



# Operating Manual FUVD040T04BS0

OIL VACUUM DEHYDRATOR AND FILTRATION UNIT



Read the safety and operating instructions  
before use!

# 1 GENERAL INDEX

<b>1</b>	<b>GENERAL INDEX</b> .....	<b>1</b>
<b>2</b>	<b>IDENTIFICATION</b> .....	<b>6</b>
2.1	Identifying the Instruction Manual .....	6
2.2	Manufacturer Identification .....	6
2.3	Machine identification .....	6
2.4	Nameplate.....	7
2.5	EC Declaration of Conformity .....	8
<b>3</b>	<b>INFORMATION FOR THE USER</b> .....	<b>9</b>
3.1	Purpose of the Instruction Manual .....	9
3.1.1	Receipt and storage of instructions .....	10
3.2	Information for Consultation .....	10
3.2.1	Notes .....	10
3.3	Glossary .....	11
3.3.1	Glossary of Security Terms .....	11
3.4	Illustrations .....	13
3.5	Warranty .....	13
<b>4</b>	<b>SECURITY</b> .....	<b>14</b>
4.1	Intended use .....	14
4.2	Reasonably foreseeable misuse .....	14
4.3	General Safety Rules .....	15
4.3.1	Safety Rules for the Customer and/or Employer .....	15
4.3.2	Safety Rules for Ordinary Persons .....	15
4.3.3	Operator Safety Rules .....	15
4.3.4	Safety Rules for the Maintainer .....	16
4.3.5	Safety Rules for Contract Work.....	16
4.4	Staff training and qualification .....	17
4.4.1	Staff training .....	17
4.4.2	Tasks and Roles .....	17
4.4.2.1	Special Requirements for Electrical/Electronic Maintenance Workers .....	18

4.4.3 Job-related qualification .....	19
4.5 Workplaces.....	20
4.5.1 Job Layout (OPERATOR) .....	20
4.5.2 Workstation layout (MAINTENANCE) .....	21
4.6 Protection Measures Taken .....	22
4.6.1 Time Limits .....	22
4.6.2 Emergency Stop .....	22
4.6.3 Fixed Shelters .....	23
4.6.4 Light signals.....	23
4.6.5 Lock Out/Tag Out (switchboard disconnection) .....	24
4.6.6 Switchboard Access Keys .....	25
4.6.7 Protection against Direct and Indirect Contact.....	25
4.7 Verification of Protective Measures .....	26
4.8 Machine information and warnings .....	27
4.8.1 Table summarising information and warnings.....	27
4.8.1.1 Dangers.....	27
4.8.1.2 Prohibitions.....	27
4.8.1.3 Obligations.....	28
4.8.2 Information and Warning Layout .....	28
4.8.2.1 PS - Power supply.....	28
4.8.2 FUVD040T04BS0 - Machine .....	28
4.9 Protection measures to be borne by the user.....	29
4.9.1 Types of Personal Protective Equipment (PPE) .....	29
4.10 Warnings concerning residual risks .....	30
4.10.1 MECHANICAL Risks .....	30
4.10.2 ELECTRIC hazards .....	31
4.10.3 THERMAL hazards .....	32
4.10.4 Risks DUE TO MATERIALS AND SUBSTANCES .....	32
4.10.5 ERGONOMIC hazards .....	33
4.10.6 Risks ASSOCIATED WITH THE USE ENVIRONMENT .....	33
<b>5 DESCRIPTION AND TECHNICAL DATA.....</b>	<b>34</b>
5.1 Principle of Operation .....	34
5.2 Process Fluid Discharge .....	35
5.3 Description of optional assemblies and accessories .....	36
5.3.1 Particle counter .....	36
5.4 Technical Data .....	36

5.4.1 General Characteristics .....	36
5.4.2 Oil characteristics .....	36
5.4.3 Plant characteristics .....	37
5.4.4 Environmental characteristics of use .....	37
5.4.5 Overall dimensions .....	38
5.5 Noise .....	39
<b>6 TRANSPORT AND UNLOADING .....</b>	<b>40</b>
6.1 Transport Information .....	40
6.2 Equipment Required for Unloading .....	40
6.3 Preparing the unloading area .....	41
6.4 Unloading from the Means of Transport .....	41
6.5 Handling of Load Groups .....	42
6.6 General Notes on Lifting and Handling .....	42
6.7 Unpacking .....	43
6.8 Machine Lifting .....	44
6.9 Temporary Storage .....	44
<b>7 INSTALLATION AND COMMISSIONING .....</b>	<b>45</b>
7.1 Pavement Requirements .....	45
7.1.1 Civil Works .....	45
7.2 Mechanical assembly .....	45
7.2.1 Preparations required for mechanical assembly .....	45
7.2.2 Assembly and positioning .....	46
7.3 Noise-reducing installation and assembly instructions .....	46
7.4 Installation and assembly instructions to reduce vibrations .....	47
7.5 Lighting .....	47
7.6 Process Fluid Discharge .....	47
7.7 System Connection .....	48
7.7.1 Electrical system connection .....	48
7.8 Commissioning (first start-up) .....	49
7.8.1 Checks Required for Initial Start-up .....	49
7.8.2 Testing of Movements .....	49
7.8.3 First machine start-up .....	49
7.9 Commissioning after a long period of inactivity .....	49

<b>8</b>	<b>COMMANDS AND SIGNALS</b> .....	<b>50</b>
8.1	Location of control panels and signals .....	50
8.2	Signalling LEDs .....	50
8.3	Main control panel.....	51
<b>9</b>	<b>CONTROL SOFTWARE</b> .....	<b>52</b>
9.1	Touch screen control panel .....	52
9.1.1	Location of the control panel .....	52
9.2	User login.....	52
9.3	MAIN Page .....	53
9.3.1	GENERAL SETTINGS page.....	54
9.3.2	STATUS Page.....	55
9.3.3	GRAPHIC page .....	56
9.3.4	ALARMS Page .....	57
9.3.5	EXHAUST page.....	57
9.3.6	PASSWORD Page .....	58
9.3.7	FUNCTIONAL PARAMETERS pages.....	58
<b>10</b>	<b>USE</b> .....	<b>59</b>
10.1	Switching on the machine .....	59
10.2	Restoring Safeguards.....	59
10.3	Operating Procedures and Adjustments .....	60
10.3.1	Vacuum Level Adjustment .....	60
10.3.2	Oil outlet flow regulation .....	61
10.4	Starting and Stopping the Work Cycle .....	62
10.5	Emergency stop and restart .....	63
10.6	Switching off.....	63
<b>11</b>	<b>MAINTENANCE</b> .....	<b>65</b>
11.1	Introduction to Maintenance.....	65
11.2	Access Procedure for Maintenance .....	65
11.2.1	Access to the machine with power supply isolation .....	66
11.2.2	Working on hot parts .....	66
11.2.3	Access to the Switchboard.....	67
11.2.3.1	Access for off-voltage work.....	67
11.2.3.2	Access for live interventions.....	67

11.3 Inspection .....	69
11.4 Cleaning .....	70
11.5 Lubrication and greasing .....	71
11.5.1 Definition of greases and lubricants used .....	71
11.5.2 Refilling the vacuum pump oil .....	71
11.6 Mechanical Maintenance .....	73
11.7 Electrical Maintenance .....	74
11.8 Alarm Message List .....	75
<b>12     DISMANTLING AND SCRAPPING .....</b>	<b>76</b>
12.1 General Information .....	76
12.2 Decommissioning for long periods .....	76
12.3 Decommissioning and scrapping .....	76
12.3.1 Waste separation, classification and disposal .....	76
12.3.2 Type of waste produced by the demolition of the machine .....	77
<b>13     FAULT SEARCH .....</b>	<b>78</b>
13.1 General Information .....	78
13.2 Power failure and start-up .....	78
13.3 Process faults .....	78

## 2 IDENTIFICATION

### 2.1 Identification of the Instruction Manual

DOCUMENT NO.	Operating Manual FUVD040T04BS0_FUVD040T04BS0_0_en
REVIEW:	0
DATA	11/10/2024

### 2.2 Manufacturer identification

MANUFACTURER:	Filtrec SpA.
ADDRESS:	Via dei Morengi, 1 24060 TELGATE (Bergamo) - Italy
CONTACTS	Url: <a href="http://www.filtrec.com">www.filtrec.com</a> E-mail: <a href="mailto:info@filtrec.it">info@filtrec.it</a> PEC: <a href="mailto:filtrec@pec.it">filtrec@pec.it</a> Tel: +39 035 8368001 Fax +39 035 831925

### 2.3 Machine identification

TRADE NAME:	<b>FUVD040 SERIES</b> Oil vacuum dehydrator and filtration unit
MODEL:	<b>FUVD040T04BS0</b>



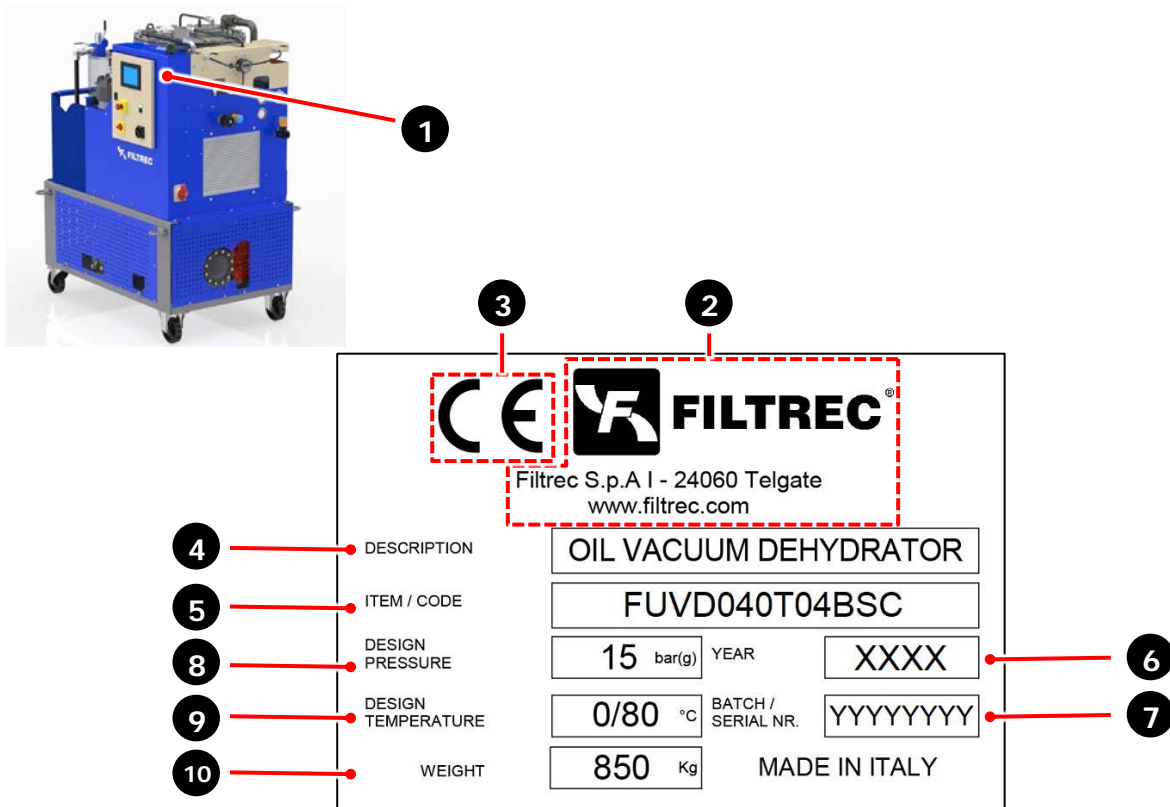
## 2.4 Nameplate

The machine identification data can be found on the identification plate (1), the position of which is shown in the figure below.

**IMPORTANT**

Identification data must always accompany any request for information, request for spare parts or other.

- It is forbidden to remove the plate or replace it.
- Always contact the manufacturer in case of damage.
- It is advisable to transcribe the nameplate data in order to preserve them for future reference.



#	FACT	Description
1	-	Identification label.
2	<b>COMPANY NAME</b>	Manufacturer identification.
3	<b>IDENTIFICATION MARKING</b>	In this area of the plate, the logo relating to the type of certification issued is affixed.
4	<b>GENERIC DESCRIPTION</b>	Identification of the generic machine name.
5	<b>MODEL</b>	Identification of the machine model.
6	<b>YEAR</b>	Year in which the manufacturing process was completed.
7	<b>MATRICOLA</b>	Unique machine identification number.
8	<b>PRESSURE</b>	Maximum operating pressure
9	<b>TEMPERATURE</b>	Permissible temperature range
10	<b>WEIGHT</b>	Weight in kg



## 2.5 EC Declaration of Conformity



Dichiarazione CE di Conformità  
(secondo Allegato II.A della direttiva 2006/42/CE)

EC Declaration of conformity  
(according to Attachment II.A of EC Directive 2006/42/CE)

Il Fabbricante:  
The Manufacturer:  
*FILTREC S.p.A.*  
*Via dei Morengi, 1*  
*24060 – Telgate (BG) – ITALIA*  
*Tel. +39 0358369001*  
*www.filtrec.com*

dichiara sotto la propria responsabilità che la macchina evaporatrice  
declares under their own responsibility that the evaporating machine

<i>Denominazione / Denomination</i>	<i>Unità di disidratazione e filtrazione sotto vuoto per olio Oil vacuum dehydrator and filtration unit</i>
<i>Modello / Model</i>	<i>FUVD040T04BS0 FUVD040T04BSC</i>

È conforme a tutte le disposizioni pertinenti della:  
Conforms with all the relevant specifications of:  
Direttiva Macchine 2006/42/CE - Machinery Directive 2006/42/CE  
Direttiva Compatibilità Elettromagnetica 2014/30/CE - Electromagnetic Compatibility Directive 2014/30/CE  
Direttiva bassa tensione 2014/35/CE - Low Voltage Directive 2014/35/EU  
Requisiti Direttiva Recipienti Semplici Bassa Pressione 2014/29/UE - Requirements of the Simple Pressure Vessels Directive 2014/29/UE

Persona autorizzata a costituire il fascicolo tecnico / Authorized Person to issue the technical dossier:  
FILTREC S.p.A.  
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Telgate (BG),  
li.....

Legale Rappresentante di FILTREC S.p.A.  
Legal Representative of FILTREC S.p.A.

Modina Sergio  
.....

## 3 INFORMATION FOR THE USER

### 3.1 Purpose of the Instruction Manual

In accordance with paragraph 1.7.4 of the European Directive 2006/42/EC, this manual provides important instructions for the safety and correct handling of the machine:

- This instruction manual is indispensable and necessary for the training and information of the personnel in charge of operating the machine. In view of the specific nature of the machine's use, the instructions have been drawn up for professional operators, thus taking into account the level of general training and perspicacity that can reasonably be expected of these operators.
- Although the manual provides information on how to properly operate the machine and the residual risks of operations, it is not a substitute for the experience of 'experienced personnel', who are considered to be trained and informed for their tasks and familiar with the associated safety and operating procedures.
- For the selection of suitable personnel, see **Chapter 'Safety', section 'Qualification of personnel'**.
- Carefully read and understand this manual in its entirety before operating the machine.
- Only follow the instructions provided and always contact the manufacturer if in doubt.
- Do not perform operations for which no information has been provided by the manufacturer.
- Do not carry out operations where it is difficult to interpret the instructions provided, always contact the manufacturer if necessary.
- Do not perform operations other than those described in this manual.
- Do not perform operations expressly forbidden in this manual.
- Should any operating conditions occur that are not expected or not described in the instruction manual, please contact the manufacturer immediately.
- The manufacturer accepts no liability for non-compliance with this manual.
- This instruction manual and all accompanying publications are an integral part of the machine purchased and provide useful information for its correct operation.
- For your own safety and the safety of persons exposed to risks during the life cycle of the machine, it is mandatory to refer to the instructions provided and always contact the manufacturer in the event of any doubt arising from the absence or difficult interpretation of these instructions.
- This manual and all accompanying publications must always accompany the machine, of which they are an integral part, throughout the entire period of operation.
- Keep this manual and all attached publications in an accessible place known to all users (operators and maintenance personnel).
- The 'original instructions' are written in ITALIAN. Any other language is a 'translation of the original instructions', in accordance with European Directive 2006/42/EC.
- The information contained in this manual is the property of the manufacturer.
- All reproduction rights of this manual are reserved to the manufacturer.
- Reproduction, even in part, is prohibited without prior authorisation.
- This manual may not be reproduced or transferred for viewing to third parties without the manufacturer's written permission.
- The manufacturer reserves the right to change the product characteristics and contents of this manual without prior notice.
- The descriptions and illustrations provided in this publication are not binding, see **chapter "User Information", section "Illustrations"**.
- Before working on the machine, read and understand the technical instructions in this publication and in the accompanying publications, and follow them carefully.

### 3.1.1 Receipt and storage of instructions

The customer and/or employer is responsible for training and informing the personnel assigned to work on the machine and must pass on the information in the instruction manual to the end users.

It is mandatory to keep all instructions (instruction manual and accompanying documentation) in a safe, accessible place known to all users for future reference. This documentation must always accompany the machine, even if it is passed on to third parties.

The manufacturer reserves the right to provide a copy of the instructions in electronic format.

## 3.2 Consultation Information

### 3.2.1 Notes

Warnings concerning personal safety and the correct use of machinery are depicted in the following style:

'LEVEL OF RISK'
<p><b>TYPE OF RISK</b> Consequence</p> <ul style="list-style-type: none"> <li>• Action to be taken.</li> <li>• ...</li> </ul>

The inscription 'RISK LEVEL' can take on the following meanings:

DANGER
Indicates an imminently hazardous situation which, if not avoided, could result in death or serious injury.

WARNING
Indicates a potentially dangerous situation which, if not avoided, could result in death or serious injury.

ATTENTION
Indicates a potentially dangerous situation which, if not avoided, may result in minor or moderate injury.

Important or particularly useful tips and information are represented in the following styles:

IMPORTANT
Indicates an obligation for special behaviour or activities for the safe operation of the machine, or possible misuse of the machine.

*NOTE: useful information.*

### 3.3 Glossary

#### 3.3.1 Glossary of Security Terms

Pursuant to the Community Machinery Directive (Directive 2006/42/EC) and the applicable European Directives on the safety and health of workers at work, the following definitions, which are used within the instruction manual, are provided.

Term	Definition
<b>DANGER</b>	A potential source of injury or damage to health.
<b>DANGER ZONE</b>	Any area inside and/or near a machine where the presence of a person poses a risk to that person's health and safety.
<b>EXPOSED PERSON</b>	Any person who is wholly or partly in a dangerous area.
<b>OPERATOR</b>	The person(s) in charge of installing, operating, adjusting, cleaning, repairing and moving a machine or performing maintenance on it.
<b>RISK</b>	Combination of the probability and severity of an injury or damage to health arising in a hazardous situation.
<b>RIPARO</b>	Machine element used specifically to provide protection by means of a material barrier.
<b>PROTECTIVE DEVICE</b>	Device (other than a guard) that reduces risk, alone or in combination with a guard.
<b>INTENDED USE</b>	Use the machine in accordance with the information provided in the operating instructions.
<b>REASONABLY FORESEEABLE MISUSE</b>	The use of the machine in a manner other than that indicated in the operating instructions, but which may result from easily foreseeable human behaviour.
<b>PROTECTIVE DEVICES INDIVIDUAL (DPI)</b>	<p>Personal protective equipment (PPE) is defined as any equipment intended to be worn and held by the worker for the purpose of protecting him against one or more risks that may threaten safety or health at work, as well as any complement or accessory intended for this purpose. It is not personal protective equipment:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Ordinary work clothes and uniforms not specifically intended to protect the safety and health of the worker;</li> <li><input type="checkbox"/> The equipment of the emergency and rescue services;</li> <li><input type="checkbox"/> The personal protective equipment of the armed forces, police forces and service personnel for maintaining public order;</li> <li><input type="checkbox"/> The identifiable protective equipment specific to road transport vehicles;</li> <li><input type="checkbox"/> Sports materials;</li> <li><input type="checkbox"/> Materials for self-defence or deterrence;</li> <li><input type="checkbox"/> Portable devices for detecting and reporting hazards and harmful factors.</li> </ul>

Term	Definition
<b>WORKER</b>	<p>A person employed by an employer, excluding domestic and family service workers, in an employment relationship, including a special employment relationship.</p> <p>Members of cooperatives or societies, including de facto ones, who work on behalf of such companies and bodies, and users of guidance or school, university and vocational training services employed by employers to facilitate or perfect their career choices are treated as workers.</p> <p>Pupils of educational and university institutions and participants in vocational training courses in which laboratories, machinery, apparatus and work equipment in general, chemical, physical and biological agents are used, are also treated as such. The persons referred to in the preceding sentence shall not be counted for the purposes of determining the number of workers from which the present decree imposes particular obligations.</p>
<b>EMPLOYER</b>	<p>The person who holds the employment relationship with the worker or, in any case, the person who, according to the type and organisation of the undertaking, has responsibility for the undertaking itself or the production unit as the holder of decision-making and spending powers.</p>
<b>INTERLOCKING DEVICE (INTERLOCKING)</b>	<p>A mechanical, electrical or other device whose purpose is to prevent the elements of a machine from operating under specified conditions (generally until the guard is closed).</p>
<b>INTERLOCKED SHELTER</b>	<p>Shelter associated with an interlocking device, so that:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the hazardous functions of the machine 'affected' by the guard cannot be performed until the guard has been closed;</li> <li><input type="checkbox"/> if the guard is opened while the machine is performing hazardous functions, a stop command is given;</li> <li><input type="checkbox"/> closing the guard allows the execution of the hazardous functions of the machine 'affected' by the guard, but does not control its start-up.</li> </ul>
<b>INTERLOCKED GUARD WITH GUARD LOCKING</b>	<p>Guard associated with an interlocking device and a guard locking device, so that:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the hazardous functions of the machine 'affected' by the guard cannot be performed until the guard has been closed and locked;</li> <li><input type="checkbox"/> the guard remains closed and locked until the danger of injury from the hazardous functions of the machine has ceased;</li> <li><input type="checkbox"/> the closing and locking of the guard allows the execution of the hazardous functions of the machine 'affected' by the guard, but does not control its start-up.</li> </ul>
<b>SHELTER LOCKING DEVICE</b>	<p>Device designed to lock a guard in the closed position and connected to the control system so that:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the machine cannot operate until the guard has been closed and locked;</li> <li><input type="checkbox"/> the shelter remains locked until the risk has ceased.</li> </ul>

### 3.4 Illustrations

The illustrations in the manual may show the structure or parts of the machine in different colours to the one you have. Differences in colour do not invalidate the correctness of the information provided, with the exception of colours strictly related to the safety of exposed persons and the machine.

