ZUP-ZUP-L

Power Supply Unit for
Fire Safety Systems

Operation and Maintenance Manual

www.smay.eu

SMAY reserves the right to modify this document.

Spis treści

1 Introduction

Careful reading of this manual, installation and usage of the **ZUP** units in accordance with instructions provided in this document, as well as complying to all safety conditions constitute the basis of proper and safe operation of the device.
It is assumed that transport and installation of the ZUP power supply, connecting the systems associated with the device, as well as maintenance and repair works are carried out by **qualified personnel** or supervised by authorized persons.
A **qualified person** is a person who is properly trained, and has professional experience regarding electrical and mechanical machines, and the knowledge of essential standards, documents and rules concerning safety and work conditions.
This operation and maintenance manual contains detailed information about possible configurations of ZUP, installation examples, as well as launching and usage. If the power supply units are used in accordance with their intended purpose, this documentation, as well as other documents delivered with the units, contain guidelines sufficient for qualified personnel.

-Installation of the unit, connecting the associated systems, launching, operation and maintenance shall be performed in accordance with directives and legal regulations valid in the country, where the unit is installed.
-It is recommend to seek assistance of SMAY Authorized Service Points during assembly, installation, launching, as well as repairs and maintenance activities.
-The documentation shall always be kept near the device and be easily accessible for the service personnel.

NOTE:

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

2 Legal Regulations

2.1 Placing on the market

The power supply for the ZUP Fire Equipment was introduced to the market on the basis of the following documents issued by the Scientific and Research Center for Fire Protection - National Research Institute in Józefów:

1. Certificate of admittance: 3970/2020
2. Certificate of constancy of performance: 1438-CPR-0406

The ZUP fire equipment power supply has been marked by the manufacturer with the sign of the admitting authority for the Scientific and Research Center for Fire Protection - National Research Institute in Józefów (CNBOP-PIB).

2.2 Deklaracja właściwości użytkowych

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

DEKLARACJA WŁAŚCIWOŚCI UŻYTKOWYCH
DECLARATION OF PERFORMANCE
008-CPR-2015

1. Niepowtarzalny kod identyfikacyjny typu wyrobu: **Zasilacz do systemów kontroli rozprzestrzeniania dymu i ciepła typu ZUP i ZUP-L (Zasilacz Urządzeń Pożarowych)**	Unique identification code of the product type: **Power supply equipment for smoke and heat control systems type ZUP and ZUP-L (Power Supply for Fire Equipment)**
2. Zamierzone zastosowanie lub zastosowania: Bezpieczeństwo pożarowe – zasilanie urządzeń / elementów w systemach sygnalizacji pożarowej, systemach kontroli rozprzestrzeniania dymu i ciepła oraz innych urządzeń przeciwpożarowych pracujących w warunkach pożaru	Intended use/es: Fire safety – power for system devices / elements in fire detection and fire alarm systems, smoke and heat controls systems and other fire protection equipment operating in the fire conditions
3. Producent SMAY Sp. z o. o. Podłęże 678, 32-003 Podłęże, Poland	Manufacturer:
4. Upoważniony przedstawiciel: nie dotyczy	Authorized representative: not applicable
5. System(-y) oceny i weryfikacji stałości właściwości użytkowych: System 1	System/s of AVCP: System 1
6. Norma zharmonizowana: EN 12101-10:2005+AC:2007 EN 54-4:1997+AC:1999+A1:2002+A2:2006	Harmonized standard: EN 12101-10:2005+AC:2007 EN 54-4:1997+AC:1999+A1:2002+A2:2006
Jednostka lub jednostki notyfikowane: **Centrum Naukowo - Badawcze Ochrony Przeciwpożarowej im. Józefa Tuliszkowskiego** **Państwowy Instytut Badawczy** ul. Nadwiślańska 213, 05-420 Józefów **Numer identyfikacyjny: 1438** Nr certyfikatu stałości właściwości użytkowych:**1438-CPR-0406**	Notified body/ies: **Centrum Naukowo - Badawcze Ochrony Przeciwpożarowej im. Józefa Tuliszkowskiego** **Państwowy Instytut Badawczy** ul. Nadwiślańska 213, 05-420 Józefów **Notified body No. 1438** No. Certificate of constancy of performance: **1438-CPR-0406**

NIP: 678-282-18-88, Regon: 356295933, KRS: 0000007764, BDO: 000042468,
Sąd Rejonowy dla Krakowa-Śródmieścia, XI Wydział Gospodarczy Krajowego Rejestru Sądowego.
Kapitał zakładowy spółki: 50.000 PLN.

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

7. Deklarowane właściwości użytkowe / Declared performance:

Zasadnicze charakterystyki wyrobu EN 54-4:1997 + A1:2002 + A2:2006+AC:1999 ***Essential characteristics of the product***	**Właściwości użytkowe** ***Performance***
Skuteczność zasilacza / *Performane of power supply*	
Wymagania ogólne / *General requirements*	spełnia / pass
Funkcjonalność / *Functions*	spełnia / pass
Materiały, konstrukcja i wykonanie / *Materials, design and manufacture*	spełnia / pass
Niezawodność eksploatacyjna / *Operational reliability*	
Wymagania ogólne / *General requirements*	spełnia / pass
Funkcjonalność / *Functions*	spełnia / pass
Materiały, konstrukcja i wykonanie / *Materials, design and manufacture*	spełnia / pass
Dokumentacja / *Documentation*	spełnia / pass
Znakowanie / *Marking*	spełnia / pass
Trwałość niezawodności działania: odporność na działanie temperatury / *Durability of operational reliability, temperature resistance*	
Zimno (odporność) / *Cold (operational)*	spełnia / pass
Trwałość niezawodności działania: odporność na wibracje / *Durability of operational reliability, vibration resistance*	
Uderzenie (odporność) / *Impact (operational)*	spełnia / pass
Wibracje sinusoidalne (odporność) / *Vibration, sinusoidal (operational)*	spełnia / pass
Wibracje sinusoidalne (wytrzymałość) / *Vibration, sinusoidal (endurance)*	spełnia / pass
Trwałość niezawodności działania: odporność na wibracje / *Durability of operational reliability, vibration resistance*	
Kompatybilność elektromagnetyczna (odporność) / *Electromagnetic compatibility (EMC), immunity tests (operational)*	spełnia / pass
Trwałość niezawodności działania: odporność na wilgotność / *Durability of operational reliability, humadity resistance*	
Wilgotne gorąco stałe (odporność) / *Damp heat, steady state (operational)*	spełnia / pass
Wilgotne gorąco stałe (wytrzymałość) / *Damp heat, steady state (endurance)*	spełnia / pass

Zasadnicze charakterystyki wyrobu EN 12101-10:2005 +AC:2007 ***Essential characteristics of the product***	**Właściwości użytkowe** ***Performance***	
Niezawodność eksploatacyjna / *Operational reliability*		
Funkcje / *Functions*	spełnia / pass	
Materiały, konstrukcja i wykonanie / *Materials, design and manufacture*	spełnia / pass	
Parametry eksploatacyjne w warunkach pożaru / *Operating parameters in fire conditions*	ZUP	ZUP-L
Postanowienia ogólne / *General provisions*	spełnia / pass	NPD[1)]
Źródła zasilania – postanowienia ogólne / *Power supply source – general provisons*	nie dotyczy / not applicable[2)]	
Czas zadziałania / *Response time*	ZUP	ZUP-L
Postanowienia ogólne / *General provisions*	spełnia / pass	NPD[1)]
Źródła zasilania – postanowienia ogólne / *Power supply source – general provisons*	nie dotyczy / not applicable[2)]	
Zasilanie z rezerwowego źródła zasilania (baterii) / *Power supply from reserve source (battery)*	spełnia / pass	
Zasilanie z rezerwowego źródła zasilania (prądnic) / *Power supply from reserve source (generator)*	NPD[1)]	

1) NPD (właściwości użytkowe nieustalone) / *NPD (No Performance Determined)*
2) nie dotyczy – zasadnicza charakterystyka nie ma zastosowania do wyrobu / *not applicalbe – the essential characteristic does not apply to the product*

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

8.	Właściwości użytkowe określonego powyżej wyrobu są zgodne z zestawem deklarowanych właściwości użytkowych. Niniejsza deklaracja właściwości użytkowych wydana zostaje zgodnie z rozporządzeniem (UE) nr 305/2011 na wyłączną odpowiedzialność producenta określonego powyżej.	The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

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

Dyrektor Zarządzania Jakością
Quality Systems Director

mgr inż. Piotr Dąbrowski

Podłęże, 27.07.2022

miejsce i data wydania
place and date of issue

3 Product Description

3.1 Application

ZUP/ZUP-L modular power supply is designed for supplying low and ultra-low voltages (max: 1000 V AC, 1500 V DC) to the smoke and heat control systems, including the power supply of the smoke exhaust and makeup air fans, using frequency converters.

The power supply is also suitable for such equipment items as fire dampers (including fire ventilation dampers), smoke exhaust windows, smoke dampers, solenoid valves, electromagnetic door holders and gates.

The product successfully passed the functional tests and evaluation of performance parameters and has been granted the approval for using in fire protection systems by the Scientific and Research Centre for Fire Protection – National Research Institute in Józefów.

The difference between ZUP and ZUP-L:

The ZUP-L type power supply is not equipped with Automatic Reserve Switching (SZR).

3.2 Basis for the Study

The subject-matter of this study is an idea of a A class, UZS modular power supply for energy distribution of low and ultra-low voltages in smoke and heat control systems (series of PN-EN 12101 and PN-EN 54-4 standards).

The appliance has been created in order to meet the formal requirements for placing on the market systems of supplying certified devices by uncertified components (e.g. inverters, contactors, relays), for which there is no legal basis for evaluation according to I conformity evaluation system and for proving the reliability of such solutions.

This study is based on the provisions of PN-EN 12101, Part 10: "Power supplies".

It contains the following part:

(…)

"A power supply for smoke and heat control systems can be intended for supplying pneumatic systems, low voltage and ultra-low voltage electrical systems, and any combination of the above.

The power supply units for smoke and heat control systems can supply energy necessary for everyday ventilation of rooms and for supplying other fire protection devices operating under fire conditions".

According to Annex A to the above standard, low voltage is the voltage up to 1500 V DC and 1000 V AC. Ultra-low voltage is the voltage up to 75 V DC and 50 V AC.

ZUP power supply unit meets the requirements of PN-EN 12101, Part 10 and PN-EN 54-4 standards.

3.3 Operating principle

The **ZUP** power supply unit may be used for supplying the components both of fire safety and household ventilation systems.

The power supply unit is adapted to work with control signals by potential-free contacts. After receiving a signal, the relevant constituent module of the power supply switches on/off the power supply to a given consumer unit. If the consumer equipment is used in non-fire mode, it can be controlled by any control system (it is possible to install its components inside the ZUP housing). In the fire mode (master) for equipment connected to the power supply unit, the control signals are sent from the Control Panels or their modules. The control panels need to meet the requirements for fire and non-fire control.

When activated, the power supply continuously monitors the parameters of the mains and feeding lines to the respective components of the fire safety system. If any irregularities are detected, a generic failure signal is sent, and the corresponding LED starts to glow on the power supply's housing.

The power supply enables the Control Panel to monitor power transmission paths to the supplied fire safety components by using line control modules embedded in the power supply. The "Żubr" series power supply unit also fully controls activation of the respective modules by external monitoring units (it is possible to install them inside the ZUP housing).

4 Constituent modules

The power supplies are manufactured as integrated units provided with a specific number of component modules. The modular design makes it possible to adapt the device functionalities to individual demands, in terms of both the number of supplying devices and their types.

The description of modules presented below is optional and depends on the technical conditions at the installation site and the intended function of the unit assumed by the designer of the system supplied.

The mutual relations between modules result from the intended functionalities of the device and are subject to individual electrical design of each of the ZUP power supply unit pieces.

4.1 MZR Module - Reserve Activation Module

The reserve activation module is used for automatic switching between separate sources of electric energy (primary and backup) with the use of the Automatic Reserve Switching (MZR) system. In the event of the loss of the primary power source, the MZR automatically switches the power supply line to the backup power supply and signals the loss of the primary power supply. When primary power is restored, the MZR switches back to primary power supply.

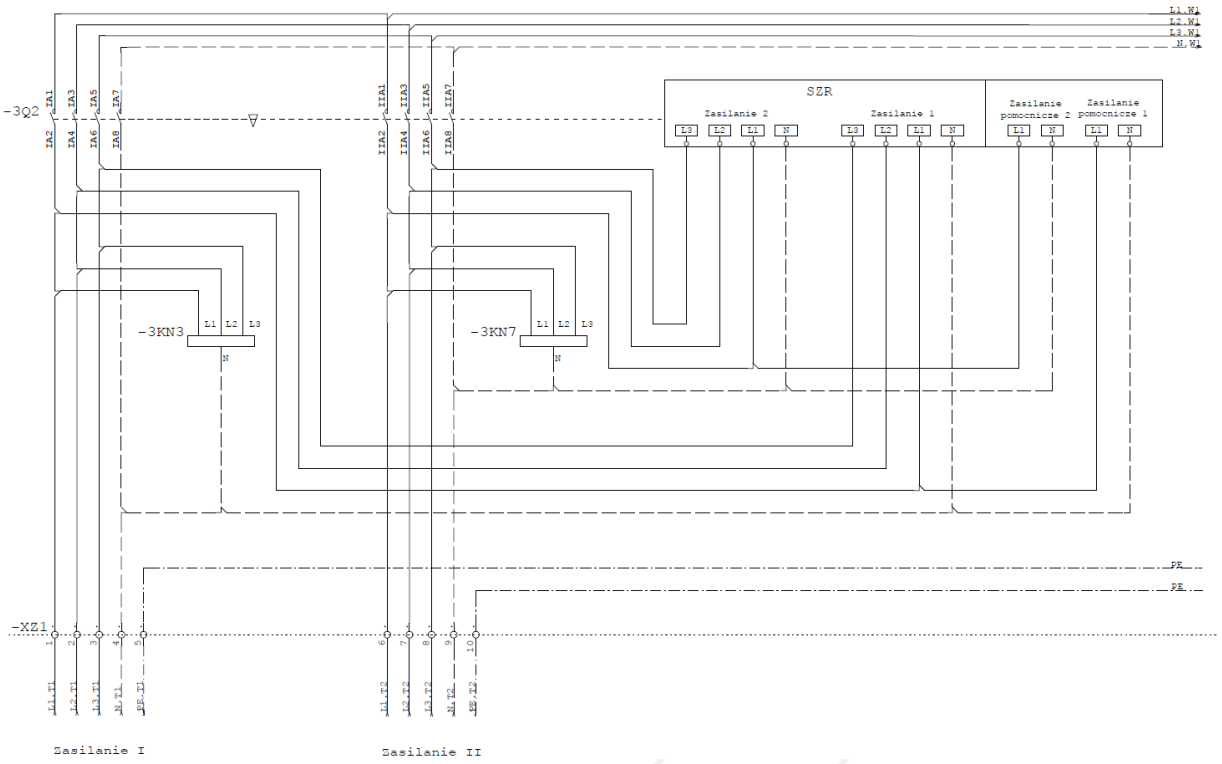


Figure 4.1 Diagram of the MZR module

The maximum switching frequency at the power input for the frequency converters used in the power supply has an important influence on setting the MZR interruption parameters.

