INSTRUCTION BOOK

D.E. FILTER MODEL DCBL

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"EC" CONFORMITY DECLARATION

Manufacturer:
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The Manufacturer, hereby states that the machinery:

SERIES IDENTIFICATION	:	FILTER
MODEL	:	
SERIAL NUMBER	:	
YEAR OF MANUFACTURING	:	2006

Is in compliance with the following legislation criteria :

- Norms 98/37/CE and subsequent amendments on safety of machinery
- Norms 89/336/CEE and subsequent amendments on electromagnetic compatibility
- Norms 73/23/CEE and subsequent amendments on safety of electrical material for low tension

The Manufacturer declares that all the following norms have been accomplished and applied :

EN 292-1:1991	Safety of machinery - Fundamental concepts and general principals of design - Terminology, basic methodology
EN 292-2:1991	Safety of machinery - Fundamental concepts and general principals of design - Specification and technical principles
EN 294:1992	Safety of machinery - Safety distances to avoid contact with lower limbs in dangerous areas - Fundamentals concepts and general principals of design
EN 349:1993	Safety of machinery - Minimum spaces to avoid body's parts crushing
EN 60204-1-1992	Safety of machinery. Electric equipment of machinery - Part 1 : general norms

ORVIETO …/…/….

MECCANICA SPADONI SRL
SERGIO SPADONI
President

2. HOW TO USE AND RESERVE THE INSTRUCTION MANUAL

In this chapter you will learn how to use the I.M. and understand its limits.

2.1 For whom is the I.M.:

This manual is addressed to those responsible for:
- transporting the unit
- loading and unloading of the unit
- operating the unit
- maintenance

2.2 Aim of the informations contained in the I.M.:

The purpose of the I.M. is to detail the; use of the machine, technical characteristics, moving instructions, installation, regulation and use, maintenance and the ordering of spare parts.

2.3 Limits of the I.M.:

We remind you that this manual can never substitute the experience of the operator and therefore the I.M. represents only a memorandum of the main operations.
We underline, that this manual reflects the machine at the time of purchase and that the manufacturer may upgrade the machine without bringing the I.M. up to date.

2.4 How to reserve the I.M.:

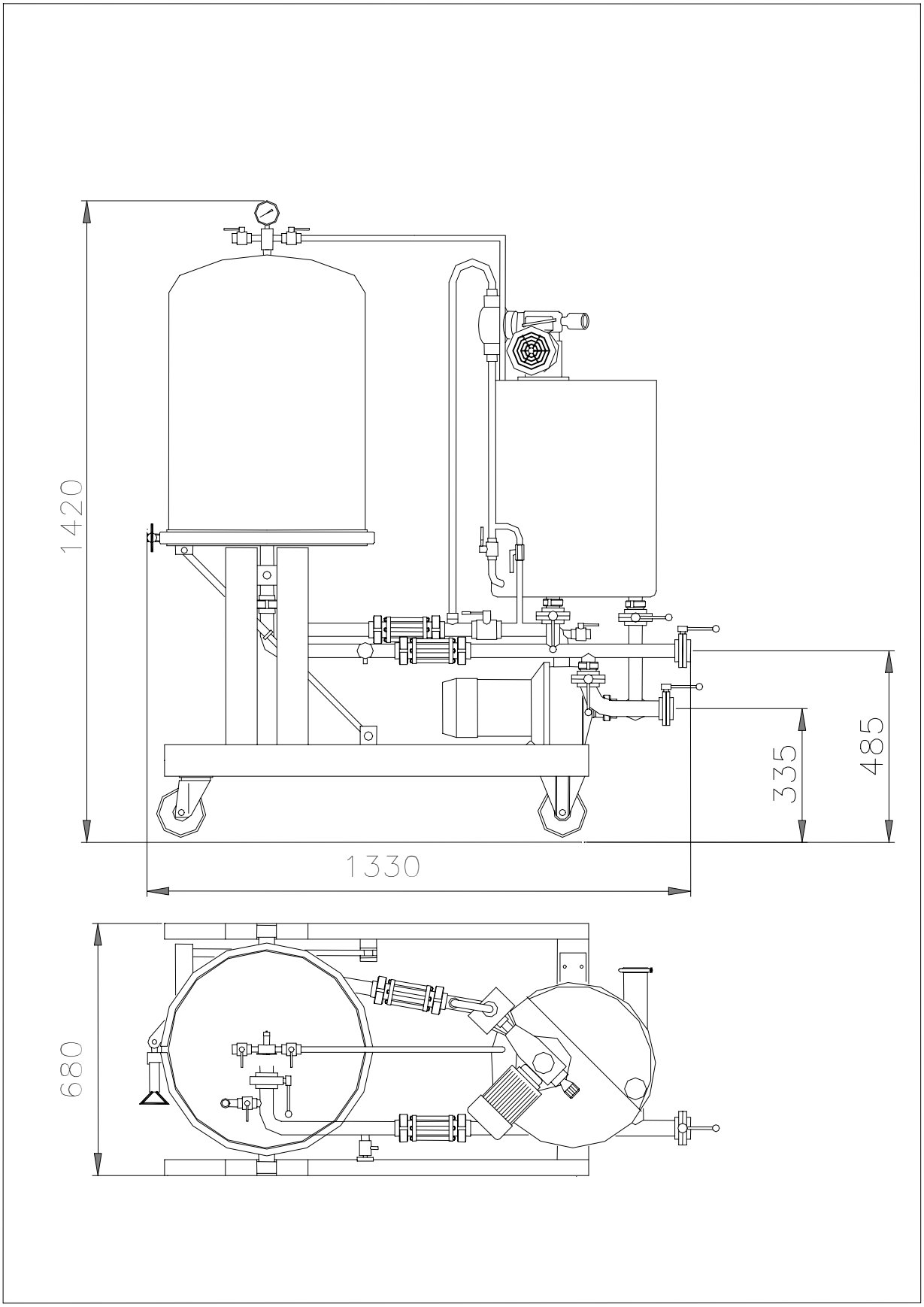
We remind the operator that this manual is to be stored with care for continual and future reference.
In the case of loss or destruction of the I.M., please refer to your sales agent or contact the manufacturer directly for a replacement copy.

WARNING
Do not effectuate any operation if you are not absolutely sure of the proper procedures. If this is the case we encourage you to contact either the sales agent or the manufacturer.

IMPORTANT
The manufacturer relieves themselves from any responsibility for damages incurred to the machine, operating personnel or to the product itself in the case of:
- **operation of the machine by unexperienced personnel**
- **incorrect installation**
- **improper feeding or operating of the machine**
- **lack of maintenance**
- **forced interventions or modifications**
- **use of non-original spare parts**
- **lack of total observation of operating instructions**
- **exceptional events**

TAV. D.1 - DCBL 50

WEIGHT KG 180



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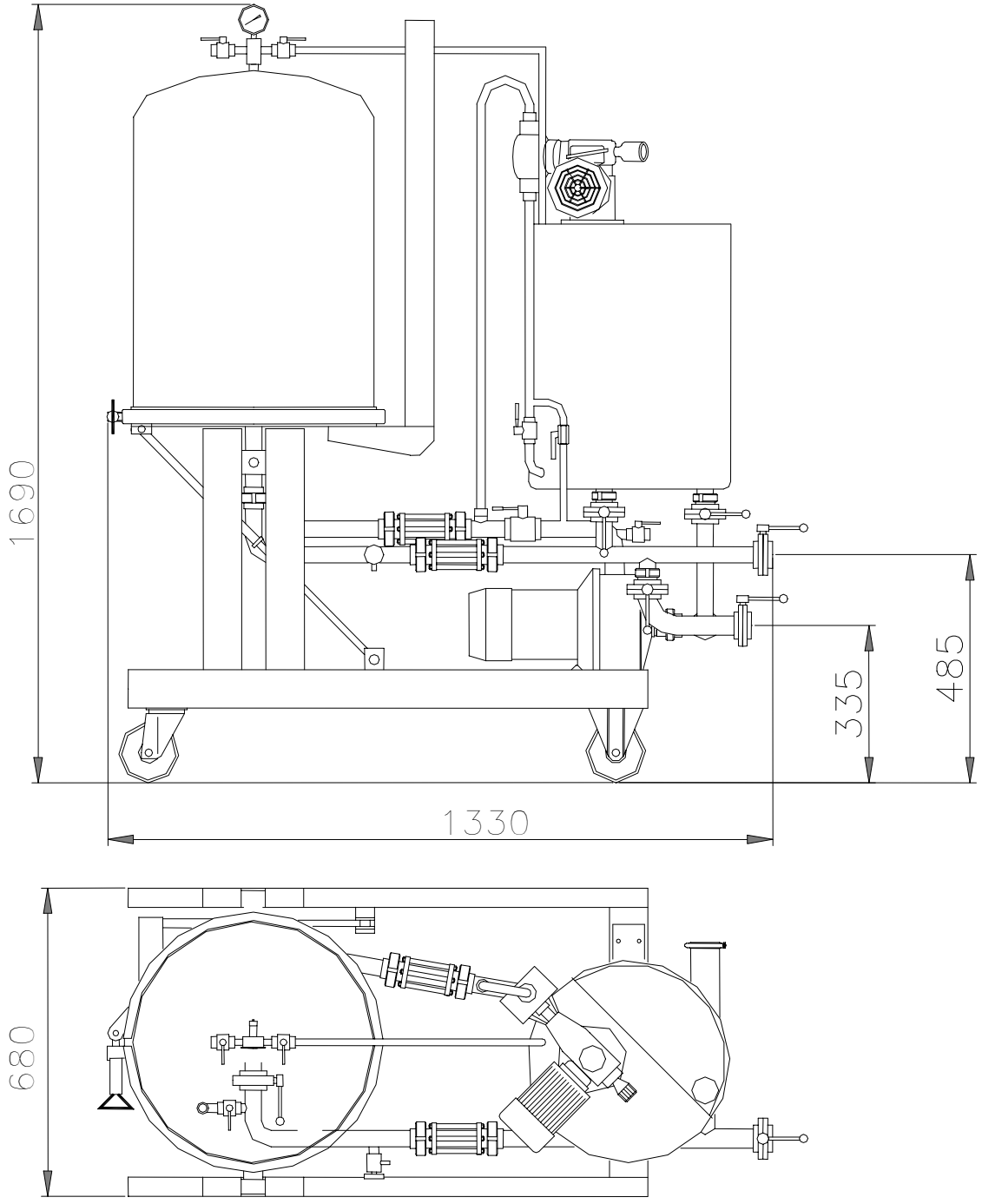

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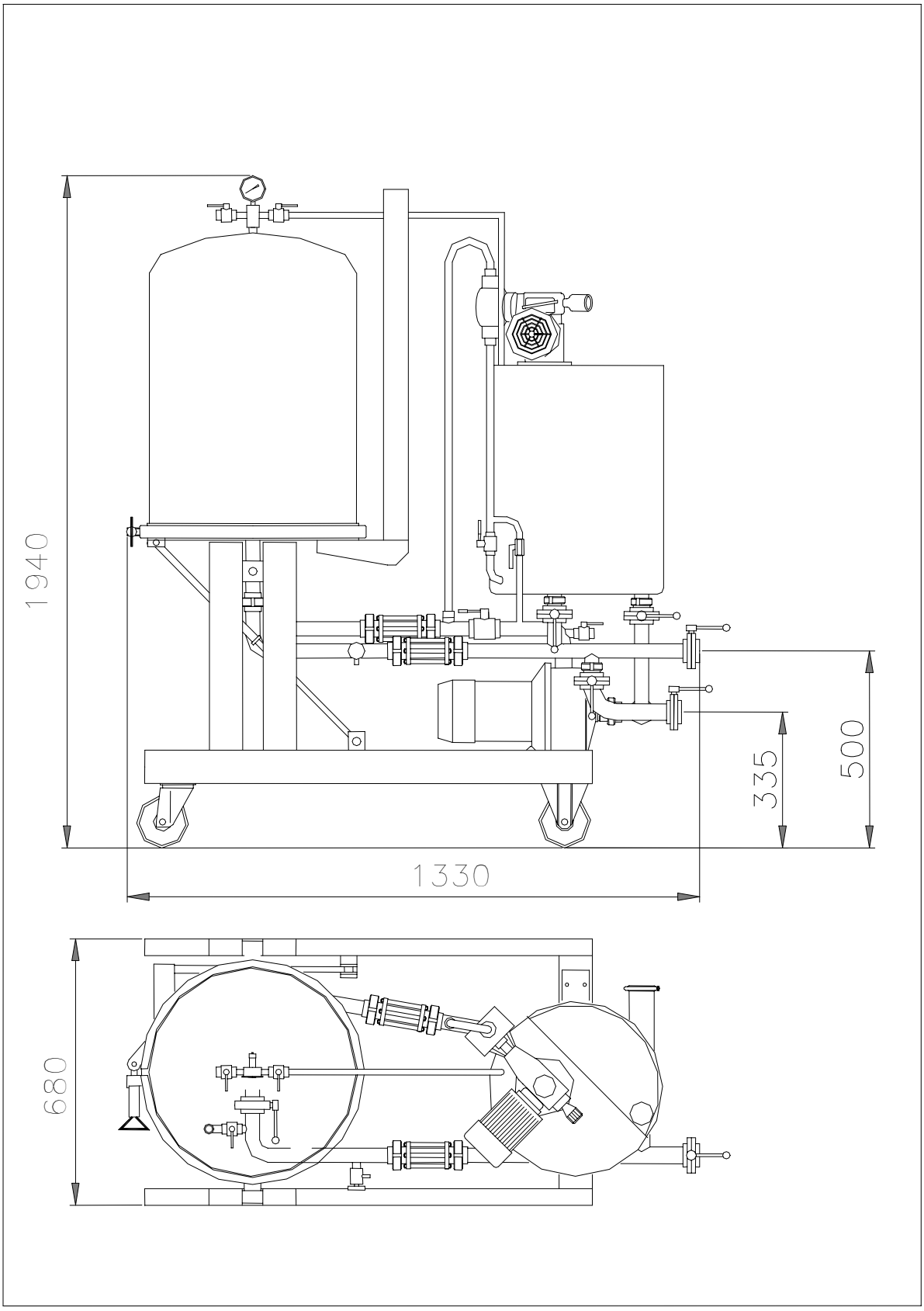

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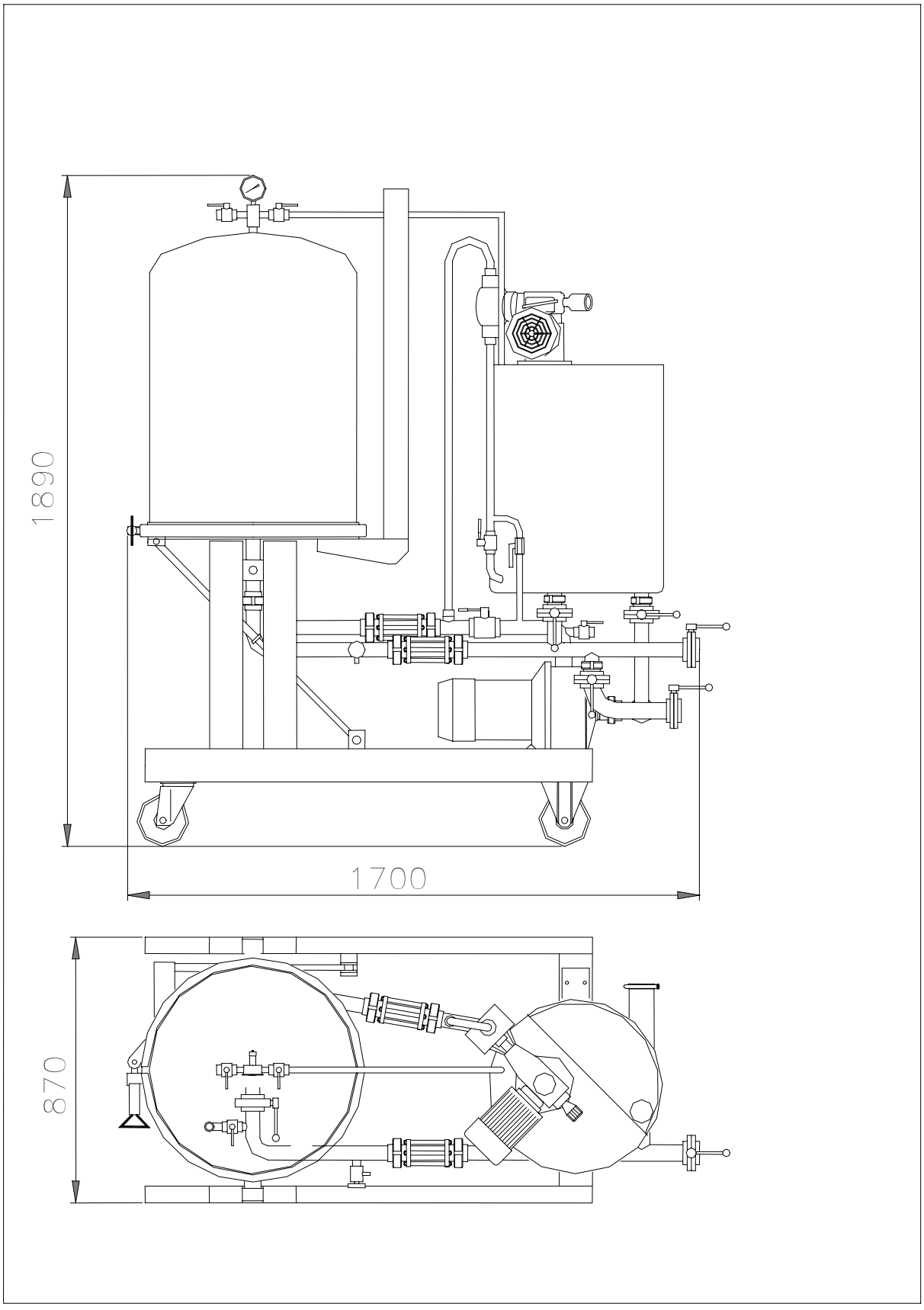

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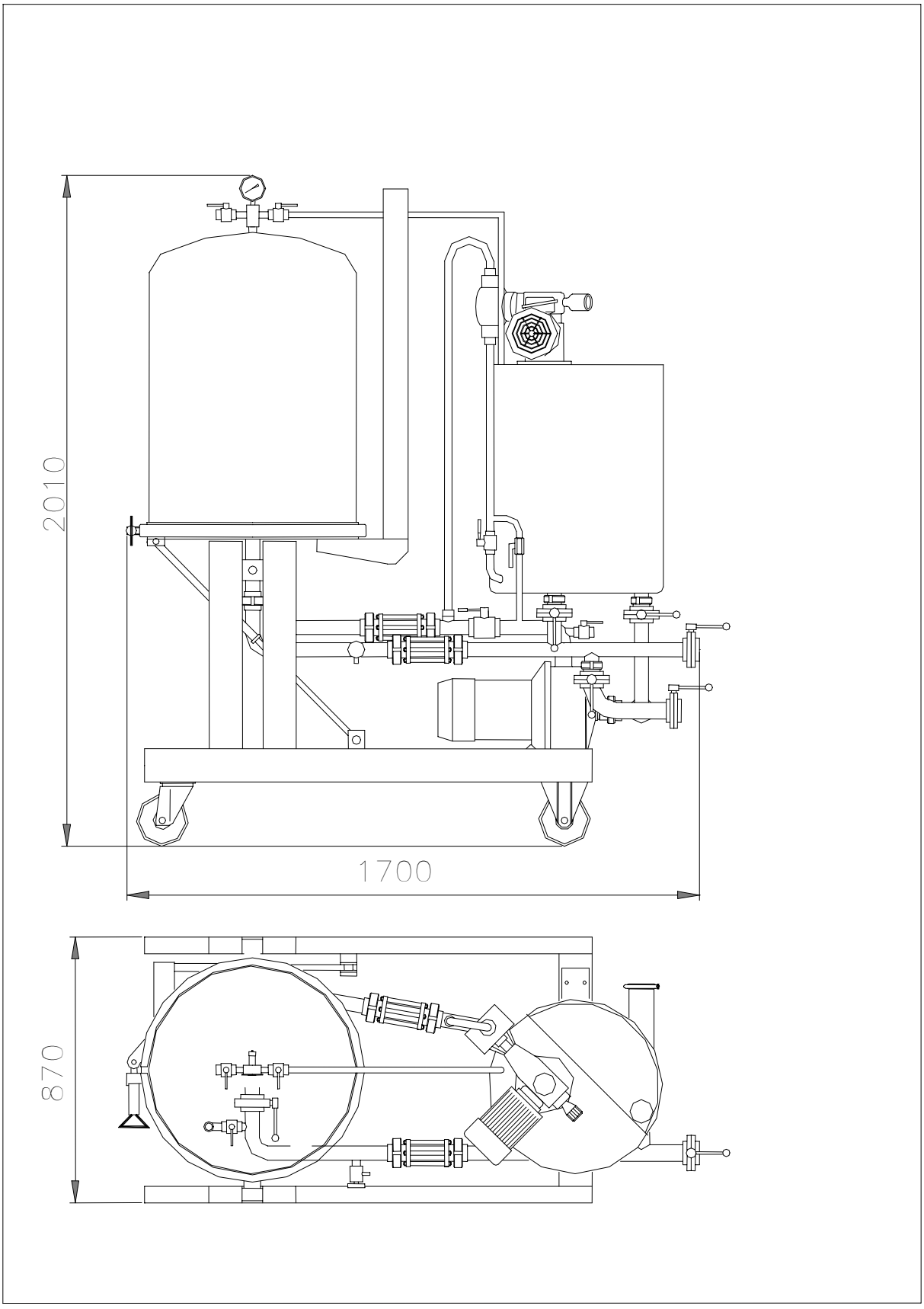


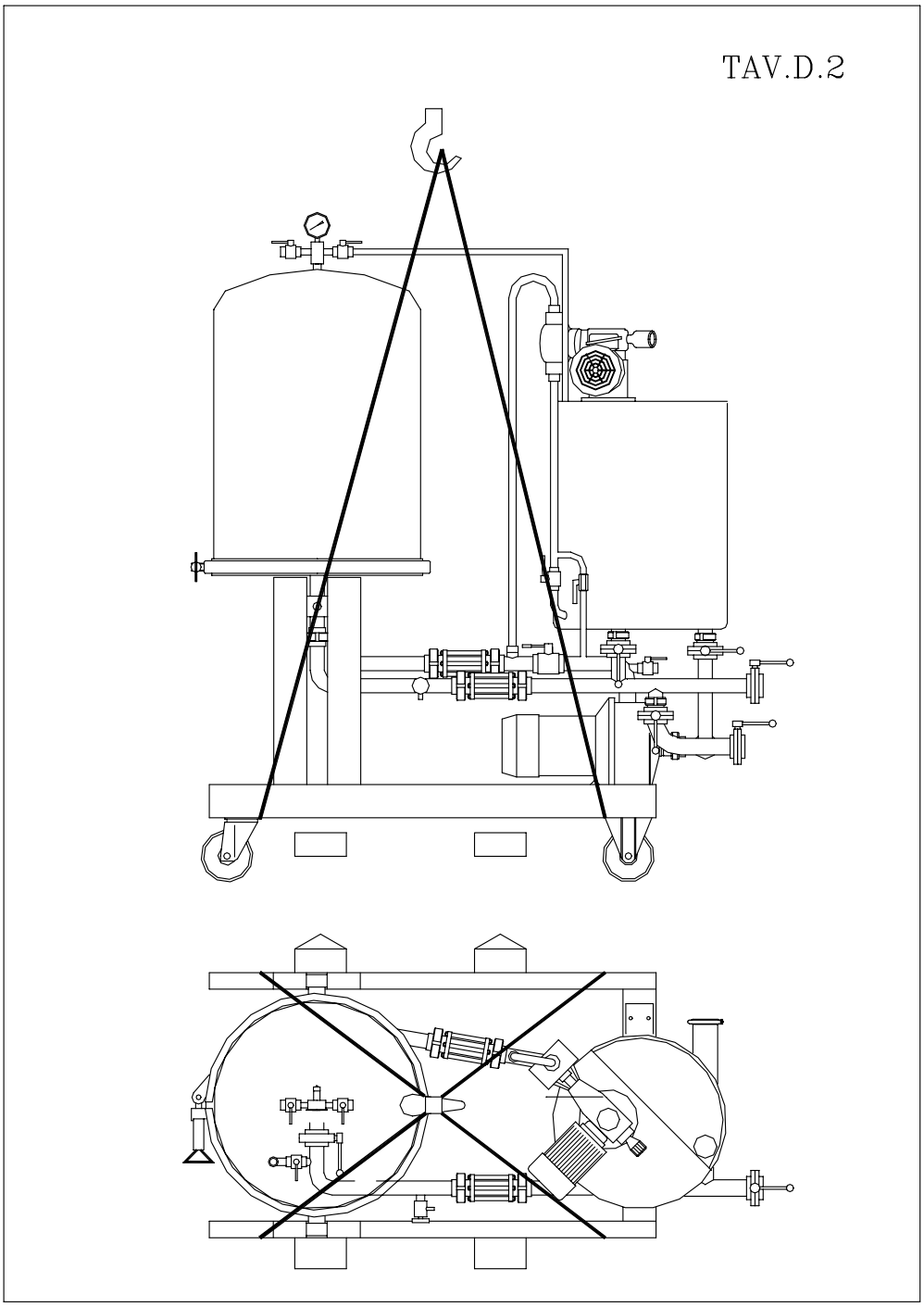


TABELLA 1

MODEL	LIFTING MACHINERY MINIMAL CAPACITY(KG)	BELT MINIMAL CAPACITY (KG)	BELT LENGTH (MM)
DCBL 50	880	880	750
DCBL 80	900	900	780
DCBL 100	920	920	800
DCBL 125	980	980	850
DCBL 150	1000	1000	900

3. MOVING OF THE MACHINE

In this chapter you will be given instructions pertaining to the physical handling of the machine.

3.1 Transport packaging:
The machine is supplied packed and palletized.

3.2 Handling operator:
We strongly suggest the use of experienced personnel in order to move the unit.

3.3 Means necessary to move the machine:
The machine can be lifted with either a fork lift or an overhead crane.
In table **D.1** in this chapter you will find specification regarding the machines weight and dimensions.

3.4 Instructions to lift the machine:
New machines are packed and palletized. The total weight of the unit is clearly marked outside the packing.
The pallet is prepared for handling by either a fork lift or an overhead crane.

IMPORTANT
We suggest that you verify the balance of your unit.

3.5 Instructions to lift uncrated machines using a forklift:
If you intend to use a fork lift to move the unit, be sure that the fork lift is positioned to avoid any damages to the machine. Follow the scheme indicated in table **D.2.**

IMPORTANT
If the machine is not palletized make sure that the metal parts of the fork lift do not touch the filter's frame directly.

3.6 Instructions to lift uncrated machine using an overhead crane:
Means: texile bands
The lifting scheme is indicated in table **D. 2** in this chapter.

IMPORTANT
Do not sling the machine with a metal cable or with metal chains.

3.7 Moving instructions:
The machine is on 4 wheels and can be moved manually on a flat surface.

IMPORTANT
Do not move the machine by hand on a non-uniformed or uneven surface. In such a case, position the machine on its frame and move it by means of a fork lift or an overhead crane taking special care not to damage the unit.
If the unit experiences any type of shock, immediately control if any damage has been incurred and if necessary immediately contact either the manufacturer or the sales agent.

