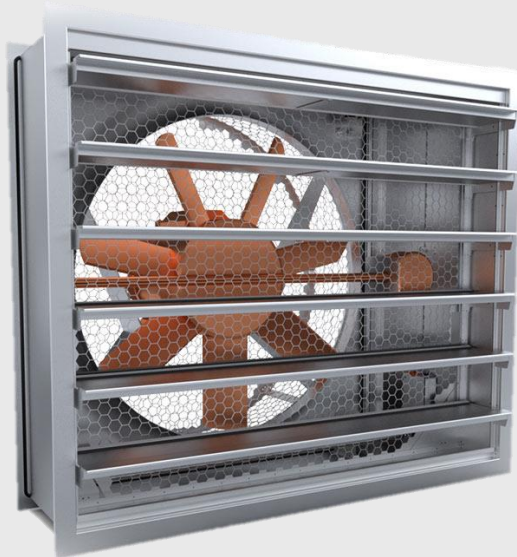


iSWAY

ISWAY® pressure
differential product

Operation and Maintenance Manual



SMAYTM



SMAY reserves the right to make changes to the document.

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1. Introduction

Thorough reading of this documentation, installation and use of the iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® units in accordance with the descriptions given herein and observance of all safety conditions are the basis for correct and safe operation of the unit.

This DTR applies to iSWAY® generation 2018. The iSWAY- FC® generation of 2012 and 2015 have a dedicated separate DTR.

It is assumed that works on the transport, installation, assembly of iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®, connection of installations related to the device as well as maintenance and repairs are carried out by **qualified personnel** or are supervised by authorized persons.

Qualified personnel are considered as persons who, in view of their training, their experience in electromechanical equipment and their knowledge of the relevant standards, documentation and regulations concerning safety and working conditions, have been authorised to carry out the necessary maintenance work on the basis of a training protocol and are able to recognise and avoid possible risks. The following operation and maintenance manual contains detailed information on all possible configurations of the air handling units, examples of their installation and commissioning, use, repair and maintenance. If the units are operated as intended, this manual and the other documents accompanying the units contain sufficient instructions for qualified personnel.

- Installation, connection of associated installations, commissioning, operation and maintenance must be carried out in accordance with the directives and regulations in force in the country where the appliance is installed.
- It is recommended to use the assistance of SMAY Authorised Service Centres during assembly, installation, commissioning, repair, and maintenance.
- The documentation should always be kept close to the unit and easily accessible to service personnel.

NOTE:


The manufacturer reserves the right to make changes in the operation and maintenance manual.

2. Regulations

2.1. Placing on the market.

The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® compact pressurization unit intended for smoke and heat control systems (iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®) has been marketed on the basis of documents issued by the Building Research Institute (ITB):

1. NATIONAL TECHNICAL ASSESSMENT ITB-KOT-2018/0565 wydanie 2
2. NATIONAL CERTIFICATE OF CONSTANCY OF USAGE PERFORMANCE NO 020-UWB-2737/W

The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® compact pressurization unit intended for smoke and heat control systems is marked by the manufacturer with a construction mark . SMAY sues iSWAY® NATIONAL DECLARATION OF PERFORMANCE NO 012-B-2019.



**KRAJOWA DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH
NATIONAL DECLARATION OF PERFORMANCE
012-B-2019**



13

- | | |
|--|--|
| <p>1. Nazwa i nazwa handlowa wyrobu budowlanego</p> <p>Zestaw wyrobów iSway® do różnicowania ciśnienia w systemach kontroli rozprzestrzeniania dymu i ciepła</p> | <p>The name and trade name of construction product</p> <p>Kit of products for pressure differential in smoke and heat control systems type: iSway®</p> |
| <p>2. Oznaczenie typu wyrobu budowlanego</p> <p>Zestaw wyrobów iSway® do różnicowania ciśnienia w systemach kontroli rozprzestrzeniania dymu i ciepła</p> | <p>The type of construction product</p> <p>Kit of products for pressure differential in smoke and heat control systems type: iSway®</p> |
| <p>3. Zamierzone zastosowanie lub zastosowania:</p> <p>Zestaw wyrobów iSway® jest przeznaczony do wytwarzania i utrzymywania nadciśnienia w przestrzeniach chronionych w celu zapobiegania zadymieniu.</p> | <p>Intended use:</p> <p>Kit of products iSway® type is intended to produce and control overpressure in the protected spaces in order to keep them free of smoke in case of fire.</p> |
| <p>4. Nazwa i adres siedziby producenta oraz miejsce produkcji wyrobu</p> | <p>Name and address of the manufacturer and place of manufacture of the product</p> |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: left;"> <p>SMAY Sp. z o.o.
ul. Ciepłownicza 29,
31-587 Kraków, Poland</p> </div> <div style="text-align: right;"> </div> </div> | |
| <p>5. Nazwa upoważnionego przedstawiciela:</p> <p>nie dotyczy</p> | <p>Name of authorized representative:</p> <p>not applicable</p> |
| <p>6. Krajowy system zastosowany do oceny i weryfikacji stałości właściwości użytkowych:</p> <p>System 1</p> | <p>The national system used to assess and verify the constancy of performance:</p> <p>System 1</p> |
| <p>7. Krajowa specyfikacja techniczna:</p> <p>Krajowa Ocena Techniczna nr ITB-KOT-2018/0565 wydanie 2</p> <p>Instytut Techniki Budowlanej,
Zakład Certyfikacji,
nr akredytacji: AC 020,
Krajowy Certyfikat Stałości Właściwości Użytkowych:
U20-UWB-2/37/W</p> | <p>National technical specification:</p> <p>Krajowa Ocena Techniczna nr ITB-KOT-2018/0565 wydanie 2</p> <p>ITB, Building Research Institute, Certification Department,
Accredited body: AC 020
National Certificate Constancy of Performance:
No. U20-UWB-2/37/W</p> |

Strona 1 z 2

+48 12 378 18 00
zapytania@smay.eu
www.smay.eu

SMAY Sp. z o.o.
ul. Ciepłownicza 29, 31-587 Kraków
NIP: 678-282-18-88, Regon: 356295933,
KRS: 0000007764, BDO: 000042468,
Kapitał zakładowy Spółki 50.000 PLN





8. Deklarowane właściwości użytkowe:

Declared performance:

Zasadnicze charakterystyki wyrobu budowlanego dla zamierzonego zastosowania lub zastosowań <i>The essential characteristics of the construction product for the intended use or uses</i>	Deklarowane właściwości użytkowe zgodnie z ITB-KOT-2018/0565 wydanie 2 <i>Declared performance according to ITB-KOT-2018/0565 wydanie 2</i>	Poziom, klasa standard, class
Wymagania dynamiczno-hydrauliczne / <i>Dynamic and hydraulic requirements</i>	p.3.1	spełnia / <i>pass</i>
<ul style="list-style-type: none"> Cykl zachowania dynamicznego (DBC) / <i>Dynamic behavior cycle (DBC)</i> Funkcjonalność / <i>Functionality</i> Niezawodność / <i>Reliability</i> Trwałość / <i>Durability</i> Test oscylacyjny / <i>Resonance test</i> 	p. 3.1.1 p. 3.1.2 p. 3.1.3 p. 3.1.4 p. 3.1.5	
Charakterystyki funkcjonalne tablicy sygnalizacyjno-sterującej TSS i tablicy sterującej TS oraz szaf automatyki SzA-FC, SzA-FCK, SzA-FCP, SzA-FCZ / <i>Essential characteristics of control-signaling panel TSS, control panel TS and control cabinet SzA-FC, SzA-FCK, SzA-FCP, SzA-FCZ</i>	p.3.2	
Wymagania w zakresie kompatybilności elektromagnetycznej i warunków środowiskowych / <i>Requirements in terms of the electrostatics and environmental conditions</i>	p. 3.3	

9. Właściwości użytkowe wyrobu są zgodne z wszystkimi właściwościami użytkowymi deklarowanymi w pkt 8.

The performance of the product complies with all the declared in section 8.

Niniejsza krajowa deklaracja właściwości użytkowych wydana zostaje zgodnie z ustawą z dnia 16 kwietnia 2004r., o wyrobach budowlanych, na wyłączną odpowiedzialność producenta.

This declaration of performance is issued in accordance with the Polish Act of 16 April 2004. on construction products, under the sole responsibility of the manufacturer.

W imieniu producenta podpisać:
Signed for and on behalf of the manufacturer by:

Dyrektor Zarządzania Jakością
Quality Systems Director

mgr inż. Piotr Dąbrowski

Kraków, 13.07.2020
miejsce i data wydania
place and date of issue

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Strona 2 z 2

+48 12 378 18 00
zapytania@smay.eu
www.smay.eu

SMAV Sp. z o.o.
ul. Giełównicza 29, 31-587 Kraków
NIP: 678-282-18-88, Regon: 356295933,
KRS: 0000007764, BDO: 000042468,
Kapitał zakładowy Spółki 50.000 PLN



3. Intended use and principle of operation

3.1. Intended use and scope of application of iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® units

The iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® product range is designed to generate and maintain overpressure in protected spaces to prevent them from becoming smoky.

The iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® product unit should be used in construction works for which pressure differential systems are designed with the following parameters:

- the volume flow rate of air supplied to the protected space to generate the required overpressure or to provide an adequate airflow velocity through open doors, separating the protected space from the unprotected space, is between 200 and 50500 m³/h for the iSWAY-FC (with AFC/ARC ventilator), from 1500 to 75000 m³/h for the iSWAY-FC (with AJF ventilator) and between 200 and 49500 m³/h for the iSWAY-RFC and between 200 and 42000 m³/h for the iSWAY-WFC;
- the required overpressure in protected spaces with closed doors between 20 and 80 Pa;
- the total air resistance on individual storeys, from the doorway between the protected and unprotected zone to the place where the air is discharged outside the building (on a given storey): between 0 and 42 Pa;
- the minimum leakage, including air flow from the zone where the overpressure is maintained, is between 200 m³/h and 36000 m³/h – in case of AFC, ARC, HCBT and iSFS ventilators.
- the minimum leakage, including air flow from the zone where the overpressure is maintained, is between 1500 m³/h and 50000 m³/h – in case of AJF ventilators.

The iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® can be used in pressure differential systems, where the air is extracted from the fire floor. The air exhaust system:

- escape (openings in external walls, ceilings, e.g. tilt windows, dampers, etc.);
- gravitational (e.g. fire ventilation shafts);
- mechanical (e.g. smoke ventilation system).

3.2. Operation principles of iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® units

The iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® unit is designed to create an overpressure of a preset value in any smoke protection space (fig. 3.1. - 3.6.), e.g. in the stairwell space, in the rescue lift shaft, in the fire atrium, in the crane shaft for rescue teams, in the evacuation corridor with all doors closed. In the event that a door is opened between the pressure protected and unprotected space, the iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® shall ensure, in conjunction with the designed air discharge system, that an amount of air is supplied to the protected zone at which the air velocity through the open door reaches the declared value (depending on the class of the designed differential pressure system).

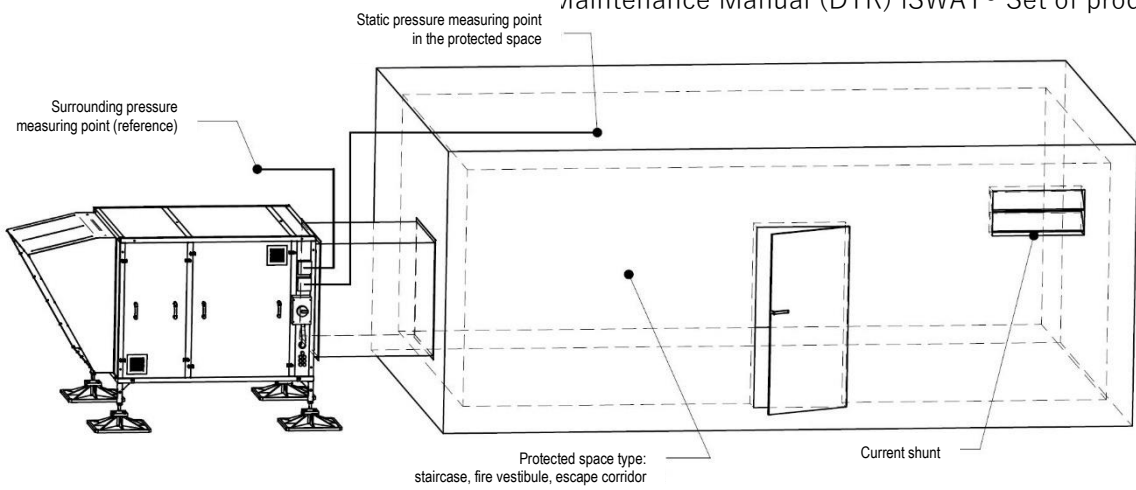


Fig. 3.1. Exemplary illustration of connection of iSWAY-FC® unit to the protected space.

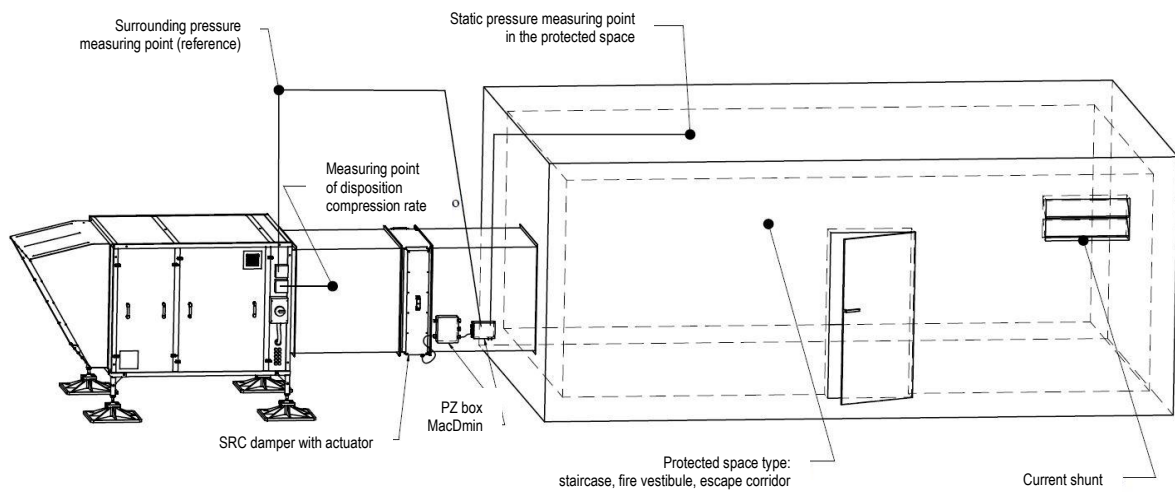


Fig. 3.2. Exemplary connection of iSWAY-FC-D® with SRC control damper, MAC-D-Min controller and pressurized space.

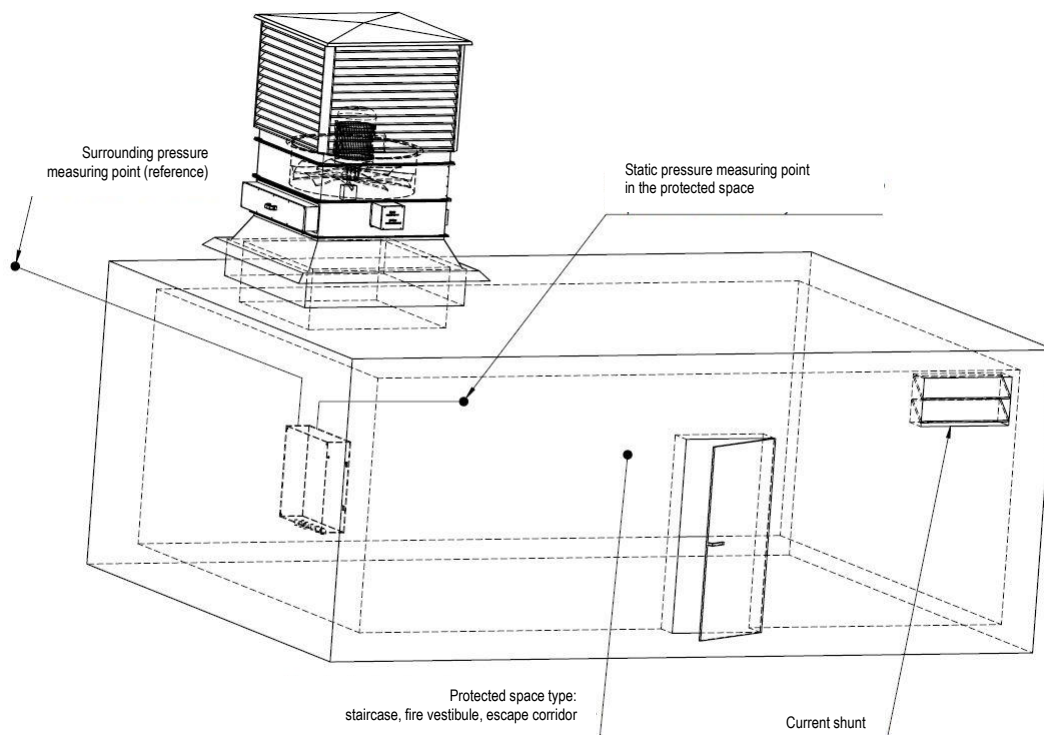


Fig. 3.3. Exemplary connection (no. 1) of the iSWAY-RFC® unit and pressurized space.

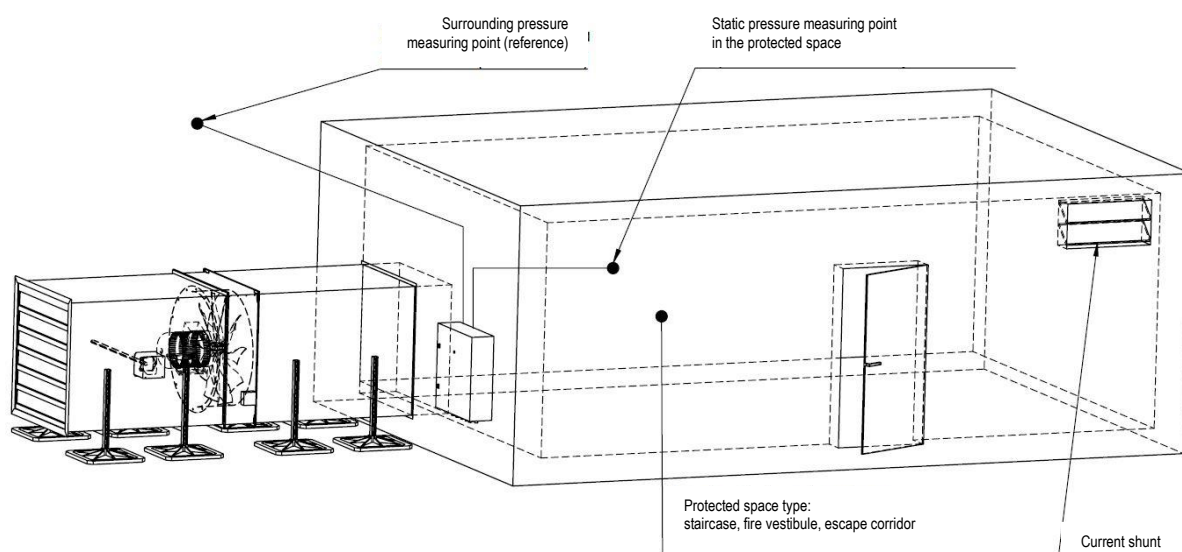


Fig. 3.4. Exemplary connection (no. 2) of the iSWAY-RFC® unit and pressurized space.

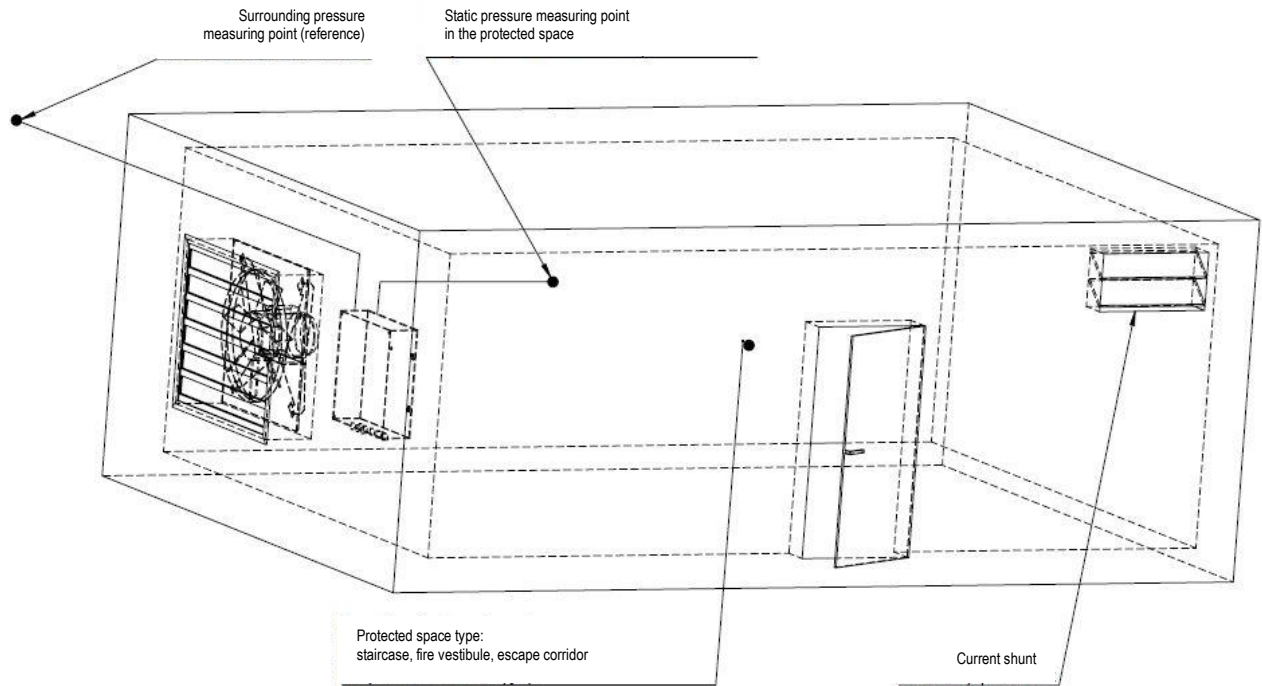


Fig. 3.5. Exemplary connection of the iSWAY-WFC® unit and pressurized space.

Generating the required pressure value when the protected space is closed and ensuring adequate air velocity through open doors connecting the protected space with the unprotected space, prevents infiltration of smoke and hot fire gases into the protected space, ensuring that escape routes are maintained and that rescue and firefighting crews are able to reach the protected space in a smoke-free state (possibly in a state of slight smoke, at which it is possible to carry out evacuation and rescue and firefighting operations). The supply of air to the overpressure protected space can be carried out using a single supply point, as well as a multi-point supply.

The amount of air supplied to the protected space (e.g. staircase) during the operation of the pressure differential kit is variable. It results from a different air demand when device is generating the required overpressure in the protected space (with all doors between the protected zone and the unprotected zone in the closed position), and another when device is generating the required speed of air flow through any door dividing the protected zone and the unprotected zone that has been opened.

In the case of the iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® units, the above mentioned change in the air supply is realized by using an MAC-FC controller and a frequency converter, which controls the fan performance by changing the fan motor speed.

In the case of the MAC-D-MIN controller, the change of the supply air volume is realized by means of a control damper with an electric rotary actuator.

The iSWAY-FC®, iSWAY-WFC® and iSWAY-RFC® pressure differentials provide continuous monitoring of the overpressure value in the protected space in relation to the adopted reference pressure. The use of the MAC-FC controller, which sends a control signal to the frequency inverter, and the MAC-D-MIN controller, which sends a control signal to the control damper, means that the pressure differential system does not require the use of overpressure relief dampers, which remove the excess air when the permitted overpressure threshold is exceeded. This is particularly important for installations in which large air flows are supplied to the protected space in order to provide normative pressure and flow criteria. As a result, large mechanical flaps are required, which may be difficult or impossible to implement.

4. Construction of the equipment

4.1. iSWAY-FC®

The main element of the set is the iSWAY-FC® aeration unit. iSWAY-FC® units have a compact design while maintaining easy access for service. All products included in the set, which are responsible for its operation (except for the elements of object automatics such as panels, pressure sensors, etc.) are mounted inside the iSWAY-FC® casing. The components inside the unit are installed, wired and connected already in the production plant. There is a possibility of mounting inside and outside the building.

Version with automation cabinet SzA-FCP (with integrated frequency converter, controller and power supply)

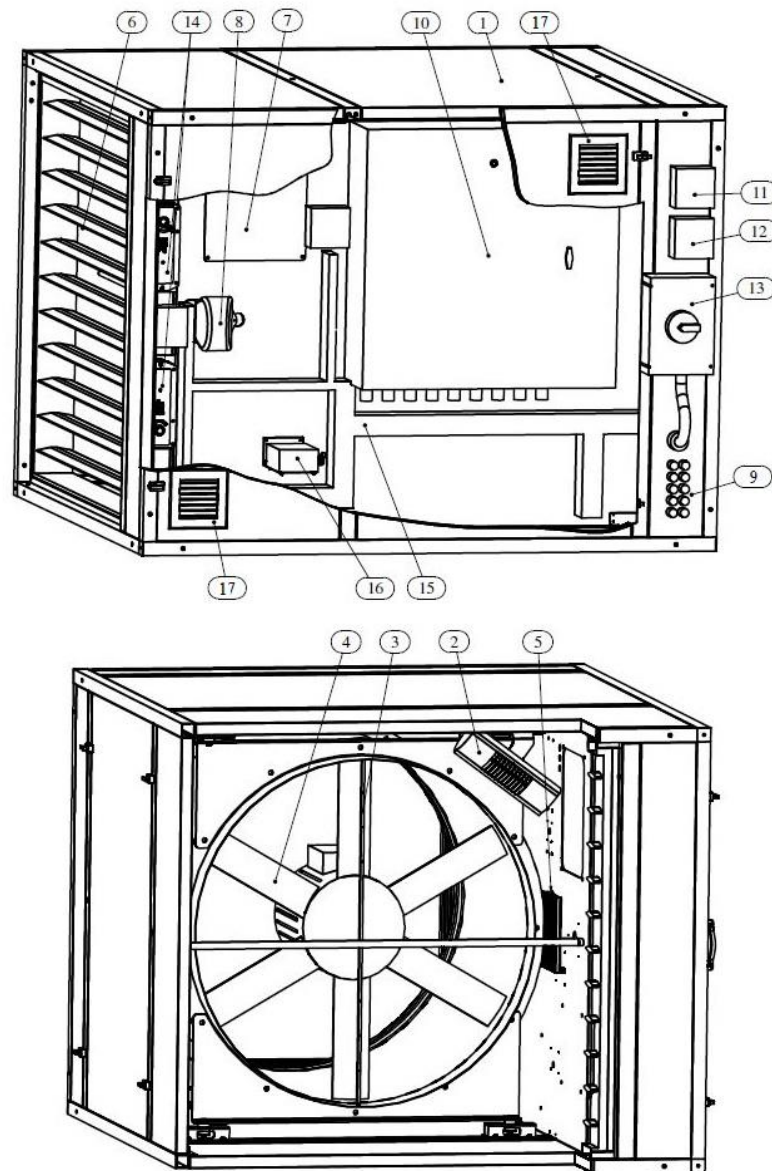


Fig. 4.1. Construction of iSWAY-FC®-2018 with frequency converter, controller and 24VDC power supply integrated inside the SzA-FCP automation cabinet.

- | | |
|--|---|
| 1. Housing insulated with sandwich slabs | 11. Pressure connection point from reference space |
| 2. Infrared heater AF OPTION | 12. Pressure connection point from the protection space |
| 3. Device performance measuring strips LP OPTION | 13. Main switch |
| 4. Fan | 14. Shut-off damper with servomotor |
| 5. Braking resistor | 15. Wiring duct |
| 6. Shut-off damper (supply) | 16. Thermostat AF OPTION |
| 7. Inspection panel | 17. Ventilation grille |
| 8. Smoke detector | 18. Roof for vertical version DA OPTION |
| 9. Control cables and buses entry point | 19. Roof servomotor DA OPTION |
| 10. Automatic Control Cabinet SzA-FCP | 20. Dowel with a screw |

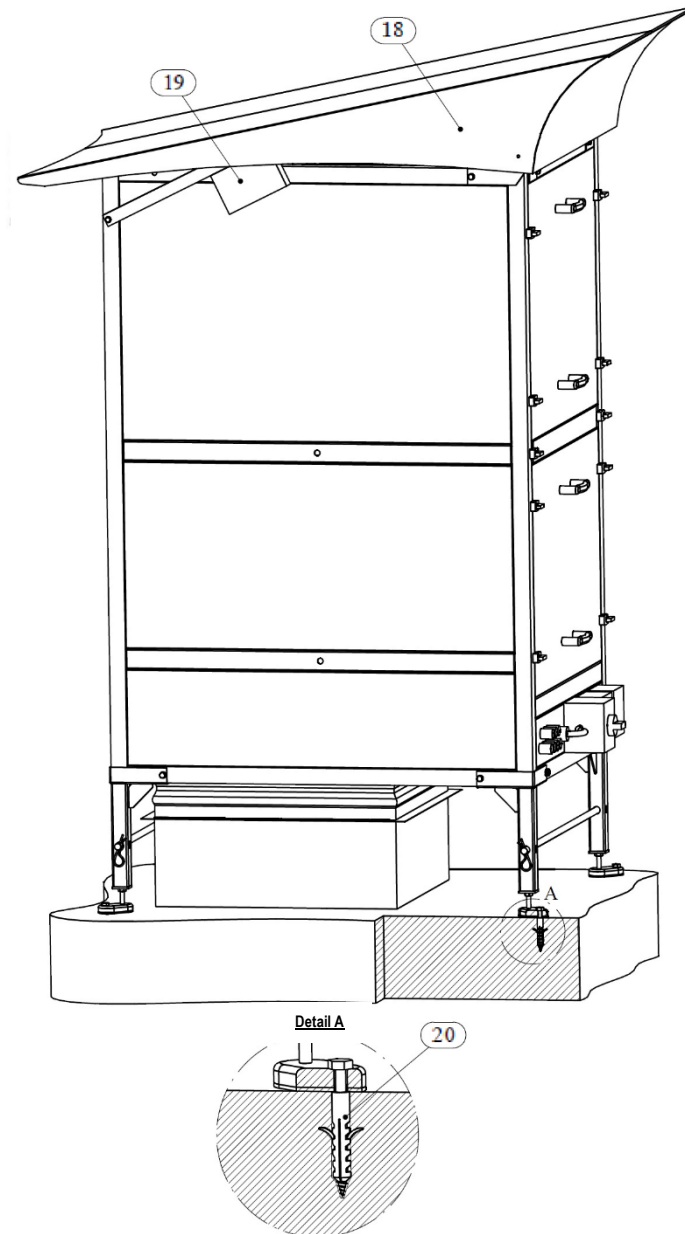


Fig. 4.2. Construction of iSWAY-FC-0.XX-DA®.

4.2. iSWAY-WFC®

iSWAY-WFC® is a so-called wall device, whose construction allows for installation directly in the wall of the building, between the space it protects and the space from which air is drawn to secure the escape route during a fire. This reduces the space required to install the unit. The protected space is insulated by the CDH inlet louvre, which is opened when the device is activated. The automation cabinet Sza-FCK (power supply and control element of the iSWAY-WFC® set) for this unit is available separately and must be connected to the unit via a cable route.

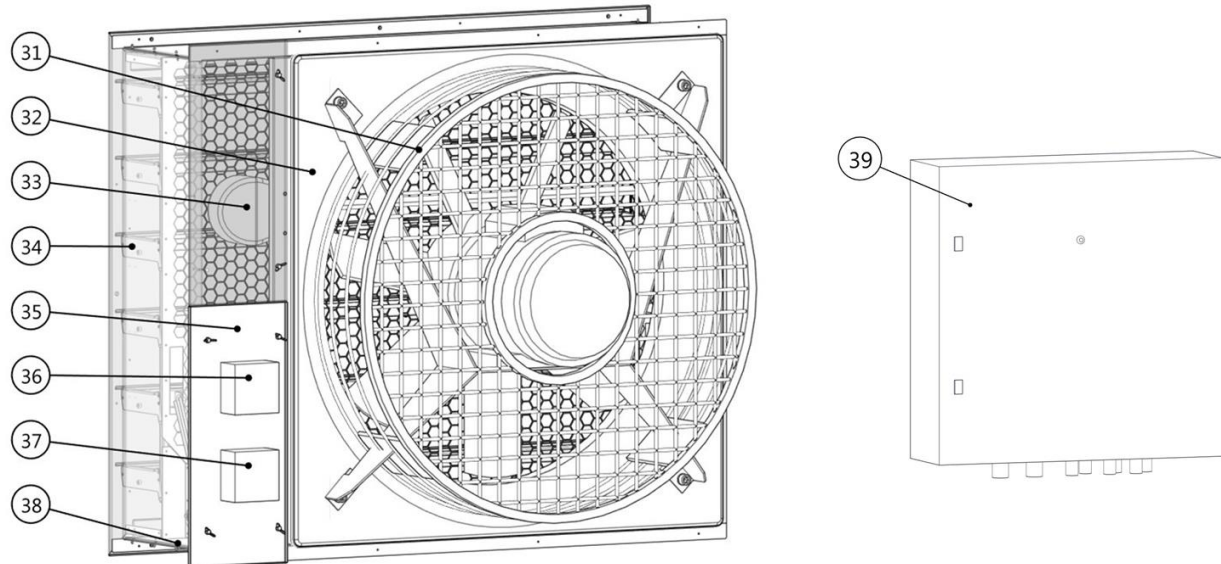


Fig. 4.5. iSWAY-WFC®-2018 construction with Sza-FCK automation cabinet (with integrated frequency converter, controller and 24VDC power supply) separately available outside the iSWAY-WFC® unit.

- 31. Fan protection
- 32. Fan
- 33. Smoke detector
- 34. CDH-K air intake with a servomotor constituting the shut-off damper
- 35. Inspection panel
- 36. Box of the air intake and smoke detector
- 37. Fan box
- 38. Telescopic duct for wall mounting
- 39. Automation cabinet Sza-FCK (with frequency converter, regulator, 24 VDC power supply)

4.3. iSWAY-RFC®

iSWAY-RFC® is a so-called roof device, but it is a common name that does not restrict its use under any circumstances. Its construction allows for installation on the roof of the building, directly above the overpressure protected space, so that the air can be supplied directly through an opening in the ceiling of the above space, where on the intake side there is only a roof air intake and on the supply side an SRC damper blade isolating the protected space from external conditions. There is also a possibility of installing air distribution on the intake and supply side in such a way that the fan can be installed in the ventilation duct both inside and outside the building, where isolation of the protected space from external conditions can be provided by CDH-K intake louver or SRC-D damper. The automation cabinet Sza-FCK (power supply and control element of the iSWAY-RFC set) for this unit is available separately and must be connected to the unit via a cable route.

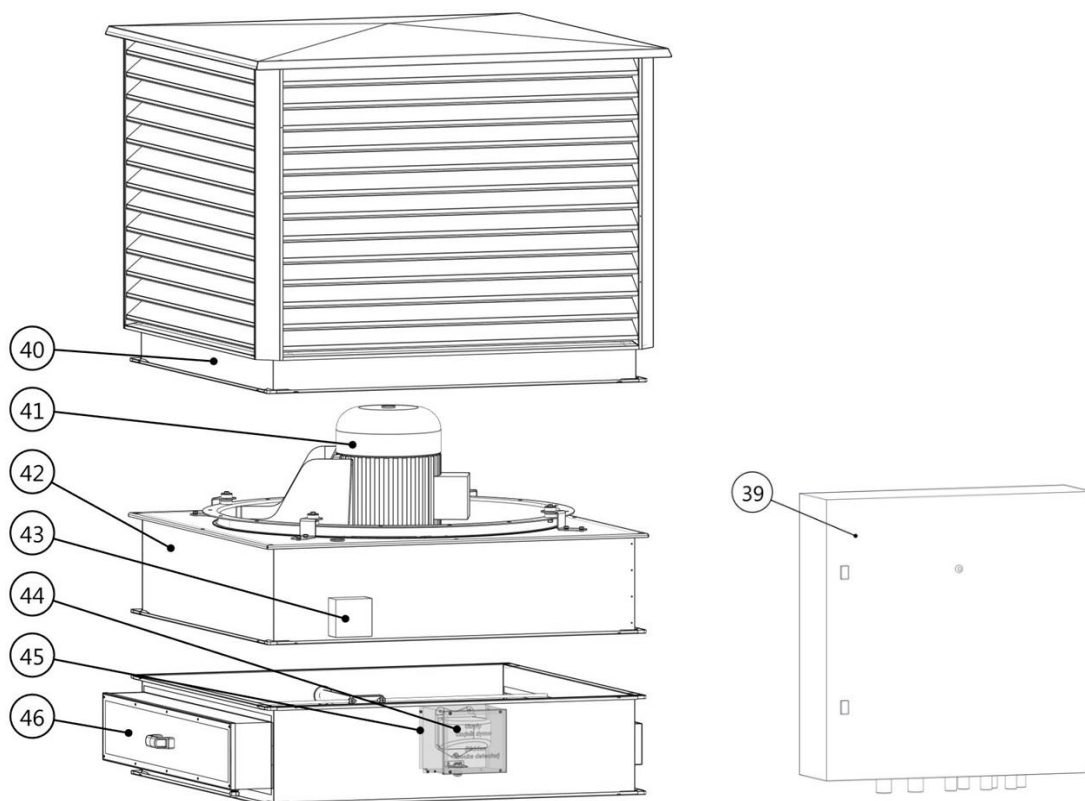


Fig. 4.6. iSWAY-RFC®-2018 construction with SzA-FCK automation cabinet (with integrated frequency converter, controller and 24VDC power supply, separately available outside the iSWAY-RFC® unit).

- 39. Automation Control Cabinet SzA-FCK
- 40. CPD-B roof intake louver (only for roof mounting, optional)
- 41. Fan
- 42. Fan duct
- 43. Fan box
- 44. Smoke detector
- 45. Smoke detector housing
- 46. SRC-D shut-off damper with servomotor (optional)

5. Performance versions

The following subsections show the different designs and installation of iSWAY® units. The overall

5.1. iSWAY-FC®

The basic version of the iSWAY-FC® unit is a compact unit (Fig. 5.1) which enables the iSWAY-FC® to be installed in a designated technical room (ventilation engine room) or on a roof with a dampers of double air intake system (Fig. 5.2).

Other typical versions of iSWAY-FC® are the air intake version (Fig. 5.3) and the vertical version only for the smallest unit iSWAY-FC-0 (Fig. 5.4).

As an option, iSWAY-FC® has introduced a system to prevent the shut-off dampers from freezing during precipitation and low temperatures. Special low-temperature resistant seals are used to seal the dampers. The system is used in the refrigeration industry and a 300 W directional infrared heater system, which is set at the factory to -2°C. When working at a temperature lower than the set temperature, the Anti-Frost system automatically switches on. The key elements for correct operation of the throttle valve at low temperature were painted black to absorb the maximum amount of infrared radiation. The remaining iSWAY-FC® interior components are left in bright colours to reflect the radiation and direct it to the essential elements, which enhances the infrared beam.

To achieve the declared capacity of the air handling fan, a straight section of duct with a minimum length equal to the diameter of the fan used must be provided directly behind the unit on the supply side. If local technical conditions allow it, a 1 m long straight line is recommended.

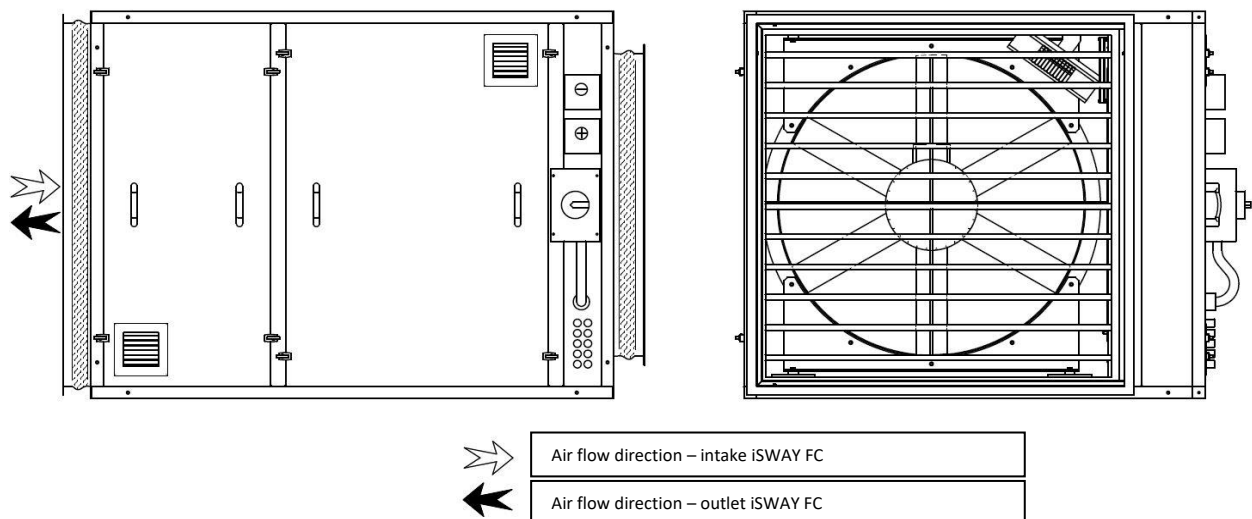


Fig. 5.1. iSWAY-FC® basic unit.

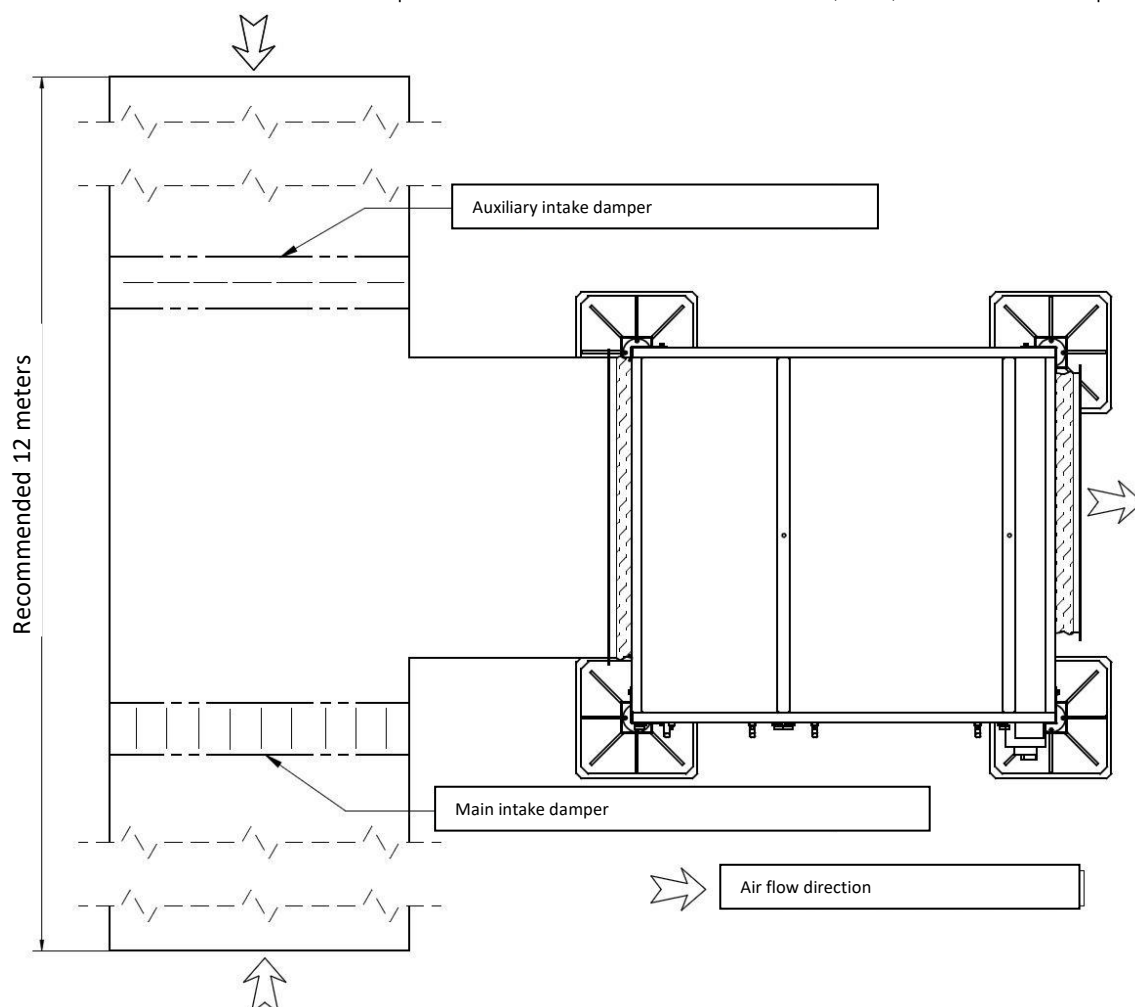


Fig. 5.2. iSWAY-FC® with two air dampers (primary and back-up, components of the two air intake system) - top view.

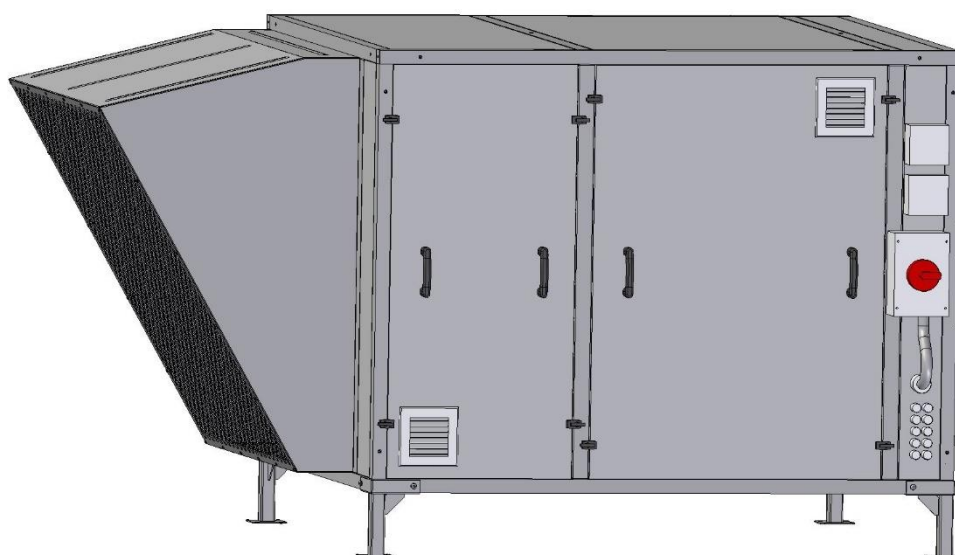


Fig. 5.3. iSWAY-FC® version with air intake.

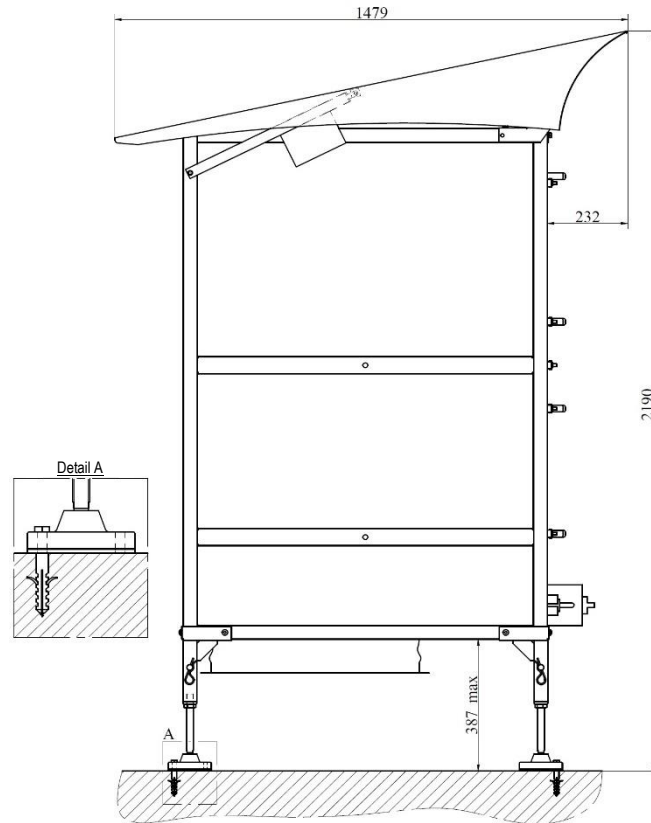


Fig. 5.4. Vertical version with closed canopy for the smallest iSWAY-FC® type 0 device.

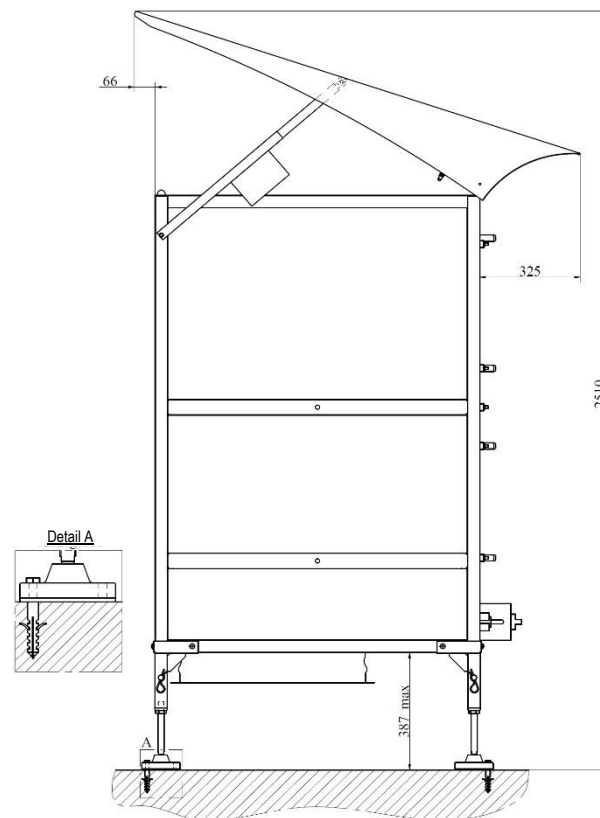


Fig. 5.5. Vertical version with open canopy for the smallest iSWAY-FC® type 0 device.

5.2. iSWAY-WFC®

iSWAY-WFC® is a wall-mounted unit. One variant of mounting the device is possible by means of a KT telescopic duct placed in the wall. On one side of the duct at the end of the installation a CDH-K air intake is mounted, and on the other side a fan.

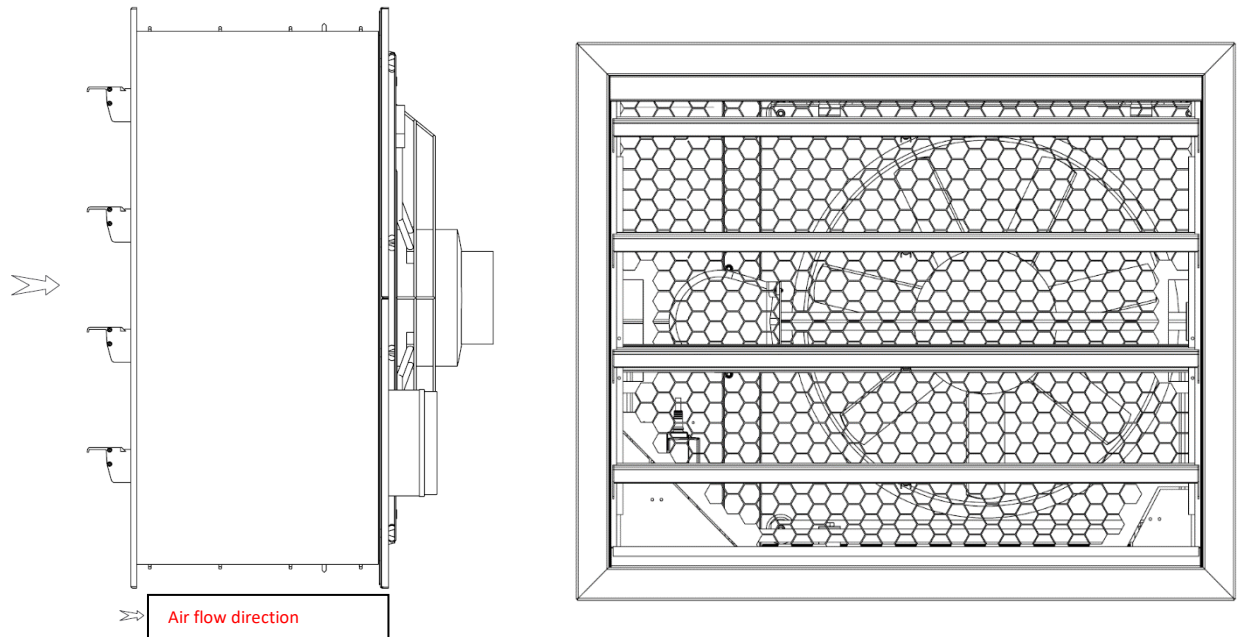
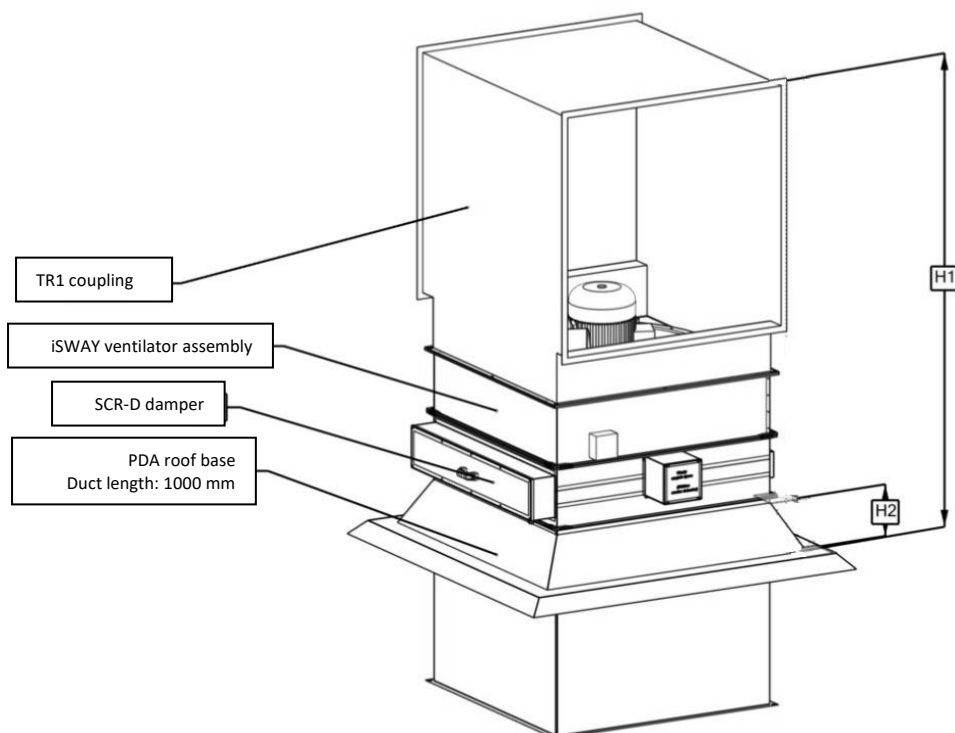


Fig. 5.6. iSWAY-WFC® type 1.1.

5.3. iSWAY-RFC®

The iSWAY-RFC® comes in several variants with different accessories and working positions (horizontal and vertical). The following types can be distinguished:

- TR1 - vertical version equipped with a duct coupling.



- TR3 - vertical version equipped with a duct connector open on one side.

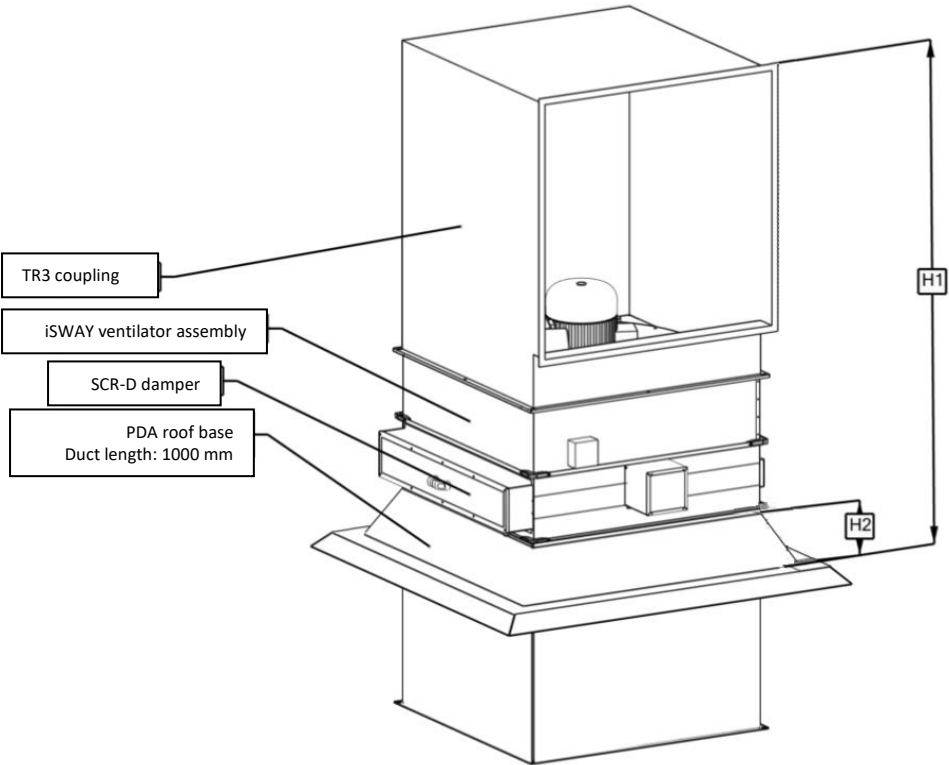


Fig. 5.8. iSWAY-RFC® with TR3 coupling.

- TR6 - vertical version equipped with a 3-way duct coupling.

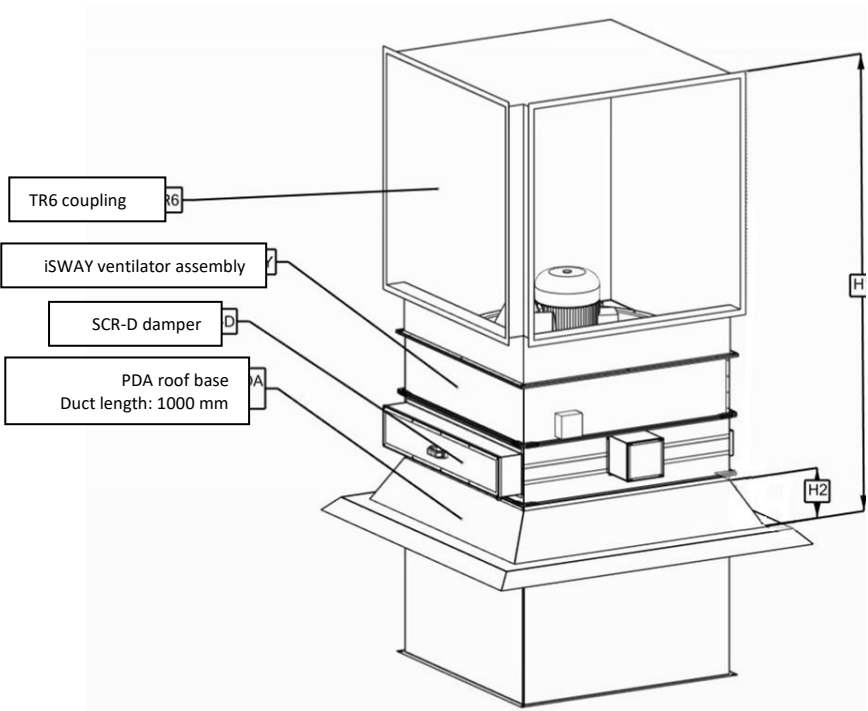


Table. 5.1. iSWAY-RFC® with coupling
TR1, TR3 or TR6.

iSWAY-RFC version	H1 [mm]	H2 [mm]
iSWAY-RFC 1.5	1270	220
iSWAY-RFC 2.2	1325	220
iSWAY-RFC 3.0 and 4.0	1660	320
iSWAY-RFC 5.5 and 7.5	2135	320

Fig. 5.9. iSWAY-RFC® with TR6 coupling.

- Vertical version equipped with CPDB roof air intake.

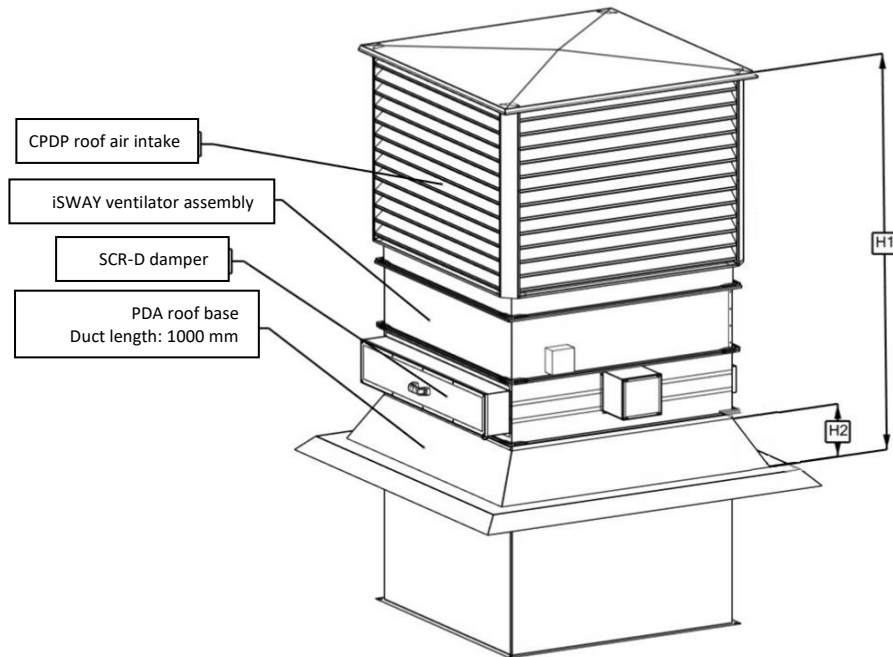


Fig. 5.10. iSWAY-RFC® with CPDB roof air intake.

Table 5.2. iSWAY-RFC® with CPDB intake vent.

iSWAY-RFC version	H1 [mm]	H2 [mm]
iSWAY-RFC 1.5 and 2.2	1135	220
iSWAY-RFC 3.0 and 4.0	1455	320
iSWAY-RFC 5.5 and 7.5	1835	320

- Horizontal version - consists of several elements that can be configured in different ways. The following figures show the most typical combinations.
Fig. 5.11 shows a configuration consisting of a wall-mounted SRC-D damper and a fan unit with a duct. The installation is completed by the ZS intake louver.

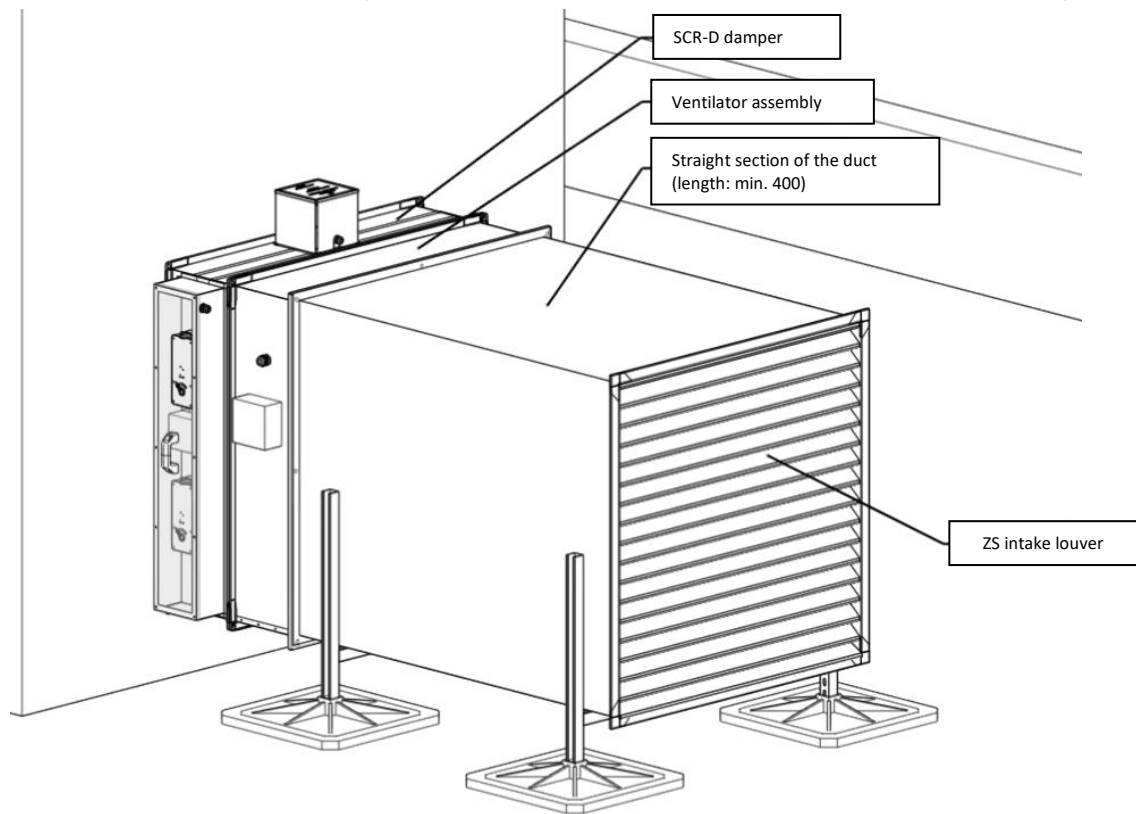


Fig. 5.11. iSWAY-RFC® in horizontal version with SRC-D damper and ZS intake louver.

