

USER'S MANUAL



Filtering device **UFO-A-N**

EN



The user's manual is valid for the following device models:

Catalog No.	Product name
805U20	UFO-A-5000-N
805U21	UFO-A-10000-N
805U22	UFO-A-15000-N
805U23	UFO-A-20000-N

User's manual – title: „Filtering devices UFO-A-N”

*The structure and form of the instructions take into account the principles included:
PN-EN 82079-1, PN-EN ISO 20607, PN-EN ISO 7010, MD 2006/42/EC and other harmonized standards.*



Just reliably

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1. INTRODUCTION

1.1. INFORMATION ABOUT THE MANUAL





These operating instructions are intended for the user of **UFO-A-N** devices. The purpose of this manual is to provide the user with instructions on the intended use, assembly, installation, start-up, and use of the device, as well as hazards and possible disruptions in operation, but also disassembly, shutdown and disposal.

INFORMATION	
	Due to the constant improvement of its products, the manufacturer reserves the right to make design changes aimed at increasing the usability and safety of use.
	The user is obliged to comply with the provisions of this manual and the relevant manuals, i.e. the operating manual of the electric motor. This manual DOES NOT contain the operating instructions for the electric motor.

<p>CAUTION!</p> <p>PLEASE READ THIS MANUAL BEFORE USING THE DEVICE!</p> <p>KEEP THE USER'S MANUAL FOR THE FUTURE!</p>
--

1.2. STRUCTURE AND INFORMATION RULES OF THE MANUAL

This manual contains 4 types of articulated messages containing an informational signal combining a word and a symbol in a graphic form depending on the level and probability of the risk, i.e.:

INFORMATION	
	Danger Level: VERY LOW or NONE Content, memo, and explanation showing the typical state and appearance, typical action, and behaviour. The content describes important information of general importance that must be implemented by those who read the operating manual.
! CAUTION	
	Danger level: LOW Warning content that indicates an elevated level of user attention. The explanation in the text presents a risk that may damage the device, but is not destructive, immobilizing or has a minor impact on the user.
! WARNING	
	Danger level: HIGH Warning text that indicates a high level of user attention. The explanation in the content presents the risk that could damage or destroy the device or may cause injury to the user.
! DANGER	
	Threat Level: VERY HIGH Warning content that indicates a very high level of user attention. The explanation in the text presents a risk that could damage the device or others in its vicinity or could result in serious personal injury or death. Working with this risk is prohibited!

**1.3. NAME AND ADDRESS OF THE MANUFACTURER**

Any requests for information or repair work or questions regarding the technical aspects of this document should be addressed to:

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81-571 Gdynia POLAND
Phone: +48 58 629 64 80
Fax: +48 58 629 64 19
E-mail: klimawent@klimawent.com.pl



2. MANUFACTURER'S DECLARATION

The **UFO-A-N** device has been designed and made with due diligence with the participation of the internal quality management system ISO 9001 and takes into account the current state of knowledge and technological level, and above all ensures safety rules during use.

Producer **KLIMAWENT S.A.** declares that the products: **UFO-A-5000-N**, **UFO-A-10000-N**, **UFO-A-15000-N** and **UFO-A-20000-N** filter devices meet the requirements of the following European directives and the specifications of harmonized and other standards:

- **Directive 2006/42/EC (MD)** – of the European Parliament and of the Council of 17 May 2006 on machinery, amending Directive 95/16 / EC (recast) (Journal of Laws UE L157 of 09.06.2006, p. 24),
- **Regulation of the (Polish) Minister of Economy** of October 21, 2008, on requirements for machines (Journal of Laws No. 199 of 2008, item 1228),
- **Directive 2014/35/EU (LVD)** – Directive of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits (Journal of Laws UE L96 of March 29, 2014),
- **Directive 2009/125/EC (ErP)** – Directive of the European Parliament and of the Council of October 21, 2009, establishing general principles for setting ecodesign requirements for energy-related products (Journal of Laws L285 of October 31, 2009),
- **Commission Regulation (EU) No 327/2011** of 30 March 2011 implementing Directive 2009/125 / EC of the European Parliament and of the Council with regard to ecodesign requirements for fans powered by an electric motor with a power consumption of 125 W to 500 kW (Journal of Laws L90 of April 6, 2011).

Additionally, the manufacturer declares compliance with harmonized standards and national standards (or their fragments):

- **EN ISO-12100:2012** – Safety of machinery – General principles of design – Risk assessment and risk reduction;
- **EN 1005-2:2003 + A1:2008** – Safety of machinery – Human physical capabilities – Part 2: Manual handling of machines and their parts;
- **EN 13849-1:2016** – Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design;
- **EN IEC 60204-1:2018** – Safety of machinery – Electrical equipment of machines – Part 1: General requirements;
- **EN IEC 60947-1:2021** – Low voltage switchgear and control devices – Part 1: General provisions;
- **EN 61310-1:2008** – Safety of machinery – Indication, marking and control – Part 1: Requirements for visual, acoustic and tactile signals;
- **EN 61310-2:2008** – Safety of machinery – Indication, marking and control – Part 2: Marking requirements;
- **EN 614-1 + A1:2009** – Safety of machinery – Ergonomic design principles – Part 1: Terminology and general principles;
- **EN IEC 61439-1:2021** – Low voltage switchgear and control gear – Part 1: General provisions;



DEKLARACJA ZGODNOŚCI WE UE EC&EU DECLARATION OF CONFORMITY



Data wystawienia / Date of issue: **dd.mm.yyyy** Nr / No.: **XXXXXXXX**

1. Producent:
Manufacturer: KLIMAWENT S.A. 81-571 Gdynia, ul. Chwaszczyńska 194, Polska

2. Opis produktu:
Product name: Urządzenie filtrowentylacyjne
Filtering unit

3. Model:
Model:

UFO-A-5000-N	UFO-A-10000-N	UFO-A-15000-N	UFO-A-20000-N
805U20	805U21	805U22	805U23

4. Nr produktu:
Product number:

5. Nr seryjny:
Serial number: XXXXXX

6. Rok produkcji:
Year of production: XXXX

7. Niniejsza deklaracja zgodności wydana zostaje na wyłączną odpowiedzialność producenta.
This declaration of conformity is issued under the sole responsibility of the manufacturer.

8. Wymieniony powyżej wyrób spełnia wymagania następujących dyrektyw europejskich:
The product mentioned above meets the requirements of the following European directives:

MD 2006/42/WE 2006/42/EC
LVD 2014/35/UE 2014/35/EU
ERP 2009/125/WE 2009/125/EC

9. Odniesienia do norm zharmonizowanych oraz norm krajowych (lub ich fragmentów), które zastosowano, w stosunku do których deklarowana jest zgodność:
References to the harmonized standards and the national standards (or parts thereof) that have been applied and against which conformity is declared:

PN-EN ISO-12100:2012 EN ISO-12100:2012
PN-EN 1005-2+A1:2010 EN 1005-2:2003+A1:2008
PN-EN 13849-1:2016-02 EN 13849-1:2016
PN-EN IEC 60204-1:2018-12 EN IEC 60204-1:2018
PN-EN IEC 60947-1:2021-07 EN IEC 60947-1:2021
PN-EN 61310-1:2009 EN 61310-1:2008
PN-EN 61310-2:2010 EN 61310-2:2008
PN-EN 614-1+A1:2009 EN 614-1+A1:2009
PN-EN IEC 61439-1:2021-10 EN IEC 61439-1:2021

10. Osoba upoważniona do przechowywania i przygotowania dokumentacji technicznej:
A person authorized to store and prepare technical documentation:

Teodor Świrbutowicz,
KLIMAWENT S.A.

11. Niniejsza deklaracja zgodności jest podstawą do oznakowania wyrobu znakiem:
This declaration of conformity is the basis for marking the product with the mark:

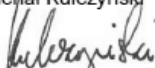


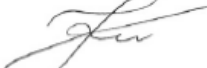
Deklaracja zgodności wystawiona została w oparciu o przeprowadzony proces oceny zgodności. Deklaracja ta odnosi się wyłącznie do urządzenia w stanie, w jakim została wprowadzona do obrotu i nie obejmuje części składowych dodanych przez użytkownika końcowego lub przeprowadzonych przez niego późniejszych działań.

The declaration of conformity was issued based on the conformity assessment process. This declaration relates only to the device in the state in which it was placed on the market and does not cover components added by the end-user or subsequent actions performed by the end user.

Gdynia, 2022-05-20

W imieniu producenta podpisali:
Signed on behalf of the manufacturer by:

Michał Kulczyński

CZŁONEK ZARZĄDU /
MEMBER OF THE BOARD

Joanna Koniarek

PREZES ZARZĄDU /
CEO



3. DEVICE DESCRIPTION

3.1. APPLICATION

The **UFO-A-N** filtering device is designed for cleaning dusty air from contaminants arising in production processes, removing dry dust (no wet, sticky, corrosive or explosive impurities), and grinding non-sparking materials during dusty processes in the chemical, pharmaceutical, food and plastics industries. etc.

The device is designed to work indoors or outdoors, but it is properly protected against weather conditions, including precipitation. Additionally, the fan motor should be protected against direct sunlight or other thermal radiation that may heat the motor body or the device housing.

The **UFO-A-N** device is designed to operate an installation consisting of a series of stationary exhausts, for example, suction arms connected to the ventilation network connecting them with the device's stub pipes, and general ventilation combined with air filtration, e.g. for use in the Push-Pull system.

The device is suitable for the filtration of smoke and dust. It has 1 filtration stage in the form of cartridge filters made of polyester fabric. During operation, the filters trap the dust on the outer surface, from where they are periodically removed automatically using pulses of compressed air, allowing the device to run without stopping.

INFORMATION



At the customer's request, the device can be equipped with filters adapted to specific working conditions.

! DANGER

Possible damage to the device, fire or explosion!



It is **FORBIDDEN** to use the device for transporting air containing sticky or caustic contaminants that may adversely affect the device!



It is **FORBIDDEN** to use the device for transporting a mixture of air and flammable substances in the form of gases, vapours, mists or dust, which create **an explosive atmosphere** with the air!

3.2. STRUCTURE

3.2.1. DESCRIPTION

The filtering device **UFO-A-N** consists of 3 modules as standard – see Picture 1 on page 11, i.e. a fan with an expansion chamber at the top of the device (module A), a support frame with a chute and a dust container (module D) and a filter module (module B + C). The structure is self-supporting and equipped with appropriate handles for transport with the use of lifting devices.

The filtration module is equipped with **1 stage of filtration**, i.e. cartridge filters and an automatic cleaning system, which allows the device to be used in a continuous cycle without the need to stop. The number and size of filter modules depend on the device model, i.e. **UFO-A-5000-N** and **UFO-A-10000-N** have 1 module; **UFO-A-15000-N**, **UFO-A-20000-N** – 2 modules – see below – Picture 2, Picture 3, Picture 4 and Picture 5.

Description of the modules (see Picture 1 on page 11):

- A. **A fan in an aluminium casing** with an elbow and a silencer, which includes a flanged **electric motor with a radial impeller** mounted directly on its shaft, balanced to class G6.3.
- B. **A filter chamber** ¹ with **cartridge filters**. At the front of this chamber, there are hinged doors for inspection and filter replacement.
- C. **A regeneration chamber** ¹ is separated from the filtration chamber, in which there are cartridge filter outlets, Venturi nozzles and the nozzles of the filter regeneration system. Removable inspection covers are mounted on the back and side of this chamber.
- D. **Support frame** with a chute and a detachable dust container with a capacity of 72 dm³.

Additionally, it may specify:

- A. The inspection covers the side and rear of the filter chambers for checking the condition of the compressed air system and the inside of the "clean" part of the chamber.
- B. **Compressed air installation** (1 set for each filtration chamber), which includes:
 - a. **Compressed air tank**, designed to work with working pressure in the range from 0.6 to 0.8 MPa and a capacity of 30.1 N L,
 - b. **Electromagnetic pulse valves** ² for generating pulses of compressed air,
 - c. **Noise silencers** mounted on impulse valves.
- C. **A control unit (electrical switchgear)** that controls the operation of the fan and the filter regeneration system.

INFORMATION



As standard, the **electrical switchgear** is installed **on the device** in place of the blind suction connector. The electric switchboard **may be installed** in a different place, far from the device.

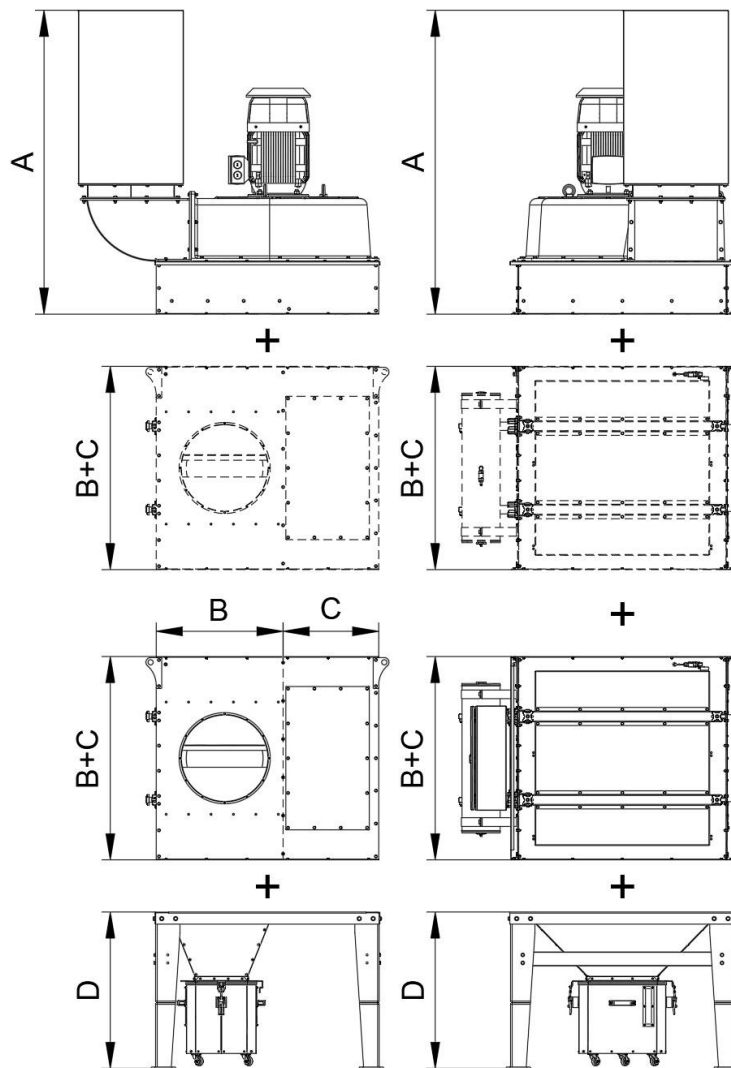
CAUTION:

- A. In the case of the **UFO-A-N** device with the inlet on the **right (RH marker)**, the **electrical switchboard** is on the **left side** of the device housing and the inlet connector is on the right, while in the case of the device with the inlet on the **left (LH marker)**, the opposite is true. A plug is installed in the place of the unused air inlet.
- B. If two inlets are used at the same time, the electric switchboard should be installed outside the device in a convenient place for use.
- C. If the electric switchboard is **located outside the device**, it is recommended to connect the electric motor with the switchgear **through a service switch** disconnecting the power supply during maintenance. This switch should be **placed next to the fan** within the **reach of maintenance personnel**.
- D. As a standard, the **fan motor** is provided with a cover against the influence of atmospheric precipitation.
- E. The filtering device **UFO-A-N** is delivered **without air intake silencers**.

¹ **CAUTION: UFO-A-5000-N** has 1 chamber; **UFO-A-10000-N; UFO-A-15000-N** and **UFO-A-20000-N** – 2 chambers;

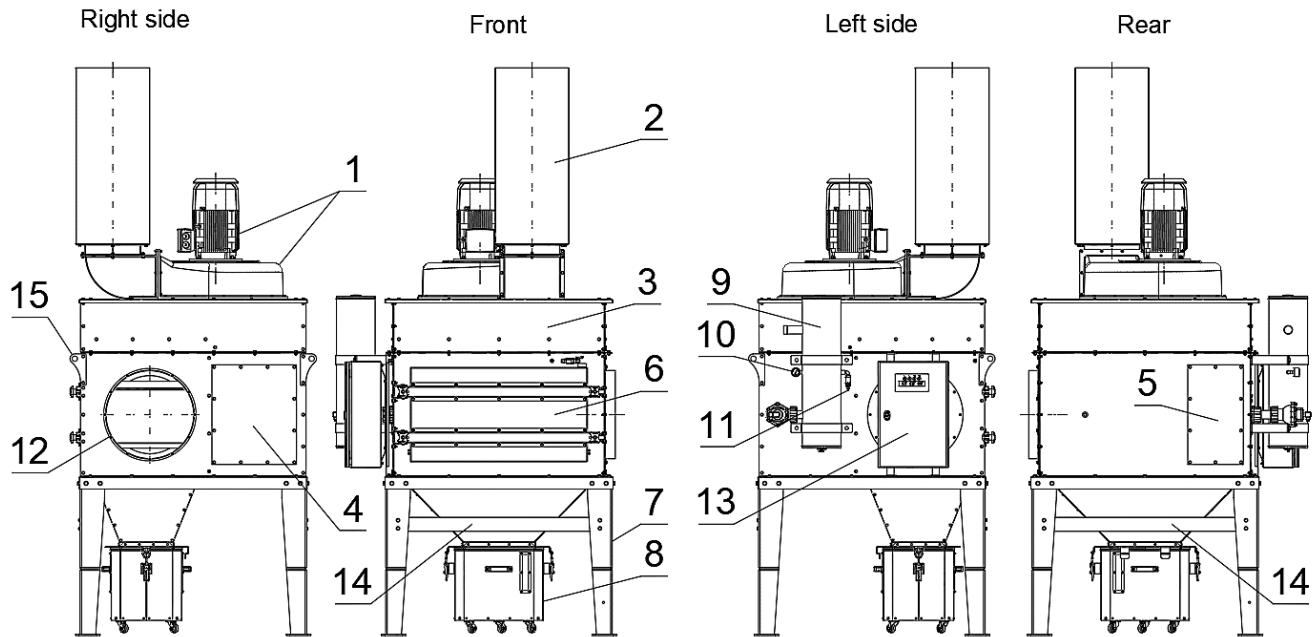
² **CAUTION: In the case of the UFO-A-5000-N device**, the compressed air tank is equipped with only 1 impulse valve. The other port is blanked off.

F. As standard, a **silencer** is installed at the outlet of the device as shown in the pictures – see below – Picture 2, Picture 3, Picture 4 and Picture 5.

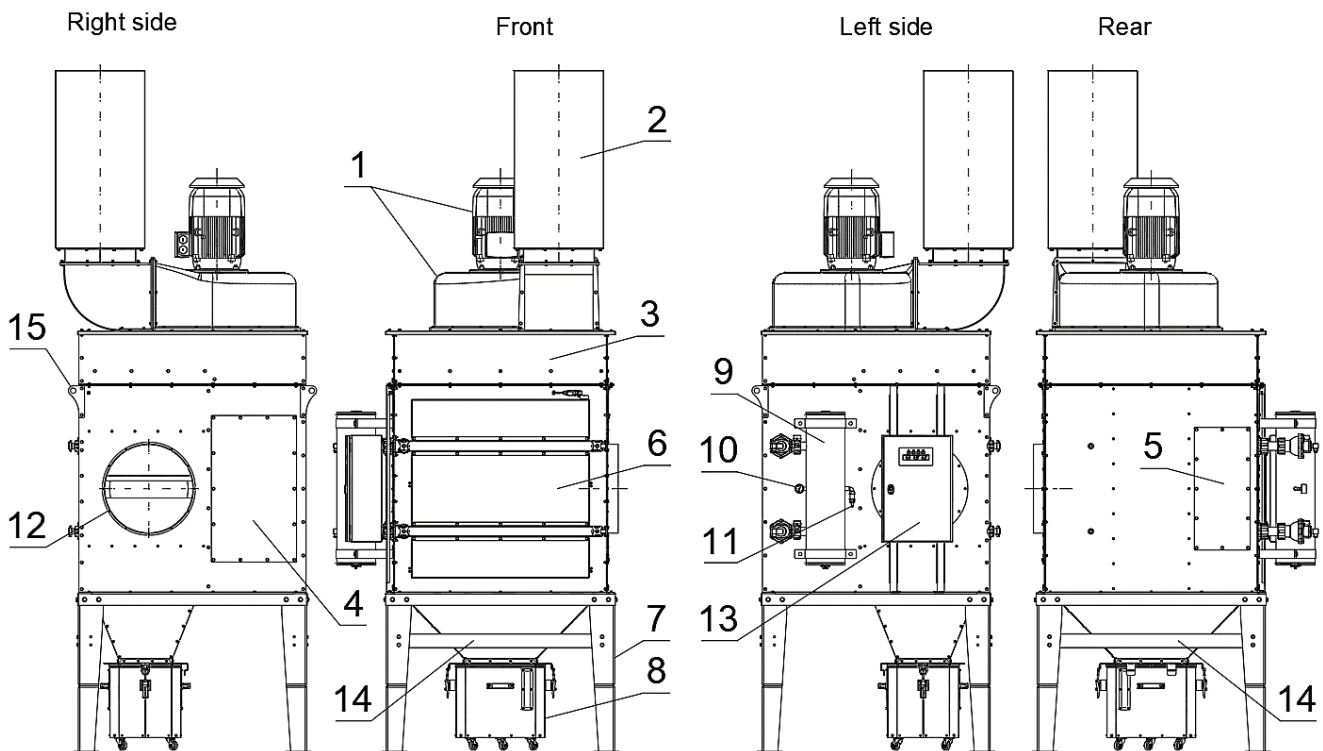


A – Fan module;
B+C – Filter module: filtration chamber
 and regeneration chamber;
D – Support frame with a chute
 and a dust container

Picture 1 A typical arrangement of the UFO-A-N device



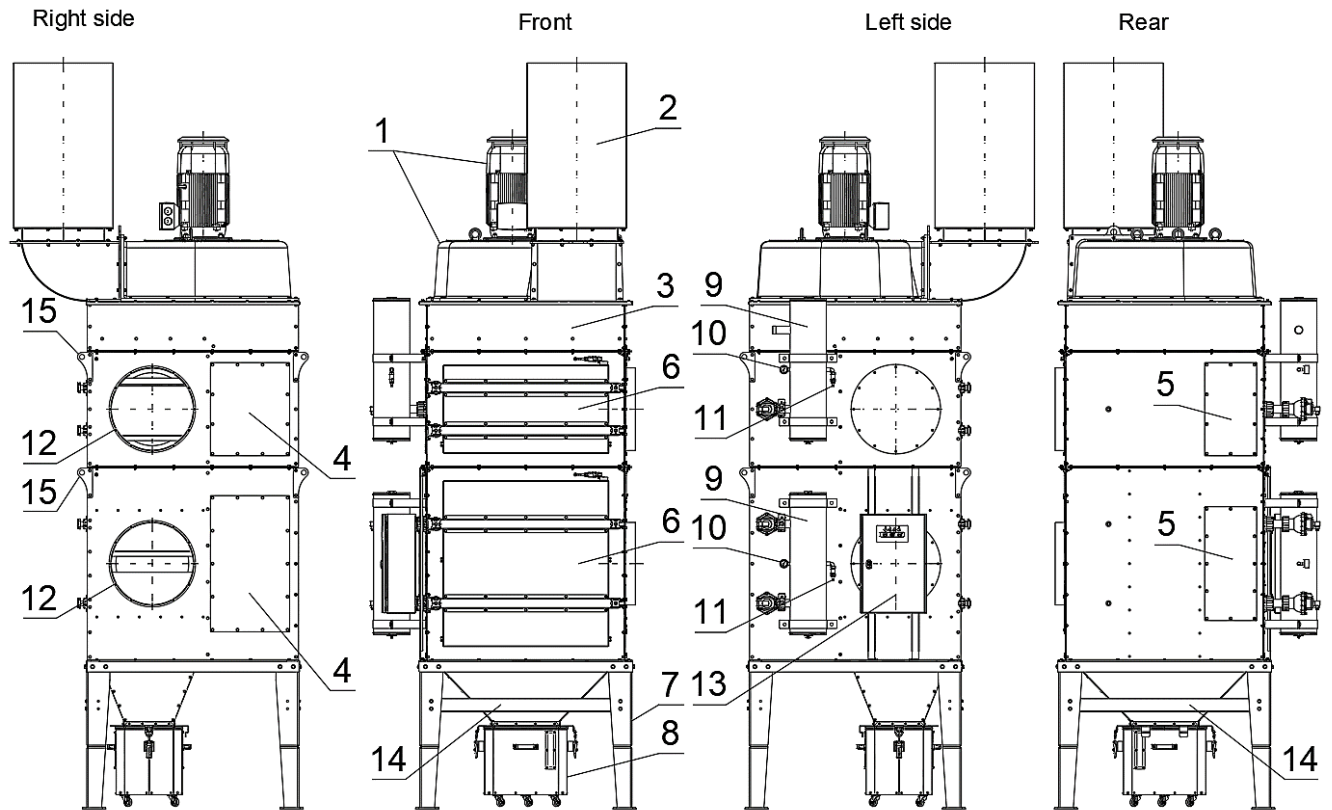
Picture 2 Functional description of the UFO-A-5000-N device with the inlet on the right side



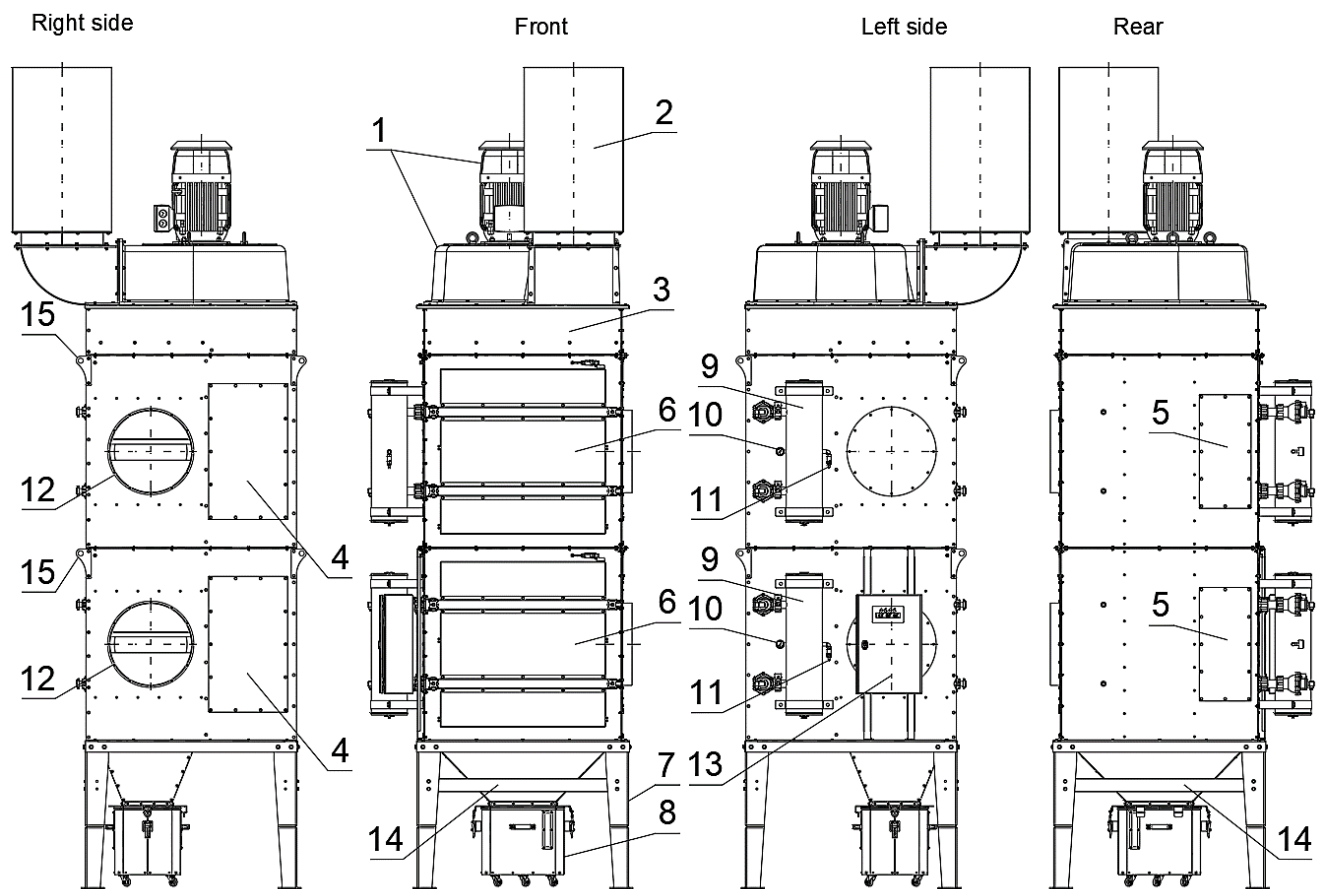
Picture 3 Functional description of the UFO-A-10000-N device with the inlet on the right side

EXPLANATION TO Picture 2; Picture 3; Picture 4; Picture 5:

- 1** – Fan, **2** – Duct silencer, **3** – Expansion chamber, **4** – Regeneration chamber inspection cover,
5 – Regeneration chamber inspection cover, **6** – Filter chamber inspection door, **7** – Support frame,
8 – Dust container, **9** – Compressed air tank, **10** – Manometer,
11 – Compressed air connection Ø12 mm, **12** – Inlet connection Ø500 mm,
13 – Electrical switchgear, **14** – Supporting beam, **15** – Hanger



Picture 4 Functional description of the UFO-A-15000-N device with the inlet on the right side



Picture 5 Functional description of the UFO-A-20000-N device with the inlet on the right side

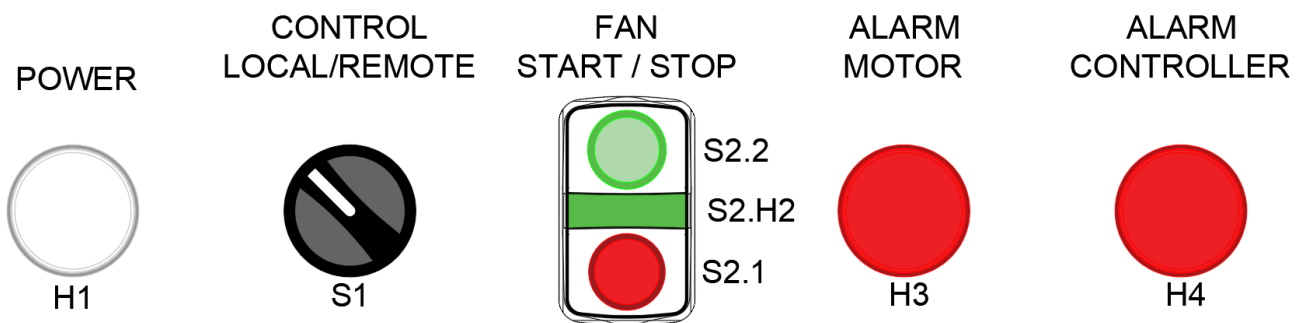


3.2.2. CONTROL UNIT (ELECTRICAL SWITCHBOARD)

The control unit consists of two basic components (see Picture 6):

- A. The control panel mounted on the cover of the electrical switchboard and
- B. The electrical apparatus built inside the switchgear serves as a power supply to the device and the controller.

The control panel consists of traffic light components and buttons such as signal lamps and illuminated buttons. Their task is to turn on the power, start the fan and signal the operating states of the device as well as an alert in the event of a failure. The switchboard with the camera is described in point – 7.2.1 – “SWITCHGEAR AND CONTROLLER” on page 45.



Picture 6 Control panel appearance

*H1 - Lamp signalling the appearance of power in the system; S1 - Mode switch;
S2.1 - Fan stop button; S2.2 - Fan start button; S2.H2 - Green light indicating fan operation;
H3 - Red light indicating engine alarm; H4 - Red light indicating a controller alarm*

! WARNING



The device can be controlled from the panel on the electrical switchboard (**LOCAL**) or from another (**REMOTE**) by connecting to terminals **17** and **18** in the switchgear of the **NO** relay signal.

3.3. SPECIFICATION

3.3.1. TECHNICAL DATA

Table 1 Technical data

Type	UFO-A-5000-N	UFO-A-10000-N	UFO-A-15000-N	UFO-A-20000-N	
Catalogue No.	805U20	805U21	805U22	805U23	
Nominal airflow	5 000 m ³ /h	10 000 m ³ /h	15 000 m ³ /h	20 000 m ³ /h	
Maximum airflow	9 200 m³/h	14 300 m³/h	18 100 m³/h	22 700 m³/h	
Working airflow	4 000-6 000 m ³ /h	8 000-12 000 m ³ /h	12 000-16 000 m ³ /h	16 000-21 000 m ³ /h	
Maximum negative pressure	4 100 Pa	4 500 Pa	5 000 Pa	5 250 Pa	
Mass net	575 kg	765 kg	1015 kg	1 125 kg	
Sound pressure level ^{3, 4}	72 dB(A) ^{3,4}	76 dB(A) ^{3,4}	78 dB(A) ^{3,4}	80 dB(A) ^{3,4}	
Device operating temperature	from -20°C to + 40°C				
Maximum air dustiness	3 g/m³				
Electric supply					
Electric motor power	5.5 kW	11 kW	18.5 kW	22.0 kW	
Supply voltage and frequency ⁵	3×400 VAC, 50 Hz ⁵				
Synchronous speed	3000 rpm				
Compressed air supply					
Nominal consumption ⁶	2.8 Nm ³ /h ⁶ (7.8 litres/min)	5.6 Nm ³ /h ⁶ (15.3 litres/min)	8.4 Nm ³ /h ⁶ (23.3 litres/min)	11.2 Nm ³ /h ⁶ (31 litres/min)	
Compressed air pressure	from 0.6 to 0.8 MPa				
Quality conditions ⁷	Oil-Solids-Water: 6:4:4 ⁷				
Equipment					
Cartridge filters	Designation	PN306638U			
	Catalogue No.	800F25			
	Filter material and surface ⁸	Non-woven polyester ⁸ \ 30 m ² per filter			
	Application ⁸	Smoke / Fine dust / Fine chips ⁸			
	Quantity in the device	2	4	6	8
	Dimensions [diameter × height]	Ø380×660 mm			
Compressed air tank	Capacity	30.1 dm ³			
	Dimensions [diameter × height]	Ø219×860			
	Working temperature and pressure	od -20°C do +80°C / 0.5 – 8 bar			
Pulse valve	Control type	Electric; opened with an electromagnetic coil			
	Diameter and type of flow	Ø1.5 ", angled 90°			
	Control voltage	24V/50-60 Hz (±10%) 19VA			
	Working temperature and pressure	from -20°C to +80°C / max 0.8 MPa			

³ **CAUTION:** Sound pressure measurement made at a distance of 1 m from the device at nominal air flow.

