TURBINE

MODULO MD2
DUAL FLOW UNIT

SAFETY INSTRUCTIONS FOR USE AND MAINTENANCE

N° W000401389

EDITION : EN
REVISION : B
DATE : 09-2022

Instructions for use

REF : **8695 8468**

Original instructions

LINCOLN® ELECTRIC

Thank for the trust you have expressed by purchasing this equipment, which will give you full satisfaction if you follow its instructions for use and maintenance.

Its design, component specifications and workmanship comply with applicable European directives.

Please refer to the enclosed CE declaration to identify the directives applicable to it.

The manufacturer will not be held responsible where items not recommended by themselves are associated with this product.

For your safety,there follows a non-restrictive list of recommendations or requirements, many of which appear in the employment code.

Finally we would ask you kindly to inform your supplier of any error which you may find in this instruction manual.

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LINCOLN ELECTRIC FRANCE SAS
Avenue Franklin Roosevelt
76120 – LE GRAND QUEVILLY

MODULO MD2 DUALFLOW TURBINE

CE DECLARATION OF CONFORMITY

1) DECLARATION OF CONFORMITY CE/UE

Dear customer,

This CE/EU declaration of conformity certifies that the supplied equipment complies with applicable laws and regulations when used in accordance with the enclosed instructions. Any other assembly or modification would void our certification. That is why you are asked to call in the manufacturer for any modifications you wish to make. Failing that, the company responsible for the modification must repeat the certification process. In that case, we would not be liable for the new certificate in any way. Please hand this document over to your technical department or purchasing department for filing.

DESCRIPTION:	**MODULO MD2 DUALFLOW TURBINE**
TYPE:	**W000401389**
NUMBER:	**See identification plate**

2) This equipment complies with European directives.

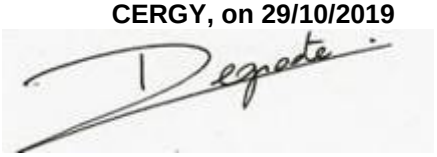
◙ N° 2006/42/CE ◙ N° 2011/65/UE ◙ N° 2014/30/UE

3) Based on the following harmonised standards:
EN ISO 12100/2010
EN ISO 13857/2019
EN ISO 12499

4) Air Treatment Products Manager, authorised to compile the technical manufacturing document.
M. Patrick DEGROOTE
LINCOLN ELECTRIC FRANCE SAS
Avenue Franklin Roosevelt
76120 – LE GRAND QUEVILLY

5) Manufacturer.
LINCOLN ELECTRIC FRANCE SAS
Avenue Franklin Roosevelt
76120 – LE GRAND QUEVILLY

CERGY, on 29/10/2019



A - INTRODUCTION

USING THE MANUAL

Please read this manual before you start handling, installing or using the machine. Keep the manual safe in a place known to the user of the machine and maintenance personnel till the machine is finally destroyed.
This manual explains how to transport, install, use and maintain the filter. It cannot in any event replace the experience of the user for operations of varying difficulty.
Before the filter is used by a new user, make sure that they have read this manual and understood all the explanations provided.
For any further information, please feel free to contact the technical departments of **LINCOLN ELECTRIC**.

MACHINE GUARANTEE

This machine is guaranteed for 12 months from the date of purchase.
During the first 12 months of use, defective parts shall be replaced free of charge providing the damage is not the result of improper use of the machine.
The machine guarantee shall cease automatically when the machine is no longer the property of the original buyer.
The terms of validity of the guarantee shall be subject to verification and acceptance by our sales department.
Any nonconforming use that could damage the machine shall not be covered by the guarantee.
For the guarantee to operate, the equipment must be inspected by our technical department.

ASSISTANCE

LINCOLN ELECTRIC is at your disposal for any work on your equipment.
Please contact the technical department for any requests.

HOT LINE (+33) 825 132 132

DESCRIPTION OF PICTOGRAMS

To make this document easier to understand, it contains pictograms with the meanings given below:

DANGER: indication used when failure to follow the instructions could lead to a serious hazard for personnel.

WARNING: indication used when failure to follow the instructions could lead to damage to the machine, associated elements or the surroundings.

This symbol shows that the description is intended for specialised personnel.

B - GENERAL SAFETY INSTRUCTIONS

ELECTRICAL SAFETY

Connection to the mains

Before you connect your machine, please make sure that:
— The meter, the overintensity protection system and the electrical installation are compatible with its maximum power rating and its supply voltage.
— It can be connected, in a single-phase or three-phase with earth system, to a socket compatible with the plug on its power cord (mobile equipment).
— If the cable is connected to a fixed point, the earth connection if there is one, may never be cut off by the system offering protection from electric shocks.
— The switch, if there is one, is set to OFF.

Operating position

Arc welding and cutting requires strict compliance with safety requirements in respect of electrical currents (Order of 14.12.88).

Servicing

Before any internal checking or repairs, make sure that the machine has been disconnected from the electrical installation by locking it out:
— Accidental connection of the cable of a fixed installation has been made impossible
— Cutting off by means of a fixed connection device relates to all poles (phase and neutral. It must be in the OFF position, with no possibility of being put into service by mistake
Some machines have an HV.HF arc strike circuit (indicated by a plate). Never work inside such a box.
Any work on electrical installations must be carried out by persons qualified for that purpose (Decree 88-1056 of 14 November 1988, Section VI, Art 46).

Maintenance

From time to time, check that the machinery and its electrical accessories - connectors, flexible cables and extension cords - are correctly insulated and connected.
Work for maintaining and repairing insulating enclosures and ducts may not be carried out in a haphazard manner (Section VI, Art. 47 Decree 88-1056 of 14 November 1988).
— All repairs are to be carried out by specialists, or better yet, defective accessories should be replaced.
— Regularly check that the electrical connections are tight, with no heating.

Any fans placed in a circuit in which the air is laden with dust must be cleaned from time to time. That is because the turbine may be fouled and become unbalanced, leading to increased noise and premature wear and tear of bearings. Maintenance is required at least after every six months, depending on the type of dust treated.

La turbine est l’element essentiel de votre ensemble aspiration.

Un mauvais fonctionnement ou un mauvais entretien risque de remettre en cause la securite du poste de travail. on veillera donc a maintenir le ventilateur en parfait etat.

votre installation a ete choisie par rapport a une application specifique. la turbine est caracterisee par un point de fonctionnement debit d’aspiration (vitesse d’air dans les canalisations), pertes de charge.

conformement aux reglementations de la carsat et de l’inrs, un controle periodique de l’installation est necessaire afin de verifier que celle-ci reste conforme au dossier des valeurs de references.

PERSONAL PROTECTION

Risks of external injury relating to welding operations

Whole body

— The operator must be clothed and protected to suit the requirements of the job.

— Make sure that no part of the bodies of operators and helpers can come in contact with metal pieces or parts that are live or are liable to become live accidentally.

— Do not wind electricity cables around the body.

— Keep safety guards and panels in place.

— The operator must always wear personal insulating protection (Order of 14 December 1988, Section III).

— The protection must be kept dry to prevent electric shocks if it is wet, or ignition in the presence of oil.

Personal protective equipment worn by operators and their helpers - gloves, aprons, safety shoes - offer the added benefit of protecting them from burns due to hot pieces, splattering and slag.

Make sure the PPE is in good condition and replace it before it ceases to offer protection.

Face and eyes

It is indispensable to protect the following:

— Eyes, from arc injury (dazzling due to visible light from the arc, and infrared and ultraviolet radiation).

— Hair, face and eyes from welding splatter and projection of slag during weld cooling

the welding mask, when used under or without a helmet, must always be equipped with a protective filter, the shade of which depends on the intensity of the welding arc current (Standards NF s77-104a 88-221 a88-222).

the coloured filter may be protected from impacts and splatter by a transparent glass located on the front of the mask.

if the filter is replaced, use another one with the same part number (shade number).

persons in the vicinity of the operator, especially any helpers, must be protected by means of suitable screens, anti-UV goggles or, if needed, masks with suitable protective filters (EN 139).

Specific case of chlorine solvents in welding: (used for cleaning or degreasing).
— The fumes from these solvents can be changed into toxic gases when subjected to arc radiation, including from a distance.
— Such solvents may therefore not be used in locations where electric arcs occur, if the solvents are not in a sealed enclosure.

Work in confined spaces

Examples :

— Mine roads
— Piping and pipelines
— Ship docks, pits, manholes, cellars
— Tanks
— Ballast tanks
— Silos
— Reactors

Special precautions must be taken before undertaking welding operations in such enclosures, where suffocating and poisoning and fire and explosion risks are very great.
A work permit procedure setting out all the safety measures must systematically be set up.

Make sure that ventilation is appropriate, paying special attention to:
— under-oxygenation
— over-oxygenation
— excess fuel gas

FILTRATION OF FUMES AND DUST

Important

Mechanical or electrostatic filtration systems are effective for the filtration of solid but not gaseous particles (exterior discharge).