The second iSWAY-RFC® configuration shown in fig. 5.12 in the horizontal version is without the SRC-D damper, and the end of the installation and the function of the dumper is performed by an air intake with moving lamellas CDH-K. In this case, a KCD smoke detector duct installed in front of or behind the fan is used.

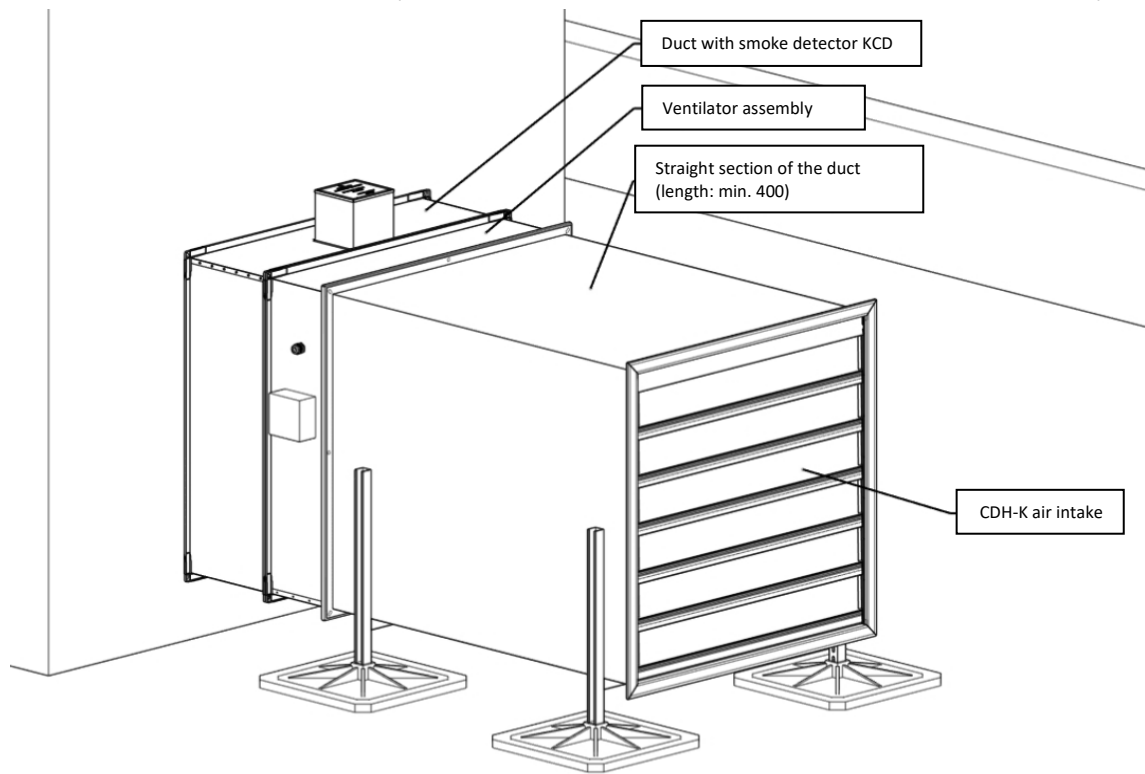


Fig. 5.12. iSWAY-RFC® in horizontal version without SRC-D damper, with CDH-K intake louver.

6. Accessories for iSWAY

6.1. iSWAY-FC®

In order to facilitate the design, assembly and commercial specifications for quoting and ordering, the construction of the unit is based on a self-supporting structure. Any working position (horizontal and vertical) is possible. Depending on the needs, the aeration unit can be laid on the roof or floor of the technical floor with the appropriate accessories.

A universal way of mounting the offered accessories has been introduced, which can be ordered in the basic aeration module. The system has been designed in such a way that each of the accessories can be mounted without any mounting holes using the existing ones clearly defined in figure 11.3.

As standard, the iSWAY-FC® is produced as a compact unit with welded feet (Fig. 6.1), equipped with flexible connectors for the connection of ventilation ducts.

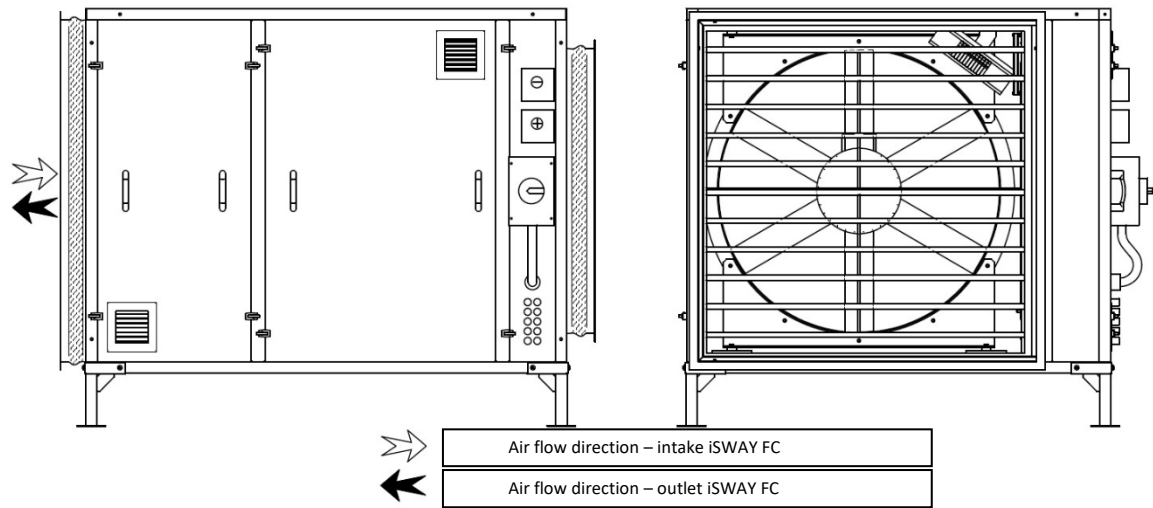


Fig. 6.1. iSWAY-FC® compact unit.

The accessories that are provided for the device are

- air intake CP
- installation on feet BF
- anti-freezing system AF
- vertical mounting feet PSW
- canopy for vertical version DA (iSWAY-FC-0 only)

6.2. iSWAY-WFC®

To the iSWAY-WFC® assembly no additional accessories are provided. The device is sold with all required elements as a set, which includes: CDH-K air intake in a mesh version, smoke detector, KT telescopic duct, fan with a protection mesh and control (power supply and control) cabinet SzA-FCK.

6.3. iSWAY-RFC®

The iSWAY-RFC® unit can be installed in two positions when placed on the building's roof. In the vertical installation, with a roof base to the roof plinth or in the horizontal installation, when the ventilation ducts are installed horizontally.

To the iSWAY-RFC® set accessories are provided:

- SRC-D damper with smoke detector for horizontal and vertical installation
- PDA or PDA-1 roof base for vertical installation
- CPDB air intake for vertical installation
- ZS or CDH-K louver for horizontal installation
- Ventilation duct with smoke detector KCD for horizontal installation
- Vertical installation connectors
 - TR1
 - TR3
 - TR6

Installation of accessories should be carried out by qualified technical personnel with due care.

7. Dampers of double air intake system (primary and back-up, components of the two air intake system).

7.1. Basic information

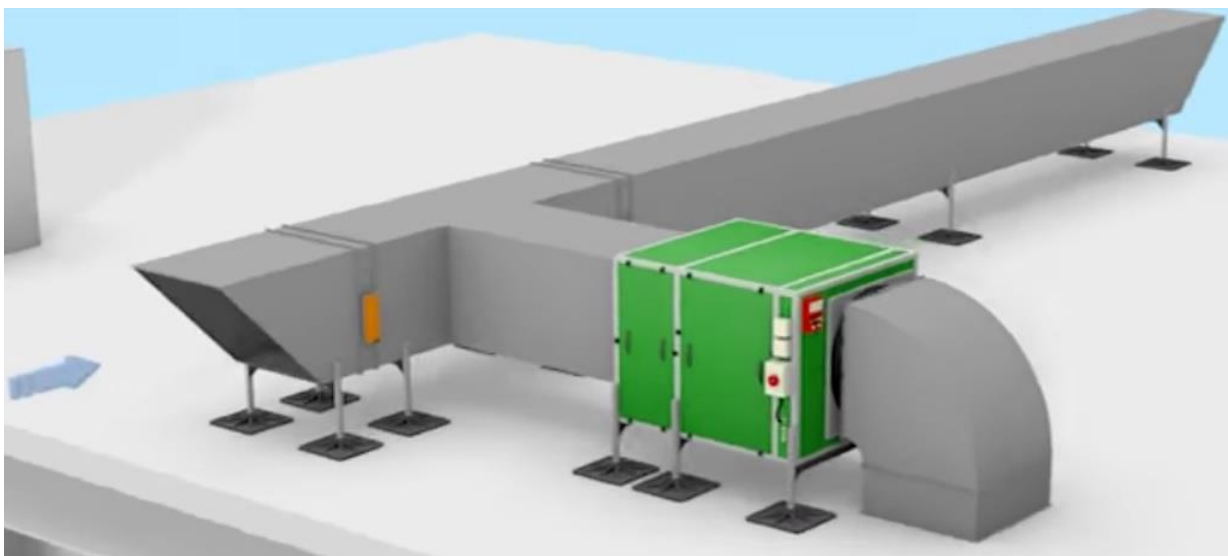
The air inlet (intake) should always be located away from any potential fire hazards. To avoid smokiness from rising smoke, air intakes should be located at or near ground level (but at a considerable distance from smoke extraction flaps from the underground). If this is not possible, air intakes should be placed at roof level.

If the air inlet is far from the fan, the air from the fan inlet should be ducted.

Where air inlets are at roof level, two air inlets shall be provided, spaced apart and directed in different directions so that they cannot be located directly on the leeward side of the same smoke source. Each inlet should independently be able to provide the full air supply required by the system. Each inlet shall be protected by an independently operating system of shut-off dampers to control the spread of smoke in such a way that, if one damper closes due to smoke contamination of the air, the other inlet continuously provides the supply of air required by the system. The outlet point of the smoke ventilation duct shall be a minimum of 1 meter above the air inlet and a minimum distance of 5 meters in horizontal.

An independent shut-off damper system for smoke control is offered by SMAY under the name Two Damper System. This set consists of two separate dampers with weatherproof actuators with service and maintenance inspections. Two damper systems are offered as standard with dimensions of iSWAY-FC inlet stubs and are intended for installation in inlet (intake) ducts.

The following figure shows an example of how to connect a system of two dampers to iSWAY-FC. The connection to iSWAY-RFC is analogous to the following. The distance between the primary and auxiliary air intake dampers shall be at least 12 meters.



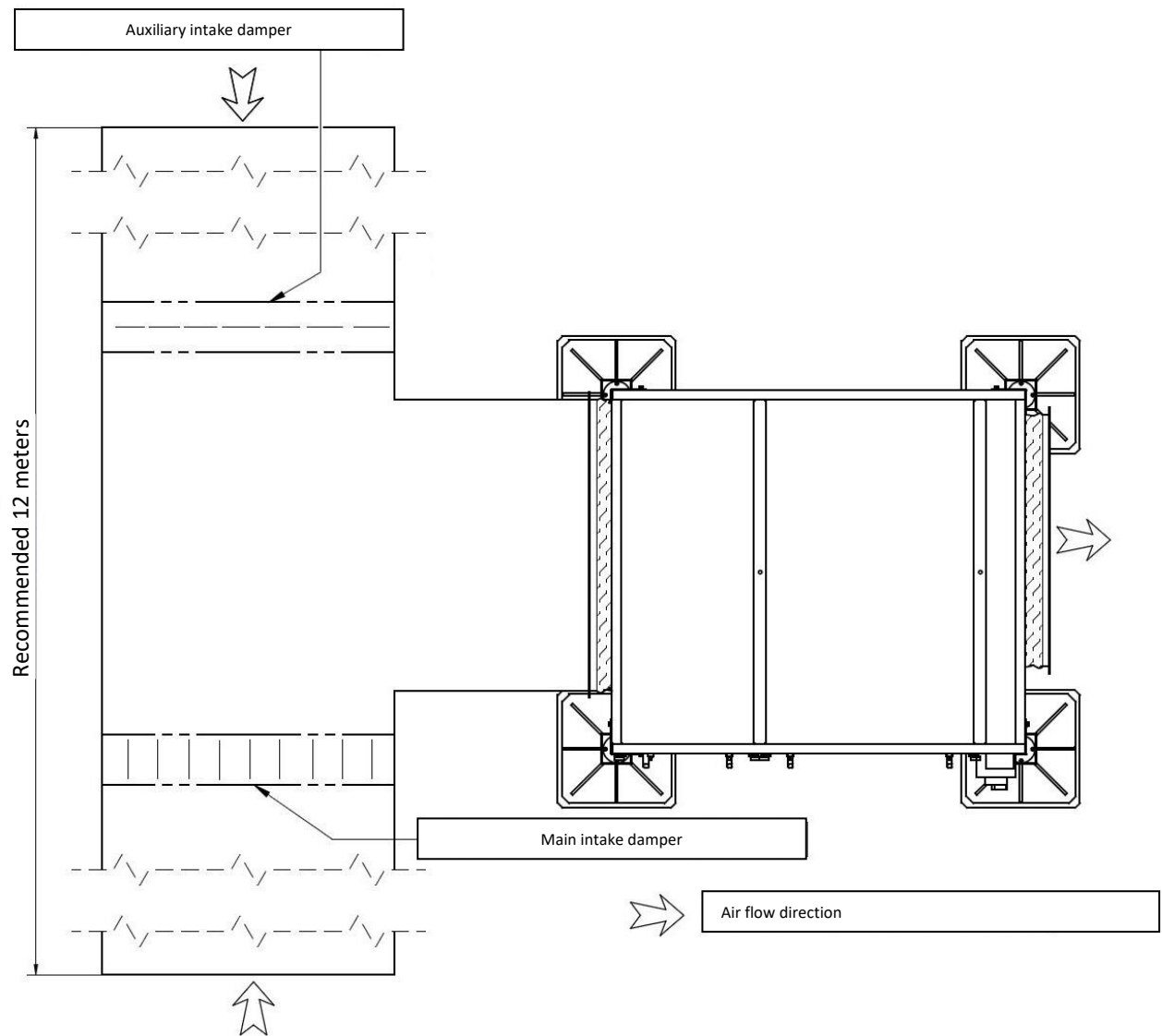


Fig. 7.1. Two air dampers system (primary and back-up, components of the two air intake system) connected to iSWAY-FC.

7.2. Technical data of the two damper system

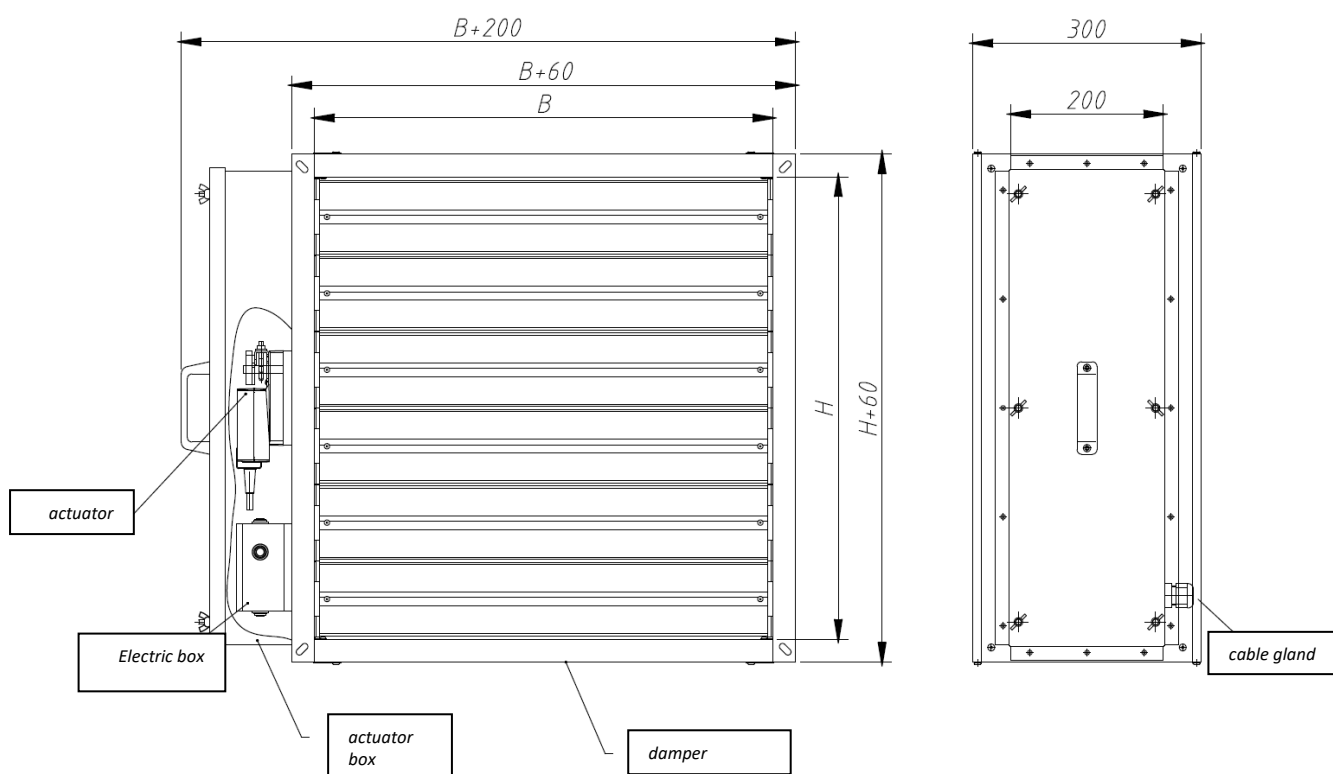


Figure 7.2. View and dimensions of the two damper system for iSWAY-FC®.

Table 7.1. Dimensions of the two damper system for iSWAY-FC®.

iSWAY-FC	B	H
	[mm]	[mm]
0	770	770
1	1000	1005
2	1200	1205

8. Identification of the unit

8.1. Rating plate

iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® is fitted on the outer casing with a rating plate, an example of which is shown in Figure 8.1.

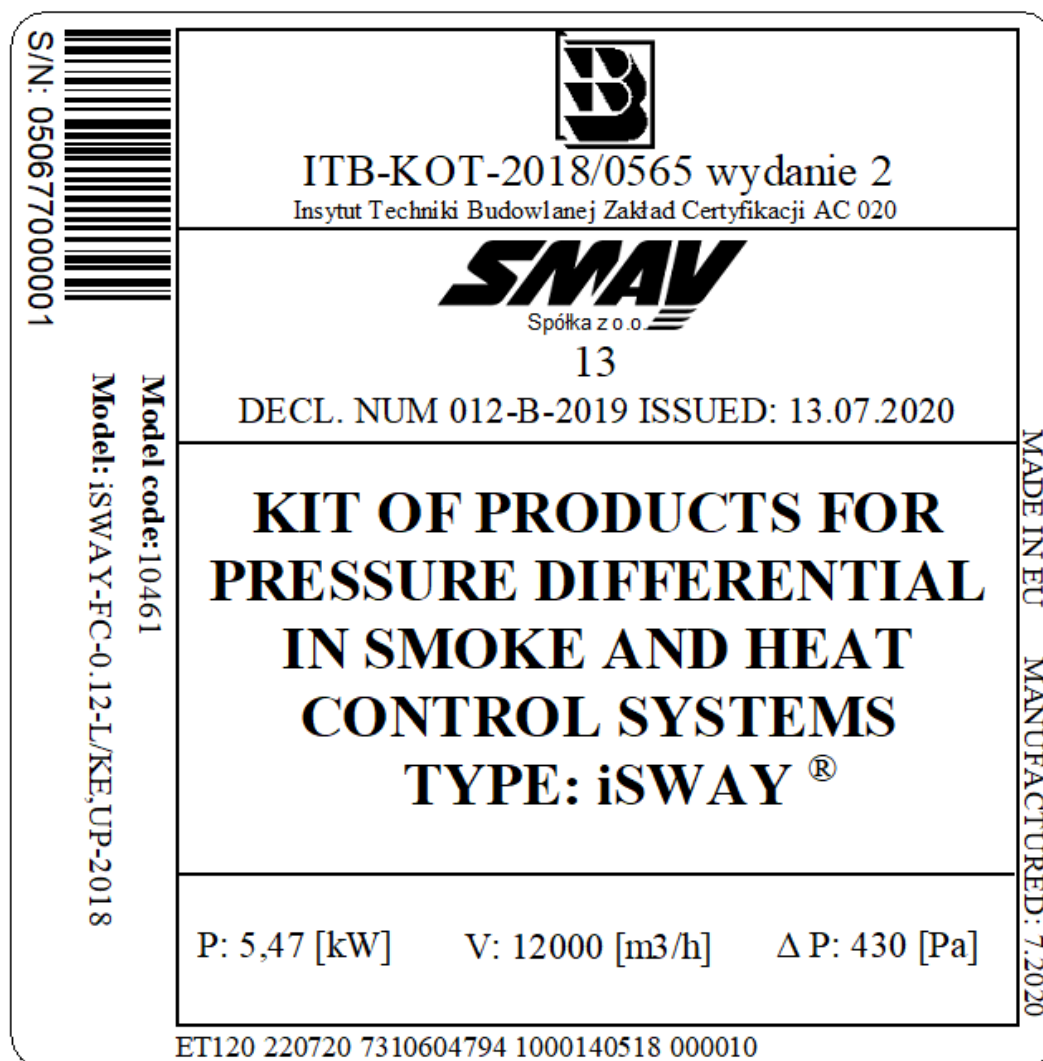


Fig. 8.1. Example of iSWAY-FC® rating plate.

The rating plate contains the following data:

- Type - defines the technical specifications of the equipment
- S/N - device serial number
- V - unit capacity in [m³/h] with available compression Δp [Pa]
- P - power of the device in [kW]
- National Technical Assessment Number
- Certification body
- No. of the National Declaration of Performance - date of issue - issuer's name

8.2. Product labelling rules

8.2.1. iSWAY-FC® labelling

iSWAY- FC-<A>-<V>-<Q>-<DR>-<X>-<T>-<U>-<Y>-<ML>-<Dc>-<K>/<ADD>

<A>- automatics*

none - standard controls

D - for Local FireBus® loop operation

R - for the reversible system

<V> - fan capacity

0.3 - max. capacity 14500 m³/h (depending on the variant)

0.12 – max. capacity 20000 m³/h (depending on the variant)

1.17 – max. capacity 27200 m³/h (depending on the variant)

1.20 – max. capacity 35600 m³/h (depending on the variant)

1.24 – max. capacity 42000 m³/h (depending on the variant)

2.31 – max. capacity 56500 m³/h (depending on the variant)

2.39 – max. capacity 61500 m³/h (depending on the variant)

2.47 – max. capacity 65000 m³/h (depending on the variant)

2.75 – max. capacity 78200 m³/h (only variant with increased capacity <Q>=J)

<Q> - variant of the unit*

none - standard

J – increased capacity

<H> - version*

none - compact (in enclosure)

B - without enclosure and wiring (elements mounted separately)

<DR>- operation direction*

none - on the air supply

E - on the exhaust

<X> - operation side*

None - right operation side

L - left-hand side

Standing in the direction of air flow in the supply air unit
the operation side is on the right-hand

Standing in the direction of air flow in the supply air unit
the operation side is on the left

<T> - operating temperature (manufacturer's recommendation)*

none = from -5 to +55 °C

AF - from -25 to +55 °C - fitted with Anti-Frost system

<U> - location of the device*

none - inside the building

Z – outside the building

<Y> - additional 24V DC outputs*

none - no additional 24V DC outputs

M - has an additional 24VDC power output for TSS panel, KSN vent, peripheral device (PMAC-F, MAC-D-Min)

<ML>- measuring strip module*

none - no measuring strip

LP – measuring strip

<Dc>- additional pressure sensor inside unit*

none - no additional pressure difference sensor

PF – additional PMAC-F pressure difference sensor ±500 Pa

<K> - automatic canopy for vertical installation*

none - without automatic canopy

DA - with automatic canopy (only compact version <H>=none and fan capacity <V>=0.3 or <V>=0.12)

<ADD>- accessories: (blocked when <H>=B)

KE - flexible rectangular connector on the intake side

CP – air intake

UP - double air intake dampers

DS - roof for housing version with operating side <X> left or right

SS - installation on welded feet - horizontal installation

BF - installation on RESTAL feet - horizontal installation

KM - fixation with angle bars

RS – installation on riveted frame

PSW - installation on platform and levelling foot

* optional values - default values will be used if optional values are not specified

Order example:

iSWAY-FC-1.20-J-L / CP, KM

As standard, the housing frame is painted in RAL 9010 (white) and the frame is filled with sandwich slabs in RAL 9010 (white).

NOTE: When ordering more than six iSWAY-FC® units for a single facility, SMAY Sp. z o.o. recommends the use of Devices Operation Status Monitoring (MSPU) with a Control Panel (TS), allowing for integration and central monitoring of the air handling units.

Equipement for version without enclosure <H>=B, every item ordered separately:

KSM-H - feet and vibration absorbers – horizontal installation

KSM-H-iSWAY-FC-<A>-<V>-<Q>-B

<A> controls*

none - standard controls

D - for Local FireBus® loop operation

R - for the reversible system

<V> fan capacity

0.3 - max. capacity 14500 m³/h (depending on the variant)

0.12 - max. capacity 20000 m³/h (depending on the variant)

1.17 - max. capacity 27200 m³/h (depending on the variant)

1.20 - max. capacity 35600 m³/h (depending on the variant)

1.24 - max. capacity 42000 m³/h (depending on the variant)

2.31 - max. capacity 56500 m³/h (depending on the variant)

2.39 - max. capacity 61500 m³/h (depending on the variant)

2.47 - max. capacity 65000 m³/h (depending on the variant)

2.75 - max. capacity 78200 m³/h (only variant with increased capacity <Q>=J)

<Q> variant of the unit *

none - standard

J - increased capacity

Order example: KSM-H-iSWAY-FC-R-2.31-B

KSM-V - feet and vibration absorbers – vertical installation

KSM-V-iSWAY-FC-<A>-<V>-<Q>-B

Order example: KSM-V-iSWAY-FC-2.31-J-B

KEK - flexible circular connector

KEK-iSWAY-FC-<V>-B

Order example: KEK-iSWAY-FC-2.31-B

KWH - rectangular air intake

KW-H-iSWAY-FC-<V>-B

Order example: KW-H-iSWAY-FC-2.31-B

DC - intake vent

DC-iSWAY-FC-<V>-B

Order example: DC-iSWAY-FC-2.31-B

UP - double air intake dampers

UP-iSWAY-FC-<V>-B

Order example: UP-iSWAY-FC-2.31-B

SKW - frame on screwed feet for the fan – horizontal installation

SKW-iSWAY-FC-<V>-B

Order example: SKW-iSWAY-FC-2.31-B

SKWA - frame on screwed feet for the fan and controls cabinet – vertical installation

SKWA-iSWAY-FC-<V>-B

Order example: SKWA-iSWAY-FC-2.31-B

BFW - frame on RESTAL feet for the fan - horizontal installation

BFW-iSWAY-FC-<V>-B

Order example: BFW-iSWAY-FC-2.31-B

BFWA - frame on RESTAL feet for the fan and controls cabinet - horizontal installation

BFWA-iSWAY-FC-<V>-B

Order example: BFWA-iSWAY-FC-2.31-B

RSK - rectangle - circle adapter

RSK-iSWAY-FC-<V>-B

Order example: RSK-iSWAY-FC-2.31-B

DW - fan canopy

DW-iSWAY-FC-<V>-B

Order example: DW-iSWAY-FC-2.31-B

DA - controls cabinet canopy

DA-iSWAY-FC-<V>-B

Order example: DA-iSWAY-FC-2.31-B

8.2.2. iSWAY-WFC® labelling

iSWAY- WFC-<W>-<U>-<Y>-<Dc>-<P><RAL>

<W> - the size/type of the device housing:

1.1 – 9500 [m³/h] unit capacity with available compression ratio of 130 Pa

1.5 – 12700 [m³/h] unit capacity with available compression ratio of 130 Pa

2.2 – 17000 [m³/h] unit capacity with available compression ratio of 140 Pa

3.0 – 27000 [m³/h] unit capacity with available compression ratio of 150 Pa

5.5 – 42000 [m³/h] unit capacity with available compression ratio of 140 Pa

<U> - location of SzA-FCK automation cabinet *

none = inside the building

Z – outside the building

<Y> - additional 24VDC outputs*

none = no additional 24VDC outputs

M - has an output for KSN vent, 24VDC power output for TSS, 24VDC output for peripheral device

<Dc>- additional pressure sensor*

none = no additional pressure sensor

PF – PMAC-F pressure sensor (as a standard, there is one pressure sensor in the MAC-FC in the SzA-FCK automation cabinet)

<P> - finish (P and RAL applies to the CDH-K intake louver of the iSWAY-WFC)

AA - lamella profiles made of anodized aluminum, frame made of powder coated aluminum
RAL9006 mat

AL - frame and lamella profiles made of powder coated aluminum

<RAL> - according to RAL palette (for AL finish)

* default values - default values will be used if optional values are not specified

Order example:

iSWAY – WFC – 3.0 - AA

8.2.3. iSWAY-RFC® labelling

iSWAY- RFC-<W>-<U>-<Y>-<Dc>-<P><RAL>/<ADD>

<W> - the size/type of the device housing:

1.5 – 10000 [m³/h] unit capacity with available compression ratio of 200 Pa

2.2 – 12000 [m³/h] unit capacity with available compression ratio of 250 Pa

3.0 – 20000 [m³/h] unit capacity with available compression ratio of 250 Pa

4.0 – 25000 [m³/h] unit capacity with available compression ratio of 240 Pa

5.5 – 36000 [m³/h] unit capacity with available compression ratio of 250 Pa

7.5 – 40000 [m³/h] unit capacity with available compression ratio of 270 Pa

<U> - location of SzA-FCK automation cabinet *

none = inside the building

Z – outside the building

<Y> - additional 24VDC outputs*

none = no additional 24VDC outputs

M - has an output for KSN vent, 24VDC power output for TSS, 24VDC output for peripheral device

<Dc>- additional pressure sensor*

none = no additional pressure sensor

PF – PMAC-F standard pressure sensor (as a standard, there is one pressure sensor in the MAC-FC in the SzA-FCK automation cabinet)

<P> - finishing (relates also for accessories: TR1, TR3, TR6, UP, SRC-D, KCD)

SO - galvanized steel

SL– powder coated steel

<RAL> - according to RAL palette (for SL finish)

<ADD>- accessories:

TR1 - AxB size connector (only for vertical installation)

TR3 - AxB size connector (only for vertical installation)

TR6 - AxB size connector (only for vertical installation)

UP - double air intake dumpers AxB size

SRC-D - AxB size damper with enclosed smoke detector (for horizontal installation recommended with ZS)

KCD - smoke detector duct with AxB size and length L=400mm (only for horizontal installation), note: select always with CDH-K air intake

CDH-K-A-<P><RAL>-BF24 – CDH-K damper of CxD dimension (only for horizontal installation)

<P> - finish

AA - anodized aluminium lamella profiles, powder coated aluminium frame, RAL9006 matt

AL – frame and lamella profiles in lacquered aluminium

<RAL> - according to RAL palette (for AL finish)

* optional values - default values will be used if optional values are not specified

Order example:

iSWAY – RFC – 2.2 - SO/SRC-D

Optional products for the iSWAY-RFC kit ordered separately:

1. PDA - AxB size roof base (only for vertical installation)
2. PDA1 - AxB size roof base (only for vertical installation)
3. CPD-B - AxB size roof air intake (only for vertical installation)
4. ZS - CxD size air intake louver (only for horizontal installation)

Table 8.1. iSWAY-RFC accessories dimensions table

iSWAY-RFC type	Dimensions A=B=C=D [mm]
iSWAY-RFC-1.5	680
iSWAY-RFC-2.2	760
iSWAY-RFC-3.0	925
iSWAY-RFC-4.0	925

iSWAY-RFC-5.5	1150
iSWAY-RFC-7.5	1150

9. Technical parameters iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®

9.1. iSWAY-FC®

9.1.1. iSWAY-FC® dimensions

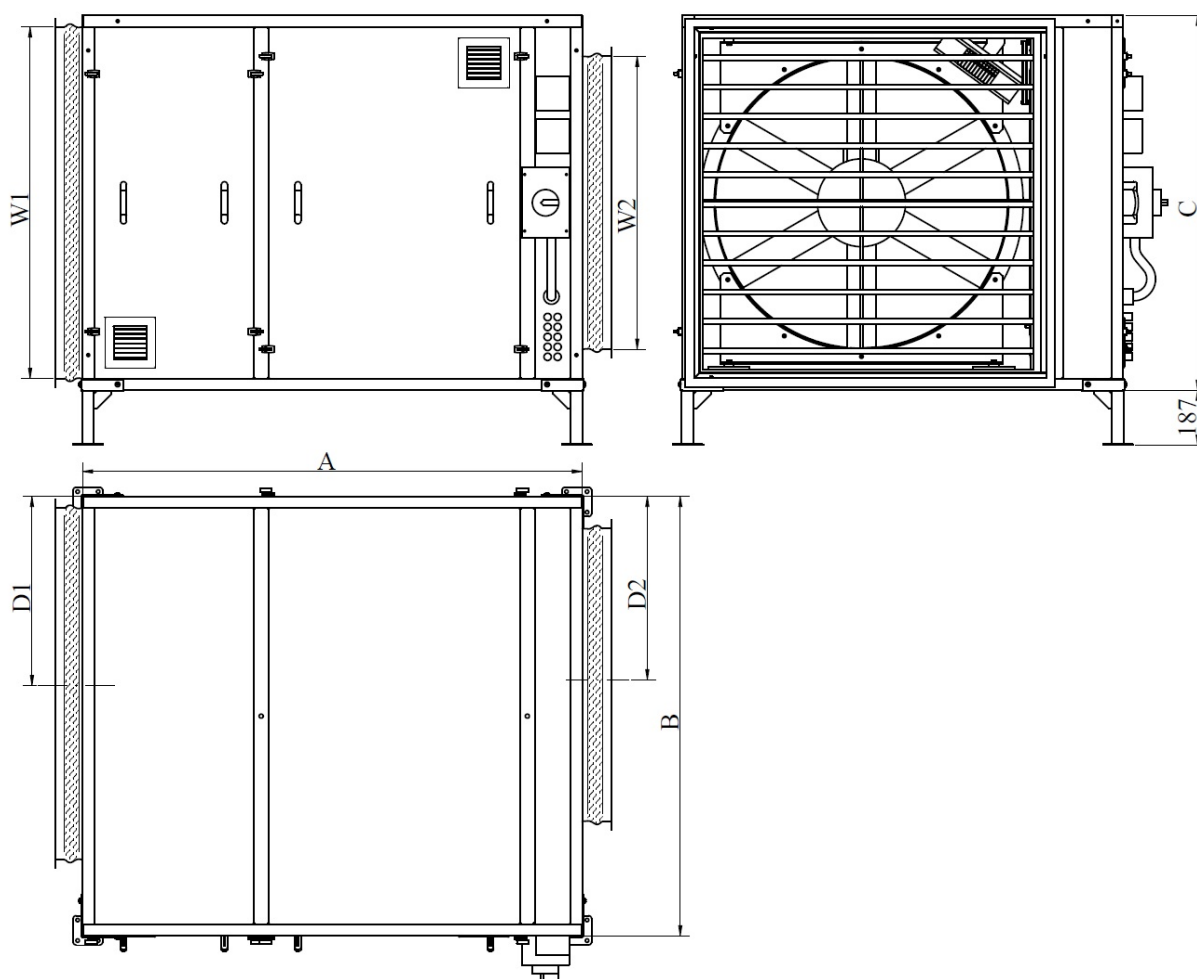


Fig. 9.1. iSWAY-FC® basic dimensions.

Table 9.1. iSWAY-FC® basic dimensions.

		A	B	C	D1	D2	W1	W2
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Unit size	0	1520	1070	870	435	435	770x770	770x770
	1	1620	1320	1100	550	550	1000x1000	1000x1000
	2	1720	1520	1300	650	650	1200x1200	1200x1200

9.1.2. Technical parameters of iSWAY-FC® devices

Table 9.2. Technical parameters iSWAY-FC.

Type	0.3	0.12	1.17	1.20	1.24	2.31	2.39	2.47	2.75
Capacity [m ³ /h] (AFC)	3 000	12 000	17 000	20 000	24 000	31 000	39 000	47 000	-
Available compression ratio [Pa] (AFC)	900	430	380	390	360	400	420	300	-
Capacity [m ³ /h] (AJF)	11 500	17 250	18 500	26 500	33 000	44 500	53 500	58 500	66 000
Available compression ratio [Pa] (AJF)	350	350	350	350	350	350	350	350	350
Capacity [m ³ /h] (ARC)	-	-	17 000	20 000	24 000	31 000	39 000	47 000	-
Available compression ratio [Pa] (ARC)	-	-	310	310	290	350	360	320	-
Weight with AFC [kg]*	219	232	320	331	352	501	527	571	-
Weight with ARC [kg]*	-	-	351	347	357	424	489	503	-
Weight with AJF [kg]*	203	229	309	319	332	412	487	515	565
Operating temperature [°C]	from -25 to +55								

* with no accessories

Table 9.3. Technical parameters - electric iSWAY-FC.

Type	Supply voltage	Active power	Apparent power
	[V]	[kW]	[kVA]
0.3	3x400	3.38	3.45
0.12	3x400	5.47	5.57
1.17	3x400	5.26	5.36
1.20	3x400	6.96	7.10
1.24	3x400	9.22	9.40
2.31	3x400	9.22	9.40
2.39	3x400	13.00	13.26
2.47	3x400	17.4	17.75
2.75	3x400	21.26	21.34

9.2. iSWAY-WFC®

9.2.1. iSWAY-WFC® dimensions

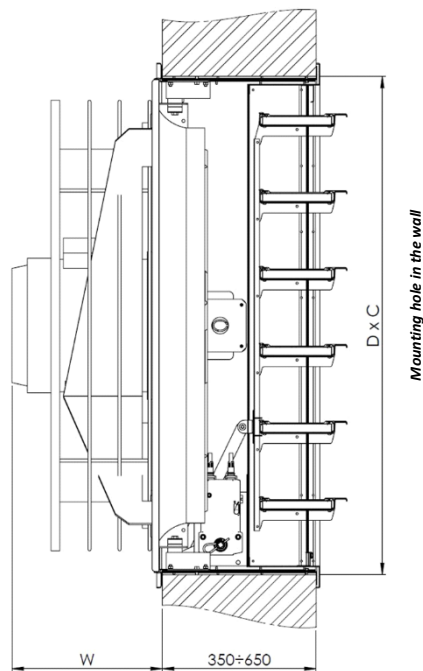


Fig. 9.4. iSWAY-WFC® basic outer dimensions.

Table 9.4. iSWAY-WFC® basic dimensions.

iSWAY-WFC	C [mm]	D [mm]	W [mm]
iSWAY-WFC 1.1	955	785	165
iSWAY-WFC 1.5	1035	785	165
iSWAY-WFC 2.2	1135	960	185
iSWAY-WFC 3.0	1240	960	315
iSWAY-WFC 5.5	1355	1135	345

9.2.2. Technical parameters of iSWAY-WFC® devices

Table 9.5. Technical parameters iSWAY-WFC.

Type	1.1	1.5	2.2	3.0	5.5
Airflow [m³/h]	9 500	12 700	17 000	27 000	42 000
Available compression ratio [Pa]	150	150	150	200	200
Total weight [kg]	66	70	80	110	180
Operating temperature [°C]	from -25 to +55				

Table 9.6. Technical parameters - electric iSWAY-WFC.

iSWAY - WFC			
Type	Supply voltage	Active power	Apparent power
	[V]	[kW]	[kVA]
1.1	3x400	2.02	2.06
1.5	3x400	2.50	2.54
2.2	3x400	3.20	3.26
3.0	3x400	4.14	4.22
5.5	3x400	7.09	7.23

9.3. iSWAY-RFC®

9.3.1. iSWAY-RFC® Dimensions

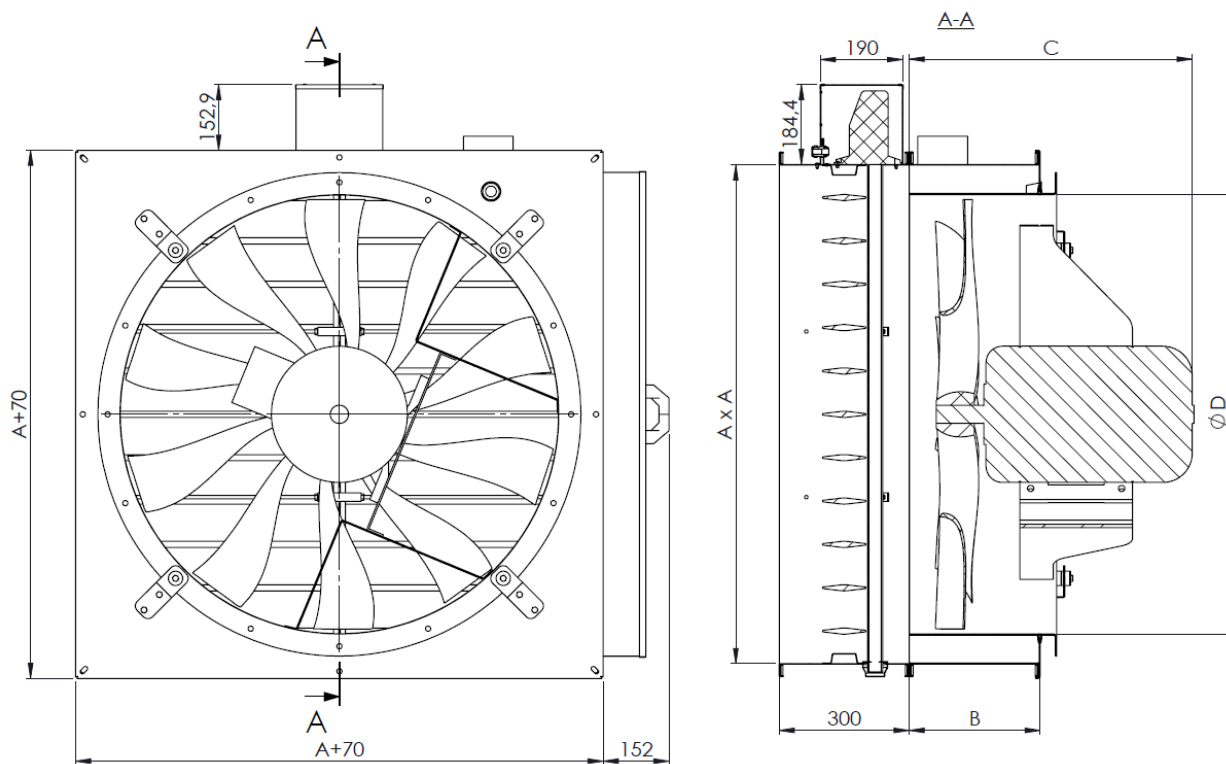


Fig. 9.6. iSWAY-RFC® basic outer dimensions.

Table 9.7. iSWAY-RFC® basic dimensions.

iSWAY-RFC version	A [mm]	B [mm]	C [mm]	D [mm]
iSWAY-RFC 1.5	680	142,5	387	559
iSWAY-RFC 2.2	760	152,5	442	633
iSWAY-RFC 3.0	925	187,5	463	801
iSWAY-RFC 4.0	925	187,5	469	801
iSWAY-RFC 5.5	1150	307,5	653	1013

iSWAY-RFC 7.5	1150	307,5	653	1013
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9.3.2. Technical parameters of iSWAY-RFC® devices

Table 9.8. Technical parameters iSWAY-RFC.

Type	1.5	2.2	3.0	4.0	5.5	7.5
Airflow [m³/h]	10 000	12 000	20 000	25 000	36 000	40 000
Available compression ratio [Pa]	200	250	250	250	250	250
Total weight [kg]*	100	120	140	160	210	215
Operating temperature [°C]	from -25 to +55					

*according to Fig. 9.6

Table 9.9. Technical parameters - electric iSWAY-WFC®.

Type	Supply voltage [V]	Active power [kW]	Apparent power [kVA]
1.5	3x400	2.52	2.57
2.2	3x400	3.34	3.40
3.0	3x400	4.11	4.19
4.0	3x400	5.25	5.36
5.5	3x400	6.93	7.07
7.5	3x400	9.19	9.37

10. Transport and storage

Do not store the aeration unit by placing one block on top of another.

The aeration unit should be stored indoors:

- Relative humidity $\phi < 80\%$ at $t = 20^\circ\text{C}$
- Ambient temperature $-40^\circ\text{C} < t < +60^\circ\text{C}$
- Aeration unit should not come into contact with dusts, gases and caustic fumes and other chemicals that could corrode equipment and components aeration units.

For the storage period, the foil packaging must be unsealed.

❖ **Any damage resulting from improper transportation, unloading and storage is not covered by the warranty and claims on this account will not be respected by SMAY Sp. z o.o.**

In addition, the device is supplied with:

- Wiring pipes - 12 m

- Fittings for wiring pipes - 3 pcs.
- Clamps for wiring pipes - 12 pcs.
- PVC hose \varnothing 5mm - 15 m
- P60KF box - 1 pc.
- Plastic material \varnothing 5 mm T-piece - 3 pcs.
- NSCH-60 box cover – 1 pc.
- Flexible plug - 7 pieces.
- Operation and Maintenance Manual - 1 pc.

10.1. iSWAY-FC®

The iSWAY-FC®, to the installation site is optionally supplied on a special RESTAL support system. Unloading from the means of transport and transporting the aeration unit to the place of assembly should be done by means of a pallet truck and it is recommended to lift the unit from the side of the service switch as shown in figure 10.1 because the weight distribution of the unit is not symmetrical and the centre of gravity is not in the geometric centre of the unit, therefore special care should be taken when transporting the iSWAY-FC®.

According to fig. 10.2. lifting by means of a crane is depicted, one set (4 pcs.) of transport screws with an extended M16 threaded eye is supplied on request. Screws for transport should be made of material with minimum strength parameters: $R_e=235$ [MPa], $R_m=380$ [MPa] e.g. C15. Remove the plugs from the holes and screw in the eye bolts as far as the stop. Remove the transportation screws after the required adjustment of the unit, and secure the holes with previously removed plugs.

In the case of supplies on pallets individual elements - sections of the aeration unit to the assembly site, these elements are to be assembled on site by the SMAY service. This documentation does not include manuals and guidelines for assembling the iSWAY-FC®. Immediately after the device has been delivered to the installation site, check the condition of the packaging and the complete documentation.

After assembling the aeration unit blocks or with the iSWAY® aeration unit delivered as a whole, only transport them in their normal operating position.

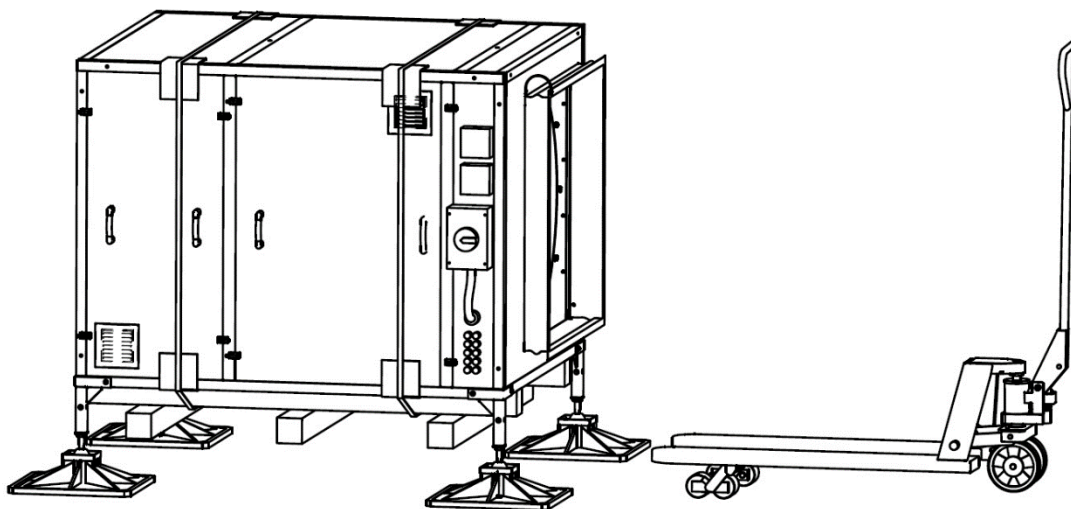


Fig. 10.1. Transportation by means of a pallet truck.

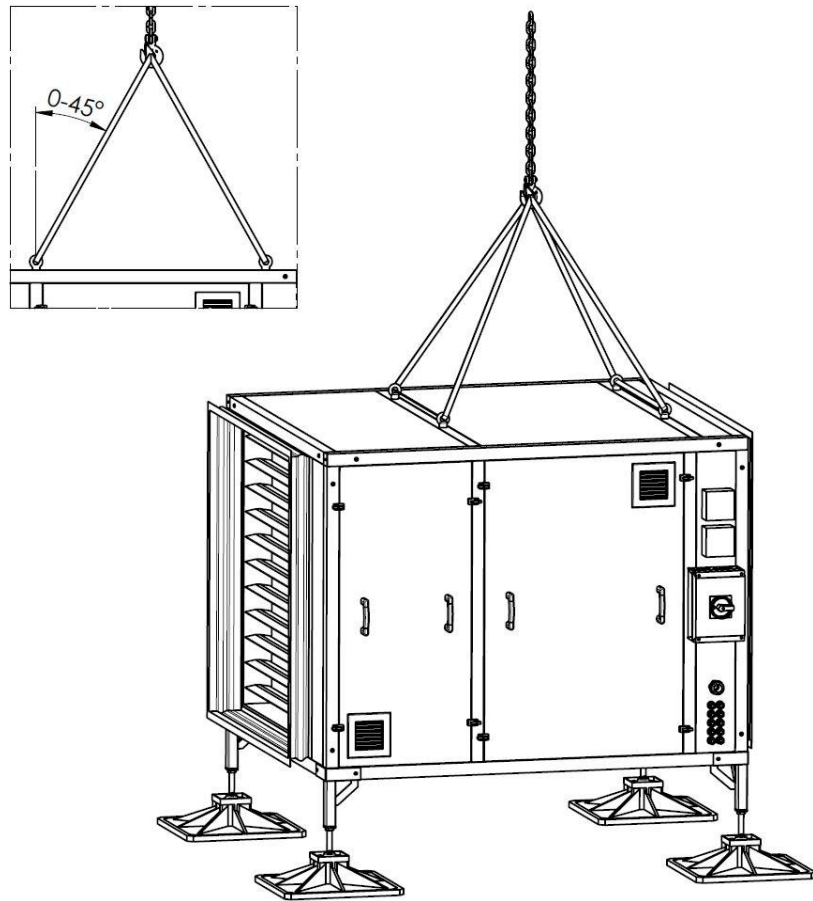


Fig. 10.2. Transportation by crane, attachment of slings to M16 long threaded eye bolts.

10.2. iSWAY-WFC®

The iSWAY-WFC® is delivered fully packed on a pallet: telescopic ventilation duct, Air intake and fan. The SzA-FCK cabinet (power supply element of the iSWAY-WFC kit) is sent with iSWAY-WFC. The product should be stored indoors, providing protection against external factors.

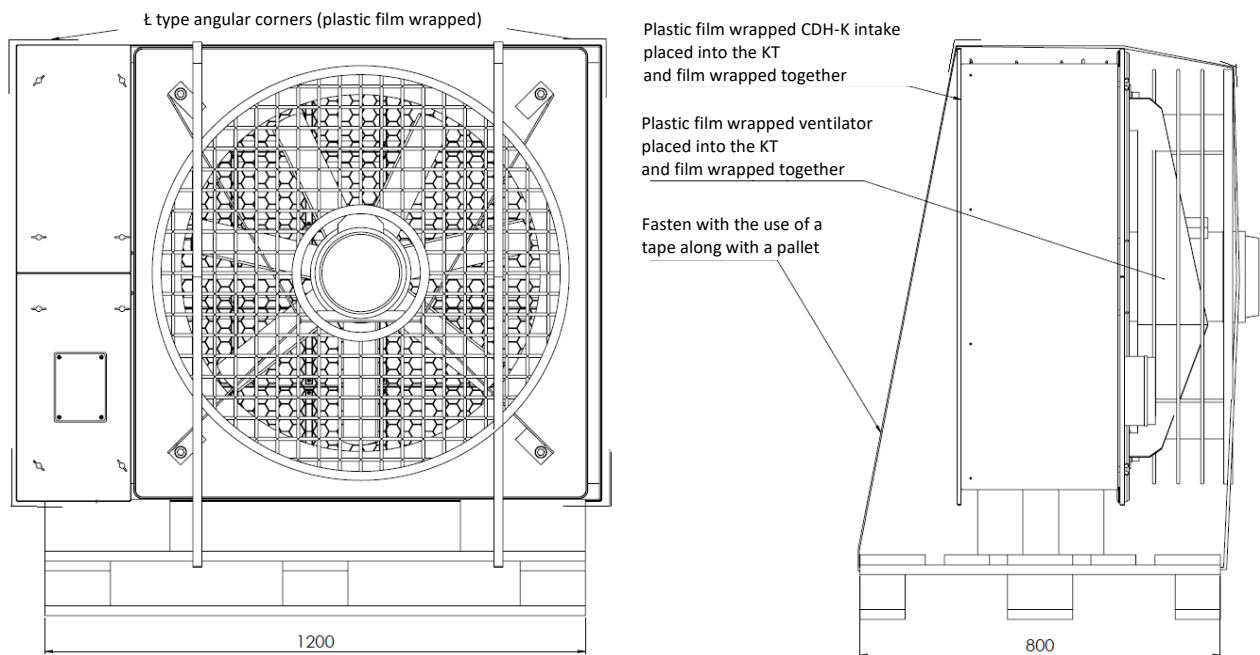


Fig. 10.3. Packing of iSWAY-WFC® on a pallet for the largest sizes of the assembly.

10.3. iSWAY-RFC®

The iSWAY-RFC® is transported disassembled to individual components to be mounted in the destination facility. The roof base, fan, damper and termination element are transported separately on pallets. The SzA-FCK cabinet (power supply element of the iSWAY-WFC kit) is sent with iSWAY-RFC.

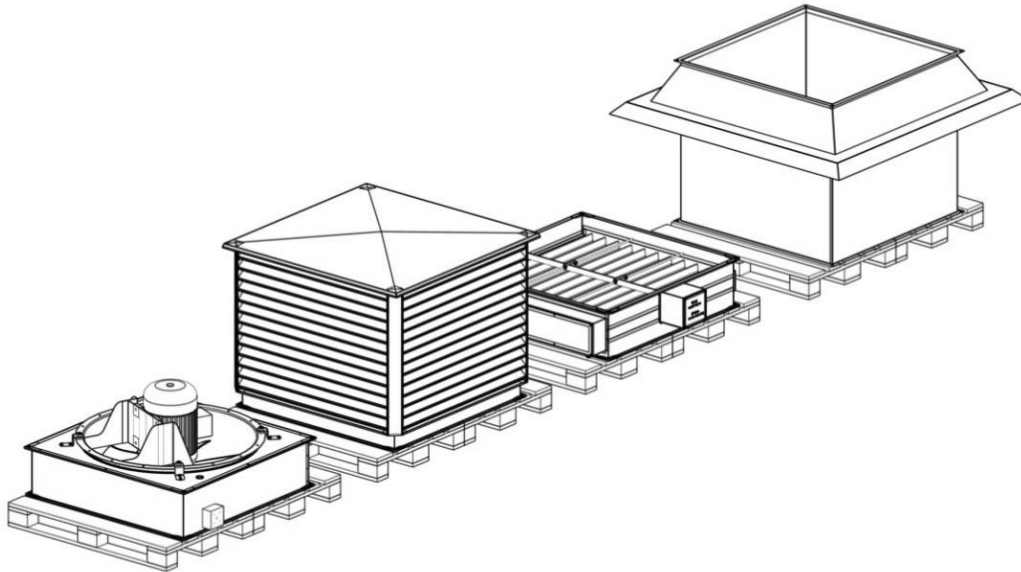


Fig. 10.4. Arrangement of iSWAY-RFC® elements on double pallets for transport with the largest unit size.

11. Installation

11.1. iSWAY-FC®

11.1.1. Installation of the device

Depending on the needs, the aeration unit can be installed on the roof or floor of the technical floor with the appropriate accessories described in point 6.

In order to facilitate design and installation, the construction of the unit is based on a self-supporting structure with a cushioned fan so that any working position (horizontal and vertical) is possible. It is recommended to determine the mounting direction of the device 1 or 2 to avoid the situation where the automation elements are placed with the bottom part facing upwards. It is allowed to position the automatics with the bottom part towards the top when the working position of the device is not known, however, it is required to change the position of the batteries of the 24VDC power supply according to the mounting direction. If it is not possible to determine the direction of installation, iSWAY is normally installed with the direction marked 1 fig. 11.1 (right-hand side of the operator).

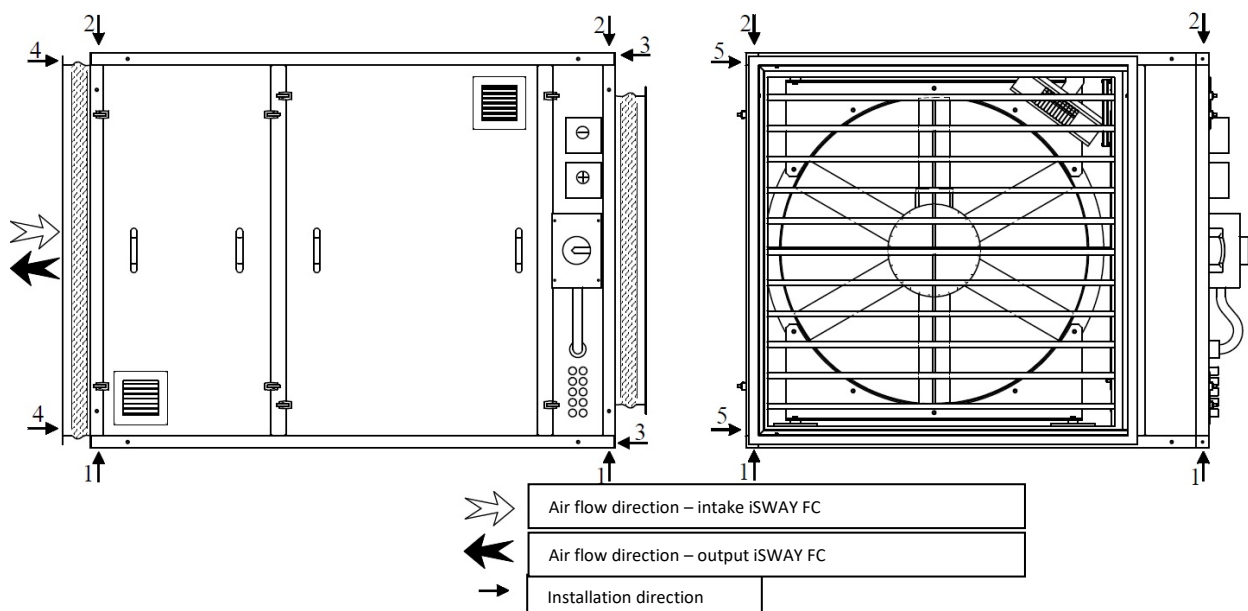


Fig. 11.1. Diagram of possible mounting options.

After determining the mounting direction, it is recommended to remove the plugs of $\varnothing 14$ drainage holes in the lower profiles of the unit housing. The arrangement of the M8 mounting holes (Fig. 11.3), allows the iSWAY unit to be mounted in any direction according to the diagram (Fig. 11.1). An example of installation on the roof using the RESTAL support system is shown in Fig. 11.2. Vertical installation requires the use of an additional substructure, a design dedicated to the designer.

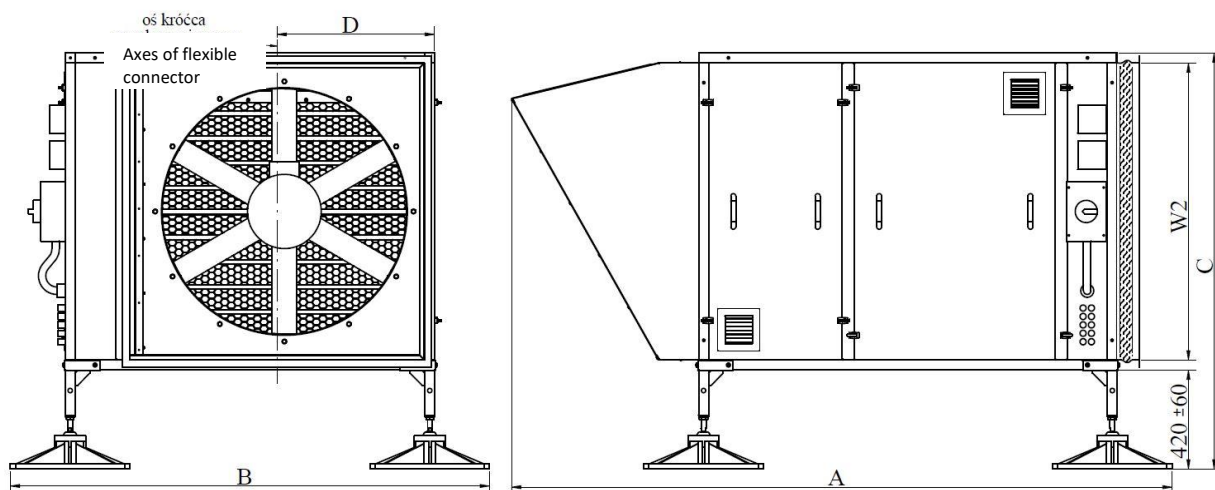


Fig. 11.2. Example of mounting the device on a roof using RESTAL installations.

Table 11.2. iSWAY-FC® basic dimensions.

Unit size	A [mm]	B [mm]	C [mm]	D [mm]	W2 [mm]
0	2292	1597	1270	435	770x770
1	2506	1847	1500	550	1000x1000
2	2714	2047	1700	650	1200x1200

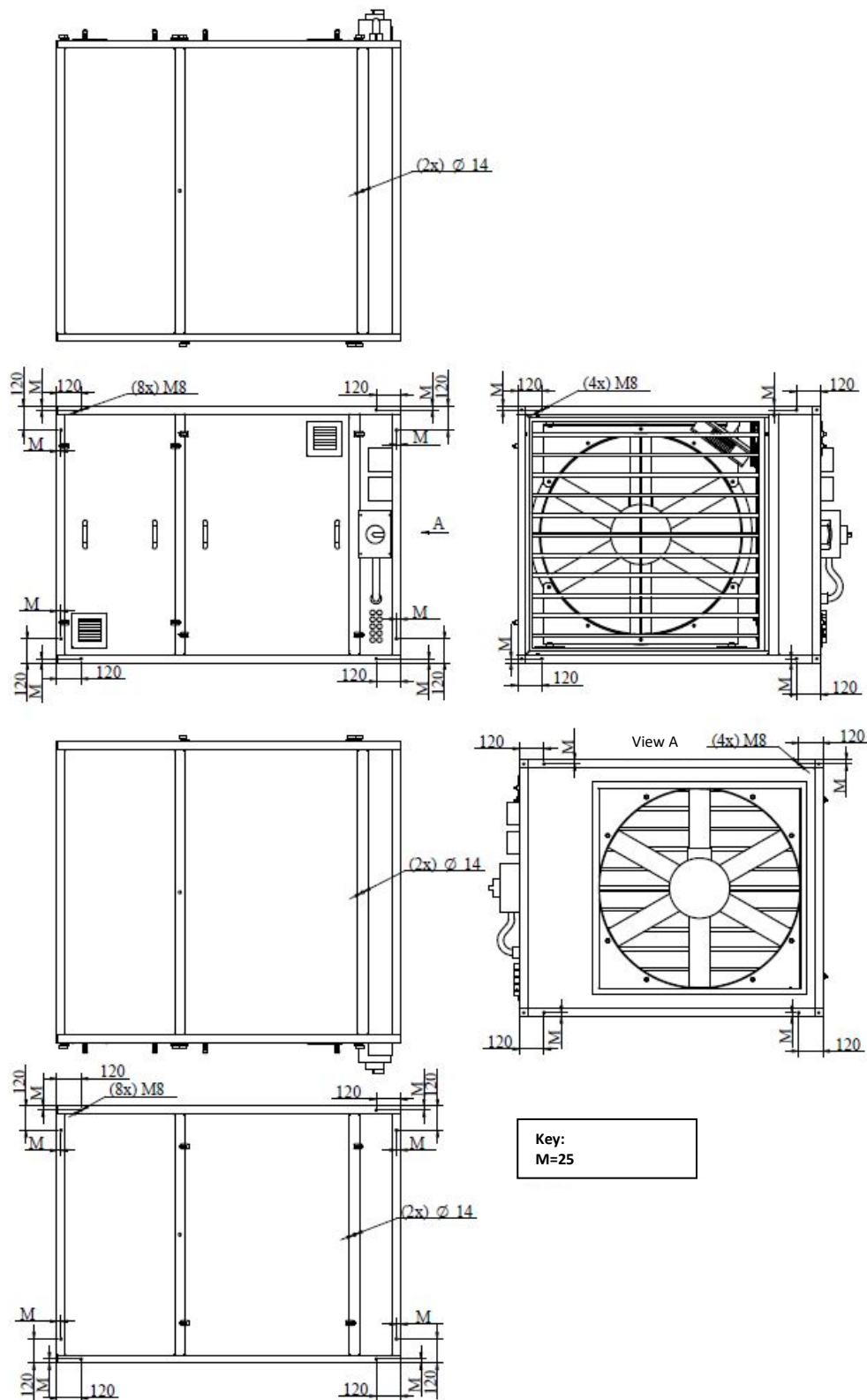


Fig. 11.3. M8 fixing holes and Ø14 drainage holes.