If used to exemplify certain machine functions, the illustrations in the manual may differ from the machine in your possession or may not be complete. If necessary, in addition to the instructions in the manual, you should consult the specific drawing to be requested from the manufacturer (e.g. installation layout, assembly assembly, etc.) of the component or assembly on which you need to work.

#### DANGER

##### **VARIOUS RISKS ARISING FROM INCORRECT USE OF THE MACHINE.**

For the sake of clarity, some illustrations may show the machine with guards and/or protective measures removed.

- IT IS FORBIDDEN to use the machine with guards and/or protective measures removed and/or disabled.

### 3.5 Warranty

The manufacturer warrants its machine and equipment against defects and/or faults in material and/or workmanship for a contractually agreed period, and in any case in accordance with the applicable statutory warranty provisions. Any disputes shall be settled exclusively by the contractually agreed court of law.

#### IMPORTANT

The guarantee will only be valid if assembly is carried out by experienced and qualified personnel in accordance with the instructions in the instruction manual. The following operations will also be a sufficient condition for voiding the aforementioned guarantee.

- Extraordinary work carried out on the machine by unskilled and unqualified personnel.
- Replacement of machine parts with non-original parts.
- Disconnecting, dismantling or tampering with guards or safeties while using the machine.
- Installation of non-original spare parts.
- Authorised warranty work carried out by the customer without the supervision of a service technician.
- Non-compliance with payment terms.

#### DANGER

##### **MODIFICATION INTERVENTIONS**

The manufacturer accepts no liability in the event of injury due to disassembly, tampering (modification) or exclusion of guards and/or safety devices, or in the event of injury due to operations carried out by personnel with less specific training than defined in the instruction manual.

- Maintain the machine in accordance with the original design and as described in this instruction manual.
- Only employ personnel suitable for the tasks to be performed.

#### DANGER

##### **COMPONENT REPLACEMENT**

Unauthorised tampering with/replacement of one or more integral parts of the machine's components, the use of accessories, tools, consumables other than those recommended by the manufacturer, may represent a risk of injury and shall release the manufacturer from civil and criminal liability.

- Only use original spare parts.

## 4 SECURITY

### 4.1 Intended use

Intended use refers to the use of the machine in accordance with the information provided in the instruction manual. The machine may only be used by professional operators who are informed and trained in the contents of this instruction manual.

A detailed description of the machine is given in **chapter 'Description and technical data'**.

#### FUNCTION

A machine used to filter oil by removing the percentage of free water it contains.

### 4.2 Reasonably foreseeable misuse

Reasonably foreseeable misuse means using the machine in a manner other than as indicated in the instructions for use, but which may result from easily foreseeable human behaviour.

#### DANGER

##### **VARIOUS RISKS ARISING FROM INCORRECT USE OF THE MACHINE.**

Incorrect use of the machine is extremely dangerous. The manufacturer accepts no liability for any personal injury or property damage resulting from use other than intended.

- Use the machine in accordance with its intended use and the instructions provided.

The manufacturer's experience allows the following cases of misuse to be reported in advance.

They are considered misuse in this sense:

#### (A) INSTALLATION

Install the machine in environments in which an explosive atmosphere remains or is likely to remain for short or long periods during normal operation (classification according to Directive 1999/92/EC ATEX).

Install the machine in environments whose characteristics do not comply with the environmental specifications in the instructions.

Install the machine without complying with the manufacturer's instructions.

#### B) USE

Use by operators who have not reached the minimum age for starting work required by the laws in force in the respective countries of use.

Use by operators who have not been previously trained, trained and informed of any risks and residual risks of the machine as well as trained in safety.

Do not use personal protective equipment (PPE) as required by the instructions and regulations in the country of use.

Tampering with or even temporarily circumventing the machine's protective measures.

Where it is possible to gain access to the inside of guards with one's whole body, it is **FORBIDDEN** to be voluntarily locked inside them.

Operate the machine even when it shows symptoms of failure or is partially out of order.

Not respecting the technical data relating to processing limits (materials, speed, etc.)

Simultaneous use of the machine by two or more operators can mutually endanger or endanger other exposed persons.

If operated, by the operator, without checking before operating the controls that no persons are exposed in the danger zones of the machine.

Use the emergency stop button as a normal stop or to perform maintenance tasks on the machine.

Climb on the machine's structures and at all points, which are not prepared for this purpose.

### (C) TRAINING AND INFORMING PEOPLE

- |  |
|--|
| Operate the machine without having read and understood the manufacturer's instructions.      |
| Perform operations for which no information has been provided by the manufacturer.           |
| Carry out operations for which it is difficult to interpret the manufacturer's instructions. |
| Carry out operations in a manner different from that described in the instructions.          |
| Perform operations expressly forbidden in the instructions.                                  |

### (D) MODIFICATIONS

- |  |
|--|
| Carry out modifications of any kind that vary the intended use of the machine. |
|--|

### (E) SPARE PARTS

- |   |
|---|
| Use spare parts that are not original and/or not intended by the manufacturer, so that their use does not affect the health and safety of the operator. |
|---|

## 4.3 General Safety Rules

The following is a list of general rules for the correct use of the machine to be supplemented with specific information on the operations that must be undertaken for its use and maintenance.

### 4.3.1 Safety Rules for the Customer and/or Employer

When making the machine available for use and maintenance, it is the customer's and/or employer's obligation to comply with the provisions of the European Directives on health and safety in the workplace and in any case with the regulations of the country in which the machine is installed and commissioned. These obligations are outside the manufacturer's responsibility. However, particular attention should be paid to the following obligations:

- It is compulsory to carry out a risk assessment of the machine in relation to the characteristics of the installation environment and the working methods of the user company. Evaluate and understand each risk as well as the residual risks indicated in the manual and adopt suitable technical, organisational and procedural measures to inform and train the personnel in charge of use and maintenance.
- It is compulsory to choose personnel and provide for their education and training. The personnel chosen must be persons who have reached the minimum age for admission to the job and are in a suitable psycho-physical condition for the tasks to be performed.
- It is compulsory to choose personal protective equipment (PPE) suitable for the tasks to be performed and to equip personnel with it.

### 4.3.2 Safety Rules for Ordinary Persons

Ordinary (untrained and uneducated) persons are not allowed to operate the machine and may only approach it if properly informed:

- It is OBLIGATORY for the customer and/or employer to inform them of the hazards of the machine and to supervise ordinary people passing by.
- It is FORBIDDEN to operate the machine for ordinary people.

### 4.3.3 Operator Safety Rules

The operator actively participates in maintaining a high level of machine safety over time. You are asked to consider the following aspects concerning your own responsibility in use:

- Only operate the machine with the authorisation of the employer.
- Know and use this manual correctly.
- Before working on the machine, it is mandatory to undergo training, carried out by the manufacturer or your employer, and to follow the instructions in the instruction manual, in compliance with the operating and safety procedures.
- Comply with warnings placed in the vicinity of hazardous areas.
- Use personal protective equipment (PPE).
- The clothing of those working on the machine must comply with the essential safety requirements in force in their country, as set out in the specific directives.
- Other special precautions for those operating the machine include a ban on wearing bracelets, watches, rings or necklaces, and the obligation to keep long hair tied back with a special cap.



- Assume ergonomically correct postures to avoid excessive strain or fatigue while performing one's duties.
- Ensure that the work area and the machine are free of production residues and objects not required for machine use.
- Check the efficiency of all guards, alarm devices and protective devices daily and before use; do not operate in the event of malfunctions and restore correct operation before using the machine.
- Do not operate if guards and/or protective devices have been removed.
- Do not deliberately circumvent or tamper with guards and protective devices.
- Preserve the characteristics of the machine and strictly avoid making any modifications that alter its operation.
- Do not use the machine in the presence of malfunctions or when fault conditions occur.

#### **4.3.4 Safety rules for the maintainer**

The maintenance technician actively participates in maintaining a high level of machine safety over time. You are asked to consider the following aspects concerning your responsibility for maintenance:

- Operate only with prior authorisation from the employer.
- Before working on the machine, it is mandatory to undergo training, carried out by the manufacturer or your employer, and to follow the instructions in the instruction manual, in compliance with the operating and safety procedures.
- Knowing and observing rules for the operator.
- Implement a proper maintenance programme for the machine according to the manufacturer's instructions.
- Check the condition of the machine daily and replace worn or damaged parts immediately.
- Do not carry out maintenance or lubrication work with the machine in motion.
- Know and carry out all the operations required to make the machine safe.
- Use suitable tools and any equipment to repair the machine.
- Remove all tools used for maintenance from the work area, and place them in the appropriate spaces, before restarting the machine.
- Restore all guards and safety devices that may have been removed and check that they are working properly before restarting the machine.

#### **4.3.5 Safety Rules for Contract Work**

One of the various obligations of the customer and/or employer is to train and inform the personnel responsible for carrying out contract work that may take place on or near the machine of the hazards of the machine, in relation to the tasks to be performed. Refer to the occupational health and safety legislation in force in the country where the machine is installed and commissioned.

*NOTE: some of the contracted work may be, for example, cleaning of premises and/or the machine, or maintenance and/or installation work carried out on or near the machine.*

## 4.4 Staff training and qualification

### 4.4.1 Staff training

#### IMPORTANT

The machine is intended exclusively for professional use. The employer is obliged to provide training for personnel who are to work on the machine.

- Personnel must undergo operational training before using the machine.

The instructions provided in this manual and in the accompanying documentation may contain important aspects to be considered during operator training, in order to enable employers to fulfil their obligations in terms of appropriate operator training.

It is not expected that the manufacturer will provide the complete training programme or a training manual with instructions, as these services are outside the scope of the Machinery Directive. To facilitate the employer in this task, it is however possible to request the manufacturer's assistance, and to agree on the provision of specific training services for the machine.

### 4.4.2 Tasks and Roles

The Machinery Directive defines the term **OPERATOR** as: the person(s) in charge of installing, operating, adjusting, cleaning, repairing and moving a machine or performing maintenance on it.

Based on the above generic definition in this manual, we will classify personnel more precisely according to the following definitions.

<b>PRODUCTION OPERATOR (OPERATOR)</b>	<p>Professional personnel with specific skills to operate the machine, trained and instructed to operate the machine controls and carry out predefined operations and adjustments.</p> <p>He is not qualified to carry out mechanical and/or electrical maintenance and can carry out non-specialised maintenance work, such as visual inspections and cleaning of the machine, which does not require specific skills.</p>
<b>GENERIC EMPLOYEE</b>	<p>Non-professional staff without specific basic skills who can only perform simple tasks, after having been duly trained and informed of the procedures and risks involved in the operations to be performed.</p> <p>It is an ordinary person duly trained and instructed for the tasks to be performed and may only work in the presence of professional personnel who are responsible for the safe operation of the machine, the management of emergency situations that may arise, and the supervision of ordinary people.</p>
<b>MAINTENANCE</b>	<p>Professional personnel with specific skills to carry out machine maintenance operations, and also capable of performing the duties of 'PRODUCTION OPERATOR' personnel.</p> <p>It can perform the mechanical or electrical maintenance required for the machine.</p>
<b>SPECIALIST TECHNICIAN</b>	<p>Professional personnel with specific skills to carry out normal and extraordinary machine maintenance or specialised operations (e.g. transport, waste disposal, etc.).</p>
<b>TECHNICAL MANUFACTURER</b>	<p>Professional personnel, selected by the manufacturer, with specific skills for the operations to be performed on the machine.</p>

**NOTE:** the WORKER, MAINTENANCE WORKERS and SPECIALISED TECHNICIANS must have relevant education, knowledge and experience to enable them to analyse risks and avoid hazards that the task may create, or have been adequately trained to enable them to avoid hazards that the task may create.

#### 4.4.2.1 Special Requirements for Electrical/Electronic Maintenance Workers

The execution of work on live parts must be entrusted to workers recognised by the employer as suitable for this activity in accordance with the relevant technical regulations. It is therefore important to consider that:

- Whoever performs electrical work must be qualified to do it;
- Whoever performs electrical work under voltage must have a licence from the employer for this type of activity.

Operators in the electrical sector are defined in the relevant technical regulations as:

OPERATOR	DEFINITION
<b>Eligible Person (IEP)</b>	A person who has been granted the technical capacity to perform specific live work.
<b>Expert Person (PES)</b>	Person with relevant education, knowledge and experience enabling them to analyse the risks and avoid the dangers that electricity can create
<b>Person Warned (PAV)</b>	Person adequately warned by experienced persons to enable them to avoid the dangers that electricity can create

Persons who do not fall into the categories PAV and PES are defined as ordinary persons (ECPs) and, as such, may only carry out electrical work off-voltage and only under the supervision or supervision of a PAV or PES.

Electrical work as 'work on systems or apparatus with access to live parts (live or off-voltage) in the context of which, if safety measures are not taken, an electrical risk is present' is divided into 3 types:

- **Live work:** all times when the worker accesses, with a part of the body or with a tool (insulator or conductor), a certain distance from accessible live parts.
- **Work in the vicinity of live parts:** when the worker accesses, with a part of the body or with a tool (insulator or conductor), a certain distance from accessible live parts. Special precautions against electrical risk must be taken for this type of work (those taken in the case of electrical work that is not live are not sufficient).
- **Off-voltage work:** work on electrical installations that are inactive and without an electrical charge.

*NOTE: The CEI EN 60204-1 standard for electrical equipment of machines does not differentiate between work carried out on the electrical equipment when it is off-voltage or live, and therefore does not require the use of suitable persons (PEI) for the latter.*

#### 4.4.3 Job-related qualification

In accordance with the manufacturer's risk assessment, the following table summarises the qualification of personnel required in relation to the tasks to be performed on the machine.

MANSION	COMMON PERSON	OPERATOR	MAINTENANCE	SPECIALIST TECHNICIAN	TECHNICAL MANUFACTURER
Passing or stopping near the car	☑	☑	☑	☑	☑
Transport, unloading and storage	⊖	⊖	⊖	☑ (1)	⊖
Installation and assembly	⊖	⊖	⊖	☑	☑
Commissioning	⊖	⊖	⊖	☑	☑
Use	⊖	☑	☑	☑	☑
Non-specialised maintenance (cleaning, inspections)	⊖	☑	☑	☑	☑
Specialist maintenance (adjustments and replacements)	⊖	⊖	☑	☑	☑
Troubleshooting and repair	⊖	⊖	☑	☑	☑
Dismantling and scrapping	⊖	⊖	⊖	☑ (2)	⊖
	<b>A</b>	<b>B</b>		<b>C</b>	
	<b>STAFF TRAINING</b>				
	A) UNTRAINED AND UNEDUCATED PERSONNEL B) TRAINED AND EDUCATED C) TRAINED AND INSTRUCTED (TECHNICAL EXPERT)				

Legend: ☑ Permitted      ⊖ Not permitted

**NOTE**

(1): Load handling technician.  
 (2): Waste disposal technician.

## 4.5 Workplaces

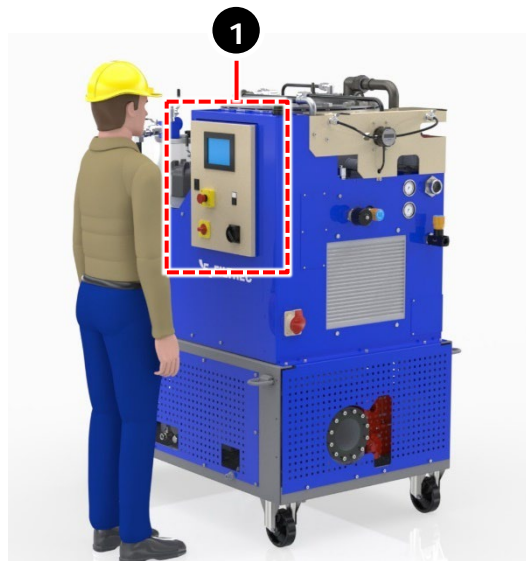
### DANGER

#### **VARIOUS RISKS ARISING FROM INCORRECT USE OF THE MACHINE.**

The work area must never be occupied, so that nothing can interfere with the operator's freedom of movement.

- In the event of an emergency, immediate access to the machine by the relevant personnel must be guaranteed.
- Access to this area is forbidden to persons who are not directly involved in the operation of the machine in order to avoid dangers due to carelessness or negligence during the performance of a task.
- The operator is therefore recommended to keep the work area free of any equipment at all times and to prohibit access to unauthorised persons in order to achieve ideal safety conditions for working on the machine.

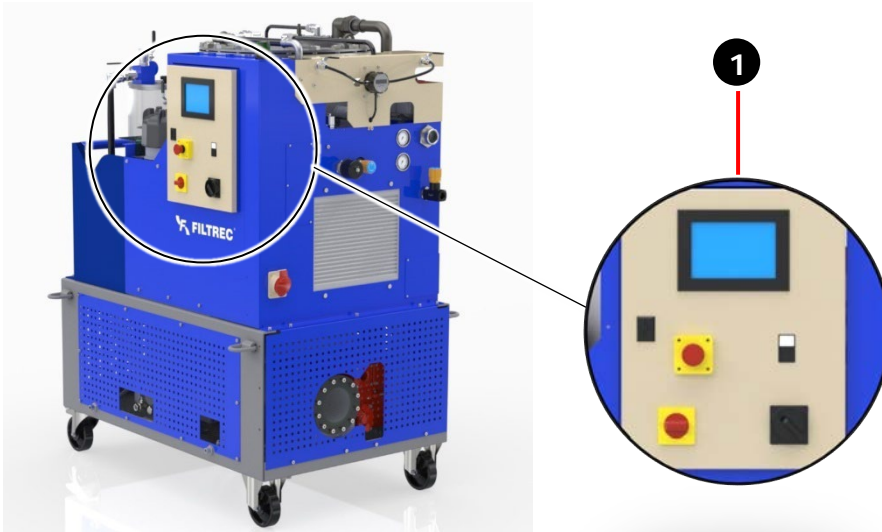
### 4.5.1 Workstation layout (OPERATOR)



#	Description
1	<b>OPERATOR WORKSTATION (MAIN PANEL)</b> Area outside the machine, from which machine start-up, start-up and setting of working parameters can be performed. The operator stays in the area for the time required to start-up, set the working parameters and supervise the machine.

*NOTE: the machine, working in automatic cycle, does not require the constant presence of an operator.*

#### 4.5.2 Workstation layout (MAINTENANCE)



#	Description
<b>1</b>	<b>SWITCHBOARDS</b> Area inside the switchboard, access to which is intended EXCLUSIVELY for specialised personnel for electrical maintenance.
-	<b>MACHINE</b> Both external and internal areas, access to which is restricted to specialised maintenance personnel electrical and/or mechanical.

*NOTE: To access the switchboard, the door must be opened using the appropriate key.*

#### 4.6 Protection Measures Taken

This section contains information on the protective measures taken to eliminate or reduce the risks present on the machine.

When the adoption of a protective measure does not completely eliminate a risk, but the risk remains in a reduced form, this is described in this manual as a residual risk.

**DANGER**

**VARIOUS RISKS ARISING FROM INCORRECT USE OF PROTECTIVE MEASURES**

The protective measures taken must be verified and maintained throughout the life of the machine.