If recycling is effective (not recommended), make sure the workplace where the machine or machines are placed is properly ventilated, so as to not reach the OELV (occupational exposure limit values) of gaseous pollutants relating to the specific pollution generated by the method (welding, cutting).

Field of use

Filtration of solid particles and dry dust, non-flammable gas, with no risk of explosion.

— Zinc, paper, flour, plant leaves, graphite, alumina and other such dust is to be excluded, because electrostatic discharge or welding splatter would present a risk for those using the filter.

— The air flow through the filter medium must not be at a temperature above 80 °C.

— This machine is not designed for extracting chemicals.

— The choice of machine is made to suit the pollutants to treat. Extraction at source of the pollutant is only effective if the machine is operating at its nominal power (air flow at the nozzle).

Take particular care to :

— Not obstruct the air outlet of the machine**.**

— Not introduce external elements into the filter (paper, cloths, cigarette butts etc.)

— Replace the filter medium with new original **LINCOLN ELECTRIC** medium, which alone can guarantee the filtration characteristics.

— Replace the hoses if they are pierced.

— Regularly clean the metal pre-filter on those machines that have one.

C - OVERALL DESCRIPTION

For your safety and optimum performance, please read this manual carefully before using the system.

MODULO MD2 DUAL FLOW EXTRACTION UNIT

MODULO MD2 DUALFLOW mobile units are particularly designed for extracting welding fumes with a variable-rate fume extraction torch.

The **DUAL FLOW** system uses a motorised damper to reduce the extraction rate of the torch in confined areas, which is fully in line with what is required, namely catching fumes without disrupting the gas shield of the weld pool.

Extraction rate adjustment management can be used in two operating modes.

- Momentary mode: the extraction rate is reduced only when the micro switch is used
- Maintained mode: a press on the micro switch reduces the extraction rate, pressing it again returns to the maximum rate

The unit is to be connected to a low-pressure duct to carry the pollutants (fumes and gas) generated by welding outside the factory.

The fumes can then be filtered overall by means of the mechanical filter depending on the welding process and the volume of air to treat.

The filter cartridge is cleaned by manual pulses (optional).

BENEFITS

- Torch extraction rate adjustment for welding in confined areas
- Large filter surface, 5m², high efficiency.
- Cartridge unclogging by manual blasts.
- Dust recovery container
- Automatic control by the electric arc via a current sensor
- Large air flow and greater efficiency over the entire life of the filter.
- Low noise, below 70 dB.
- Simple installation, mobile unit
- Compact design.
- Minimum maintenance.

FIELD OF USE

The following applications are not within the field of use of the **MODULO MD2 DUALFLOW** extraction unit :

- zinc dust,
- paper dust,
- flour,
- plant leaves,
- graphite,
- alumina,
- etc.

because electrostatic discharge or welding splatter would present a risk for those using the filter.

The air flow through the filter must not be at a temperature above 80°C.

The equipment is not designed for extracting chemicals.

The choice of equipment is made to suit the pollutants to treat. Extraction at source of the pollutant is only effective if the machine is operating at its nominal power (air flow at the torch or nozzle).

Take particular care to:
Not obstruct the air outlet of the machine.
Replace the filter medium with new original **LINCOLN ELECTRIC** medium, which alone can guarantee the filtration characteristics.
Replace the hoses if they are pierced.
Regularly clean the metal pre-filter.

Never introduce incandescent particles into the extraction duct.
E.g.: cigarette ends, burning paper, incandescent grinding particles and gouging particles, arcair or plasma.

Delivery :

The **MODULO MD2 DUALFLOW** extraction unit is supplied with the following :

- Five-metre long power supply cable
- Metal pre-filter
- Connecting hoses with 50 diameter end fittings for extraction
- 80 mm diameter connecting hoses for extraction discharge
- Control by the electric arc through a current detection clamp
- Unclogging solenoid valve

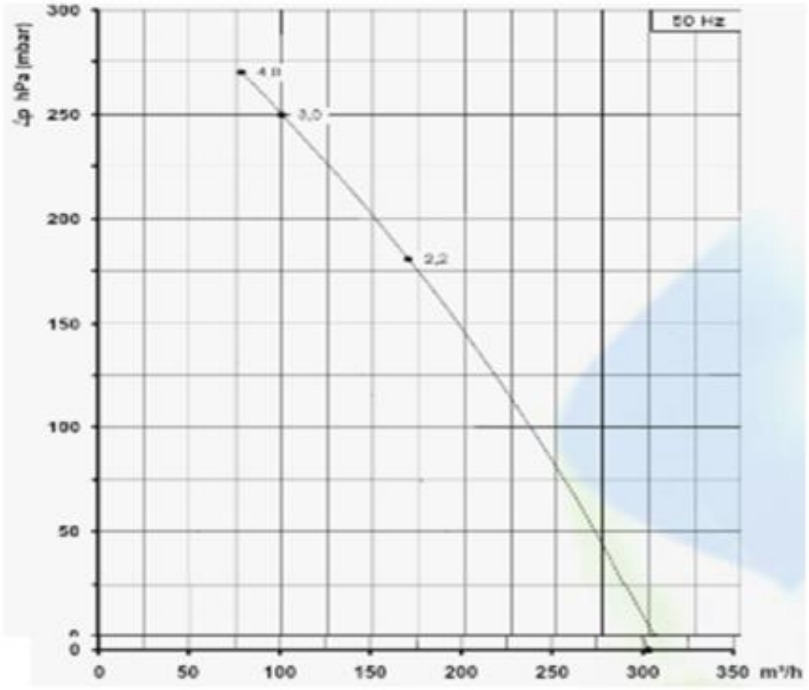
The optional filter cartridge and unclogging compressed air supply are not included and may be added if needed by the customer.

The duct system for outdoor discharge or towards a centralised recovery system will depend on the configuration of the end user's workshop, and can thus be supplied on request.

TECHNICAL DATA

DESCRIPTION	UNIT	MODULO MD2
Machine power rating	kW	3
Power voltage	V	230 / 400V - 3 Phases
Max. vacuum	kPa	30
Free flow rate	m³/h	310
Inlet connection	mm	50
Outlet connection	mm	80
Noise	dB	68

Impeller motor curves :



WEIGHT AND DIMENSIONS

DESCRIPTION	UNIT	MODULO MD2
Machine weight	kg	102
Machine body width	mm	520
Machine body depth	mm	515
Machine body height	mm	1060

D - INSTALLATION

INTRODUCTION

As the **MODULO MD2 DUALFLOW** extraction unit is on wheels, it can be put in place at the location identified in the customer's workshop.

But this machine is not designed to be moved all the time.

Please note that this extraction unit must be connected by a 80mm diameter hose to a low-pressure ducting network with a 80 mm diameter for outdoor discharge (along cladding or from the roof) or a network of collecting ducts with ventilation.
See PART NUMBERS

The 80 mm diameter hose is quite flexile and you could damage it if you make the **MODULO MD2 DUALFLOW** extraction unit mobile.

Any damage to the hose could affect the extraction quality, and the extracted air would be discharged back into the workshop. The customer is responsible for regularly checking the condition of the hoses. Weekly visual maintenance. The cost of any damage to the hose over time is to be paid by the end user, based on the maintenance plan.

OPERATING PRINCIPLE

Two operating modes :

The working of the extraction unit **MODULO MD2 DUALFLOW** may either be manual (continuous operation) or automatic (controlled by the welding machine through a current detection clamp).

Manual :
Continuous impeller operation.

Automatic :
As soon as the arc is struck, the extraction system starts up; after the arc stops, the fan stops (delay adjustable from 2 seconds to 9 min).

The front control panel has two indicator lights :
- A white indicator shows the network connection of the impeller,
- A green indicator shows that the impeller is operating,
- A second green indicator shows the use of the **DUAL FLOW** mode

Further, an In service signal *(NO closing dry contact output)* is available for both operating modes, Manual or Automatic.
That information, which is an image of the operating of the unit, can be used for automating the extraction system.

OPERATING PRINCIPLE OF DUALFLOW

Depending on the welding applications of a fume extraction torch, the induced extraction speed, which must be 0.35 m/s at the point of emission, may be too high in corners or in confined areas, and potentially result in poor quality welds by disturbing the gas shield.

To address that possibility, **LINCOLN ELECTRIC** has developed a range of patented fume extraction torches with micro switches, namely **DUALFLOW** torches, which allow the welder to determine the extraction power to suit the type of welds being made.

DUAL FLOW torches have a pushbutton on their handle to adjust the extraction rate by means of the **MODULO MD2 DUAL FLOW** impeller, in Momentary or Maintained mode.

- Momentary mode:
  The torch extraction rate is modulated as long as the pushbutton is kept pressed in.
- Maintained mode:
  To modulate the extraction rate, you press the button once; to return to the nominal rate, you need to press it once again.

In any event, the extraction rate goes back to nominal if the arc is shut down and a new welding operation is started.

SAFETY WARNING

Pre-filter :

The impeller must not operate without a pre-filter as that would destroy it.