11.1.2. Foundation and supporting structures

The iSWAY-FC® should be located on:

- concrete foundation floor
- concrete pillars of appropriate dimensions
- concrete in the steel floor of the foundation frame

- specially prepared BIG - FOOT support system (BF accessory)

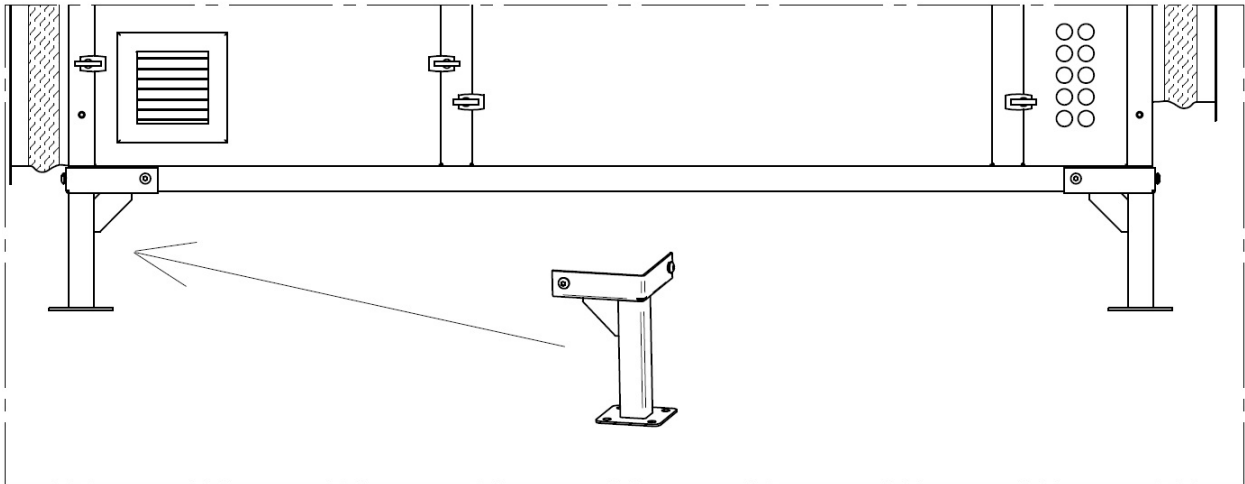


Fig. 11.4. Foundation on welded feet.

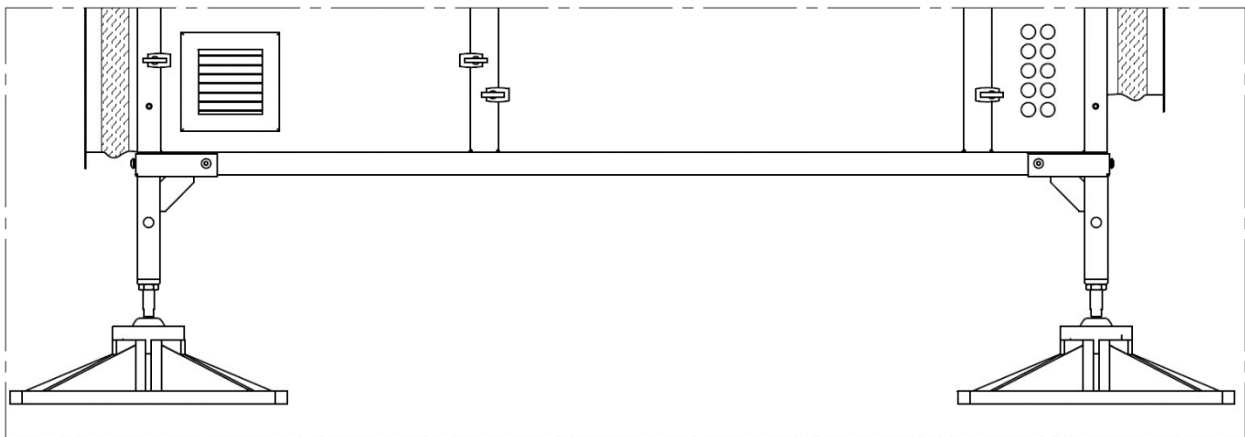


Fig. 11.5. Foundation on BIG-FOOT installation system.

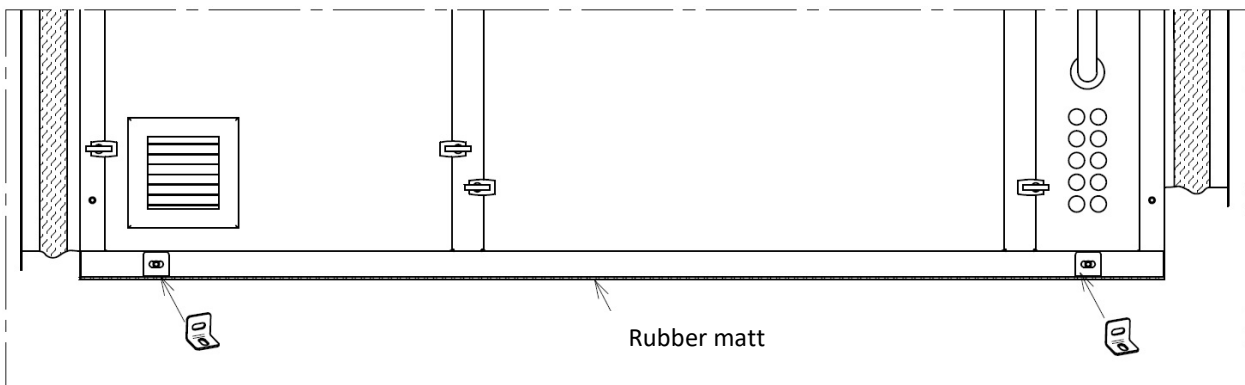


Fig. 11.6. Foundation directly on the concrete foundation floor.

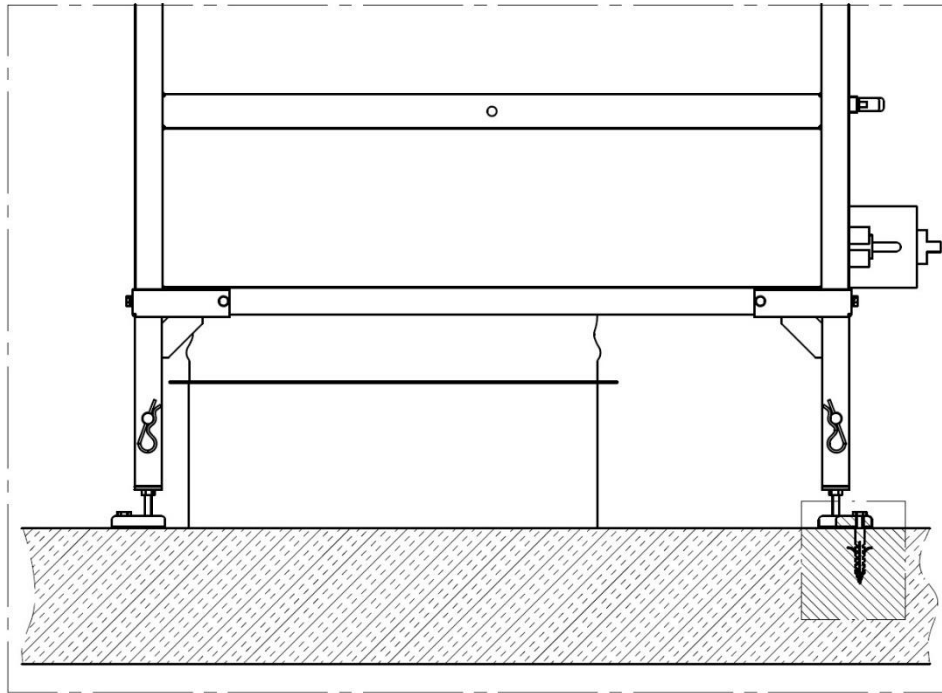


Fig. 11.7. Vertical installation (also horizontal) on steel feet screwed to the ground with dowels.

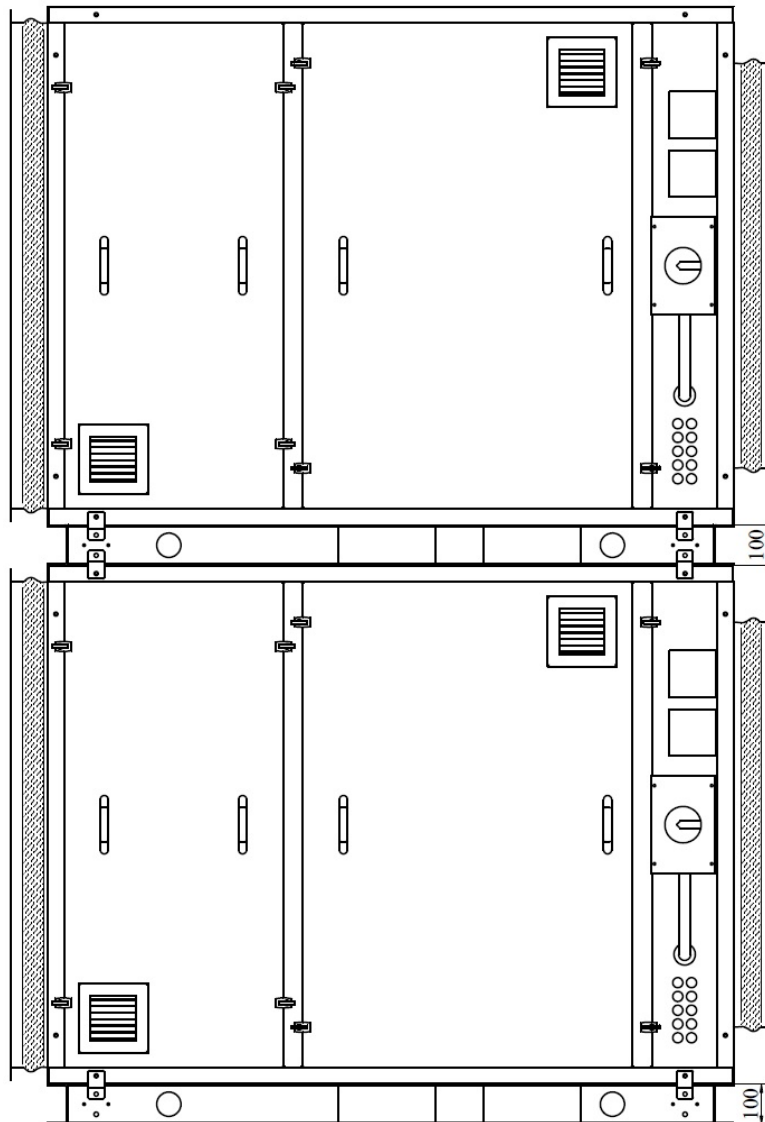


Fig. 11.8. Storeyed installation on a steel frame.

The foundation, frame or steel structure used as the supporting structure of the unit must be flat and levelled.

11.1.3. Place of installation

The unit should be installed in such a way that the connection of related installations (ventilation ducts, cable trays) does not cause any collision with inspection panels. In order to carry out proper assembly, minimum distances (fig. 11.9) must be maintained between the operating side and the existing fixed installation elements (walls, supports, pipelines, etc.). This is also important for the operation of the device and the possibility of performing service and maintenance work. However, it is allowed to install in the service space such installations as: pipelines, supporting structures whose method of disassembly and assembly during service repair and overhaul is easy and does not affect the operation of these devices. To ensure the safety of the maintenance and servicing operations, an operating platform of at least half the width of the unit must be provided if necessary.

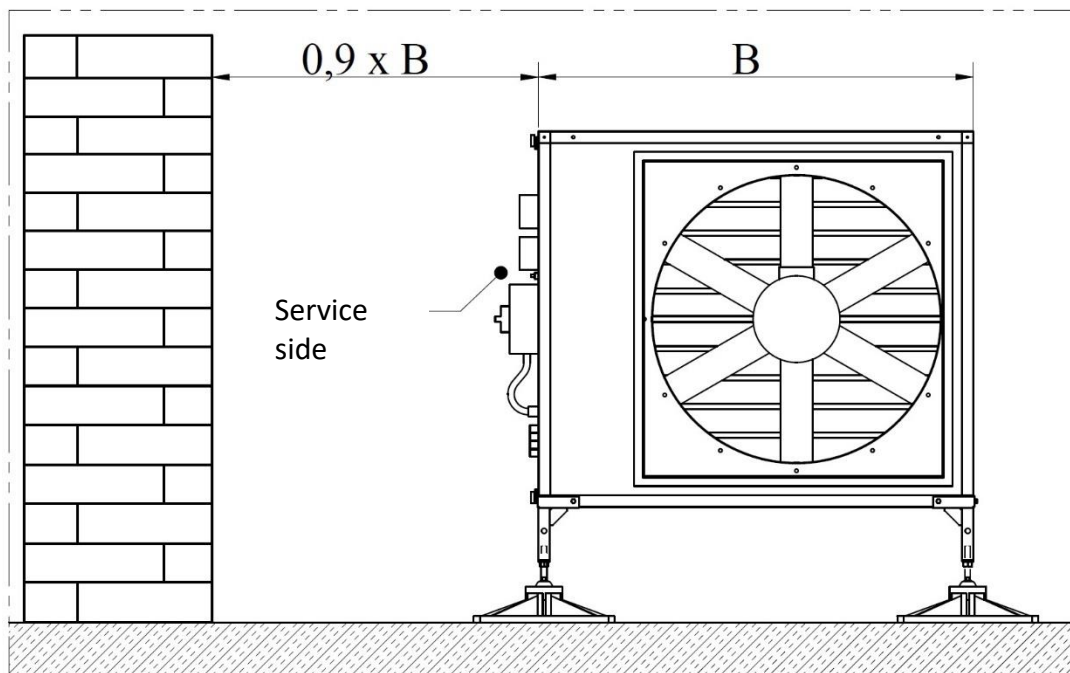


Fig. 11.9. Minimum distance between iSWAY-FC® units and fixed installation elements.

11.1.4. Connection of ventilation ducts

Ventilation ducts are connected to the unit iSWAY-FC® unit, by means of flexible connections (supplied with the aeration unit) preventing the transmission of vibrations and eliminating minor deviations in the concentricity of the duct and outlet opening of the aeration unit. The flexible connections (fig. 11.10) are terminated with a 30 mm high profile frame. Frames for ventilation ducts should be screwed in the corners with M8 screws. In the case of larger duct cross-sections (1000mm x 1000mm and more), additional fastening elements should be used on the frame profiles, with an appropriate spacing (in accordance with the rules of installation of ventilation ducts). Additional fastening elements are not included in the scope of delivery. The proper functioning of the elastic connection is ensured when the sleeve is stretched to a length of about 100 mm. In order to maintain the electrical continuity of the system at the place of application of the flexible connection, the aluminium profile of the device should be connected to the ventilation duct with an ground wire of appropriate size (fig.11.10).

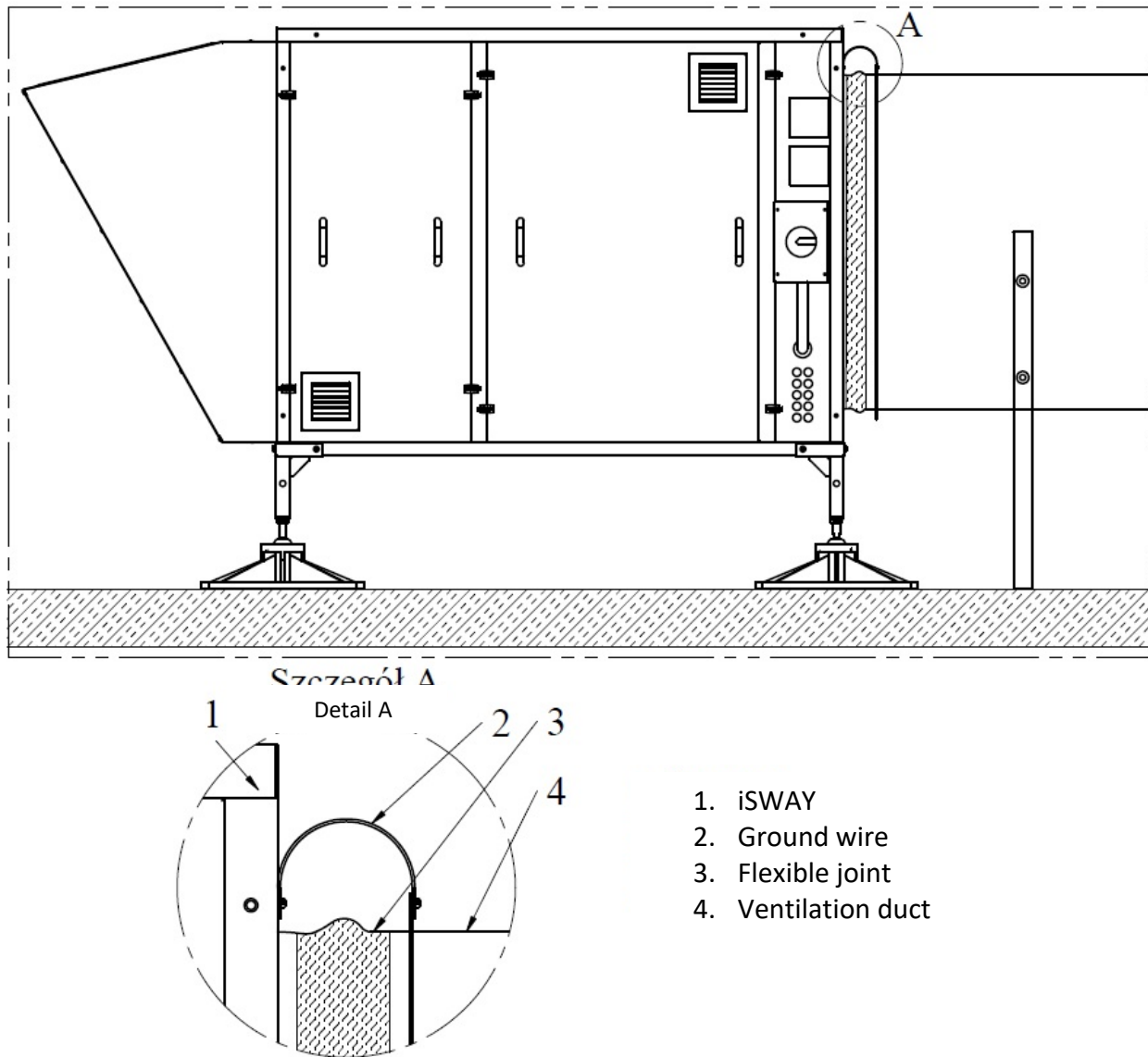


Fig. 11.10. Connection of ventilation ducts, connection of flexible ground wire.

The correct connection of the channels to the iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® unit requires the use of appropriate support elements which will guarantee the appropriate load capacity and stability of the structure. The method of conducting ducts and fittings connecting the aeration unit with the aeration system should eliminate the possibility of generating noise from elements of the system.

11.2. iSWAY-WFC®

The iSWAY-WFC® unit: wall-mounted. The product is delivered fully packed on a pallet. After delivery to the installation site, the kit should be unwrapped and laid out into elements that should be assembled on the wall in the following order.

- Step 1.

At the beginning, the telescopic duct is screwed directly to the wall as shown in figure 11.11. Respectively the outer part of the ventilation duct and then the inner part.

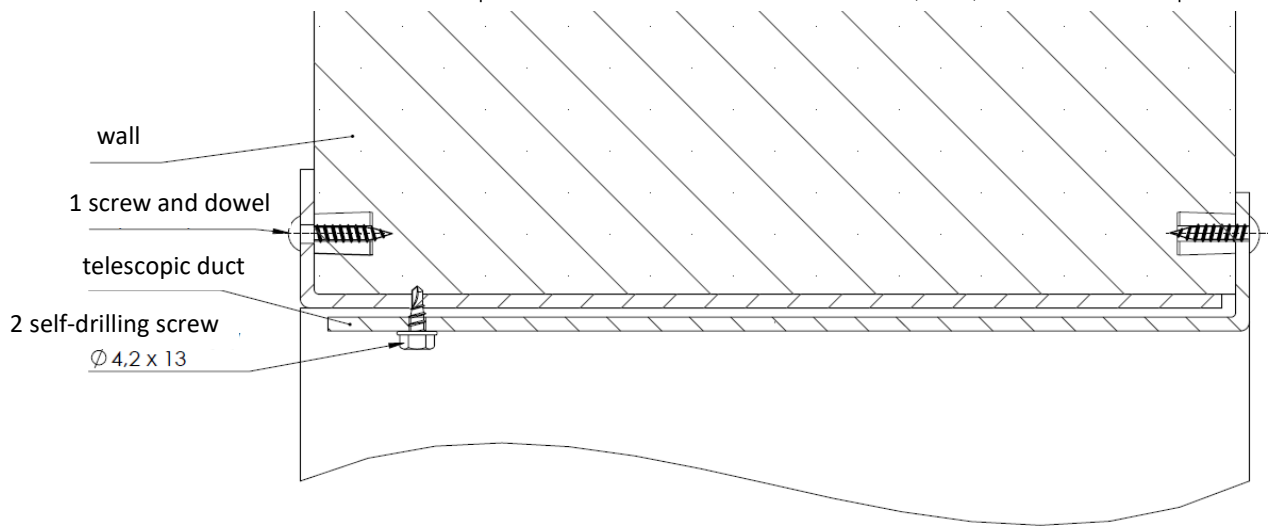


Fig. 11.11. Installation of a telescopic duct in a brickwork wall.

The duct should be mounted with screws to the wall supporting elements. For item 1 marked in figure 11.11 use screws with heads not higher than 4mm. Self-drilling screws marked as 2 should be screwed around the entire circumference into existing holes in the duct. Screws 2 are included in the delivery. Two self-drilling screws must be screwed into the hat profiles $\varnothing 6.3 \times 16$ in the existing holes on both sides of each hat profile, drill through two telescopic duct sheets. Screws are included in the delivery. The assembly is shown on fig. 11.12.

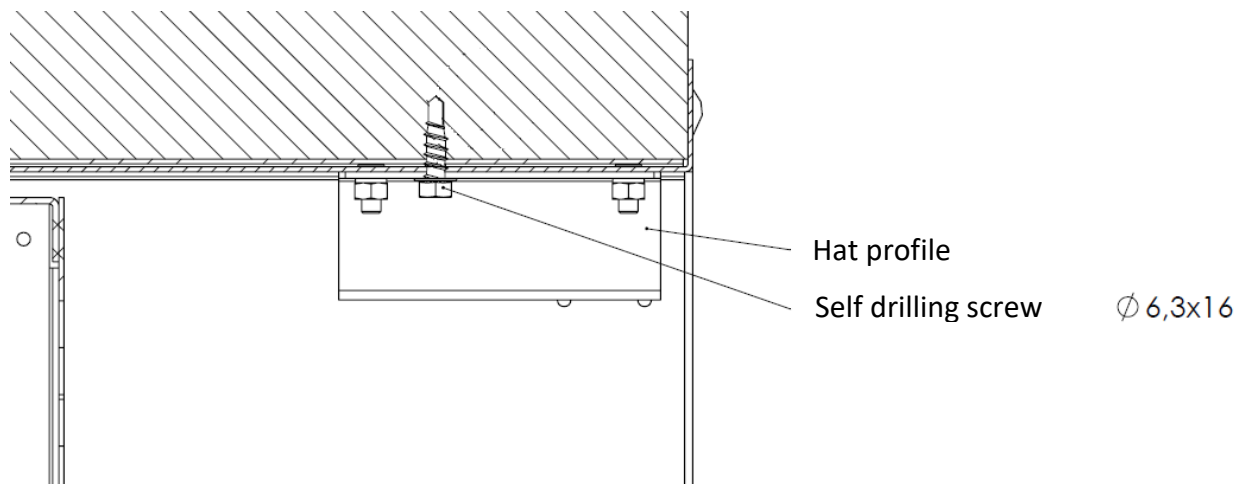


Fig. 11.12. Mounting the hat profile to the telescopic duct.

- Step 2.

After the duct has been installed, the air intake has to be screwed in from the outside of the building. Drill holes in the flange $\varnothing 6.5$ at ~ 300 mm spacing. Use sheet-metal screw in the air intake $\varnothing 5.5$ with a minimum length of 16mm by connecting the intake flange with the telescopic duct flange. Use a PES 10x10 gasket between the flanges to seal the joint. Gasket are included in the delivery. Assembly of the intake louver is shown on fig. 11.13.

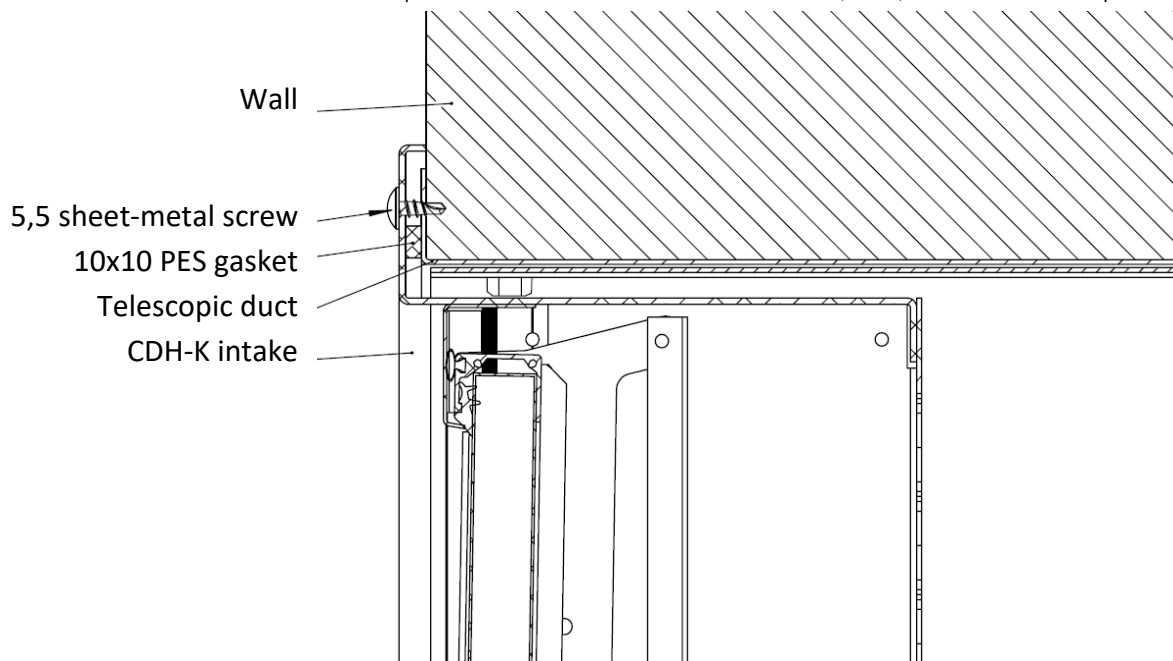


Fig. 11.13. Mounting the CDH-K air intake louver to the telescopic duct.

- Step 3.

Mount the panel using $\varnothing 4,2 \times 19$ self-drilling screws to the telescopic duct, screwing the screws through the holes in the panel. Gasket the PES 10x4 seal supplied between the duct flange and the panel, as shown in figure 11.14. Then install the fan on four vibration absorbers mounted on hat profiles.

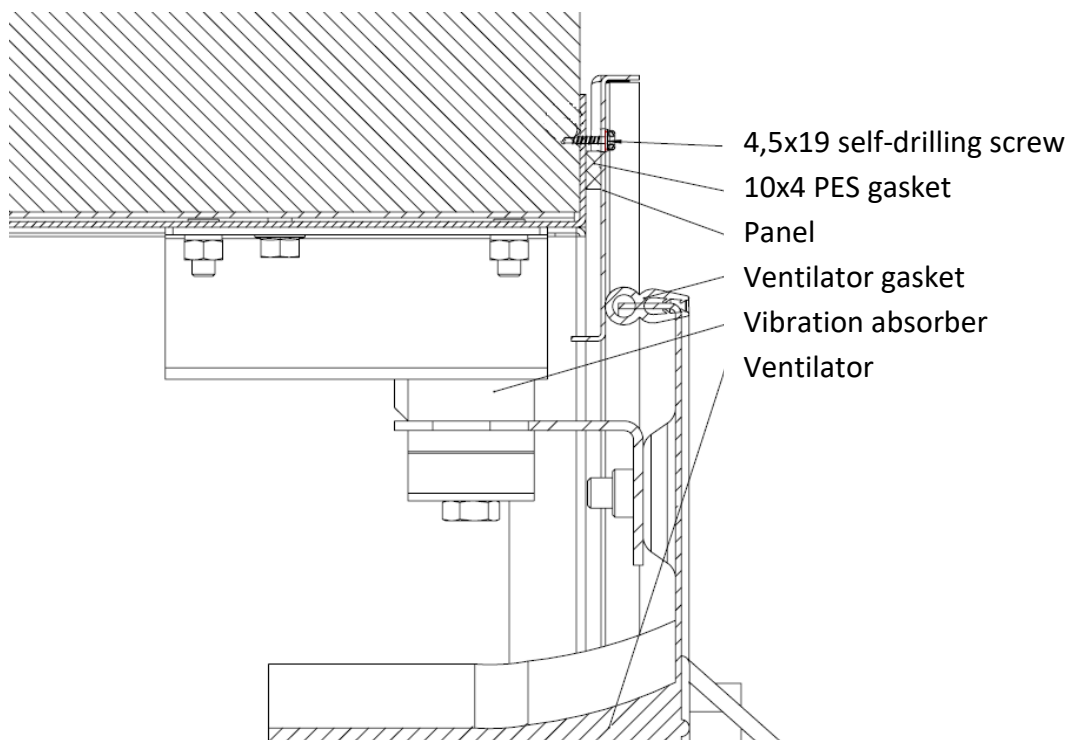


Fig. 11.14. Fan installation.

11.3. iSWAY-RFC®

11.3.1. iSWAY-RFC® vertical version

When installing the iSWAY-RFC® unit in vertical installation, the use of a roof base is recommended to ensure adequate tightness and ease of installation. The PDA roof base is available as an additional accessory to the iSWAY-RFC® system. The PDA base should be screwed to the roof plinth depending on the material of which the plinth is made, with a spacing of ~500mm. For steel plinth use self-drilling farmer screws, for concrete plinth use farmer screws with dowel.

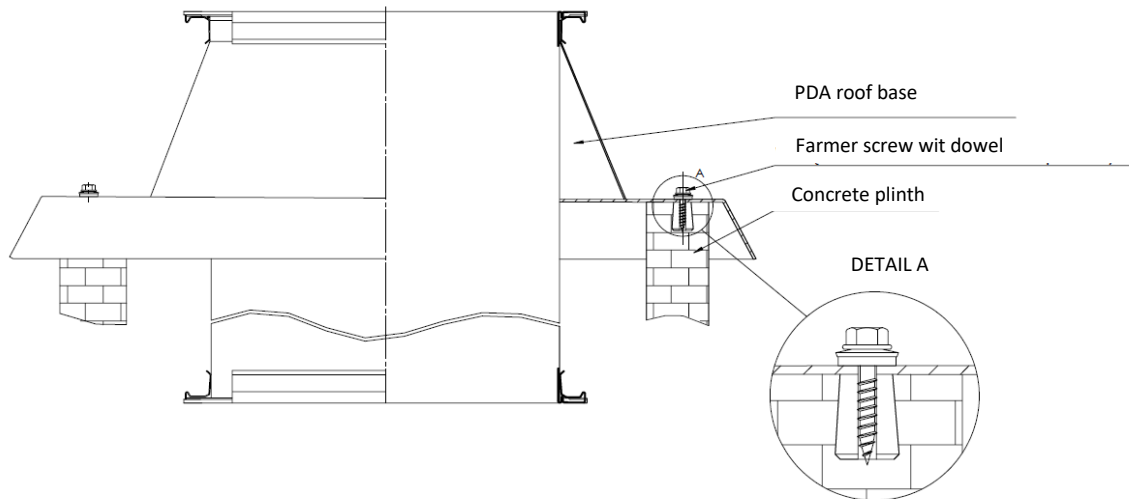


Fig. 11.15. Assembly of the roof base to the roof plinth.

Using the lower flange connection in the PDA roof base, it is possible to connect the ventilation system to the ductwork through the corners in the flange by means of M8 hexagon bolts (acc. to DIN 933), with M8 nuts (acc. to DIN 934). Enlarged washers Ø8 (acc. to DIN 9021) are used for connection. Seal up the connection with a PES 20x7 gasket.

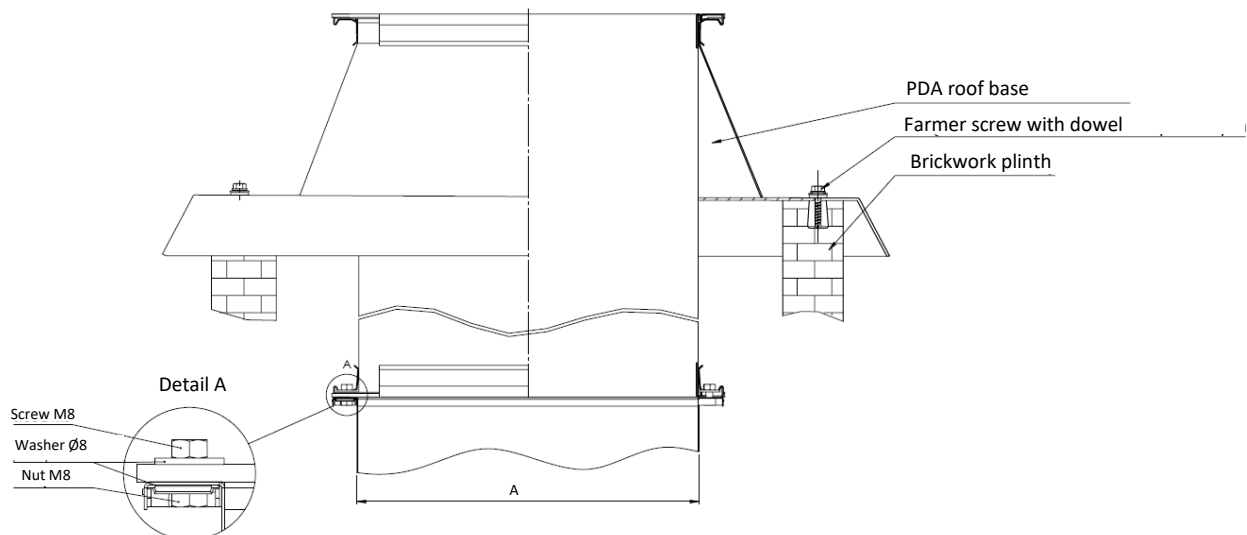


Fig. 11.16. Connection of the roof base with the installation plinth.

For dimensions $A > 600$ mm, additional MKZ clamps with M8x25 screw (acc. to DIN 933) must be used on each wall in ~500 mm spacing.

If there is no ventilation duct when the iSWAY-RFC® unit supplies air directly into the room, it is recommended to use a PDA-1 roof base, which does not have a simple connection to the installation (fig. 11.17).

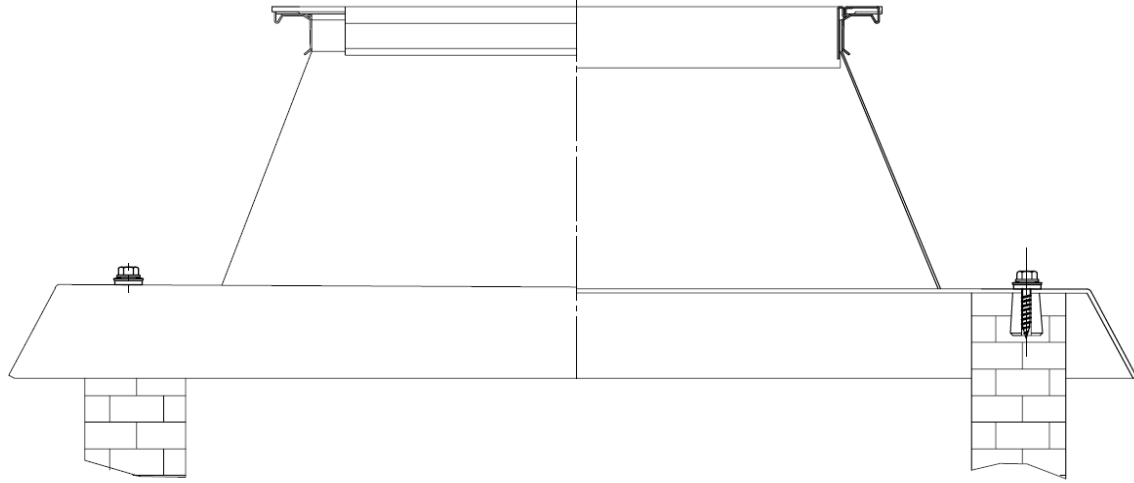


Fig. 11.17. PDA-1 roof base.

On the top side, the base connects to the other modules of the iSWAY-RFC® unit in the same way as the connection to the ventilation duct. All components of the iSWAY-RFC® unit have flanged connections to the other modules in corners with screws and MKZ clamps. View of the kit connection as shown in Fig. 11.18.

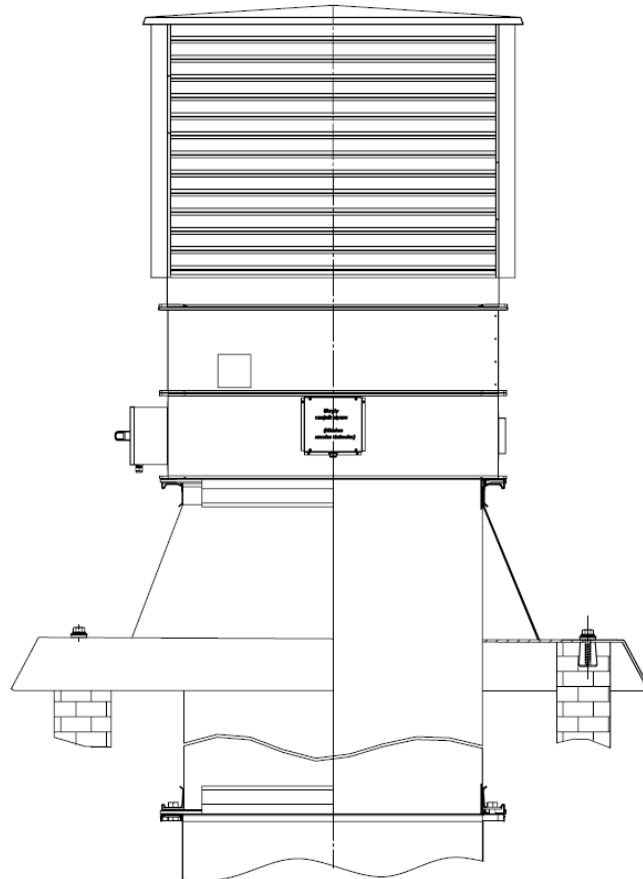


Fig. 11.18. iSWAY-RFC® mounted using a PDA base for the brickwork plinth with CPDB air intake.

11.3.2. iSWAY-RFC® in the horizontal version

The iSWAY-RFC® kit is recommended to be mounted on the RESTAL feet support system, not offered as an additional accessory for iSWAY-RFC®. The supports are mounted to the duct sections of the set in order to support the system. One RESTAL module consists of two feet, two vertical and one horizontal profile

Operation and Maintenance Manual (DTR) iSWAY® Set of products and two ribs as shown in Fig. 11.19. The iSWAY-RFC® kit includes minimum four modules.

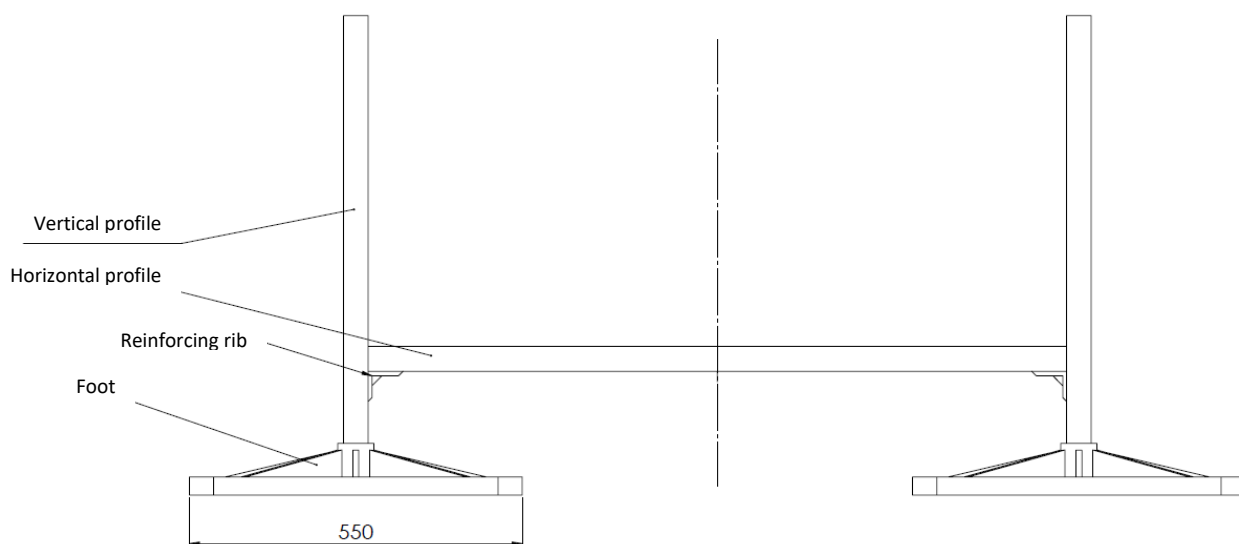


Fig. 11.19. BIG FOOT H module.

The RESTAL profile is screwed to the rectangular duct by means of screws screwed through the vertical profiles, two screws per profile.

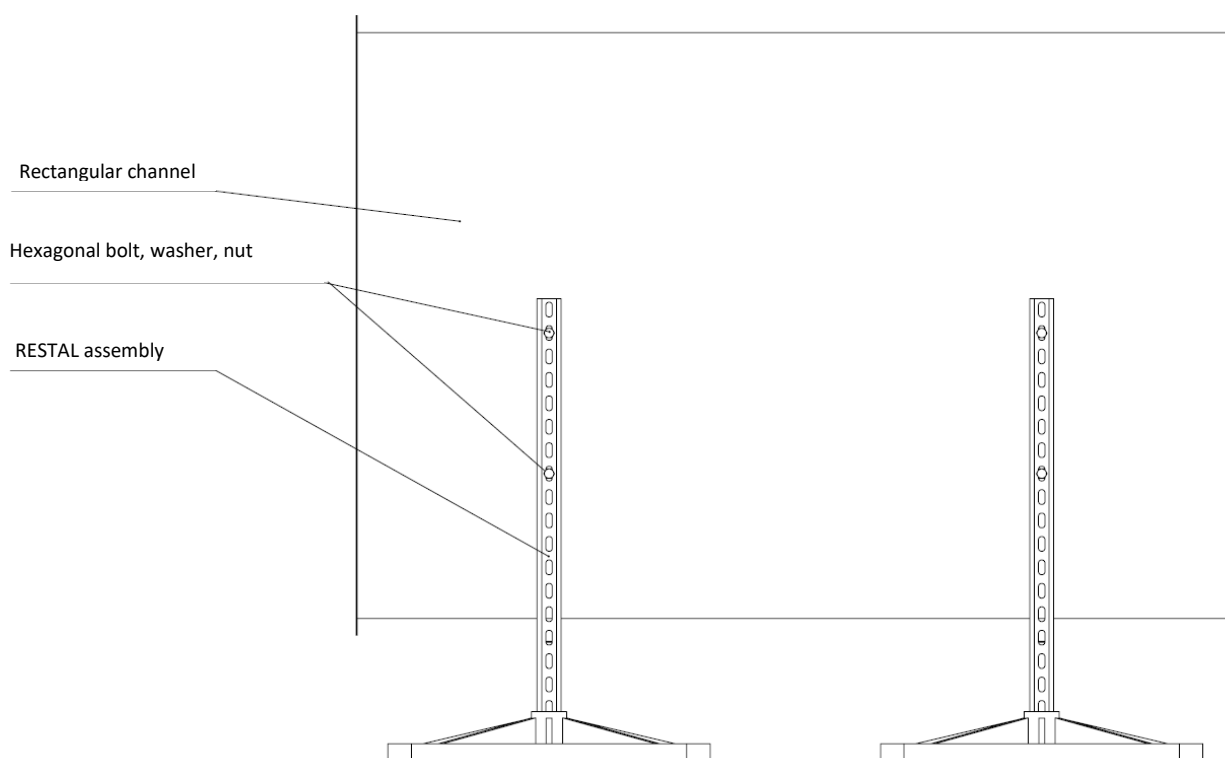


Fig. 11.20. Rectangular duct with mounted RESTAL supports.

The rectangular ducts and the other iSWAY-RFC® modules in the horizontal installation have standard flange connections, by means of which the elements are connected to each other by turning in corners. For clearance dimensions over 600 mm, use additional MKZ clamps on the sides of the flange mounted at a spacing of ~500mm.

11.4. Automatic Control Cabinet SzA-FCK

Note! The distance between the low-current installation and the power (high-current) and lightning protection system must be maintained in order to avoid unwanted impacts (a minimum distance of 400mm is recommended).

Note! The device must be installed in a place that ensures free air circulation of minimum 50 mm on each side of the housing. The device has IP 54 protection. The cabinet should be positioned so as to prevent the device from being submerged in water.

Note! The cabinet should be installed with the exclusion of direct influence of precipitation and solar radiation (under a roof or in a technical room). It can work in conditions of water vapor condensation.

Mount the cabinets directly using the holes in the rear wall of the enclosure (for version 600x750x210 fig. 11.21).

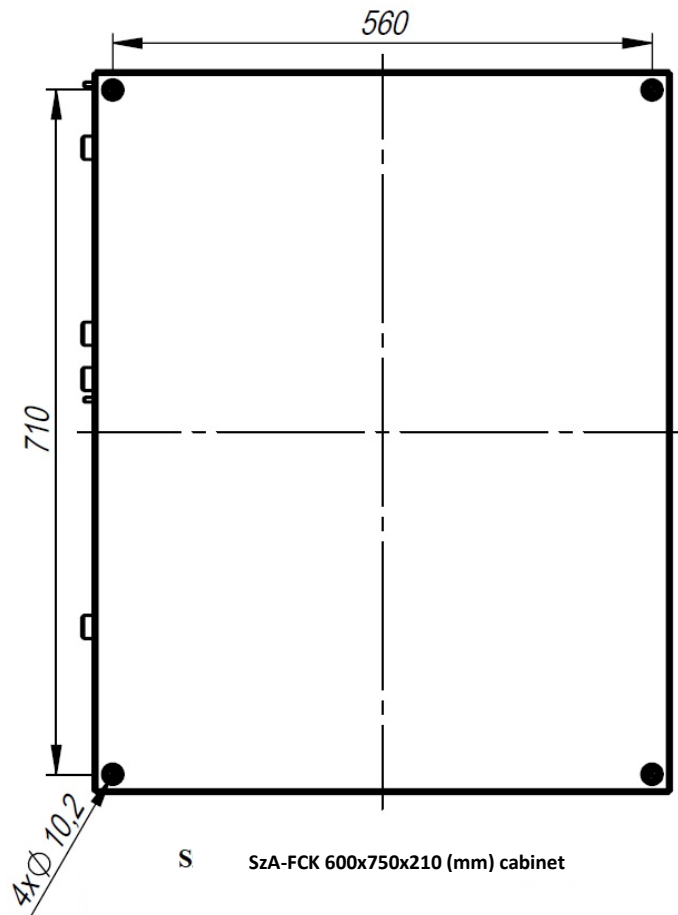


Fig. 11.21. Mounting hole dimensions in SzA-FCK 600x750x210.

SzA-FCK cabinet is available in multiple sizes, with differences for example in spacing of mounting holes, those versions are:

- 600x750x210 – for iSWAY-WFC/RFC/FC without enclosure (0.3 – 2.31)
- 750x750x210 – for iSWAY-FC without enclosure (2.39, 2.47)
- 800x800x300 – for iSWAY-FC without enclosure (2.75)

SzA-FCK cabinet can also be available in a non-standard size version.

11.5. Pneumatic connections

Very important elements that are largely responsible for the correct operation of the device

Operation and Maintenance Manual (DTR) iSWAY® Set of products iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®: pressure measuring points. Therefore, at the design stage, both the location of the static pressure measurement points in the overpressure protected space, the compression measurement point in the ventilation duct and the reference pressure must be clearly defined. The pneumatic installation should enable undisturbed collection of air pressure from measurement points by the differential pressure sensor. Therefore, when installing impulse lines, special care must be taken to ensure that they are not bent or clamped by other elements. The connection points of the pressure measurement lines are located on the housing of the device from the operating side. It is recommended that the pressure measuring point be routed to a sheltered location to eliminate the adverse effects of air blasts.

The pressure (compressor) measurement inside the ventilation duct for the iSWAY-FC (similarly to the iSWAY-RFC) is shown in figure 11.22. The measuring points should be located on three different walls, on a straight section of the ventilation duct behind the silencer. Pneumatic pipes are terminated at the measurement points with stubs inserted into the ventilation duct.

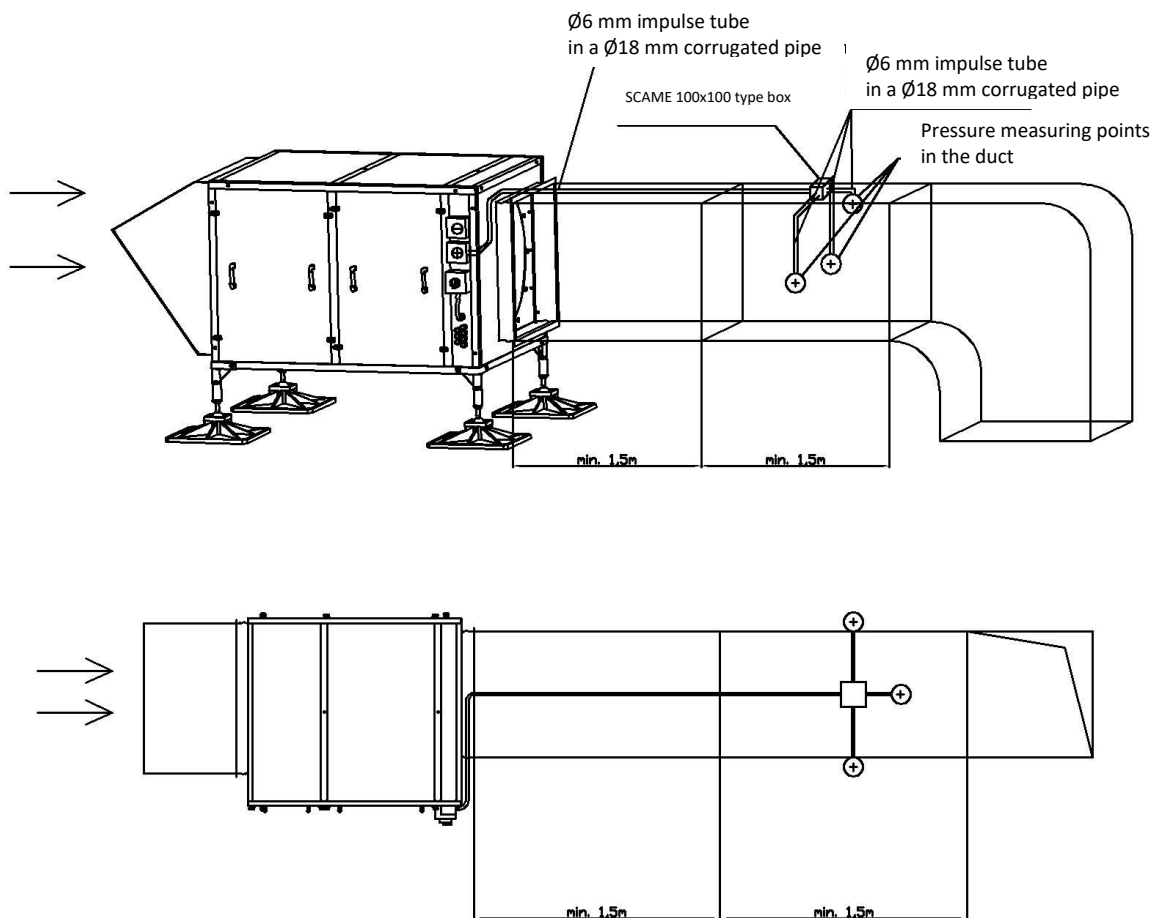


Fig. 11.22. Compression measurement point in the ventilation duct.



Fig. 11.23. Static pressure measurement point (wall-mounted version).



Fig. 11.24. Static pressure measurement point (wall mounted version).

The measurement of pressure in the protected space and reference pressure is carried out at a properly located and prepared measuring point (Fig. 11.23) and (Fig. 11.24). The impulse tube inside the measuring point should be terminated with a T-piece manifold. The wall version requires 2 holes on the sides of the box, when installed outside the building, also 2 holes at the bottom of the box should be made for dehydration.

12. FireBUS® bus loop

FireBUS® is a bidirectional annular data bus with a fixed transmission direction at system startup. The transmission of information between devices takes place via a differential voltage signal according to RS485 standard at 115200 [bps]. Physical connections between devices are shielded, insulated, protected against surges and current. The possibility of hardware short-circuiting of receiving lines with transmitting lines for individual bus nodes allows for very fast information transfer. Hardware short-circuiting of receiving and transmitting lines is carried out automatically via software.

The bus allows for multi-level communication between the regulators, pressure and temperature sensors that are part of the differential pressure system on a given object. The FireBUS® bus enables all the devices on a given site to be connected to one network with one decentralized monitoring and fault detection system. Devices that are part of the FireBUS® bus include two bus types: FireBUS® global and FireBUS® local.

Each of the devices on the bus can act as a master, but there can be one master on the bus at any one time. The devices transfer the master function to each other during system operation. Initialization of a given bus and the process of passing the access is initiated by one of the regulators in the network, which acts as an active monitor additionally monitoring the status of devices included in the given FireBUS® bus and monitoring the correctness of information transmitted on the given bus.

The FireBUS® bus is equipped with a number of mechanisms protecting against line interruption or damage to one of the devices in the network. If a failure is detected on a line or one of the devices, all devices on the bus shall be switched to emergency communication mode which continues to provide effective fire protection in aerated rooms.

Bus interruption and short circuit resistance:

- One interruption/shortening, anywhere on the loop (wires D+ or D-), **does not change the functionality of the kit**. The loss of transmission in the loop causes an emergency operation in line mode and a failure is reported (registered alarm). Communication with all equipment in the kit is maintained. After the damage has been repaired, the transmission is automatically resumed in standard mode and the damage

signal is switched off. A failure of the COM line does not affect the operation of the loop, but it can make it less resistant to interference.

- A double interruption/short circuit causes the transmission to cease only with devices in a loop between interruptions/short circuit.

- There can be up to 64 connected devices on the Local FireBUS® line. These devices need not be of the same type. Both P-MACF, MAC-D-Min, MAC-Link etc. can be connected on one line.
- There can be up to 36 connected devices on the Global FireBUS® line. ISWAY-FC®, iSWAY-WFC®, iSWAY-RFC® can be placed on the loop in any order.

Note:

1. The bus cables must be routed at a distance of at least 0.4m from power cables (230VAC, 400VAC)
2. When connecting, remember that there must be one pair of wires connected to terminals D+ and D-. This includes Global FireBUS® and Local FireBUS® loops.

13. Electrical connections and parameters.

13.1. Power connection, SzA-FCK, SAP

Electrical connections should be made by persons with appropriate qualifications and authorizations, in accordance with the standards and regulations in force in the country where the device is installed. Connection methods are shown in the attached diagrams. The guidelines from tables 13.2 - 13.6 show the electrical data of the equipment and the recommended cable cross sections to be supplied from the electrical switchboard. The applied assumptions:

- For 3x400VAC cables it has been assumed that the maximum share of hot zone does not exceed 20% for 50m length, while the voltage drop is 3%.
- For 1x230VAC cables it has been assumed that the maximum share of hot zone does not exceed 20% for 60m length, while the voltage drop is 5%. In case of other parameters, it is necessary to contact the manufacturer (reselection of cables).
- For 1x24VDC power wires MAC-D MIN(2;4) regulators and PZ box it has been assumed that the maximum share of hot zone does not exceed 20% for 40m length, while the permissible voltage drop does not exceed 10%.
- For 1x24VDC supply cables of P-MACF sensors it has been assumed that the maximum share of hot zone does not exceed 20% for 100m length, while the allowed voltage drop does not exceed 10%.
- For 1x24VDC supply cables of TSS-X-24V it has been assumed that the maximum share of hot zone does not exceed 20% for 135m length, while the allowed voltage drop does not exceed 5%.
- For bus cables, it is assumed that the cable length between the individual devices must not exceed 250m.

The power supply to the equipment should be guaranteed during a fire. Before connecting the power supply, check that it has been supplied with the appropriate cable in accordance with the guidelines given in the tables. In addition, it is required to check the voltage and frequency values of the mains supply, which may differ by no more than $\pm 5\%$ from those given in this technical and operational documentation. Do not connect the units if there are significant inconsistencies in the value of the network voltage and frequency.

13.1.1. Main power connection

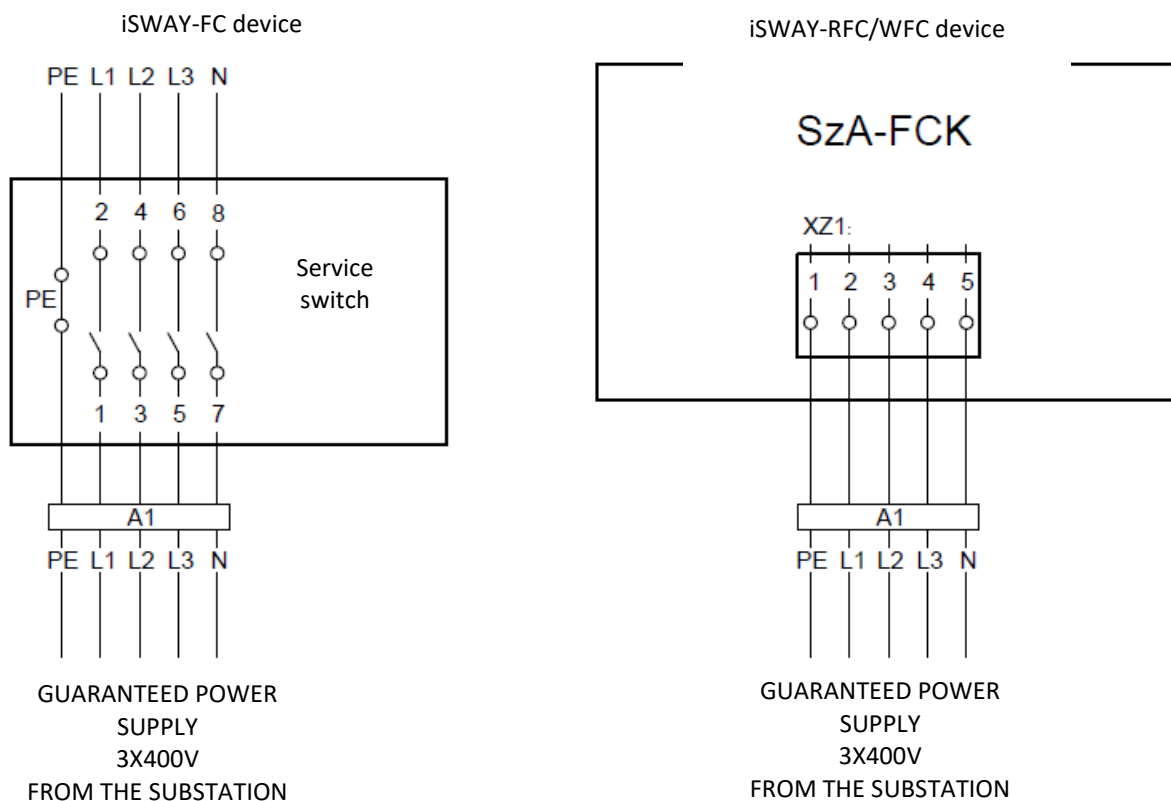


Fig.13.1. Left side power connection to iSWAY-FC®. On the right, main power supply to iSWAY-WFC® and iSWAY-RFC® connect to the SzA-FCK automation cabinet

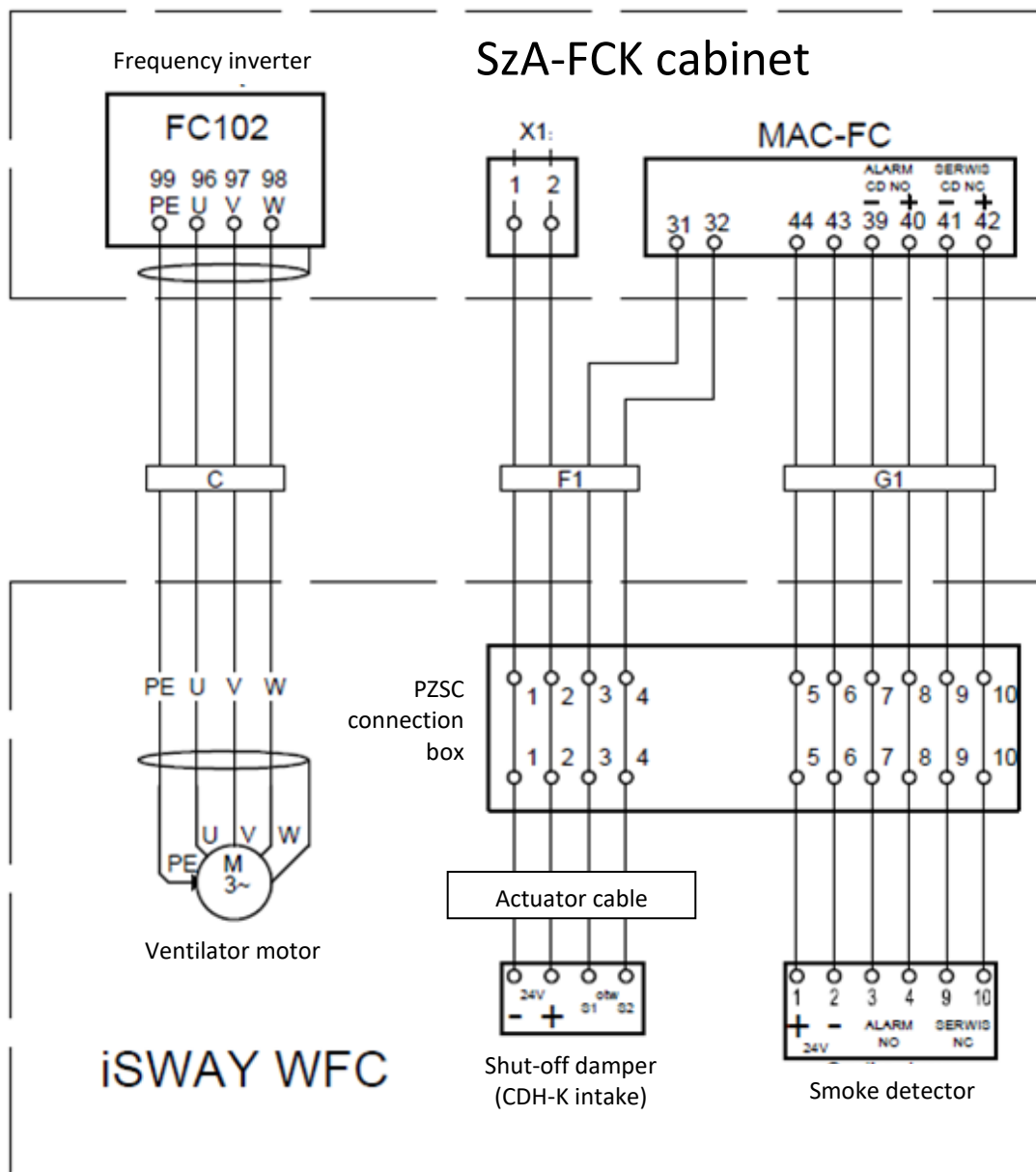
Table 13.1. Series of main switches used in iSWAY-FC®.

The device	Breaker type
iSWAY-FC 0.3	4G25-92-PKS6
iSWAY-FC 0.12	4G25-92-PKS6
iSWAY-FC 1.17	4G25-92-PKS6
iSWAY-FC 1.20	4G25-92-PKS6
iSWAY-FC 1.24	P3-63
iSWAY-FC 2.31	P3-63
iSWAY-FC 2.39	P3-63
iSWAY-FC 2.47	P3-100
iSWAY-FC 2.75	P3-100

The iSWAY-FC® service switch may be replaced by a larger one by SMAY or an authorized SMAY service.