Maximum number of switchings at the power input for converters:

- FC 101 for housing sizes H1-H5 - max. 1 time/30 sec
- FC 101 for housing sizes H6-H10 – max. 1 time/min
- FC 102 for power ≤ 7.5 kW – max. 2 times/min
- FC 102 for power 11 – 90 kW – max. 1 time/min

4.2 MZ24 Module – 24V DC Power Supply Module

24 V DC power supplying is carried out by the power supply unit adjusted for cooperating with batteries, which meets the requirements of PN-EN 12101-10 for signalling systems and firefighting automation.

24 V DC power supply unit is available in various power variants, depending on expected load (output current – from 5,5 A to 50 A).

The **MZ24** power supply module is equipped with a battery backup system. The batteries are selected so that their capacity meets assumptions of Item 6.2 of the standard. They are charged and monitored by the power supply unit. In case the discharge state or damage of batteries has been detected, the power supply unit reports an error to the Control Panel.. MZ24 can handle batteries with a capacity from 7.2Ah to 300Ah (depending on the power supply used).

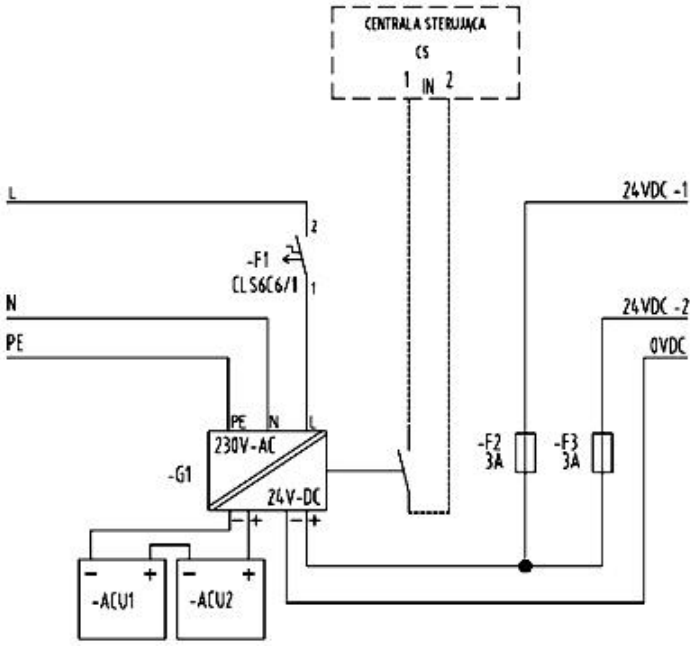


Figure 4.2 Schemat modułu MZ24 z podtrzymaniem bateryjnym

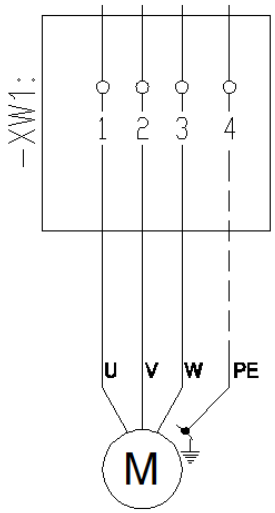
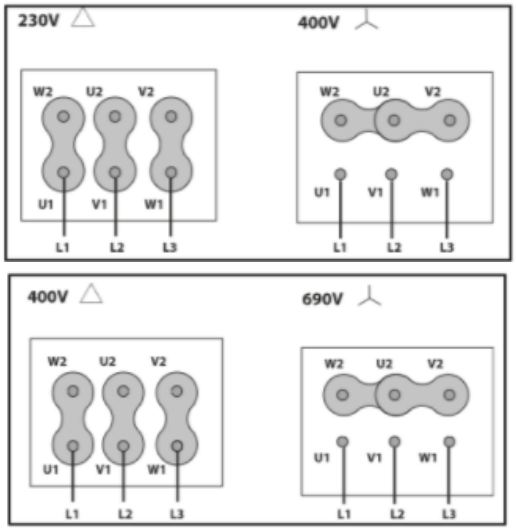
4.3 MZSW Module – Power Supply Unit for Fire Safety Fan Motors

In the ZUP and ZUP-L fire appliance power supplies, classic starting methods are used to start fan motors or other three- or single-phase drives:

Power contactors:

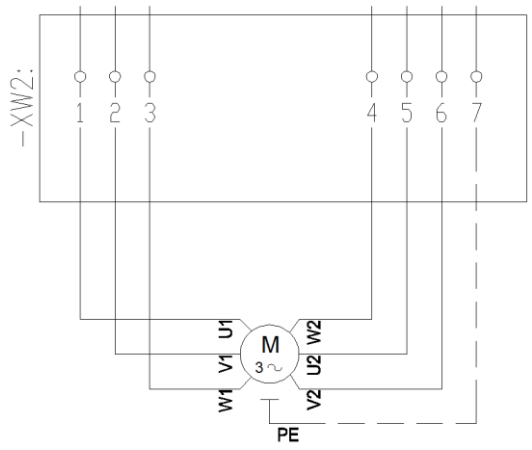
- **Direct activation (up to 5.5 kW) – MZSW-ZB** – consists in directly connecting an electric motor (e.g. a fan) to the network by activating the contactor coil, switching its contacts and applying the rated voltage to the motor terminals, a solution commonly used for motors with power up to 5.5 kW. The starting current can reach up to 8x In (rated motor current).

Table 4.1 Example of wiring and connecting a direct start motor

Wiring diagram	Recommended number of electric wires	Motor winding terminals
	4 x *(designed cable) **Terminal connection according to the supply voltage and motor nameplate.**	

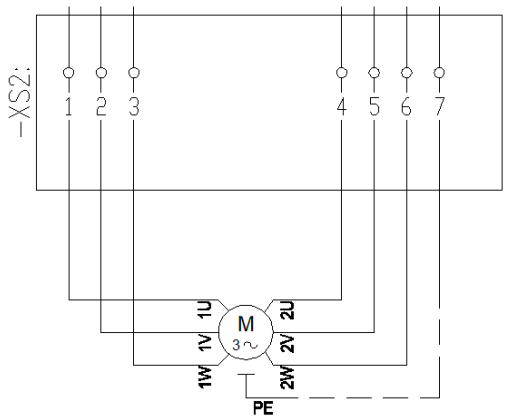
- **Activation through a star-delta system** (**from 7.5 kW to 75 kW**) – **MZSW-GT** – For higher power motors, a frequently used starting system is the Y/D system, which allows for significant reduction of the device's starting currents (up to 3x In) and reduction of wire cross-sections. In the initial phase of start-up, the motor windings are connected in a star manner, and the automation system switches them to a triangle when the rotor speed is reached, which reduces the power consumption from the network. This method is usually used for engines with power above 5.5 kW.

Table 4.2 Example of wiring and connecting a start-delta system (Y/Δ)

Wiring diagram	Recommended number of electric wires
	4 + 3 x *(designed cable) or 4 + 4 x *(designed cable) or 7 x *(designed cable)
	Separate output for each motor winding terminal.

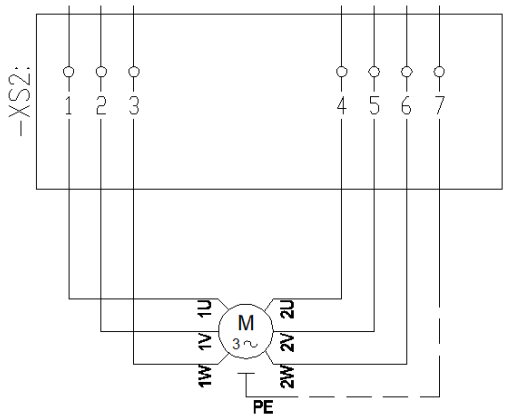
- Activation of first/second gear of the fan (**Dahlander system**) – **MZSW-2B** – a contactor system allowing automatic control of the engine speed by changing the number of pole pairs. The most common system is Y/YY (star/double star).

Table 4.3 Example of wiring and connecting with Dahlander system

Wiring diagram	Recommended number of electric wires
	4 + 3 x *(designed cable) or 4 + 4 x *(designed cable) or 7 x *(designed cable)
	Separate output for each motor winding terminal.

- **Activation of first/second gear of the fan** with two winding e.g. Y/Y – regulation of the rotational speed of motors with two independent windings, e.g. Y/Y

Tabela 4.4 Example of wiring and connecting in any direction motor

Wiring diagram	Recommended number of electric wires
	4 + 3 x *(designed cable) or 4 + 4 x *(designed cable) or 7 x *(designed cable)
	Separate output for each motor winding terminal.

- Activation in any direction – reverse/forward – **MZSW-2K** – allowing you to change the direction of fan rotation by changing the phase sequence, it is possible to use reverse operation in all the above-mentioned starting systems, also in two speeds.

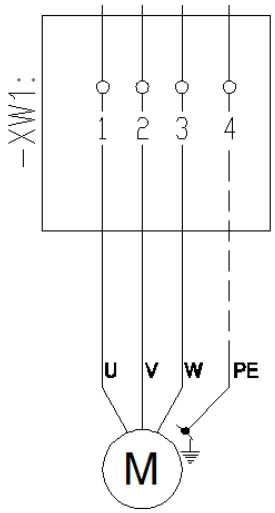
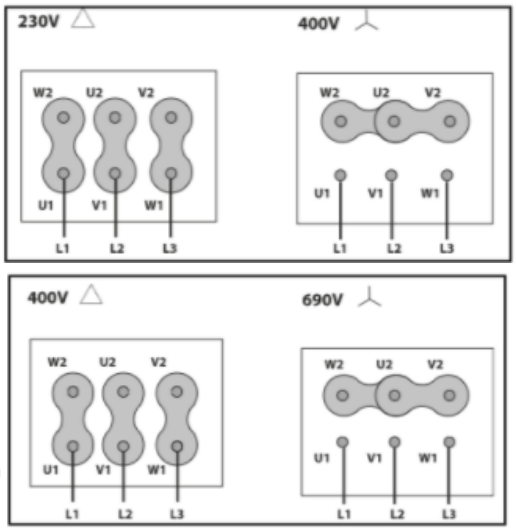
In contactor start-up systems, confirmation of the presence of drive power and contactor activation is used to confirm correct operation of the fan. It is also possible to check the continuity of the fan power supply circuit.

- Softstarter system

To start fan motors using the soft start, more commonly known as softstart systems, ZUP and ZUP-L power supplies use devices from renowned companies such as:

- ABB series PSR,
- Danfoss series MCD201 i MCD500

Table 4.5 Example of wiring and connecting with softstart

Wiring diagram	Recommended number of electric wires	Motor winding terminals
	4 x *(designed cable) **Terminal connection according to the supply voltage and motor nameplate.**	

The use of this type of devices allows the fan starting current to be reduced to approximately 4x In (rated current).

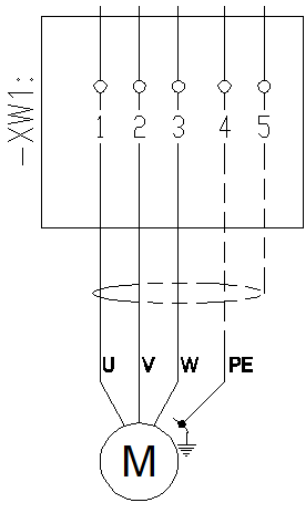
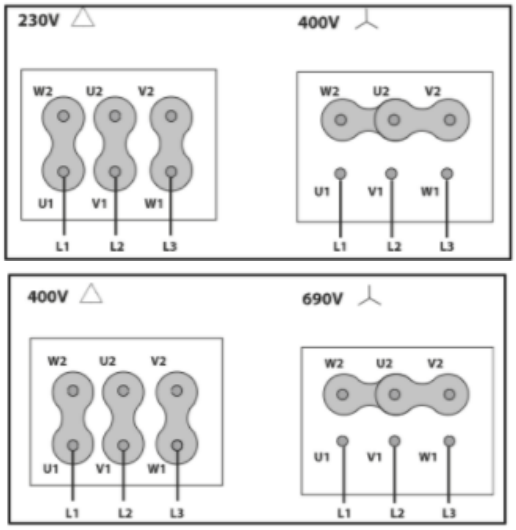
Frequency converters type:

- Danfoss series FC101 i FC102.
- Mitsubishi series FR-F800, FR-E800 and FR-CS80
- Eura series E810

The frequency converter may have braking resistors connected if it is to power fans operating at rapidly changing speeds. The converter can accept an analog signal in the range of 0-10VDC or (0-20)4-20mA determining the set speed of the powered engine.

Tabela 4.6 Example of wiring and connecting with frequency converter

Wiring diagram	Recommended number of	Motor winding terminals

	electric wires	
	4 x *(designed cable) with shield **Terminal connection according to the supply voltage and motor nameplate.** The power cable should be shielded	

The use of this type of devices allows the fan starting current to be reduced to approximately 2x In (rated current).