Mechanical components :

The impeller is mechanically protected so the operator cannot come in contact with its hot parts.

Further, the impeller is driven directly by the motor, minimising maintenance and allowing the automation of the welding process.

Before making any connections to the mains, make sure that the information on the identification plate matches the electricity distribution system

Make sure that there is electrical protection before the electrical connection, with a rating that complies with the given extractor plates and a catchment system with an earth connection.

Before you connect your machine to the 400 V system, please make sure that:

- The meter, the overintensity protection system and the electrical installation are compatible with its maximum power rating and its supply voltage.
- It can be connected in a three-phase with earth system, to a socket compatible with the plug on its power cord (mobile equipment).
- If the cable is connected to a fixed point and there is an earth connection, the current may never be cut off by the system offering protection from electric shocks.
- The switch, if there is one, is set to OFF.

Upon powering up:

Verify the extraction and discharge rotation direction, which is normally tested in the factory

If inverted, change over two phases at the variable drive OUTPUT.

The customer is responsible for installing the earth connection.

The machine MAY NOT BE connected to an electrical system with no earthing.

ELECTRICAL CONNECTIONS

- Three-phase 400V power supply without neutral – 50 Hz
- Compressed air supply 5 Bars minimum.

All the operations relating to the installation, such as those for assembly, installation, putting into service and maintenance, are to be carried out by qualified personnel under the control of a responsible technician.

Electrical requirements

POWER (kW)	50HZ SYSTEM VOLTAGE		
	230V mono	230 3PH	400 3PH
	Section (mm²)		
0,18	3x1,5	4x1,5	4x1,5
0,25	3x1,5	4x1,5	4x1,5
0,37	3x1,5	4x1,5	4x1,5
0,55	3x1,5	4x1,5	4x1,5
0,75	3x1,5	4x1,5	4x1,5
1,1	3x1,5	4x1,5	4x1,5
1,5	3x1,5	4x1,5	4x1,5
2,2		4x2,5	4x1,5
3		4x2,5	4x1,5
4		4x2,5	4x1,5
30			4x16

Part numbers of cables

Cable section	Part number
3x1.5 mm²	W000010098
3x2.5 mm²	W000010099
4x2.5 mm²	W000010100
4x4 mm²	W000010101
4x6 mm²	W000010102
4x10 mm²	W000010103
4x16 mm²	W000010104
4x25 mm²	W000010105
4x35 mm²	W000010106

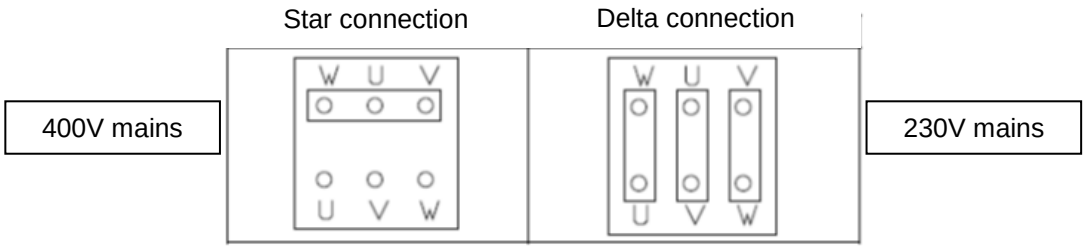
Before making the connections, check the system voltage and wire the extraction unit accordingly.

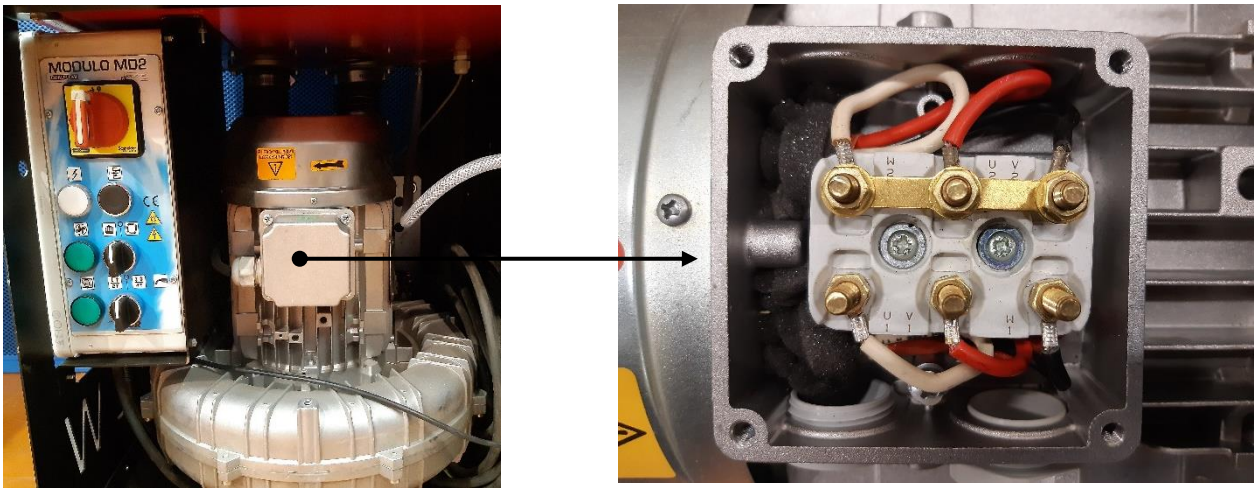
MODULO MD2 DUAL FLOW extraction units are wired for 400V in the factory (motor and auxiliary transformer).

If your company system is three-phase 230V, you must modify the connections of the motor terminal plate and the auxiliary transformer in the electrical cabinet.

230V/400V WIRING OF MODULO MD2 DUAL FLOW UNIT

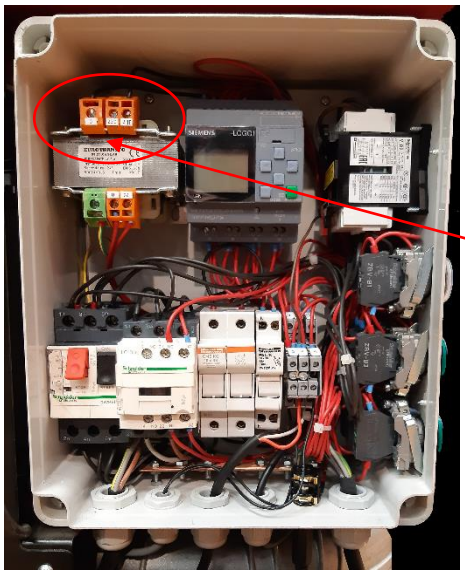
Motor terminal plate wiring :





Star connection for 400V mains as delivered from factory

Auxiliary transformer wiring:



Wire the auxiliary transformer to the **0/230V** or **0/400V** terminal depending on your system.

OPTIONAL FILTER CARTRIDGE - W000382775

As an option, depending on the customer's needs, we could supply a welding fume filter cartridge, part number W000382775, which may be supplemented if needed by a compressed air supply kit.

Installing the filter cartridge:

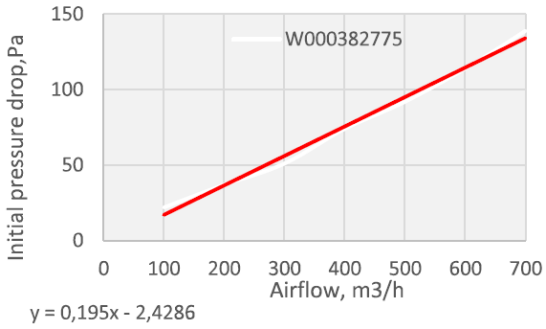
- Open the front of the unit **MODULO MD2 DUAL FLOW**
- Remove the 355 x 445 x 24mm - W000340600 metal pre-filter
- Remove the dust recovery container

- After loosening the first nut, insert the cartridge W000382775 on the threaded rod above the unclogging mechanism.

- Fasten the nut, making sure that the cartridge seal is adequately pressed against the bottom of the **MODULO MD2 DUAL FLOW** extraction unit

- Put back the container, then the metal pre-filter and close the door

TECHNICAL DATA SHEET



Product specification

Item number	W000382775
Item description	Filter cartridge
Dimensions, mm	325x248
Filter media composition	260g/m2 100% polyester, spun bond
Filter media treatment	-
Filter frame	Galvanized steel Open + Close
Inner cage	Galvanized expanded metal ,CAS
Bonding component	2K Polyurethane
Gasket	12x14mm EPDM
Acc. DIN EN 60335-2-69: 2010; DUST CLASS	M
Filter media area, m^2	4.8
Filter weight, kg	2.5
Rated air flow, m3/h	300
Maximum operating temperature, ˚C	90
Initial pressure drop, Pa	chart

OPTIONAL COMPRESSED AIR SUPPLY - W000401386

In addition to the optional filter cartridge and depending on the customer's need, we can supply a compressed air supply kit, part number W000401386, which will be integrated into the fan to carry out unclogging. The unclogging solenoid valve and the control button are pre-installed in the unit.

