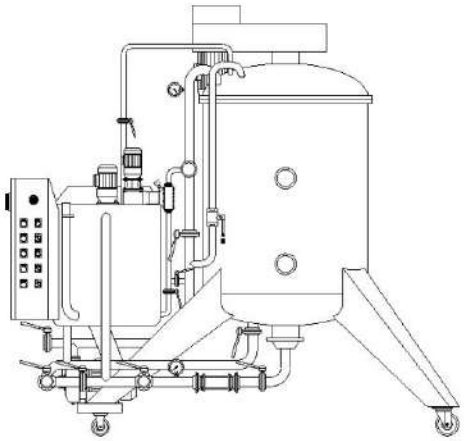
FR



Instructions for use and maintenance of NF 5 filters

DELLA TOFFOLA

Read all the following safety provisions very carefully before undertaking any operation with the machine.

ALWAYS LEARN AND APPLY ALL THE SAFETY INSTRUCTIONS

Before installing and using the machine, read these safety instructions very carefully.

Also read all information and warning signs affixed to the machine. Check that they are still clearly legible, replace any that are damaged and add more if any are missing.

Before using the machine, get to know its mode of operation and all the control devices thoroughly by reading this manual carefully.

Never put off learning this important information until you have already started working.

Do not allow anyone who is not authorized and does not have the necessary knowledge to approach the machine, let alone use it.

Always keep this manual close at hand so that those who have to work on the machine can use it.
In the event of sale or transfer to third parties of the machine, it is also compulsory to transmit in full all the technical documentation received (use and maintenance manuals, electrical and hydraulic diagrams, etc.).

EXPLANATION OF SYMBOLS

Inside this manual and on the machine, you will find symbols accompanying indications of danger or indications concerning safety.

These warnings serve primarily to ensure the safety of Installers, Technicians and Operators and, secondly, to prevent damage to the machine.

THE PRESENCE OF THIS SYMBOL IS INTENDED TO DRAW ATTENTION TO THE POSSIBILITY OF FATAL ACCIDENTS, SERIOUS INJURY OR SIGNIFICANT DAMAGE IF THE SPECIFIED SAFETY MEASURES ARE NOT APPLIED. THIS SYMBOL DRAWS ATTENTION TO GENERAL HAZARDS.

THE PRESENCE OF THIS SYMBOLS IS INTENDED TO DRAW ATTENTION TO THE POSSIBILITY OF FATAL ACCIDENTS, SERIOUS INJURY OR SIGNIFICANT DAMAGE IF THE SPECIFIED SAFETY MEASURES ARE NOT APPLIED. THIS SYMBOL DRAWS ATTENTION TO RISKS DUE TO THE PRESENCE AND USE OF ELECTRICITY.

ATTENTION

The presence of this definition indicates a passage of the manual containing important information on the machine. Carefully read the

DEFINITIONS

Below are definitions of the physical and legal users involved in the management and use of the machine.

OWNER: In this user manual, OWNER means the legal representative of the Company, Organization or Natural Person who signed the act of purchase of the machine. He is responsible for ensuring compliance with all the safety standards indicated in this manual as well as the standards in force in the State where the machine is installed. An exception to this last point is provided for if a MANAGER is in charge of the installation; in which case he is responsible for enforcing and complying with safety standards during use of the machine and for managing relations with the OPERATOR.

INSTALLER: In this user manual, INSTALLER means the legal representative of the Company appointed by the OWNER to set up and connect the machine to the water, electricity, pneumatic networks, etc. of the installation. He is responsible for handling and correct installation, in accordance with what is prescribed in this manual and in the regulations in force in the State where the machine is installed.

OPERATOR: In this user manual, OPERATOR means the person authorized by the OWNER or, where appropriate, by the MANAGER to carry out on the machine all the operations of use, adjustment, control and ordinary maintenance expressly indicated in this manual, to which he must strictly refer, limiting his action to what is clearly authorized.

TECHNICIAN: In this user manual, TECHNICIAN means the person directly authorized by the Manufacturer or, under his orders and under his total responsibility, by the Distributor of the latter for the various Community States, with the exception of Italy, to carry out all the extraordinary maintenance operations, as well as the adjustments, checks, repairs and replacement of parts which may prove necessary during the life of this same machine.

GENERAL SAFETY INSTRUCTIONS

For the operations of unloading the machine on delivery, lifting and positioning in the workplace and for any other handling operation, scrupulously respect the indications of the specific paragraph of this manual. In particular, be careful when moving machines on wheels: once on the ground, they must be handled manually. In order to avoid any risk

of crushing, these machines should only be moved with pushing movements, never pulling, so that no one can ever stand in the path of movement of the machine. Whoever handles the machine must do so under the supervision of another person, who is not involved in the maneuver but who continuously checks for the possible appearance of obstacles, third parties or risk situations on the path. The person in charge of the surveillance must quickly warn the person moving the machine of the appearance of a risk situation so that it is possible to stop the moving machine immediately.

The surface on which the machine moves, as well as the one on which the machine works, must meet all the essential safety requirements: it must not be sloping, nor have any roughness or depressions that could make movement difficult or dangerous. First check that the route to be traveled with the machine fully satisfies the above conditions. Check that the surface of movement and that of support have a mechanical resistance enabling them to support the weight of the machine both when empty and in operation. Any discontinuous elements in the floor (expansion joints, gratings and catch basins) must also meet the requirements.

Do not, for any reason, use lifting points other than those intended.

Before each commissioning, the machine must always be immobilized using the securing devices supplied.

The machine must be set up in an area to which access will only be authorized for OPERATORS and TECHNICIANS; otherwise, the machine must be protected by an enclosure placed at least two meters from its external surfaces. OPERATORS and TECHNICIANS may only enter the area in which the machine is used if they are properly dressed and provided with the individual protection devices prescribed by law (safety shoes, gloves, helmet, etc.). INSTALLER personnel or any visitors must always be accompanied by an OPERATOR. Unauthorized personnel must never be alone in contact with the machine. The place of installation must be inaccessible to children.

The OPERATOR must limit himself to intervening on the controls of the machine; he cannot therefore open any panel other than the control access panel (if present).

The INSTALLER must limit himself to working on the connections between the installation and the machine; he cannot therefore open any panel, nor operate any command.

For all handling, use, maintenance or repair operations, all accident prevention standards in force in the country where the machine is used must be applied. This is valid both for the equipment used and for the way of proceeding.

Always disconnect the power supply before performing any installation, maintenance, repair or moving operation on the machine. This operation is of fundamental importance to avoid any fatal accident, serious injuries or major damage to the installations.

During certain phases of normal use, containers of the machine are pressurized (for example the filter tank, the compensation chambers, the erosion feeders, etc.). Never open these containers or remove any components connected to them until this pressure has been completely relieved. The pressure relief must be done using the valves provided for this purpose on the machine.

During normal work cycles, do not move the machine.

Before any new work cycle, check the integrity and efficiency of the mobile electrical connections (connecting cables, plugs, etc.).
If damage is found, the repair can only be carried out by a specialized TECHNICIAN.

Never carry out on your own initiative operations or interventions that are not provided for in this manual.

Connect the machine to the mains following the instructions in this manual.

Before starting the machine, check the effectiveness of the earthing of its electrical installation and its frame (or its structure).

Do not use cables with an unsuitable section or temporary connections, not even for short periods, let alone in an emergency.

Only start the machine when you have checked that its connection to the installations supplying energy or everything necessary for its correct operation (electrical installation, water network, compressed gas distribution network, drain water network, etc.) is correct and safe.

Keep a safe distance from any moving mechanical parts.

Immediately inform the TECHNICIAN of any alarm or intervention of the machine's automatic protections.

Do not carry out manual resets following alarms or automatic protection interventions without having first identified and eliminated the cause.

Do not remove the guards from moving parts when the machine is running.

Before starting the machine, check that the guards are correctly positioned.

Carry out all scheduled maintenance operations regularly.

Dispose of the packaging material used for the machine in landfills provided for this purpose, paying particular attention to plastic films and bags which constitute a risk of suffocation for children.

Do not dispose of residues deriving from work cycles in the environment.

REGULATIONS FOR THE USE OF MACHINES FOR THE FOOD SECTOR

The following remarks concern only "FOR FOOD" machines, i.e. those intended to come into contact with food substances for human consumption:

The machine in your possession has been designed and built in such a way as to be suitable for contact with food (in this case, food liquids). If in doubt about the intended use of the machine, consult the specific chapter of this manual.

For logistical reasons related to the phases preceding their use, such as transport to the user, storage in the warehouse, etc., it is not possible to guarantee that the machines will be delivered in conditions allowing immediate use without

thorough prior hygienization. The end user will therefore take care to respect any protocols provided for (HACCP for example).

MACHINE DEMOLITION AND DISPOSAL

At the end of the operational life of the machine, it is necessary to demolish and dispose of it.

MACHINE DEMOLITION AND DISPOSAL OPERATIONS SHOULD ONLY BE PERFORMED BY ADEQUATELY TRAINED AND CORRECTLY EQUIPPED PERSONNEL, WHO SHOULD APPLY THE FOLLOWING PROCEDURE.

1. Separate the different parts of the installation, selecting, if necessary, the materials from which it is made:
   - mechanical parts (reducers, pump bodies);
   - metal parts (structure, pipes, etc.);
   - electrical parts;
   - rubber parts;
   - plastic and synthetic parts.
2. All recovered materials must be treated and disposed of in accordance with the laws in force in the country where the facility is used.
3. All components contaminated with oil or oil residues are special waste which must be disposed of by qualified personnel. approved consortia. This same concept should be applied to lubricants that need to be changed periodically.
4. In case of storage, even temporary, the machine must be placed in a place inaccessible to children. All cut-off devices and sectioning devices must always be carefully isolated and placed in the deactivation position.
   A thorough check and elimination of any residual energy accumulations such as liquid or gas pressure states inside containers or pipes must be carried out. The machine must also be checked statically, which means that any risks of unforeseen movements of the machine or parts of it must be eliminated.

WE DECLINE ANY RESPONSIBILITY FOR DAMAGE CAUSED TO PERSONS OR PROPERTY DUE TO THE RE-USE OF PARTS OF THE MACHINE FOR DIFFERENT FUNCTIONS OR ASSEMBLY SITUATIONS THAN THE ORIGINAL.

CHECK OF GOODS UPON RECEPTION

At the time of delivery, the machine must immediately be checked by the Customer to detect any obvious damage suffered during transport and to see if it has all the parts indicated in the order form.
If damage is observed, immediately take note on the transport document (accompanying note or CMR) of the anomalies noted, by writing the words “REMOVAL WITH RESERVE FOR OBVIOUS DAMAGE TO THE MACHINE”. The return free Establishment includes the reimbursement of damages by the Insurance in accordance with what is provided for by Law 450 of 22.08.1985 “Limit of compensation”.

In the event of a claim, the Customer must produce adequate photographic documentation of the most obvious damage.

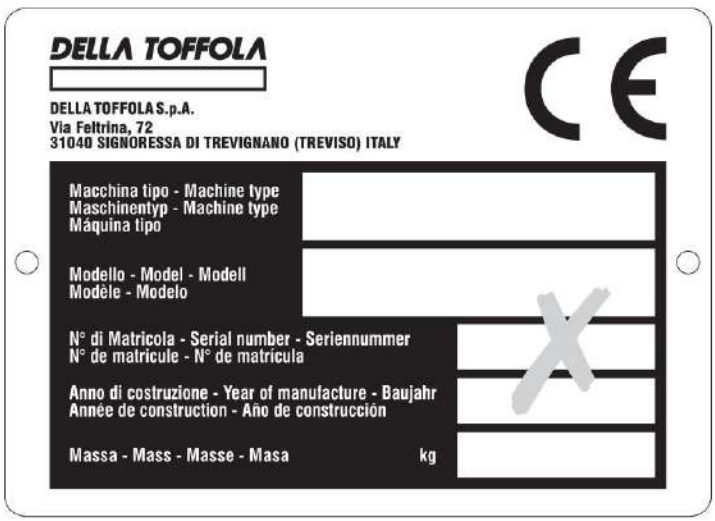
GUARANTEE

The Manufacturer guarantees the delivered machine for the period indicated on the order form.
The WARRANTY only includes the free repair or replacement of parts recognized as defective.
All electrical parts are excluded from the WARRANTY.
The WARRANTY is valid only if all the rules of installation and use are respected, whether they are those possibly issued by the Manufacturer or those dictated by current practice.
The WARRANTY is not applied in the event of any maintenance operations carried out by personnel not approved by the Manufacturer.
If the machine triggers alarms or automatic protection interventions, manual resets must not be carried out before eliminating the cause that generated the functional blockage. Repeated manual reset attempts may be considered grounds for Termination of Warranty.

The GUARANTEE is only valid if the defects or faults are communicated within eight days from the moment when they are observed. In this case, the WARRANTY only takes effect if the use of the machine has been suspended immediately after noting the damage.

SUPPORT SERVICE

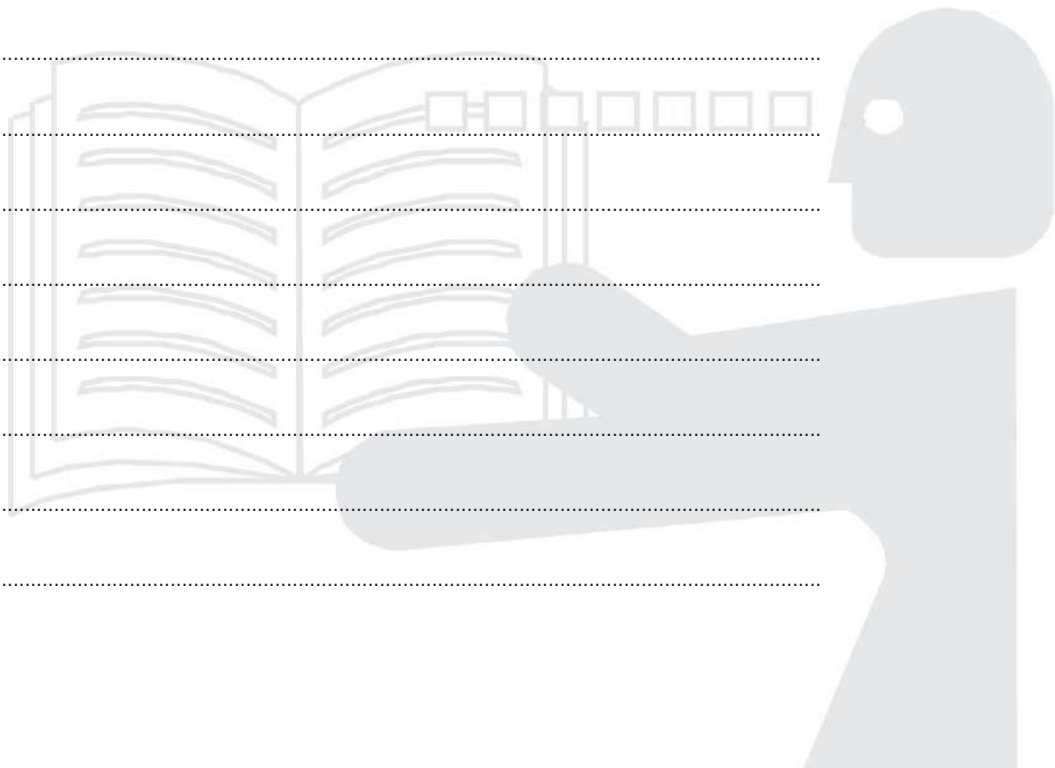
For any request for information, interventions, etc., always indicate the SERIAL NUMBER of the machine.
It is impossible to provide precise instructions or to schedule interventions without this data.
The registration number is stamped on a plate attached to the machine.



FROST PROTECTION PROVISIONS

If it is possible for the ambient temperature to drop to 0°C / 32°F, the liquids present in all the hydraulic circuits of the machine must be drained as a preventive measure (water or product to be treated).
This is to prevent possible ice formation from damaging the machine components.

NOTES



Contents

REQUESTS AND INFORMATION:

For any requests or additional information on the use of the machine, on anything not contained in this manual and on technical assistance, contact the Della Toffola SpA Assistance Service at:

Della Toffola SpA – Servizio Assistenza Via
Feltrina 72 - 31040, Signoressa di Trevignano (TV) (Italia)
Such. : +39 0423 6772 - Fax: +39 0423 670841

CONSERVATION :

Keep one copy of the manual close to the machine so that it can be consulted at any time by the user and keep the second in an appropriate and safe place.

In case of loss or damage, request additional copies from Della Toffola SpA

This manual reflects the state of the machine at the time of writing.

Do not forget that, in accordance with the standards in force, the instruction manual is an integral part of the machine and that it must therefore accompany the latter in each of its movements.

DOCUMENT IDENTIFICATION:

Title	Instructions for use and maintenance of NF 5 filters
File code	NF5_SAL0216R00EN.doc
Matricule No.	000467820
CI	32665
Cod.	005686
Rev. No.:	00 – 02.16

1. General information

1.1. Introduction

This machine has been designed and built to guarantee maximum quality filtrations, while offering considerable ease of use.
However, for its use and maintenance, the instructions in this manual must be observed, which must be read carefully before undertaking any authorized installation, use or maintenance operation.

The correct execution of the operations and the control of the product on entry and exit are essential conditions for satisfying production requirements and obtaining optimum performance.

Pay particular attention to the indications on the safety standards for the use of the machine.
The knowledge and the application of these standards relate directly to the safety of the operator.
It is essential that the operator be able to carry out all the operations described in this manual and that he knows how to repeat them each time he uses the machine.

Always have the instruction manual to hand when working on the machine.

The manufacturer declines all responsibility in the event of damage caused directly or indirectly to persons or material goods and due to non-compliance with the instructions in the manual.

1.2. Notes on the instructions Due to the many

variables influencing the use of these machines, it is extremely difficult to provide unambiguous indications on the optimal conduct of the various operations.

That said, it will be enough to acquire a little experience in the use of these machines to understand all their potentialities, which will make it possible to meet the different requirements of use.

Machines in special version or with manufacturing variants made for the customer's needs may differ in detail from what is described in this manual, without this compromising in any way efficiency or performance. a) This manual contains the instructions for the

standard version and it is therefore possible that the machine you have is not equipped with some of the devices described. b) In order to guarantee maximum longevity

of the machine and the best possible operating economy, it is advisable to comply with the provisions contained in this manual.

c) Periodically check the proper functioning of all machine components (valves, taps, etc.); in case of anomalies, avoid

imperative to use the machine and carry out the necessary checks and repairs.

d) Not to carry out on his own initiative procedures or interventions not provided for in this manual. e) Keep

this notice with care so that it can be consulted at any time. moment by the operators.

f) Della Toffola is not responsible for any inconveniences, breakages, accidents, etc. due to non-knowledge or non-compliance with the instructions contained in this manual. The same applies in the case of variants, modifications and installation of accessories carried out without authorisation.

Della Toffola also declines all responsibility for damage caused by:

- natural calamities; - the use of unsuitable detergents; - the presence of electrostatic or stray currents; - incorrect manoeuvres; - lack of maintenance.

g) For any problem not dealt with in this manual, contact the service nearest assistance

1.3. How to read the note

This document has been specially studied and produced so that the personnel in charge of the machine find its use easy and safe.

The symbol below has been used to highlight general requirements, failure to comply with which would endanger the physical safety of people:

As for the electrical prescriptions, the non-respect of which would also endanger the physical safety of people, the following symbol has been used to highlight them:

It is therefore recommended to read these parts as carefully as possible.

The text of the document contains frequent numerical references to parts described in the overview diagram at the end of the notice; for faster consultation, keep this diagram open.

1.4. General description

The NF series kieselguhr filters essentially consist of an airtight container containing a filtration group, the latter being formed by a series of horizontal filtering discs provided with a central hole and threaded, spaced from each other, on a hollow shaft.

The liquid to be filtered is introduced into the tank (from the top) and passes, under pressure, through a cake of kieselguhr previously formed on the upper part of all the discs. After being filtered in the cake, the liquid passes through the inside of the disc and arrives in the central collector shaft through the holes.

Finally, the filtered liquid arrives in the lower part of the tank, where the outlet is located.

At the end of the filtration, the residual cake, composed of the kieselguhr and the impurities of the liquid, is evacuated from the filter unit by centrifugation. The pasty residues are evacuated through a hole located in the bottom of the tank.

During evacuation and cleaning operations, the filter is not subjected to vibrations or scraping. The machine is also equipped with a kieselguhr dosing tank, with dosing pump, and a centrifugal feed pump.

All NF filters are similar in function and construction.
The models differ mainly in their operating pressure, their dimensions, their number of filter discs and therefore in their filtration capacity and their hourly flow rate of liquid; the weight varies of course also according to the different dimensions.

These data can be found on the plate attached to the machine and in the technical data sheet.

On customer request, the machine can be supplied with a power supply frequency of 50 or 60 Hz.

Depending on the requirements, the filters are equipped with pumps and accessories adapted to the characteristics of the liquid to be filtered.

1.5. helpdesk

Della Toffola makes its technical assistance service available to its customers in order to solve any type of problem concerning the adjustment, use and maintenance of the machine.

Requests must be made after a careful analysis of the inconveniences observed and the possible causes.

Also provide the assistance service with: • the

serial number of the machine;

• the year of construction;

• the description of the defects observed; •

any checks that have already been carried out; • the adjustments

and modifications made as well as their effects and consequences;

• any other information deemed useful for solving the problem.

In the event of technical intervention or assistance concerning use, contact the following DELLA TOFFOLA centre:

Technical Assistance Center:

DELLA TOFFOLA SpA
Such. : +39 0423 6772

Fax: +39 0423 670841

Email: dtgroup@dellatoffola.it

1.6. Guarantee

The manufacturer undertakes to repair any manufacturing defect that occurs during the warranty period.

Normal wear parts are excluded from the guarantee.

The warranty is only valid if the user scrupulously respects the indications given in the manual for the correct use of the machine.
To replace any damaged or defective components, only use original spare parts.

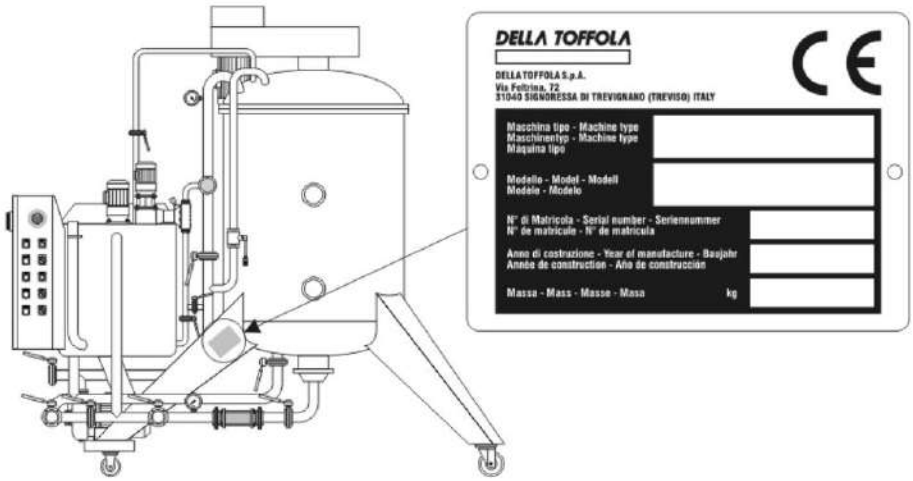
Any modification made without the authorization of the manufacturer entails the immediate loss of the benefit of the guarantee.

ATTENTION

Della Toffola SpA cannot be held liable for damage resulting from repairs carried out by unauthorized personnel.

1.7. Machine identification

The machine is identified by the plate shown below, the position of which is shown in the figure.



The identification plate must always be in good condition and visible because it contains the main characteristics of the machine, namely:

- company name and address of the manufacturer; - name of the machine; - registration number ; - year of construction ;
- mass.

1.8. EC declaration of conformity

The machine is made in accordance with the relevant Community directives applicable at the time of its placing on the market.

As the machine is not covered by APPENDIX IV of DIRECTIVE 2006/42/EC, the manufacturer carries out the “EC self-certification” procedure.

The CE conformity certificate is delivered in a separate plastic envelope from the instruction manual.