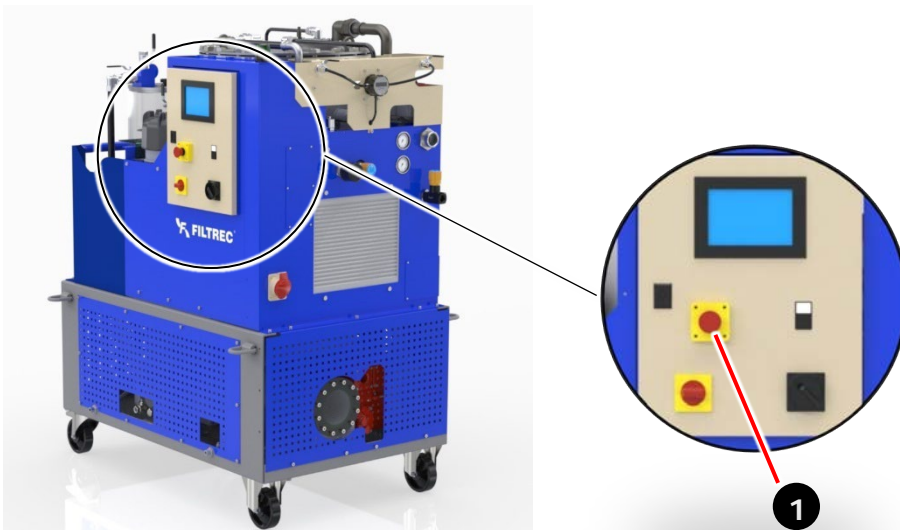
- Carry out the periodic checks described in the manual.
- The removal or even temporary circumvention of protective measures (e.g. guards, light barriers, etc.) is prohibited.

##### 4.6.1 Time Limits

The machine is intended for an operational life of 20 years. The command and control circuits with safety functions have been designed with this limit in mind.

##### 4.6.2 Emergency Stop

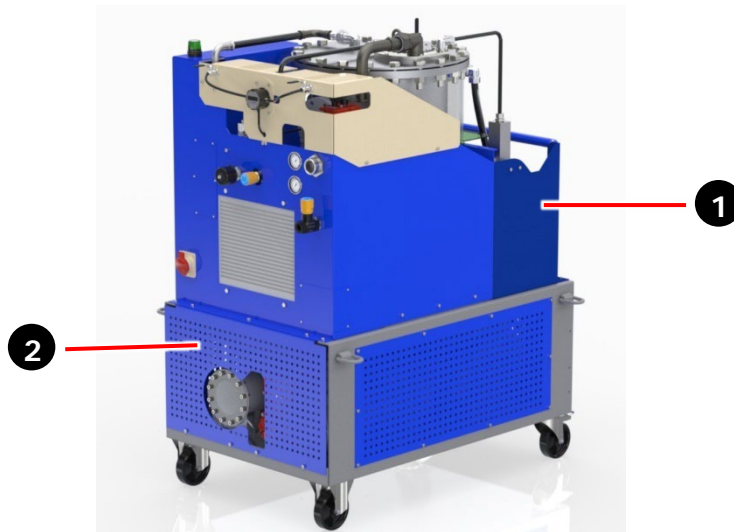
Emergency stop device located on the control panel, which can be activated in the event of personal and collective danger.



#	Description
1	Emergency stop button located on the main control panel.

#### 4.6.3 Fixed shelters

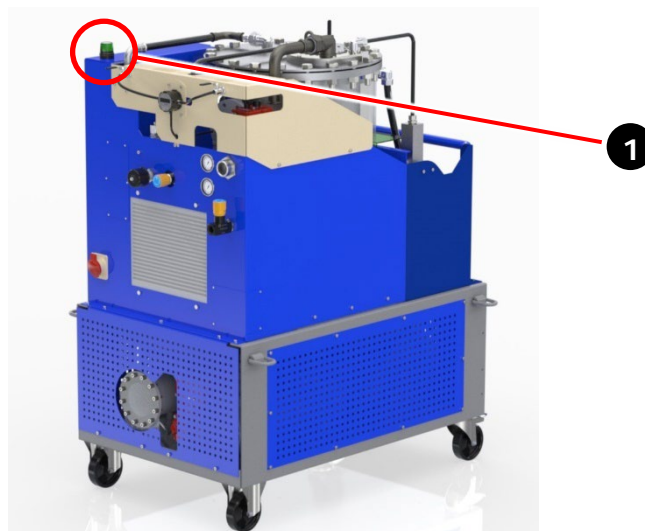
Protection of moving parts by fixed panels that can only be removed with the use of tools.



#	Description
1	Sheet metal protective cover (upper section of the machine).
2	Wire mesh protective cover (lower section of the machine).

#### 4.6.4 Light signals

Light signal used to draw the operator's attention.



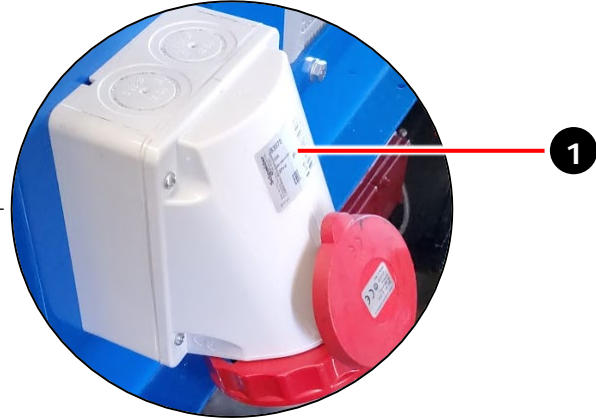
#	Description
1	LED light above the control panel.

*NOTE: inside the machine there is a plexiglass panel where LED strips are installed that replicate the colour of the LED above the control panel.*



#### 4.6.5 Lock Out/Tag Out (switchboard disconnection)

Receptacle/plug combination (EN 60204-1).



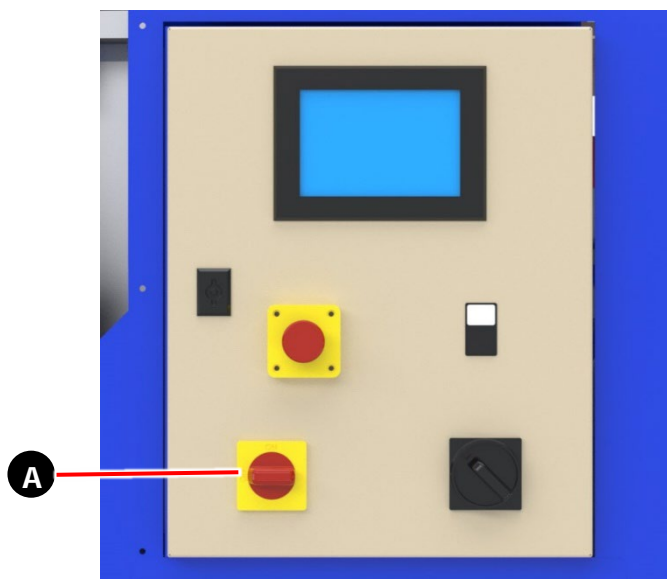
#	Description
1	Switchboard socket.

*NOTE: The manufacturer only supplies the plug, which is already incorporated in the machine. The plug will have to be purchased by the customer.*

#### IMPORTANT

##### ELECTRICAL DISCONNECTOR

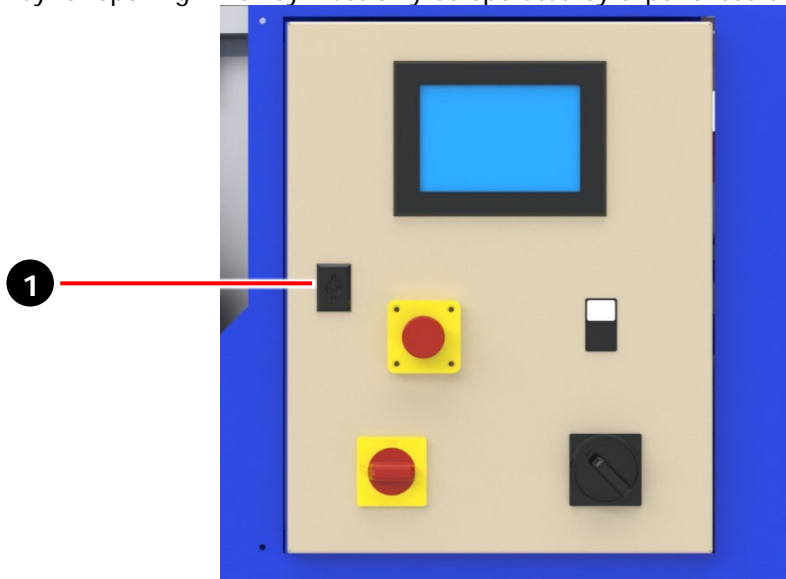
The machine is also equipped with a general electrical disconnect switch on the panel (A). However, this element is designed to switch the power supply on/off if this becomes necessary for operational reasons (e.g. for shutdown at the end of the day). For maintenance work it remains **MANDATORY** to disconnect the power supply socket, following the procedure for **isolation from power sources** described in the "Maintenance" chapter of the manual.



**A**

#### 4.6.6 Access Keys to the Switchboard

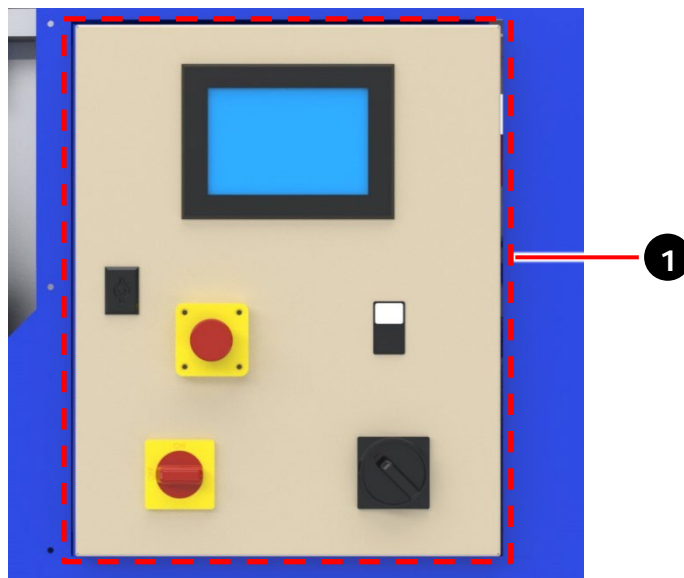
Lock with key for opening. The key must only be operated by experienced and qualified personnel



#	Description
1	Lock for access key to electrical cabinet.

#### 4.6.7 Protection against Direct and Indirect Contact

Construction/adoption of enclosures and casings to ensure an adequate level of insulation of live parts.  
Wiring of electrical equipment according to IEC EN 60204-1



#	Description
1	Electrical cabinet

#### 4.7 Verification of protective measures

MEASURE	MODE OF VERIFICATION	FREQUENCY
Emergency button	<p>Test A): machine start-up impediment</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Press the emergency button and check that it remains locked.</li> <li><input type="checkbox"/> Check that the emergency lamp lights up.</li> <li><input type="checkbox"/> Check that with the emergency button pressed, it is not possible to start the machine.</li> </ul> <p>Test B): resetting the emergency button</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Turn the emergency button clockwise and check that it unlocks.</li> <li><input type="checkbox"/> Check that it is possible to start the machine.</li> </ul> <p>NOTE: Both tests must be repeated for each emergency button on the machine.</p>	SEMESTRAL
Fixed and/or mobile shelters	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check for loss of or damage to any part of the shelter, particularly if this causes a decrease in safety functions (e.g. reduction in impact resistance, scratches on glass panes, etc.).</li> <li><input type="checkbox"/> Replace wear parts, checking in particular for deterioration of joints or fastening points.</li> <li><input type="checkbox"/> Check for deterioration due to corrosion, temperature changes or chemical effects.</li> <li><input type="checkbox"/> Check that there are no changes to safety distances and opening dimensions</li> </ul>	MONTHLY
Light signals	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check regularly that the signal lamps are lit correctly.</li> </ul>	SEMESTRAL
Keys	<ul style="list-style-type: none"> <li><input type="checkbox"/> The keys must be used for the time required to carry out the intervention. At the end of the intervention they must be removed and kept by the person in charge, or left inserted in the machine operating mode enabling switches (e.g. JOG enable, MANUAL control, etc.).</li> <li><input type="checkbox"/> Keys may only be used by authorised and qualified persons, identified by means of a written procedure.</li> <li><input type="checkbox"/> Duplicating keys is prohibited.</li> </ul>	TO EACH EMPLOYMENT
Direct / indirect contacts	<p>Carry out the following procedures described in the "Electrical Maintenance" section:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Terminal clamping inspection.</li> <li><input type="checkbox"/> Verification of the enclosure's degree of protection.</li> <li><input type="checkbox"/> Inspection of the condition of electrical conductors.</li> <li><input type="checkbox"/> Protective equipment.</li> </ul>	ANNUAL

## 4.8 Machine information and warnings




In accordance with paragraph 1.7.1 of European Directive 2006/42/EC, the information and warnings described below are provided on the machine:

- Failure to comply with any of the prescriptions, through deterioration, loss or failure to consult a safety sticker, can lead to serious accidents.
- It is mandatory to know and comply with the information and warnings on the machine in accordance with the meaning and actions described in this instruction manual.
- The information and warnings on the machine must be kept intact throughout the life of the machine; in this regard, specific verification instructions are given in the following paragraphs.
- The manufacturer disclaims any liability arising from failure to comply with the requirements set out on the machine and in the manuals provided.



*NOTE: For descriptions of pictograms relating to components purchased and integrated in the machine, please refer to the relevant documentation.*

### 4.8.1 Table summarising information and warnings


#### 4.8.1.1 Dangers

#	Symbol	Description	Location
W012		<b>Danger; electricity</b> Warns of the presence of voltage	Place on the switchboard door and on all boxes containing live parts
W017		<b>DANGER; HOT SURFACE:</b> Warns of the presence of a hot surface	Place in the bottom section of the vacuum chamber
C008		<b>DANGER; RESIDUAL HYDRAULIC PRESSURE:</b> Warns of hydraulic pressure build-up in pipes and/or actuators	Located on the top cover of the main oil filter

#### 4.8.1.2 Prohibitions

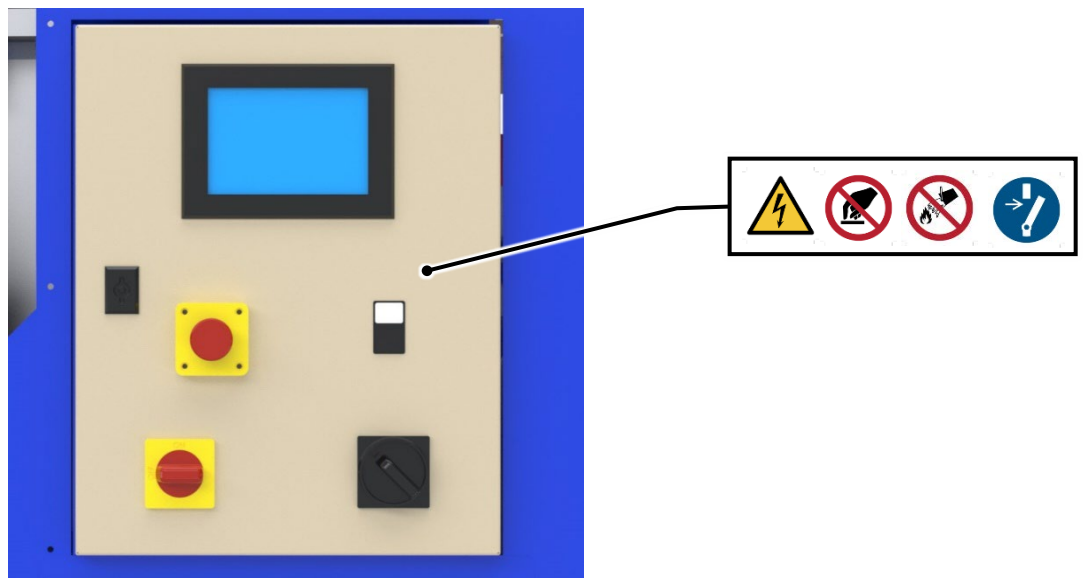
#	Symbol	Description	Location
P010		<b>No touching</b> Indicates a prohibition to touch an object or parts of an object	Place on the switchboard door
P011		<b>No extinguishing with water</b> Indicates a ban on the use of water to extinguish fires	Place on the switchboard door

### 4.8.1.3 Obligations

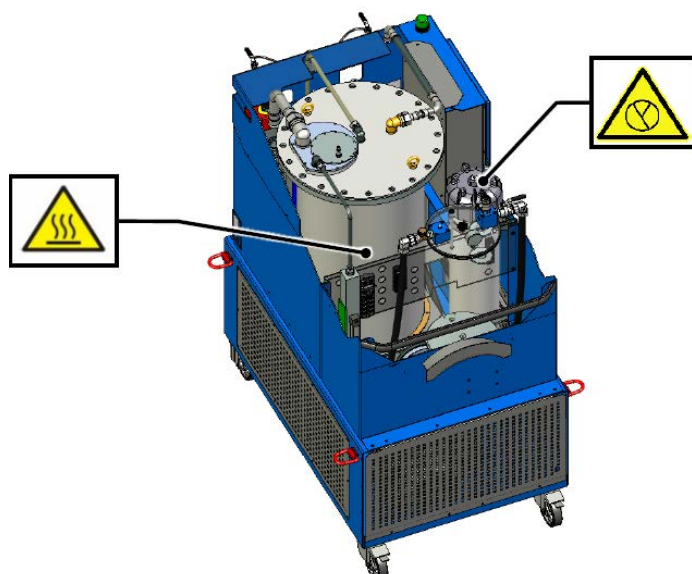
#	Symbol	Description	Location
M021		<b>Disconnect the machine before performing maintenance or repairs</b> Indicates the obligation to disconnect the machine, which is connected to the general power supply, from any power source before carrying out maintenance or repair work.	Place near the switch of the switchboard and disconnection points from power sources

## 4.8.2 Information and Warning Layout

### 4.8.2.1 PS - Power supply









### 4.8.2 FUVD040T04BS0 - Machine



## 4.9 User Protection Measures

### 4.9.1 Types of Personal Protective Equipment (PPE)

Symbol	Description	Technical Standard
	<p><b>Full-body protection</b> (1, 2, 3, 4, 5, 6, 7)</p> <p>Always wear the appropriate protective clothing for the task at hand. The column opposite shows the reference standards according to the protection requirements.</p>	UNI EN ISO13688 Protective clothing general requirements
	<p><b>Head protection</b></p> <p>Always wear a protective helmet (or helmet) when lifting and positioning the machine and in all cases where there is a risk of objects falling from above.</p>	UNI EN 397 Industrial safety helmets
	<p><b>Hand protection</b> (1, 2, 3)</p> <p>Always wear protective gloves if operations that expose you to various risk factors are necessary. The column opposite shows the reference standards according to the protection requirements.</p>	<p>1) UNI EN 374 Protective gloves against chemicals</p> <p>2) UNI EN 388 Protective gloves against mechanical and electrostatic hazards</p> <p>3) UNI EN 407 Protective gloves against thermal risks</p>
	<p><b>Eye protection</b></p> <p>Wear at all times in the event of operations where there is a danger of ejection of materials or exposure to splashes.</p>	UNI EN 166 Personal Eye Protection - Specifications
	<p><b>Foot protection</b> (1, 2, 3)</p> <p>Always wear safety footwear. The column opposite shows the reference standards according to the protection requirements.</p>	<p>1) UNI EN ISO 20345 Safety footwear</p> <p>2) UNI EN ISO 20346 Protective footwear</p> <p>3) UNI EN ISO 20347 Work footwear</p>
	<p><b>Respiratory protection</b> (1, 2, 3, 4)</p> <p>Always wear respiratory protective masks when cleaning the machine with solvents or chemicals. The column opposite shows the reference standards according to the protection requirements.</p>	<p>1) UNI EN 149 Filtering anti-dust half-masks</p> <p>2) UNI EN 405 Filtering gas and dust half-masks</p> <p>3) UNI EN 143 Dust filters</p> <p>4) UNI EN 14387 Gas and combined filters</p>

## 4.10 Warnings concerning residual risks

In accordance with paragraph 1.7.2 of European Directive 2006/42/EC, the residual risks that remain despite the adoption of design-integrated protective measures and complementary protective measures are described.