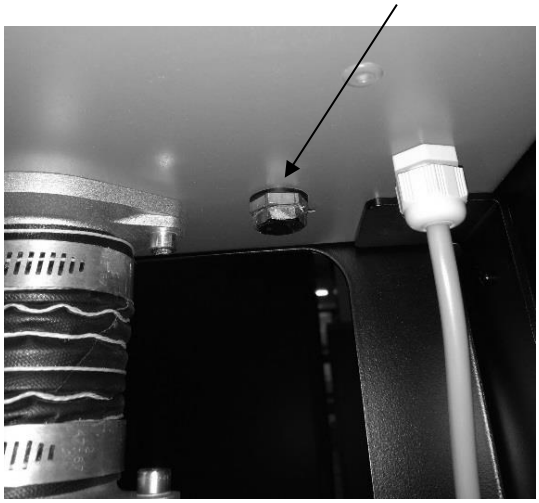
Kit composition :

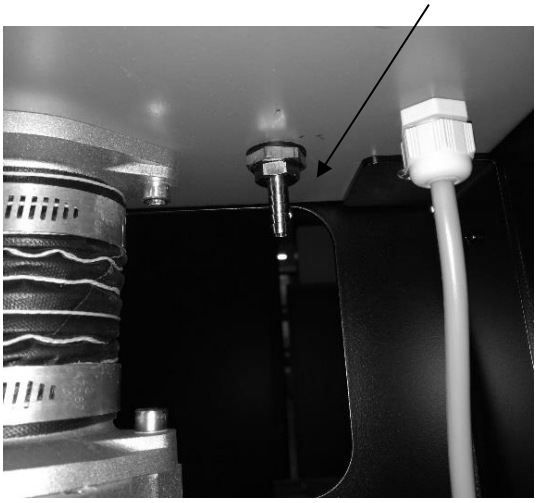
- 1 Pressure reducer filter
- 1 Pressure gauge
- 1 Transparent PVC hose
- 1 set of fittings and collars

Installation of the option in the impeller :

Step 1 :

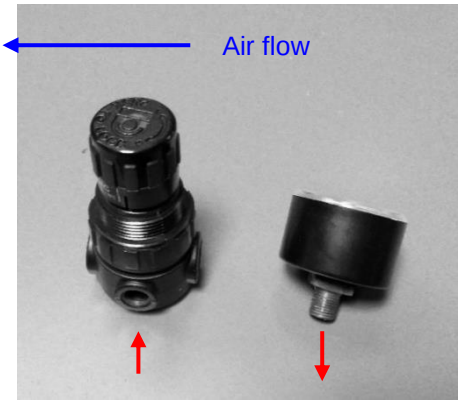
Remove the shutting screw and screw the fitting of the compressed air pipe

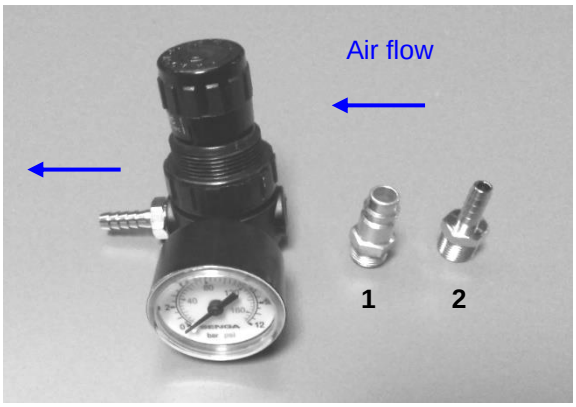




Step 2 :

Identify the air flow direction engraved on the pressure reducer filter and screw a pressure gauge on the front/the shutting screw on the rear/the second fitting of the pipe on the left-hand side

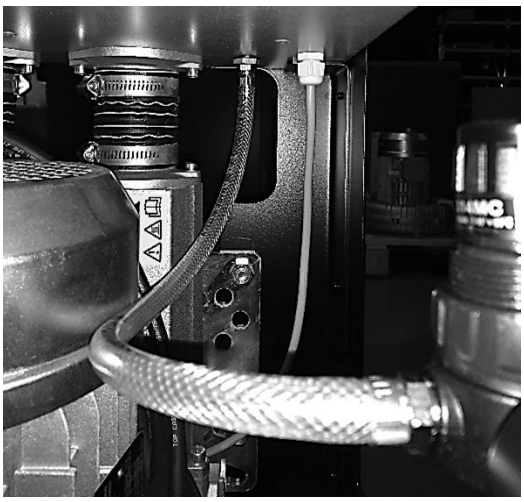


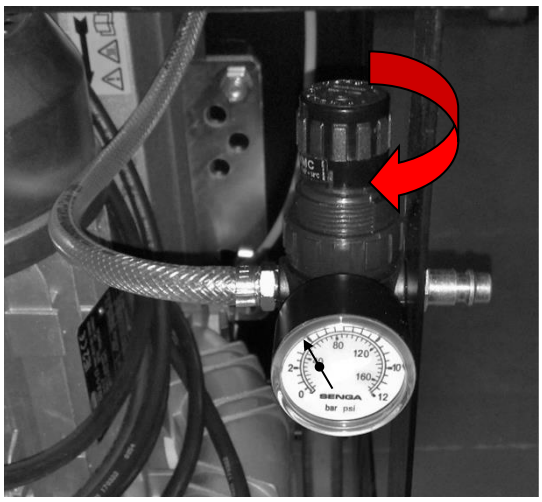


Depending on the type of the compressed air supply connection, you could use quick-action coupling (1) or the coupling for the compressed air pipe (2) to equip the pressure reducer filter. Route the fitting through the frame of the impeller before screwing it to the pressure reducer filter.

Step 3:

Connect the PVC hose and tighten it at each end with the two metal collars supplied in the kit.





Start the customer's main compressed air system and adjust the pressure with the filter adjustment knob to obtain 4.5 bar.

E - STARTING UP

VERIFICATION UPON POWERING UP

Check the rotation direction of motor :

If, on the front of the unit, the torch connection fitting blows out air instead of taking it in, change over two phases on the 230V or 400V connector of your **MODULO MD2 DUAL FLOW**.

CONNECTING THE FUME EXTRACTION TORCH DUAL FLOW

- Connect the extraction hose with a 50 mm diameter between the connecting tee of the torch and the impeller inlet

- Connect the control of the **DUAL FLOW** fume extraction torch to the 6.5mm jack connector located under the electrical cabinet

The torch may never be used without the extraction system, or without coolant where applicable, or it may be destroyed.
The extraction system also cools the torch

CONNECTING THE CURRENT CLAMP

The impeller is supplied with a current clamp, W000380662

→ **The current clamp only detects DC direct currents above 80 A.**

The ground cable must pass through the current clamp, and the current clamp must be closed correctly as shown in the photograph above.

Connect the current clamp to the 3.5mm jack connector located under the electrical cabinet.

F - USE

CONTROL CABINET

REFERENCE	DESCRIPTION
1	Padlockable disconnecting switch for CE conformity
2	White Mains power on indicator
3	Unclogging pushbutton
4	Green Impeller on indicator
5	Selection switch **Manual/Stop/Automatic**
6	Green **DUAL FLOW** in service indicator
7	Mode selection switch **DUAL FLOW** in **Momentary mode/ Maintained mode**

The working of the **MODULO MD2 DUAL FLOW** extraction unit may either be manual (continuous operation) or automatic (controlled by the welding machine through a current sensing clamp or external dry contact).

OPERATING

After first connecting the **MODULO MD2 DUAL FLOW** extraction unit to the electrical system,

- Turn the main switch (**1**) to **I**

The white Mains power indicator (**2**) shows that the impeller is connected to the mains and supplied with power,

- Use switch (**5**) to select the Manual mode for immediate starting or Automatic mode for starting controlled by an external setting.

- The green Impeller on button (**4**) shows that the extraction of the **MODULO MD2 DUAL FLOW** unit is in service

- Using switch (**7**), select the Momentary or Maintained mode to enable the **DUAL FLOW** mode.
  - Momentary mode: The torch extraction rate is modulated as long as the pushbutton is kept pressed in.
  - Maintained mode: To modulate the extraction rate, you press the button; to return to the nominal rate, you need to press it once again.

- The green (**6**) **DUAL FLOW** On indicator shows that the vacuum damper is open when it is activated by the switch on the **DUAL FLOW** fume extraction torch.

- The pushbutton (**3**) allows you to start unclogging blasts to clean the filter cartridge when the **MODULO MD2 DUAL FLOW** extraction unit has this optional feature.

- The **MODULO MD2 DUAL FLOW** extraction unit is stopped by moving the selection switch (**5**) to the Stop position and then setting the main switch (**1**) to « **0** »

PARTICULARITIES OF THE MANUAL/AUTOMATIC MODE

Manual mode :

When the switch (5) is moved to the manual position, the impeller operates continuously.
The green Impeller on button (4) shows that the extraction of the **MODULO MD2 DUAL FLOW** unit is in service

The impeller is stopped when the selection switch is brought back to the Stop position

Automatic mode :

In automatic mode, the impeller is started up by a welding current sensor or by an external function wired to the jack plug at J3.5/1 and J3.5/3.