⁴ **CAUTION:** The device is a source of impulse noise during the operation of the automatic cartridge filter cleaning system.

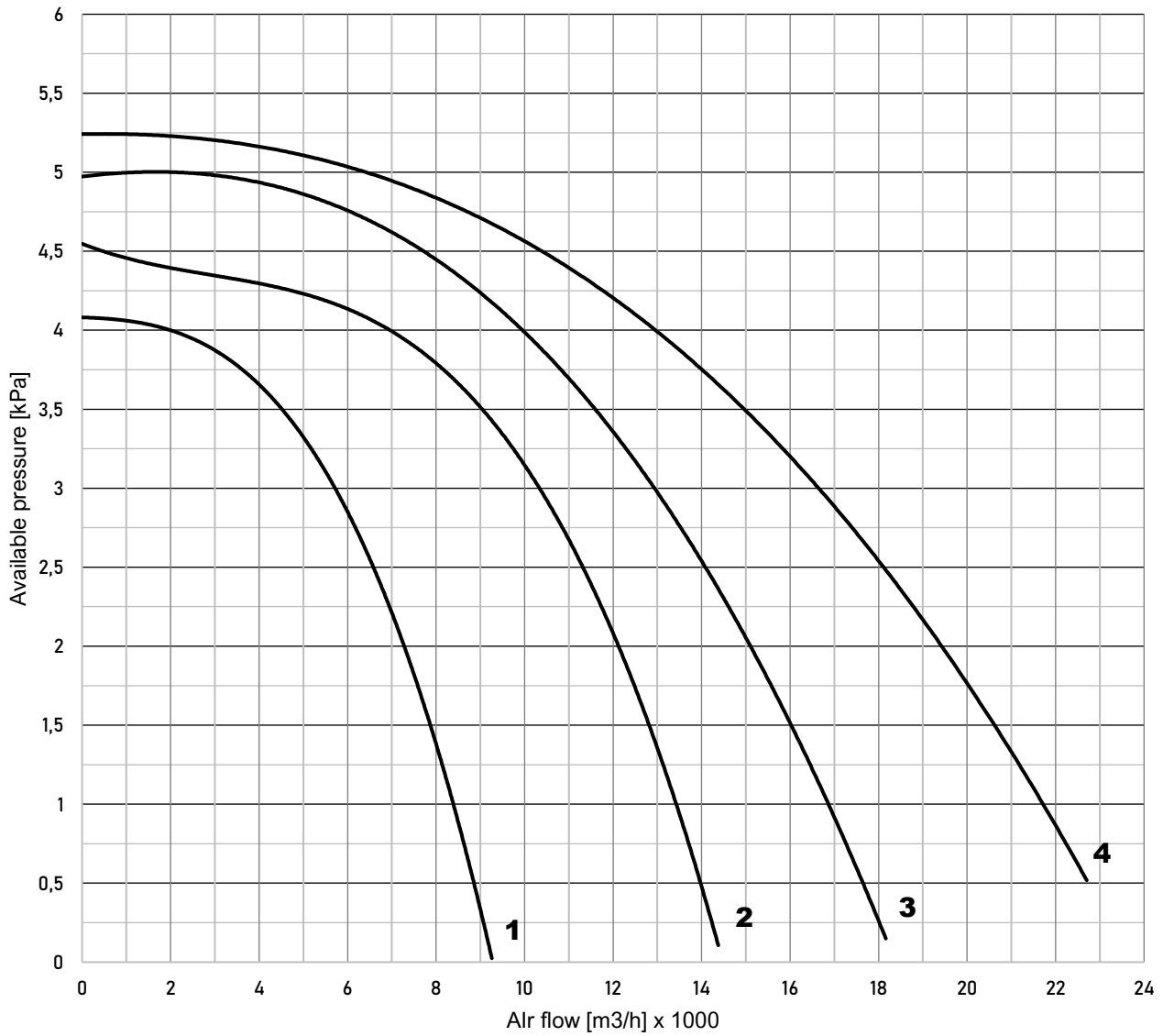
⁵ **CAUTION:** It is possible to adjust the rotational speed of the motor with the use of a frequency converter.

⁶ **CAUTION:** Air consumption for factory set regeneration parameters.

⁷ **ISO 8573-1:2010 class 6:4:4** – see point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 38.

⁸ **CAUTION:** At the customer's request, the filtration method can be adapted to specific working conditions.

3.3.2. FLOW CHARACTERISTICS



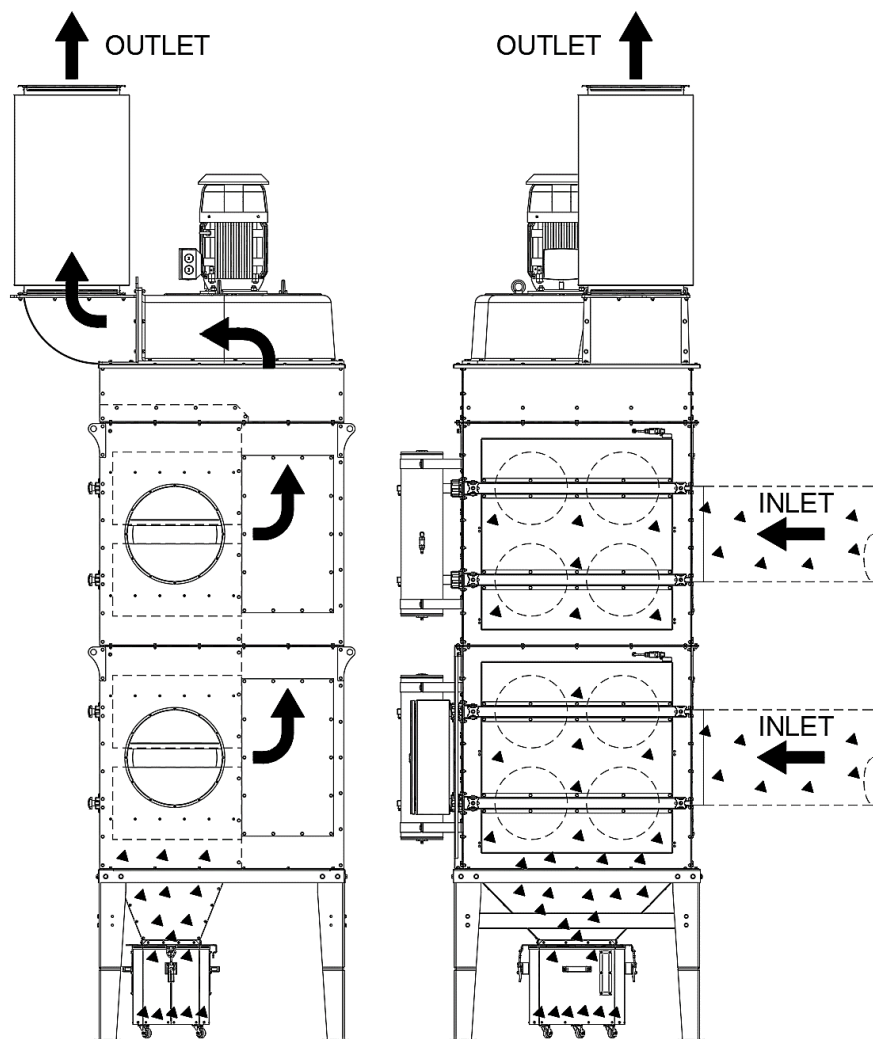
Picture 7 Summary diagram of the efficiency of UFO-A-N filtering devices

1 – UFO-A-5000-N; 2 – UFO-A-10000-N; 3 – UFO-A-15000-N; 4 – UFO-A-20000-N

3.4. PRINCIPLE OF OPERATION

The purpose of the **UFO-A-N** device is to clean the conveyed air from dust contamination with the use of cartridge filters with polyester fleece ⁹.

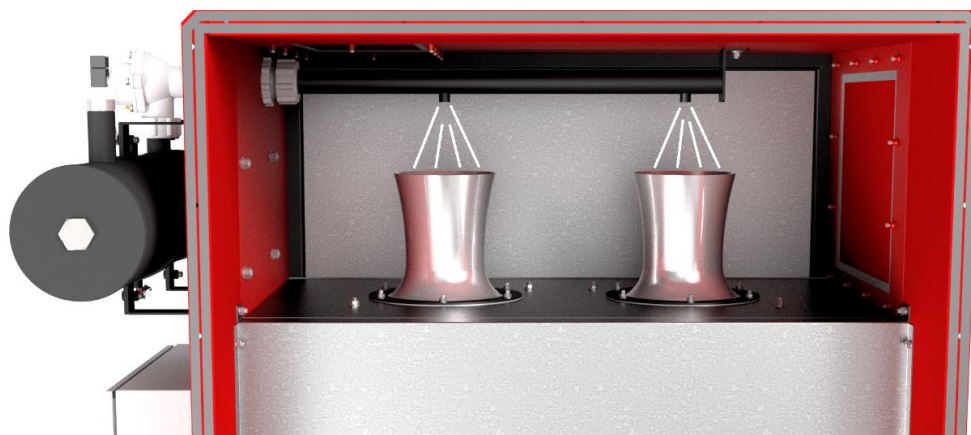
The **UFO-A-N** device, depending on the model, has from 1 to 2 filtration chambers, which are equipped with 1 suction connector with a diameter of Ø500 mm – see Picture 32 to Picture 39 on page 70 – located on the right or left side of the casing, to which a ventilation system must be connected. The air sucked in enters the filtration chamber, where the impurities contained in the air precipitate on the surface of the filters, and the cleaned air flows through the filter fleece to the ventilation system – see Picture 8.



Picture 8 Air flow path

Some of the pollutants fall into the tank and the rest adheres to the external surface of the filters as a result of suction (negative pressure) by the flowing air. Adjacent impurities increase the flow resistance during the operation of the device, so to counteract this phenomenon and reduce the flow resistance, pulses of compressed air are generated during the operation of the device, shot through special nozzles (so-called Venturi nozzles) to the filters from the "clean" side, which cleans them from dust – see Picture 9 on page 18. The removed dust drops off and accumulates at the bottom of the device in a container. Dust in the container must be systematically removed so as not to cause repeated entrainment of the dust from the container.

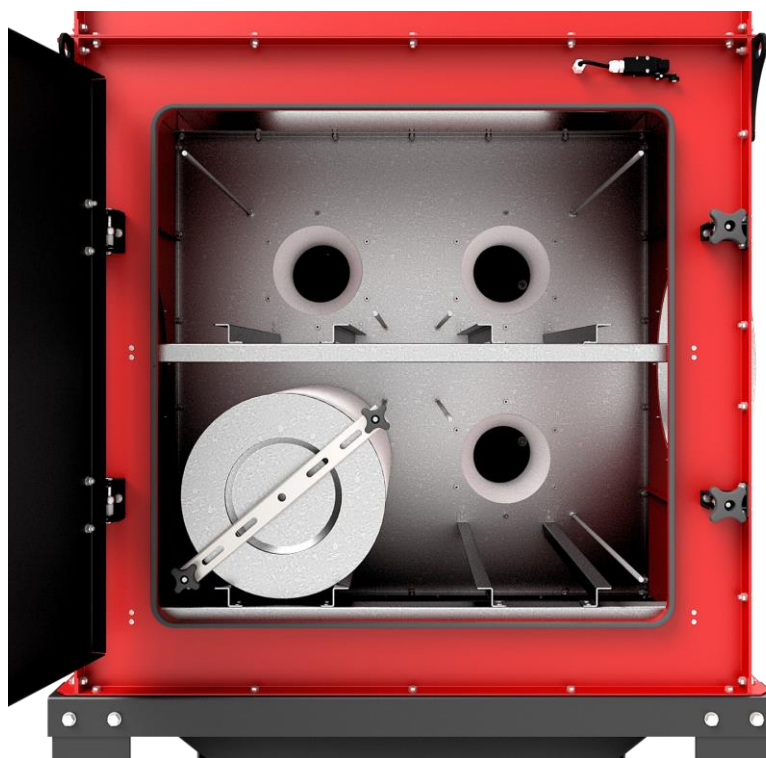
⁹ At the customer's request, the filter material can be adapted to the specific operating conditions of the device.



Picture 9 View of the inside of the chamber and Venturi nozzles

The filter regeneration process takes place automatically and at specific intervals during the operation of the device, thanks to which the device can work without stopping.

In the case of a high dust load or after a longer period of operation, it is possible to increase the flow resistance and decrease the efficiency of the device, regardless of the operation of the filter regeneration system. This is normal. When a significant drop in efficiency is found, the filters should be removed from the device and cleaned manually or mechanically using a device designed for this purpose.



Picture 10 View of the inside of the filters' chamber

! CAUTION



The design and principle of the control of the device enabling maintenance in a continuous cycle, requires the control of the sequence of control, the number of controls of the sequence of control and the condition of the cartridge control, and then systematic control of the assembly of the master.



To ensure an effective filtration process, it is required to ensure a stable connection of compressed air with the filter cleaning system, and the conditions and minimum parameters of the compressed air are presented in point 3.3.1 – TECHNICAL DATA on page 15.

4. SAFETY OF USE

4.1. MANUFACTURER'S DISCLAIMER

! CAUTION



Producer **KLIMAWENT S.A.** conducted a risk analysis only for the **UFO-A-N** device, but it does not take into account the impact of additional risks arising from use and application at the installation site.



Unauthorized modifications to the device and installation of additional elements that are not part of the device or additional equipment are **FORBIDDEN** and may affect the safe use of the device!

4.2. SAFETY RULES AND APPLICATION RESTRICTIONS

! CAUTION



PLEASE READ this manual before putting the device into operation!

KEEP THIS MANUAL for future reference where it is accessible to all users.



PROTECT the device against mechanical damage.



PROTECT all markings, descriptions, nameplates and, in particular, warnings against seizure, damage causing illegibility or tearing off.



The device is intended for **PROFESSIONAL USE**. Before starting work, familiarize yourself with the procedures and principles of operating the device. Service may only be performed by **TRAINED** and **QUALIFIED** personnel.

! WARNING

Possible equipment damage or serious personal injury!



The manufacturer is not responsible for any injuries resulting from improper use, moreover, for all operations to be performed on the device (assembly, maintenance, cleaning, etc.), operators must be equipped with appropriate Personal Protective Equipment (PPE) to prevent or minimize injuries that cannot be prevented by other means.



Before assembling the device, check the load-bearing capacity of the structural elements to which it will be attached. **Improper, careless or unstable mounting** of the device may damage it, and also pose a real threat to people in the vicinity.



The equipment **MUST NOT** be put into operation before making sure that the continuity and connection of the **PE** conductor have been checked.



Unauthorized modifications to the device and installation of additional elements that are not part of the device or additional equipment are **FORBIDDEN!**

**! WARNING****Possible damage to the device and disruptions in operation.**

The temperature of filtered air **CANNOT** exceeds **+60°C**.



The ambient temperature during the operation of the device **MUST** be between **-20°C** and **+40°C**.

The fan motor should not be exposed to direct sunlight or other thermal radiation that could significantly heat its body.



Ambient relative humidity **MUST NOT** exceed **95%** without condensation.



The atmospheric pressure **MUST** be between **800 hPa** and **1100 hPa**.



The altitude above sea level **CAN NOT** exceed **1000 m**.



The dust limit of the filtered air **MUST NOT** exceed **3 g/m³**.



The device **CAN NOT** be used for the filtration of moist or sticky dust adhering to the surface of the filters, significantly reducing the filtration efficiency.



The device **MUST** be permanently connected to the compressed air network to ensure the uninterrupted operation of the automatic filter cleaning system. Compressed air **MUST** be prepared by appropriate filtering and reducing unit with a pressure ranging from **0.6 to 0.8 MPa** and meeting the purity conditions specified in point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36.



The device **CAN** work continuously under certain conditions – see 3.4 – “PRINCIPLE OF OPERATION” on page 17.



The device **MUST NOT** work in an environment that may cause an accelerated rate of corrosion.



When the device is powered by a frequency converter (inverter), the maximum speed of the motor **MUST NOT** be greater than the nominal speed of the fan motor. In addition, the frequency variation up and down should be limited so that the frequency is between **15 Hz** and **50 Hz**. This limit **MUST NOT** be exceeded by any unauthorized modification of the fan control system.

! DANGER**Possible damage to the device, fire or explosion!**

It is **FORBIDDEN** to use the device for transporting air containing sticky or caustic contaminants that may adversely affect the device!



It is **PROHIBITED** to use devices for cleaning the air of carcinogenic, radioactive dust or contaminated with pathogens and other dangerous substances posing a high risk to human health and life.



It is **FORBIDDEN** to use the device for transporting a mixture of air and flammable substances in the form of gases, vapours, mists or dust, which create an explosive atmosphere with the air!

4.3. REQUIRED PERSONAL PROTECTION

RECOMMENDED PERSONAL PROTECTION	
	<p>Use head protection</p> <p>The warning indicates that personnel must use a protective helmet. Always wear head protection when operating the equipment or during maintenance. The device has protruding housing elements and adjusting elements that can be injured when it is tilted.</p>
	<p>Use hearing protection</p> <p>The warning indicates that ear protection must be worn when operating the device. During operation, the device generates noise that may harm people nearby.</p>
	<p>Use eye protection</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation (e.g. emptying the dust container or replacing filters) and maintenance.</p>
	<p>Use foot protection</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation and maintenance.</p>
	<p>Use hand protection</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation (e.g. emptying the dust container or replacing filters) and maintenance.</p>
	<p>Use protective clothing</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation and maintenance.</p>
	<p>Use face protection</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be taken during operation (e.g. emptying the dust container or replacing filters) and maintenance.</p>
	<p>Use dust masks</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation (e.g. emptying the dust container or replacing filters) and maintenance.</p>
	<p>Respiratory protection required</p> <p>A warning indicates that it must be used by security personnel.</p> <p>Protective measures must always be used during operation (e.g. emptying the dust container or replacing filters) and maintenance.</p>
 	<p>The requirement to disconnect the device from the mains</p> <p>A warning indicates that the appliance must be disconnected from the power supply for maintenance, fault finding and similar operations involving the opening of covers and access to hazardous parts, especially the fan impeller.</p>



4.4. WARNINGS

RECOMMENDED MARKINGS ON OR NEAR THE DEVICE



CAUTION: Danger due to sudden noise!

During the regeneration of filters with compressed air, air blows from the nozzles regenerating the filters, which generates impulse noise!

The warning indicates that ear protection must be worn when operating the device.



CAUTION: Danger due to noise!

The warning indicates that ear protection must be worn when operating the device. The device generates noise during operation and may adversely affect people in the vicinity.



CAUTION: Danger due to dusty atmosphere!

The device itself is not a source of dust emission and has a sealed housing, but due to the purpose of the device for air purification, dust from the filtration process accumulates inside, on the surfaces of the filters and the chute and in the tank. Each

time the device is opened, or the dust container is emptied, the user comes into contact with potentially harmful process dust.



4.5. RESIDUAL RISK INFORMATION

KLIMAWENT S.A. performed a Risk Assessment carried out following **EN-ISO 12100**. This assessment shows the residual risk for the above device (machine) and is illustrated in this chapter. The person who will design the system, together with the company/person who will integrate the above device into the machine/end system, must carry out another residual risk analysis and ensure that the entire installation is safe and complies with **Directive 2006/42/EC**.

The table below presents information on the residual risk and the rules of conduct during use in each phase of the device's life.

**ATTENTION: THE DEVICE IS SAFE AS THE PROVISIONS SHOWN
IN THE TABLE BELOW FOLLOW THE DEVICE.**

Table 2 Safety rules and information on residual risks

THREATS AND SAFETY RULES			
No.	Phase	Threats	Procedure
1.	Unpacking	Impact, abrasion, overturning	Use personal protective equipment to protect against accidental abrasions, cuts and injuries, in particular anti-cut gloves, protective clothing and work shoes. Pay attention to protruding parts when walking and working next to the device.
2.	Transporting, lifting and moving	Hitting, rubbing, overturning the load, sliding the load	Lifting, carrying or transporting elements (modules) of the device is allowed only with the use of fastening elements installed on the device and intended for transport – see points 5.1 – “TRANSPORT” on p. 27 and 5.2 – “STORAGE” on p. 27: <ul style="list-style-type: none"> • in the case of a support frame with a chute – a transport beam with lugs serving as a support for forklifts; • in the case of filtration chambers and chambers with a fan – transport lugs mounted on the edges of the chambers, are used to fasten crane hooks.
3.			Keep hands, hands and other parts of the body away from ropes, lanyards or chains, lifting hooks while lifting, handling, and preventing them from being crushed and sheared as a result of tension in the ropes due to the weight of the load.
4.	Storage	Impact, abrasion, overturning	Use personal protective equipment to protect against accidental abrasion, cuts and injuries on protruding elements. Follow the rules described in point 5.2 – “STORAGE” on p. 27 to protect the device structure against damage, leakage, crushing or destruction.
5.	Assembly	Impact, scratch, cut	When handling cargo, operators must be equipped with personal protective equipment: <ul style="list-style-type: none"> • helmets, helmets, • anti-cut gloves, • protective clothing, • work boots.
6.			During assembly, keep hands, hands and other parts of the body away from ropes, tie rods, chains, lifting hooks, and gaps to prevent crushing and shearing due to rope tension under the load.
7.	Installation	Impact, fall	The user must prepare a suitable base suitable for the size and weight of the machine, and the surface must be level to prevent deformations that may affect the frame and the machine housing – see points 6.1 – “WORK AREA AND COMMUNICATION SPACE” on p. 29 and 6.3 – “INSTALLING” on p. 35.
8.		Electric shock	Make sure that the electric circuit is disconnected from the electricity supply.
9.			The design and execution of the electrical connection of the machine to the power supply must be carried out by a qualified electrician (see section 6.4.1 –



THREATS AND SAFETY RULES

No.	Phase	Threats	Procedure
10.			"ELECTRICAL CONNECTION" on p. 36) and the electric motor operating manual.
			It is necessary to ensure the correctness of the equipotential bonding, and check if the earthing connection with the main earthing bar is made – see section 6.5 – "COMMISSIONING / CHECKING / TESTING" on p. 39.
11.		Injection, burst, high air pressure	<p>The device must have a permanent connection to a compressed air network that provides stable pressure for the automatic cleaning of the filters in the device. The condition, pressure and quality of the compressed air must be constantly monitored.</p> <p>The design and execution of connection of the device to such a network must be performed by qualified personnel, following the principles of implementation of this type of installation.</p> <p>Regularly check the tightness of the tightening of the pneumatic elements. No air blows are allowed – they should be removed immediately, and in the event of damage to an element that prevents removal of the fault, disconnect the device from the compressed air system, empty the compressed air tanks and replace the defective element.</p>
12.	Commissioning, Operation	Discomfort, noise-induced stress	We recommend isolating the machine from the ground and the ventilation ducts of the suction and discharge part with elastic shock-absorbing elements and the use of duct silencers at the fan outlet. Do not place the device near corners, near walls or on enclosed metal structures due to the possibility of causing vibrations and resonances. The device is a source of impulse noise generated by the automatic system of filter cleaning with compressed air. Place appropriate warnings about the impulse noise generated by the device – see section 4.4 – "WARNINGS" on p. 22.
13.		Noise, discomfort, fatigue	The user or the employer must comply with the regulations on protection against the daily exposure of operators to noise generated in the workplace (required by applicable European and national standards) and require the use of personal protective equipment (ear muffs, earplugs, etc.) depending on the overall sound pressure level in individual workplaces and the level of daily personal exposure of workers – see point 4.3 – "REQUIRED PERSONAL PROTECTION" on pages 21 and 3.3.1 – "TECHNICAL DATA" on p. 15. Place appropriate warnings about the impulse noise generated by the device – see section 4.4 – "WARNINGS" on p. 22
14.		Electric shock, burns	All electrical equipment must be designed concerning the electric current consumption times and peaks of the installation and must be performed by qualified personnel.
15.			Make sure that the electric current consumed by the fan does not exceed the value stated on the motor nameplate.
16.			Avoid consecutive engine starts that lead to constant overloads of the starting system that overheat electrical components. Allow the electric motor to cool down before restarting.
17.			The construction of device is designed to work with frequency converters (inverters). Make sure that the maximum engine speed is not greater than the rated speed of the electric motor. In addition, you should limit the frequency variation from the bottom and top of the frequency value so that $f = (15 - 50) \text{ Hz}$, where f is the inverter output frequency and the larger value ($f = 50\text{Hz}$) is the rated frequency of the electric network.
18.		Burn	The company/person installing the machine in the ventilation system must provide adequate ventilation for the electric motor if adequate heat transfer cannot be guaranteed for the motor, such as during idle periods, when the motor is at high temperatures or when used with frequency converters. The lack of an adequate additional cooling system for the electric motor will adversely affect its properties and may cause its failure.



THREATS AND SAFETY RULES				
No.	Phase	Threats	Procedure	
19.			Do not touch the engine during and after long-term operation. Allow the motor casing and adjacent surfaces to cool down.	
20.			Provide scheduled maintenance to prevent technical failures that may occur over time as a result of excessive vibration.	
21.		Excessive vibration	Excessive vibrations should be avoided, as they may cause deformation or cracks in the rotor structure, seizure of the bearings, increased noise levels, loosening of bolts and nuts of important connections, and ultimately lead to the destruction of the rotating elements and create a situation threatening the safety of operators and people in the vicinity. Where possible, the use of bearing vibration and temperature monitoring systems is recommended.	
22.			It is recommended to monitor the fan vibrations with the use of a vibration sensor or to carry out the inspection every 4000 hours of work and vibration measurement to avoid exceeding V_{rms} = 11.8 mm/s – see point 8.4 – “MEASURING VIBRATIONS OF THE FAN” on p. 56.	
23.			Overspeed, Overtemperature, Destruction	The design device is designed to work with frequency converters (inverters) within the limits f = (15 – 50) Hz , where f is the inverter output frequency and the upper frequency f = 50Hz is the rated frequency of the electric network. This limit may not be exceeded by arbitrary modifications to the fan control system. The machine should be used in the conditions for which it was designed, especially to avoid excessive speed and temperature. Changing parameters may lead to irreversible damage to the device and, consequently, pose a threat to people.
24.				Poisoning, suffocation
25.		Slip, fall	Keep the minimum gaps of the device from walls or partitions during installation, otherwise, it may cause hazards and inconvenience in confined spaces during operation or maintenance – see pt. 6.1 – “WORK AREA AND COMMUNICATION SPACE” on p. 29.	
26.			Properly light the area surrounding the machine.	
27.		Maintenance, Cleaning, Troubleshooting, Disassembly	Trip, fall, slip	Keep the minimum gaps of the device from walls or partitions during installation, otherwise, it may cause hazards and inconvenience in confined spaces during operation or maintenance – see pt. 6.1 – “WORK AREA AND COMMUNICATION SPACE” on p. 29.
28.				Properly light the area surrounding the machine.
29.	Operators must be equipped with appropriate personal protective equipment to prevent slipping: footwear and protective clothing.			
30.	It is necessary to ensure the correctness of the earthing connection with the main earthing bar – see point 6.5.2 – “EARTHING AND EQUIPPING CONTROL” on p. 39.			
31.	Injection, burst, high air pressure			The device must have a permanent connection to the compressed air network, ensuring a stable pressure, and enabling automatic cleaning of the filters in the device. Regularly check the tightness of the tightening of the pneumatic elements. No air blows are allowed – they should be removed immediately, and in the event of damage to an element that prevents removal of the fault, disconnect the device from the compressed air system, empty the compressed air tanks and replace the defective element.



THREATS AND SAFETY RULES

No.	Phase	Threats	Procedure
32.			Before any maintenance work, switch off and disconnect the power supply to the device. Wait until all mechanisms have come to a complete stop. In the event of maintenance of the fan's interior, it is recommended to disconnect the power supply using the service switch located on the fan housing. This prevents the fan from being accidentally started by another person.
33.		Cut, entanglement, collision, electric shock, Burns	During maintenance of the rotor or the inside of the fan, even if the electrical supply has been disconnected, the impeller may rotate due to natural or induced air currents flowing through the device, as it is connected to the ventilation system. As a result, there can be a serious risk of cuts and/or entanglement. For this reason, it is necessary to mechanically block the moving parts of the fan. Operators must be equipped with appropriate personal protective equipment such as cut-off gloves and protective clothing.
34.	Be careful not to cut yourself with sharp parts or any manufacturing waste when removing the safety nets.		
35.	It is strictly forbidden to: <ul style="list-style-type: none"> • maintenance of the device during its operation, • removing covers and covers during device operation, • maintenance of the device without disconnecting the power supply. 		
36.	Cut / Collision / Poisoning / Choking / Cancer		Operators must be equipped with appropriate personal protective equipment: <ul style="list-style-type: none"> • (Certified) footwear, • (Certified) clothing, • helmets, helmets, • anti-cut gloves, • protective dust masks, • additional protections required by the safety data sheet of the pumped mixture and other regulations in force in the country of installation.
37.		Burn	Do not touch the engine after a long-term operation. Allow the electric motor housing and adjacent surfaces to cool down. Additionally, wait until the temperature inside and outside reaches a value that is not hazardous to touch. Operators must be equipped with appropriate personal protective equipment such as gloves and protective clothing.



5. TRANSPORT AND STORAGE

5.1. TRANSPORT

- A. Due to the dimensions of the device, the device is disassembled during transport and divided into several parts, enabling transport. Each of these parts is protected against weather conditions.
- B. The temperature during transport should be between **-30°C** and **+40°C**.
- C. Do not allow moisture to enter or flood the device. The device must be tightly protected against the influence of weather conditions.

During vertical transport, follow the guidelines for safe transport with the use of lifting equipment. Carry out a trial lifting of the load to a height of 0.5 m and check the correctness of the load securing. In addition, it is forbidden to stay under the load during transport.

Only certified slings should be used for vertical transport. Suspend the load on a 4-rope sling ended with hooks using an intermediate traverse that stabilizes the device and relieves the device's hangers from oblique forces – see Picture 16 and Picture 17 on page 32. In addition, the hooks should be fastened with hangers with holes of Ø30 mm, maintaining a safe opening angle between slings max 120 degrees. Use the directional rope to guide the load at height. It is allowed to guide the cargo manually to the structure with which it is to be connected. Keep hands and other parts of the body away from ropes, lanyards or chains and hooks while lifting or guiding to prevent them from being crushed or sheared due to tension in the ropes due to the weight of the load.

5.2. STORAGE

- A. The device should be stored folded or unfolded. Protect against the influence of moisture and penetration of dust as well as external weather conditions and above all protect against direct sunlight or other heat source or radiation.
- B. The storage place should be dry, dust-free, at a temperature from **-30°C** to **+40°C**, and the device must be empty and protected against the ingress of moisture. Relative humidity must not exceed 95%, non-condensing.
- C. The device must be protected against any shocks that could compromise its integrity.
- D. The device must be protected against the influence of oxidizing or corrosive substances that can adversely affect the sealing materials and the device in general.
- E. It is unacceptable to load the device with forces that could deform or destroy the housing of the device.
- F. The electric motor and the fan impeller must not stay stationary for a long time, both during storage and when the system in which the device will be placed is still under construction or at a standstill. During these periods, the condition of the impeller and fan should be checked periodically by turning the impeller to avoid damage to the motor bearings, especially oxidation of the bearing tracks.

! CAUTION



Producer **KLIMAWENT S.A.** is not responsible for damage to mechanisms as a result of long-term inactivity.



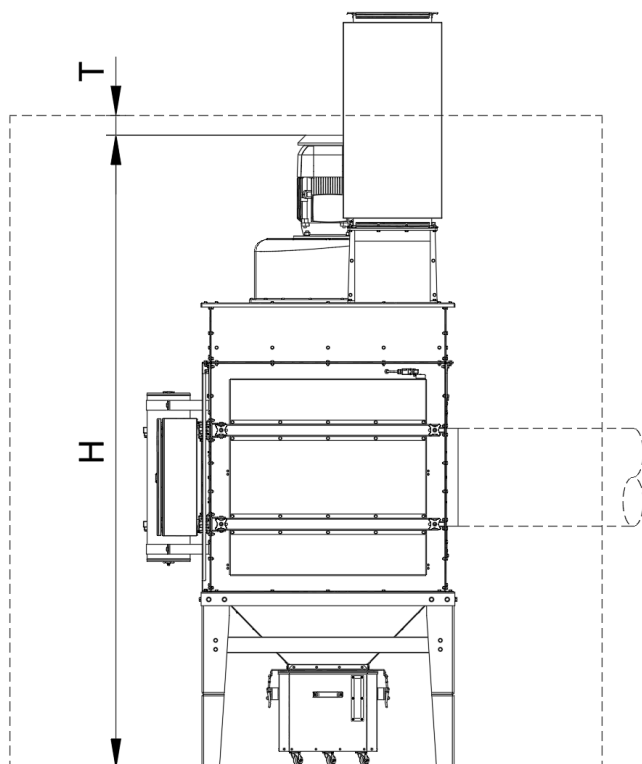
6. ASSEMBLY, INSTALLATION AND COMMISSIONING

6.1. WORK AREA AND COMMUNICATION SPACE

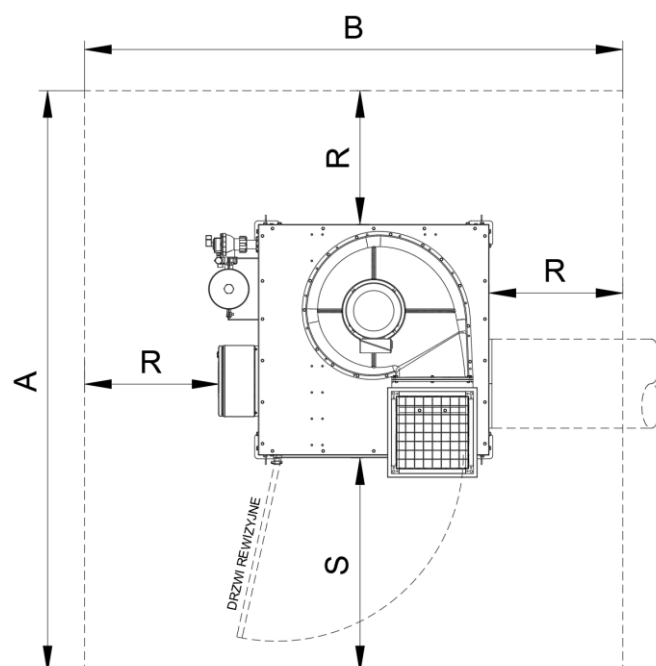
The device must be placed in places protected from unfavourable weather conditions and free from corrosive factors.

For the sake of the safety and convenience of communication and ergonomic operation of the device, it is necessary to provide a free area around the machine to prevent the risk of accidents.