DELLA TOFFOLA Dichiarazione di Conformità CE

CE Declaration of Conformity - EG-Konformitätserklärung
Déclaration de Conformité CE -Declaración de Conformidad CE

DELLA TOFFOLA S.p.A. - Via Feltrina, 72 – 31040 - Signoressa di Trevignano (Treviso) Italy
Dichiara, sotto la propria esclusiva responsabilità che la Macchina:
hereby declares under its own sole responsibility that the machine: - erklärt in alleiniger Verantwortung, dass die Maschine:
Déclare sous sa responsabilité que la Machine: - Declara, bajo su propria y exclusiva responsabilidad, que la Máquina

Descrizione:
Description - Beschreibung - Description - Descripción:

Matricola:
Serial number – Seriennummer - Numéro de série - Matricula Número:

Modello:
Model-Modell-Modèle-Modelo:

Anno:
Year- Baujahr -Année-Año:

è stata costruita in accordo alle seguenti norme:
has been manufactured in accordance with the following standards: - in Übereinstimmung mit den nachstehenden Normen konstruiert wurde:
a été construite conformément aux normes suivantes: - ha sido fabricada de acuerdo con las normas siguientes:

1. Direttiva **2006/42/CE (Allegato II/A)** "Direttiva Macchine"
   *Directive **2006/42/CE** (Annex II/A) - Richtlinie **2006/42/CE** (Anlage II/A) - Directive **2006/42/CE** (Annexe II/A) - Directiva **2006/42/CE** (Anexo II/A)*
2. Direttiva **2004/108/CE** "Direttiva EMC"
   *Directive **2004/108/CE** - Richtlinie **2004/108/CE** - Directive **2004/108/CE** - Directiva **2004/108/CE***
3. Direttiva **2006/95/CE** "Direttiva Bassa Tensione"
   *Directive **2006/95/CE** - Richtlinie **2006/95/CE** - Directive **2006/95/CE** - Directive **2006/95/CE***
4. Regolamento n° **1935/2004** "Materiali e oggetti destinati a venire a contatto con prodotti alimentari" nel caso la macchina rechi il simbolo riprodotto nell'allegato II del regolamento stesso e sia dichiarata idonea nelle istruzioni per l'uso.
   *Regulation No. **1935/2004** "Materials and articles intended for food contact" if the machine bears the symbol reproduced in Annex II of said Regulation and is declared suitable in the user instructions.*
   *Verordnung Nr. **1935/2004** "über Materialien und Gegenstände, die dazu bestimmt sind, mit Lebensmitteln in Berührung zu kommen", falls die Maschine mit dem im Anhang II dieser Verordnung dargestellten Symbol versehen ist und in ihrer Betriebsanleitung erklärt wird, dass sie zu diesem Zweck geeignet ist.*
   *Règlement n° **1935/2004** "Matériaux et objets destinés à entrer en contact avec les denrées alimentaires" lorsque la machine porte le symbole reproduit dans l'annexe II de ce même règlement et qu'elle est déclarée comme étant adaptée dans les instructions d'utilisation.*
   *Reglamento nº **1935/2004** sobre los "materiales y objetos destinados a entrar en contacto con alimentos" en caso de que la máquina lleve el símbolo reproducido en el anexo II del propio reglamento y sea declarada apta en las instrucciones para el uso.*

Riferimento alle norme armonizzate:
Harmonized standards: - die folgenden harmonisierten Normen wurden angewandt: - Référence aux normes harmonisées: - Normas armonizadas:

5. **EN ISO 12100-1:2005** Sicurezza del macchinario. Concetti fondamentali, principi generali di progettazione. Terminologia, metodologia di base.
   EN ISO 12100-2:2005 Sicurezza del macchinario. Concetti fondamentali, principi generali di progettazione. Specifiche e principi tecnici.
   CEI EN 60204-1:2007 Sicurezza del macchinario. Equipaggiamento elettrico delle macchine.
   The following standards have also been applied (where applicable):
   EN ISO 12100-1:2005 - EN ISO 12100-2:2005 - CEI EN 60204-1:2007
   Zudem wurden folgende Richtlinien (soweit zuständig) angewandt:
   EN ISO 12100-1:2005 - EN ISO 12100-2:2005 - CEI EN 60204-1:2007.
   Ont été en outre appliquées (lorsqu'elles étaient pertinentes) les normes suivantes:
   EN ISO 12100-1:2005 - EN ISO 12100-2:2005 - CEI EN 60204-1:2007
   Asimismo (en medida pertinente), se han aplicado las normativas siguientes:
   EN ISO 12100-1:2005 - EN ISO 12100-2:2005 - CEI EN 60204-1:2007

e autorizza a costituire il fascicolo tecnico per suo conto, il seguente incaricato:
and it authorizes the following delegate to prepare the technical file: - und bevollmächtigt die nachstehend genannte Person, die technischen Unterlagen in ihrem Namen zusammenzustellen: - et autorise à constituer le fascicule technique, pour son compte, la personne ci-après nommée: - y autoriza al encargado siguiente para que constituya por su cuenta el expediente técnico:

ALBERTO CAMPEOL – Via Feltrina n.72 – 31040 – Signoressa di Trevignano – TV – ITALY

Signoressa di Trevignano lì: _____

Il Presidente
President - Der Präsident - Le Président - El Presidente
Vittorio Della Toffola

1.9. Authorized uses

The NF series kieselgur filters can be used for the filtration of wine and liquid foods at a service temperature ranging from -10°C/14°F to +50°C/122°F.

They are exclusively intended for personnel who have received adequate training, qualified, trained and informed on the use of their components and on the execution of the treatments provided by Della Toffola SpA

No other use is intended.

1.10. Contraindications (unauthorized uses)

As the machine has been designed to guarantee safety in the event of normal use or reasonably foreseeable use, always carefully consider the following instructions: - Any use other than that for which

the machine was designed and manufactured (as indicated in the previous paragraph “Intended use”) is absolutely prohibited.

- The use of parameters other than those specified in the paragraph "Checking the imbalance between the phases" cannot give sufficient guarantees of safety and reliability, such use is absolutely prohibited.

2. Security

2.1. Foreword Worker

safety is one of designer Della Toffola's main concerns.

For the realization of the machine, Della Toffola sought to foresee all risk situations and, of course, to adopt all the necessary safety measures. However, risks of accidents remain, mainly resulting from the careless or incorrect use of this machine.

This is why it is essential to read this chapter very carefully before carrying out any operation to put the machine into service.

Careful reading of this manual and the correct use of the machine resulting from it are necessary conditions for the safe use of this machine.

Otherwise, Della Toffola SpA declines all responsibility for accidents or damage.

Della Toffola SpA also declines all responsibility in the event of modifications made to the machine without its written authorisation: these modifications in fact compromise the marking and cancel the corresponding declaration of conformity.

2.2. Authorized operators In

addition to the standards listed below, the person responsible for the machine must comply with what is provided for by the laws in force on the safety and health of personnel at work stations.

The person responsible for the machine must inform the

operators of: - safety and accident prevention standards;

- the specific standards concerning the machine;
- the correct execution of the different phases of treatment and maintenance in complete safety;
- the limits of use.

The person in charge of the machine designates the operators authorized for the various tasks and establishes the skills and intervention limits of each of them.

Only the above-mentioned operators can work on the machine.

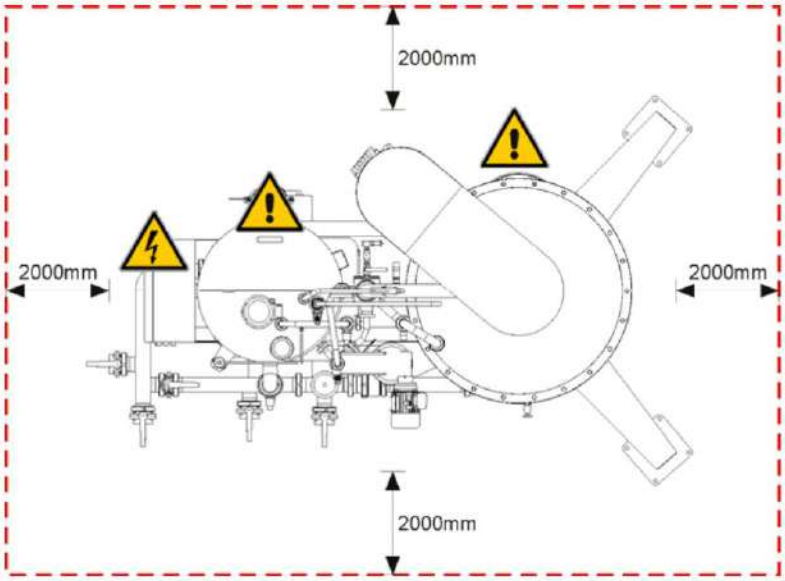
2.3. Definitions

In designing the machine, the following definitions, referred to in paragraph 1.1.1 of Directive 2006/42/EC, have been

applied. **a) hazard :** a possible source of injury or damage to health;

b) danger zone : any zone inside and/or around a machine in which a person is subjected to a risk for his safety or for his health.

The danger zone is delimited by the dashed line shown below on the plan drawing of the machine. This area is made up of an external perimeter strip at least 2000 mm deep on all sides of the machine.



c) exposed person: any person who is wholly or partially in a danger zone; **d) operator :** the person(s)

responsible for installing, operating, adjusting, maintaining, cleaning, repairing or moving a machine; **e) risk:** combination of probability and severity of

injury or damage to health that may occur in a hazardous situation; **f) guard:** machine element used specifically to provide protection by means

of a physical barrier; **g) protective device:** device (other than a guard) which reduces the risk, alone or associated with a

guard; **h) normal use :** use of a machine according to the information provided in the instruction handbook; **i)**

reasonably foreseeable misuse: use of the machine in a manner not provided for in the instruction

manual, but which is likely to result from easily foreseeable human behaviour.

2.4. General safety rules • The use of the machine is forbidden to unauthorized personnel.

- It is prohibited for anyone under the influence of drugs, alcohol or medication that reduces reactivity to carry out assembly, commissioning, control, maintenance or dismantling operations.
- Operate the machine only if it is safe to operate.
- Use the machine only for the use for which it was intended. In case of different or abnormal use, no sufficient safety is guaranteed.
- It is absolutely forbidden for anyone outside the work or unauthorized to approach the machine when it is running.
- It is forbidden for any person to independently perform operations or maneuvers that are not part of their skills or that could compromise their safety and that of others.
- The operation of the emergency button must be checked each time the machine is put into service.
- The operator is required to have any damage or modification to the components of the machine removed or immediately reported which could compromise its safety.
- Do not dismantle, modify or put out of service any part of the machine (functional parts, control systems and protection devices).
- It is forbidden to use, in the workplace, personal clothes or garments which, due to the nature of the operations and the characteristics of the machine, could represent a risk for personal safety. Personal clothing adopted in the workplace must therefore not have parts that are loose or that can get caught in any moving parts.
- Do not wear bracelets, chains or other objects that can be caught up in moving parts.
- Always use the personal protective clothing and devices prescribed in this document and in the safety standards in force in the establishment.
- Personnel authorized to work on the machine must only use the equipment made available to them and tools (in good condition) suitable for the maintenance work to be carried out; the planned method must be followed scrupulously and with continuity.
- During work, personnel must maintain a correct position allowing you to never expose yourself to any risk.
- Workstations should always be clean and tidy; any waste, of any kind, must be thrown into the containers provided for this purpose.
- It is forbidden to carry out operations not provided for in this manual or, in any case, without placing the machine in safe conditions.

• Competencies for assembly, dismantling and reassembly as well as for starting up and servicing the machine must be clearly defined and adhered to.

• Do not direct water jets at the electrical components of the machine.

• In the event of a fire, use dry extinguishers to prevent the spread.

• In the event of an emergency, each worker must make his contribution in order to contribute, within the framework of his abilities, his experience, his aptitudes and in concert with the designated persons, to the implementation of fire prevention, firefighting, evacuation, rescue and first aid measures.

• Work on electrical equipment should only be carried out by a qualified electrician

2.5. Safety devices Emergency stop

button The machine is equipped

with an emergency stop button of the "punch" type.

- Triggering of the emergency

During normal operation of the machine, in the event of malfunctions or serious risks that could endanger the safety of personnel or the machine, operation by pressing the emergency button.

Stop immediately

Before each start-up of the machine, check the correct operation of the emergency device.

- Restoration of normal operation after an emergency stop.

After identifying and resolving the problem that caused the emergency stop, normal machine operation can be restored by releasing the emergency button.

To do this, turn the palmswitch in the direction indicated by the arrow on it.

Then press the start button.

Safety valves The NF

filter is equipped with two safety valves, **28** and **53,** whose correct operation must be periodically checked. This check should be performed before each filter cycle.

In the event of a malfunction, contact the assistance service immediately.

In addition: ÿ **Do not change the setting of the safety valves for any reason.**

ÿ **Do not exceed the maximum allowable pressure provided (see table of technical characteristics).**

2.6. Verification of the effectiveness of safety devices

ATTENTION !

As checks on devices have a strong influence on the safety of the operator and the machine, they must be carried out with maximum precision.

Checking the emergency stop device The

correct operation of the palmswitch button must be checked before commissioning: once pressed, it must completely stop machine operation.

2.7. Safety pictograms

Symbol	Denomination
	**Dangerous electrical voltage.** The presence of this symbol is used to draw attention to the possibility that fatal accidents, serious injuries or considerable damage may occur if the specified safety measures are not applied. This symbol draws attention to the risks associated with the presence and use of electricity.
	**General danger.** Highlights very important information/prescriptions, in particular with regard to safety, failure to comply with which would endanger the physical integrity of persons. Crushing of the upper
	limbs. Do not introduce any objects and even less the upper limbs inside the machine when it is running in order to avoid any risk of crushing by the parts in movement.
	**Irritant.** The chemical maintenance washing of the machine requires caustic soda, a highly irritating and corrosive substance.
	**Irritating** on contact with skin and eyes.
	**moving organs**

3. Installation requirements

Before being delivered, the machines are subjected to rigorous tests for each work situation, so as to guarantee their perfect operation.

For the installation to be correct and safe, it is necessary to observe the following instructions.

3.1. Machine lifting and handling

HAZARD

Before unloading the machine, make sure that the place where it will be placed is able to support its weight.
The surface on which the machine is installed must have a mechanical resistance suitable FOR THE SUM of the weight of the machine and the weight of the load of product to be treated. Consult the table of technical characteristics beforehand.
Also make sure that the means used for unloading and handling the machine have a load capacity appropriate to its weight.

For lifting and moving during transport operations, use slings and a crane.

TRANSPORT, UNLOADING AND ASSEMBLY OF THE MACHINE
MUST ONLY BE PERFORMED BY SPECIALIZED AND AUTHORIZED PERSONNEL.

Make sure that the slings do not exert pressure on deformable components, in plastic, or on electrical cables.
To lift the machine, follow the instructions in the diagram in figure 1.

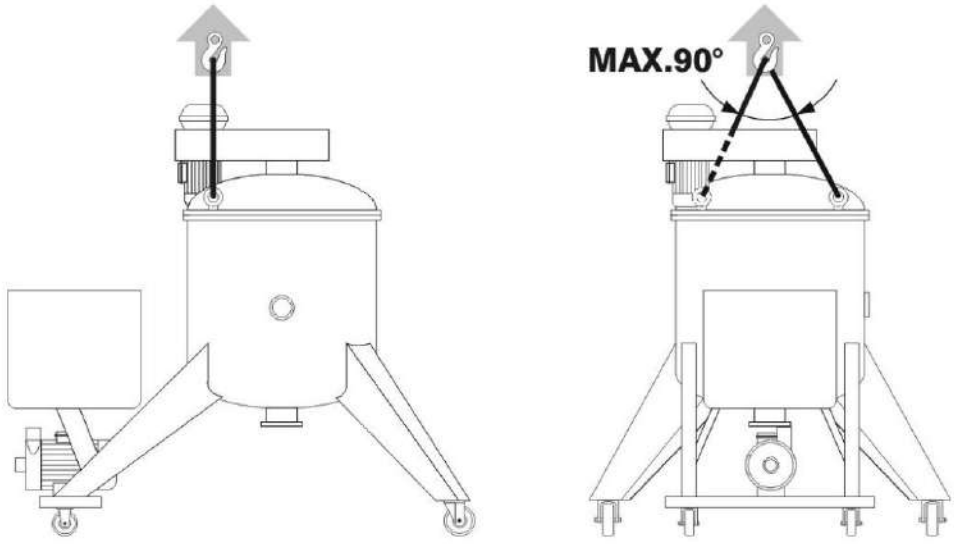


Figure 1

Modello	Massa (Kg)
NF5	700

3.2. Dimensions of installation rooms

For easy and safe use and maintenance of the machine, observe the following minimum distances for the installation rooms (see fig. 2).

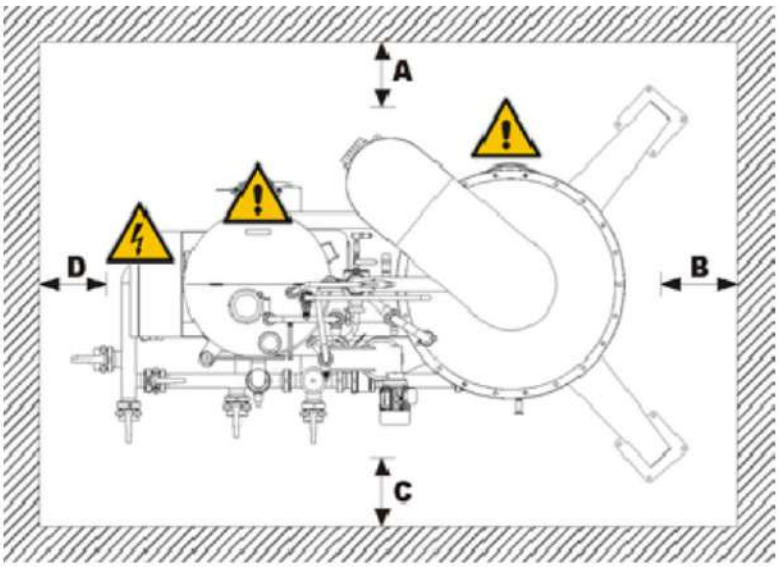


Figure 2

AT (mm)	B (mm) Per il normal funzionamento	B (mm) In case of maintenance	VS (mm)	D (mm)	Altezza minima del locale per il normal esercizio (mm)	Altezza minima del locale per le operazioni di manutenzione (mm)
900	500	1600	900 600		2000	2700*

*add space for a possible lifting system (overhead crane, crane, etc.)

ATTENTION

If a fixed or mobile drain pan is used, provide adequate space around the filter.

3.3. Operator Workstations Figure 3 shows
workstations for operations typically performed with NF filters.

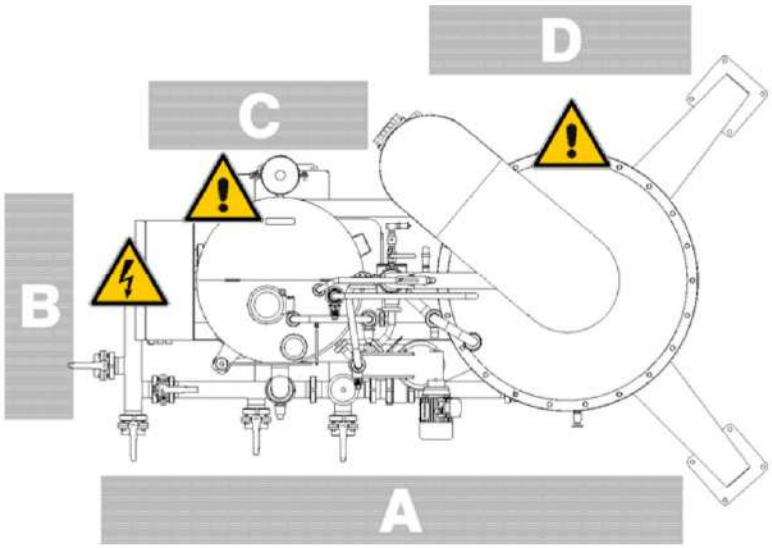


Figure 3

A Control zone for transformations, actuation of valves and mobile hydraulic connections.

B Actuation and control area for electrical devices, actuation of valves and mobile hydraulic connections.

C Area for kieselgur filling and content control operations of the doser.

D Filtration residue emptying area

3.4. Electrical connection All filters
are three-phase powered.

400 V 3 ~ 50

Check that the establishment's installation provides a power supply corresponding to the characteristics of the filter.
The connection to the power supply must be made by means of a terminal block located inside the control panel, on terminals L1, L2, L3 plus Neutral.

DANGER
As with all other ordinary or exceptional work on the electrical installation of the filter, the electrical connection must be carried out by a specialized TECHNICIAN, and the external power supply line must comply with the standards in force (IEC, etc.) and the provisions of the law. In this regard, do not forget that it is
mandatory to connect the machine to the earth.

Also comply with all the safety regulations concerning the premises where the machine is installed.

3.5. Checking the cyclic direction of the power supply phases After connecting the filter to the power supply network and before using it, it is necessary to ensure that the power supply phase connections are correct.

Activate the main switch.
Operate, but only with brief, rapid pulses, the agitator motor (in some models it is coupled to the dosing pump).
Make sure that the motor rotates in the direction indicated by the red arrow affixed to the crankcase.
If the motor does not rotate in the correct direction, correct the position of the cables connecting the power supply.

DANGER

During the normal functioning of the filter, it is necessary to be particularly careful, especially when the agitator of the doser or the cake discharge motor are running.
If necessary, press the EMERGENCY STOP button immediately.

WARNING

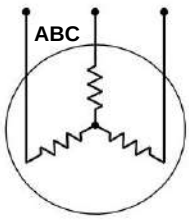
Filter pumps must never run dry. If the pumps run without liquid, even for short periods, the mechanical seals may be damaged.

3.6. Phase Imbalance Check Do not operate electric motors when the voltage imbalance between phases is greater than 3%.

For this verification, apply the following formula:

$$\% \text{ voltage unbalance} = \frac{\text{maximum voltage deviation from the average}}{\text{medium voltage}} \times 100$$

Example: nominal network voltage 400 V 3~ 50 Hz
AB = 409V
BC = 398V
AC=396V



$$\text{medium voltage} = \frac{409 + 398 + 396}{3} = 401\text{V}$$

How to calculate the imbalance percentage:

$$\% \text{ voltage difference} = \frac{409 - 401}{401} \times 100 = 1.99\%$$

This value is satisfactory because it is lower than the maximum allowed by 3%,

WARNING

If the mains voltage has an imbalance greater than 3%, contact the electricity distribution company. Operating the machine with a voltage imbalance between phases greater than 3% will VOID THE WARRANTY.

The voltage of the supply network must correspond to the nominal value ± 10%.

3.7. Connection to the pneumatic system (Optional)

In some versions, the NF filters can filter the residual liquid thanks to the use of compressed gases.

DANGER

The use of compressed gases for carrying out the final filtration is only permitted on machines with the appropriate certification.
Certification according to Directive 97/23/EC is evidenced by the plate affixed to the container and by the declaration of conformity, both issued by the manufacturer upon authorization by a notified body.
The owner of the machine must keep the declaration of conformity with the utmost care, which must be produced on request by a notified body.

The supply pressure of these gases must be as indicated on the filter test plate.

The supply of these gases (by cylinders or generators) must be connected to the 3/8" GAS connection of valve 4. The supply pressure required must be equal to the maximum operating pressure indicated in the technical characteristics table.

3.8. Hydraulic connections

The filter must be correctly connected to the various tanks, from which it receives or to which it sends the liquid to be treated or treated, as well as to the various accessory connections.

- The pipes can be of the mobile type (flexible plastic material) or fixed (steel).
- The rigid connection pipes must be fixed independently of the filter, so that their weight does not weigh on the suction and outlet connections.
- Provide flexible joints between the filter and the fixed pipes so that there is no reciprocal transmission of vibrations.
- The pipes must meet all the conditions of compatibility with the product to be treated (they must be suitable, for example, for food-grade or aggressive liquids).
- They must be able to withstand the mechanical stresses generated by the filter; for example, they must not be crushed by the suction force of the feed pump.
- They must be correctly sized; their diameter must therefore be proportionate to the flow rate of the filter and never be less than the diameter of the suction and delivery fittings.

- In the presence of both fixed and mobile pipes, often check that the joints are perfectly sealed, so as to prevent the filter from sucking in air through any cracks.

Connect the tank of the liquid to be filtered to valve **10** and the tank of the filtered liquid to one of the valves **14.** The dimensions and types of connection at the filter inlet and outlet are indicated in the technical characteristics table.

Connect the water delivery pipe to valve **11** for washing

pos.	Description	Type/dimension
10	LIQUID VALVE TO FILTER	DN 50
11	WATER DELIVERY VALVE FOR FILTER WASHING	DN 50
14	WATER DELIVERY VALVE FOR FILTER WASHING	DN 50

3.9. Pre-commissioning operations

WARNING Liquid

must flow in such a way that the flow always comes FROM THE FILTER TANK and goes to the outlet valves.

A flow going in the opposite direction through one of these valves, i.e. TOWARDS THE INSIDE OF THE TANK, even for a short time, can cause serious damage to the machine (Figure 4)

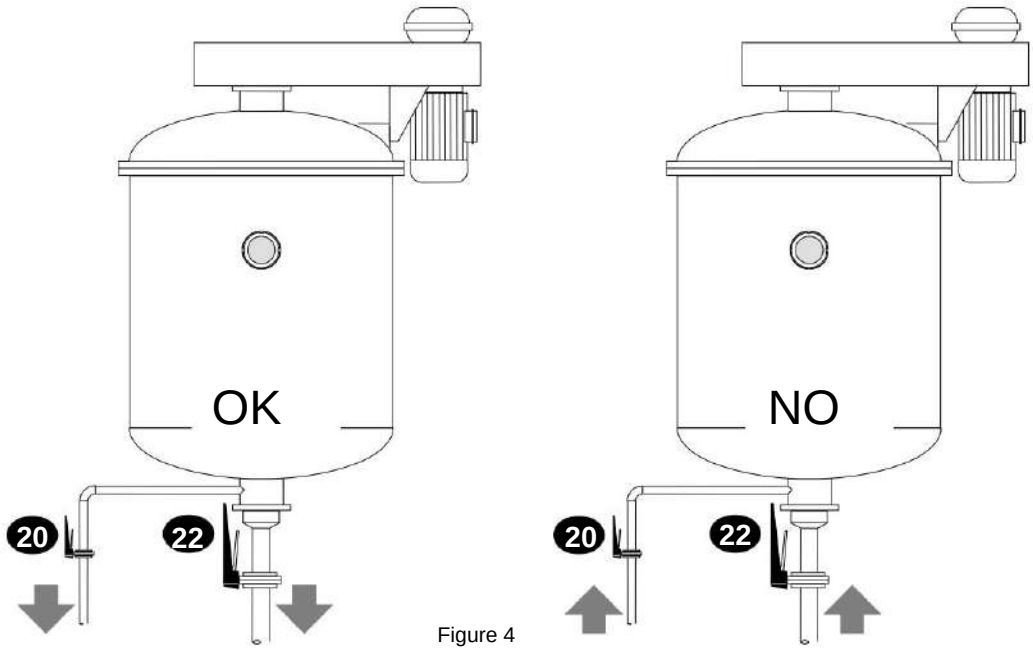


Figure 4

The instructions in Chapter 5 are for starting the filter with the supply tank at a higher level than the pump (Figure 5 - SUPPLY BELOW LOAD).

If the tank is at a level lower than that of the pump axis (figure 6 - SUPPLY ABOVE THE LOAD), manual priming must be carried out, as follows:

Provide a non-return valve at the end of the suction tube in the tank and fill the filter dispenser with product to about a quarter of its capacity.

Check that all the valves are closed and only open the doser suction **9** and the supply **10 .** The liquid will fill the suction tube and the pump can be started, which is now full of liquid.

Once the pump has been primed, close valve **9** and continue with the other operations indicated in the paragraph.

