

Integrated Sun Blinds



Venetian blinds integrated into glazed glass unit

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Integrated sun blinds - no disadvantages

Horizontal blinds have always been the most popular way to limit the excessive sunlight in any room. Adjusting the amount of light by lifting and tilting movements allows for smooth regulation of the light intensity and provides privacy by limiting visibility of house interior, even in the full light.

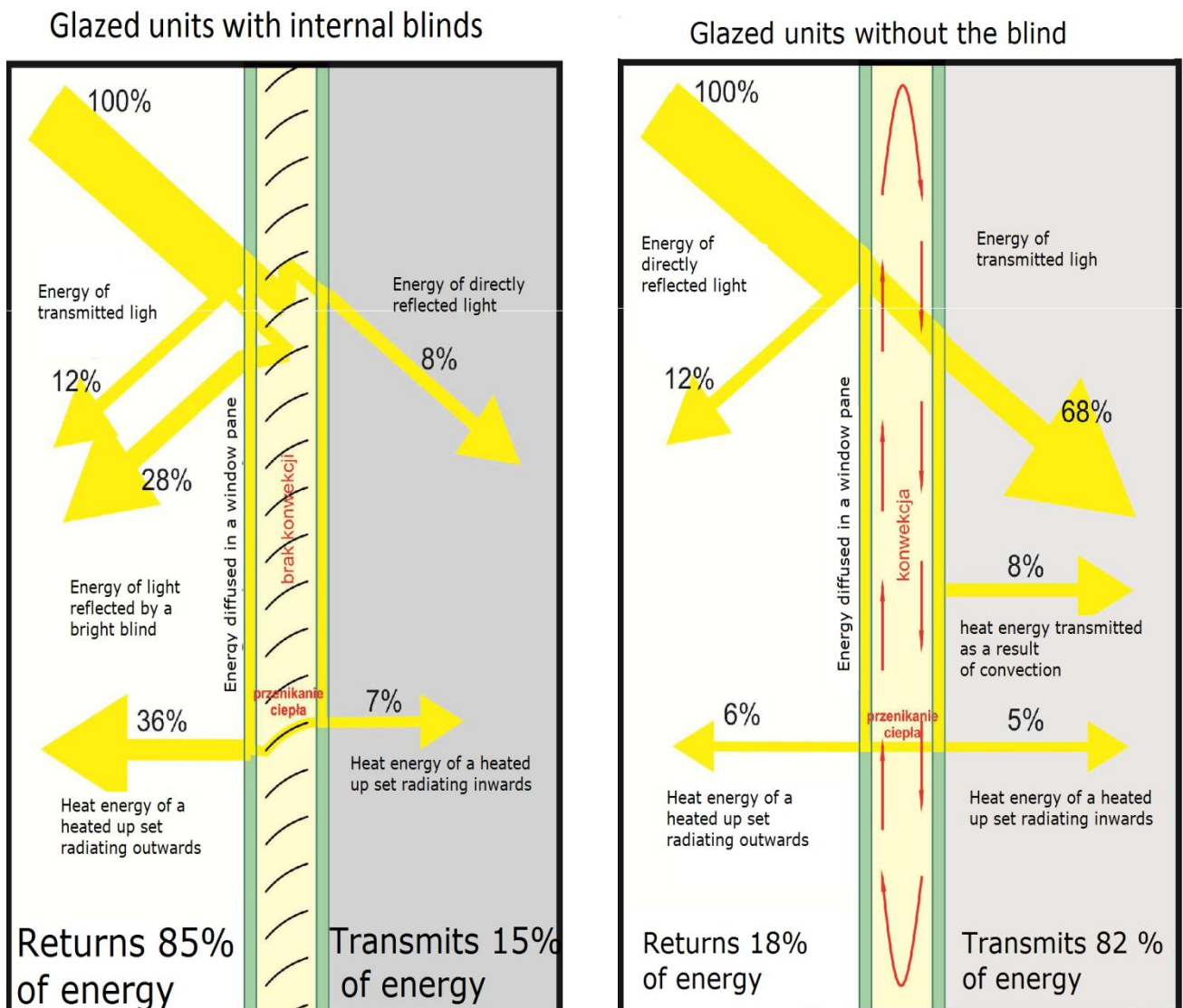
Most important advantages:

