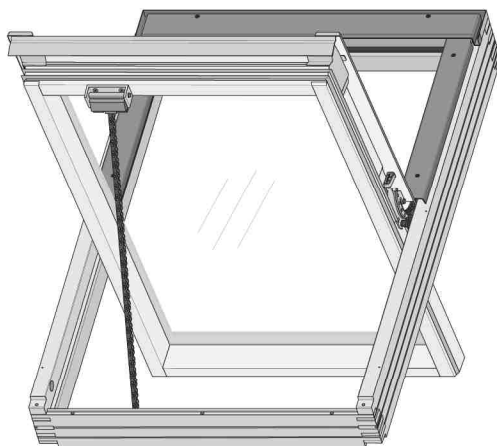


## Smoke Ventilation Window

# FSR



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*Dear Sir/Madam! Thank you for purchasing the product from FAKRO. We do hope that it will meet your expectations. To ensure appropriate functioning of the product, please peruse this User Manual.*

## SAFETY REQUIREMENTS



**Please read carefully the instructions below before proceeding to the window installation so as to prevent electric shock, injury, etc.**

- After unpacking, check the FSR window elements for any signs of mechanical damage. Plastic containers used for packing should be stored out of children reach as they may be a potential source of danger.
- Cables used: type, length and cross-section must be compliant with technical data. To enable inspection or repair of devices, the window must be disconnected from the power supply.
- The window must not be operated by minors without adult supervision.
- Any activities related to cleaning, adjustment or dismantling should be preceded with disconnecting the window from the power supply.
- Window parts must not be washed using solvent-based substances or open stream of water (do not immerse in water).
- When the window is closed / opened, actuators are stopped by activating integrated overload module. **Warning!** The actuator may cause serious injury / crush the body. During assembly and operation of actuators, do not interfere into the window gap. Potentially dangerous points between the window sash and the frame must be secured up to a height of 2.5m.
- When closing, the actuator features active protection of the main closing edge. In the event of an overload in the chain closing area from 23mm to the maximum extension, the actuator stops and retracts, i.e. it opens for 10 seconds and then try again to close. If there is no closure after three such attempts, the actuator stops in this position. In addition, the actuator is equipped with a passive protection function which consists in the fact that the speed in the closing area from 100mm to the minimum extension is reduced to 5mm/s.



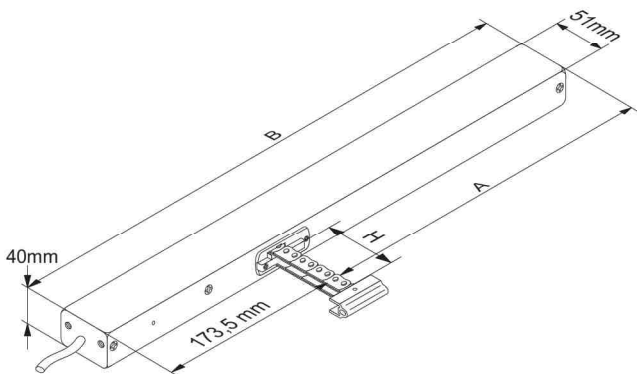
**Warning!!! Danger of jamming and crushing! Window is closed automatically. Significantly greater forces may occur on the side closing edges.**

## USE

Always ensure that the actuator corresponds to applicable regulations. In particular, pay attention to opening range of the window, permissible sizes, opening time and opening speed, working temperature of the actuator and cables, cable cross-section in relation to its length and power consumption. Installed parts must be adapted to the particular window type and complemented if required.

## ACTUATOR DIMENSIONS

| WINDOW SIZE | Chain rated extension | Size A [mm] | Size B [mm] |
|-------------|-----------------------|-------------|-------------|
| 78x78       | 510                   | 472,5       | 646         |
| 78x98       | 640                   | 472,5       | 646         |
| 78x118      | 775                   | 472,5       | 646         |
| 78x140      | 800                   | 472,5       | 646         |
| 94x78       | 510                   | 472,5       | 646         |
| 94x98       | 640                   | 472,5       | 646         |
| 94x118      | 775                   | 472,5       | 646         |
| 94x140      | 890                   | 514,5       | 688         |
| 94x160      | 890                   | 514,5       | 688         |
| 114x78      | 510                   | 472,5       | 646         |
| 114x98      | 640                   | 472,5       | 646         |
| 114x118     | 775                   | 472,5       | 646         |
| 114x140     | 890                   | 514,5       | 688         |
| 134x78      | 510                   | 472,5       | 646         |
| 134x98      | 640                   | 472,5       | 646         |
| 134x118     | 775                   | 472,5       | 646         |
| 134x140     | 890                   | 514,5       | 688         |