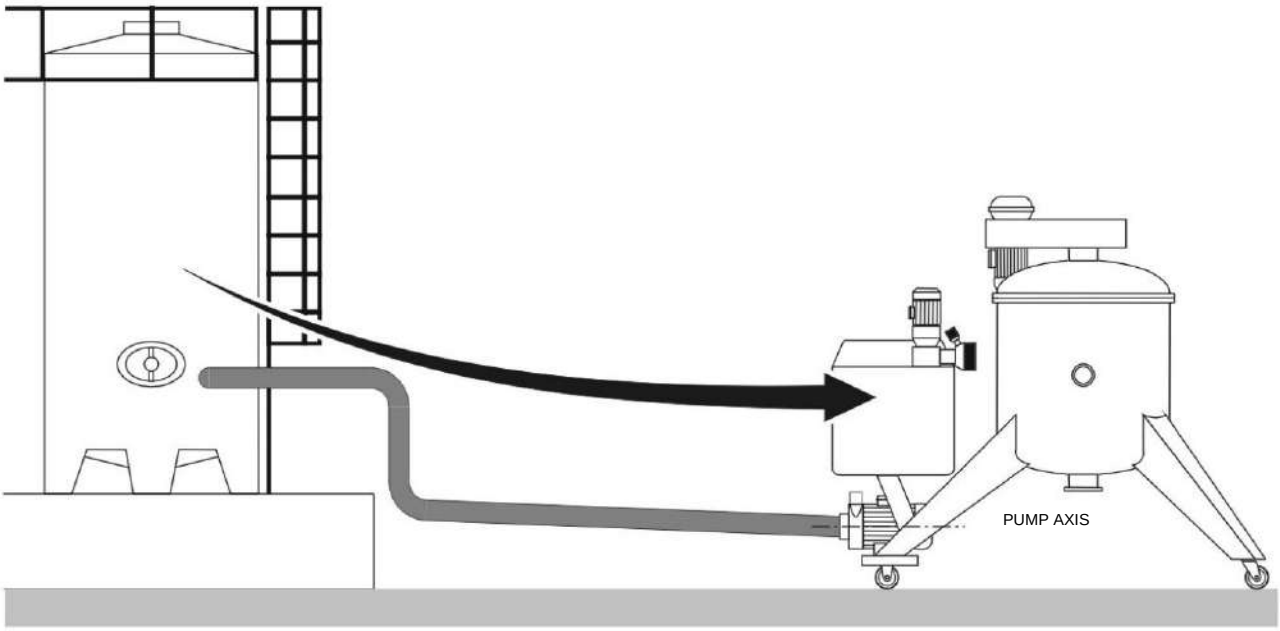


Figure 5 - FEEDING BELOW LOAD

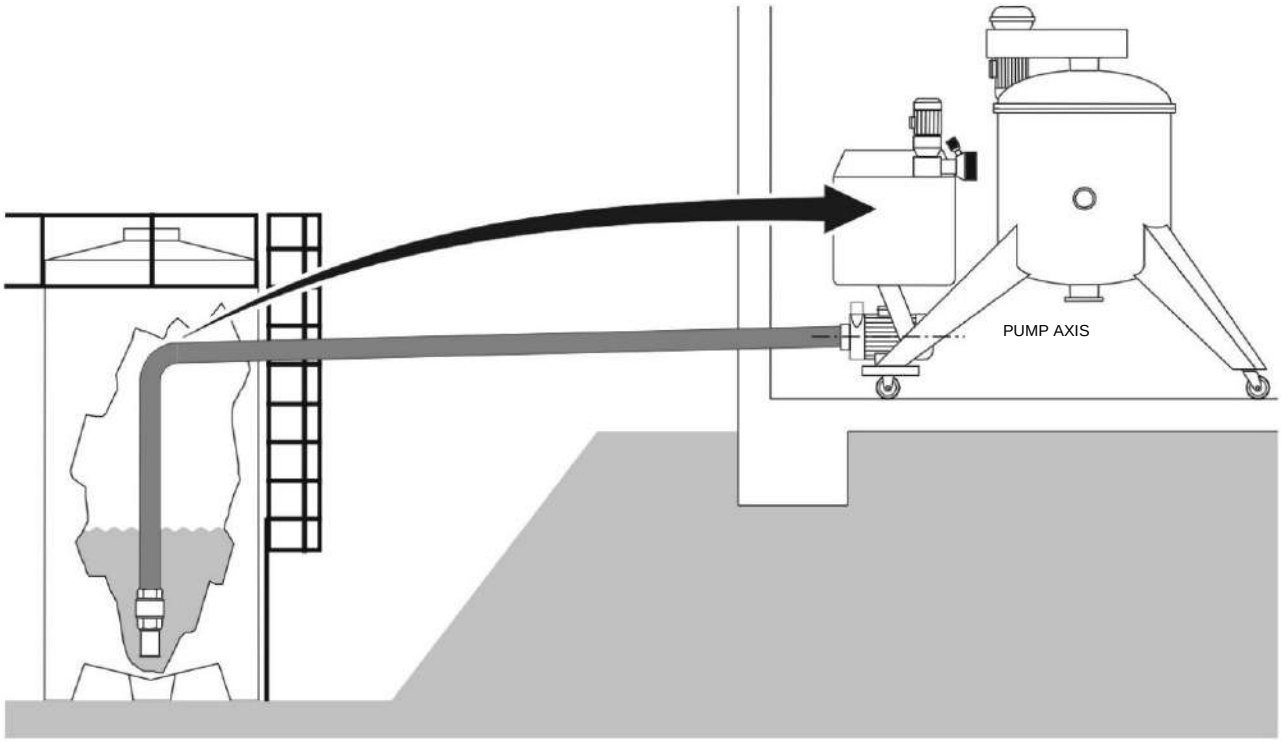


Figure 6 - FEEDING ABOVE THE LEAF

4. Water filling

Check that all the valves and the drain hole **23** are closed.

Connect the supply tank to valve **10** and the receiving tank to valve **14.** Open valves **7** for delivery, **2** for venting, **13** for filling the doser, **22** for exclusion of the outlet and valve **10** for supply.

Start the feed pump and allow the liquid to flow in order to fill the filter. When the doser is half full, open valves **12** for reassembly, **9** for suction of the doser, then close valve **10.**

5. Formation of the precoat

HAZARD

For the normal operation of this machine, kieselguhr is used, a product considered harmful.

READ CAREFULLY BEFORE USING KIESELGUHR

KIESELGUHR (DIATOME)

Contains crystalline silica (Quartz and Cristobalite)

Xn HARMFUL

R20 HARMFUL: RISK OF IRREVERSIBLE EFFECTS IN CASE INHALATION

R48 RISK OF SERIOUS DAMAGE TO HEALTH IN CASE OF LONG EXPOSURE.

S22 DO NOT BREATHE DUST.

When handling the product, it is mandatory to observe the following precautions: A) Wear

an appropriate respiratory mask.

B) Ensure that the work environment is well ventilated and equipped with a dust extraction system.

C) Wear appropriate protective clothing.

For any additional information concerning medical and scientific research on kieselguhrs, request the product's safety data sheet from the manufacturer.

PERLITIC-type kieselguhrs do not fall into this hazard class.

Start the agitator **37** and slowly pour the kieselguhr required for the precoat into the dispenser (see table).

CAUTION

In the upper part of the doser there is a DIN DN 65 F type connection with cap, for dust extraction. In case of manual loading of the kieselguhr, remove the cap and connect a suitable dust extraction system, with a flow rate equal to 150 m3 /h. Activate the suction device during the operations of introducing kieselguhr into the doser.

WARNING The

quantity of kieselgur required for both sedimentation and filtering must never exceed 6 kg (approximately) per square meter of filtering surface of the machine used.

The maximum weight of adjuvant must be observed even when mixing kieselgur with other substances.

For example, if a mixture of kieselgur and activated carbon is used, the total weight should not exceed 6 kg/m.

A higher dosage can cause damage to the filter discs.

DANGER

When the agitator is running and the kieselguhr is poured into the dispenser, it is advisable to act with the utmost caution, so as not to come into contact with the rotating blades. The agitator alone guarantees excellent mixing of kieselguhr and water. It is therefore never necessary to use sticks or extension cords, and even less to put your hands in the dispenser.
The lid of the doser must only remain open for the time strictly necessary for the introduction of the kieselguhr.
Do not approach the agitator while wearing clothing such as loose-sleeved shirts, ties, scarves, or items such as chains, bracelets, etc.

Slowly half-open the circulation valve **12** until all the kieselguhr contained in the dispenser is sucked up; then, open it completely. This operation having been completed, close the valves **2** for the vent, the filling of the doser **13,** the suction of the doser **9** and open the valve **10** for the supply.

Throughout these operations, the liquid circulates in a closed circuit, without any introduction of any other product.

5.1. Filter aid dosage The maximum quantity

of filter aid must be calculated by multiplying the useful volume of the cake (see table below) by the density of the aid to be used. Contact the adjuvant supplier to find out its density, which varies in all cases from 0.2 to 0.4 kg/litre.

Example:

If the density of the filter aid is 0.3 kg/l and the useful volume of the cake is 220 liters, the maximum admissible quantity usable for filtration will be:

0.3 kg/lx 220 l = 66 kg

Care must be taken because the quantity thus determined already includes both the dose for the formation of the precoat, usually equal to 1 kg per square meter of filtering surface, and that which is then necessary to complete

all the filtration, which is therefore equal to the remaining part of the quantity just calculated.

The maximum weight of the adjuvant must also be respected if other substances are used with the kieselguhr. In this case, the determined maximum admissible quantity must therefore be identical to the sum of the weight of the various adjuvants used.

Finally, also pay attention to the quantity of solids in suspension in the liquid to be filtered.

Normally it does not influence the final weight of the residual cake but in certain cases, for example when activated carbon, bitartrate crystals, etc. have been added. to the liquid, this weight must also be subtracted from the maximum admissible quantity of adjuvant.

Useful volume pannello / Useful volume of cake / Useful volume cake Useful panello volume / Useful panello volume	l	81 + 5 for final filtration
Farina fossile per un prepanello / Kieselgur for one precoat Menge an Kieselgur für eine Anschwemmung / Kieselguhr for alluvium	kg	5 / 6

CAUTION

Never exceed the maximum admissible quantity of adjuvant because this could seriously and irreparably damage the filter unit.

6. Filtration

Prepare the quantity of kieselguhr for filtration (see Table) and pour slowly into the dispenser.

IMPORTANT

Before each start-up of the dosing pump, always check that valve **3** is in the correct position (only for suitable models).

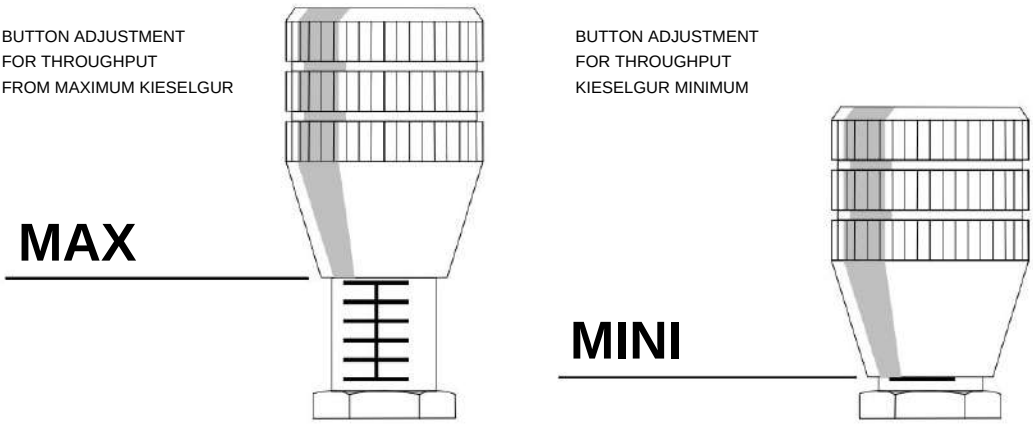
Start the dosing pump and open the mixture suction valve **16,** adjust the flow of the liquid to be filtered using valve **7** and vent for about a minute using valve 2.

Slowly open the filtered product outlet valve **14** and, still slowly, close the recirculation valve **12.**

The maneuvers on these two valves must be carried out at the same time.

During filtration, adjust the flow rate of the dosing pump with handle 1.
For correct adjustment of the quantity of kieselguhr emitted by the dosing pump, observe the inlet pressure gauge 5: if the pressure increases rapidly, the flow of kieselguhr must be increased by unscrewing handle **1** (if necessary, also reduce the flow of product with valve 7); on the other hand, if the pressure increases too slowly, reduce the flow of kieselguhr by screwing this same

handle (see Figure 7). This flow rate adjustment must be made at each new filtration because the fouling power varies from one liquid to another. The safety valve **53** protects the installation against any overpressure.



Picture 7

During filtration, the mixture of kieselguhr and liquid contained in the dispenser may run out before the product to be filtered has been finished.
In this case, prepare a new dose of mixture, but only if the maximum quantity of kieselguhr allowed has not yet been exhausted.
Fill the dispenser just enough by opening valve **13 ,** partially and only for the time necessary for the operation. After having closed the valve, add the kieselgur that you still have.

WARNING

If the permitted amount of kieselgur has been used, filtration should be considered complete regardless of how much product still needs to be filtered.

During the next filtration, calibrate the amount of kieselgur so that it is sufficient for all the liquid to be filtered. At the

end of the filtration, open the doser suction valve **9** and close the valve **10.** Switch off the dosing pump and the agitator.

When the doser is completely empty, close valve **9** and open valve **12.**

Filtration should be considered complete in the following cases:

a) exhaustion of the liquid to be

filtered; b) exhaustion of the allowed quantity of

kieselgur c) when the filter reaches the saturation pressure of the filter unit.

In each of these cases, the emptying of the residual liquid contained in the filter can be carried out.

7. Final filtration of residual liquid

Once the liquid to be filtered has been exhausted or when the filter has reached the saturation pressure of the filtering unit, the final filtration can be carried out with compressed gases.

HAZARD

The use of compressed gases for carrying out the final filtration is only permitted on machines that have obtained an appropriate certification.

Certification according to Directive 97/23/EC is evidenced by the plate affixed to the container and by the declaration of conformity, both issued by the manufacturer upon authorization by a notified body.
The owner of the machine must keep the declaration of conformity with the utmost care, which must be produced on request by a notified body.

Without moving any valve, run the filter for 5/8 minutes. In this way, the liquid recirculates so as to purify itself of the coarsest impurities before the final finishing filtration. Once this time has elapsed, open valve **14** and close valves **12** and 7, open valve **4** and, immediately afterwards, close the filtrate exclusion valve **22.**

Stop the feed pump.

IMPORTANT

Pay close attention to the pressure of the air to be introduced into the tank. Under no circumstances should it exceed the maximum admissible pressure indicated in the table of technical characteristics. During the filtration, it is also necessary to constantly observe the manometer **5** which must never indicate values higher than the maximum admissible pressure.

Entering the tank under pressure, the gas pushes the liquid through the final discs.

A safety valve protects the entire circuit for the final filtration with compressed gases.

When a mixture of liquid and gas begins to pass through sight glass **26,** close valves **4** and **14** and open valve **2** to vent the gas contained in the tank.

In this operation, the best results are obtained by using gases such as carbon dioxide (CO2) or nitrogen (N2).

On non-approved filters, the final filtration must be carried out using the centrifugal pump provided for this purpose or a piston pump operating in depression.

Once the final filtration is complete, discharge the residual liquid still contained in the tank using the feed pump and opening the valves **21** and **15,** or through the mouth **23.**

DANGER

Mouth **23** must only be opened after having carefully and completely purged the tank of the residual gases under pressure which it contains.

8. Unloading the cake

WARNING The

spent sediment to be eliminated contains, in addition to the impurities of the filtered liquid, all the kieselgur used during the filtration.

This product must be treated with the precautions indicated for its use and must be disposed of in a landfill provided for this purpose after adequate treatment.

These instructions must also be observed for drain water from washing the filter

To unload the cake, carry out the following operations in sequence :

filtration residues; open your mouth **23.**

b) operate the emptying motor, which must run only for the time necessary to empty all the residues and never more than one and a half minutes.

To operate this motor, follow the instructions provided in Figure 8.

DANGER

When the emptying motor is running, keep a good safety distance from the open drain outlet **23** for the exit of residues.

For the operations of evacuation of the cake and of washing, the devices with which the filter is provided suffice.

When the drain motor is running, never slip your hands or insert sticks or other tools inside the filter bowl.

ATTENTION!

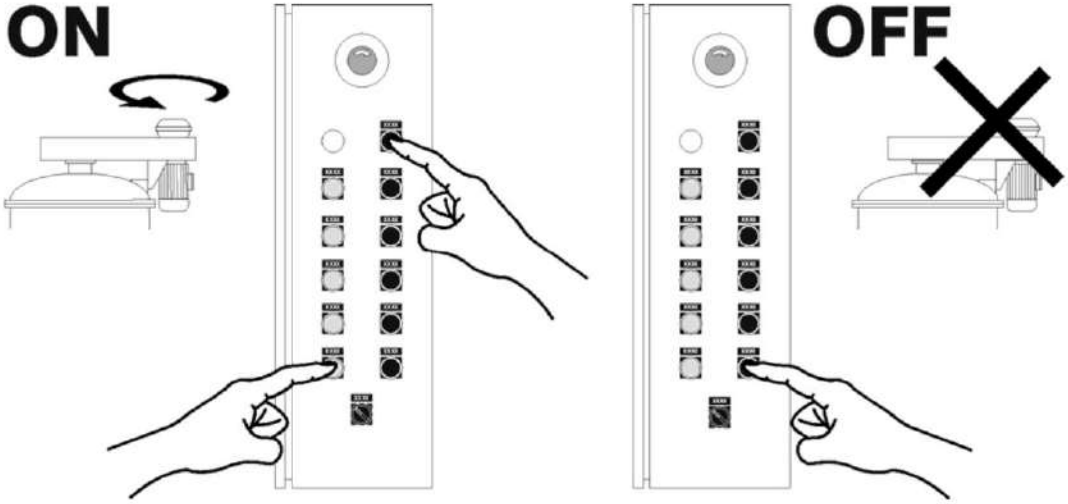
TO AVOID ANY ACCIDENTAL STARTING OF THE DRAIN MOTOR, A DOUBLE START BUTTON HAS BEEN PROVIDED.

TO START THE ENGINE, PRESS BOTH BUTTONS AT THE SAME TIME.

To stop it, just press the corresponding button.

The figure shows a generic alluvium coating whose quantities and arrangement of orders may vary.

The mode of actuation of the drain motor remains unchanged anyway



Picture 8

WARNING The kieselgur panel mixed with impurities from the filtration must be considered as special waste; it is therefore necessary to handle, store and dispose of it in accordance with the laws in force in the country where the machine is used.

This procedure should also be followed for the filter wash water that is produced during the next work phase.

9. Washing at the end of filtration

To wash the filter discs, connect the water supply (from a pump or from the network) to the inlet valve **11;** it is also possible to clean the inside of the doser and fill it with water which will then be sucked in by opening the valve 9.

During this operation, the centrifugal pump must be running and the filtering unit must be rotating, however only activating the drain motor for short pulses in order to avoid overheating of the seals.

Open valve **7** for 5/10 seconds, then valve **18** until the end of dosing pump washing. Open valve **8** at short intervals to completely clean the filter.

It is important to always clean the dosing pump, even when filtration has to be interrupted for any reason; in such a case, the pump must be cleaned with the same liquid to be filtered, closing the suction valve **16** and opening the washing valve **18.**

Instead of using a water tank, the filter can be washed using the doser **36.** The pump **35** will then suck up, through the valve 9, the washing water contained in the doser **36** previously washed and filled.

Once the doser is empty, fill it through valve **11** which should only remain open for the time required to fill the doser.

The quantity of water required for washing the filter can be calculated by multiplying the filtering surface of the latter by approximately 60-80 litres.

When washing is finished, drain the water through drain **23.** Check that the water is perfectly clean and free of impurities; if this is not the case, carry out a new wash.

DANGER

To clean the machine manually with liquids, it is necessary to pay the greatest attention. Before directing jets of water against any part of the filter, it is necessary to disconnect it from the power supply.

10. Brief interruptions or stoppage of filtration

During the filtration, it may happen that it is necessary to stop the machine momentarily, for example to change the collection or feeding tank; in this case it is necessary to perform some operations in order to keep the cake stable on the discs: - open valve **12** and at the same time

close valve **14.** - then also close valve **10.** - stop metering pump

38. - close valve **16** and open valve **18**

for about 5 seconds. In this

way, it is possible to eliminate the kieselgur which has deposited in the dosing pump.

If the shutdown exceeds 5 minutes, close valves **12** and 7 at the same time, and stop pump **35.**
To resume work, repeat the same maneuvers but in reverse.

WARNING If the machine has been filled and is working with cold product and a shutdown is foreseen, all the valves of the internal circuit must be left open and only the valves leading to the outside should be closed, so as to avoid the breakage or deformation of machine components: in fact, the expansion of the product, under the effect of natural heating, could cause the breakage of sight glasses, valves, pressure gauges, etc.

11. Maintenance operations

Use the following PPE:

	Mandatory protective gloves
	Mandatory safety shoes
	Glasses or protective mask
	Protective clothing

11.1. Washing with detergent substances Over time,
filtration operations can become difficult due to the gradual clogging of the filter discs. This progressive obstruction is caused by various clogging substances often contained in the liquids to be filtered.

This progressive obstruction of the discs causes the cake to become more and more irregular even if all the maneuvers have been carried out correctly.
This is why, once a month, during periods of intensive use or when a prolonged period of inactivity is foreseen, the filter should be filled with a solution of hot water and suitable detergent substances based on caustic soda, in doses not exceeding 2% of the volume of the filter.

Example: if the sum of the capacity of the tank and that of the doser is equal to 1000 litres, use approximately 20 kg of detergent substance.
Three separate washes must be carried out, each time using a new detergent solution and increasing the temperature according to this scheme: 1st wash: solution at 40 o C / 104 F; 2nd wash: solution at 55 o C / 131 F; 3rd wash: solution at 70 o C / 158 F.
Perform closed circuit recirculation for half an hour each time, then leave the solution to act with the filter stopped for approximately one and a half hours for each cycle.
The time required for the removal of deposits can vary, sometimes considerably, depending on the consistency and type of clogging substance.

During each of these three washing cycles, pull the lever **66** at least 5 or 6 times so as to effectively clean the safety valve **53.**

ATTENTION

The cleaning of the valve **53** is a fundamental operation because it eliminates any encrustations and deposits of product which could block its operation and be the cause of dangerous situations. At the end of the three cycles, perform a rinse with water at room temperature, then drain the filter completely.

DANGER

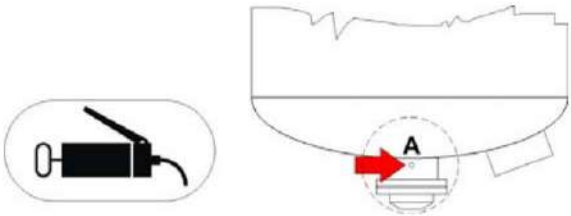
The use of caustic corrosive substances (alkalines) can harm the health of the operator.

Respect the doses indicated.

Before use, consult the manufacturer's instructions, which appear on the packaging, and take all the precautions indicated.

11.2. Lubrication operations During periods of continuous use, check that the drain valve **23** can be operated correctly . When actuation becomes particularly difficult, grease the seat of the valve.

Generously grease the lower bearings of the disc-holder shaft using grease nipples A.



11.3. Mechanical sealing of the centrifugal pump All centrifugal pumps have hydraulic sealing systems to prevent liquid from leaking from the motor shaft. Their gradual wear should be considered normal given the presence of liquid/kieselguhr mixtures.

Pumps fitted with “mechanical seal” type systems may, over time, develop fluid leaks. In this case, contact the assistance service for the purchase of a new seal and the replacement of the worn seal.

11.4. Exceptional maintenance

All maintenance operations that are not part of the scheduled maintenance indicated in this manual (replacement of seals, bearings, gaskets, etc.) must be considered as “exceptional maintenance” and may ONLY BE PERFORMED BY THE MAINTENANCE DEPARTMENT OR BY AUTHORIZED PERSONNEL . These stakeholders must be informed in detail about the possible foreseeable risks.

12. Demolition and disposal

Machine demolition and disposal operations must only be carried out by personnel who have received adequate training and are properly equipped.

1. Selectively disassemble and separate plastics, electric motors, pipes, steel and other materials.

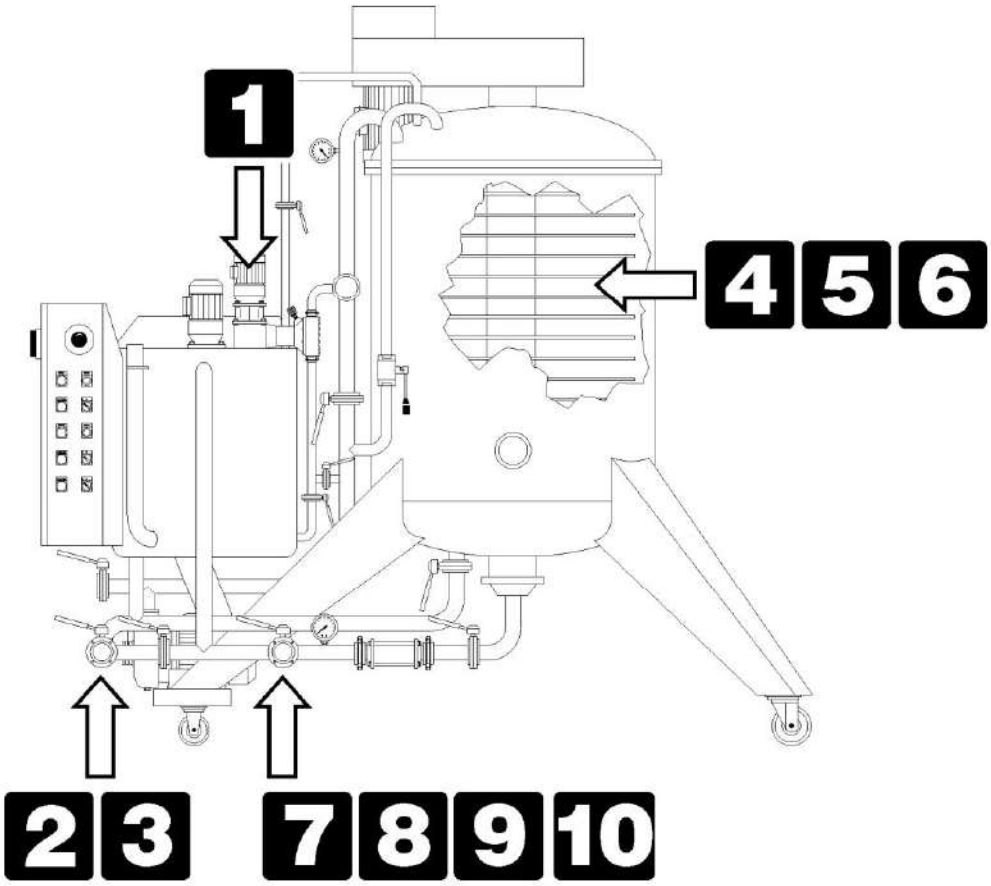
2. Waste disposal must be done in accordance with applicable standards.
   force by product type.