- no cleaning needed,
- do not interfere during window cleaning,
- protection against mechanical damage,
- no radiator effect* when looking from the outside,
- prevent convection by creating many chambers in the space between the window panes,
- lower the heat transfer factor,
- the drive allows for using in multiple-glaze units,
- may be electrically driven and operated,
- are a great architectural feature,
- may limit eye contact through glass partition walls,
- may be used as uniform cover of ceiling partitions in glass-aluminium post and beam facades,
- unlimited use of window decoration such as bevels and stained-glass windows,
- many years of reliable operation.



How sun blinds limit the excessive heat on scorching hot days.

Example of comparison how the heat is transferred to the room with average sun position and for typical glazed unit with and without a blind.



Using the integrated sun blinds as protection against overheating of rooms improves thermal comfort on hot days and saves energy used for air-conditioning. In winter, when we need to keep the heating energy inside, the integrated blind limits gas convection, thus limiting heat transfer by app. 0,1 W/m²K.

Great results in increasing the energy savings, especially in passive houses, may be obtained by installing the blinds in multiple-glazed units.

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„G” Factor

The Fraunhofer Institute of Building Physics in Stuttgart has defined the factor for glazed units 4- 24-LE4 (low-? 0,04 Optirerm-S) without blinds: $G=0,27$, and with a closed blind $G=0,08$.

The influence of using an integrated blind on the heat transfer values.

European standard			American standard		
k [W/m ² K]		number of glass panes	BTU / sq.ft degF h		number of glass panes
glazed unit without blinds	with the blind down and closed		glazed unit without blinds	with the blind down and closed	
2,7	1,75	2	0,48	0,31	2
2,6	1,71	2	0,46	0,30	2
2,5	1,67	2	0,44	0,29	2
2,4	1,62	2	0,43	0,29	2
2,3	1,57	2	0,41	0,28	2
2,2	1,52	2	0,39	0,27	2
2,1	1,48	2	0,37	0,26	2
2,0	1,43	2	0,35	0,25	2
1,9	1,37	2	0,34	0,24	2
1,8	1,32	2	0,32	0,23	2
1,7	1,26	2	0,3	0,22	2
1,6	1,21	2	0,28	0,21	2
1,5	1,15	2	0,27	0,20	2
1,4	1,09	2	0,25	0,19	2
1,3	1,03	2	0,23	0,18	2
1,2	0,96	2	0,21	0,17	2
1,1	0,9	2	0,19	0,16	2
1,0	0,83	2	0,18	0,15	2
0,9	0,76	3	0,16	0,14	3
0,8	0,68	3	0,14	0,12	3
0,7	0,61	3	0,12	0,11	3
0,6	0,53	3	0,11	0,10	3
0,5	0,45	3	0,09	0,08	3

The values specified above have been measured and presented in a report of the Danish Institute for Building Technology, the report was based on research. (Report number 254.16381-3.1991)

The conclusion of the report read "The integrated blind improves the factor in most popular U glazed glass units by approximately 0,2 m2K/W. (Document XD-336-31, page 16)

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Motors

It is possible to make blinds with electric drive, easily connected to the central control system or the intelligent house system.