## TECHNICAL SPECIFICATION

The actuator is designed for smoke exhaust systems (SHEV) and ventilation.

|                               |  |
|-------------------------------|--|
| Power supply                  | 24V DC   |
| Rated current                 | 1,4 A  |
| Working temperature           | -5°C to +75°C  |
| Chain pushing force           | 1000/500N  |
| Chain closing force           | 500N   |
| Closing force                 | 250N   |
| Opening speed                 | 14.9 mm/s  |
| Rated locking force           | 2000 N   |
| Switch on time                | 30% (with tolerance time of 10 min.)                               |
| Protection type               | IP 32 (with cover plugs that are provided with brackets)           |
| Temperature resistance        | 30 min. / 300 °C   |
| Emission sound pressure level | $L_{pA} \leq 70$ dB(A)   |
| Additional functions          | Closing edge protection (3-times repeated stroke test) – activated |
| Locking relief                | activated  |
| Housing                       | Powder coated aluminium (RAL 9006)                                 |

## **INSTALLATION**

To ensure safety and proper operation of the window, follow the original user manual and fitting instructions included to the product. The installation process must be carried out by people trained in this area, dealing with installation of electrical wiring and its maintenance, electricians and mechanics with knowledge of electric and mechanic actuator systems. Correct operation of the window and prevention of damage is guaranteed only if the installation process is carried out in compliance with included fitting instructions.

In particular, pay attention to the actuator power supply voltage, rated power. It is strictly forbidden to connect 24V actuators to 230V AC.

## **ELECTRICAL WIRING**

Electrical wiring must be carried out by qualified electricians only. When connecting devices follow the guidelines obligatory in a country concerned. If possible, a cable type should be agreed with local authorities and fire services. In particular, pay attention to low voltage cables system (24V DC) which must be separated from high voltage cables system. Cables must be installed in such a way that they are not sheared off, twisted or bent off during operation.

Cables used: type, length and cross-section must be compliant with technical data. In order to carry out maintenance and repair, there must be an option to disconnect the window from the 230V power supply.

## **CONTROL AND MAINTENANCE OF ELECTRIC ACTUATORS**

- Smoke ventilation system requires regular control and maintenance. Make sure what is the frequency of the system maintenance required by local regulations.
- Actuators in use must be regularly inspected by qualified technicians (authorized to install and maintain smoke exhaust and ventilation systems).
- Operational availability should be examined regularly, including the following operations: dirt removal, checking tightness of screws, testing opening and closing.
- Defective actuators can be repaired only by the manufacturer.

After installation and any changes introduced, check the entire system. The user must be informed about all important changes.

## **PROCEDURE OF FSR SMOKE VENTILATION WINDOW CONTROL**

The FSR window is one of the elements of the natural smoke ventilation system. Such system, acting as an active fire protection measure should be serviced by qualified company every 6 months. It is recommended to be the same company that has installed and started the system. When servicing the system it is required to check the following:

- If the FSR window does not open after connection to the control system, check the operation of the actuator by connecting it directly to the power supply (24V batteries) and make sure that the power consumption does not exceed permissible values provided on the actuator data plate.
- Check all metal elements for rust spots and remove them if required (see “FSR window maintenance procedure”).
- Check wooden elements for any signs of damage, especially at fixing points of metal holders coupling actuators to the sash.

## PROCEDURE OF FSR SMOKE VENTILATION WINDOW MAINTENANCE

- Windows are coated with two layers of ecological acrylic varnish. They should be repainted with acrylic varnish every 2-5 years depending on the usage conditions.
- Remove leaves and other dirt from the flashing at least once a year to ensure proper water drainage.
- Hinges in smoke ventilation windows should be lubricated with grease every few years.
- Elements covered with rust should be cleaned (with sand paper, wire brush), washed and painted.



**Before inspection and maintenance work and replacement of system parts (e.g. replacement of actuators), always disconnect all power sources, including emergency power supply batteries. Power switch must be protected against being switched on by third parties.**

## SPARE PARTS, ACCESSORIES AND OPERATION

Use original parts only.