3. All components contaminated with oil or acid are special waste and must therefore be disposed of through authorized centres.

Della Toffola SpA declines all responsibility for damage caused to persons or property due to non-compliance with the aforementioned rules and recommendations.

Likewise, under no circumstances can it be held liable for damage caused to persons or property caused by the reuse of parts of the machine for functions or assembly situations different from those of origin.

13. Troubleshooting



This chapter describes some malfunctions that may occur during normal use of the filter.

DANGER

For any intervention on the filter, always comply with all the safety instructions mentioned above.

Do not carry out operations not provided for in this user manual.

All interventions must only be carried out by suitably qualified personnel (INSTALLERS, OPERATORS, TECHNICIANS, etc.).

1. THE DOSING PUMP IS NOT WORKING If the pump is on

but the intermittent injection of kieselgur is not visible by the light **27** on the delivery of the liquid to be filtered, this means that the pump is blocked. ÿ CAUSES The non-return valves of the

pump are

blocked; The pump is full of air. ÿ HOW TO INTERVENE

If the valves are blocked, proceed immediately to pressure wash the pump, momentarily closing valve **16** and opening valve **18** for a few moments . If the problem persists, repeat the operation several times.

ÿ If the pump is full of air, in addition to activating the valves indicated above, empty the gas pocket in the dispenser using valve **3** (only on the models provided).

When the pump is functioning normally again, immediately return the valves to the position prior to the anomaly.

2. THE CENTRIFUGAL PUMP OPERATES WITHOUT

VACUUM This type of erroneous maneuver irreparably damages the mechanical seal of the pumping unit, causing a liquid leak outside. ÿ CAUSE The lack of liquid inside the pump

body causes

overheating and rapid wear of the mechanical seal.

ÿ HOW TO INTERVENE

Contact the after-sales service to replace the mechanical seal.

3. THE CENTRIFUGAL PUMP HAS A LOW EFFICIENCY An

abnormally low liquid flow at the outlet of the filter may indicate a malfunction of the pump. ÿ CAUSE

The direction of rotation of the pump is wrong.
The pump rotor is clogged with residues contained in the liquid to be filtered.

ÿ HOW TO INTERVENE

Check the connections of the power supply cables.
Contact the after-sales service for cleaning the rotor.

4. AIR POCKETS ARE PRESENT INSIDE THE FILTERED

Imperfect formation of the cake and a liquid that remains cloudy even after filtration are often the consequences of the presence of gas pockets inside the filter.

In this case, observing the inside of the filter through the sight glass **42** placed on the bell, one can notice that the cake has a wavy surface. This determines areas of kieselgur with uneven thickness through which the pressurized liquid is poorly filtered.

ÿ CAUSE

The connections between the pipes coming from the tanks and the filter are not tight and the pump continuously sucks in air.
Filtered liquids produce gas if agitated too much.

ÿ HOW TO INTERVENE

Periodically check the tank and filter pipe seals.

In the case of a special liquid, bleed the air from the bell periodically and with the greatest care, open valve **2** as strictly necessary and if necessary reduce the flow (slightly) of the filter by closing valve 7.

5. THE FILTERED LIQUID IS LITTLE CLEAR OR CLOUDY

The liquid is cloudy even though the problems in point **4** have been solved.

ÿ CAUSE

The filter cake that has formed above the discs is insufficiently thick.

Erroneous maneuvers have been carried out or tank changes have been made too abruptly.

ÿ HOW TO INTERVENE

Check the operation of the dosing pump.
Perform the various maneuvers correctly and carefully read the instructions concerning the incorrectly performed phase.

6. FILTER CAKES ALWAYS FORM IN A WAY IRREGULAR

Observing the inside of the machine, the formation of the filter cakes is badly carried out with each new filtration. ÿ

CAUSE

The filter cloths of the discs are partially clogged with encrusting substances.

ÿ HOW TO INTERVENE See

chapter 11.

7. THE FILTER CLOGS PREMATURELY

Once filtration has started, the cake clogs too quickly.

ÿ CAUSE

The type of kieselgur selected is not suitable for the filtered liquid.

The suction in the supply tank is too low and a lot of sediment is sucked up with the liquid. ÿ HOW TO INTERVENE

Consult the kieselgur table.

The suction pipe in the tank must be at least ten centimeters above the sediment level.

The bottom can be vacuumed once most of the liquid in the tank is used up.

8. THE FILTER DOES NOT HAVE OPTIMAL PERFORMANCE

The output liquid flow rate is not the maximum flow rate.

ÿ CAUSE

The suction and the discharge of the filter are carried out with pipes of reduced diameter and unsuitable for the flow rate of the

machine. ÿ HOW TO INTERVENE

Install connection pipes of a suitable diameter.

9. A MOTOR OR PUMP STOPS

A motor stops during normal operation.

ÿ CAUSE

The motor protection thermal relay has tripped.

ÿ HOW TO INTERVENE

Interrupt filtration and set the main switch to OFF.

DANGER

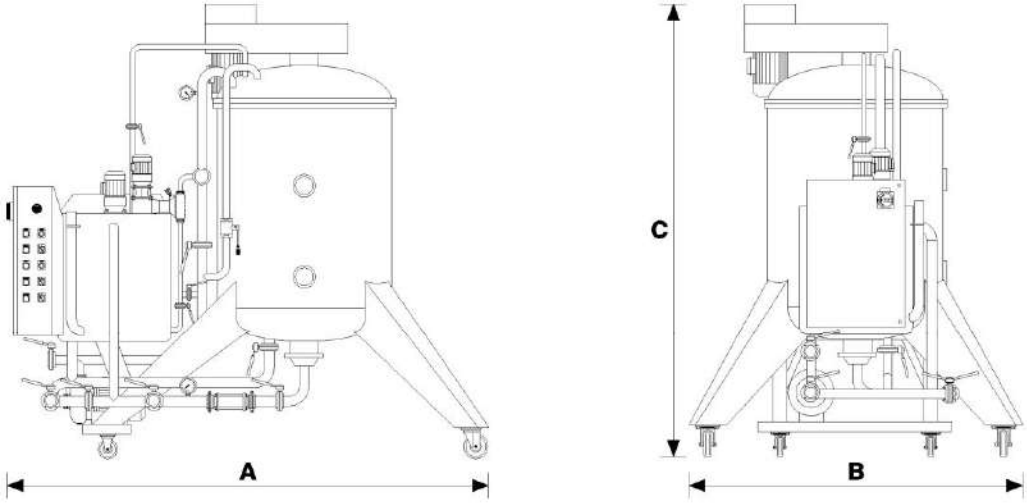
Any ordinary or extraordinary intervention on the electrical installation of the filter must be carried out by a specialized TECHNICIAN.

Open the electrical panel and reset the thermal relay.

The thermal relay protects the motor against overloads.

It is not recommended to reset the thermal relay several times before having identified and eliminated the problem which causes it to trip.

14. Table of technical data



Model-Filter area / Model-Filter ares, Modell-Filterflâche / Model e-Filtering surface Filter surface model	mq / sm / qm	**NF 5**
Production / Capacity hl/h Productionsleistung / Production Production	hl/h	150*
Maximum permissible pressure (PS) / (PS) Maximum permissible pressure / Zulässiger Höchstdruck (PS) / Maximum allowable pressure (PS) / Maximum allowable pressure (PS)	bar	8
Pressure of the lavoro / Running pressure / Betriebsdruck / Working pressure / Presión de trabajo		7.2
Campana volume / Fitter Vessel volume Volumen of the Filterkessel / Volume of the filter tank Campana volume	l	325
Volume dosatore / Dosing vessel volume Volumen des Dosierbehâlter / Volumen doser Dosing volume	l	240
Potenza pompa centrifuga / Centrifugai pump power Leistung der Zentrifugalpumpe / Power centrifugal pump Potency of the centrifugal bomb	kW	7.5
Potenza dosing pump / Dosing pump power Lelstung der Dosierpumpe / Power dosing pump Power of the dosificadora bomba	kW	0.37
Potenza motore di scarico / Discharge motor power Leistung des Motcr für des Ablassen / Motor power for oil change Potencia motor de motot	kW	3
Potenza total installata / Total installed power Kraftgebrauch / Total power installed Power total installed	kW	10.87
Consumo di acqua per il lavaggio / Washing water consumption Wasserverbrauch für die Reinigung / Water consumption for washing		300/400
Livello pressione sonora / Sound pressure level / Schalldruckpegel Sound pressure level / Acoustic pressure level	dB(A)	84.7**
Weight / Weight Gewicht / weight / cuelga	kg	700

** Livello di pressione sonora media ad 1 metro di distanza / Average sound pressure level at 1-meter distance / Mittlerer Schalldruckpegel auf einem Meter Distanz / Level of average sound pressure at 1 meter distance / Nivel de presión acústica mediana a 1 metro de distancia.

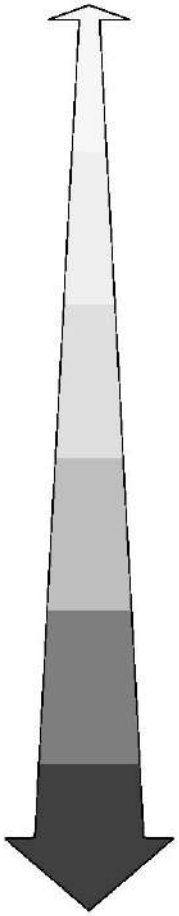
15. Valves and components legend

1) KIESELGUR FLOW ADJUSTMENT KNOB
2) BELL VENT VALVE
4) VALVE WITH QUICK COUPLING FOR COMPRESSED GAS (OPTIONAL)
5) BELL LIQUID INLET PRESSURE GAUGE
6) PRESSURE SWITCH
7) LIQUID DELIVERY ADJUSTMENT VALVE TO BE FILTERED
8) VALVE FOR INTERNAL FILTER WASH
9) DOSER SUCTION VALVE
10) LIQUID SUPPLY VALVE TO FILTER
11) WATER DELIVERY VALVE FOR FILTER WASHING
12) REASSEMBLY VALVE
13) METERING FILLING VALVE
14) FILTERED LIQUID OUTLET VALVE
15) AUXILIARY DRAIN VALVE
16) KIESELGUR SUCTION VALVE OF THE DOSER
17) FILTERED LIQUID OUTLET PRESSURE GAUGE
18) DOSING PUMP WASHING VALVE
19) DRAIN AND SAMPLING VALVE
21) BELL DRAIN VALVE
22) FILTERED LIQUID ADJUSTMENT VALVE
23) RESIDUAL PANEL DRAIN PORT
24) BELL RESIDUE DRAIN VALVE
25) DUST EXTRACTION CONNECTION
26) MANHOLE WITH FLOWMETER FOR LIQUID AT THE FILTER OUTLET
27) INSPECTION LAMP FOR LIQUID AT FILTER INLET
28) SAFETY VALVE FOR FINAL FILTRATION WITH COMPRESSED GAS (OPTIONAL)
35) LIQUID TO BE FILTERED FEED PUMP
36) KIESELGUR DOSING TANK
37) KIESELGUR DOSING TANK AGITATOR
38) DOSING PUMP
39) MOTOR FOR FILTERING PACKAGE ROTATION
40) FILTERING PACKAGE
41) FILTER BELL
42) BELL CONTROL LOOK
53) SAFETY VALVE FOR FILTRATION CIRCUIT
65) DOSER CAPACITY METER
A) OILER LOWER BRACKET DISC HOLDER SHAFT

Tabella comparativa delle flour fossili --- Comparative kieselgur table --- Kieselgur ---Vergleichstabelle --- Comparative table of Kieselguhrs --- Tabla de comparación de las tierras

− Portata -- Flow rate -- Durchsatz
Flow -- Capacitance

+ Limpidezza -- Clarity -- Klarheit
Limpidity -- Limpidezza



+ Portata -- Flow rate -- Durchsatz
Flow -- Capacitance

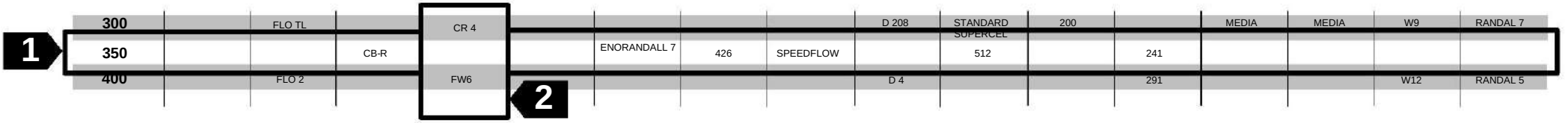
− Limpidezza -- Clarity -- Klarheit
Limpidity -- Limpidezza

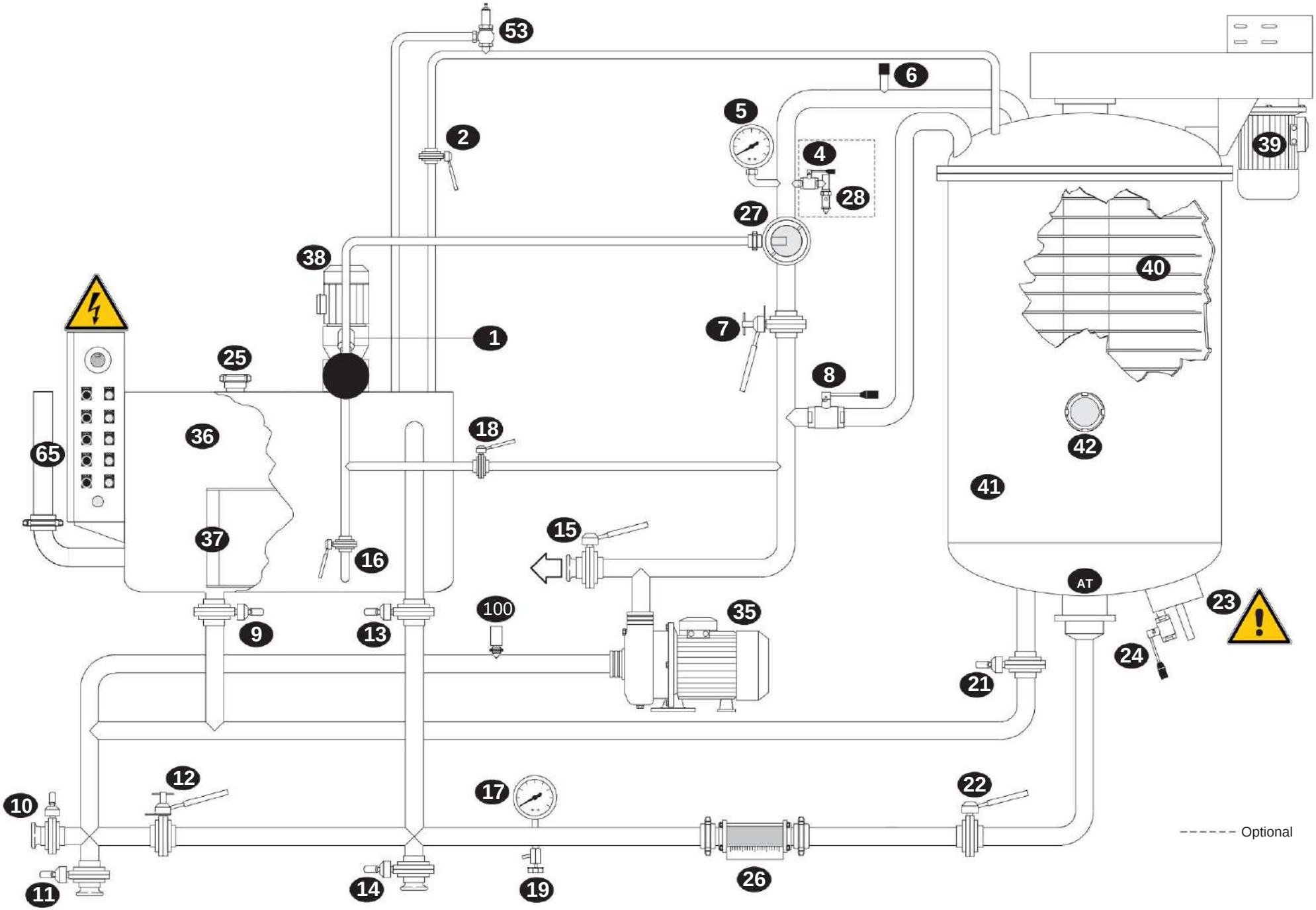
Portata Relative Relative Flow rate Relative Durchsatz Relative flow Relative capacity l /h/ m2	AEB	CECA		CELATOM	CHEMIA PERLOMARI DIACEL	DAL CIN	DICALITE		MANVILLE – CELITE		KENITE	PRIMISIL	SCHENK	SEITZ	WINKELMANN	
	DIATOMITE	PEARLITE	DIATOMITE	DIATOMITE	DIATOMITE	DIATOMITE	PEARLITE	DIATOMITE	PEARLITE	DIATOMITE	DIATOMITE	DIATOMITE	DIATOMITE	DIATOMITE	PEARLITE	DIATOMITE
100	MINI-SPEED		CB L3	FN 2	CF/SS		408	215		FILTERCEL	100	121	# 1			CF 2
120			CB L2			ROSA S								EXTRA FINE		
150			CB L	CR 22	CF/S			SUPERAID		577	101	141	# 2	EXTRA		
200			CB	PF 2			416	UF		505		201			W6	
300		FLO TL		CR 4					D 208	STANDARD SUPERCEL	200		MEDIA	MEDIA	W9	RANDAL 7
350			CB-R			ENORANDALL 7	426	SPEEDFLOW		512		241				
400		FLO 2		FW6					D 4			291			W12	RANDAL 5
450	DIATOCEL		CB R2	CR 6			436				300					
500			DC B			ENORANDALL 7 EXTRA	4108	231		HYFLO SUPERCEL		401				
600			DIF-B	FW12			456	341								
650			DIFB0				476 SP						GREAT	GREAT		
700	NORMAL SPEED		DIC B	FW14	CF/MM	ENORANDALL 3	476			501	700	502A	SPECIAL	SPECIAL	W 19	RANDAL 3
800		FLO MA	DIF	DC 14	CF/M		4158	SPEEDPLUS	D 2			511				
850	DIATOCEL		DIF 2R	FW18			4106	DIAFLUS 1			900	602A				
900		FLO 1	DIC S3	FW 20		ENORANDALL 3 EXTRA	4258	SPEEDEX			1000	611	SPECIAL V	SPECIAL V	W 24	RANDAL 1
1000		FLO 2A					4156	375	D 10	503	177W	722A			W 26	
1100	SILITE						SPECIAL 2				723	741			W 28	
1150				FW40				SWIM POOL GRADE				802				
1200		FLO R	DIT R				SPECIAL 1		D 100						W32	
1350							SPECIAL 1L	2500								
1400			DIT 2R	FW50		ENORANDALL 1					2500	802A				EXTRA 1
1450								4500			3000	1002A				
1500	HIGH SPEED			FW60		ENORANDALL 1 EXTRA		4200		535		1201		ULTRA		
1800			DIR 3R					5000			5500	1202				GREAT EXTRA 1
2000				FW 80		RANDALL FLOW		6000								RANDAL MORE
2500					CF/V					545						
3000					CF/VV					560						

Come usare la tabella -- How to use the table -- Gebrauch der Tabelle -- How to use the table -- Cómo usar la tabla:

1 -- Tutti i tipi di farina che compaiono su una riga sono corrispondenti e quindi tutti ugualmente adatti all'ottenimento della stessa portata. La scelta di un tipo oppure di un altro può quindi essere fatta liberamente in funzione della reperibilità, preferenze particolari etc.
All types of kieselgur appearing on the same line are similar, and thus equally suitable for attaining the same flow rate. Thus one type may be chosen freely over another based on factors such as availability, personal preference, etc.
Alle in einer Zeile aufgeführten Kieselgurtypen sind gleichwertig und folglich alle zum Erzielen des gleichen Durchsatzes geeignet. Die Wahl des einen oder anderen Typs kann also beliebig in Abhängigkeit von der Verfügbarkeit, speziellen Vorlieben usw. erfolgen.
All the types of flour appearing on a line correspond and they are therefore all identically suited to obtaining the same throughput. We can thus freely choose one type or the other according to the ease of identification, particular preferences, etc.
Todos los tipos de tierra that appear in a line its equivalent y, por lo tanto, adecuados para conseguir la misma capacidad. The choice of a type can be made freely, of acuerdo con la disponibilidad, the preferences of the usuario, etc.

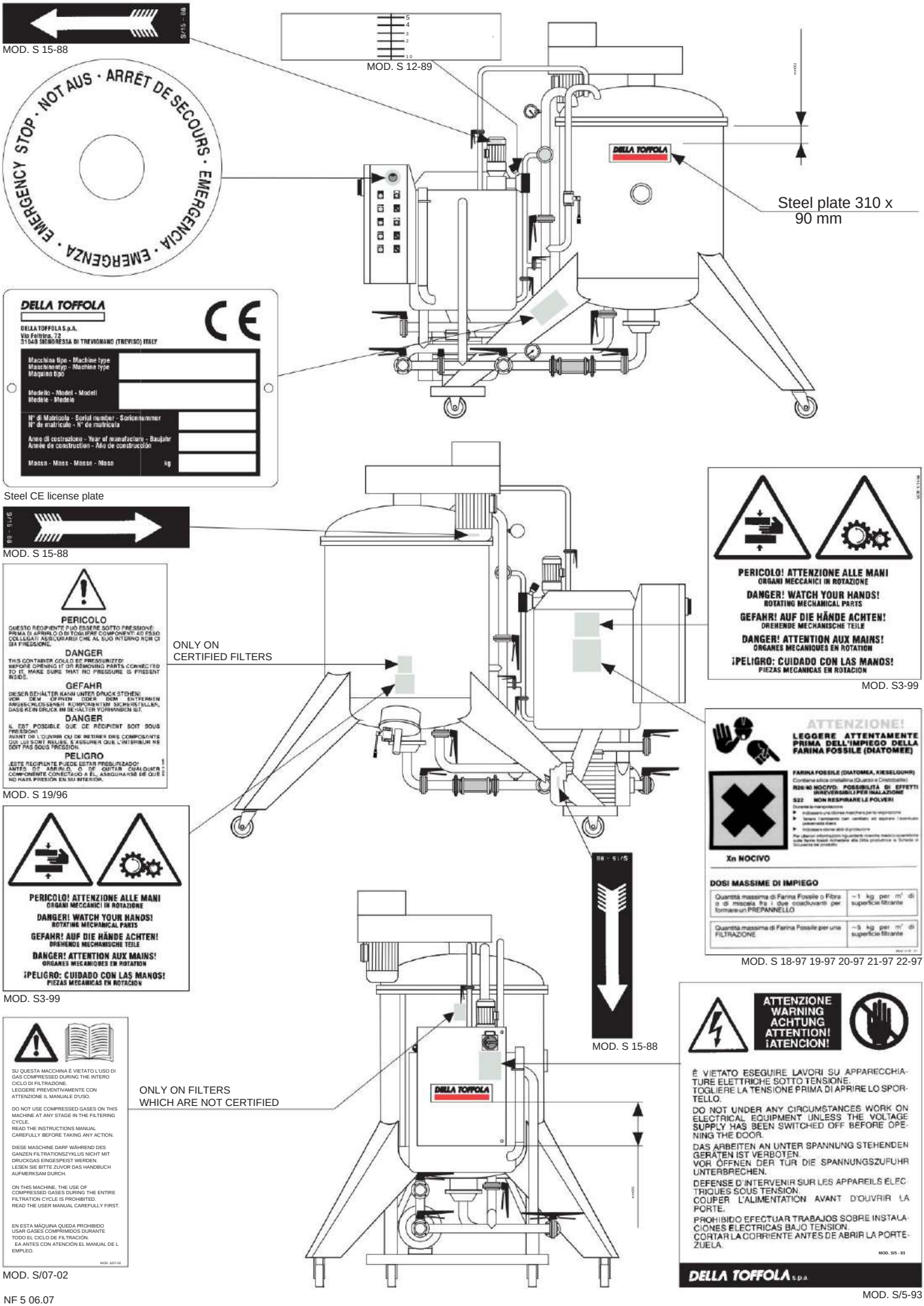
2 -- Se di una Ditta Produttrice un viene indicato il tipo di farina adatto ad una specifica portata è comunque possibile adottare il tipo indicato sulla riga superiore o inferiore. Naturally in question case è poi possibile riscontrare una seppur trascurabile variazione di portata.
If the type of kieselgur by a certain manufacturer is not listed for a specific flow rate, the type listed on the previous or following line may be used. In these cases, there may of course be a slight variation in the flow rate.
Wenn bei einem Hersteller nicht der Kieselgurtyp für die Erzielung eines bestimmten Durchsatzes angegeben ist, kann man den Type in der Zeile darüber oder darunter verwenden. Selbstverständlich kann es in diesem Fall zu allerdings vernachlässigbaren Abweichungen beim Durchsatz kommen.
In the event that, for a given Producer, there is no indication as to the type of flour suitable for a specific throughput, the type appearing on the upper or lower line can always be adopted. Naturally, in this case, a variation in flow rate will be observed, but this variation will be negligible.
If a manufacturer does not indicate the type of tier adecuado a una specific capacity, you can use the type indicated in the superior or inferior line. In these cases, naturally, it is possible to observe light variations of the capacity.