*NOTE: In assessing the risks, the manufacturer, in compliance with current legislation, did not take into account (nor did he have the necessary information) the risks inherent in the working environment and the specific working methods of the user company.*

### 4.10.1 MECHANICAL Risks

<b>DANGER</b>	ISOLATION OF ENERGY SUPPLY SOURCES
<b>CONSEQUENCES</b>	Various hazards originating from the machine/quasi-machine
<b>HOW TO AVOID</b>	OBLIGATORY: - Disconnect power sources and discharge residual energy.
<b>SITUATION</b>	Unexpected start of movements during maintenance operations
	Unexpected initiation of pneumatic movements during piping and/or actuator dismantling operations

<b>DANGER</b>	MOVING MEANS OF TRANSPORT
<b>CONSEQUENCES</b>	Investment, crushing, impact
<b>HOW TO AVOID</b>	MANDATORY: - Use the horn to signal arrival. - Separate pedestrian paths from areas used for vehicle transit.
<b>SITUATION</b>	Running over, crushing, hitting the body with moving transport equipment around the machine

<b>DANGER</b>	HANDLING OF MACHINES OR MACHINE PARTS
<b>CONSEQUENCES</b>	Crushing
<b>HOW TO AVOID</b>	OBLIGATORY: - Make sure the load is properly gripped before starting to lift - Lift slowly. - Keep an adequate safety distance. - Use the horn to signal arrival. - Separate pedestrian paths from areas used for vehicle transit.
	FORBIDDEN: - Stand in the danger zone. - Passing under a suspended load. - Leaving suspended loads unattended.
<b>SITUATION</b>	INDIVIDUAL PROTECTION DEVICES: - Safety helmet
	Crushing of the body due to falling load during lifting and handling

<b>DANGER</b>	MANUAL HANDLING OF LOADS
<b>CONSEQUENCES</b>	Crushing
<b>HOW TO AVOID</b>	FORBIDDEN: - Carry out the operation if you do not have an adequate grip.
<b>SITUATION</b>	Crushing of fingers/hand/foot due to falling load during manual handling (machine parts during transport)

<b>DANGER</b>	SLIPING FLOORING AND/OR PRESENCE OF WORKING RESIDUES OR MATERIALS (oil residues)
<b>CONSEQUENCES</b>	Slip, trip and fall
<b>HOW TO AVOID</b>	<b>OBLIGATORY:</b> - Remove unnecessary processing residues or material from the floor - Mark off the area and clean up promptly in the event of a spillage of materials - Respect the manufacturer's cleaning times and procedures
<b>SITUATION</b>	During use and maintenance (especially cleaning) of the machine.

<b>DANGER</b>	LADDERS AND/OR TEMPORARY MEANS OF ACCESS
<b>CONSEQUENCES</b>	Slip, trip and fall
<b>HOW TO AVOID</b>	<b>MANDATORY:</b> - Use ladders and/or temporary means of access in compliance with the regulations in force.  <b>FORBIDDEN:</b> - To climb on the machine's structures and at all points, which are not provided for this purpose.
<b>SITUATION</b>	Slip, trip, fall from ladders and/or temporary means of access

<b>DANGER</b>	CONNECTING PIPES WITH OIL TANK
<b>CONSEQUENCES</b>	Slip, trip and fall
<b>HOW TO AVOID</b>	<b>OBLIGATORY:</b> - Position the machine as close as possible to the oil tank - Mark, where possible, temporary connecting pipes - Move carefully while standing near the machine
<b>SITUATION</b>	Standing near the machine when the automatic operation cycle is in progress.

#### 4.10.2 ELECTRIC hazards

<b>DANGER</b>	DIRECT CONTACT WITH LIVE PARTS
<b>CONSEQUENCES</b>	Electrocution
<b>HOW TO AVOID</b>	<b>OBLIGATORY:</b> - Operations on the electrical equipment, both live and off-voltage, are reserved exclusively for QUALIFIED/SPECIALISED personnel who, following training and professional experience, have been expressly authorised to install, use and maintain the electrical panel and electrical system on board the machine  <b>INDIVIDUAL PROTECTION EQUIPMENT:</b> - Gloves and insulating footwear. - Helmet and visor against the risk of electric arcs.
<b>SITUATION</b>	Electrocution through direct contact with live parts



<b>DANGER</b>	ELECTRIC ARC CAUSED BY SHORT-CIRCUIT OR INTERRUPTION OF CIRCUITS WITH HIGH CIRCULATING CURRENTS
<b>CONSEQUENCES</b>	Electrocution, burning, projection of molten particles
<b>HOW TO AVOID</b>	<p>MANDATORY:</p> <ul style="list-style-type: none"> <li>- Operations on electrical equipment, both live and off-voltage, are reserved exclusively for QUALIFIED/SPECIALISED personnel who, following training and professional experience, have been expressly authorised to install, use and maintain the electrical panel and electrical system on board the machine.</li> </ul> <p>INDIVIDUAL PROTECTION EQUIPMENT:</p> <ul style="list-style-type: none"> <li>- Gloves and insulating footwear.</li> <li>- Hard hat and visor against the risk of electric arcs.</li> </ul>
<b>SITUATION</b>	Short-circuit electric arc

#### 4.10.3 THERMAL hazards

<b>DANGER</b>	TEMPERATURE PARTS Heat ( $50^{\circ}\text{C} < T < 100^{\circ}\text{C}$ )
<b>CONSEQUENCES</b>	Burning, scald
<b>HOW TO AVOID</b>	<p>MANDATORY:</p> <ul style="list-style-type: none"> <li>- Follow the procedure for access to the area and/or intervention on the hot part - Wait for complete cooling of the elements before intervening.</li> </ul> <p>INDIVIDUAL PROTECTION EQUIPMENT:</p> <ul style="list-style-type: none"> <li>- Gloves thermal risk - heat (<math>50^{\circ}\text{C} &lt; T &lt; 100^{\circ}\text{C}</math>)</li> </ul>
<b>SITUATION</b>	Burning of hands from contact with the outer surface of the vacuum chamber or hot machine elements

#### 4.10.4 Risks DUE TO MATERIALS AND SUBSTANCES

<b>DANGER</b>	FIRE
<b>CONSEQUENCES</b>	Fire
<b>HOW TO AVOID</b>	<p>OBLIGATORY:</p> <ul style="list-style-type: none"> <li>- Keep the workplace and the machine clean.</li> <li>- Prepare extinguishing media.</li> </ul>
<b>SITUATION</b>	Fire caused by sparks of mechanical and/or electrical origin and/or use of open flames in contact with flammable materials

<b>DANGER</b>	MATERIALS AND SUBSTANCES USED
<b>CONSEQUENCES</b>	Poisoning, sensitisation
<b>HOW TO AVOID</b>	<p>OBLIGATORY:</p> <ul style="list-style-type: none"> <li>- Refer to the safety data sheet of the product used.</li> </ul> <p>INDIVIDUAL PROTECTION DEVICES:</p> <ul style="list-style-type: none"> <li>- Refer to the safety data sheet of the product used</li> </ul>
<b>SITUATION</b>	<p>Poisoning and/or sensitisation (skin contact and/or inhalation of hazardous vapours) from the use of cleaning substances</p> <p>Poisoning and/or sensitisation (skin contact and/or inhalation of hazardous vapours) resulting from contact with process oil or oil used to top up the pump tank</p>

**IMPORTANT**

**TREATED OIL**

The manufacturer of the machine cannot be aware of the specific characteristics (and associated risks) of the oil that will be used. It remains the responsibility of the employer to train personnel in consulting safety data sheets and in safe product handling procedures.

**4.10.5 ERGONOMIC hazards**

<b>DANGER</b>	MANUAL HANDLING OF LOADS
<b>CONSEQUENCES</b>	Fatigue, musculoskeletal disorders
<b>HOW TO AVOID</b>	<p><b>MANDATORY:</b></p> <ul style="list-style-type: none"> <li>- Assume ergonomically correct positions when lifting, dragging, pushing or moving the load in order to avoid discomfort and disease to the spine, joints and muscles.</li> </ul> <p><b>FORBIDDEN:</b></p> <ul style="list-style-type: none"> <li>- Lifting loads exceeding 20/25 [kg] for men and 15/20 [kg] for women (ISO 11228).</li> </ul>
<b>SITUATION</b>	Fatigue and musculoskeletal disorders during lifting and manual handling of loads

**4.10.6 Risks ASSOCIATED WITH THE USE ENVIRONMENT**

<b>DANGER</b>	MATERIALS AND SUBSTANCES USED
<b>CONSEQUENCES</b>	Environmental pollution
<b>HOW TO AVOID</b>	<p><b>OBLIGATORY:</b></p> <ul style="list-style-type: none"> <li>- Dispose of any waste in accordance with current legislation.</li> </ul> <p><b>INDIVIDUAL PROTECTION DEVICES:</b></p> <ul style="list-style-type: none"> <li>- Refer to the safety data sheet of the product used</li> </ul>
<b>SITUATION</b>	<p>Environmental pollution from incorrect disposal of packaging materials. Poisoning, sensitisation or environmental pollution resulting from incorrect handling of spent filters Poisoning, sensitisation or environmental pollution resulting from incorrect handling of process fluids (contaminated water and/or residual oil)</p>

<b>DANGER</b>	PLUMBING
<b>CONSEQUENCES</b>	Slip, fall, pollution
<b>HOW TO AVOID</b>	<p><b>OBLIGATORY:</b></p> <ul style="list-style-type: none"> <li>- Dispose of any waste in accordance with current legislation.</li> </ul> <p><b>INDIVIDUAL PROTECTION DEVICES:</b></p> <ul style="list-style-type: none"> <li>- Refer to the safety data sheet of the product used</li> </ul>
<b>SITUATION</b>	Slipping, falling and environmental pollution as a result of spilling treated oil or oil used to top up the vacuum pump.

## 5 DESCRIPTION AND TECHNICAL DATA

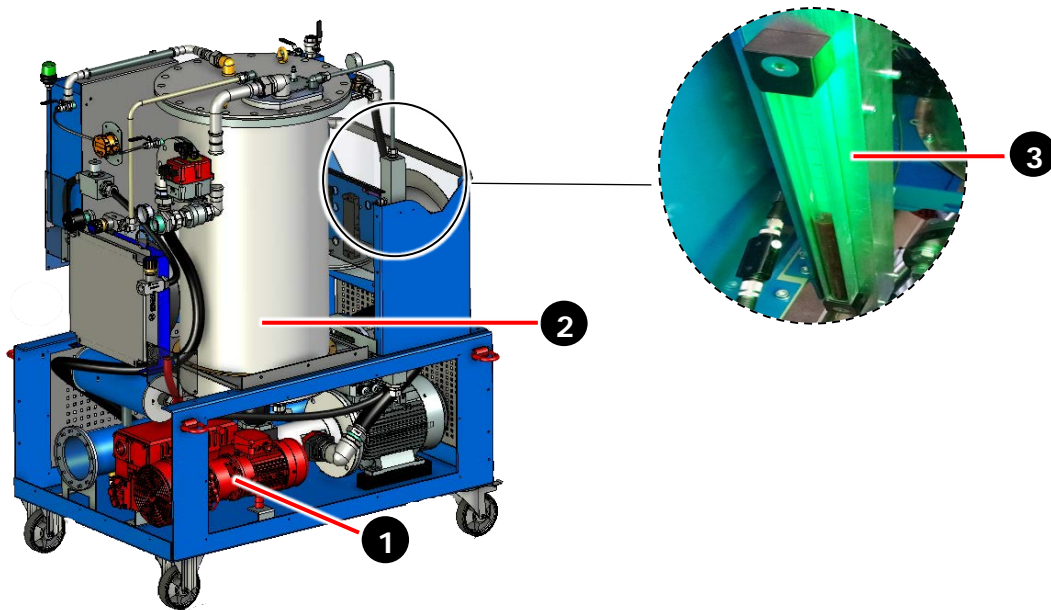
### 5.1 Principle of Operation

The machine was designed and built for the purpose of filtering oil by removing the percentage of free and dissolved water it contains. This machine can be used on different types of industrial plants.

The only operator scheduled to operate the machine, after having made the hydraulic connections and set the working parameters, has the task of checking its correct operation.

The contaminated oil is introduced into the purification system via the vacuum created by the vacuum pump (1) and undergoes an initial filtration cycle through the steel mesh basket filter installed before entering the vacuum chamber (2). The degree of vacuum achieved is read off by means of a vacuum stat.

After filtration, the oil falls by gravity to the bottom of the chamber where, thanks to the presence of two heating elements inside, it is heated until it reaches the ideal temperature for the dehydration process. The filling level can be displayed by means of a capacitive level indicator (3). The process is optimised so that the temperature of the oil does not alter its physical qualities.



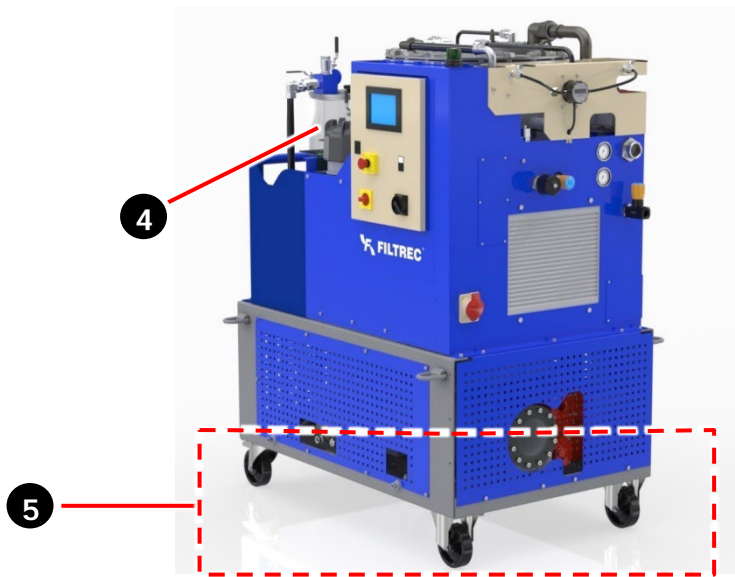
When the delivery level is reached, the suction valve closes and the recirculation valve is activated, which sucks the oil out of the chamber and sends it to a filter on the delivery side. The oil undergoes a second filtration process by means of a U564 filter element, whereby any solid particles are removed until the desired contamination class is reached.

A portion of the filtered oil is sent to the spray nozzles, which atomise it so as to increase the contact surface area exposed to the vacuum and thus facilitate the evaporation process. A small percentage of filtered oil returns to the collection tank of the hydraulic system without undergoing the evaporation process so that the process is cyclic.

The water resulting from the evaporation process is conveyed into the vacuum pump suction line and from there sent to a siphon filter (4) where any impurities that may be present are removed. As the steam flows through the pipes, it returns to a liquid state and is collected in the condensation tank.

The dehydrated and filtered oil remains at the bottom of the vacuum chamber, where it is removed by the drain pump and reintroduced into the collection tank of the hydraulic system.

The machine is equipped with wheels (5) so that it can be moved easily.



**IMPORTANT**

**MINIMUM TANK CAPACITY**

To ensure a minimum quality standard of the process, it is recommended to use the machine with oil tanks of not less than 500 litres capacity.

**5.2 Discharge of process fluids**

At the end of the evaporation process, process fluids remain inside the machine and can be removed by means of the drains indicated in the following section.



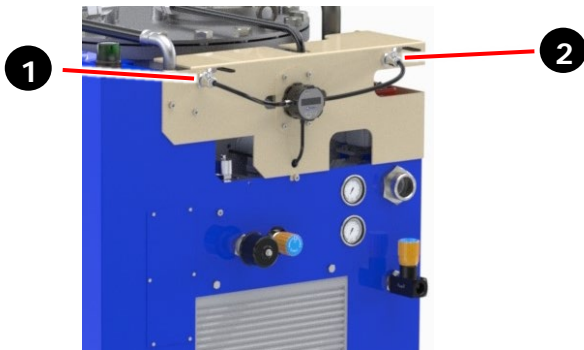
#	Function
1	<b>RESIDUAL OIL DRAIN</b> Tap for draining residual oil at the end of the work cycle.
2	<b>CONDENSATE DRAIN</b> Condensate drainage tap.
3	<b>BATHTUB DISCHARGE</b> Tap used for draining fluids that could be deposited inside the tank due to spills.

### 5.3 Description of optional assemblies and accessories

The machine is prepared for the installation of various optional devices that can be requested when ordering or even after commissioning.

#### 5.3.1 Particle counter

This sensor can be installed downstream of the main pump and allows the contamination class of the oil to be characterised. When the moisture indicator shows a value below 50%, the particle counter can be activated by manually opening the valve (1) shown in the figure. To regulate the flow of oil through the counter, adjust the valve (2). If the fluid contains large amounts of water, care must be taken as this may alter the contamination class reading provided by the particle counter. For further information on particle counter operation, please refer to the FMSC01S0 operating manual available at [www.filtrec.com](http://www.filtrec.com).



### 5.4 Technical Data

#### 5.4.1 General Characteristics

Data	Value	Unit
Maximum vacuum pump pressure	-1	bar
Maximum pressure in the hydraulic circuit	12	bar
Maximum working temperature	75	°C

#### 5.4.2 Oil characteristics

Data	Value	Unit
Recommended type of oil	32 - 460	cSt
Temperature operating range	50-60	°C

### 5.4.3 Equipment characteristics

#### 5.4.3.1 Electrical installation

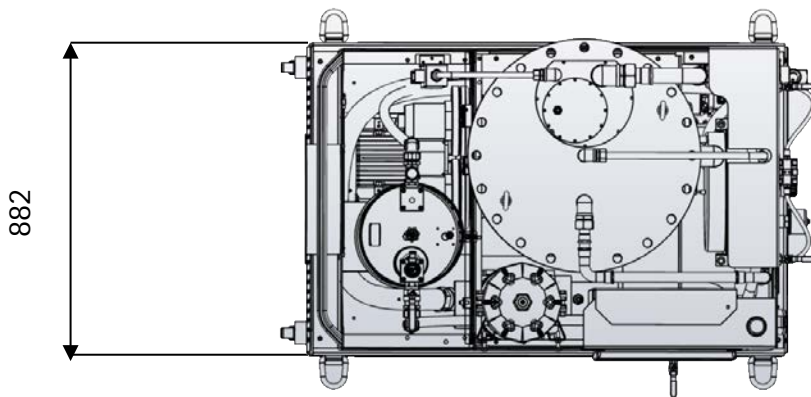
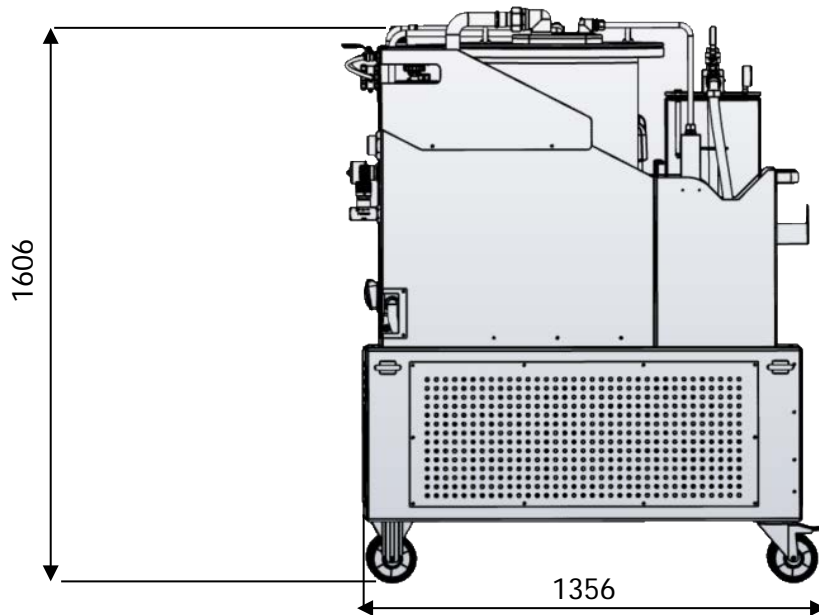
Data	Value	Unit
Rated voltage	400	V
Number of steps	3P + N + T	No.
Frequency	50	Hz

#### 5.4.4 Environmental characteristics of use

Data	Value	Unit
Working Environment	Light, indoor, well ventilated and bright industrial environments	-
Ambient temperature	5 ÷ 40	°C
Humidity at 40 °C	50	%
Storage temperature	See note (1)	-

**NOTE (1):** Storage of the machine not in operation allows a temperature variation between -10 °C to +55 °C (peaking at up to 70 °C for a period not exceeding 24 hours), subject to other precautions.

### 5.4.5 Overall dimensions



*NOTE: Dimensions are in millimetres.*

## 5.5 Noise

The machine has been designed and constructed to reduce airborne noise emission at source to the lowest possible level (Machinery Directive 2006/42/EC, Annex I, para. 1.5.8.).

### IMPORTANT

When assessing the noise risk, pay particular attention to the following points:

- The noise values indicated do not necessarily represent safe operating levels, but represent the state of the art for technically comparable machines representative of the machine to which this manual refers, taking into account technical progress and the availability of means to limit noise, particularly at source.
- The type of product processed and the environment in which the machine is installed can affect the indicated noise levels.
- Although there is a relationship between emission levels and exposure levels, this cannot be reliably used to determine whether or not further precautions are necessary.
- Permissible exposure levels may vary from country to country, what is provided in this manual refers to what is established within the European Community.
- Factors that determine the level of exposure to which the workforce is subjected include the duration of exposure, the characteristics of the workplace and other sources of noise (number of machines, adjacent processes, etc.).
- According to the requirements of Directive 2003/10/EC, the assessment of the noise risk of one's own work environment, the adoption of all necessary safety measures (use of personal hearing protection equipment PPE) or the implementation of permanent soundproofing systems, are the obligation of the employer and are outside the responsibility of the machine manufacturer.
- Supplement the information provided in this manual with the regulations in force in your country.

