladder (loft ladders are sold separately - see Loft Ladder Catalogue).

- Can be mounted on an additional XRD/W base with a height of 15cm, for installation in green and living roofs.

- As an option there is available the ZBL/D lock, which locks the DRL exit.

- Option to install an additional ZBR lock which protects against accidental closure of the sash.



- Suitable for roof pitches between 0° and 5°.



DRL

- mounted on the roof surface
- the whole structure is insulated



LML (details to be found in Loft Ladder Catalogue)

- can be installed in the opening under the DRL roof access door
- mechanism to support unfolding and folding the ladder
- additional tread in the box
- wide (13cm) anti-slip treads

FLAT ROOF ACCESS DOOR

Roof access door size [cm]	60x120	70x120	70x130	70x140	86x130	92x130
DRL	+	+	+	+	+	+

Room height [cm]	280						305				
Loft ladder size [cm]	60x120	70x120	70x130	70x140	86x130	92x130	60x130	70x130	70x130	86x130	92x130
LML	+	+	+	+	+	+	+	+	+	+	+

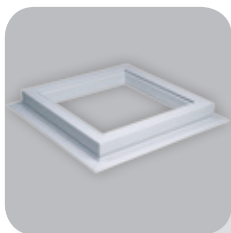


XRD

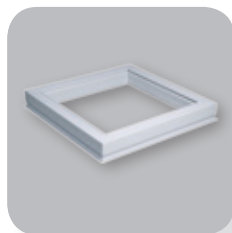
► INSTALLATION BASE **XRD**

The XRD installation base is specifically designed for our range of flat roof windows. It allows the window to be installed above the roof line by 15cm which may be required with green or warm roof designed systems. Up to two 15cm XRD systems may be combined with one window or up to three if XRD/W is used.

- The XRD installation base is designed for flat roof windows type C and type F. It allows to raise the window above the flat roof by an additional 15cm.
- Reduces to a minimum the time of window installation on flat roofs where an upstand to raise a window is required (e.g. green or gravel roofs).
- 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 installation 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 also possible to manufacture non-standard size of the XRD installation base to fit non-standard size of the type F flat roof windows.
- XRD/W is designed to be used with DR_ and DXW.
- XRD/A - angled installation frame uplifting the installation angle by three degrees, to be installed with F and G type windows, used directly under the window and compatible with XRD i XRD/W frames.



- extended element of the frame, the so called 'fin' allows for connection of the installation base with waterproofing layer of the roof



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



- XRD/W has impregnated timber inserts to provide added rigidity to the kerb upstand allowing the possibility to combine 3 kerbs for additional height.

INSTALLATION BASE											
window size [cm] size symbol	60x60 01K	60x90 02K	70x70 03K	80x80 04K	90x90 05K	90x120 06K	100x100 07K	100x150 10K	120x120 08K	140x140 09K	120x220 11K
XRD	+	+	+	+	+	+	+	+	+	+	+
XRD/W	+	+	+	+	+	+	+	+	+	+	+

window size [cm] size symbol	60x120 13K	70x120 14K	70x130 15K	70x140 16K	86x130 17K	92x130 18K
XRD/W	+	+	+	+	+	+

➤ ADDITIONAL ACCESSORIES



TELESCOPIC ROD ZSD

is used for operating flat roof windows DMF, DMC and internal roller blinds ARF/D. Standard rod length is 119 cm (can be extended to 330 cm).

ZSD	+
------------	---



ZBR LOCK

protects against unintentional closure of the sash caused by accidental push or strong gusts wind.

ZBR	+
------------	---



ZBL/D LOCK

enables closing the window with the key everywhere where it is necessary to protect the roof against unauthorized entrance (eg in the multi family building). The lock is compatible with all standard DRF and DRC windows and DRL roof access door.

ZBL/D	+
--------------	---

AMZ/F
AMZ/C



➤ EXTERNAL ACCESSORIES - **AWNING BLINDS**

The Awning Blinds are available for both: for F and C type flat roof windows in Solar and Z Wave versions. Once installed they absorb solar radiation before it reaches the glazing.