3.8 Stationary precautions:
The machine is manufactured to work on a flat surface.
If operated on a flat surface no other means are necessary to keep the unit stationary.

IMPORTANT
If the machine has to work on an uneven surface, secure the fixed wheels with the provided stops and position the brakes on the two free wheels.
It is not suggested to keep the machine on a slope greater than 2 %.

4. OPERATIONS, MEANS AND MATERIALS NECESSARY FOR INSTALLATION

In this chapter you will find those informations pertaining to the set up and installation of the unit.

4.1 Electrical outlet:
The plug must have the following characteristics:
industrial plug 3P + T, IP 44, 32 A, 380/415 V. following to EN 6030 - 1 - 2.

4.2 Control panel:
To feed the machine you have a control panel - plug with double protection with the following characteristics:
- a Magnetic Switch with **In=32A**
- an industrial plug with switch 3 P + T, 32 A, 380/415 V., IP 44 with fuse carrier E 16 and fuses of 16 A, following the EN 6030 - 1 - 2.

4.3 General plant caracteristics:
The electric table's in point 5.2, is to be connected with a differential switch with a ground following IEC 364/4 art. 413.1, or:
Vc = Rt * Is < 50 V.
Vc = Contact tension
Rt = Separator resistence
Is = Sensibility line of the differential
When required by law smaller Rt values must be respected.
When required by law smaller Rt values must be respected.

5. INSTRUCTIONS FOR POSITIONING OF THE MACHINE

5.1 Receiving of the machine:
The machine is delivered already mounted and ready to start.

IMPORTANT
Before unloading the machine from its packaging be sure to carefully inspect that it has not been damaged during transport.

In the case of damages be sure to:
- contact the sale agent
- make a written report
- send a copy of written report to the:
  - insurance company
  - transport company.
  - sales agent or manufacturer.

5.2 Electric feed connections and grounding:
The connecting operations of the electrical line must be done by specialized personnel with electrical qualifications.
The machine is equipped with a cable connected to the panel.
It is sufficient to connect the plug (type written in point 5.1) to the other side of the cable.

IMPORTANT
Connection of the cable must be done with plug/tap following EN 60309- 1 - 2.

You must verify the tension follows the following formula:
V/V=K * L * I < 4 %
K = Characteristic coefficient of the cable
L = Length of cable

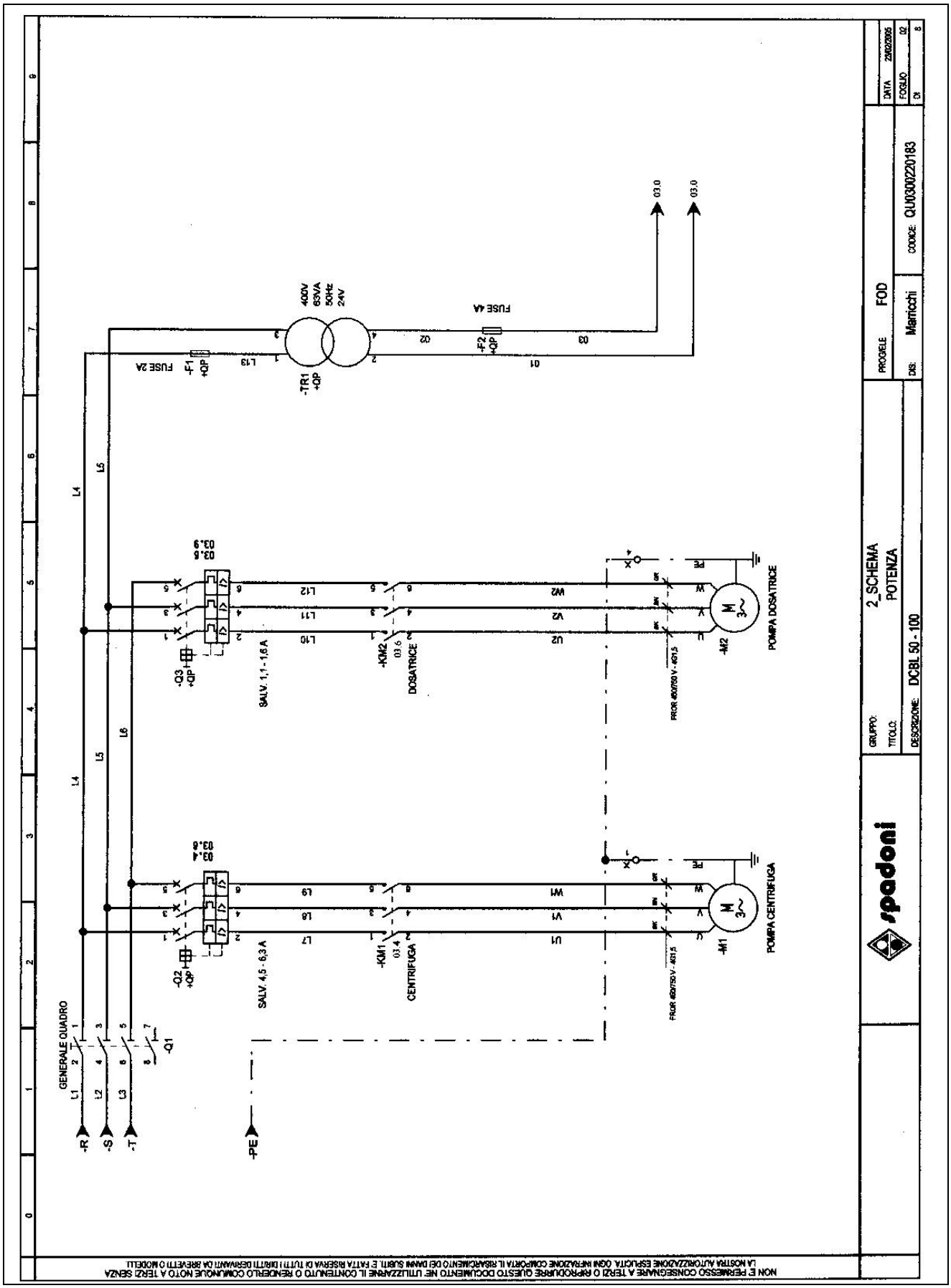
The machine does not require any other grounding.
The grounding of the plant is sufficient.

IMPORTANT
Control the revolution direction of the motor.
The proper direction is indicated by the arrows located on the back of the motor.

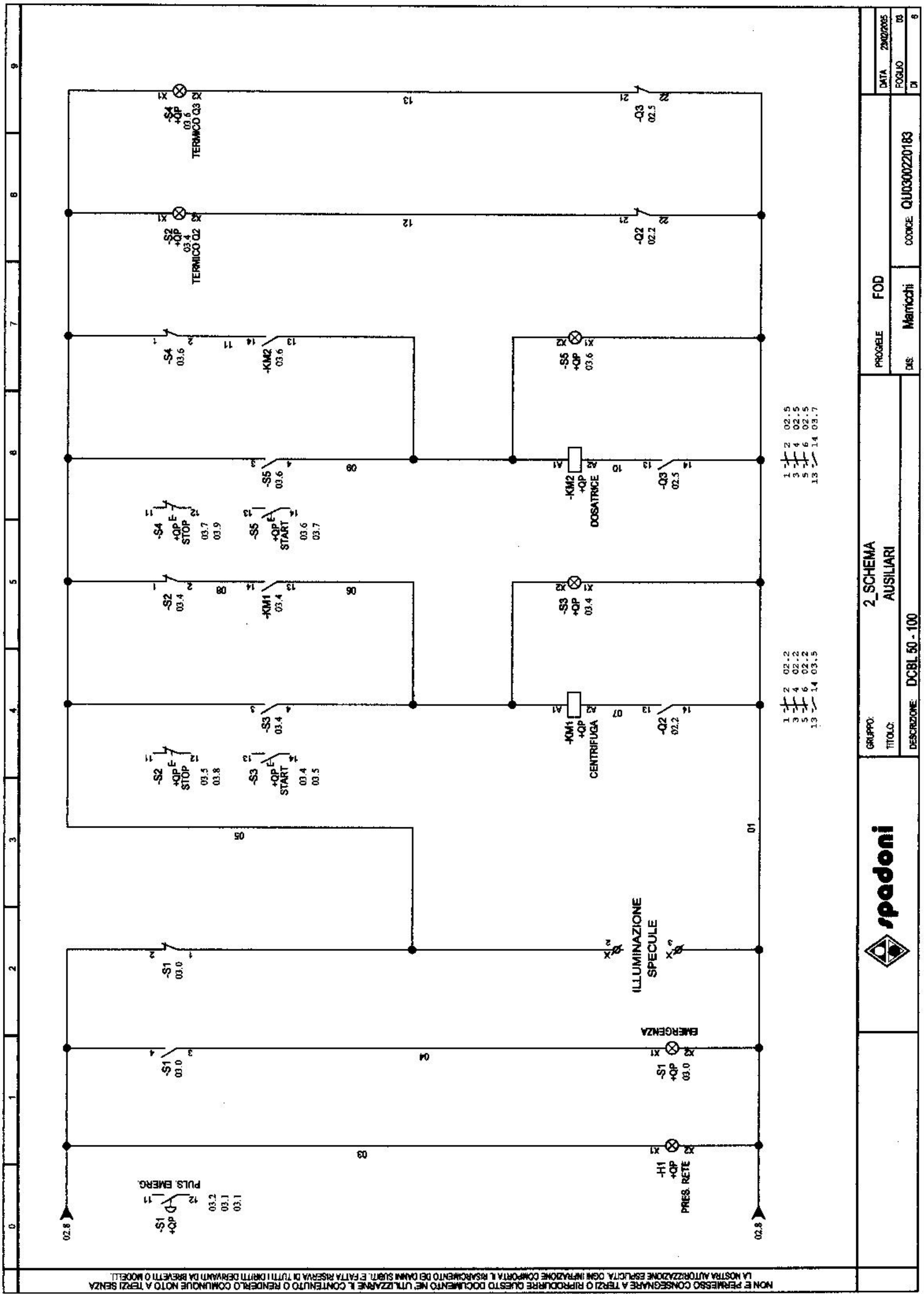
5.2.2 Connection to a magnetic switch
The machine needs, for its power, a double protection, as specified in the last chapter.
To connect, correctly, the machine, it must be done as follows.
- connect the cable heads (except yellow and green) to the magnetic switch outlet;
- connect the yellow cable to the grounding of the user.

5.3 Oil level control:
Control the level of the lubricating oil of the dosing pump. The level should always read at middle line.

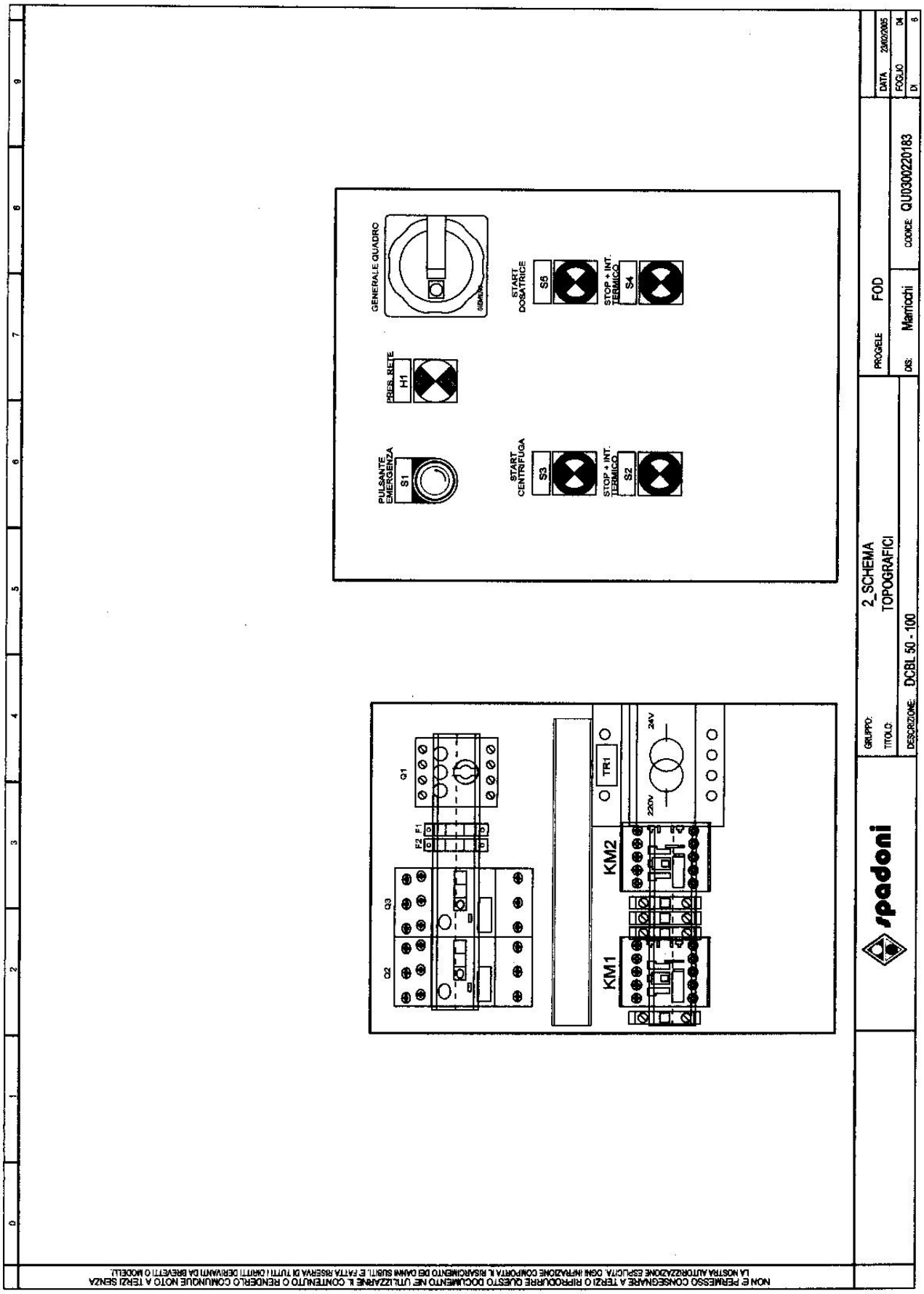
TAV.D.0.8


2_SCHEMA POTENZA
DCBL 50 - 100
FOD
Manicchi
QU03002220183
spadoni
GENERALE QUADRO
-R
-S
-T
-PE
-Q1
-Q2 +QP
-Q3 +QP
-F1 +QP
-F2 +QP
-TR1 +QP
400V 63VA 50Hz 24V
FUSE 2A
FUSE 4A
SALV. 4,5 - 6,3 A
SALV. 1,1 - 1,6 A
-KM1
CENTRIFUGA
-KM2
DOSATRICE
-M1
POMPA CENTRIFUGA
-M2
POMPA DOSATRICE

TAV.D.0.8


2_SCHEMA
AUSILIARI
DCBL 50 - 100
FOD
ILLUMINAZIONE SPECULE
EMERGENZA
PRES. RETE
PULS. EMERG.
CENTRIFUGA
DOSATRICE
START
STOP
spadoni

TAV.D.0.8



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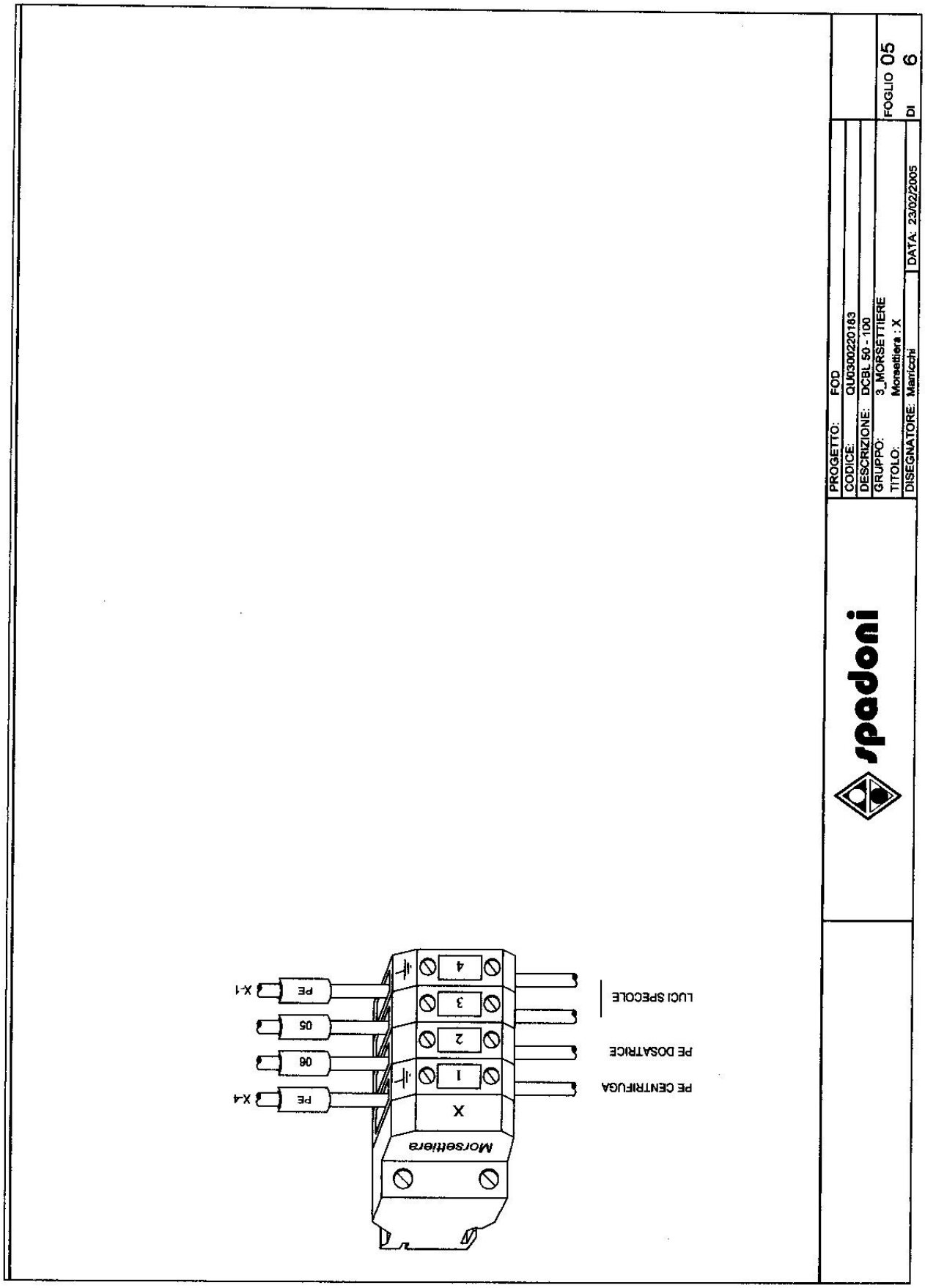

PROGETTO: FOD
CODICE: QU0300220163
DESCRIZIONE: DCBL 50 - 100
GRUPPO: 3_MORSETTIERE
TITOLO: Morsettiera : X
DISEGNATORE: Marricchi
DATA: 23/02/2005
FOGLIO 05
DI 6
spadoni
Morsettiera
X
1
2
3
4
PE CENTRIFUGA
PE DOSATRICE
LUCI SPECCHIE
X-4
PE
06
X-1
PE
05

6. USE OF THE MACHINE

In this chapter you will be given informations describing the unit's main operations and its limitation of use.

6.1 Use of the machine:

The machine is manufactured for the sole purpose of filtration. See attached for list of products approved for filtration with this unit.
It is not to be used in any other way, nor does the manufacturer suggest usage of the unit other than for those indicated in point 1.1.2. letter C law 89392 CEE.

6.2 Machine use destination:

This machine is destinated to an industrial use.

6.3 The Operator:

You do not need specific technical knowledge in order to operate the unit.
It will suffice to read the I.M. thoroughly, remembering that experience and product knowledge are an important factor.

6.4 Filtering Product:

The machine requires for its operation a filtering aid.
This aid is what is known as Diatomaceous Earth (D.E. Powder)
The characteristics of different kinds of filtering aids can be found in chapter 8.

6.5 Products to be treated:

Our filters are suitable for filtering liquids.

6.6 Limits of usage:

IMPORTANT
The machine is not idoneous to treat flammable products.

6.7 Working place:

The unit can be operated anywhere outside of areas subjected to heavy humidity, dust, temperature changes and where corrosives are present.

IMPORTANT
The machine can not be operated anywhere near explosives.

6.8 Working outside:

The machine is not idoneous to work outside.

If it is absolutely necessary to work outside, prepare a waterproof cover in which to operate and store the unit under.

7. TECHNICAL DESCRIPTION OF THE MACHINE.

In this chapter you will find information pertaining to the operations of the machine which maybe considered useful for the operator. This chapter, will hopefully provide a better understanding of the machine for easier detection of defaults and misfunctions.
A lot of the arguments treated in this chapter are provided in schemes or cards to make for easier reading.

7.1 Working of the machine

As mentioned in the previous chapter, the aim of this machine is to filter out impurities from those products being filtered.
The operation is developed in three phases:
- filling phase and precoat formation
- filtering phase
- emptying phase

7.1.1 Filling phase and precoat formation:

This step consists of depositing a certain amount of D.E. powder on to the filter screens in order to commence the production cycle.
Fill the filtering vessel half with water or a clean product and half with D.E. powder. Turn on the mixer and the dosing pump.
After a certain period the precoat will be ready to start a filtration (See chapter 8).

7.1.2 Filtering phase:

Once the precoat is formed you can start the filtration phase.
Allow the product to be treated into circulation, discharging that which was used for the precoat formation. Regulate the addition of D.E. in the vessel based on the dirtiness of the product to be filtered. Continue this procedure until filtration is completed by pumping the product in the filtering vessel. (See chapter 8).

7.1.3 Residual filtration phase and discharge:

At the end of the cycle, empty the filtering vessels of the residual product and clean the screens. (See chapter 8).

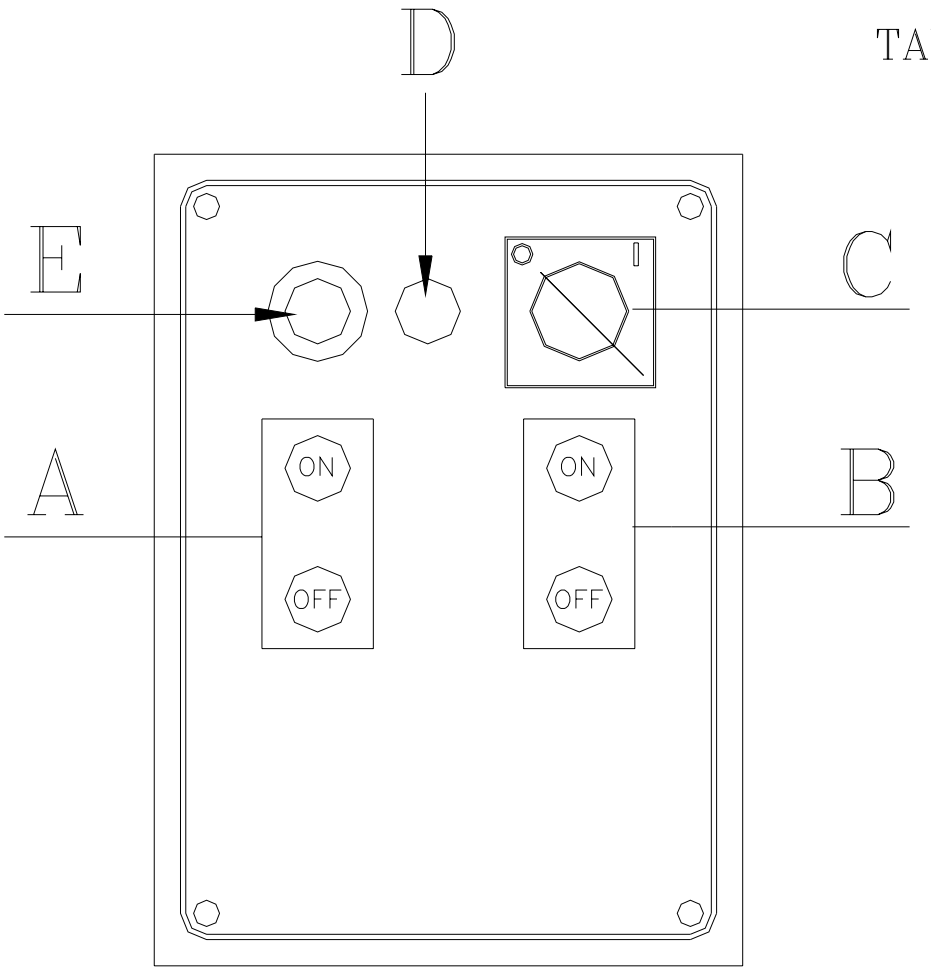
7.2 Description and location of the task commands

7.2.1 Starting and stopping of the main pump, the dosing pump and the reducer for the filtering screen rotation:

The start and stop commands of the main pump, the dosing pump and the reducer for the filtering screen rotation (centrifugation) are situated on the electric panel, clearly indicated on table **D.100,** in particular in table **D 3** of this chapter.

IMPORTANT
Before starting the main pump you must ensure that its circuit is filled with product.
Never run the pump dry.