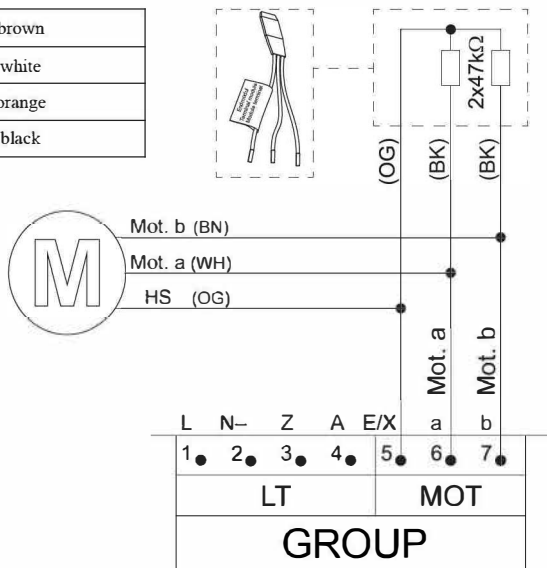
## WINDOW LIFE EXPECTANCY

According to EN12101-2, Annex A, tested number of cycles is 11,000, including 10,000 to the ventilation position and 1,000 to the emergency position.

## ACTUATOR CONNECTION

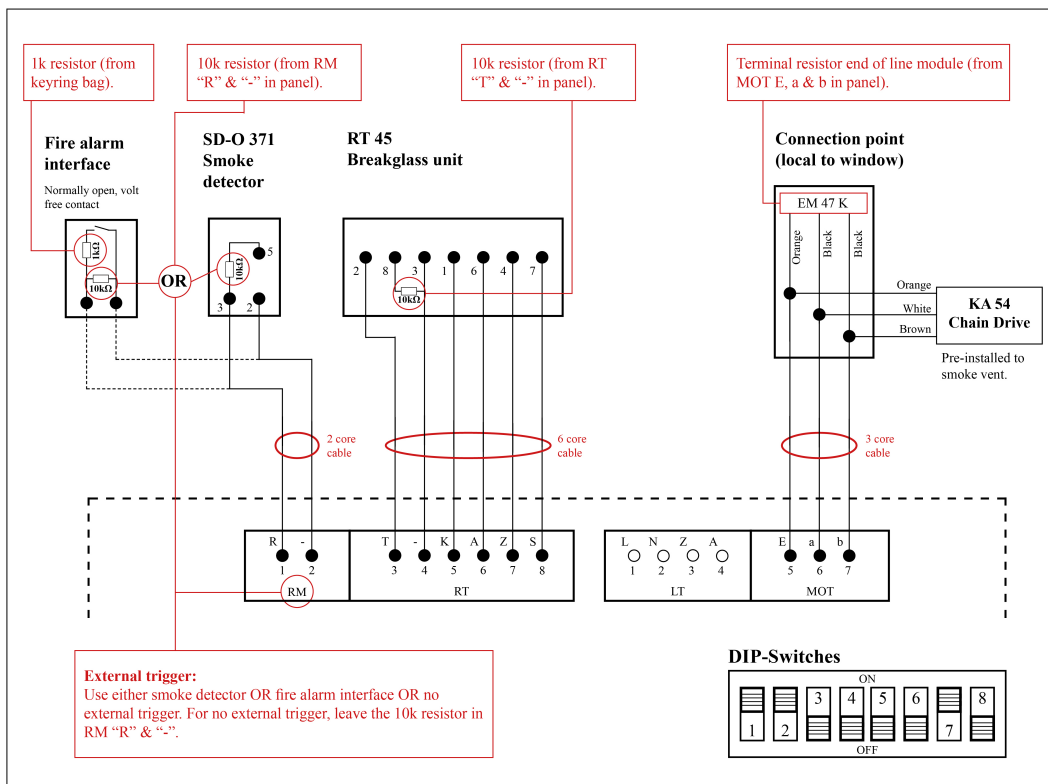
The actuator in the FSR smoke ventilation window comes with a HS option (High Speed), which means that from 100mm to the maximum extension, the actuator works at an increased speed of 15mm/s. This only happens when triggered during an emergency, i.e. by means of RT45 alarm button, SD-371 smoke sensor or the fire alarm system. To make the HS mode available, connect the actuator as shown in the diagram below. The FSR window is fully compliant for operation with the RZN 4503-T control panel.

|    |        |        |
|----|--------|--------|
| BN | brown  | brown  |
| WH | white  | white  |
| OG | orange | orange |
| BK | black  | black  |



*Connection diagram of the actuator in the FSR smoke ventilation window to the RZN 4503-T control panel.*

## SAMPLE CONNECTION DIAGRAM



### Pre-installation information

- All cables should be fire resistant type.
- Terminal resistor end of line module must be fitted in junction box along with drive connections.
- Ensure the dip switches are set as shown above.
- Only connect battery after mains 230V power is supplied to the panel.