Below are diagrams showing the minimum distances from the device, which should be kept when installing the device. The surrounding areas should also be left free to allow for safe maintenance work. In addition, there must be space above the motor to allow adequate ventilation and heat exchange by the electric motor. **The access of cooling air to the electric motor housing must not be obstructed.**



Picture 11 Workspace – Side Projection



Picture 12 Workspace – Top view

	A [m]	B [m]	H [m]	R [m] ¹⁰	S [m] ¹¹	T [mm]
UFO-A-5000-N	3.3	3.0	2.6	0.75 (1.0)	Min 1.25	Min 50
UFO-A-10000-N			3.3			
UFO-A-15000-N			4.1			
UFO-A-20000-N			4.6			

¹⁰ **CAUTION:** Passages between machines and other devices or walls intended only for the operation of these devices should be at least 0.75 m wide, and if there is two-way traffic in these passages, their width should be at least 1 m.

¹¹ **CAUTION:** Dimension on the cartridge filter access door side. If movement around the machine is required while opening the door, it is recommended to increase this value by another 1 m.



6.2. ASSEMBLY

6.2.1. GENERAL GUIDELINES

During transport to the installation site, the device is divided into several parts. All modules should be connected by a flange connection with a gasket and screwed together. These connections should be made carefully to ensure tightness. It is not allowed to omit any of the bolted joints, which may cause joint leakage, but also result in deformation, damage or instability of the structure and, as a result, a catastrophe.

To assemble the unit, at least 2 hexagon socket wrenches, size 13 (14) are required. When bolting, a specific bolting sequence is not required, but it is required to bolt in a uniform manner that prevents deformation of the flange connection. All connections should be tightened using force, bearing in mind the crush of the gasket and the distortion of the flanges. Do not use high-torque electric, pneumatic or similar screwdrivers! After screwing the device together, check the tightness of the connection during a test run.

6.2.2. ASSEMBLY PROCEDURE

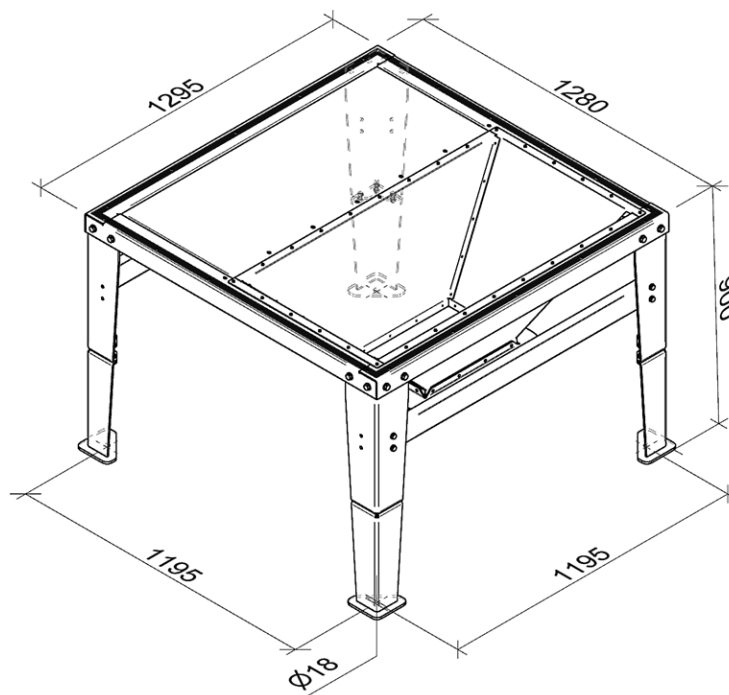
Depending on the model, the device can be divided into 2 or 3 parts for transport.

The device should be assembled at the workplace, observing the necessary safety measures, following the guidelines presented in point 6.1 – “WORK AREA AND COMMUNICATION SPACE” on page 29 and in pt. 4.5 – “RESIDUAL RISK INFORMATION” – Table 2 "Safety rules and information on residual risks" on page 23.

Depending on the division of the device, install by selecting the appropriate steps from the list below, and skip the rest.

ASSEMBLY PROCEDURE

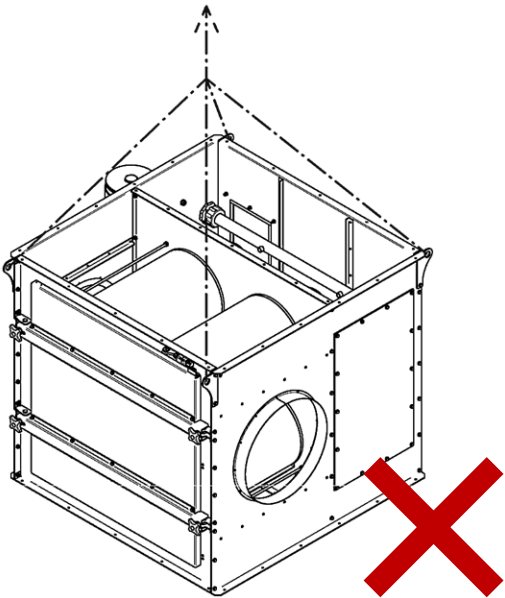
- A. Place the device supporting frame in the place of installation. A transport beam is used for transport, mounted between the legs of the support frame. The frame should be transported using forklifts.
- B. Level the carrying frame. Attach to the ground using the mounting holes in the legs – see Picture 13 below. The size and spacing of the mounting holes: $\varnothing 18$ to $\square 1195 \times 1195$ mm ¹².



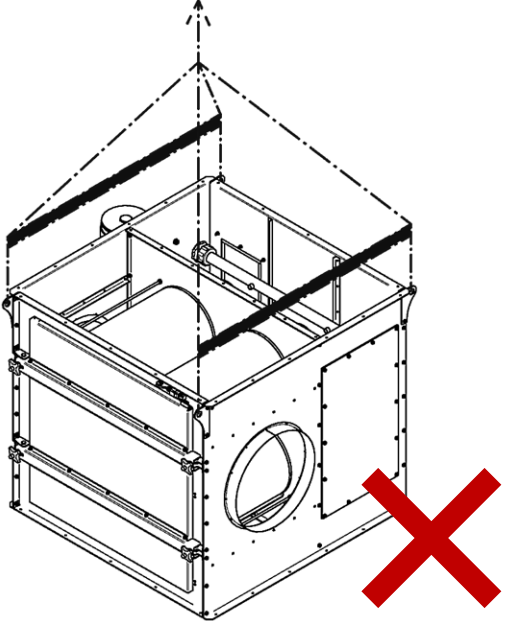
Picture 13 Support frame

- C. Apply the gasket on the frame surface as shown above – see Picture 13. Create a square from the gasket evenly spaced from the outer edge of the load-bearing frame, covering the mounting holes in the frame with a strip width of at least 25 mm. Check the quality and condition of the prepared gasket.
- D. Place the first filter chamber on the support frame. Use hangers mounted in the corners of the chamber – see Picture 21 on page 33. Pay attention to the smoothness of the adjacent surfaces and the condition of the sealing. Fix the elements with the M8 screws attached to the device.
- E. When suspending modules, follow the guidelines for the correct suspension of loads with elastic slings – see point 5.1 – “TRANSPORT” on page 27. Use appropriate intermediate beams such as crossbeams to protect the body structure from distortion or loss of stability. Diameter and spacing of hanger points: $\varnothing 30$ by $\square 1210 \times 1345$ mm – see Picture 18, Picture 19 and Picture 20 on page 33.
- F. The methods of hanging the filter modules shown in Picture 14 and Picture 15 are not allowed! Recommended methods are shown in Picture 16 and Picture 17 on page 32.
- G. Put the next modules in the same way, respecting the conditions of transporting loads specified in point E described above on page 31. Fasten the modules with the M8 screws attached to the device.
- H. Connect all modules with equipotential bonding. For this purpose, use the bolts to connect the modules by placing them under the head of the bolt and the eyelet of the equalizing wire. Check the conductivity of equipotential bonding.

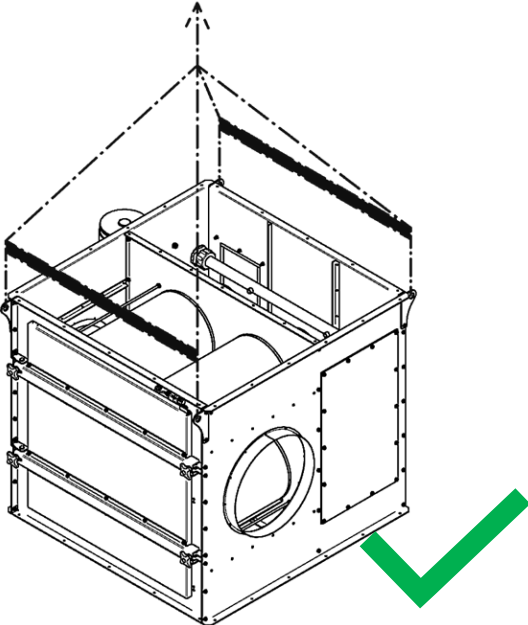
¹² Nominal dimension of the leg spacing. The design of the frame allows manipulation within small limits.



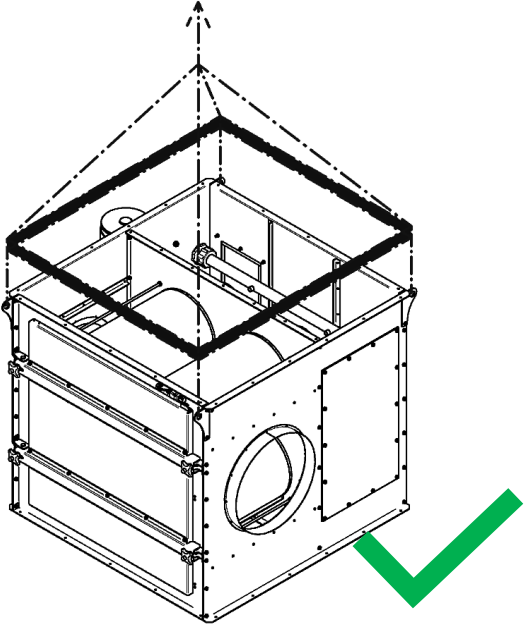
Picture 14



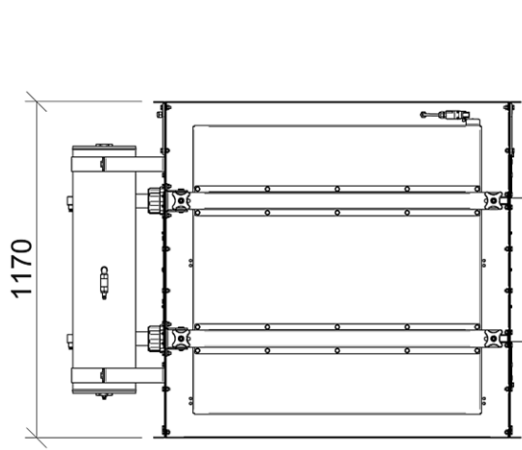
Picture 15



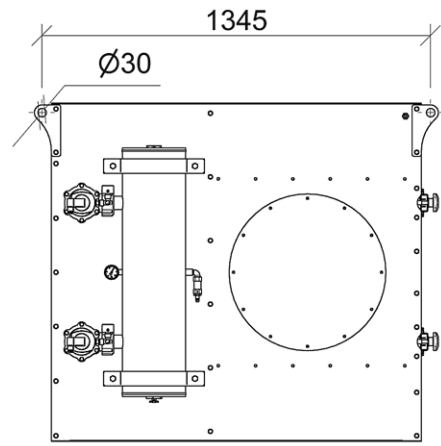
Picture 16



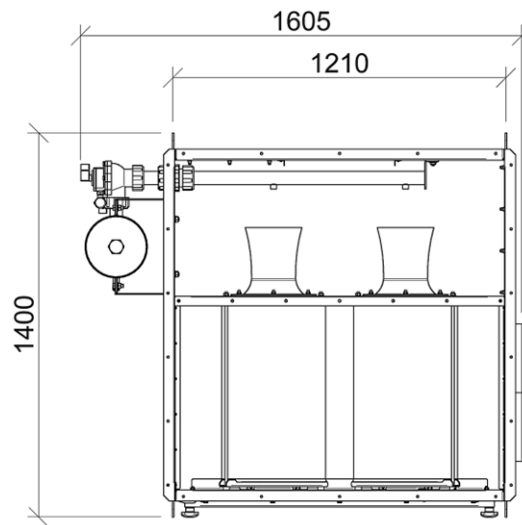
Picture 17



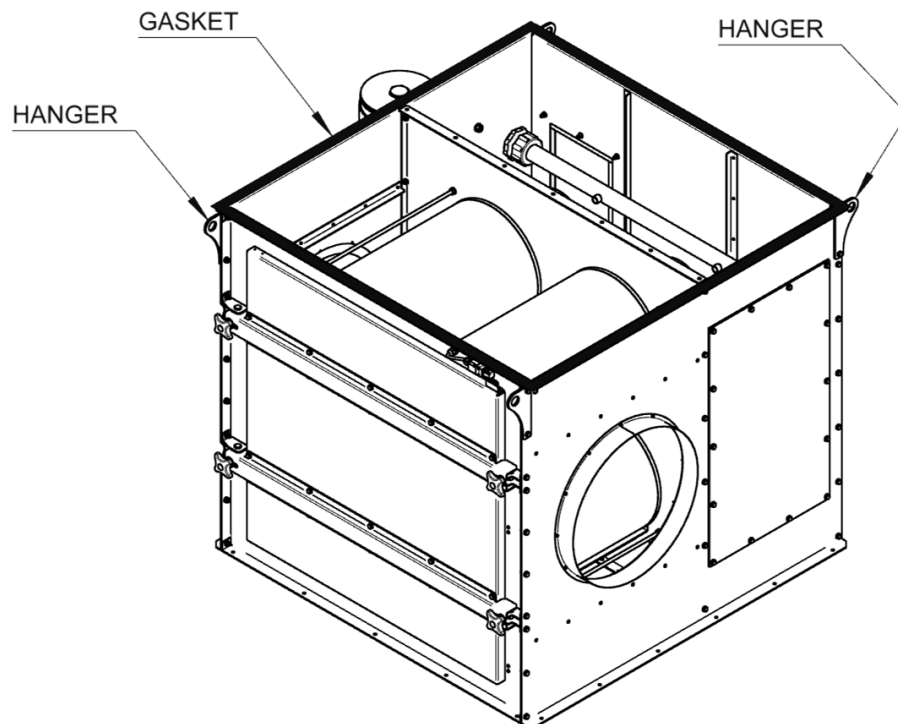
Picture 18



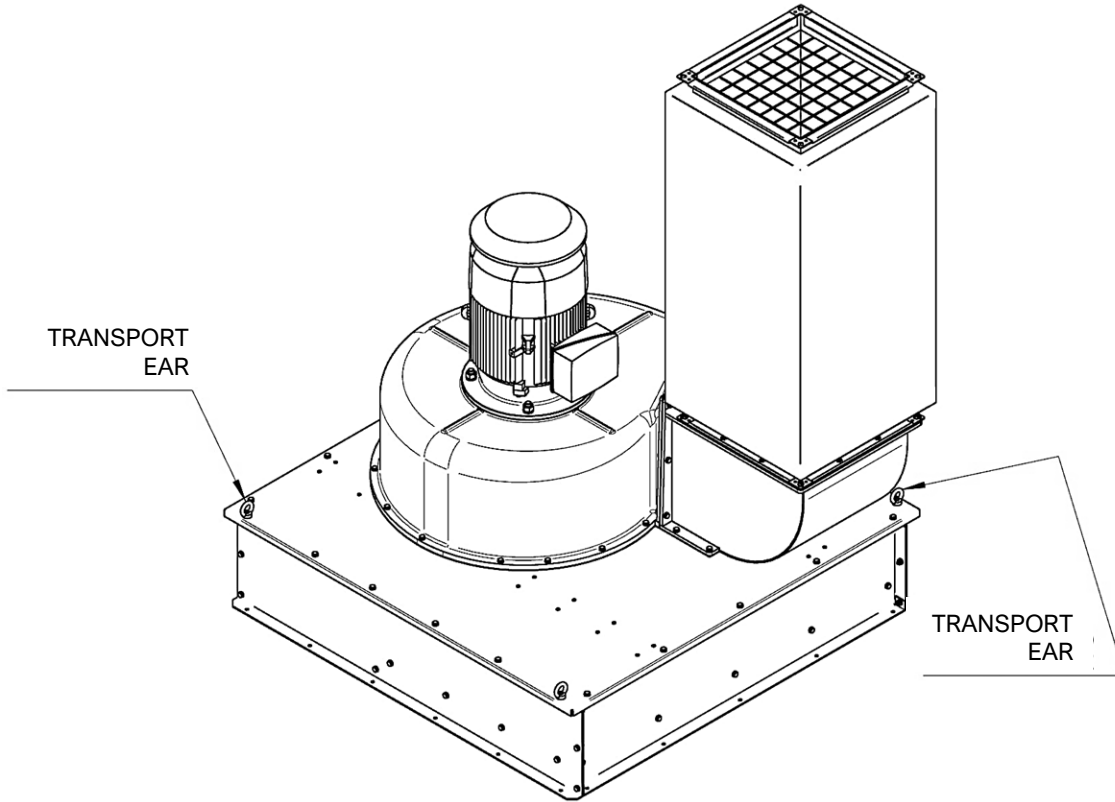
Picture 19



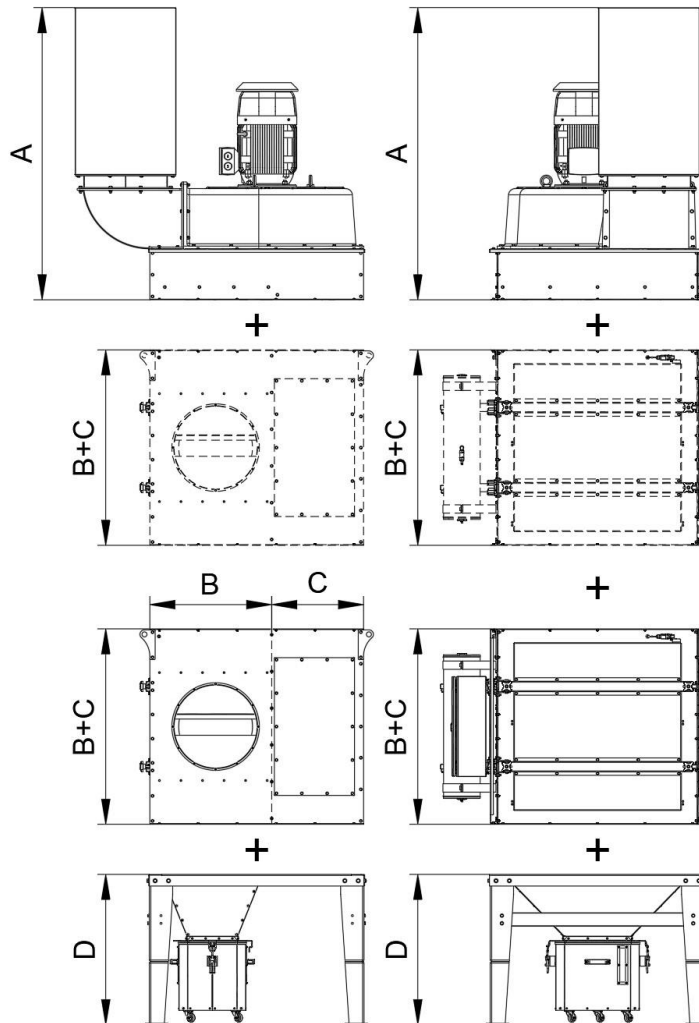
Picture 20



Picture 21 Filter chamber



Picture 22



Picture 23

6.3. INSTALLING

The user must prepare a surface suitable for the size and weight of the machine, and the surface must be level to prevent deformation that may affect the support frame and the machine housing.

The size of the area provided for the ergonomic and safe operation of the device is shown in point 6.1 – “WORK AREA AND COMMUNICATION SPACE” see – Picture 11 and Picture 12 on page 29.

The device should be connected to the **electric power supply** (see section 6.4.1 – “ELECTRICAL CONNECTION” on page 36), to the **compressed air network** (see section 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36) and to the filtered process **ventilation system** (see section 6.4.3 – “CONNECTION TO THE VENTILATION INSTALLATION” on page 37).

All installation activities must be performed by qualified personnel with confirmed authorizations after familiarizing themselves with the requirements – see point 4.2 – “SAFETY RULES AND APPLICATION RESTRICTIONS” on page 19.

! CAUTION



It is necessary to ensure the correctness of the connections to equalize the potentials of all parts of the ventilation system, to check if these connections have been made correctly and to make the earthing connection between the device and the main earthing bar – see point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36.



The device **MUST** be permanently connected to the compressed air network to ensure the uninterrupted operation of the automatic filter cleaning system. Compressed air **MUST** be prepared by appropriate filtering and reducing unit with a pressure ranging from **0.6 to 0.8 MPa** and meeting the purity conditions specified in point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36.

! DANGER



The user **MUST** ensure that adequate safety measures are taken in the ventilation system where the equipment is to be installed regarding **IGNITION** or **EXPLOSION DANGER** if required.



6.4. CONNECTIONS

6.4.1. ELECTRICAL CONNECTION

- A. The device requires the connection of an electric power supply that meets, above all, the minimum requirements for the electric motor of the fan drive, i.e. the voltage variation in the network must be within $\pm 5\%$. The design and execution of the electrical connection with the power supply must be performed by a qualified electrician following the diagrams in point 13 – “WIRING DIAGRAMS” on page 75 and the instruction manual for the electric motor.
- B. The device **MUST** be powered by the **ZE-UFO-A-N** electrical switchboard and properly connected to the device – see point 13 – “WIRING DIAGRAMS” on page 75. No modification is allowed.
- C. The device **MUST** be powered by electricity adapted to the power consumption of the device – see technical data in point 3.3.1 – “TECHNICAL DATA” on page 15.
- D. The device **MUST** be connected to the main equipotential bar. For this purpose, there are threaded studs in the legs of the support frame.
- E. The device **MUST** be powered from the **TN-S network**, i.e. from the three phases L1, L2 and L3 together with the **neutral conductor N** and the **protective conductor PE**. Power should be connected to **X1** strip terminals marked respectively L1, L2, L3, N, PE – see wiring diagrams in point 13 – “WIRING DIAGRAMS” on page 75.
- F. If after connecting the power supply and setting the main switch in the **ON** position, the diode **H1 "POWER"** does not light up, pay attention to the indications of the **CKF** monitoring relay. The diode on the **CKF** relay may be on or blinking continuously. If it flashes, it means that the device is not connected properly. This may be due to the wrong phase sequence, a missing phase, or a too-low supply voltage. In this case, check that the voltage values are correct, that the voltage is on all three phases, or reverse the phase sequence. When properly connected, the diode on the **CKF** relay will be lit continuously, and the white lamp **H1 "POWER"** on the switchgear door will light.
- G. It is recommended to connect the fan's electric motor to the electric switchboard through the **service switch** following the wiring diagram – see point 13 – “WIRING DIAGRAMS” on page 75 by placing it on the unit near the fan. The designation of the terminals on the motor must correspond to the same marked terminals in the service switch and the switchgear, i.e.: the terminal on the **U1** motor must be connected to the **U1** terminal in the switchgear; terminal **V1** on the motor with terminal **V1** in the switchboard etc.
- H. The electric motor is adapted to work with frequency converters (inverters) in the frequency range from **15 Hz to 50 Hz**. This limit **MUST NOT** be exceeded by any unauthorized modification of the fan control system.
- I. It is recommended to use a **service switch** that disconnects power from the fan during maintenance works. This switch should be placed next to the fan within the reach of maintenance personnel.
- J. As a standard, the electrical switchgear is built on the device, but it is allowed to locate in a convenient place for service or to perform remote control.

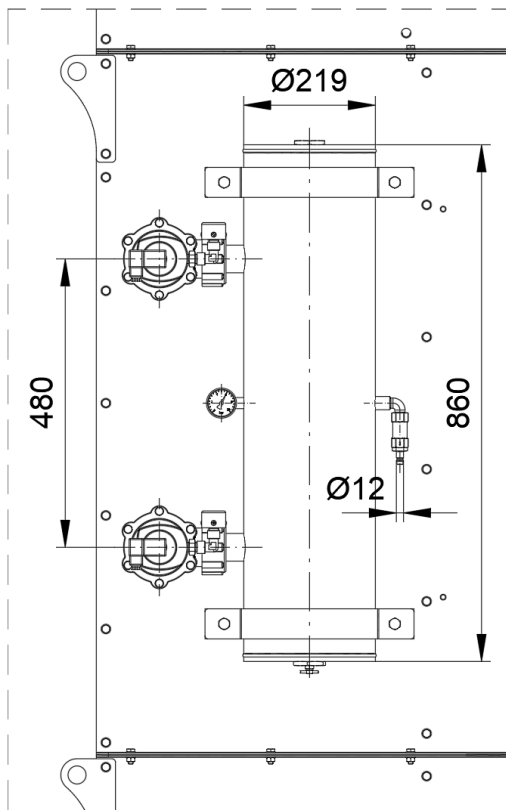
6.4.2. COMPRESSED AIR CONNECTION

- A. The device should be connected to the compressed air network ensuring uninterrupted operation of the automatic filter cleaning system. Compressed air must be prepared by appropriate filtering and reducing unit with a pressure ranging from **0.6 to 0.8 MPa** and ensure appropriate cleanliness classes

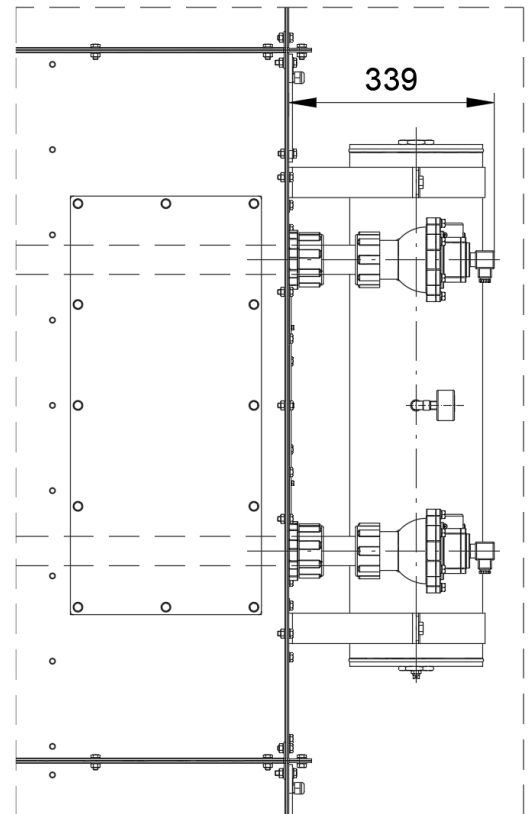
for individual pollutants, i.e. following ISO 8573-1, air supplied to the filter cleaning system with compressed air should meet the minimum requirements set out in the table below:

The type of contaminants	Purity class according to ISO 8573-1: 2010
Oil	6
Solid particulates	4
Water	4

- B. The design and execution of connection of the device to the compressed air network must be performed by qualified personnel, following the rules of execution of this type of installation.
- C. The device, depending on the model, has from 1 to 2 compressed air tanks with a capacity of 30.1 L each, working with a limit pressure of 8 bar (0.8 MPa). For a filter regeneration system, the pressure should be between **0.6** and **0.8 MPa**. Each of the tanks is equipped with a pressure gauge to control the pressure in the system, impulse valves $\varnothing 1.5''$ on the discharge nozzles, a drainage valve at the bottom of the tank and a quick coupling connector $\varnothing 12$ mm with a check valve – see Picture 24 and Picture 25 on page 37 onto the connector and check the tightness of the connection.
- D. Compressed air consumption in the filter regeneration process in the case of factory settings of the filter regeneration parameters is specified in point 3.3.1 – “TECHNICAL DATA” – see Table 1 on page 15.



Picture 24



Picture 25

6.4.3. CONNECTION TO THE VENTILATION INSTALLATION

- A. The device should be connected to the filtered process ventilation system through appropriate flexible connectors ensuring isolation of the system structure against vibrations.



- B. Connect all parts of the ventilation system and the device with equalizing pipes to ensure the flow and equalization of electrostatic charges. For this purpose, suitable threaded pins are located near the stubs.
- C. Before starting the device, make sure that the ventilation system has the appropriate safety measures concerning the risk of explosion if required.

! DANGER**Possible damage to the device and the installation, fire or explosion!**

The user **MUST** ensure that adequate safety measures are taken in the ventilation system where the equipment is to be installed regarding **IGNITION** or **EXPLOSION DANGER** if required.

6.5. COMMISSIONING / CHECKING / TESTING

6.5.1. ELECTRIC MOTOR CHECK

A. Before starting the electric motor:

- ✓ check the condition of the motor winding insulation and temperature sensor circuits, if the measured insulation resistance is too low, the winding should be dried; Insulation resistance measurement should also be performed in the event of a longer stoppage of the motor,
- ✓ check if there is a free flow of cooling air to the ventilator,
- ✓ check the electrical installation, operation of the switch, meters and other auxiliary and protection devices,
- ✓ check the tightness of all fastening screws, the security of the cable connection and all elements affecting the degree of motor protection,
- ✓ check the quality of earthing and neutralization,
- ✓ check that the device is ready for commissioning and conduct a trial run.

B. During the test run of the device, check:

- ✓ value of the supply voltage,
- ✓ current value,
- ✓ motor rotation direction,
- ✓ correct engine cooling,
- ✓ there are no excessive vibrations or other abnormalities in the engine operation,
- ✓ degree of heating of individual engine components, such as bearing shields, bearings, frame,
- ✓ correct operation of starting devices, safety control devices,
- ✓ electrical parameters achieved by the motor.

INFORMATION



The user is obliged to comply with the provisions contained in the non-smaller manual and the relevant manuals, i.e. the operating manual of the electric motor.

This manual **DOES NOT** contain the operating instructions for the electric motor.

INFORMATION



Electric motors powered by frequency converters make a characteristic "chirping" sound and this is normal. This is not a malfunction of the electric motor!

6.5.2. EARTHING AND EQUIPPING CONTROL

Before starting the device, check the condition and correctness of all electrical connections and equipotential bonding on the device. It is recommended to check the conduction of these connections regularly. In addition, check and systematically control the conductivity between the farthest elements and the connection of the device to the structure to which it is attached.

6.5.3. CONTROL OF THE ROTATION DIRECTION OF THE FAN IMPELLER

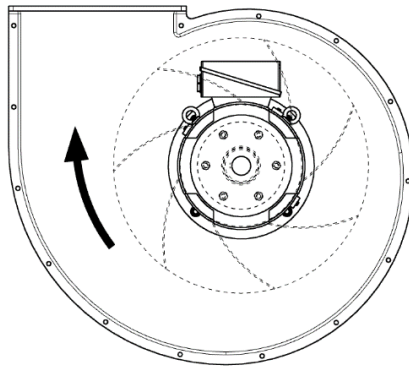
Check the direction of rotation of the fan impeller (check the direction of rotation of the fan ventilating the electric motor) before starting the device in the ventilation system. It should match the arrow on the fan housing or as shown below – see Picture 26 on page 40.

The control system protects to a very high degree against the possibility of incorrect rotation of the fan impeller, however, if the impeller rotates in the wrong direction despite the correct connection and start-up, immediately contact the manufacturer **KLIMAWENT S.A.** – additionally see point 6.4.1 – “ELECTRICAL CONNECTION” on page 36.

! CAUTION



The device **MUST NOT** be used with the **wrong direction** of rotation of the fan impeller.



Picture 26 Correct direction of rotation of the impeller. View from above.

6.5.4. INSPECTION OF THE FILTER REGENERATION SYSTEM ELEMENTS

Before switching the device on to work in the dust extraction system, check the correctness of the selection of the capacity of the compressed air installation connected with the filter regeneration system – see the requirements in point 3.3.1 – “TECHNICAL DATA” – Table 1 – “Compressed air supply: nominal consumption, pressure and quality conditions” on page 15. System capacity and pressure should be at least as specified in this table.

Compressed air parameters should be controlled throughout the lifetime of the device, not allowing the pressure limit to be exceeded, which could lead to the destruction of pneumatic elements not intended for operation with increased pressure.

In the event of damage to the equipment of the device, contact the manufacturer of **KLIMAWENT S.A.**

! WARNING

Possible damage to the device, burns or serious injuries as a result of bursting elements of the pneumatic system!



REGULARLY CHECK the tightness of connections of pneumatic elements.

RECTIFY any leaks immediately and in the event of damage to a component that prevents recovery, **DISCONNECT** the device from the compressed air system, **EMPTY** the compressed air tanks and **REPLACE** the defective component.

6.5.4.1. PULSE VALVES

Pulse valves are designed to work with filtered air with a working pressure not exceeding **7.5 bar (0.75 MPa)**. Exceeding the pressure may destroy the valve.

The impulse valve during operation, i.e. when opened and closed, bleeds air through an opening located on the side of the valve. This is normal. To eliminate the whistle and noise, a throttle valve acting as a silencer is installed in this place. This silencer should not be permanently disassembled. It should be regularly cleaned and unblocked in case of clogging.

The impulse valve is controlled by a solenoid switch mounted on its top. The switch is powered with **24 V**. All impulse valves are connected to the electrical switchboard **ZE-UFO-A-N**, which controls their opening in the right order. Regularly check the condition of the connection between electrical sockets and impulse valve plugs.

6.5.4.2. COMPRESSED AIR TANK

Compressed air tanks require the control of the amount of condensate accumulated inside and their systematic emptying. In the event of excessive condensation inside the tank, check the filtration of the compressed air connected to the filter cleaning system – see the conditions specified in point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36. Additionally, check pneumatic connections for tightness. Level the leakage by tightening (sealing) or replacing damaged elements with new ones.

6.5.5. VIBRATION CONTROL

All rotors manufactured by **KLIMAWENT S.A.** are balanced following ISO 1940-1 with a balancing degree of G6.3.

During the final acceptance of the device, a fan test is carried out with appropriate control of the vibration level on a fully assembled machine. **KLIMAWENT S.A.** applies the guidelines for the assessment of vibrations provided in the standards PN-ISO 14695:2008 and ISO 14694:2003. Fans built into the **UFO-A-N** type device manufactured by KLIMAWENT S.A. belong to fans in category BV-3 and as such do not exceed the residual unbalance during commissioning tests, measured as vibration velocity $V_{rms} = 2.8$ mm/s when rigidly mounted or $V_{rms} = 3.5$ mm/s – flexibly.

The manufacturer is not responsible for the level of vibrations in the device (fan) in the place of final assembly, because the measured vibration values are influenced by the device levelling and the strength and flexibility of the supporting structure, therefore it should be taken into account when assessing vibrations "in situ".

Avoid excessive vibrations in the fan, as they may result in deformation or cracking of the impeller structure, seizure of bearings, increased noise level, loosening of bolts and nuts of important connections, and ultimately lead to the destruction of rotating elements and create a situation threatening the safety of operators or persons in its vicinity.