TAV.D.3



A ELECTROPUMP

B DOSING PUMP

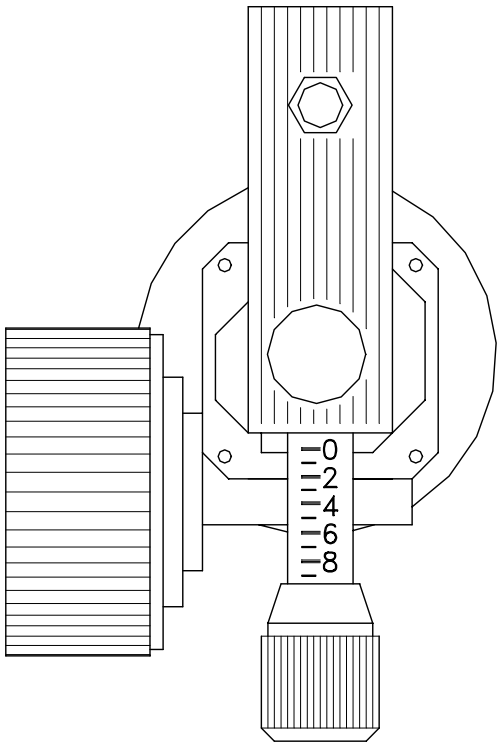
C MAIN SWITCH

D POWER LIGHT TENSION

E EMERGENCY STOP

TAV.D.4

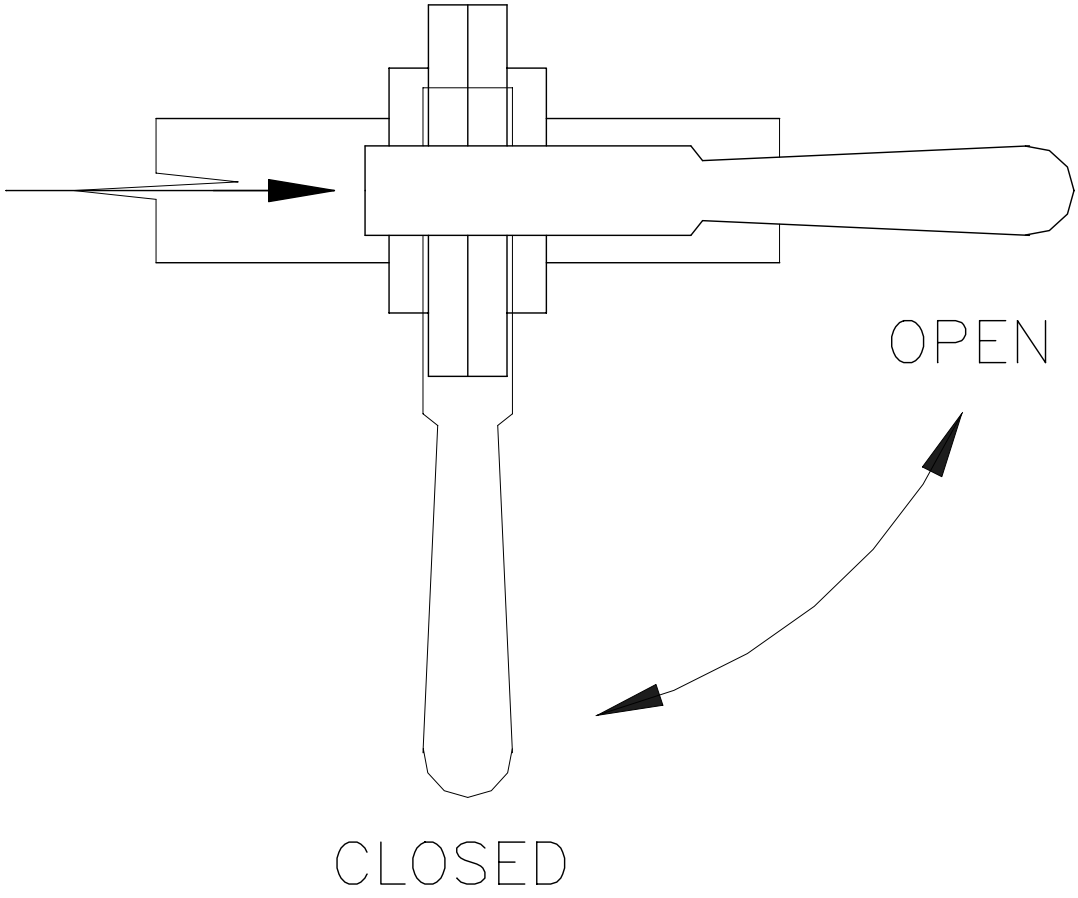
DOSING PUMP



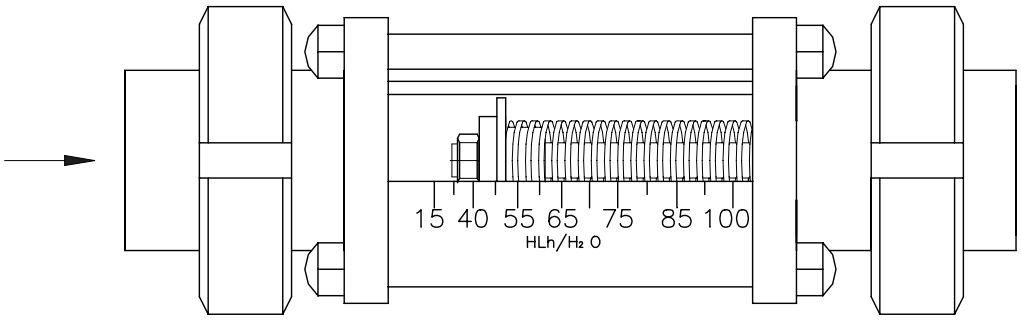
DOSING PUMP REGULATOR

TAV.D.5

VALVE SCHEME



TAV.D.6



FLOW METER

7.2.2 Dosing pump's production regulator:
The command for regulating the flow of D.E. is clearly indicated in table **D 100**, in particulal in table **D. 4** of this chapter.

7.2.3 Manoeuvre valves and caps:
The manoeuvre valves are clearly indicated in table **D. 100** and in particular in table **D. 5** , where you will also find indicated the positions for "open" and "close".

IMPORTANT
The valve is closed when the handle is perpendicular (90 degrees) to the piping, and it is open when it is parallel to the piping.
The middle position will provoke a strangling effect on the valve.

7.3 Safety controls

7.3.1 Max. pressure valve of the filtering vessel:
Pos. **19** of table **D. 100**.

7.4 Control instruments

7.4.1 Pressure gauge to measure pressure in the filtering vessel:
The gauge is indicated as pos. **21** on table **D 100.** The pressure gauge acts as a useful working tool, indicating the pressure of the filtering vessel graduated in BAR.

7.4.2 Inlet sight glass:
This device serves to control the liquid entrance and the proper working of the dosing pump. It is found at pos. **E** in table **D. 100**.

7.4.3 Outlet graduated sight glass:
This device serves to control the clarity of the product and provides an indication of how much product has been filtered.
It is graduated in Hl/h and is at pos. **D** in table **D. 100**, in particular in table **D 5**.

7.5 Technical schemes and cards

7.5.1 Electric scheme:
See table **D 08A** and **D 3.**

7.5.3 Technic cards for the electropumps:
See chap.14 **Table. D.P. 100** and **4802**.

7.5.4 Comparison table of the different kinds of D.E.:
See **Table. D. 9**.

7.6 Phonometrical testing

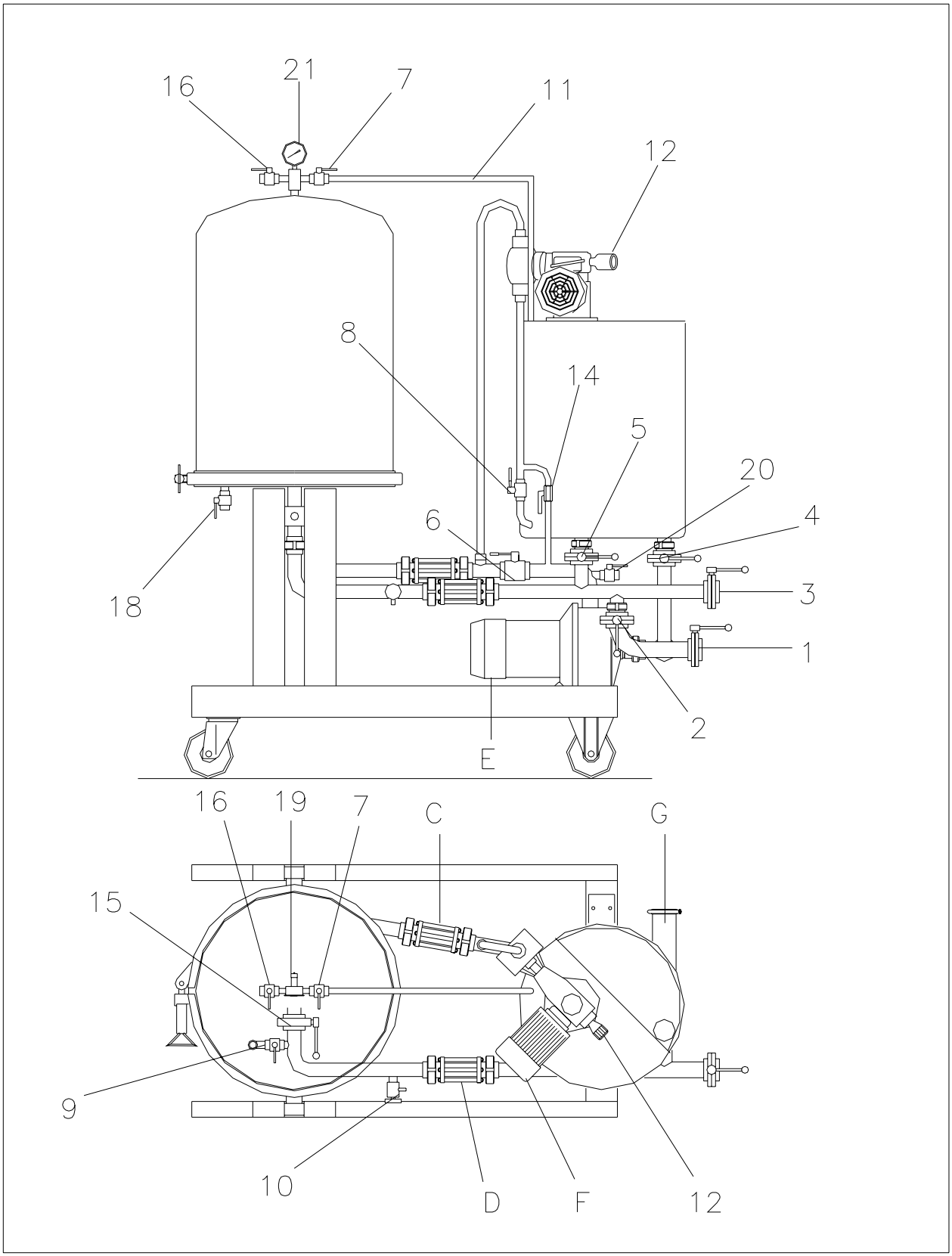
7.6.1 Functioning conditions of the filter:
- mixer turned on
- feeding pump turned on
- circulation valves opened (max. capacity).
- product used: water.
- function: continous in closed circuit.

7.6.2 Conditions for testing:
It was not possible to test the unit in individual working situations, therefore, the level of the acoustic pressure has been assumed at 1 mt. from the surface of the filter, and at 1.60 mt in height from the ground, on the four median axis of the support base, in accordance to Directive CEE 89/392 (point 1.7.4, paragraph "f").

7.6.3 Leq (A) middle:

Leq = 68 db(A).

TAV.D.100



TAV.D.101

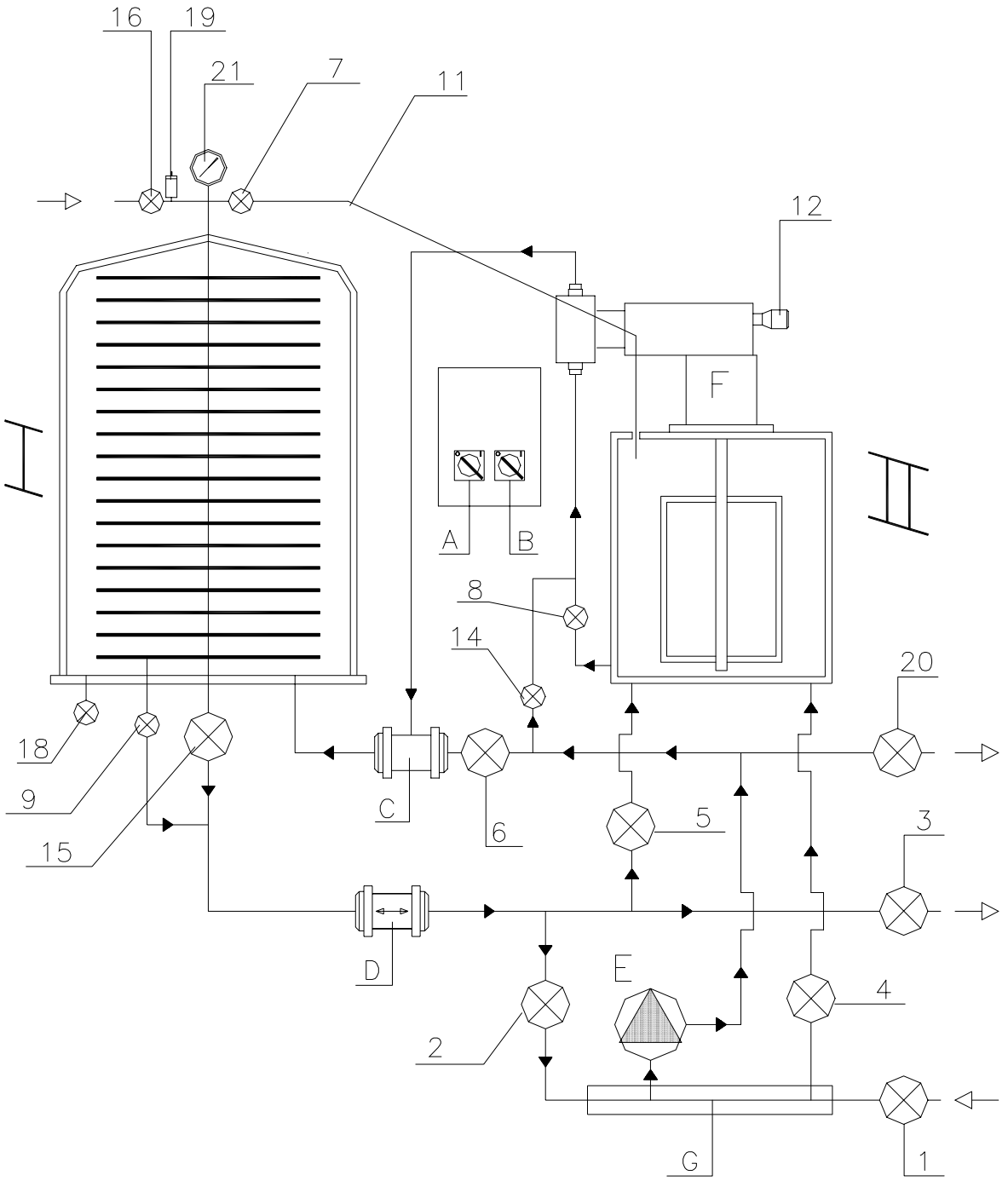


TABLE D. 101

A	-	Centrifugal pump switch
B	-	Dosing pump switch
C	-	Inlet sight glass
D	-	Outlet sight glass with graduated indicator
E	-	Inox centrifugal pump
F	-	Dosing pump and mixer
G	-	Pre-filter
I	-	Filtering tank
II	-	Dosing and mixing tank
	-	
1	-	Inlet valve
2	-	Recycling valve
3	-	Outlet valve
4	-	Inlet valve from dosator
5	-	Inlet valve to dosator
6	-	Production's regualting valve
7	-	Air outlet valve
8	-	Dosing tank cleaning and outlet
9	-	Empty valve for residual filtration and interruption valve
10	-	Sampling valve
11	-	Caouchou pipe
12	-	Dosing pump's regluator
14	-	Dosing pump's selfcleaning valve
15	-	Empty addition valve
16	-	Gas inlet valve
18	-	Not filtered product total discharge valve
19	-	Safety valve
20	-	Product's outlet valve from tank
21	-	Pressure gauge

8. INSTRUCTIONS FOR STARTING AND OPERATING THE MACHINE.

In this chapter you will be given preliminary instructions for the operation of the unit and its correct usage.

8.1 Instructions for the proper use of the commands

The command tasks as described in chapter 7 are easy to use, and should not present any difficulties in the operations of the unit for the operator.

IMPORTANT
Before turning on the main pump be sure that the circuit is filled with product.
Never run the pump dry.

8.2 To starting the machine

The machine, once connected to the feeding line, is ready to start.

IMPORTANT
Before starting the machine ensure the following :
Initial start : a sanitizing wash has been completed
After an inactive period : a sanitizing wash has been completed.

8.2.1 Sanitizing:

Sanitizing solution: prepare a solution of water and citric acid of 3% at a temperature of 45 degrees C.

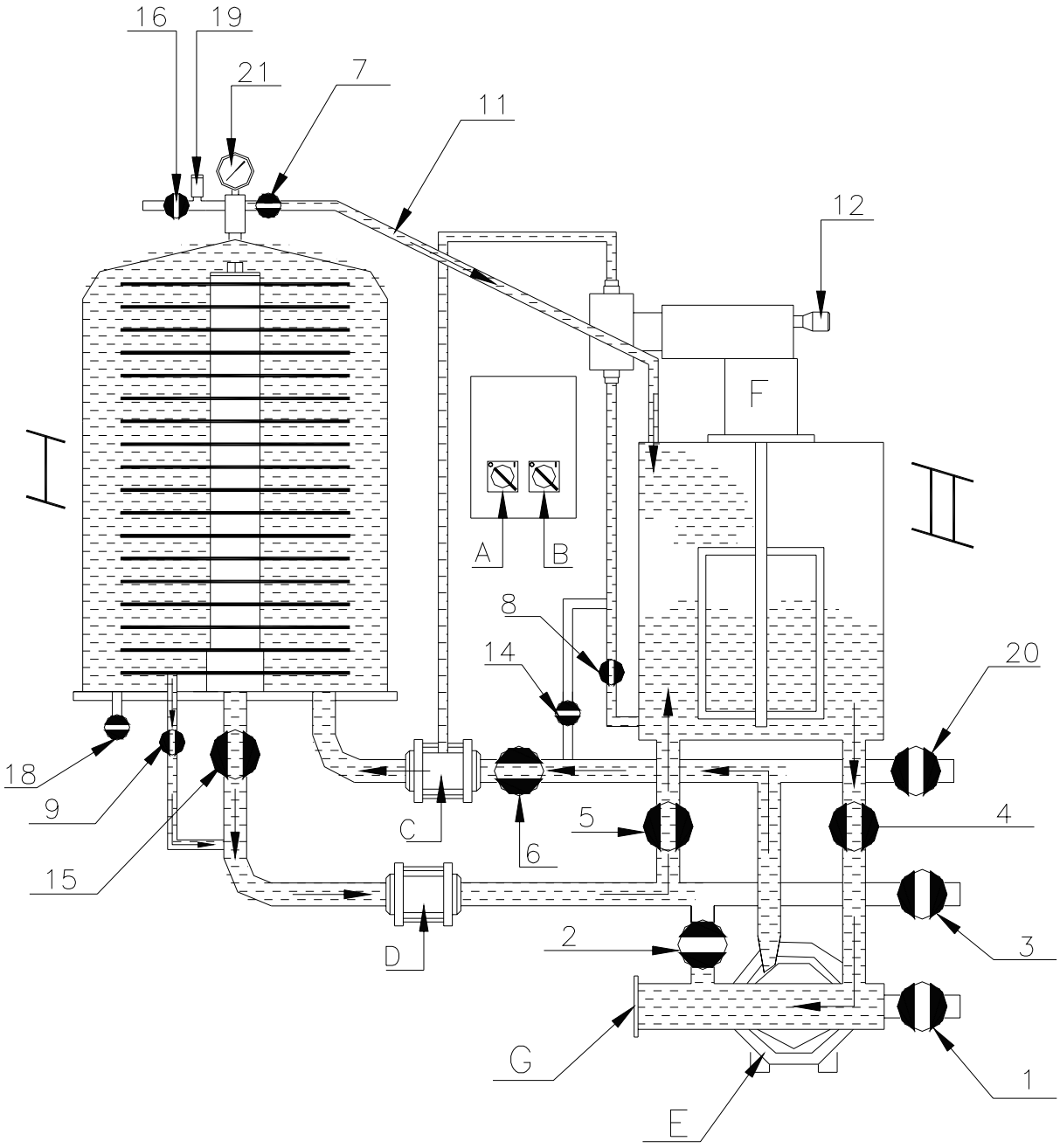
a) Prepare the sanitizing solution. (approx. Lt)
b) Prepare the valves following the schemes in table **D.I./1, that is**:
Valves **1, 2, 3, 8,** and **20** closed.
Valves **4, 5, 6, 7, 9, 14** and **15** opened.
c) Begin to fill the filtering vessel **II** with the sanitizing solution
d) Turn on the main pump **E** and the dosing pump **F**.
e) Continue to add product until the circuit is filled up and let it circulate for 15-20 minutes.
f) Completely empty the filter, turning off the pumps and opening the valves.
g) Repeat this operation at least twice with potable water.

8.3 Uses of the machine

The following is a detailed description of the main phases of filtering as breifly mentioned in previous chapters.
- Filling phase and precoat formation
- Filtration phase
- Emptying phase

IMPORTANT
Before commencing with filtration, read the following tables :
A/9, B/9, C/9

TAV.D.I./1



CHEMICAL CLEANING OF THE FILTERING ELEMENTS

TABLE A/9

INDICATIONS AND FORMULES FOR D.E. DOSING.

G = Quantity of D.E. (gr.) to put in vessel II
A = Filling in Gr./hl of D.E. depending of the product to filter
V = Hl of product in vessel II
Pe = Capacity of the main pump G in hl/h
Pf = Capacity of the dosing pump F in hl/h

G = (Pe : Pf) * A * V

Example:
We have to filter a product that needs an **A** = 30 Gr/hl
We put in vessel **II** 0,8 hl of product (80 Lt).
The capacity of the main pump **E** is 100 hl/h.
We regualte the capacity of the dosing pump **F** on 0.3 Hl/h (30 Lt/h).
We developp the formula: **G** = (100 : 0,3) * 30 * 0,8 = 333 * 30 * 0,8 = 8000 Gr. (8 Kg) of D.E.

IMPORTANT
Verify that the quantity of D.E. is compatible with the max. quantity of D.E. that can be contained vessel II (see Table B/9).

If you want to know the duration of the filtering cycle (before adding more D.E.) calculate:
T = V : Pf
In this case: T = 0,8 : 0,3 = 2,6 h
Formulaes that derive from the prinipal one are as follows:
Pf = (Pe : G) * A * V **V = (G * Pf) : (Pe * A)**

IMPORTANT
The formulaes in this Table must be used considering the values of tabels B/9 and C/9.

TABLE B/9

REGULATING OF THE DOSING PUMP

HANDLE POSITION	PRODUCTION hl/h
Position nr. 1	0.1 hl/h
Position nr. 2	0.2 hl/h
Position nr. 3	0.3 hl/h
Position nr. 4	0.4 hl/h
Position nr. 5	0.5 hl/h
Position nr. 6	0.6 hl/h
Position nr. 7	0.7 hl/h
Position nr. 8	0.8 hl/h
Position nr. 9	0.9 hl/h
Position nr. 10	1.0 hl/h

MAXIMUM QUANTITY OF D.E. USED IN MODEL DCBL 50

D.E. quantity in precoat contained(very dirty products)	4.000 g
D.E. quantity in precoat contained (clearer products)	2.000 g
D.E. volume vessel **II**	0.65 hl
Max. quantity of D.E. in vessel **II**	15.000 g
Max. quantity of D.E. in vessel **I** (precoat included)	15.000 g

MAXIMUM QUANTITY OF D.E. USED IN MODEL DCBL 80

D.E. quantity in precoat contained(very dirty products)	6.000 g
D.E. quantity in precoat contained (clearer products)	3.000 g
D.E. volume vessel **II**	0.65 hl
Max. quantity of D.E. in vessel **II**	15.000 g
Max. quantity of D.E. in vessel **I** (precoat included)	23.000 g

MAXIMUM QUANTITY OF D.E. USED IN MODEL DCBL 100

D.E. quantity in precoat contained(very dirty products)	8.000 g
D.E. quantity in precoat contained (clearer products)	4.000 g
D.E. volume vessel **II**	0.65 hl
Max. quantity of D.E. in vessel **II**	15.000 g
Max. quantity of D.E. in vessel **I** (precoat included)	32.000 g

MAXIMUM QUANTITY OF D.E. USED IN MODEL DCBL 125

D.E. quantity in precoat contained(very dirty products)	10.000 g
D.E. quantity in precoat contained (clearer products)	5.000 g
D.E. volume vessel **II**	1.5 hl
Max. quantity of D.E. in vessel **II**	40.000 g
Max. quantity of D.E. in vessel **I** (precoat included)	40.000 g

MAXIMUM QUANTITY OF D.E. USED IN MODEL DCBL 150

D.E. quantity in precoat contained(very dirty products)	12.000 g
D.E. quantity in precoat contained (clearer products)	6.000 g
D.E. volume vessel **II**	1.5 hl
Max. quantity of D.E. in vessel **II**	40.000 g
Max. quantity of D.E. in vessel **I** (precoat included)	48.000 g

IMPORTANT
For a correct filtration never surpass the values in this table.
If you have reached the max. quantity of D.E. in vessel I,
INTERRUPT FILTRATION

TABLE C/9 – DCBL 50

INDICATIVE TABLE OF D.E. QUANTITY TO USE FOR FILTRATION OF VARIOUS PRODUCTS (FILLING A) AND OF MAIN PUMP'S PRODUCTION (E).

TYPE OF PRODUCT	DIRTH CONCENTRATION	PUMP E CAPACITY (hl/h)	D.E. TYPE	FILLING A (g/hl)
Wine	3 %	20	middle/large	150
Wine	1 %	50	middle	40
Vinegar*	1.5 %	25	fine	60
Sparkling wine*	1 %	30	fine	50
Distilled*	2 %	35	middle/large	100
Water	-	-	-	-

TABLE C/9 – DCBL 80

INDICATIVE TABLE OF D.E. QUANTITY TO USE FOR FILTRATION OF VARIOUS PRODUCTS (FILLING A) AND OF MAIN PUMP'S PRODUCTION (E).

TYPE OF PRODUCT	DIRTH CONCENTRATION	PUMP E CAPACITY (hl/h)	D.E. TYPE	FILLING A (g/hl)
Wine	3 %	30	middle/large	150
Wine	1 %	80	middle	40
Vinegar*	1.5 %	40	fine	60
Sparkling wine*	1 %	45	fine	50
Distilled*	2 %	70	middle/large	100
Water	-	-	-	-

* **SPECIAL MODELS ONLY**

TABLE C/9 – DCBL 100

INDICATIVE TABLE OF D.E. QUANTITY TO USE FOR FILTRATION OF VARIOUS PRODUCTS (FILLING A) AND OF MAIN PUMP'S PRODUCTION (E).

TYPE OF PRODUCT	DIRTH CONCENTRATION	PUMP E CAPACITY (hl/h)	D.E. TYPE	FILLING A (g/hl)
Wine	3 %	40	middle/large	150
Wine	1 %	90	middle	40
Vinegar*	1.5 %	55	fine	60
Sparkling wine*	1 %	60	fine	50
Distilled*	2 %	70	middle/large	100
Water	-	-	-	-

TABLE C/9 – DCBL 125

INDICATIVE TABLE OF D.E. QUANTITY TO USE FOR FILTRATION OF VARIOUS PRODUCTS (FILLING A) AND OF MAIN PUMP'S PRODUCTION (E).

TYPE OF PRODUCT	DIRTH CONCENTRATION	PUMP E CAPACITY (hl/h)	D.E. TYPE	FILLING A (g/hl)
Wine	3 %	50	middle/large	150
Wine	1 %	120	middle	40
Vinegar*	1.5 %	70	fine	60
Sparkling wine*	1 %	75	fine	50
Distilled*	2 %	90	middle/large	100
Water	-	-	-	-

* **SPECIAL MODELS ONLY**

TABLE C/9 – DCBL 150

INDICATIVE TABLE OF D.E. QUANTITY TO USE FOR FILTRATION OF VARIOUS PRODUCTS (FILLING A) AND OF MAIN PUMP'S PRODUCTION (E).

TYPE OF PRODUCT	DIRTH CONCENTRATION	PUMP E CAPACITY (hl/h)	D.E. TYPE	FILLING A (g/hl)
Wine	3 %	50	middle/large	150
Wine	1 %	150	middle	40
Vinegar*	1.5 %	85	fine	60
Sparkling wine*	1 %	90	fine	50
Distilled*	2 %	110	middle/large	100
Water	-	-	-	-

* **SPECIAL MODELS ONLY**

TAV. D. 9

TABLE OF FILTER AID EQUIVALENTS (D.E.)