### System indications

- Green OK LED on: System fully operational.
- Green OK LED off, Yellow LED on: Fault within system.
- Red LED on: System in alarm.

### Operation

- System can be triggered into alarm from RZN 4503-T control panel, RT 45 breakglass unit and SD-O 371 smoke detector or fire alarm interface.
- System can only be reset from RZN 4503-T control panel or RT 45 breakglass unit.
- If a fire alarm interface is being used, the system cannot be reset or the vent closed until the fire alarm has been reset.
- Natural ventilation functions will not operate whilst the system is in alarm or on battery back-up.

### Components



1 no. RZN 4503-T  
Smoke control panel



1 no. RT 45  
Breakglass unit



1 no. SD-O 371  
Smoke detector



1 no. 12v 3.2A  
battery

|   |  |                               |   |                           |
|---|--|-------------------------------|---|---------------------------|
|  | <b>Deklaracja właściwości użytkowych</b> | Nr<br><i>R40/CPR/12101/17</i> | <br>EN 12101-2 | Rok<br>wprowadzenia<br>17 |
|---|--|-------------------------------|---|---------------------------|

1. Model produktu (numer):  
FSR P1 (87DKxx), FSR/U P1 (87DRxx), FSR/W P1, FSR/RAL P1 (RB-xxxx)

2. Zamierzone zastosowanie:  
Kłapa dymowa do naturalnego odprowadzania dymu i ciepła typu FSR (pakiet szybowy: 4H+14Ar+33.21\*) z silownikiem KAS4 do zastosowania w budynkach mieszkalnych i innych przeznaczonych na pobyt ludzi.  
\*gdzie: H – szkło hartowane, Ar – argon, T – szkło z warstwą niskoemisyjną

3. Producent:  
FAKRO PP Sp. z o.o.  
ul. Węgierska 144a,  
33-300 Nowy Sącz, Polska

4. Upoważniony przedstawiciel:  
J.

5. System oceny i weryfikacji stałości właściwości użytkowych:  
1

6. Norma zharmonizowana:  
Jednostka notyfikowana:  
EN 12101-2:2003  
Fires s.r.o., (Jednostka Notyfikowana nr 1396, Osloboditeľov 282, 059 35 Batizovce, Słowacja), przeprowadziła wstępne badania typu w systemie 1 (zawarte w pkt. 7.1-7.7) i wydała certyfikat stałości właściwości użytkowych nr 1396-CPR-0124.