It is recommended to constantly monitor the fan vibration with a sensor or to carry out vibration measurements during fan inspections every **4,000 operating hours** or in the event of increased noise, vibration and other symptoms indicating a possible defect – see 8.4 – “MEASURING VIBRATIONS OF THE FAN” on page 56.

The value of the measured vibrations expressed as velocity V_{rms} should not exceed **$V_{rms} = 6.3$ mm/s**, the value of **$V_{rms} = 11.8$ mm/s** is considered **alarming**, and the value of **$V_{rms} = 12.5$ mm/s** qualifies for an **immediate stop** of the device.



6.6. ADDITIONAL EQUIPMENT

! CAUTION



The additional equipment is not installed in the device as standard. Additional equipment is delivered on a separate order.



Contact the manufacturer **KLIMAWENT S.A.** to order additional equipment.












6.6.1. FILTER SPRAY SYSTEM

The **UN-1** sputtering system (spray chamber) is used to sputter the cartridge filters with CaCO₃ synthetic calcium carbonate. This process protects the filters by extending their working time by creating a protective layer that protects the filter material against sticking sticky substances. In addition, it increases the safety of operation in dedusting systems installed in many industries.

Type	Catalogue No.	Comments
UN-1	840U20	Spraying chamber with synthetic calcium carbonate CaCO ₃ (chalk)

7. OPERATION USE

7.1. TERMS OF USE

! WARNING	
Possible damage to the device and disruptions in operation.	
	The temperature of filtered air CANNOT exceeds +60°C .
	The ambient temperature during the operation of the device MUST be between -20°C and +40°C . The fan motor should not be exposed to direct sunlight or other thermal radiation that could significantly heat its body.
	Ambient relative humidity MUST NOT exceed 95% without condensation.
	The atmospheric pressure MUST be between 800 hPa and 1100 hPa .
	The altitude above sea level CAN NOT exceed 1000 m .
	The dust limit of the filtered air MUST NOT exceed 3 g/m3 .
	The device CAN NOT be used for the filtration of moist or sticky dust adhering to the surface of the filters, significantly reducing the filtration efficiency.
	The device MUST be permanently connected to the compressed air network to ensure the uninterrupted operation of the automatic filter cleaning system. Compressed air MUST be prepared by appropriate filtering and reducing unit with a pressure ranging from 0.6 to 0.8 MPa and meeting the purity conditions specified in point 6.4.2 – "COMPRESSED AIR CONNECTION" on page 36.
	The device CAN work continuously under certain conditions – see 4.4 – "WARNINGS" on page 19.
	The device MUST NOT work in an environment that may cause an accelerated rate of corrosion.
	When the device is powered by a frequency converter (inverter), the maximum speed of the motor MUST NOT be greater than the nominal speed of the fan motor. In addition, the frequency variation up and down should be limited so that the frequency is between 15 Hz and 50 Hz . This limit MUST NOT be exceeded by any unauthorized modification of the fan control system.

**! DANGER****Possible damage to the device, fire or explosion!**

It is **FORBIDDEN** to use the device for transporting air containing sticky or caustic contaminants that may adversely affect the device!



It is **PROHIBITED** to use devices for cleaning the air of carcinogenic, radioactive dust or contaminated with pathogens and other dangerous substances posing a high risk to human health and life.



It is **FORBIDDEN** to use the device for transporting a mixture of air and flammable substances in the form of gases, vapours, mists or dust, which create an **explosive atmosphere** with the air!

7.2. OPERATION

7.2.1. SWITCHGEAR AND CONTROLLER

On the cover of the electrical switchboard, there is a control panel with a membrane keyboard for controlling and manipulating the operation of the device, and inside there is a controller and electrical devices.

! WARNING

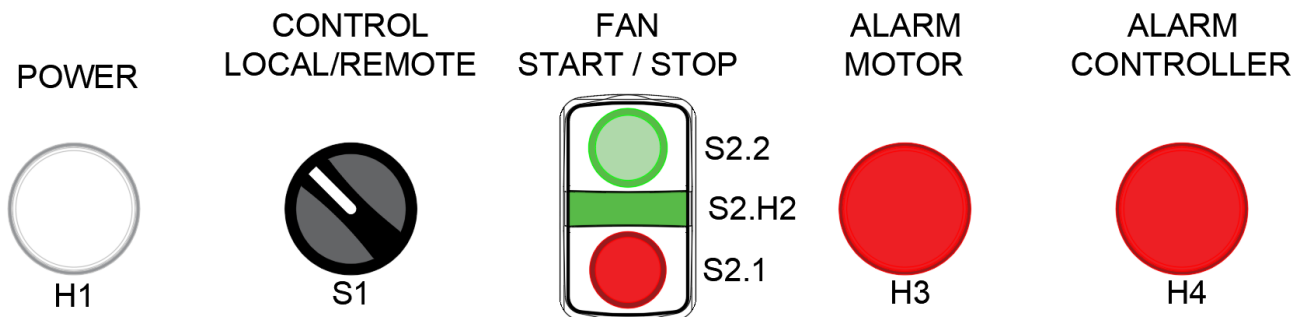


The device can be controlled from the panel on the electrical switchboard (**LOCAL**) or from another (**REMOTE**) by connecting to **terminals 17 and 18** in the switchgear of the **NO** relay signal.

7.2.1.1. CONTROL PANEL

The **control panel** consists of light signalling elements and membrane buttons, such as:

- A. signal lamp **H1 (white lamp) "POWER"**, which signals the switching on of the control voltage – *continuous light*,
- B. signal light **S2.H2 (green light) "FAN"** indicates the fan operation status – *continuous light*,
- C. signal lamp **H3 (red lamp) "ALARM FAN"** which signals the alarm of the fan,
- D. signal light **H4 (red light) "ALARM CONTROLLER"** which signals the alarm of the controller,
- E. green button **S2.1 "START"** which starts the fan motor.
- F. red button **S2.2 "STOP"** which stops the fan motor.



Picture 27 Control panel appearance

H1 - Lamp signalling the appearance of power in the system; **S1** - Mode switch;
S2.1 - Fan stop button; **S2.2** - Fan start button; **S2.H2** - Green light indicating fan operation;
H3 - Red light indicating engine alarm; **H4** - Red light indicating a controller alarm

**7.2.1.2. TURNING THE MAIN POWER ON**

Before starting the device, make sure that the inspection doors and the inspection covers of the device are closed and secured. **WK limit switches** are installed in the inspection doors of the filtration chambers, which switch off the device, preventing accidental activation.

- A. To turn on the power, set the main switch **Q1** on the side of the switchgear to the **ON** position - see Picture 28 on page 48 below. The voltage will appear in the power circuit, then the controller will initialize and the white light **H1** located on the control panel will illuminate – see Picture 27 on page 45 above.

7.2.1.3. TURNING FAN ON

- A. Press the **S2.2 "START"** button on the control panel. The fan operation is indicated by the **green light S2.H2**. See Picture 27 on page 45 above.

! CAUTION

CHECK the efficiency of the compressed air system connected to the device.
ENSURE the minimum specified in point 3.3.1 – “TECHNICAL DATA” – Table 1 on page 15.

7.2.1.4. TURNING FAN OFF

- A. Press the **S2.1 "STOP"** button on the control panel. The fan will coast to a stop. The green lamp **S2.H2** goes out. See Picture 27 on page 45 above.

7.2.1.5. TURNING THE MAIN POWER OFF**! CAUTION**

TURN OFF the machine's main power supply **ONLY** after the fan stops.

- A. Turn off the power by setting the main switch **Q1** on the side of the switchgear to the **"OFF"** position. The white lamp **H1** will go out. See Picture 28 on page 48 below.

7.2.1.6. CONTROLLER

See the operating instructions for the TURBO sequencer:

- Title of the manual: **SEQUENCER E1T 4–16 OUTPUT CHANNELS**
- Publication date: **01/2022**
- Revision: **2.00**
- Manufacturer's name and address:

TURBO s.r.l.

Electronic Control Systems For Dust Collectors
e-mail: info@turbocontrols.it
web: www.turbocontrols.eu
Tel. ++39 (0)362 574024 Fax ++39 (0)362 574092

INFORMATION



This manual does **NOT** include the operating instructions for the electric motor and controller.

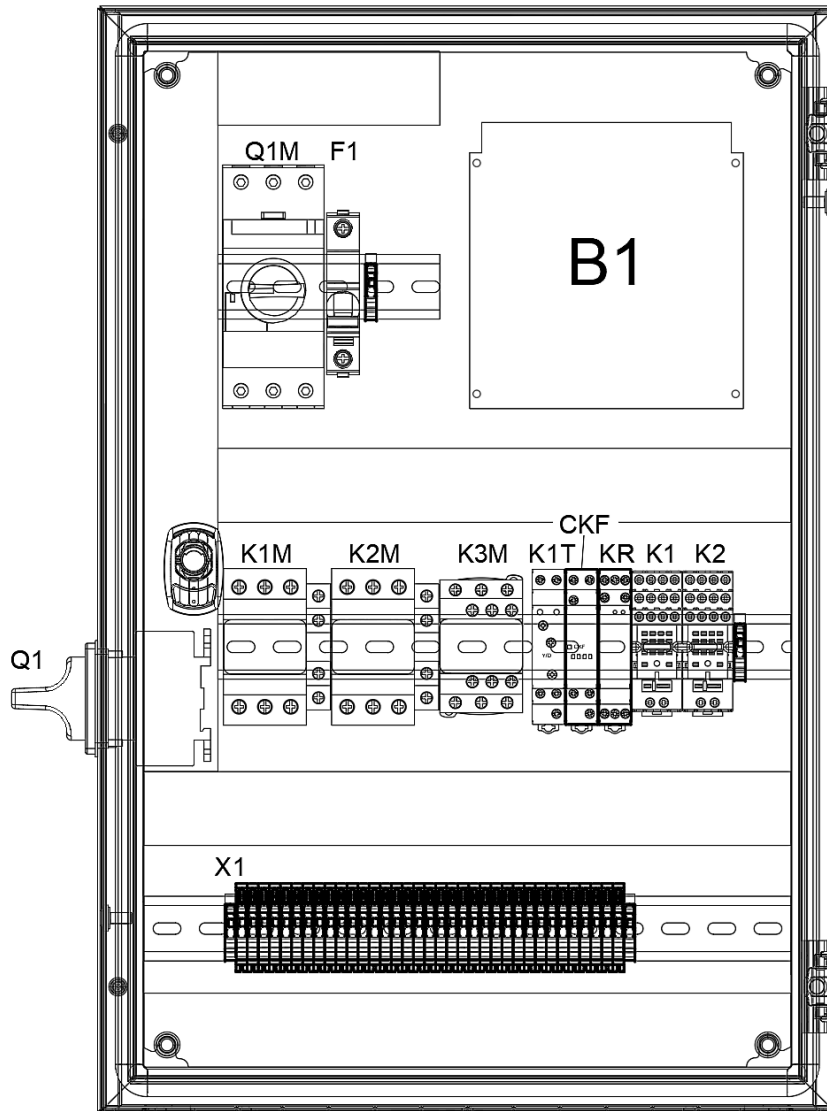
7.2.1.7. FACTORY SETTING VALUES

Function No.	Description	Value			
F02	Time of action	0.20"			
F03	Pause time in normal cycle ¹³	240"	120"	80"	60"
F04	Number of outputs ¹⁴	1	2	3	4
F05	Output voltage: 24Vdc, 24Vac, 115Vac, 230Vac.	24 Vac			
F06	Manual activation of the solenoid valve	1			
F13	Number of cycles after the fan has stopped	2			
F14	Pause time during the cycle with the fan off	020"			
F15	Maintenance break in 10 hours. (1 = 10h, 100 = 1000h)	100			
F16	Enable (1) either deactivation or (0) of the maintenance interval alarm	0			
F17	Reset maintenance hour counter: By setting 1, the maintenance counter is reset to zero after confirmation	0			
F24	Valve shutdown during short circuit	1			

¹³ The settings for each version of the device are different, i.e. : 240 s for UFO-A-5000-N, 120 s - UFO-A-10000-N, 80 s - UFO-A-15000-N, 60 s - UFO-A -20000-N

¹⁴ The settings for each version of the device are different, i.e. : 1 for UFO-A-5000-N, 2 - UFO-A-10000-N, 3 - UFO-A-15000-N, 4 - UFO-A-20000-N

7.2.1.8. ELECTRICAL APPARATUS



Picture 28 View of the interior of the electrical switchgear with a standard 3x400V power supply

Table 3 Functions of electrical apparatus in the electric unit

Type of apparatus ¹⁵	Description	Function
Q1	Power switch	It supplies power to the device, which is indicated by the H1 lamp
Q1M	Motor circuit breaker	It is used to protect the motor against damage due to blocked start, overload, short circuit
F1	Miniature circuit breaker	Protects the transformer and driver circuit
K1M, K2M, K3M	Contactors	They are used to soft start the star-delta fan
K1	Electromagnetic relays	Engine failure relay
K2		Controller failure relay
K1T	Time transmitter	Controls the start-up of the fan
B1	UFO controller	Control of solenoid valves – see point 7.2.1.6 on page 46
CKF	Monitoring relay	It is used to detect missing, asymmetry and wrong phase sequence
KR	Resistance relay	Controls the temperature of the fan's electric motor

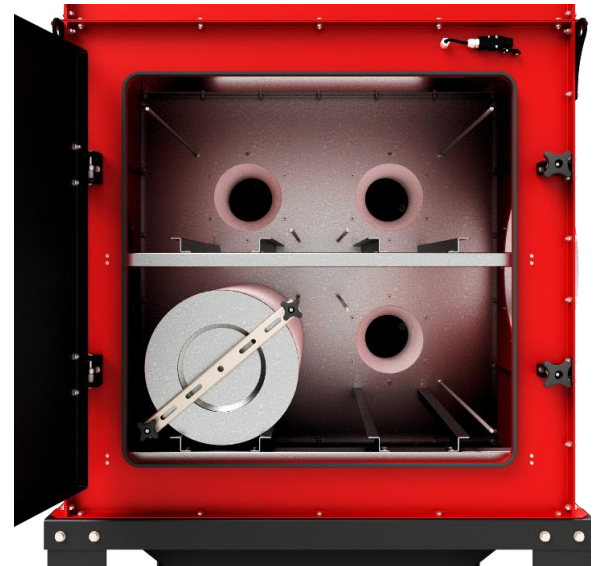
¹⁵ The electrical diagrams of the device are presented in point 13 – WIRING DIAGRAMS on page 92.

7.2.2. REPLACEMENT OF FILTERS

- A. Turn off the fan and wait for all mechanisms to stop – see 7.2.1.4 – “TURNING FAN OFF” on page 46.
- B. Wait until the final filter regeneration cycles are completed, then turn off the power with the Q1 main switch – see 7.2.1.5 – “TURNING THE MAIN POWER OFF” on page 46.
- C. Unscrew and open the access door to the cartridge filter chamber. The **WK limit switch** located at the top of the door will disconnect the power from the device and protect it against the blast of compressed air during service work.

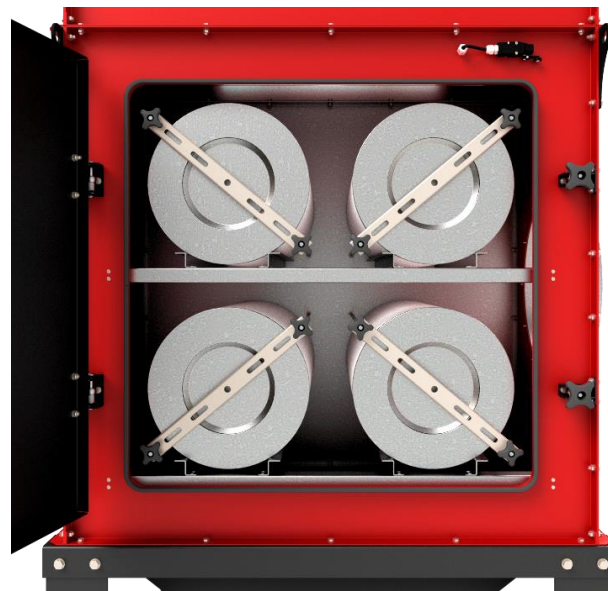


Picture 29



Picture 30

- D. Loosen and remove star-shaped knobs and filter holders.
- E. Remove the filters, replace or regenerate them – see 8.2.1 – “CARTRIDGE FILTER MAINTENANCE” on page 54.



Picture 31

- F. Put the clean filters back in the same place.
- G. Put pressure on the threaded studs, tighten and tighten with star-shaped knobs. Tighten so that the filter cannot be turned around its axis. **Be careful not to deform the filter!**
- H. Close and tighten the access door. The **WK limit switch** located at the top of the door will switch the power on.



- I. Turn on the power with the main switch Q1 – see 7.2.1.2 – “TURNING THE MAIN POWER ON” on page 46.
- J. The device is now ready for use.

! CAUTION



Opening the filter access door **SWITCHES OFF** the device!

! WARNING



DO NOT DEFORM the filters when pressing them by excessive squeezing – this may lead to bad adhesion of the gasket and/or damage to the filters in the form of e.g., kinks or perforation of the filter paper!

7.2.3. FILTER REGENERATION

The filter regeneration process takes place automatically during the device operation and is controlled by the device controller installed in the **ZE-UFO-A-N** electric unit. The process of releasing an impulse of compressed air is determined by the time parameters coded in the controller and they have been adjusted to the average (standard) operating conditions of **UFO-A-N** devices.

! WARNING



DO NOT CHANGE the filter regeneration parameters without consulting the manufacturer. To adjust the parameters to the specific operating conditions of the device, **CONTACT** the manufacturer of **KLIMAWENT S.A.**

7.2.4. EMPTYING DUST CONTAINER

During operation, the dust container should be checked. Visors on both sides of the tank are used for this purpose. Avoid overloading with dust – it may cause dust entrainment during work.

- A. Turn off the fan and wait for the fan to stop and airflow to cease – see 7.2.1.4 – “TURNING FAN OFF” on page 46.
- B. Wait for the final filter regeneration cycles to complete and turn off the power either turn off the power before starting the final filter regeneration cycle – see 7.2.1.5 – “TURNING THE MAIN POWER OFF” on page 46.
- C. Remove the buckles securing the container and slide it out.
- D. Empty and clean the container from possible permanent dirt.
- E. Slide the container into the same place and tighten the buckles. Check the correctness of pressure and tightness. If necessary, adjust the buckles.
- F. Turn on the power with the main switch Q1 – see 7.2.1.2 – “TURNING THE MAIN POWER ON” on page 46.
- G. The device is ready for operation.

7.2.5. ALARM SIGNALS

! WARNING



REACT immediately to alarm signals displayed by the control unit and take immediate **CORRECTIVE ACTION!**

7.2.5.1. ELECTRIC MOTOR FAILURE

The fan motor is protected by the **Q1M** motor switch installed in the **ZE-UFO-A-N** electrical switchboard. This switch protects the motor against overload, short-circuit and non-full-phase operation. Additionally, the fan motor is equipped with a **PTC** sensor, which changes its resistance along with the temperature of the motor winding. The **PTC** sensor resistance is monitored by the **KR1** resistance relay.

If the **Q1M** switch is activated or the **PTC** resistance relay detects **excessive heating** of the electric motor windings, the control system will disconnect the electric motor power supply circuit, and the alarm will be signalled by the **H3 "ALARM MOTOR"**. When this alarm occurs, the electrical and mechanical condition of the motor must be checked.

Activation of the alarm results in blocking the operation of the system until the alarm stops.

7.2.5.2. PULSE VALVE FAILURE

The control system monitors the correctness of the power source of the electromagnetic valves during the entire operation of the device. In the event of a **loss** or **incorrect value of the supply voltage**, an alarm will appear, which is signalled by only the red light **H4 "CONTROLLER ALARM"** lighting up and then the alarm code should be read from the **B1 controller** display inside the electric unit – see point 7.2.1.6 – “CONTROLLER” on page 46.

7.2.5.3. CONTROLLER ALARM CODES

! CAUTION



Description of alarm codes – see point 7.2.1.6 – “CONTROLLER” on page 46.

7.2.5.4. EMERGENCY STOP

To stop the device in an emergency, press the **S2.2 "STOP"** button (**red field**) on the control panel – see Picture 6 on page 14. The green light will go out. The fan will coast to a stop.

7.2.6. RETURN TO NORMAL OPERATION AFTER THE PROBLEM SOLVED

Starting the device after a breakdown as a result of a failure requires the device operation control - start the device and let it work for **at least 15 minutes** to stabilize its parameters and make sure that there are no problems, and the failure does not return. After this time, the device can be "switched on" back to the technological process.

Perform a restart following points 7.2.1.2 – “TURNING THE MAIN POWER ON” on page 46 and 7.2.1.3 – “TURNING FAN ON” on page 46 and take into account all the guidelines presented in the table "Table 2 Safety rules and information on residual risks" – see point 4.5 – “RESIDUAL RISK INFORMATION” on page 23.

7.2.7. UNPLANNED STOPPING AND RESTARTING

In the event of a power failure, first, check the condition of the device before restarting whether the electrical devices in the electric unit are operational and not damaged. The device should be started and allowed to work for



at least 15 minutes to stabilize its parameters and make sure that there are no problems. After this time, the device can be "switched on" back to the technological process.

Perform a restart following points 7.2.1.2 – "TURNING THE MAIN POWER ON" on page 46 and 7.2.1.3 – "TURNING FAN ON" on page 46 and take into account all the guidelines presented in the table "Table 2 Safety rules and information on residual risks" – see point 4.5 – RESIDUAL RISK INFORMATION on page 23.

7.3. PERSONAL PROTECTION MEASURES

During operation, maintenance and cleaning, i.e. using, cleaning the container from sludge and sediments, cleaning the inside of the container and other similar activities, always use personal protective equipment – see section 4.3 – "REQUIRED PERSONAL PROTECTION" on page 21.

8. MAINTENANCE AND REPAIR MANUAL

8.1. GENERAL GUIDELINES

! WARNING



DISCONNECT the device from the power supply, turn the controls **OFF** and **WAIT** for all mechanisms to stop. **PROTECT** the control against uncontrolled restart!



USE personal protective equipment as well as protective clothing and footwear – see section 4.3 – “REQUIRED PERSONAL PROTECTION” on page 21! **FOLLOW** the safety rules – see the guidelines in point 4.5 – “RESIDUAL RISK INFORMATION” on page 23.

! CAUTION



The **USER** is responsible for the maintenance of the device and its parts. Regular maintenance is a prerequisite for safe use and compliance with the **WARRANTY CONDITIONS**.



Any repairs are **MADE BY THE MANUFACTURER** or his **REPRESENTATIVE**. In special cases, it may be performed by the **USER**, but in this case, please contact the manufacturer of **KLIMAWENT S.A.**

8.2. MAINTENANCE SCHEDULE

Table 4 Recommended inspection and maintenance intervals

Period	Procedure
Ongoing control and activities	Regularly clean the device and its components to avoid excessive build-up of dust inside and out. Remove the dust from the container and remove any deposits.
Once every 1 month	Check the condition and tightness of the connections of the ventilation system connecting the device with the installation on the suction and discharge sides. Drain the condensate from the compressed air tank.
Once every 3 ÷ 6 month	Perform a visual inspection of the load-bearing structure and housing, as well as the condition of bolted connections and tightness, and close the inspection covers.
	Clean the noise silencers mounted on the impulse valves.
Once every 12-18 months	Check the condition of the electrical connections and installations of the compressed air network and pressure vessel, and the connection of electrical impulse valves.
	Clean and check the condition of the fan and the fan motor following the recommendations of the motor manufacturer.
	Check the continuity of the protective connection and the connection of the device to the main earthing bar.
	Check the condition of the inside of the filter chambers. Additionally, inspect the chambers behind the filters on the "clean" side by unscrewing the inspection covers on the side of the device. Check that there is any contamination on the "clean" side of the device – see 8.2.1 – “CARTRIDGE FILTER MAINTENANCE” on page 54. Remove any accumulated deposits.
Once every 18 to 24 months	Check the condition of the electric motor, pneumatic system components and pulse solenoid valves. Carry out maintenance according to the instructions of the pulse valve manufacturer.
	Replace the cartridge filters with new ones or when the filters are worn out, i.e. despite manual or mechanical regeneration of the filters, the device does not return to the rated capacity.



8.2.1. CARTRIDGE FILTER MAINTENANCE

- A. The visual inspection of the cartridge filters should be performed at each operation of removing dust from the container under the chute. Check the correct installation of the filters and the condition of the filtering surface – the degree of contamination, the presence of damage or foreign bodies, sticky and difficult-to-remove deposits, moisture, etc.
- B. When you notice a noticeable decrease in the efficiency of the device, which persists for a longer period, regardless of the operation of the filter regeneration system, remove the filters from the device and clean them manually or mechanically using a device designed for this purpose – contact the manufacturer of **KLIMAWENT S.A.**
- C. The filter check should also be performed when there are other irregularities in the operation of the device. In the event of normal wear or damage or perforation, replace the cartridge filter with a new one – see 8.5 – “SPARE PARTS” on page 57.
- D. When replacing filters, place them on guides and push them against the rear wall of the chamber. Apply pressure to the threaded studs, tighten and tighten with star-shaped knobs. Tighten so that the filter cannot be turned around its axis. Do not deform the filter paper! Then close the access door tightly and tighten the bolts.

! CAUTION



Both too weak and too strong pressing of the filters may cause dust to get to the "clean" side of the device. Tightening it too lightly will cause dragging of impurities between the filter gasket and the device's partition, while pressing too much may distort the filter, damaging the filter paper and leading to its perforation and contamination entering the "clean" side of the device.

! WARNING



MOISTURE or **OIL** contained in the transported air and in the air used to regenerate the filters **CAN DAMAGE** the filters! The device **MUST** be connected to the compressed air network prepared by appropriate filtering and reducing unit with a pressure ranging from **0.6 to 0.8 MPa** and meeting the purity conditions specified in point 6.4.2 – “COMPRESSED AIR CONNECTION” on page 36.

8.2.2. MAINTENANCE OF THE DUST CONTAINER

The dust container is the most exposed element to the deposition of dust and hard fractions that can permanently stick to internal surfaces therefore, its condition should be regularly checked.

The container has a seal on the edge, which may be damaged during use. If damaged, replace it with a new one. For this purpose, contact the manufacturer **KLIMAWENT S.A.**

8.2.3. MAINTENANCE OF THE COMPRESSED AIR TANK

The compressed air tank must be checked and maintained following the regulations for pressure equipment. All connections of the tank should be checked periodically, and the tank should be drained through a stub pipe installed for this purpose in the lower stub pipe. If damaged, replace it with a new one. For this purpose, contact the manufacturer **KLIMAWENT S.A.**

8.2.4. MAINTENANCE OF PULSE VALVES

The applied solenoid valves do not require ongoing maintenance. You only need to check the condition of electrical connections, grounding and tightness of the pneumatic system. If damaged, replace it with a new one. For this purpose, contact the manufacturer of **KLIMAWENT S.A.**

8.2.5. FAN MAINTENANCE

- A. Check the correctness and accuracy of the tightening of mechanical and electrical connections.
- B. Check the condition of the impeller and inside of the fan and detect and remove any accumulated dirt and foreign matter. To do this, dismantle the attached installation and the elbow. Perform a visual inspection of the interior. Secure the device against unintentional switching on or rotation of the impeller as a result of induced airflow!
- C. Check the impeller's alignment with the inlet stub (the uniform distance around the entire circumference between the impeller inlet and the fan inlet stub). For this purpose, look under the fan by removing the inspection cover of the regeneration chamber of the fan.
- D. In the event of vibrations or noise during fan operation, measure the vibrations on the motor (see point 8.4 – “MEASURING VIBRATIONS OF THE FAN” page 56) and check whether the rotor elements are in contact with the inlet stub pipe or other housing elements. In the event of excessive vibration, deformation and/or damage, contact the manufacturer of **KLIMAWENT S.A.** without delay. to replace parts with new ones.

! WARNING



It is **FORBIDDEN** to use the machine with a damaged motor or impeller or show excessive vibrations during operation. This can lead to impeller or motor damage, fire or explosion due to sparking!

8.3. SERVICE AND REPAIR

! CAUTION



The **USER** is responsible for the maintenance of the device and its parts. Regular maintenance is a prerequisite for safe use and compliance with the **WARRANTY CONDITIONS**.



Any repairs are **MADE BY THE MANUFACTURER** or his **REPRESENTATIVE**. In special cases, it may be performed by the **USER**, but in this case, please contact the manufacturer of **KLIMAWENT S.A.**



8.4. MEASURING VIBRATIONS OF THE FAN

Measurement of fan vibrations should always be performed before the first start-up of the device in the installation or during the maintenance inspection according to the schedule for the given type of device. Nevertheless, it is recommended to constantly monitor the fan vibration with a sensor or to carry out vibration measurements during fan inspections every **4,000 operating hours** or in the event of increased noise, vibrations and other symptoms indicating a possible defect.

Before measuring vibrations, allow the device to run for **at least 15 minutes** to stabilize its operating parameters, assuming that the fan is powered by electricity of rated voltage, frequency and the appropriate number of phases.

8.4.1. DIRECTION AND PLACE OF MEASURING VIBRATIONS

The vibration values should be measured in two mutually perpendicular directions on the motor body in each bearing location and one perpendicular to the other, i.e. one of these directions is to be parallel to the axis of rotation of the motor shaft and the other two directions should be in a plane perpendicular to this axis.

The measurement perpendicular to the axis of rotation should be made in the plane of the lower and upper motor bearings in two or three mutually intersecting directions. It should be noted that the measurement in the plane of the upper bearing should be performed on the housing, i.e. before the measurement, if possible, remove any non-rigid motor covers, and if it is not possible, perform the measurement just below.

The measurement of vibrations parallel to the axis of rotation should be performed on the motor flange or the fan housing right next to the motor.

8.4.2. VIBRATION LIMITS

The measurement result should be compared with the limit values recommended by ISO 14694:2003. The value of measured vibrations expressed as velocity **Vrms** should not exceed **Vrms = 6.3 mm/s**. Measured values with a value above **Vrms = 11.8 mm/s** are considered alarming, while values above **Vrms = 12.5 mm/s** qualify for an immediate stop of the device.

<i>Fan status</i>		Flexible attachment		Rigid attachment	
		Peak [mm/s]	RMS [mm/s]	Peak [mm/s]	RMS [mm/s]
Operation	Start-up	↓			
		6,4	4,5	8,8	6,3
	Alarming condition	↓			
		10,2	7,1	16,5	11,8
Maintenance / Repair					
Emergency shutdown		12,7	9,0	17,8	12,5

8.5. SPARE PARTS

If one of the device parts is worn out, contact the manufacturer of **KLIMAWENT S.A.**

Any requests for information or repair work or inquiries regarding spare parts should be directed to:

KLIMAWENT S.A.

Chwaszczyńska 194 street


81-571 Gdynia POLAND

Phone: +48 58 629 64 80

Fax: +48 58 629 64 19

e-mail: klimawent@klimawent.com.pl

8.5.1. CARTRIDGE FILTER

	Type	Catalogue No.	Diameter [mm]	Height [mm]	Mass [kg]	Comments
	PN306638U	800F25	Ø380	660	4,5	Standard replacement frequency - 1 to 2 years

! INFORMATION



At the customer's request, the manufacturer **KLIMAWENT S.A.** can equip the device with filters with non-woven fabric impregnated with active carbon for additional filtration of gases generated in welding processes! The use of this type of filter increases the absorption of unpleasant odours generated in various technological processes.



At the customer's request, the manufacturer **KLIMAWENT S.A.** can provide the **UN-1** sputtering system (see point 6.6 – "ADDITIONAL EQUIPMENT" on page 42) for sputtering filters with CaCO₃ synthetic calcium carbonate, which protects filters by extending their service life by creating a protective layer that reduces sticking of sticky substances. In addition, it increases the safety of operation in dedusting systems installed in many industries.

! CAUTION



The additional equipment is not installed in the device as standard. Additional equipment is delivered on a separate order.





9. TROUBLESHOOTING GUIDE

Table 5 Typical disturbances and remedies for the suction device

No.	Disruptions	Potential causes	Remedies
1.	The fan does not start	Activation of the Q1M switch. Motor overload or short circuit in the motor supply.	Check the condition of the electric motor windings.
2.			Check if the electric motor is not blocked. Unlock the engine.
3.		Incorrect power supply. Activation of the CKF relay.	Check for the presence of voltage on the terminals L1, L2, L3, N and PE of the X1 strip. Correct the electrical supply parameters.
4.		Activation of the KR1 relay. An excessive temperature rise of the motor windings.	Check the condition of the electric motor windings.
5.		No power.	Check for the presence of voltage on the terminals L1, L2, L3, N and PE of the X1 strip. Correct the electrical supply parameters.
6.		Damage to the WK switch (WK1 or WK2) at the inspection door of the filtration chamber.	Replace the electric apparatus with a new one. Contact the manufacturer KLIMAWENT S.A.
7.	No or very low fan draft	Clogged suction port or system.	Check the condition and clean the connector and the installation.
8.		Filters were contaminated significantly.	Check the condition of the filters. Clean manually or mechanically using a device designed for this purpose or replace the filters with new ones.
9.		Adherence of sticky or moist dust to the filter surface.	Drain the compressed air tank and check the condition of the compressed air network.
10.			Eliminate any source of moisture or sticky substances entering the intake air.
11.	Limit (lower) the temperature of the inlet air below +40°C.		
12.	No regeneration pulses or pulses of less force	No power to the solenoid valve.	Check the electrical connections at the valve, electrical switchboard and junction box on the device.



No.	Disruptions	Potential causes	Remedies
13.		Closed or closed valve supplying compressed air to the tank.	Open the valve.
14.		Too low pressure of compressed air in the tank due to slow filling from the system or low pressure in the system.	Adjust the pressure within the range of 0.6 to 0.8MPa.
15.	Dust ingress into the discharge system	Perforation or loosening of the cartridge filter mounting or damage to the pressure seal.	Replace the filters with new ones or correct the mountings.
16.		Too much dust load on the device.	Limit the amount of dust drawn in by the device to 3 g/m ³ .
17.		Dust type is not provided for in the intended use of the device.	Contact the manufacturer KLIMAWENT S.A.

10. DISMANTLING, DECOMMISSIONING AND DISPOSAL

10.1. DISASSEMBLY AND DECOMMISSIONING

After the period of use, when decommissioning the device, the device should be disassembled and disassembled following general health and safety and PP regulations, paying special attention to internal elements and potentially hazardous substances accumulated inside. Use personal protection measures such as those mentioned in point 4.3 – “REQUIRED PERSONAL PROTECTION” on page 21. Follow the recommendations set out in point 4.2 – “SAFETY RULES AND APPLICATION RESTRICTIONS” on page 19.

10.2. DISPOSAL, SCRAPPING AND RECYCLING

! CAUTION



At the time of handing over the product to withdrawal from use, it **SHOULD COMPLY** with the provisions on withdrawal from use of machines and/or recycling of waste.