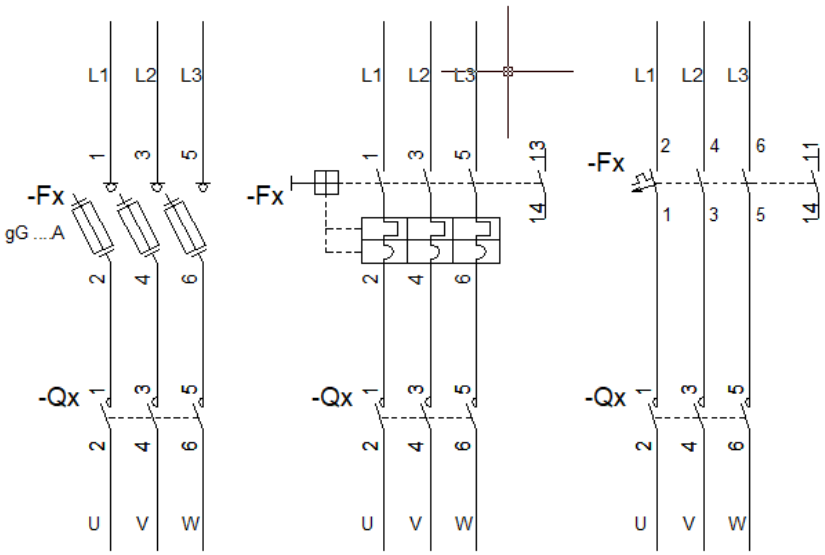


Figure 4.3 Diagram of the MZSW-ZB module powered by a contactor

For starting motors of higher power, star–delta changeover switches consisting of contactors (e.g. DILM) and time relays are used.

Depending on the power of the fan and its operating mode, the following modules, performing tasks listed below, may be applied:

- Direct activation (**up to 5.5 kW**) – **MZSW-ZB**
- Activation through a star-delta system (**from 7.5 kW to 75 kW**) – **MZSW-GT**
- Activation of first/second gear of the fan (**Dahlander system**) – **MZSW-2B**
- Activation in any direction – **MZSW-2K**
- Activation of first/second gear of the fan (**Dahlander system**) in any direction - **MZSW-2B2K**
- Activation and supplying through a frequency converter – **MZSW-FC**

Besides the distribution of electrical power needed for operation of the fans, the modules also monitor the operation status and possible failures of the power circuit. Operation confirmation and generic failure signals are transferred to the Control Panel.

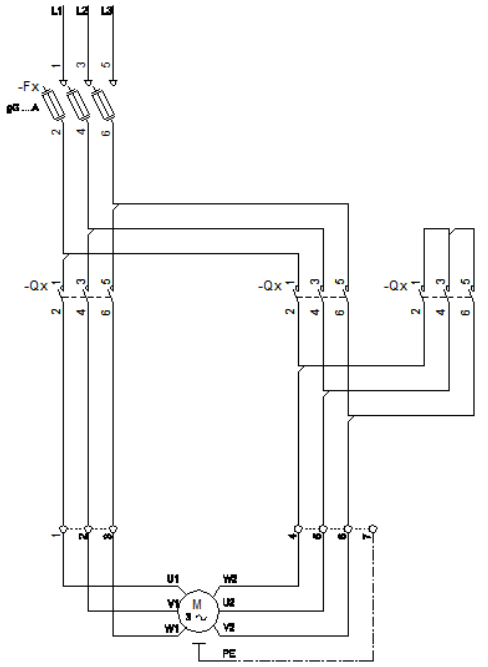


Figure 4.4 MZSW-GT module scheme – supplying motors with Y/Δ start-up

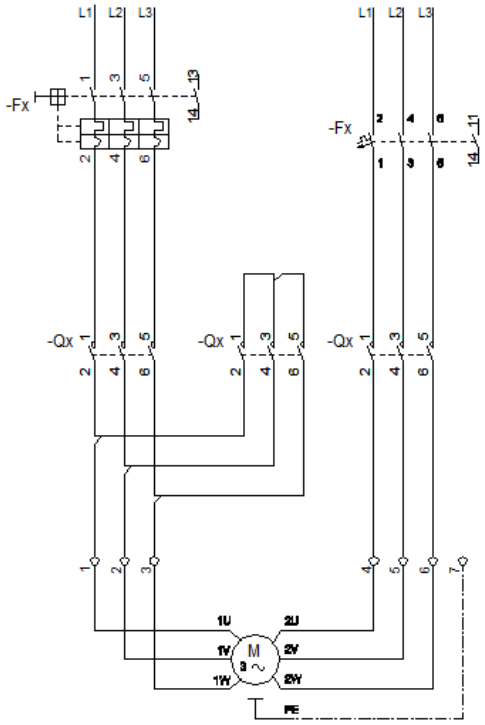


Figure 4.5 MZSW-2B module scheme – supplying bipolar electrical Dahlander motors

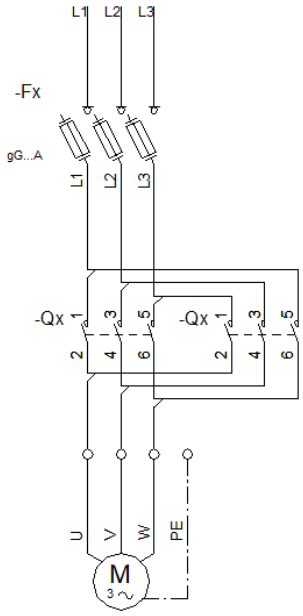


Figure 4.6 MZSW-2K module scheme – supplying bidirectional motors

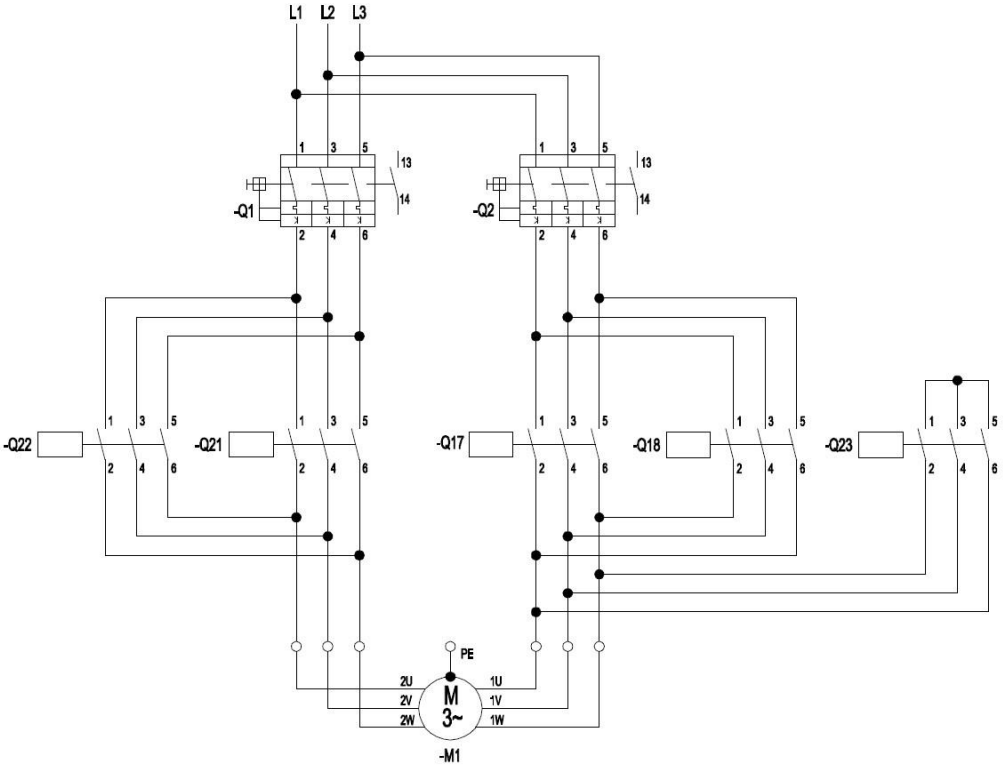


Figure 4.7 Diagram of the MZSW-2B2K module - power supply for two-speed, two-directional motors

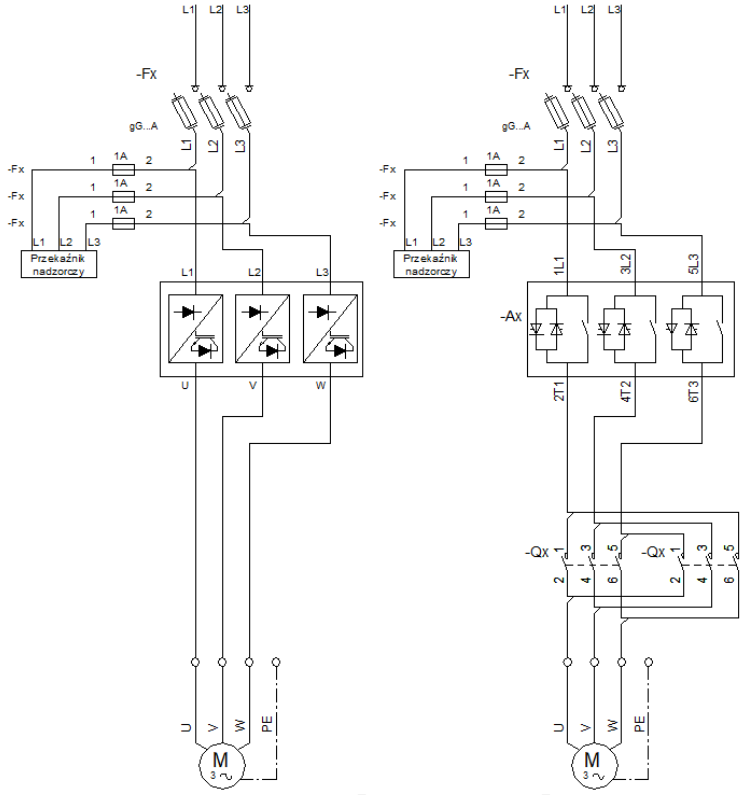


Figure 4.8 Diagram of MZSW-FC module – power supply wth frequency converter ang softstart

4.4 MZKDC Module - Power Supply Unit for Components of the Smoke and Heat Control System

These modules will provide guaranteed power supply for components of the systems described in PN-EN 12101-12. The supply lines of these devices are monitored for short and open circuit. The protection circuits of the powered devices may also be monitored. The line damage or protection activation signals are transferred to the Control Panel.

The modules are equipped with protection circuits selected for receivers and the supply line so that the fire protection conditions and the requirement of selectiveness of activation are met. Depending on the type and power of the receiver, the overcurrent protection or fuses with proper characteristics are used.

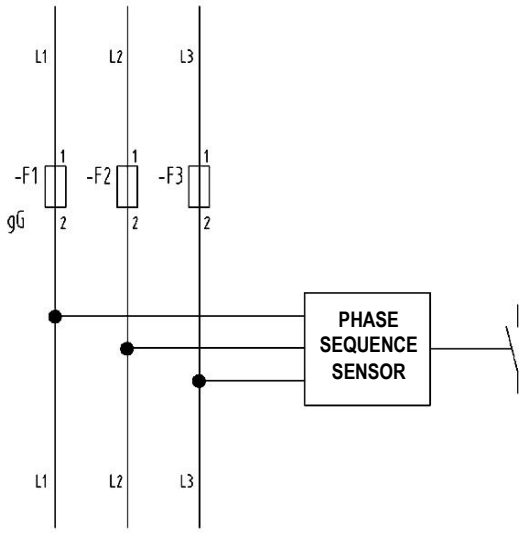


Figure 4.9 Scheme of a power supply module for the components of the smoke and heat control system

4.5 MZKP Module - Power Supply Unit for Fire Damper Actuators

These modules make it possible to supply the actuator or group of actuators of fire dampers (with transition to the fire position once the power supply failure occurs) and the fire ventilation (controlling supply changeover between the actuator contacts).

The position of the damper baffle is controlled in two positions – open and closed. Additionally, the Control Panel is capable of supervising the correctness of the damper operation by monitoring the time of change of the baffle position.

The supply outputs are protected with proper fuses which are monitored by the Control Panel.

The connecting and switching functions in the power circuit are performed by relays with monostable changeover contacts (NO and NC)

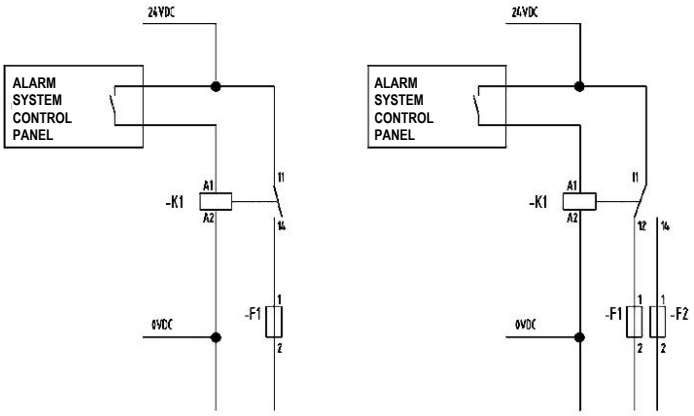


Figure 4.10 Scheme of a power supply module for fire damper actuators with a safe position and voltage overdrive

4.6 MZOD Module - Power Supply Module for Smoke Ventilation Window and Door Actuators

These modules make it possible to supply the actuator or group of actuators of fire windows and doors, controlled by the change of polarization of the mains voltage. In order to monitor the door or window status, the module can operate a potential-free contact of an additional reed relay.

The connecting and switching functions in the power circuit are performed by relays with monostable changeover contacts (NO and NC).

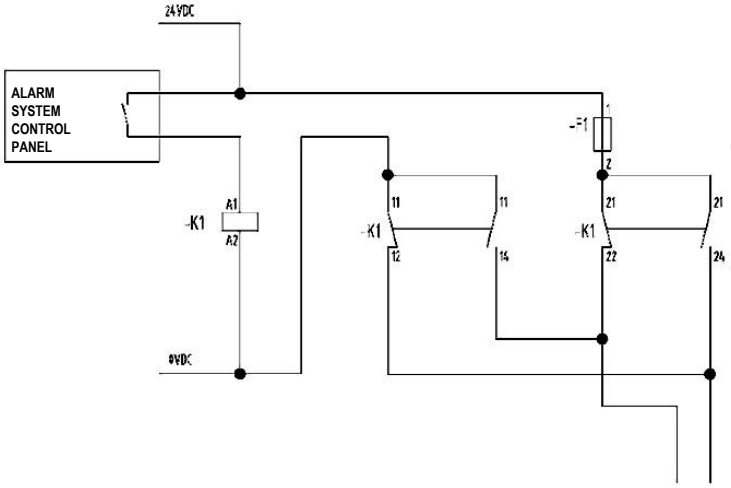


Figure 4.11 Scheme of a power supply module for smoke ventilation window or door actuators

4.7 MSOA Module - Module for Strobe Light Sirens

This module makes it possible to supply optical indicators, fire alarm sounders or strobe light sirens connected in parallel. The module safety circuits are adjusted according to the power and number of supplied signalling devices. The module may be adapted to 24 V DC or 230 V AC power supply.