The sound pressure level  $L_{pA}$ , measured at the operator's station, is:

**$L_{pA} < 80 \text{ dB(A)}$**



# 6 TRANSPORT AND UNLOADING

## 6.1 Transport Information

The machine is shipped in perfect working condition after being tested at the manufacturer's plant.

Depending on the type and size of the components to be shipped, the manufacturer will use appropriate packaging to ensure integrity and preservation during transport until delivery to the customer.

Depending on the distance to the place of delivery, the customer's requirements and the storage time of the machine inside the packaging, the machine will be shipped directly on the truck bed or inside containers. The number and type of trucks and/or containers may vary depending on the load units to be shipped.

In anticipation of a long stay in the packaging or in the case of crossing stretches of sea, where necessary, appropriate precautions are taken to prevent oxidation and rusting of metal parts and the formation of moisture and condensation in electrical equipment

**DANGER**

**VARIOUS HAZARDS ARISING FROM LOAD HANDLING OPERATIONS**

Load-handling operations may present various risks (crushing, shearing, etc.) to persons present in the areas where the operations take place.

- Unloading and handling of the machine must only be carried out by trained and experienced technicians who are familiar with load handling activities.
- The area for unloading and handling of loads must be cordoned off and accessible only to the personnel in charge of the operations.

## 6.2 Equipment Required for Unloading

The customer receiving the machine must be equipped with the unloading equipment listed below. The sizing of the equipment must be made according to the masses of the load units to be lifted and the characteristics of the environment in which the unloading will take place.

	Device	Retrieved
Crane and/or overhead crane		<b>NO</b>
Forklift truck		<b>SI</b>
Lifting bands		<b>NO</b>
Cricket		<b>NO</b>

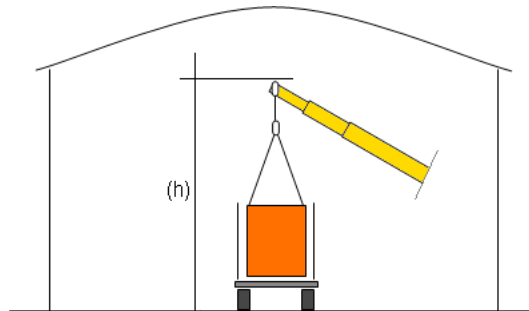
Adjustable chains		<b>NO</b>
Bilancino		<b>NO</b>
Ladders and scaffolding		<b>SI</b>

### 6.3 Preparation of the unloading area

Follow the instructions below in order to set up a dedicated area for unloading.

#### Procedure:

1. Reserve a working area that allows the machine to be unloaded easily. It must be possible to manoeuvre the transport truck and the lifting equipment provided for unloading in the area.
2. Mark off the area and prohibit access by unauthorised persons to unloading operations.
3. In the case of unloading in a covered area, when choosing the lifting gear, take into account the minimum height of the structures (h), which could restrict manoeuvring.



### 6.4 Unloading from the means of transport

Follow the instructions below for proper unloading from the means of transport.

#### Procedure:

1. Use ladders and scaffolding to climb on and off the means of transport. Do not climb on either the means of transport or the loading units.
2. Check that the load units have not been moved or damaged during transport. If they have, report this immediately to the transporter and the manufacturer.
3. Always start unloading the easily accessible load units by unloading one at a time.
4. Locate the attachment points of the load units and always secure the lifting devices before removing the straps and crossbars that secure the load.
5. Reach the attachment points of the load units. Secure the lifting devices by bringing them slightly under tension but without lifting the load.








6. Remove the blocks and straps used to stabilise the load units during transport so that they can be lifted.
7. Move away and unload.

## 6.5 Handling of load groups

Please follow the instructions below for the correct handling of the load units.

### Procedure:

1. There may be illustrations on the load unit indicating the type of lifting or other useful information. Pay attention to the presence of these warnings and always follow their instructions. The following table describes the meaning of the symbols that may be used:

SYMBOL	DESCRIPTION
	<p><b>ISO 780 symbol 6.</b> Slings point. Point at which lifting devices (straps, chains, etc.) can be passed.</p>
	<p><b>ISO 780 symbol 1.</b> Fragile. Load and unload carefully.</p>
	<p><b>ISO 780 symbol 7.</b> Keep the packaging dry and protect it from the weather.</p>
	<p><b>ISO 780 symbol 3.</b> High. Do not turn the packaging upside down.</p>
	<p><b>ISO 780 symbol 8.</b> Centre of gravity. Centre of gravity of the package.</p>
	<p><b>ISO 780 symbol 2.</b> Do not use lifting hooks.</p>
	<p><b>DIN 30600 N.02903</b> Do not use forklift trucks.</p>

## 6.6 General Notes on Lifting and Handling

The load groups can be lifted and then moved in two different ways:

<b>LIFTING FROM BELOW</b>	Using the forks of a forklift or pallet truck properly inserted into the appropriate slots of the loading unit.
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For proper lifting of the load unit, use a lifting device with a capacity appropriate to the weight to be lifted.

**Procedure:**

1. Due to the fact that the centre of gravity of the system is slightly shifted towards the electrical cabinet, it is advisable to place the forklift fork under the machine asymmetrically, slightly shifted towards the electrical cabinet. Care must be taken to avoid damaging the discharge tube attached to the bottom of the machine.
2. After placing the spike platform under the machine, it is recommended to lift it a little off the floor and check whether the machine is stable. If it is not stable and well balanced, it is necessary to place the machine back on the floor and find another place to attach the fork. Repeat the operation until the machine is stably balanced when lifted.
3. Carry out unloading operations carefully, placing the loading unit as close as possible to the point of installation, laying it on the ground very slowly in order to avoid damage to the most delicate parts.
4. During this operation, the lifting equipment must be driven by trained personnel, assisted on the ground by a person in charge of signalling, as the size of the machine does not allow sufficient visibility for manoeuvring.

**WARNING****VARIOUS HAZARDS ARISING FROM LOAD HANDLING OPERATIONS**

During the lifting and handling of loads, there are risks of collision with the handled load and of crushing between the load and fixed parts (machinery, building structures, etc.).

- Entrust all lifting and handling operations to specialised personnel (slingers, crane operators, wheelchair operators, etc.) coordinated, if necessary, by an experienced signalman.
- The lifting devices must necessarily be appropriate for the weight of the load groups to be handled. These organs must also be in excellent condition and certified to safely lift the weight of the machine.
- During lifting and moving of the various assemblies, only unloading and transport personnel should work in the work area, in compliance with common safety regulations, which require buffer zones around suspended loads, forklifts and/or moving bridge cranes.
- Do not stand or walk under the suspended load.
- Authorised operators must be equipped with the personal protective equipment required for material lifting operations.

## 6.7 Unpacking

Upon receipt of the material, follow the instructions below to unpack it properly.

**Procedure:**

1. Open the packaging protecting each individual module.
2. Check that the material is in perfect condition and corresponds to what is described on the delivery notes.
3. After unpacking, no defects or tampering may occur. If they do occur, first notify the carrier, then the manufacturer.

**IMPORTANT**

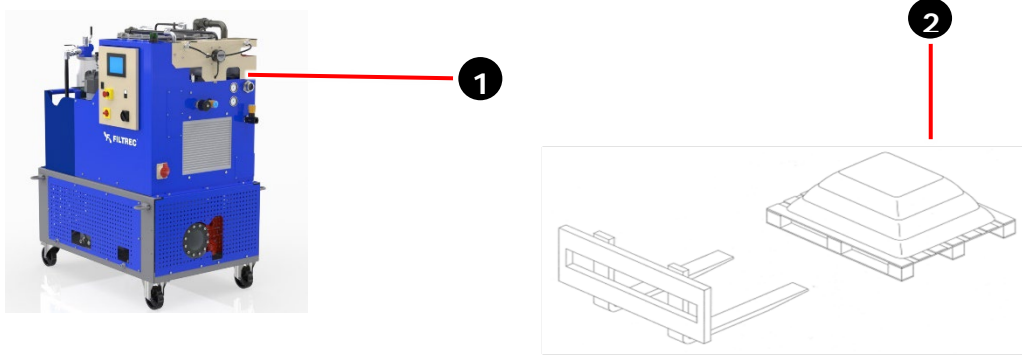
Disposal of packaging materials will be the responsibility of the recipient, who must carry it out in accordance with the regulations in force in the country in which the machine is used.

- Unpack the load units, taking care to separate and sort the waste from the packaging materials.
4. In some machines, the trick is to block certain mechanical parts by placing wooden blocks between them, so as to prevent movement and/or damage to the various assemblies during transport.
  5. As a rule, this is not the case with our machines; however, if in special cases this is necessary, we will clearly mark this on the machine.

## 6.8 Machine Lifting

The machine is shipped in one piece. Please refer to the following for handling and transport.

#	Group	Weight (kg)	Lifting type
1	Machine	650	Low
2	Integrative groups (if any)	-	Low



## 6.9 Temporary Storage

If it is necessary to store the machine for a longer or shorter period pending installation, it is necessary:

### Procedure:

1. Prepare a covered area sheltered from outside weather conditions, large enough to store the machine.
2. Leave the load units in the original packaging in which the machine was shipped.
3. Cover the loading units with tarpaulins to prevent contact with dust.
4. Always check that storage temperatures remain within the limits defined in the technical data.

# 7 INSTALLATION AND COMMISSIONING

## 7.1 Pavement Requirements

With reference to civil works and levelling work on the surface that will house the machine, the machine must be placed on an industrial floor, designed and constructed in a workmanlike manner, in accordance with the legislation and technical standards in force in the country of installation and commissioning (e.g. for Italy, UNI 11146-2005 Concrete floors for industrial use - Criteria for design, construction and testing).

The floor must also be tested and subjected to routine maintenance in order to ensure that functionality is guaranteed during the expected service life.

The rheological and mechanical properties of the concrete mix, which are necessary for the floor to maintain functionality throughout the entire service life of the project, must be established taking into account

- Execution requirements at the time of realisation of the work.
- Static and dynamic loads during operation.
- Possible conditions of aggression.
- Need for an anti-slip surface finish or not.

The flat surface must have no irregularities, whether convex or concave, and the maximum deformation, measured over a distance of 2 m, must be  $\pm 3$  mm (1.5%), and never more than  $\pm 5$  mm (2.5%). Definitions according to classes A and B of UNI 11146.

### 7.1.1 Civil Works

Any civil works and works necessary for the preparation of the installation site are the responsibility of the customer. Any works to be carried out are indicated in the specific layout.

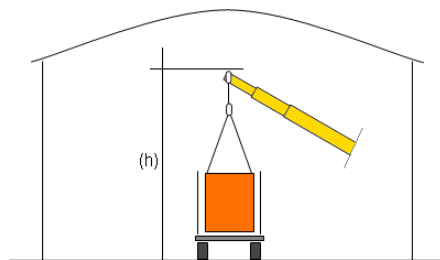
## 7.2 Mechanical assembly

### 7.2.1 Preparations required for mechanical assembly

The customer receiving the machine must carry out the following work in advance:

#### Procedure:

1. Check in advance the dimensions and load-bearing capacity of the flooring according to the size and weight to be supported.
2. Reserve a work area of such dimensions that the machine can be easily assembled. Around the area it must be possible to manoeuvre the lifting equipment intended for assembly.
3. Mark off the work area and prohibit access by unauthorised persons to assembly operations.
4. When choosing the lifting gear, take into account the minimum height of the structures (h), which could restrict manoeuvring.
5. Provide suitable ducting and piping to connect the machine to energy sources (electrical, pneumatic, etc.).



### 7.2.2 Assembly and positioning

After positioning the machine, and checking that the position is in accordance with the installation layout, proceed as follows:

#### Procedure:

1. Free the machine from all fasteners, stiffening equipment and protective tongues of moving parts that may be used for transportation.
2. Using the wheels (**1**) mounted underneath the machine, bring it closer to the oil tank to be treated.
3. When you reach the work station, lock the wheels of the machine.
4. Connect the machine to the power supply.
5. Connect the suction hose and the return hose for the oil to be treated.



#### IMPORTANT

##### CONNECTING PIPES

The characteristics of the pipes are summarised below:

- Oil inlet: FLEXIBLE PIPE WITH 1"1/2" GAS CONNECTIONS
- Oil outlet: FLEXIBLE PIPE WITH 3/4" GAS CONNECTIONS

*NOTE: To ensure optimum working efficiency and reduce pressure losses, the length of the connecting pipes should not exceed 8 metres.*

#### ATTENTION

##### TRIPPING HAZARD

In order to reduce the risk of tripping over temporary connecting pipes, it is MANDATORY:

- Position the machine as close as possible to the product tank to be treated
- Mark, where possible, the presence of temporary piping

### 7.3 Noise-reducing installation and assembly instructions

Under conditions of proper use, the noise level is such that no dangerous situations arise.

#### **7.4 Installation and assembly instructions to reduce vibrations**

Under conditions of proper use, vibrations are not such as to give rise to dangerous situations.

#### **7.5 Lighting**

The lighting of the installation environment must comply with the laws in force in the country where the machine is installed and must in any case ensure good visibility at all points, not create dangerous reflections and allow the control panels to be clearly read and the emergency buttons to be identified.

The machine has no independent light sources, and the working environment must be equipped with general lighting to ensure values between 200 and 300 lux at every point of the machine.

#### **7.6 Discharging Process Fluids**

The machine is equipped with taps for draining the fluids at the end of the machining process.

It remains the responsibility of the machine's end customer to set up a drainage system (connection pipes, connection to sewers, dedicated sumps) to collect the fluids discharged by the machine. The management of the collected fluids is also left entirely to the machine's end customer.

#### **IMPORTANT**

##### **OIL DISPOSAL**

It is **OBLIGATORY** to dispose of residual oil in accordance with the regulations in force in the country of use.

*NOTE: To see the positioning and operation of the drains, please refer to the chapter DESCRIPTION AND TECHNICAL DATA.*



## 7.7 System Connection

### 7.7.1 Electrical system connection

#### IMPORTANT

The installation of electrical equipment must be carried out in accordance with current legislation on safety and electrical installations.

- It is the obligation of the final machine manufacturer to assess compliance with the applicable directives and standards.

#### Prerequisites:

The customer receiving the machine must provide a distribution board for a 32A industrial-type socket in the vicinity of the machine.



#### DANGER

#### ELECTROCUTION RISKS

Poorly executed connections or wiring can cause electrical hazards.

- Make sure that the machine's electrical cabinet is actually prepared for mains voltage. If it is necessary to change the supply voltage, contact the manufacturer.
- If work has to be carried out on the electrical installation upstream of the main switch (e.g. phase reversal), the main switch must be locked in the "OFF" position so that only the maintenance operator can reactivate it. (e.g. padlocking).

#### Procedure:

1. The electrical installation and earthing line must comply with the regulations or legal provisions in force in the country where the machine is installed.
2. If the machine is not equipped with overcurrent protection, the installation of the protection device must be carried out by the customer. The circuit diagram shows data on the type of device, rated current, regulation or setting against overloads and short-circuits. If there is a neutral conductor, it is not necessary to provide protection against overcurrents if its cross-section is the same as that of the phase conductors.
3. Check that the mains voltage of corresponds to that shown on the circuit diagrams
4. The connection to the mains supply must be made exclusively via the terminal box inside the control cabinet and the prepared earth connection.
5. It is necessary that there are no voltage fluctuations on the 'lines' and, above all, that the connecting cables have an adequate cross-section for the installed electrical power.

## 7.8 Commissioning (first start-up)

Testing and verification of initial start-up must be carried out by specialised personnel authorised by the manufacturer.

### DANGER

#### **VARIOUS MECHANICAL RISKS RESULTING FROM THE ABSENCE OR TEMPORARY DISABLING OF MACHINE PROTECTION MEASURES**

During the initial start-up phase, protection measures may be removed or temporarily disabled for technical reasons.

- Only experienced personnel (maintenance technicians and/or the manufacturer's), trained and informed of the risks involved, are authorised to work on the machine with the protective measures removed or temporarily disabled.
- Personnel assigned to work on the machine (machine operator) must be informed of the risks present at this stage and remain away from the danger zones.
- It is compulsory to affix a warning sign and not to approach dangerous areas of the machine.

### 7.8.1 Checks required for initial start-up

Carry out the following checks before testing the movements:

#### **Procedure:**

1. Check that the mechanical and electrical assembly operations, described in the previous paragraphs, have all been completed.
2. Power up the machine and check that all energy sources are working properly.
3. Check that all machine commands and signals from detection and control devices (sensors, photocells, etc.) are correctly acquired by the command and control logic.

### 7.8.2 Testing of Movements

Please follow the instructions below to carry out the movement test:

#### **Procedure:**

1. Power up each individual motor and check its direction of rotation.
2. Test all functions that can be carried out with manual controls.
3. Test all work cycles.

### 7.8.3 First machine start-up

The first start-up of the machine must be carried out by our service department or by experienced and qualified personnel. The initial start-up procedure can be carried out without the product, to check the correct operation of the machine's assemblies, and subsequently with the product to be processed to check the correct operation of the machine.

### DANGER

#### **VARIOUS MECHANICAL RISKS CAUSED BY THE INITIATION OF MOVEMENTS**

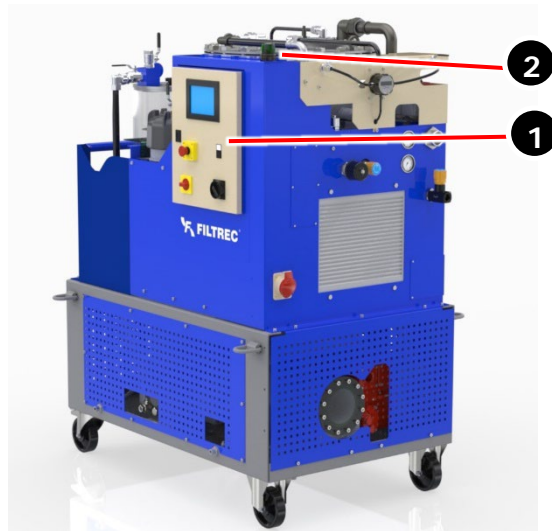
Untimely start-up of the machine with personnel working on moving parts or power circuits causes danger to any 'exposed persons'.

## 7.9 Commissioning after a long period of inactivity

After a long period of inactivity of the machine, it is necessary to repeat the operations described for initial start-up.

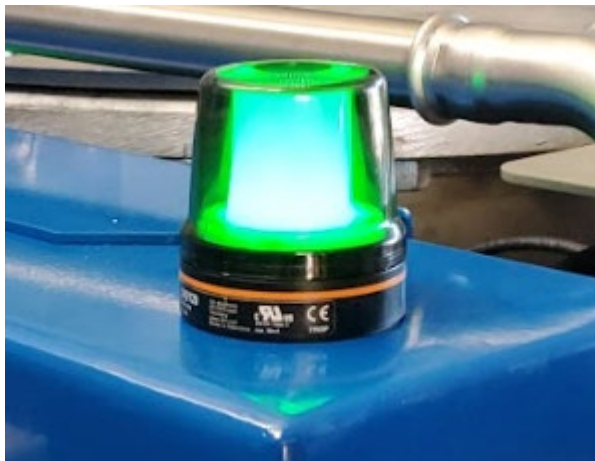
## 8 COMMANDS AND SIGNALS

### 8.1 Location of control panels and signals



#	Component
1	Main control panel
2	Signalling LEDs

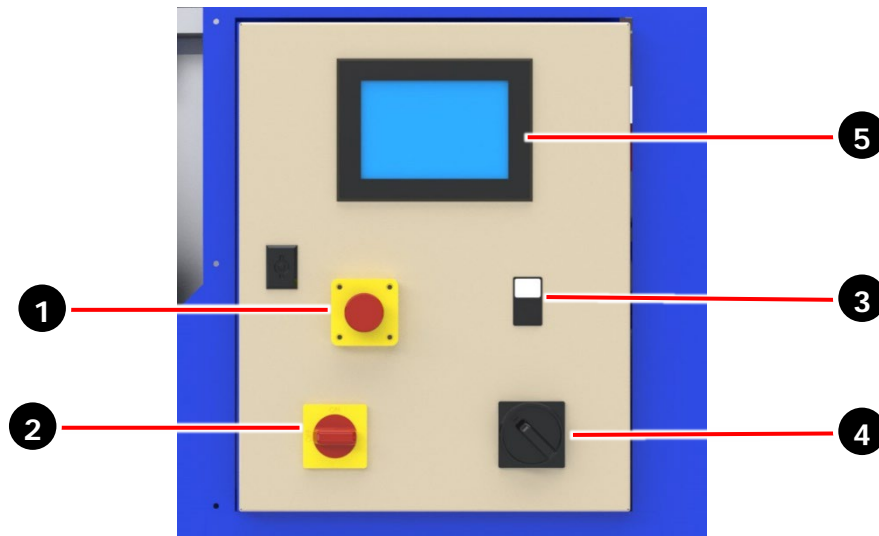
### 8.2 Signalling LEDs



#	Function
-	<b>GREEN LIGHT</b> The machine is in automatic operation.
-	<b>RED LIGHT</b> The machine is in a state of emergency.