TYPOLOGY OF WORK	PRODUCT	GRADE OF D.E.	CECA	SCHENCK	SEITZ	EAGLE PECHER	CELITE	DIACEL	DICALITE	PROMISIL	WINKELMAN	KENITE
Coarse filtration	Solid	Coarse	DIT R	SPEZ W	ULTRA	FW 80 FW 60	560 545	CF/VV CF/V	4200	1202	RANDALL/1 EXTRA	3000
Medium polishing filtration	Normal	Medium	DIF BO	N° 100	SUPER	FW 15	HYFLO SUPERCEL	CF7M	SPEED PLUS	511 611	RANDALL/3	700
Polishing filtration	Clean	Fine	CB	N° 1	EXSTRA	FP 1	STANDARD SUPERCELL	CF/S	SUPERAID	241	RANDALL/7	200

P.S. For the precoat in a coarse filtration we suggest ti mix ¾ of mediunm D.E. with ¼ of fine D.E. or whatever pre-packaged compound you find on the market.

8.3.1 Individual protection measures

IMPORTANT
A protective breathing mask must be worn at all times while working with D.E. powder.

8.3.2 Filling phase:

a) Close all circuit valves

b) Connect the tank of product to be filtered to the filter (next to valve **1**).

IMPORTANT
For precoat formation use only water or clean product.

IMPORTANT
The pump must be regulated at the max. capacity (see table D/7).

c) Open valves **1, 6 and 7** and turn on main pump **E** in order to fill filtering vessel **I** (when vessel is full product will discharge from valve **7**)

d) When product starts to lower in vessel **II**, costrain the pump's capacity by slightly closing valve **6** (position handle at 45 deg. In respect to main piping.)

e) When vessel **II** is half full , turn off pump **E** and close valve **1**

8.3.3 Precoat formation:

Refer to the scheme in table **D.I./2**

a) Turn on mixer **F** (which will turn on the mixer) and open valve **8.**

b) Slowly put cellulose (table .....) in vessel **II,** taking care to amalgamate with liquid.

c) Open valve **4, 5, 15** and turn on the main pump **E.**

d) Open valve **9** and after 10/15 sec. Close valve **7.**

e) When the liquid circulating is clear (seen through sight glass **C**), the D.E. powder has deposited and settled on the screen, the precoat is ready. Thies procedure usually takes approx 8-10 minutes.

g) you can start your filtration.

8.3.4 Filtration phase:

Once precoat formation is ended, you can start with filtration as follows:

8.3.4.1 Preliminary operations:

a) Connect the tank of product to be filtered to the filter (next to valve **1**).

IMPORTANT
Be sure that the feeding line is full at all times (eventual air could damage the pump).

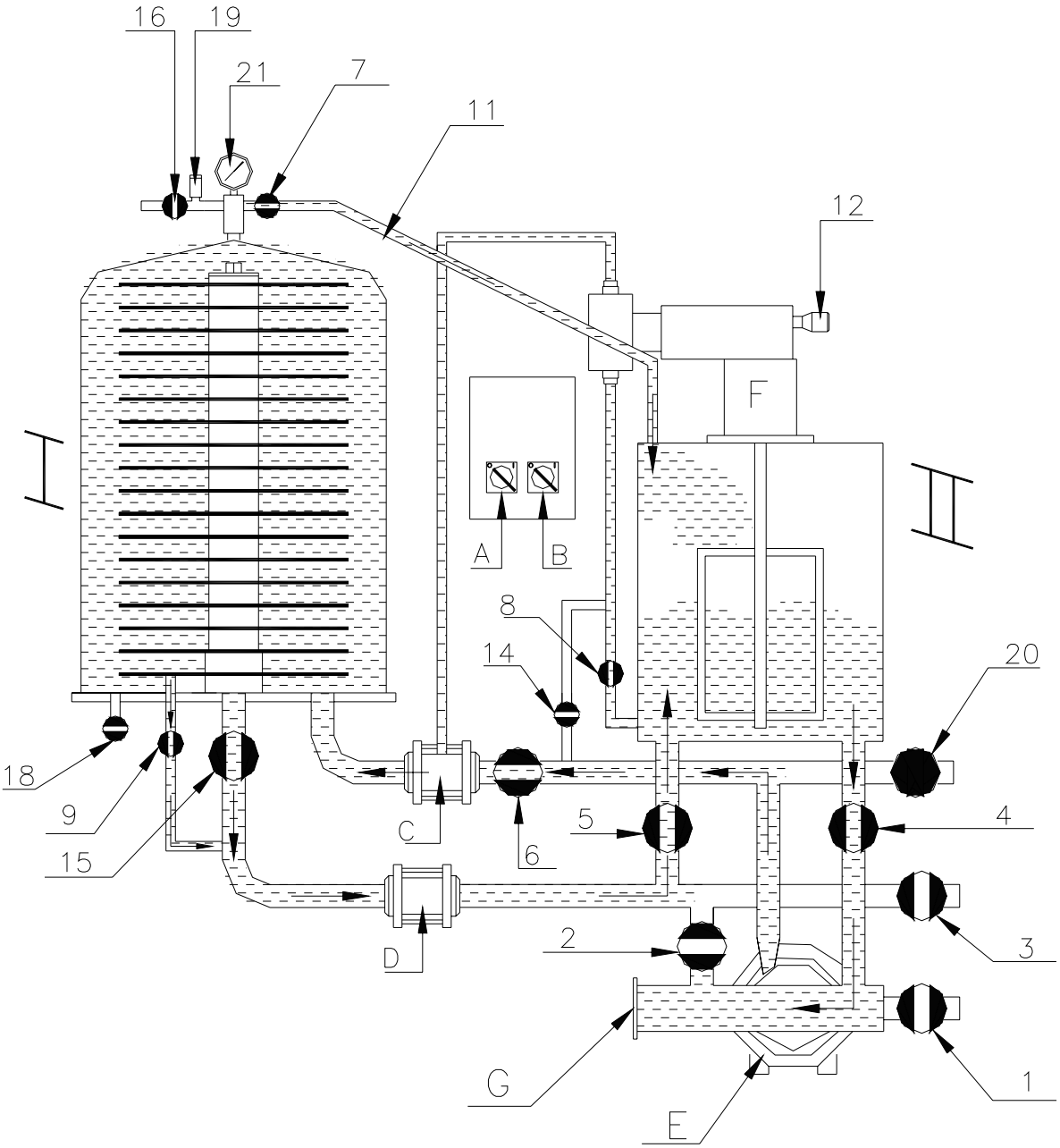
FEEDING PIPE DIAMETER	
DCBL 50	**at least mm.30**
DCBL 80	**at least mm.30**
DCBL 100	**at least mm.40**
DCBL 125	**at least mm.40**
DCBL 150	**at least mm.40**

b) Open valve **2** and close valve **5**

c) Open valve **1** and close valves **4 and 9**

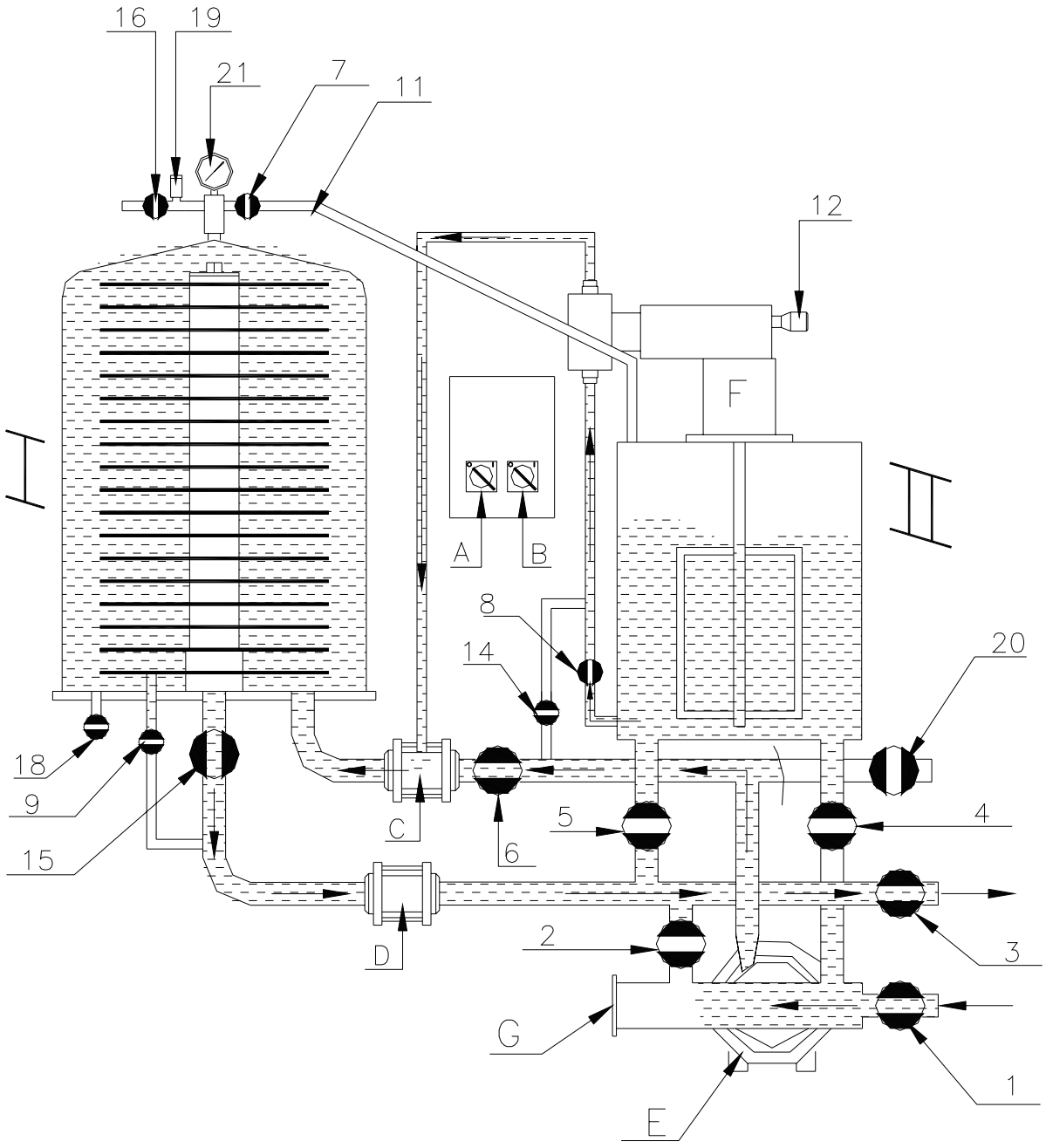
d) Put in vessel **II** the D.E. powder following table **A/9**

TAV.D.I./2



FILLING AND PRECOAT FORMATION

TAV.D.I./3



FILTRATION

8.3.4.2 Filtration:
Refering to the scheme in table **D.I./3**:

a) Open valve **3** and close valve **2**
b) Open valve **7** and allow any air in vessel **I** to escape
When liquid escapes from pipe connecting valve to vessel **I,** close valve **7**.
c) Regulate the addition of D.E. powder with dosing pump's regulator **12** following data in table **B/9**.
d) When vessel **II** is almost empty, open valve **5** until it refills and add additional D.E. powder.

IMPORTANT
During filtration the pressure must not overpass 6 bar.

8.3.5 Short interruptions or shut down of unit

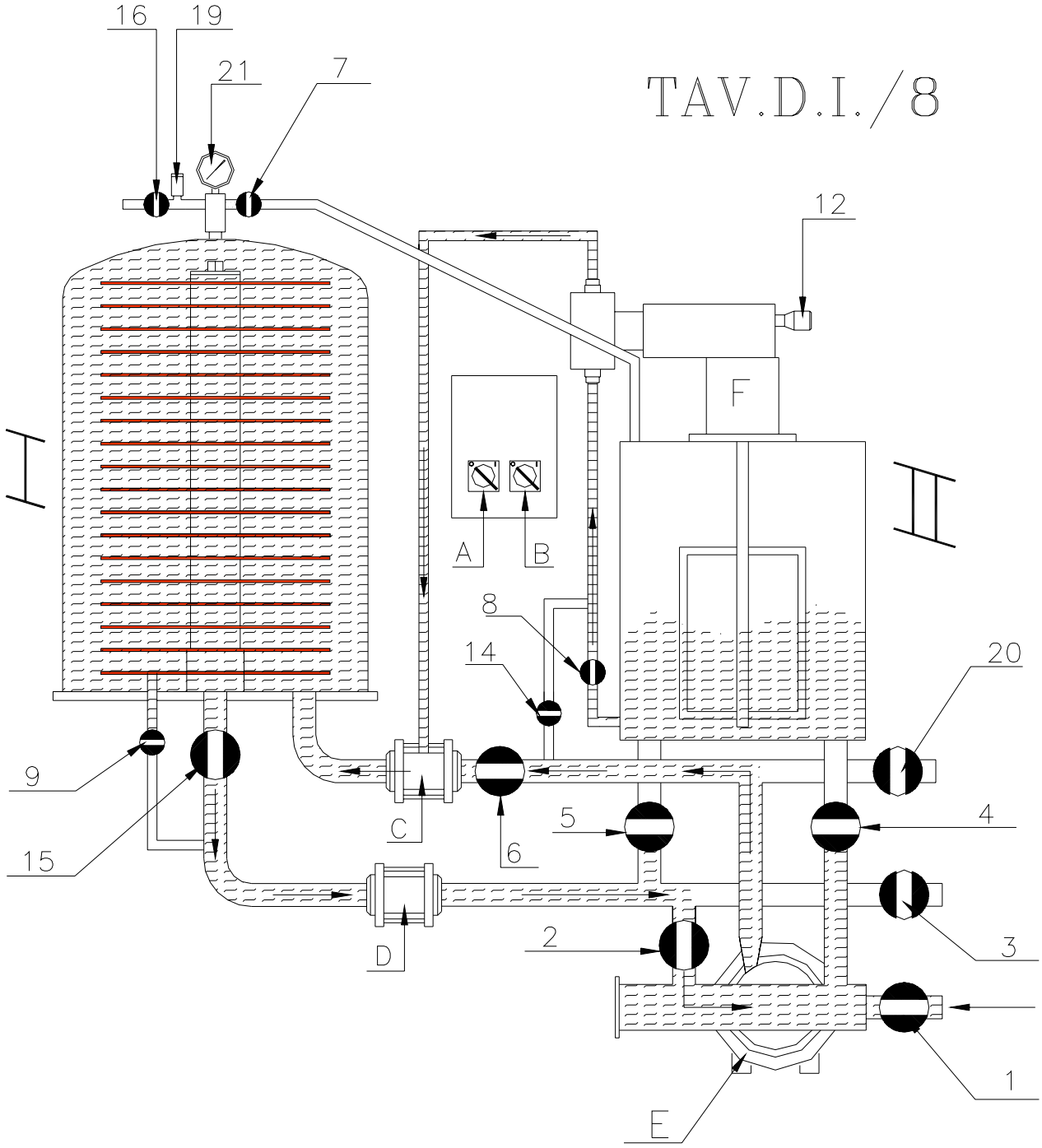
8.3.5.1 Short interruptions:
Sometimes, it may be necessary to interrupt filtration for a few moments. In order to carry out this operation (max. time 10-15 minutes) proceed as follows:
a) Open valve **2** and close valve **3**
b) After a max. of 15 minutes, close valve **2** and open valve **3**
c) Close valve **2**
Refer to table **D.I./8**.

8.3.5.2 Stopping:
It is possible to interrupt filtration in the following way:
a) Open valve **2**
b) Close valve **1,3** and **8**
c) Turn off pumps **E** and **F**
Refer to table **D.I./9**

8.3.5.3 Restarting unit:
To restart unit proceed as follows:
a) Open valve **6**
b) Turn on the pump **E**
c) Open valves **1** and **2**
d) Turn on pump **F**
e) Open valve **8**
f) Once you see the flow of clean product through the sight glass **D**, open valve **3** and close valve **2**
Refer to table **D.I./10**.

8.3.6 Residual filtration and discharge
At the end of filtration, when there is no more product to treat, the product remaining in the filter must be filtered and the unit emptied.

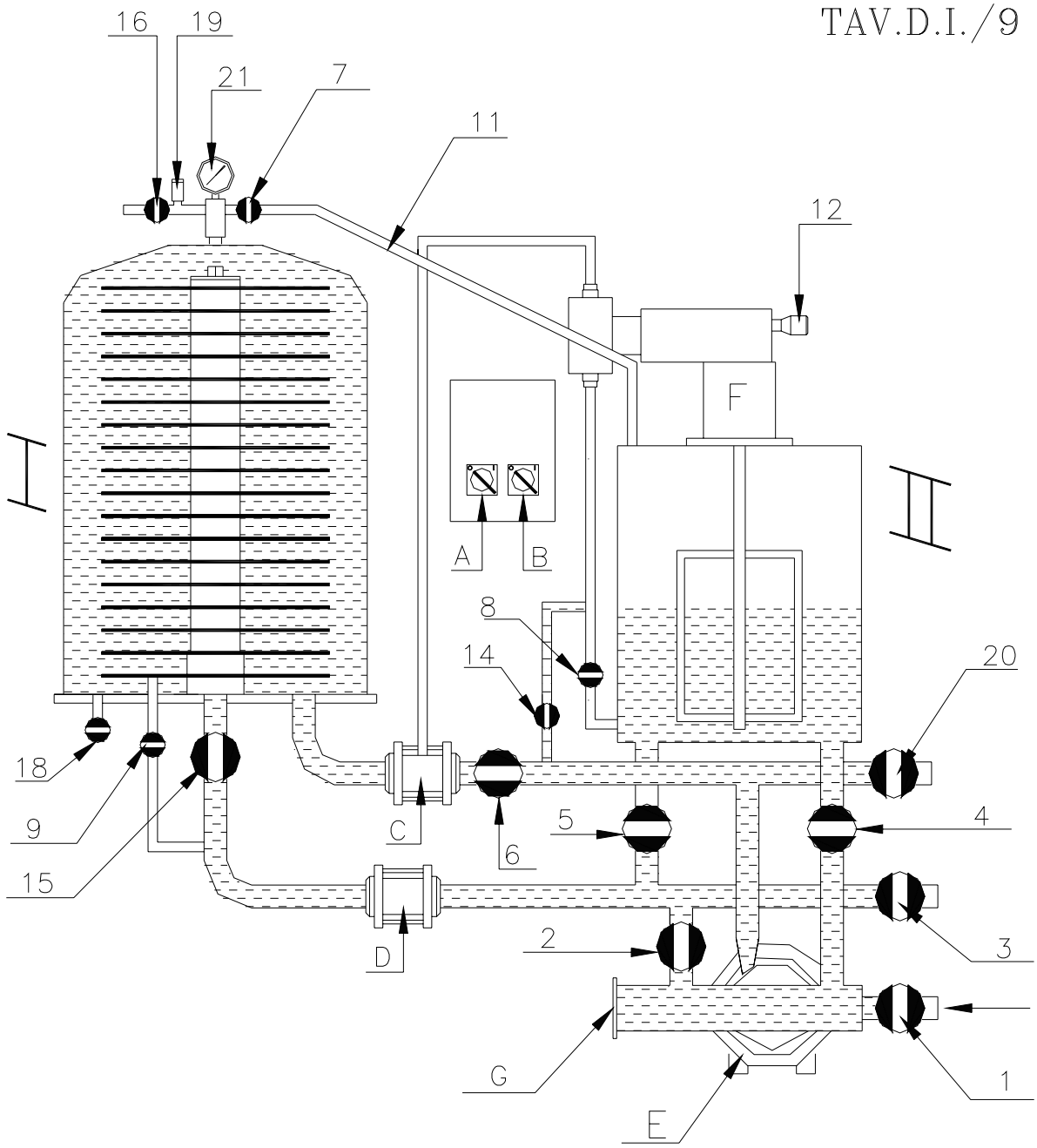
IMPORTANT
It is mandatory to end the filtration when the quantity of D.E. added in vessel I reaches its max. limit as indicated in table B/9.



SHORT INTERRUPTION

In case of short interruption (10/15')
open valve 2 and close valve 3.
To start filtration invert the valve.

TAV.D.I./9



STOP FOR LONG INTERRUPTION

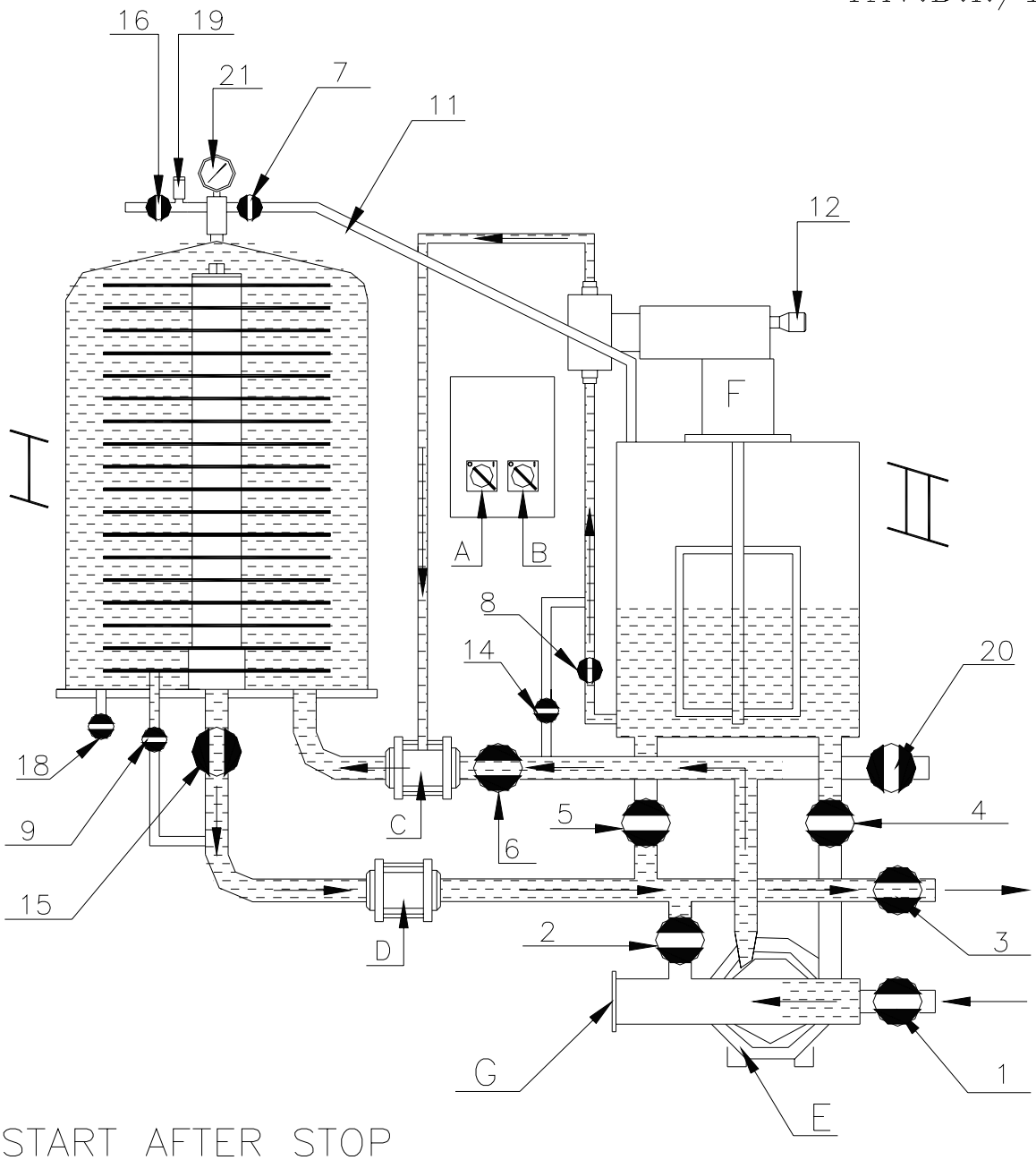
Open valve 2

Close valve 1,3,4,5,7,8.

Stop pumps E and F.

Close valve 6.

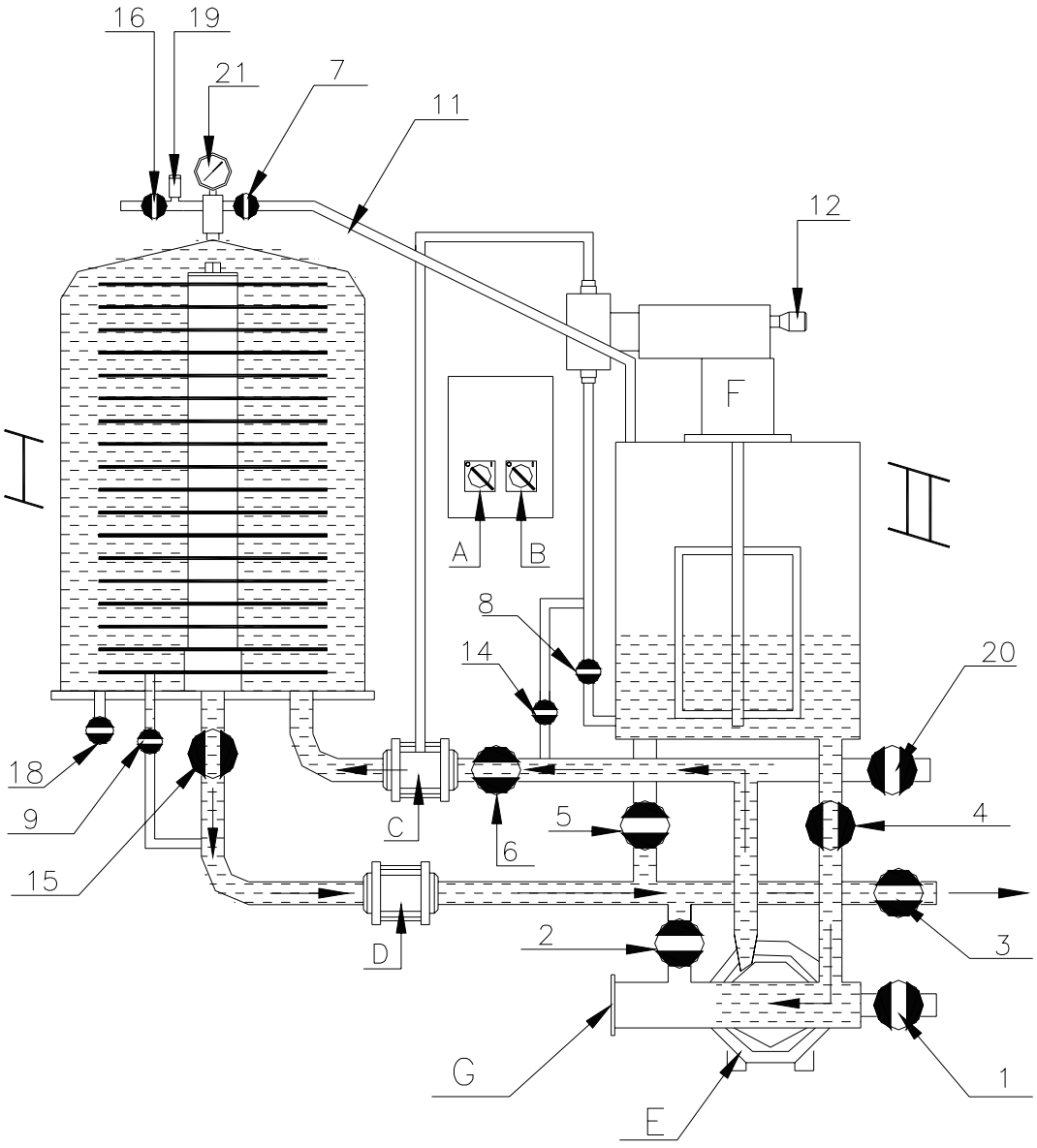
TAV.D.I./10



START AFTER STOP

Open valve 6, turn on pump E,
open valve 1 and 8.
Turn on dosing pump F.
When the product is clear in sight glass D,
open valve 2 and close valve 3.