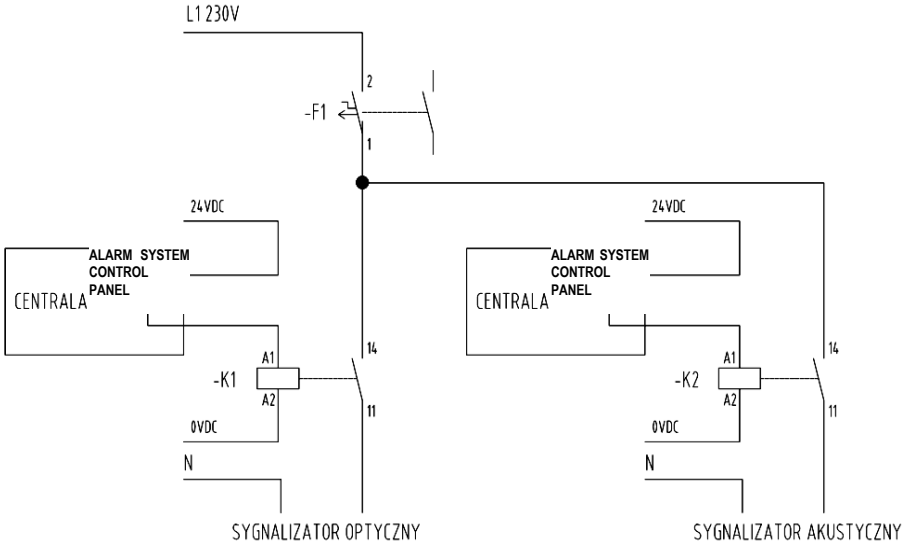


Figure 4.12 Scheme of the power supply module for strobe light sirens

4.8 MKL Module - Supply Line Control Module

This module makes it possible to detect the damage in power cables for peripheral actuators (e.g. fan motors, fire damper actuators). The MKL module makes the Control Panel capable of continuously supervising the status of the system supplying energy receivers.

4.8.1 MKL N-780

The N-780 Line Control Module makes it possible to detect open and short circuits in the fans power and control circuit along with the supervision of the motor winding. Due to the use of MKL N-780 it is possible to monitor the service (repair) switch applied in the fan wirelessly. Disconnecting the fan power and control circuit by the service switch is detected by the MKL N-780 module as an open transmission circuit which triggers the alarm. Thanks to this functionality, the cost of the service switch alone is reduced (no need for extending the circuit with additional position monitoring contacts) and the cost of the additional cable for monitoring the service switch position contact is completely eliminated.

With the use of MKL N780 it is possible to monitor power cables for fan motors in the following configurations:

- two fans with direct start-up (star or delta)
- two fans supplied and controlled by frequency inverters
- single fan with a star-delta start-up
- single two-speed and/or two-way Dahlander fan

Figure 4.13 MKL N780 Module

- Connect 24 V and 230 V AC power supply.
- The green D1 LED should indicate the activation of the system.
- Connect all motor windings according to the markings.
- In order to start the measurement apply 24 V voltage to the "contactor" input.

By pressing and holding the S1 button for about 3 seconds, the system memorizes the parameters of the windings of the engine being in good working order. It is the so-called "teaching process", indicated by the yellow D2 LED flashing. Once the process is successfully completed, this LED stops flashing and starts to light continuously.

Henceforth the system begins to analyse the status of the power supply and control transmission circuit for the motor along with its windings. In case of open or short circuit in the power supply circuit or motor winding, the module indicates this state by the red D3 LED flashing.

In order to shut the motor down disconnect the "contactor" input beforehand. Otherwise the system will suffer damage.

The S2 switch is used for selecting the module operating mode. When the switch is in position No. 1, the module is adapted for examining a single motor with 6 cables, whereas in position No. 0 the module works with two motors with 3 cables each.

Wiring diagrams:

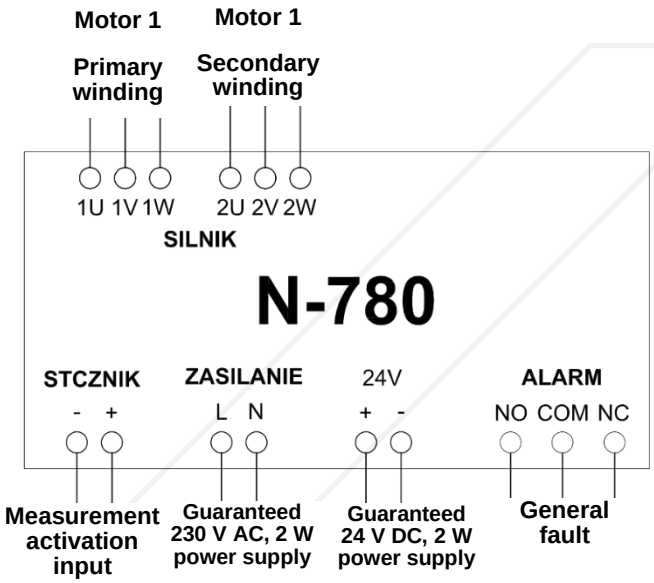


Figure 4.14 Monitoring the cable and windings of a single motor (star-delta or Dahlander system)

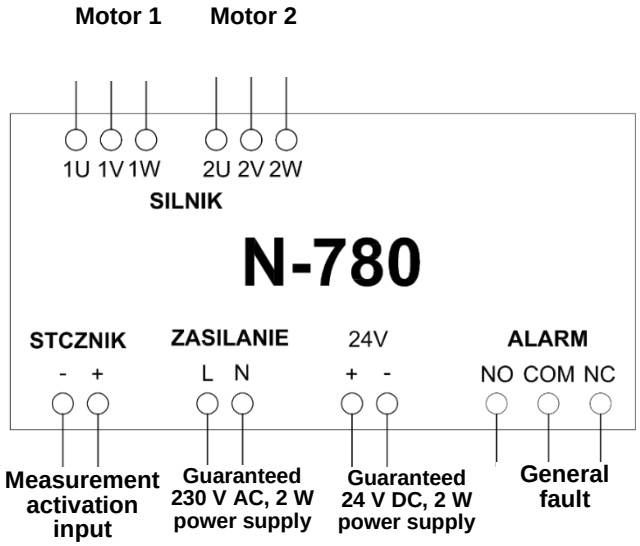


Figure 4.15 Monitoring the cable and windings of two motors

Technical Data:

Table 4.7 Technical data MKL N780 module

Power supply	230 V / 50 Hz +/-20%
Module power consumption	2 W
Ambient temperature	-25÷75 ºC
Maximum load of the "contactor" contact	4 A
Load capacity of the generic failure contact	3 A

4.8.2 MKL N-781/A

The N-781/A Line Control Module makes it possible to detect open and short circuits in the fire safety system actuators power circuits for supplying and controlling 230 V AC voltage, such as:

- fire ventilation dampers
- smoke dampers
- smoke exhaust windows
- doors

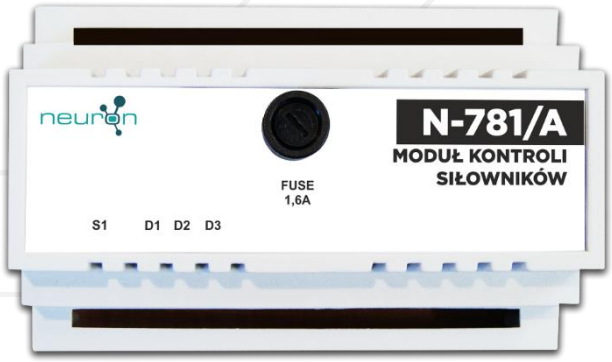


Figure 4.16 MKL N781/A Module

The MKL N-781/A module makes it possible to monitor the transmission circuit for a group of devices, provided that maximum power consumption of these devices does not exceed the maximum load current of the contact.

The module is powered by 230 V AC. Supply voltage for the actuator is applied to the "input". The actuator is connected to the "output". Once connected to the mains, the green D3 LED lights.

The module "teaching" procedure starts from the moment of applying 230 V power supply to one of the inputs (L1 or L2). The actuator needs to position itself in an outermost position; wait for 5 seconds and push the S1 button and hold it for about 3 seconds. The green LED will start flashing; once the "teaching" procedure is over it will be lighting continuously.

Then apply power supply to the second output and wait for the actuator to be positioned in the opposite outermost position. Wait for 5 seconds and push the S1 button and hold it

for about 3 seconds – the yellow LED will start flashing; once the "teaching" procedure is over it will be lighting continuously. The module is ready to work.

After any short or open circuit has been detected in the actuator power circuit, the module communicates this fact by means of the red D1 LED flashing.

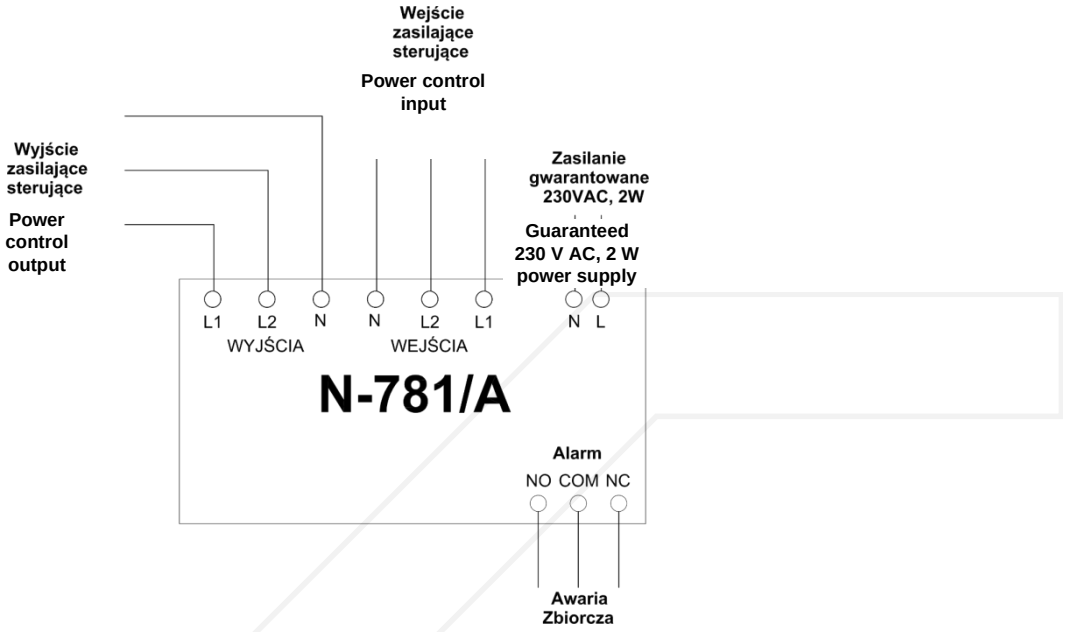


Figure 4.17 Monitoring the power and control circuit of a single or many three-wire or two-wire 24 V DC actuators

Table 4.8 Technical data of MKL N781/A module

Power supply	230V / 50Hz +/- 20%
Module power consumption	2W
Ambient temperature	-25÷75ºC
Load capacity of the generic failure contact	3A
Load capacity of the power supply and control output	350 mA – actuators working (up to 2 minutes) 20 mA – standby

4.8.3 MKL N-782/A

The N-782/A Line Control Module makes it possible to detect open and short circuits in the fire safety system actuators power circuits for supplying and controlling 24 V DC voltage, such as:

- fire ventilation dampers
- smoke dampers
- smoke exhaust windows
- doors

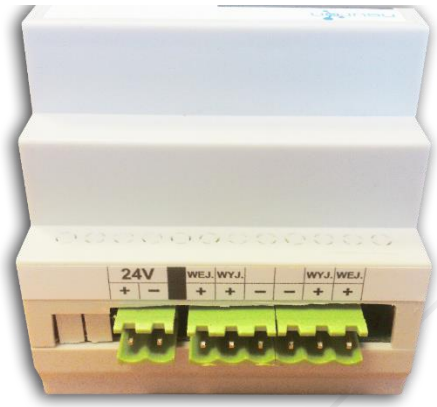
The MKL N-782/A module makes it possible to monitor the transmission circuit for a group of devices, provided that maximum power consumption of these devices does not exceed the maximum load current of the contact.

The MKL N-782/A makes it possible to monitor a line for devices with the three-phase control (-,+,+; power supply and control by means of changing the voltage applied to the

first or second "positive" contact of the actuator), and two-phase control (+,-; -,+; power supply and control by means of changing the polarisation of the supply voltage).

In case of the line monitoring for devices supplied and controlled by means of three wires, it is necessary to use the MKL N782/B module installed at the end of the supply and control line, directly before the supplied device.

Connecting the Module:



Supply voltage for the actuator is applied to the "input".

The actuator is connected to the "output".

The module can cooperate with two-wire or three-wire actuators.

The S2/S3 switches are for selecting the operating mode of the device (two-wire/three-wire actuator).

Setting S2 and S3 switches in the right position (when viewed from the front of the device) means the three-wire mode is selected.

The D3 LED indicates that the module is connected to power supply.