13.1.2. SzA-FCK connection

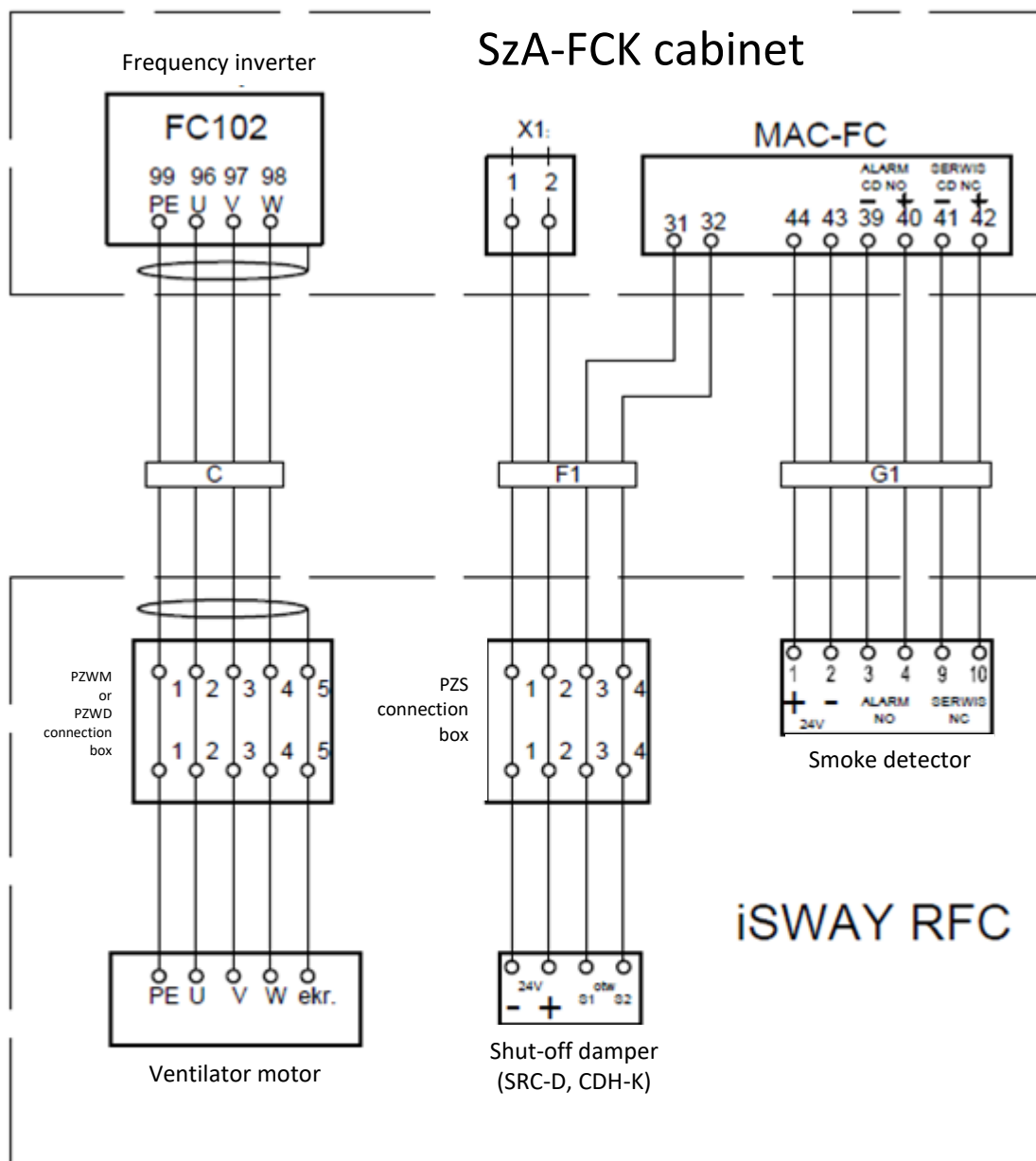
- iSWAY-WFC®



CABLES DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C	NHXCH FE180/PH90	4XDiameter (DEPENDING ON THE CAPACITY)
F1	HTKSH FE180/PH90	2x2x1,0
G1	HTKSH FE180/PH90	3x2x0,8

Fig.13.2. SzA-FCK connection in iSWAY-WFC®

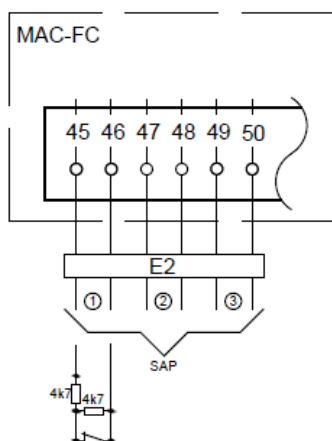


CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
C	NHXCH FE180/PH90	4XDIAMETER (DEPENDING ON THE CAPACITY)
F1	HTKSH FE180/PH90	2x2x1,0
G1	HTKSH FE180/PH90	3x2x0,8

Fig.13.3. SzA-FCK connection in iSWAY-RFC®

13.1.3. Connection of SAP signal

The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® units require a signal from the Fire Panel (CSP). This signal is self-sustaining, so it can be impulsive and is most often given by means of Control and Monitoring Elements. The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® device monitors the signal transmission line from the CSP for breakage and short-circuit, for this purpose suitable resistors must be installed on the contact side of the CSP Control and Monitoring Module according to the instructions in Figure 13.14. The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® transmit a confirmation and a collective fault signal to the CSP.



CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
E2	HTKSH FE180/PH90	3x2x0,8

SIGNAL DESCRIPTION FOR SAP:

1 – FIRE SIGNAL FROM SAP (NC)

2 – DEVICE OPERATION CONFIRMATION “CORRECT OPERATION” FOR SAP (NO)

3 – COLLECTIVE FAILURE OF THE DEVICE FOR SAP (NC)

Fig. 13.4. Connection diagram of MAC-FC controller (devices in SzA-FCP/SzA-FCK) to SAP system

13.2. Electrical parameters

Table 13.2. Electrical data sheet for iSWAY-FC®

Type	Supply voltage	Active power	Apparent power	Protection on the device	Suggested protection in the main switchboard	Suggested power cables for the device
	[VAC]	[kW]	[kVA]	Type	[A]	Type
0.3	3x400	3.38	3.45	B 10A	gG 16A	NHXX FE180/PH90 5x2,5 ¹
0.12	3x400	5.47	5.57	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹
1.17	3x400	5.26	5.36	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹
1.20	3x400	6.96	7.10	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹
1.24	3x400	9.22	9.40	B 20A	gG 32A	NHXX FE180/PH90 5x6 ¹
2.31	3x400	9.22	9.40	B 20A	gG 32A	NHXX FE180/PH90 5x6 ¹
2.39	3x400	13.00	13.26	B 32A	gG 40A	NHXX FE180/PH90 5x10 ¹
2.47	3x400	17.40	17.75	B 40A	gG 50A	NHXX FE180/PH90 5x16 ¹
2.75	3x400	21.26	21.34	B 50A	gG 63A	NHXX FE180/PH90 5x16 ¹

Table 13.3. Electrical data sheet for iSWAY-WFC®

Type	Supply voltage	Active power	Apparent power	Protection on the device	Suggested protection in the main switchboard	Suggested power cables for the device
	[VAC]	[kW]	[kVA]	Type	[A]	Type
1.1	3x400	2.02	2.06	B 6A	gG 10A	NHXX FE180/PH90 5x2,5 ¹
1.5	3x400	2.50	2.54	B 6A	gG 16A	NHXX FE180/PH90 5x2,5 ¹
2.2	3x400	3.20	3.26	B 10A	gG 16A	NHXX FE180/PH90 5x2,5 ¹
3.0	3x400	4.14	4.22	B 10A	gG 16A	NHXX FE180/PH90 5x4 ¹
5.5	3x400	7.09	7.23	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹

¹ The maximum cable length of 70m with 20% share of the hot zone was assumed - voltage drop not exceeding 3%. For other conditions, the cross-section must be recalibrated

Type	Supply voltage	Active power	Apparent power	Protection on the device	Suggested protection in the main switchboard	Suggested power cables for the device
	[VAC]	[kW]	[kVA]	Type	[A]	Type
1.5	3x400	2.52	2.57	B 6A	gG 10A	NHXX FE180/PH90 5x2,5 ¹
2.2	3x400	3.34	3.40	B 10A	gG 16A	NHXX FE180/PH90 5x2,5 ¹
3.0	3x400	4.11	4.19	B 10A	gG 16A	NHXX FE180/PH90 5x2,5 ¹
4.0	3x400	5.25	5.36	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹
5.5	3x400	6.93	7.07	B 16A	gG 25A	NHXX FE180/PH90 5x4 ¹
7.5	3x400	9.19	9.37	B 20A	gG 32A	NHXX FE180/PH90 5x6 ¹

Table 13.5. Summary of electrical parameters of TSS-1...3, TS-X and MSPU

Type	Supply voltage	Active power	Apparent power	Protection on the device	Suggested protection in the main switchboard	Suggested power cables for the device
	[VAC]	[W]	[VA]	Type	[A]	Type
TSS-1	1x230	16	20	1.25 delayed	B6	NHXX FE180/PH90 3x1,5 ²
TSS-2	1x230	16	20	1.25 delayed	B6	NHXX FE180/PH90 3x1,5 ²
TSS-3	1x230	16	20	1.25 delayed	B6	NHXX FE180/PH90 3x1,5 ²
TS-X TS-X/YR	1x230	16	20	1.25 delayed	B6	NHXX FE180/PH90 3x1,5 ²
Power supply to MSPU	1x230	18	22	-	B6	socket

Table 13.6. Electric parameters of the TSS-1...3-24V, MAC-D-MIN, P-MAC and T-MAC device

Urządzenie TSS-X-24V, MAC-D MIN, P-MACF, T-MACF			
Type	Supply voltage	Active power	Suggested power cables for the device
	[VDC]	[W]	Type
TSS-1-24V	24	6	HDGs FE180/PH90 3x2,5
TSS-2-24V	24	11.5	HDGs FE180/PH90 3x2,5
TSS-3-24V	24	14.5	HDGs FE180/PH90 3x2,5
MAC-D MIN	24	12	HDGs FE180/PH90 3x1,0
P-MACF	24	2.2	HDGs FE180/PH90 3x1,0
T-MACF	24	1.2	Powered by Local FireBus

² it is assumed that the length of the supply cables does not exceed 60m with 20% share of the hot zone and acceptable voltage drops of 5%. For other conditions, the cross-section must be recalibrated

NOTE:

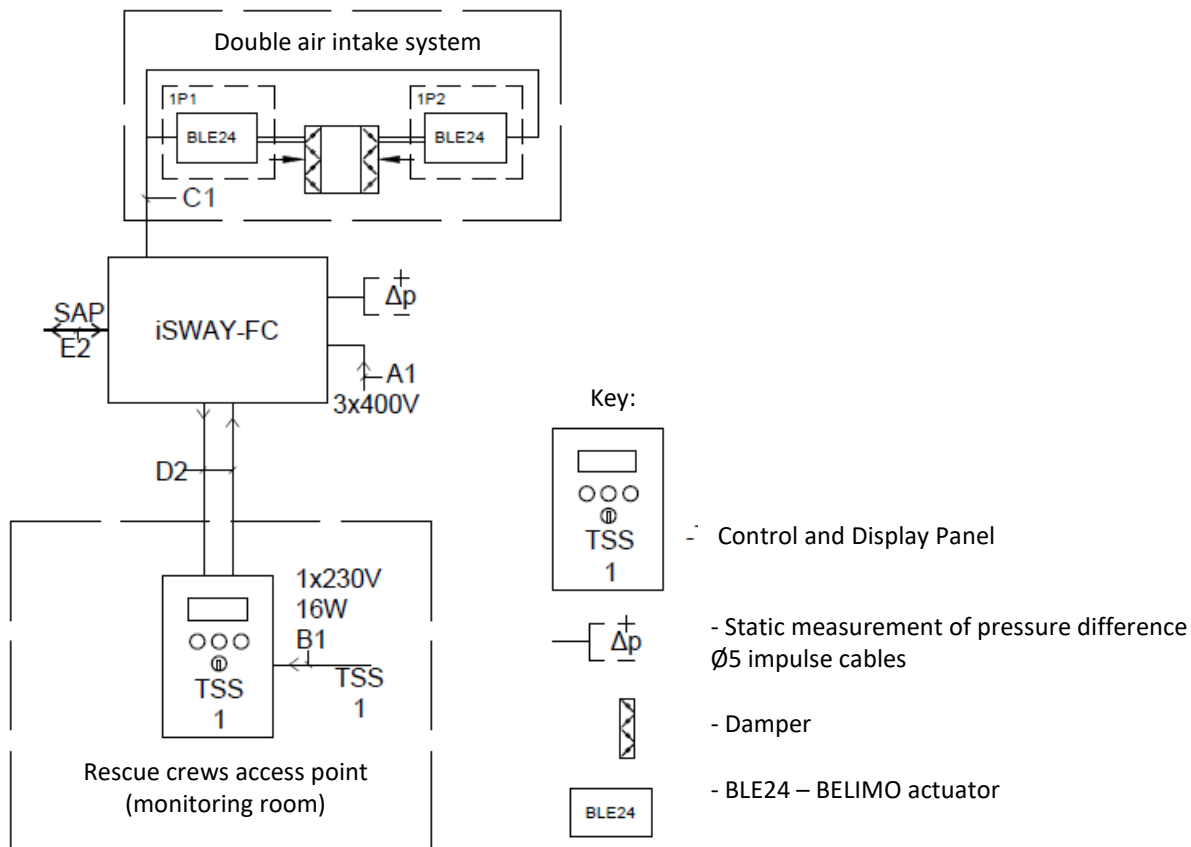
"Separate overcurrent (short-circuit) protection is required for each of the power outlets. The requirement applies to each power circuit, both 24VDC and 230VAC and 3x400VAC. Overcurrent protections must be installed directly behind the power distribution point, the selectivity of the protections used must be ensured"

13.3. Wiring block diagrams

The iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® units are combined as standard with a Control and Display Panel (TSS-X, TSS-X-24V) or with the Control Panel and Devices Operation Status Monitoring (TS-..., MSPU), with a double intake system, with P-MACF pressure sensors, MAC-D Min controllers, Fire Alarm System (SAP), making up the SAFETY WAY® system.

The diagrams below show typical solutions for securing areas such as: staircases, lift shafts and vestibules. The last diagram of Figure 13.12 in this point shows an example of the connection diagram of an extended Safety Way® system.

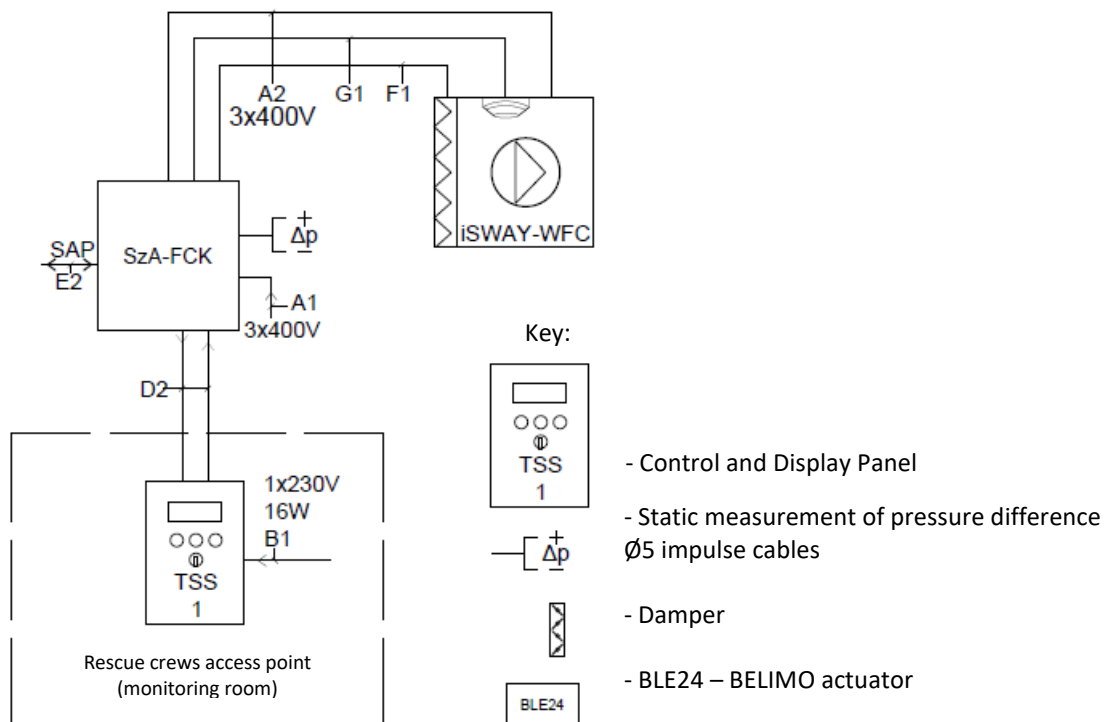
Detailed wiring diagrams of the individual system components can be found in the next chapter.



WIRING

Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXX FE180/PH90 5x cross section
B1	Guaranteed power supply 1x230VAC MSPU, TS, TSS	NHXX FE180/PH90 3x1,5
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
D2	Global FireBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8

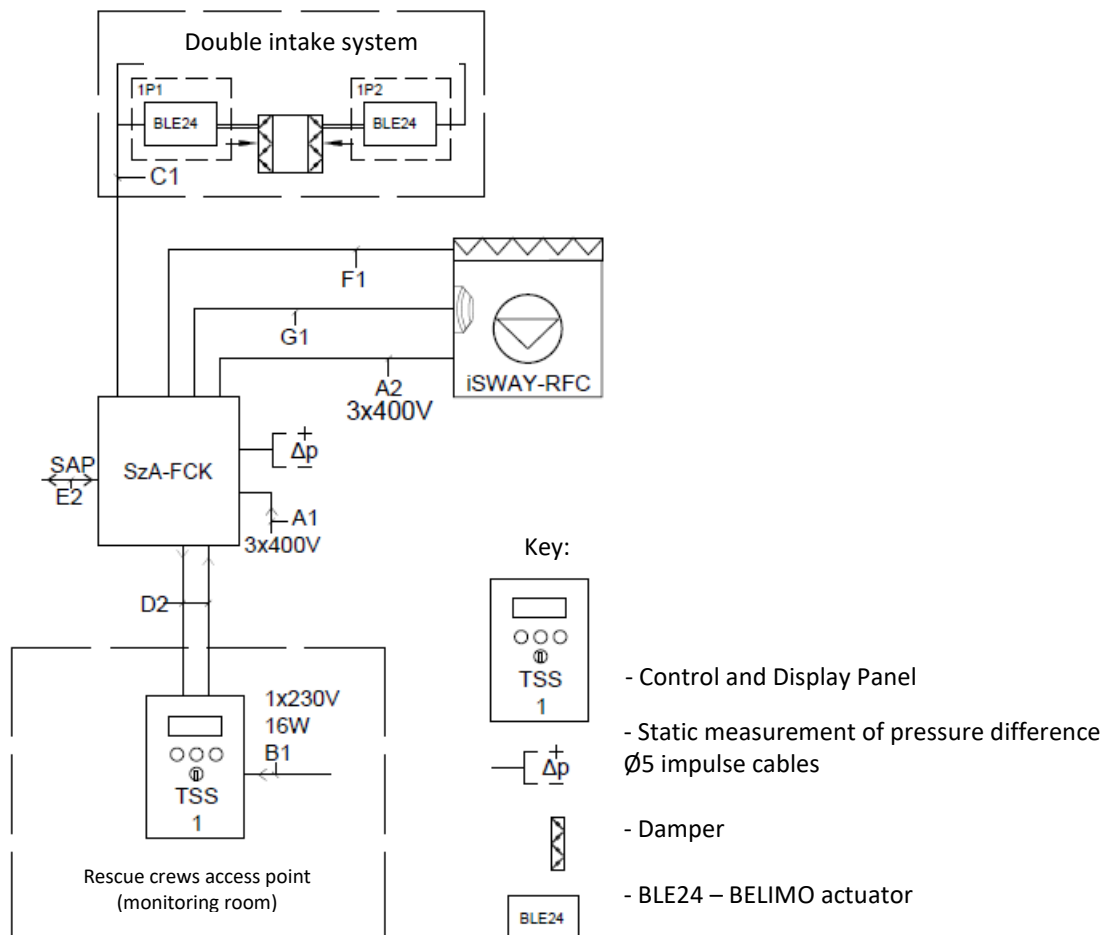
Fig. 13.5. Block diagram for the connection of the TSS-1 Control and Display Panel to the iSWAY-FC with double air intake system (optional)



WIRING

Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXXH FE180/PH90 5x cross section
A2	Ventilator power supply 3x400V for iSWAY-FC/-WFC/-RFC	NHXXH FE180/PH90 4x cross section
B1	Guaranteed power supply 1x230VAC MSPU, TS, TSS	NHXXH FE180/PH90 3x1,5
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
D2	Global FireBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8
F1	Control/power supply cable 24 VDC (shut-off damper)	HTKSH FE180/PH90 2x2x1,0
G1	Power supply, alarm, failure, smoke detector signal cable,	HTKSH FE180/PH90 3x2x0,8

Fig. 13.6. Block diagram for the connection of the TSS-1 Control and Display Panel to the iSWAY-WFC device



WIRING

Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXH FE180/PH90 5x cross section
A2	Ventilator power supply 3x400V for iSWAY-FC/-WFC/-RFC	NHXCH FE180/PH90 4x cross section
B1	Guaranteed power supply 1x230VAC MSPU, TS, TSS	NHXH FE180/PH90 3x1,5
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
D2	Global FirsBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8
F1	Control/power supply cable 24 VDC (shut-off damper)	HTKSH FE180/PH90 2x2x1,0
G1	Power supply, alarm, failure, smoke detector signal cable,	HTKSH FE180/PH90 3x2x0,8

Fig. 13.7. Block diagram for the connection of the TSS-1 Control and Display Panel to the iSWAY-RFC with double intake system (optional)

The connection of the iSWAY devices to the TSS-6 is shown below (number 6 means that the panel is intended for control and monitoring of 6 iSWAY devices). They can be either iSWAY-FC, iSWAY-WFC, iSWAY-RFC. The connection of iSWAY devices to TSS-2 to TSS-5 panels is similar to the following only instead of 6 devices, it will be 2 and 5 iSWAY devices respectively.

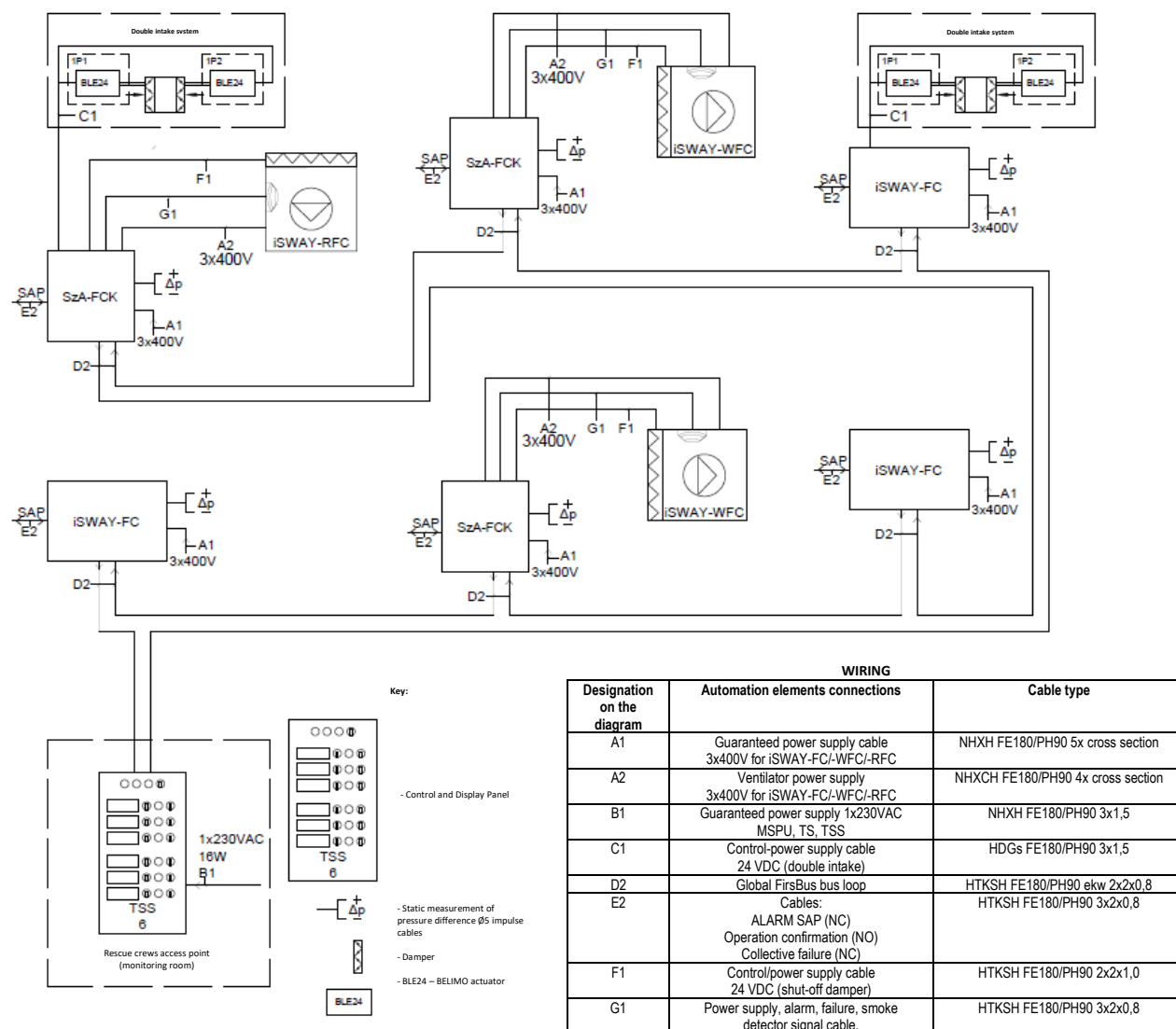
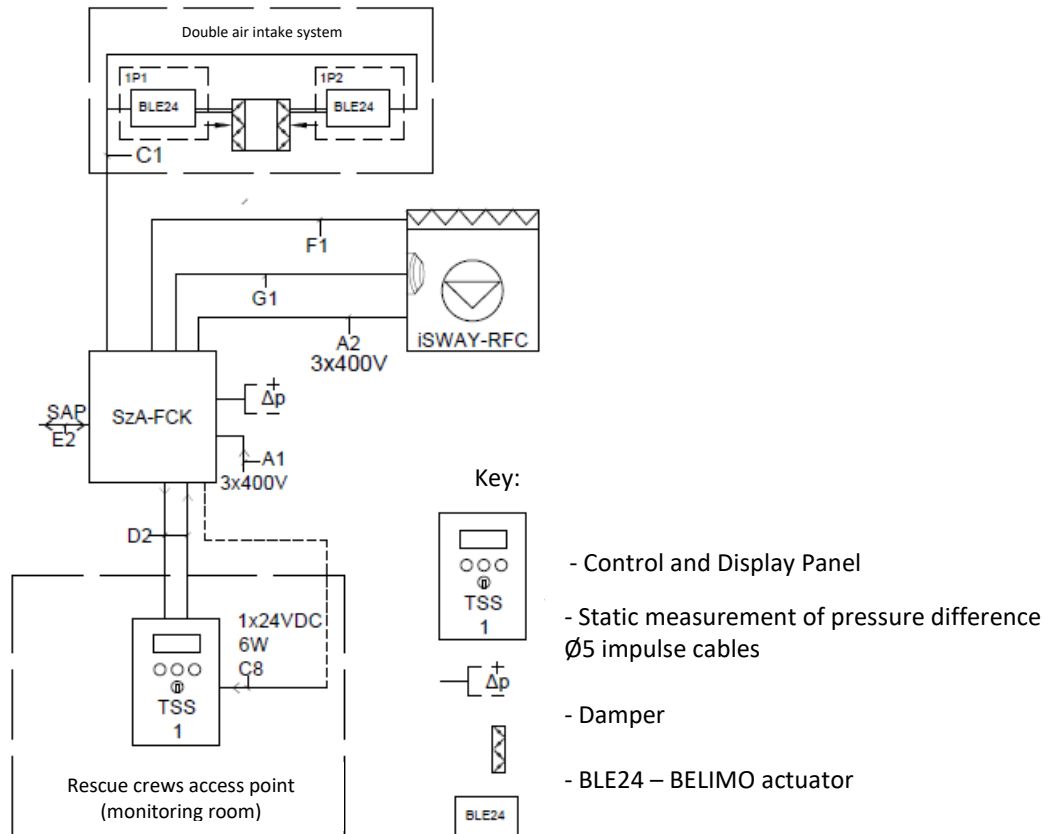


Fig. 13.8. Block diagram for the connection of the TSS-6 Control and Display Panel with the iSWAY device

It is possible to make TSS-(1,2,3)-24V devices, using 24VDC guaranteed power supply. These devices can then be powered from the iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®. Such versions are shown in Figures 13.9, 13.10 and 13.11.

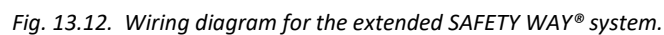
Fig. 13.10. Block diagram for the connection of the TSS-1-24VDC Control and Display Panel to the iSWAY-WFC (TSS-X-24VDC supply from iSway is optional)



WIRING

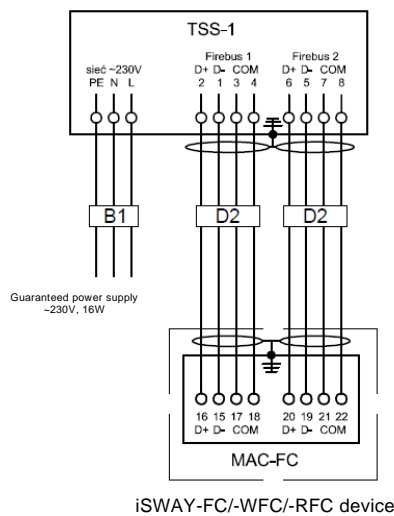
Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXXH FE180/PH90 5x cross section
A2	Ventilator power supply 3x400V for iSWAY-FC/-WFC/-RFC	NHXXCH FE180/PH90 4x cross section
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
C8	Guaranteed power supply cable TSS-X-24 VDC	HDGs FE180/PH90 3x2,5
D2	Global FirsBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8
F1	Control/power supply cable 24 VDC (shut-off damper)	HTKSH FE180/PH90 2x2x1,0
G1	Power supply, alarm, failure, smoke detector signal cable,	HTKSH FE180/PH90 3x2x0,8

Fig. 13.11. Block diagram for the connection of the TSS-1-24VDC Control and Display Panel to the iSWAY-RFC (TSS-X-24VDC supply with iSway is optional) with double air intake system (optional)



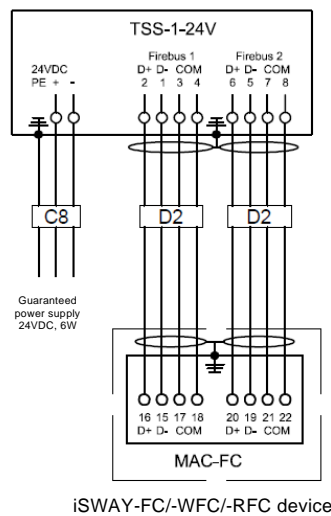
13.4. Connection diagrams for SAFETY WAY®/iSWAY® devices (FC, WFC, RFC)

13.4.1. TSS, TS, MSPU connection - FireBUS global loop



CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
B1	NHXH FE180/PH90	3x1,5
D2	HTKSH FE180/PH90 ekw.	2x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!



CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
C8	HDGs FE180/PH90	3x2,5
D2	HTKSH FE180/PH90 ekw.	2x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.13. Detailed wiring diagram of the TSS-1 Control and Display Panel with a single iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC device.

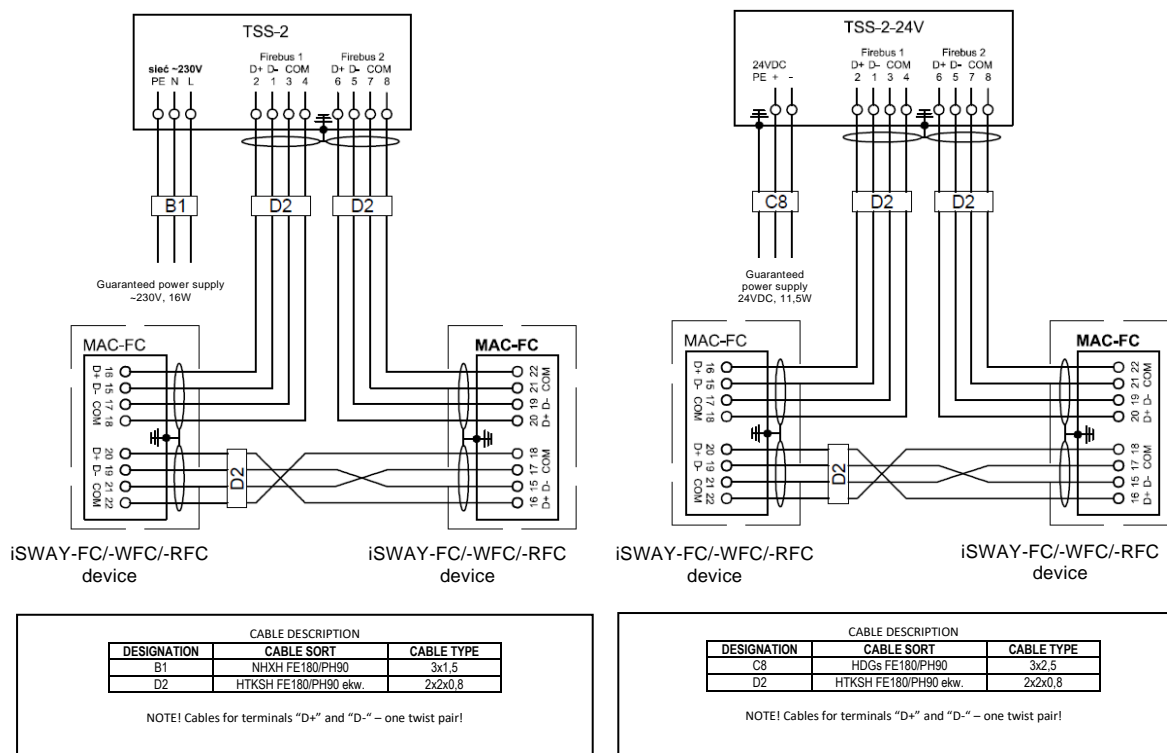


Fig. 13.14. Detailed wiring diagram of the TSS-2 Control and Display Panel with a single iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC device.

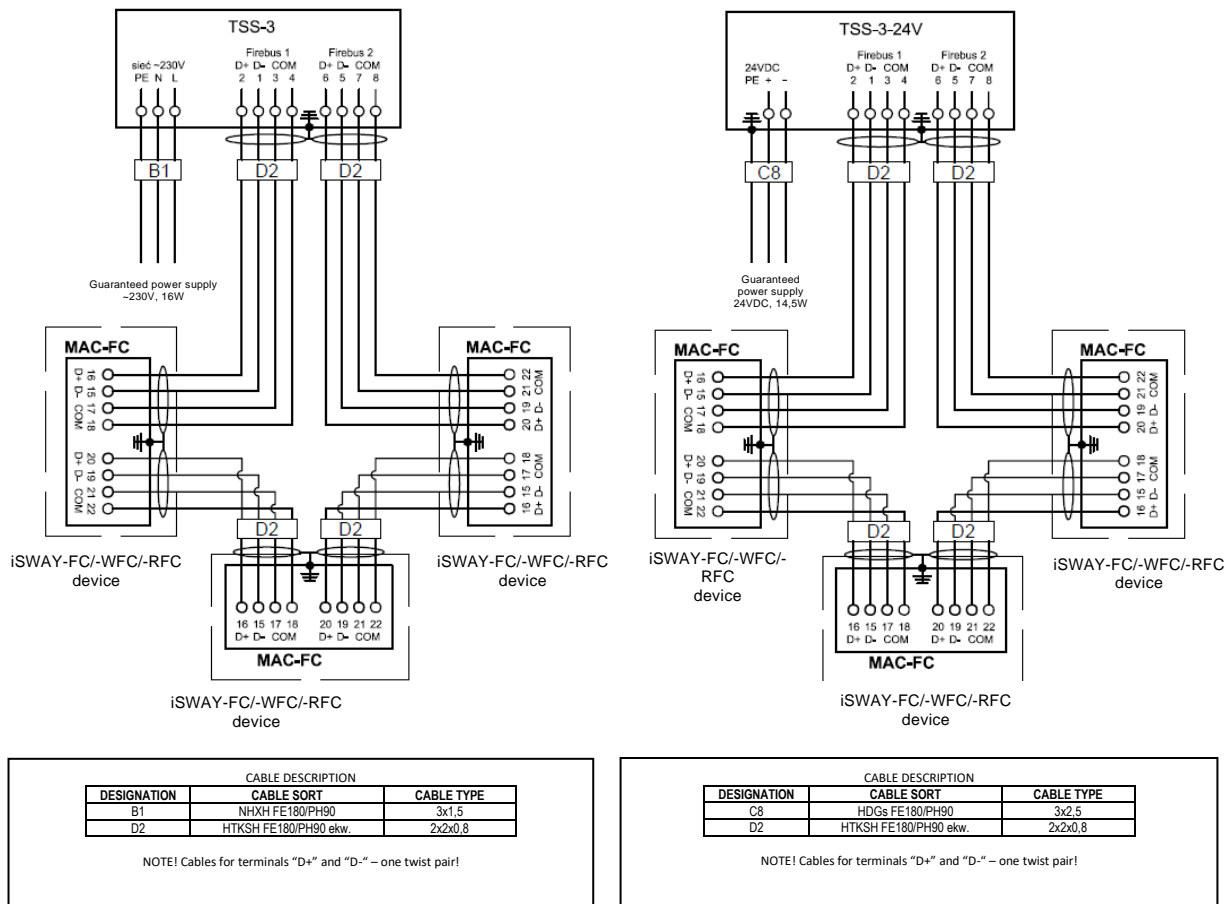
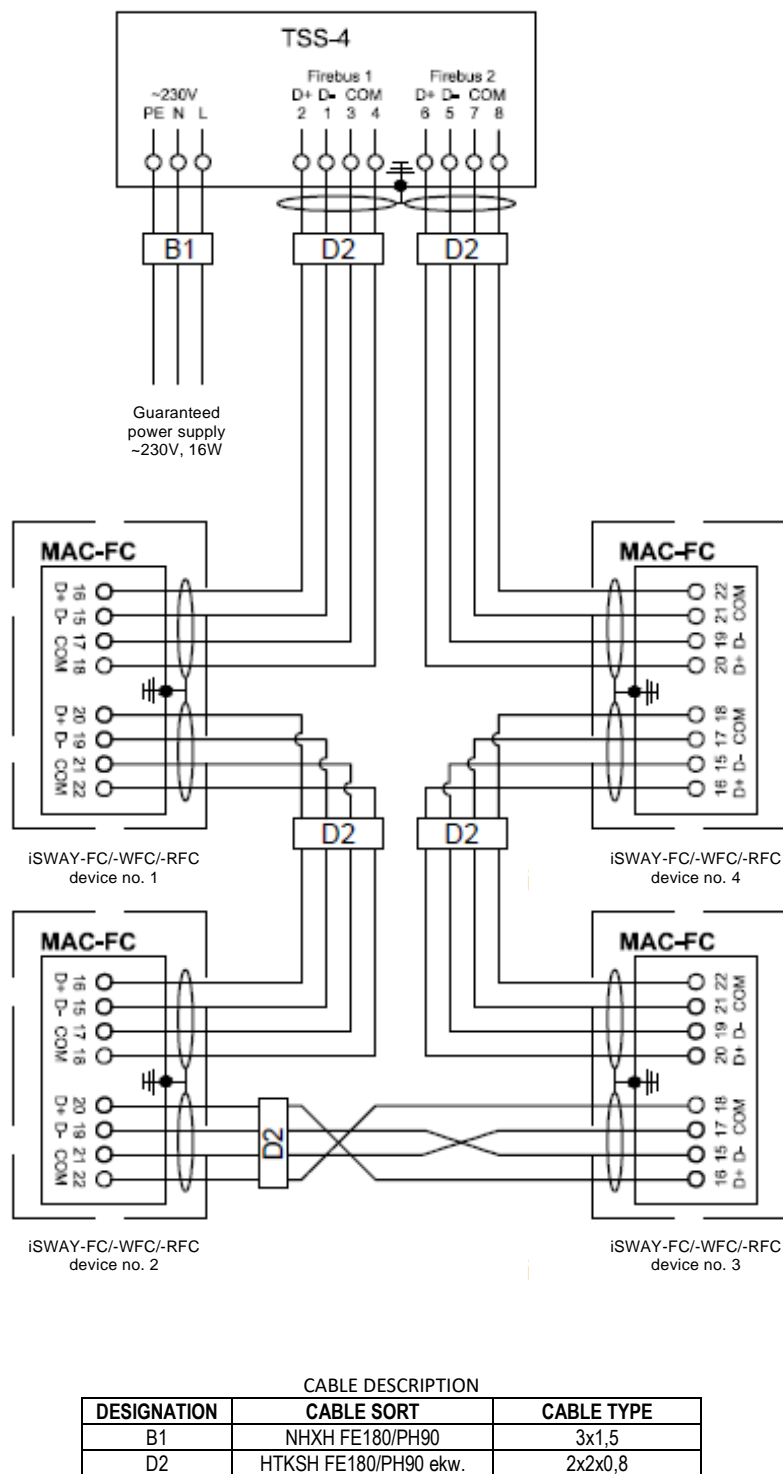
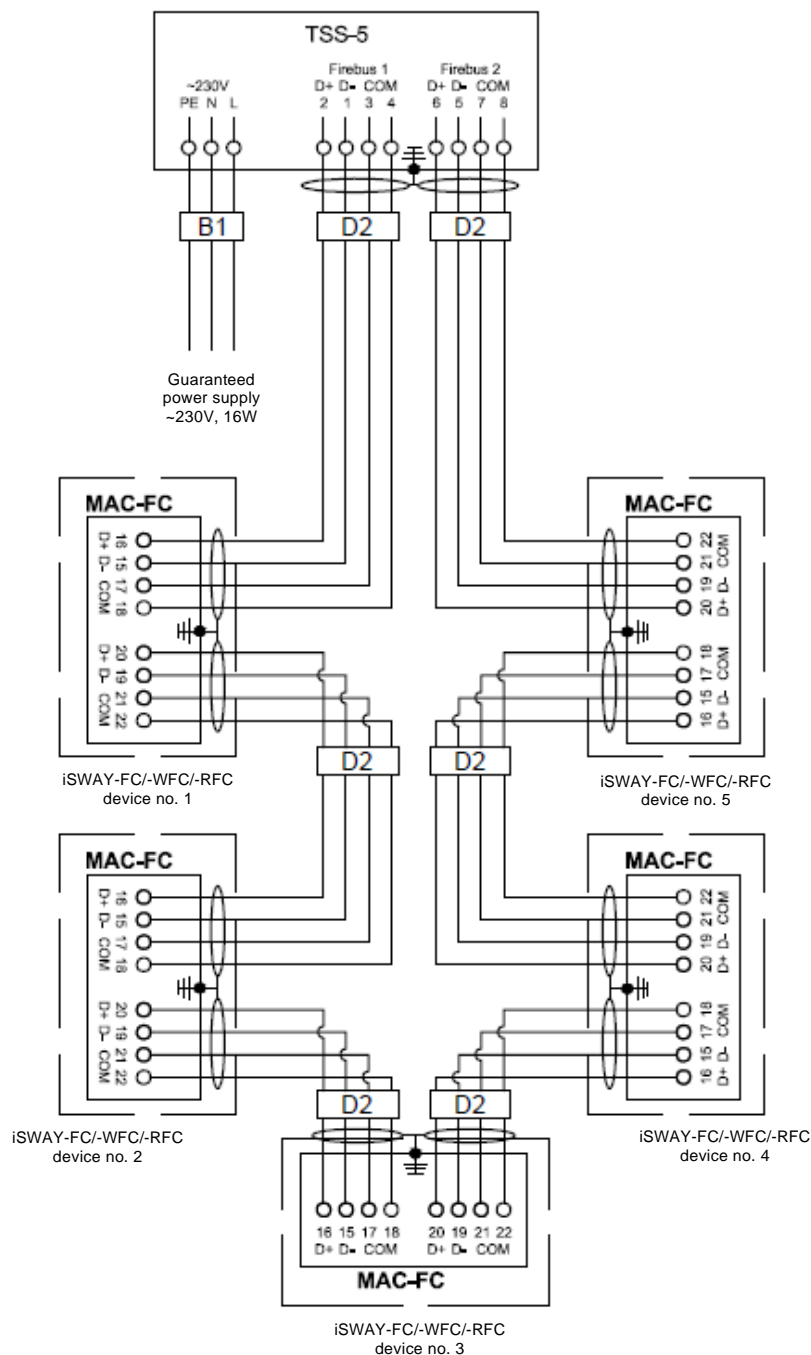


Fig. 13.15. Detailed wiring diagram of the TSS-3 Control and Display Panel with a single iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC device.



NOTE! Cables for terminals "D+" and "D-" – one twist pair!

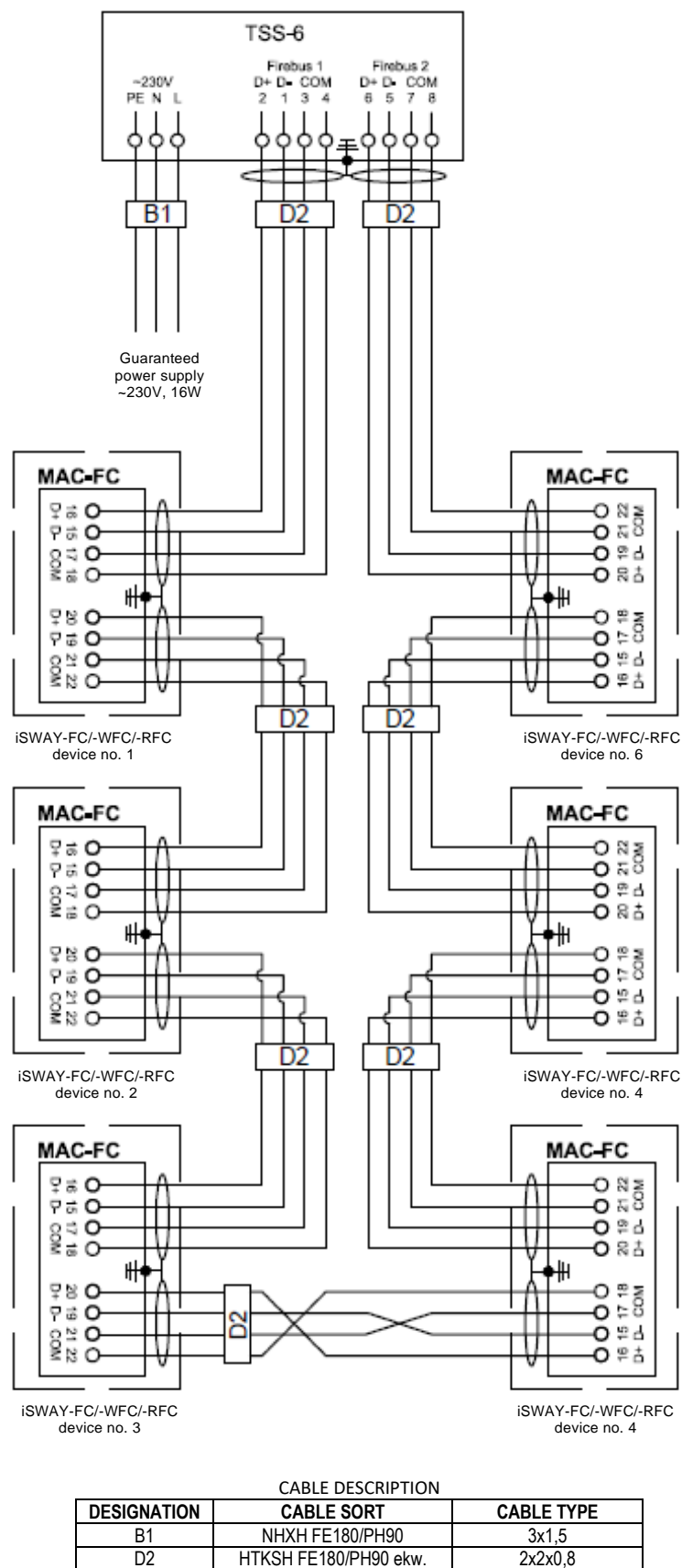
Fig. 13.16. Detailed wiring diagram of the TSS-4 Control and Display Panel with four iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC devices.



CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
B1	NHXX FE180/PH90	3x1,5
D2	HTKSH FE180/PH90 ekw.	2x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.17. Detailed wiring diagram of the TSS-5 Control and Display Panel with five iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC devices.



NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.18. Detailed wiring diagram of the TSS-6 Control and Display Panel with six iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC devices.

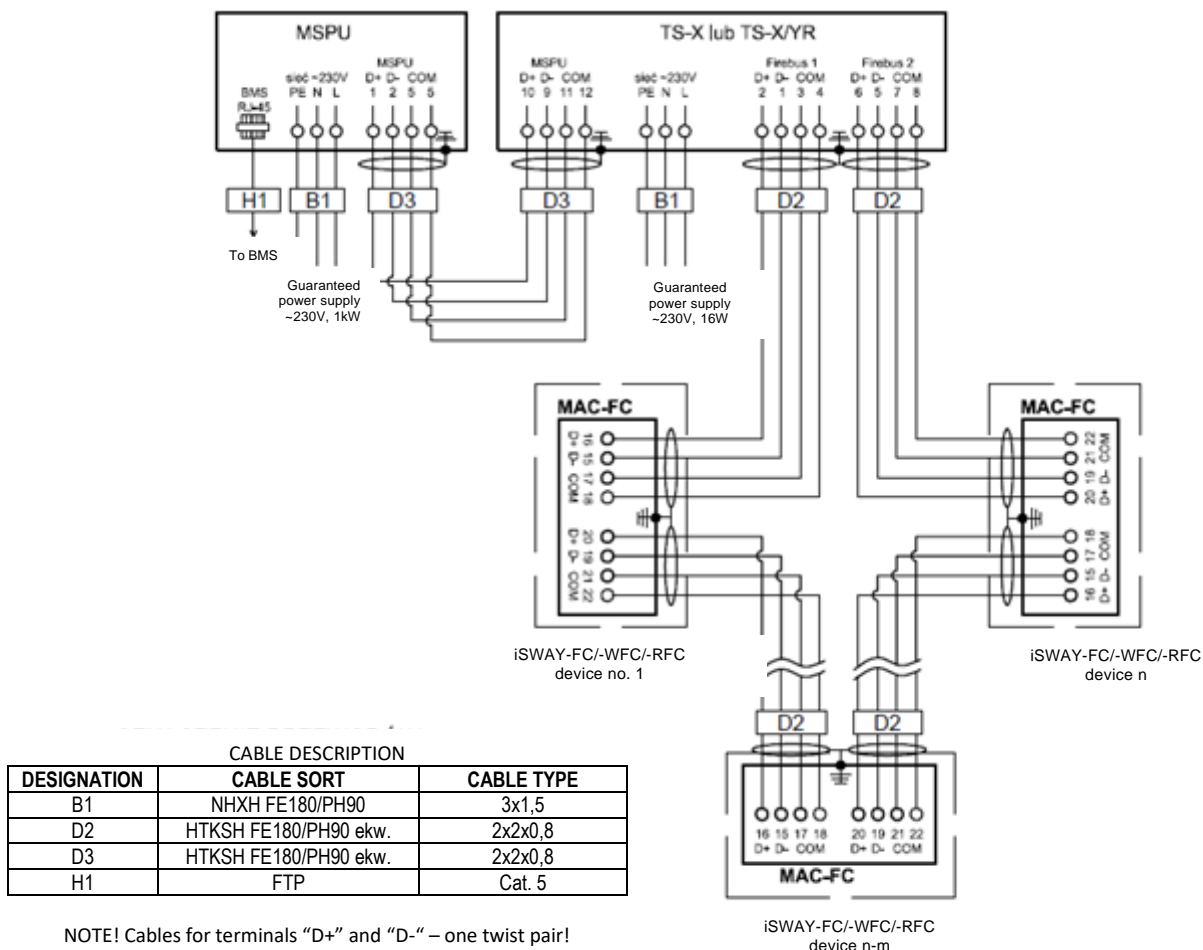
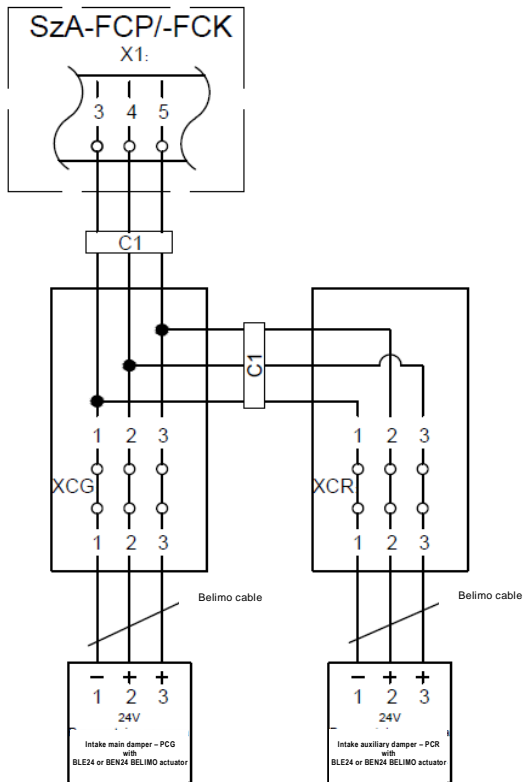


Fig. 13.19. Detailed wiring diagram of the TS-n Control Panel (TS-n/mR) with iSWAY-FC/iSWAY-WFC/iSWAY-RFC devices and with Monitoring of the operating states of devices MSPU.

13.4.2. Connection of double intake system, fixed lack of tightness opening damper, TSS-X-24VDC, 24VDC peripheral device

Connection diagram of the double intake to the SzA-FCP/-FCK cabinet (iSWAY-FC/-RFC device)

iSWAY-FC/-RFC device

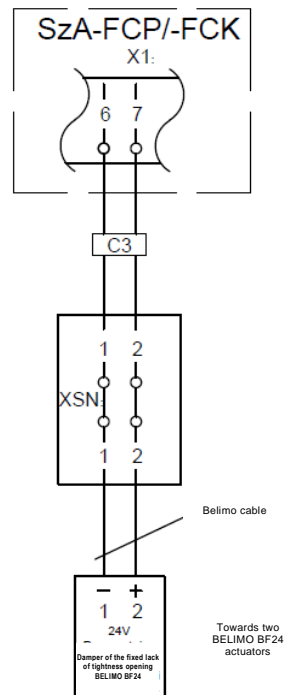


CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C1	HDGs FE180/PH90	3x1,5

Connection diagram of the fixed lack of tightness opening damper to the SzA-FCP/-FCK cabinet (iSWAY-FC/-WFC/-RFC device)

iSWAY-FC/-WFC/-RFC device



CABLE DESCRIPTION

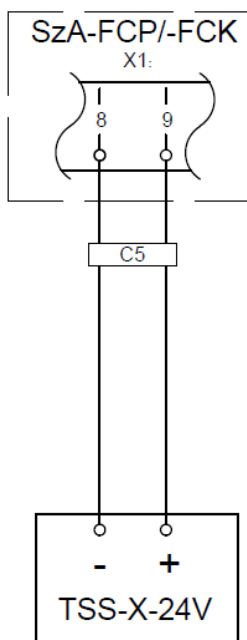
DESIGNATION	CABLE SORT	CABLE TYPE
C3	HDGs FE180/PH90	2x1,0

Fig. 13.20. Detailed wiring diagrams of the double intake system (and the distribution damper system for the base break assembly) to iSWAY FC, iSWAY RFC and the fixed inlet throttle to iSWAY FC, iSWAY WFC, iSWAY RFC (optional output)

Connection diagram. 24VDC power supply of the TSS-X-24V panel to the SzA-FCP/-FCK cabinet (iSWAY-FC/-WFC/-RFC device)

Connection diagram. 24VDC power supply of the peripheral device to the SzA-FCP/SzA-FCK cabinet (iSWAY-FC/-WFC/-RFC device)

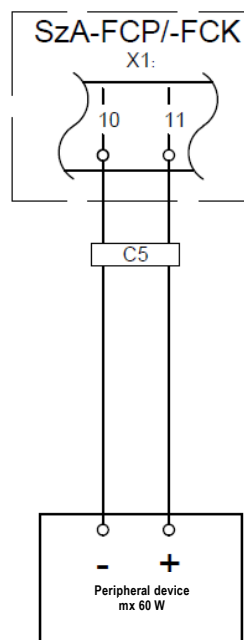
iSWAY-FC/-WFC/-RFC device



CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C5	HDGs FE180/PH90	2x2,5

iSWAY-FC/-WFC/-RFC device



CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C5	HDGs FE180/PH90	2x2,5

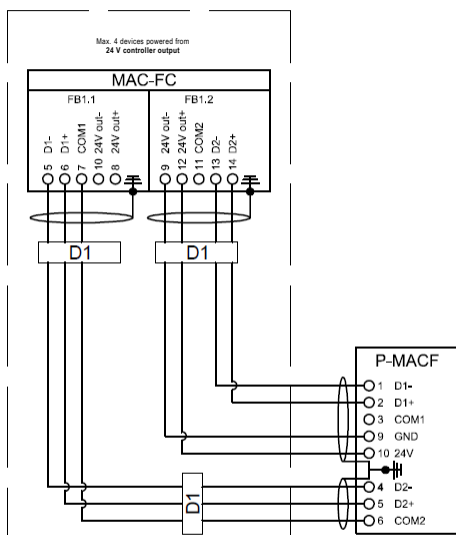
Fig. 13.21. Detailed wiring diagrams for TSS-X-24VDC and 24VDC peripheral device to iSWAY FC, iSWAY WFC, iSWAY RFC (optional output)

13.4.3. Connection of P-MACF pressure transmitters

Connection diagram for additional P-MACF pressure sensor.

Connection diagram for additional P-MACF pressure sensor to the SzA-FCP/-FCK cabinet equipped with P-MACF pressure sensor.

iSWAY-FC/-WFC/-RFC device

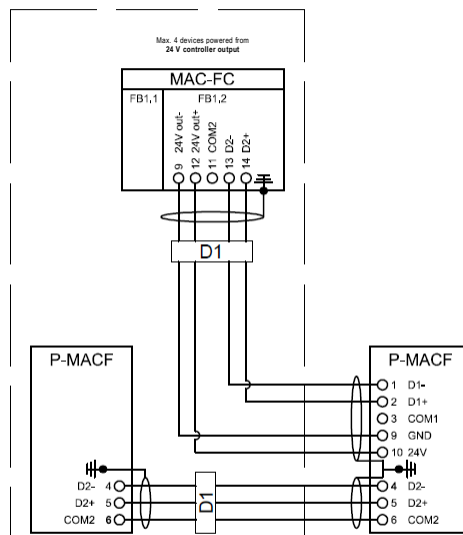


CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
D1	HTKSH FE180/PH90 ekw.	2x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

iSWAY-FC/-WFC/-RFC device

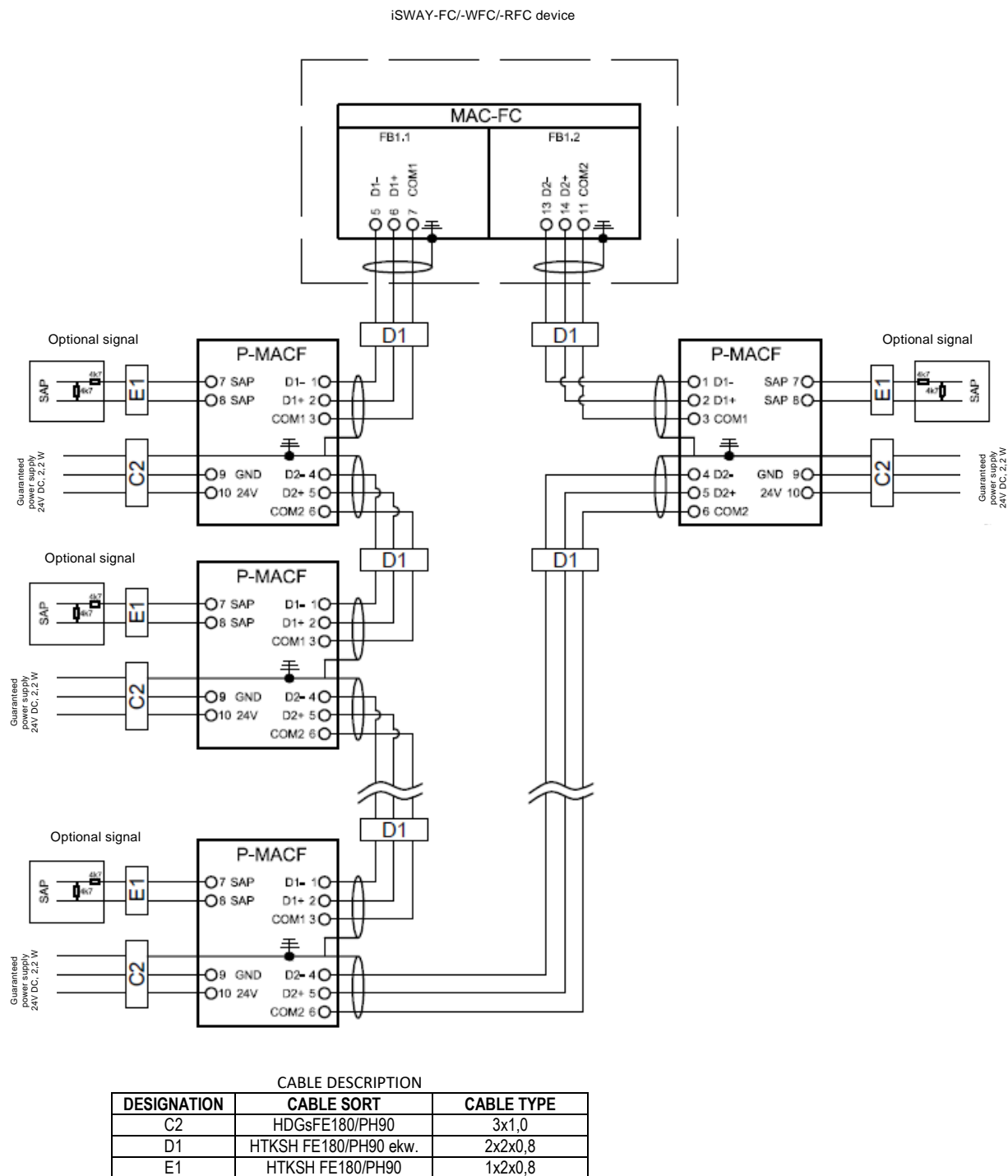


CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
D1	HTKSH FE180/PH90 ekw.	2x2x0,8

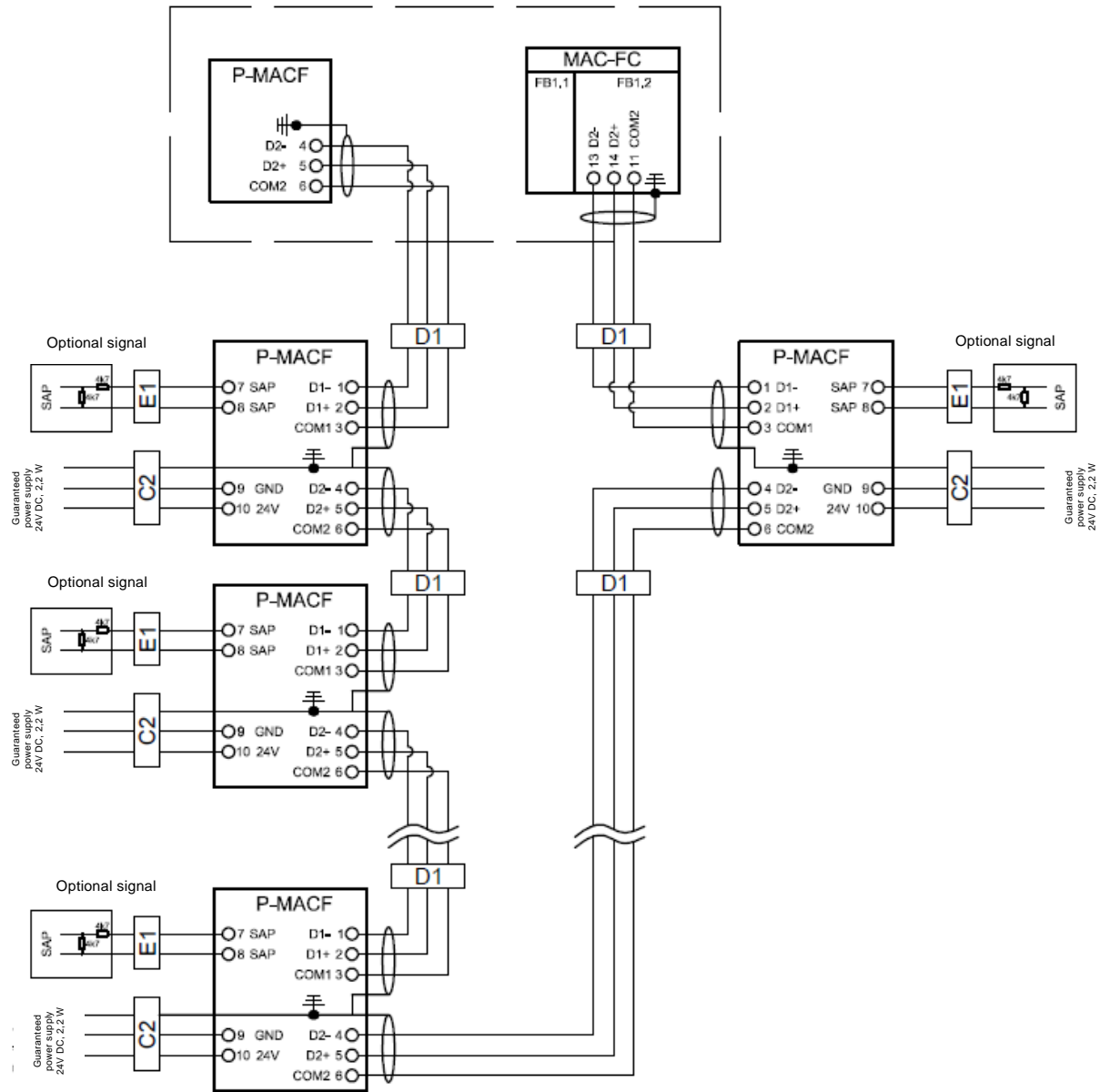
NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.22. Connection of an external P-MACF sensor to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC.



NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.23. Connection of external (object) P-MACF pressure sensors to the iSWAY-FC®/ iSWAY-WFC®/ iSWAY-RFC® unit.

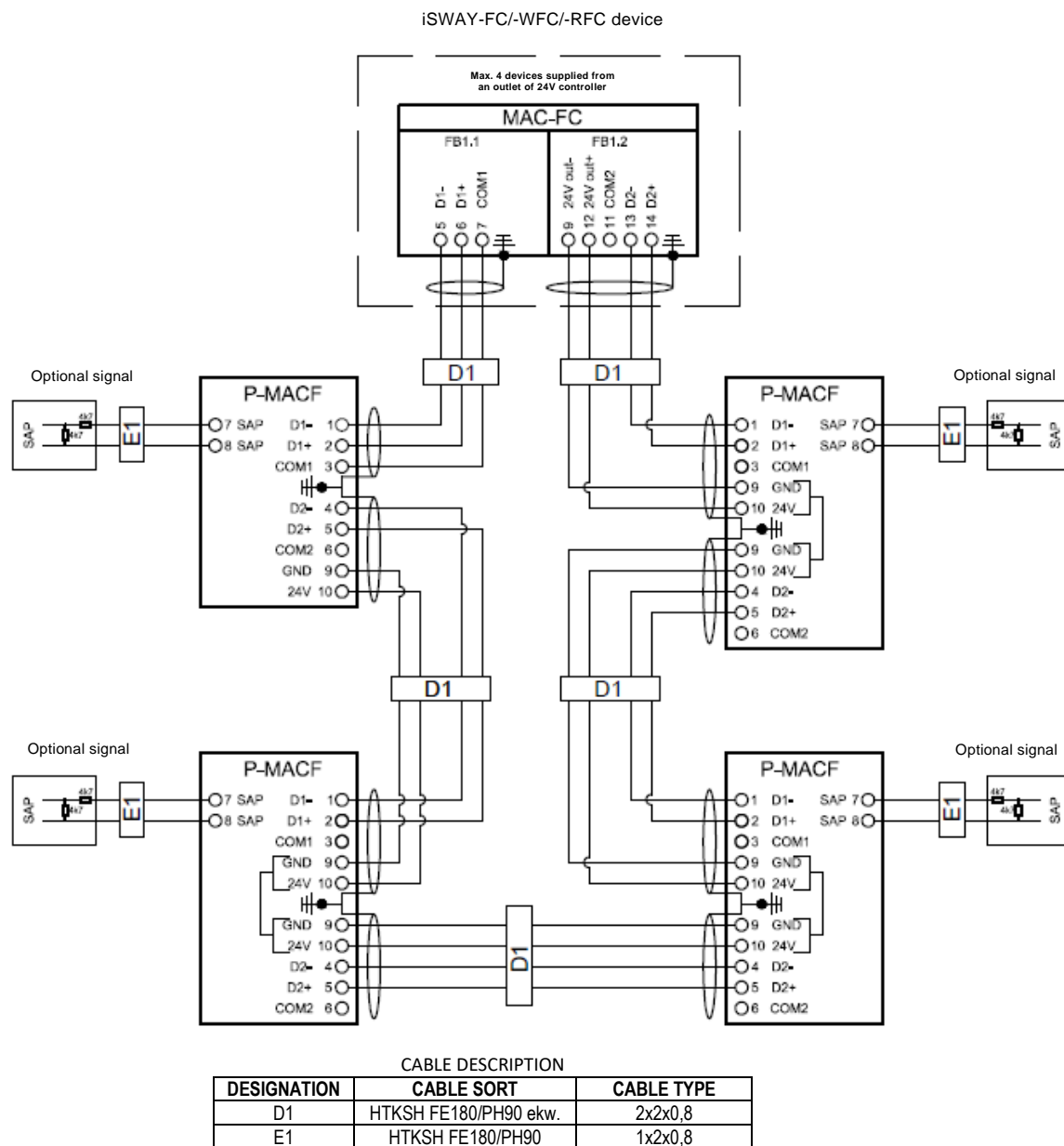


CABLE DESCRIPTION		
DESIGNATION	CABLE SORT	CABLE TYPE
C2	HDGsFE180/PH90	3x1,0
D1	HTKSH FE180/PH90 ekw.	2x2x0,8
E1	HTKSH FE180/PH90	1x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.24. Connection of external (object) P-MACF pressure sensors to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC unit for the SzA-FCP/SzA-FCK cabinet equipped with the optional P-MACF pressure sensor

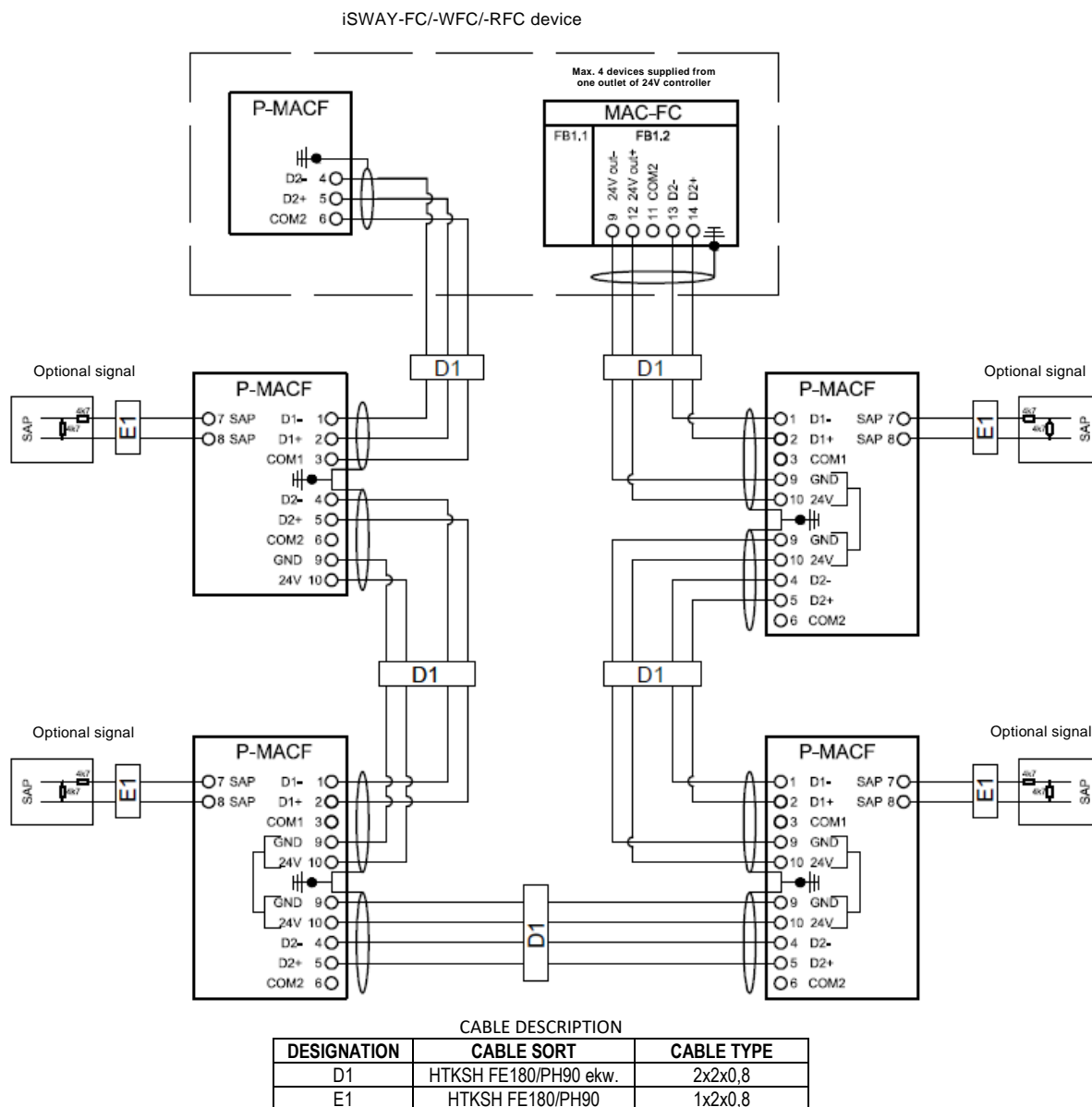
**Connection diagram for additional P-MACF pressure sensors
- P-MACF power supply from MAC-FC controller.**



NOTE! Cables for terminals "D+" and "D-" – one twist pair!

*Fig. 13.25. Connection of external (object) P-MACF pressure sensors to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC.
P-MACF power supply from the MAC-FC controller*

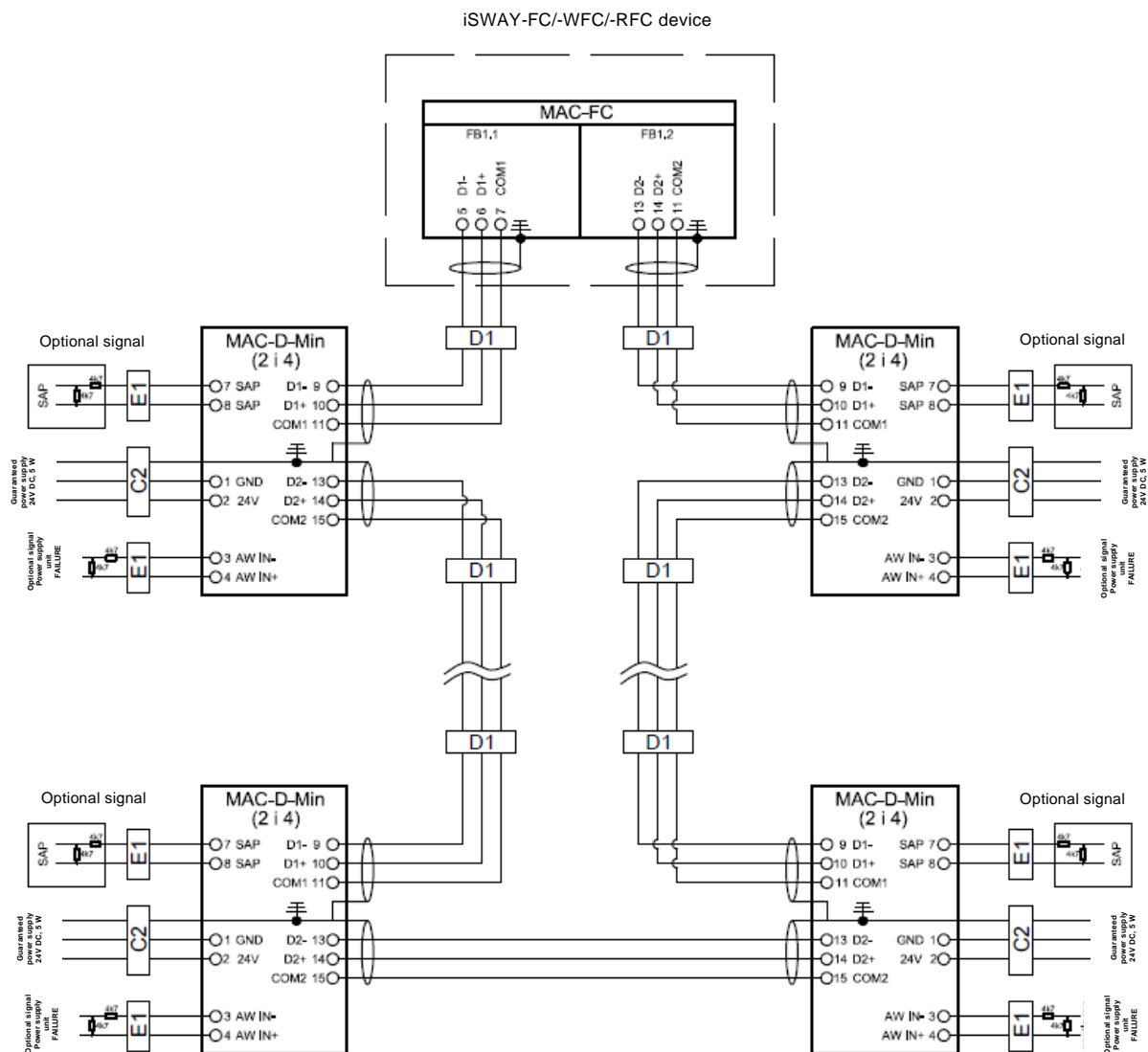
Connection diagram for additional P-MACF pressure sensor
to the SzA-FCP/-FCK cabinet equipped with P-MACF pressure sensor.
- P-MACF power supply from MAC-FC controller



NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.26. Connection of external (object) P-MACF pressure sensors to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC unit for a ShA-FCP/SzA-FCK cabinet equipped with an optional P-MACF pressure sensor. P-MACF power supply from the MAC-FC regulator

13.4.4. Connection of the MAC-D-Min regulator and the PZ Connection Box



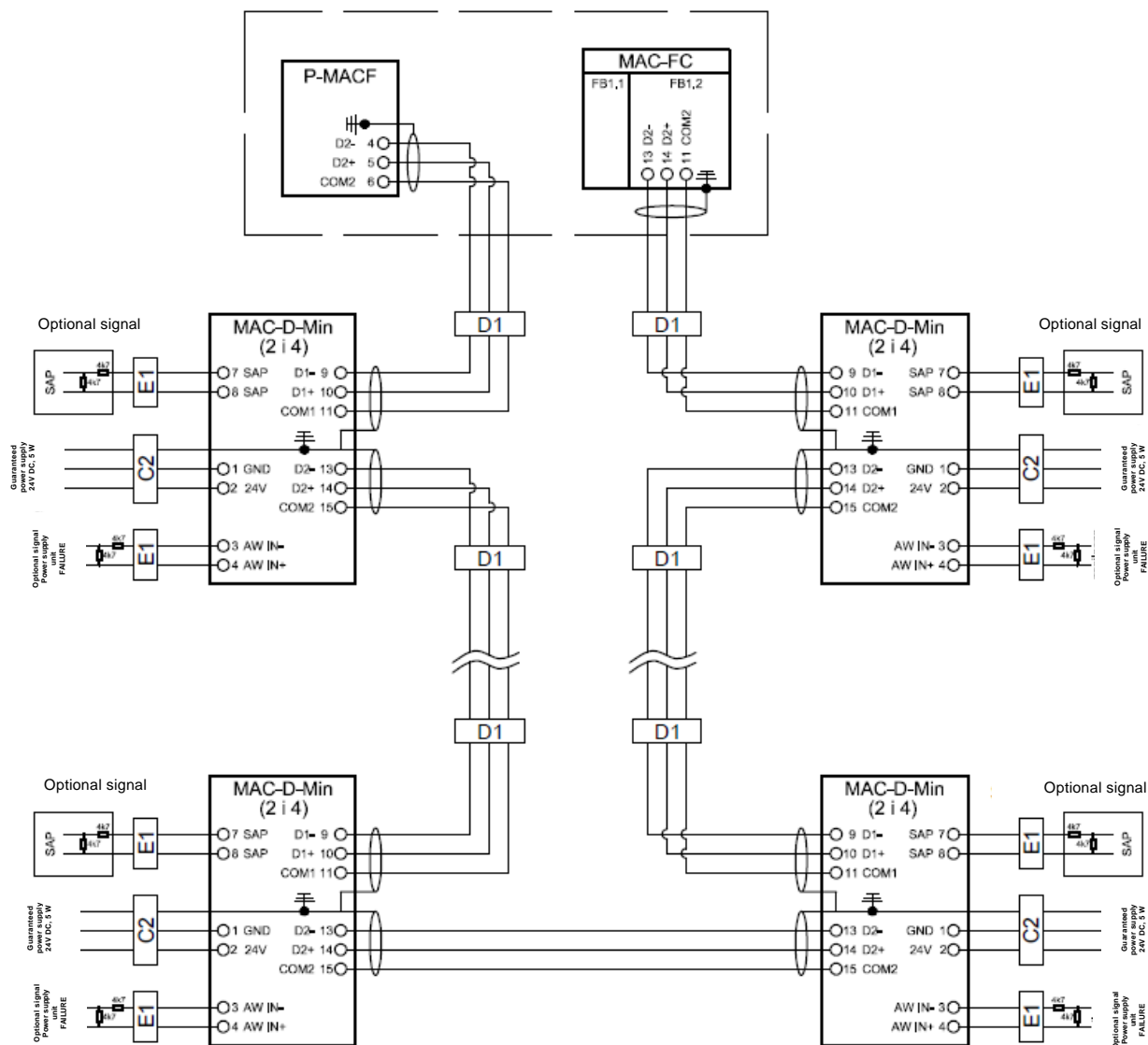
CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C2	HDGsFE180/PH90	3x1,0
D1	HTKSH FE180/PH90 ekw.	2x2x0,8
E1	HTKSH FE180/PH90	1x2x0,8

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.27. Connecting MAC- D-Min regulators to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC.

iSWAY-FC/-WFC/-RFC device



CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C2	HDGsFE180/PH90	3x1,0
D1	HTKSH FE180/PH90 ekw.	2x2x0,8
E1	HTKSH FE180/PH90	1x2x0,8
F2	HTKSH FE180/PH90	3x2x1,0

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.28. Connection of MAC-D-Min regulators to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC unit for the SzA-FCP/SzA-FCK cabinet equipped with the optional P-MACF pressure sensor

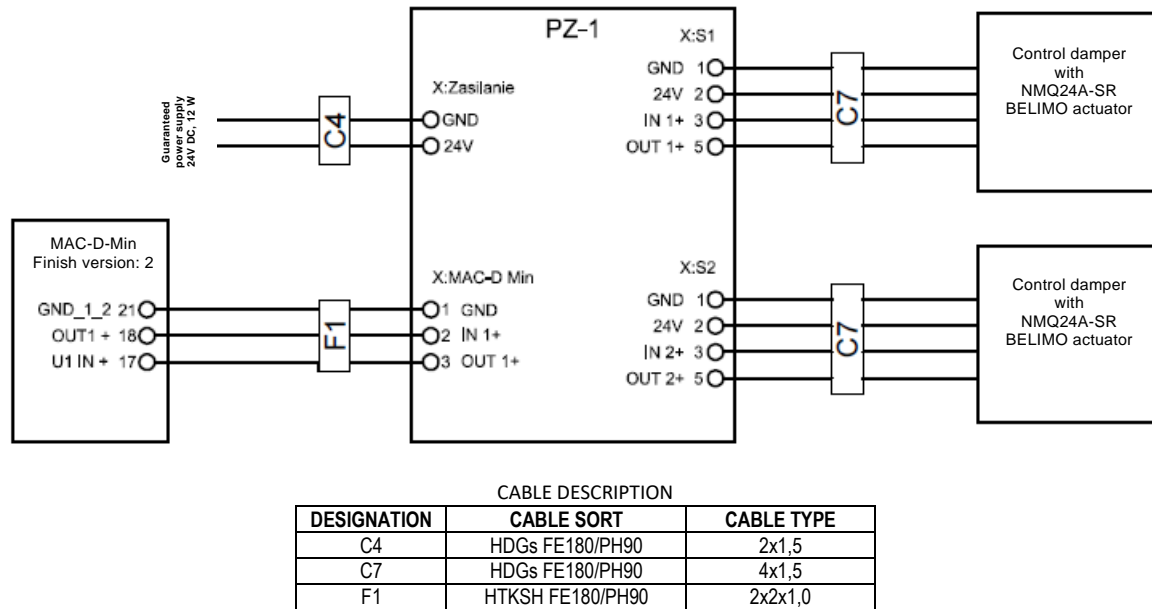


Fig. 13.29. Connection diagram for actuators, power supply and control from MAC-D Min to PZ1 Junction Boxes.

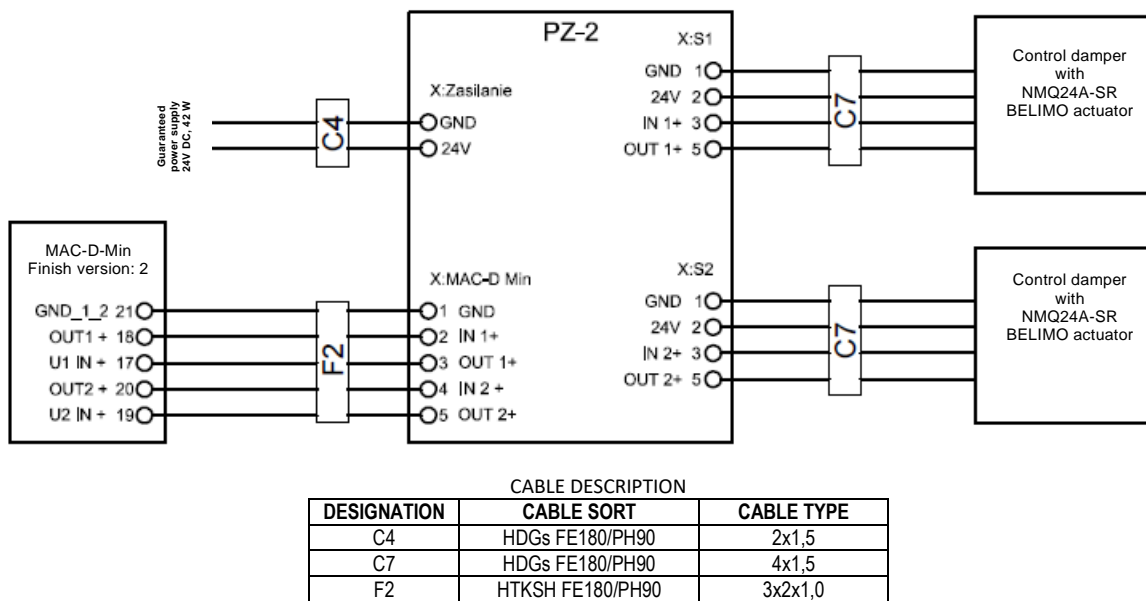
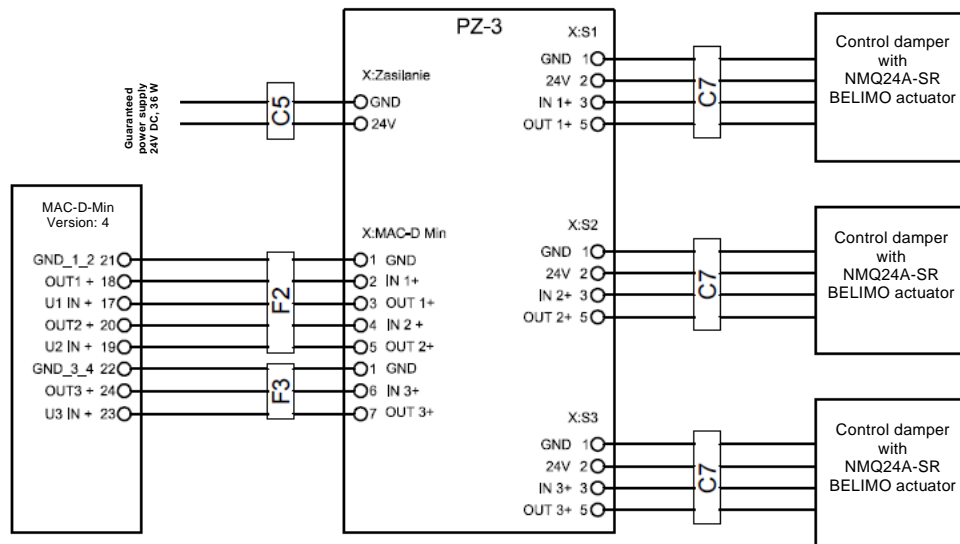


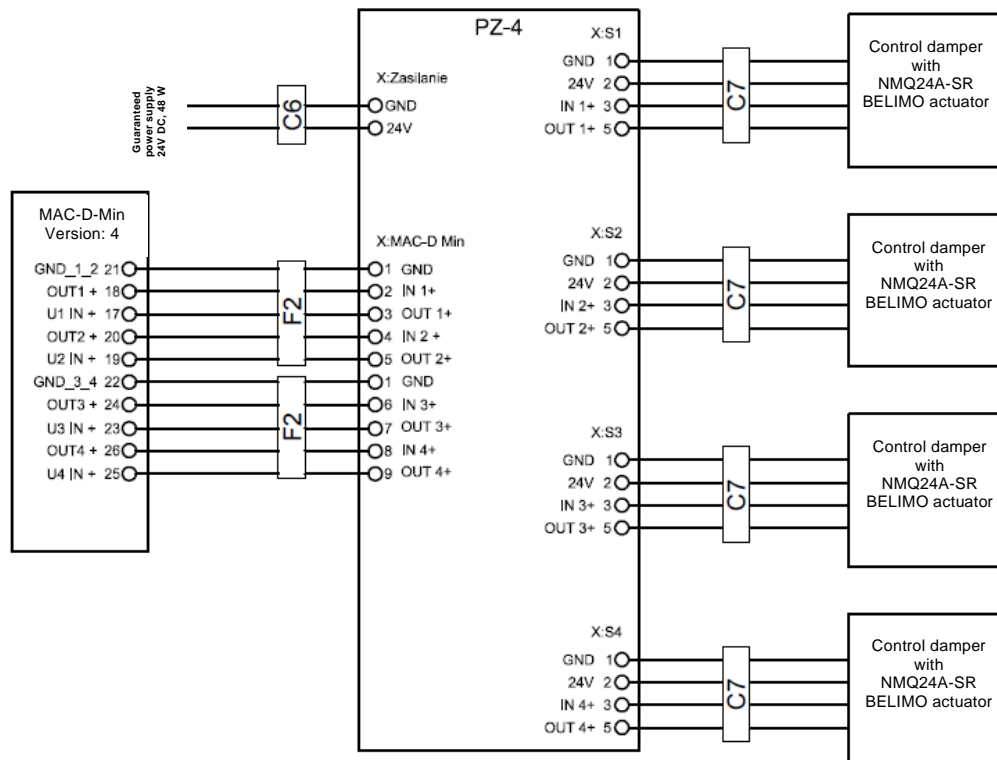
Fig. 13.30. Connection diagram for actuators, power supply and control from MAC-D Min to PZ2 Junction Boxes.



CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C5	HDGs FE180/PH90	2x2,5
C7	HDGs FE180/PH90	4x1,5
F2	HTKSH FE180/PH90	3x2x1,0
F3	HTKSH FE180/PH90	2x2x1,0

Fig. 13.31. Connection diagram for actuators, power supply and control from MAC-D Min to PZ3 Junction Boxes.



CABLE DESCRIPTION

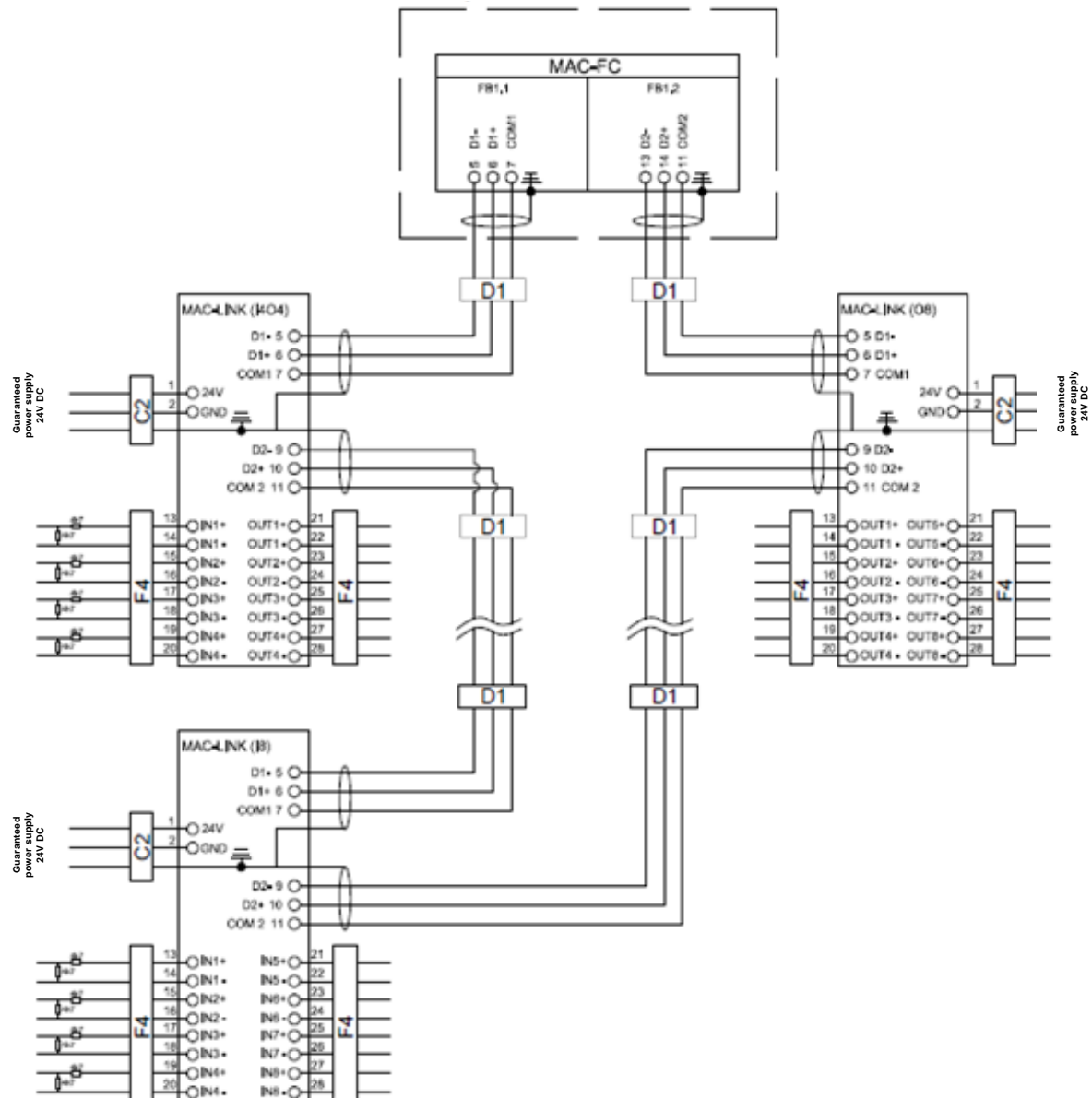
DESIGNATION	CABLE SORT	CABLE TYPE
C6	HDGs FE180/PH90	2x4
C7	HDGs FE180/PH90	4x1,5
F2	HTKSH FE180/PH90	3x2x1,0

Fig. 13.32. Connection diagram for actuators, power supply and control from MAC-D Min to PZ4 Junction Boxes.

13.4.5. Connection of MAC-Link card, T-MACF temperature sensors, iSWAY® booster/reserve

Maximum 8 MAC-LINK cards on one LocalFireBUS loop

iSWAY-FC/-WFC/-RFC device



CABLE DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C2	HDGsFE180/PH90	3x1,0
D1	HTKSH FE180/PH90 ekw.	2x2x0,8
F4	HTKSH FE180/PH90	4x2x1,0

NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.33. Connecting a MAC-LINK input-output cards to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC.

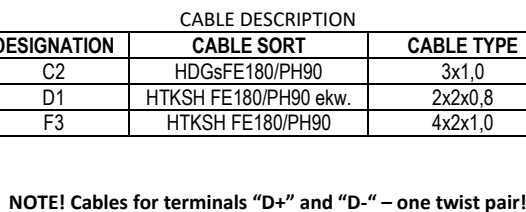


Fig. 13.34. Connection of MAC- LINK in-out cards to the iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC unit for the SzA-FCP/SzA-FCK cabinet equipped with the optional P-MACF pressure sensor.

iSWAY-FC-R device is always equipped with an additional P-MACF pressure sensor

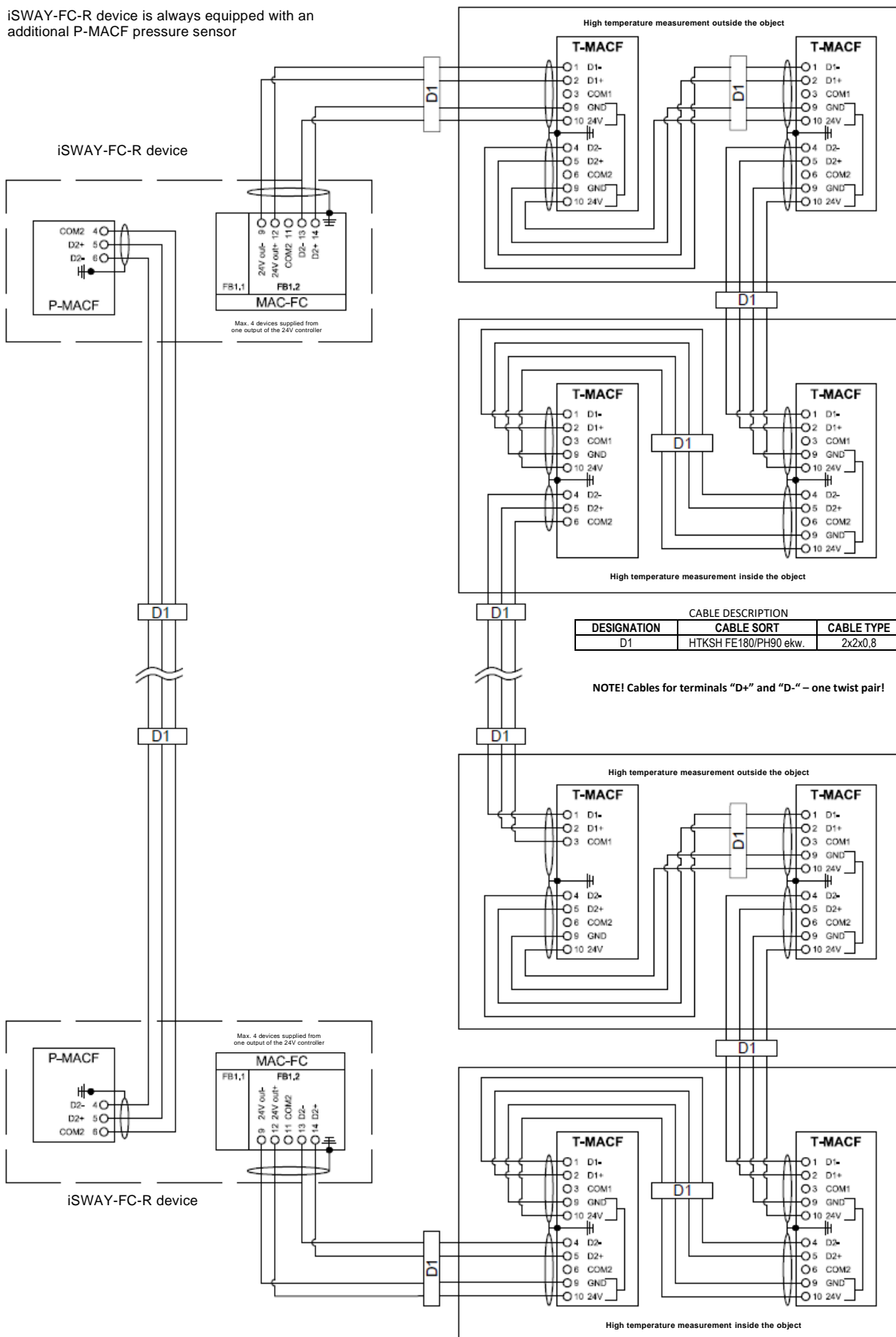
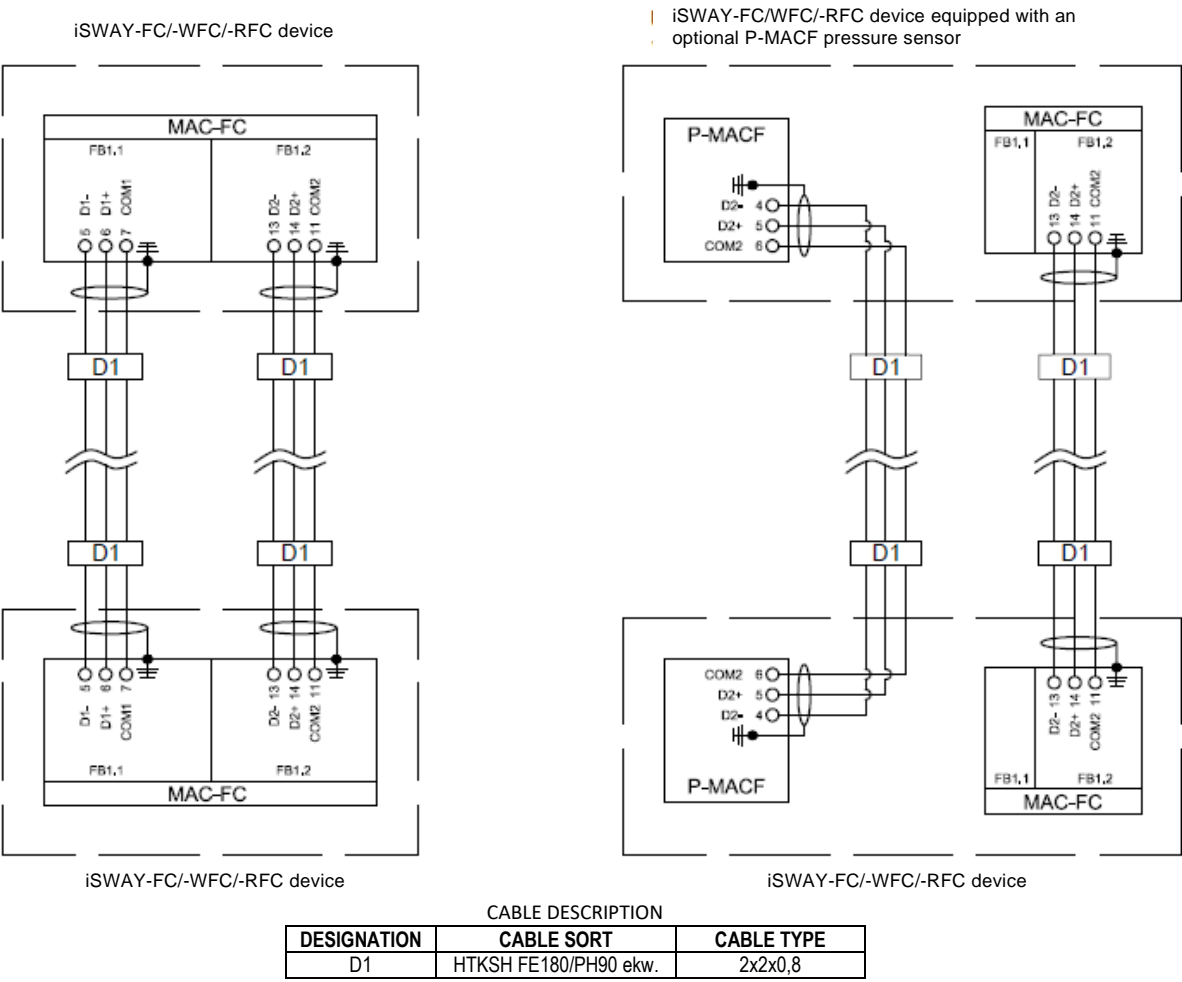


Fig. 13.35. Connection of T-MACF temperature sensors to the iSWAY-FC for the reversible system.

Note:

The recommended number of temperature sensors for a single staircase is 8.



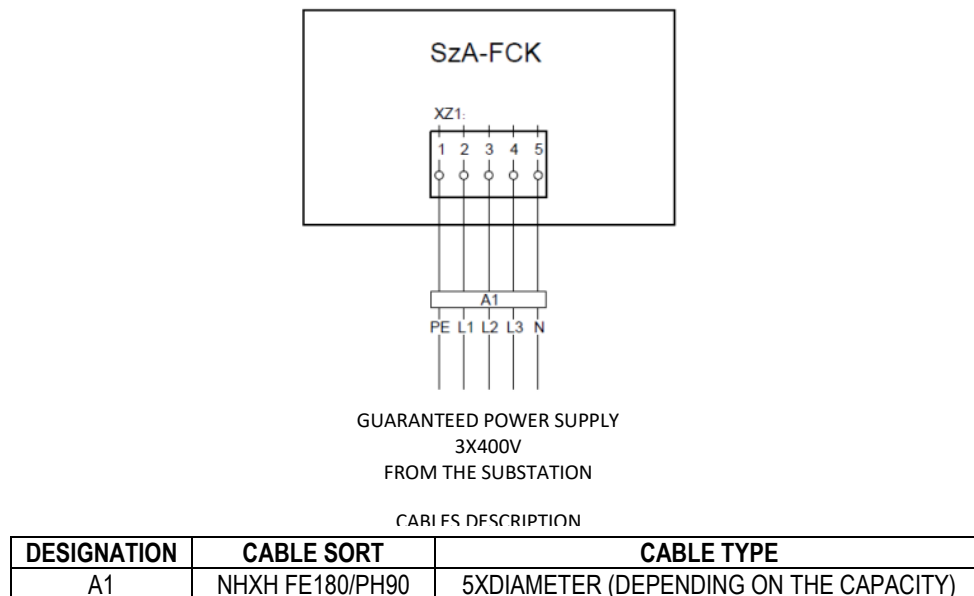
NOTE! Cables for terminals "D+" and "D-" – one twist pair!

Fig. 13.36. Connecting iSWAY-FC/ iSWAY-WFC/ iSWAY-RFC booster/reserve devices.

13.5. Connections for iSWAY-FC without enclosure

1.1.1. Main power supply connection

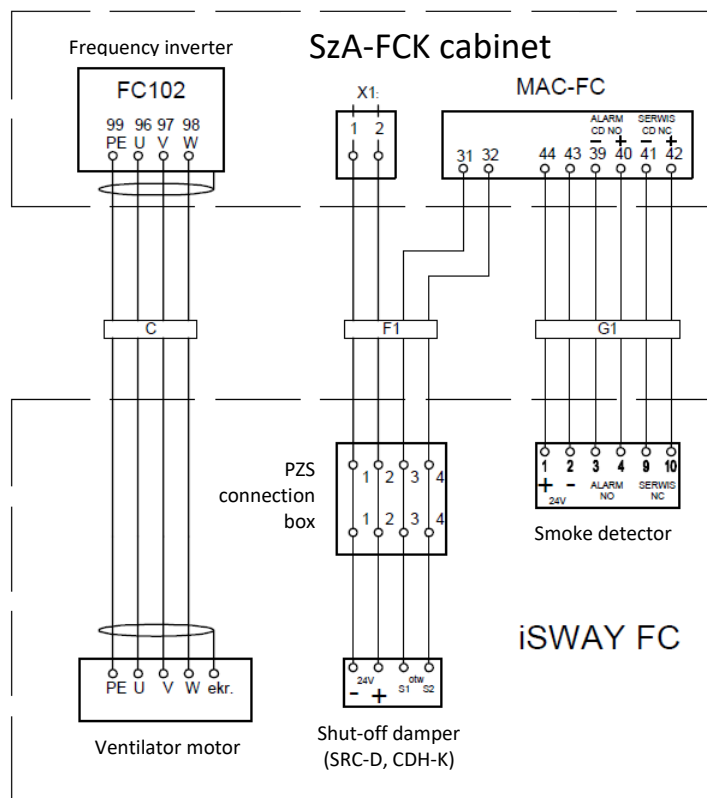
Main power supply in iSWAY-FC without enclosure is connected directly to terminals in the SzA-FCK cabinet, in iSWAY-FC without enclosure there is no service switch.



Rys. 14.1. Power supply connection for iSWAY without enclosure.

2.1.1. SzA-FCK connection

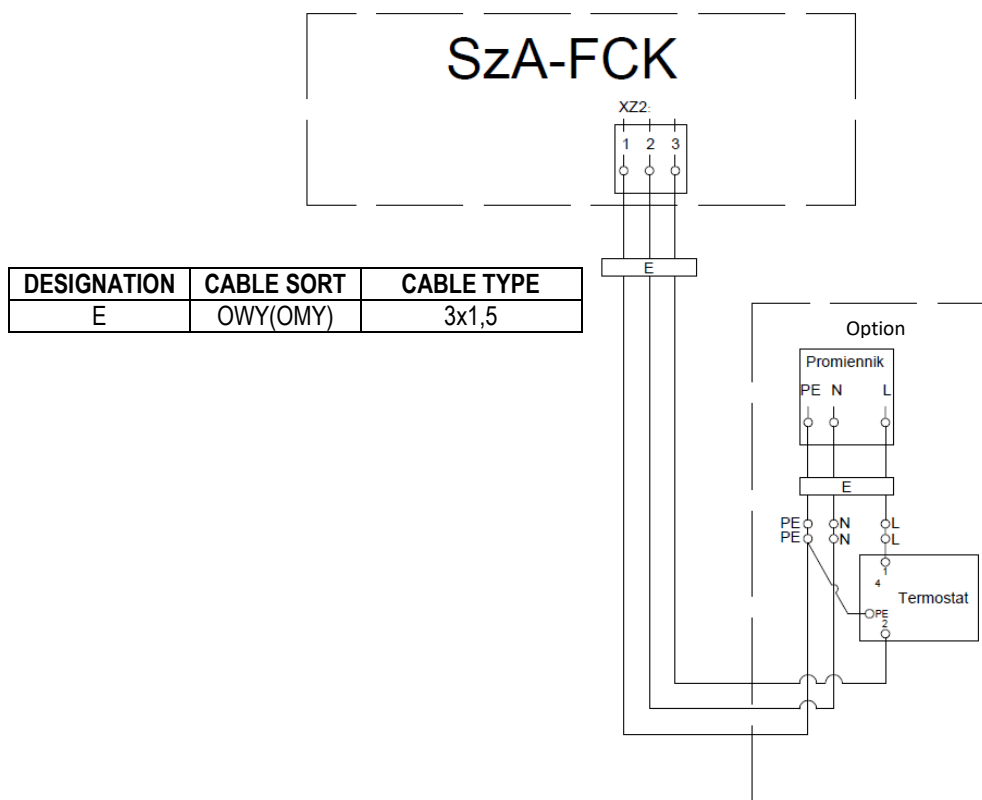
For iSWAY-FC with enclosure, a fan motor, a PZS junction box (connected to the cut-off damper) and a smoke detector are connected during production, while for iSWAY without enclosure, these connections must be made on site.



CABLES DESCRIPTION

DESIGNATION	CABLE SORT	CABLE TYPE
C	NHXCH FE180/PH90	4XDIAMETER (DEPENDING ON THE CAPACITY)
F1	HTKSH FE180/PH90	2x2x1,0
G1	HTKSH FE180/PH90	3x2x0,8

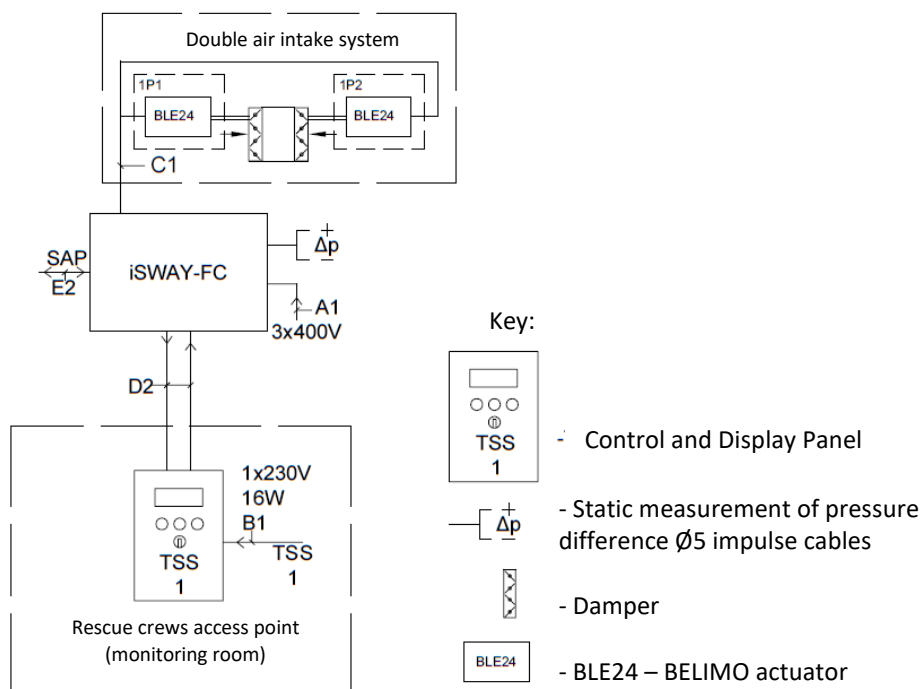
Rys. 14.2. SzA-FCK in iSWAY-FC without enclosure connection



Rys. 14.3. Anty Frost system connection for iSWAY-FC without enclosure

3.1.1. Wiring block diagram

iSWAY-FC without enclosure, just like iSWAY-FC with enclosure, is connected as standard with the Control and Display Panel (TSS-X, TSS-X-24V) or with the Control Panel and Devices Operation Status Monitoring panel (TS- ..., MSPU), double air intake system, P-MACF pressure sensors, MAC-D-Min regulators, and the Fire Alarm System (FAS), jointly forming the SAFETY WAY® system.

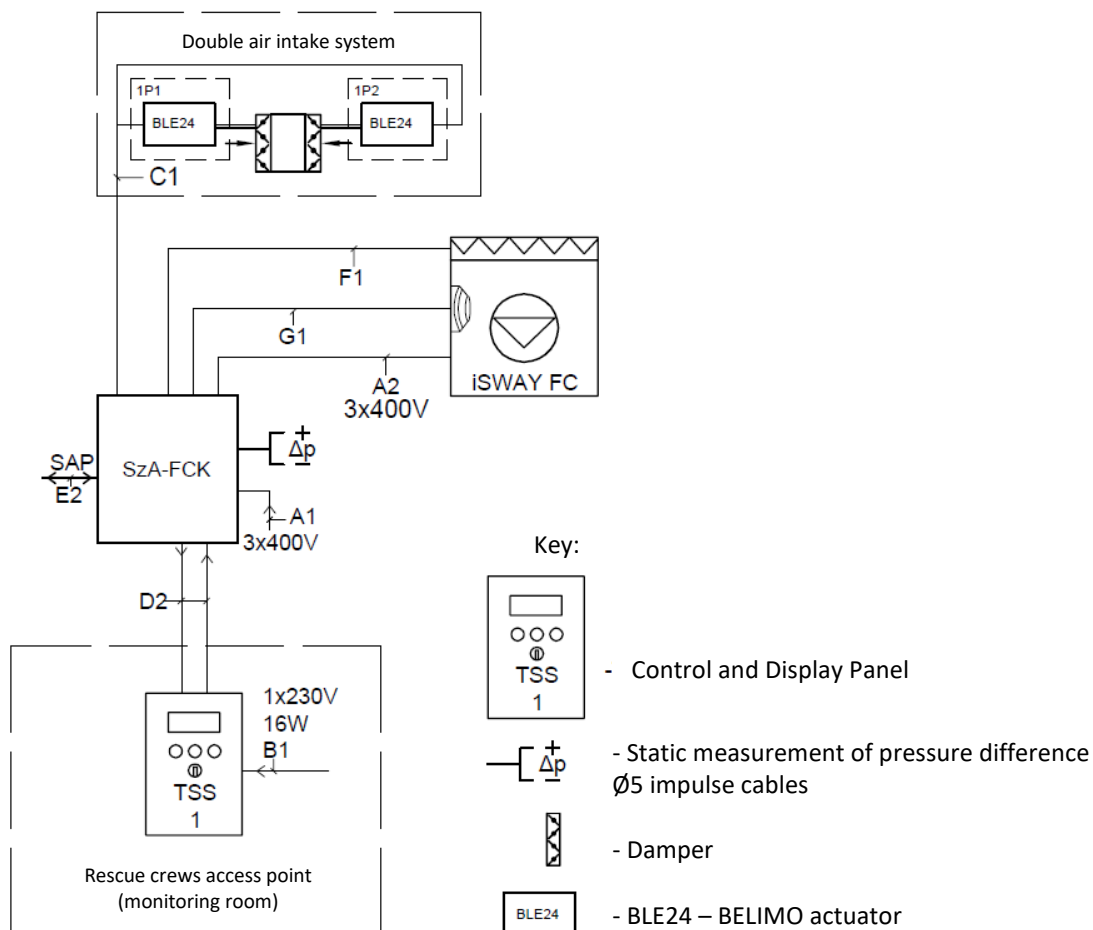


WIRING

Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXXH FE180/PH90 5x cross section
B1	Guaranteed power supply 1x230VAC MSPU, TS, TSS	NHXXH FE180/PH90 3x1,5
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
D2	Global FireBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8

Rys. 14.4. Wiring block diagram of Control and Display Panel TSS-1 with iSWAY-FC with enclosure and with double air intake system (option)

iSWAY-FC without the housing has a decentralized structure, which allows it to be mounted in places where there is not enough space for the iSWAY-FC with the housing. An exemplary iSWAY system without a housing and recommended cable types are presented in the block diagram below (Fig. 14.5).



WIRING

Designation on the diagram	Automation elements connections	Cable type
A1	Guaranteed power supply cable 3x400V for iSWAY-FC/-WFC/-RFC	NHXXH FE180/PH90 5x cross section
A2	Ventilator power supply 3x400V for iSWAY-FC/-WFC/-RFC	NHXCH FE180/PH90 4x cross section
B1	Guaranteed power supply 1x230VAC MSPU, TS, TSS	NHXXH FE180/PH90 3x1,5
C1	Control-power supply cable 24 VDC (double intake)	HDGs FE180/PH90 3x1,5
D2	Global FirsBus bus loop	HTKSH FE180/PH90 ekw 2x2x0,8
E2	Cables: ALARM SAP (NC) Operation confirmation (NO) Collective failure (NC)	HTKSH FE180/PH90 3x2x0,8
F1	Control/power supply cable 24 VDC (shut-off damper)	HTKSH FE180/PH90 2x2x1,0
G1	Power supply, alarm, failure, smoke detector signal cable,	HTKSH FE180/PH90 3x2x0,8

Rys. 14.5. Wiring block diagram of Control and Display Panel TSS-1 with iSWAY-FC without enclosure and with double air intake

14. Automation components of the iSWAY-FC® iSWAY-WFC®, iSWAY-RFC® device - support for the facility manager/administrator



Fig. 14.1. iSWAY-FC®.



Fig. 14.2. iSWAY-WFC®.



Fig. 14.3. iSWAY-RFC®.

14.1. Shut-off damper actuator

The BF24 and BFN24 actuators (Fig. 14.4) are designed to control the shut-off damper. Both open and close automatically. BFN24 actuator is used in iSWAY-WFC 1.1, 1.5, 2.2 and 3.0.



Fig. 14.4. Shut-off damper actuators. BF24 on the left and BFN24 on the right.

The actuator is powered by 24VDC.

During normal operation ("standby"), the damper should be closed (90° damper axis position indication). During the fire operation of the device (aeration), the damper should be open (0° indication of damper axis position).

NOTE!

If an actuator malfunction is detected, inform the SMAY service immediately. Do not repair or replace the actuator yourself, only SMAY Service or an authorised SMAY Service Centre can do so.

14.2. Damper actuator of double intake module and distribution damper for Primary and back-up

The BLE24 or BEN24 actuator (Fig. 14.5) is designed to control the dampers of the double intake modules and the Primary and back-up Distribution Dampers. It opens and closes automatically.



Fig.14.5. Damper actuators of the double intake module. BLE24 on the left and BEN24 on the right.

The actuator is powered by 24VDC.

During normal operation, one of the dampers defined as main should be open (0° damper axis position indication) and the reserve damper closed (90° damper axis position indication). If the device sucks in smoke, the main damper is closed and the reserve damper is opened. The person in charge of the rescue and firefighting action can return to the original state of the "Smoke Detector Lock" placed on the TSS or TS panel.

NOTE!

If an actuator malfunction is detected, inform the SMAY service immediately. Do not repair or replace the actuator yourself, only SMAY Service or an authorised SMAY Service Centre can do so.

14.3. Smoke detector in a duct casing

The UG-3-A40 smoke detector in a duct casing (Fig. 14.6) is a stand-alone smoke detector, located in a duct casing. A probe is placed in the airflow path through the iSWAY® unit. The detector is equipped with relay outputs to signal alarm (smoke detection) and technical (service) alarm.

If the smoke detector is dirty, its sensitivity increases, which can result in false smoke detection alarms. The technical alarm signal indicates the need to perform maintenance such as cleaning the detector or replacing it if it fails.



Fig. 14.6. Channel housing smoke detector

Diagnosing the function states of the smoke detector:

- Normal operation: Detector light under the removable cover at the rear lights up green
- Smoke alarm: Detector LED lights up red
- Service alert: When the detector detects smoke or is dirty, the green LED lights up first before going into the red alarm state.
If the detector is dirty, it will show a green light. This is an optical indication (prealarm or service alarm), which means that the sensor is dirty and if it is not cleaned, it will later give a false alarm.
- Fault: The alarm relay will switch the contacts:
 - a) in case the sensor module is removed
 - b) in the event that the supply voltage is interrupted

NOTE!

In the event of a smoke detector malfunction, the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. First of all, the smoke detector must be cleaned according to the instructions below. If cleaning does not eliminate the failure, inform the SMAY service immediately. Do not repair or replace the smoke detector yourself. This can only be done by SMAY service or an authorised SMAY service.

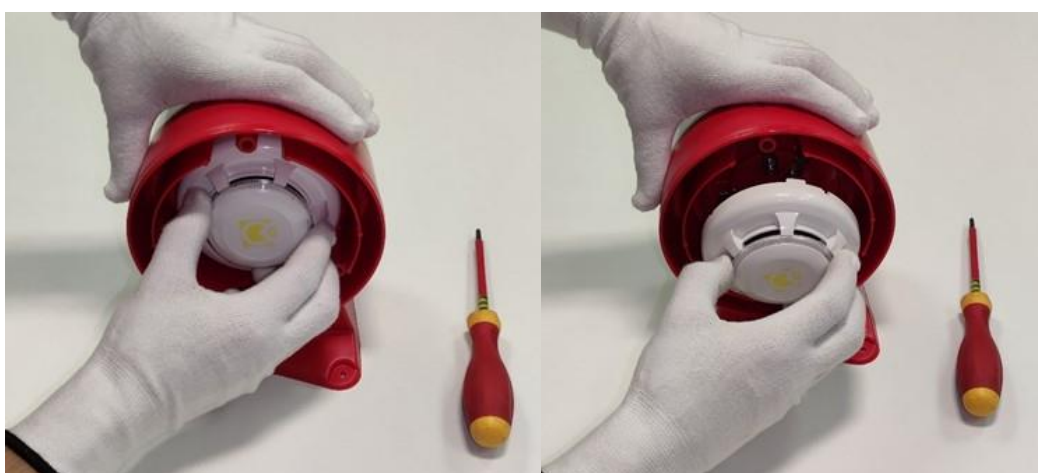
Step 1

Use a screwdriver to loosen the 3 screws on the detector cover. After removing the screws, remove the smoke detector cover.



Step 2

After removing the cover, grasp the EVC detector as shown in the picture and turn it counterclockwise to remove it from the holders holding it in the housing.



Step 3

It is not allowed to interfere with the EVC detector (do not blow, do not use compressed air). Place a vacuum cleaner on the edge of the EVC detector (5 cm from the holes) and vacuum on each side. Be careful not to damage the EVC detector.



Step 4

Vacuum the dirt and dust inside the housing with a vacuum cleaner, wipe with a soft cloth.



Step 5

When the EVC detector is correctly inserted into the housing, turn it clockwise. The smoke detector housing must then be mounted.



Step 6

After closing the smoke detector front cover, open the cover on the back of the detector housing. Use a flat screwdriver to open. The pictures below show how to open.



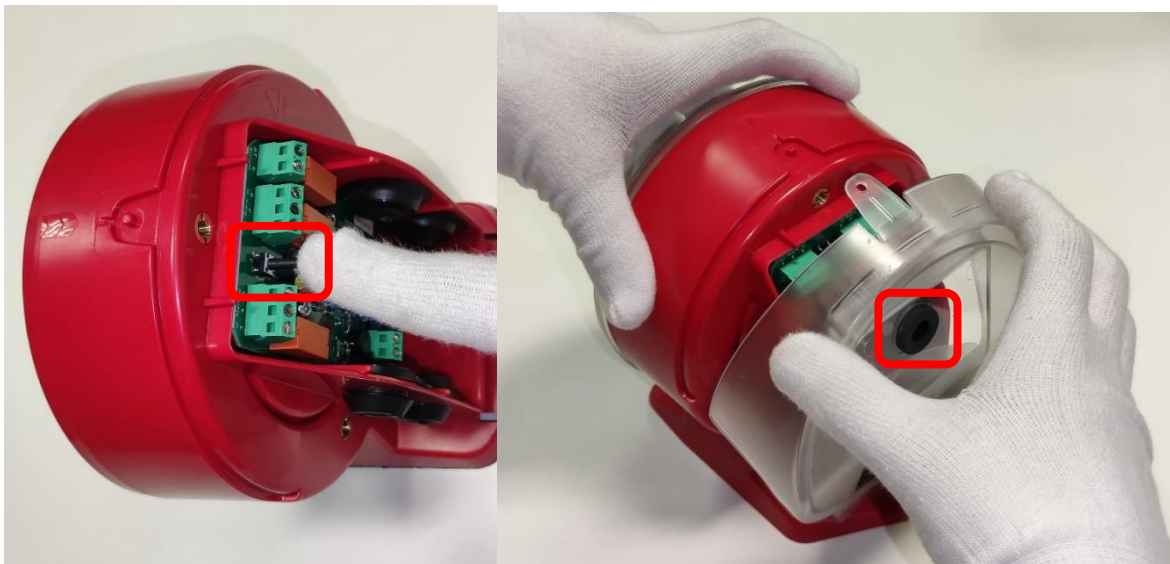
Step 7

After opening and removing the back cover, press the button located on top of the PCB between the connection terminals. After pressing the button, put on the cover.

Attention!

When replacing the cover, pay attention to the Reset button S2, if you do not put it back carefully, the button may be pressed down with the cover.

If the rubber element of the cover locks the reset button in the pressed position, remove the cover and put it on again so that the reset button is in the center of the rubber element.



14.4. Fans

14.4.1. AFC, ARC and AJF

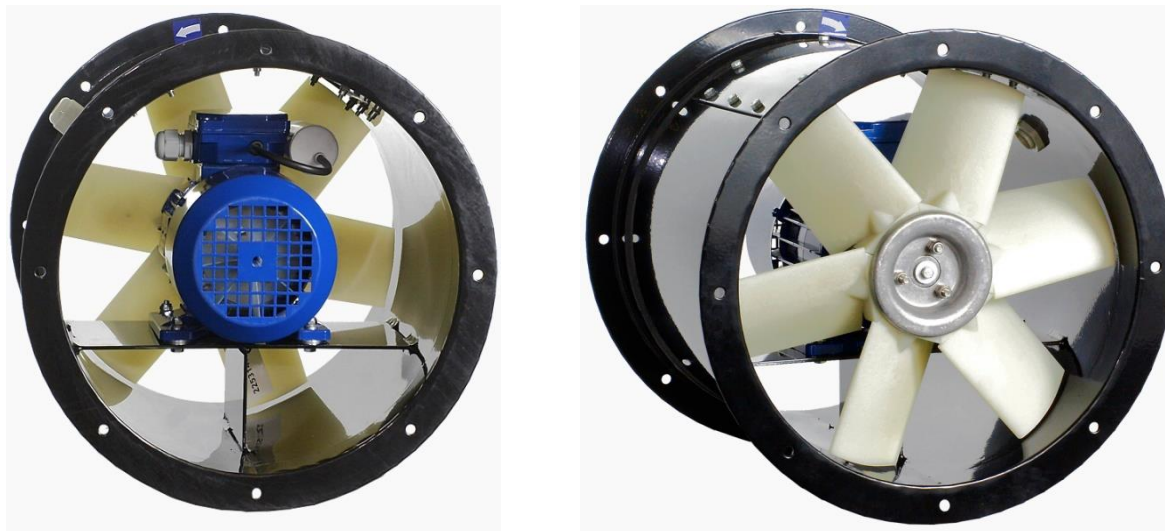


Fig. 14.7. View of AFC (left) and ARC (right) fans.

Table 14.1. The fan series used in iSWAY-FC® units.