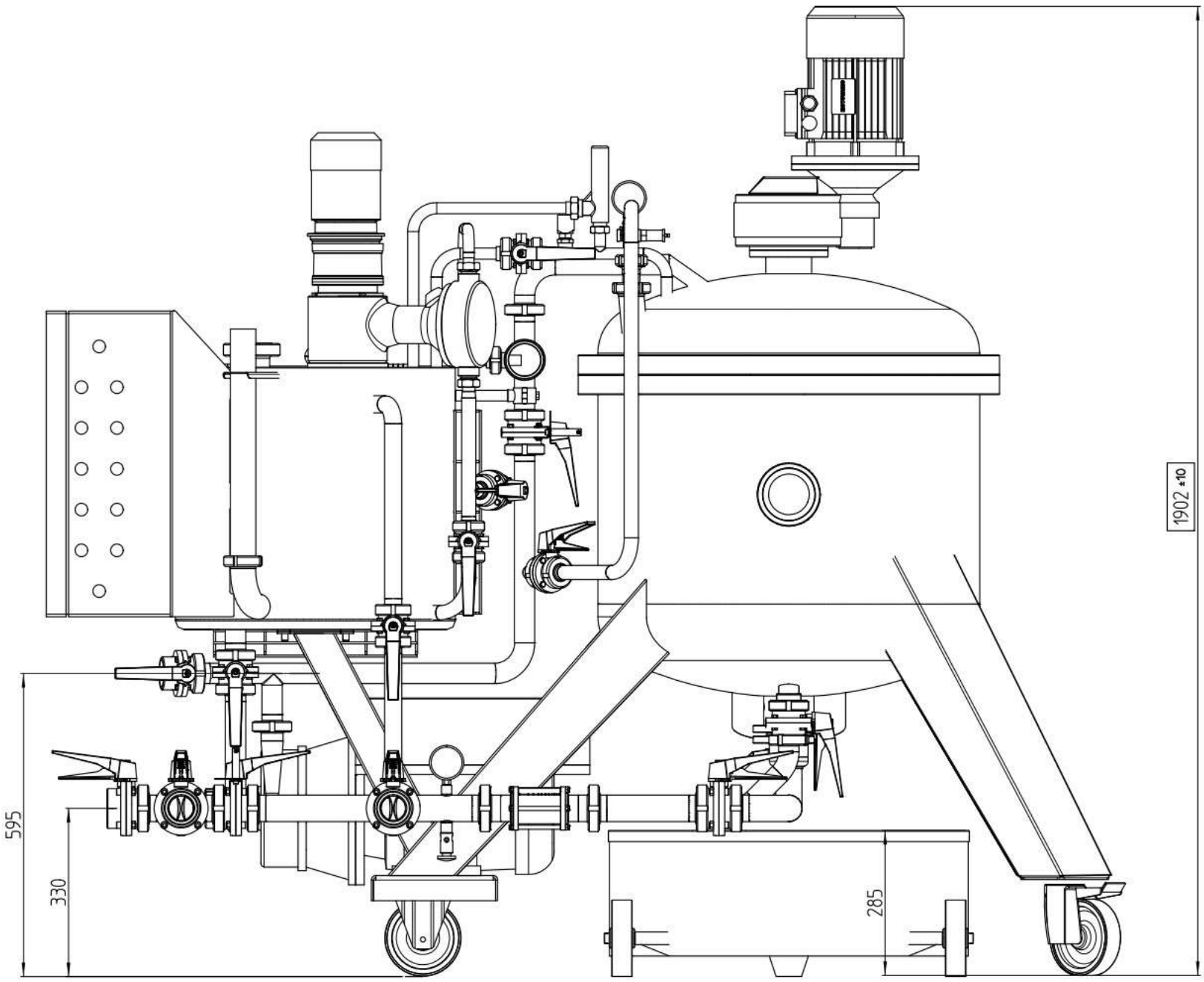


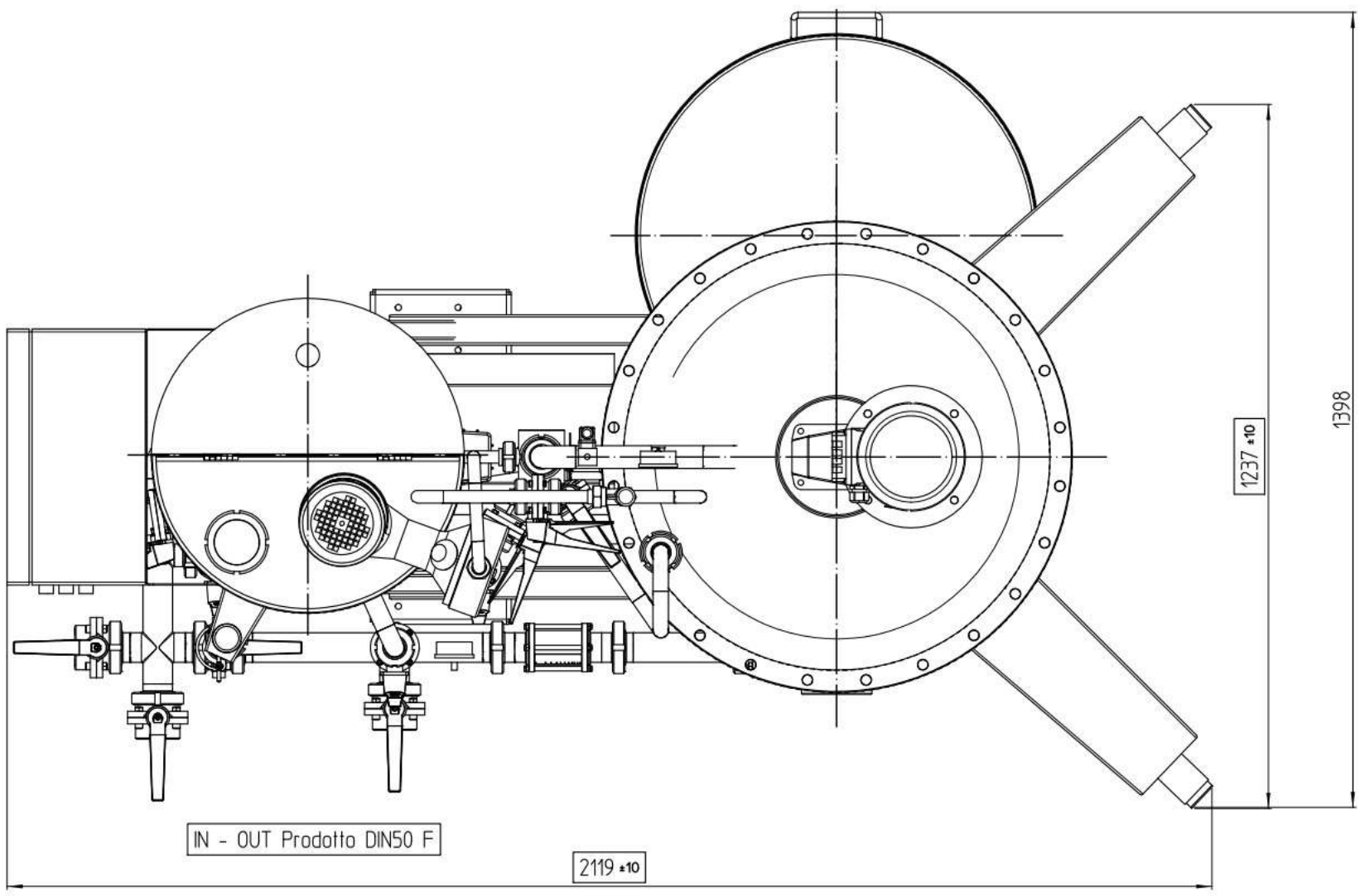
Schema Funzionale NF - ***NF Function Diagram - Funktionsplan Filter NF - Schema fonctionel du filter NF - Diagrama de las funciones de NF***

Position of labels on NF 5



NF 5 06.07





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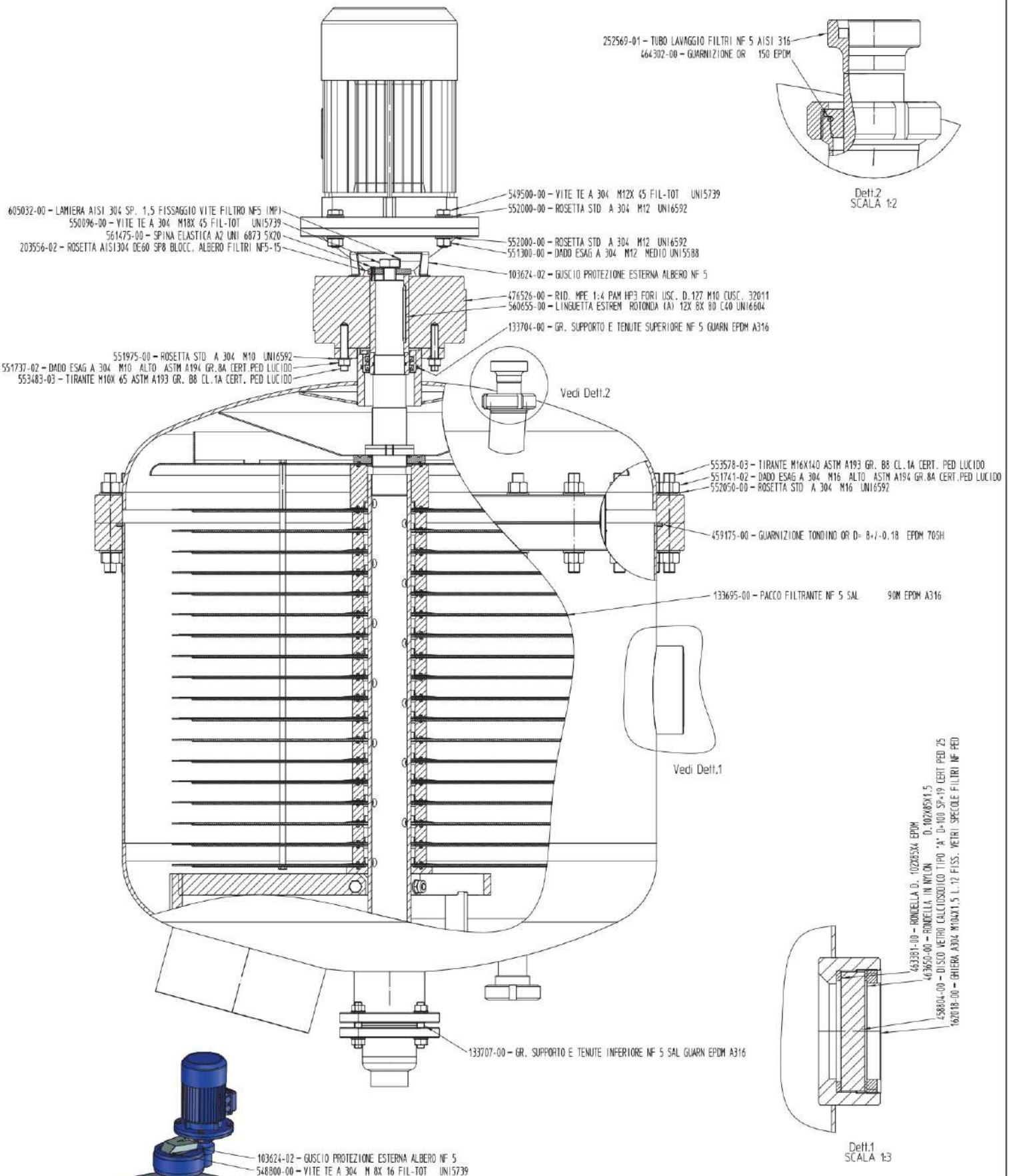
Rev	Descrizione modifica

DELLA TOFFOLA	Eseguito da: Gianni Piovesan	Data: 16/12/2015
	Controllato da: Gianni Piovesan	Data: 08/02/2016
	Approvato da: Amedeo Bonotta	Data: 08/02/2016

Descrizione FILTRO NF 5 /SAL/PED 8 PA CSF/A316 IE400/50A						Peso Kg
Tolleranze generali UNI-EN 22768-m		Scala 1:10	Validita' comp.:	Codice doc. 005686	Rev /00	Pagina 1/1

 A3V



Rev	Descrizione modifica
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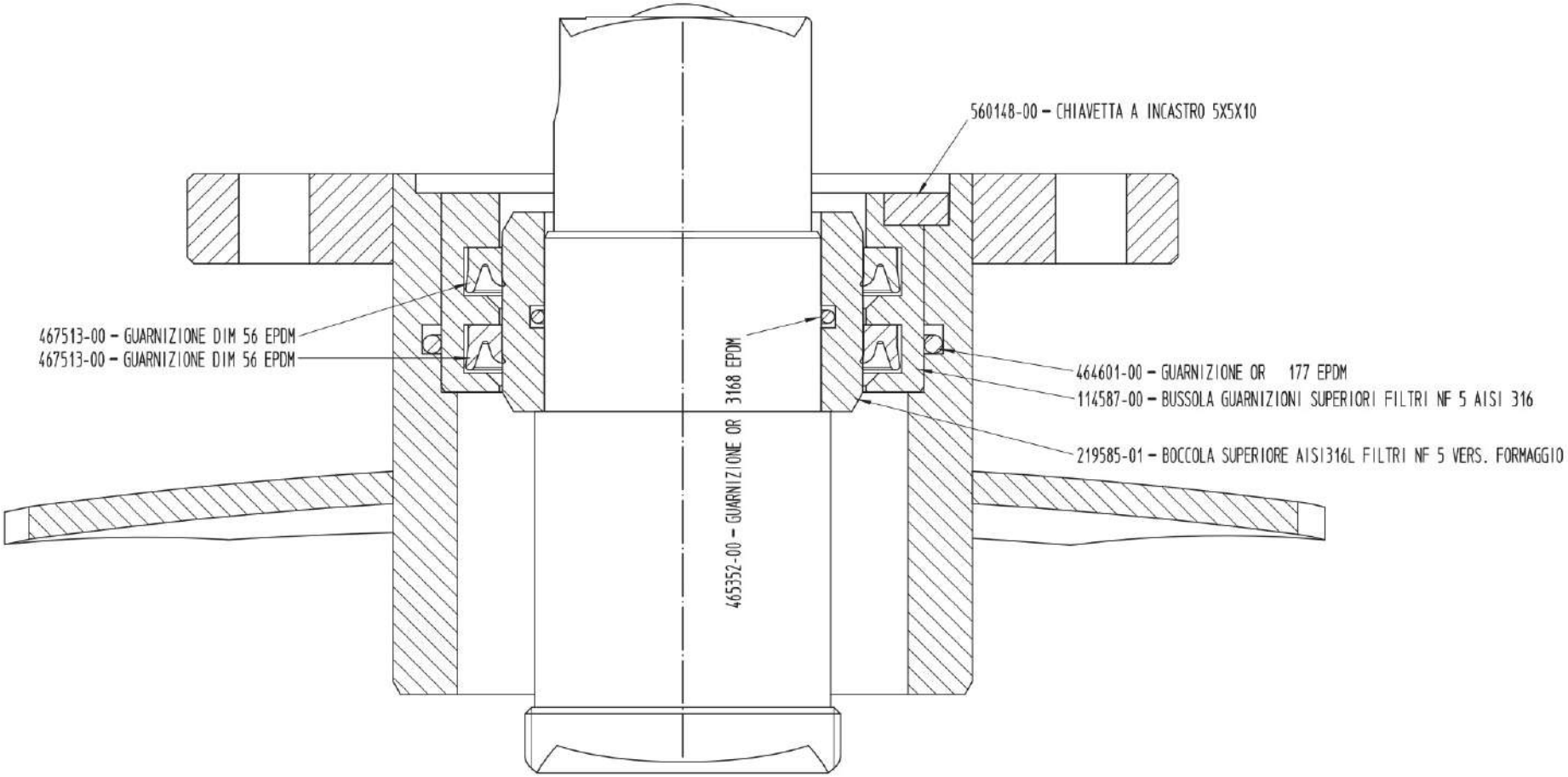
DELLA TOFFOLA	Eseguito da: Gianni Piovesan	Data: 15/12/2015
	Controllato da: Gianni Piovesan	Data: 15/12/2015
	Approvato da: Amedeo Bonatto	Data: 16/12/2015

Descrizione: GR. PACCO FILTR NF 5 SAL 90M EPDM A316 +SUPP SUP/INF 50HZ					Peso Kg: 213
Tolleranze generali: UNI-EN 22768 mK		Scala: 1:6	Validita' comp.:	Codice doc.: 133686	Rev: /00
					Pagina: 1/1



Rev	Descrizione modifica
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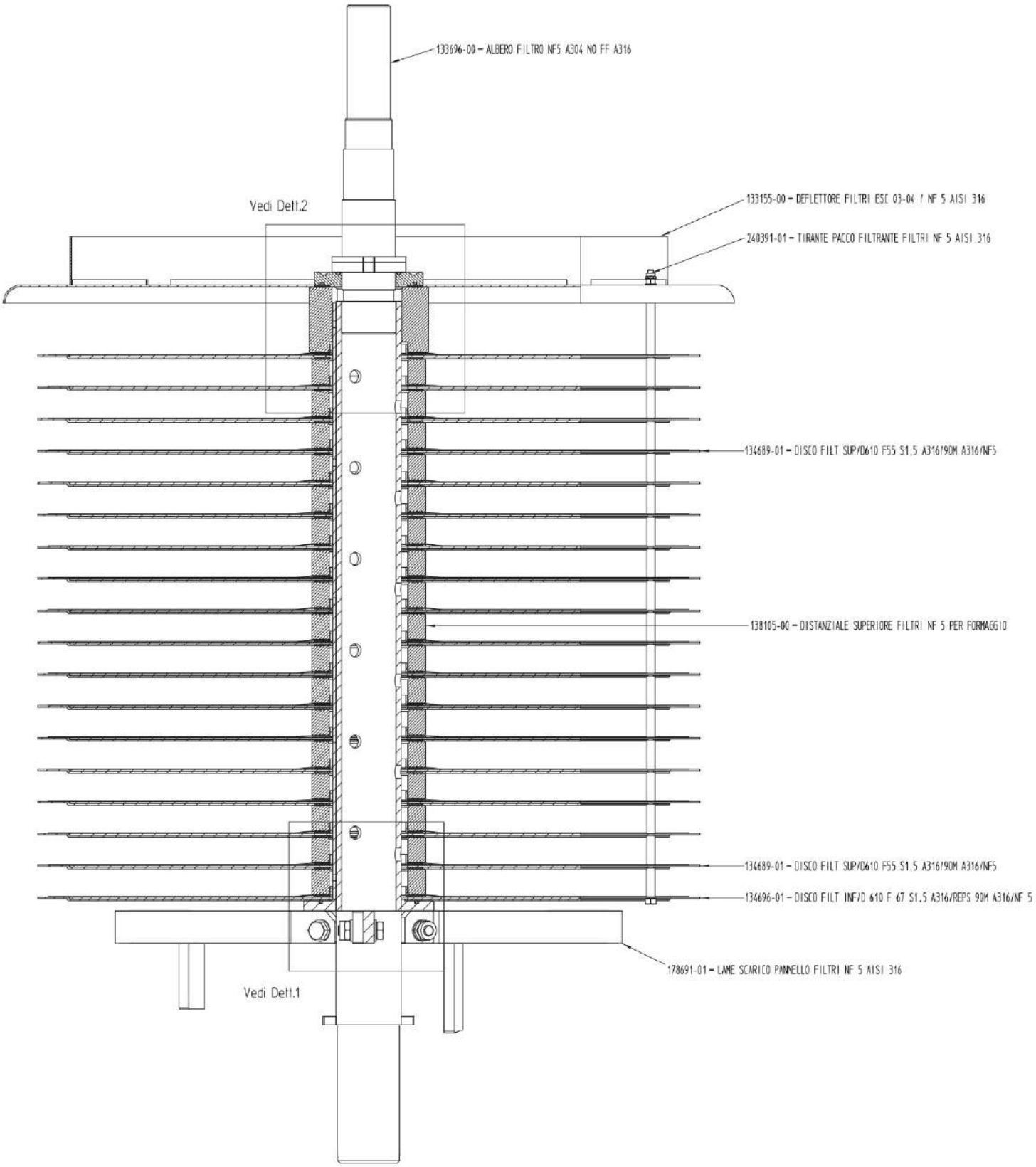
DELLA TOFFOLA

Eseguito da:	Gianni Piovesan	Data: 15/12/2015
Controllato da:	Gianni Piovesan	Data: 15/12/2015
Approvato da:	Amedeo Bonotto	Data: 16/12/2015

Descrizione						Peso Kg
GR. SUPPORTO E TENUTE SUPERIORE NF 5 GUARN EPDM A316						0.5
Tolleranze generali		Scala	Validita' comp.:	Codice doc.	Rev	Pagina
UNI-EN 22768 mK		1:1		133704	/00	1/1

 A40

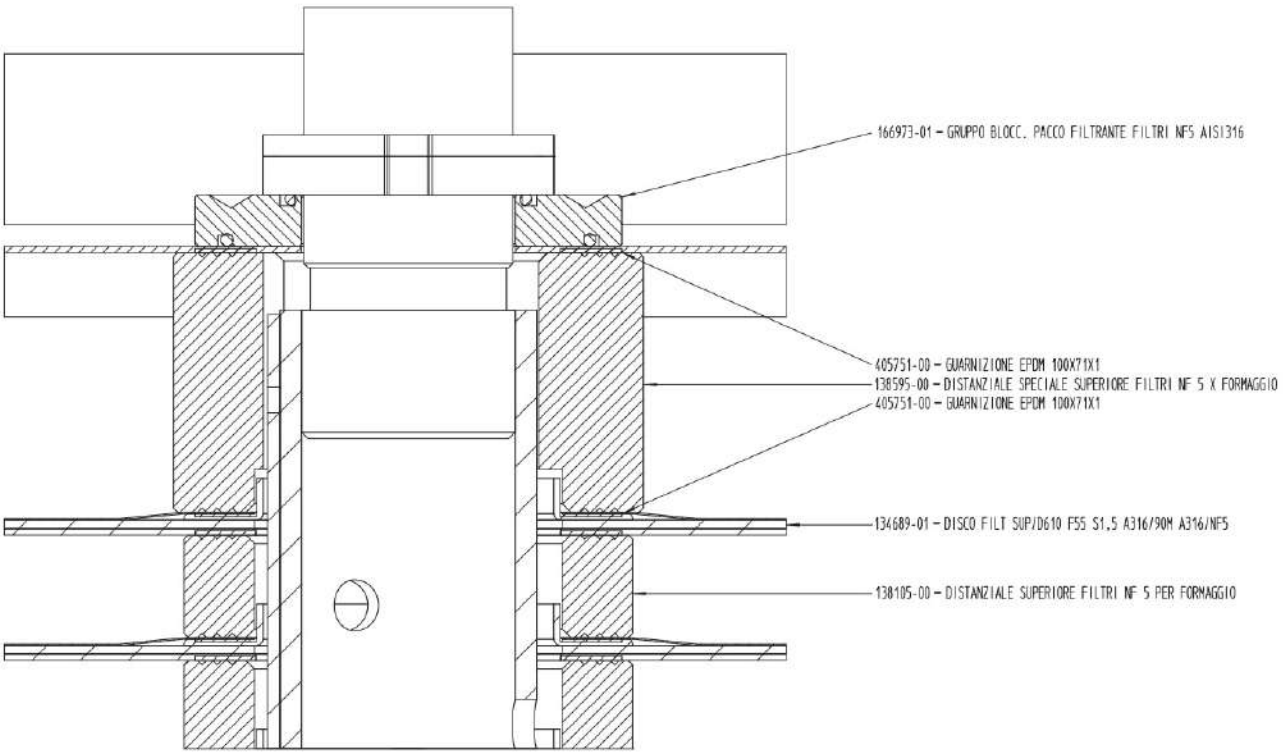


Rev	Descrizione modifica
01	cambiato distanziali con guarn piatte

DELLA TOFFOLA

Eseguito da: Gianni Piovesan	Data: 24/02/2016	
Controllato da: Gianni Piovesan	Data: 24/02/2016	
Approvato da: Amedeo Bonatto	Data: 25/02/2016	

Descrizione						Peso Kg
PACCO FILTRANTE NF 5 SAL 90M EPDM A316/NYLON						99.0
Tolleranze generali		Scala	Validita' comp.:	Codice doc.	Rev	Pagina
UNI-EN 22768 mK		1:5		133695	/01	1/2



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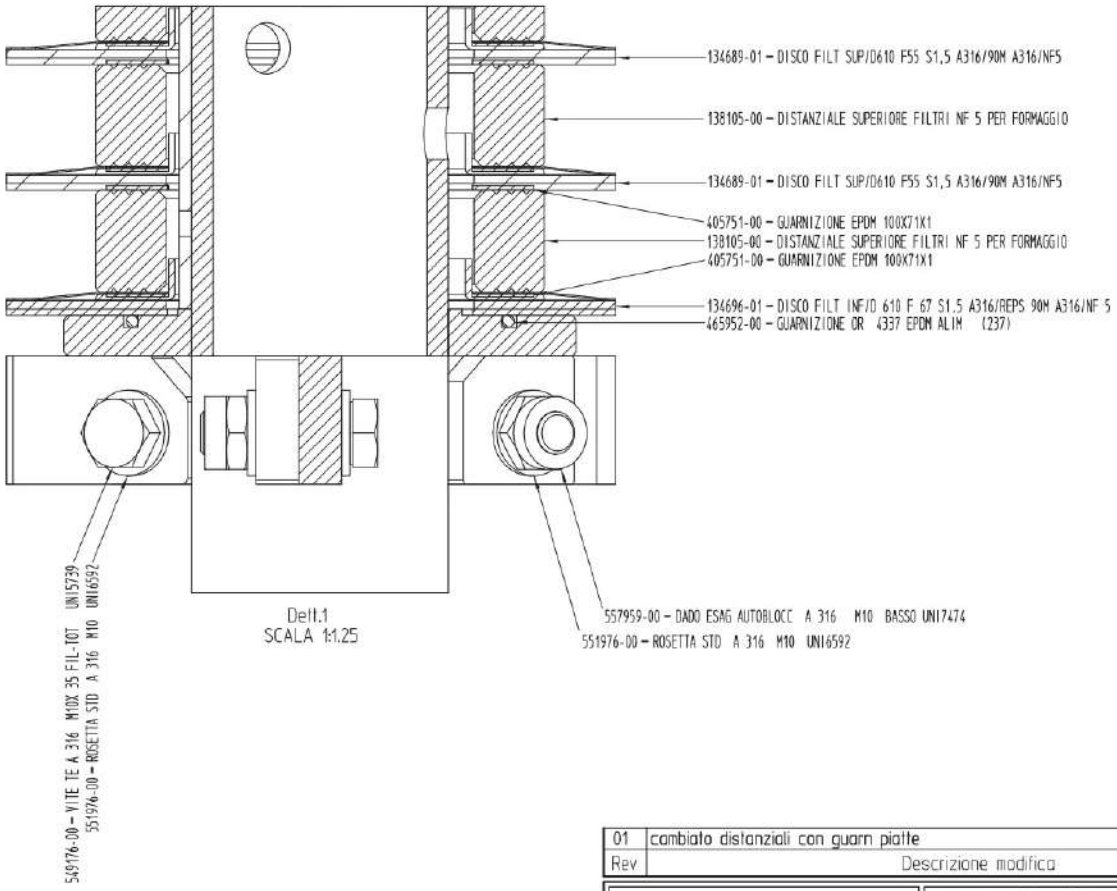
SCALA 1:1.25