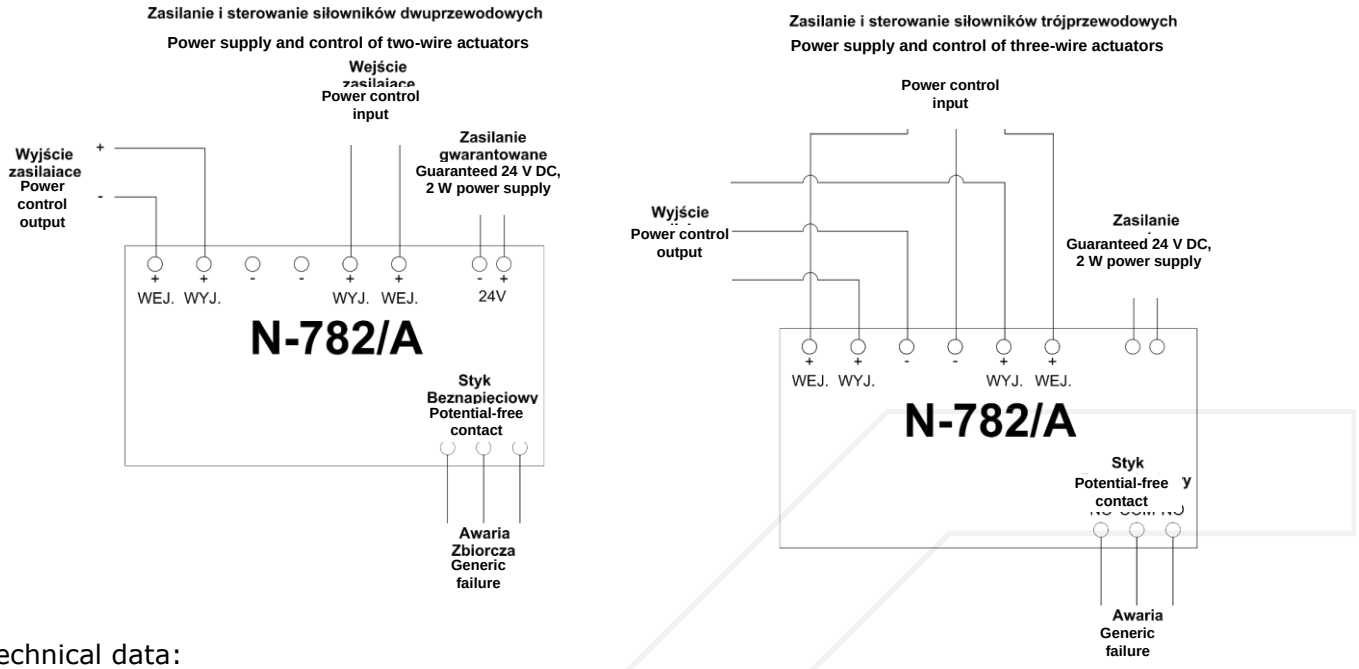
The module "teaching" procedure starts from the moment of applying 24 V power supply to one of the inputs (left or outermost right terminal of the connector). The actuator needs to position itself in the outermost position; wait for 5 seconds and push the S1 button and hold it for about 3 seconds. The green LED will start flashing; once the "teaching" procedure is over it will be lighting continuously.

Then apply power supply to the second output and wait for the actuator to be positioned in the opposite outermost position. After 5 seconds push and hold the S1 button for about 3 seconds. The yellow LED will start flashing; once the "teaching" procedure is over, it will be lighting continuously. The module is ready to work.

After any short or open circuit has been detected in the actuator power circuit, the module communicates this fact by means of the red D1 LED flashing.

In case of a two-wire actuator, the "teaching" process is similar to teaching a three-wire actuator, however the voltage applied to the "inputs" is (+ -) or (- +).

Wiring diagrams:



Technical data:

Table 4.9 Technical data of MKL N782/A module

Power supply	24 V DC
Module power consumption	2 W
Ambient temperature	-25÷75 ºC
Load capacity of the generic failure contact	3 A
Load capacity of the power supply and control output	5 A – actuators working (up to 2 minutes) 280 mA – standby

4.8.4 MKL N-782/B

The N782/B line control module supports supply and control line monitoring of three-wire 24 V DC actuators.

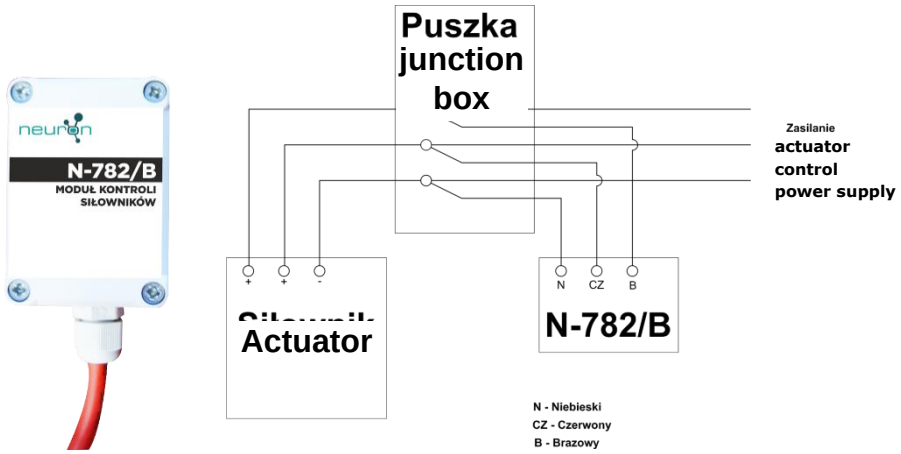


Figure 4.18 Module MKL N-782/B

Technial data:

Table 4.10 Technical data of MKL N782/B module

Power supply	24 V DC
Module power consumption	2 W
Ambient temperature	-25÷75 ºC

The system is installed in the vicinity of the actuator by connecting it to the junction box along with the actuator. It has three terminals:

Blue wire – GND

Black wire – first supply line

Brown wire – second supply line

The D4 and D5 LEDs indicate which line is currently powered. When the actuator changes its direction of operation, the first LED goes off and the second one goes on.

If both LEDs light simultaneously or none of them is on, this indicates failure of the actuator supply line.

4.9 MMG Module - Power Generator Module

In case of a backup power supply system in the form of a power generator, the "ZUP" power supply unit may be equipped with a relay outputs module which receives diagnostic signals sent by the generator in the form of potential-free contacts. Signals specified by PN-EN 12101-10 are as follows:

- Too low voltage of start-up batteries
- Start-up failure
- Too high engine temperature
- Too low engine oil pressure
- Overspeed
- Generator overload
- Low fuel level (for less than 3 hours of operation)

The monitoring module transmits the status of these signals to the Control Panel as individual signals or the generator generic failure signal. The failure information may also be transferred to the front panel of the "ZUP" power supply unit in the form of individual signals or a generic signal.

Detecting and signalling functions are fulfilled by relays with monostable changeover contacts (NO and NC).

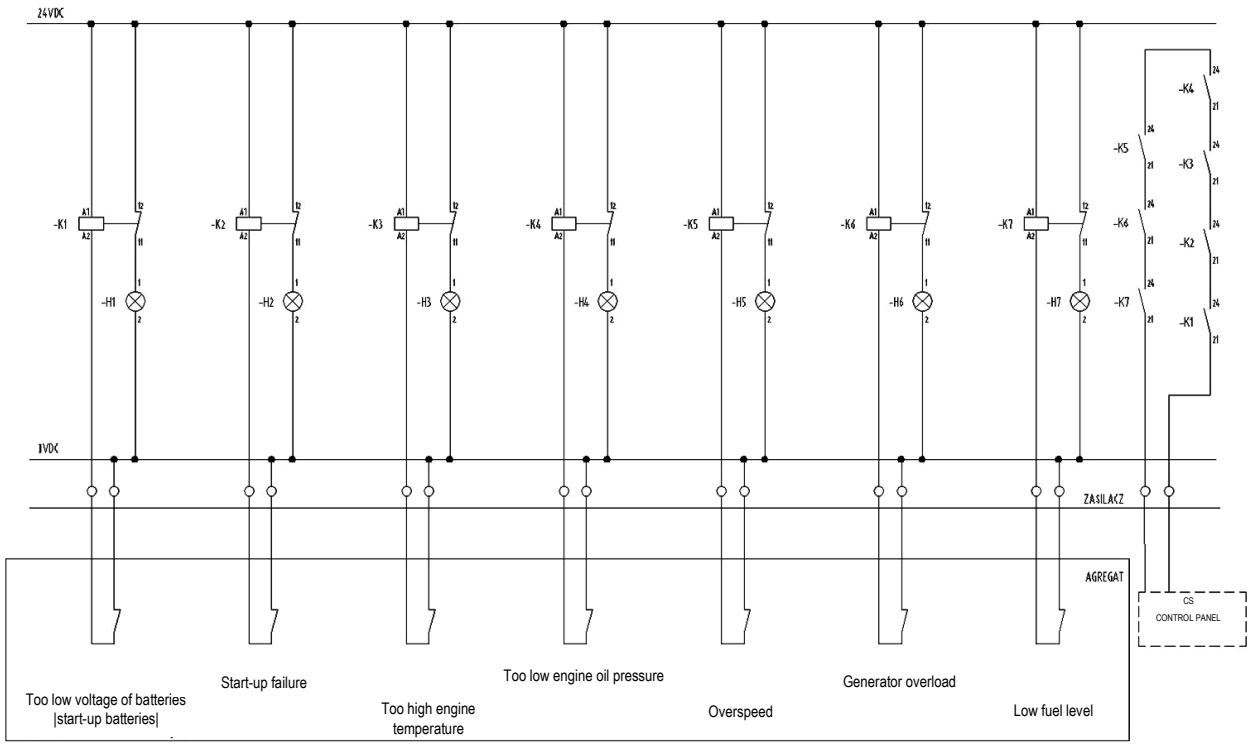


Figure 4.19 Diagram of the monitoring module for a power generator with the generic failure signal transferred to the Control Panel

4.10 MPP Module - Overvoltage Protection Module

This module protects the installation and supported devices against consequences of overvoltage resulting from:

- close or direct lightning strike at the installation elements
- switching processes in the electric network (motor commutation discharge)

The module includes lighting arresters (e.g. SPB-type) including varistor sets (plus spark-gap arresters optionally) and an auxiliary contact for indicating the state of varistors, which is the source of the information about the necessary replacement, sent to the Control Panel.

In case of the main protection with the amperage higher than 160 A, the overvoltage protection shall be supplemented with fuses (-F1) of the same amperage.

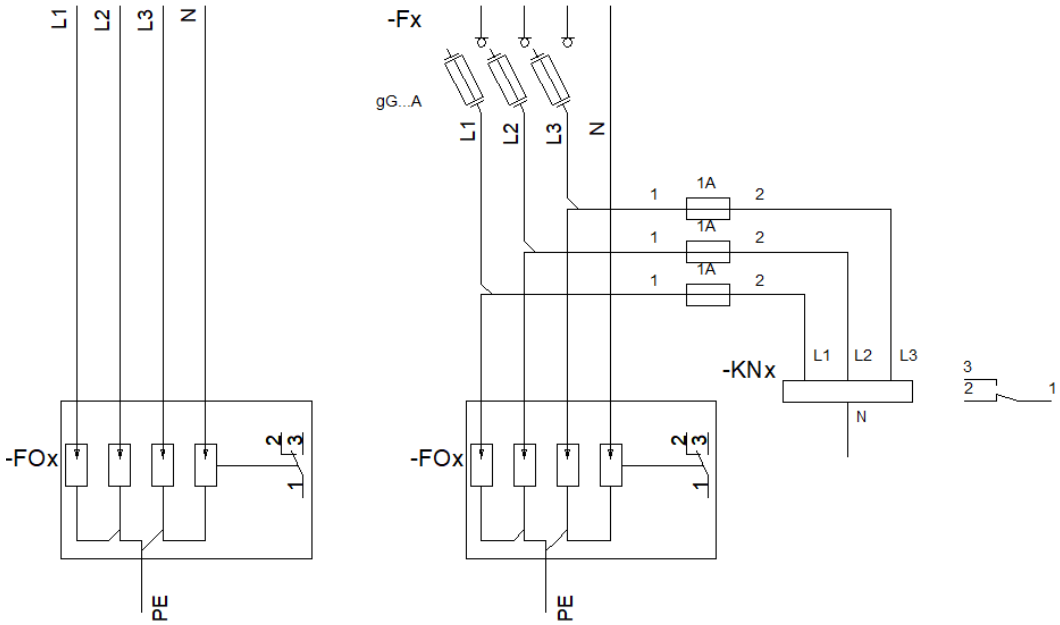


Figure 4.20 Diagram of the overvoltage protection module

4.11 MOW Module - Heating and Ventilation of the interior of the Power Supply Unit

This module is used in case the "ZUP" power supply unit is installed outside the building, in a zone characterized with high temperature changes, or if the power supply unit is equipped with fan power supply modules with frequency converters. The module consists of two independent mechanical thermostats – one activates the ventilation fan and the other one activates cabinet heaters.

This way the user can separately set the activation temperature for ventilation and the activation temperature for heating the Power Supply Unit interior.

The ventilation-heating module is equipped with an auxiliary contact in the overcurrent protection device, which makes it possible to detect the failure of the supply line or of one of the module elements. The power of the fan and heaters matches the size of the "ZUP" power supply unit housing, its version (double housing walls for the outdoor version) and expected ambient temperature.

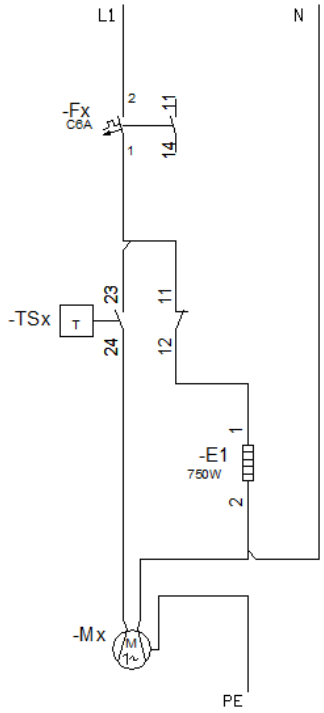


Figure 4.21 Diagram of the module for heating and ventilation of the "ZUP" Power Supply Unit interior

4.12 M230 Module - 230 VAC power supply module

The M230 module with battery backup supplies guaranteed 230VAC from the mains supply or after its loss, from the DC / AC 230VAC inverter powered from an internal 24V battery bank. As the total power is taken from the battery bank in the event of a mains power failure, its presence and efficiency is an essential element of the power supply operation.
The module is available in versions with a power of 400 W to 3000 W.