Type of device		Type/Diameter	Power supply[VAC]/ Power consumption[kW]
iSWAY-FC®	0.3	AFC(AJF)/560	3x400/2,2
	0.12	AFC(AJF)/560	3x400/4,0
	1.17	AFC(ARC, AJF)/800	3x400/4,0
	1.20	AFC(ARC, AJF)/800	3x400/5,5
	1.24	AFC(ARC, AJF)/800	3x400/7,5
	2.31	AFC(ARC, AJF)/1000	3x400/7,5
	2.39	AFC(ARC, AJF)/1000	3x400/11
	2.47	AFC(ARC, AJF)/1000	3x400/15
	2.75	AJF/1000	3x400/18,5

14.4.2. HCBT



Fig. 14.8. View of HCBT fans.

Table 14.2. Fans used in iSWAY-WFC® units.

Type of device		Type/Diameter	Power supply[VAC]/ Power consumption[kW]
iSWAY-WFC®	1.1	HCBT/4/560	3x400/1,3
	1.5	HCBT/4/630	3x400/1,7
	2.2	HCBT/4/710	3x400/2,6
	3.0	HCBT/4/800	3x400/3,0
	5.5	HCBT/4/900	3x400/5,5

14.4.3. iSFS SMAY



Fig. 14.9. View of iSFS fans.

Table 14.3. Fans used in iSWAY-RFC® units.

Type of device		Type/Diameter	Power supply[VAC]/ Power consumption[kW]
iSWAY-RFC®	1.5	iSFS 56 T4	3x400/1,5
	2.2	iSFS 63 T4	3x400/2,2
	3.0	iSFS 80 T4	3x400/3,0
	4.0	iSFS 80 T4	3x400/4,0
	5.5	iSFS 100 T4	3x400/5,5
	7.5	iSFS 100 T4	3x400/7,5

NOTE!

In the event of a fan motor malfunction, the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a fan malfunction is detected, inform the SMAY service immediately. Do not repair or replace the fan yourself. This can only be done by SMAY service or an authorised SMAY service.

14.5. SzA-FCP - automation cabinet

The Sha-FCP automation cabinet supplies power for iSWAY-FC components® and is mounted inside this compact unit. SzA-FCP has a built-in frequency inverter with fire mode. The cabinet has a built-in MAC-FC regulator and output circuits - among others, control of the shutter and of the double intake system. It also provides 24VDC power, with battery backup. The cabinet's power supply is monitored and a power confirmation signal is displayed on a light on the front panel of the automation cabinet.

Optionally, a P-MAC or P-MACF pressure converter and additional 24VDC outputs (to TSS, peripheral device) can be installed in the SzA-FCP automation cabinet.

Cabinets are manufactured in different types depending on the devices mounted inside the cabinet and the power of the built-in inverter as shown in Table 14.4.



Fig. 14.10. View of SzA-FCP Automatic Control Cabinet.

Table 14.4. Series of SzA-FCP Automatic Control Cabinet.

SzA-FCP	0.3	0.12	1.17	1.20	1.24	2.31	2.39	2.47	2.75
Inverter power [kW]	2.2	4.0	4.0	5.5	7.5	7.5	11.0	15.0	18.5
Overcurrent protection of the inverter	B10	B16	B16	B16	B20	B20	B32	B40	B50

NOTE!

The absence of the indication "POWER CONTROL" first means that the main switch is in the "0" position. If the main switch is in position "1", it may mean that one of the fuses has tripped: 1F1, 1F2, 1F3, 1F5, 1F6 in the SzA-FCP cabinet or there is a damage to the power supply circuit of a frequency inverter (SzA-FCP cabinet - inverter).

Description of security features: SzA-FCP

1. 1F1, 1F2, 1F3 - frequency inverter protection (3x400V) - Tables (13.2, 14.4)
2. 1F4 - Anti-Frost protection (1x230V) - B10
3. 1F5 - power supply protection (1x230V) - C10
4. 1F6 - protection of 24VDC circuits in the cabinet (1x24V) - 3.15A
5. 1F7 - MAC-FC controller protection (1x24V) - 3.15A
6. 1F8 - 24VDC power output protection for peripheral devices (1x24V) - 3.15A
7. 1F9 - 24VDC power output protection for TSS-X-24V panel (1x24V) - 3.15A

NOTE!

In the event of a SzA-FCP cabinet malfunction (or power supply loss), the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP.

If a SzA-FCP cabinet malfunction is detected, inform the SMAY service immediately. Do not repair or replace the cabinet yourself. This can only be done by SMAY service or an authorised SMAY service.

14.6. SzA-FCK - automation cabinet

The SzA-FCK automation cabinet differs from the SzA-FCP automation cabinet in that it is used for iSWAY-WFC, iSWAY-RFC and iSWAY-FC without enclosure, and additionally it has braking resistors mounted on the cabinet, covered with perforated sheet metal. It is not mounted inside the unit (like the SzA-FCP) but directly inside or outside the building.

SzA-FCK has a built-in frequency inverter with fire mode. The cabinet has a built-in MAC-FC regulator and output circuits - among others, control of the shutter and of the double intake system. It also provides 24VDC power, with battery backup. Braking resistors are mounted on the side of the cabinet. The cabinet's power supply is monitored and a power confirmation signal is displayed on a light on the front panel of the automation cabinet.

Optionally, a P-MAC or P-MACF pressure converter and additional 24VDC outputs (to TSS, peripheral device) can be installed in the SzA-FCK automation cabinet. Additionally cabinet can be equipped with a heater.

Cabinets are manufactured in different types depending on the devices mounted inside the cabinet and the power of the built-in inverter as shown in Table 14.5.



Fig. 14.11. View of SzA-FCK Automatic Control Cabinet.

Table 14.5. Series of SzA-FCK Automatic Control Cabinet.

SzA-FCK	1.1	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18.5
Inverter power [kW]	1.1	1.5	2.2	3.0	4.0	5.5	7.5	11	15	18,5
Overcurrent protection of the inverter	B6	B6	B10	B10	B16	B16	B20	B32	B40	B50

NOTE!

If the "POWER CONTROL" is not signalled, it may mean that one of the fuses is tripped: 1F1, 1F2, 1F3, 1F5, 1F6 in the SzA-FCK cabinet or there is a damage to the power supply circuit of a frequency inverter (SzA-FCK cabinet - inverter).

Description of security features: SzA-FCK

1. 1F1, 1F2, 1F3 - frequency inverter protection (3x400V) – Tables 13.3, 13.4, 14.5
2. 1F5 - power supply protection (1x230V) - C10
4. 1F6 - protection of 24VDC circuits in the cabinet (1x24V) - 3.15A
5. 1F7 - MAC-FC controller protection (1x24V) - 3.15A
6. 1F8 - 24VDC power output protection for peripheral devices (1x24V) - 3.15A
7. 1F9 - 24VDC power output protection for TSS-X-24V panel (1x24V) - 3.15A

NOTE!

In the event of a SzA-FCK cabinet malfunction (or power supply loss), the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP.

If a SzA-FCK cabinet malfunction is detected, inform the SMAY service immediately. Do not repair or replace the cabinet yourself. This can only be done by SMAY service or an authorised SMAY service.

NOTE!

The cabinet should be installed with the exclusion of direct influence of precipitation and solar radiation (under a roof or in a technical room). It can work in conditions of water vapor condensation.

14.7. Frequency inverter



Fig. 14.12. Frequency inverter for iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®.

Table 14.6. Series of frequency inverters used in iSWAY-FC® version 2018.

Type of device		Type	Power supply[VAC]/Power[kW]
iSWAY-FC® 2018	0.3	VLT FC102 IP20	3x400/2,2
	0.12	VLT FC102 IP20	3x400/4,0
	1.17	VLT FC102 IP20	
	1.20	VLT FC102 IP20	3x400/5,5
	1.24	VLT FC102 IP20	3x400/7,5
	2.31	VLT FC102 IP20	
	2.39	VLT FC102 IP20	3x400/11
	2.47	VLT FC102 IP20	3x400/15
	2.75	VLT FC102 IP20	3x400/18,5
On request, IP66 inverter can be delivered			

Table 14.7. Series of frequency inverters used in iSWAY-WFC®.

Type of device		Type	Power supply[VAC]/Power[kW]
iSWAY-WFC®	1.1	VLT FC102 IP20	3x400/1,1
	1.5	VLT FC102 IP20	3x400/1,5
	2.2	VLT FC102 IP20	3x400/2,2
	3.0	VLT FC102 IP20	3x400/3,0
	5.5	VLT FC102 IP20	3x400/5,5
On request, IP66 inverter can be delivered			

Table 14.8. Series of frequency inverters used in iSWAY-RFC®.

Type of device		Type	Power supply[VAC]/Power[kW]
iSWAY-RFC®	1.5	VLT FC102 IP20	3x400/1,1
	2.2	VLT FC102 IP20	3x400/1,5
	3.0	VLT FC102 IP20	3x400/2,2
	4.0	VLT FC102 IP20	3x400/3,0
	5.5	VLT FC102 IP20	3x400/5,5
	7.5	VLT FC102 IP20	3x400/7,5
On request, IP66 inverter can be delivered			

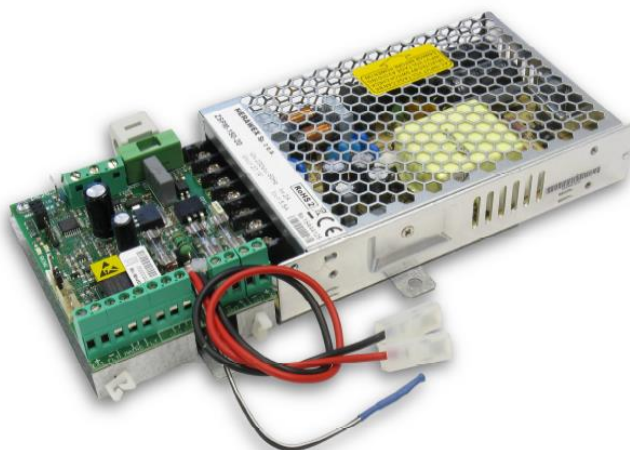
NOTE!

If the inverter is not powered (the green "ON" light on the inverter is not lit), first check whether the main switch is in position "0". If the main switch is in position "1", it may mean that one of the fuses has tripped: 1F1, 1F2, 1F3, in the automation cabinet.

In the event of a frequency inverter malfunction, the "Collective fault" light on the TSS or TS panel, or "Alarm" light on the inverter and the MAC-FC controller issues a fault signal to the CSP. If a inverter malfunction is detected, inform the SMAY service immediately. Do not repair or replace the frequency inverter or change its parameter settings yourself. This can only be done by SMAY service or an authorised SMAY service.

14.8. ZSPM-150-10 Power Supply

ZSPM-150-10 power supply is installed inside SzA-FCK and SzA-FCP automation cabinets. Provides 24 VDC power supply with battery backup.



Rys.14.13. ZSPM power supply

Tabela 14.9. ZSPM-150-10 technical parameters.

Rated output voltage (25°C)	27,1V
Working temperature	-25...+55°C
Functional class PN-EN 12101-10	A
Protection class PN-EN 60950-1 + A1	I

14.9. Braking resistor

A braking resistor is a device in which the current generated by the fan motor during braking is converted into heat (the motor goes into generator mode during braking). This is a component closely connected to the frequency inverter. It has a IP 65 class protection and a resistor in the radiator design.

SzA-FCK cabinet has braking resistors mounted on the side of the enclosure, SzA-FCP has connected resistors which are mounted on bulkheads on the fan side.

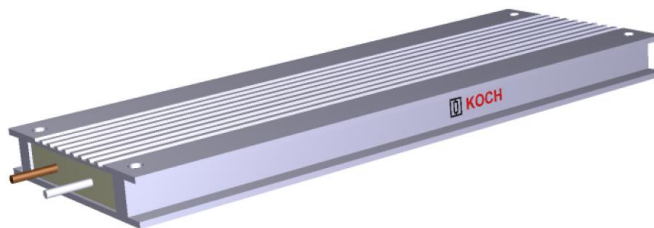


Fig.14.14. Braking resistor.

Table 14.10. Series of braking resistors used in iSWAY- FC.

Type of device		Resistor type	Number of resistors
iSWAY-FC®	0.3	BWD500-310	1
	0.12	BWD500-300	2
	1.17	BWD500-300	2
	1.20	BWD500-130	2
	1.24	BWD600-080	2
	2.31	BWD600-080	2
	2.39	BWD600-080	2
	2.47	BWD600-072	2
	2.75	175U3339	1

Table 14.11. Series of braking resistors used in iSWAY- WFC.

Type of device		Resistor type	Number of resistors
iSWAY -WFC®	1.1	BWD500-430	1
	1.5	BWD500-430	1
	2.2	BWD500-310	1
	3.0	BWD500-210	1
	5.5	BWD500-130	2

Table 14.12. Series of braking resistors used in iSWAY- RFC.

Type of device		Resistor type	Number of resistors
iSWAY -RFC®	1.5	BWD500-430	1
	2.2	BWD500-310	1
	3.0	BWD500-210	1
	4.0	BWD500-300	2
	5.5	BWD500-130	2
	7.5	BDW600-080	2

NOTE!

The resistor is a maintenance-free element. The inspection is carried out by an Authorised SMAY Service during the annual inspection. If a resistor malfunction is detected, inform the SMAY service immediately. Do not repair or replace the resistor yourself. This can only be done by SMAY service or an authorised SMAY service.

14.10.MAC-FC controller

The MAC-FC controller is a processor-controlled electronic device. The controller is used to control pressure differential systems in accordance with the requirements given in PN-EN 12101-6.

The MAC-FC controls the fan with a frequency inverter, based on a pressure reading from a pressure sensor located in the MAC-FC, P-MAC or P-MACF. The controller selects the operating status of the system automatically depending on the status of its inputs, and displays it on the cooperating device, the TSS Signalling and Control Panel or the Devices Operation Status Monitoring (MSPU).

The controller is powered by 24VDC.

- Connecting the device:

The connection (SAP, FireBUS) should be made according to the electrical and automation design. Individual wiring diagrams of the devices can be found in the above operation and maintenance manual in chapter 13.

NOTE!

For lines where the use of shielded cables is provided, unshielded cables are not allowed.

- FireBUS communication bus :

Communication with other devices has been implemented in RS-485 standard. Shielded cables are required for proper transmission operation. For correct operation, the signal lines D+, D- and COM reference line (D+ and D- must be connected in a wire pair).

If the 24V power supply to the cooperating devices (e.g. P-MACF differential pressure transmitters, T-MAC temperature transmitters) is provided together with the communication bus, the +24V OUT+ line must also be connected. The reference level of the 24V power supply out-(power ground) and FireBUS® COM transmission can be made with the same cable.

For FireBUS®, the HTKSH FE180/PH90 ekw 2x2x0.8 is recommended.

- Input line fault monitoring:

All input lines, digital lines, MAC-FC controller are equipped with functions of monitoring of line fault conditions, short circuit or open circuit status. For proper operation of the monitoring function, it is required to connect the opposite end of the monitored line of two resistors with the given value and in the given configuration, see figure 14.14.

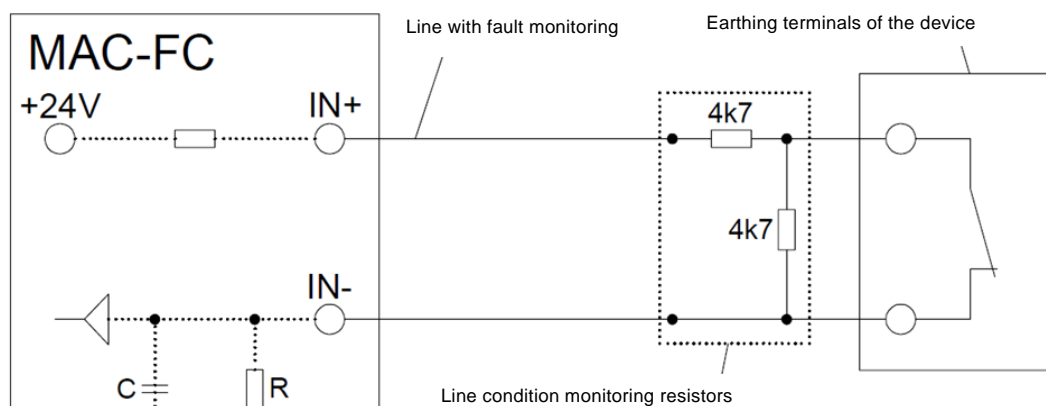


Fig. 14.15 Diagram of connecting the line with fault monitoring to the MAC-FC controller. Connection shown in standby (no fire). It is possible to change the logic of the MAC-FC input.

- Connection to the SAP fire panel:

The MAC-FC controller has one input: "SAP fire" and two digital outputs: "Correct operation", "Collective fault", designed to work with any fire system control panel.

- The controller is installed in the automation cabinet. The design and principle of operation of the MAC-FC regulator is the same for all executions, only the way of connecting wires to it changes. The MAC-FC device is shown below, as well as a description of the terminals.

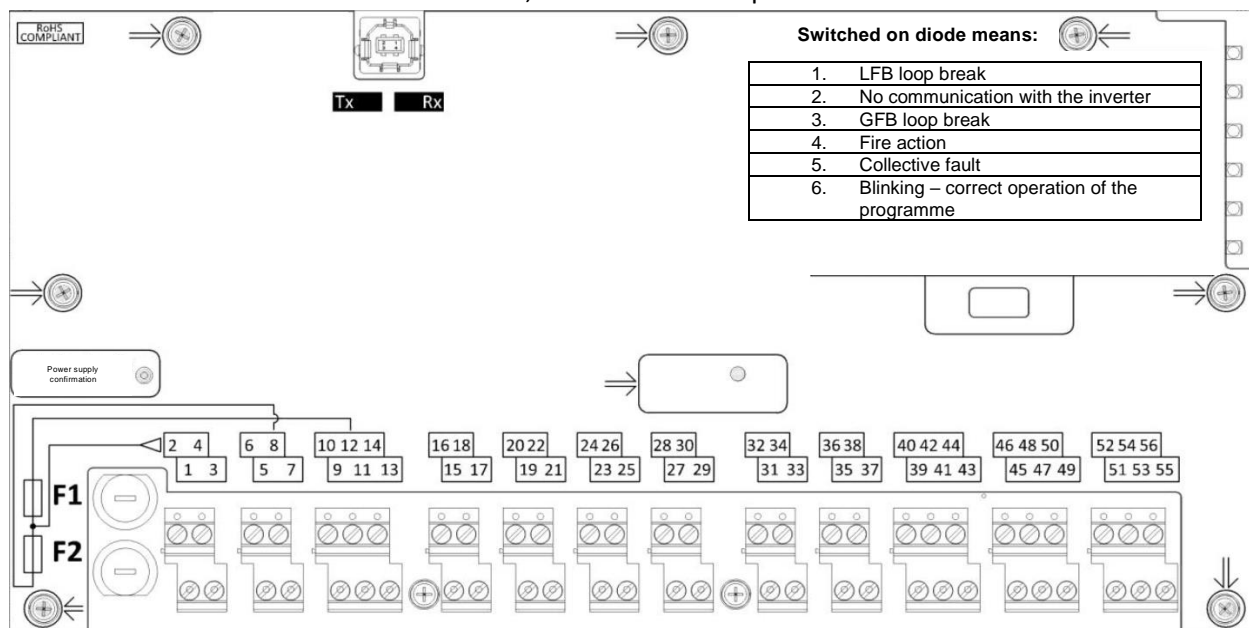


Fig.14.16. MAC-FC - device view.

Permissible range of cable diameters in terminals 0.5-1.5mm.

The use of both solid and stranded wires is permitted.

For stranded wires the use of sleeve ends is required.

24V power supply		Local		Local		Global		Global		Inverter RS485		Inverter		Shut-off damper		Auxiliary intake		Phase sensor		Smoke sensor		SAP		
24V IN+	Awaria IN+	FB1.1 D+	FB1.1 24V OUT+	FB1.2 24V OUT-	FB1.2 24V OUT+	FB1.2 D+	FB2.1 D+	FB2.1 COM	FB2.2 D+	FB2.2 COM	Fal.(P) D+	Fal. COM	0-20mA OUT+	FireMode/Start OUT1	Krańcówka IN+	Przepustnica OUT 1	Czerpnia OUT 1	Czujnik faz IN+	Alarm Dym IN+	Popr. praca IN+	Zasilanie 24V OUT+	Pożar IN+	Popr.praca OUT 1	Awaryjny OUT 1
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
24V IN-	Awaria IN-	FB1.1 D-	FB1.1 COM	FB1.2 24V OUT-	FB1.2 COM	FB1.2 D-	FB2.1 D-	FB2.1 COM	FB2.2 D-	FB2.2 COM	Fal.(N) D-	Fal. COM	0-20mA OUT-	FireMode/Start OUT2	Krańcówka IN-	Przepustnica OUT 2	Czerpnia OUT 2	Czujnik faz IN-	Alarm Dym IN-	Popr. praca IN-	Zasilanie 24V OUT-	Pożar IN-	Popr.praca OUT 2	Awaryjny OUT 2
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49

Fig.14.17. MAC-FC - terminal description.

NOTE!

In the event of a controller malfunction, the "Collective failure" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a controller malfunction is detected, inform the SMAY service immediately. Do not repair or replace the controller yourself. This can only be done by SMAY service or an authorised SMAY service.

14.11. Anti-Frost system

iSWAY- FC has introduced a system to prevent the shut-off dampers from freezing in extremely low temperatures. Special low-temperature seals are used to seal the dampers, which are resistant to low temperatures currently used in the refrigeration industry, also a directional infrared heater system is used. When operating at a temperature below the set temperature, the Anti-Frost system switches on automatically. The iSWAY-FC components are painted in different colours to ensure adequate absorption or reflection of radiation.

The Anti-Frost system is powered by 230VAC.

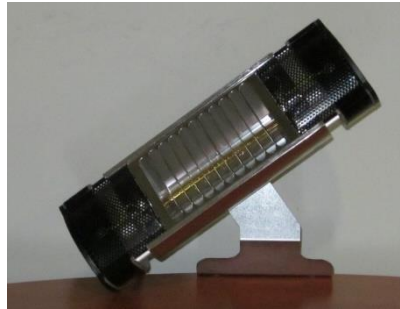


Fig.14.18. Infrared illuminator LDHR005G-D.

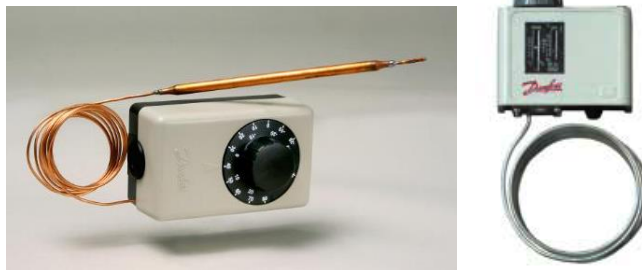


Fig.14.19. UT72 and KP61 thermostats used interchangeably.

NOTE!

If the Anti-Frost system is found to be malfunctioning, check the 1F4 protection position in the SzA-FCP cabinet and inform SMAY service immediately. Do not repair or replace the devices of the system yourself. This can only be done by SMAY service or an authorised SMAY service.

NOTE!

The LDHR005G-D infrared illuminator can ignite dry components directly on its housing. Therefore, it is recommended to check the cleanliness of the LDHR005G-D infrared heater periodically (instruction manual below) between the beginning and the end of October due to its operation in winter conditions.

Instructions for checking the cleanliness of the infrared heater

Before checking the IR illuminator for cleanliness, the iSWAY-FC type must be specified:

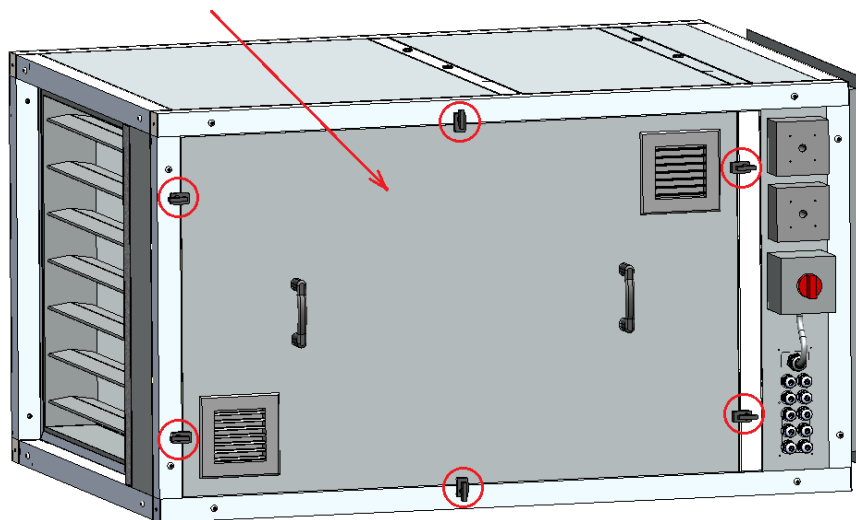
- I. iSWAY-FC-0
- II. iSWAY-FC-1
- III. iSWAY-FC-2

After determining the type of the iSWAY air handling unit, we proceed to the corresponding point of the

I. Instructions for checking the cleanliness of the infrared heater - iSWAY-FC-0 (SzA-FCP)

Step 1.

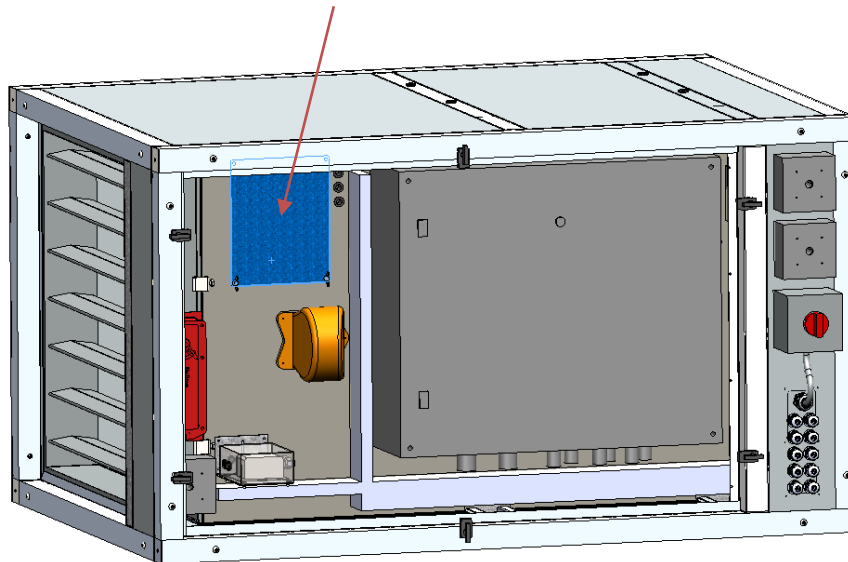
The inspection panel should be removed.



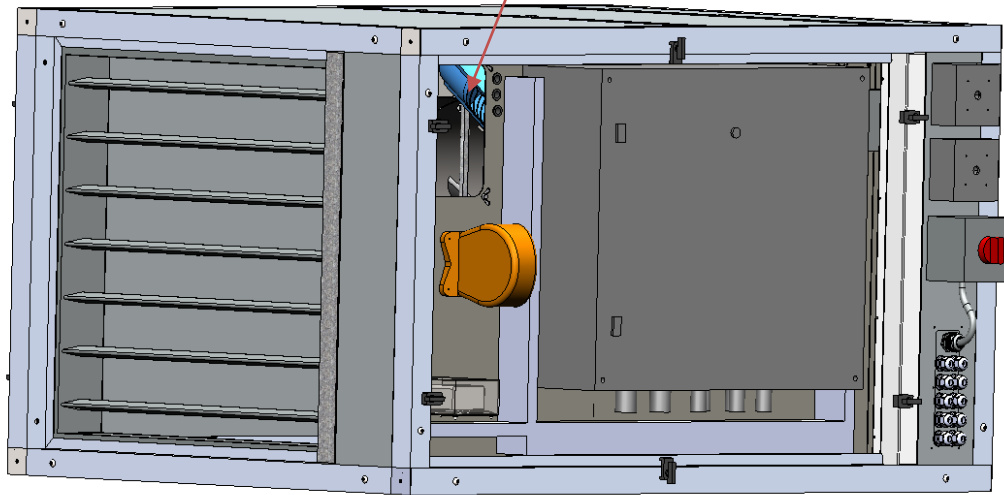
For this purpose we dismantle the yoke joints (6 in total) placed in the vertical plane of the device.

Step 2.

Then dismantle the inspection panel in the bulkhead wall on which the automation devices are hung .



After removing the inspection sheet, the heater is located to the right of the window.

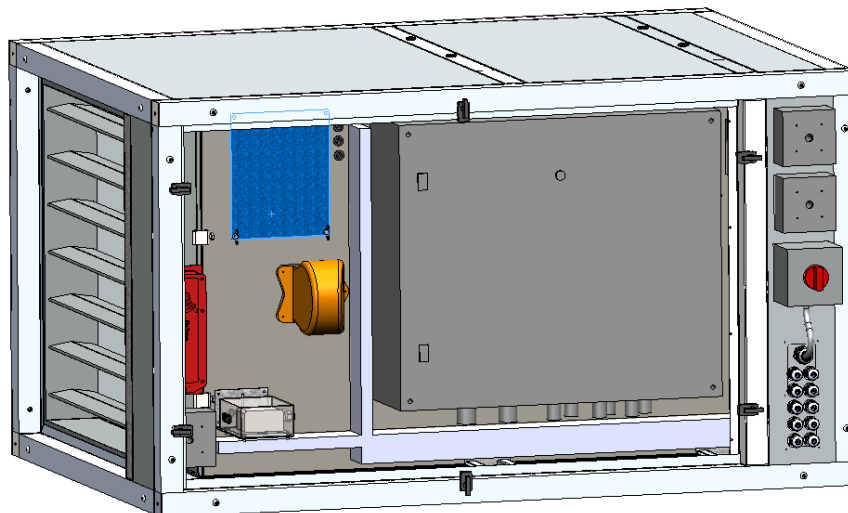


Step 3.

Check and clean the area around the infrared heater. The presence of any objects (grass, sticks, rags, gloves, etc.) near the radiator is prohibited.

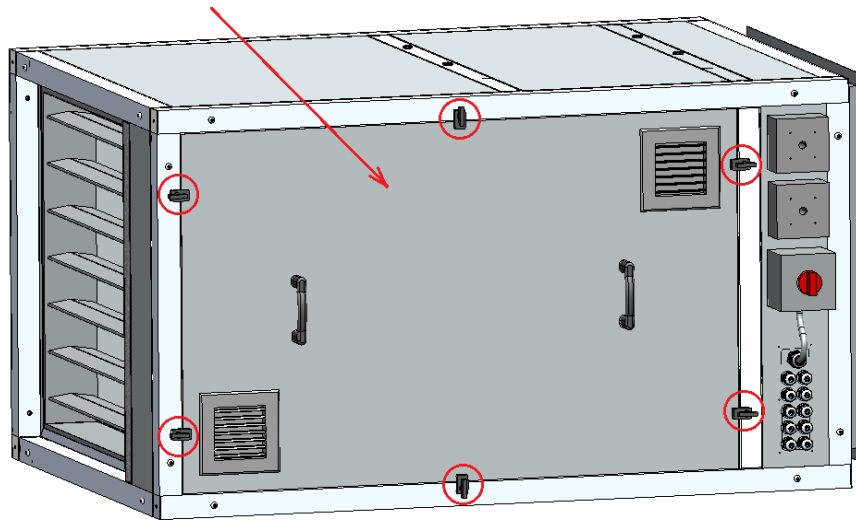
Step 4.

Screw back the inspection panel closing the window (4 screws).



Step 5.

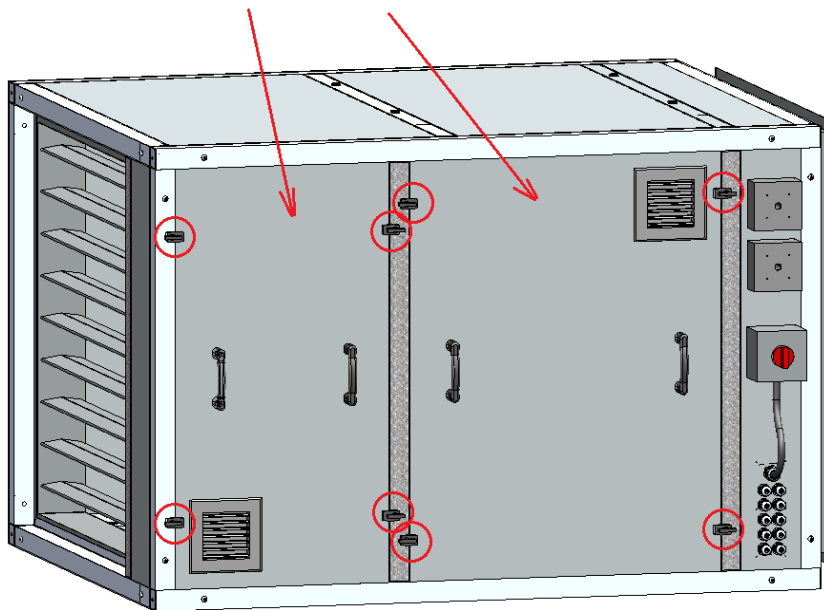
Attach the inspection panel by securing it with the yoke joints (6 pieces).



II. Instructions for checking the cleanliness of the infrared heater - iSWAY-FC-1 (SzA-FCP)

Step 1.

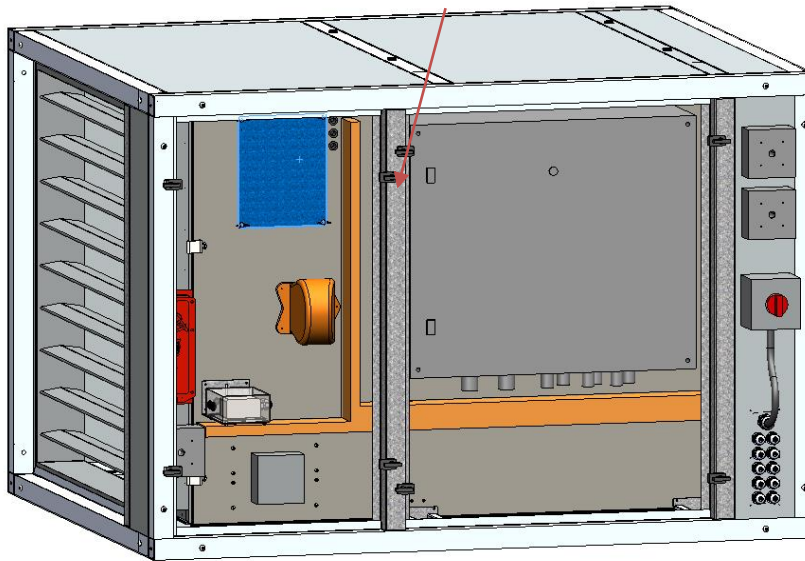
Remove 2 inspection panels.



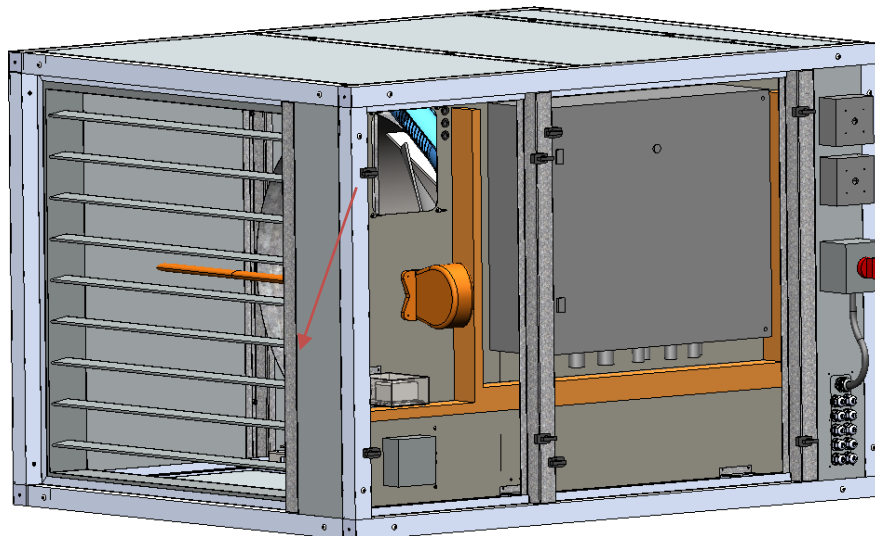
For this purpose we dismantle the yoke joints (4 per each panel, 8 in total) placed in the vertical plane of the device.

Step 2.

Then dismantle the inspection panel in the bulkhead wall on which the automation devices are hung .



After removing the inspection sheet, the heater is located to the right of the window.

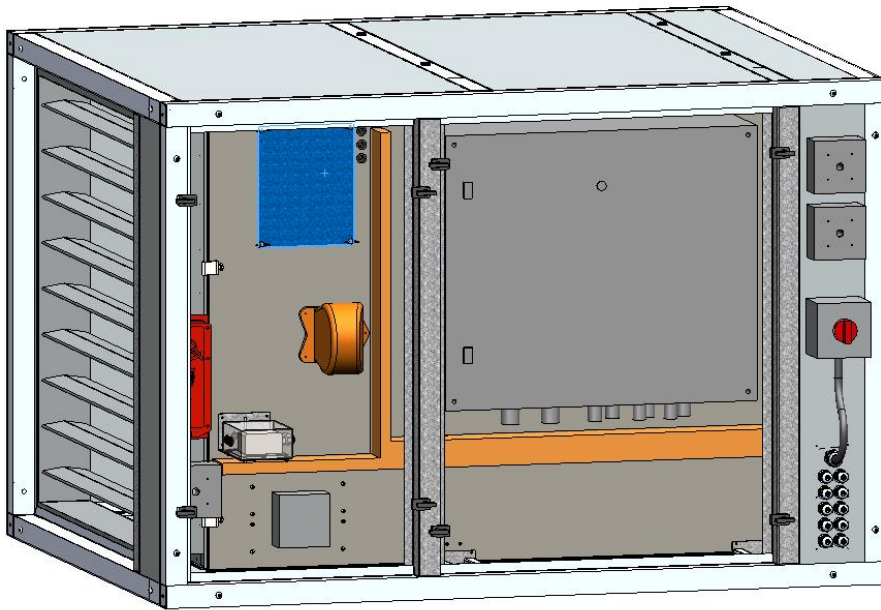


Step 3.

Check and clean the area around the infrared heater. The presence of any objects (grass, sticks, rags, gloves, etc.) near the radiator is prohibited.

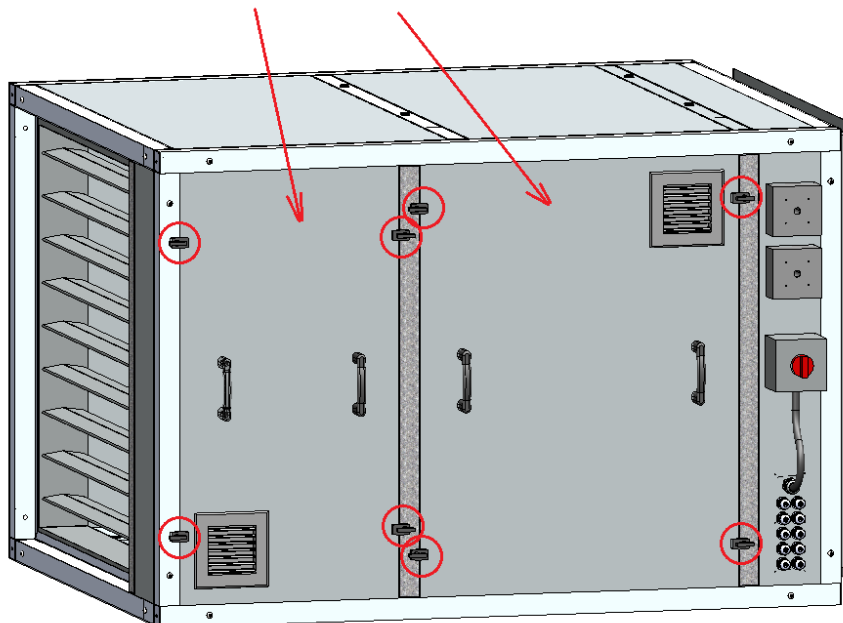
Step 4.

Screw back the inspection panel closing the window (4 screws).



Step 5.

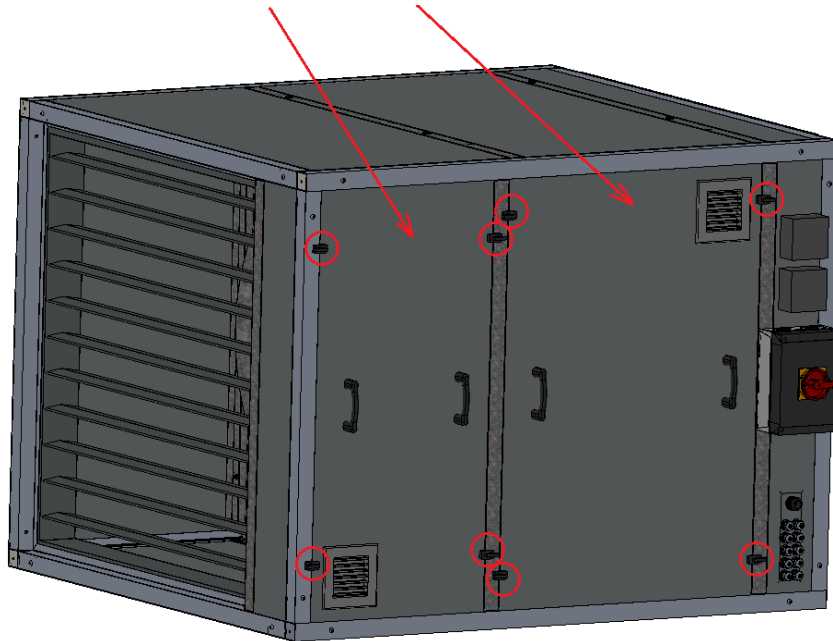
Attach inspection panel (2) by securing them with the yoke joints (8).



III. Instructions for checking the cleanliness of the infrared heater - iSWAY-FC-2 (SzA-FCP)

Step 1.

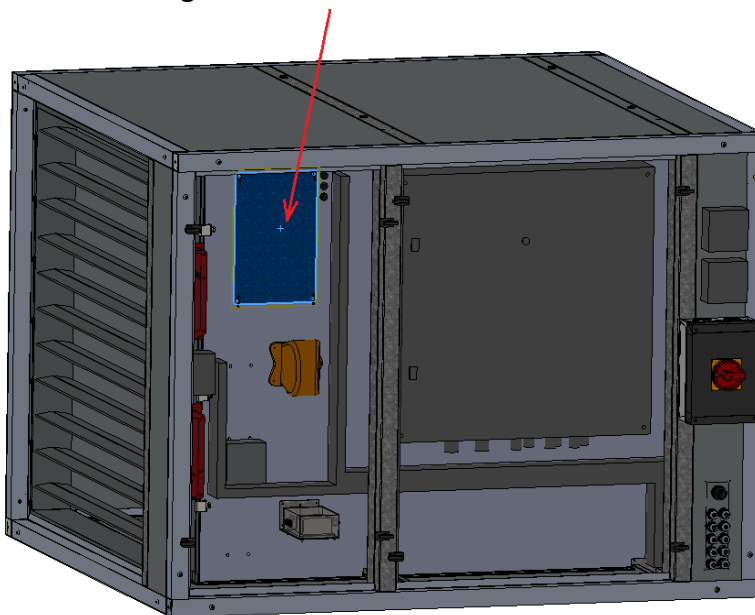
Remove 2 inspection panels.



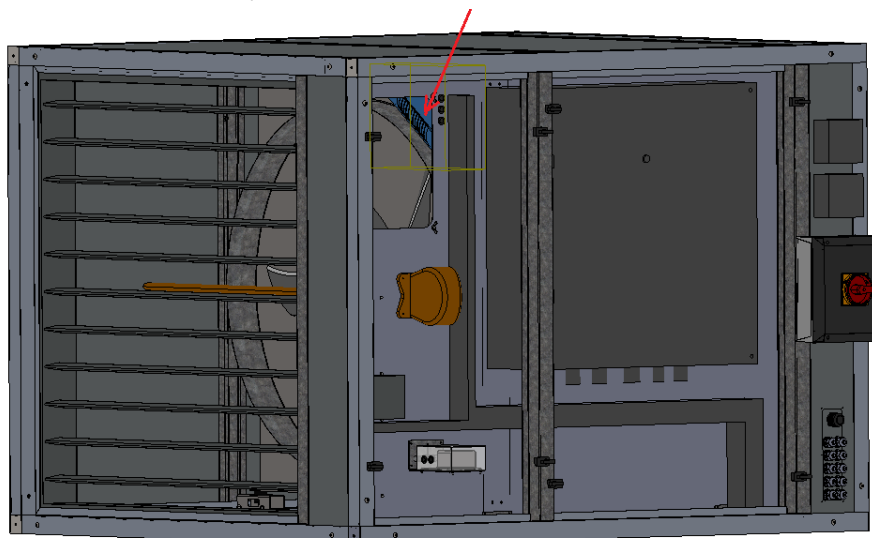
For this purpose we dismantle the yoke joints (4 per each panel, 8 in total) placed in the vertical plane of the device.

Step 2.

Then dismantle the inspection panel in the bulkhead wall on which the automation devices are hung .



After removing the inspection sheet, the heater is located to the right of the window.

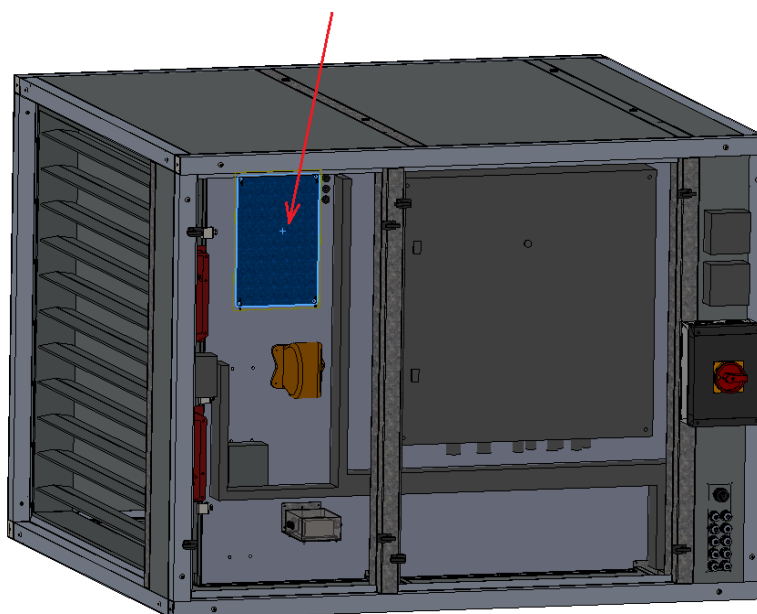


Step 3.

Check and clean the area around the infrared heater. The presence of any objects (grass, sticks, rags, gloves, etc.) near the radiator is prohibited.

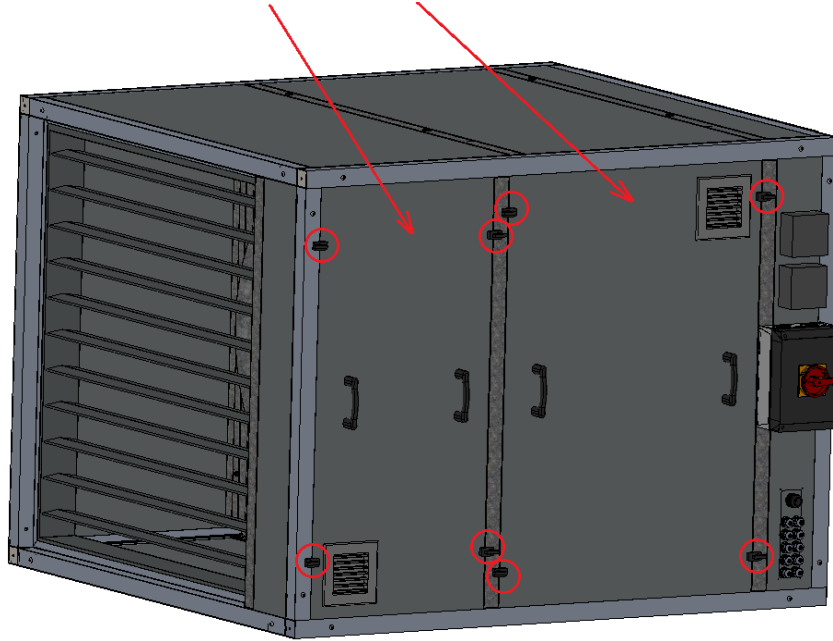
Step 4.

Screw back the inspection panel closing the window (4 screws).



Step 5.

Attach inspection panel (2) by securing them with the yoke joints (8).



14.12. P-MAC(F) pressure sensor

P-MAC and P-MACF are a digital differential pressure converter equipped with one differential pressure sensor and a connector for power supply and transmission via FireBUS® protocol channel. The P-MAC converter is obsolete and is being replaced by P-MACF converter.

The built-in internal microprocessor system performs linearity corrections taking into account, among other things, the operating temperature and the characteristics introduced during calibration. The high accuracy and stability of the measurement is ensured by the use of high-end calibration devices and a long ageing process of the device components. The converter is designed for measuring air pressure with a low degree of contamination.

The MAC-FC pressure regulator has a built-in pressure sensor. When a sensor from the MAC-FC is used for a measuring strip or to measure the compressor in a duct, it may be necessary to equip iSWAY with an additional P-MAC(F) sensor.

For details, see DTR of the P-MAC and P-MACF pressure sensor. If the SAP fire input is not used, the input terminals must be shorted with a 4k7 resistor or configured in the program as unused so that they do not cause a line failure condition.

IP54 protection class for standard P-MAC(F) finish. On request IP65 protection class can be delivered.

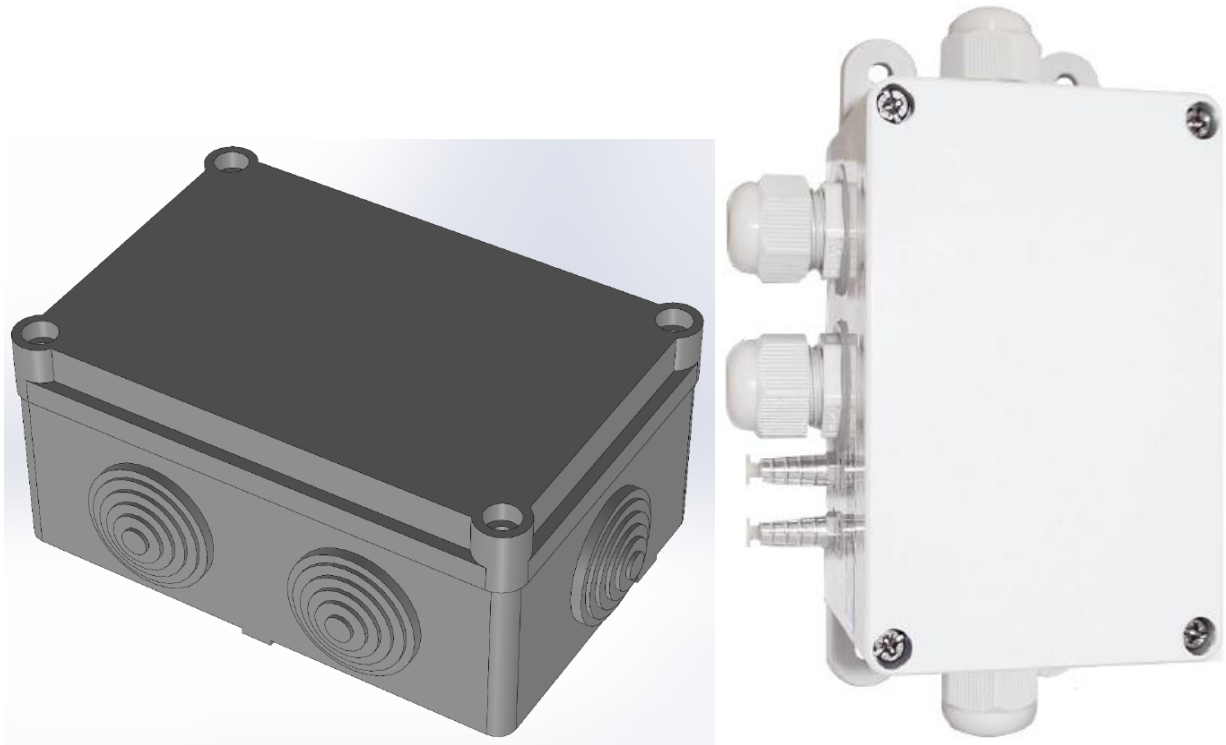


Fig.14.20. P-MAC(F) pressure sensor

Depending on the functions of the converter, we distinguish between two types:

- P-MAC +/-250 - measurement range: -250;250Pa - measurement in a protected space - for iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®
- P-MAC +/-600 - measurement range: -600;600Pa - measurement in a protected space or measurement in a duct - for iSWAY-FC, iSWAY-RFC

NOTE!

In the event of a pressure sensor malfunction, the "Collective failure" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a sensor malfunction is detected, inform the SMAY service immediately. Do not repair or replace the sensor yourself. This can only be done by SMAY service or an authorised SMAY service.

14.13.ZA 85/350 BSY canopy actuator

The ZA 85/350 BSY actuator (Fig. 14.20) is designed to control the canopy of the iSWAY-FC® standing version "0" equipped with a canopy.

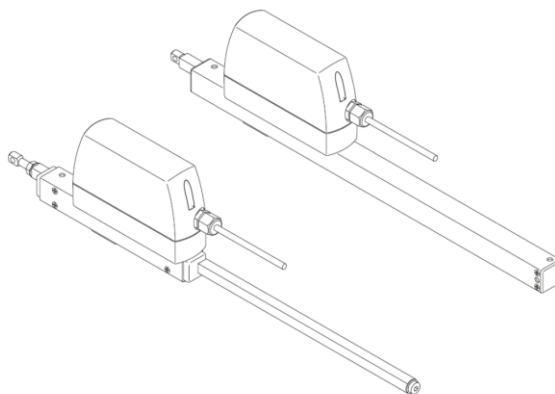


Fig.14.21. ZA 85/350 BSY canopy actuator

The actuator is controlled by means of power supply polarity. The appropriate voltage control polarity for the component is determined during the start-up of the device, previously connected according to the electrical design of the device. The canopy does not signal the end positions (closing, opening). After starting the device, if the canopy does not open due to a malfunction, the iSWAY-FC device still has a limited performance algorithm.

The actuator is powered and controlled by 24VDC.

On request IP65 protection class can be delivered.

NOTE!

If an actuator malfunction is detected, inform the SMAY service immediately. Do not repair or replace the actuator yourself. This can only be done by SMAY service or an authorised SMAY service.

14.14. Heating of SzA-FCK Automatic Control Cabinet

The SzA-FCK automation cabinet can be installed both inside the building and outside. When mounted outdoors, the SzA-FCK automation cabinet is equipped with a heating system. The thermostat KTO 011 manufactured by STEGO activates the SHT100 heater by Alfa Electric when the temperature in the automation cabinet falls below the value set on the thermostat.



Fig.14.22. KTO011 thermostat (left) and SHT100 heater (right).

15. Object Automation - SAFETY WAY system components

15.1. P-MACF pressure sensor

The P-MACF differential pressure converter is a developmental version of the P-MAC. It has two

Operation and Maintenance Manual (DTR) iSWAY® Set of products transmission channels of the Local FireBUS and an input of fire signal from the Fire Alarm System. The P-MACF transmitter is installed in the facility (object) in two cases:

1. When the iSWAY-FC, iSWAY-WFC, iSWAY-RFC, is away from the protected space and the required pulse length would be more than 12m. The P-MACF sensor is then connected to iSWAY-FC, iSWAY-WFC, iSWAY-RFC by Local Firebus loop.
2. In the case of fire atrial protection, P-MACF sensors are installed in the vestibule, and are connected to the iSWAY Local FireBUS loop. A 24VDC power supply and a fire signal are supplied to each sensor. The P-MACF sensor has a SAP fire input with line fault monitoring. For proper operation of the monitoring function, it is required to connect to the opposite end (looking from the sensor side) of the monitored line two resistors with the given value (4,7k Ω) and in the given configuration. The maximum number of sensors in the loop (number of protected floors) is 64.

In case of loss of communication between the iSWAY® device and the P-MACF sensor installed on the site, iSWAY® goes into emergency operation. Emergency operating mode, consists of pressure regulation based on pressure readings from the P-MACF if there is one mounted inside the iSWAY-FC, iSWAY-WFC, iSWAY-RFC.

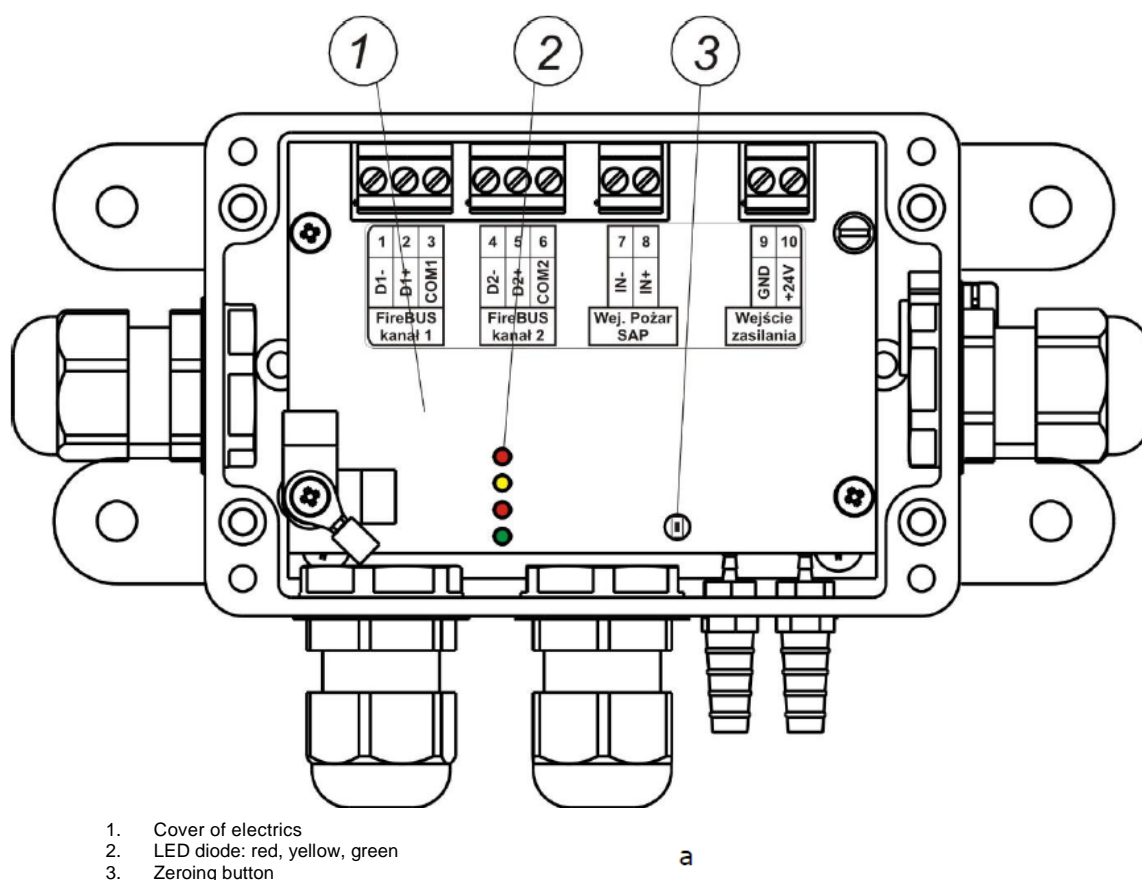
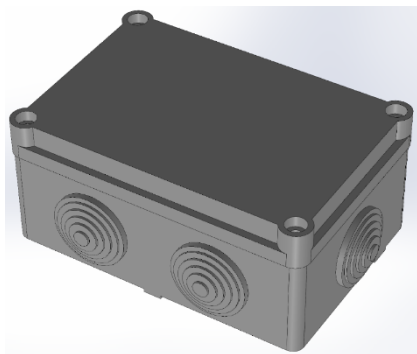


Fig.15.1 P-MACF pressure sensor - inside view.

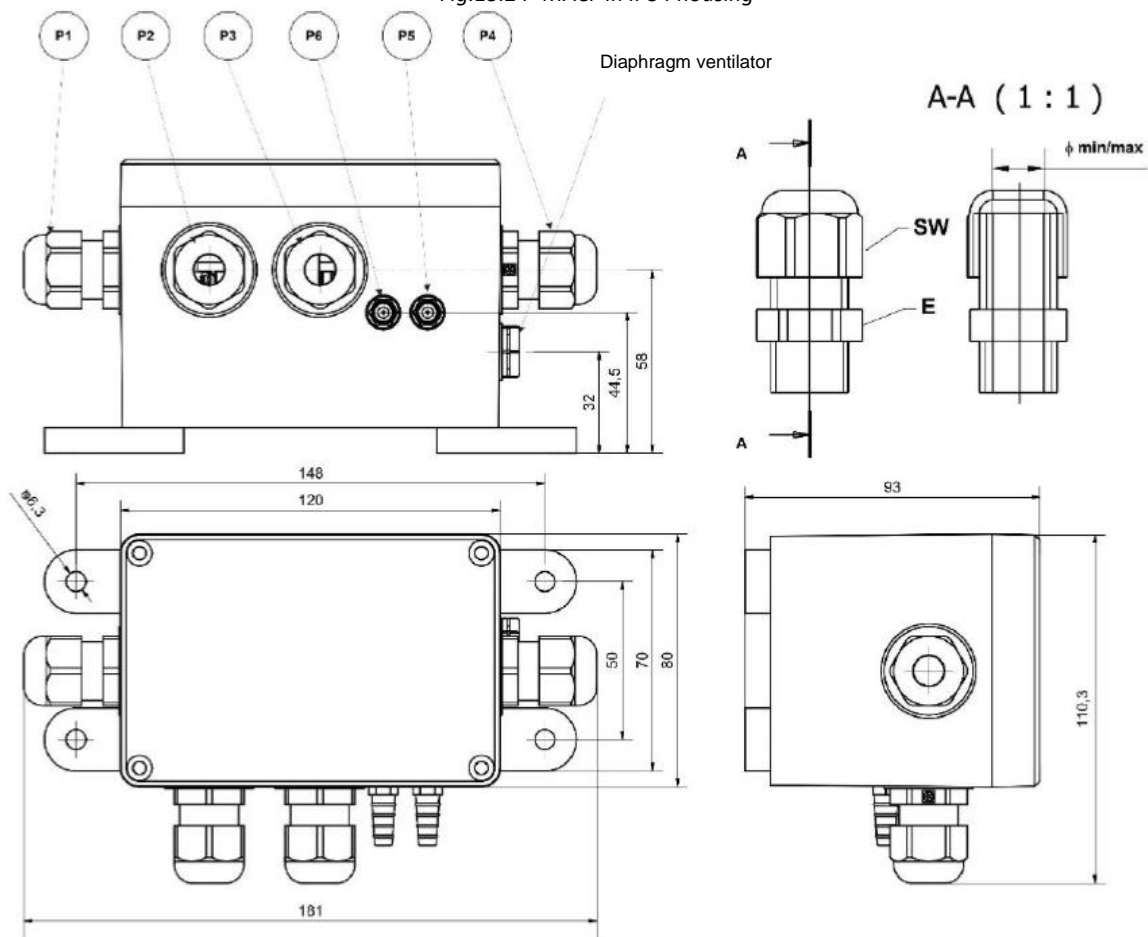
24VDC power supply. The minimum supply of the power supply is 0.2 A for each P-MACF. IP54 protection class is delivered as standard. On request IP65 class can be delivered. For details and technical information, see DTR P-MAC and P-MACF. Connection and wiring diagrams can be found in section 13.



Name	Dimension [mm]
Length	128
Height	51
Width	88
Hole diameter for the gland	28

Number of glands	6
Cable diameter range min./max [mm]	8.0-26

Fig.15.2 P-MACF in IP54 housing



Part list				
No.	Qty.	Name	Diameter range min./max. [mm]	SWxE key size [mm]
P1	1	Przepust UNI	5 - 10	22,1x21,9
P2	1	Przepust UNI	5 - 10	22,1x21,9
P3	1	Przepust UNI	5 - 10	22,1x21,9
P4	1	Przepust UNI	5 - 10	22,1x21,9
P5	1	Króciec "s"	śr. wew. przewodu 5,5 - 6,5	
P6	1	Króciec "s"	śr. wew. przewodu 5,5 - 6,5	

Fig.15.2 P-MACF in IP65 housing

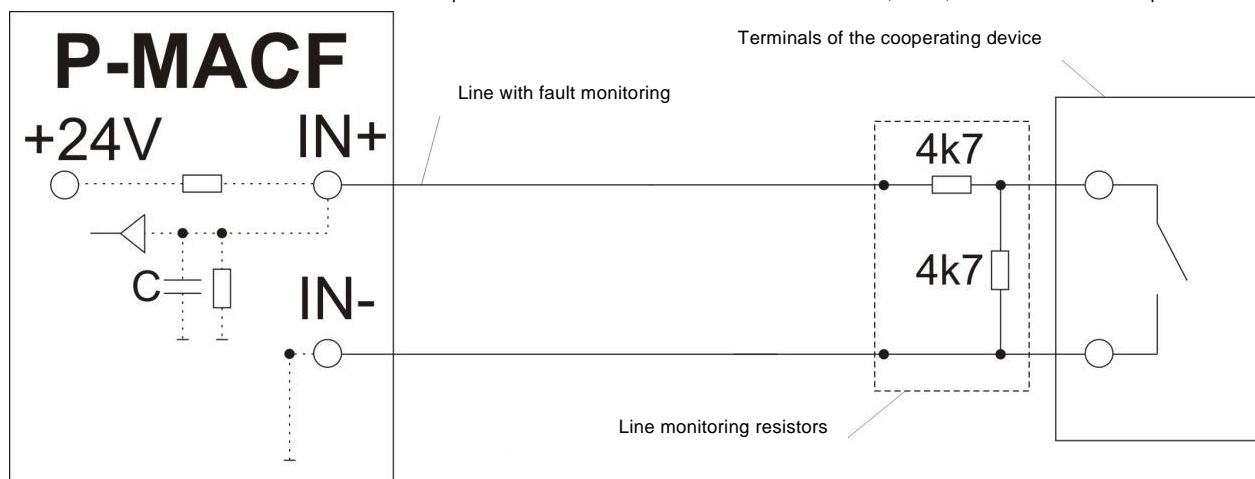


Fig. 15.14 Diagram of connecting the line with fault monitoring to the P-MACF pressure sensor.