As soon as the arc is struck (or the external contact is sensed), the extraction system starts up.
When the electric arc stops, the impeller will stop after the set time (45 seconds by default).

Welding of short beads, tack welding or successive welding operations must be carried out in Automatic mode with a delay of 120 seconds or more to avoid the impeller restarting with every arc strike. That allows the impeller to cool down adequately and will prevent the accidental tripping of thermal safety systems.

DAMPER OPENING ADJUSTMENT

If in the idle state (no trigger pressed), the depression damper is in the “open” position;

Then invert the operating direction using the button by moving it from one position to the other.

SETTING THE IMPELLER STOPPING DELAY

Modification of the stopping time delay in relation to current detection.

NB: For this setting, the cabinet must be powered and nothing else may be operating.

The first two digits indicate the minutes, while the last two digits indicate the seconds.

By default, the factory setting is 45 seconds.

To modify the stopping time:

- Press the ESC key for one second.
- A flashing bar is displayed under the first digit.
- Press OK.
- The digit flashes.
- Move the flashing to the digit to modify with the right and left arrows.
- Modify the figure with the up and down arrows.
- Confirm by pressing OK and then ESC.

Repeat for all the digits to modify.

G - MAINTENANCE

Please read the manually carefully before you start any servicing work. Maintenance operations may only be carried out by specialised and qualified individuals. Behaviour that does not comply with the safety instructions provided could lead to major hazards for personnel and damage to property and/or the surroundings.

All routine and/or exceptional maintenance must be carried out with the machine disconnected from the supply system.

Advice for machine users: maintenance is to be carried out as described in the manual.

1. Electrical risks
2. Cutting and abrasion risks in filter area.

Mind the maintenance of the electrical frame. Hazards are indicated by a plate saying “HAZARDOUS VOLTAGE”.
In order to ensure the proper working of the machine, defective spare parts must be replaced with original spare parts from **LINCOLN ELECTRIC**.

Before starting up the machine, make sure that the replaced parts are perfectly installed and that the tools used are removed from the machine.
Make sure that each safety device is in good condition and legible.

Hazards relating to rotating impellers: cutting or shearing.
The openings on the machine and its cover allow access to the rotating impeller after the manifolds or blind flanges are removed.
Never put your hands or any other object through those openings.

Introduction

All routine maintenance operations must be carried out by disconnecting the machine from the electricity supply.

During maintenance work, the operator must wear PPE (protective gloves, goggles, mask and clothing on the body).

MAINTENANCE OF MECHANICAL PARTS

The machine requires negligible mechanical maintenance if it is used correctly in accordance with its technical characteristics.
Before any type of maintenance that is not clearly defined in these instructions, please make inquiries with the technical department of **LINCOLN ELECTRIC**.

The performance of operations that have been defined as “not feasible” or are contrary to the standards and procedures described in the “General Instructions” section would release **LINCOLN ELECTRIC** from liability for any damage caused and would void the guarantee if it is still valid.

PRE-FILTER MAINTENANCE

Periodically, as a preventive measure, or whenever extraction does not seem adequate :

Clean with dry compressed air or immerse in a solution made of water and + FILTER CLEAN 20L part number W000342878.
Then dry with air

FILTER CARTRIDGE MAINTENANCE

When the **MODULO MD2 DUAL FLOW** extraction unit is fitted with the optional filter cartridge and compressed air supply kit, unclogging cycles must be carried out from time to time with the dedicated pushbutton.
That will remove welding fume particles from the cartridge and maintain the regulatory extraction level at the welding torch.

- Run unclogging cycles once the work is complete
- Leave the dust to rest in the container

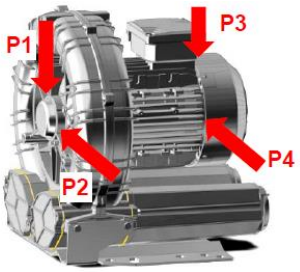
Empty the container in dedicated skips, as welding and cutting dust must be recycled

EXTRACTION IMPELLER MAINTENANCE

Every 3 or 6 months depending on the type of work and the usage time (by an approved technician):

Vibration measurement :

To determine the vibration speed (mm/s), use an electronic vibration meter and apply it to the following points:
Points P1 and P2 (front bearing): Place the vibration meter close to the front bearing and log the highest value.
Points P3 and P4 (rear bearing): Place the vibration meter on the frame of the electric motor, near the bearing housing (not on the fan guard) and log the highest value.



Key: Machine classification: Class I = SCL with electric motor, power rating ≤15 kW Class II = SCL with electric motor, power rating > 15 kW Evaluation zones: Zone A = vibrations (a) inside this zone are acceptable for long-term operation. Zone B = vibrations (a) inside this zone are acceptable for continuous long-term operation. The machine may operate in these conditions for a limited period, till an opportunity for appropriate corrective maintenance work arises.	Effective value of vibration speed (mm/s)	Class I (≤15 kW)
	A < 1,8	A
	1,8 < a < 4,5	B

Vibration values above zone B may not be considered to be acceptable as they could seriously damage the machine.

CAUTION! Deposit inside the compressors could lead to:

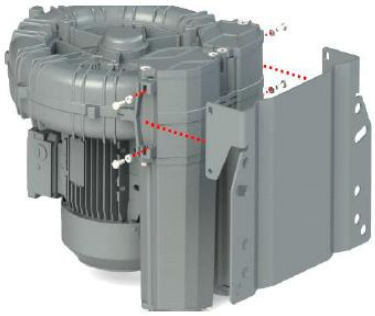
- variations in operating characteristics;
- cancelling of clearance, and therefore seizing;
- rotor unbalance.

Internal cleaning:

To clean the inside of the machine, proceed as follows :

- Set the machine vertical by placing the fan on a flat and stable surface (1).
- Loosen the screws 920 and remove the stand 183 (1).
- Loosen the screws of the cover (three Philips head and nine Allen screws (2)).
- Lever up the two grooves located between the body 161 and the cover 162 (3) to remove the cover.
- Loosen the screws 900 and remove the washer 365 (4).
- Remove the bearing 321 and the cover 360 of the bearing using an extractor (5).
- Remove the impeller 230 (6).
- Clean and reassemble, in reverse order of assembly.
- Make up the seal 423 with Loctite 598 or the like after carefully cleaning the surfaces of the previous seal

1



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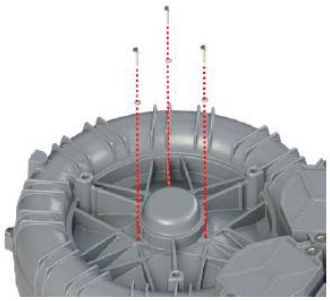

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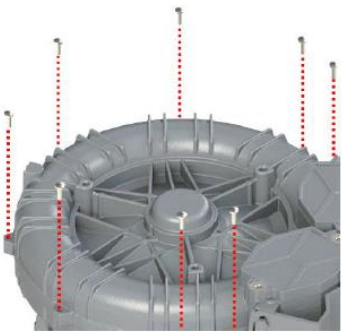

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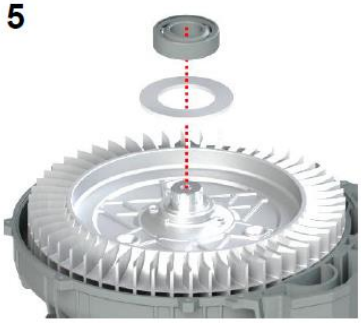
5



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Life of bearings:

In normal working conditions, machine bearings must be replaced every 25,000 hours (operation to be carried out by **LINCOLN ELECTRIC**) personnel only) or three years if the 25,000 hours of operation are not reached.

Replacement of sound-proofing boards:

- Loosen the screws 906 (1)
- Remove the unit silencer 700. Take
- care to not misplace the seals 424.
- Extract the foam 720 from the body of
- the silencer.
- Collect the meshes 710.
- Replace and put back, in reverse order, and remember the seals 424.