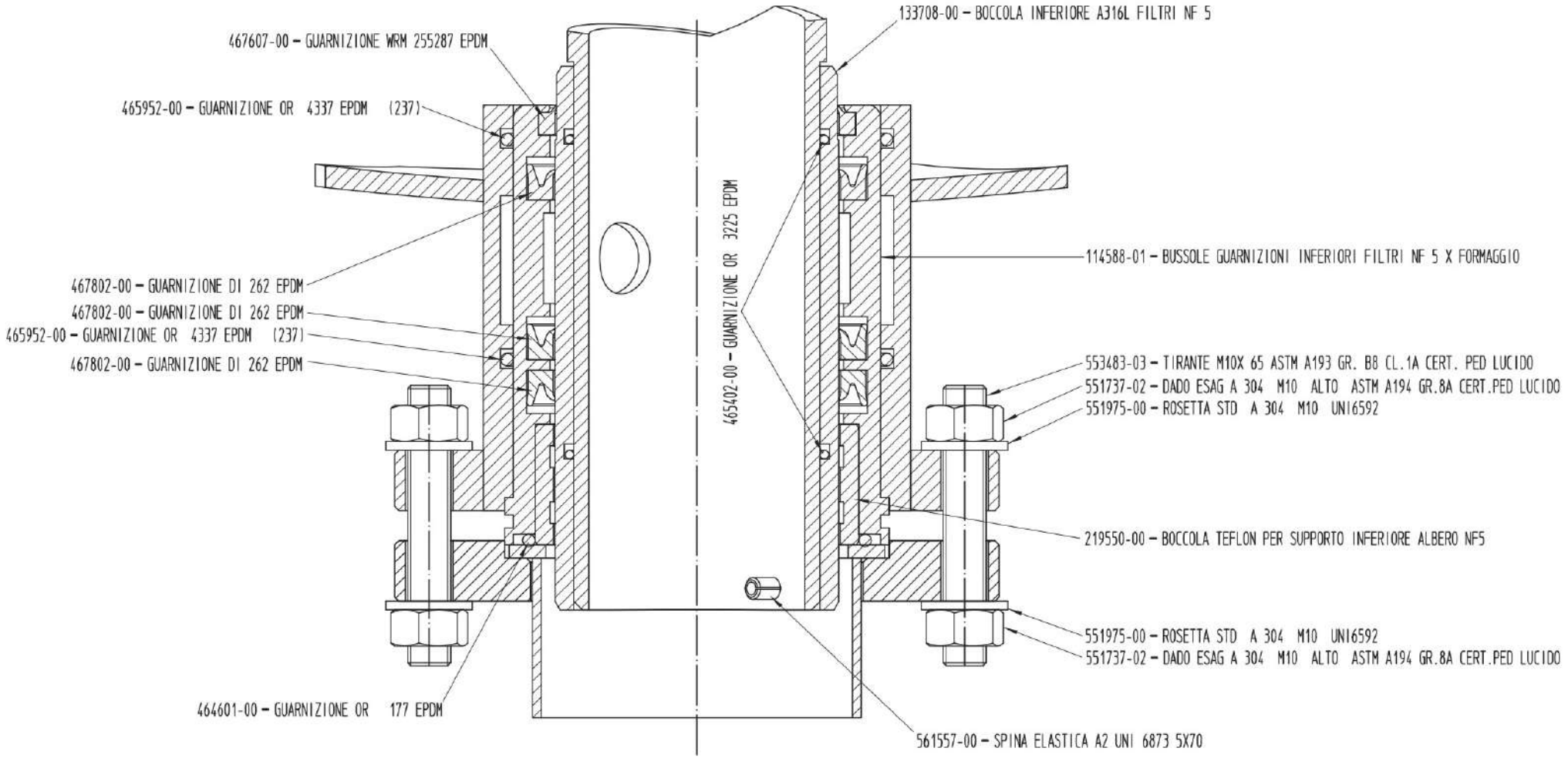
Dett.1
SCALA 1:1.25

Rev	Descrizione modifica
01	cambiato distanziali con guarn piatte

DELLA TOFFOLA

Eseguito da: Gianni Piovesan	Data: 24/02/2016	
Controllato da: Gianni Piovesan	Data: 24/02/2016	
Approvato da: Amedeo Bonatto	Data: 25/02/2016	

Descrizione					Peso Kg
PACCO FILTRANTE NF 5 SAL 90M EPDM A316/NYLON					99.0
Tolleranze generali UNI-EN 22768 mK	Scala 1:5	Validita' comp.:	Codice doc. 133695	Rev /01	Pagina 2/2



Rev	Descrizione modifica
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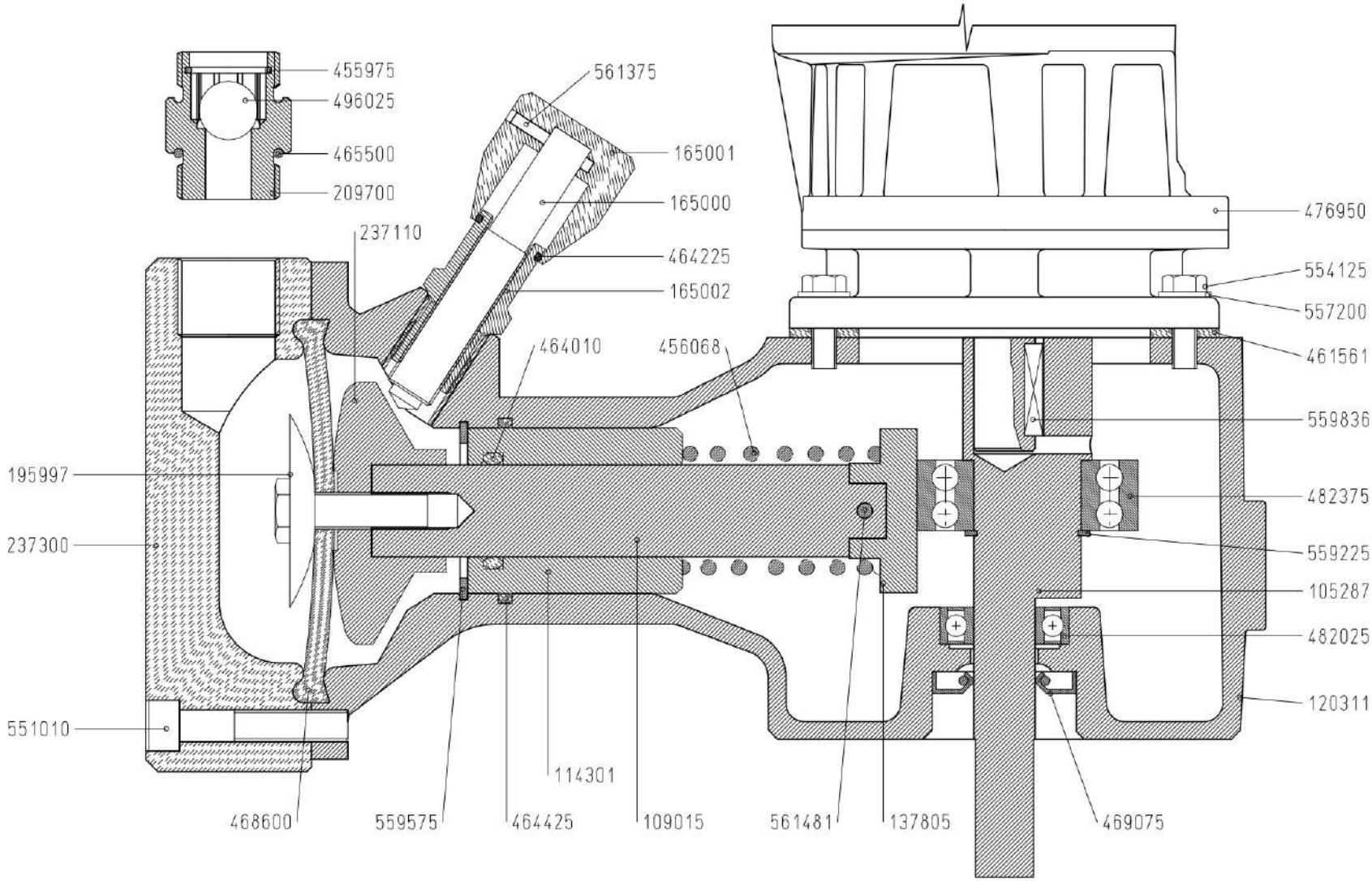
DELLA TOFFOLA

Eseguito da: Gianni Piovesan	Data: 15/12/2015	
Controllato da: Gianni Piovesan	Data: 15/12/2015	
Approvato da: Amedeo Bonotto	Data: 16/12/2015	

Descrizione						Peso Kg
GR. SUPPORTO E TENUTE INFERIORE NF 5 SAL GUARN EPDM A316						2.1
Tolleranze generali UNI-EN 22768 mK		Scala 1:2	Validita' comp.:	Codice doc. 133707	Rev /00	Pagina 1/1

 A40



01	UNIFICATO CUSCINETTO COME DT400
IM revision	MODIFICHE / changes

DELLA TOFFOLA	ESEGUITO / made by: BAMBACE	CONTROLLATO / checked: OSELLAME	APPROVATO / approved PONTELLO
file: E:\UT\TMM\DOC2000\DV000154-M110000-01.d	DATA / date: 17/05/2000	DATA / date: 17/05/2000	DATA / date: 17/05/2000
Stato: APPROVATO — F. to: A4			

DESCRIZIONE / description: POMPA DOSATRICE MEMBRANA MOD. DT300 200L/H (CON AGIT.) — PF 79244

MATRICOLA / part number:	NOTE / note:	CODICE / code:	IM/rev	FOGLIO / sheet
0 - 1999	Esec. STD			1 di 2

561481	1	SPINA ELASTICA INOX A2 5X30	GOUPILLE ELASTIQUE INOX A2 5X30
561375	1	SPINE ELASTICHE 6873 4X30	GOUPILLES ELASTIQUES 6873 4X30
559836	1	LINGUETTA INOX A2 UNI 6604 6X6X30	LANGUETTE INOX A2 UNI 6604 6X6X30
559575	1	ANELLI D'ARRESTO PER FORI UNI 7437 I D 55	ANNEAUX DE ARRET POUR TROUS UNI 7437 I D 55
559225	1	ANELLI D'ARRESTO PER ALBERI UNI 7435 E D.35	ANNEAUX DE ARRET POUR ARBRES UNI 7435 E D.35
557200	4	ROSETTA ZINCATA 4.8 UNI 6592 M8	RONDELLE ZINGUEE 4.8 UNI 6592 M8
554125	4	VITE TE 4.8 UNI 5739 ZINCATE M 8X20	VIS TETE HEX. 4.8 UNI 5739 ZINGUEES M 8X20
551010	8	VITE TCEI INOX A2 UNI 5931 M10X55	VIS TETE CYL. TROU SIX-PANS INOX UNI 5931 M10X55
496025	2	SFERE 19,050 B AISI 316	BILLES 19,050 B AISI 316
482375	1	CUSCINETTO SKF 4207 ATN9	ROULEMENT SKF 4207 ATN9
482025	1	CUSCINETTI 6204 2RS	ROULEMENTS 6204 2RS
476950	1	MOTORIDUT. MRCF032 R=1/16.5 V1 4P KW0.37 220/380/50-60 IP55	MOTOREDUCT. MRCF032 R=1/16.5 V1 4P KW0.37 220/380/50-60 IP55
469075	1	PARAOLIO 20X47X7	PARE-HUILE 20X47X7
468600	1	MEMBRANA GOMMA DE 125 D.110 J0770100B5100	MEMBRANE CAOUTCHOUC DE 125 D.110 J0770100B5100
465500	2	GUARNIZIONE OR 4100	JOINT TORIQUE 4100
464425	1	GUARNIZIONE OR 158	JOINT TORIQUE 158
464225	1	GUARNIZIONE OR 121	JOINT TORIQUE 121
464010	1	GUARNIZIONE RSW 30	GARNITURE RSW 30
461561	1	GUARNIZIONE IN GUARNITAL 140X125X0.5 PER MOTORID. MRCF032	GARNITURE EN GUARNITAL 140X125X0.5 POUR MOTORED. MRCF032
456068	1	MOLLA A COMPRESS. C85 FILO 5 DE=42 L=90 PASSO=13 SPIRE=8	RESSORT A COMPRESS. C85 FIL 5 DE=42 L=90 PAS=13 SPIRES=8
455975	2	ANELLI OMEGA FILO 2 INOX 13.1802	ANNEAUX OMEGA FIL 2 INOX 13.1802
237300	1	TESTA SUPPORTO SEDI SFERE POMPA DOSATRICE MOD. 0:300 0:350	TETE SUPPORT SIEGES BILLES POMPE DOSEUSE MOD. 0:300 0:350
237110	1	TESTA SPINGIMEMBRANA IN FUSIONE DI ALLUMINIO POMPA DT300	TETE POUSSE-MEMBRANE EN MOULAGE ALUMINIUM POMPE DT300
209700	2	SEDE SFERE POMPE DOSATRICI MOD. 0:300 - 0:350 - 0:400	SIEGE BILLES POMPES DOSEUSES MOD. 0:300 - 0:350 - 0:400
195997	1	PIATTELLO FERMA MEMBRANA POMPA DOSATRICE DT300-DT400	DISQUE DE ARRET MEMBRANE POMPE DOSEUSE DT300-DT400
165002	1	ATTACCO FIL. PER REGOL. DI PORTATA DT300-DT400	RACCORD FIL. POUR REGUL. DE DEBIT DT300-DT400
165001	1	MANOPOLA PER REGOLATORE DI PORTATA POMPE DT300-DT400	BOUTON POUR REGULATEUR DE DEBIT POMPES DT300-DT400
165000	1	ASTA PER REGOLATORE DI PORTATA POMPE DT 300-DT400	TIGE POUR REGULATEUR DE DEBIT POMPES DT 300-DT400
137805	1	DISCO SPINGI PISTONE ASTA CROMATA POMPE DOSATRICI MOD.DT	DISQUE POUSSE-PISTON TIGE CHROMEE POMPES DOSEUSES MOD.DT
120311	1	CARCASSA POMPA DOSATRICE MOD. DT300 CON AGITATORE	CARCASSE POMPE DOSEUSE MOD. DT300 AVEC AGITATEUR
114301	1	BRONZINA GUIDA ASTA CROMATA POMPE DT	COUSSINET EN BRONZE GUIDE-TIGE CHROMEE POMPES DT
109015	1	ASTA CROMATA PISTONE POMPE DOSATRICI MOD.DT	TIGE CHROMEE PISTON POMPES DOSEUSES MOD.DT
105287	1	ALBERO ECCENTRICO POMPE DOS. MOD.DT300-DT400(VERS.AGITATORE)	ARBRE EXCENTRIQUE POMPES DOS. DT300-DT400(VERS.AGITATEUR)
CODICE code	*Q.TA' q.ty*	*DESCRIZIONE / description*	

LEGENDA COMPONENTI / components list

FRA

DELLA TOFFOLA
Signoressa di Trevignano (TV) ITALY

DESCRIZIONE / description
POMPA DOSATRICE MEMBRANA MOD. DT300 200L/H (CON AGIT.)

FOGLIO / sheet
2 *di of* 2

CENTRIFUGAL PUMPS

CS- series

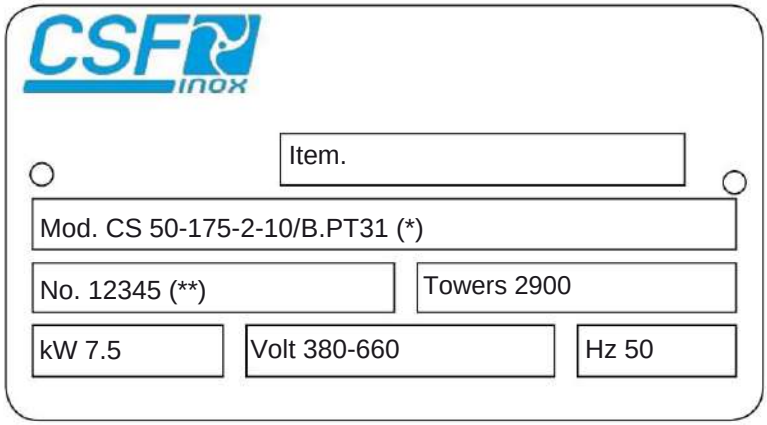
INSTALLATION INSTRUCTIONS
OPERATION AND MAINTENANCE

"Original Instructions"

INDEX

INTRODUCTION

- Read the instructions carefully and keep them for future reference.
- CSF Inox SpA reserves the right to modify, if necessary, the documentation without updating the one already issued.
- For any information, spare parts, assistance, always indicate the type of pump (*) and the registration number (**) for a fast and efficient service: the complete code is shown on the plate and on the purchase documents.



Example of brochure

1 SYMBOLS USED

ATTENTION	*Read blocks of text marked with this symbol very carefully.*
	**Danger:** *failure to observe the warnings may cause serious injury to persons and/or or things.*
	**Danger:** *only qualified personnel are authorized to carry out operations relating to the electrical part.*

2 SAFETY INSTRUCTIONS

During operation there are:
- Live electrical parts.
- Moving mechanical parts.
- The pump body, pipes and junction areas subject to internal pressure. Therefore, do not remove any guards or closures, nor loosen screws or fasteners, as serious damage to persons or things may be caused. The clamp that unites the body and the lantern must be tight and must not be unscrewed easily by hand. Tightening the clamp should always be done with a wrench and NOT by hand.

- Lack of inspection and maintenance can cause damage to people or things, especially when dangerous or toxic liquids have to be pumped.
- When pumping liquids at temperatures above 60°C, protection must be adopted or the danger correctly indicated.
- When buying a bare shaft pump, the coupling operations with the motorization must comply with the technical standards and the laws in force, providing adequate protection for joints, transmission belts, etc.

- Any operation concerning the electrical part must be carried out by qualified personnel, capable of complying with the technical standards and laws in force, with the authorization of the person in charge of the installation.

- The installation must allow adequate ventilation for motor cooling and sufficient space for maintenance.

- Before carrying out any operation that requires dismantling the pump (inspection, cleaning, replacement of the seal, etc.), the following operations must be carried out:
switch off the current to the motor and disconnect the electrical connection;
close the valves on the suction and delivery pipes to avoid the risk of flooding;
use adequate hand and face protection if the pump contains liquids that are hazardous to health (eg acids, solvents, etc.);
assess whether the liquid that comes out when the pump is disassembled presents any risk and therefore take appropriate safety measures.

3 GUARANTEE

All products manufactured by CSF Inox SpA are guaranteed to the purchaser for one year from the date of purchase against hidden defects in materials or workmanship, provided that these are installed and used according to the company's instructions. Are excluded from the warranty, in addition to parts out of service due to wear, the repair of damage and/or wear caused by: improper use, abrasion, corrosion, negligence, faulty installation, lack of maintenance or incorrect maintenance, use of non-original spare parts, accidental and unforeseen causes as well as any action carried out by the purchaser with the aim of altering the normal performance indicated by the company.

WARNING Before sending CSF Inox SpA the parts to be replaced or repaired under warranty, report the problem to the customer assistance office and follow the instructions received. The parts must be properly packaged to avoid transport damage and **accompanied by a description of the defect and how it occurred.**

Each part that is presumed to be defective must be returned, carriage paid, to CSF Inox SpA, unless otherwise agreed. CSF Inox SpA will examine what it has received and will repair or exchange it, shipping it FREE FROM CSF and without any charge if covered by the warranty. In the event of defects that are not covered by the warranty, CSF Inox SpA will carry out the necessary repairs or replacements, debiting the normal cost. CSF Inox SpA extends to its own customers the warranty on components and accessories purchased from suppliers.

4 TRANSPORT, RECEPTION AND HANDLING

4.1 TRANSPORTATION

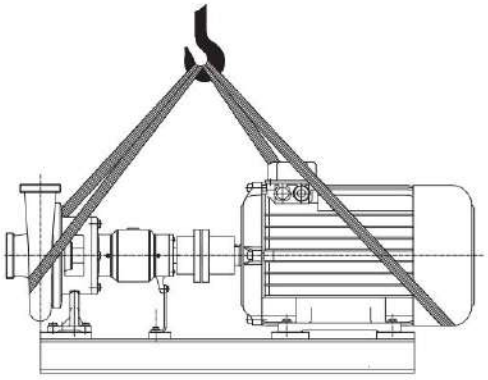
The packaging of the pumps produced by CSF Inox SpA is defined according to the agreements made when ordering. Unless otherwise agreed, the goods are packed only for the duration of transport and not for the time of storage; if it is essential to keep the pumps outside, they must be covered with a waterproof tarpaulin, so that atmospheric agents (rain), dust, humidity, etc. do not come into contact with the electrical parts (motorization).

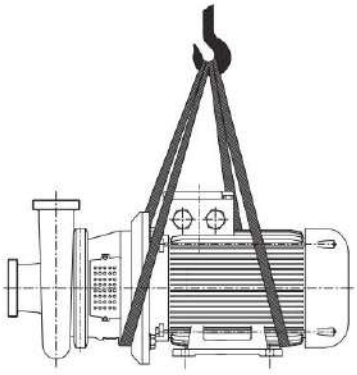
4.2 RECEPTION

IMPORTANT When receiving the equipment, check the integrity of the packaging in order to locate any damage linked to transport and to be able to dispute this with the driver.
In case of damage proceed as follows:
- withdraw the goods with reservation;
- obtain photographic documentation proving the damage;
- note the damage suffered, by means of a registered letter with acknowledgment of receipt, to the company which carried out the transport, simultaneously presenting the photographic documentation.

4.3 HANDLING

Place the packed pumps as close as possible to the place of installation with lifting means and proceed with unpacking. During these operations, pay close attention to unstable parts that could possibly fall. The packaging material must be disposed of by the user in compliance with the regulations in force in his own country. After completing the unpacking procedures, use lifting straps of adequate dimensions for lifting and transporting the pump-motor unit to the installation point; never use the motor's eyebolt to move the entire unit, as these are designed to transport the motor only. In executions with cover, the latter must be removed before moving the motor-pump group in order to avoid damaging it.

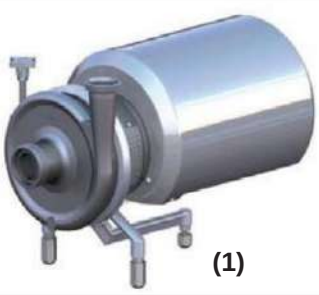
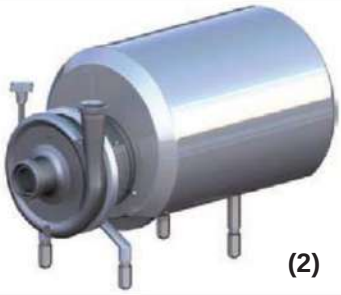
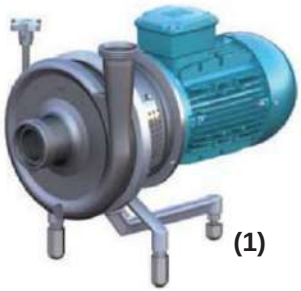
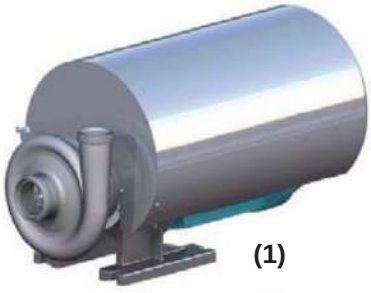




5 DESCRIPTION

The "CS" series pumps are single-state centrifugal with axial suction mouth, open centrifugal impeller and trapezoidal volute. All models are fitted with threaded connections, for connections according to DIN 11851 standards (unless otherwise agreed) the seal is of the mechanical type, the material of the components and the mechanical seal are chosen according to the pumped liquid.
They are assembled with three-phase electric motors with degree of protection IP 55, unless otherwise specified when ordering.
These machines are intended for professional use.
In addition to services for which particular characteristics are not required, the pumps in question are used in all cases where the liquid to be pumped:
- has not been subjected to any type of pollution,
- is at a temperature between +140°C and -30°C,
- absolutely must not come into contact with the external environment,
- is not considered chemically aggressive.

6 EQUIPMENT

 **(1)**  **(2)**	**(1)** CS - exec. hood with feet adjustable from kW 0.37 to kW 4 **(2)** CS - exec. hood with adjustable feet from kW 5.5 to kW 22
 **(1)**  **(2)**	**(1)** CS - exec. without hood with adjustable feet from kW 0.37 to kW 4 **(2)** CS - exec. without hood with adjustable feet from kW 5.5 to kW 22
	CS - exec. without cover with fixed feet kW 0.37 ÷ 22
 **(1)**  **(2)**	**(1)** CSX - exec. hood kW 30 **(2)** CSX - exec. without hood kW 30
	CSK - exec. with bare shaft (for coupling with base and joint)

7 NOISE EMISSIONS

The noise index of sanitary centrifugal pumps is as follows (see table):

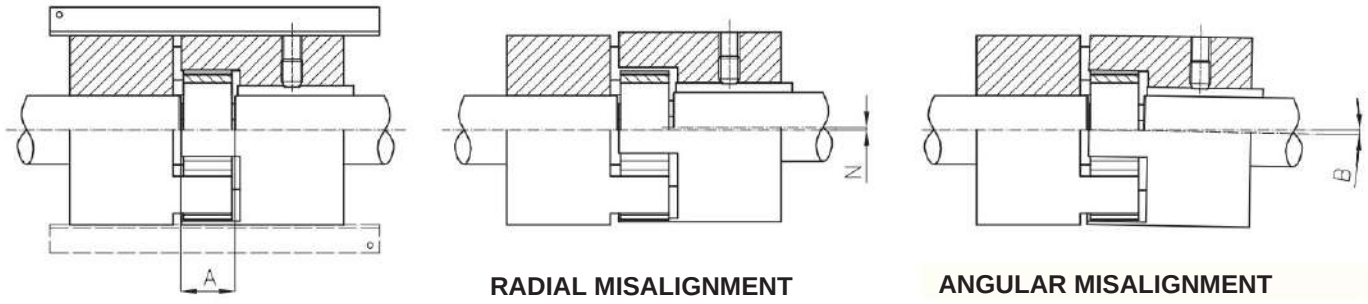
		Typical pump					
	< 70	CS 25-145 4-pole CS 32-145 4-pole CS 32-260 4-pole CS 40-210 4-pole CS 50-175 4-pole CS 65-145 4-pole		CS 25-175 4-pole CS 32-175 4-pole CS 40-145 4-pole CS 40-260 4-pole CS 50-210 4-pole CS 65-175 4-pole		CS 32-110 4-poles CS 32-210 4-poles CS 40-175 4-poles CS 50-145 4-poles CS 50-260 4-poles CS 65-210 4-poles	
	71÷75	CS 25-145 2-poles CS 32-145 2-poles CS 80-175 4-poles		CS 25-175 2-poles CS 32-175 2-poles CS 80-210 4-poles		CS 32-110 2-poles CS 65-260 4-poles CS 80-260 4-poles	
	76÷80	CS 32-210 2-poles CS 40-210 2-poles CS 50-210 2-poles		CS 40-145 2-pole CS 50-145 2-pole		CS 40-175 2-pole CS 50-175 2-pole	
	81÷85	CS 32-260 2-poles CS 40-260 2-poles CS 50-260 2-poles CS 80-175 2-poles		CS 65-145 2-poles CS 65-175 2-poles CS 80-310 4-poles		CS 100-260 4-pole CS 125-260 4-pole CS 100-310 4-pole	
	86÷90	CS 65-210 2-pole CS 80-260 2-pole		CS 65-260 2-pole CS 100-210 2-pole		CS 80-210 2-pole CS 100-260 2-pole	

Measurement taken with a phonometer at a distance of 1 m from the pump and at a height of 1.6 m from the ground.
That said, the pump must be fixed correctly and must not, when it is running, enter into cavitation; this evaluation does not take into account external noise sources (valves, sudden hydraulic deviations, etc.).