7. Deklarowane właściwości użytkowe:

| Zasadnicze charakterystyki           |                                     | Właściwości użytkowe |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | Zharmonizowana<br>specyfikacja<br>techniczna |                 |
|--------------------------------------|-------------------------------------|----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|-----------------|
|                                      |                                     | FSR, FSR/U, FSR/W    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |  |                 |
| Romiłar olaa [cm]                    |                                     | 78x78                | 78x98   | 78x118  | 78x140  | 94x78   | 94x98   | 94x118  | 94x160  | 114x78  | 114x98  | 114x118 | 114x140 | 134x78  | 134x98  | 134x118 | 134x140 |  |                 |
| 7.1 Powierzchnia czarna              | A, [m <sup>2</sup> ] <sup>(1)</sup> | 0.29                 | 0.38    | 0.47    | 0.58    | 0.35    | 0.46    | 0.58    | 0.70    | 0.80    | 0.44    | 0.57    | 0.71    | 0.86    | 0.52    | 0.68    | 0.84    | 1.01   |                 |
| 7.2 Odporność na obciążenie wiatrem  |                                     | WL 3000              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | 6  | 7.4.1           |
| 7.3 Odporność na obciążenie śniegiem | 15°                                 | SL 2007              | SL 1944 | SL 1877 | SL 1804 | SL 1686 | SL 1645 | SL 1598 | SL 1346 | SL 1500 | SL 1850 | SL 1816 | SL 1775 | SL 1727 | SL 1586 | SL 1563 | SL 1534 | SL 1500                                      |                 |
|                                      | 20°                                 | SL 2063              | SL 1908 | SL 1929 | SL 1854 | SL 1733 | SL 1691 | SL 1643 | SL 1500 | SL 1542 | SL 1901 | SL 1866 | SL 1824 | SL 1775 | SL 1630 | SL 1607 | SL 1577 | SL 1542                                      |                 |
|                                      | 25°                                 | SL 2139              | SL 2072 | SL 2000 | SL 1922 | SL 1797 | SL 1753 | SL 1703 | SL 1648 | SL 1599 | SL 1971 | SL 1935 | SL 1891 | SL 1841 | SL 1690 | SL 1666 | SL 1635 | SL 1599                                      |                 |
|                                      | 30°                                 | SL 2238              | SL 2168 | SL 2093 | SL 2012 | SL 1880 | SL 1834 | SL 1783 | SL 1725 | SL 1673 | SL 2063 | SL 2025 | SL 1979 | SL 1926 | SL 1768 | SL 1743 | SL 1711 | SL 1673                                      |                 |
|                                      | 35°                                 | SL 2366              | SL 2292 | SL 2213 | SL 2127 | SL 1988 | SL 1939 | SL 1884 | SL 1823 | SL 1768 | SL 2181 | SL 2140 | SL 2092 | SL 2036 | SL 1870 | SL 1843 | SL 1809 | SL 1768                                      |                 |
| 7.4 Niska temperatura otoczenia      | 40°                                 | SL 2530              | SL 2451 | SL 2366 | SL 2274 | SL 2126 | SL 2073 | SL 2015 | SL 1949 | SL 1891 | SL 2332 | SL 2289 | SL 2237 | SL 2177 | SL 1999 | SL 1971 | SL 1934 | SL 1891                                      |                 |
|                                      | 45°                                 | SL 2741              | SL 2655 | SL 2563 | SL 2463 | SL 2303 | SL 2246 | SL 2183 | SL 2112 | SL 2048 | SL 2526 | SL 2479 | SL 2423 | SL 2358 | SL 2165 | SL 2135 | SL 2095 | SL 2048                                      |                 |
| 7.5 Niezawodność                     |                                     | T (-15)              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | 7.3.1  | EN 12101-2:2003 |
| 7.6 Odporność na wysoką temperaturę  |                                     | RE 1000              |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | 7.1.1  |                 |
| 7.7 Reakcja na ogień                 |                                     | B 300                |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | 7.5.1  |                 |
|                                      |                                     | F                    |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         | 7.5.2.1                                      |                 |

(1) wg EN 12101-2, załącznik B, punkt B.2.4.2.2

Właściwości użytkowe określonego powyżej wyrobu są zgodne z zestawem deklarowanych właściwości użytkowych. Należy deklaratorem właściwości użytkowych wydana zostaje zgodnie z rozporządzeniem (UE) nr 305/2011 na wyłączną odpowiedzialność producenta określonego powyżej.

W imieniu producenta podpisał:



Ewa Łukaszczyk-Haslik  
(Dyrektor ds. Certyfikacji i Kontroli Jakości)

Nowy Sącz, 24.04.2017 r.

## WARRANTY

The manufacturer guarantees correct device functioning. It also undertakes to repair or replace faulty device if damage is a result of material or structural faults. The warranty period is 24 months from the date of purchase, fulfilling the following conditions:

- Installation has been performed as per manufacturer recommendations.
- Seals remain intact and no authorised structural changes have been made.
- The device has been used in accordance with its intended use as per user manual.
- Damage is not a result of improperly made electrical system or atmospheric phenomena.
- The manufacturer is not liable for damage which occurred as a result of improper use or mechanical damage.
- In case of failure, the device must be submitted for repair with a Warranty Card.

Defects revealed within the warranty period will be removed free of charge no longer than 14 days after accepting the product for repair. Warranty and post-warranty repairs are performed by the manufacturer i.e. FAKRO PP. Sp. z o.o.

Quality certificate:

Device

---

Model

---

Serial number

---

Seller

---

Address

---

Purchase date

---

Invoice No.

---

Signature (stamp) of person installing a device

FAKRO PP Sp. z o.o.  
ul. Węgierska 144A, 33-300 Nowy Sącz, PL  
tel. +48 18 4440444, fax +48 18 4440333  
[www.fakro.com](http://www.fakro.com)