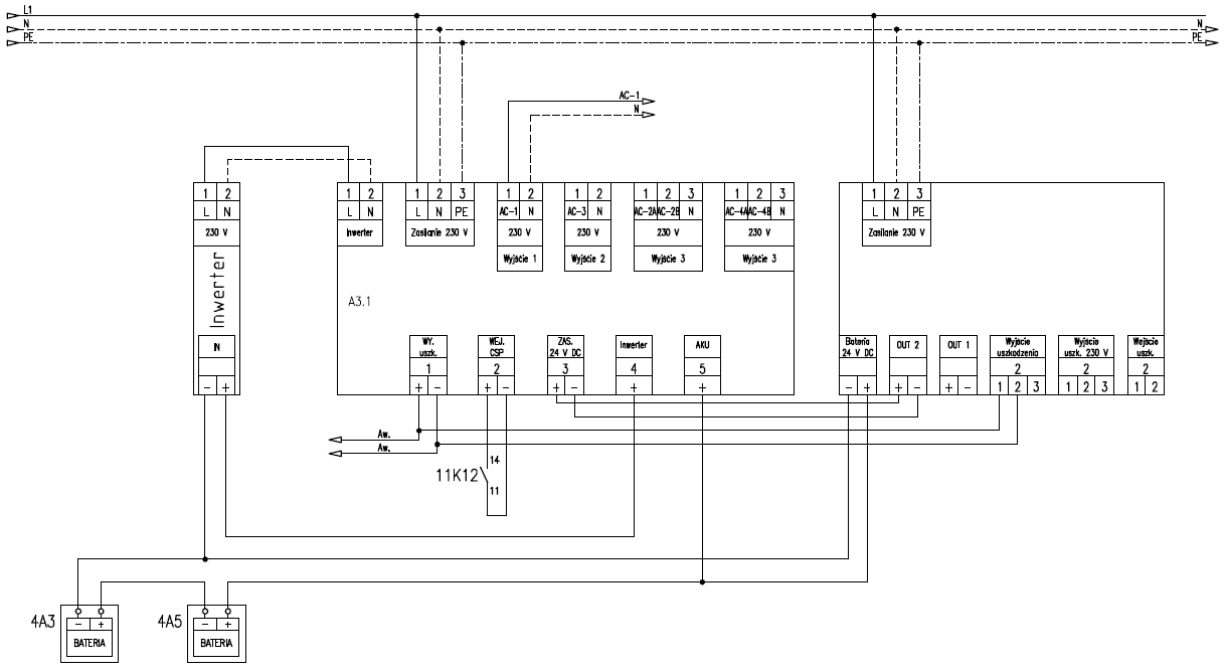


Figure 4.22 Diagram of the M230 module

The M230 module can be used to power aeration or smoke exhaust fans adapted to operate with a voltage of 3x230V (standard motor up to 4kW), properly connected in accordance with the engine nameplate. Correct selection and connection will allow for operation in buffer mode of fans up to 2.2kW (or in the case of using the ZNZ system up to 2x1.3kW) and with a rated motor current not exceeding 8A.

The battery aging factor was taken into account in the calculations to determine the system operating time depending on the load. A well-selected and activated system will allow you to work within a specified time. During startup, the 5 most important operating parameters for the M230 module powering the fan should be monitored.

- Battery discharge current – should not exceed 120 A DC.
- Frequency converter supply current – should not exceed 16A.
- Frequency converter supply voltage – cannot be lower than 205 V
- Battery voltage – cannot be lower than 21V.
- The current consumed by the fan should not be higher than 8A.

Table 4.11 Designated operating time (min) of the system when powered by batteries

Fan power [kW]			
	2,2	**1,5**	**1,1**
100 Ah	-	41	54
150 Ah	41	61	82
200 Ah	54	82	109
250 Ah	68	102	136
300 Ah	82	122	163

Backup batteries with a capacity >45Ah for the M230 module are not included in the set (unless specified when ordering).

Such batteries can be additionally ordered after contacting the SMAY Sales Department.

Minimum requirements for the use of battery banks:
- maintenance-free lead-acid batteries with VLRA-AGM technology
- designed battery life >5 years
- intended for buffer work

4.13 List of Component Modules

The list of modules presented below is optional and depends on the technical conditions at the installation site and the intended function of the unit assumed by the designer of the system supplied.

No.	Module	Application	Overview
1.	**MZR**	Cooperating two power sources (main-reserve).	Automatic switching of the power supply to the reserve with the use of the Automatic Switching Reserve system.
2.	**MZ24**	24 V DC power supply unit with battery backup.	Various output power options available, depending on the actual load. Output current for a single module from 5,5 A to 50 A.

3.	**MZSW**	Power supply unit for fire safety fan motors.	Various options of the module are available, depending on the motor type and its operating duty: - automatic activation or star triangle - two-speed or two-way duty - two-way and two-speed duty - activation and supplying through a frequency converter
4.	**MZKDC**	Power supply unit for the components of the smoke and heat control system.	The module ensures uninterruptible power supply to constituents of systems described by a series of standards, i.e. PN-EN 12101 "Smoke and heat control systems". The module controls the status of the line safety devices and accuracy of the power supply. It is manufactured in two versions – for AC and DC power supply.
5.	**MZKP**	Power supply unit for the fire damper actuators.	Changing the fire damper position by applying voltage to various actuator contacts or by de-energising the actuator (spring return actuator).
6.	**MZOD**	Power supply unit for smoke ventilation door and window actuators.	The actuator is controlled by changing the polarisation of the supply voltage. It is possible to monitor the door and window opening with a potential-free contact.
7.	**MSOA**	Power supply unit for strobe light sirens.	The module may be adapted to 24 V DC or 230 V AC power supply. The module safety circuits are adjusted according to the power and number of supplied signalling devices.
8.	**MKL**	Detection of damage to power cables supplying peripheral actuators.	It enables the Control Panel to continuously supervise the status of the installation supplying power to consumer equipment.
9.	**MMG**	Power generator monitoring.	It is used when a power generator is a backup power supply. The module makes it possible to receive the signals indicating the generator status from the potential-free contacts.
10.	**MPP**	Overvoltage protection.	It protects the system against the effects of lightning strikes on the installation and overvoltages resulting from switching processes in the electric network.
11.	**MOW**	Heating and ventilation of the power supply unit interior.	It allows to determine and maintain the temperature set inside the power supply unit.
12.	**M230**	230 VAC power supply with backup power supply in the form of batteries	Various power variants available (from 400 W to 3000 W) depending on the load.

5 Internal Wiring

The wiring inside the cabinet is made of LGY-type single-core installation cables (accordingly H05V-K 300/500V or H07V-K 450/750V) in the following colours:

Funkcja	Przekrój	Kolor	
Live wires 230VAC „~”	Od 1 mm^2	black	
Neutral wires for230VAC „~”	Od 1 mm^2	blue	
Protective wires „PE”	Od 1 mm^2	yellow-green	
Live wires 24VDC „+”	Od 1 mm^2	red	
Live wires 24VAC „~”	Od 1 mm^2	brown	
Wires 24VDC „-”	Od 1 mm^2	white	
Potential-free cables	Od 1 mm^2	green	

The system designer should select the cables on the basis of EN 61439 guidelines and calculated circuit work current.

6 Available versons - Housing

“ZUP” power supply unit housings should be selected after the unit parameters are defined. The basic housing used in the production of ZUP power supplies is the universal OS-B housing from SMAY. The housings are made of steel sheets or aluminum panels. Depending on the need for space inside the housing, variants of hanging or floor-standing cabinets, with one or two doors, are available. Thanks to system solutions, large power supplies can be built into more than one housing by connecting the housing bodies.
Power supplies mounted outside buildings can be standing on the ground, on a pedestal or hanging. These housings always contain a module for heating and ventilation of the interior of the power supply cabinet. Equipping the housing with a drip roof is optional and specified based on the design.

The way of marking the enclosures is as follows:

OS-B-<KO>-<WYK>-<MAT>-<SZ><WYS><GŁ>-<KAB>-<AKC>

KO – Protection Class
- I – I class of protection
- II – II protection class

WYK – Execution
- W – Internal execution
- Z – External design

MAT - Material
- S – Steel
- A - Aluminum

SZ – Width
- Width in mm

WYS – Height
- Height in mm

GŁ – Depth
- Depth in mm

KAB – Type of cable exit from the housing

PSZ – Brush bushings
DP – Polyester chokes
DS – Steel chokes
MG – Rubber membranes
AKC – Accessories
U – Transport ears
C – Plinth with height in mm
UN – Wall mount
FM – FM Foundation
D – Roof

Np.: OS-B-II-W-S-560-1650-250-DS-C100
OS-B housing in protection class II, internal made of steel, dimensions 560x1650x250, IP54, cables from the housing through steel glands, additional plinth 100 mm high.

All elements of the "ZUP" device are placed in sealed housings (IP54). Depending on the number and type of selected modules and the installation location, the housings may have the following dimensions: from 400mm x 400mm x 200mm to 10,000mm x 2,000mm x 600mm + plinth.

Access to the interior of the device is provided by doors with the option of locking with a system key. There may be a main switch on the device casing, which is used to manually disconnect the power supply during maintenance work or emergency disconnection of the device, as well as optical indicators indicating the status of correct power supply and collective failure. Depending on the configuration of the "ZUP" power supply, additional signals, as well as switches for manual control of powered components or devices, are placed on the façade.

7 Packing, Transport and Storage

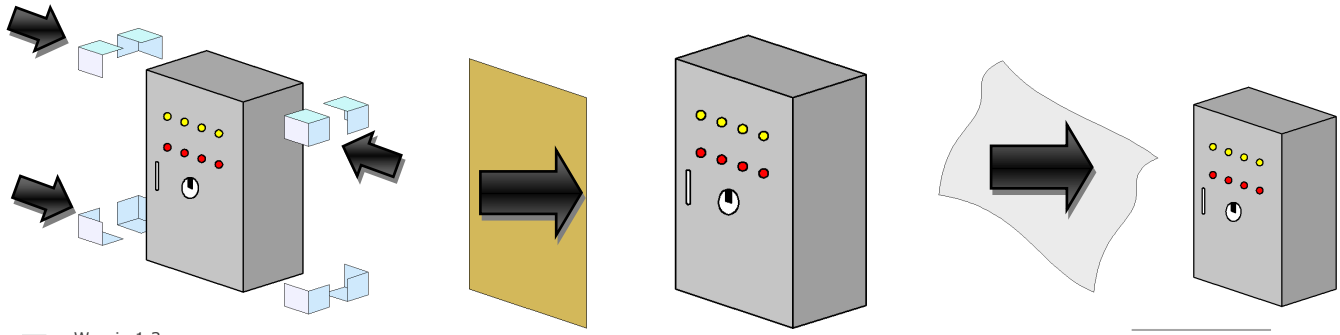
- **No damage resulting from incorrect transport, unloading and storage is covered by the warranty, and no related claims shall be handled by SMAY Sp. z o.o.**

7.1 Packing

The power supply units are protected during transport by the appropriate packaging. A standard packaging consists of polystyrene corners, corrugated cardboard and packaging film.

The power supply unit shall be packed as shown below:

Protect the power supply unit corners by means of polystyrene boards. Protect the front of the cabinet and all LEDs along with switches by means of corrugated cardboard. The power supply unit shall be wrapped for moisture protection.



7.2 Transport

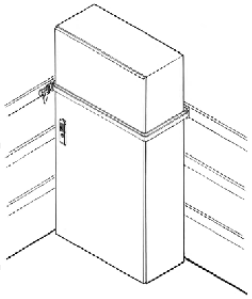
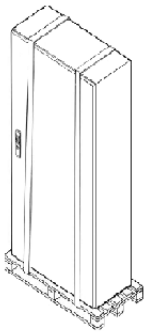
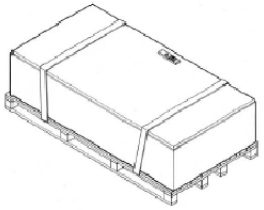
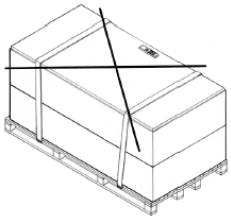
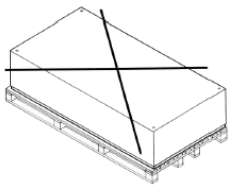
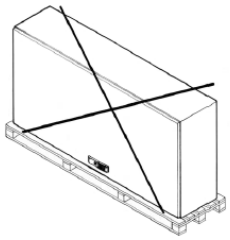
It is recommended to transport "ZUP" power supply units in their original packaging until they reach their destination.

- Use only appropriate means of transport, such as pallet trucks or forklifts.
- In case the power supply units are transported manually, make sure the number of engaged people is sufficient to secure and carry the load.
- During transport and handling take into consideration dimensions and weight of the power supply units.

During transport of power supply units the batteries are disconnected in order to avoid discharging.

When transporting the units take into consideration the following risks:

- Do not drop or throw the power supply unit! The packaging the unit is being transported in does not prevent damage resulting from incorrect transport.
- The suspended loads may fall posing a deadly threat, therefore keep safe distance from them.
- Using load carriers other than the ones specified in this manual may result in serious damage to the power supply unit.

7.3 Storage

Power supply units should be stored in rooms, where:

- Relative humidity φ < 80% at t = 20 °C
- Ambient temperature -40 °C < t < +60 °C

Power supply units should not be in any contact with dust, gas and corrosive vapours or other chemical substances that could cause corrosion.

8 Installation

8.1 Installation of Wall Mounted Power Supply Units

The wall mounted versions of the power supply unit may be installed:

- directly with the use of holes in the rear wall of the housing
- with the use of special fixtures

Figure 8.1 Rear wall with a hole, prepared for direct wall mounting.

- using specially prepared handles that must be previously attached to the housing.

Figure 8.2 Mounting fixtures attached to the power supply unit rear wall.

8.2 Installation of Free-Standing Power Supply Units

Setting the power supply unit:

- There should be at least 80 mm of free space around the power supply unit.
- Distance between the top of the power supply unit and the ceiling should be at least 500 mm.