*NOTE: inside the machine there is a plexiglass panel where LED strips are installed that replicate the colour of the LED above the control panel.*

### 8.3 Main control panel



#	Function
1	<p><b>EMERGENCY BUTTON</b></p> <p>Press in case of imminent danger to the person. The stop has priority over all controls. When the machine or its dangerous functions are stopped, the power supply to the relevant actuators is interrupted.</p> <ul style="list-style-type: none"> <li>□ When pressed, turn to unlock.</li> </ul>
2	<p><b>MAIN SWITCH</b></p> <p>Turn the switch to position:</p> <ul style="list-style-type: none"> <li>□ "ON", to switch on the power supply.</li> <li>□ "OFF" to switch off the power supply.</li> </ul> <p>The switch can be locked in the 'OFF' position by means of special jaws and/or padlocks.</p>
3	<p><b>CYCLE START/STOP</b></p> <p>Press the button to start or stop the work cycle.</p>
4	<p><b>PHASE INVERTER</b></p> <p>If the phases are reversed, the machine will not switch on. This control is used to align the switchboard phases with the external power supply phases.</p>
5	<p><b>COMMAND SOFTWARE</b></p> <p>Please refer to the <b>software chapter</b> for further information.</p>

## 9 CONTROL SOFTWARE

### 9.1 Touch screen control panel

The machine is equipped with a touch screen control panel on which the control software runs. From the various pages of the touch screen it is possible to set and check the working parameters of the machine, according to the specific instructions given below.

#### IMPORTANT

Incorrect use of the touch screen may result in breakage of the device itself.

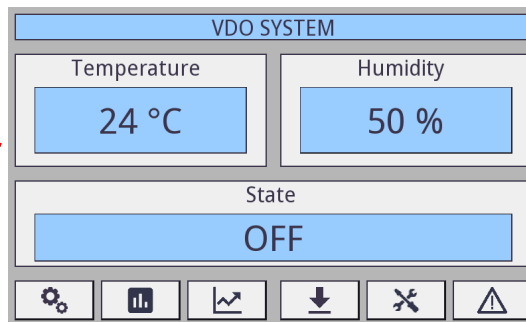
- Do not press too hard on the video.
- Do not press the video with tools (e.g. screwdrivers, spanners, etc.).

#### IMPORTANT

Incorrect setting of software work parameters can generate errors in machine cycles, causing product processing problems.

- Interventions or parameter adjustments may only be carried out by qualified personnel.
- Always contact the manufacturer in case of doubt or if you need more information.

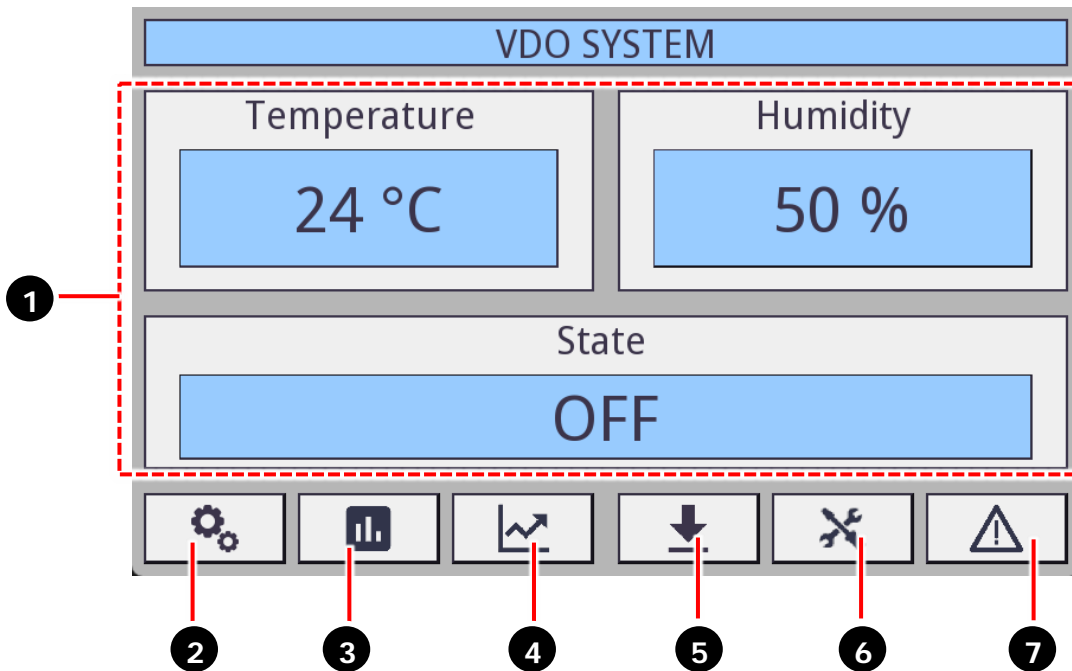
#### 9.1.1 Location of the control panel



### 9.2 User login

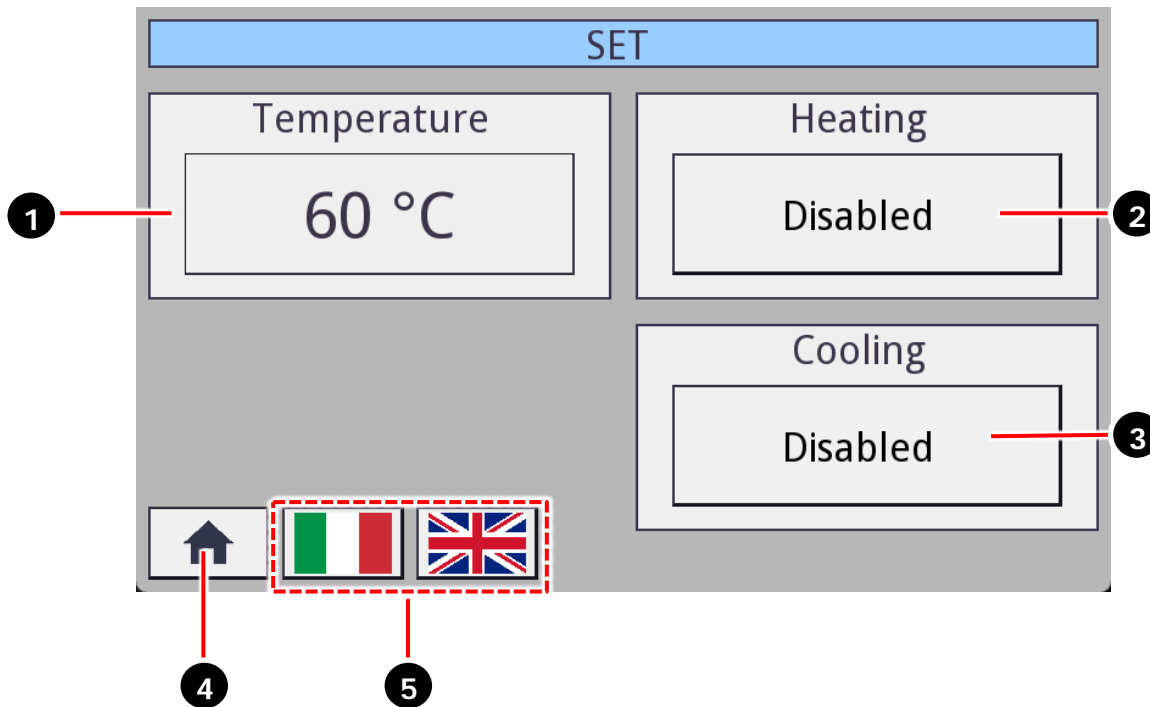
All main machine functions are freely accessible by the operator. The modification of functional parameters is reserved for authorised technical personnel after access by means of a suitable password.

### 9.3 MAIN Page



#	Function
1	<b>INFORMATION AREA</b> The area contains information on: <ul style="list-style-type: none"> <li><input type="checkbox"/> Oil temperature</li> <li><input type="checkbox"/> Percentage of oil moisture</li> <li><input type="checkbox"/> Machine Status</li> </ul>
2	<b>GENERAL SETTINGS</b> Press the button to access the general settings page.
3	<b>STATES</b> Press the button to access the general machine diagnostics display page.
4	<b>GRAPHICS</b> Press the button to access the page displaying the trend graphs of the working parameters.
5	<b>DISCHARGE</b> Press the button to access the manual oil drain adjustment page.
6	<b>PASSWORD</b> Press the button to access the basic settings and access the real time panel
7	<b>ALARMS</b> Press the button to access the alarm display page.

### 9.3.1 GENERAL SETTINGS page



#	Function
1	<b>TEMPERATURE</b> Allows the maximum heating temperature to be set.
2	<b>HEATING</b> Press the button to enable/disable the oil heating process.
3	<b>COOLING</b> Press the button to enable/disable the cooling process of the steam formed during the process.
4	<b>MAIN PAGE</b> Press the button to return to the main page.
5	<b>LANGUAGE</b> Press the buttons to select the language of the control software.

#### IMPORTANT

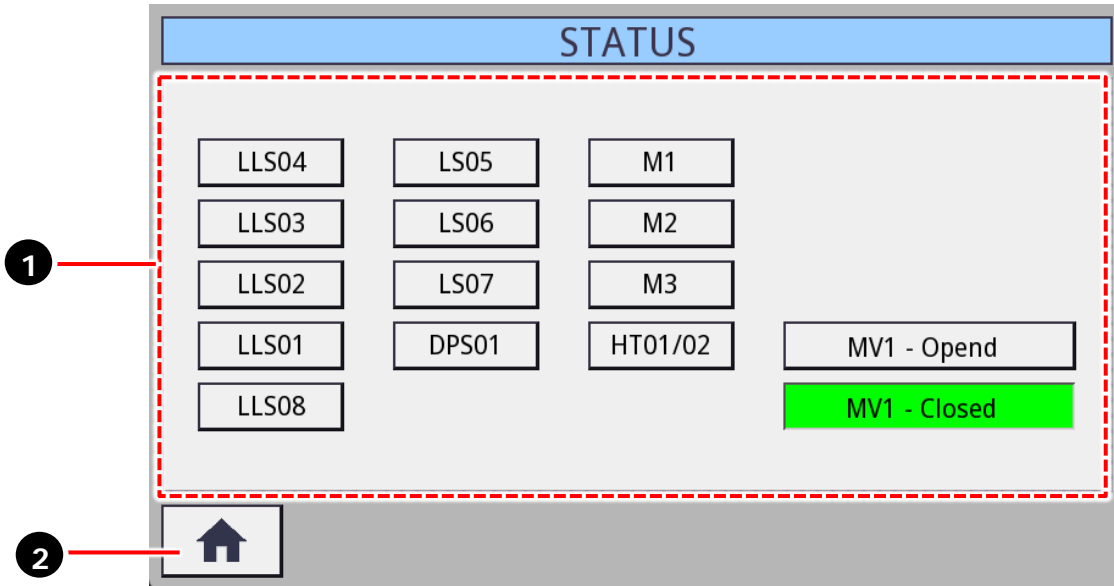
##### HEATING AND COOLING

Heating and cooling processes are always active during the entire work cycle. They can only be enabled or disabled in the following cases:

- Cleaning the machine.
- Machine maintenance.

### 9.3.2 STATUS Page

The screen displays the status of the sensors, valves and motors on the machine. When a status lights up green, it means that it is currently active.

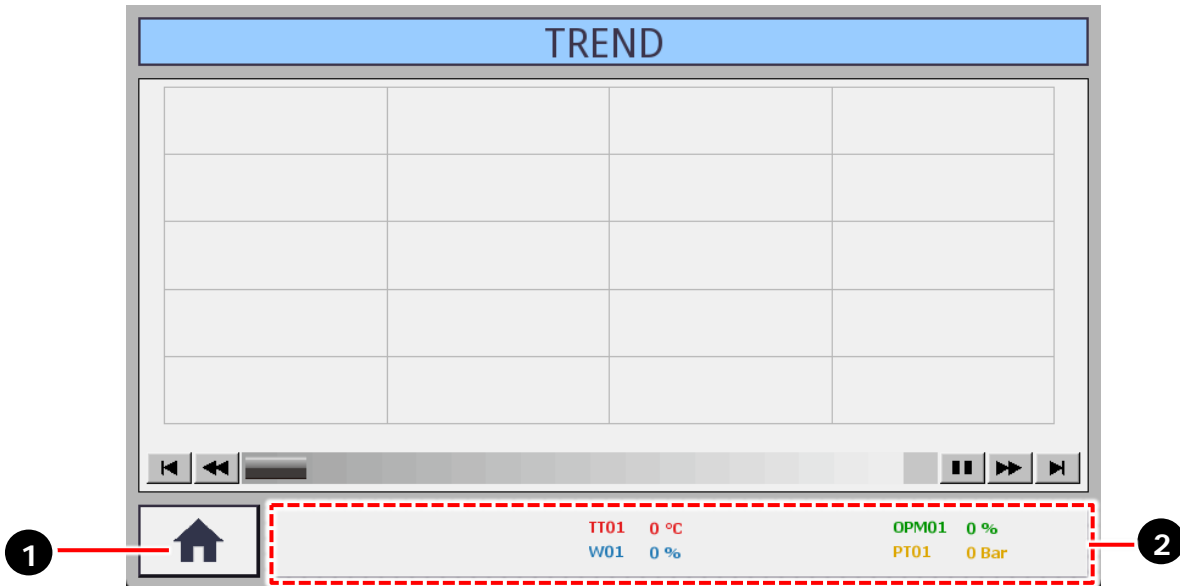


#	Function
1	<b>INFORMATION AREA</b> LLS01 - MINIMUM FILLING LEVEL LLS02 - TREATMENT START LEVEL LLS03 - INTERMEDIATE WORKING LEVEL LLS04 - MAXIMUM FILLING LEVEL LS05 - INTAKE FILTER CLOGGING LS06 - WATER PRESENCE IN WATER STORAGE TANK LS07 - WATER PRESENCE IN VACUUM PUMP FILTER LLS08 - OIL PRESENCE ON TROLLEY  DPS01 - CLOGGING FILTER ON DISCHARGE  M1 - OIL PUMP MOTOR M2 - VACUUM PUMP MOTOR M3 - FAN MOTOR  HT01/02 - OIL HEATING RESISTOR  MV1 - OIL SUCTION VALVE
2	<b>MAIN PAGE</b> Press the button to return to the main page.



### 9.3.3 GRAPHIC page

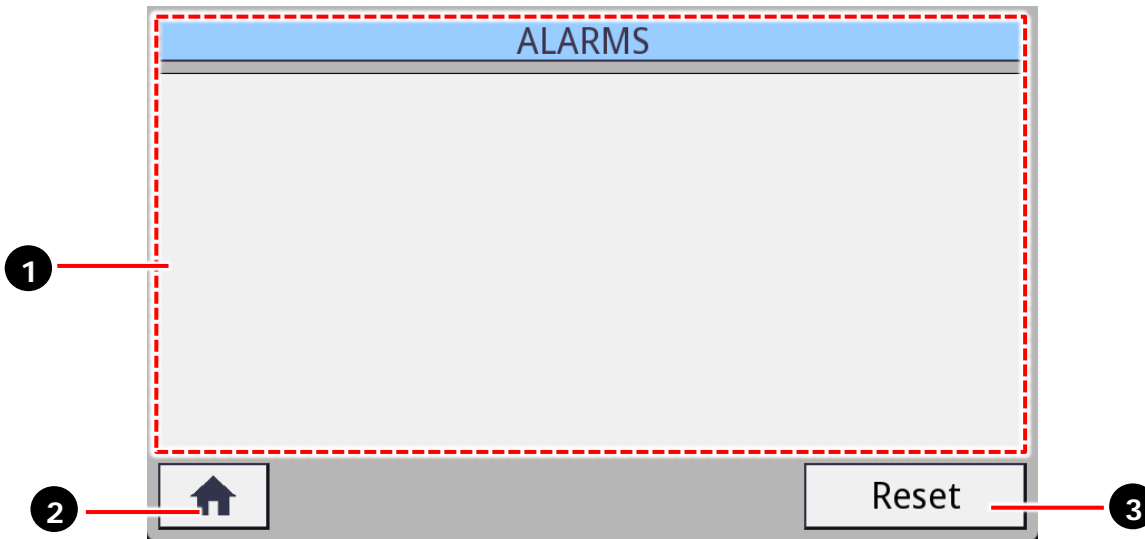
The screen allows you to view the progress of working parameters, such as temperature, pressure and humidity percentage, during the work cycle.



#	Function
1	<b>LEGEND</b> TT01 - Oil temperature W01 - % relative humidity OPM01 - oil contamination level PT01 - delivery pressure
2	<b>MAIN PAGE</b> Press the button to return to the main page.

### 9.3.4 ALARMS page

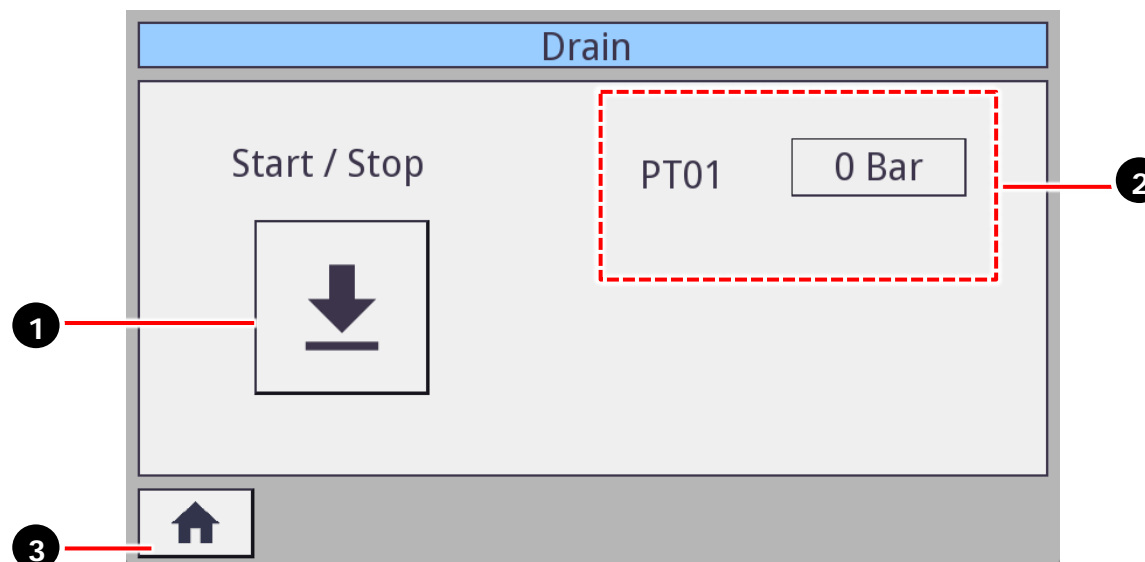
The screen displays the active alarms.



#	Function
1	<b>ALARM TABLE</b> Within the area, alarms currently present are shown.
2	<b>MAIN PAGE</b> Press the button to return to the main page.
3	<b>RESET</b> Press the button to logically reset the alarm signals, after the causes that caused them have been resolved.

### 9.3.5 DISCHARGE page

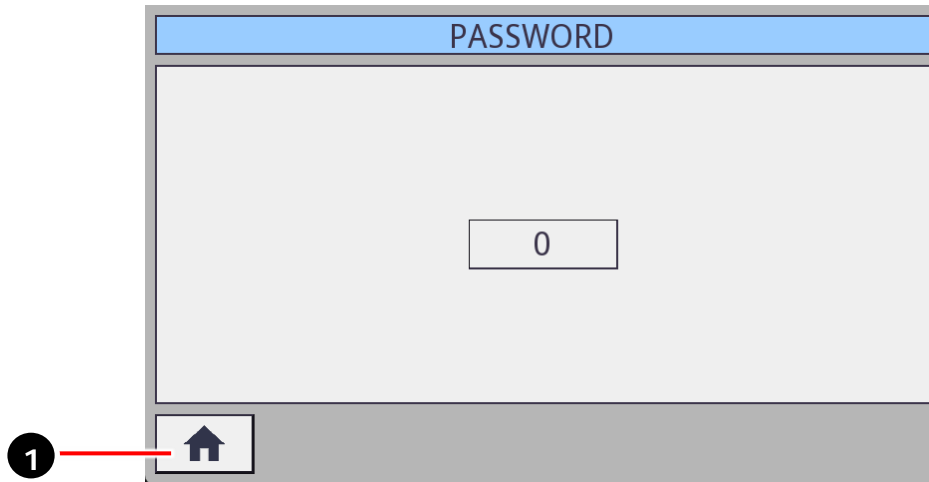
The screen allows you to start/stop oil draining.



#	Function
1	<b>START/STOP</b> Press the button to start or stop the oil draining process.
2	<b>PRESSURE</b> Allows the oil delivery pressure to be displayed.
3	<b>MAIN PAGE</b> Press the button to return to the main page.