Depending on the functions of the converters, we distinguish between several types:

- P-MACF +/-250 - measurement range: -250;250Pa - measurement in a protected space
- P-MACF +/-600 - measurement range: -600;600Pa - measurement in a protected space or measurement of the compression ratio in a duct

NOTE!

In the event of a pressure sensor malfunction, the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a sensor malfunction is detected, inform the SMAY service immediately. Do not repair or replace the sensor yourself. This can only be done by SMAY service or an authorised SMAY service.

15.2. T-MACF temperature sensor

T-MACF is a digital temperature transmitter equipped with one temperature sensor and connectors for power supply and transmission via two Local FireBUS channels. The built-in internal microprocessor system performs linearity corrections taking into account the characteristics in time. The high accuracy and stability of the measurement is ensured by the use of high-end calibration devices and a long ageing process of the device components.

The T-MACF sensor is used in SAFETY WAY reversible systems to measure the temperature difference between the outside temperature and the staircase temperature in order for the system controller to determine the direction of air flow in the secured staircase. As standard, eight temperature sensors are recommended for a single staircase, of which 4 measure the outside temperature and 4 measure the inside temperature of the staircase.

The maximum number of T-MACF temperature sensors mounted on one Local FireBUS loop is 8.

24VDC power supply.

On request IP65 protection class can be delivered.

For details and technical information, see DTR T-MAC.

Connection and wiring diagrams can be found in section 13.

- [illegible]

130

NOTE!

In the event of a temperature sensor malfunction, the "Collective failure" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a sensor malfunction is detected, inform the SMAY service immediately. Do not repair or replace the sensor yourself. This can only be done by SMAY service or an authorised SMAY service.

15.3. MAC-D-Min controller (2 and 4)

The MAC-D-Min is a digital pressure controller, designed to control 1 to 2 (2) and 3 to 4 (4) damper actuators. It is equipped with an internal pressure sensor and connectors for power and transmission via two Local FireBUS® channels. The built-in internal microprocessor system performs linearity corrections taking into account, among other things, the operating temperature and the characteristics introduced during calibration. The high accuracy and stability of the measurement is ensured by the use of high-end calibration devices and a long ageing process of the device components. The MAC-D-Min controller should be connected to the PZ box with a specified wire (or wires) of maximum 20 m length.

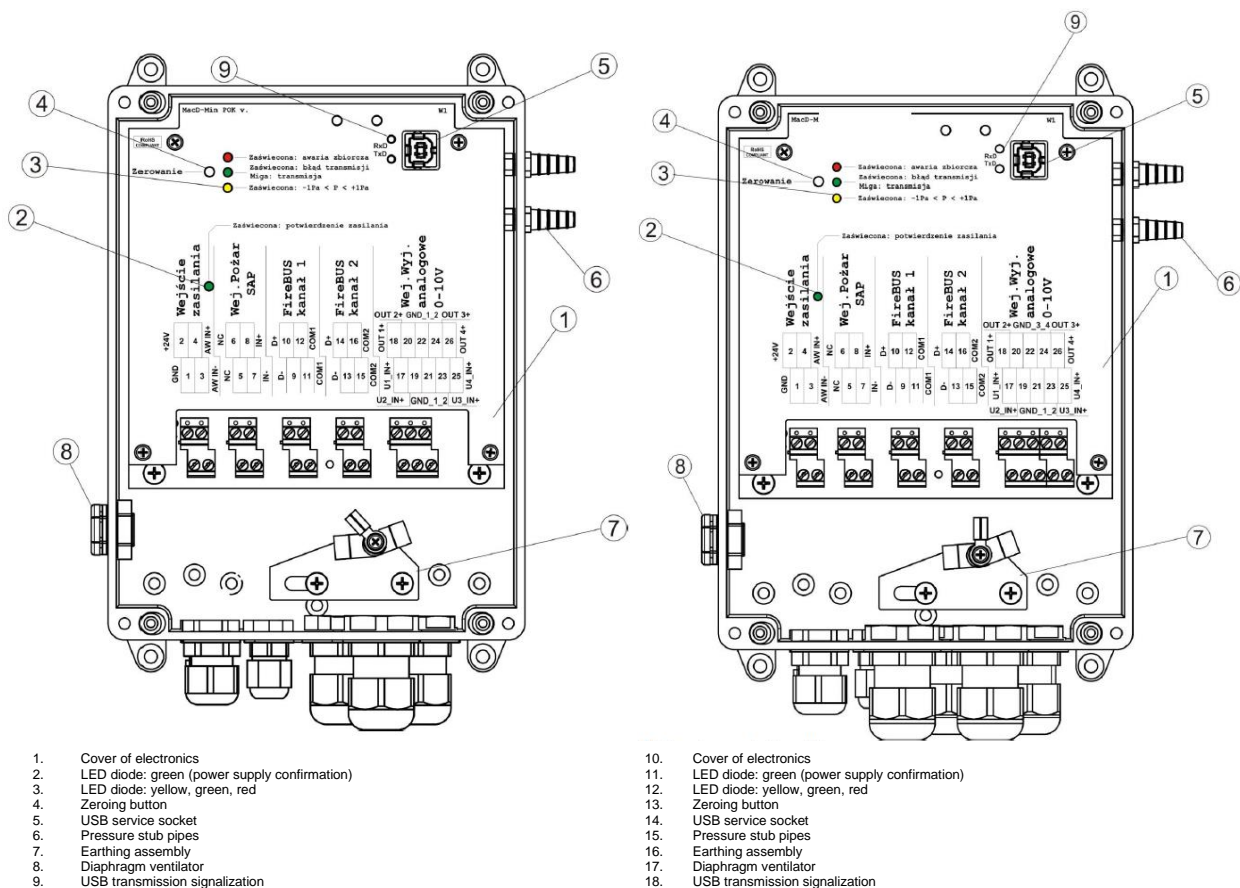


Fig.15.7 MAC-D Min controller (2 on the left, 4 on the right) - inside view.

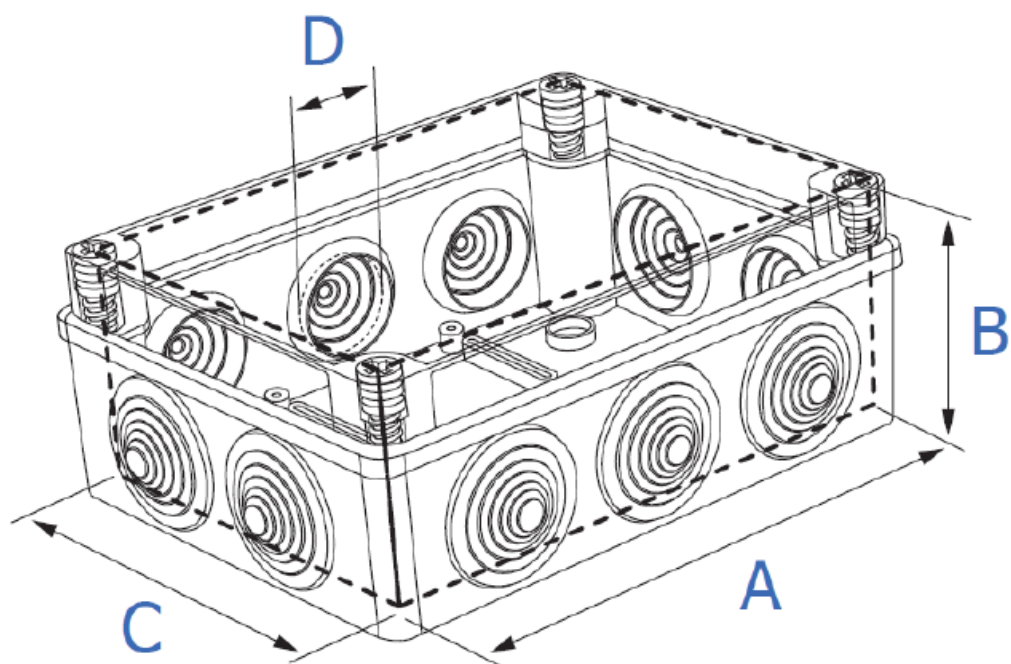
24VDC power supply.

IP54 protection class is delivered as standard. On request IP65 class can be delivered.

For details and technical information, see DTR MAC-D Min.

Connection and wiring diagrams can be found in section 13.

The MAC-D Min controller should be installed so that it is not directly exposed to sunlight or precipitation



Designation	Name	Dimension [mm]
A	Width	200
B	Height	76
C	Length	150

Ilość przepustów	12
Zakres średnic przewodów D min./max. [mm]	8,0 – 35

Fig.15.8 MAC-D Min controller in IP54 enclosure (2 and 4) - dimensions.

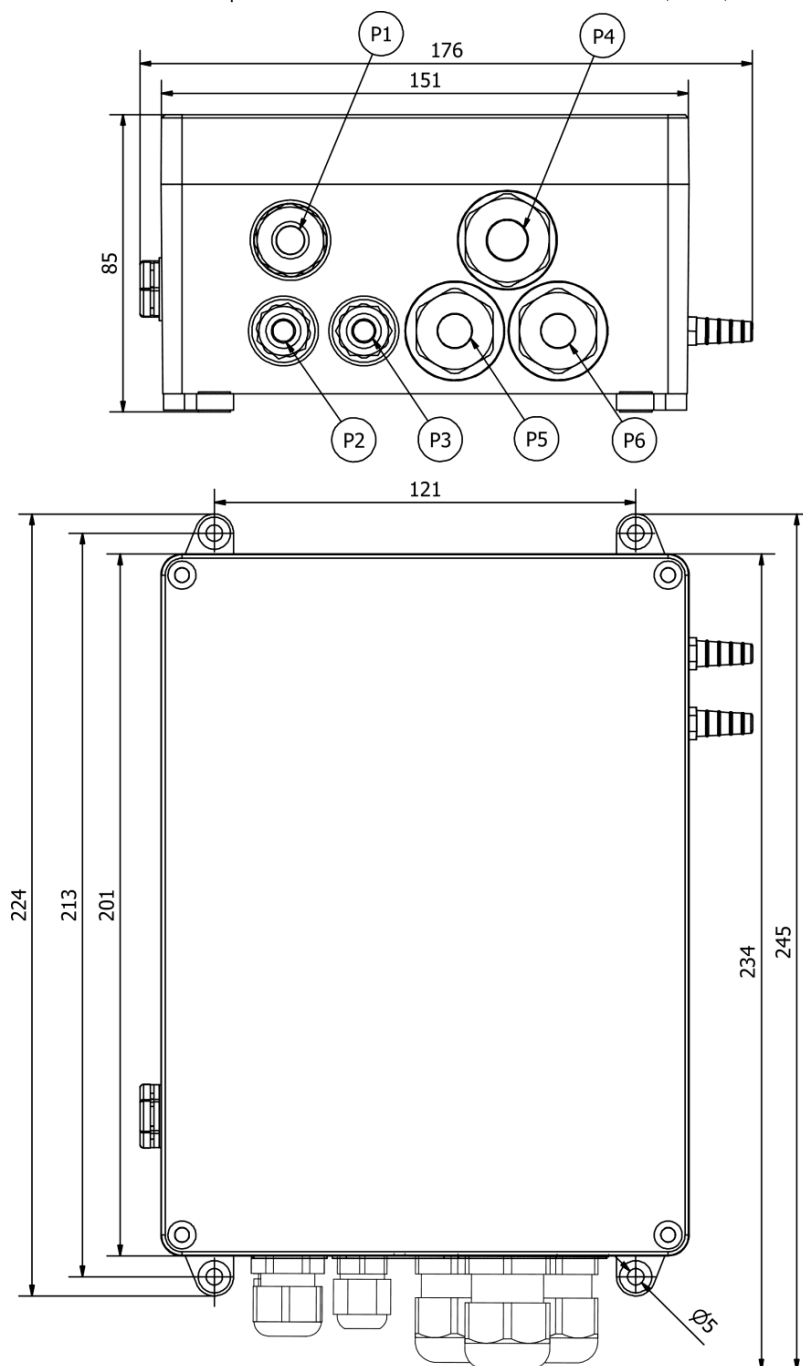


Fig.15.9 MAC-D Min controller in IP65 enclosure (version 2) - dimensions.

Item No	Quantity	Name	Diameter range min./max. [mm]
P1	1	UNI Pass	4.0– 8.0
P2	1	UNI Pass	3.5– 6.0
P3	1	UNI Pass	3.5– 6.0
P4	1	UNI Pass	6.0– 12.0
P5	1	UNI Pass	5.0– 10.0
P6	1	UNI Pass	5.0– 10.0

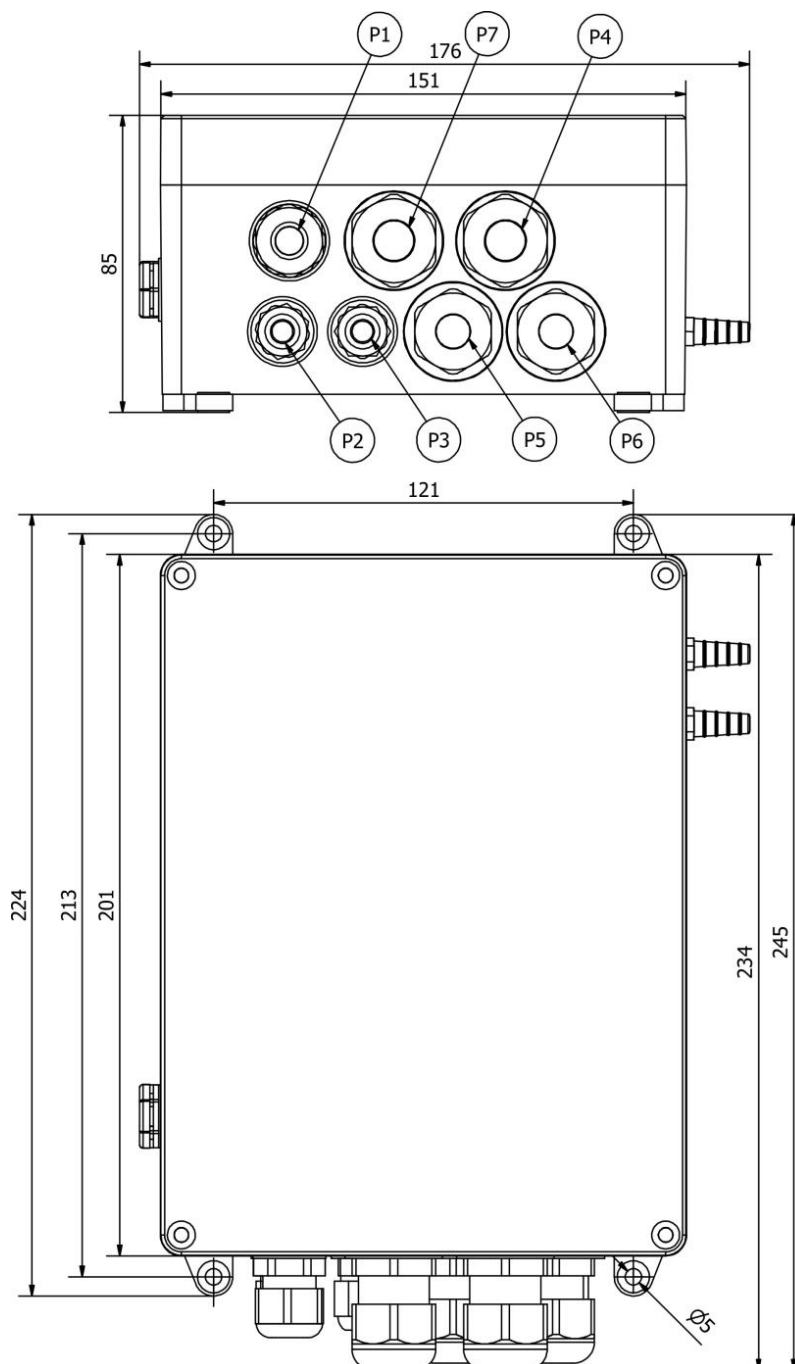


Fig.15.10. MAC-D Min controller in IP65 enclosure (version 4) - dimensions.

Item No	Quantity	Name	Diameter range min./max. [mm]
P1	1	UNI Pass	4.0– 8.0
P2	1	UNI Pass	3.5– 6.0
P3	1	UNI Pass	3.5– 6.0
P4	1	UNI Pass	6.0– 12.0
P5	1	UNI Pass	5.0– 10.0
P6	1	UNI Pass	5.0– 10.0
P7	1	UNI Pass	6.0– 12.0

NOTE!

In the event of a MAC-D-Min malfunction, the "Collective fault" light on the TSS or TS panel and the MAC-FC controller issues a fault signal to the CSP. If a controller malfunction is detected, inform the SMAY service immediately. Do not repair or replace the controller yourself. This can only be done by SMAY service or an authorised SMAY service.

15.4. PZ connection box

The PZ connection box is used to connect damper actuators with MAC-D-Min controller and to connect power supply for damper actuators. For the power supply of the damper actuators, a 3A quick-acting axial fuse is installed.

There are four types of boxes: PZ1, PZ2, PZ3 and PZ4. One NMQ24A-SR actuator can be connected to PZ1, two NMQ24A-SR actuators to PZ2, three NMQ24A-SR actuators to PZ3, four NMQ24A-SR actuators to PZ4. The boxes should be mounted in the same zone as the MAC-D- Min regulator, in its immediate vicinity. The PZ box should be installed so that it is not directly exposed to sunlight or precipitation (when installed outside the building, it should be covered).

The box housing is made of halogen-free material.

When mounting to the concrete base, use the dowels supplied with the MKR6x32 screw (1). The use of self-drilling screws is permitted if the box is mounted to sheet metal substrates. To maintain IP 55 protection, the hole in the box must be made with a screw that will fix the box. The assembly is carried out as shown in Figure 14.9.

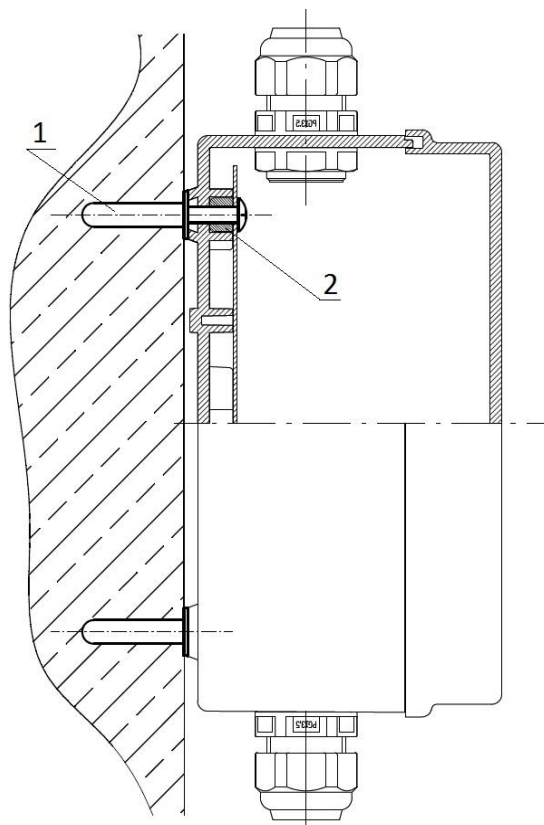


Fig.15.11. PZ box - method of fixing to the ground.

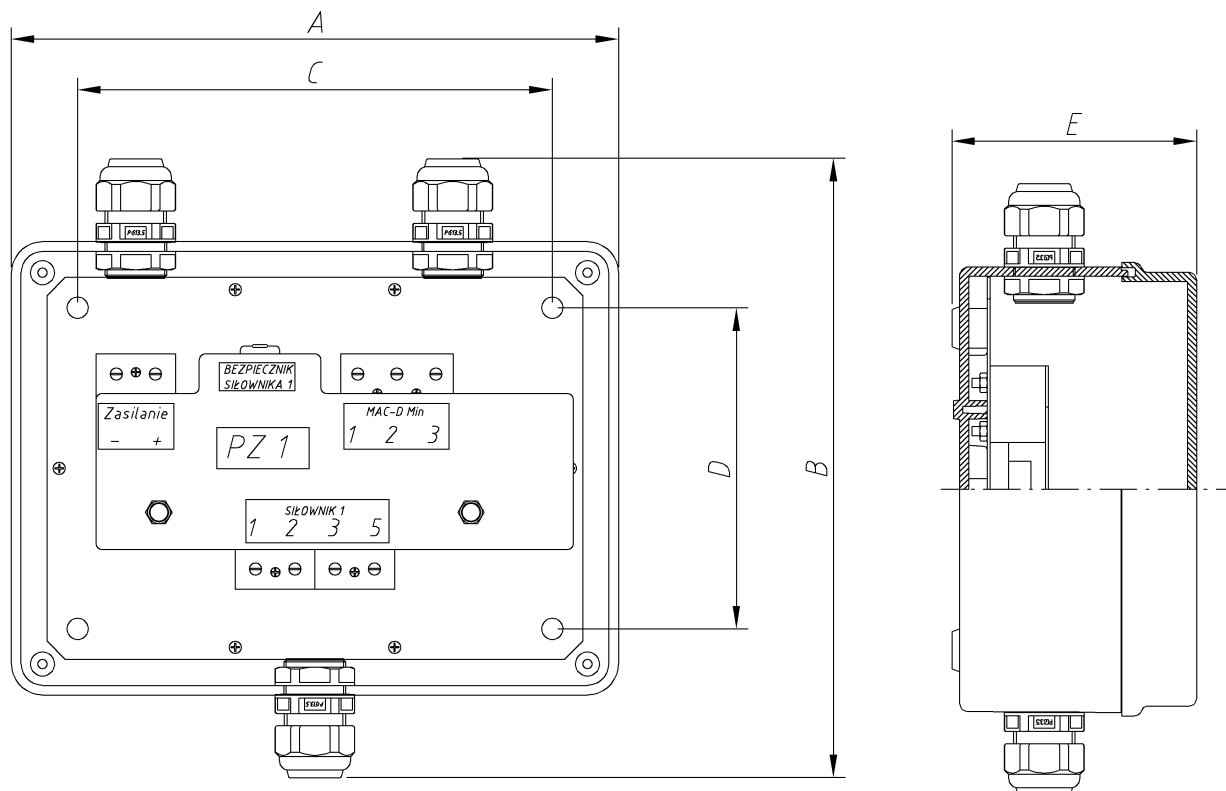


Fig.15.12. PZ1 box - dimensions, view without cover.

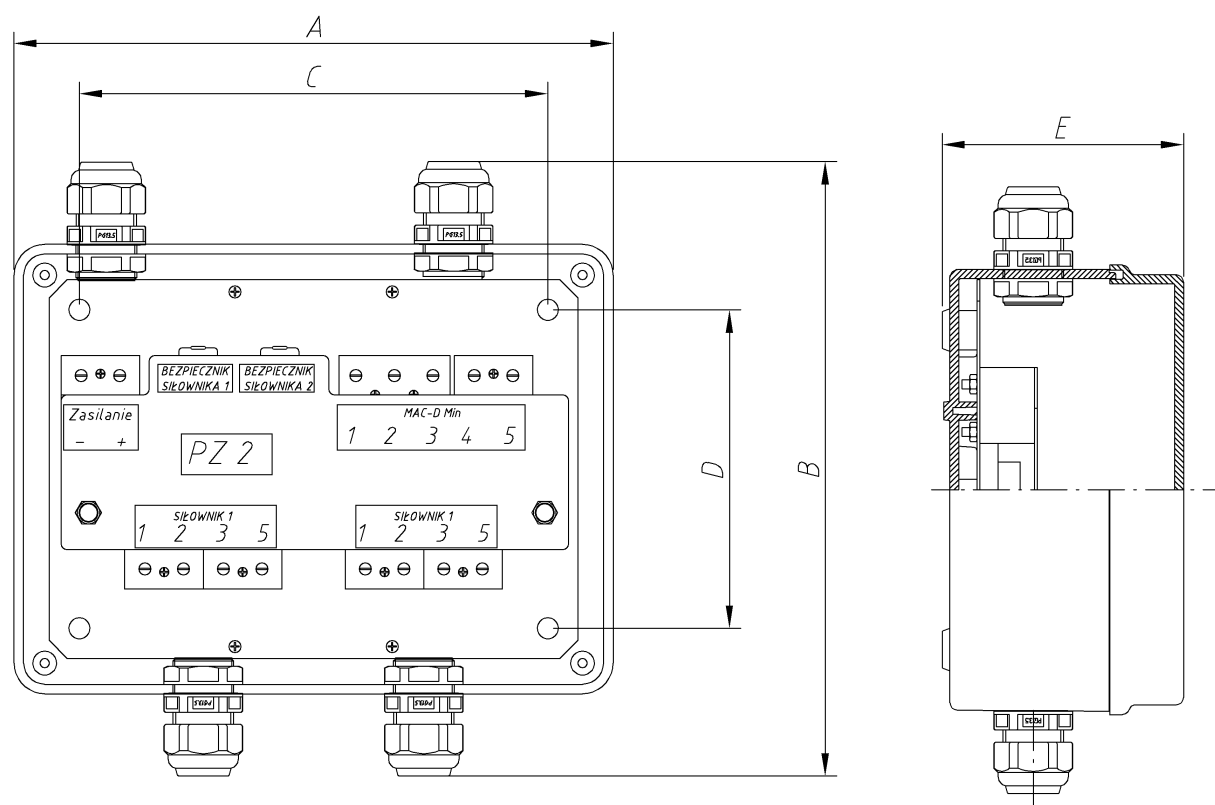


Fig.15.13. PZ2 box - dimensions, view without cover.

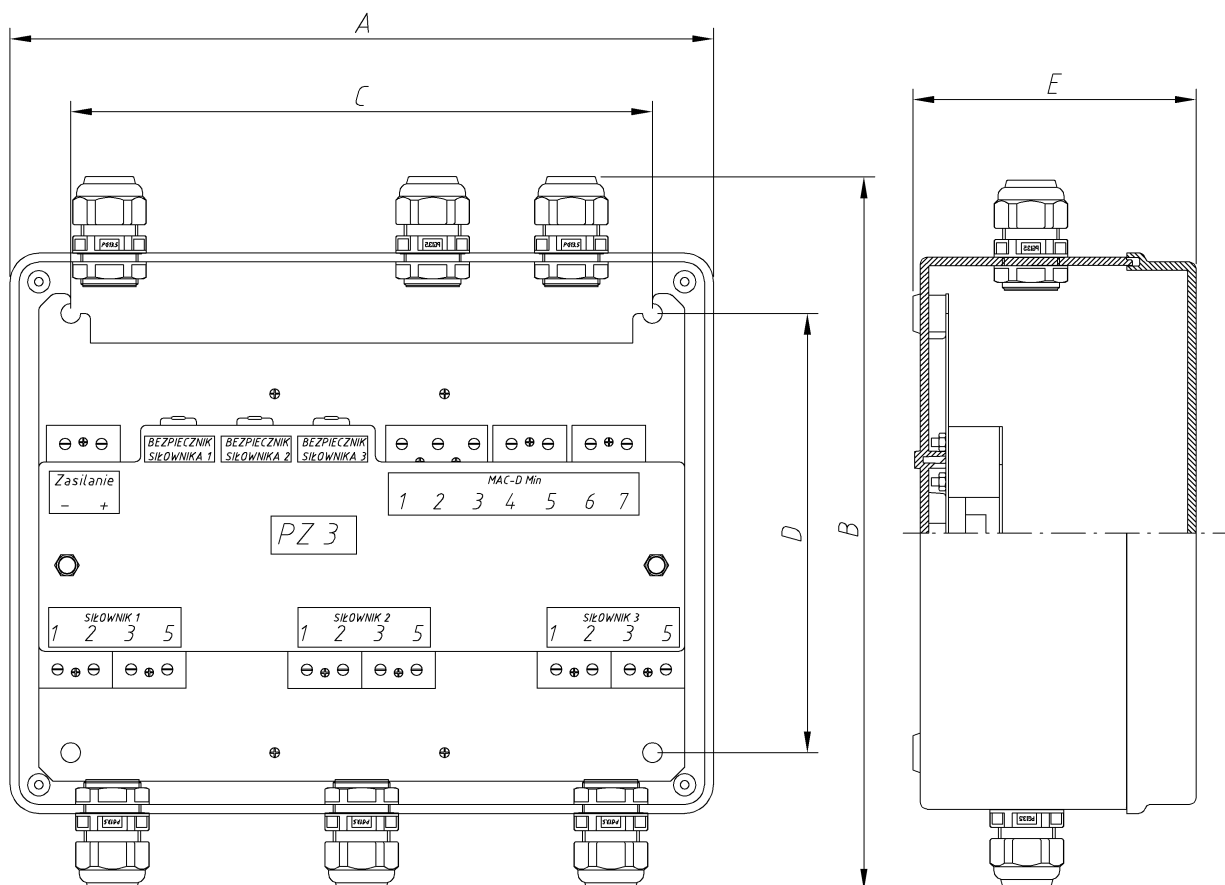


Fig.15.14. PZ3 box - dimensions, view without cover.

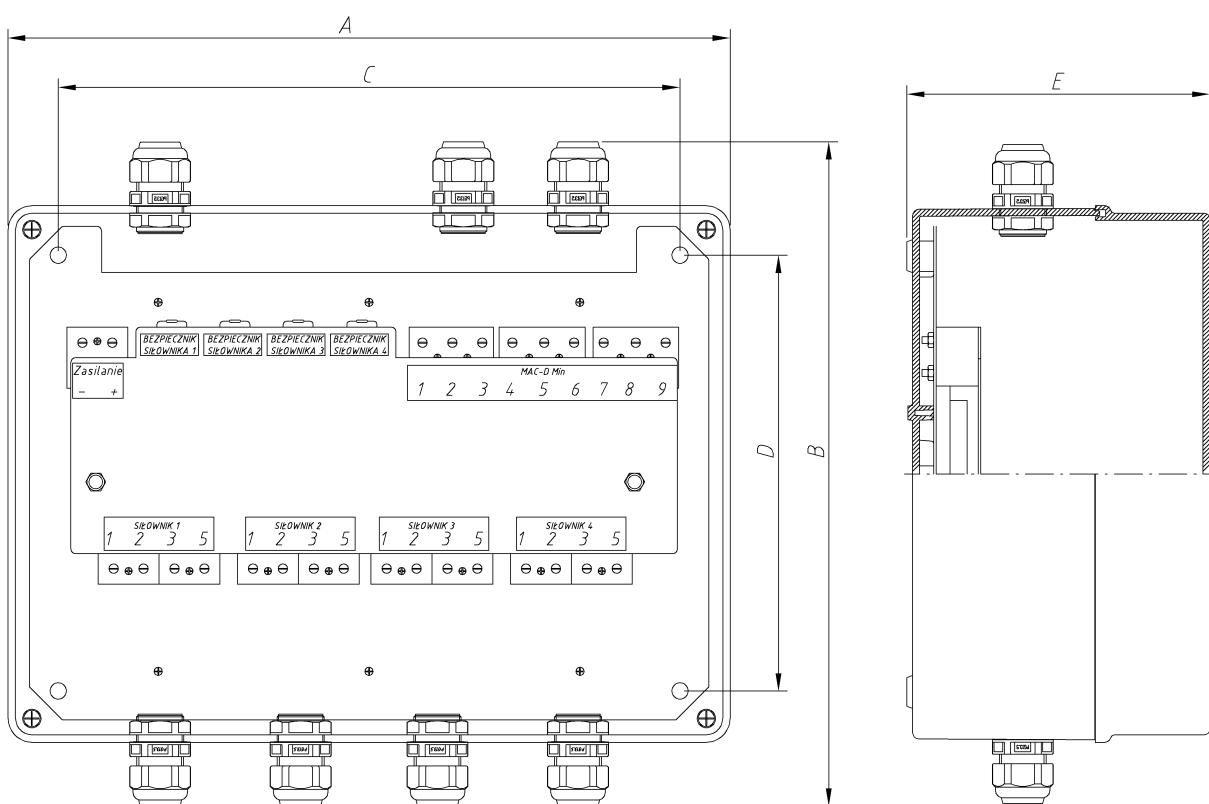


Fig.15.15. PZ4 box - dimensions, view without cover.

Table 14.1. Dimensions of PZ1/2/3/4 connection boxes.

	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
PZ1	198	203	155	105	80
PZ2	198	203	155	105	80
PZ3	248	253	205	155	100
PZ4	308	283	265.4	185.4	129.5

24VDC power supply.

IP56 protection class.

Connection and wiring diagrams can be found in section 13.

NOTE!

If there is no 24VDC power supply on the actuators, check the fuse for the actuator. The manufacturer allows the fuse to be replaced on your own. Keep the same fuse type (B-PICO/3A) when replacing it. To replace the fuse, you have to: remove the top cover of the PZ box. Then unscrew the two M5 screws so that the panel inside the PZ box can be removed. There are ceramic cubes under the panel. There are fuses in the upper middle row. The exchange is the same in all types of PZ boxes.

If PZ box malfunction is detected, inform the SMAY service immediately. Do not repair or replace the box yourself. This can only be done by SMAY service or an authorised SMAY service.

15.5. NMQ24A-SR actuator

The NMQ24A-SR actuator (Fig. 15.16) is designed to drive the SCR control dampers. The MAC-D-Min controller is the source of the setpoint value for the actuator and controls its current operating position via a feedback signal. The control and feedback signals are transmitted to/from the MAC-D-Min regulator via connectors in the PZ box.



Fig.15.16. Control damper actuator

The actuator is powered by 24VDC through the connectors in the PZ box. For the supply tracks of the damper blade actuators, a 3A quick-acting axial fuse is installed in the PZ box.

Connect the NMQ24A-SR to the PZ box with the original cable (0.6m) or extend the cable with a specified cable (max. Length: 50m) and an additional installation box.

NOTE!

If there is no 24VDC power supply on the actuators, check the fuse for the actuator in the PZ box. The manufacturer allows the fuse to be replaced on your own. Keep the same fuse type (B-PICO/3A) when replacing it. The instructions for replacing the fuse can be found in the section describing the PZ.

If an actuator malfunction is detected, inform the SMAY service immediately. Do not repair or replace the actuator yourself, only SMAY Service or an authorised SMAY Service Centre can do so.

15.6. MAC-LINK input-output card

The MAC-LINK Input/Output Card family is designed to extend the basic functionality of building pressure differential systems. MAC-LINK cards use the existing communication infrastructure of the fireBUS® pressure differential system on site. The use of cards in a separate housing provides flexibility in the choice of place of installation and significantly reduces the number and length of connection cables. The differential pressure system ensures continuous monitoring of the cards' status and signals of their failure. Depending on the needs, the cards can be equipped with a different number of inputs and/or outputs. MAC-LINK cards also allow you to increase the number of analog inputs or outputs, for example for MAC-FC or MAC-D-MIN controllers.

MAC-LINK family cards can have the following inputs/outputs:

- **I** - digital inputs, with optional line fault monitoring;
- **IA** - analog inputs;
- **O** – digital outputs;
- **OA** – analog outputs.



Fig.15.17. MAC-LINK input-output card

MAC-LINK cards can be found in the following subtypes, depending on demand:

- MAC-LINK I card with inputs only;
- MAC-LINK O card with outputs only;
- MAC-LINK I/O card with inputs and outputs.

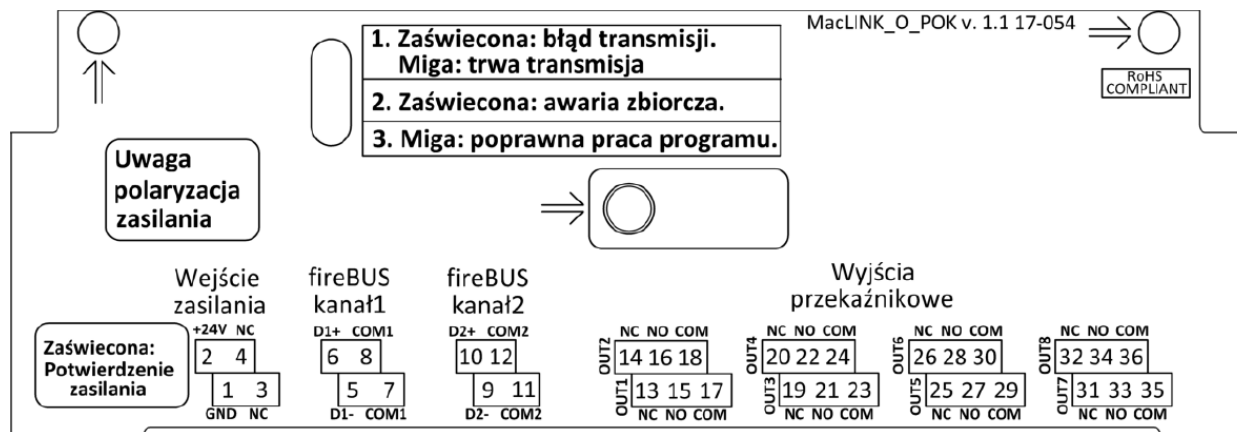
Table 15.1. Basic technical parameters of MAC-LINK card.

MAC-LINK card	
Power supply parameters	U = 24 VDC +20% -20%
Digital inputs (option I, applies to all inputs with line fault monitoring)	Designed to work with dry contacts.
	U _{out} = U _{supply max.} < 28.8 VDC I _{out} = 2 mA

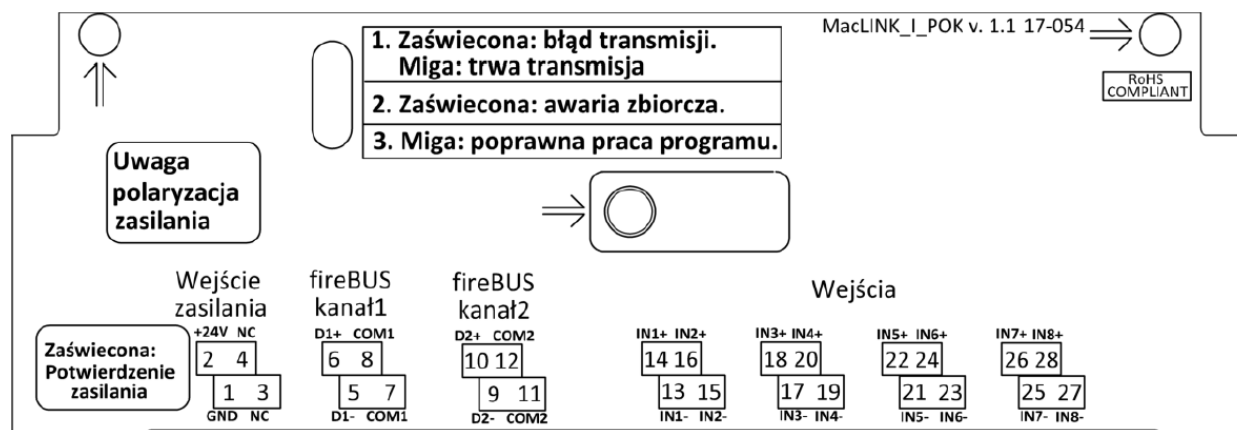
Analogue inputs (option IA)	0 – 10 VDC
Digital outputs (option O)	Dry contacts: 30 VDC/max 2 A
Analogue outputs (option OA)	0 – 10 VDC 4 – 20 mA
Protection class	IP54 or optionally IP65

The maximum number of MAC-LINK cards mounted on one Local FireBUS loop is 8.

Detailed technical data can be found in the operation and maintenance documentation of the device.

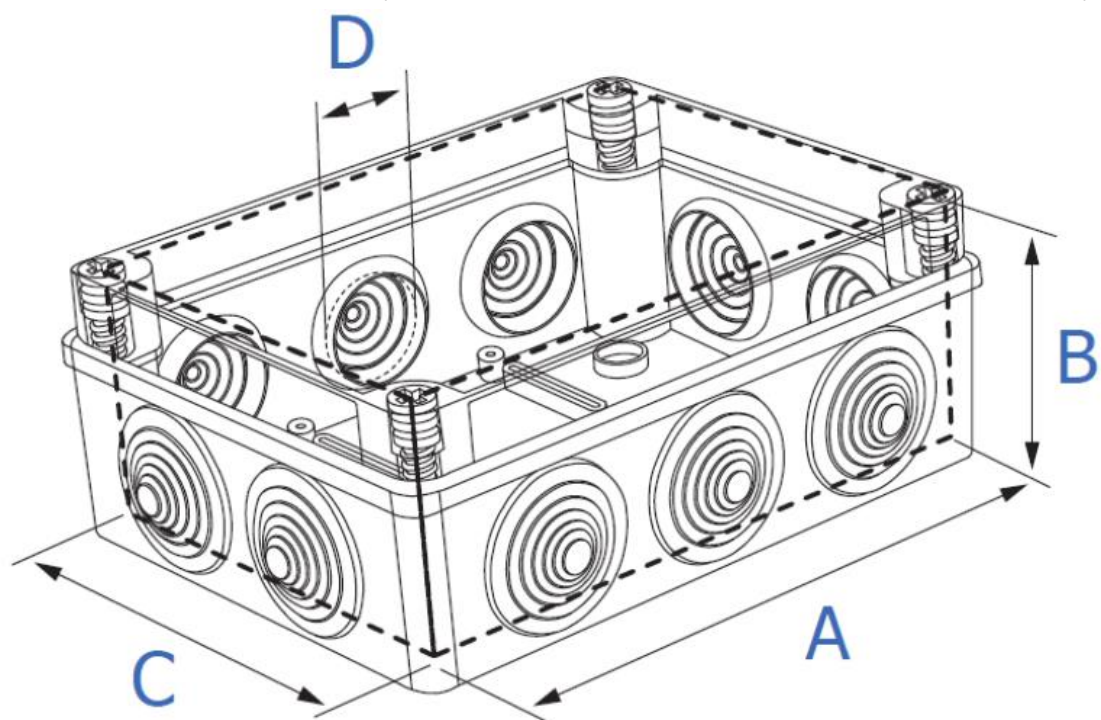


MAC-LINK O opis złącz



MAC-LINK_I opis złącz

Fig.15.18. MAC-LINK input-output card - connectors description

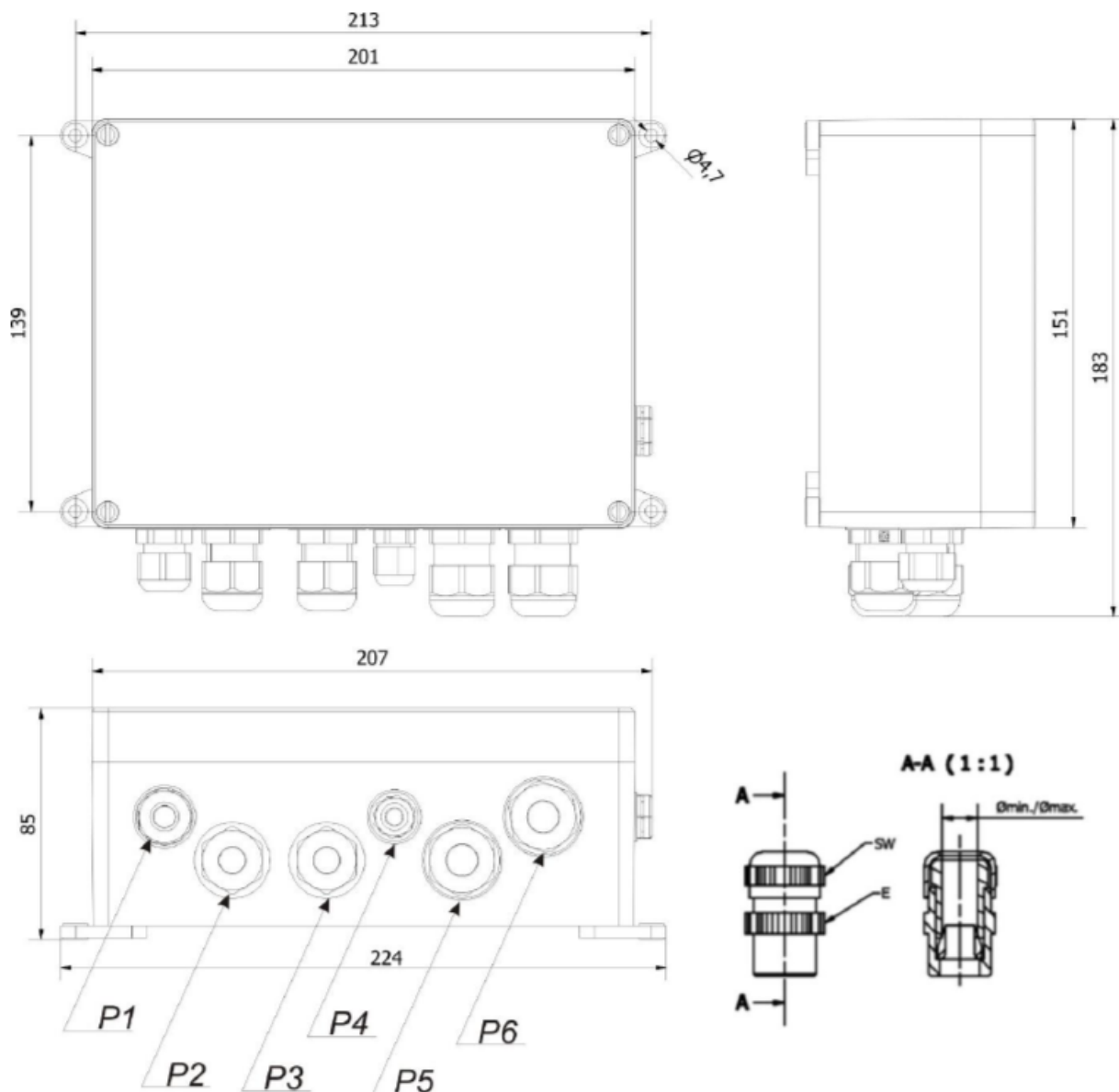


Designation	Name	Dimension [mm]
A	Width	190
B	Height	70
C	Length	140
D	Hole diameter for a gland	37

Note! The given dimensions are inner dimensions of the housing!

Ilość przepustów	12
Zakres średnic przewodów min./max. [mm]	8,0 – 35

Fig.15.19. MAC-LINK I/O card in IP54 housing - dimensions



Nr poz.	Ilość	Przepusty kablowe z gwintem	Zakres średnic min./max. [mm]	Rozmiar klucza [mm]
P1	1	PG 9,0	4,0-8,0	19
P2	1	PG11,0	5,0-10,0	22
P3	1	PG11,0	5,0-10,0	22
P4	1	PG 7,0	3,0-6,5	15
P5	1	PG13,5	6,0-12,0	24
P6	1	PG13,5	6,0-12,0	24

Fig.15.20. MAC-LINK I/O card in IP65 housing - dimensions

15.7. TSS Control and Display Panel

The Control and Display Panel is a component that is installed together with the iSWAY-FC®, iSWAY-RFC®, iSWAY-WFC® devices. Its task is to display basic information on the status of iSWAY devices. The panel also contains switches at the disposal of the manager of the rescue and firefighting action, therefore its location is determined on the level of access of rescue services.

The **TSS-1** panel is used to monitor and manually control a single iSWAY device. For overall dimensions see Table 15.2.

Table 15.2. Basic dimensions of the TSS-1 panel.

Mounting dimensions	Overall dimensions
SxW [mm]	SxWxG [mm]
160x320	210x340x188

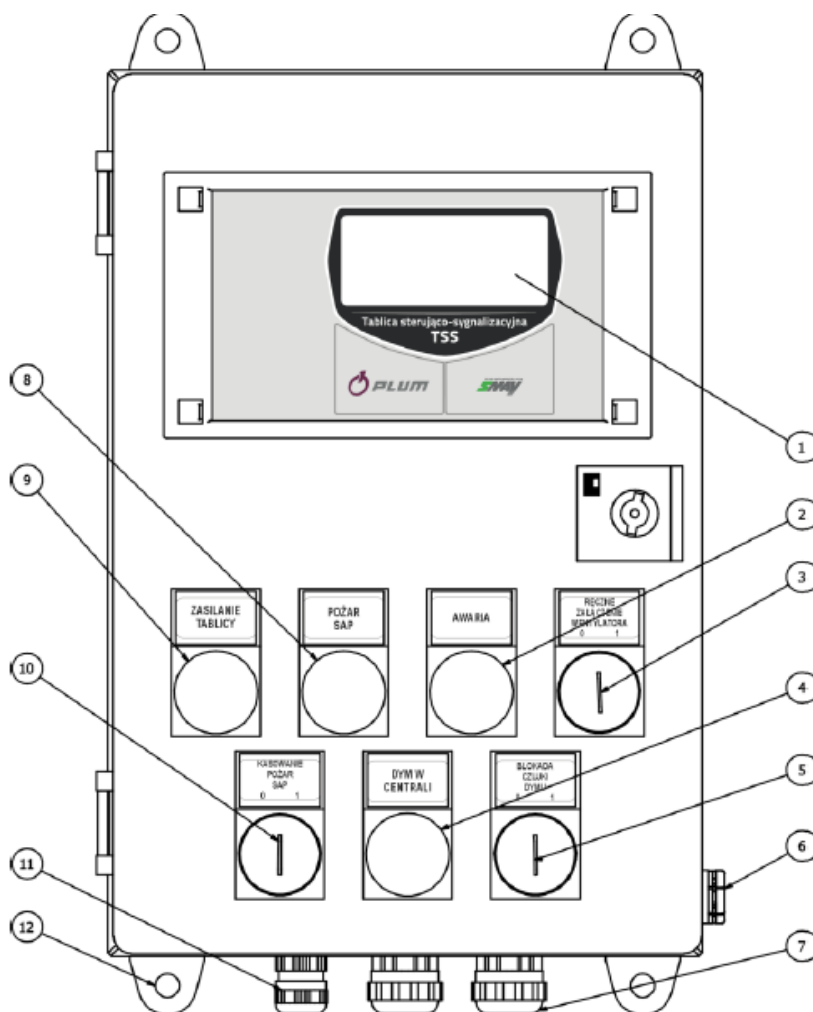


Fig.15.21. View of TSS-1 panel.

Power supply 230VAC (type TSS-1) or 24VDC (type TSS-1-24V).

On request IP65 protection class can be delivered.

For details and technical information, see DTR TSS-1.

Construction:

- 1 - seven-segment display (three segments)
- 2 - a yellow light signal indicating a failure
- 3 - two-position switch with a key for manual fan activation
- 4 - a yellow light signal informing about the smoke in the unit
- 5 - two-position, key-operated switch controlling the smoke detector lock or double intake switch
- 6 - diaphragm fan
- 7 - EMC cable gland - 2 pieces
- 8 - a red light signal indicating a SAP fire
- 9 - a green light signal indicating power supply to the panel
- 10 - two-position switch with a key controlling cancellation of SAP fire

11 - UNI cable gland - power supply of the panel

12 - wall bracket

TSS-2

The TSS-2 panel is used to monitor and manually control two iSWAY devices. For overall dimensions see Table 15.3.

Table 15.3. Basic dimensions of the TSS-2 panel.

Mounting dimensions	Overall dimensions
SxW [mm]	SxWxG [mm]
260x320	305x340x188

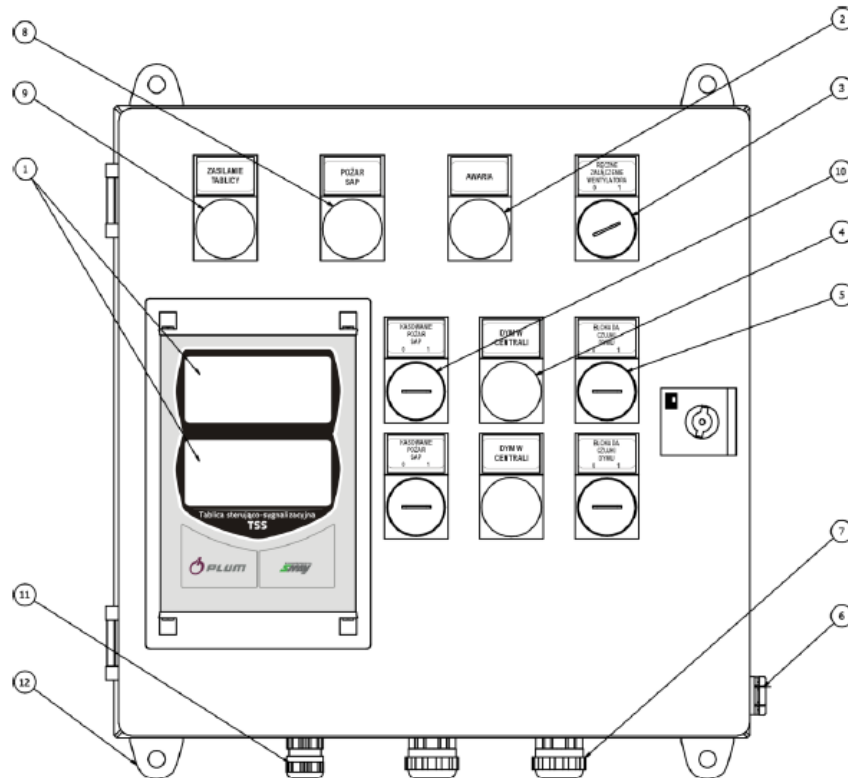


Fig.15.22. View of TSS-2 panel.

Power supply 230VAC (type TSS-2) or 24VDC (type TSS-2-24V).

On request IP65 protection class can be delivered.

For details and technical information, see DTR TSS-2.

Construction:

1 - seven-segment display (three segments)– 2 pcs.

2 - a yellow light signal indicating a failure

3 - two-position switch with a key for manual fan activation

4 - a yellow light signal informing about the smoke in the unit - 2 pcs.

5 - two-position, key-operated switch controlling the smoke detector lock or double intake switch - 2 pcs.

6 - diaphragm fan

7 - EMC cable gland - 2 pieces

8 - a red light signal indicating a SAP fire

9 - a green light signal indicating power supply to the panel

10 - two-position switch with a key controlling cancellation of SAP fire

11 - UNI cable gland - power supply of the panel

12 - wall bracket

TSS-3

The TSS-3 panel is used to monitor and manually control two iSWAY devices. For overall dimensions see Table 15.4.

Table 15.4. Basic dimensions of the TSS-3 panel.

Mounting dimensions	Overall dimensions
SxW [mm]	SxWxG [mm]
260x320	305x340x188

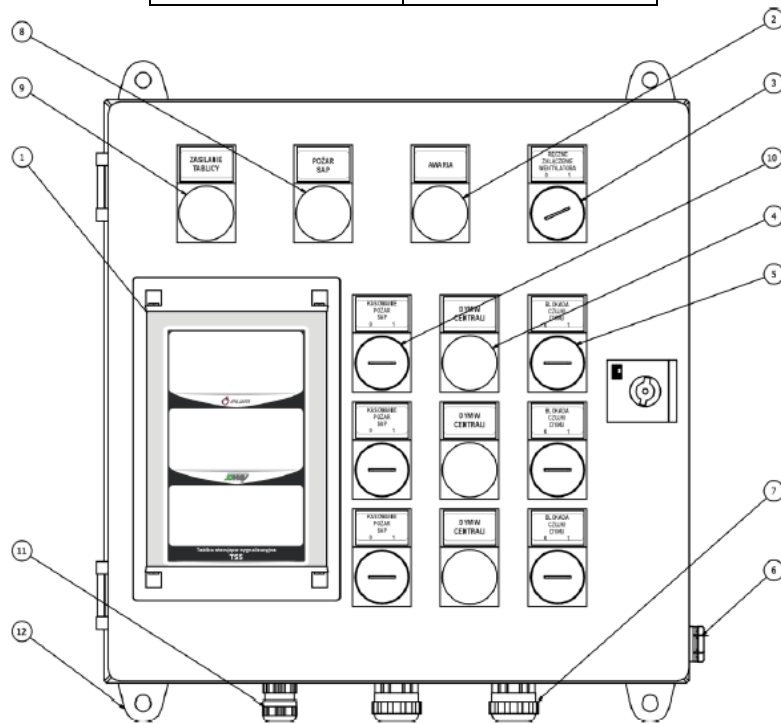


Fig.15.23. View of TSS-3 panel.

Power supply 230VAC (type TSS-3) or 24VDC (type TSS-3-24V).

On request IP65 protection class can be delivered.

For details and technical information, see DTR TSS-3.

Construction:

1 - seven-segment display (three segments)– 3 pcs.

2 - a yellow light signal indicating a failure

3 - two-position switch with a key for manual fan activation

4 - a yellow light signal informing about the smoke in the unit - 3 pcs.

5 - two-position, key-operated switch controlling the smoke detector lock or double intake switch - 3 pcs.

6 - diaphragm fan

7 - EMC cable gland - 2 pieces

8 - a red light signal indicating a SAP fire

9 - a green light signal indicating power supply to the panel

10 - two-position switch with a key controlling cancellation of SAP fire

11 - UNI cable gland - power supply of the panel

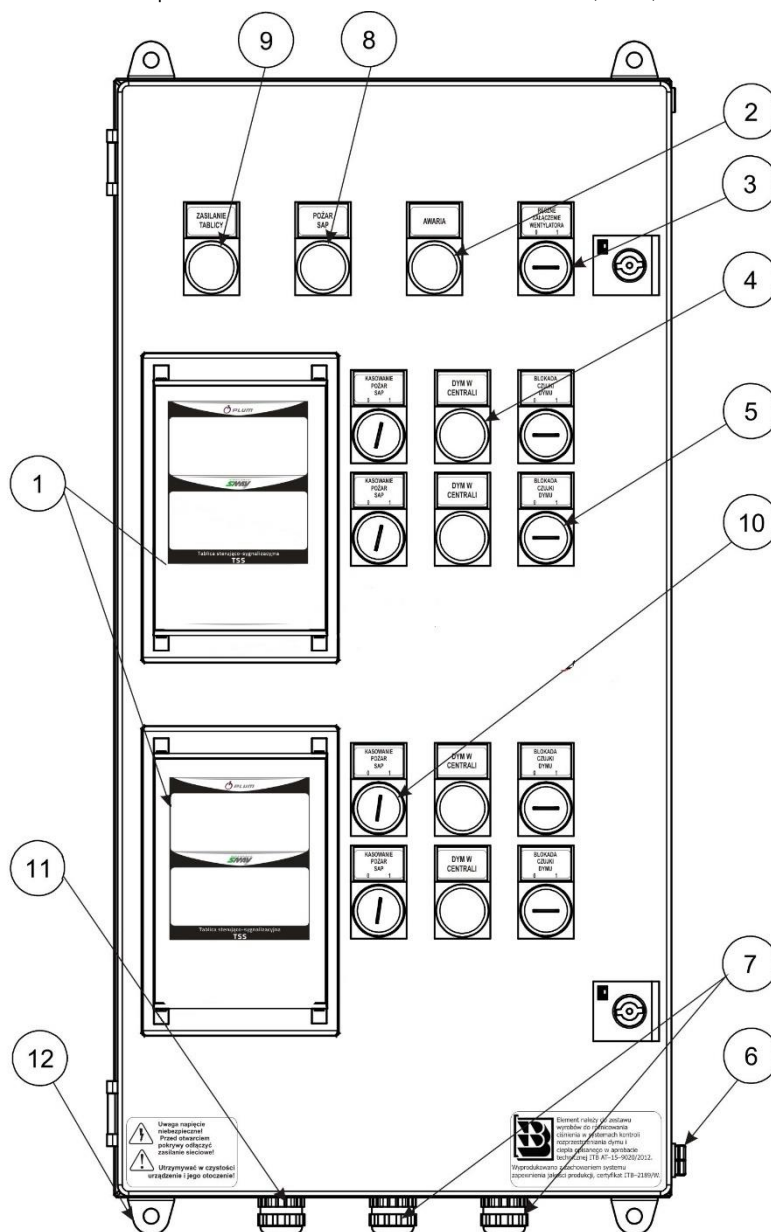
12 - wall bracket

TSS-4;5;6

The TSS-4;5;6 panel is used to monitor and manually control two iSWAY devices. For overall dimensions see Table 15.5.

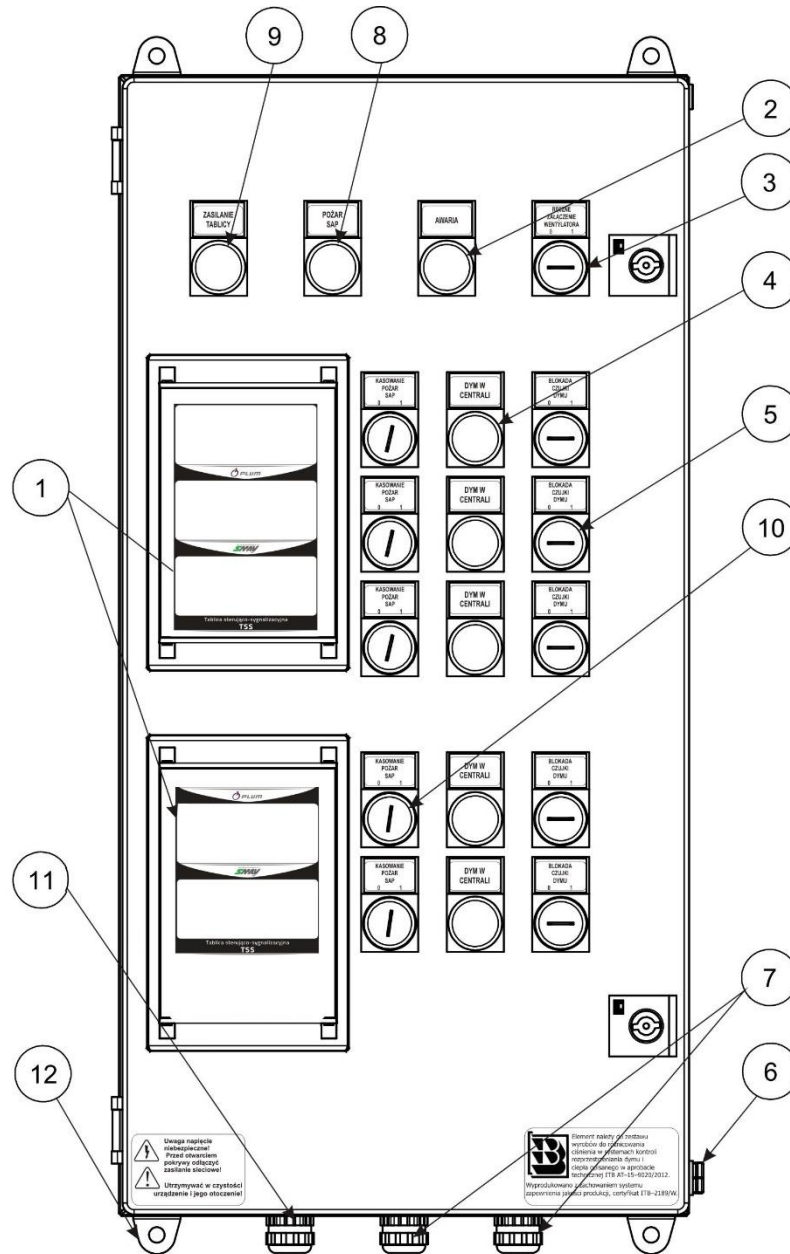
Table 15.5. Basic dimensions of the TSS-4/5/6 panel.