TAV.D.I./4



END OF FILTRATION

8.3.6.1 Filtration end:
Refer to table **D.I./4**

a) Close valve **1** and open valve **2**
b) Close vales **3** and **8**
c) Turn off dosing pump **F**
d) Open valves **5** and **4** and close valve **2**
e) Let the product from vessel **I** to vessel **II** circulate unitl product is seen in sight glass **C.**
f) Open valve **3** and close valve **5**
g) When vessel **II** is empty, close valve **4** and turn off pump **E**

8.3.6.2 Residual filtration

a) Close all the valves
b) Open valves **9, 2 and 6**
c) Turn on pump **E**
d) Allow it to run for approx. one minute
e) Turn off pump **E**
f) Close valve **6**
g) Connect valve **20** to tank holding filtered product
h) Open valves **7** and **20** and turn on pump **E**
Refer to table **D.I./5**
i) When the flow of product has stopped as seen in sight glass **D**, close valve **20** and turn off pump **E**

8.3.7 Residual filtration utilizing compressed gas

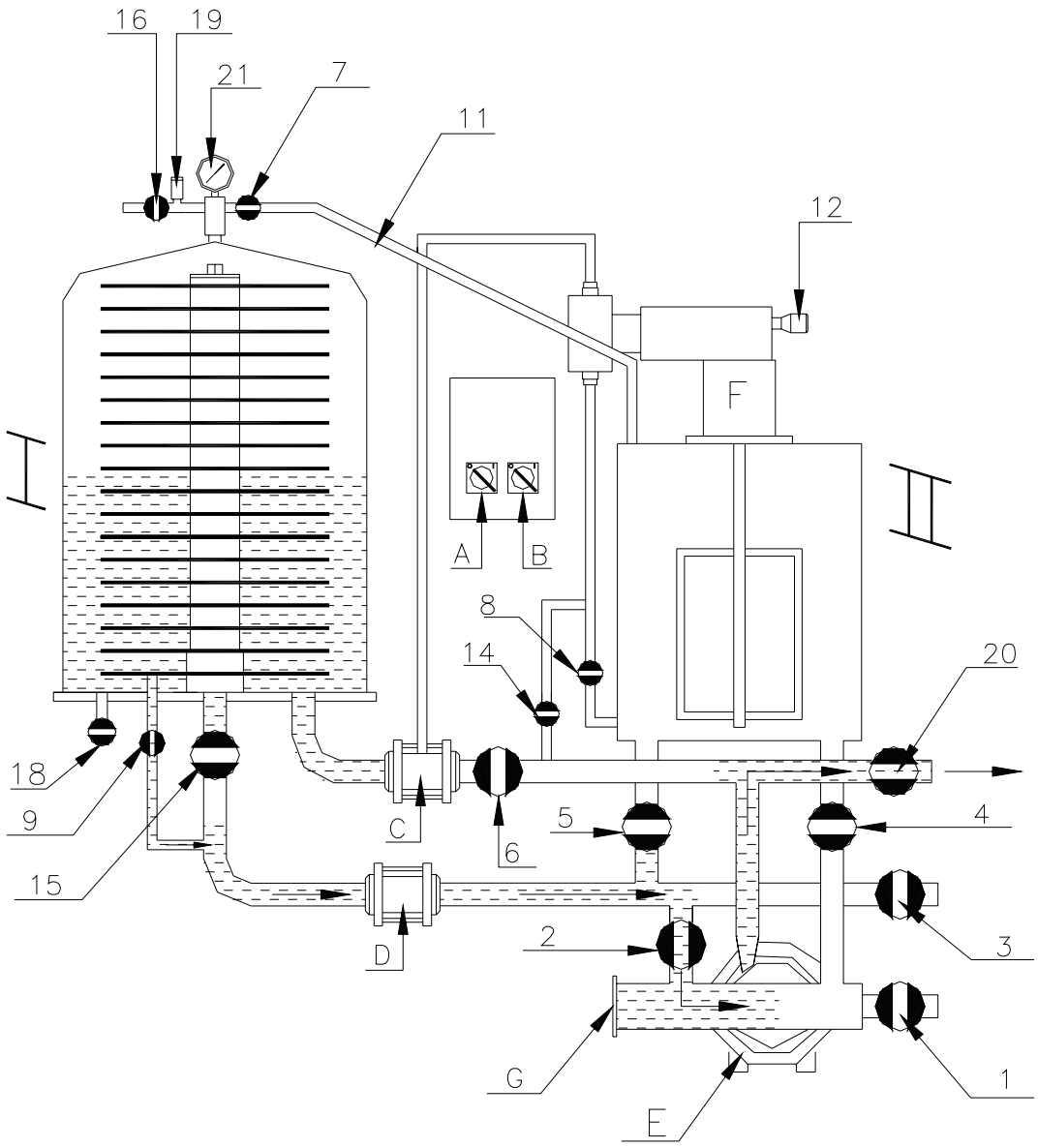
If the operations described in point 8.3.5 is not sufficient to filter residual product, effectuate the operation utilizing compressed gas.

IMPORTANT
Never overpass 0.49 bar

WARNING
Use only inert gas!

a) Close all valves
b) Open valves **9, 2 and 6**
c) Turn on main pump **G** for approx. 3 minutes
d) Turn off pump **E**
e) Close valves **2 and 6**
f) Open valve **3**
Refer to table **D.I./6**.
g) Release gas into vessel I through valve **16**
h) When no further product can be seen in sight glass **D**, interrupt the gas flow
i) Close valve **3**
l) Eliminate pressure by opening valve **7**

TAV.D.I./5

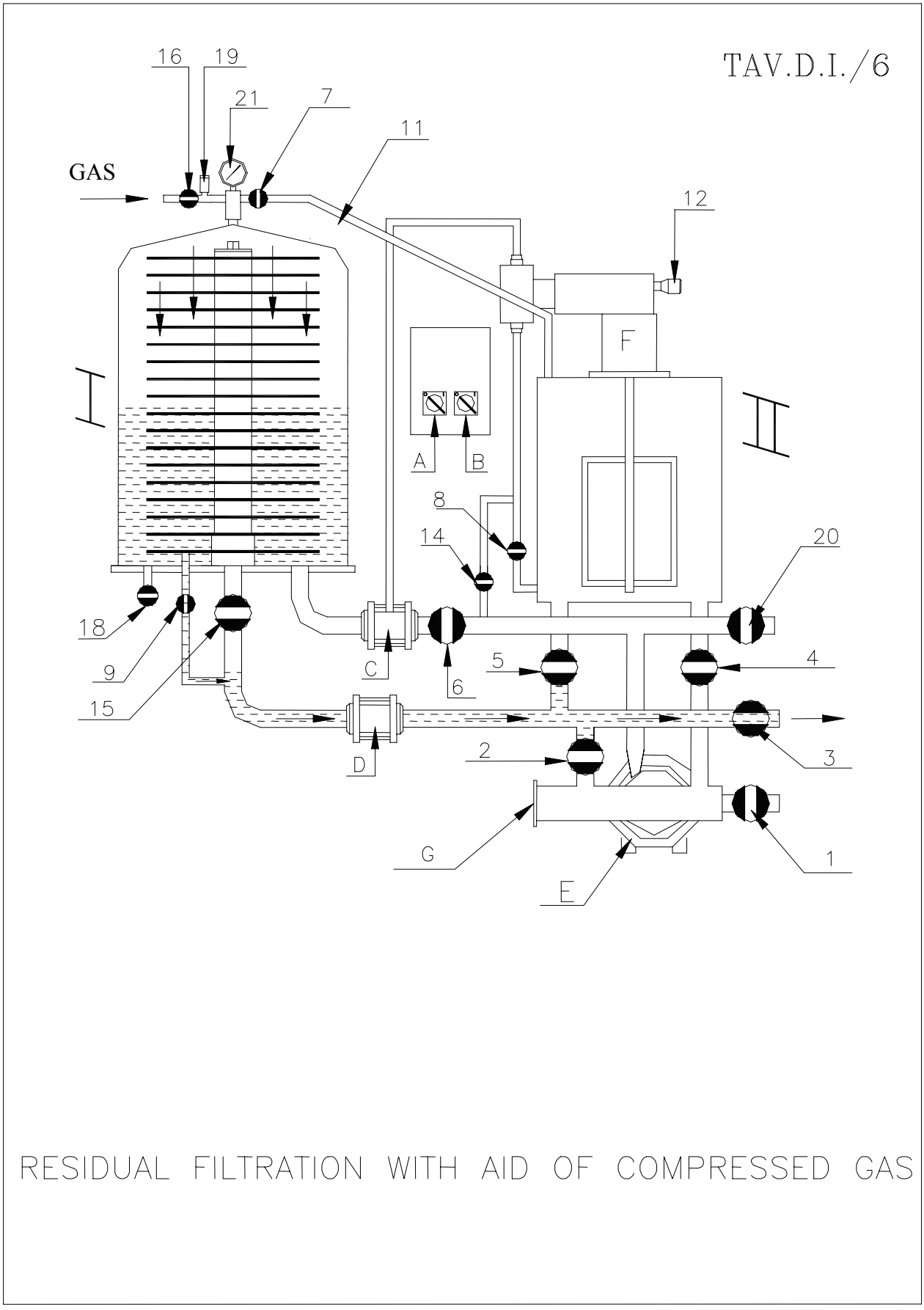


RESIDUAL FILTRATION WITH PUMP

Close valves 1,3,4,5,6,8,15.

Open valves 2,20,7,9.

Turn on pump E.



8.3.8 Cycle end

When the working cycle is completed or the filter has been out of service for a perod of time, you must wash the filtering screens..

Proceed as follows, refering to table **D.I./7**:
a) Detch pipe **11** from the dosing tank
b) Remove the safety clamp from vessel **I**
c)Block the wheells with the breaks.
d) Remove vessel **I.**
e) Remove the closing clamp and the filtering bell down its axial.
f) Clean the screens dry with a plastic spatula.

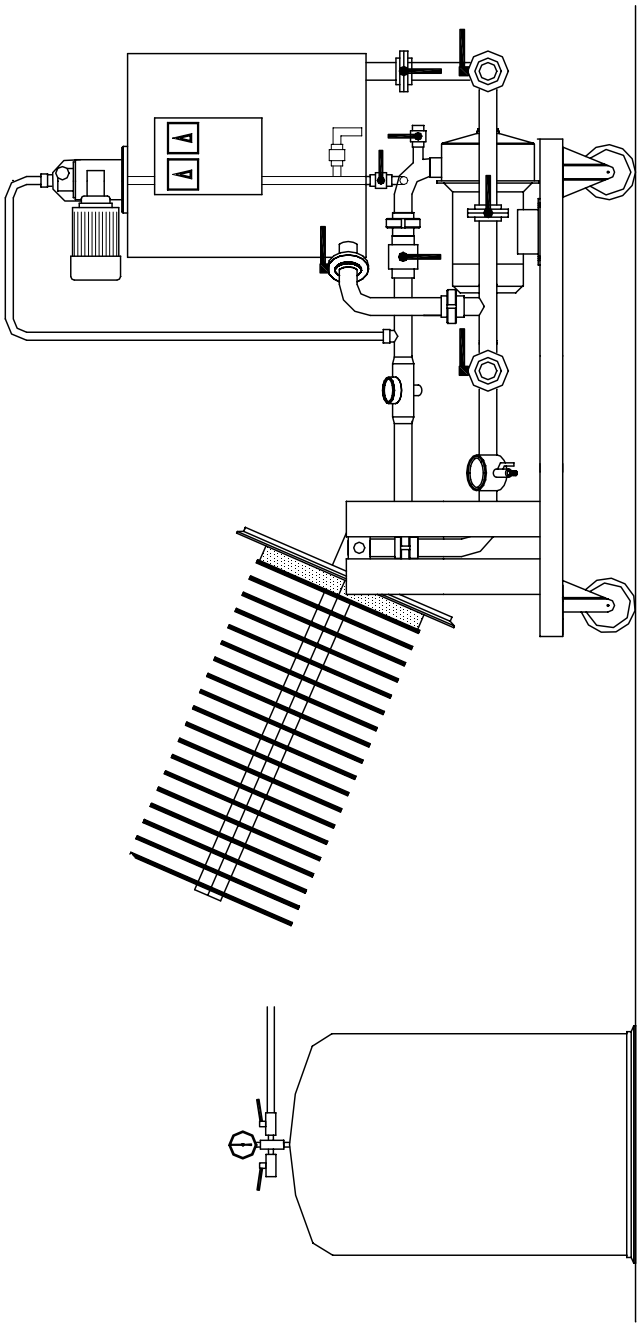
IMPORTANT
Do not use metallic objects.

g) Rinse the screen and inside tubing with water.
h) Rinse out the filtering bell.
i) Straighten the bell out and return it to its upright position
l) Resposition the closing clamp and reconnect pipe **11.**
If unit remains unused for aver a week's time, undergo a sanitizing wash of the unit before using.

IMPORTANT
If the machine is situated in a cold room empty the main pump E, as the residual liquid may freeze and cause damage to the pump.

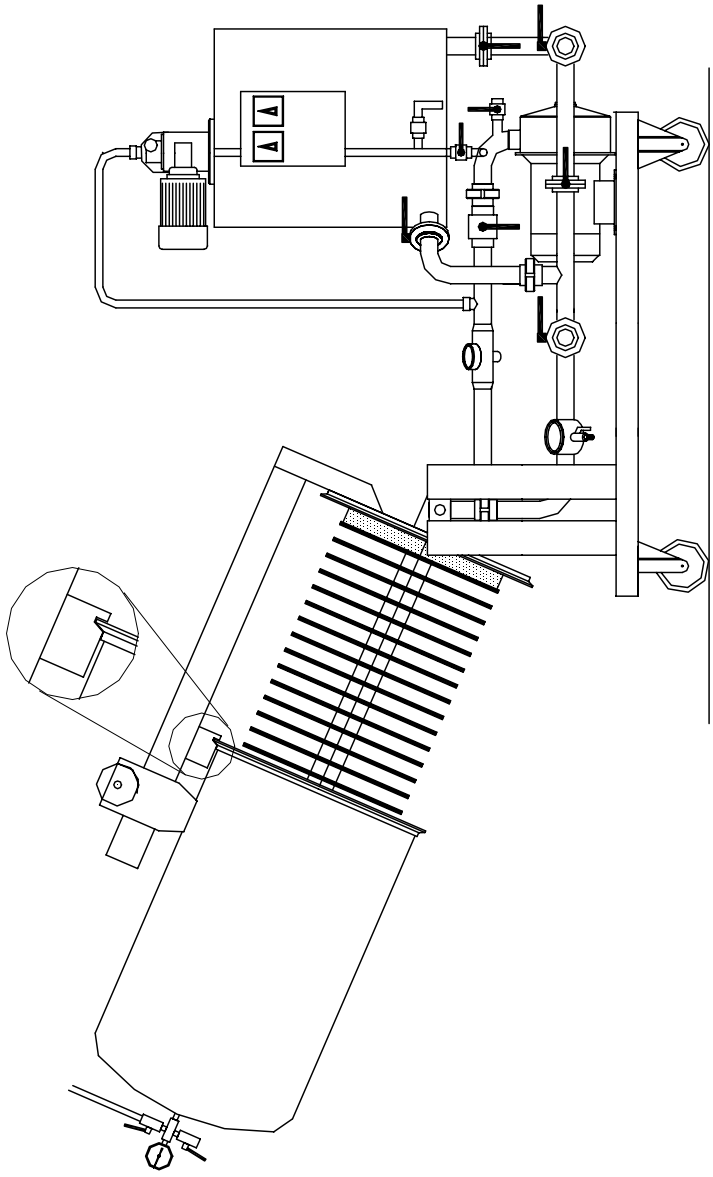
DCBL 50

TAV. D.I./7



DCBL 80-100-125-150

TAV. D.I./7



9. SAFETY : VERIFYING AND CALIBRATION

9.1 Max. pressure valve

Verify at least once a year that max. pressure valve **19** on the filtering tank is working properly.

The valve is calibrated at a pressure of 7 bar and has been tested before the delivery of the machine.

Effectuate the operation following the scheme in table **D.I./11**, that is :

a) Fill tank **I** with water
b) Close all the valves
c) Fill tank **II** with water
d) Open valve **8**
e) Turn on dosing pump
f) When tank **I** is full, the pressure reading on the gauge will start to increase.
g) Regulate the pressure, when product begins to escape from the safety valve **19**.

IMPORTANT
If the pressure differs from that indicated above, contact your sales agent or the manufacturer.

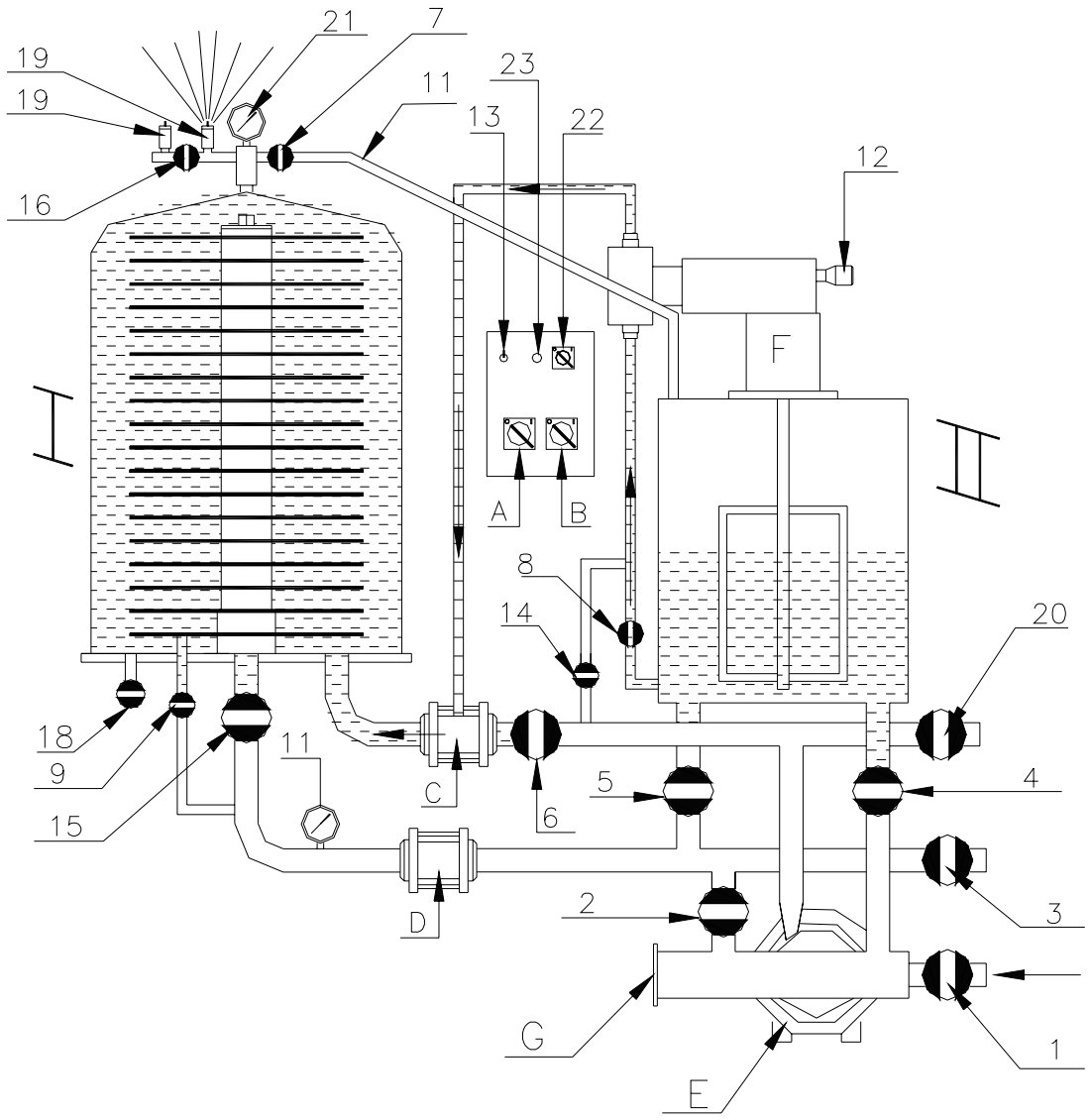
9.2 Gas max. pressure valve

Insert a flow meter compressor and control the intervention pressure value of the valve.
The valve is calibrated at a pressure of 0,5 bar.

10. INSTRUCTIONS FOR DISMOUNTING

There is no need for particualr instructions to dismount the machine.
It is sufficient to remove the feeding plug from the machine.

TAV.D.I./11



VERIFYING AND CALIBRATION MAX PRESSURE.
Every valve closed , except valve 8.
Start dosing pump F.

11. INSTRUCTIONS FOR SERVICING

The machine has been designed and constructed in order to reduce servicing to a minimum.
In this chapter instructions will be provided for basic servicing.
In chapter 13 necessary instructions will be given in order to solve problems that are more frequent and that are not a direct result of poor servicing and that request an immediate intervention.

IMPORTANT
Before preforming any servicing operation :
- eliminate the tension from the machine's control panel
- unplug the unit from its outlet
If necessary empty the machine

11.1 Programmed servicing

11.1.1 Changing of oil in the dosing pump:
Authorized personel: operator with mechanical qualifications
Substitute the oil in the dosing pump every 1000 working hours or every 6 months.

Suggested oils:

IP	MELLANA 320
ESSO	SPARTAN EP 320
AGIP	BLASIA 320

MOBIL	MOBILGEAR 632
SHELL	OMALA EP 320
BP	ENERGOL GR-XP 320

11.1.2 Changing of bearings in pumps **E** and **F**:
Authorized personel: operator with mechanical qualifications
Substitute the bearings of the pumps every 5000 working hours or max. every 3 years.
See mounting scheme in chapter 14 in this manual table **4802** and **D.P. 10**.

11.1.3 Changing of gaskets on dosing pump:
Authorized personel: operator with mechanical qualifications
Substitute gaskets in dosing pump (pos. **32** table **4802** chapter 14) every 1000 working hours or when leakage occurs.

11.1.4 Changing of piston on the dosing pump:
Authorized personel: operator with mechanical qualifications
Substitute the piston of the dosing pump (pos. **1** table **4802** chapter 14) every 3000 working hours.

11.1.5 Changing of gasket of vessel **I**:

Authorized personel: operator with mechanical qualifications

Substitute the gasket of vessel **I** (pos**. 8** table **5** chapter 14) every 1000 working hours.

11.1.6 Caustic washing:

During filtration, a tartaric deposit forms on the screens.

This must be removed using a caustic solution, every 1200 working hours or at least once a year.

Caustic solution :
Solution of water and caustic soda at 3 % at a temperature of 50 °C.

Follow the instructions in chapter 8 point 8.2.1 using this solution.

11.2 Principles for storage or shelter of the machine:

There is no need for particular attention for storage purposes.

The metallic parts of the machine are in stainless steel and the motors and electrical equipment are resistant to foreign agents.

It is however, good practice, if the unit is to remain outdoors, to secure and cover it, to avoid any possible shock.

12. SOLUTIONS FOR PROBLEMATIC SITUATIONS

In this chapter, you will find common problems that may occur and possible solutions.

12.1 Reoccuring breakdowns and/or malfunctions

12.1.1 Reasons that could provoke cloudiness of product:

A non sufficient D.E. panel on the filtering screens:
act on dosing pump increasing the flow of E. or increasing
the concentration of D.E. in vessel **II**

b. Sudden pressure change
- Avoid brush manoeuvres at filtration beginning
- Avoid brush manoeuvres when changing the feeding vessel
- Avoid sudden stops of the dosing pump

12.1.2 Malfunctioning of dosing pump during a filtration:

A leak from the dosing pump during filtration results in a improper injection of D.E. and to a rapid obstruction of the screens. This causes a poor filtration of the product and a low production capacity. This can be noted by observing sight glass **C,** generally you will see D.E. present in the circuit, the lack of this D.E. indicates a malfunction.

If this is the case act as follows:
a) Control if product in vessel **II** is empty
b) Control if D.E. has been added to the product in vessel **II**, in that case follow tables **A/9**, **B/9**, **C/9**.

If a) and b) are verified, and the problem continues, it is possible that the pump is dirty, in which case:
c) Close valve **8** and open valve **14** for about 15/20 sec.
b) Open valve **8** and close valve **14**
If necessary repeat this operation a few times. Suspend this procedure when you notice through the sight glass, the normal passing of D.E.

12.1.3 Low rendering of the electropump:

a. Incorrect revolution direction
-This may happen simply by changing the feeding plug, during which the phases may become inverted.
Control the correct revolution direction as indicated by arrows
b. Obstruction of the prefilter (chapter 14 pos. **13** table **6**).
-Remove obstruction and rinse.
c. Obstruction of the impellers
If after having regulated the previous controls the situation continues, you need to dismount the pump and wash the impellers. Scheme chap. 14 table **D.P.10** pos.**3**.

IMPORTANT
Never let the pump run dry. The manufacturer responsable for any dameges caused from this action.

12.1.4 Presence of air or gas in the filter:

You will notice a presence of air or gas in the filter by a diminution of capacity and/or if the pump turns with discontinuance and/or the presence of air balls in sight glass **C**.
The presence of air or gas will cause an irregular cake formation.
The presence of air or gas may be caused by the following:

a) An imperfect union of the pipings.
   - Check each connection and evacuate air by means of valve **7**.

b) Turbulence caused from very dirty products
   - Reassume normal conditions, opening more frequently valve **7** and, if necessary, close valve **3** gradually, eliminating the air or gas.

12.2 Malfunctioning of electrical parts

SYMPTOM	**CAUSE**	**CONTROL AND ACTION**
Warning light **6** does not work.	Burnt out.	Control that the lamp is not burnt out, the unit is still operational.
	Intervetion of the fuses of the trasformer.	Verify if fuses of trasformer have not blown out. Replace blown out fuses. If they continue to blow contact elettrical assistance.
		Verify that plug is crrectly inserted.
Motor does not turn on.		
Light **6** and **7** are off.	Lack of tension.	Verify if the fuses are not blown in the control panel, if this is the case contact eletrical assistence.
		Verify the sensor of the control panel is activated.
		Verify if there lacks tension in the general panel.
Motor does not turn on.	Lack of tension in the motors.	There could be damage to push button **2** and/or **4**. Or at bobbin **KM1** and/or **KM2.**
		Light **6** and **7** are off.
		Contact assistence.
Motors shuts down during operation, warning lights come on.	Invertion at the motor protection.	Open the control panel and set the auto switch (**QF1** and/or **QF2**) on.
		If switch turns immediately off, the motor has a short circuit.
		Contact assistance or replace the motor.

13. DISMOUNTING OF THE MACHINE.

The unit can be dismantled without following any particular instruction.
It is necessary to eliminate the lubricating oil from the reducer of the dosing pump. Proper disposal procedures must be followed.

IMPORTANT
Do not dispose the oil of the dosing pump into the environment.
For proper disposal contact specialized hazardous waste agencies.

14. SPARE PARTS MANUAL.

14.1 General

The spare parts manual is composed of a series of cross-section designs that, refer to the general table **D.P. 100** and **4802**, to allow for a quick indentification of parts to be ordered.

14.2 Ordering spare parts

To order spare parts, follow the scheme in this chapter.