### 9.3.6 PASSWORD page

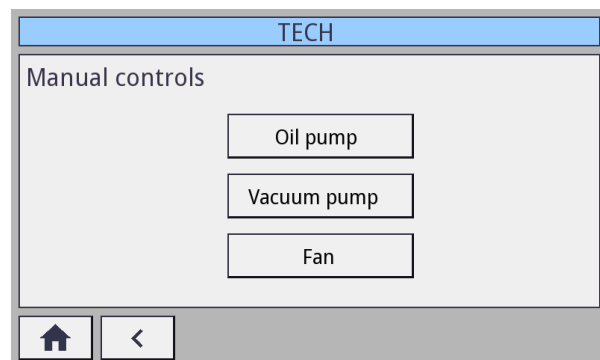
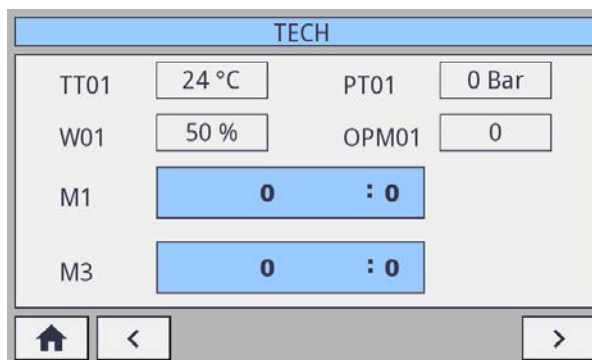
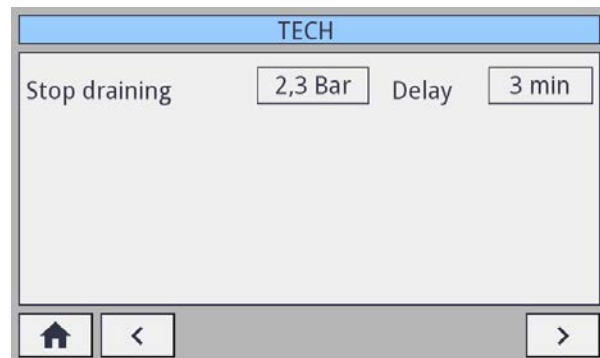
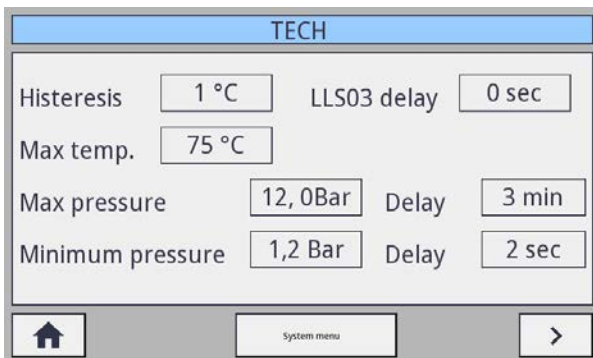
The screen allows you to enter the password to access the machine parameter edit pages. Only specialised technical personnel are allowed to do this.



#	Function
1	<b>MAIN PAGE</b> Press the button to return to the main page.

### 9.3.7 FUNCTIONAL PARAMETERS pages

The following screens allow you to change the machine's functional parameters. As the operation is reserved for experienced personnel, no detailed description of the pages is given.



# 10 USE

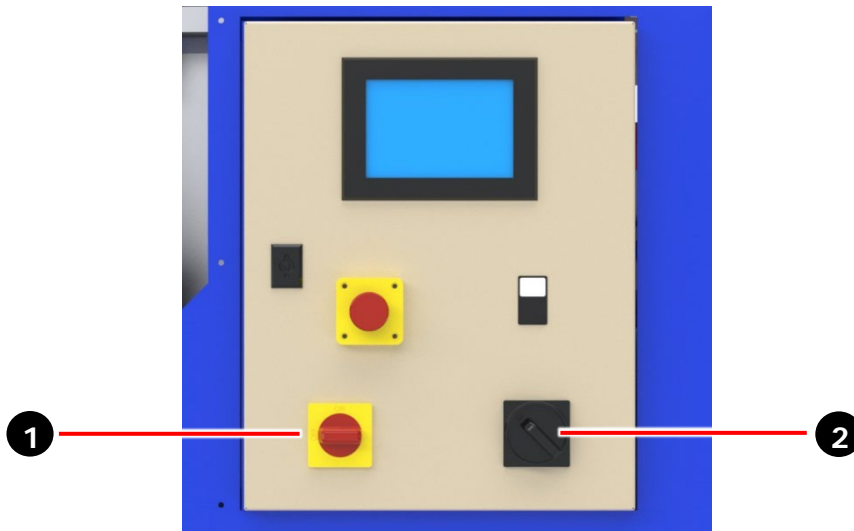
## 10.1 Switching on the machine

### Prerequisites:

- The machine must be in a condition in which it can be powered. Switching on the power supply must not generate unforeseen risks.
- If maintenance work has been carried out, check that all dismantled parts have been put back in place.
- All machine guards must be fitted and functional.
- Access doors to the switch cabinet and all boxes containing live parts must be closed.

### Procedure:

1. Turn the GENERAL SWITCH (1) on the main panel to the 'ON' position to switch on the power supply. The control panel display will light up and the main software page will be displayed. If the power supply does not switch on, turn the phase selector switch (2) and repeat the previous sequence.



## 10.2 Restoring security

### Prerequisites:

- The machine must be powered
- The emergency button was pressed

### Procedure:

1. Unlock the emergency button by turning it
2. Restart the operating cycle by pressing the RUN/STOP CYCLE button

## 10.3 Operating procedures and adjustments

### 10.3.1 Vacuum level adjustment

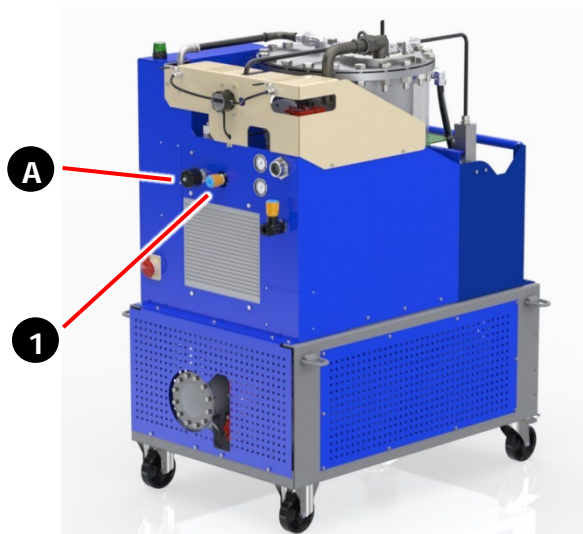
If it is necessary to adjust the vacuum level within the working chamber, please refer to the following procedure.

#### Prerequisites:

- The machine is in operation.

#### Procedure:

1. Turn the manual valve (1) clockwise to close it and decrease the incoming air flow.
2. Turn the manual valve (1) anti-clockwise to open it and increase the incoming air flow.



#### IMPORTANT

##### AIR INPUT

The incoming air is first filtered through a specific filter (A) that removes any impurities that may be present.

Adjust the vacuum level to -0.75 bar with hot oil at a temperature of 50°/60°.

### 10.3.2 Output oil flow regulation

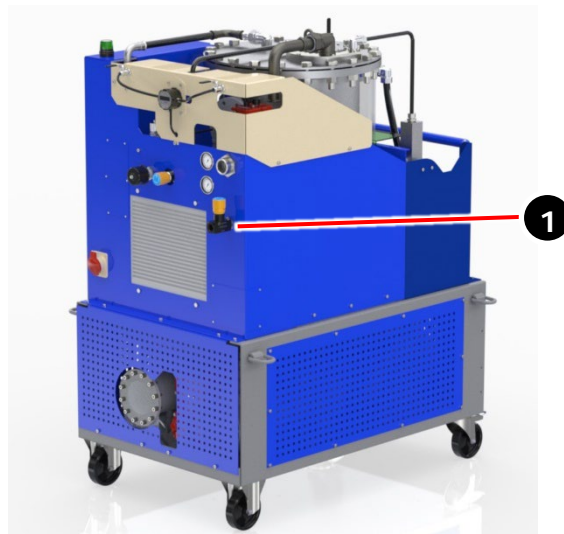
If it is necessary to adjust the oil flow out of the machine, please refer to the following procedure.

#### Prerequisites:

- The machine is in operation.

#### Procedure:

1. Turn the manual valve (1) clockwise to close it and decrease the oil flow.
2. Turn the manual valve (1) anti-clockwise to open it and increase the oil flow.



#### IMPORTANT

##### OIL OUTPUT

Adjust oil outlet until internal system pressure  $>1.5$  bar is reached.  
Maximum permissible pressure 6 bar

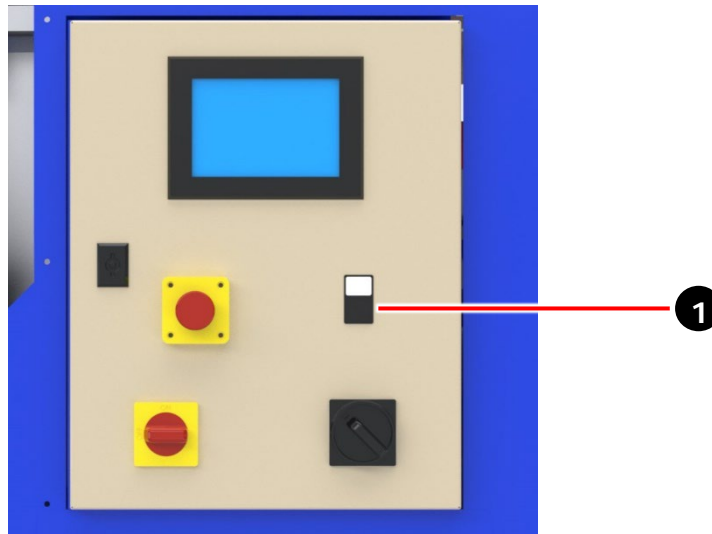
## 10.4 Starting and Stopping the Work Cycle

### Prerequisites:

- The machine is powered
- Piping connection procedures to and from the oil tank were carried out

### Procedure:

1. **Start machine** - Press the RUN/STOP CYCLE button (1) to start the automatic oil treatment cycle
2. **Operational stop** - Press the RUN/STOP CYCLE button (1) to carry out the operational cycle stop procedure.  
At the end of the procedure the machine is ready to resume the work cycle that has just been interrupted.



### ATTENTION

#### **BURN HAZARD - OIL SPILLAGE**

The maximum process temperature the oil can reach is 75°C. The execution of a standard work cycle does not result in hot oil residue remaining in the machine, as all the treated product is returned to the tank from which it was taken. In the event of an accidental spillage (e.g. caused by a pipeline rupture), this can lead to burns. The use of thermal-heat-risk gloves (50°C < T < 100°C) is MANDATORY during the ensuing intervention procedures.

### DANGER

#### **WATER BAN IN THE EVENT OF FIRE**

Given the nature of the product being treated, it is ABSOLUTELY FORBIDDEN to use water to extinguish any fires that may develop. It is the responsibility of the employer to provide suitable extinguishing media.

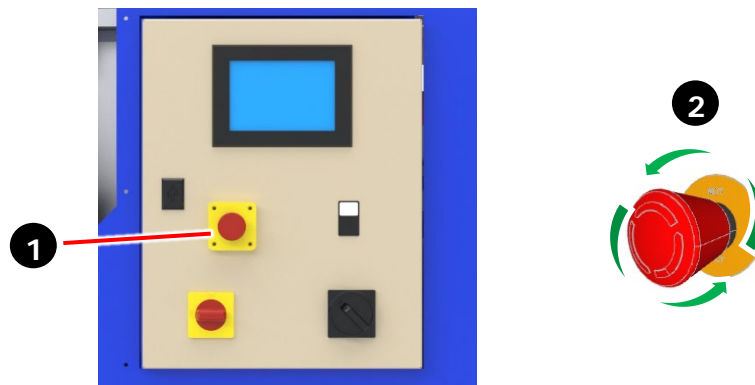
## 10.5 Emergency stop and restart

### Prerequisites:

- The emergency stop is a safety stop procedure for the machine and should only be used in the event of danger to the operator or exposed person.
- When starting this procedure, priority is given to stopping the movements of all machine parts quickly in order to minimise risks to the exposed person.
- During the emergency stop, the integrity of the processed material is not guaranteed.

### Procedure:

1. Press the emergency button (1) on the machine in a condition of imminent danger. The stop takes place in the shortest possible time.
2. After an emergency stop, the causes must be identified and removed and normal operating conditions restored.
3. Unlock the emergency button by turning it (2). This operation is necessary to perform a safety reset.
4. Restart the automatic work cycle by pressing the RUN/STOP CYCLE button



## 10.6 Switching off

### WARNING

#### VARIOUS RISKS ARISING FROM INCORRECT SWITCH-OFF

Switching off the machine in any other way than indicated may result in damage or danger to exposed persons.

- Follow the switch-off procedure.

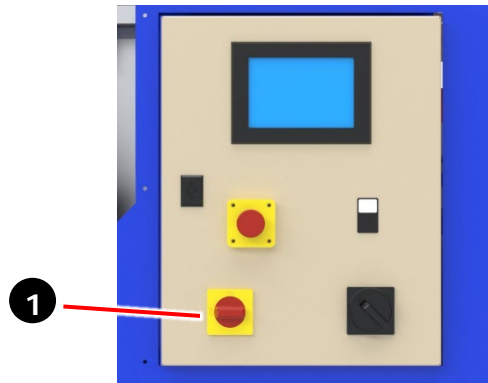
### Prerequisites:

- Depending on work shifts and planned stops, if the machine has to remain idle, or has to be accessed for maintenance work, it must be switched off.

### Procedure:

1. Complete the work cycle by passing all material through and stop the machine.
2. Turn the GENERAL SWITCH (1) on the control panel to the OFF position to switch off the power supply.





#### WARNINGS

##### **ACCESS FOR MAINTENANCE WORK**

In the case of access for maintenance work, the activation of power supplies can create risks for exposed persons.

- Section the feeds and lock them with jaws and padlocks, in accordance with LockOut/TagOut procedures.

# 11 MAINTENANCE

## 11.1 Introduction to maintenance

The chapter contains information on the maintenance operations that must be carried out to keep the machine in proper working order at all times, in accordance with the purposes for which it was built.

By definition, MAINTENANCE is the combination of all technical and administrative actions, including supervisory actions, aimed at maintaining or returning an entity to a state in which it can perform the required function.

This information is divided according to the type of maintenance:

- Inspection interventions
- Cleaning
- Lubrication and greasing operations
- Mechanical maintenance work
- Electrical maintenance work

### IMPORTANT

It is MANDATORY that maintenance personnel be trained and instructed in the residual risks that remain during maintenance operations.

- The complete list of risks and the corresponding safety measures are described in the **chapter 'Safety'**.
- Knowledge of the contents of the **'Safety' chapter** is a prerequisite for machine maintenance.
- For all work not described in this chapter, it is MANDATORY to always contact the manufacturer for support.

### IMPORTANT

#### PREMISE - EXTERNAL SUPPLY COMPONENTS

The machine includes a range of externally supplied equipment (vacuum pump, electric heating resistors, siphon filter, etc.) for the integration of which the relevant safe installation instructions have been followed. Please refer to the relevant instruction manuals for all specific maintenance procedures.

## 11.2 Access Procedure for Maintenance

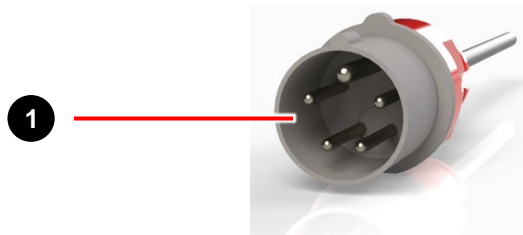
### 11.2.1 Access to the machine with power supply isolation

#### IMPORTANT

In order to carry out maintenance work, it is MANDATORY to isolate the machine from energy sources, in order to prevent unexpected start-up during work.

#### Procedure:

1. Disconnect the plug (1) from the plant's electrical distribution panel to switch off the power supply.
2. Bring the plug close to the machine where the service technician can always check its presence.



*NOTE: a general disconnecting switch is also provided on the electrical panel, but its use is intended for normal operating procedures for switching the machine on/off. For all maintenance operations it is MANDATORY to disconnect the power supply socket.*

### 11.2.2 Working on hot parts

The maximum process temperature the oil can reach is 75°C. The following is the procedure for safe intervention on components heated directly or indirectly (by the passage of oil) .

#### Procedure:

1. Switch off the machine and carry out the safe power disconnection procedure
2. Wait for all hot elements to cool down COMPLETELY before carrying out scheduled maintenance work.

#### ATTENTION

#### BURN RISK

If immediate work must be carried out on hot parts (without having waited for complete cooling), it is MANDATORY to use thermal-heat-risk gloves (50°C < T < 100°C).

### 11.2.3 Access to the Switchboard

**DANGER**

#### **RISK OF ELECTROCUTION**

The switchboard access key allows the doors to access live parts to be kept closed and locked.

- The key must be used for the time necessary to carry out the intervention. At the end of the intervention, it must be removed and kept by the person appointed for this purpose.
- The key may only be used by authorised and qualified persons, identified by means of a written procedure.
- Duplicating the key is prohibited.

#### **11.2.3.1 Access for off-voltage work**

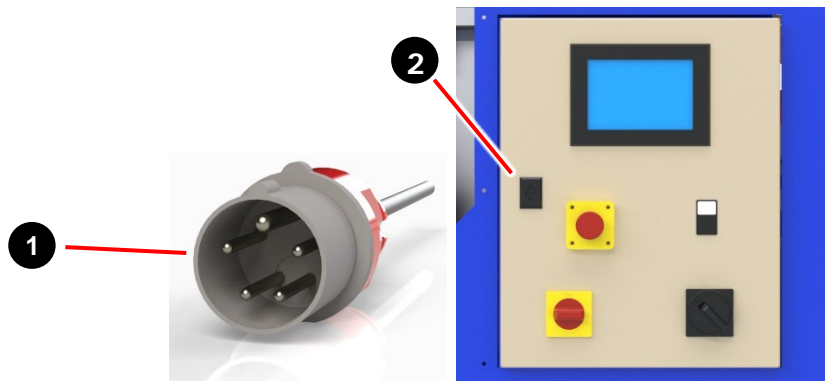
If it is necessary to intervene on the switchboard, for off-voltage work, proceed as follows:

##### **Prerequisites**

- Use of experienced (PES) or warned (PAV) personnel.

##### **Procedure:**

1. Disconnect the plug (1) from the plant's electrical distribution board to switch off the power supply.
2. Bring the plug close to the machine where the service technician can always check its presence.
3. Make sure the power selector switch is in the OFF position.
4. Insert and turn the key into the appropriate locks (2) to open the ignition access door.
5. After completion of the work, lock the door. Remove the key and store it in a safe place.



#### **11.2.3.2 Access for live interventions**

If it is necessary to work on the switchboard, for live work, proceed as follows:

##### **Prerequisites**

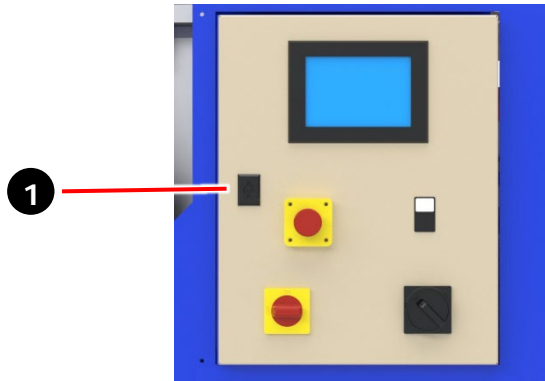
- Use of experienced (PES) or warned (PAV) personnel.
- Employment of suitable personnel (IEP).

**Procedure:****DANGER****RISK OF ELECTROCUTION**

Working on components can cause electrocution risks through contact with live parts.

- Only persons qualified and authorised to carry out live work, who are aware of the specific risks for such activities, may access the switch cabinet.

1. Switch off the machine.
2. Insert and turn the key in the appropriate locks (1) to open the access door to the switch cabinet.



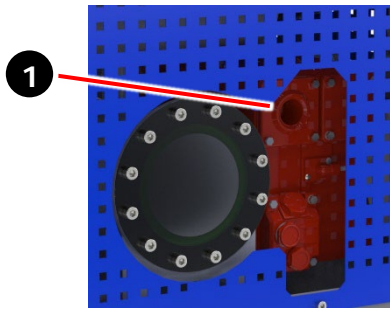
3. Perform work on live components.



4. Power up the switchboard again by means of the main switch.
5. After completion of the work, lock the door. Remove the key and keep it in a safe place.