Mounting dimensions	Overall dimensions
SxW [mm]	SxWxG [mm]
260x620	313x640x188



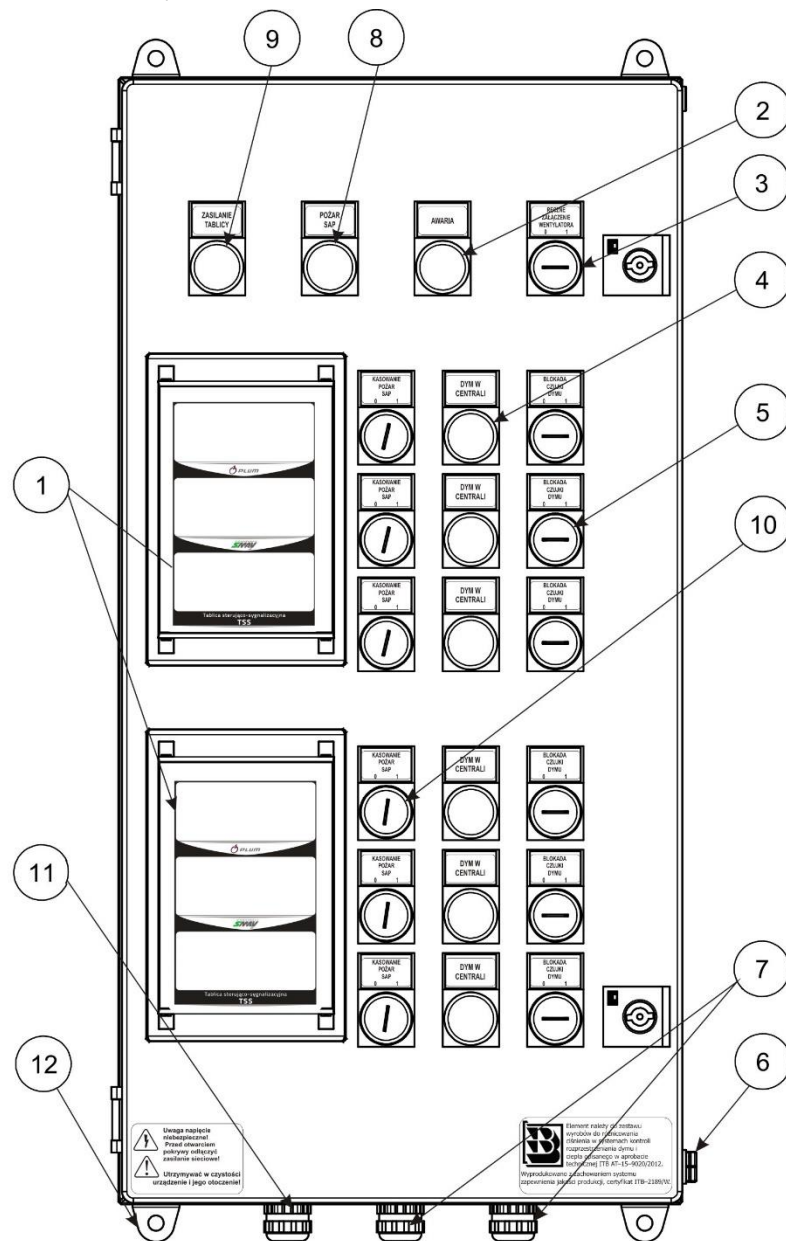
1. 7-segment display
2. a yellow light signal indicating a failure
3. 2-position switch controlling a manual triggering of the ventilator
4. a yellow light signal informing about the smoke in the unit
5. 2-position switch controlling the lock of the smoke sensor or double intake switch
6. Diaphragm ventilator
7. EMC cable gland
8. a red light signal indicating a SAP fire
9. a green light signal indicating power supply to the panel
10. 2-position switch controlling cancelation of SAP fire
11. UNI cable gland
12. Wall mount

Fig.15.24. View of TSS-4 panel.



1. 7-segment display
2. a yellow light signal indicating a failure
3. 2-position switch controlling a manual triggering of the ventilator
4. a yellow light signal informing about the smoke in the unit
5. 2-position switch controlling the lock of the smoke sensor or double intake switch
6. Diaphragm ventilator
7. EMC cable gland
8. a red light signal indicating a SAP fire
9. a green light signal indicating power supply to the panel
10. 2-position switch controlling cancelation of SAP fire
11. UNI cable gland
12. Wall mount

Fig.15.25. View of TSS-5 panel.



1. 7-segment display
2. a yellow light signal indicating a failure
3. 2-position switch controlling a manual triggering of the ventilator
4. a yellow light signal informing about the smoke in the unit
5. 2-position switch controlling the lock of the smoke sensor or double intake switch
6. Diaphragm ventilator
7. EMC cable gland
8. a red light signal indicating a SAP fire
9. a green light signal indicating power supply to the panel
10. 2-position switch controlling cancelation of SAP fire
11. UNI cable gland
12. Wall mount

Fig.15.26. View of TSS-6 panel.

230VAC power supply.

IP65 protection class.

For details and technical information, see DTR TSS-4;5;6.

The wiring diagrams of the Control and Display Panels can be found in section 13.

Operation and Maintenance Manual (DTR) iSWAY® Set of products
For FireBUS®, the HTKSH FE180/PH90 ekw 2x2x0.8 line is applied. The correct installation of the shielded cable in the EMC gland of the TSS panel is shown below (Fig. 15.27).



Fig.15.27. Installation diagram of shielded cable in EMC cable duct.

NOTE!

In the event of a TSS panel malfunction or communication loss with the iSWAY-FC, the "Collective fault" light on the panel is displayed and the MAC-FC controller issues a fault signal to the CSP. If TSS panel malfunction is detected or communication loss, inform the SMAY service immediately. Do not repair or replace the panel yourself. This can only be done by SMAY service or an authorised SMAY service.

Each control and display panel should be permanently fitted with a "User's manual for Control and Display Panel "TSS"".

INSTRUKCJA OBSŁUGI TABLICY STEROWNICZEJ „TSS”



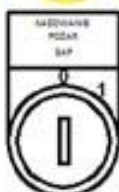
Power supply indicator



Fire Alarm Signal indicator – air supply fan starts to pressurize protected space with the default time delay of 15 s



iSWAY unit failure alarm indicator

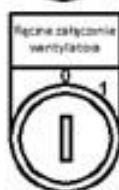


Key-locked switch canceling Fire Alarm Signal (test start-up, calibration) – stops the air supply fan

Switch with **no self-restoring option** – please check the position!

0 – default operation

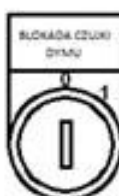
1 – reset



Air supply fan operating mode switch:

0 – automatic start-up of the air supply fan after receiving Fire Alarm Signal,

1 – manual start-up by the authorized person (e.g. chief of the fire brigade)



Switch changing the reaction of the unit after smoke detection (smoke detector signal):

For units without Twin Air-Intake module:

0 – auto-stop of the air supply fan after “SMOKE IN THE iSWAY UNIT” alarm and switching on “SMOKE IN THE iSWAY UNIT” indicator,

1 – switching on “SMOKE INSIDE THE iSWAY UNIT” indicator, air supply fan operates until manual stop (aware action of the authorized person)

For units with Twin Air-Intake module:

0 – automatic change of the throttle state after detecting smoke in the unit

1 – changing the throttle state to before smoke detection



Displays the current pressure in the protected space (if the unit is the last regulator – display shows compression in the duct.

Fig.15.28. Operating instructions for the TSS control and signalling panel.

15.8. TS control panel

The control panel (TS) is always mounted on the object together with **the MSPU**. There is a light on the panel to confirm the power supply to the panel. This panel must be installed at the emergency services access point. On the TS panel there is a common attachment "Manual fan activation", which activates all devices. Because each device can be individually stopped from the TS panel - it is possible to switch on a single or any group of devices. For each device there is a switch "SAP fire cancelling", which makes it possible to stop the device. ISWAY® units work autonomously and require a stop after receiving a fire signal. With this switch we can also stop the device, making it impossible for it to work. For security reasons, this switch has a key lock. There is a "Smoke Detector Lock" switch or a "Double Intake Switch" switch for each device. This switch has two interchangeable functions, depending on whether the device has a double intake system. If there is a double air intake after the appearance of smoke in the air handling unit, it automatically switches to the second air source and the switch allows to return to the original source. In the absence of a double inlet, the appearance of smoke in the duct stops the unit. The switch then allows you to ignore the information about the smoke and causes the device to work. Confirmation of smoke occurrence in the channel is displayed on the MSPU panel located near the TS.

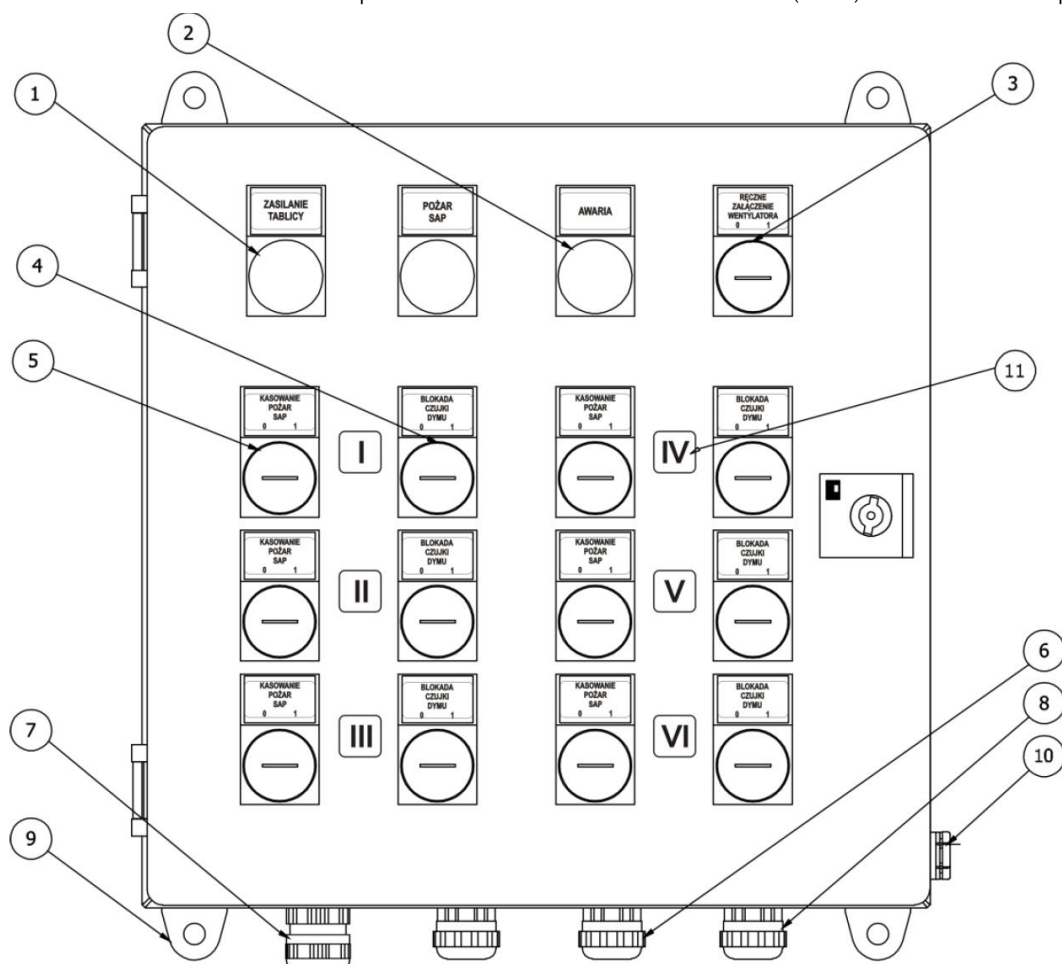
Table 15.6. Basic dimensions of the TS panel.

No.	TS Dimensions	
	Installation	Overall
	SxW [mm]	SxWxG [mm]
TS-4; TS-6	260x320	313x340x188
TS-7; TS-16	556x449	605x522x263
TS-17; TS-32	556x649	605x722x263
TS-33, TS-36	756x849	805x922x313

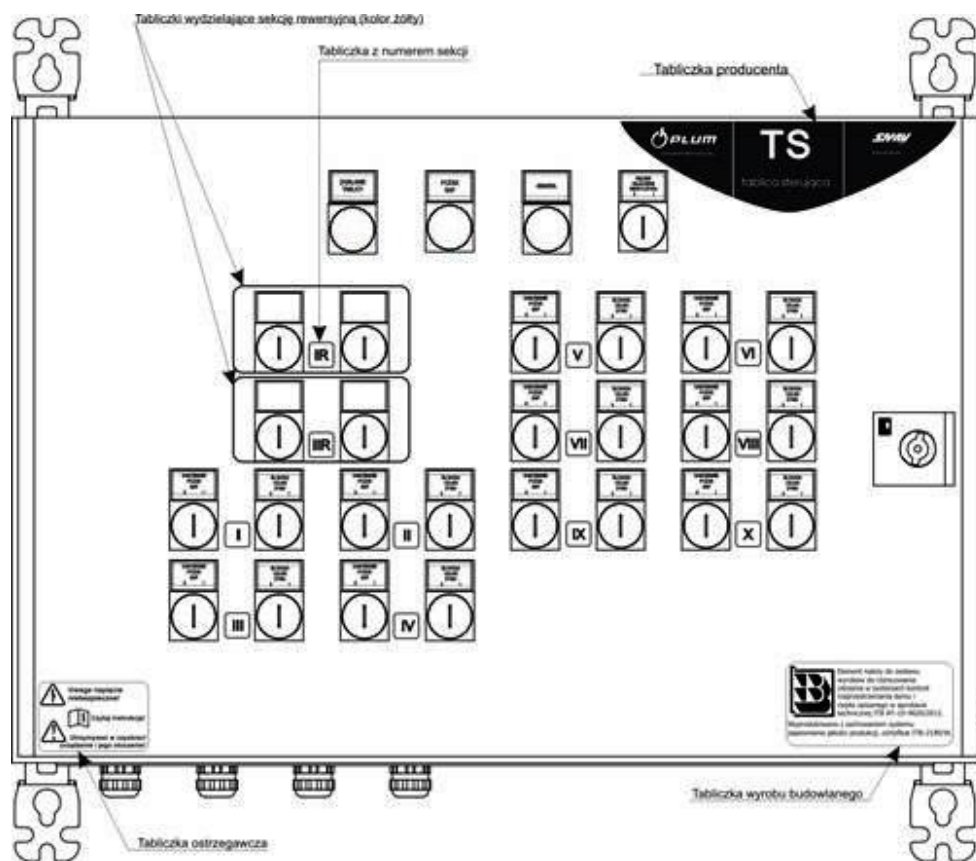
Power supply: 230VAC.

Protection class: IP65.

For details and technical information, see DTR TS.



Rys.15.29. TS control panel



- 1 - a green light signal indicating power supply to the panel
- 2 - a red light signal indicating a failure
- 3 - two-position switch with a key for manual fan activation
- 4 - two-position, key-operated switch controlling the smoke detector lock or double intake switch
- 5 - two-position switch with a key controlling cancellation of SAP fire
- 6 - EMC cable gland - 2 pieces - FireBUS® transmission circuits
- 7 - UNI pass, power supply of the panel
- 8 - EMC cable gland - 1 pieces - transmission to the visualisation system
- 9 - wall bracket
- 10 - diaphragm fan
- 11 - section number descriptions

Connection and wiring diagrams of the control panels can be found in section 13.

For FireBUS®, the HTKSH FE180/PH90 ekw 2x2x0.8 line is applied. The correct installation of the shielded cable in the EMC gland of the TS panel is shown below (Fig. 15.31).



Rys.15.31. Installation diagram of shielded cable in EMC cable duct.

NOTE!

In the event of a TS panel malfunction or communication loss with the iSWAY-FC, the "Collective fault" light on the panel is displayed and the MAC-FC controller issues a fault signal to the CSP. If TS panel malfunction is detected or communication loss, inform the SMAY service immediately. Do not repair or replace the panel yourself. This can only be done by SMAY service or an authorised SMAY service.

Each control panel shall be permanently fitted with a "Control panel "TS" service manual".

CONTROL PANEL „TS” SERVICE MANUAL



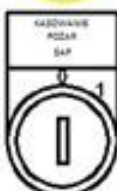
Power supply indicator



Fire Alarm Signal indicator – air supply fan starts to pressurize protected space with the default time delay of 15 s



iSWAY unit failure alarm indicator

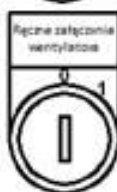


Key-locked switch canceling Fire Alarm Signal (test start-up, calibration) – stops the air supply fan

Switch with **no self-restoring option** – please check the position!

0 – default operation

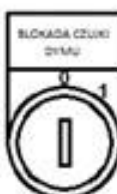
1 – reset



Air supply fan operating mode switch:

0 – automatic start-up of the air supply fan after receiving Fire Alarm Signal,

1 – manual start-up by the authorized person (e.g. chief of the fire brigade)



Switch changing the reaction of the unit after smoke detection (smoke detector signal):

For units without Twin Air-Intake module:

0 – auto-stop of the air supply fan after “SMOKE IN THE iSWAY UNIT” alarm and switching on “SMOKE IN THE iSWAY UNIT” indicator,

1 – switching on “SMOKE INSIDE THE iSWAY UNIT” indicator, air supply fan operates until manual stop (aware action of the authorized person)

For units with Twin Air-Intake module:

0 – automatic change of the throttle state after detecting smoke in the unit

1 – changing the throttle state to before smoke detection



Only for reversible system.

Changing the direction of work of the fan after manual switch:

AUTO – direction of the flow set automatically by the system

D – direction of the flow from bottom to top

G – direction of the flow from top to bottom

Rys.15.32. Operating instructions for the TS control panel.

15.9. Devices Operation Status Monitoring (MSPU)

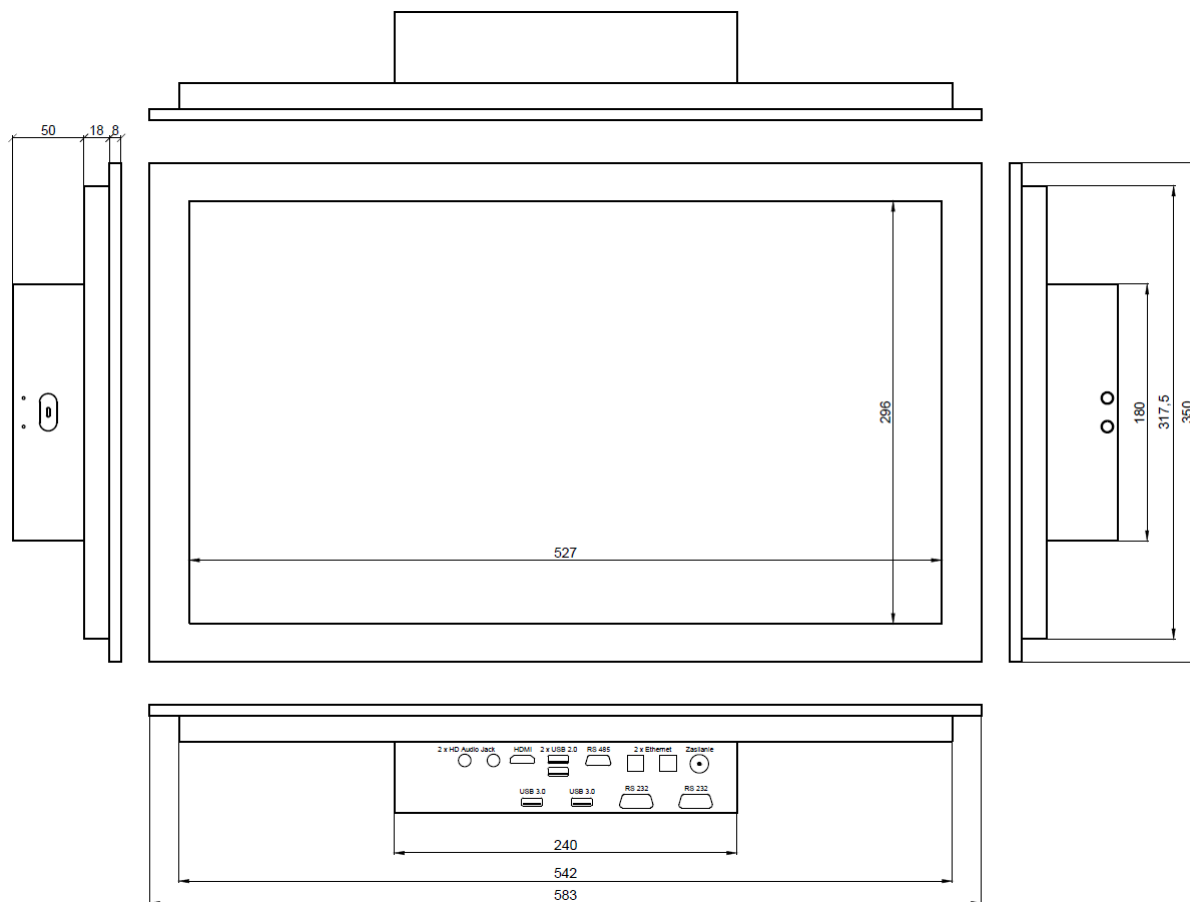
Devices Operation Status Monitoring MSPU complements the offers of SMAY Sp. z o. o. in the scope of equipping the systems of positive pressure protection of escape routes during fire. The purpose of the device is to control the transmission paths and operating parameters of SAFETY WAY® system actuators. The MSPU panel should be mounted near the TS panel. The MSPU is in the form of a 23.8" operator panel, which allows to call various functions of the monitoring system.

Devices Operation Status Monitoring (MSPU) is used to visualize the state of the devices. Visualization graphics created each time individually to the system (up to its size, type and number of protected spaces). It allows to quickly and easily diagnose a possible failure and its location, as well as shorten the time of system operation tests by displaying all operating parameters of each of the devices included in its composition.

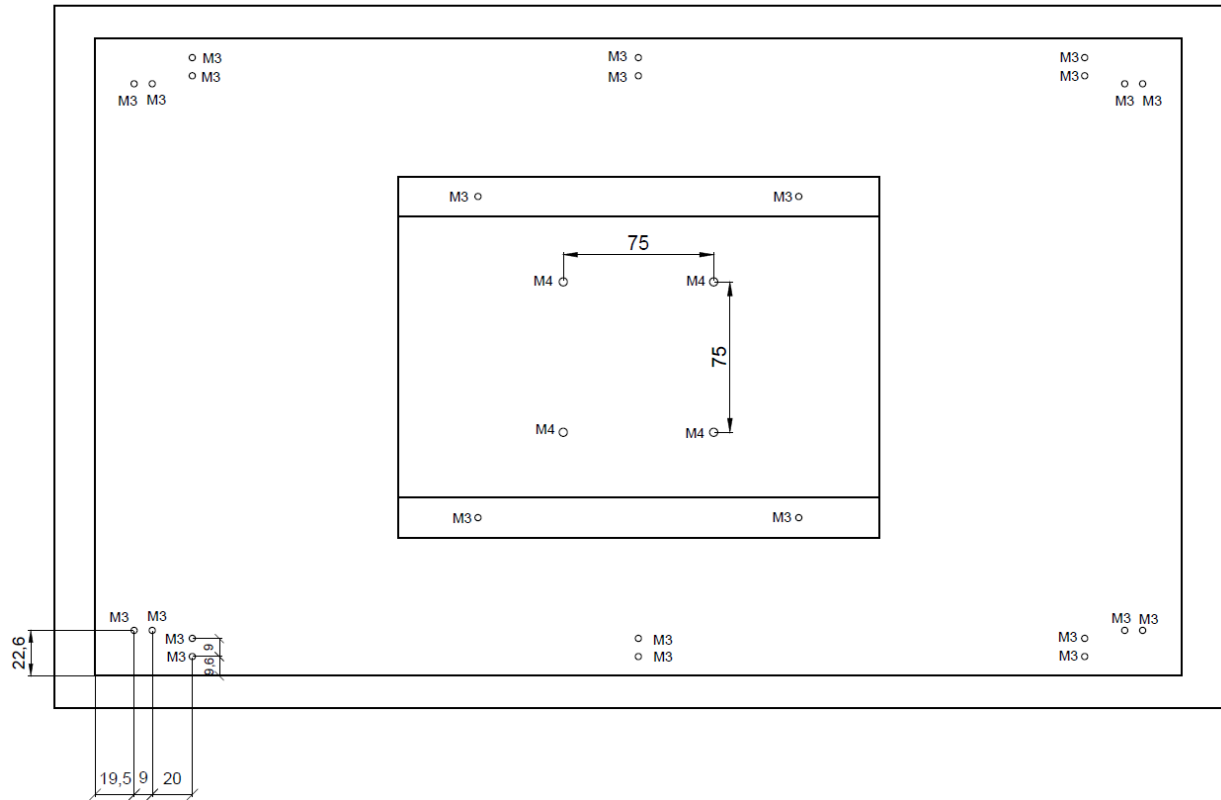
Table 15.7. Technical parameters of MSPU.

Screen size	23.8" (16:9)
Resolution	1920x1080
Supply voltage	12 VDC*
Power consumption	18 W
Protection class from the front	IP66
Touch technology	Capacitive PCT
Number of touch points	10
Installation	Wall or desk bracket (VESA 75 standard)

*230 VAC/12 VDC power supply included with the MSPU

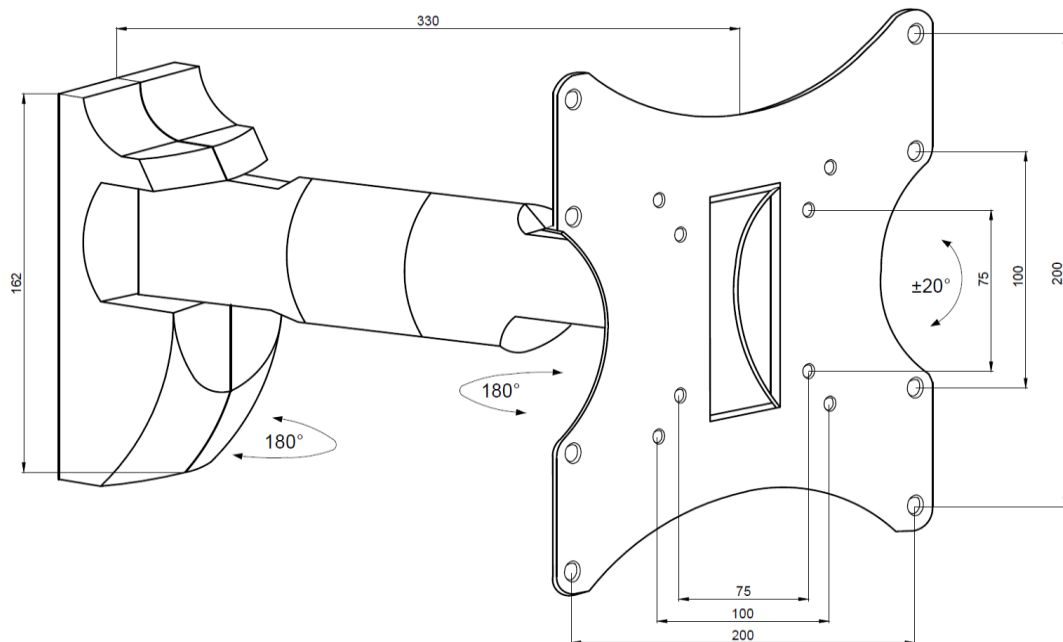


Rys.15.33. MSPU - operator panel - overall dimensions and panel connectors.

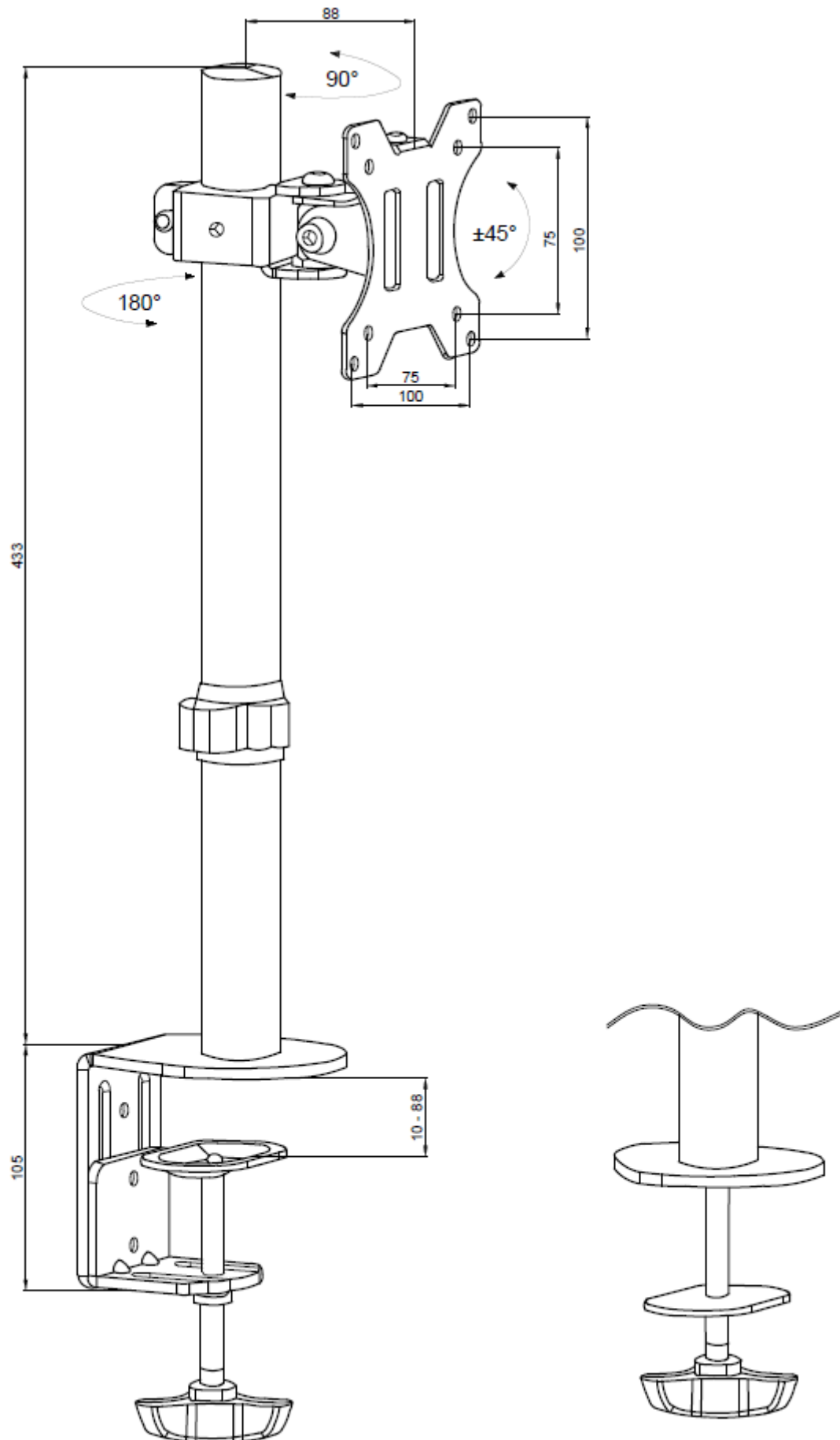


Rys.15.34. MSPU - operator panel - mounting dimensions.

MSPU is mounted on wall or desk mounts in VESA standard: 75x75. As a standard, MSPU is installed on the wall stand WS-01, but it is also possible to mount the operator screen on the wall bracket WS-02 (more degrees of freedom of the stand) and on the DS-01 and DS-02 desk brackets, which can be permanently mounted to the desk top or fixed on a clamp, which can be unscrewed at any time and mounted in another place. The following are the recommended SMAY screen racks for operator screens.



Rys.15.35. WS-01 stand for MSPU - dimensions, mounting holes for operator screen.



Rys.15.36. DS-01 stand for MSPU - dimensions, mounting holes for operator screen.

MSPU device can be connected to BMS system using MODBUS RTU protocol in TCP/IP standard. For system integration, feed the Cat5 cable terminated with an RJ45 plug into the MSPU panel computer and plug it into the LAN card slot. The service is available on port 502. Brief description of the data exchange protocol:

1. Only command 03 from the protocol is supported in the generated query. All information from the regulator is recorded on two 2 byte registers starting from register number 0x01:

Register number	Description
01	regulator pressure of the 400 address
02	relative address and status of the controller with 400 address
03	regulator pressure of the 401 address
04	relative address and status of the controller with 401 address
05	regulator pressure of the 402 address
06	relative address and status of the controller with 402 address
07	regulator pressure of the 403 address
08	relative address and status of the controller with 403 address
09	regulator pressure of the 404 address
10	relative address and status of the controller with 404 address
...	...
65	regulator pressure of the 432 address
66	relative address and status of the controller with 432 address

- question 01 03 00 01 00 02 95 CB will return two records from index 1
 - 1 byte - address of the MSPU
 - 1 byte - MODBUS RTU command number - 03 registers reading (only supported)
 - 2 bytes - RTU modbus register number
 - 2 bytes - number of registers to be sent
 - 2 bytes - CRC sum of the question
- answer: 01 03 04 01 00 33 24 ef 24. The content of the answer:
 - 1 byte - address of the MSPU
 - 1 byte - MODBUS RTU command number - 03 registers reading (only supported)
 - 1 byte - number of transmitted data bytes in response
 - The next 4 bytes are information about the controller:
 - 2 bytes - 2 bytes - current value of pressure in the protected space recorded on the number of WORD type;
 - 1 byte - relative address of the regulator - value presented in the form of HEX (01 = address 1, 1F = address 31);
 - 1 byte - status (the operating status of the unit, consecutive bits have the following meaning):
 - Bit 0 = Standby - all correct - no fire signal;
 - Bit 1 = Fire - the device receives and sustains a fire signal;
 - Bit 2 = Reset - in addition to the "collective failure", there should be information in the BMS whether this failure is not caused by a deliberate action, i.e. "Reset";
 - Bit 3 = Smoke in the central unit;
 - Bit 4 = Correct operation - works after receiving SAP signal - identical to the contacts;
 - Bit 5 = Collective fault - if something is wrong - it reports it - identical to the contacts;
 - Bit 6 = No communication with the controller;
 - 2 bytes - the last 2 bytes of the answer are CRC answers



DEVICES OPERATION STATUS MONITORING – USER MANUAL



- ASB Monitor starts automatically after start of the computer

Main screen view

Presented screen is the default view of the application and has all aering units in the system. Information about the units can be found here, current pressure in protected zones, current flow through the aiering units, alarm list, and general state of the system. If other devices are connected to the main aiering unit (MAC-DMIN regulators, P-MACF converters), those devices will be shown on additional screen. To return to the main screen press

General state of the system

Stand-by

Fault

Fire

Brak alarmów

Alarmy:2		
Czas	Urządzenie	Alarm
2014-10-23 08:47:06	Klatka 1	Awaria zastąpienia pólki
2014-10-23 08:47:06	Klatka 1	Awaria zbiorcza

050 Pa

08:47

Indication, alarm description:

Main unit icon

1. SAP is displayed here when the unit receives the signal
2. Icon appears in complex systems. Pressing shows an additional screen.
3. Informational icon of the aeration unit. Pressing shows info screen
4. Icon showing the number of active alarms in the unit. Pressing shows individual alarm list.
5. Shows current state of the aeration unit is being shown
6. Only in the flow system. The arrow shows the current flow direction.

Main icon in complex system

During fire action you can see: compression in the duct and pressure in the unit that received SAP signal. In stand-by mode first unit in line is shown.

Additional screen in complex system with regulators

You can see: compression in the duct, pressure in protected space, degree of opening of the regulating throttle

Additional screen in complex system with pressure converters

During fire action you can see: compression in the duct (reserve sensor) and pressure from the unit that received SAP signal – similarly shown is the regulators screen

Unit description screen

To close the screen press again

Individual alarm list

To close the screen press again

Fault unit description screen

Inspection reminder screen

When yearly inspection is approaching, reminders will be shown. Reminders are shown 1 month, 2 weeks and a day prior to the inspection. After that they are shown everyday and are informational.

Rys.15.37. MSPU User Manual.

16. Preparation for commissioning

Commissioning of the iSWAY-FC, iSWAY-WFC, iSWAY-RFC (SAFETY WAY system), must only be carried out by the SMAY Service or an authorised SMAY Service Centre when the fire protection system is put into operation.

Before starting up the unit/system, perform the steps to prepare the unit/system for start-up. To do this, check that:

1. there is no contamination inside the ducts and the aeration unit
2. during the assembly work, the components of the aeration unit and installation, automation or automation elements were not damaged,
3. all components of the unit/system are properly installed mechanically and connected to the ventilation network,
4. the earthing conductors connecting the aeration unit to the ventilation ducts are correctly installed,
5. electricity receivers are properly wired and ready for operation,
6. the automation elements in the entire aeration unit are correctly mounted, wired and connected.

16.1. Electrical installation

Before closing the components of the SAFETY WAY system, check them:

1. based on the electrical and automation design for a given object (system) the compatibility of wire connections and connections between terminals,
2. the correctness of the applied protections of all electricity consumers,
3. tightening of all screws and correct installation of the holding elements and electrical connections (also unused auxiliary terminals - if any, unused glands, etc.),
4. cables and conductors in terms of meeting all the requirements for protection, layout, cross sectioning, etc,
5. correct execution of grounding and protective connections,
6. the inside of electrical and automation equipment, whether there are any residual wires left in it,
7. condition of gaskets and sealing surfaces

After performing the above-mentioned checking activities, all inspection panels should be carefully closed.

NOTE!!!

Operation with open inspection panels is not permitted.

16.2. Checking the readiness of the device for operation

The check of the overall efficiency and readiness for operation of the device comes down to checking the correctness of the power supply and the correctness of the individual components iSWAY-FC, iSWAY-WFC, iSWAY-RFC. To do this, follow these steps:

1. Check the position of the main switch ("0" switched off, "1" switched on)
2. Check the status of the 1H1 "Power Control" light on the enclosure cover SzA-FCP/K.
In the absence of light signalisation, proceed with the checks in point 3.

3. Check the status of the 1K1 phase control relay in the SzA-FCP/K cabinet. The red color of the LED on the relay indicates incorrect phase sequence or no phase. In this case, first perform the steps of point 3.

If the supply voltage is found to be correct, you should

- **turn off the power,**
 - change the connection sequence of phase 1 and 2 wires on the terminals of the XZ1 strip of the power supply and control cabinet SzA-FCP/K
 - turn on the power,
4. Check the phase supply voltage (230V +/- 5%) and the interphase supply voltage (400V +/- 5%) at the terminals of the XZ1 strip of the SzA-FCP/K power supply and control cabinet based on the electrical design. If the measured voltage values deviate from the permissible parameters, discontinue further commissioning and notify the relevant technical service on site.
 5. Check that the shut-off damper is in the fully closed position (damper blade in the perpendicular position to the direction of air flow, actuator indicator in the position +85;+95[°]).
 6. Check 24V (+/- 10%) at the terminals of the power supply and control cabinet SzA-FCP/K (based on the cabinet design). If the measured voltage values deviate from the permissible parameters specified in the DTR of the power supply, it is necessary to start service activities, based on the technical documentation of the power supply, aimed at diagnosing and removing the failure.
 7. Check the status of the controls on the automation components:
 - MAC-FC controller power light, and current status of the MAC-FC front panel LEDs



- UG-3-A40 channel housing smoke detectors

In case of lack of power supply signalling for the mentioned devices, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.

8. Check the state of supply of the actuator(s) of the shut-off damper by visual inspection of the actuators (after the voltage is applied, the dampers should go to the closed position - in about 150 seconds - damper blade in the position perpendicular to the direction of air flow, the indicator of the actuator in the position +85;+95[°])
9. Check the correct operation of TSS or TS indicators and display:
 - check the power supply status of TSS or TS panels ("Board power supply" lamp), in case of power failure check the correctness of electrical connections of panels on the basis of an appropriate electrical design
 - check the collective fault indication ("General fault" light),
 - check the status of the power supply and the accompanying system components based on the DTR documentation of the equipment
 - check the correctness of the pressure maintained display. During "Standby", the displayed value should be between 0 and 5[Pa]. In case of indication of values off the allowed range,

Operation and Maintenance Manual (DTR) iSWAY® Set of products
it is necessary to start service activities, based on the device's technical documentation,
aimed at diagnosing and removing failures.

Note:

The fault diagnosis must be carried out using the ASB Manager software after connecting the computer to the service connectors of the TSS, TS or MAC-FC device. Diagnosis can be performed by the SMAY service or by an authorized SMAY service provider based on the instructions of the ASB Manager.

17. Start-up and adjustment

The purpose of start-up is to prepare the device for operation, which is understood as the state "Standby" (no fire alarm) and "Operation" status (fire alarm or test connection).

Only the SMAY service or an authorized SMAY service, equipped with a set of specialized mounting and measuring instruments, is authorized to start up and calibrate.

NOTE:

Start-up may only be carried out if proper installation, electrical connections are made and the building is prepared for start-up.

NOTE:

Start-up must be carried out by at least two people.

18. Operation and maintenance

1. Before starting any operation and maintenance work, please read this documentation. In particular, the persons responsible for operating the equipment/system in service and maintenance are obliged to do so.
In the absence of trained personnel with specific technical skills, the current inspection of the equipment should be performed by SMAY Service or an Authorized SMAY Service.
2. Any damage to the iSWAY-FC, iSWAY-WFC, iSWAY-RFC or parts thereof (parts of the SAFETY WAY system) resulting from non-compliance with the guidelines contained in the documentation will not be subject to warranty repairs.
3. The iSWAY-FC, iSWAY-WFC, iSWAY-RFC (SAFETY WAY® system) may only be operated with the unit not in operation.

18.1. iSWAY® Daily test

The iSWAY-FC, iSWAY-WFC, and iSWAY-RFC device performs a daily test automatically every 24 hours. During each test, the efficiency of the part controlling the aeration fan is tested. During the test, the opening of the shut-off damper is checked and the fan is started (the inverter control is set to 10Hz as

Operation and Maintenance Manual (DTR) iSWAY® Set of products standard). The total daily test time shall not exceed 1 minute. As a standard, the daily test is set at 4:09 a.m. (the time may be changed by a SMAY service technician or by an authorized SMAY service technician), the activation of individual devices is silent and does not disturb the night's silence.

If the daily test is passed incorrectly, the "Failure" lamp is lit on the TSS/TS panel and the "Day Test Error" message is displayed on the MSPU. In order to reset the error of the daily test, reset the device with the switch "Reset SAP Fire" on TSS/TS. In the case of permanent activation of the "SAP Fire Cancellation" switch, the device will not perform a daily test.

All information about the tests are stored in the flash memory of the MAC-FC controller.

18.2. Automatic test of the device/system with control of operating parameters

Automatic testing of the device can be performed by a person who has received SMAY service training or an authorized SMAY service provider confirmed by a "Training Protocol" for iSWAY-FC, iSWAY-WFC, iSWAY-RFC devices .

For an automatic test of the iSWAY-FC, iSWAY-WFC, iSWAY-RFC with performance control, it is necessary to:

1. Call the fire alarm in the specified area where the fire signal activates iSWAY.
2. Check that the equipment/system is working satisfactorily - according to the "Fire Emergency Scenario" for the specific building/system.
3. Remove the SAP signal from iSWAY-FC, iSWAY-WFC, iSWAY-RFC from the fire detection and signalling system.
4. Deactivate the fire signal on the TSS panel or by using the "SAP Fire Cancellation" switch. The aeration fan should stop working.
5. Leave the device in standby mode.

Note:

If the system operation deviates from the requirements of the "Fire Incident Development Scenario" for a specific building/system, the following checks should be carried out:

1. Check that the device/system has received a fire signal (TSS or TS). In case the indicator does not signal the reception of the SAP signal, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
2. Check the "Correct operation" signal transmitted to the Fire Alarm System. In case the signal is not forwarded by the unit, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
6. Check the activation of the aeration fan (frequency inverter) 15 seconds after the SAP signal is given. In case the aeration unit is not activated, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
7. Check the indications of the differential pressure values between the protected space and the reference space on the held overpressure display on the TSS panel. Where all doors to the protected space are closed (not applicable to lift shafts), the pressure indication should be in accordance with the design guidelines for the facility. In case of lack of stable pressure value on the display, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures. If an MSPU is installed, the pressure values are displayed on the monitor screen in the visualization program.

8. Check whether the "SAP Fire" fire alarm light on the TSS panel has gone out after removing and deactivating the SAP signal. In case the indication light goes off, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures. In case the aeration fan would not stop its operation, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
9. Check the condition of the shut-off damper. Approximately one hundred and fifty seconds after the aeration fan has been switched off, the shut-off damper goes into the fully closed position. In case of no return to such state, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.

18.3. Manual test of the device with control of operating parameters.

Manual testing of the device can be performed by a person who has received SMAY service training or an authorized SMAY service provider confirmed by a "Training Protocol" for iSWAY-FC, iSWAY-WFC, iSWAY-RFC devices (SAFETY WAY system). Manual testing of the device may only be carried out if the device aerates a single space (staircase, lift, etc.) and there are no fire ventilation flaps in the airway that would have to open.

In order to correctly perform all activities related to the manual test of the iSWAY-FC, iSWAY-WFC, iSWAY-RFC with performance control, it is necessary:

1. Change the unit's operating mode switch "Fan manual switch-on" , on a TSS or TS panel, from "A" position - auto to "R" position - hand. After 15 seconds the aeration fan should be switched on.
2. Check that the equipment/system is working acceptably - according to the "Fire Emergency Scenario" for the specific building/system.
3. Change the "Manual fan activation" switch on the TSS panel from position "R" to position "A". The aeration fan should stop working. In case the aeration fan would not stop its operation, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
4. Leave the device in standby mode.

Note:

If the system operation deviates from the requirements of the "Fire Incident Development Scenario" for a specific building/system, the following checks should be carried out:

1. It has been activated. In case the device has not been activated, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
2. Check the "Correct operation" signal transmitted to the Fire Alarm System. In case the signal is not forwarded by the unit, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing faults.
3. Check the activation of the aeration fan (frequency inverter) 15 seconds after triggering. In case the aeration unit is not activated, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing failures.
4. Check the indications of the differential pressure values between the protected space and the reference space on the hold overpressure display on the TSS panel. Where all doors to the protected space are closed (not applicable to lift shafts), the pressure indication shall be in

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accordance with the design guidelines for the facility. In case of lack of stable pressure value on the display, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing faults. If an MSPU is installed, the pressure values are displayed on the monitor screen in the visualization program.

5. Check the condition of the shut-off damper. Approximately one hundred and fifty seconds after the aeration fan has been switched off, the shut-off damper goes into the fully closed position. In case of no return to such state, it is necessary to start service activities, based on the device's technical documentation, aimed at diagnosing and removing faults.

18.4. Maintenance and testing requirements according to standard 12101-6 and manufacturer's requirements

PN-EN 12101-6

Smoke and heat control systems

Part 6: Specification for differential pressure systems

Kits of Equipment

(...)

12 Acceptance tests

12.1. General provisions

The design recommendations given in this document assume that pressure differential systems are designed to overcome both the pressures of the chimney effect caused by non-pressurised shafts elsewhere in the building and the differences caused by wind.

The following five acceptance tests: differential pressure, net differential pressure, air velocity, door opening force and system activation should only be carried out when the installation has been completed and the differential pressure system and, where applicable, the air conditioning have been put into service and properly adjusted. All construction work should be completed.

12.2. Requirements for acceptance tests

NOTE In buildings higher than eight storeys, the tests specified in 12.2.1 and 12.2.2 shall be performed in groups of eight storeys.

12.2.1 Differential pressure

The first acceptance test should be carried out to determine the differential pressure caused by the wind and the chimney effect with the differential pressure fans switched on. The test(s) shall be carried out as follows:

- a) *Start the differential pressure system. Allow the fans to operate for at least 10 minutes to stabilize air temperatures;*
- b) *Switch off the fans of the differential pressure system, leaving all other components in their operating mode;*
- c) *Measure the pressure difference between the pressurised space and the corresponding utility room;*
- d) *Measure the difference between the staircase where the pressure will be increased and a suitable utility room on at least two floors.*

These readings should be taken using a calibrated pressure gauge with appropriate tube connections.

The measured differential pressure corresponding to the first acceptance test shall correspond to the minimum values indicated in Figures 2, 3, 4, 5, 6 and 7.

12.2.2 Net differential pressure

12.2.2.1 Second acceptance test

Within 15 minutes after meeting the requirements of 12.2.1 a second acceptance test shall be carried out, consisting of the measurement of the net differential pressure on both sides of all doors separating the space with increased pressure and the space with no increased pressure from a suitable service space on all storeys with the differential pressure system in operation.

12.2.2.2 *The change in measurements between the first and second pressure readings shall be compared with the performance requirements specified for design pressure differences.*

12.2.3 Air velocity

12.2.3.1 *In the third acceptance test the air velocity through the open door separating the high pressure space from the low pressure space shall be measured, which shall meet the requirements of Chapter 4 for the relevant system class. The test(s) shall be carried out as follows:*

12.2.3.2 *Measure the air speed using a calibrated manometer.*

12.2.3.3 *The measurement of the speed of flow through the relevant door shall be taken with all other doors open or closed in accordance with the relevant system class described in Chapter 4. The doorway shall be unobstructed (see Figures 2, 3, 4, 5, 6 and 7 for the relevant doors).*

12.2.3.4 *To determine more accurately the air velocity, take at least 8 measurements, evenly*

Operation and Maintenance Manual (DTR) iSWAY® Set of products distributed throughout the doorway. Calculate the arithmetic mean of these measurements or alternatively move the corresponding measuring device evenly across the open door and record the average air speed.

12.2.3.5 The calibration of all test equipment shall be such that the measurements are accurate to $\pm 5\%$.

12.2.4 Door opening force

12.2.4.1 The fourth acceptance test shall consist of measuring the force required to open the door in the case of a door between a high pressure and a non-pressurised space, as defined in Chapter 4. The opening force of an individual door shall be measured as follows:

12.2.4.2 Start the differential pressure system.

12.2.4.3 Attach the end of the force measuring device (e.g. spring weight) to the door handle, on the door side corresponding to the direction of opening.

12.2.4.4 Release all locking mechanisms, hold open if necessary.

12.2.4.5 Pull the free end of the force measuring device, noting the highest force measured during the opening of the door.

12.2.5 System start-up

The last test should consist in starting the automatic fire detection system (smoke detector) by letting smoke into the detector head. This in turn should activate the central fire alarm panel, thus activating the pressure differential.

13 Maintenance

13.1st General provisions

The pressure differential system, including the smoke detection system or any other fire alarm system used, the switching mechanism, the fans, the power supply systems of the equipment and the activation of the automatic ventilation equipment shall be subject to regular maintenance and functional test procedures.

The person responsible for the design of the system should provide the user with a list of devices to be checked periodically. Records of all maintenance and functional tests should be kept by the building management.

Any records should show repeated faults, so that potential system defects can easily be traced

13.2nd Maintenance requirements

13.2.1 *The equipment should be included in the maintenance schedule of the building services.*

13.2.2 *A maintenance and functional test schedule must be prepared.*

13.2.3 *All unsatisfactory results or faults in the maintenance of the equipment shall be recorded in a logbook and reported to the building management.*

13.2.4 *Maintenance of the equipment shall comply with the manufacturer's instructions.*

13.2.5 *The records shall indicate all reports of recurring faults which may be considered as design errors.*

13.3rd Weekly tests

13.3.1 *The pressure differential system shall be operated weekly. During system operation, check that the fans are working satisfactorily and that the ventilation system has worked.*

13.3.2 *The level of fuel in the auxiliary power supply shall be checked every week so that the amount of fuel is sufficient to operate the generator for the required time if the generator is an auxiliary power supply.*

13.4th Monthly tests

Each month, in addition to weekly tests, emergency source tests shall be carried out as well as power and backup equipment:

13.4.1 *Simulate the failure of the primary power supply and check that the system has automatically switched to an additional power supply. If the additional power source is a diesel generator, it shall supply the system for at least 1 h.*

13.4.2 *Simulate airflow loss situations and check that back-up fans, if any, are running.*

13.5th Annual tests

Every 12 months, in addition to the manufacturer's recommendations and monthly tests, the entire differential pressure system shall be tested by carrying out the acceptance test procedures in 12.2.1, 12.2.2, 12.2.3, and 12.2.4 in sequence.

13.6th Repeated tests

The entire differential pressure system shall be re-tested in accordance with 12.1 (acceptance tests) following any modification of the building which may have affected the differential pressure system, e.g. changes in internal divisions, extension and changes in the differential pressure system

13.7th Test results

The results of the tests shall be recorded as set out in Chapter 14.

13.8th Facilitating access for maintenance purposes

The system designer should provide easy access for maintenance purposes. When designing the system it is required to take into account installation, measurement/testing, adjustment, maintenance, repair and replacement according to the following conditions:

- a) Access must be provided to enable installation, repair and replacement to be carried out satisfactorily;*
- b) Access shall be provided for the inlet guide vanes of the fan(s) and dampers of the distribution system;*
- c) Inspection hatches shall be provided in ducts in the vicinity of control dampers and fire dampers;*
- d) There shall be sufficient free space around the generators;*
- e) To ensure safe access to manual triggering mechanisms of the flaps, if any, access panels must be placed.*

(...)

Recommendations of SMAY Sp. Z o.o. concerning the maintenance of the system and personnel performing weekly, monthly and annual tests:

1. The system should be tested on a weekly, monthly and annual basis.
2. Once a year a comprehensive review of the system should be carried out, including annual testing and maintenance activities.
3. Weekly, monthly and annual tests should be performed based on the recommendations of **PN-EN12101-6:2007**.
4. Weekly and monthly tests should be carried out by building service personnel trained by the system manufacturer.

5. Monthly tests should be carried out by building service personnel trained by the system manufacturer.
6. Annual tests should be carried out by the system manufacturer or by a qualified service technician authorized by the system manufacturer.

Annual tests should be carried out during the annual system inspection.

18.5. Battery handling

In the event of a power failure, it is not possible to recharge the batteries, which, however, provide the energy needed to sustain operation. The power failure must be rectified immediately to avoid disconnection on deep discharge, recharge the batteries and guarantee safe operation. If the batteries are critically low and not recharged after just a few days, there is a danger of permanent damage to the batteries.

Batteries are recommended to be tested at least once a year. In the event of decommissioning or temporary shutdown, disconnect the batteries to avoid deep discharge or damage. Charged but unconnected batteries can be stored for about 6 months. If stored for a longer period of time, they must be recharged.

18.6. Remote Access System

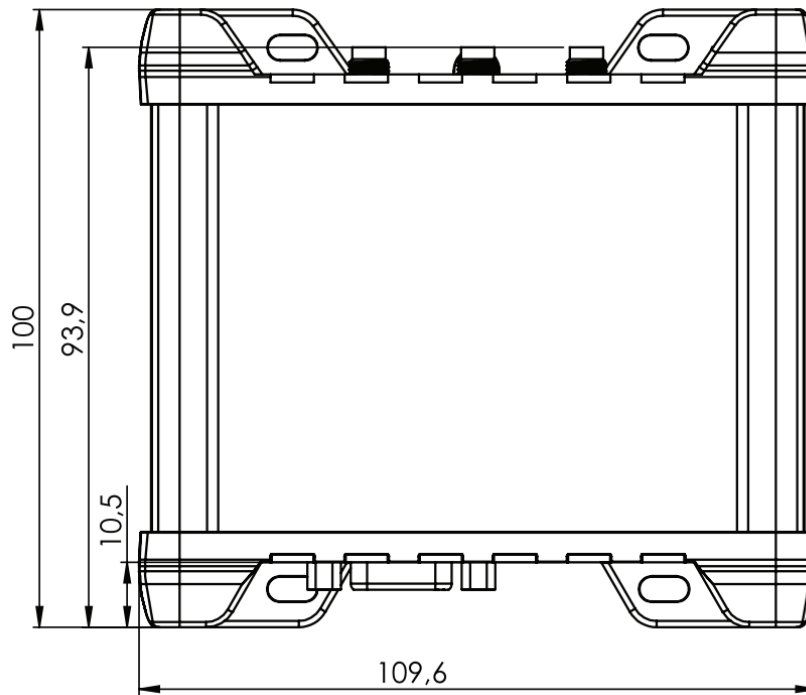
SafetyWay system can be optionally equipped with a dedicated remote service access system. The system allows service technician to connect remotely to the automation systems in the facility, which enables faster technical support.

The remote access system consists of:

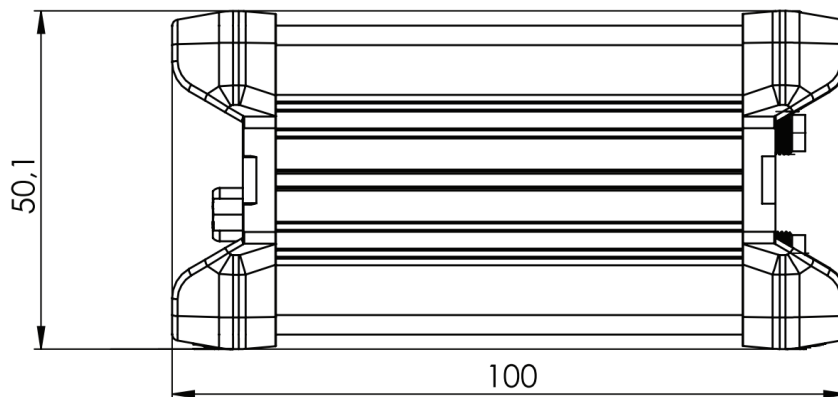
- RUT 955/956 Remote Access Router
- USB Type B or micro USB cable
- USB type A terminals with screw connection
- SIM card
- Additional antennas that amplify the GSM signal – optional

Technical data

Supply voltage	9–30 V DC
Power demand – in standby mode	<2 W
Power demand – maximum	<7 W
IP rating	IP30
Operating temperature	From -40°C to 75°C
Permissible humidity during operation	from 10% to 90%
Dimensions	109 × 50 × 103 mm
Weight	287 g



Rys. 10.1. RUT 955/956 Router Dimensions



Rys. 10.2. RUT 955/956 Router Dimensions

The remote access system connects to the automation systems via a USB connection. For the SafetyWay system, a USB cable with a type B plug is required. The other end of the cable does not have a connector. A USB Type-A connector with screw connection must be installed in order to connect it to the RUT955/956 router.

Remote Access System should be placed next to the TS/TSS panel and should be connected directly to it. TS/TSS panel should be ordered in a special version for Remote Access.

19. Health and Safety Instructions

1. Connection and start-up of iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® devices should be carried out by qualified personnel under conditions corresponding to the applicable regulations, especially in terms of operating the electrical equipment in accordance with the electrical and automation design for the facility/system.
2. Do not apply mains voltage before connecting the unit to the protective system.
3. It is forbidden to carry out any repair and maintenance work without first turning off the power.
4. Operating the unit with the inspection panel removed from any section of aeration units is forbidden.
5. The operator, repairer or maintainer must be qualified and licensed according to the regulations in force in the country where the equipment is installed.
6. The installation location of the iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC® must be equipped with the necessary protective equipment to ensure safe handling and the necessary fire safety equipment as required by local regulations.

20. Information

Cyclic inspections in accordance with the requirements of PN EN12101-6 part 6 concerning pressure differential systems guarantee reliable and failure-free operation for many years. These inspections are divided into weekly and monthly inspections, which are carried out by the technical services on site, specially trained by the SMAY service or an authorised SMAY service. When starting up the device, the technical services of the facility receive an Inspection and Maintenance Book. In addition to the inspections mentioned above, annual inspections are also carried out by SMAY Service or an authorised SMAY Service. In addition, service personnel are ready to take part in plant start-ups, maintenance work and to be at your disposal at any time in case of an emergency.

Delivery documentation:

Together with iSWAY-FC, iSWAY-WFC, iSWAY-RFC the customer receives:

- DTR of the iSWAY-FC®, iSWAY-WFC®, iSWAY-RFC®

When the iSWAY unit/system is started, the customer receives:

1. Start-up protocol
2. Internal calibration and measurement protocol
3. Inspection and maintenance book

21. OWG - Guarantee General Terms and Conditions

1. SMAY sp. z o.o. with its registered office in Kraków at ul. Ciepłownicza 29, 31-587 Kraków (hereinafter referred to as: "Warrantor"), NIP (Tax Number): 6782821888, REGON: 356295933, KRS: 000000007764, grants a quality warranty for sold products, materials, parts, workmanship or assembly and undertakes to remove defects free of charge if they occur during the warranty period under the terms and conditions specified in these General Terms and Conditions of Warranty.
2. The person entitled under the warranty is the purchaser - the entity which made a direct purchase of products from the Warrantor.
3. The warranty is valid in Poland for a period of 24 months from the date of sale by the Warrantor, unless an agreement provides otherwise.
4. The warranty period may be extended on terms agreed separately with the Warrantor.
5. Guarantee for fire safety systems and equipment and devices certified in the conformity assessment system 1 and for elements of the SmayLab® system is granted on condition that annual paid warranty reviews are conducted by the Warrantor or an entity authorized by the Warrantor on the basis of a separate agreement.
6. The basis for handling a complaint is to lodge a complaint within the warranty period within 3 days from the date of detection of a defect, making the product available in the condition in which the defect appeared, together with a detailed description of the technical problem and documents confirming the performance of all inspections, periodic checks and maintenance (if applicable) provided by the Warrantor and the applicable regulations. Complaints are filed by sending the completed form "Application sheet - service form" available on the website to the address of the Warrantor's registered office www.smay.pl or else the application will not be accepted. It is acceptable to send the application form by e-mail to serwis@smay.eu Continued use of the defective product is absolutely forbidden.
7. All visible defects, shortages and damage of the consignment delivered by the carrier must be noted by the warranty holder on the consignment note. Shortages, damage and defects which could not be detected with due diligence during delivery shall be reported to the Warrantor immediately after detection, or else the Warrantor shall lose their rights under the warranty.
8. A person entitled under the warranty is obliged to immediately report complaints about damage to shipments, but not later than 24 hours from the date of receipt of products by the person entitled under warranty.
9. The claimed product will be sent by the warranty holder to the Warrantor in a package guaranteeing protection against damage or destruction, after prior arrangement of settlement rules and specifying the method and date of shipment.
10. The return of defective products in order to replace them with defect-free products shall take place on time and under conditions agreed upon with the Warrantor.
11. If a complaint is accepted, the Warrantor is obliged, at his choice justified by the type of defect, to remove the defect or replace the product with a defect-free one. In justified cases the Warrantor may decide to reduce the price of the defective product.
12. The Warrantor reserves the right to repair the product in the framework of an approved warranty repair directly at the storage or installation site, including via a company authorised by the Warrantor, in the event that the transport of the product involves excessive costs or the risk of further damage.
13. In case the complaint is accepted, the Warrantor shall not be held responsible for costs related to disassembly and reassembly of the product in the place of installation.
14. The Warrantor undertakes to remove the defect within 14 working days from the date of receipt of a complete notification (and in the case of sending back the defective product to the Warrantor within 14 working days from the date of receipt of the defective product by the

Warrantor), and in the case of the need to bring in materials or parts that are difficult to access, the repair will be carried out in the shortest, technically justified time. The warranty period is extended by the duration of the repair. The person entitled under the warranty is obliged to enable the Warrantor to perform all necessary actions related to the determination of the causes of the failure and its removal. In the case of concealment or misrepresentation by the warranty holder of incorrect information, the warranty holder shall bear the costs of repair and shall lose the warranty granted to it.

15. The warranty is valid if:

- a) the products/system components which have been sealed at the factory (if applicable) are intact and original or have been fitted by the Warrantor or a seal service authorized by the Warrantor;
- b) the products/system elements are fully identifiable (in particular they have intact, legible rating plates, if any);
- c) all periodical, maintenance and service inspections and inspections required by the Warrantor and/or the applicable law, in particular those specified in the Operation and Maintenance Documentation (if applicable), applicable standards, including PN-EN12101-6 (if applicable), required by construction law (The Act of 7 July 1994 Construction law, consolidated text, Journal of Laws of 2018 , item 1202 as amended), required by the Act of 24 August 1991 on fire protection (consolidated text Journal of Laws of 2018 , item 620 as amended), properly documented in the Inspection and Maintenance Book and/or the object book.
- d) the products/elements of the system were properly installed, used, operated and maintained in accordance with the technical documentation of the Warrantor, including the Operation and Maintenance Documentation (if any).

16. The warranty does not cover:

- a) execution of the checks and inspections required by the Warrantor and/or the applicable law, periodical, maintenance and service inspections and inspections;
- b) claims to the technical data of the products/system components insofar as they comply with the information in the current documentation;
- c) normal wear and tear of equipment or parts thereof;
- d) consumption of products/system components defined as operational, whose lifetime depends on the intensity of use (e.g. circuit breakers, switches, tapes, fuses, batteries, accumulators, etc.);
- e) loss of data stored in the memory of relevant system components;
- f) loss of control application settings due to lack of basic power supply for a period longer than the warranty time of emergency power supply operation, after the start-up process is completed;
- g) malfunction of third party software used in cooperation with the purchased system.

17. The warranty does not cover damage caused by reasons attributable to the holder of the warranty or third parties, in particular:

- a) caused by incorrect power supply voltage or electrical installation, incorrect installation of the product/system, storage of its components or its operation in conditions and rules inconsistent with those specified by the Warrantor in the Operating Manuals, Operation and Maintenance Documentation;
 - b) negligence in timely and qualitative performance of the appropriate inspections, periodic checks and maintenance referred to in section 15(c) above;
 - c) resulting from the use of consumables (e.g. batteries, fuses, etc.) that do not comply with the instructions of the Warrantor in the Operation and Maintenance Documentation;
 - d) mechanical and electrical damage and defects caused by them;
- chemical and electrochemical damage resulting from the use of substances inconsistent with

the position material cards or from the use of a device made of improper material and defects caused by them;

damage to the lacquer coating caused by non-observance of the "Terms and conditions of storage and transport of lacquer products" instructions (manual available at www.smay.pl); when repairs and interferences in the system were made by unauthorized persons and not authorized by the Warrantor.

18. The warranty does not cover damage caused directly or indirectly by force majeure events such as, in particular: flood, fire, lightning, etc..

19. In the event of unjustified claims by the person entitled under the guarantee. The Warrantor charges a diagnostic and logistic fee according to the " Service Work Tariff ", available at www.smay.pl. Transport costs in the event of unjustified claims shall be borne in full by the warranty holder.

20. In the event of the existence of any payable financial obligations of the authorized person under the warranty towards the Warrantor, the obligation of the Warrantor to remove the defect is suspended until the time of their payment, while the course of the warranty period is not suspended.

21. Warranty liability of the Warrantor for physical defects of products and services is excluded.

22. The Warrantor's liability for actual damage resulting from a product defect is limited to the value of the order / contract, which included the defective product; the Warrantor's liability for lost profits is excluded.

23. In matters not regulated above, the provisions of the Civil Code shall apply.

24. These General Terms and Conditions of Warranty - Smay sp. z o.o. come into force on 01/07/2019.