IMPORTANT
We suggest, to avoid errors, that you photocopy the module and send it to either the manufacturer or to your sales rep. directly, indicating as best possible those parts needed. Utilize the diagrams and the reference tables.

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Via dei Vinari (Zona ind. Bardano)
ORVIETO – TERNI – ITALY
Tel. 0763/316181 – Telefax.0763/316384
e–mail:sspado@tin.it – internet: http://www.spadoni.it

SPARE PARTS ORDER

Costomer's address _____

_____

_____

Machine type _____
Machine number _____
Construction year _____

Please send at my address the under listed parts:
Shipping way _____

Tav. Nr	Ref. Nr	Requested Quantity	DESCRIPTION	Parts Received

Date _____ _____

Signature

PREPARATION FOR USE

On three-phase main electropumps, check the direction of rotation of the motor. The impeller must turn in a clockwise direction.

When viewing the electropump from above (see the arrow on the pump).
As it is not possible to check the direction of rotation of the impeller visually, proceed as follows : before anchoring the electropump in the system and without the pipes, connect the power cables to the electric panel and switch on the main switch for a moment ; the direction of rotation of the fan that cools the motor of the electropump is the same as the direction of rotation of the impeller. If it is turning in the wrong direction (that is anti-clockwise), invert two of the three leads on the motor base.

ELECTRIC CONNECTION

ABSOLUTELY AVOID GETTING THE BASE WET OR DAMP WHEN CONNECTING THE ELECTROPUMP.

THE ELECTRIC CONNECTION MUST BE CARRIED OUT BY A SKILLED TECHNICIAN.

FOR BOTH THE THREE-PHASE AND THE SINGLE-PHASE VERSION, WE ADVISE FITTING A HIGH-INTENSITY DIFFERENTIAL SWITCH IN THE ELECTRIC SYSTEM

ATTENTION
For connection to the power mains, use a cable complying with IEC standards with a suitable section and a suitable length ; remember also the mains voltage and polarity.
The power cable must be connected to the terminals as illustrated in the wiring diagram, in accordance with standards CEI 6150/26.6.
The mains must have an efficient earth system complying with the electrical standards in force in the user's country ; the installer is responsible for checking this.

SINGLE - PHASE VERSION

The electropump must preferable be fed by means of an electric panel with a switch and fuses. The electric panel must be prepared by a skilled technician or bought from EBARA ITALIA Spa.
All single-phase electropumps have the capacitor housed inside the terminal cover box, or fixed on the outside by means of a clamp. Motors up to 1.2 HP have thermal protection in the winding, while 1.5 and 2 HP motors have a motor-protector housed inside the terminal cover box.

a) Slacken the screws that hold down the base cover, then remove it.
b) Unscrew the cap of the cable clamp and slip in the power cable, then pass the end of the cable through the hole in the base.
c) Connect the yellow and green lead of the power cable to the earth screw.
d) Connect the power leads to the termianl board as shown in the diagram inside the base cover.

e) When you have completed connection, screw the cable clamp onto the base, blocking the ower cable in place.

f) Replace the cover on the base and tighten the screw.

THREE - PHASE VERSION

The three-phase version does not have an internal motor-protector, so the protection against overload must be supplied by the user. The electropump must be fed by means of an electric panel with switch, fuses and a thermal switch set at the current absorbed by the electropump.
The electric panel must be prepared by a skilled technician or bought from EBARA ITALIA Spa.

a) Slacken the screws that hold down the base cover, then remove it.

b) Unscrew the cap of the cable clamp and slip in the power cable, then pass the end of the cable through the hole in the base.

c) Connect the yellow and green lead of the power cable tothe earth screw.

d) Connect the power leads to the terminal board as shown in the diagram inside the base cover.

e) Connect the jumpers on the terminal board in delta or star formation, depending on the supply voltage, as shown in the diagram inside the base cover.

f) When you have completed connection, screw the cable clamp onto the base, blocking the power cable in place.

g) Replace the cover on the base and tighten the screws.

FILLING THE PUMP

ATTENTION
This operation must be performed with the electric base of the motor perfectly closed.

a) Unscrew the hexagonal cap located on the top of the pump body, in front of the delivery union.

b) Using a funnel, fill the pump body with water until it overflows.

c) Screw the hexagonal cap back on until it is firmly locked, to prevent air infiltrations.

USE AND START UP

NEVER RUN THE ELECTROPUMP WITHOUT WATER : LACK OF WATER MAY CAUSE SEVERE DAMAGE TO THE INTERNAL COMPONENTS.

GENERAL WARNINGS.

a) Prolonged operation of the electropump with the gate valve on the delivery pipe closed may cause damage.

b) Avoid frequent starting and stopping of the electropump.

c) If there is an interruption in the power supply, it is Advisable to switch off the pump.

STARTING

a) Ensure that the foot valve is not blocked.
b) Switch on and off two or three times to check operating conditions.
c) Begin continuous operation and gradually open the gate valve on delivery.
d) check that noise, vibrations, pressure and electric voltage are at normal level.

STOPPING

a) First of all, close the gate valve on delivery (this should always be done if the system is without no-return valves, especially in the presence of high heads), to prevent overpressures in the pipes and pump due to water hammer.
b) Switch off.

MAINTENANCE AND REPAIRS

ATTENTION
Before carrying out any maintenance operations, disconnect the plug and/or switch off. The electropump must be dismantled only by skilled technicians. failure to observe this rule renders the guarantee invalid. the same applies to repair jobs and/or replacements.

When the pump is to remain inactive for a long period, it is advisable to empty it completely, removing the drainage and filling caps, wash it out accurately with clean water then drain it again, ensuring that no water is left inside it.
This operation must always be performed when there is a risk of frost, to prevent breakages of the pump body.

TROUBLESHOOTING

Type of Fault
The pump does not work (the motor does not turn over)

Cause	**Remedy**
No electric power	Check the contactor on the electric line
Plug not inserted	Check power connection to the line
Automatic switch has tripped	Reset the switch and check the cause
Thermal protection has tripped (single-phase)	This resets automatically (single-phase only)
Protection fuses are burnt out (three-phase)	Replace the fuses with others of the same type
Incorrect electric connection	Check terminal board and electric panel
Faulty motor or capacitor	Contact the nearest dealer
Damaged bearing (noisy)	Contact the nearest dealer

Type of Fault
The pump does not work (the motor turns over)

Cause	**Remedy**
Voltage drop on the power line	
Clogged filter at end of suction	Dismantle and clean the filter
Foot valve blocked	Clean the valve and check its operation
No water in the pump	Fill the pump
Pressure too low	Choke the delivery gate valve

Type of Fault
The pump works at a low flow rate

Cause	Remedy
Foot valve partly clogged	Clean the valve and check its operation
Water level too low	Switch off the pump or immerse the foot valve
Wrong direction of rotation	Check the direction of rotation (three-phase only)
Wrong supply voltage	Feed the pump with the voltage indicated on the data plate
Leaking pipes	Check the connections
Pressure too high	Check the system

Type of Fault
The pump stops after brief periods of operation (tripping of the thermal protection)

Cause	Remedy
Liquid temperature too high	The temperature exceeds the technical limits of the pump
Internal defect	Contact the nearest dealer

Type of Fault
The pump stops after brief periods of operation (booster set applications)

Cause	Remedy
Very small difference between maximum and minimum pressure	Increase the difference in pressure

Type of Fault
The pump does not stop

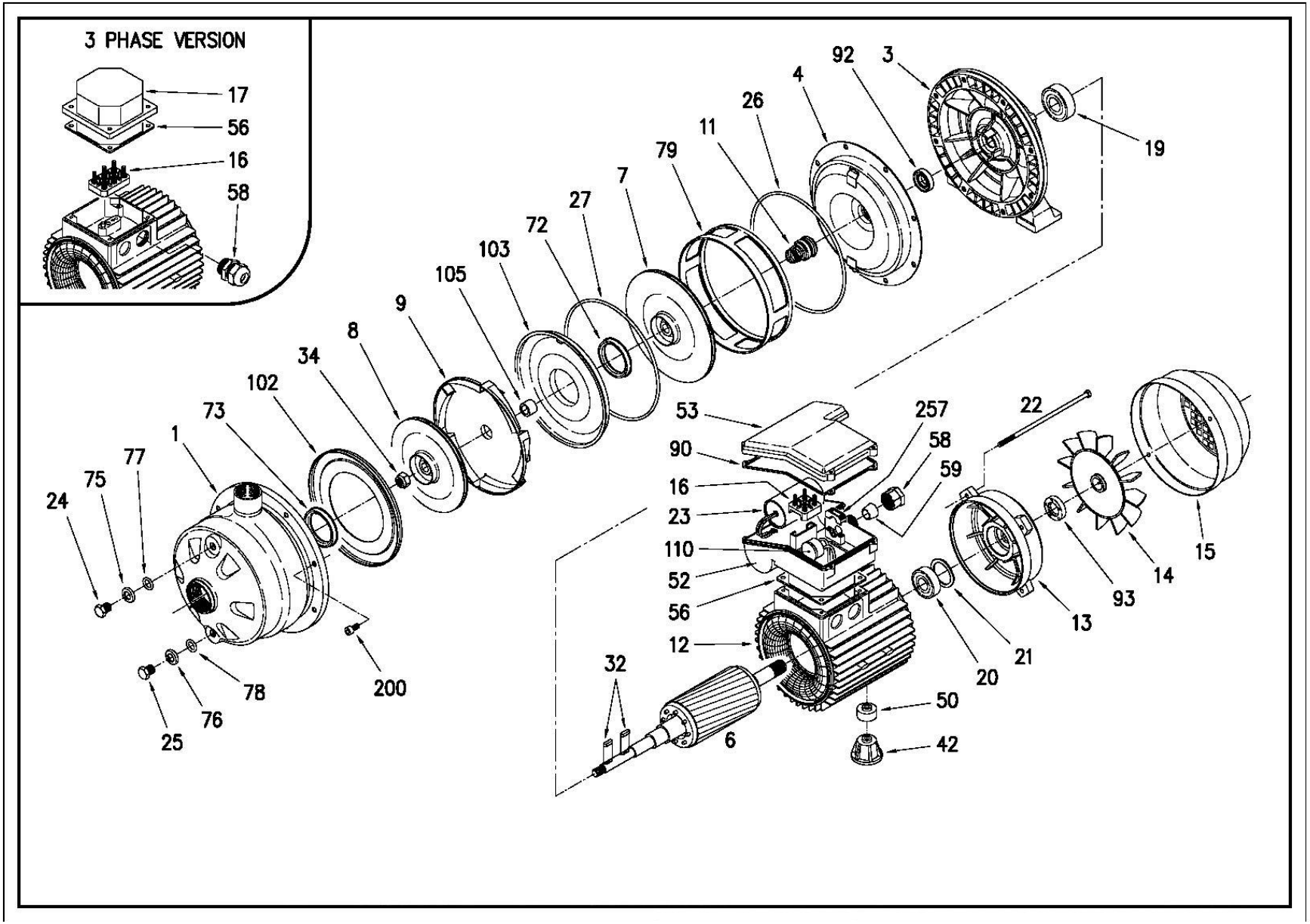
Cause	Remedy
Maximum pressure too high	Set the maximum pressure at lower values

Type of Fault
The pump vibrates or makes too much noise while operating

Cause	Remedy
Flow rate too high	Reduce flow rate
Cavitation	Contact the nearest dealer
Irregular piping	Fix the pipes better
Noisy bearing	Contact the nearest dealer
Foreign bodies rubbing against the motor fan	Remove the foreign bodies

TAV. D.P.100 – DCBL 50/80/100

PUMPS 2CDX SPARE PARTS DRAWING N.01320



TAV. D.P.100 – DCBL 50

PUMPS 2CDX 70/20 SPARE PARTS DRAWING N.01320

Pos.	Denominazione	Part name	2CDX/A 70/10	2CDX/A 70/12	2CDX/A 70/15	2CDX/A 70/20	2CDX/A 120/15	Data di creaz./
			1611100004	1611120004	1611150004	1611200004	1621150004	First release
001	CORPO POMPA	Casing	251420688		251420692		251420694	**May 2002**
003	SUPPORTO MOTORE	Motor bracket	240280545		240280563		240280546	
004	DISCO P/TENUTA	Casing cover	251402069		251402065		251402069	
006	ALBERO ROTORE	Shaft with rotor	275412189	275412190	275412246	275412232	275412246	
007	GIRANTE	Impeller	251450000		251450721		251450003	
008	GIRANTE	Impeller	251450720		251450721	251450002	251450003	
009	DIFFUSORE	Diffuser	251435024		251435026		251435024	
011	TENUTA PARTE FISSA	Mechanical seal fixed	360408116					
011	TENUTA PARTE ROTANTE	Mechanical seal rolling	360407115					
012	CASSA	Motor frame	277930180	277930181	277930801	277930220	277930801	
013	COPERCHIO MOTORE	Motor cover	230225071		230225072			
014	VENTOLA	Fan	369950002		369950008			
015	COPRIVENTOLA	Fan cover	362250071		362250080			
016	MORSETTIERA	Terminal box	365940256		365950326			
017	COPRIMORSETTIERA	Terminal box cover	363232010		363232008			
019	CUSCINETTO	Bearing	360306203		360306204			
020	CUSCINETTO	Bearing	360306202		360306203			
021	ANELLO COMPENSATORE	Adjusting ring	360600035		360600040			
022	TIRANTE	Tie rod	369305135 (4)		369305148 (4)			
024	TAPPO	Priming plug	375192107					
025	TAPPO	Drain plug	375192107					
026	ANELLO OR	"O" ring	360931647		360939837		360931647	
027	ANELLO OR	"O" ring	360921584		360921774		360921584	
032	LINGUETTA	Key	361304414 (2)					
034	DADO GIRANTE	Impeller nut	363300013					

(n)= Quantità per pompa / Quantity for pump

TAV. D.P.100 – DCBL 50

PUMPS 2CDX 70/20 SPARE PARTS DRAWING N.01320

Pos.	Denominazione	Part name	2CDX/A 70/10	2CDX/A 70/12	2CDX/A 70/15	2CDX/A 70/20	2CDX/A 120/15
			1611100004	1611120004	1611150004	1611200004	1621150004
042	PIEDINO	Foot	371415013		371415015		
050	DISTANZIALE	Spacer	....	....	371415018		....
056	GUARNIZIONE	Box gasket	364700810		364700811		
058	PRESSACAVO	Cable entry	366550010				
072	ANELLO RASAMENTO	Casing ring	255410019				255410011
073	ANELLO RASAMENTO	Casing ring	255410019				255410011
075	RONDELLA TAPPO	Washer	367667000				
076	RONDELLA TAPPO	Washer	367667000				
077	ANELLO OR	"O" ring	360920919				
078	ANELLO OR	"O" ring	360920919				
079	DISTANZIALE DIFFUSORE	Spacer diffuser	251434026		251434028		251434026
092	ANELLO TEN. LATO POMP	Lip seal	360991528				
093	ANELLO TEN. LATO VENT.	Lip seal	360991528		360991529		
102	COPERCHIO DIFF.	Suction cover	251424008		251424012		251424008
103	COPERCHIO CONVOGLIAT	Conveyor cover	251402068		251402089		251402066
105	DISTANZ.GIRANTE	Sleeve	375434027				
200	VITE	Screw	369600023 (8)	369641003 (8)			369600023 (8)

Data di creaz./ First release **May 2002**

(n)= Quantità per pompa / Quantity for pump

TAV. D.P.100 – DCBL 80/100

PUMPS 2CDX 120/30 SPARE PARTS DRAWING N.01320

Pos.	Denominazione	Part name	2CDX/A 120/20	2CDX 120/30	2CDX 120/40	2CDX 200/30	
			1621200004	1989300004	1989400004	1999300004	
001	CORPO POMPA	Casing	251420694	251420696		251420689	
003	SUPPORTO MOTORE	Motor bracket	240280546	240080565		240080564	
004	DISCO P/TENUTA	Casing cover	251402069	251402065		251402069	
006	ALBERO ROTORE	Shaft with rotor	275412232	275412255	275412256	275412257	
007	GIRANTE	Impeller	251450004			251450007	
008	GIRANTE	Impeller	251450003	251450004	251450005	251450006	
009	DIFFUSORE	Diffuser	251435024	251435026		251435024	
011	TENUTA PARTE FISSA	Mechanical seal fixed	360407115				
011	TENUTA PARTE ROTANTE	Mechanical seal rolling	360408116				
012	CASSA	Motor frame	277930220	277930430	277930425		
013	COPERCHIO MOTORE	Motor cover	230225072	230225504			
014	VENTOLA	Fan	369950008	369950009			
015	COPRIVENTOLA	Fan cover	362250080	362250009			
016	MORSETTIERA	Terminal box	365950326				
017	COPRIMORSETTIERA	Terminal box cover	363232008				
019	CUSCINETTO	Bearing	360306204	360306305		360306205	
020	CUSCINETTO	Bearing	360306203	360306205			
021	ANELLO COMPENSATORE	Adjusting ring	360600040	360600052			
022	TIRANTE	Tie rod	369305148 (4)	369305165 (4)	369305190 (4)		
024	TAPPO	Priming plug	375192107				
025	TAPPO	Drain plug	375192107				
026	ANELLO OR	"O" ring	360931647	360939837		360931647	
027	ANELLO OR	"O" ring	360921584	360921774		360921584	
032	LINGUETTA	Key	361304414 (2)				
034	DADO GIRANTE	Impeller nut	363300013				

Data di creaz./ First release **May 2002**

(n)= Quantità per pompa / Quantity for pump

TAV. D.P.100 – DCBL 80/100

PUMPS 2CDX 120/30 SPARE PARTS DRAWING N.01320

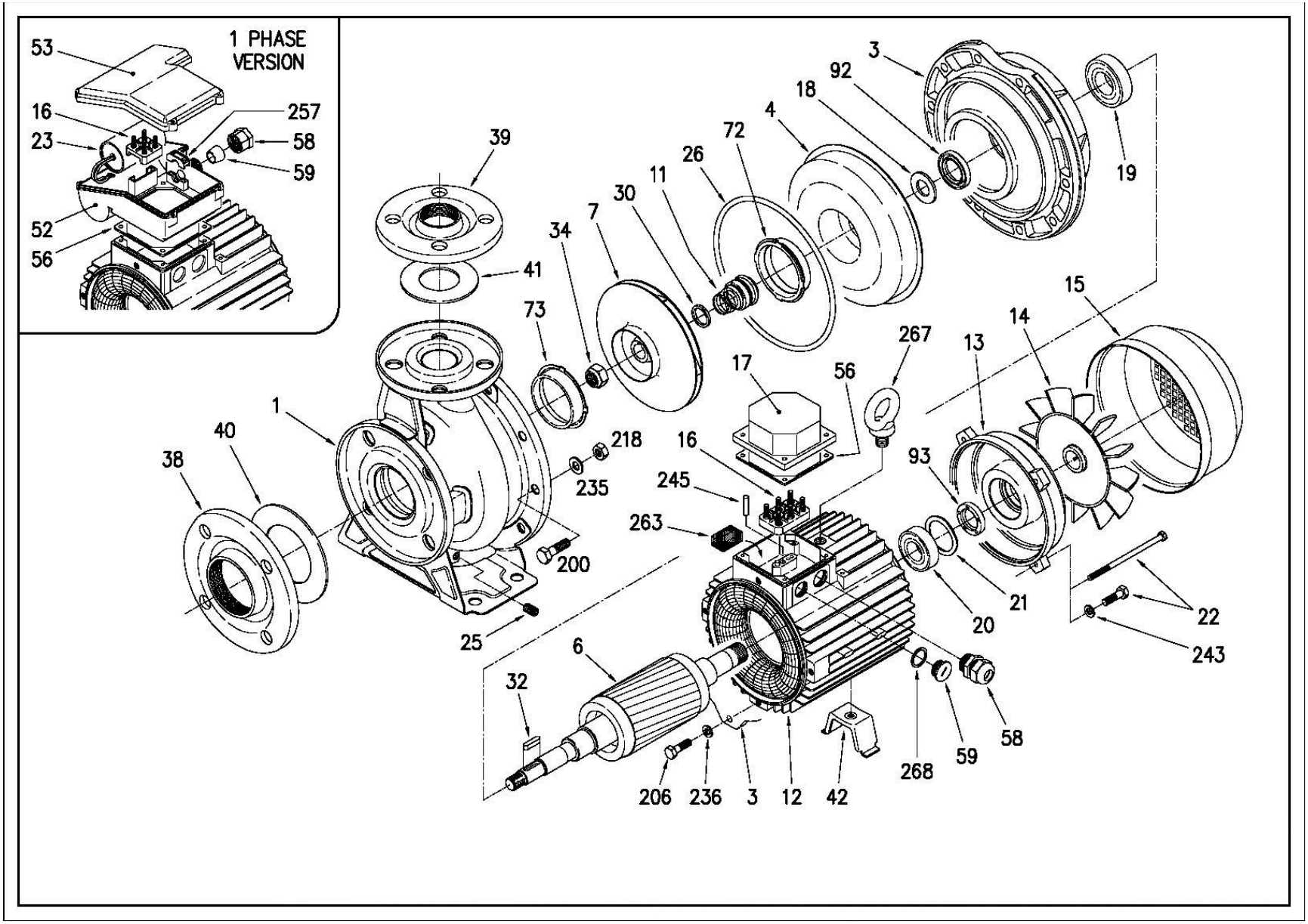
Pos.	Denominazione	Part name	2CDX/A 120/20	2CDX 120/30	2CDX 120/40	2CDX 200/30	
			1621200004	1989300004	1989400004	1999300004	
042	PIEDINO	Foot	371415015	371415013		371415014	
050	DISTANZIALE	Spacer	....	....	....	....	
056	GUARNIZIONE	Box gasket	364700811				
058	PRESSACAVO	Cable entry	366550010	366550013			
072	ANELLO RASAMENTO	Casing ring	255410011			255410012	
073	ANELLO RASAMENTO	Casing ring	255410011			255410012	
075	RONDELLA TAPPO	Washer	367667000				
076	RONDELLA TAPPO	Washer	367667000				
077	ANELLO OR	"O" ring	360920919				
078	ANELLO OR	"O" ring	360920919				
079	DISTANZIALE DIFFUSORE	Spacer diffuser	251434026	251434028		251434026	
092	ANELLO TEN. LATO POMP	Lip seal	360991528				
093	ANELLO TEN. LATO VENT.	Lip seal	360991529	360991531			
102	COPERCHIO DIFF.	Suction cover	251424008	251424012		251424008	
103	COPERCHIO CONVOGLIAT	Conveyor cover	251402066	251402071		251402066	
105	DISTANZ.GIRANTE	Sleeve	375434027				
200	VITE	Screw	369600023 (8)	369641003		369600023 (8)	

Data di creaz./ First release **May 2002**

(n)= Quantità per pompa / Quantity for pump

TAV. D.P.100 – DCBL 125/150

PUMPS 3M 32-200/4 SPARE PARTS DRAWING N.01300



TAV. D.P.100 – DCBL 125/150

PUMPS 3M 32-200/4 SPARE PARTS DRAWING N.01300

Pos.	Denominazione	Part name	32-125/1,1	32-160/1,5	32-160/2,2	32-200/3	32-200/4
			1300200004	1300202404	1300300004	1310402404	1310550004
001	CORPO POMPA	Casing	251419027	251419001		251419003	
003	SUPPORTO MOTORE	Motor bracket	240080518	240080513		240080514	240080515
004	DISCO P/TENUTA	Casing cover	251438000	251438001		251438002	
006	ALBERO ROTORE	Shaft with rotor	275412842		275412845	275412844	275412303
007	GIRANTE	Impeller	251450632	251450013	251450009	251450015	251450011
011	TENUTA	Mechanical seal	360400001				
012	CASSA MOTORE	Motor frame w/stator	277930901		277930430	277930425	277930421
013	COPERCHIO MOTORE	Motor cover	230225504				230225507
014	VENTOLA	Fan	369950009				369950004
015	COPRIVENTOLA	Fan cover	362250009				362250100
016	MORSETTIERA	Terminal	365950326				365956366
017	COPRIMORSETTIERA	Terminal box cover	363232008				
018	RONDELLA PARASPRUZZI	Splash ring	367650215				
019	CUSCINETTO	Bearing	360306205				360306206
020	CUSCINETTO	Bearing	360306205				
021	ANELLO COMPENS.	Adjusting ring	360600052				
022	TIRANTE	Tie rod	369305165 (4)			369305190 (4)	369306200 (4)
025	TAPPO SCARICO	Drain plug	369631000				
026	ANELLO OR	"O" ring	360951581	360951898		360952279	
030	DISTANZIALE	Spacer	345134100				
032	LINGUETTA	Key	361306625				
034	DADO GIRANTE	Impeller nut	363331000				
038	CONTROFLANGIA	Counter flange	364401003				
039	CONTROFLANGIA	Counter flange	364401002				
040	GUARNIZIONE	Suction gasket	364701150				

Data di creaz./ First release **May 2002**

(n)= Quantità per pompa / Quantity for pump

TAV. D.P.100 – DCBL 125/150

PUMPS 3M 32-200/4 SPARE PARTS DRAWING N.01300

Pos.	Denominazione	Part name	32-125/1,1	32-160/1,5	32-160/2,2	32-200/3	32-200/4
			1300200004	1300202404	1300300004	1310402404	1310550004
041	GUARNIZIONE	Delivery gasket	364701132				
042	PIEDINO	Foot	371415011	371415000		371415001	371415003
056	GUARNIZIONE PER BASE	Box gasket	364700811				
058	GHIERA FISSAGGIO	Faesting nut	366550013				366550014
072	ANELLO RASAMENTO	Casing ring				251410000	
073	ANELLO RASAMENTO	Casing ring	251410000				
092	ANELLO TENUTA	Lip seal	360991531				360991525
093	ANELLO TENUTA	Lip seal	360991531				
200	VITE C/POMPA	Screw	369610308 (8)	369611000 (10)		369611000 (12)	
218	DADO	Nut	363301080 (8)	363301005 (10)		363301005 (12)	
235	RONDELLA	Washer	367637001 (8)	367637002 (10)		367637002 (12)	

Data di creaz./ First release **May 2002**

(n)= Quantità per pompa / Quantity for pump

PUMP STARTUP

The followingschecks must be carried out before starting the pump :

- Oil level (the pumps are always supplied without oil ; for oil type see table **D**. Pour slowly the oil though the filling orifice until you reach the required level).
- Check all electric connections and also the direction of rotation of the motor (shown by the arrow on motor body).
- Make sure that all isolatins valves on the suction and discharge lines are open.
- Make sure that the liquid to be metered has not solidified or frozen inside the piping.
- Carry out the first startup with discharge pressure as low as possible and with adjustment knob set to 20% ; **keep** these conditions about 3-5 minutes. Increase gradually the flow rate up to the maximum value, then set the pump to the required working conditions (flow rate and pressure).
- During the first stage check the pump discharge pressure by means of the pressure gauge : the pressure value (max. Oscillation of the pointer) shall not exceed the max : pressure indicated on the pump rating plate.

TABLE D

IP	MELLANA 320
ESSO	SPARTAN EP 320
AGIP	BLASIA 320

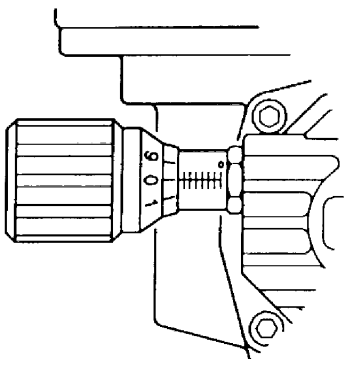
MOBIL	MOBILGEAR 632
SHELL	OMALA EP 320
BP	ENERGOL GR-XP 320

CAUTION !
The pump cannot stand pressure higher than those indicated on the rating plate.