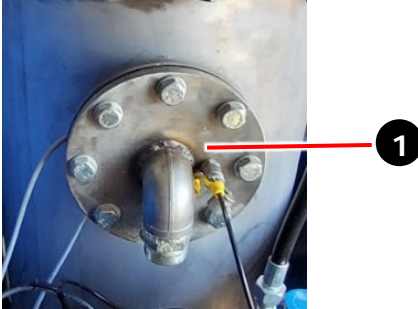
### 11.3 Inspection

Purpose	Actions
Prevent abnormal operating conditions by means of visual inspection of the components/work cycle, carried out both by the operating personnel, while the machine is being operated, and by maintenance personnel.	During the work cycle, visually check the machine and report any faults to be rectified by maintenance personnel.
	Prevent prolonged malfunctions from causing a fault, which would result in damage or a breakage that would impair smooth operation.
	Carry out regular inspections as set out in the maintenance plan

WHAT	HOW	FREQUENCY
Verification of protective measures	<ul style="list-style-type: none"> <li>Check the presence and efficiency of guards, alarm devices and protective devices before each use of the machine. See <b>chapter "Safety"</b>.</li> </ul>	DAILY
Checking machine information and warnings	<ul style="list-style-type: none"> <li>Visually inspect that all information and warning signs on the machine are intact and legible, and replace them if necessary. See <b>chapter 'Safety'</b>.</li> </ul>	SEMESTRAL
Fluid leakage control	<ul style="list-style-type: none"> <li>Visually inspect for fluid leaks from pipes, flanges and circuit fittings on the machine. If necessary, feed the circuits for checking. If leaks are found, maintenance personnel must repair them before the machine can be used.</li> </ul>	DAILY
Visual check of vacuum pump oil level	<ul style="list-style-type: none"> <li>Visually inspect the level of lubricant present via the level indicator (1) on the vacuum pump</li> </ul>  <ul style="list-style-type: none"> <li>Should this level be below the minimum required, please refer to the procedure under <b>'Lubrication and Greasing'</b>.</li> </ul>	WEEKLY
Visual check of filter status	<ul style="list-style-type: none"> <li>The status of the filters can be displayed by means of electrical sensors or visual indicators installed in the lower section of the machine. If these are saturated, contact the manufacturer for replacement.</li> </ul>	ON CONDITION

## 11.4 Cleaning

Purpose	Actions
Eliminate the superfluous from the workplace and order the necessary things.	Distinguish between what is needed and what is not.
Keep the workplace and the machine clean.	After initial cleaning, remove sources of dirt (dust, machining residues, etc.) making the workstation and machine perfectly clean.

WHAT	HOW	FREQUENCY
General machine and workplace cleaning	<ul style="list-style-type: none"> <li><input type="checkbox"/> Promptly remove dirt deposits (residual dust, oil, grease) that could affect the proper functioning of the machine and its components.</li> <li><input type="checkbox"/> Remove machining residues from the machine and working areas.</li> </ul>	DAILY
Cleaning control panels	<ul style="list-style-type: none"> <li><input type="checkbox"/> Clean the control panels with a suitable cloth, avoiding the use of aggressive cleaning products.</li> </ul>	WEEKLY
Dust removal	<ul style="list-style-type: none"> <li><input type="checkbox"/> Avoid the accumulation of dust by removing it from the machine using an appropriate device (vacuum cleaner) or rags.</li> <li><input type="checkbox"/> If suspended dusts may be a source of explosion risk, remove them only with vacuum cleaners classified for use in an ATEX environment.</li> </ul>	WEEKLY
Cleaning spray nozzles	<ul style="list-style-type: none"> <li><input type="checkbox"/> Unscrew and remove the support flange (1) of the various nozzles, located at the top of the vacuum chamber.</li> </ul> <div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li><input type="checkbox"/> Disassemble them individually and clean with compressed air</li> </ul>	ON CONDITION

**ATTENTION**

**PREVENTIVE DEPRESSURISATION**

- Before performing any work on the vacuum chamber, it is necessary to ensure that the interior is COMPLETELY depressurised.

*NOTE: Contact the manufacturer before working on the support flange or other chamber components.*

## 11.5 Lubrication and greasing

Purpose	Actions
Rotating parts, bearings, axles, etc. must be lubricated to reduce possible friction.	Check and reset the oil level at the scheduled intervals or when necessary.

WHAT	HOW	FREQUENCY
Lubrication	<ul style="list-style-type: none"> <li>- When using an equivalent oil for the first time, the system must be emptied and completely cleansed of the old oil. Mixing oils of different brands can lead to functional problems and should be avoided.</li> <li>- Top up the oil in the tanks without exceeding the maximum level.</li> <li>- Change oil in case of contamination or depletion of lubricating capacity</li> </ul>	As needed

### IMPORTANT

Improper use of lubricants could result in injury or malfunction of the machine.

- Use only the intended type of lubricant or one with equivalent characteristics.
- Before use, request the 'product safety data sheet' from the lubricant manufacturer. If necessary, follow the instructions in the product-specific data sheets.
- In the event of a spillage, it is recommended to collect the lubricant by suitable means.
- Oils or lubrication materials in general are highly polluting and harmful to the environment. Always dispose of used lubricants via the appropriate waste oil collection agencies.

### 11.5.1 Definition of greases and lubricants used

#### IMPORTANT

#### LUBRICATING OIL

Please refer to the enclosed data sheet of the pump for the correct type of lubricating oil to be used in case refilling is required in the vacuum pump.

### 11.5.2 Refilling the vacuum pump oil

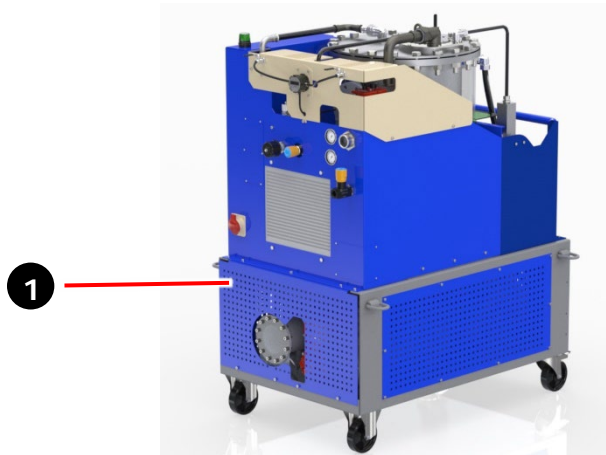
#### Prerequisites:

- The machine must be stopped and all energy sources disconnected.
- The lubricating oil level must be below the minimum working level.

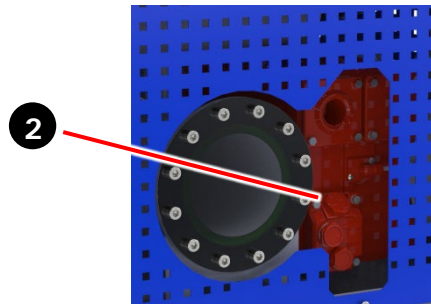


**Procedure:**

1. Remove the protective metal grille (1) of the vacuum pump.



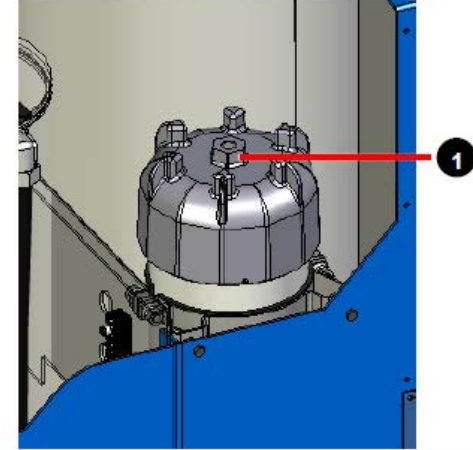
2. Unscrew the cap (2) of the pump oil tank.



3. Top up with the specific oil to the level required to ensure proper functioning of the vacuum pump.
4. Screw the cap on and refit the protective cover.

## 11.6 Mechanical Maintenance

Purpose	Actions
Avoiding accidents and unwanted machine breakdowns	Carefully check the tightening of belts, chains, bolts, fittings, cables, plugs, locks, connections, etc.
Perform maintenance work before the failure occurs in the component or when the event occurs (on condition)	Perform 'replacement', 'overhaul', or 'repair' operations in accordance with the procedures described in this manual or in the component-specific documentation.

WHAT	HOW	FREQUENCY
Facilities	- Check the tightness of all fixing bolts.	ANNUAL
Fixed and mobile shelters	<ul style="list-style-type: none"> <li>- Check for loss of or damage to any part of the shelter, particularly if this causes a decrease in safety functions (e.g. reduction in impact resistance, scratches on glass panes, etc.).</li> <li>- Replace wear parts, checking in particular for deterioration of joints or fastening points.</li> <li>- Check for deterioration due to corrosion, temperature changes or chemical effects.</li> <li>- Check that there are no changes to safety clearances and opening dimensions.</li> </ul>	SEMESTRAL
Oil Filter	<ul style="list-style-type: none"> <li>- If you need to carry out ANY work on the oil filter, you must contact the manufacturer in advance.</li> <li>- Please note that residual hydraulic pressure remains inside the filter even after the machine has been de-energised. It is therefore necessary to preliminarily vent the upper zone (1) before opening the protective casing of the component.</li> </ul> 	As needed

## 11.7 Electrical Maintenance

Purpose	Actions
Preserve performance and initial safety level by containing normal degradation and ageing of components.	Prevent prolonged malfunctions from causing a fault, and thus damage or a breakage that impairs smooth operation.
	Carry out regular inspections as set out in the maintenance plan
Comply with the provisions of the law.	Carry out the planned work in accordance with the relevant technical standards and local legislation where the system is installed and commissioned.

WHAT	HOW	FREQUENCY
Visual inspection of components	- Carry out a check on the good condition of equipment and devices inside and outside the switchboard.	SEMESTRAL
Electrical diagram.	- Check that the circuit diagram is present and up-to-date.	ANNUAL
Controls, instrumentation and signal lamps.	- Replace non-readable plates. - Replace controls and instruments that do not guarantee normal operation. - Replace the lamps of the signalling devices.	ANNUAL
Inspection of water infiltration and condensation.	- Check that there is absolutely no infiltration of water or dangerous condensation. Check the sealing (gaskets) and conditioning systems inside the equipment in good time. Remove water immediately and carry out repairs.	SEMESTRAL
Cleaning the switchboard	- Use a vacuum cleaner to remove dust from the filters in the switch cabinet. If the filters are too dirty, wash them with mild soap and water and allow them to dry completely before reassembling them. If they are too worn out, replace them. - Use a Hoover to remove dust from inside the control cabinet.	SEMESTRAL
On-board component clamping inspection	- Check the tightness of the sensors, encoders and photocells on the machine.	ANNUAL
Terminal clamping inspection	- Check the tightening of power cables and connection bars. - Check the tightness of the wires on the terminal blocks by exerting a slight pull on the cable.	ANNUAL
Verification of the enclosure's degree of protection.	- Check the tightness of the cable glands by exerting a slight pull on the cable, tighten if necessary. - Check the integrity of the gaskets and the correct tightness of the covers of the junction boxes and motor terminal boxes on the machine. - Check the integrity of the gaskets and the correct tightness of the control cabinet doors. - Check locks, hinges, and paintwork and carry out any repair and restoration work.	ANNUAL
Inspection of the condition of electrical conductors	- Check the condition of the electrical conductors on board the machine and replace them if the optimal conditions of flexibility and insulation are altered. - Pay particular attention to the control of electrical conductors in mobile locations and those placed near the product passage or located in unfavourable environments (e.g. presence of high temperatures, water, oil, acid, etc.).	ANNUAL

WHAT	HOW	FREQUENCY
Protective equipment	- Checking the characteristics of protective equipment in relation to overcurrents, conductor ratings and indirect contacts	ANNUAL
Checking the continuity of the equipotential protection circuit	<ul style="list-style-type: none"> <li>- Checking the state of preservation of all protective conductors, earthing conductors and equipotential conductors connected to the main collector and secondary collectors, if any</li> <li>- Checking identification plates and restoring them if illegible or missing</li> <li>- Checking the correct tightening of cable lugs and junction terminals</li> <li>- Checking the colour of the insulation sheath</li> <li>- Checking conductor dimensions</li> <li>- Checking connections to masses and extraneous masses</li> <li>- Verification of the continuity of protective conductors, earth conductors and equipotential conductors, both main and secondary.</li> </ul>	EVERY TWO YEARS OR FOLLOWING DISMANTLING AND REASSEMBLY OF PARTS

### 11.8 Alarm Message List

ITEM	DESCRIPTION	NOTES
Alarm1	Oil spillage	Presence of Oil on Carriage Background
Alarm2	Failure to open EV01	Intake Valve Fault
Alarm3	Failure to close EV01	Intake Valve Fault
Alarm4	Thermal M1	Oil Pump Engine Fault
Alarm5	M2 Thermal	Vacuum Pump Motor Fault
Alarm6	Thermal M3	Fan Motor Fault
Alarm7	Blockage M2	Presence Water Filter Vacuum Pump
Alarm8	Maximum pressure	Maximum Oil Line Pressure
Alarm9	FULL water container EMPTY	Water Collection Container Full
Alarm10	Minimum pressure	Minimum Pressure Oil Line
Alarm11	Emergency pressed	Unlock Mushroom
Notice1	Humidity probe failure	Sensor W01 Fault
Notice3	Suction clogging	Replacing the Suction Filter
Notice4	Maximum temperature	Max. oil temperature
Notice5	Maximum oil level	Maximum Oil Level in Tank
Notice6	Draining water	Emptying the Water Collection Container
Notice7	Clogged filter	Oil Discharge Filter to be replaced
Notice9	Anomaly AL100	Fault Communication Module
Notice10	Anomaly AL100 X0	Faulty Com Module Port
Notice11	Anomaly AL100 X1	Faulty Com Module Port
Notice12	Anomaly AL100 X2	Faulty Com Module Port
Notice13	Anomaly AL100 X3	Faulty Com Module Port
Notice14	Anomaly AL100 X4	Faulty Com Module Port
Notice15	Anomaly AL100 X5	Faulty Com Module Port
Notice16	Anomaly AL100 X6	Faulty Com Module Port

	Alarms stop the machine.
	The warnings remain active with the machine running until the problem is resolved.

# 12 DISMANTLING AND SCRAPPING

## 12.1 General Information

All work described in this chapter is reserved exclusively for technical personnel specialised in load handling and waste disposal:

- Final decommissioning and scrapping must be carried out by technical personnel at a specialised waste treatment centre, to which the machine must be handed over or requested to be taken back.
- The machine may not be abandoned in the environment, either intact or partially dismantled or demolished.
- Always contact the manufacturer for support.

## 12.2 Decommissioning for long periods

If you decide not to use the machine for long periods of time, carry out the following operations to ensure proper storage and preservation.

### Prerequisites:

- Whether the machine is dismantled or left idle, it is important that the storage location has the temperature and humidity characteristics in accordance with the technical data.
- The storage location must not be dirty and exposed to the accumulation of dust and dirt.
- Always store the machine in a closed place protected from the weather.

### Procedure:

1. Disconnect all power sources.
2. Clean the machine by completely removing machining residues and dust.
3. Grease and lubricate all components.
4. If the machine is not to be used for more than 3 months, protect rust-prone parts with a suitable protective product. Protect electrical and electronic equipment by placing moisture-proof salt bags in electrical cabinets.
5. Cover the machine with tarpaulins to prevent dust deposits.

## 12.3 Decommissioning and scrapping

### Procedure:

1. Carefully consult the laws in the user's country regarding environmental protection and safety procedures. Activate in accordance with the law the inspection procedure of the relevant authority and the subsequent record of demolition.
2. Disconnect all power sources.
3. Dismantle the switch cabinet and all plastic components such as covers and pipes and send them for separate collection. Electrical cabinets and control panels shall be completely dismantled by separating electrical components from cables. The electrical cables on the machine will be collected with the electrical cables in the cabinets.
4. Dismantle the various machine components and then break them down into parts according to the type of metal or alloy, taking care to remove oil or grease residues from the various parts.
5. Once the first division has been made, the plastic pipes will be separated from the rubber hoses and seals.
6. Electric motors will be stacked separately from the gearboxes. The gearboxes will have to be emptied of oil. The recovered oil will have to be collected in drums, stored and not dispersed in the environment. The same procedure must be followed when grease is present.

### 12.3.1 Waste separation, classification and disposal

Waste is defined as any substance or object that is the product of human activities or natural cycles, abandoned or destined for abandonment.

The following categories of waste are to be considered special waste:

- Deteriorated and obsolete machinery and equipment in general.
- End-of-life motor vehicles and their components.

European Directive 2008/98/EC establishes a legal framework for the treatment of waste within the Community.



Waste Electrical and Electronic Equipment may contain hazardous substances with potentially harmful effects on the environment and human health. It is therefore recommended that they be disposed of properly using appropriate precautions. With reference to the WEEE directive (Waste Electrical and Electronic Equipment - WEEE Directive 2012/19/EU), the user must separate the electrical and electronic components during disposal and dispose of them at authorised collection centres.

### 12.3.2 Type of waste produced by the demolition of the machine

The following table summarises and classifies the type of waste produced by the demolition of the machine:

- Enquire with the relevant authorities about the current arrangements for the storage and disposal of waste.
- Always contact the manufacturer for support.

Component / material	Location
Electrical Cables	Wiring of electrical equipment
Metal material	Structure
Stainless Steel	Structure, filters
Lubricants	Vacuum pump, geared motor

#### ATTENTION

##### **OIL / PROCESS WATER MANAGEMENT**

The residual oil and water from the disposal process **MUST NOT** be disposed of into the sewerage system, as it is a source of potential damage to the environment, and must therefore be disposed of or purified by appropriate bodies. Management of this eventuality is entirely the responsibility of the customer.

Refer to the safety data sheet of the product used and the legislation in force in the country of use for the correct disposal procedures.

# 13 FAULT SEARCH

## 13.1 General Information

The information below is intended to assist in identifying and correcting any faults and/or malfunctions that may occur when using the machine:

- Please read the **chapter 'Safety'** carefully before performing any operation.
- Some faults can be solved by the operator; others require precise technical expertise or special skills, and must only be carried out by experienced and qualified personnel with recognised experience in the specific field of intervention.
- For all work not described in this chapter, it is **MANDATORY** to always contact the manufacturer for support.

## 13.2 Power failure and start-up

Incident	Probable cause	Possible remedy
Power failure	Non-powered electrical cabinet.	<input type="checkbox"/> Check that the switch-disconnector of the distribution panel (customer panel) is turned to the 'ON' position and that the overload protection has not tripped. <input type="checkbox"/> Check that voltage is reaching the power terminals of the machine's electrical cabinet.
	Electrical isolator in OFF position	<input type="checkbox"/> Turn the electrical isolator switch to the ON position.
	Check fuses and/or circuit breakers on the supply line	<input type="checkbox"/> Check fuses and/or circuit breakers and ascertain the cause of the fault.
The machine is in an emergency	Emergency stop button engaged	<input type="checkbox"/> Eliminate the cause of shutdown. <input type="checkbox"/> Unlock the emergency button and then proceed to start the machine.

## 13.3 Process faults

Incident	Probable cause	Possible remedy
Oil pressure is high	High oil viscosity	<input type="checkbox"/> Check the function of the resistors
	Clogged atomising nozzles	<input type="checkbox"/> Service the nozzles installed inside the tank by accessing the flat flange.

Incident	Probable cause	Possible remedy
Oil screw pump inoperative	Choked suction	<input type="checkbox"/> Check suction pipe <input type="checkbox"/> Check the pressure drop in the suction pipe (small and with too many bends)
	Air infiltration	<input type="checkbox"/> Check suction inlet, suction fittings <input type="checkbox"/> Check the pump shaft <input type="checkbox"/> Check for foam in the oil
	High depression	<input type="checkbox"/> Check that the vacuum value inside the tank does not exceed the recommended value
	Faulty drive	<input type="checkbox"/> Check coupling <input type="checkbox"/> Follow the pump manufacturer's instructions
	Oil viscosity too high	<input type="checkbox"/> Follow the pump manufacturer's instructions
	Internal pump faults	<input type="checkbox"/> Check seals <input type="checkbox"/> Check the tightening of the pump body <input type="checkbox"/> Check internal parts to be replaced
	Worn pump	<input type="checkbox"/> Replace the pump
Noisy oil screw pump	Cavitation	<input type="checkbox"/> Check that the vacuum value inside the tank does not exceed the recommended value <input type="checkbox"/> Check suction pipe
	Air infiltration	<input type="checkbox"/> Check suction inlet, suction fittings <input type="checkbox"/> Check the pump shaft
	Internal usuries	<input type="checkbox"/> Check clearance of pump components
	Plant vibration	<input type="checkbox"/> Check installation
	Low oil temperature	<input type="checkbox"/> Check the correct functioning of the electric heater
The oil pressure is too high	The discharge pressure control valve was set too high	<input type="checkbox"/> Adjust the valve
The oil is too hot	The oil temperature control thermostat has been set too high	<input type="checkbox"/> Readjust thermostat
	Thermostat does not work	<input type="checkbox"/> Replacing the thermostat



Incident	Probable cause	Possible remedy
Minimum oil level	The machine's suction is blocked	<input type="checkbox"/> Check intake valves <input type="checkbox"/> Check the condition of the hose
	Low depression	<input type="checkbox"/> Adjust the vacuum using the vacuum adjuster <input type="checkbox"/> Check for air leaks <input type="checkbox"/> Check the status of the vacuum pump
Maximum oil level	P1-Pe pump not working	<input type="checkbox"/> See previous failure
	Suction-actuated valve not functioning	<input type="checkbox"/> Check valve status

**For any questions please contact:**

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