In order to set a power supply unit with the cables led at the bottom it is necessary to use a foundation with a culvert or a cable duct. The power supply unit should primarily be positioned on a foundation frame, which is fastened:

- in a concrete base,
- or on brackets serving as a technical floor.

The ZUP power supply unit may be connected with the ground by means of screwing or welding.

9 Operation and Maintenance

Before any operation or maintenance work read this documentation. Particularly, any person responsible for operation of the device/system within the framework of operation and service is obliged to do it. If there is no trained personnel with required technical skills, ongoing inspections shall be carried out by the SMAY Service or Authorized SMAY Service Point.

No damage to the "ZUP" unit resulting from failure to observe the guidelines given in the documentation shall be repaired under the warranty.

Service operations at the "ZUP" unit shall be carried out only when the unit is OFF. In order to ensure safe operation of the device, a main switch is mounted on the unit housing. It is used for manual disconnecting power supply from the device for service work.

SMAY Sp. z o.o. Recommendations Regarding Maintenance of the "ZUP" Power Supply Unit

The "ZUP" power supply unit, according to the Act published in the *Journal of Laws 1994 No. 89, item 414 on 7 July 1994,* should be put under inspection at least once a year. During the yearly inspection the following shall be carried out:

- checking for proper operation of individual component modules of the power supply unit
- carrying out all possible control operations of the power supply unit according to the device function list assumed by the designer of the system supplied (pay special attention to the fire scenario)
- measuring fire protection effectiveness

ATTENTION!

In case of blackout it is not possible to charge the batteries, but they will provide power supply needed to maintain the panel operation. The reason for the failure shall be removed as soon as possible in order to avoid disconnection in case of deep discharge; the batteries shall be recharged and the device safety operation shall be ensured. In case of critically low state of batteries charge and the lack of recharging, a risk of permanent damage to batteries occurs after few days.

The batteries should be tested at least once a year. In case of decommissioning or temporary shutdown of the unit, disconnect the batteries to avoid deep discharge or damage. Charged but disconnected batteries may be stored for approx. 6 months. In case of long-term storage it is necessary to charge up the batteries.

9.1 Operation Safety

Each of the power supply outputs is protected by means of appropriate fuses protecting the circuits and components and also ensuring fire protection. Additionally, the "ZUP" power supply unit housing has IP54 Ingress Protection rating, which makes safety operation of the device possible indoor and outdoor (in a non-corrosive environment).

9.2 Certyfication

All components of the "ZUP" power supply unit have certificates of conformity (CE) issued by the manufacturers.

9.3 Impact on the Environment

A worn out product is a hazardous waste, which shall be handed over to a local authorized electric and electronic waste management facility for disposal.
Proper handling of worn out electric and electronic equipment will help to avoid harmful impact on people's health and natural environment resulting from inappropriate storage and processing of such equipment.

10 General Warranty Terms and Conditions

The GUARANTOR provides the warranty for the purchased product/system under the terms and conditions specified below:

Article 1

The GUARANTOR warrants proper functioning of the purchased fire safety product/system and commits to remove defects free of charge if they occur during the granted warranty period. The following shall be considered as a fire safety product/system:

- *Power supply unit for smoke and heat control systems,* ZUP *type (power supply unit for fire safety systems)*

Article 2

The warranty for the system/product specified in this Warranty Terms and Conditions is effective on the territory of the Republic of Poland and remains valid for 24 months from the date of sale or for other time duration specified in the contract. The GUARANTOR provides the warranty under a condition precedent, i.e. full payment of the required purchase price for the system/product. In case of lack of payment for the system/product, it shall remain the property of the GUARANTOR, and the warranty rights specified below shall not arise and shall not bind the GUARANTOR.

Article 3

It is possible to extend the Warranty Period on the condition that a separate Maintenance and Service Agreement between the GUARANTOR and the Owner/Manager of the plant is concluded. Yearly inspections are integral part of such an agreement. They are chargeable and include replacement of wear parts and specification of the plant during the Extended Warranty Period.

Article 4

The basis for consideration of the reported claim during the Warranty Period is submitting the claim within 7 days from the date of detection of the defect; making the product/system available in the same state as when the defect occurred, along with the detailed description of the technical problem and documents confirming carrying out all inspections and periodic checks/maintenance anticipated by the GUARANTOR. The claim shall be submitted by sending filled "Claim Application Card" form available on www.smay.pl, to the GUARANTOR's address. It is acceptable to send the application form to e-mail address info@smay.pl or via fax. Further use of the defective system/product is absolutely unacceptable.

Article 5

The GUARANTOR undertakes to begin repairing the defect within 2 working days from the date of the receipt of the claim. The GUARANTOR undertakes to repair the defect within 21 working days from the date of the receipt of the claim with full documentation (description of the defect – filled "Claim Application Card" form, copies of the inspection and periodic test reports). If it is necessary to import some hard to reach materials or parts the repair will be carried out within the shortest possible period of time reasonable from the technical point of view. The Warranty Period shall be extended by the repair time. The Warranty Holder is obliged to make it possible to the GUARANTOR to carry out all indispensable actions associated with identification of the reasons for the failure and with the removal of the failure. In case of concealment or misinformation on the Warranty Holder's side, the Warranty Holder shall bear the repair costs and lose the granted warranty. The GUARANTOR undertakes to remove malfunctions and physical defects or to provide new, defect-free items, free of charge, during the Warranty Period, if the defect concerns any element included in the system and subject to replacement, reported by the Ordering Party.

Article 6

The Warranty is valid in case when:

- The elements of the system/product, which have been factory sealed (if applicable), have intact, original seals, or seals placed by the GUARANTOR or a service point authorised by the GUARANTOR.
- The elements of the system/product are fully identifiable (in particular, they have intact, legible identification plates – if applicable).
- All inspections and periodic maintenance and service controls required by the GUARANTOR and/or legal regulations in force have been carried out, in particular the ones specified in the Operation and Maintenance Manual (if applicable), in valid standards, including PN-EN 12101-6 (if applicable), required by the Building Law (Act of 7 July 1994, "Building Law", consolidated text, Journal of Laws 2013, item 1409 as amended), required by the Act of 24 August 1991 concerning fire protection (Journal of Laws 2002, No. 147, item 1229 as amended), appropriately recorded in the Inspection and Maintenance Book and/or the Plant Book.

- The elements of the system/product have been correctly installed, used, operated and maintained, according to the GUARANTOR's technical documentation, including the Operation and Maintenance Manual (if applicable).

Article 7

The Warranty does not cover:

- Inspections and periodic, maintenance and service controls required by the GUARANTOR and/or legal regulations in force, in particular the ones specified in the Operation and Maintenance Manual (if applicable), in valid standards, including PN-EN 12101-6 (if applicable), required by the Building Law (Act of 7 July 1994, "Building Law", consolidated text, Journal of Laws 2013, item 1409 as amended), required by the Act of 24 August 1991 concerning fire protection (Journal of Laws 2002, No. 147, item 1229 as amended), which the Warranty Holder is required to carry out on their own and at their own expense.
- Claims concerning technical parameters of the products/elements of the system, provided that they are consistent with the data given in the valid documentation.
- Normal wear and tear of the devices or their parts.
- Wear and tear of the products/elements of the system defined as consumables, which durability depends on the intensity of use (e.g. buttons, switches, belts, fuses, batteries etc.).
- The loss of data stored in the memory of suitable elements of the system.
- The loss of settings in the control application resulting from the lack of the main power supply for the time duration longer than guaranteed operation time of the backup power supply, once the launching process has been completed.
- Faulty operation of the third parties' software used for cooperation with the purchased system.

Article 8

The Warranty does not cover any damage resulting from the reasons directly attributable to the Warranty Holder or Third Party, both intentional and accidental, particularly:

- Damage resulting from applying incorrect supply voltage or connecting to an incorrect electric installation, incorrect assembling of the product/system, and storage of its elements or using under the terms and conditions incompatible with the ones specified by the GUARANTOR in the Instruction Manual and Operation and Maintenance Manual.
- Negligence in respect of prompt and quality performance of appropriate inspections, periodic controls and maintenance mentioned in Article 6 above.
- Being the result of using consumables (e.g. batteries, fuses, etc.) incompatible with the GUARANTOR's recommendations given in the Operation and Maintenance Manual.
- Mechanical and electrical damage and consequential defects.
- Chemical and electrochemical damage resulting from using substances incompatible with the technical specifications of the station or using equipment made of improper materials and consequential defects.
- When the repairs and interference with the system have been carried out by the persons without the GUARANTOR's authorization.

Article 9

The Warranty does not cover any damage directly or indirectly resulting from force majeure, such as, in particular: flood, fire, lighting, etc.

Article 10

In case of the Warranty Holder's unjustified claims, the GUARANTOR shall charge for diagnostics (device check tests) and logistics (transport cost), according to the "Service Work Charges" available on www.smay.pl.

Article 11

The GUARANTOR's decisions concerning reported defects shall be definitive.

Article 12

With regard to all matters that are not regulated above the provisions of the Civil Code shall apply.

11 Annexes

11.1 ZUP Assembly and On-site Launch Instruction Manual

	Instruction Manual	I-03/DT/A
	ZUP (ZUP-L) Assembly and On-site Launch Instruction Manual	**Revision IV of 22.11.2023**
		Page **1** z **18**

1. Purpose

The purpose of this instruction is to ensure correct installation and launching of ZUP (ZUP-L) power supply unit, which directly affects the safety of operation as well as correctness and reliability of work.

ZUP (ZUP-L) Assembly and On-site Launch Instruction is also an integral part of the ZUP (ZUP-L) Operation and Maintenance Manual.

2. Subject of the Manual

The subject of this Manual is the course of action during installation and on-site launching of the following device:
Power supply for smoke and heat control systems, ZUP type (ZUP-L) (power supply unit for fire safety systems)

3. Technical Description of the Device

The device is designed for supplying low and ultra-low voltages (max: 1000 V AC, 1500 V DC) to the components of the smoke and heat control systems, including supplying smoke exhaust and make-up air fans, using frequency converters.
The power supply unit is also suitable for such equipment items as fire dampers, fire ventilation dampers, smoke exhaust windows, smoke dampers, solenoid valves, electromagnetic door holders and gates.
The power supply unit is a UZS-type, A-class modular device (for the use with all systems), in accordance with PN-EN 12101-10 and PN-EN 54-4 with valid attachments A1 and A2.
The ZUP power supply unit is an electrical device, therefore installation and launching operations can only be carried out by employees, who hold appropriate Level 1 Electrical Certificates for using devices at least up to the level of 1 kV.

4. Basic Principles and Information

Along with the unit, technical documentation is delivered, which includes external wiring connection diagrams. The technical documentation is prepared individually for each ZUP (ZUP-L) unit. Before installation make sure that the technical documentation matches the device model (check the data on the identification plate and in the documentation headline – ZUP (ZUP-L) serial number has to match the number given in the technical documentation).

I-03/DT/A ZUP (ZUP-L) Assembly and On-site Launch Instruction Manual Date last printed: 09.11.2022 14:25:11	Note: The document is supervised in electronic form. The document is valid on the day of printing. The user of the copy is obliged to track changes in the document after the printing date.

During installation and launching strictly observe instructions given in the technical documentation of ZUP (ZUP-L) power supply unit.

Installation operations may only be carried out when power supply is OFF. In order to de-energise the instruments inside the unit use main load switches mounted on the unit elevation. Once the procedure described above is carried out, remember that inside the power supply unit there still may be dangerous live circuits (a terminal strip for connecting the power cable, main load switches). In order to completely de-energise the unit use security devices/switches in the LV Main Switchboard supplying the ZUP (ZUP-L) unit. Prior to installation it is necessary to visually check the device for mechanical damage.

5. Housing

The components of the "ZUP (ZUP-L)" unit are placed in a sealed housing (IP54). Access to the unit interior is provided by means of the key-lockable doors.

There is a main switch on the unit housing, which is used for disconnecting power supply manually in case of maintenance work or the unit emergency shut-down. Optical indicators for correct power feed and generic failure status are located on the housing wall. Depending on the configuration of the "ZUP (ZUP-L)" power supply unit, additional signals are terminated on the housing, as well as switches for manual control of supplied components or equipment items. The functionalities of additional indicators and manual control switches are described in detail in the ZUP (ZUP-L) technical documentation.

Devices inside the unit are mounted in accordance with the technical documentation accompanying the unit.

6. Installation

On-site installation of the unit should be carried out at a place specified in the installation design, according to the ZUP (ZUP-L) Operation and Maintenance Manual. Installation should be carried out by qualified and experienced personnel assigned by the site manager.

7. Connecting and Launching

All wires connected to ZUP (ZUP-L) unit shall be led inside through the cable glands in accordance with the technical documentation accompanying the unit, in order to maintain the declared IP Ingress Protection Rating.

The electrical connections (power supply and control wiring) shall be made in accordance with the unit technical documentation, by means of cables specified in the professional installation design. Terminal strips and receivers are specified in the unit technical documentation.

The electrical start-up shall be carried out in accordance with the unit technical documentation, professional installation design and fire hazard scenario.

Note:

The frequency converters implemented in the ZUP (ZUP-L) power supply unit require additional programming on the basis of the technical parameters of connected receivers and in accordance with the fire hazard scenario.

The frequency converters should be programmed on the basis of the Technical Documentation, Instruction Manual and Programming Manual.

The following actions are necessary for programming the frequency converters applied in ZUP (ZUP-L) unit:

1. AMA (Danfoss) or Autotuning (Mitsubishi) – auto-matching converter parameters to the electrical drive being handled
2. Programming:
   - drive parameters:
     - Engine power [kW]
     - Engine voltage [V]
     - Engine current [A]
     - Engine frequency [Hz]
     - Nominal engine speed [rpm]
   - time delay of engine activation
   - time delay of engine shut-down
   - drive acceleration time
   - drive brake time
   - set points for standby operation
   - set points for fire operation (Fire Mode)
   - limits for operation (maximum and minimum values)

When using MKL modules with the fan power cables, at the fans manual start-up (from contactors or the frequency converter) disconnect the wires inside the MKL connected to the "Contactor" input and secure them with a terminal strip.
If the wires are not disconnected from the "Connector" input, there will be no deactivation of the MKL control module when the fans are turned on manually, which can cause the MKL module to burn out.