8 FACILITY

8.1 ALIGNMENT (For CSK)

The pump-motor group is aligned on the base at the CSF factory, before shipment.
After completing the installation, fixing the unit to the foundation and connecting the suction and delivery pipes, check the alignment again as follows:
- remove the seal protection
- check, with gauge and thickness gauge, that the distance between the half-joints is between 2-3 mm, with no deviations greater than 0.05 mm between the measurements
- check the coaxiality of the half-seals by pressing on the external diameter of the half-seals with a metal ruler or a comparator, repeating the measurement at 4 opposite and equidistant points.



RADIAL MISALIGNMENT **ANGULAR MISALIGNMENT**

To correct any alignment errors, loosen the fixing bolts of the base and insert calibrated shims until the correct alignment is obtained.
Check manually that the rotating part rotates correctly.
After starting the pump-motor unit, reaching the operating speed of each foreseen operating condition, it is necessary to check again that the alignment is correct; we recommend regularly checking the alignment of the unit, during inspections and maintenance operations.

ATTENTION: before starting the unit, the joint protection must be installed; the latter can be removed by specialized personnel for inspections and/or maintenance only after stopping the unit and disconnecting the power supply.
Warning: misalignments and forcing cause stresses and vibrations on the transmission which cause wear and early breakage of the seal and bearings.

8.2 SUCTION AND INFLUX CONDITIONS

(NPSH = Net Positive Suction Head)
Installation NPSH (NPSH available)
To obtain disturbance-free operation of the pump (cavitation), the limit values for the maximum admissible suction height **ha geo max** or for the minimum admissible head hc geo min must be observed.
Pump NPSH (NPSH required)
Proper operation of centrifugal pumps is only possible if there is no formation of steam inside the pump. For this reason, the head on the reference point for the NSPH is the center point of the impeller, i.e. the point of intersection of the axis of the pump shaft with the vertical plane which passes through the external points of the entry angles of the blades.

NPSHnec. is the value required by the pump, expressed in m, obtained from the characteristic curve. In practice, 0.5 m is added to this value as a safety margin.

8.3 PIPING

In order to avoid serious stresses, the suction and delivery pipes must be connected to the pump mouths without any forcing; these pipes must be independently supported without passing over the pump. The internal diameter must correspond to the pump fittings, in any case, it must not be smaller in order to avoid load losses and/or poor performance.

Always use curves with large radius and, if the diameters change along the pipes, use the reduction cones, choosing the most suitable in order to avoid the formation of air bubbles. (Fig.1).

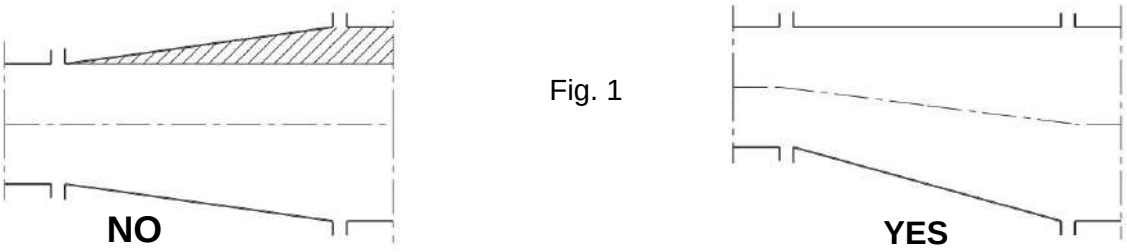


Fig. 1

The suction pipe must be as short as possible and slightly uphill in the direction of the pump if it has to suck in a tank, (Fig. 2), vice versa, if it is loaded, it must be slightly downhill (Fig.3). When the pump conveys hot liquids, expansion joints must be provided in order to absorb the extension pipes. The maximum speed of the liquid in the suction pipe must not exceed 3 m/s. We recommend a speed of 1 to 2 m/s. The suction pipe must prevent air from entering the pump.

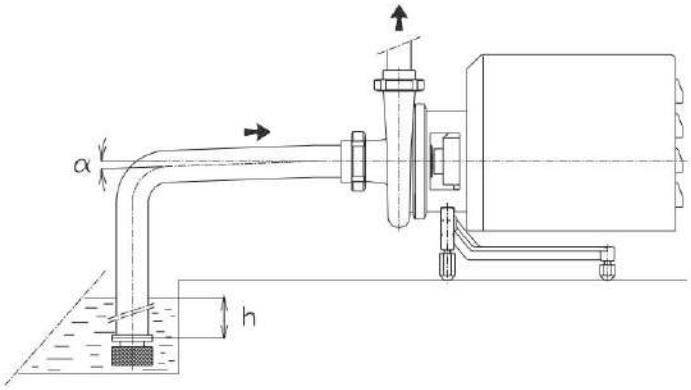


Fig. 2

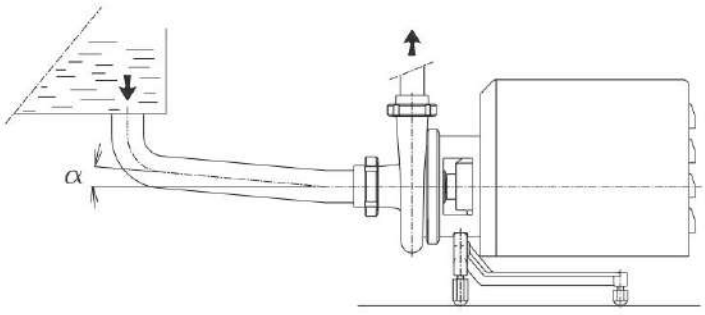


Fig. 3

For this reason, when sucking from a tank at a lower level, the pipe must emerge below the level of the liquid. In order to guarantee that no vortex is formed through which the air is sucked, a minimum load on the pipe (h. min.) must always be maintained equal to the kinetic height in addition to a safety margin of 0.1 m (Fig. 2).

hmin = m

$$h\ min = \frac{Go2}{2g} + 0.1$$

V = m/s

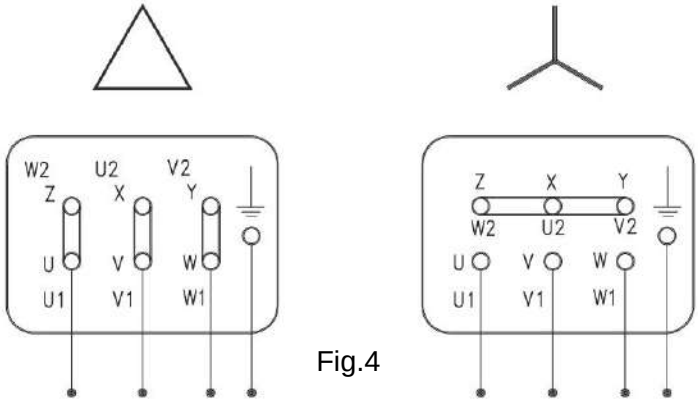
To avoid the formation of vortices, in the event that the minimum available charge values cannot be respected, steering elements can be provided, a system also valid in tanks with positive charge.

- Avoid creating obstacles that could increase suction pressure drops and thus disrupt the flow of the fluid stream. Do not create, at the discharge, near the pump, chokes, sudden variations, too narrow curves because they increase the noise.

8.4 ELECTRICAL CONNECTION

The electrical connection must be made after the hydraulic connection; the motor control system must be made in accordance with the technical standards in force (EN 60204-1): a manual power supply disconnection device capable of cutting the current must be installed, in addition to overcurrent and overload protection (e.g. fuses, automatic switches, etc.), providing, if necessary, a device to prevent spontaneous restarts.
It is necessary to check that the voltage and frequency of the network and the power available are adequate for the motor installed. All the material used for the electrical connection (cables, cable glands, switches and protection devices) must have the appropriate degree of protection for the environment in which it is installed; it is important to use cables with a section suitable for the passage of the current indicated on the motor plate, so as to prevent the conductors from overheating.
First earth the motor using the terminal block provided on the motor and a conductor of suitable section. The connection of the cables to the terminal board can be done either in delta or in star, respecting the data given on the motor nameplate according to the mains voltage as shown in the diagram in fig. 4; during the motor starting phase the current absorption increases by 5 to 6 times for a very short period of time compared to the nominal value, if the network is not able to support this increase, it is necessary to resort to star-delta starters or other systems (e.g.: autotransformer).

Tension lower



Tension superior

Fig.4

CSF Inox SpA declines all responsibility for damage to things and/or persons in the event of non-compliance with the technical standards and laws in force.

9 FORESEEABLE USES NOT ALLOWED

Do not use the pump with a higher suction pressure than expected (0.5 times the prevalence developed by the pump).
The pump must always be used in an environment suitable for the degree of protection of the motor which must always be checked on the motor plate before installation.

CAUTION IT IS THEREFORE FORBIDDEN TO USE THE PUMP IN ENVIRONMENTS WHICH REQUIRE A HIGHER DEGREE OF PROTECTION, TYPE OF MOTOR AND ELECTRICAL PARTS.

In this case, it is necessary to use components that comply with safety standards according to the environment.

10 EXERCISE

10.1 PRELIMINARY OPERATIONS

- Control. by hand, that the pump rotates freely; - Check that the clamp that joins the body and the lantern is well tightened and should not be unscrewed easily by hand. Tightening the clamp should always be done with a wrench and NOT by hand.
- Check the direction of rotation indicated on the pump (CLOCKWISE, view from the motor side).
- The suction pipe and the pump must be filled with liquid; Here are two cases: a) When the pump must operate at a negative suction height, it must be primed by injecting the liquid into the pump body.

b) When the pump must operate under load, i.e. with a positive load, the suction and delivery valves must be opened until the pressure gauge placed on the pump delivery indicates a pressure corresponding to the positive suction load.

- If the seal chamber is to be cooled, open the cooling water supply by adjusting its circulation.

10.2 STARTING

- Carry out the preliminary operations, completely close the delivery valve and ensure that the suction valve is completely open.
- Start the pump and check the direction of rotation again.

10.3 CHECKS IN OPERATION

- If the pump does not produce the necessary head very quickly, stop and repeat the priming operation.

- If the delivery valve is opened more than necessary, or well beyond the planned exercise point and the pump operates with a lower head than necessary, an increase in flow rate and absorbed power will be obtained. In this circumstance, the delivery must be throttled until the required head and flow values are stabilized.

- If the head generated by the pump is higher than that required, the diameter of the impeller can be reduced. If, on the other hand, the prevalence is lower than that required, with the same flow, a larger impeller is needed (if the one fitted is not already the largest) and probably a more powerful motor.
- The pump must always operate smoothly and without vibrations.
- Avoid running dry and in any case prolonged operation with the discharge valve closed.
- Check that the level of liquid in suction always guarantees a sufficient energy load for the normal operation of the machine.

- Mechanical seal: it is necessary to check, through the shaft, that there are no losses.

10.4 LONG STOP

In the event of prolonged stoppage of the pump, it must be completely emptied of the pumped liquid and carefully washed to prevent the formation of deposits and/or encrustations. For subsequent starts, proceed as described in the previous paragraphs.

10.5 PUMP CLEANING

The pump does not require any specific washing, the washing cycles normally used for the system in which it is installed are sufficient; we recommend to always carry out a washing in case of pumping of liquid which tend to induce or to crystallize during the life of the seal and of this same pump before the periods of stoppage of the machine. The user is responsible for checking the compatibility of the washing liquid with the process liquid and the pump.

11 DECOMMISSIONING

To dismantle the pumps, proceed as follows:
- disconnect the current and the hydraulic connection in accordance with the technical standards and laws in force.

- Dismantle the pump of all its components for separate dismantling, wash all the parts and carefully clean the structure.

The main components of the pump are made of the following materials:
- Body, pump cover, impeller Aisi 316L stainless steel
  shaft, impeller nut -
Elastomers NBR-EPDM-FLUORINE (VITON)-PTFE
- Motor Aluminum - Cast iron - Copper

No component containing Asbestos or Lead is used.

ATTENTION The disposal of the pump components must be carried out by the user in accordance with the regulations in force in the country concerned.

SPARE PARTS
12 12.1 REFERENCE TABLE OF THE MAIN PARTS SUBJECT TO WEAR

Pump Type CS-CSX / Piece		32-110	25-145 25-175	32 40 50 65	32 40 50 65	32 40 50	80	65 80 100	32 40 50 65 80 100 125	80 100	125 150
				-145 -175		-210	-175 -210		-260	-310	-350
*Mechanical seal EN2756-ISO3069		D.20		D.28			D.43				D.55
O-ring (OR) body OR 6412 OR 215 OR 6670				GOLD 215	GOLD 6670	GOLD 6795	GOLD 6670	GOLD 6795	GOLD 6995	GOLD 61200	GOLD 81300
O-ring (OR) impeller nut		GOLD 2087		GOLD 2112			GOLD 2150				GOLD 3206
Rolling	IEC 71	3205		---			---				---
	IEC 80	3207A 2RS-C3		3208A 2RS-C3			3208A 2RS-C3				
	IEC 90										
	IEC 100	3208A 2RS-C3		3208A 2RS-C3			3208A 2RS-C3				
	IEC 112										
	IEC 132	---		3210A 2RS-C3			3210A 2RS-C3				
	IEC 160	---		3212A C3			3214A C3				
	IEC 180	---		22214 E			22214 E				
	IEC 200 (CSX)	---		---			C 2216.C3				
		---		---			6216 A.C3				
O-ring "Gaco"	IEC 160	---		AS 70x90x10			AS 80x100x10				
	IEC 180	---		AS 80x100x10			AS 80x100x10				
Ring "V-Ring"	IEC 200 (CSX)	---		---			V-Ring 90				
		---		---			V-Ring 75				

Pump Type CSK / Piece		32 40 50 65	32 40 50 65	32 40 50	80	65 80 100	32 40 50 65 80 100 125	80 100	125 150
		-145	-175	-210	-175	-210	-260	-310	-350
*Mechanical seal EN2756-ISO3069		D.28			D.43				D.55
O-ring (OR) body OR 215 OR		6670 OR 6795 OR	6670 OR 6795 OR		6995 OR 61200 OR		81300		
O-ring (OR) impeller nut		GOLD 2112			GOLD 2150				GOLD 3206
Bearings	Before	3206			3309				3311 C3
	Back	6206			6309				6311 C3
O-ring "Gaco"	Before	AS 40x47x7			AS 45x62x8				AS 55x72x8
	Back	AS 40x47x7			AS 45x62x8				AS 55x72x8

NB:
The type and materials used in the manufacture of the packings are identified in the attached technical list.

12.2 RECOMMENDED RESERVE

RECOMMENDED RESERVE OF SPARE PARTS FOR TWO YEARS OF OPERATION IN DEPENDING ON THE QUANTITY OF INSTALLED PUMPS ACCORDING TO VDMA STANDARD						
Denomination	**QUANTITY OF PUMPS** (including reserve ones)					
	12345					
MECHANICAL SEAL 12344						
BODY O-RING 23567						
O-RING NUT IMPELLER 23567						
ROLLING	12344					
GACO O-RING (for power from kW 11) 12344						

CSF Inox declines all responsibility for damages resulting from the use of non-original spare parts.

13 OPERATING IRREGULARITIES

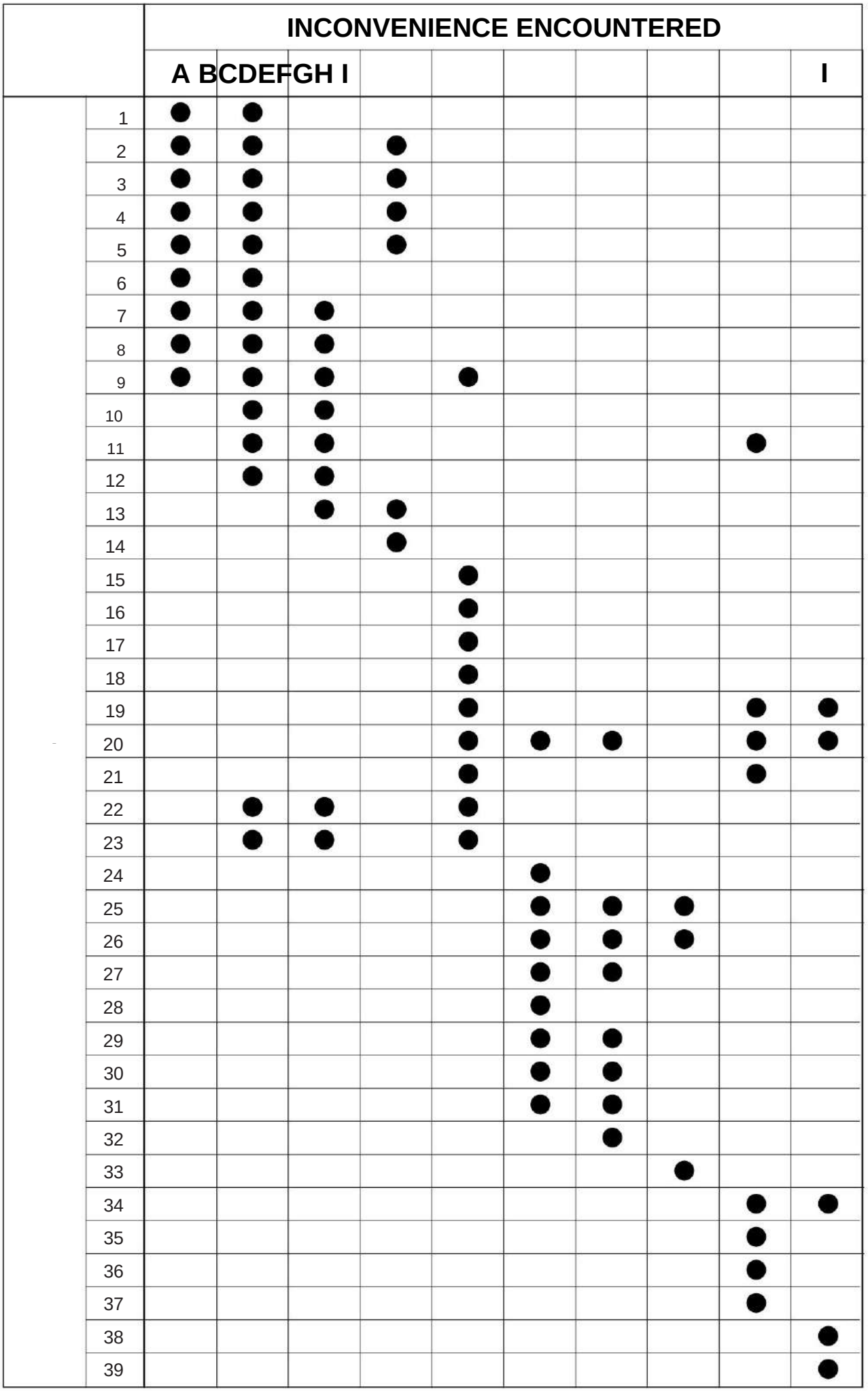
Below is a list of the inconveniences that can be encountered when using centrifugal pumps, together with a table that allows you to trace the possible causes and the steps to take to eliminate them.

Inconvenience:

A) The pump does not deliver
B) The flow rate is insufficient
C) The pressure is insufficient
D) The pump loses prime
E) Excessive electrical absorption
F) Losses through the mechanical seal
G) Short life of the mechanical seal
H) Breakage of the mechanical seal
I) Vibrations and/or abnormal noise
L) Short bearing life

Possible causes and operations required for their elimination: 1)
Poorly primed pump.
- Repeat priming.
2) Air inlet through suction fittings.
- Check the tightening
3) Air inlet through the mechanical seal.
- Replace the gasket or provide a solution with a spring for the vacuum in the event of operation with vacuum suction.
4) Obstruction along the suction line or possibly closed valves along the pipes.
- Check and remove any foreign bodies blocking the pipes and check the condition of the valves (if they are closed, they must be opened).
5) NPSH available on the installation lower than the NPSH required by the pump.
- Reduce head losses or adjust the pump to a lower flow point.
6) Faulty foot valve operation (pumps not under load)
- Restore proper operation of the valve or replace it with another in good condition.
7) System pressure drops greater than the pump characteristics.
- Reduce pressure drops or replace the pump with another more suitable for the performance required.

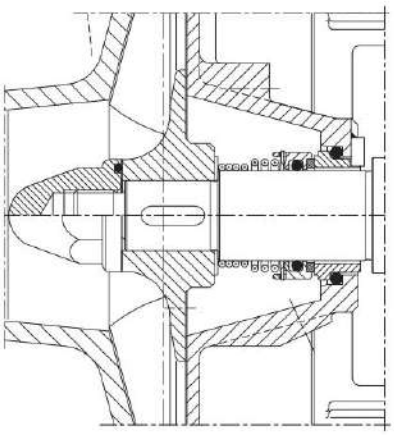
8) Incorrect direction of rotation or speed too low (for pumps ordered with converter).
- Restore the correct direction of rotation; increase engine speed.
9) Impeller blocked by foreign bodies (pumps with closed impeller)
- Remove foreign bodies.
10) Worn packings.
- Replace worn components.
11) Worn or partially clogged impeller.
- Replace the impeller or remove the bodies obstructing it.
12) Viscosity of the pumped product higher than expected.
- Check the sizing of the pump.
13) Excessive presence of gas dissolved in the liquid.
- Insert a deaerator.
14) System pressure drops lower than forecast.
- Increase pressure drops or adjust the pump to a higher operating point.
15) Specific weight of fluid higher than expected.
- Increase the power of the installed motor.
16) Excessive viscosity of the pumped liquid.
- Check the sizing of the pump.
17) Operation of the pump with a higher flow rate than expected due to system pressure drops lower than assumed.
- Adjust the pump to a lower operating point or increase the pressure drops of the installation.
18) Excessive rotation speed (for pump supplied with converter).
- Decrease the speed.
19) Friction caused by sliding between the rotating parts and the fixed parts.
- Restore normal assembly conditions.
20) Bad alignment of the pump-motor unit or deformed shaft.
- Restore the correct pump-motorisation alignment; replace the shaft with a new one.



21) Damaged pump or motor bearings.
- Replace the bearings.
22) Bad electrical connection.
- Modify the connection, respecting the data shown on the motor plate according to the voltage available.
23) Incorrect voltage for the installed motor.
- Replace the motor with another with adequate voltage.
24) Excessive packing wear.
- Replace the mechanical seal.
25) Pumped liquid and/or temperature not suitable for the type of seal or its materials.

- Check the garnish chosen.
26) Lack of cleaning with liquids that tend to crystallize.
- Increase the washing cycles and do not leave the product too long inside the pump.
27) Incorrect assembly of the gasket.
- Refit the trim with more care.
28) Incorrect direction of rotation for non-reversible seals.
- Restore the correct direction of rotation.
29) Insufficient washing in case of fluxed external gaskets.
- Increase the amount of fluxing liquid.
30) Pump running dry.
- Provide protections to block the operation of the pump (eg: flow switch) in order to prevent such a phenomenon from happening again.
31) Oscillations on the shaft due to excessive mounting clearances, worn bearings, etc.
- Restore normal assembly conditions by replacing worn parts.
32) Solid parts in suspension in the liquid.
- Check the garnish chosen.
33) Excessive temperature or thermal shock.
- Gradually increase the temperature of the liquid, avoiding instantaneous thermal variations; avoid dry running of the pump.
34) Impeller imbalance.
- Replace the impeller.
35) Operation at too low a flow.
- Adjust the pump to a higher exercise point.
36) Excessive flow operation.
- Set the pump to a lower exercise point.
37) Pump and/or hoses attached incorrectly.
- Arrange the fastening systems of the parts concerned.
38) Lack of bearing lubrication (if provided).
- Replace the bearings and restore the lubrication, which must be topped up, from time to time, depending on the conditions of use.
39) Water infiltration due to worn oil deflectors.
- Replace worn components.

14 SINGLE MECHANICAL SEALS - CS / CSX / CSK



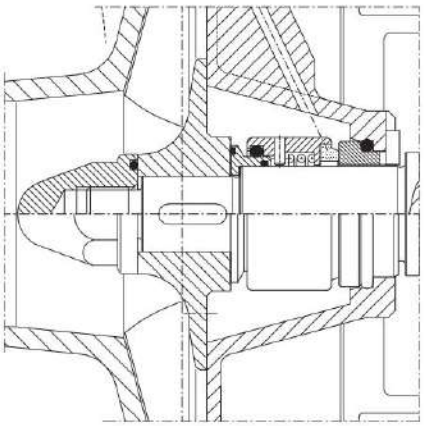
T/W EXECUTION

STANDARD MECHANICAL SEAL "T"

The standard execution provides for the assembly of an internal mechanical seal within the product, housed behind the impeller in a conical chamber provided for this purpose in order to guarantee the appropriate lubrication conditions.

MECHANICAL SEAL WITH "W" CIRCULATION

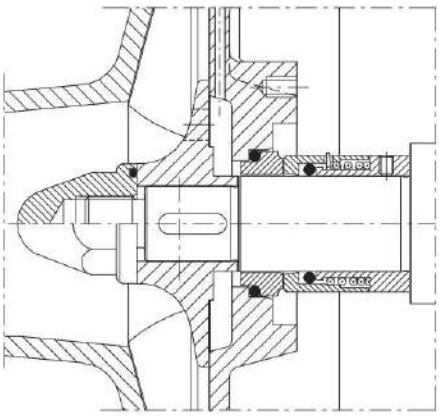
Internal mechanical seal with circulation forced from the pumped liquid in question.