- The structure of the flat roof window enables installation of internal as well as external accessories.
- The awning blind absorbs solar radiation before it reaches the glazing and emits the heat to the outside. It therefore provides much better protection against solar gain.
- Up to 8 times more effective than internal blinds.
- Effective shading of the room whilst still allowing view to the outside.
- Provides relief for the eyes and protection from harmful effects of strong reflected light, especially uncomfortable when working on a computer.
- Protection against UV radiation.



8 times
more effective

AMZ/F Solar

- for type F roof windows
- comfortable, automatic operation of the blind (intelligent system controls the awning blind depending on the insolation level). Photovoltaic panel acts a sensor and reacts to solar radiation. High insolation levels trigger the awning blind to unroll automatically. In cloudy weather, the awning blind rolls back up automatically without any user intervention.
- powered by a solar battery pack

Control:

- automatic operation or remote control



AMZ/C Z-Wave

- for type C roof windows
- opened with wireless Z-Wave system
- innovative profile system enables installation of the awning blind under the window's dome
- powered from the mains

Control:

- remote control or wall switch

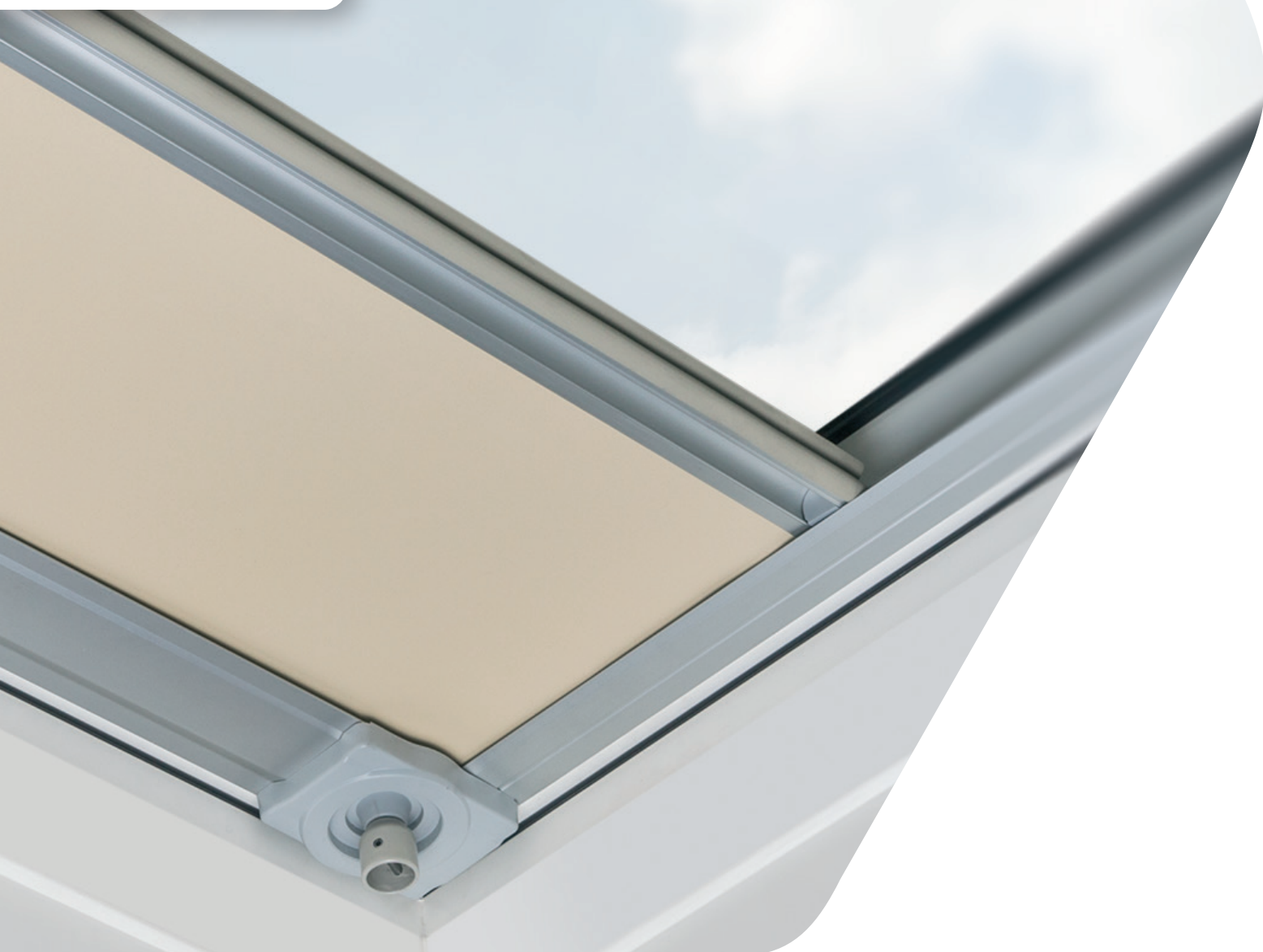


The material samples printed can differ in colour from the actual product.

Window size [cm] Size symbol	60x60 01K	60x90 02K	70x70 03K	80x80 04K	90x90 05K	90x120 06K	100x100 07K	100x150 10K	120x120 08K	140x140 09K	120x220 11K
AMZ/F I Solar (088, 089, 090, 091, 094, 097)	+	+	+	+	+	+	+	+	+	+	+
AMZ/F II Solar (092, 093)	+	+	+	+	+	+	+	+	+	+	+
Window size [cm] Size symbol	60x60 01K	60x90 02K	70x70 03K	80x80 04K	90x90 05K	90x120 06K	100x100 07K	100x150 10K	120x120 08K	140x140 09K	120x220 11K
AMZ/C I Z-Wave (088, 089, 090, 091, 094, 097)	+	+	+	+	+	+	+	+	+	+	+
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.

ARF/D



➤ INTERNAL ACCESSORIES - **BLINDS**

- Provides a pleasant shade in the interior when you need a rest from the glare of the sun.
- Offers scope to lock the blind in any position thanks to the side guides and achieve gradual reduction of incoming light up to blackout.
- Available in two opening options.



ARF/D

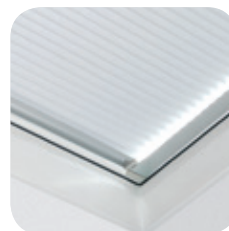
Control:
- operated by means
of ZSD control rod



ARF/D Z-Wave

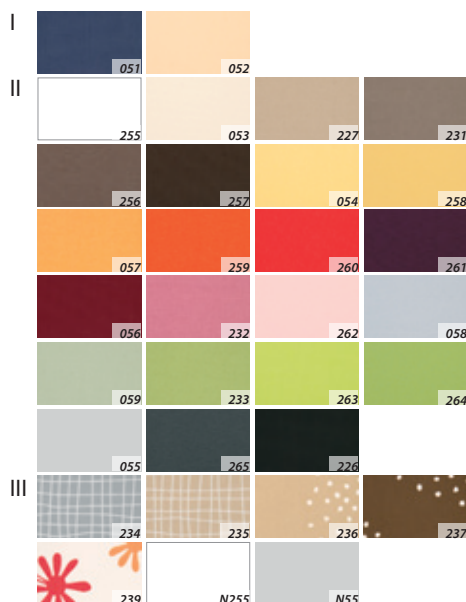
- opened with wireless
Z-Wave system
- powered from the mains