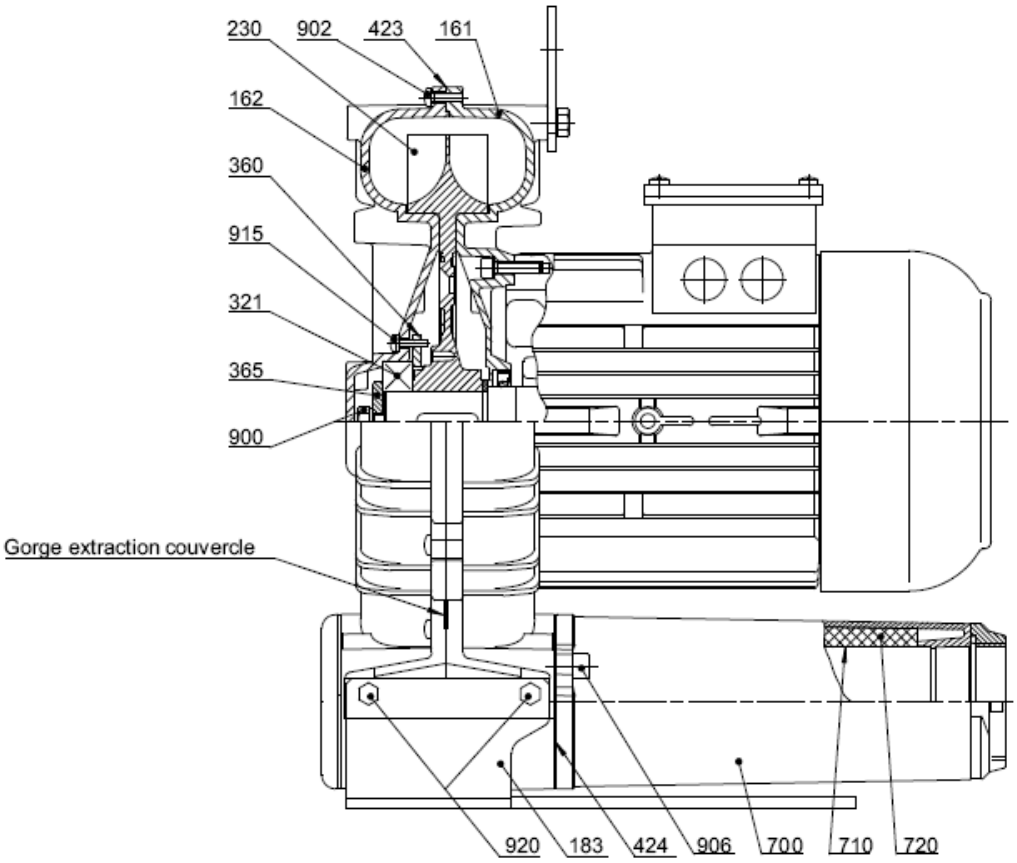
1

2

Motor:

Clean the motor cooling impeller blades (after every 6 months).

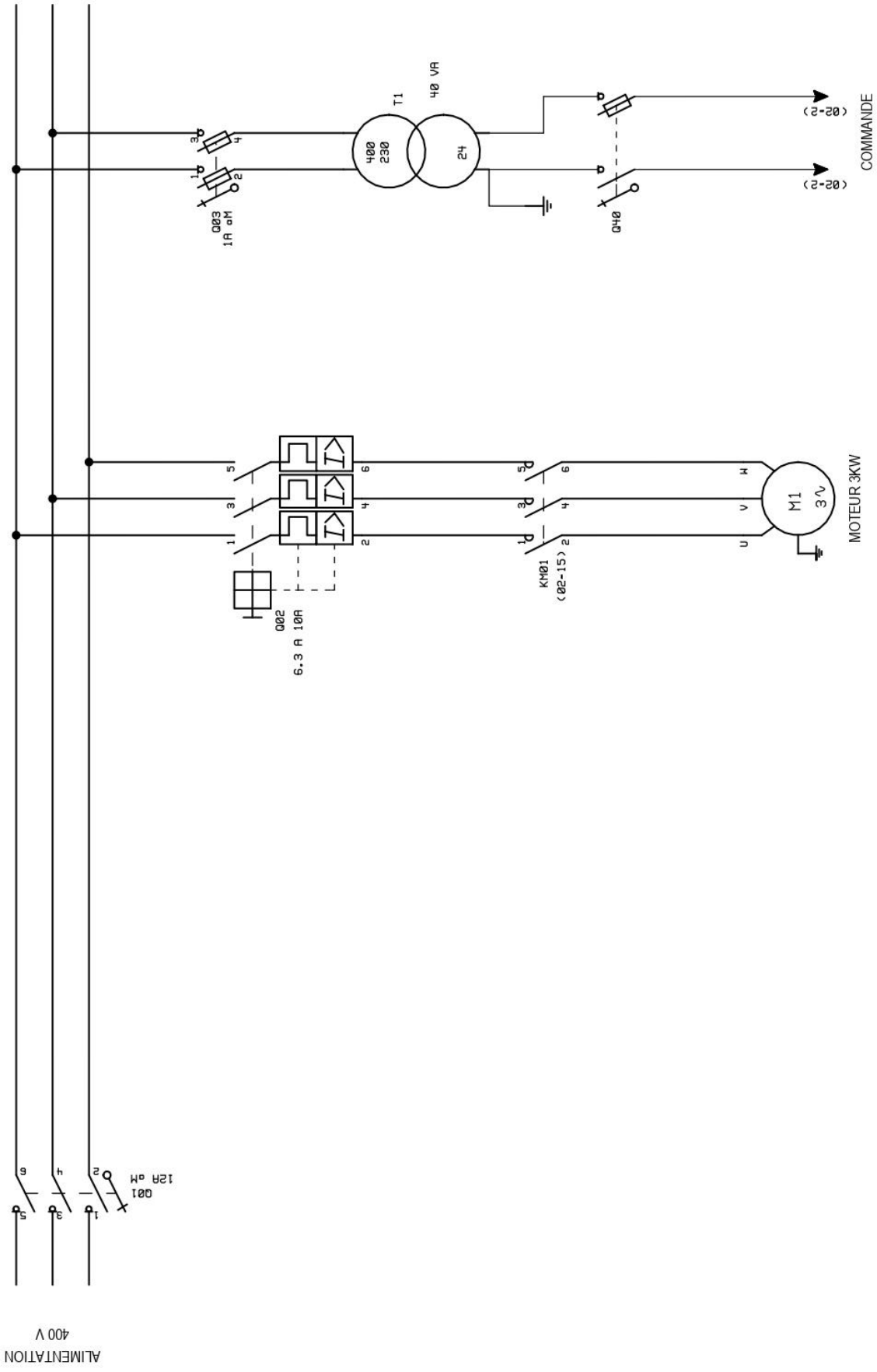
NB: This unit does not require lubrication.