Activities performed during set-up should be noted in the set-up protocol for the ŻUBR fire appliances power supply, a template of which, together with attachments, is provided below.

SMAY Sp. z o.o.
Podłęże 678
30-003 Podłęże,
POLAND
VAT UE: PL6782821888

smay.eu

COMMISSIONING REPORT
OF SET OF DEVICES NR ..../.....

1. Facility: .....
2. Facility address: .....
3. Purchaser: .....
4. Scope of commissioning: .....

5. Date of commissioning execution:
   day: .... month: .... year: ....
6. Commissioning team:

No.	Name and Surname	Job position	Electric permission
1.			
2.			
3.			

A representative of Smay provides support in commissioning Smay devices.

7. Measuring instruments used:

No.	Measuring device	Measured parameter	Unit
1.	Type: ..... S/N:	- AC/DC Voltage - AC/DC Current - Resistance	VAC, VDC AAC, ADC Ω
2.	Multifunctional Electrical Installation S/N:	Loop impedance	Ω

VAT UE: PL6782821888, District Court for Krakow-Srodmiescie Business Division XI of the National Court Register Share capital – PLN 50,000, fully paid up, KRS: 0000007764 BDO: 000042468

SMAY Sp. z o.o.
Podłęże 678
30-003 Podłęże,
POLAND
VAT UE: PL6782821888

smay.eu

8. Devices:

Type of device:	Attachment No.
Power Supply ZUP s/n:	1
	2
	3

9. Additional devices powered from ZUP:

Protocol name	Attachment No.

10. Comments:

None.

I confirm the commissioning, preparation of relevant attachments to this protocol and the correct operation of the devices.

Contractors

....

VAT UE: PL6782821888, District Court for Krakow-Srodmiescie Business Division XI of the National Court Register Share capital – PLN 50,000, fully paid up, KRS: 0000007764 BDO: 000042468

SMAY Sp. z o.o.
Podłęże 678
30-003 Podłęże,
POLAND
VAT UE: PL6782821888
smay.eu

Attachment No. .....

For Commissioning Report No. .....

1. Device: **ZUP,** s/n: **.....**

2. Date of commissioning execution: day: **....** month: **....** year: **.....**

3. Commissioning measurements:

The Scope of work	Result	
1. Checking the device before start-up:		
a. Checking the visual condition of the device	☐ negative	☐ positive
b. Check markings and descriptions	☐ negative	☐ positive
c. Checking the correctness of assembly	☐ negative	☐ positive
d. Checking the correctness of electrical connections	☐ negative	☐ positive
2. Checking the device after switching on the power:		
a. Checking the power light on the switchboard	☐ negative	☐ positive
b. Check the 24V DC power supply	☐ negative	☐ positive
c. Checking the correctness of work MKL N782	☐ negative	☐ positive
d. Checking the correctness of work MKL N781	☐ negative	☐ positive
e. Checking the correctness of work MKL N780	☐ negative	☐ positive
f. Checking the ventilation of cabinet	☐ negative	☐ positive
g. Checking the power switch base-reserve	☐ negative	☐ positive
3. Measurements in the stand-by:		
a. Cabinet supply voltage L1-L2		V AC
b. Cabinet supply voltage L1-L3		V AC
c. Cabinet supply voltage L2-L3		V AC
d. Power supply voltage 24V DC		V AC
e. Power supply on voltage		V DC
f. Power supply for MKL modules		V AC
4. Current		
a. Fire scenario B1.020 L1/L2/L3	/ /	A AC
5. Correct operation in standby/ ventilation mode		
a. Control of operation in ventilation mode	☐ negative	☐ positive
b. Control of operation when the CO/LPG concentration is exceeded	☐ negative	☐ positive
6. Automatic start in fire scenarios		
a. Control of Fire Signal reception, realization of fire scenarios	☐ negative	☐ positive
b. Control of the execution of fire the fire scenario by CSUP-CP	☐ negative	☐ positive
7. Reset		
a. Operation stopped via reset signal	☐ negative	☐ positive
b. Operation stopped via reset key (CSUP-CP)	☐ negative	☐ positive

VAT UE: PL6782821888, District Court for Krakow-Srodmiescie Business Division XI of the National Court Register Share capital – PLN 50,000, fully paid up, KRS: 0000007764 BDO: 000042468

SMAY Sp. z o.o.
Podłęże 678
30-003 Podłęże,
POLAND
VAT UE: PL6782821888
smay.eu

8. Checking the device failure alarm		
a. Protection of connected devices	☐ negative	☐ positive
b. Power supply 24VDC	☐ negative	☐ positive
c. Line control module – MKL	☐ negative	☐ positive
d. 230V control protection	☐ negative	☐ positive
e. Cooling fan and heater	☐ negative	☐ positive
f. Overvoltage protection	☐ negative	☐ positive
g. Power switch base-reserve	☐ negative	☐ positive
h. Return to standby	☐ negative	☐ positive

4. List of CSUP devices inside ZUP:

Device:	**S/N:**	**Designation**	**Program execution:**	
CSUP-CP			☐ negative	☐ positive
CSUP-DIO			☐ negative	☐ positive
CSUP-RS			☐ negative	☐ positive
CSUP-AO			☐ negative	☐ positive

5. Comments:

.....

.....

I confirm the correct commission of the ZUP-L device.

Contactors

....

VAT UE: PL6782821888, District Court for Krakow-Srodmiescie Business Division XI of the National Court Register Share capital – PLN 50,000, fully paid up, KRS: 0000007764 BDO: 000042468

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device: .....

2. Designation: .....

3. Fan location: .....

4. Date of commissioning execution: day: .... month: .... year: .....

5. Rated data

RATED DATA	
Motor power	.... kW
Motor current	I_N= ..... Amper
Rotation speed	n = ... 1/min
Voltage	400V/ 50Hz /3 phases

6. Commissioning checking:

SCOPE OF WORK	RESULT		
1. Checking the device before start-up:			
a. Checking the visual condition of the device	☐ negative	☐ positive	
b. Check markings and descriptions	☐ negative	☐ positive	
c. Checking the correctness of assembly	☐ negative	☐ positive	
d. Thermistor connected	☐ no	☐ yes	
e. Type of start	☐ DOL	☐ Y / Δ	☐ Dahlander
f. Frequency converter operation	☐ no	☐ yes	
g. Inspection: Damage / Corrosion / Contamination / Foreign body	☐ no	☐ yes	
h. Confirmation of correct installation by the installation company	☐ no	☐ yes	
2. Checking the device after switching on the power:			
a. Launch control	☐ negative	☐ positive	
b. Checking the correctness of the work	☐ negative	☐ positive	
c. vibrations are within the norm	☐ negative	☐ positive	
d. Rotation control	☐ negative	☐ positive	
3. Measurements in the work:			
a. Supply voltage L1-L2	V AC		
b. Supply voltage L1-L3	V AC		
c. Supply voltage L2-L3	V AC		

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

d. Current		A AC
3.1 Work on the inverter		
a. Frequency inverter model		s/n:
b. Current (read from frequency converter)		.... A/ ....Hz
4. Checking stop of device		
a. Stop device	☐ negative	☐ positive

OVERALL DEVICE TEST RESULT	☐ positive	☐ negative	☐ positive with remarks

7. Fan operating points (applies to inverter operation):

No.	Frequency (Hz)	Direction
1.	....	.....
2.	....	.....

8. Comments:

.....

.....

.....

I confirm the correct commission of the device.

Contractors

....

NIP: **678-282-18-88**, Regon: 356295933,
KRS: **0000007764**, BDO: **000042468**,
Kapitał zakładowy Spółki 50.000 PLN

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device: **.....**

2. Fan location: **.....**

3. Date of commissioning execution: day: **....** month: **....** year: **.....**

4. Rated data

a) Fan number .... (type) ....

DANE ZNAMIONOWE	I. BIEG	II. BIEG
Motor power	..... kW	..... kW
Motor current	I_N= ..... Amper	I_N= ..... Amper
Voltage	400V/ 50Hz /3fazy	400V/ 50Hz/ 3fazy

b) Fan number .... (type) ....

DANE ZNAMIONOWE	III. BIEG	IV. BIEG
Motor power	..... kW	..... kW
Motor current	I_N= ..... Amper	I_N= ..... Amper
Voltage	400V/ 50Hz /3fazy	400V/ 50Hz/ 3fazy

5. Commissioning checking:

SCOPE OF WORK	RESULT	
1. Checking the device before start-up:		
a. Checking the visual condition of the device	☐ negative	☐ positive
b. Check markings and descriptions	☐ negative	☐ positive
c. Checking the correctness of assembly	☐ negative	☐ positive
d. Type of start	☐ Dahlander	
e. Inspection: Damage / Corrosion / Contamination / Foreign body	☐ no	☐ yes
2. Checking the device after switching on the power:		
a. Launch control	☐ negative	☐ positive
b. Checking the correctness of the work	☐ negative	☐ positive
c. Rotation control	☐ negative	☐ positive
3. Measurements in the work:		
	I speed	II speed
a. Motor current WSxx (L1/L2/L3)	.../.../... A	.../.../... A

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

b. Motor current WSxx (L1/L2/L3)	.../.../... A	.../.../... A
c. Motor current WSxx (L1/L2/L3)	.../.../... A	.../.../... A
d. Motor current WSxx (L1/L2/L3)	.../.../... A	.../.../... A

OVERALL DEVICE TEST RESULT	☐ positive	☐ negative	☐ positive with remarks

6. Comments:

.....

.....

.....

I confirm the correct commission of the device.

Contractors

....

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device: Fire dumpers / others additional elements (ZUPxx)

2. Date of commissioning execution: day: **....** month: **....** year: **.....**

3. Controlled items:

Mark	Model/ Type of actuator	Localization	Device condition		Voltage
			☐ negative	☐ positive	..... VDC
			☐ negative	☐ positive	..... VDC
			☐ negative	☐ positive	..... VDC
			☐ negative	☐ positive	..... VDC

4. Comments:

.....

.....

.....

.....

.....

I confirm the correct commission of the device.

Contractors

....

NIP: **678-282-18-88**, Regon: 356295933,
KRS: **0000007764**, BDO: **000042468**,
Kapitał zakładowy Spółki 50.000 PLN

	Instruction Manual	I-03/DT/A
	ZUP (ZUP-L) Assembly and On-site Launch Instruction Manual	**Revision IV of 22.11.2023**
		Page **14** z **18**

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../......

1. Device: **Carbon monoxide detectorSmay uniTOX.CO G/RS485**

2. Date of commissioning execution: day: **....** month: **....** year: **......**

3. Controlled items:

BUILDING	GARAGE (LEVEL ......, zone/y ......)					
Marking/ adress	**Gas / factor**	**Model/Type**	**Serial number**	**Stan Urządzenia**		**Voltage**
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
BUILDING	**GARAGE (LEVEL ......, zone/y ......)**					
Marking/ adress	**Gas / factor**	**Model/Type**	**Serial number**	**Stan Urządzenia**		**Voltage**
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC
	CO	uniTOX.CO G/RS485		☐ negative	☐ positive	...... VDC

4. Comments:

....
....
....
....
....

Contractors

....

NIP: **678-282-18-88**, Regon: 356295933,
KRS: **0000007764**, BDO: **000042468**,
Kapitał zakładowy Spółki 50.000 PLN

I-03/DT/A ZUP (ZUP-L) Assembly and On-site Launch Instruction Manual Date last printed: 09.11.2022 14:25:11	Note: The document is supervised in electronic form. The document is valid on the day of printing. The user of the copy is obliged to track changes in the document after the printing date.

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device: **Gas detector (carbon monoxide, liquid propane gas, other)**

2. Date of commissioning execution: day: **....** month: **....** year: **.....**

3. Controlled items:

BUILDING	**GARAGE (LEVEL ....., zone/y .....)**					
Marking/ adress	**Gas / factor**	**Model/Type**	**Serial number**	**Stan Urządzenia**		**Voltage**
	CO			☐ negative	☐ positive	..... VDC
	LPG			☐ negative	☐ positive	..... VDC
	CO			☐ negative	☐ positive	..... VDC
	LPG			☐ negative	☐ positive	..... VDC
BUILDING	**GARAGE (LEVEL ....., zone/y .....)**					
Marking/ adress	**Gas / factor**	**Model/Type**	**Serial number**	**Stan Urządzenia**		**Voltage**
	CO			☐ negative	☐ positive	..... VDC
	LPG			☐ negative	☐ positive	..... VDC
	CO			☐ negative	☐ positive	..... VDC
	LPG			☐ negative	☐ positive	..... VDC

4. Comments:

.....

.....

.....

.....

.....

Contractors

....

SMAY Sp. z o.o.
Podlęże 678
32-003 Podlęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device:

2. Date of commissioning execution: day: **....** month: **....** year: **.....**

3. Controlled items:

BUILDING	**GARAGE (LEVEL ....., zone/y .....)**			
Marking	**Model/Type**	**Serial number**	**Device condition**	
			☐ positive	☐ positive
			☐ positive	☐ positive
			☐ positive	☐ positive

4. Comments:

.....
.....
.....
.....
.....

Contractors

....

SMAY Sp. z o.o.
Podłęże 678
32-003 Podłęże

NIP: 6782821888

smay.eu

Attachment No. ....

For Commissioning Report No. ..../.....

1. Device:

2. Date of commissioning execution: day: **....** month: **....** year: **.....**

3. Commissioning checking:

1. Power supply unit (TYPE/MODEL) S/N:		
Standard measurements:		
a. Input voltage		V AC
b. Output voltage		V DC
c. Localization		
d. Failure indication	☐ negative	☐ positive
2. Power supply unit (TYPE/MODEL) S/N:		
Standard measurements:		
a. Input voltage		V AC
b. Output voltage		V DC
c. Localization		
d. Failure indication	☐ negative	☐ positive

4. Comments:

.....

.....

.....

.....

.....

I confirm the correct commission of the device.

Contractors

....

VERSION HISTORY

No.	Date	Change	Approved by
1.	28.05.2015	The Manual supplemented with the reference to the ZUP-L unit	
2.	30.11.2018	The Manual supplemented with the reference to PN-EN 54-4 with valid attachments	
3.	22.11.2023	Protocols and protocol annexes updated. Changes in graphic design of document Adding in point 7 information about other models of frequency converters. Adding information to use	