FLOW RATE ADJUSTMENT

In **"R"** pumps, the adjustment of the flow rate is performed by means of a graduate knob and fixex vernier, in per cent (0 to 100%) of the max. Rated capacity (fig.7).

Fig. 7



ROUTINE MAINTENANCE

- Check the oil level peridiocally.
- Change the oil every 10.000 operating hours.
- In case of lower or irregular flow rate, check the valve units as follows :
  Refer first to the pumphead section drawing.
  Pay attention to the arrangement of the valve components ; each valve ball rests by gravity on its seat.
- Unscrew the suction and discharge valve units, one at a time. Check their components for soundness and cleanness. Clean carefully all valve components : seat, ball, guide, housing.
- Reassemble the valve unit.

OPERATING TROUBLES

Flow rate lower than expected.
Possible cause and steps to be taken :

- Air enters the suction piping through the fittings : Check
- Air trapped inside the pump : For a short while , keep flow rate to maximum .
- Excessive suction lift : Reduce it.
- Vapour pressure of the liquid too high : Increase hydrostatic head on suction side.
- Pumping temperatures too high : Increase hydrostatic head on suction side.
- Viscosity of the liquid too high : Install a suction piping of larger diameter. Increase hydrostatic head on suction side.
- Feed tank hermetically sealed and with no vent : Make a vent in the tank upper part.
- Suction piping clogged or valves shut : Check.
- Strainer on suction side clogged : Clean it.
- Pump valves jammed because of dirt : Strip the valves and clean them carefully.
- Safety valve setting pressure too low : Check.

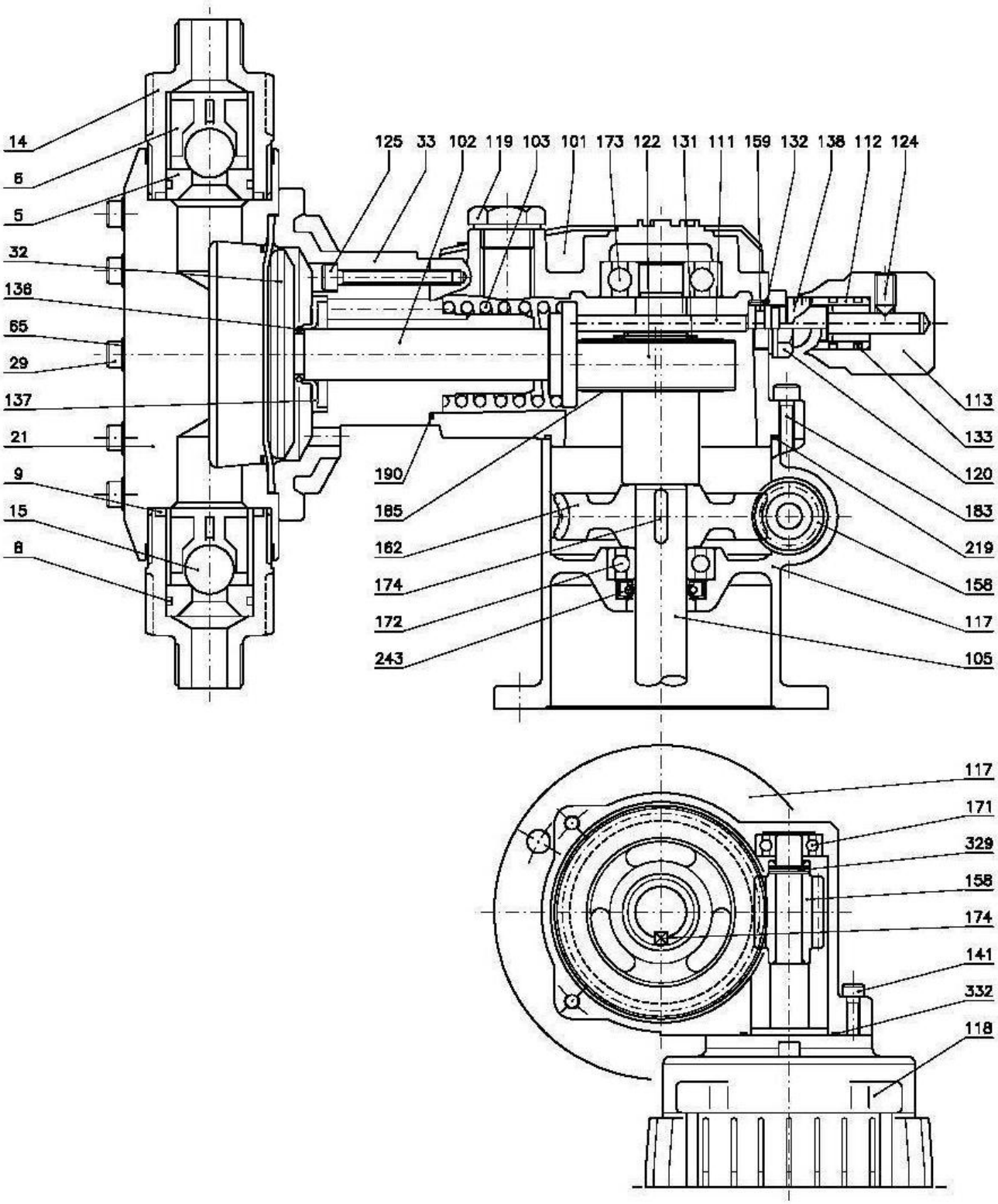
Flow rate irregular or higher than expected.
Possible cause and steps to be taken :

- Suction head higher than discharge head : Increase the discharge head of at least 3-5 m in respect of the suction head.
- Back pressure valve stuck in open position because of dirt or setting pressure too low : Check.

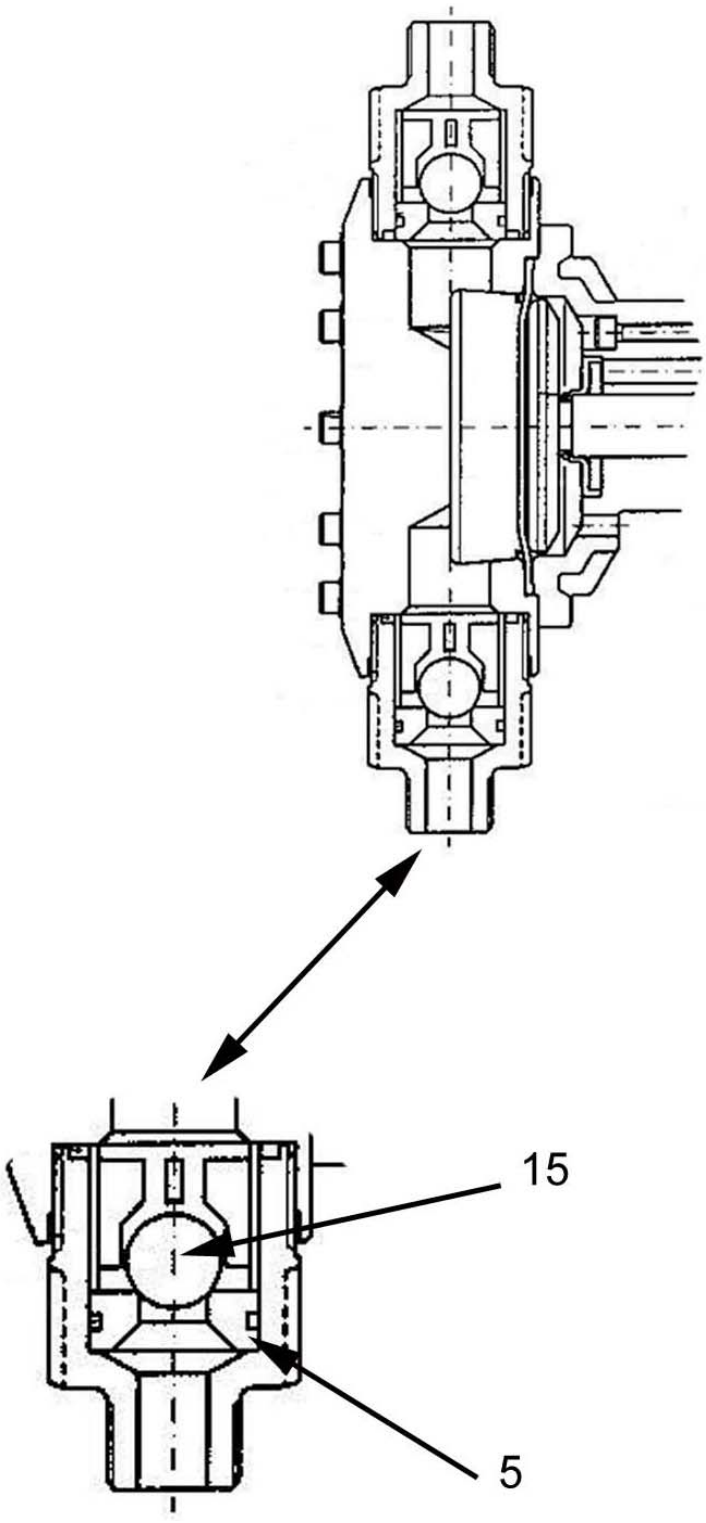
Overheating of pump body and motor.

- Incorrect wiring : Check.
- Overheating due to pump working pressure higher than allowed : Check max. Discharge pressure by means of a pressure gauge fitted on the discharge pipeline. Should the pressure be higher than allowed (see max. pressure indicated on pump rating plate), reduce the discharge pressure or in case of excessive reductions in section, many bends on the discharge line-install a pulsation damper.
- Stresses on pump flanges : Loosen the pipes connected to the pumphead and check.
- Discharge pipeline clogged or valve shut : Check.
- Back pressure valve set to a pressure higher than allowed : Check.
- Oil level in the gearbox is low : Add suitable oil.
-

	POMPA DOSATRICE A MEMBRANA TIPO MHB *DIAPHRAGM METERING PUMP MHB TYPE* TESTATA A MEMBRANA MECCANICA IN PP	TAVOLA 4802	REV. 0 / LINGUA I/E
		SOSTITUISCE IL –	DATA 02.05.02
	PP MECHANICAL DIAPHRAGM PUMPHEAD	*SECTIONAL DRAWING*	



TAV. 4802/D

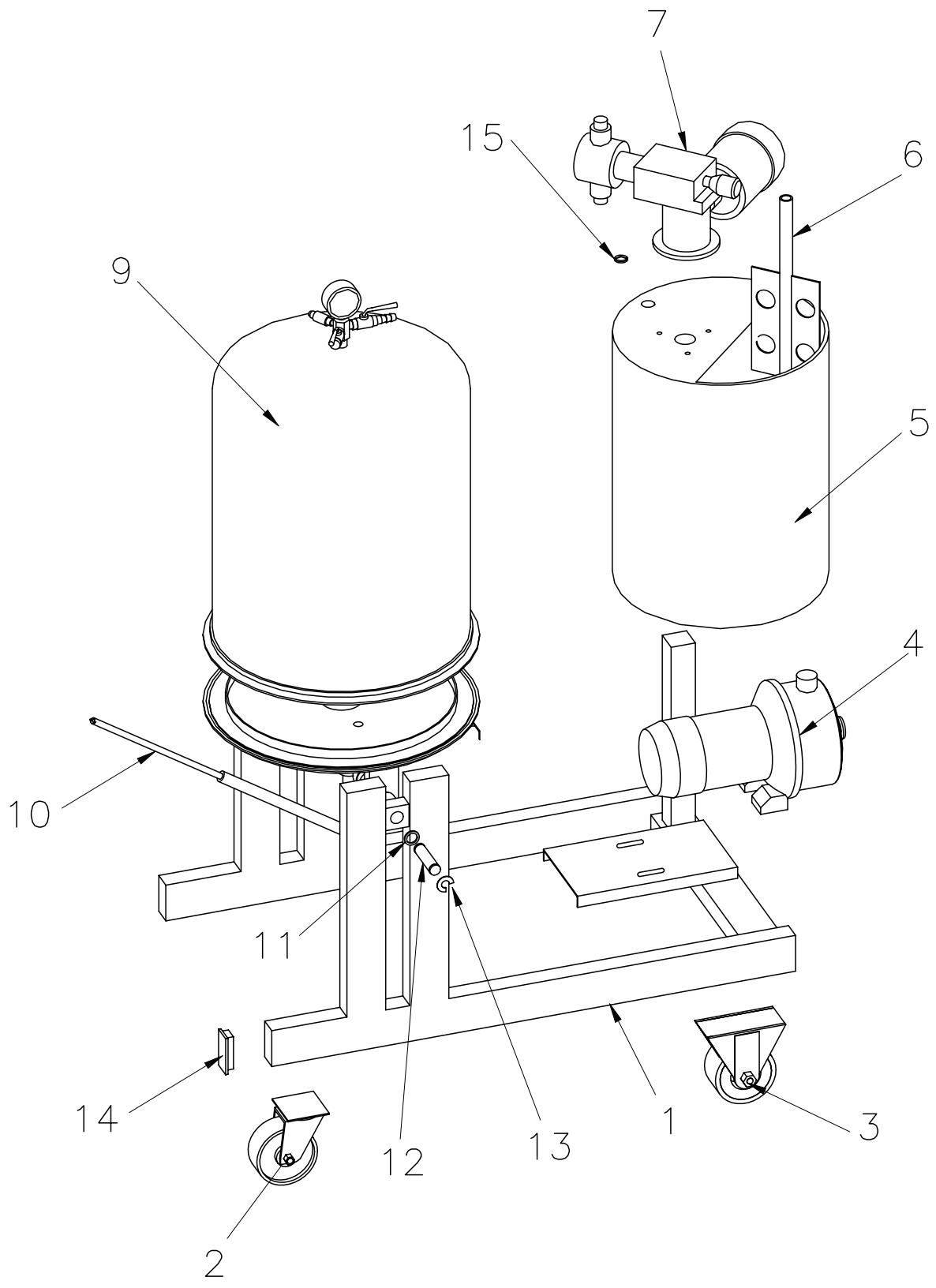


CORRECT SEAT (RIF. 5) AND VALVE (RIF. 15) ASSEMBLY.

POS. ITEM	COMPONENTI TESTATA POMPANTE PUMPHEAD COMPONENTS	
5	**SEDE VALVOLA**	VALVE SEAT
6	**GUIDA VALVOLA**	VALVE GUIDE
8	**OR SEDE VALVOLA**	VALVE SEAT O-RING
9	**OR CONTENITORE**	HOUSING O-RING
14	**CONTENITORE VALVOLE**	VALVE HOUSING
15	**VALVOLA**	VALVE
21	**CORPO TESTATA**	HEAD
29	**VITE FISSAGGIO TESTATA**	HEAD LOCK. SCREW
32	**MEMBRANA MECCANICA**	MECHANICAL DIAPHRAGM
33	**CAMERA MEMBRANA**	DIAPHRAGM CHAMBER
65	**RONDELLA**	WASHER

POS. ITEM	COMPONENTI MECCANISMO MECHANISM COMPONENTS	
101	**CORPO POMPA**	CASING
102	**SLITTA**	SLIDE
103	**MOLLA RITORNO MEMBRANA**	DIAPHRAGM SPRING RETURN
105	**ALBERO ECCENTRICO**	ECCENTRIC SHAFT
111	**ASTA DI REGOLAZIONE**	ADJUSTMENT SPINDLE
112	**GUIDA MANOPOLA**	SETTING KNOB GUIDE
113	**MANOPOLA**	SETTING KNOB
117	**CORPO RIDUTTORE**	GEARBOX CASING
118	**MOTORE**	MOTOR
119	**TAPPO CARICO OLIO**	OIL FILLING PLUG
120	**TAPPO LIVELLO OLIO**	OIL WINDOW
122	**CUSCINETTO**	BEARING
124	**GRANO FISS. MANOPOLA**	SETTING KNOB LOCK. DOWEL
125	**VITE FISS. CAMERA MEMBRANA**	DIAPH. CHAMBER LOCK. SCREW
131	**SEEGER CUSCINETTO**	BEARING CIRCLIP
132	**OR GUIDA MANOPOLA**	SETTING KNOB GUIDE O-RING
133	**OR MANOPOLA**	SETTING KNOB O-RING
136	**OR GUARNIZIONE SLITTA**	SLIDE GASKET O-RING
137	**GUARNIZIONE SLITTA**	SLIDE GASKET
138	**NONIO ADESIVO**	ADHESIVE VERNIER
141	**VITE FISS. MOTORE**	MOTOR LOCK SCREW
158	**VITE SENZA FINE**	ENDLESS SCREW
159	**OR ASTA DI REGOLAZIONE**	ADJUSTMENT SPINLE O-RING
162	**CORONA**	WORM WHELL
171	**CUSCINETTO VITE SENZA FINE**	ENDLESS SCREW BALL BEARING
172	**CUSCINETTO RIDUTTORE**	GEARBOX BALL BEARING
173	**CUSCINETTO CORPO POMPA**	CASING BALL BEARING
174	**LINGUETTA CORONA**	WORM WHELL KEY
183	**VITE FISS. CORPO POMPA**	CASING LOCK. SCREW
185	**RONDELLA CUSCINETTO**	BEARING WASHER
190	**OR CAMERA MEMBRANA**	DIAPHRAGM CHAMBER O-RING
219	**OR CORPO RIDUTTORE**	GEARBOX CASING O-RING
243	**GUARNIZIONE ALBERO**	SHAFT GASKET
329	**SPINA VITE SENZA FINE**	ENDLESS SCREW PIN
332	**OR MOTORE**	ADJUSTMENT RING NUT

TAV. 1N – DCBL 50



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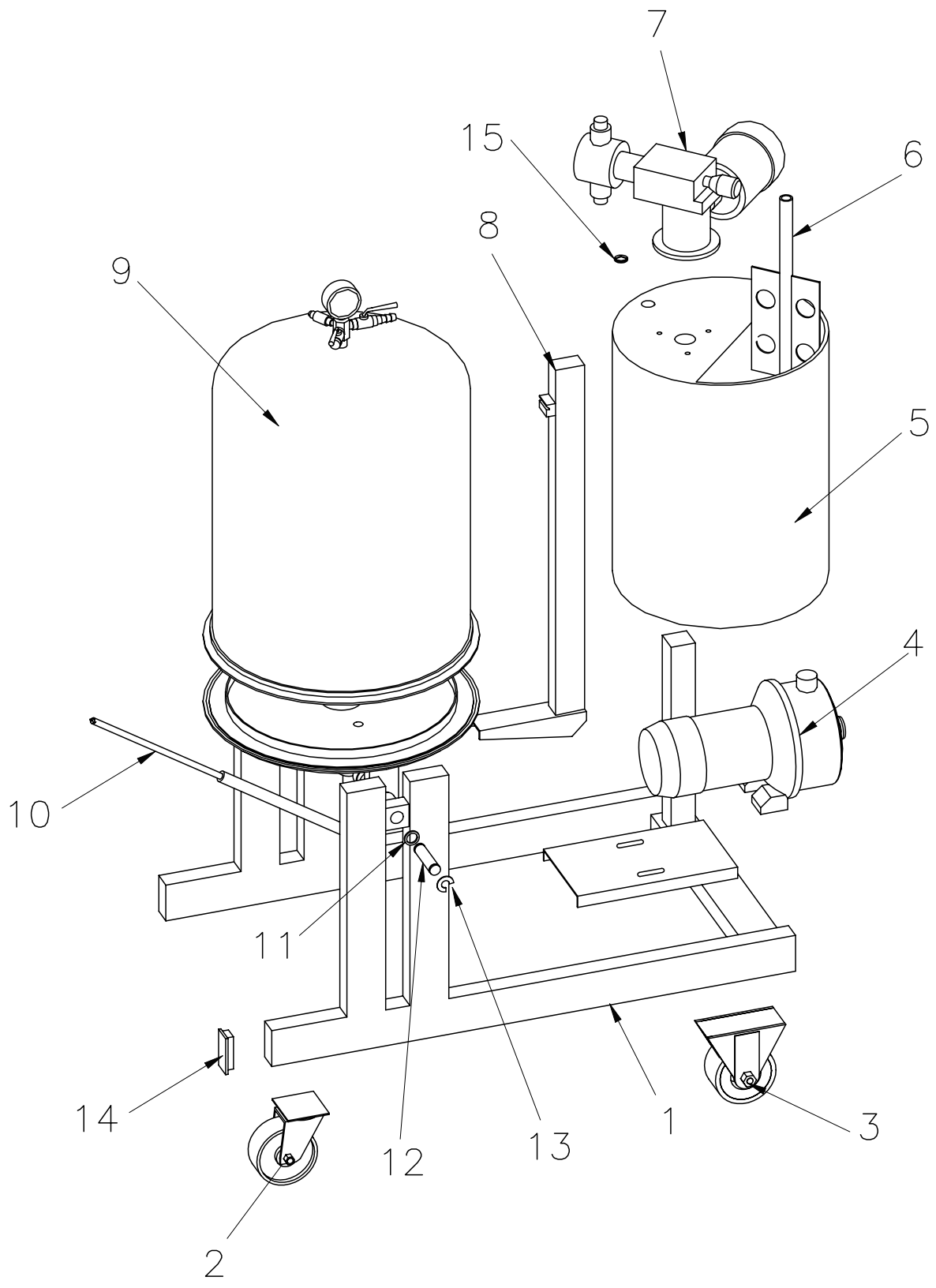
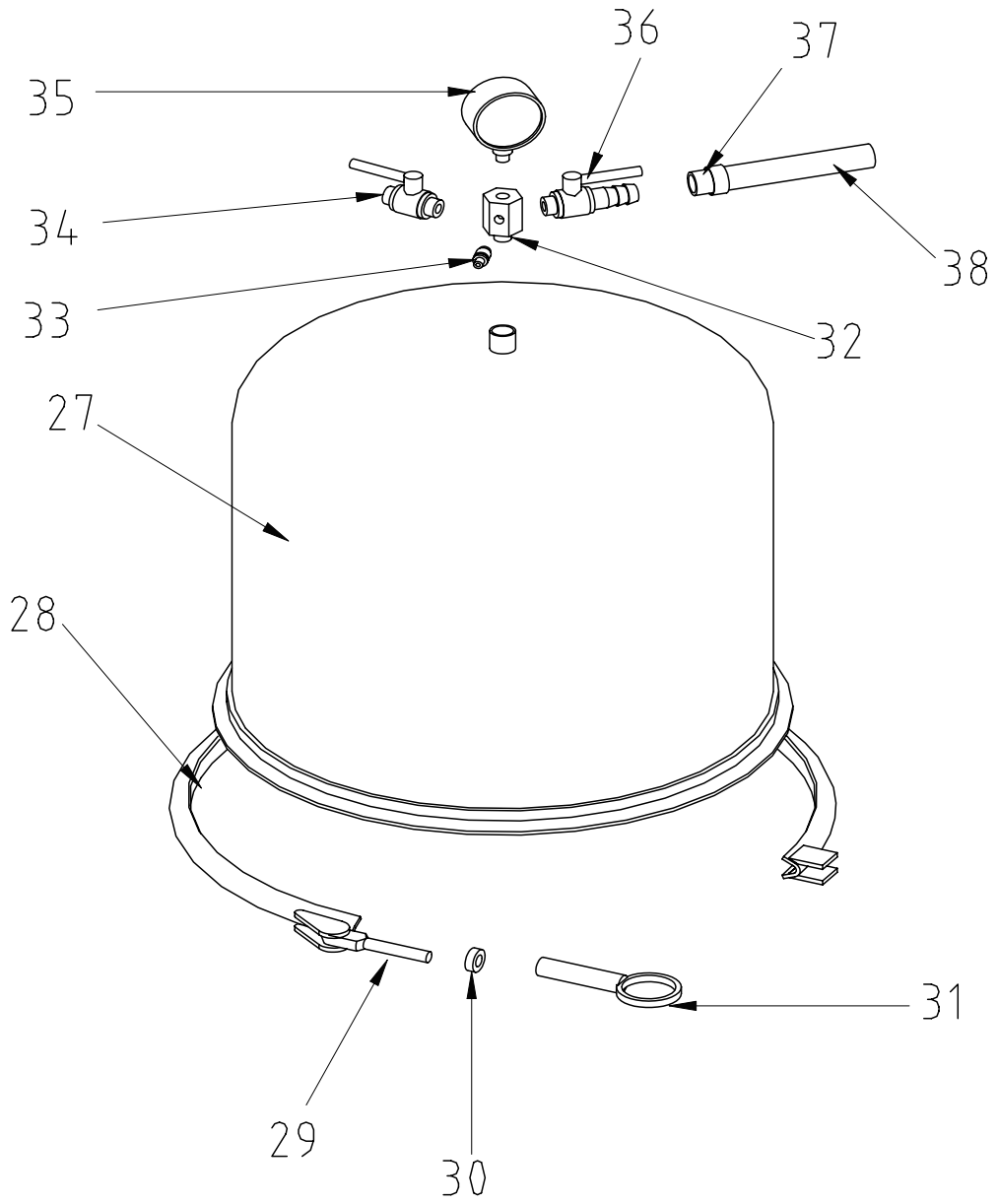


RIF.	DESCRIZIONE	DESCRIPTION
1	TELAIO PORTANTE	FRAME
2	RUOTA SGP C/FRENO	WHEEL SGP W/BRAKE
3	RUOTA SF	WHEEL SF
4	ELETTROPOMPA	ELECTROPUMP
5	DOSATORE	DOSATOR
6	MISCELATORE	MIXER
7	POMPA DOSATRICE	DOSING PUMP
8	ASTA SCORRIMENTO CAMPANA *	BELL RUNNING AXE *
9	CAMPANA	BELL
10	AMMORTIZZATORE	SHOCK ABSORBER
11	RONDELLA	WASHER
12	PERNO INOX	INOX PIVOT
13	ANELLO BENZING	BENZING RING
14	TAMPONE	PLUG
15	PASSACAVO	PIPE GUIDE
	**SOLO X VERSIONI DA MQ.3-4-5-6*	**ONLY FOR 3-4-5-6*