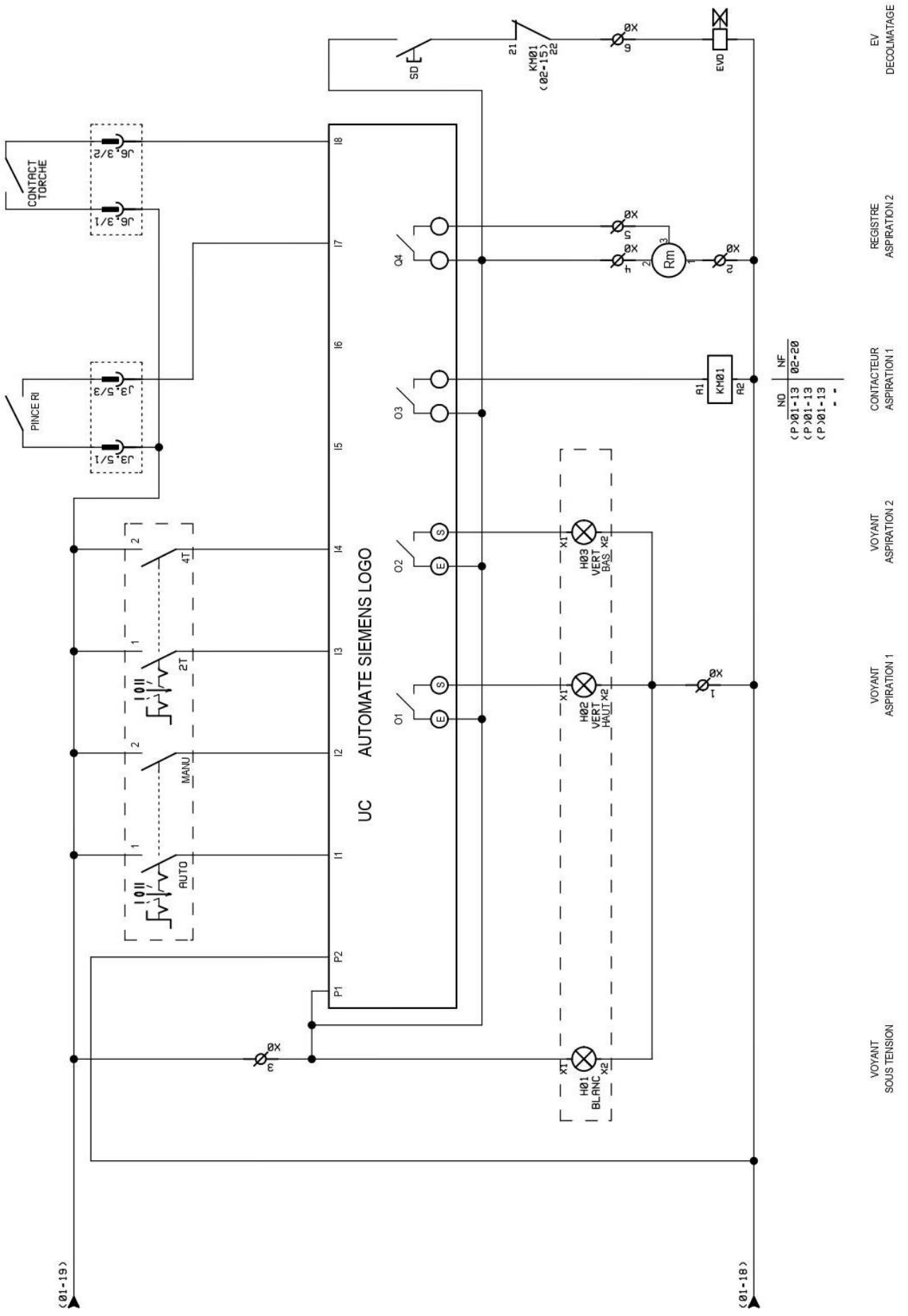


TROUBLESHOOTING

Problem	Cause	Solution
The unit does not start	The electrical wiring is not correct.	Make sure that the electrical connections match the diagram indicated in the terminal box.
	The power supply voltage is not suitable.	Make sure that the power supply voltage measured at the motor terminals is equal to +/-5% of the nominal voltage.
	The impeller is blocked.	Cause the machine to be repaired by qualified personnel.
No or inadequate air flow	The rotation direction is incorrect.	Make sure that the rotation direction is as indicated on the casing protecting the motor fan.
	The extraction filter is clogged.	Clean or replace the cartridge.
Current consumption above the acceptable value	Wiring not correct.	Make sure that the electrical connections match the diagram indicated in the terminal box.
	Power supply voltage drop.	Restore the power supply voltage of the terminals with the acceptable values.
	The extraction filter is clogged.	Clean or replace the cartridge.
	Deposits have built up inside the unit.	Cause the inside of the machine to be cleaned by qualified personnel.
	The unit works with pressure and/or vacuum above the acceptable value.	Adjust the installation and/or the adjustment valve to reduce the pressure differences.
Discharge air temperature high	The unit works with pressure and/or vacuum above the acceptable value.	Adjust the installation and/or the adjustment valve to reduce the pressure differences.
	The extraction filter is clogged.	Clean or replace the cartridge.
	Deposits have built up inside the unit.	Cause the inside of the machine to be cleaned by qualified personnel.
	The extraction and/or discharge pipes are blocked.	Remove the obstructions.
	Temperature of extracted air above 40°C	Use heat exchangers to reduce the temperature of the extracted air.
Abnormal noise	The soundproofing panel is damaged.	Replace the soundproofing panel.
	The impeller is rubbing against the frame. a) The unit works with pressure and/or above the acceptable value. b) Reduction of assembly gaps due to internal deposits (dust, impurities on tubes, process residues etc.)	Adjust the installation to reduce the pressure differences. Cause the inside of the machine to be cleaned by qualified personnel.
	Bearing worn.	Replace the bearing.
	The unit is not installed in a suitable position.	Install the units on structures that cannot transmit or amplify noise (tanks, metal plates etc.).
Abnormal vibrations	The impeller is damaged.	Replace the impeller.
	Deposit has built up inside the impeller.	Cause the inside of the machine to be cleaned by qualified personnel.
	The unit is not fastened correctly.	Fasten the unit with anti-vibration systems.

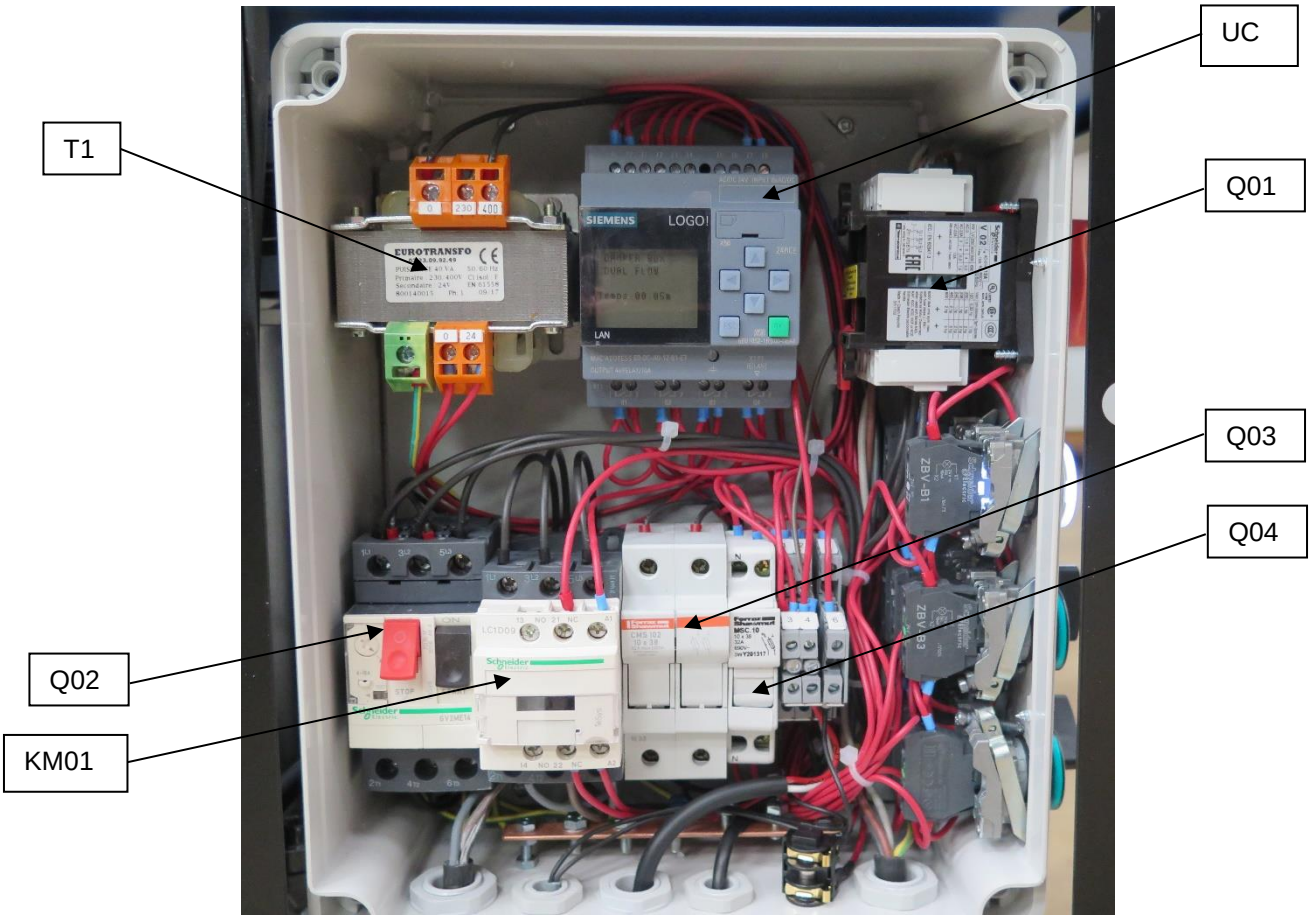
ELECTRICAL DIAGRAM




UC AUTOMATE SIEMENS LOGO
CONTACT TORCHE
PINCE RI
SD
KM01 (02-15)
EVD
EV DECOLMATAGE
REGISTRE ASPIRATION 2
CONTACTEUR ASPIRATION 1
VOYANT ASPIRATION 2
VOYANT ASPIRATION 1
VOYANT SOUS TENSION
H01 BLANC
H02 VERT HAUT
H03 VERT BAS
Rm
4T
2T
MANU
AUTO
(01-19)
(01-18)

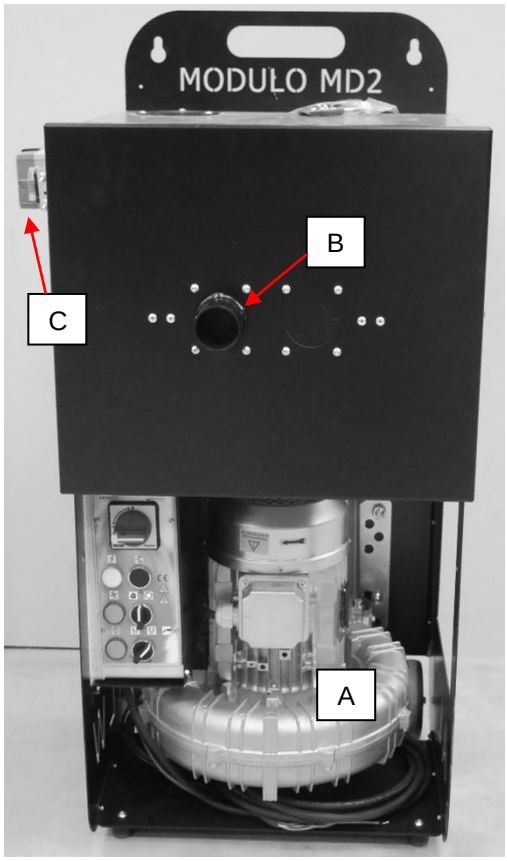
ELECTRICAL COMPARTMENT

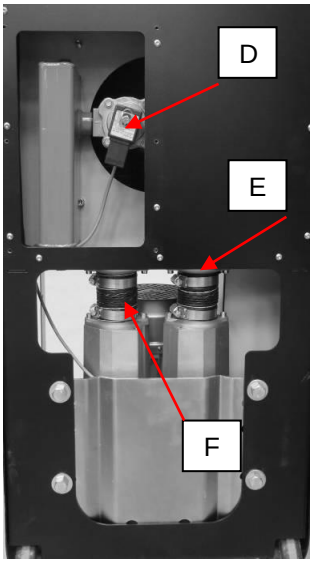
DESCRIPTION	REFERENCE	PART NUMBER
40W transformer	T1	W000403084
Main disconnector	Q01	W000403086
Motor switch	KM01	W000403087
Motor circuit breaker	Q02	W000403088
Fuse holder	Q03	Please enquire
Fuse holder	Q04	Please enquire
PLC	UC	EM61000504