! WEEE



The symbol shown here indicates that the product marked with it must not be disposed of as unsorted municipal waste. Such a product must go to a separate collection point, where it will be recovered and recycled. The **WEEE** label is placed on every electrical and electronic equipment placed on the EU market.

Some parts of the **UFO-A-N** device must be treated following the recommendations of the European Parliament Directive **2012/19/EU** on Waste Electrical and Electronic Equipment (**WEEE**). These are the elements included in the electrical switchgear, in particular, the control panel with the microcontroller and the display.

Such parts **MUST NOT** be thrown into the unsorted waste bin but should be taken to a special collection point for used electrical and electronic equipment!



11. TERMS OF WARRANTY

The warranty period is specified in the **Warranty Card** of the device.

! CAUTION



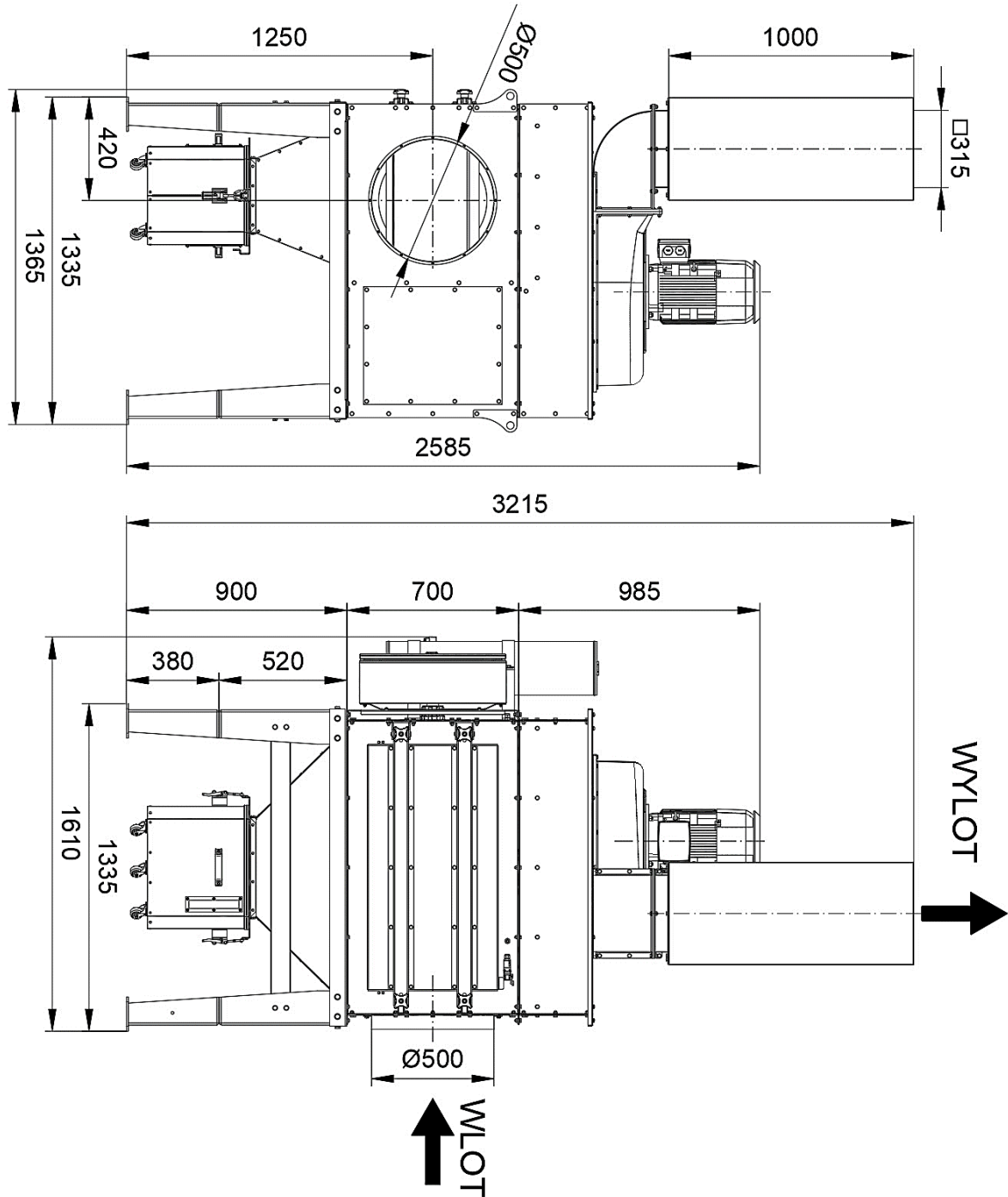
FAILURE TO OBSERVE the recommendations of this manual, and especially if the device is arbitrarily modified or used contrary to its intended use, the **WARRANTY WILL BE LOST!**

! CAUTION

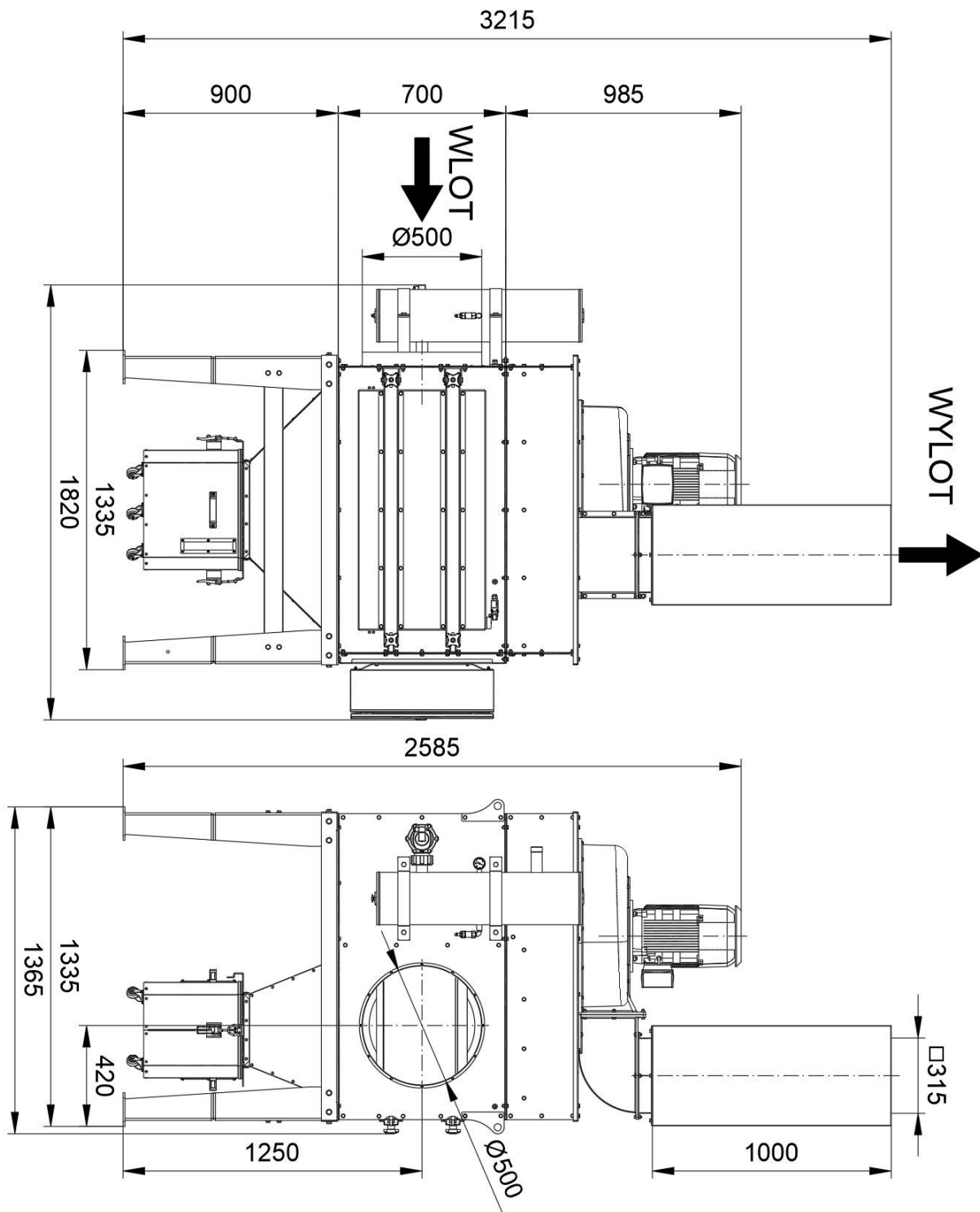


The user is **MANDATORY** to measure the operating parameters of the device during the first start-up. **FILLING IN** and **SENDING** the **START-UP PROTOCOL** to the manufacturer is a condition of **FULFILLMENT OF THE WARRANTY CONDITIONS** – see point 14 – “START-UP PROTOCOL” on page 91.

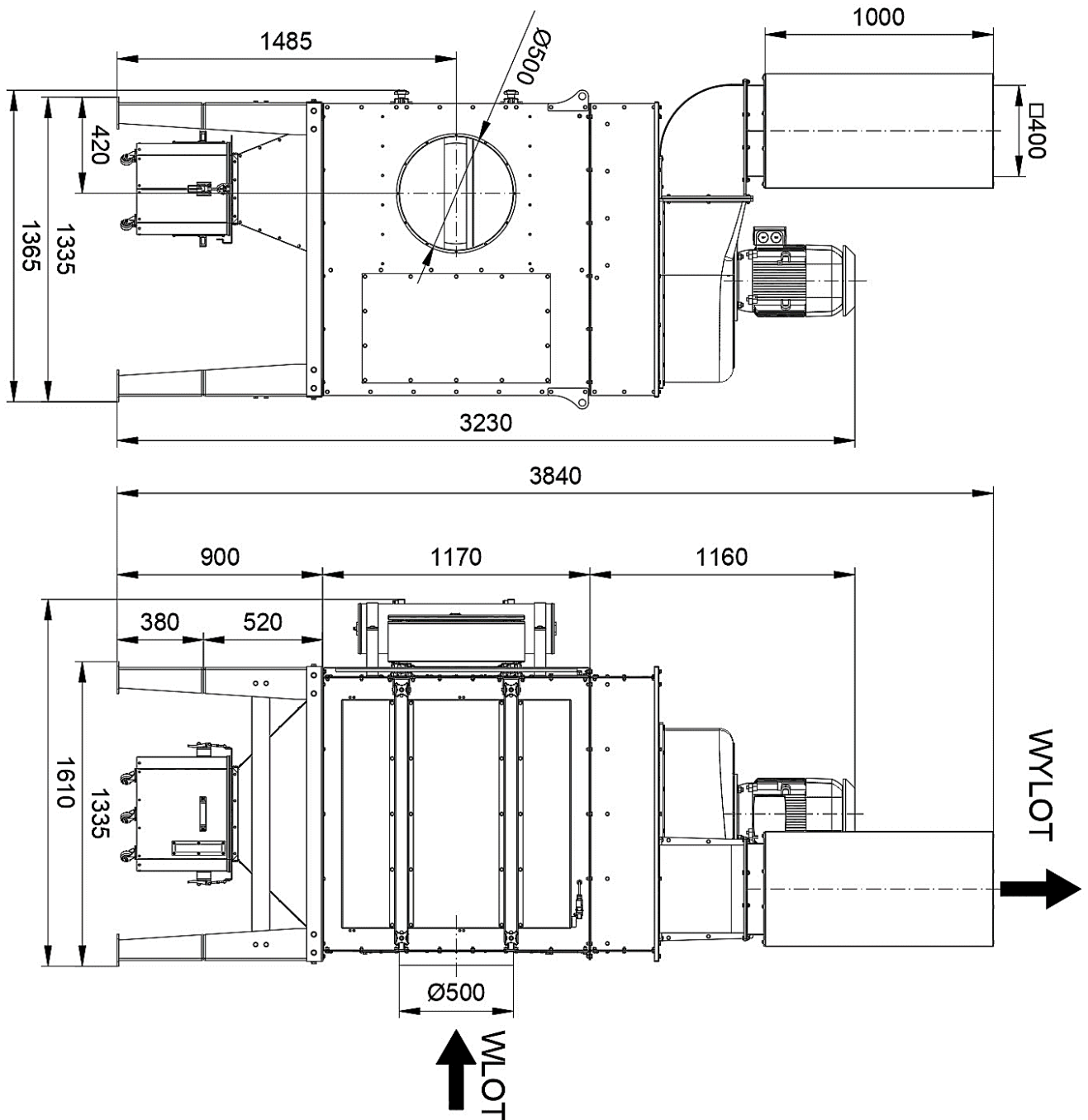
12. DRAWINGS AND SKETCHES



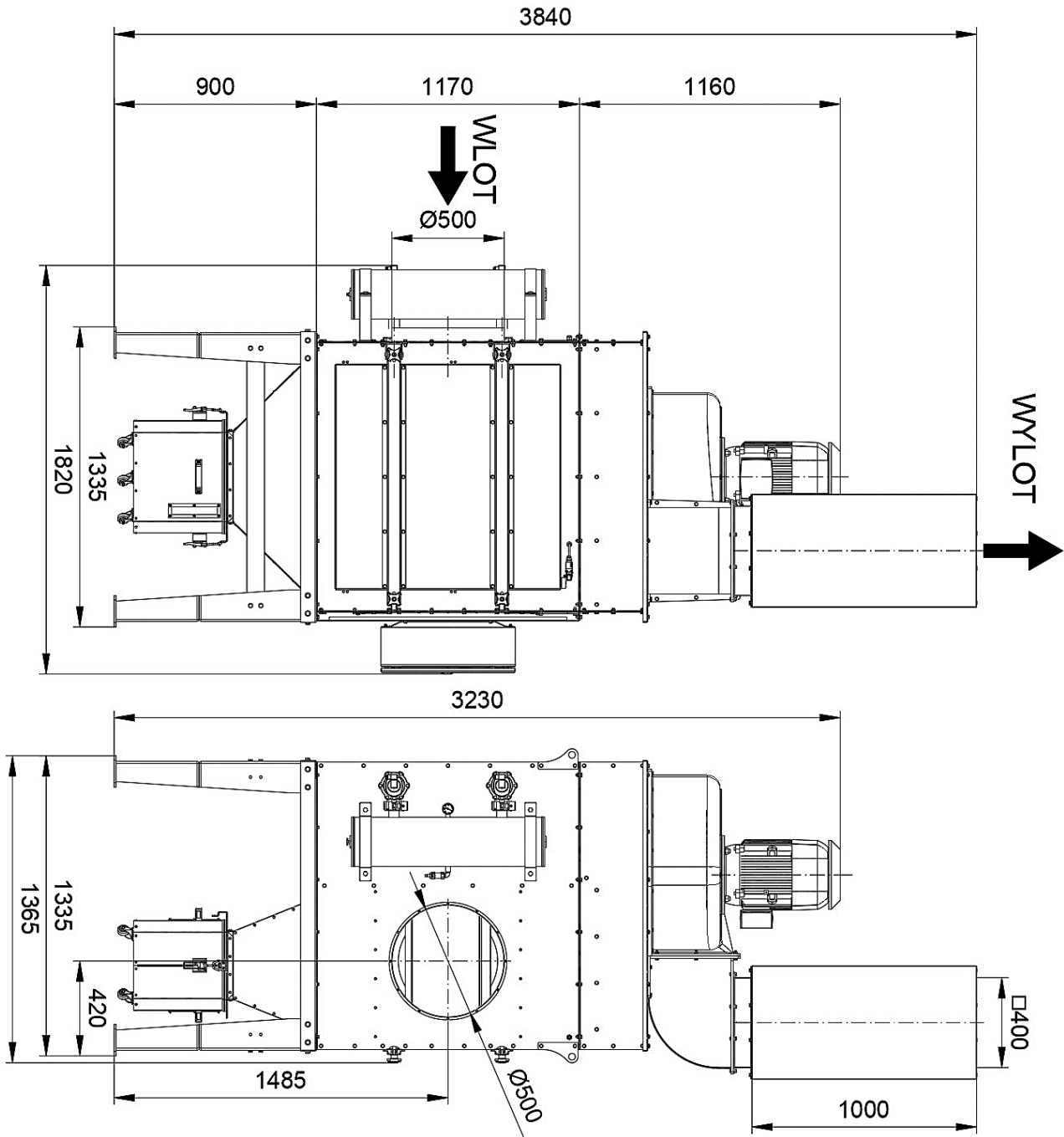
Picture 32 Overall dimensions of the UFO-A-5000-N-RH device (with an inlet on the right)



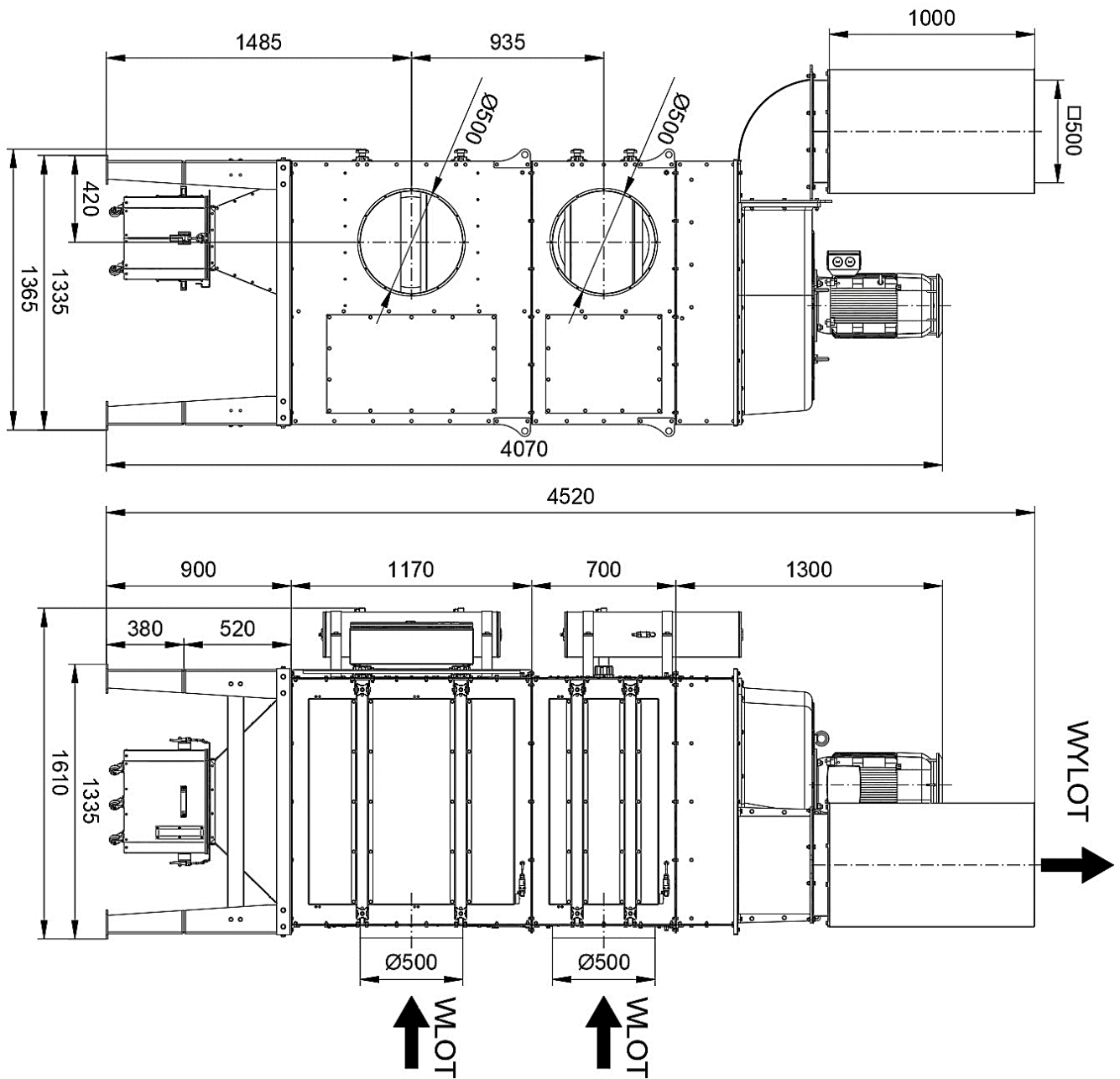
**Picture 33 Overall dimensions of the UFO-A-5000-N-LH device
(with an inlet on the left side)**



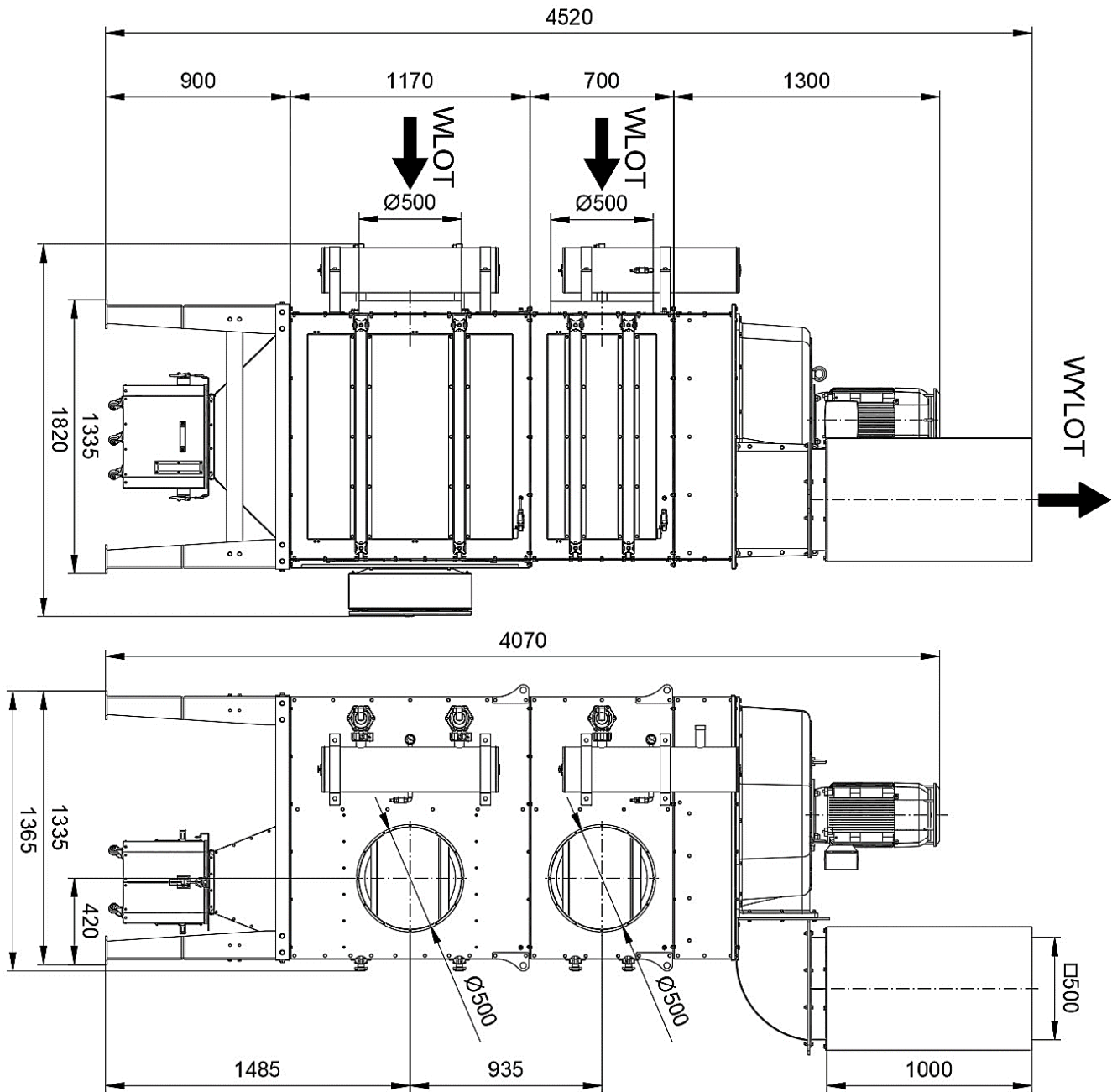
Picture 34 Overall dimensions of the UFO-A-10000-N-RH device (with an inlet on the right)



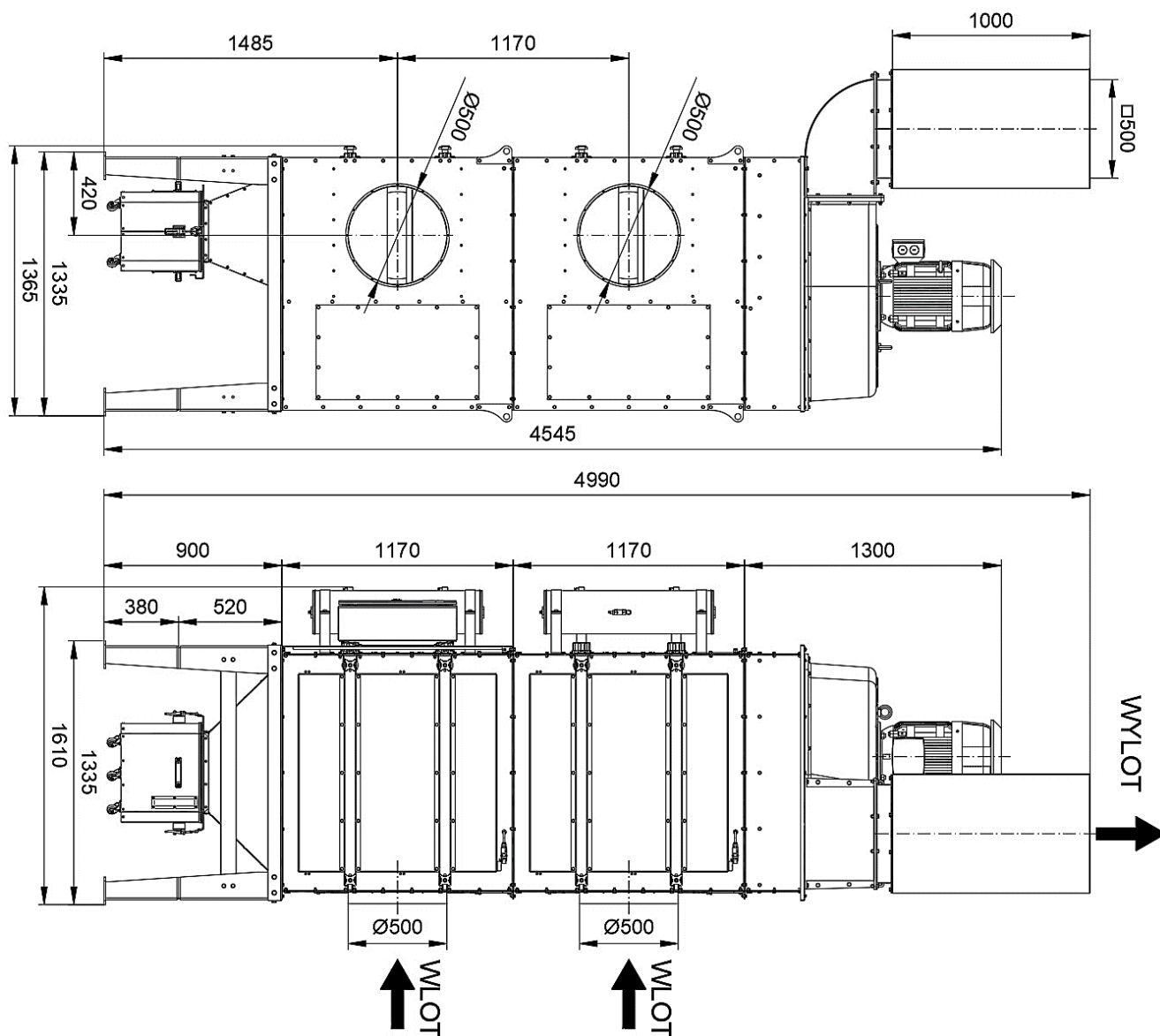
Picture 35 Overall dimensions of the UFO-A-10000-LH device (with an inlet on the left side)



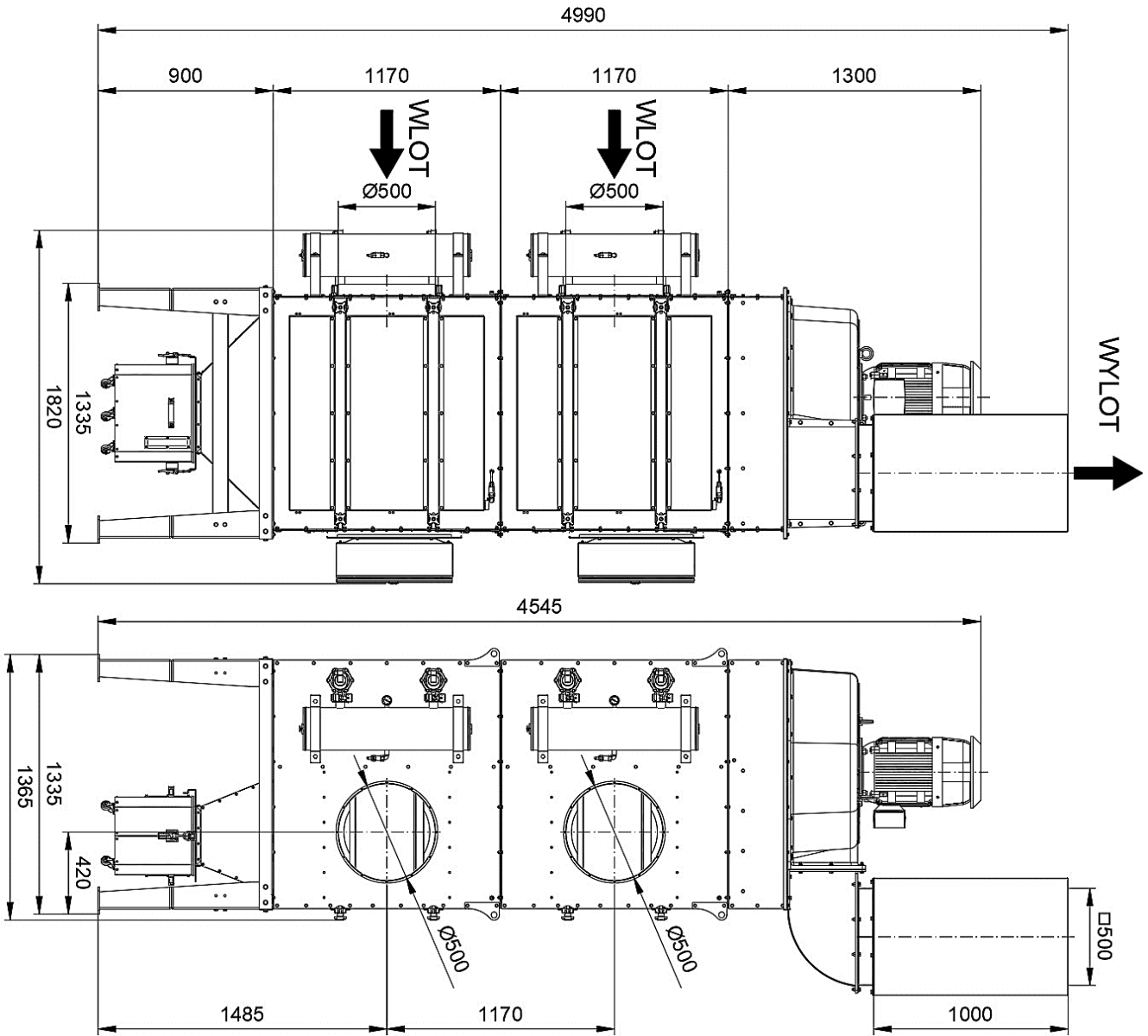
Picture 36 Overall dimensions of the UFO-A-15000-N-RH device (with an inlet on the right)



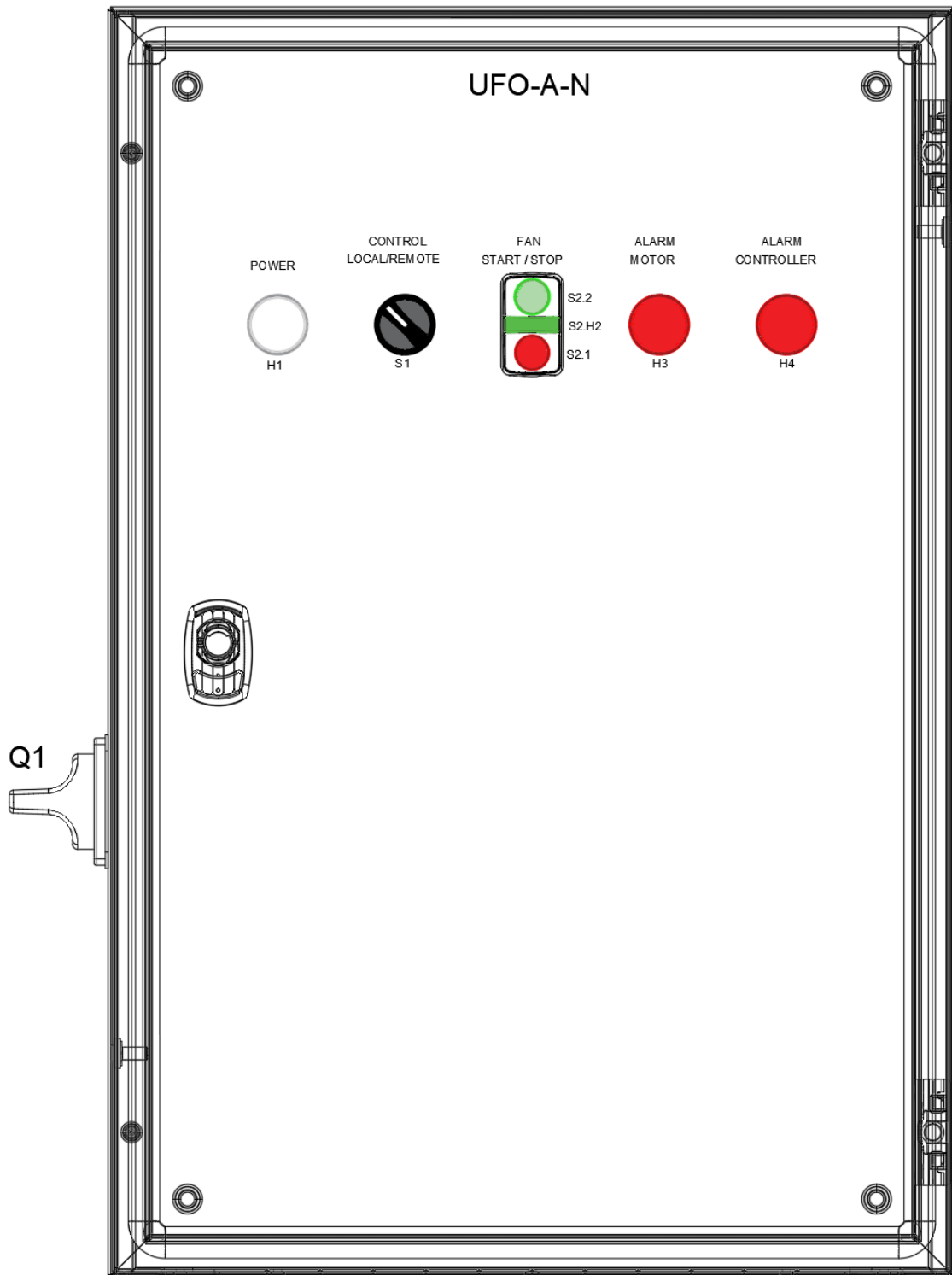
**Picture 37 Overall dimensions of the UFO-A-15000-N-LH device
(with an inlet on the left side)**