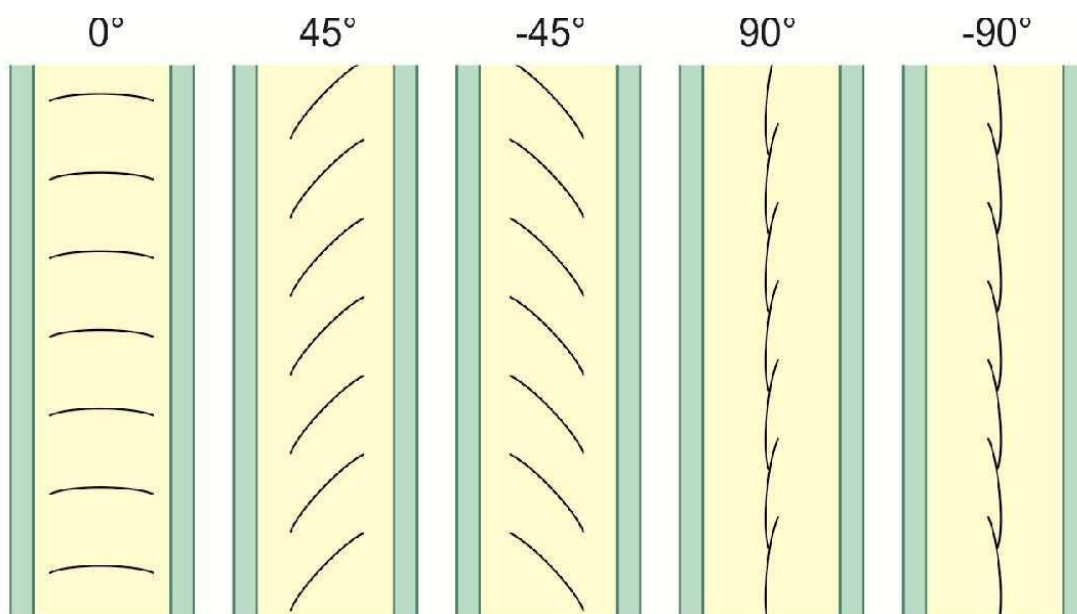
AC electric motors are used to drive the blinds. The Swiss company, who produces those reliable motors, specialises in production of motors for NASA, that are used in satellites and spaceships. The motors operate in large amplitude of temperatures. DC 12V, 1,2W, 60 rpm with planetary gear. Using a motor requires operation under visual supervision or by means of dedicated controller.



The controller (available as an option) has the function of joint and remote movement of the blinds. The remote movement signifies no need for visual supervision, as the controller will switch the current off when the blind reaches its extreme position. Joint movement signifies that the controllers may be connected in order to operate many blinds with one button.

Recommended position of the blinds matching individual needs:

1. Strong overshadowing on a sunny day - the blind completely down, angle set at 90° .
2. Strong protection against heat, outside of the room visible - the blind down, angle set at 45° .
3. Covering the outside view, but using the sunlight to enlighten and heat the room - the blind completely down, angle set at -45° directly onto the sun.
4. During winter time heating the room on a sunny day, if windows face the sun - the blind completely up.
5. Saving on heating and keeping the outside view - the blind completely down, the blinds set approximately 0° angle.
6. Nighttime savings on heating - the blind completely down, the angle set at 90° .
7. Lowering contrast for the eyes - lowering the blinds until the sky is not visible, angle set at 90° .



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Dimensioning of the sun blinds

While ordering it is necessary to specify the dimensions of the blinds and the window pane.

Maximal and minimal blinds dimensions: **Sz** - 350 mm up to 2700 mm;

H_z - 200 up to 3500 mm, max surface 4 m², Dimensions ratio limit: **Sz/H_z** max. 5;