WH EXECUTION

INTERNAL MECHANICAL SEAL "WH"

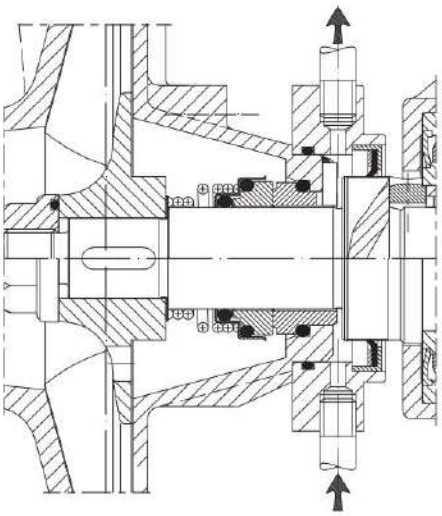
Protected, balanced and bidirectional execution with forced circulation of the pumped liquid in question. Easily washable, and therefore ideal for sanitary, pharmaceutical, etc. uses.



EXECUTION Y

EXTERNAL MECHANICAL SEAL "Y"

Execution used in all cases in which the structure of the mechanical seal must not be involved with the pumped product, in order to avoid sanitary problems, corrosion, and related to its operating conditions.

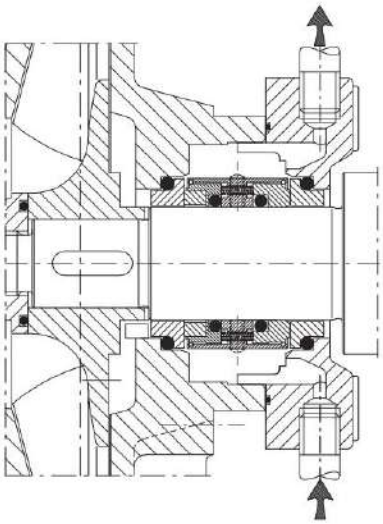


EXECUTION V

INTERNAL "V" MECHANICAL SEAL

The external liquid circulation chamber creates a protective barrier in the presence of aggressive or toxic liquids. It contributes to the cleaning of the contact faces of the lining and limits its wear.

15 DOUBLE MECHANICAL SEALS - CS / CSX



EXECUTION Q

COMPACT DOUBLE MECHANICAL SEAL "Q"

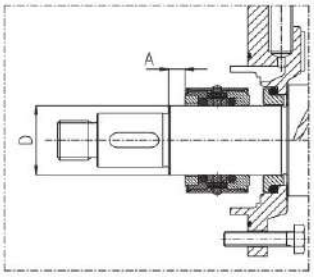
Double mechanical seal with circulation of washing and cooling liquid. The washing function is to clean, lubricate and cool the packing; the circulating liquid must be clean. In the event of loss of tightness, the washing liquid highlights its presence.

A = mounting measurement

D=20 11mm

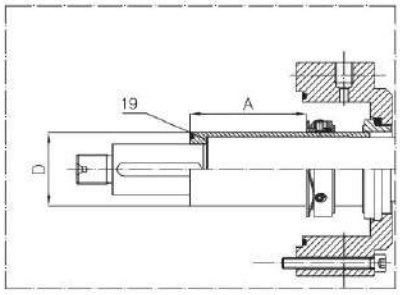
D=28 8mm

D=43 20.5mm

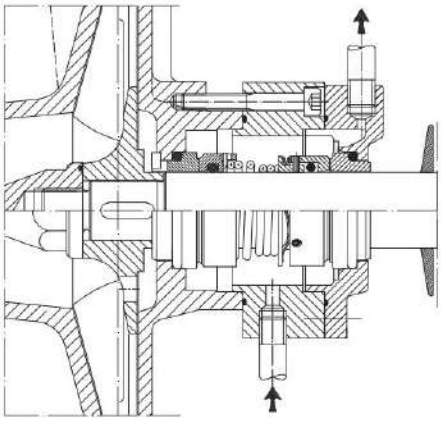


A = mounting measurement

D=55 86.5mm



16 DOUBLE MECHANICAL SEALS - CSK



Q EXECUTION FOR CSK SERIES

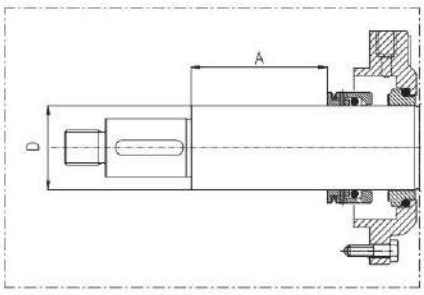
DOUBLE "Q" MECHANICAL SEAL

Double mechanical seal (2 opposed seals) with liquid circulation. The washing function is to clean, lubricate and cool the packing; the circulating liquid must be clean. In the event of loss of tightness, the washing liquid highlights its presence.

A = mounting measurement

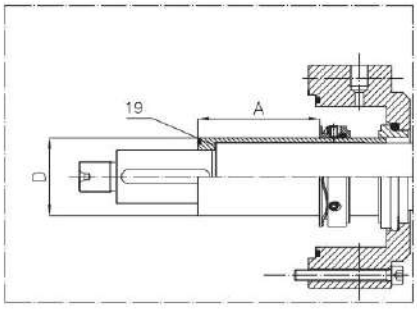
D=28 42mm

D=43 70mm



A = mounting measurement

D=55 86.5mm



17 DISASSEMBLY

17.1 DISASSEMBLING THE CS EXEC PUMP. "T/W"

(Version with single mechanical seal)

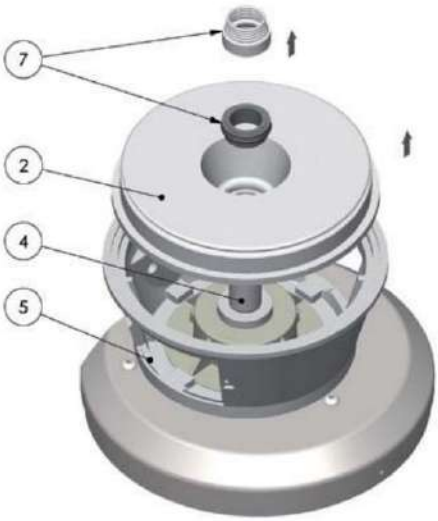
A - Remove the screws (42-81) to remove the cover (41) and the casings (80)
- Unscrew the screw (36) of the motor and extract it from
the pump - Remove the front and rear feet (20-23) with the screws (24).

NB: THE NEXT OPERATIONS MUST BE PERFORMED BY POSITIONING THE PUMP VERTICALLY

B - Loosen the clamp (13) to remove the body (1) and the O ring (18).

C - Unscrew the nut (14) anti-clockwise, this operation can be carried out:
1) with a pneumatic wrench
2) blocking the pump shaft on the motor side
3) if the motor is not disassembled, it is possible to remove the fan cover and block the motor shaft with self-locking pliers.

Extract the impeller (3) and remove the shims (19) which create the assembly clearances.

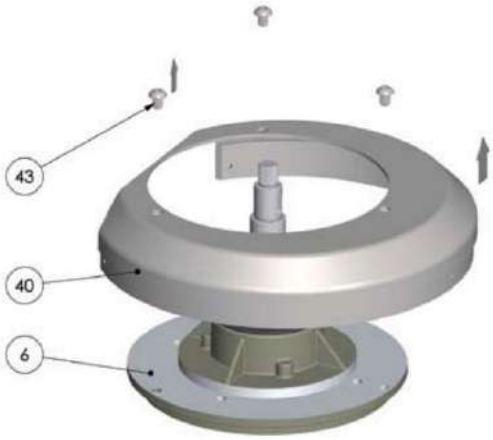


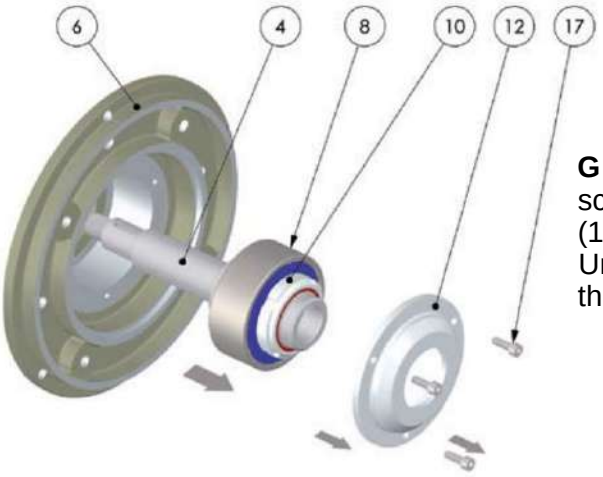
D - Extract the rotating part of the mechanical seal (7) by turning the spring anti-clockwise.

Separate the pump cover (2) from the lantern (5), remove the fixed part of the mechanical seal (7) housed on the latter.

E - Reverse to access the screws (35) which allow the support (6) to be separated from the lantern (5).

F - Remove the screws (43) and extract the eccentric of the cover (40) from the support (6).
NB: Only for versions with hood.

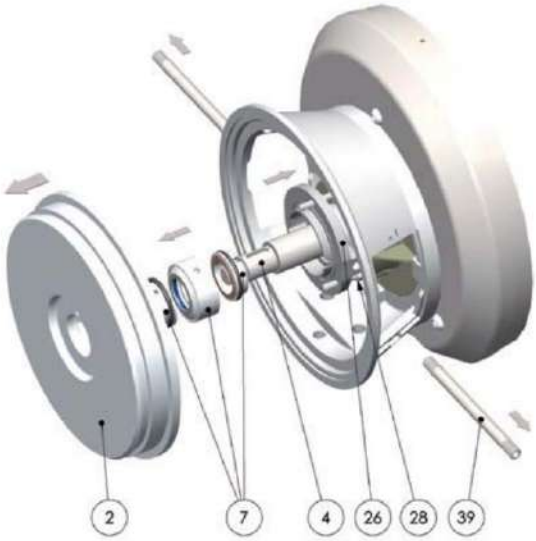




G - Remove the bearing cover (12) by removing the screws (17); and extract the shaft (4)-bearing (8)-nut (10) group from the support (6).
Unscrew the nut (10) and extract the bearing (8) from the shaft (4).

17.2 DISASSEMBLING THE CS EXEC PUMP. "Q" (Version with double mechanical seal)

1st Phase: carry out the operations indicated in par. 17.1 **(ABC)**



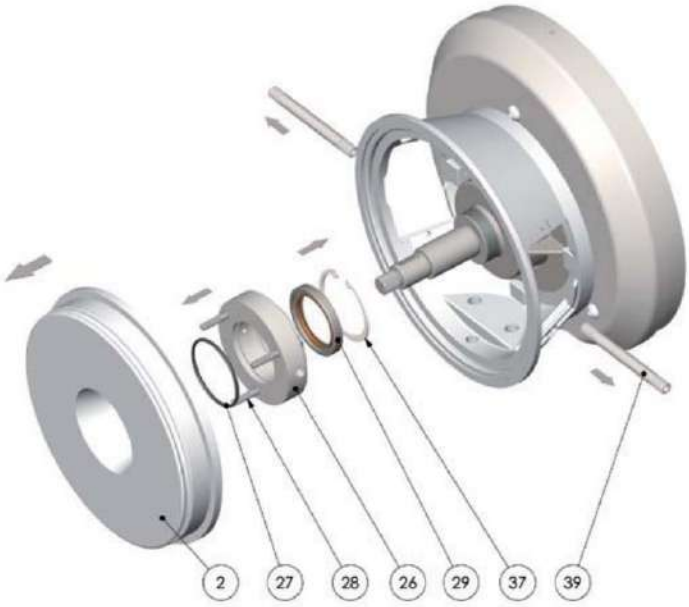
2nd Phase: after dismantling the valve pipes (39) separate the seal chamber cover (26) from the pump cover (2) by removing the screws (28). Remove the pump cover (2) from the lantern (5). Disassemble the seal (7): Remove the internal fixed part of the pump cover (2), remove the rotating part from the shaft (4), after loosening the fixing studs, remove the external fixed part of the seal cover (26).

3rd Phase: carry out the operations indicated in par. 17.1 **(EFG)**

17.3 DISASSEMBLING THE CS EXEC PUMP. "V"

1st Phase: carry out the operations indicated in par. 17.1 **(ABC)**

2nd Phase: extract the rotating part of the mechanical seal (7) by turning the spring anti-clockwise.



3rd Phase: after dismantling the washing pipes (39) separate the seal chamber cover (26) from the pump cover (2) by removing the screws (28).
Dismantle the Seeger (37) and the radial mechanical seal (29).
Extract the O-ring (27) from the pump cover (2).

4th Phase: carry out the operations indicated in par. 17.1 **(EFG)**

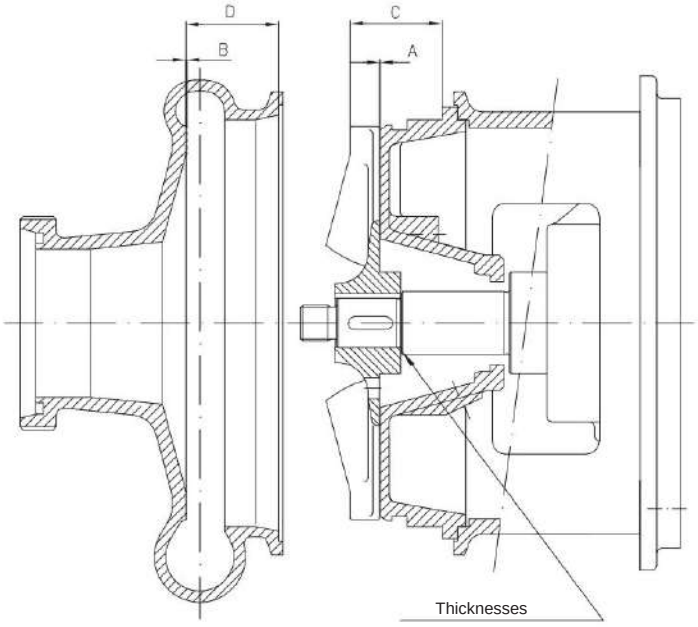
17.4 MOUNTING THE CS EXEC SERIES PUMP. T/W/Q/V

By carrying out the dismantling operations in the opposite direction, the successive phases are obtained allowing the assembly of the pump to be carried out.

NB: Consult the table (par. 18) to respect the assembly clearances.
For this operation, use the thicknesses, pos. 19.

18 REFERENCE CHART FOR ASSEMBLY GAMES

Pump CS-CSX CSK	Dimensions			
	A	B	C	D
25-145	0.3	0.3	34.9	35.2
25-175	0.3	0.3	34.3	34.6
32-110	0.3	0.4	29.8	30.2
32-145	0.3	0.3	37.8	38.1
32-175	0.3	0.4	36.3	36.7
32-210	0.3	0.5	37.3	37.8
32-260	0.4	0.4	41.4	41.7
40-145	0.3	0.4	38.8	39.2
40-175	0.4	0.4	39.4	39.8
40-210	0.4	0.4	38.9	39.3
40-260	0.4	0.4	42.4	42.8
50-145	0.4	0.4	43.9	44.3
50-175	0.4	0.4	40.9	41.3
50-210	0.4	0.4	40.9	41.3
50-260	0.4	0.4	44.9	45.3
65-145	0.5	0.3	51.0	51.3
65-175	0.4	0.4	48.9	49.3
65-210	0.4	0.4	51.9	52.3
65-260	0.5	0.5	49.5	50.0
80-175	0.4	0.4	64.4	64.8
80-210	0.4	0.4	56.9	57.3
80-260	0.5	0.5	54.0	54.5
80-310	0.5	0.5	54.9	55.3
100-210	0.5	0.5	64.0	64.5
100-260	0.5	0.5	57.8	58.3
100-310	0.5	0.5	61.9	62.3
125-260	0.5	0.5	63.9	64.3
125-350	0.5	0.5	74	74.5
150-350	0.5	0.5	86	86.5



A = Impeller/cover mounting clearances
pump (they are made with thicknesses pos. 19)

B = Impeller/housing mounting clearances

C = Impeller/cover distance with the thicknesses

D = Internal depth of the body corresponding to B+C

19 BEARING MAINTENANCE

19.1 BEARING MAINTENANCE FOR CS SERIES PUMPS

On the CS series, up to motor size 132 (5.5 ÷ 9.2 kW), the installed bearings are shielded, so they do not need to be lubricated.

19.2 MAINTENANCE OF BEARINGS FOR CS - CSX SERIES PUMPS WITH SUPPORT SIZE 160 ÷ 200

The bearings of the CS - CSX series pumps are dimensioned for a service life greater than or equal to 20,000 hours of operation.
The life of the bearing and the frequency of relubrication can be reduced in the following cases: unfavorable ambient conditions (ambient temperature, high humidity and dustiness, corrosive atmosphere), use requiring frequent start-ups and/or variable loads, prolonged stoppages.

Maintenance frequencies must therefore be established according to the conditions of use and on the basis of acquired experience.

"CS" series pumps
(Fig.1)

Lubricator

"CSX" series pumps
(Fig.2)

Lubricators

On the CS series with support size 160 ÷ 200 (11 ÷ 22 kW), the bearings must be lubricated at regular intervals; to ensure good lubrication, it is necessary to dismantle the bearing, clean it carefully and fill it with new grease, taking care to fill the crowns to half their volume. It is possible to replenish grease at regular intervals at the level of the grease nipple present on the bearing support (see fig. 1 - fig. 2).

Each time it is disassembled, change the grease sealing lip seal (pos. 32 CS, pos. 206-207 CSX), ensuring that there is no wear on the ring holding housing.
For proper bearing lubrication, it is recommended to use SKF LGHP2 high performance grease for use over a temperature range of -30°C to 150°C.

The table below indicates the frequency of relubrication, the quantity of grease to be used and the type of bearing present on the pump.

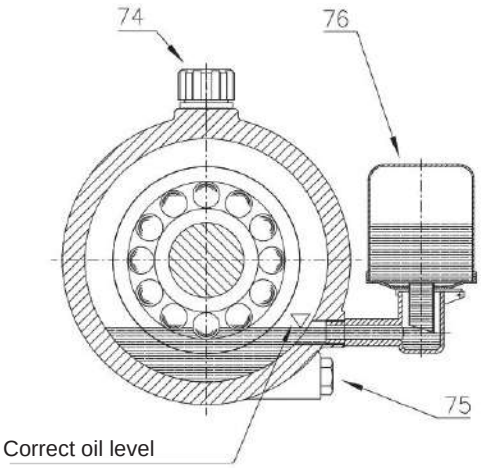
Pump **CS-CSX** / Piece		32 40 50 65	32 40 50 65	32 40 50	80	65 80 100	32 40 50 65 80 100 125	80 100	Interval of lubrication (working hours ment)	Qty fat (grams)
		145 175 210 175 210 260 310								
IEC 160 motor	Rolling	3212A C3			3214A C3				5000	20
IEC 180 motor		22214 E C3			22214 E C3				500	20
Motor IEC 200 30 kW 2 poles (CSX with 2 bearings)		---			C.2216				500	23
		---			6216A					18

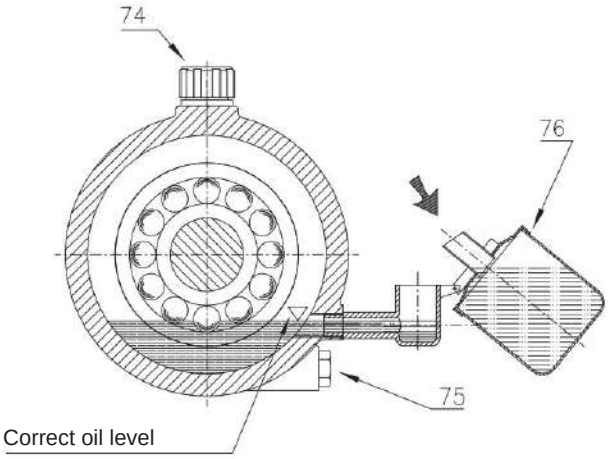
20 BEARING MAINTENANCE FOR CSK SERIES PUMPS

The pump bracket bearings are splash lubricated in an oil bath. The pump is supplied with an oil-free bracket. Fill the tank before using the pump using oil supplied by CSF or an oil of equivalent quality. The filling procedure is as follows: With the pump stopped, unscrew the filler cap (pos.74) and rotate the constant level oil bulb (pos.76) as shown in the figure.

Pour oil through the vent hole until it reaches the level of the oil fitting as shown.
Partially fill the bulb as a reserve and rotate it to the closed position before screwing the filler cap back on. Check the oil level in the bulb after a short period. It is important to maintain the correct level in the tank. It is important to periodically check the oil level and top it up if necessary, but without exceeding the maximum level indicated in the figure. An excessive amount of oil can generate an increase in the temperature of the bearings. It is recommended to carry out the first oil change after approximately 300-500 hours, then the following changes approximately every 8000 hours for bearings at an operating temperature of up to 60°C (replace the oil anyway once a year) and reduce the interval for higher temperatures (consult CSF Inox or follow the SKF instructions). To replace the oil in the support, unscrew the drain plug (pos. 75) and drain the oil into a suitable container, then screw the drain plug back on and pour in the new oil according to the procedure described above.

BRAND	KIND	ISO GRADATION VISCOSITY INDEX	
MOBILE	DTE OIL LIGHT	112	32





PLANNED OIL Q.TE
CSK 2° Gr. = l 0.1 of oil
CSK 3° Gr. = l 0.3 of oil
CSK 4° Gr. = l 0.5 of oil

The table below indicates the type of bearings present on the pump.

Pump CSK / Piece		32 40 50 65	32 40 50 65	32 40 50	80	65 80 100	32 40 50 65 80 100 125	80 100	125 150
		145	175	210	175	210	260	310	350
Bearings	Before	3206			3309 C3				3311 C3
	Back	6206			6309 C3				6311 C3

21 CLEANING PROCEDURE

The procedure for cleaning a stainless steel pump is chosen according to the fluid it treats. It is up to the production manager to choose the most suitable cleaning procedure.

CSF Inox recommends a flow speed through the piping equal to 1.5-3 m/s, alternating phases of rinsing with clean water with phases of treatment with chemical agents such as acid solutions and alkaline detergents.
Attention ! Do not use chlorine or hypochlorite based products as they corrode stainless steel.

Alkaline detergents:
One can use a solution based on sodium hydroxide at a concentration of 1-3% and at a temperature of 70-90°, and optionally add surfactants to reduce the formation of mousse.

Acid solution :
An acid solution can be used to neutralize the alkaline detergent and for passivation of the stainless steel surface. One can for example use a solution based on nitric acid at a concentration of 1-2.5% at an ambient temperature of 45°C maximum. Other acid solutions based on citric acid at a concentration of 0.5-3% up to 70°C, or based on phosphoric acid at 0.5% up to 45°C (with corrosion inhibitors) can be used.

Recommended cleaning procedure:
1) Pre-wash with cold water (15-25°C) for 10-15 minutes to remove dirt deposits.

2) Rinse with hot water up to 45-60°C for 10 minutes.
3) Cleaning with an alkaline solution at 70-95°C for 20-30 minutes.
4) Intermediate rinse with water (hot or cold) up to 60°C for 5-10 minutes.
5) Cleaning with an acid solution, based on nitric acid for example, for 10 – 15 minutes at room temperature.
6) Final rinse with cold water for 10-15 minutes, until the complete elimination of chemical agents.

Warnings :
1) CIP cleaning causes thermal expansion; it is therefore advisable to avoid sudden changes in temperature.
2) At high temperature, chemical agents are potentially dangerous to human health; follow the manufacturer's instructions and wear the recommended personal protective equipment (PPE).

3) Monitor concentration and temperature of solutions during CIP cleaning.
4) Store chemical agents in accordance with current safety rules.

Sterilization:
If necessary, sterilization can be carried out with superheated water or steam. During sterilization with steam, the pump must not be running. Respect the maximum permitted sterilization temperature according to the elastomers of which the pump is made.

Elastomers/temperature limit	Steam/superheated water	Bactericidal chemicals
EPDM	121°C	82°C
FPM/FKM	149°C	82°C

Cleaning and sterilizing the impeller nut:
1) The impeller nut must be cleaned before mounting (internal thread).
2) Clean the nut with ultrasonic washing systems or with detergent, then rinse with water.

3) Sterilize the nut with steam at 143°C for 30 minutes in an autoclave or with chemical agents (solutions based on glutaraldehydes for example). Do not use chlorine-based solutions, as they corrode stainless steel.

N° di Matricola - Serial Number
Seriennummer - Matricule No.
Matrícula number

SERVIZIO ASSISTENZA Per
qualunque richiesta di informazioni, interventi etc. è sempre necessario comunicare il NUMERO DI MATRICOLA della macchina.
Non è possibile fornire istruzioni precise o programmare intervention senza che sia fornito questo dato.
Il numero di matricola è anche stampigliato su una apposita targhetta fissata sulla macchina.

SERVICE ASSISTANCE For any
request regarding information, service, etc., it is always necessary to indicate the SERIAL NUMBER of the machine.
It is not possible to provide precise instructions or schedule servicing unless this information is communicated.
The serial number is printed on the plate fixed to the machine, too.

KUNDENDIENST Bei
allen Anfragen um Informationen, Eingriffe usw. stets die SERIENNUMMER der Maschine angeben.
Ohne diese Angabe können keine exakten Informationen geliefert und keine Eingriffe geplant werden.
Die Seriennummer ist auch dem Typenschild auf der Maschine zu entnehmen.

ASSISTANCE SERVICE For any
request for information, interventions, etc., always indicate the SERIAL NUMBER of the machine.
It is impossible to provide precise instructions or to schedule interventions without this data.
The registration number is also stamped on the plate attached to the machine.

SERVICIO DE ASISTENCIA Para
cualquier solicitud de información, de interventions u otros servicios, indicar siempre el NÚMERO DE MATRÍCULA de la máquina.
Es imposible suministrar indicaciones precises o programar interventions sin este dato.
El número de matrícula se encuentra impreso también en una placa especial aplicada a la máquina.

DELLA TOFFOLA

Numero Verde
800-803276

DELLA TOFFOLA SpA
Via Feltrina, 72
31040 SIGNORESSA DI TREVIGNANO
(TREVISO) ITALY
Such. +39 0423
6772 Internet:
www.dellatoffola.it e-mail: dtgroup@dellatoffola.it

Fax
+39 0423 670 841
Direzione - Uffici Commerciali
Ufficio Amministrazione
+39 0423 679 196
Ufficio Tecnico
+39 0423 670 491
Ufficio Acquisti