**Picture 38 Overall dimensions of the UFO-A-20000-N-RH device
(with an inlet on the right)**

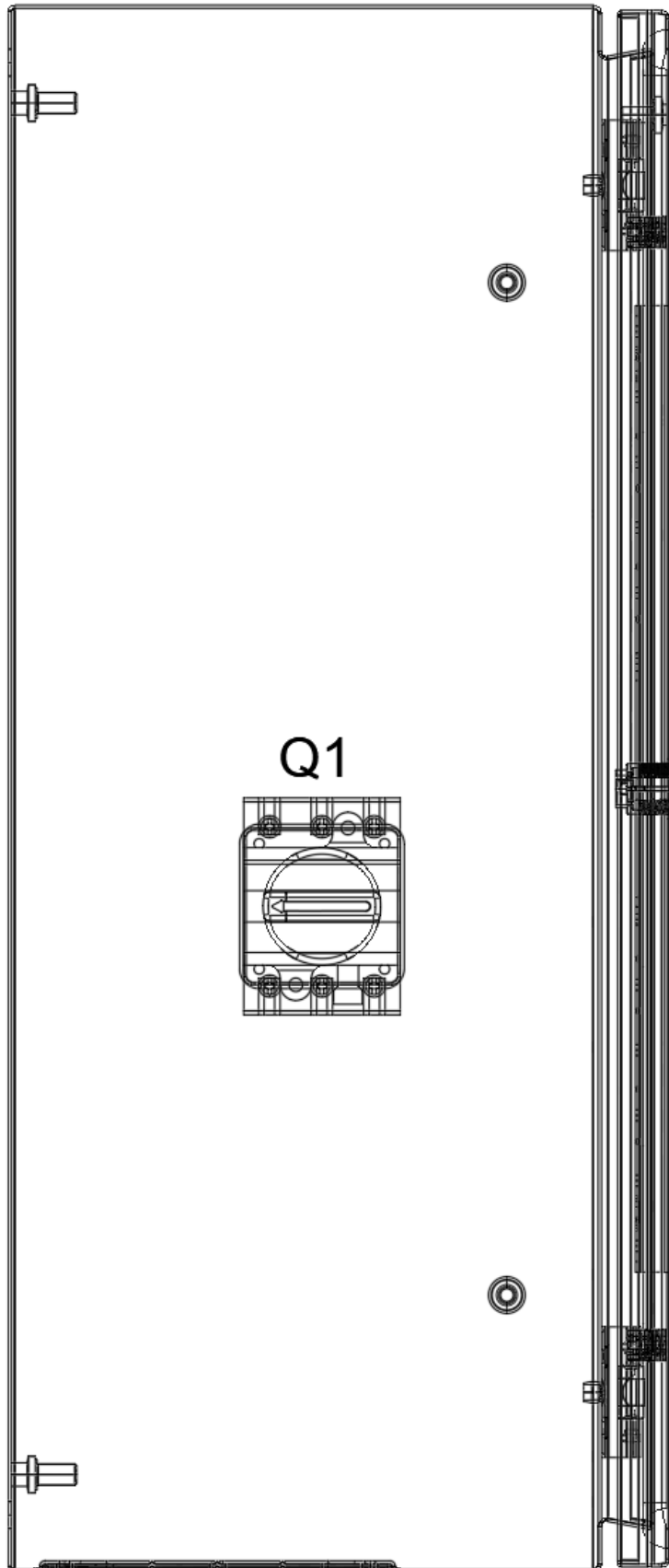


**Picture 39 Overall dimensions of the UFO-A-20000-N-LH device
(with an inlet on the left side)**



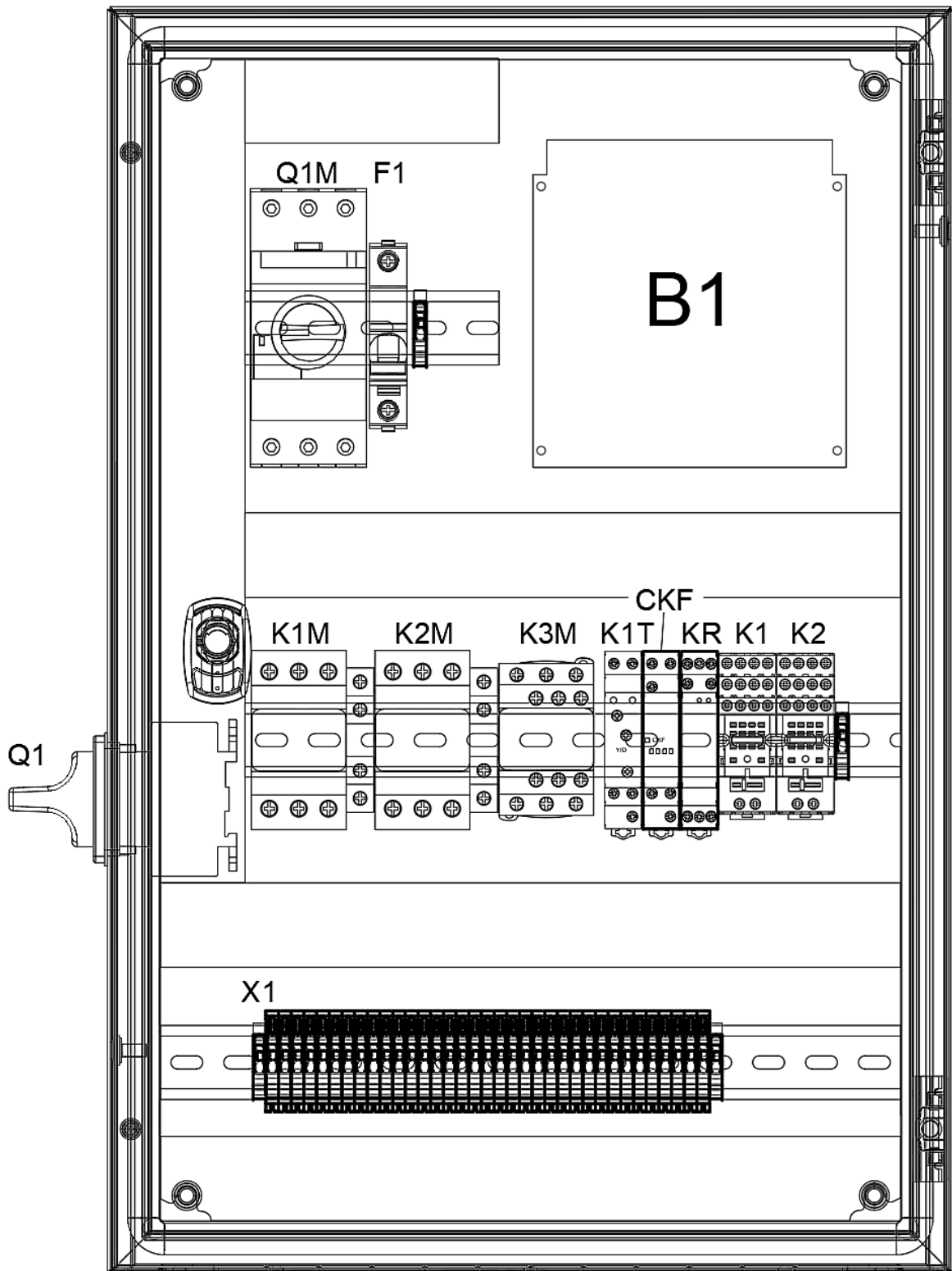
Picture 40 Electrical switchboard facade

Q1 – Main switch



Picture 41 Side of the electrical switchboard

Q1 – Main switch



Picture 42 The interior of the electrical switchboard

Q1 – Main switch; **Q1M** – Motor circuit breaker; **F1, F2** – Miniature circuit breakers;
K1M, K2M, K3M – Contactors; **K1T** – Time transmitter; **CKF** – Phase controller;
KR – Resistance relay; **K1, K2** – Electromagnetic relays; **B1** – Controller



13. WIRING DIAGRAMS

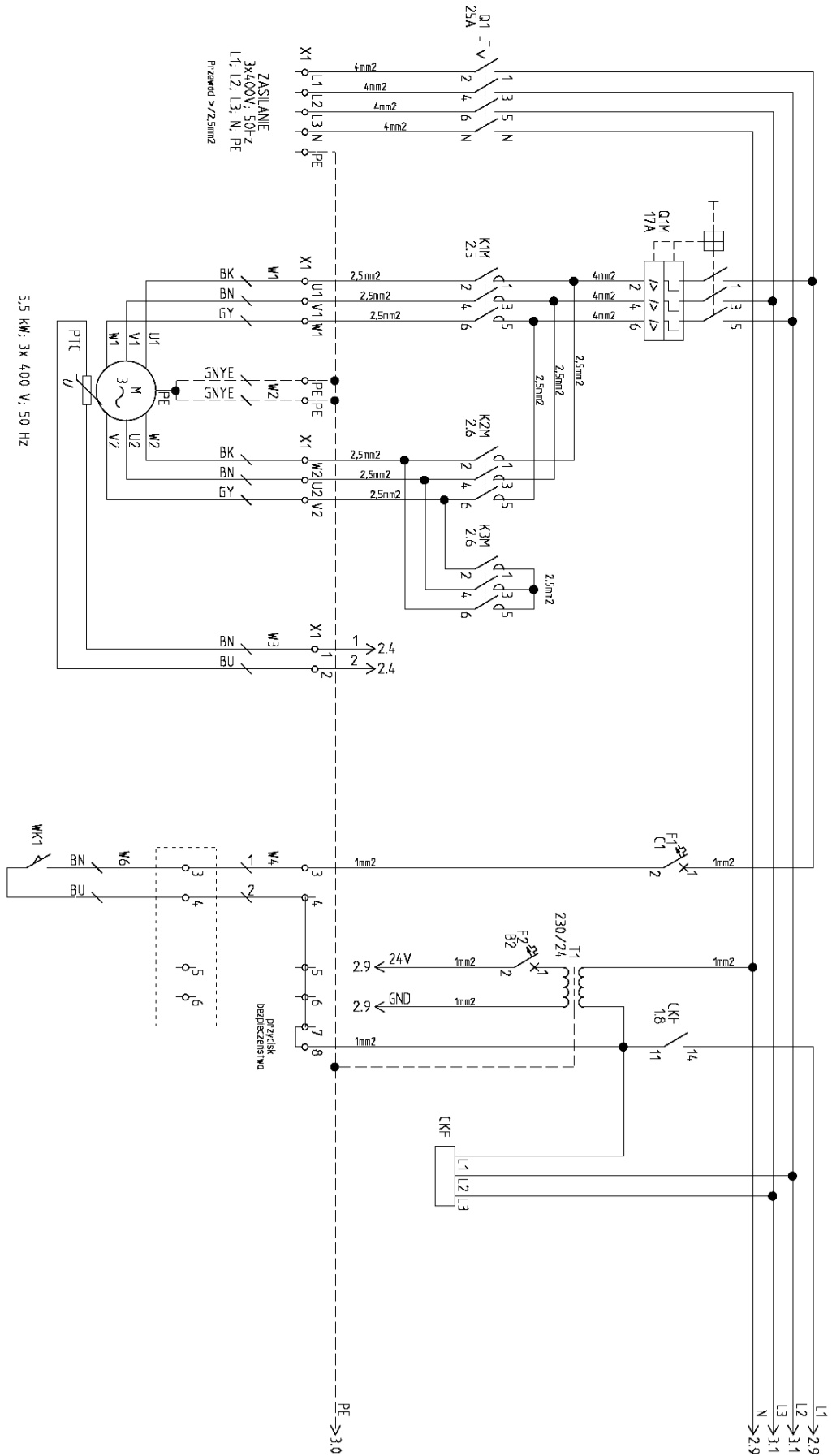


Diagram 1 UFO-A-5000-N, part 1 of 4

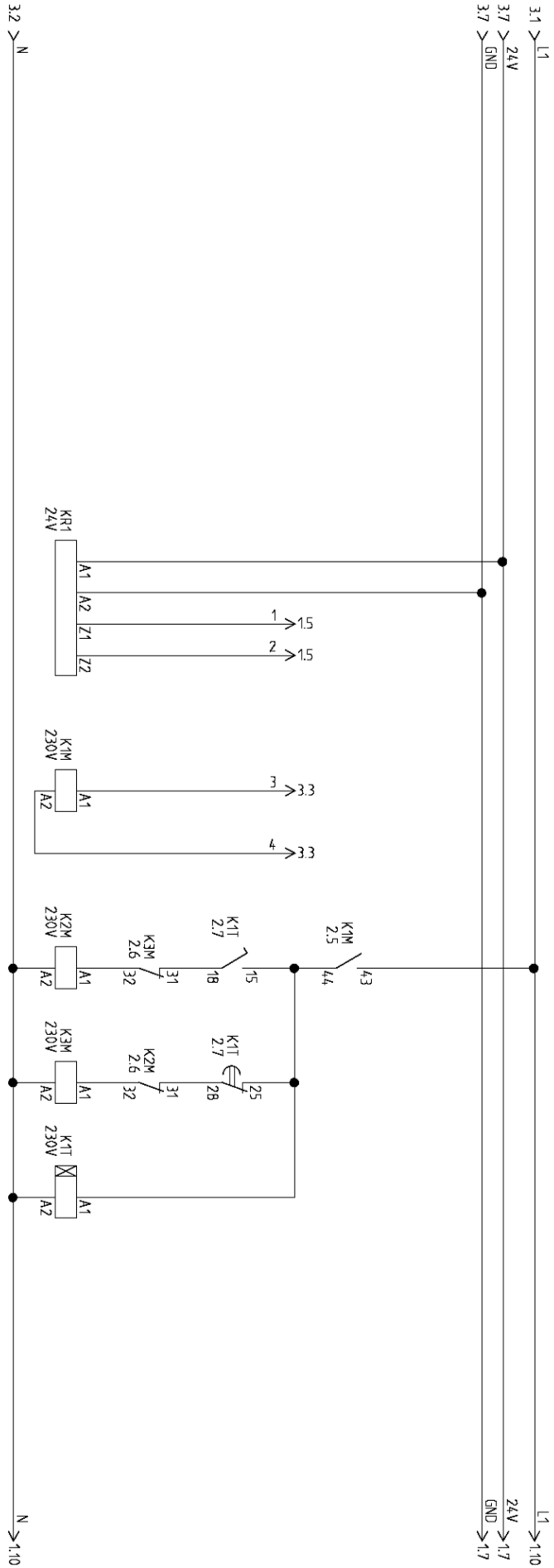


Diagram 2 UFO-A-5000-N, part 2 of 4

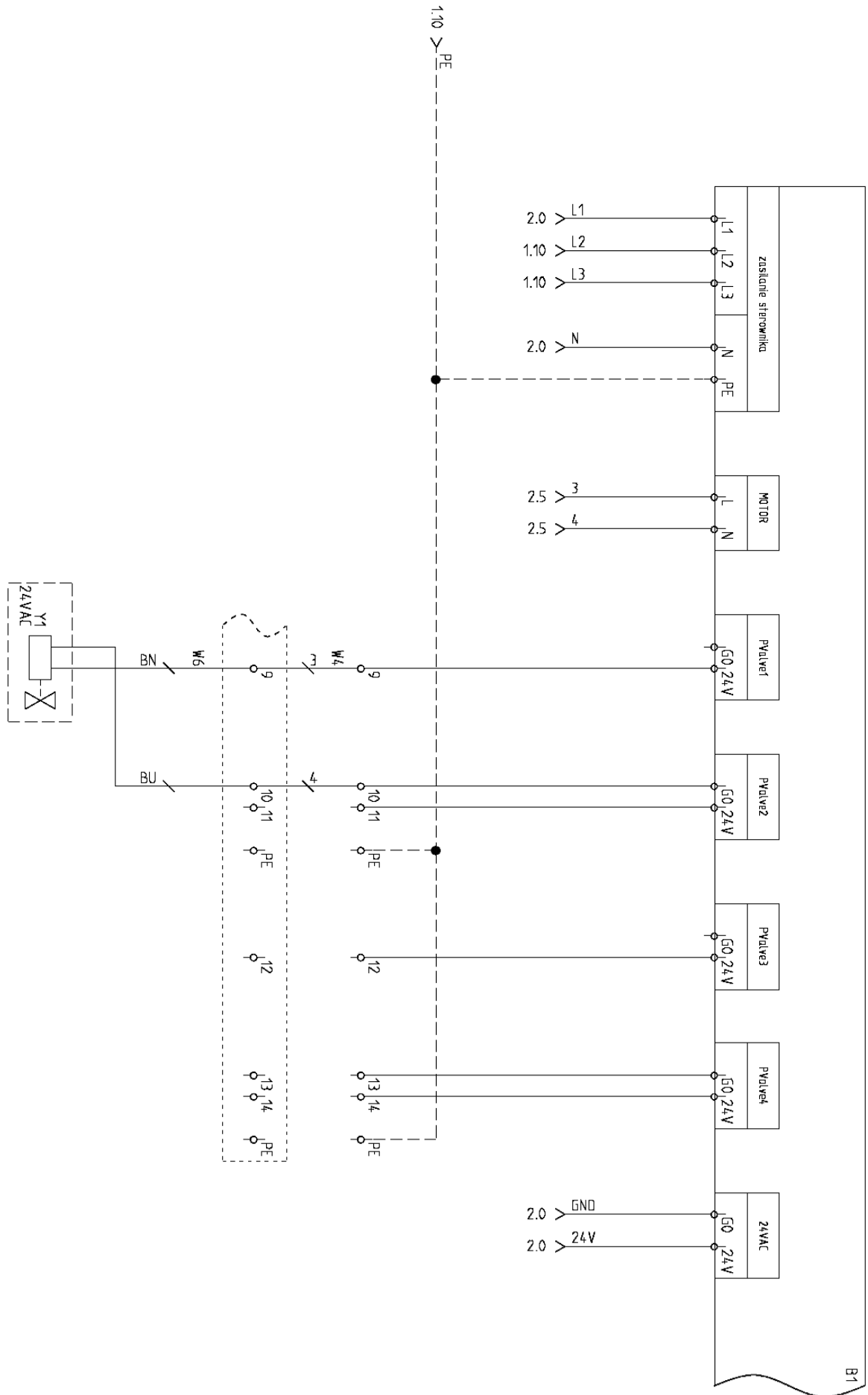


Diagram 3 UFO-A-5000-N, part 3 of 4

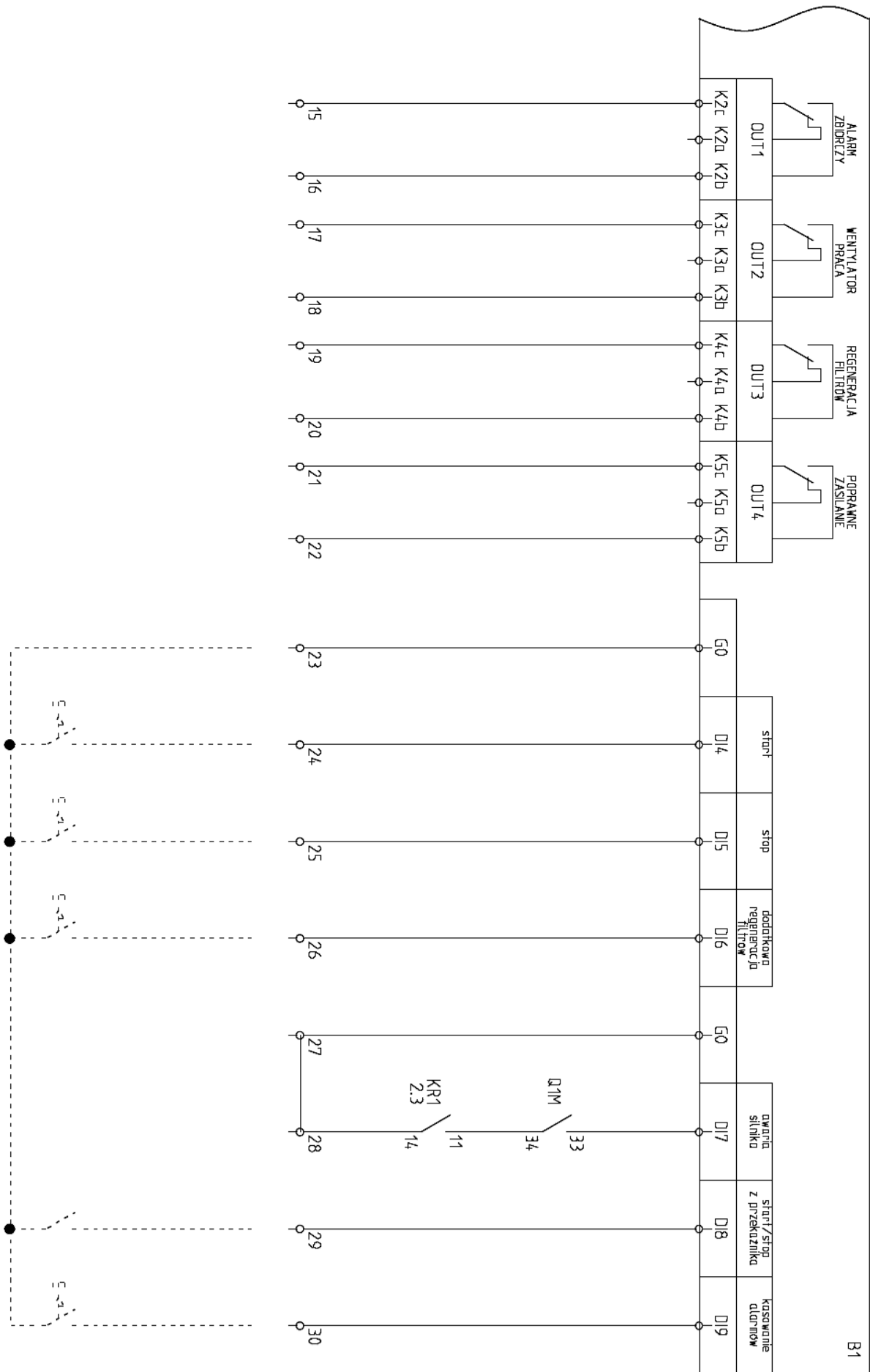
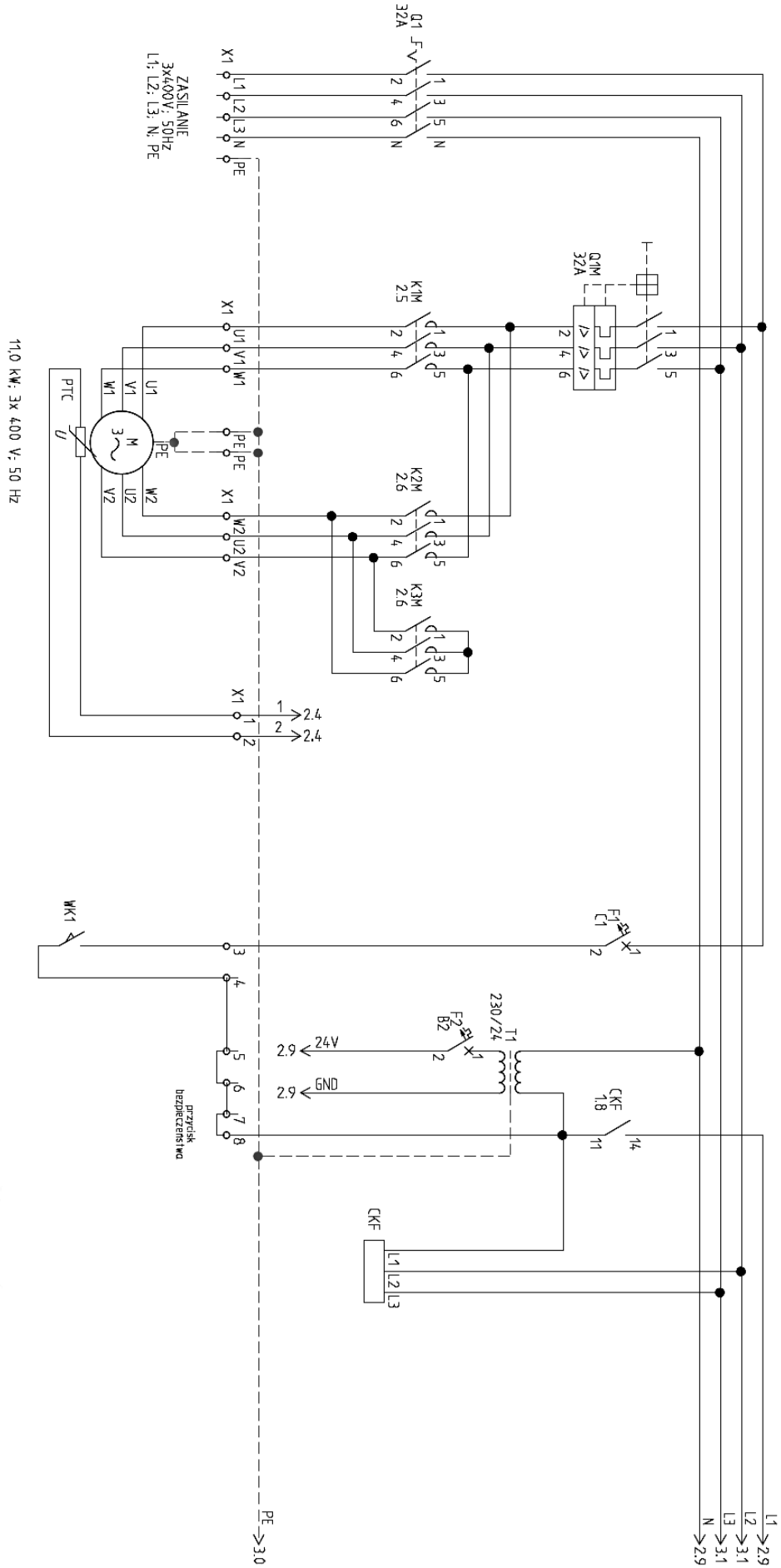