Control:
- remote control or wall switch

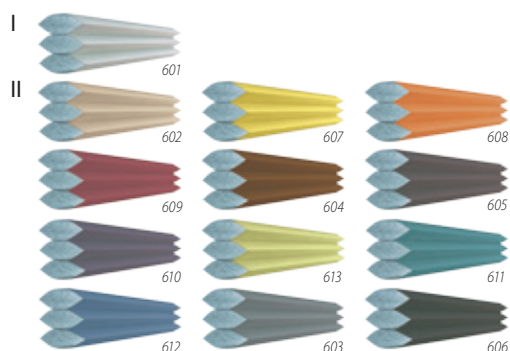


APF/D

- partial reduction of heat in the room
- fabric with a honeycomb structure and an internal
aluminium coating 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
- operated by means of ZSD or ZST control rod



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



Window size [cm] Size symbol	60x60 01K	60x90 02K	70x70 03K	80x80 04K	90x90 05K	90x120 06K	100x100 07K	100x150 10K	120x120 08K	140x140 09K	120x220 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	+	+	+	+	+	+	+	+	+	-	-
APF/D I	+	+	+	+	+	+	+	+	+	+	+
APF/D II	+	+	+	+	+	+	+	+	+	+	+

When installing the Z-Wave blinds on DX_ and DM_ windows, power supply and remote control have to be purchased additionally.



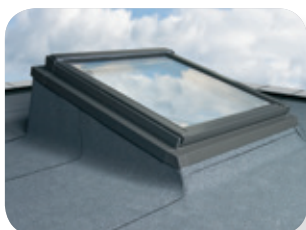
EF_

➤ FLAT ROOF SYSTEM **EF_**

Flat roof system makes it possible to install windows on flat or very low-pitch roofs providing natural light when adopting attic with low pitched roof to living space.



- The system enables you to provide a pitch within the window upstand and therefore enables a standard roof window to be used on a flat roof.
- The flat roof system is an ideal solution for illumination of residential or commercial spaces while retaining good insulation performance of the roof.
- It consists of two main components: a specially designed wooden base with insulation material and aluminium flashing to join the window with the housing. Once installed, the wooden housing must be properly fixed and sealed to the existing roof covering.
- Windows in the flat roof system can be equipped with internal accessories to protect against sunlight and external accessories to protect against overheating of the room. We recommend the use of electrically operated accessories.
- Suitable for roof pitches between 0° and 15°.
- Available in several options. Each provides illumination and ventilation of the room and, depending on the requirement, can provide several additional functions.



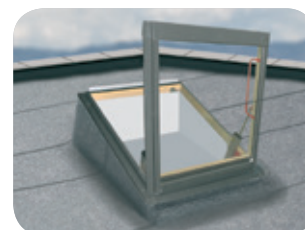
ILLUMINATION EFW

- with roof window - FTP Z-Wave window with remote control is recommended



EXIT EFE

- with FW_side hung escape window - access to a flat roof



SMOKE VENTILATION / EFS

- with FSP smoke ventilation window used for extraction of smoke and heat emitted during a fire

FLAT ROOF SYSTEM													
window size [cm]	55/78	55/98	66/98	66/118	78/98	78/118	78/140	78/160	94/118	94/140	114/118	114/140	134/98
size symbol													
EFW Flat roof system	+	+	+	+	+	+	+	+	+	+	+	+	+

window size [cm]	66/78	66/98	66/118	78/98	78/118	94/118	94/98
size symbol							
EFE Flat roof system	+	+	+	+	+	+	+
FWR U3, FWL U3 Side hung escape window	+	+	+	+	+	+	+

window size [cm]	78/140	94/140	114/118	114/140	134/98
size symbol					
EFS Flat roof system	+	+	+	+	+
FSP P1 Smoke ventilation window	+	+	+	+	+

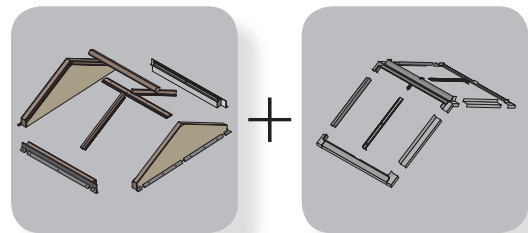


EFR


➤ FLAT ROOF GABLE SYSTEM **EFR**

The EFR system provides a pitch for the installation of standard roof windows in combination in flat roof structure.