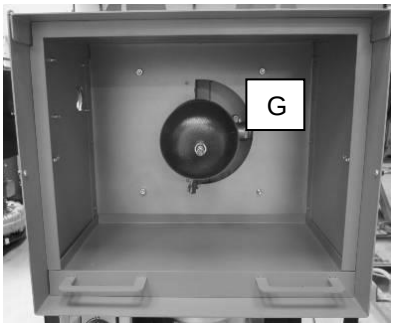


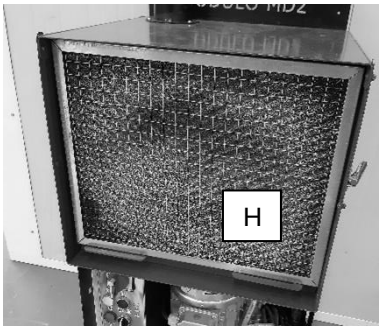
SPARE PARTS

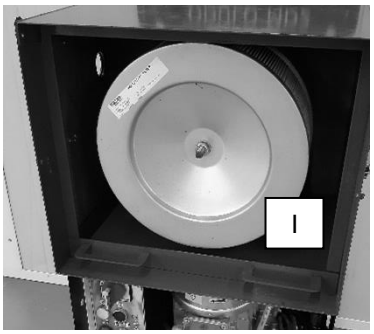
DESCRIPTION	REFERENCE	PART NUMBER
Impeller, K06MS – 3KW	**A**	W000278615
Ø 50 mm extraction connection	**B**	W000403083
24V servomotor	**C**	W000403092
Unclogging solenoid valve	**D**	S94002086
Smooth flange, MP 6 - 2"	**E**	W000278616
Impeller collars and hose kit	**F**	EM61000465
Unclogging mechanism	**G**	ATS61000211
Metal pre-filter	**H**	W000340600
Polyester filter cartridge	**I**	W000382775



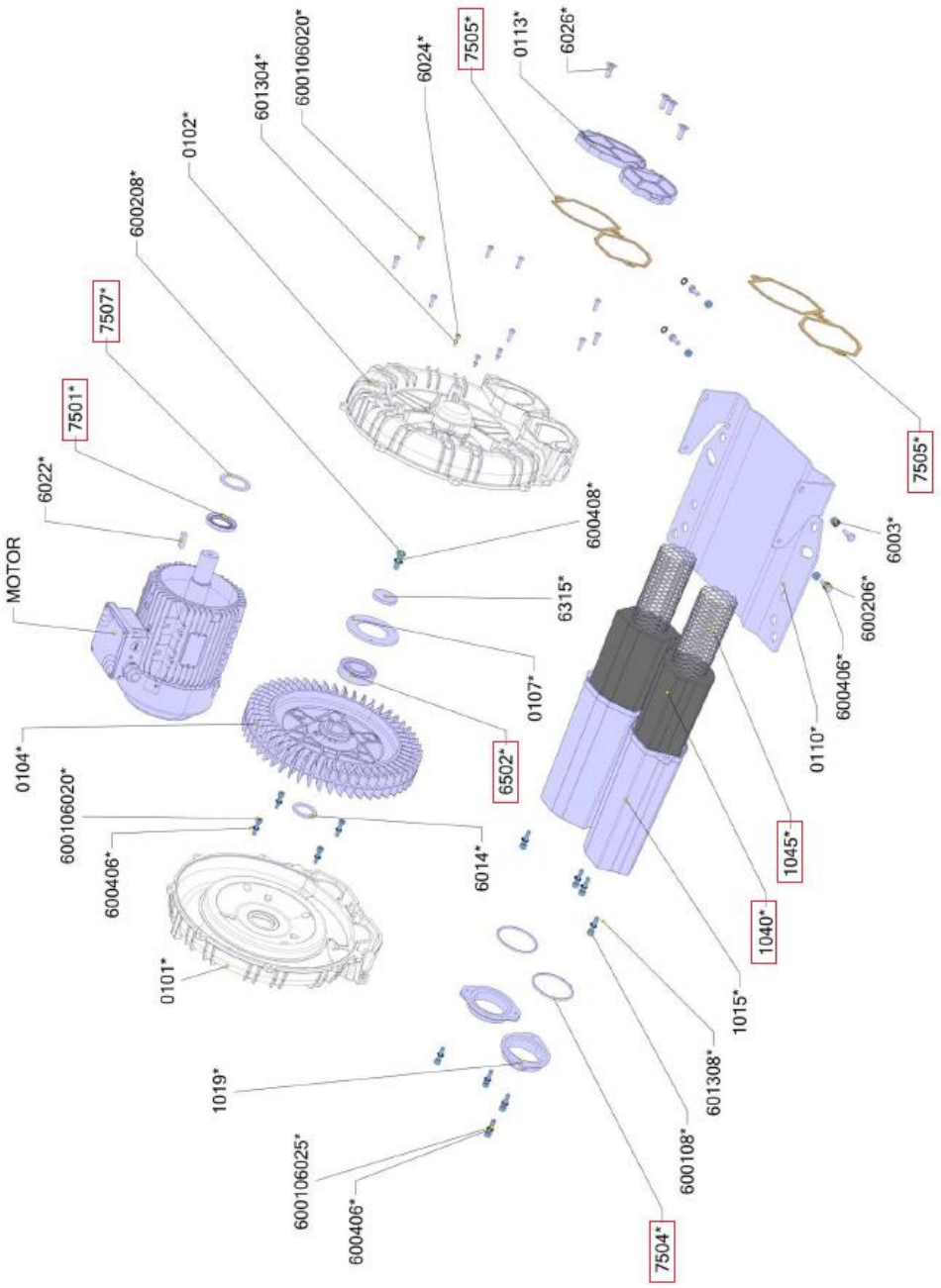








DESCRIPTION	PART NUMBER	
Rotor - 0104	EM61000449	
Impeller maintenance kit	EM61000203	
Including:	**reference**	**quantity**
Impeller bearing	6502	1
Motor sealing ring	7501 & 7508	3
Sliding bearing	7507	1
Silencer seal	7505	4
Flange seal	7504	2
Silencer mesh	1045	2
Silencer foam	1040	2



PART NUMBERS

Basic part numbers

✓ **MODULO MD2 DUAL FLOW** unit	W000401385
✓ Metal pre-filter, class EU2.	W000340600
✓ Current sensing clamp.	W000380662

Options:

✓ Optional polyester filter cartridge	W000382775
✓ Optional pressure reducer filter + compressed air connecting hose	W000401386
✓ Additional connection for connecting a hose, Ø 50mm	W000403038

Accessories :

✓ Hose, VAC Ø 50mm 5m with end fittings	W000402140
✓ Hose, VAC Ø 50mm 10m with end fittings	W000402142
✓ Hose, VAC Ø 50mm 15m with no end fittings	W000375488
✓ Set of 2 end fittings, VAC 50	W000375489
✓ Discharge hose, Ø 80mm 5m	W000386139
✓ Discharge hose, Ø 80mm 10m	W000386140
✓ Discharge hose, Ø 80mm 15m	W000386141
✓ Long nozzle, 300 mm with magnetic stand, Ø 50mm	EM61000353
✓ Contact type torch rest	W000279767

✓ Clad wall discharge kit, Ø80 mm — EM61000235

- 1 Spiral tubing, Ø80 mm
- 1 Bend, 90° Ø80 mm
- 1 Meshed vent, Ø80 mm
- 2 Blinding plates, Ø80 mm
- 1 Polyurethane hose, Ø80 mm - Lg 1 ml
- 1 set of assembly accessories.

✓ Roof discharge kit Ø80 mm — EM61000236

- 1 Spiral tubing, Ø80 mm
- 2 Bend, 90° Ø80 mm
- 1 Meshed vent, Ø80 mm
- 1 Roof waterproofing guard
- 1 Polyurethane hose, Ø80 mm - Lg 1 ml
- 1 set of assembly accessories.

PERSONAL NOTES

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