Diagram 4 UFO-A-5000-N, part 4 of 4



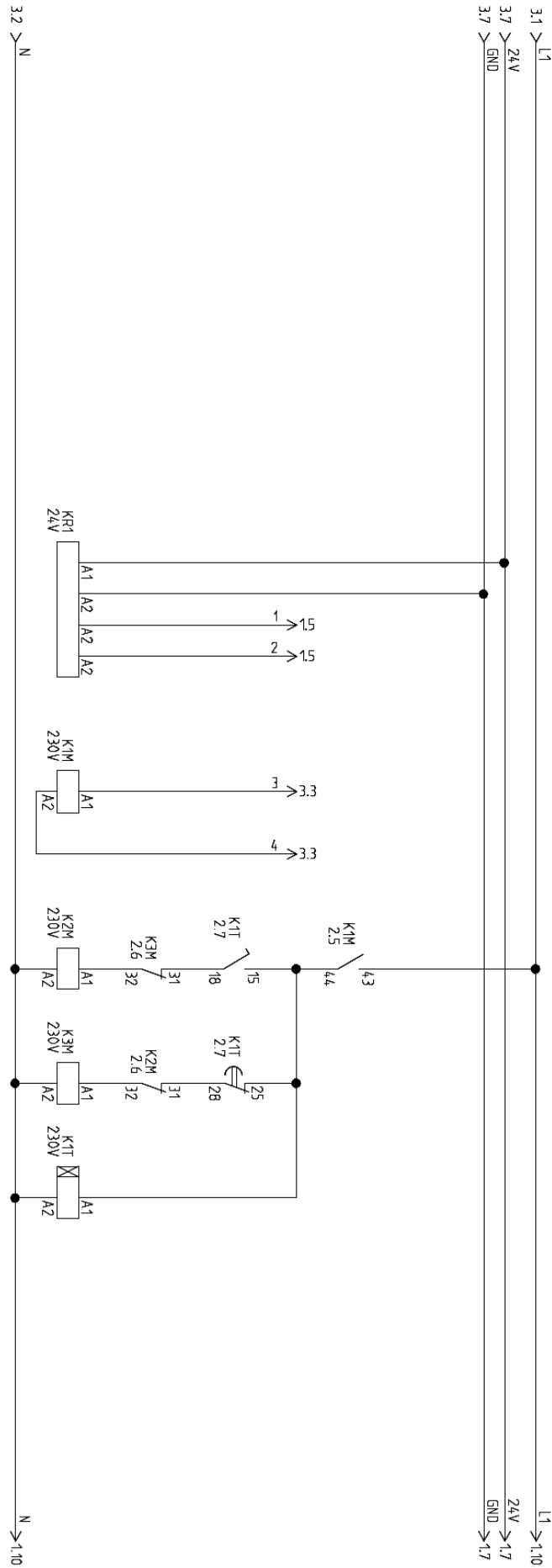


Diagram 44 UFO-A-10000-N, part 2 of 4

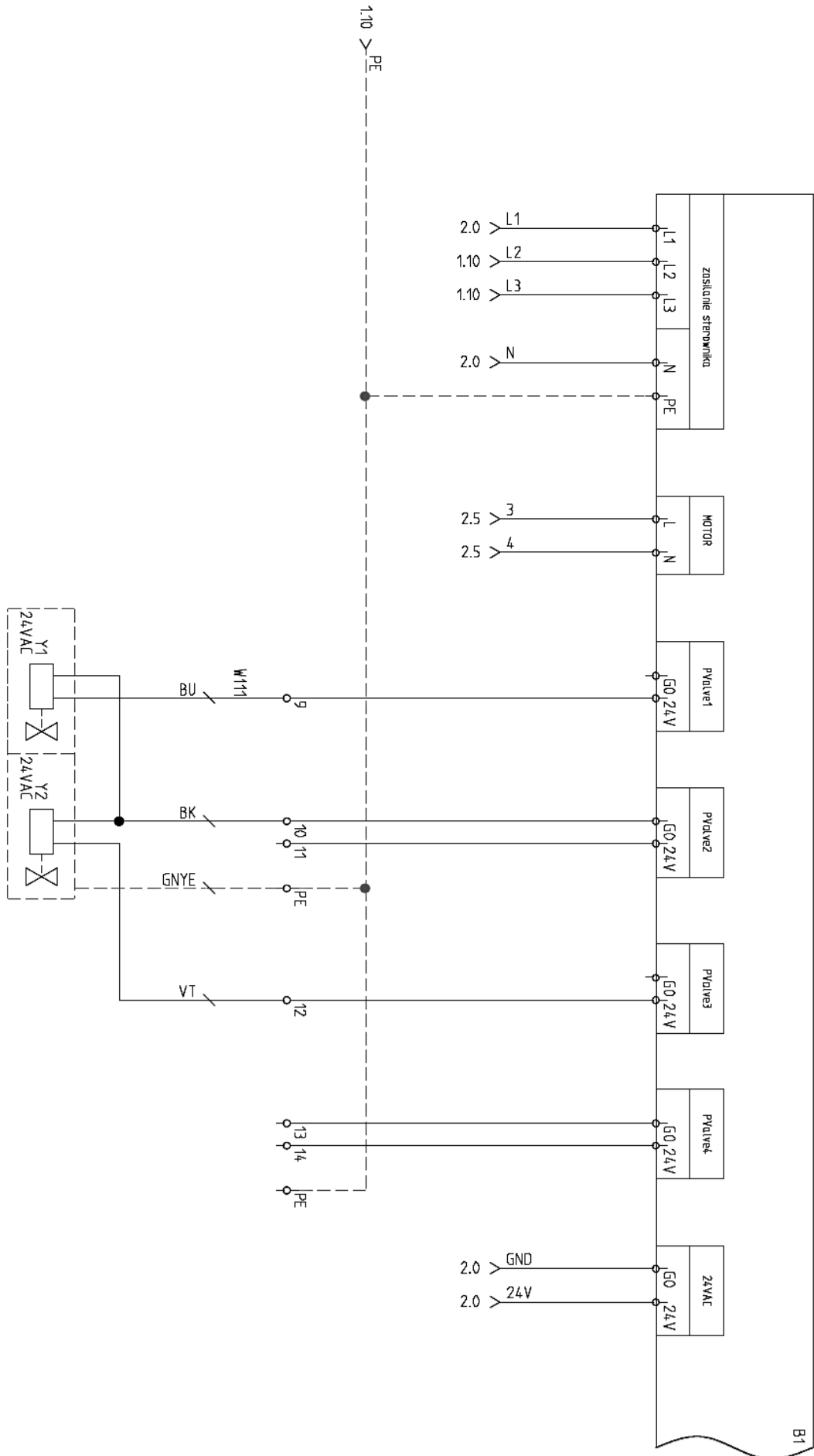


Diagram 45 UFO-A-10000-N, part 3 of 4

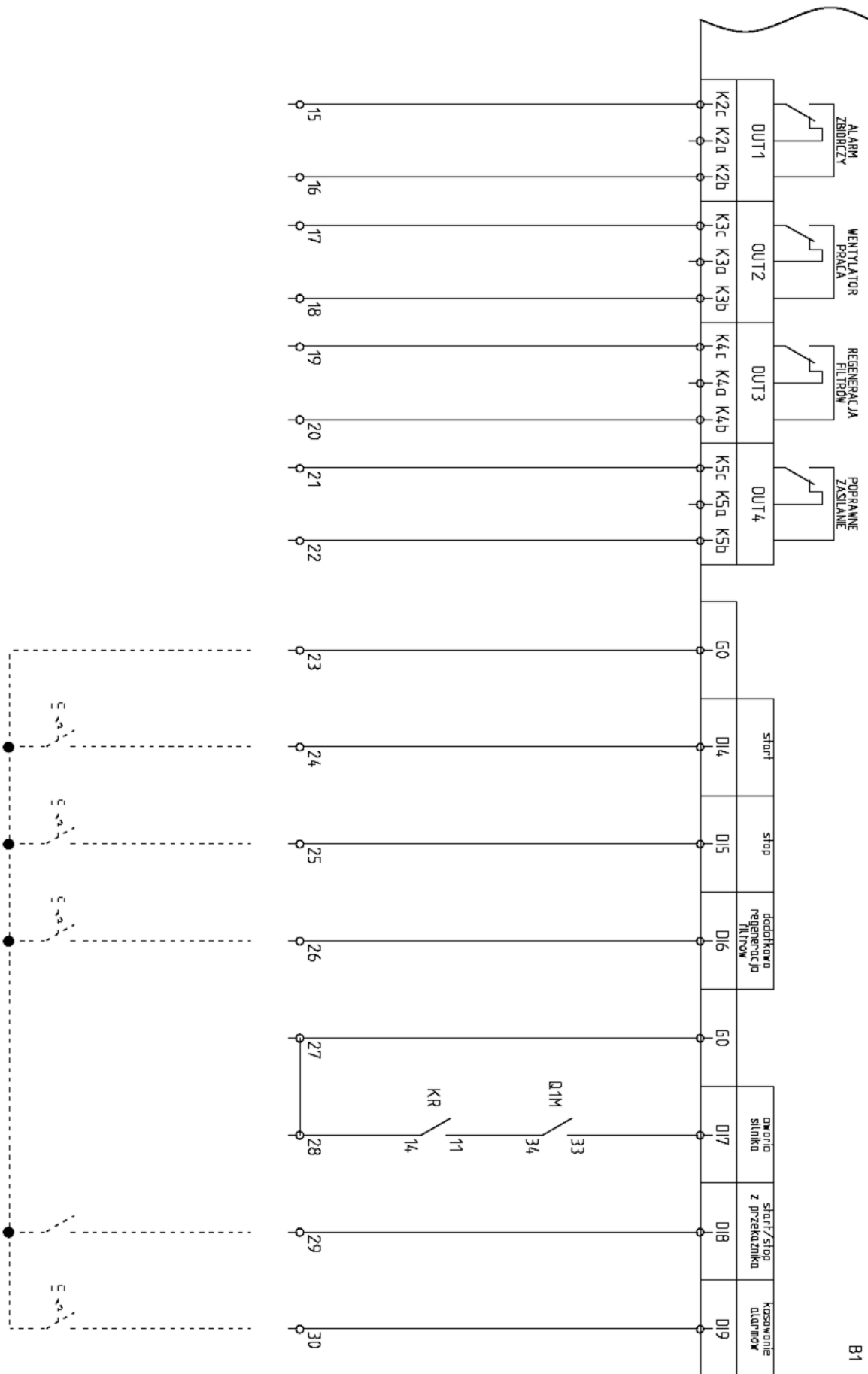


Diagram 46 UFO-A-10000-N, part 4 of 4

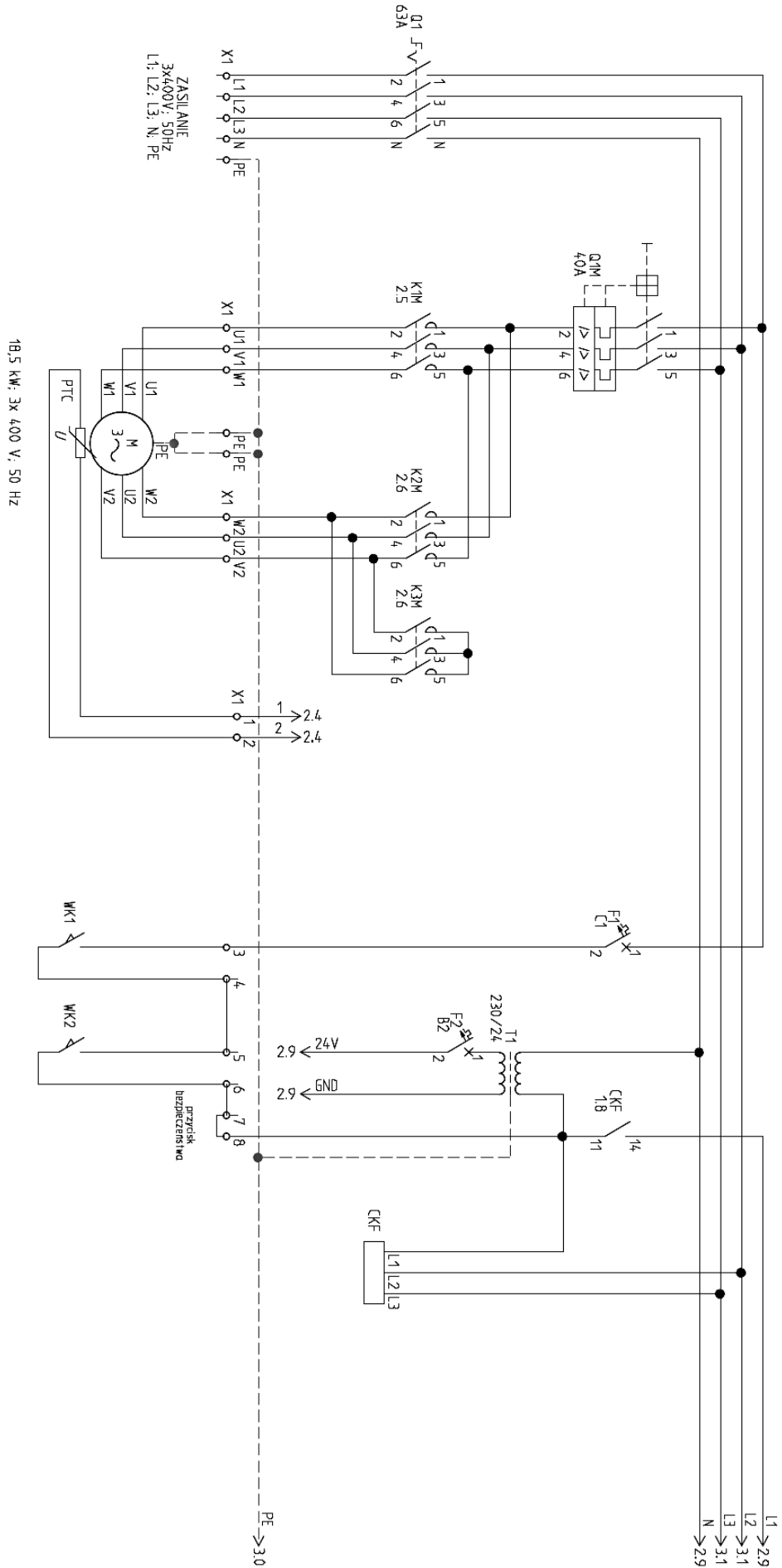


Diagram 47 UFO-A-15000-N, part 1 of 4

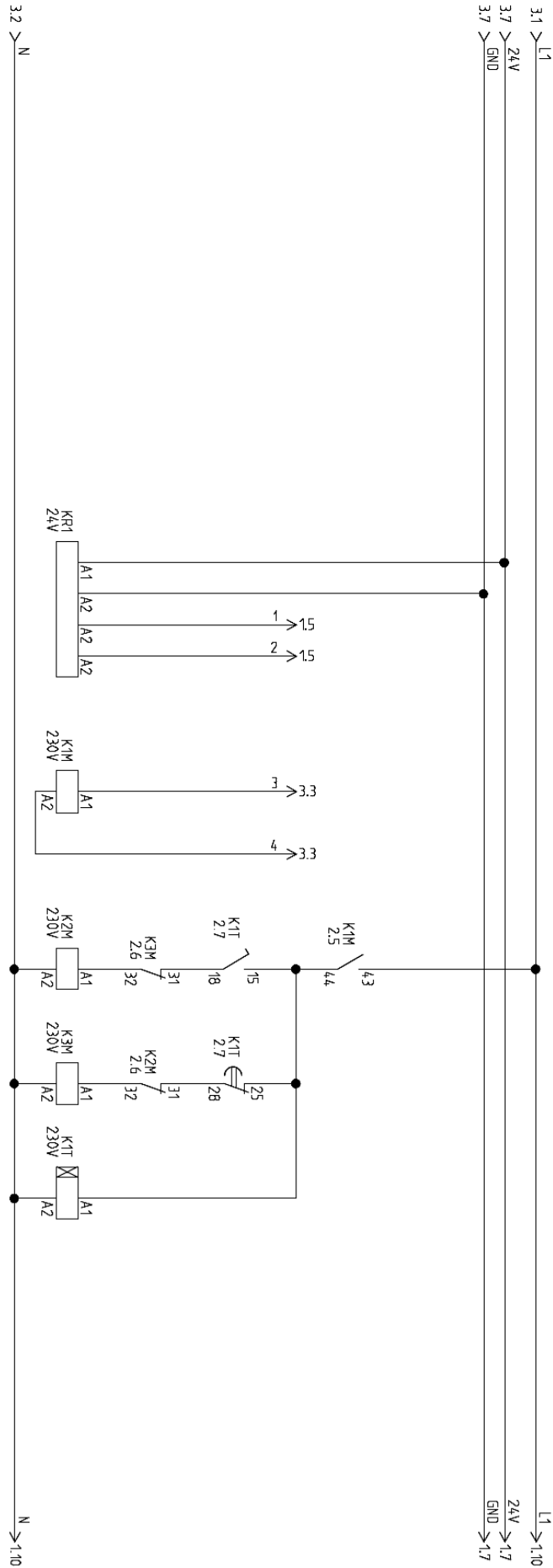


Diagram 48 UFO-A-15000-N, part 2 of 4

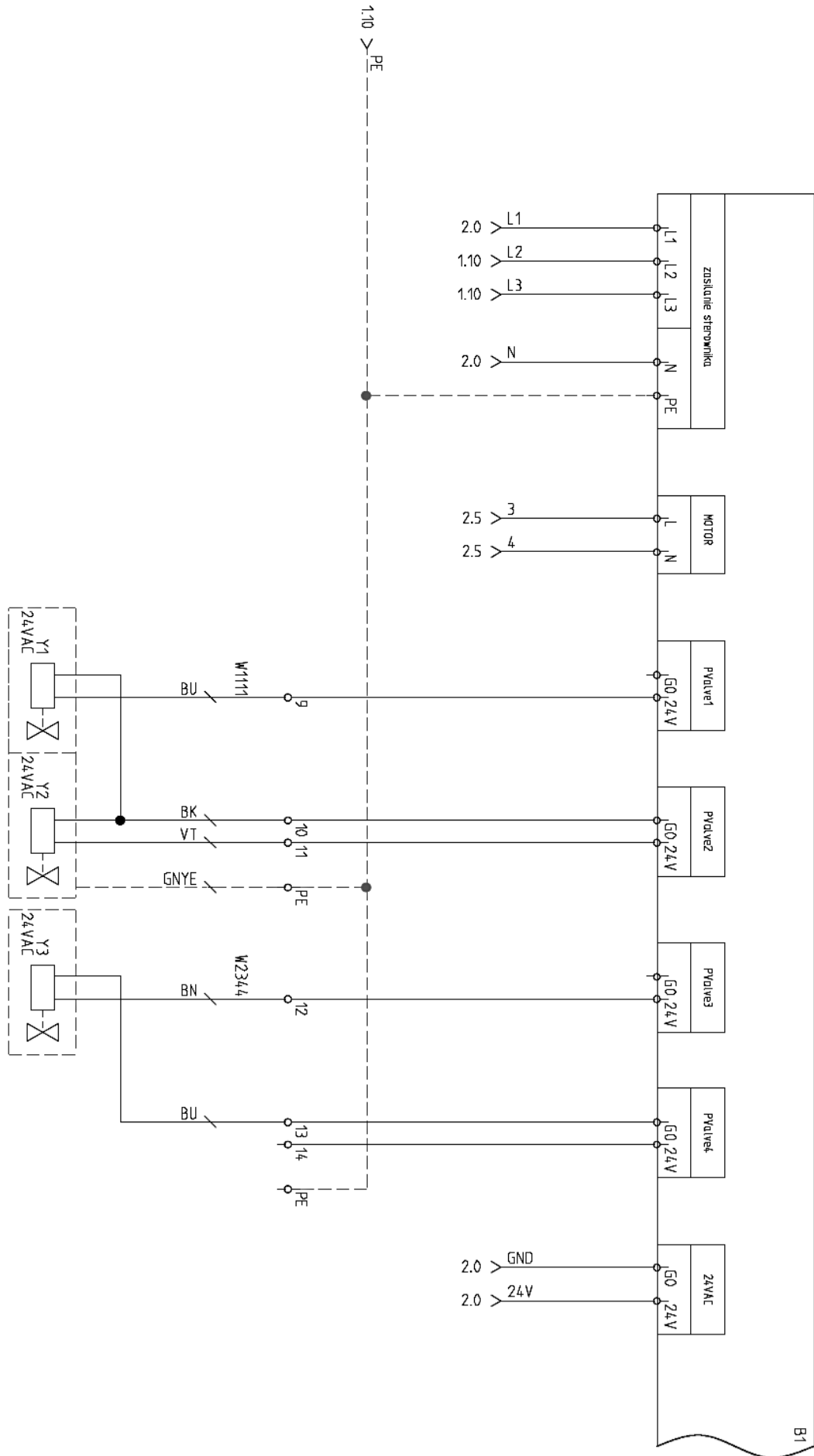


Diagram 49 UFO-A-15000-N, part 3 of 4

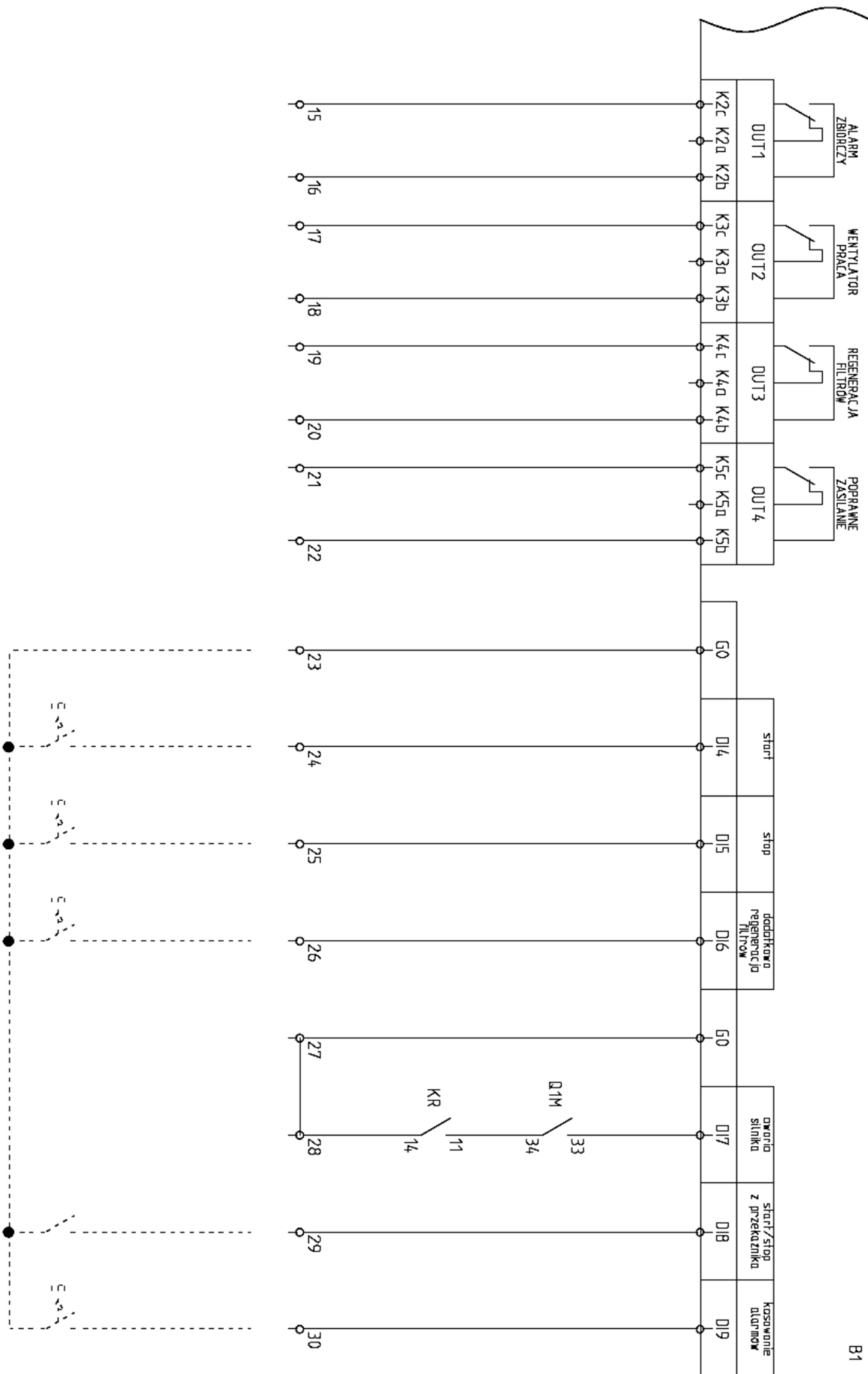


Diagram 50 UFO-A-15000-N, part 4 of 4

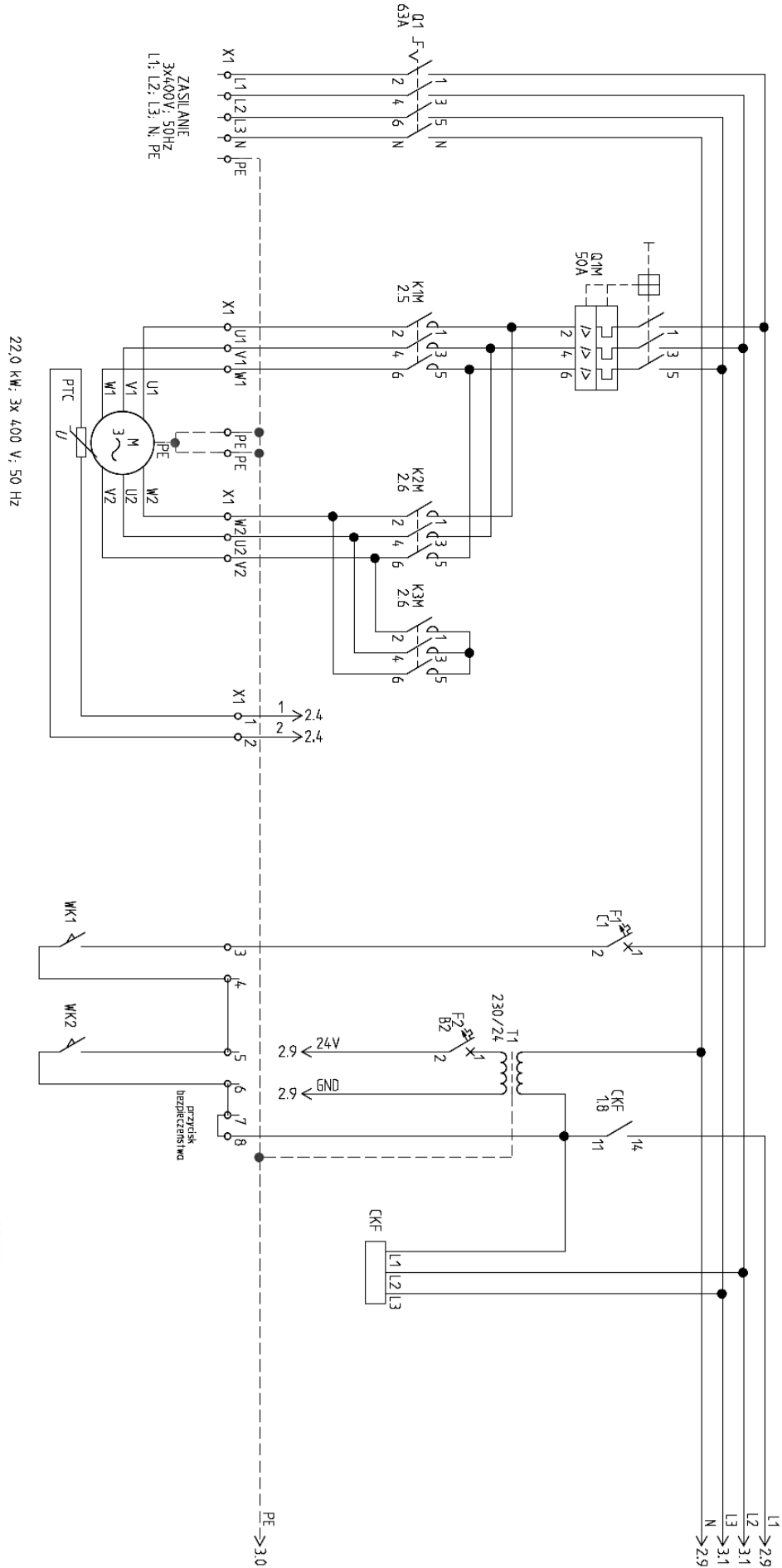


Diagram 51 UFO-A-20000-N, part 1 of 4

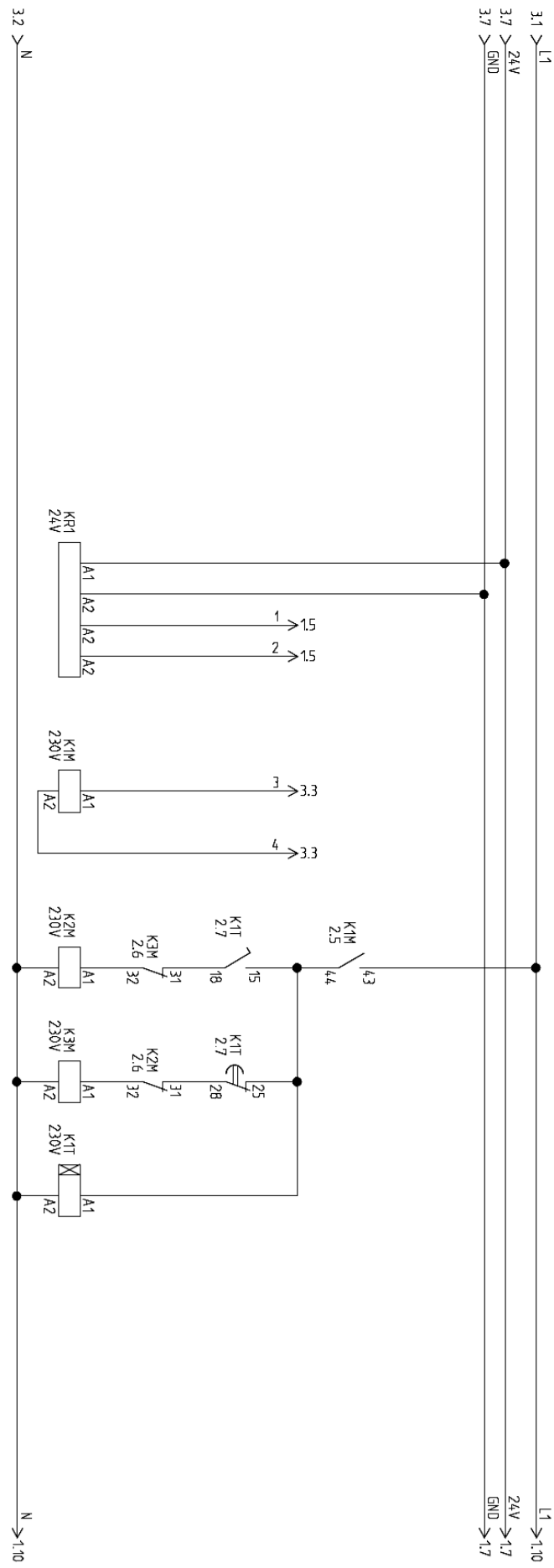


Diagram 52 UFO-A-20000-N, part 2 of 4

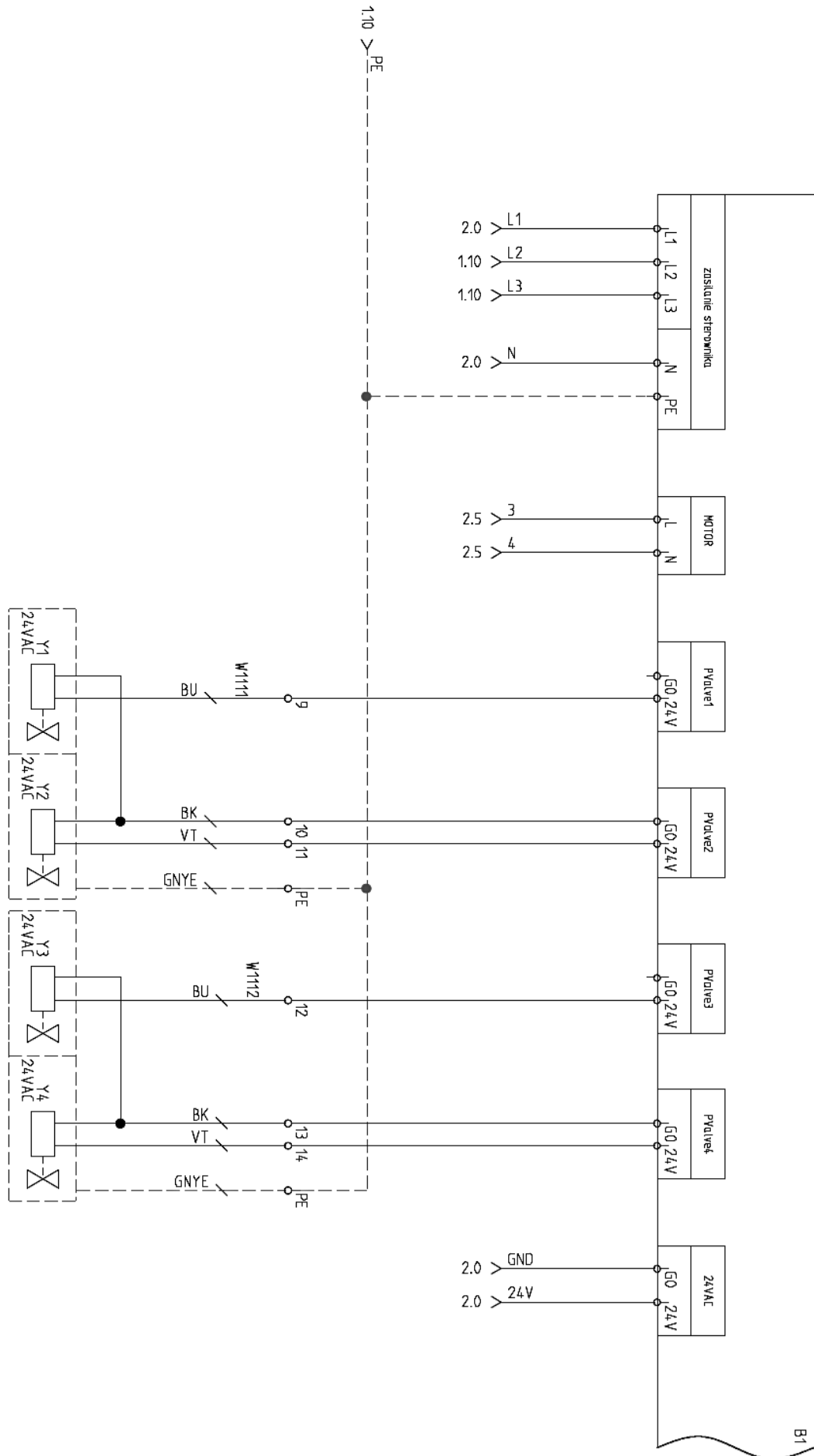


Diagram 53 UFO-A-20000-N, part 3 of 4

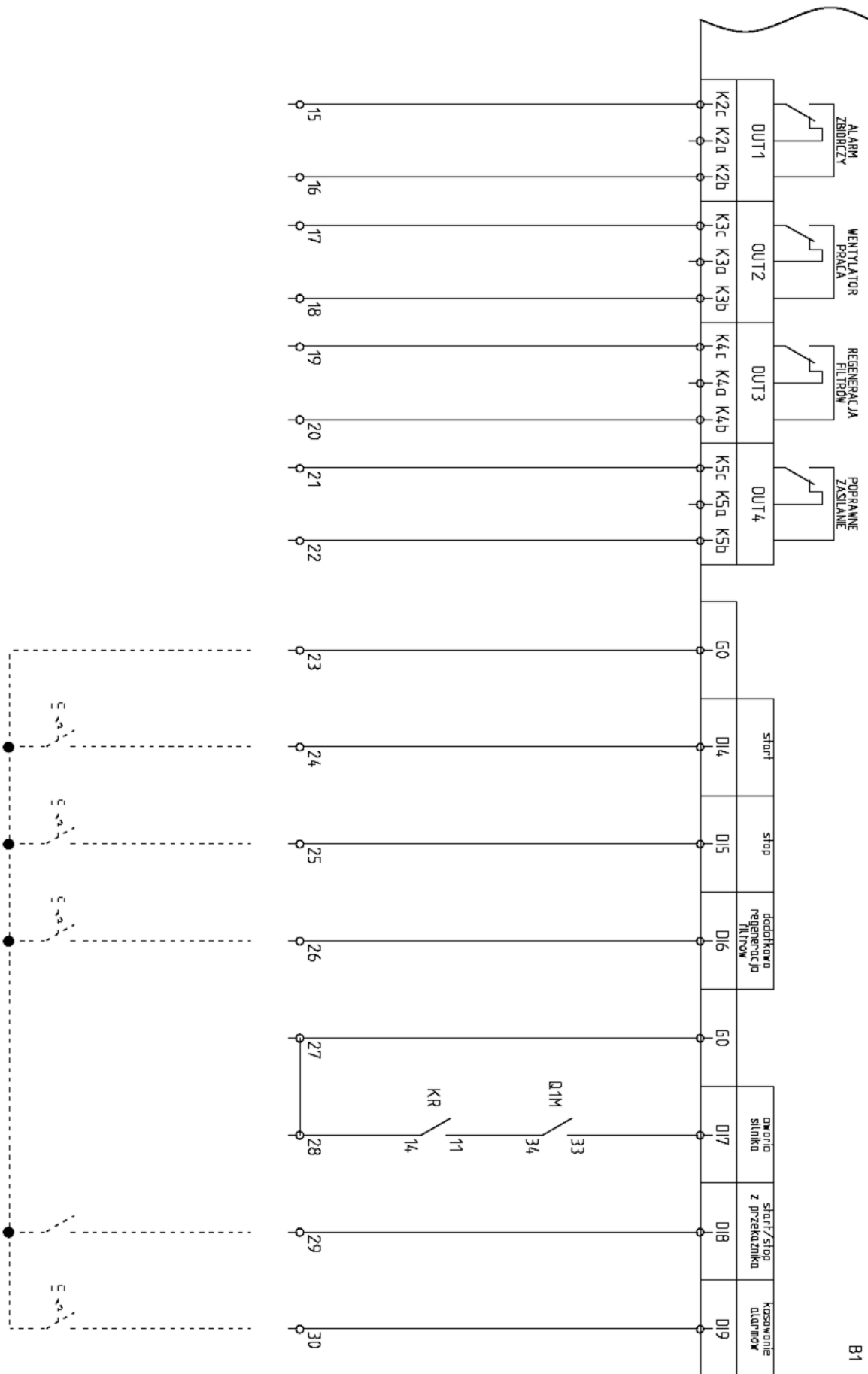


Diagram 54 UFO-A-20000-N, part 4 of 4



Pressure transducers	Differential pressure transducer: _____ setting: _____ <input type="radio"/> works correctly <input type="radio"/> doesn't work properly <input type="radio"/> lack		
Fan	Fan motor type, designation, manufacturer: _____ Rated power: _____ kW Rated current: _____ A The connection of the windings on the motor: <input type="radio"/> star Y <input type="radio"/> delta Δ <input type="radio"/> other _____ Electric supply: <input type="radio"/> 1x230V,50Hz <input type="radio"/> 3x400V,50Hz <input type="radio"/> other _____ Starting: <input type="radio"/> direct <input type="radio"/> star-delta <input type="radio"/> inverter <input type="radio"/> other, _____ Motor protection switch setting: _____ A Inverter settings: - minimum frequency: _____ Hz - maximum frequency: _____ Hz - thermal protection setting: _____ A - setting of the rated motor current: _____ A Adjustment: <input type="radio"/> gradual: gear 1 _____ Hz, gear 2 _____ Hz <input type="radio"/> smooth, of the function: _____ <input type="radio"/> correct direction of rotation of the rotor Measured current consumption: _____ A		
TC/PTC <i>TC – temperature controller</i> <i>PTC – positive temperature coefficient</i>	TC of the fan	<input type="radio"/> connected <input type="radio"/> not connected <input type="radio"/> lack	
	PTC of the fan	<input type="radio"/> connected <input type="radio"/> not connected <input type="radio"/> lack	
Work simulation	Performance measurement was performed: <input type="radio"/> YES <input type="radio"/> NO Full airflow: _____ m ³ /h Minimal airflow: _____ m ³ /h Maximum dustiness: _____ g/m ³ /h		
Working environment	Location	<input type="radio"/> inside sheltered from the influence of precipitation <input type="radio"/> outdoors without a roof <input type="radio"/> outdoors with a roof <hr/> The distance between the engine ventilator and the partition is maintained: <input type="radio"/> YES <input type="radio"/> NO Preserved work area and communication space: <input type="radio"/> YES <input type="radio"/> NO	
Training	Training <input type="radio"/> carried out <input type="radio"/> not carried out Leader: _____ Date: _____		
	Scope of the training: <input type="radio"/> use of automation <input type="radio"/> filter replacement <input type="radio"/> user's manual of the device <input type="radio"/> user responsibilities <input type="radio"/> health and safety conditions <input type="radio"/> access to controlled points <input type="radio"/> failure reporting procedure <input type="radio"/> complaint protocol		
	No.	First name and last name	Position
	1.		
	2.		
	3.		
	4.		
5.			
6.			
I declare that all measurements have been made correctly and in compliance with the rules, applicable regulations and technical standards:		Date and signature of the recording person:	
I declare that I have been acquainted with the use of the device and that I confirm that the device is ready for use:		Date and signature of the person authorized to collect the device:	



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Sequencer

E1T 4÷16 Output Channels



Use and Maintenance Instructions

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Description

The E1T control unit is an electronic device designed to drive pneumatic cleaning of industrial dust collector systems.

The construction technology of the control unit allows to connect up to 16 solenoids valves.

The control unit is equipped with a powerful microcontroller that, thanks to an innovative software, makes the instrument easy to use even by inexperienced users.

The control unit control unit is equipped with a seven-segment display, through which the user can monitor the entire cleaning process and make the settings by means of a series of buttons placed on the front panel of the device.