- Gabled, wooden structure with a set of flashings reduces the time needed to create an effective and aesthetic solution which provides illumination of the room under a flat roof.
- Flat roof gable system ensures good thermal insulation performance using any standard FAKRO roof windows.
- Design allows for fitting standard wooden roof windows.
- The product is supplied as a complete system and provides a high standard of thermal insulation (using an optional Thermo flashing if required). It consists of a wooden kerb with auxiliary rafters, OSB and EPS panels. The inner OSB panels can be finished with a lining. The minimum distance between adjacent windows is 40mm.
- Windows can be equipped with internal accessories to protect against sunlight and external accessories to protect against overheating of the room. We recommend the use of electrically operated accessories.
- Suitable for roof pitches between 0° and 5°.



- Maximum window height for this system is 140cm.
- Maximum flat roof opening is 228x250cm.
- Standard angle between windows is 120° and the angle to that of the roof is 30°.
- Other designs of the EFR flat roof gable system (B3/2, B4/2) and other window angles are available to individual order. The total width of the combination cannot exceed 250cm.

FLAT ROOF GABLE SYSTEM						
Size [cm]	4 pcs.78x98	4 pcs.78x118	4 pcs.78x140	4 pcs.114x98	4 pcs.114x118	4 pcs.114x140
Overall product size [cm] - (S x L x h)	196x217x73	196x252x83	196x290x94	268x217x73	268x252x83	268x290x94
Flat roof opening [cm]	156x177	156x212	156x250	228x177	228x212	228x250
 Glazing area B2/2 [m²]	1,88	2,36	2,92	3,04	3,80	4,64
Product code	B2/2 05	B2/2 06	B2/2 07	B2/2 20	B2/2 10	B2/2 11
EFR	+	+	+	+	+	+

NON-STANDARD DIMENSIONS OF TYPE F WINDOWS

DXF DU6

		Window width = 60 to 220cm																		
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220		
Window height = 60 to 220cm	60	0,23																		
	70		0,33																	
	80			0,46																
	90	0,37			0,6															
	100					0,77														
	110																			
	120				0,83			1,16												
	130																			
	140									1,63										
	150					1,21														
	160																			
	170																			
180																				
190																				
200																				
210																				
220								2,23												

- available non-standard sizes
- sizes not available
- 0,23 - effective glazing area in standard windows

DMF DU6

		Window width = 60 to 220cm																		
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220		
Window height = 60 to 220cm	60	0,23																		
	70		0,33																	
	80			0,46																
	90	0,37			0,6															
	100					0,77														
	110																			
	120				0,83			1,16												
	130																			
	140									1,63										
	150					1,21														
	160																			
	170																			

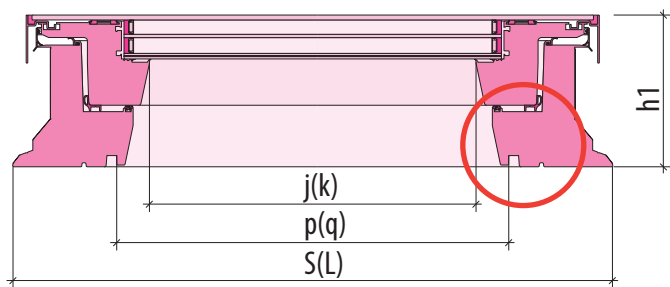
- available non-standard sizes
- sizes not available
- 0,23 - effective glazing area in standard windows