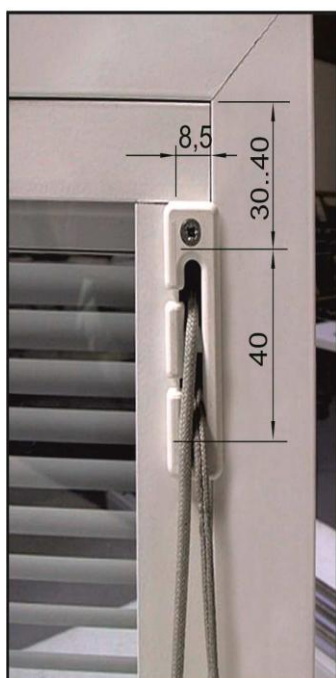
H_z/Sz max. 3,6

Sun blinds glazing

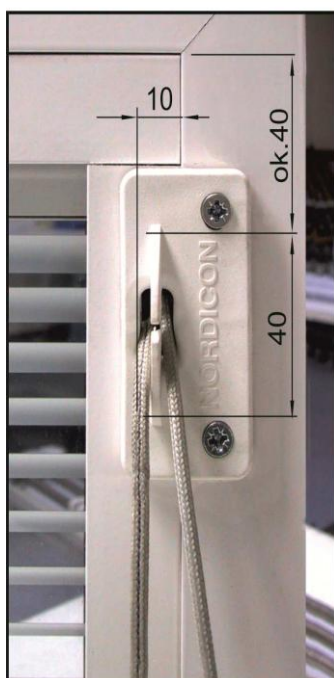
It is recommended to use hardened glass in glazed units due to strong anti - sunlight effect of the blinds and protection of internal low-emissivity coating.

Dimensioning of milling the glazing bead to provide a pass-through for the cord.

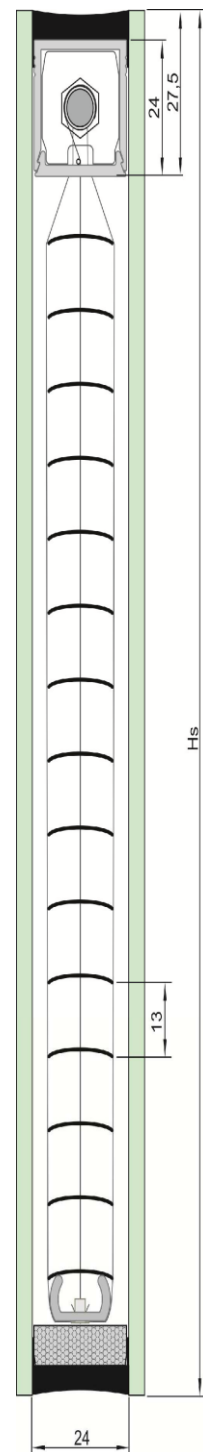
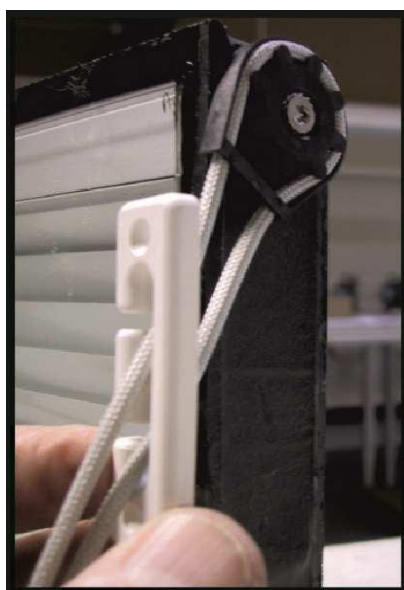
K2



K3



K4



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Examples of glazing and parameters:

One-chamber units:

32mm	4esg/24air/4esg	Ug=2,8 – max dimensions 3m2 not exceeding 1300x2300mm
32mm	4esg/24arg/4esg Ne	Ug=1,2 – max dimensions 3m2 not exceeding 1300x2300mm
36mm	6esg/24air/6esg	Ug=2,8 – max dimensions 4m2 not exceeding 3200mm for one side
36mm	6esg/24arg/6esg Ne	Ug=1,2 – max dimensions 4m2 not exceeding 3200mm for one side

Two-chamber units: in such units the sun blind is placed in the first chamber on the external side of the window.

50mm	4esg /24arg/4esg Ne/14arg/4esg Ne	Ug=0,6 – max dimensions 2,9m2 not exceeding 1300x2200mm
48mm	4esg /24arg/4esg Ne/12arg/4esg Ne	Ug=0,7 – max dimensions 2,9m2 not exceeding 1300x2200mm
54mm	6esg /24arg/6esg Ne/12arg/6esg Ne	Ug=0,7 – max dimensions 3,5m2 not exceeding 2500mm for one side
56mm	6esg /24arg/6esg Ne/14arg/6esg Ne	Ug=0,6 – max dimensions 4m2 not exceeding 3000mm for one side