Main features:

- 2 digital free-voltage contact inputs for remote control (Remote Enable & Fan Status);
- 2 Alarm relays (event programmable);
- 16 outputs for solenoid valve actuators;

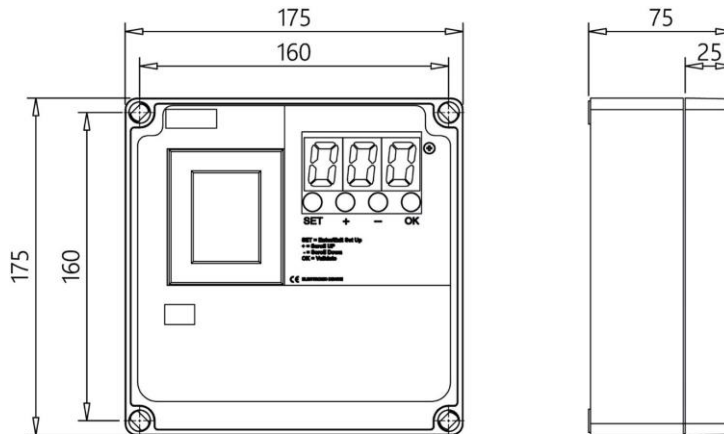
Other features:

- 7 segment 3 digits 0,8" LED display;
- Power supply selectable in hardware for 115-230Vac 50/60Hz or 24Vac-24Vdc;
- Output voltage selectable in hardware and software for 24Vdc, 24Vac, 115Vac, 230Vac;
- Fully configurable cleaning cycle;
- Post cleaning function (PCC) when Fan is OFF, by detection on the "Fan Status" contact input;
- Total and partial hours counter for maintenance;
- Alarm for solenoid valve not operating;
- Alarm for maintenance of filter elements;
- Remote enabling of the Control unit by mean of "Remote Enable" contact input;
- Single solenoid actuator manual activation for system check;

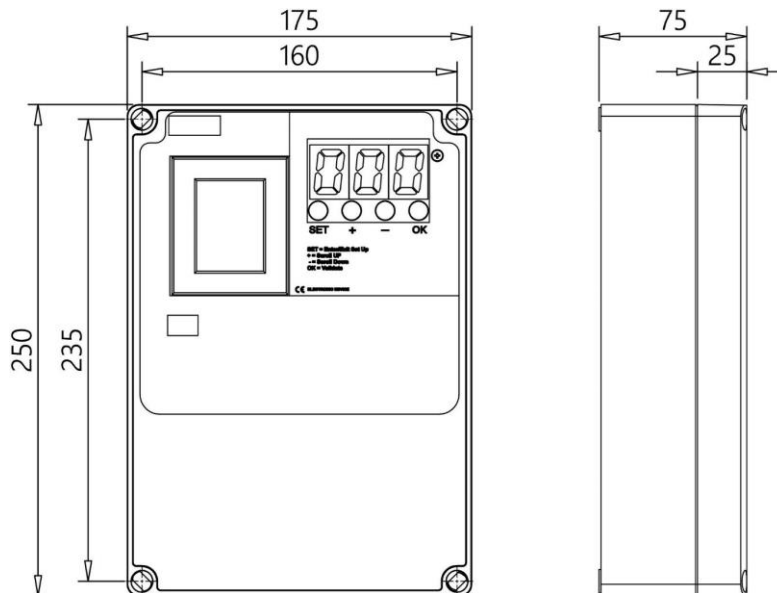
Electrical Specifications

Power Supply Voltage		115Vac 50/60 Hz \pm 10 % 230Vac 50/60 Hz \pm 10 % 24Vac 50/60 Hz \pm 10 % (on request) 24Vdc \pm 10 % (on request)
Power consumption		28 VA @ max Load (on request: 50VA)
Protection fuse		1AT (115Vac - 230Vac models) 3AT (24Vac / 24Vdc models)
Operating Temperature		-10°C ÷ 55°C
Storage Temperature		-20°C ÷ 60°C
Environmental Humidity		0 ÷ 95% Relative (Non Condensing)
Solenoid valve opening Pulse Time		50msec ÷ 9,99sec
Pause Time between solenoid solenoids activations		1sec ÷ 999sec
Output Voltage For Solenoid solenoids		115Vac 50/60 Hz 230Vac 50/60 Hz 24Vac 50/60 Hz 24Vdc
Digital inputs (Not galvanically isolated free-voltage input)		1x FAN OFF detection 1x REMOTE Enable
Digital outputs (free-voltage contacts)		2x SPST FORM A Relay contact
Display		3 digit 0,8" 7 segments LED display
Casing		Base = ABS Transparent cover = Polycarbonate
Protection Degree from water and dust		IP65 DIN EN 60529
Shock Resistance		IK08 (EN62262).
Weight		2,1 Kg

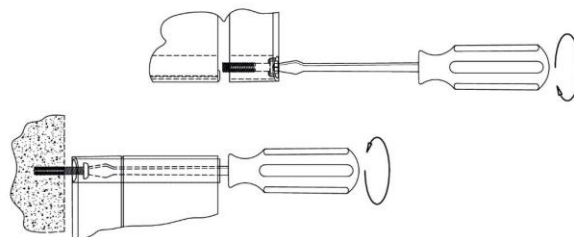
Dimensions and Constrains



*4-8 Outputs Enclosure
 Dimensions in mm*






*12-16 Outputs Enclosure
 Dimensions in mm*









Warning symbols used in this manual


The safety-related indications are highlighted using the symbols:

	Attention - Danger	Warning - Generic
	Risk – Danger	Electric Current
	Dispose of in compliance with the electrical and electronic equipment Standard WEEE	

Installation regulations and warnings

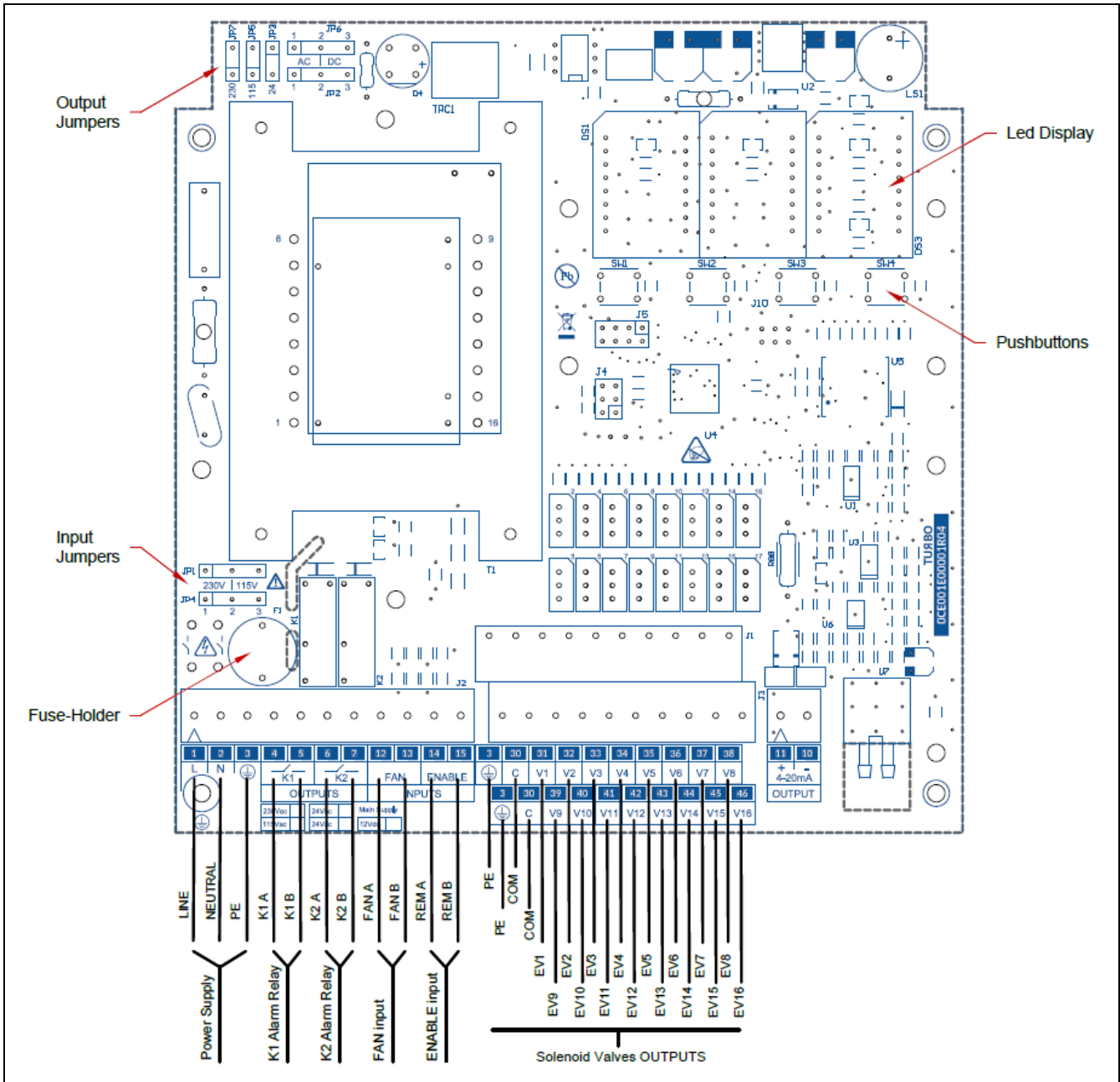
<ul style="list-style-type: none"> Protect the equipment from direct exposure to sunlight. 	
<ul style="list-style-type: none"> Do not position the equipment near or directly in contact with sources of heat or electromagnetic fields. 	
<ul style="list-style-type: none"> Fix the Control Unit at a height of at least 60 cm from the ground floor and in a clearly visible place that is easily accessible. 	
<ul style="list-style-type: none"> Connect the Control Unit to a power supply line other than those used for operating motors or other high-power devices, which could generate network interference or instability. 	
<ul style="list-style-type: none"> The power supply must be protected by a 230Vac 30mA Residual Current Device RCD and a bipolar 230Vac 10A magnet circuit breaker, positioned in a place that is easily accessible. 	
<ul style="list-style-type: none"> Before intervening on the equipment to perform any operation, deactivate the magnet circuit breaker switch and check if the environment conditions are safe. 	
<ul style="list-style-type: none"> For electric operations, always remove voltage, wait 30 seconds for the internal capacitors to discharge before opening. At the end of the operations, close the equipment before powering up. Before intervening on the equipment to perform any operation, check the conditions of the atmosphere are safe. 	
<ul style="list-style-type: none"> The PE (ground terminal/Earth) wire must be Yellow/Green, and it must be the first to be connected. No other cables different than PE must be with its color. 	
<ul style="list-style-type: none"> The terminal block must not be the mechanical anchorage point of the wires. 	
<ul style="list-style-type: none"> Sealing of the cable glands is guaranteed by the compression of the rubber gasket that tightens on the outer diameter of the cable. 	
<ul style="list-style-type: none"> The size of cable and cable gland must ensure that power cord traction is not acting on the terminal. 	

<ul style="list-style-type: none"> Any use not described in this user instruction manual or incorrect use of the device may cause damage to the Control Unit or to the equipment connected to it. 	
<ul style="list-style-type: none"> Incorrect use or tampering with the equipment may cause injury. 	
<ul style="list-style-type: none"> The impermeability of the casing is guaranteed when the cover is closed. 	
<ul style="list-style-type: none"> Make sure that rigid or flexible ducts used for wiring, do not fill up with water or other liquids. 	
<ul style="list-style-type: none"> Switch OFF the power supply immediately if water is found in the casing. 	
<ul style="list-style-type: none"> Do not make unprotected holes in the container or holes that are protected by accessories with protection rating lower than that of the Control Unit. 	
<ul style="list-style-type: none"> If the Control Unit is used in ways not specified by the manufacturer, the protection provided by the device may be impaired. 	
<ul style="list-style-type: none"> No part with dangerous voltage is normally accessible. 	
<ul style="list-style-type: none"> The Control Unit does not release potentially toxic or harmful substances to the health and the environment. 	

	<p><u>IMPORTANT</u></p>
<p>Do not use the control unit if you have not read or do not understand this manual.</p>	

Electrical wirings

To connect the wires to the Control Unit, remove the lower front panel to access the terminal board, unscrewing the two screws.



Note: If the Control Unit is a +24Vdc power-supplied model, please connect:

Terminal 1	=	+24Vdc IN
Terminal 2	=	0Vdc IN
Terminal 3	=	PE

Terminals Table

Ref.	Cat	Terminal	Marking	Description	
Main Power Supply	A	1	L	115-230Vac 50/60Hz ±10%	24Vac 50/60Hz ±10%
		2	N		24Vdc ±10%
	PE	3	PE	Protective ground terminal (Earth)	
Relay K1 Output ⁽¹⁾	B	4	1A	Contact type	1 Form A (1SPST NO)
				Ratings	250Vac/30Vdc 5A
		5	1B	Max switching voltage	400Vac
				Dielectric Strength	4000Vac (750Vac contacts)
				Expected life	10M mechanical, 100K electrical
Relay K2 Output ⁽¹⁾	B	6	2A	Contact type	1 Form A (1SPST NO)
				Ratings	250Vac/30Vdc 5A
		7	2B	Max switching voltage	400Vac
				Dielectric Strength	4000Vac (750Vac contacts)
				Expected life	10M mechanical, 100K electrical
Fan Status Input ⁽²⁾	C	12	FANA	Mode	Free contact (limited to 5mA@5V)
		13	FANB	Insulation	2KVac main transformer
Remote Enable Input ⁽²⁾	C	14	REMA	Mode	Free contact (limited to 5mA@5V)
		15	REMB	Insulation	2KVac main transformer
Ground	PE	3	PE	Protective ground terminal (Earth)	
Solenoid Valve Common	D	30	COM	Ratings	8A
				Max switching voltage	600VAC
Solenoid Valve Output	D	31	EV1	Ratings	4A
		32	EV2	Max switching voltage	600VAC
		33	EV3		
		34	EV4		
		35	EV5		
		36	EV6		
		37	EV7		
		38	EV8		
		39	EV9		
		40	EV10		
		41	EV11		
		42	EV12		
		43	EV13		
		44	EV14		
		45	EV15		
		46	EV16		

Note (1): Free-voltage SPST contacts.

Note (2): Free-voltage contacts powered by the main-board. DO NOT provide voltages at these terminals.



DANGER

Risk of electric shock

The input and output terminals, numbered 12 to 15 are safety extra low voltage (SELV) terminals and must only be connected to low voltage circuits.

Recommended cable cross-section

Cat	Cable Cross-section	Approvals	Notes
A	0,75 mm ²	IEC60227, IEC60245	No-Flame or flame-retardant cable
B	0,75 mm ²	IEC60227, IEC60245	No-Flame or flame-retardant cable
C	0,50 mm ²	IEC60227, IEC60245	No-Flame or flame-retardant cable
D	0,75 mm ²	IEC60227, IEC60245	No-Flame or flame-retardant cable
PE	0,75 mm ²	IEC60227, IEC60245	No-Flame or flame-retardant cable, Yellow/Green cable

Fuse Table & replacing

Voltage	Value
230 Vac	1AT 250V
115 Vac	1AT 250V
24Vac/dc	3AT 60V/250V



DANGER

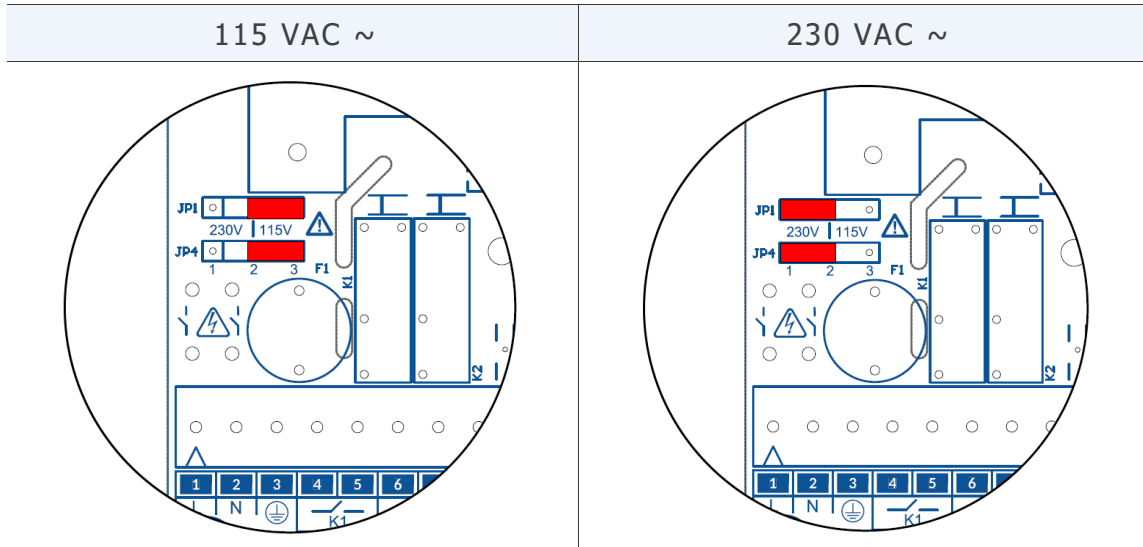
Risk of electric shock

Before replacing the main Fuse on the board, you **MUST** remove the main power supply to avoid electrical shocks.

To replace the fuse:

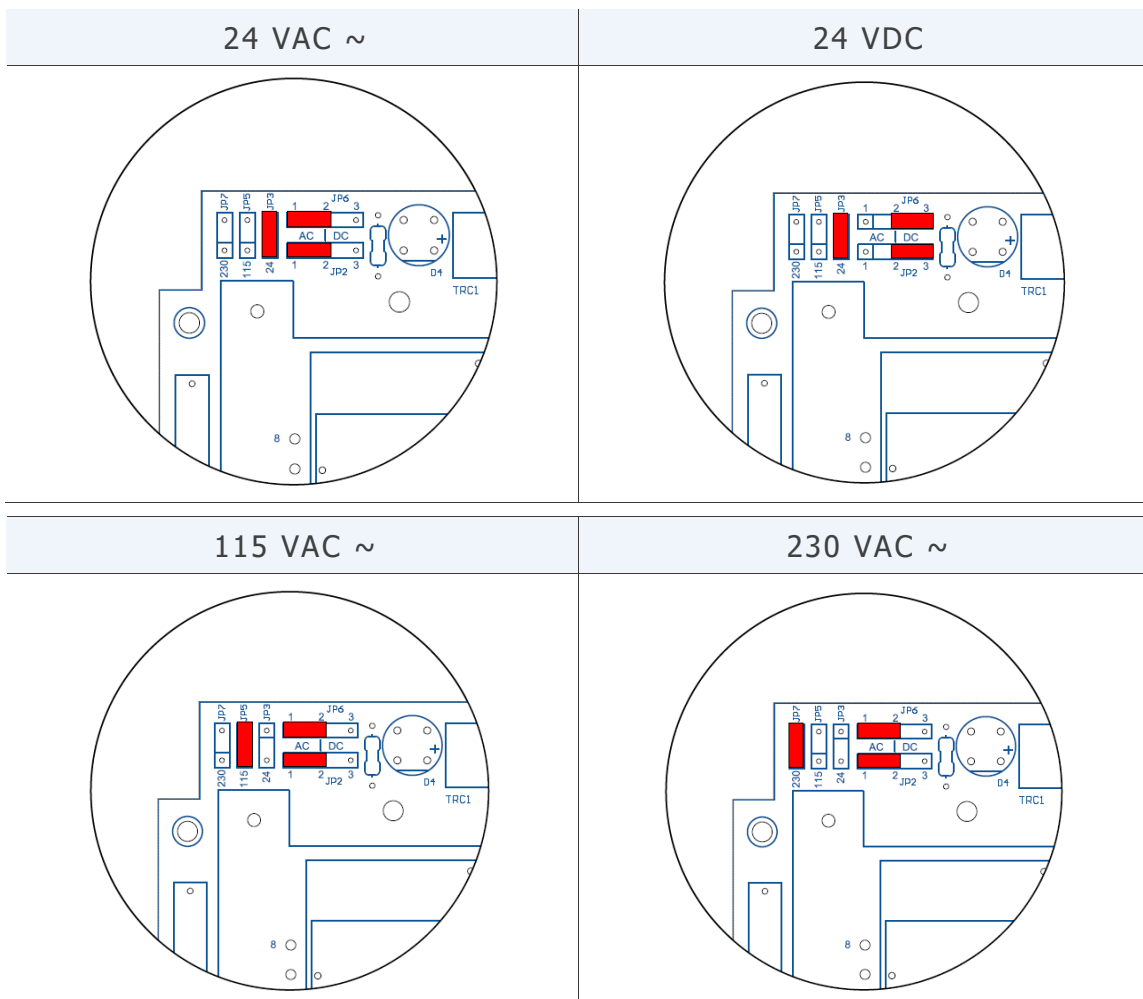
- Remove the lower front panel;
- Unscrew the black fuse-holder cap;
- Remove the fuse cap with the fuse inside;
- Replace the fuse with a new one;
- Insert the fuse in the fuse cap;
- Insert the fuse cap into the fuse-holder;
- Screw the fuse-holder cap;
- Close the lower front panel;
- Power-on the Control Unit.

Jumper Configuration for Power Supply Input



In the 24Vac and 24Vdc models JP1 and JP4 jumper are not used.

Jumper Configuration for Output Voltage



The output voltages 115Vac or 230Vac is not available in 24Vdc power input models.

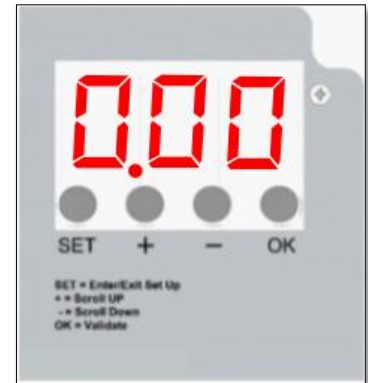
Display and pushbuttons

A local user interface made of a large seven segment display and four pushbuttons is available on the Control Unit. The user interface shows the main functionalities and events during a cleaning process.

It is also useful to access to the programming parameters.

At power-on the Control Unit will show the software version mounted for few seconds and then it will be ready to be used.

The Pause Time countdown is the main information shown on display. It will be alternated with some other information like output pulsed and error codes.



The pushbuttons enable the user to perform some operations:

(SET)	Enable the user to access or exit the programming mode.
	Activate a single solenoid during manual test with the related function F06, available in programming mode.
(OK)	Save parameter's value modified during programming mode.
	Reset alarms in main screen.
(+)	Increases the scroll of the parameters in programming mode.
	Increases the value of a selected parameter during programming.
	Displays the total hours counter since the first power-on.
(-)	Decreases the scroll of the parameters in programming mode.
	Decreases the value of a selected parameter during programming.
	Displays the partial hours counter for maintenance.

Accessing the programming menu

Press (SET) pushbutton to access the programming mode. The blinking message "F02" will appear to indicate the first parameter available.

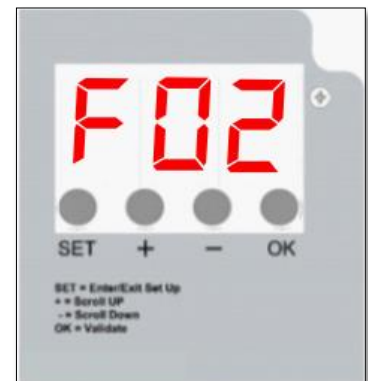
Press (+) or (-) pushbuttons to move at the required parameter.

Press (OK) pushbutton to access the value of the selected parameter.

Press (+) or (-) pushbuttons to change the value of the parameter.

Press (OK) to save the parameter's value.

Press (SET) pushbutton to exit the programming menu and return to the main screen.



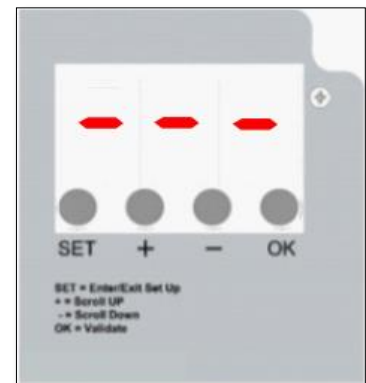
List of Parameters

Function	Min Value	Max Value	default Value
F02 Solenoid activation Time (seconds)	0,05	5,00	0,20
F03 Pause Time between solenoids activations (seconds)	001 010 (F01=3)	999	20
F04 Number of solenoids connected	01	16	01
F05 Output voltage setting (Related to hardware jumpers)	D24= Out 24Vdc A24= Out 24Vac 115= Out 115Vac 230= Out 230Vac	d24 230	A24
F06 Manual Solenoid valve activation for test	1	F04	1
F13 Amount of Post Cleaning cycles after Fan stop	0	99	1
F14 Pause Time between solenoids valve activation when in Post Cleaning cycle (seconds)	1	999	10
F15 Maintenance Time limit for warning (E11) expressed in 10th of hours	1	999	100
F16 Maintenance Time limit warning (E11)	0=Disabled 1=Enabled	0 1	0
F17 Maintenance Hour counter Reset	0=No Reset 1=Reset Counter	0 1	0
F24 Exclusion of a solenoid in case of short circuit	0=Leave the solenoid 1=Skip the solenoid	0 1	0

Description of the operations

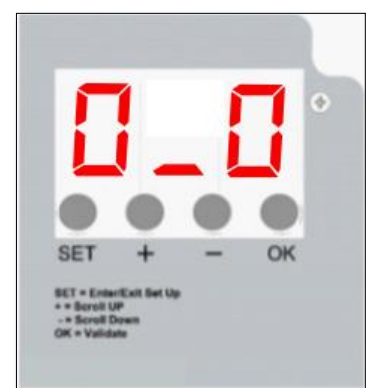
After showing the software version at power-on, the Control Unit shows the message “---”, meaning that a diagnostic task is running to check the coherence between settings stored in the microcontroller memory and the hardware jumper’s settings.

An error code will appear in case of discrepancies between settings (see Alarms list). Only editing functions will be allowed on the Control Unit. The operator may switch-off the device, check and configure the hardware jumpers in the right manner.

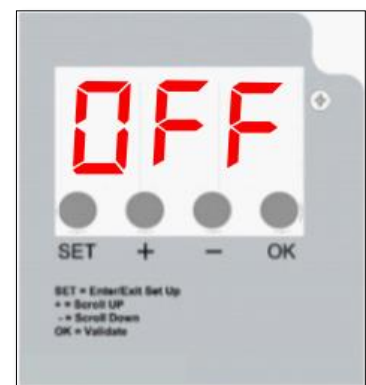


At the end of the diagnostic task, a “0_0” message will appear on the display to indicate that the test was successfully completed.

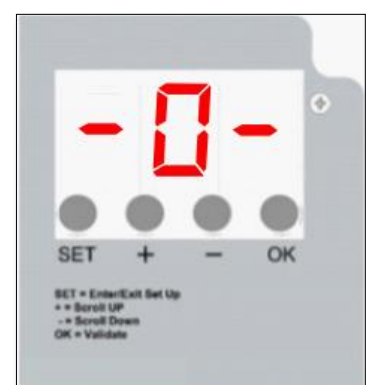
The Pause Time countdown will appear on the main screen.



A “OFF” message appears if the “Remote EN” contact input (terminals 14-15) is open.



A “-0-” message appears if the “FAN Status” contact input (terminals 12-13) is open when the Control Unit is in Manual mode.



Operating Modes

MANUAL Mode

The Control Unit works as a programmable cycle sequencer.

The solenoids connected at the control unit will be activated sequentially to perform a cleaning cycle, with the timing values configured in the related parameters. After the last activated solenoid valve, the cleaning cycle will continue restarting from the first solenoid valve.

Parameters involved:

F01	0 (MANUAL)
F02	Pulse Time
F03	Pause Time

Other functions

POST CLEANING CYCLE (PCC)

This function allows to perform a cleaning cycle after the fan was stopped (OFF state) by the user.

The PCC function is enabled if the value configured in "PCC cleaning cycles" was set with a value different from zero. This parameter determines how many PCC cycles will be performed.

Parameters involved:

F13	PCC cleaning cycles
F14	PCC Pause Time

If "Fan detection mode" parameter is set to 0, the PCC function will be performed only if the Fan Status Input contact (terminals 12-13) will be opened.

The PCC Pause Time is available to be set to perform a different Pause Time than in standard cleaning cycle. The Pulse Time (F02) is the same previously set for a standard cleaning cycle.

PCC handled by "FAN OFF" input contact

The number of the PCC to perform can be set with "PCC cleaning cycles" parameter. At the end of the last PCC, the Control Unit will stop all activities until the Fan Status Input contact will be detected as closed. Then, a new standard cleaning can start, if required.

If the Fan Input Contact is detected as closed while a PCC is in progress, a new standard cleaning cycle will be started at the end of PCC, if required.

Number of solenoids connected

The number of solenoids valves connected at the Control Unit can be set. The Control Unit will run the cleaning cycle in order from the first to the last solenoid valve programmed into the parameter.

Parameters involved:

F04	Number of solenoids
-----	---------------------

Hour Counters

After showing the software version at power-on, the Control Unit

An hour counters information is available on the main screen.

The purpose is to show the total operating hours from the first power-on and the maintenance hours.

By pressing the (+) pushbutton the display will show the operating hours from the first power-on. The value can't be reset.

By pressing the (-) pushbutton the display will show the maintenance hours. The parameter F17 can be used to reset the maintenance hours.

The hours are shown on two screens.

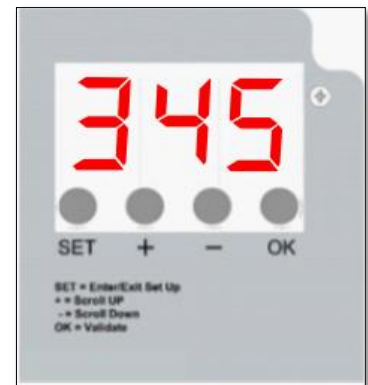
The first screen shows the thousands of hours, the second screen shows the units of hours.

Example:

First screen count = 012

Second screen count = 345

Amount of hours = $(012 \times 1000) + 345 = 12345$



Inputs & Outputs

Inputs	Terminals	Description
Remote ENABLE contact	14-15	<p>It is used to place the Control Unit in Run or Stand-By mode.</p> <p>When the input contact is open, the Control Unit is placed in stand-By mode. No functions will be executed.</p> <p>When the input contact is closed, the Control Unit is placed in Run mode. All the functions will be executed when needed.</p> <p>The Control Unit is factory set with a wire jumper between the terminals to close the input.</p>
FAN Status contact	12-13	<p>It is used to send to the control unit the state of the fan (Running or Stopped).</p> <p>If the input contact is open, the control unit will detect the fan stopped and then run the Post Cleaning function.</p> <p>The control unit is factory set with a wire jumper between the terminals to close the input.</p>

Outputs	Terminals	Description
Alarm Relay K1	4-5	<p>The relay K1 is factory configured as normally closed contact and opens with multiple error events.</p> <p>The contact is also open when the control unit is not powered.</p> <p>The alarms events set by default for the relay are: E06 E08. Maintenance interval reached.</p>
Alarm Relay K2	6-7	<p>The relay K2 is factory configured as normally closed contact and opens with multiple error events.</p> <p>The contact is also open when the control unit is not powered.</p> <p>The alarms events set by default for the relay are: E06 E08. Maintenance interval reached.</p>

Alarms

The control Unit perform some diagnostic check at power-on and during operations.

An alarm event is shown by mean of "Exx" error code. The possible alarms and respective troubleshooting are listed in the below table:

Alarm Event	Description	Action
E01	F05 set to 24Vdc but AC jumper position detected	For 24Vdc, switch the device off and set the AC/DC jumpers to DC. For 24Vac, press OK, then press SET, set the function F05 using (+) and (-), select A24 and press OK to confirm.
E02	F05 set to 24Vac but DC jumper detected	For 24Vac, switch the device off and move the AC/DC jumpers to AC. For 24Vdc, press OK, then press SET, set the function F05 using (+) and (-), select d24 and press OK to confirm.
E03	F05 set to 24Vac or 24Vdc. Voltage Out of Range detected	To use 24V valves, switch the device off and move the output voltage selection jumper to 24V. - If the jumper is in the correct position, press OK, then SET, select the F05 function with (+) and (-), set 115 or 230 (as jumper) and press OK.
E04	F05 set to 115V. Voltage Out of Range detected	To use 115V valves, switch the device off and move the output voltage selection jumper to 115V. - If the jumper is in the correct position, press OK, then SET, select the F05 function with (+) and (-), set 115 or 230 (as jumper) and press OK.
E05	F05 set to 230V. Voltage Out of Range detected	To use 230V valves, switch the device off and move the output voltage selection jumper to 230V. If the jumper is in the correct position, press OK, then SET, select the F05 function with (+) and (-), set a24, d24 or 115 (as jumper) and press OK.
E06	Solenoid valve current lower than minimum threshold or disconnected solenoid valve. The error is displayed alternating with solenoid position Uxx failed.	Check correct connection of the solenoid valve and respective data. The alarm is auto-reset if event disappears.
E07	Solenoid valve current higher than maximum threshold. The error is displayed alternating with solenoid position Uxx failed.	Check correct connection of the solenoid valve and respective data. The alarm is auto-reset if event disappears.
E08	Short circuit alarm at output. The error is displayed alternating with solenoid position Uxx failed.	Switch the device off and back on after having checked the solenoid valve system.
E11	Maintenance deadline reached	Carry out maintenance and then reset the error.
E14	Indicates that a valve in short circuit has been excluded from the cycle. The error code E14 alternates with the indication of the failed output that is shown as "Uxx", where xx is the number of the output. An output is considered a short circuit if not responding for 3 following activations.	Switch the device off and back on after having checked the solenoid valve system.

Troubleshooting

Fault	Possible Cause	Solution
The display does not light up.	Fuse Blown. Power voltage missing.	Check the protection fuse on the power voltage. Check that the power voltage is provided at power supply terminals and compliant with that required for the device.
The outputs are not activated.	Output voltage. Wiring to solenoid valves.	Check that the solenoid valves output voltage is congruent with hardware jumper settings and programming. Check wiring between Control Unit and solenoid valves.
The cleaning cycle doesn't run	Remote Enable input is open	Check Remote Enable input contact.
Does the device occasionally reset?		Check that there are no unfiltered voltage spikes on the power line (spot welding machines, welding machines, plasma cutters etc.). Install a common-mode line filter between the Control Unit and the power line.
Does post-cleaning start during normal cleaning?	FAN OFF input is closed	Check FAN OFF
Do the alarms fail to activate relay contacts?		The relay contacts must be powered by external voltage A relay contact opens when activated by an alarm event.

Maintenance

The control unit has no parts that can be replaced, except for the fuse.

All repair operations must be carried out by the manufacturer.

To clean dust and dirt from the surfaces, gently rub with cotton or other soft cloth soaked with non-aggressive, non-abrasive detergents, use those used for glass surfaces; do not use solvents or aromatic compounds and do not rub with abrasive sponges.



Disposal

Dispose of properly after use. Dispose of the product according to laws in force for electronic equipment.

This device is for use in a dust collection system and is therefore part of a fixed installation.



Warranty

The warranty has a duration of 2 years. The company will replace any electronic component deemed defective exclusively at our workshop, except in the presence of contrary agreements to be authorized by the company.

Warranty Exclusions

The warranty will be cancelled in case of:

- Signs of unauthorized tampering or repairs.
- Incorrect use of the device not respecting technical data.
- Wrong electrical connections.
- Failure to respect system standards.
- Use not in accordance with EC standards.
- Atmospheric events (lightening, electrostatic discharges,), power surges.
- Obstructed pneumatic connections. Damaged tubes.