DEF DU6

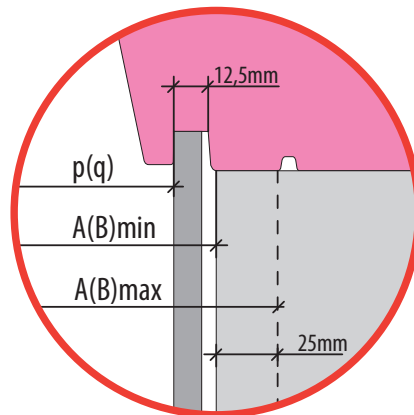
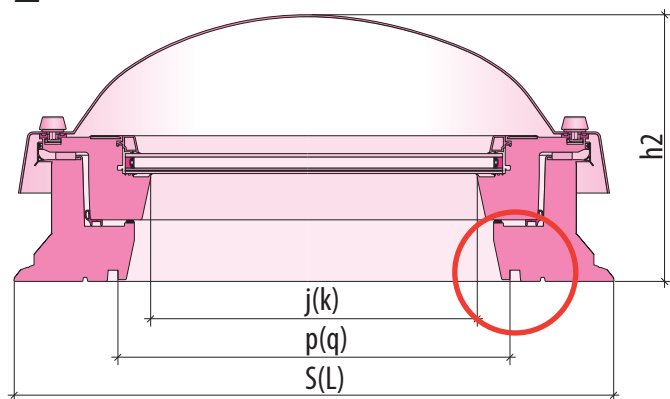
		Window width = 60 to 220cm																		
		60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220		
Window height = 60 to 220cm	60	0,23																		
	70		0,33																	
	80			0,46																
	90	0,37			0,6															
	100					0,77														
	110																			
	120				0,83			1,16												
	130																			
	140									1,63										
	150					1,21														
	160																			
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200																				
210																				
220							2,23													

- available non-standard sizes
- sizes not available
- 0,23 - effective glazing area in standard windows

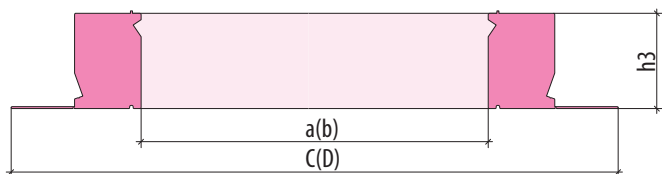
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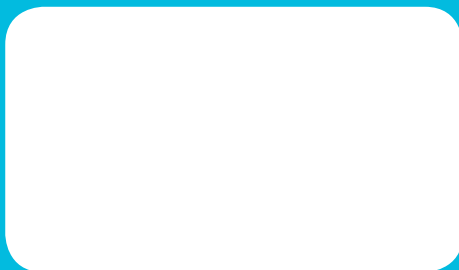
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XRD



Roof opening dimensions	Size symbol	External dimensions	Lining grooves spacing	Glazing area	Height		Base internal dimensions	External dimensions with a 'fin'	Height
AxB min.		SxL	pxq	jxk	h1	h2	axb	CxD	h3
[cm]		[mm]							
60 x 60	01K	820 x 820	558 x 558	476 x 476	191	347	610 x 610	1020 x 1020	150
60 x 90	02K	820 x 1120	558 x 858	476 x 776	191	347	610 x 910	1020 x 1320	150
70 x 70	03K	920 x 920	658 x 658	576 x 576	191	347	710 x 710	1120 x 1120	150
80 x 80	04K	1020 x 1020	758 x 758	676 x 676	191	347	810 x 810	1220 x 1220	150
90 x 90	05K	1120 x 1120	858 x 858	776 x 776	191	382	910 x 910	1320 x 1320	150
90 x 120	06K	1120 x 1420	858 x 1158	776 x 1076	191	382	910 x 1210	1320 x 1620	150
100 x 100	07K	1220 x 1220	958 x 958	876 x 876	191	382	1010 x 1010	1420 x 1420	150
100 x 150	10K	1220 x 1720	958 x 1458	876 x 1376	191	432	1010 x 1510	1420 x 1920	150
120 x 120	08K	1420 x 1420	1158 x 1158	1076 x 1076	191	432	1210 x 1210	1620 x 1620	150
140 x 140	09K	1620 x 1620	1358 x 1358	1276 x 1276	191	432	1410 x 1410	1820 x 1820	150
120 x 220	11K	1420 x 2420	1158 x 2158	1076 x 2076	191	432	1210 x 2210	1620 x 2620	150



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