TAV. 2N – DCBL 50



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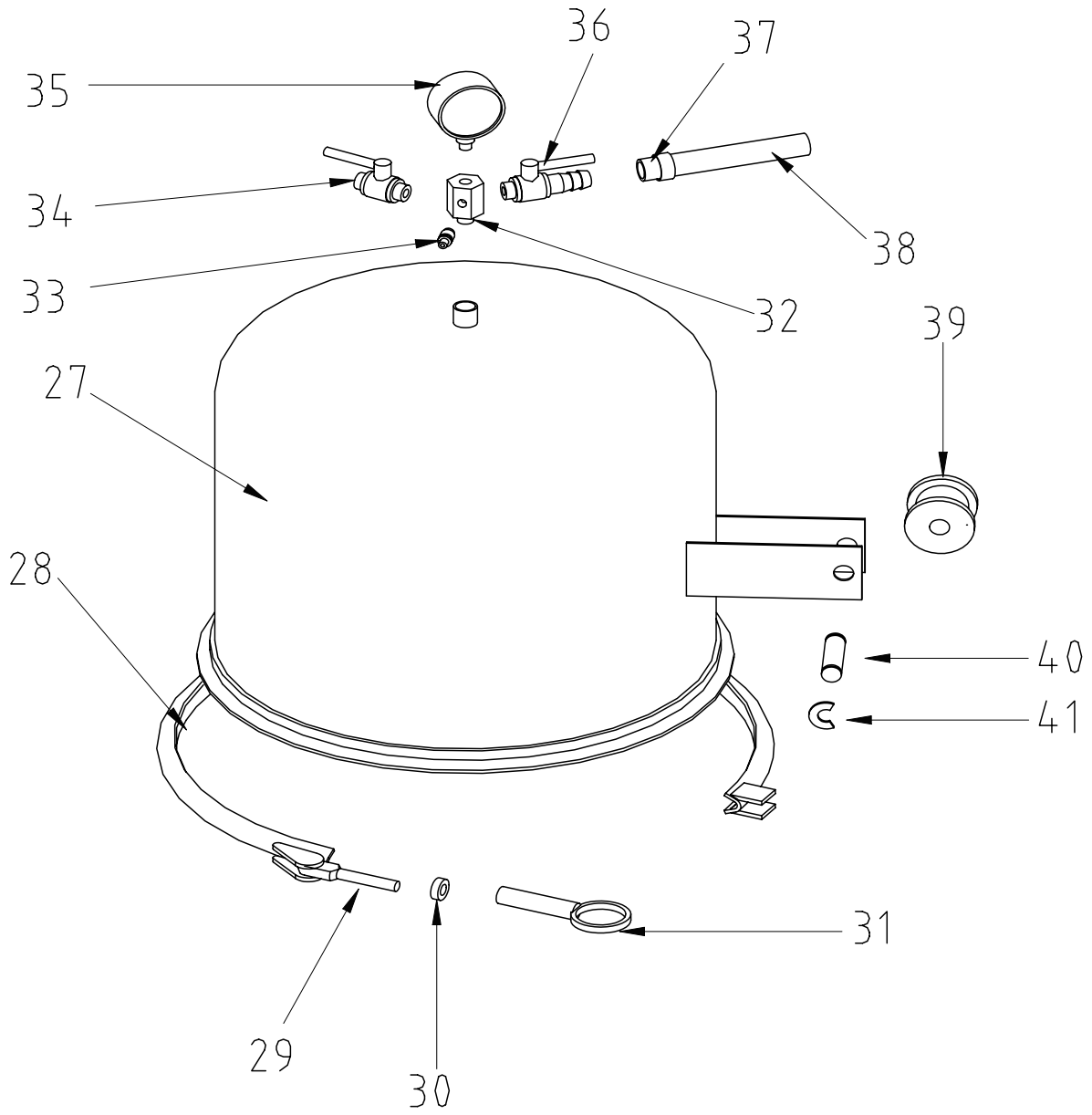

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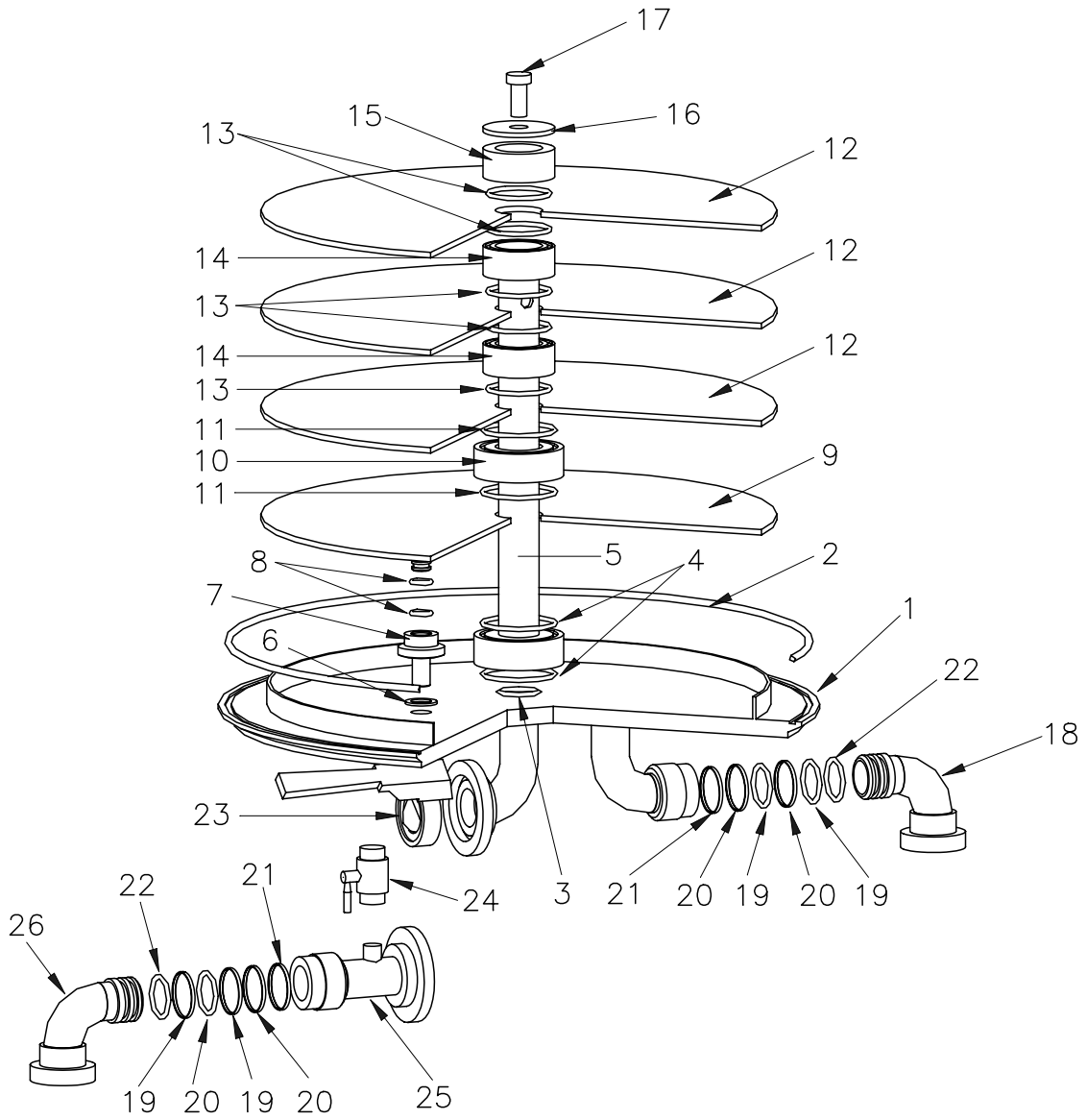
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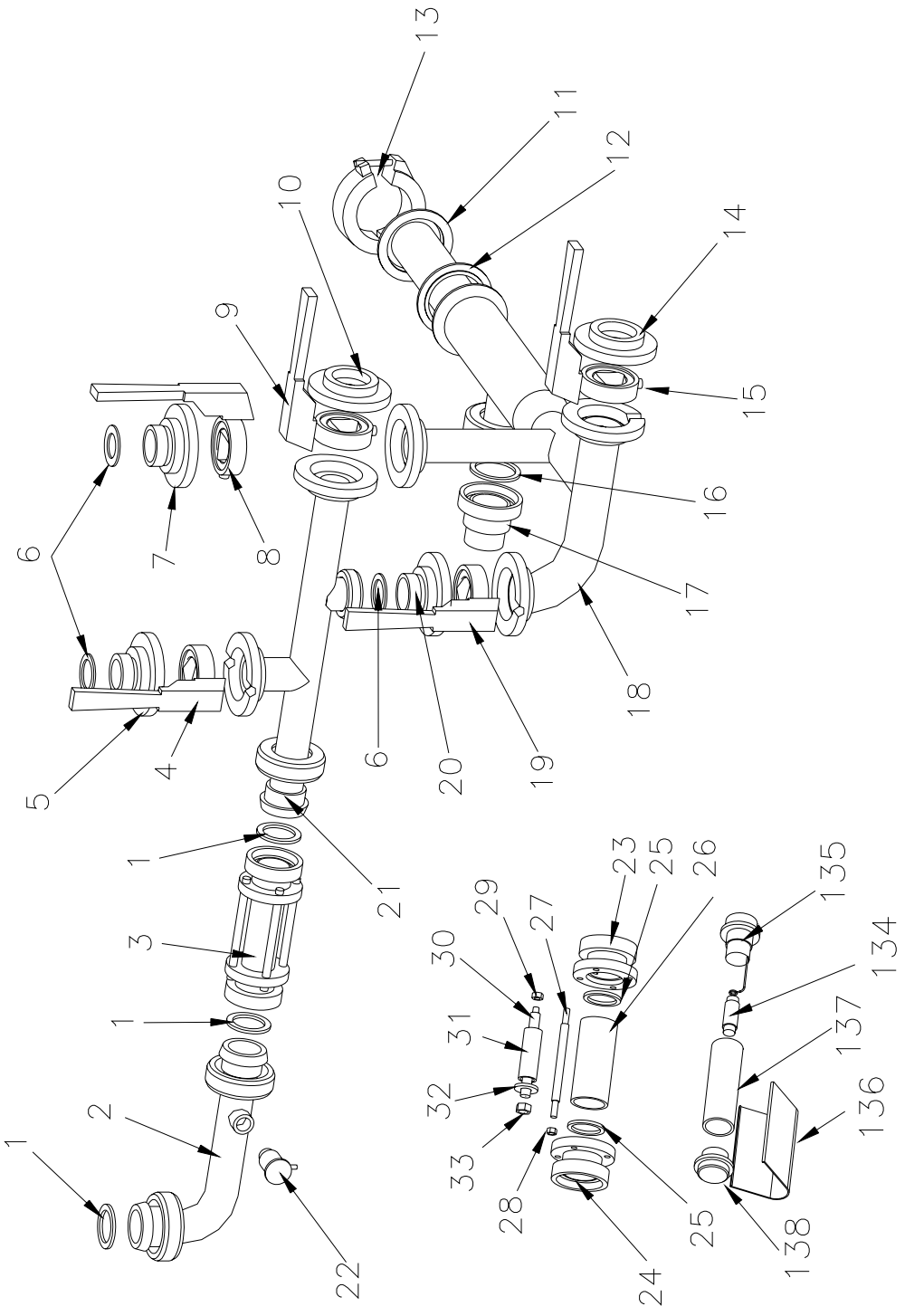
RIF.	DESCRIZIONE	DESCRIPTION
1	GRUPPO BACINO	BASE PLATE
2	OR CAMPANA	0-RING BELL
3	OR	O-RING
4	OR	O-RING
5	COLLETTORE DISCHI	PLATES' COLLECTOR
6	GUARNIZIONE	GASKET
7	SNODO FEMMINA DISCO RESIDUO	FEMALE OUTLET RESIDUAL PLATE
8	OR	O-RING
9	DISCO FILTRAZIONE RESIDUO	RESIDUAL FILTRATION PLATE
10	DISTANZIALE	SPACER
11	O-RING	O-RING
12	DISCO FILTRANTE	FILTERING PLATE
13	OR	O-RING
14	DISTANZIALE	SPACER
15	DISTANZIALE DI CHIUSURA	CLOSING SPACER
16	RONDELLA INOX	INOX WASHER
17	VITE	SCREW
18	SNODO MASCHIO INGRESSO	MALE INLET
19	RING	RING
20	OR	O-RING
21	ANELLO ANTIESTRUSIONE	ANTI-SEIZING RING
22	ANELLO ANTIESTRUSIONE	ANTI-SEIZING RING
23	MANIGLIA COMPLETA	COMPLETE HANDLE
24	RUBINETTO	TAP
25	TUBAZIONE SNODO USCITA	OUTLET PIPING
26	CURVA SNODO MASCHIO USCITA	MALE PIPING ELBOW OUTLET
27	CAMPANA	BELL
28	CLAMP	CLAMP
29	BULLONE SERRAGGIO	BLOCKING NUT
30	RONDELLA ANTIGRIPPO	ANTI-SEIZIING WASHER
31	DADO SERRAGGIO	BLOCKING NUT
32	SFIATO MULTIPLO	MULTIPLE OUTLET
33	VALVOLA SICUREZZA	SURETY VALVE
34	VALVOLA	VALVE
35	MANOMETRO	PRESSURE GAUGE
36	RUBINETTO	TAP
37	FASCETTA INOX	INOX CLAMP
38	TUBO RETIFLEX	RETIFLEX PIPE
39	RULLO CARRUCOLA	PULLEY
40	PERNO CARRUCOLA	GUDGEON PIN
41	ANELLO BENZING	BENZING RING

TAV. 3N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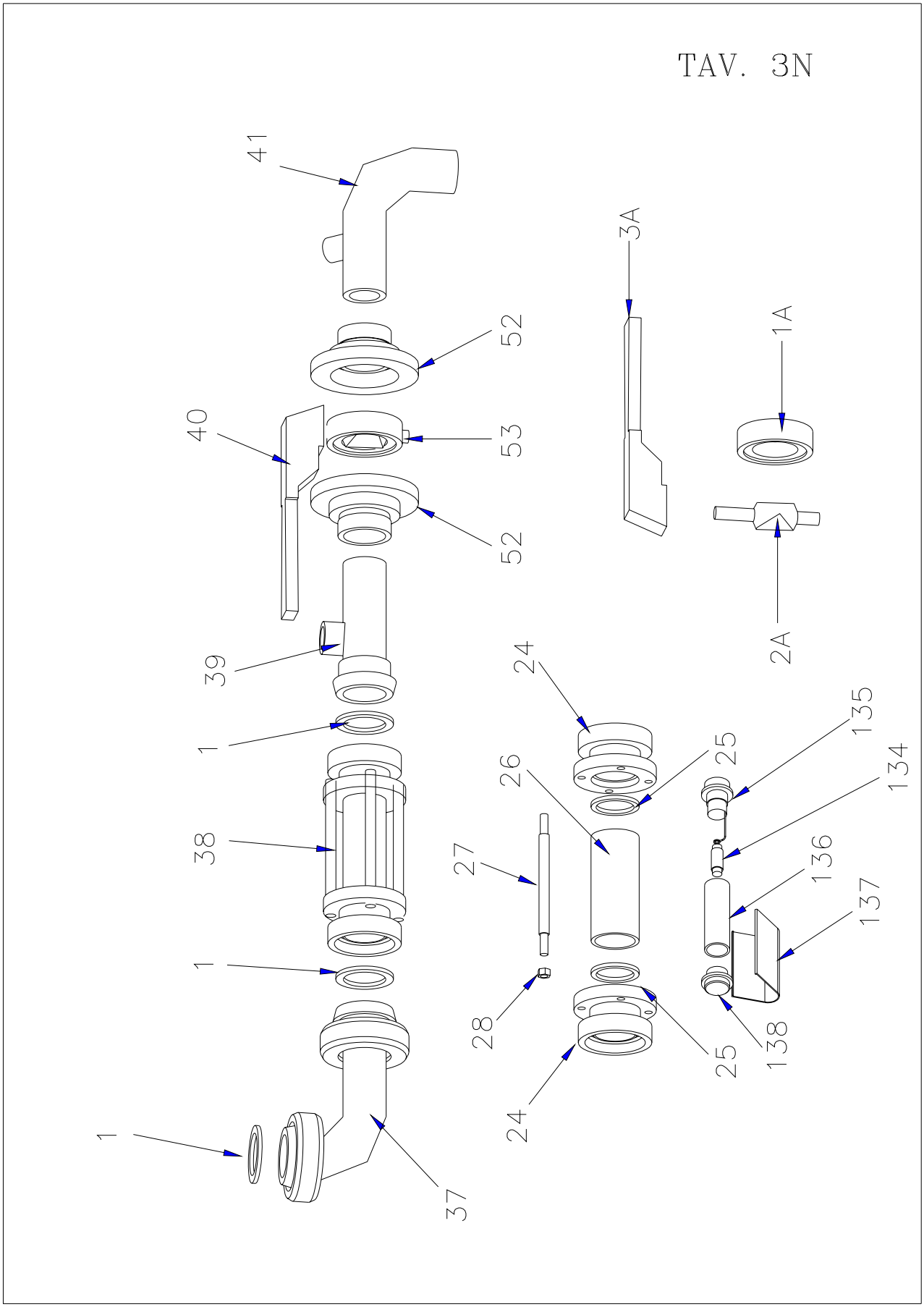
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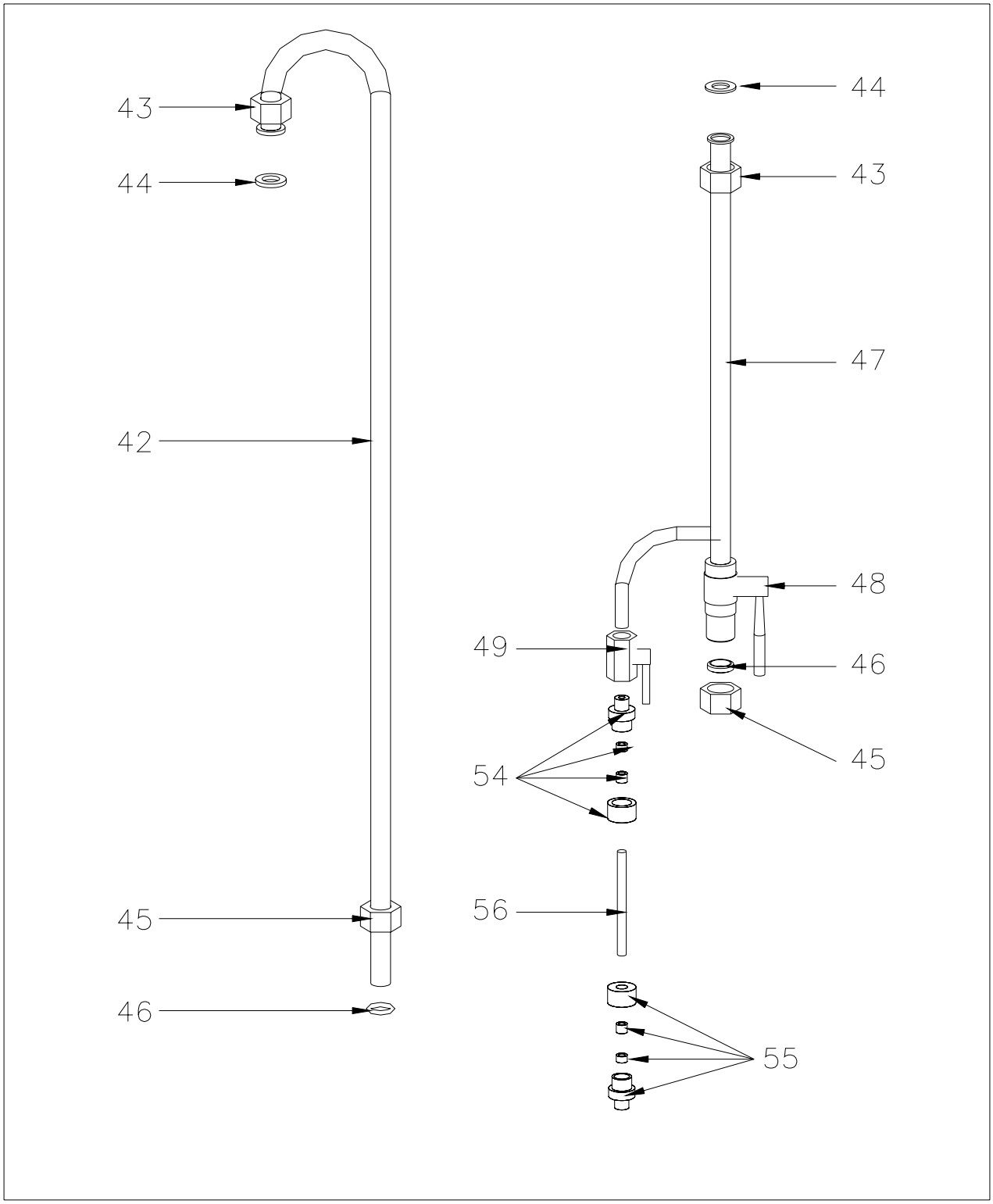
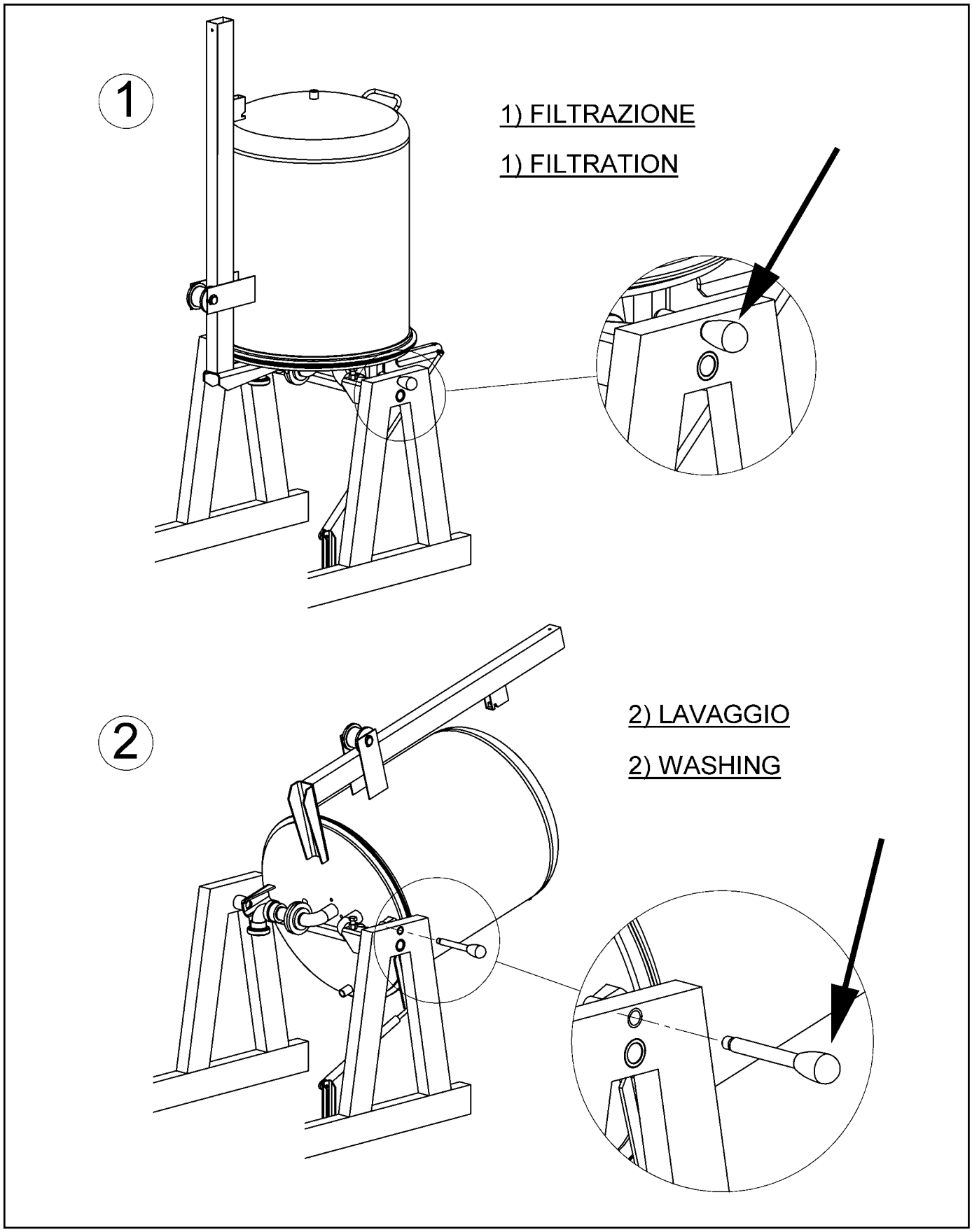
RIF.	DESCRIZIONE	DESCRIPTION
1	GUARNIZIONE	GASKET
2	TUBAZIONE CURVA USCITA	PIPING ELBOW OUTLET
3	SPECOLA CON FLUSSOMETRO	SIGHT GLASS W/FLOW METER
4	MANIGLIA COMPLETA	COMPLET PULL
5	FLANGIA	FLANGE
6	GUARNIZIONE	GASKET
7	FLANGIA	FLANGE
8	MANIGLIA COMPLETA ASPIRAZIONE	COMPLETE PULL INLET
9	MANIGLIA COMPLETA USCITA	COMPLETE PULL OUTLET
10	FLANGIA VALV. FARFALLA	BUTTERFLY VALVE FLANGE
11	PREFIGURO DI ASPIRAZIONE	INLET PRE-FILTER
12	GUARNIZIONE MORSETTO	GASKET
13	MORSETTO	CLAMP
14	FLANGIA VALVOLA FARFALLA	BUTTERFLY VALVE FLANGE
15	MANIGLIA COMPLETA	COMPLETE PULL
16	GUARNIZIONE	GASKET
17	RACCORDO ASPIRAZIONE POMPA	PUMP'S INLET CONNECTION
18	TUBAZIONE RIMONTAGGIO	RECYCLING PIPING
19	MANIGLIA COMPLETA	COMPLETE PULL
20	FLANGIA	FLANGE
21	TUBAZIONE USCITA FILTRATO	FILTERED OUTLET PIPING
22	PRELIEVO CAMPIONE	SAMPLE TAP
23	FLANGIA SPECOLA BF	SIGHT GLASS FLANGE BF
24	FLANGIA SPECOLA BF	SIGHT GLASS FLANGE BF
25	GUARNIZIONE SPECOLA	SIGHT GLASS GASKET
26	VETRO PIREX PER SPECOLA	PIREX GLASS FOR SIGHT GLASS
27	TIRANTI PER SPECOLA	TIE ROD FOR SIGHT GLASS
28	DADO	NUT
29	DADO	NUT
30	ASTA MISURATORE	AXE MEASURER
31	MOLLA	SPRING
32	RONDELLA	WASHER
33	DADO	NUT
37	TUBAZIONE INGRESSO CAMPANA	BELL INLET PIPING
38	SPECOLA DI LINEA	LINE SIGHT GLASS
39	TUBAZIONE INNESTO MANDATA FARINA	D.E. INLET PIPING
40	VALVOLA	VALVE
41	TUBAZIONE MANDATA POMPA	PUMP'S INLET PIPING
42	TUBAZIONE MANDATA POMPA DOSATRICE	DOSING PUMP'S INLET PIPING
43	GHIERA	RING
44	GUARNIZIONE	GASKET
134	LAMPADA TUBOLARE	LAMP
135	PORTALAMPADA	LAMPHOLDER
136	SCATOLA INOX PORTALAMPADA	INOX LAMPHOLDER BOX
137	PROTEZIONE LAMPADA	LAMP PROTECTION
138	CHIUSURA LAMPADA	LAMP TAP

RIF.	DESCRIZIONE	DESCRIPTION
45	GHIERA	RING
46	OGIVA	OGIVE
47	TUBAZIONE ASPIRAZIONE FARINA FOSSILE	D.E. INLET PIPING
48	VALVOLA	VALVE
49	VALVOLA ASSAGGIAVINO	SAMPLING TAP
52	FLANGIA	FLANGE
53	OTTURATORE	SAFETY CATCH
54	RACCORDO EC 10	CONNECTION EC 10
55	RACCORDO EW 10	CONNECTION EW 10
56	TUBAZIONE LAVAGGIO	WASHING PIPING
1A	GUARNIZIONE VALVOLA A FARFALLA	BUTTERFLY VALVE GASKET
2A	FARFALLA	BUTTERFLY
3A	MANIGLIA	HANDLE

TAV.3N




1
1) FILTRAZIONE
1) FILTRATION
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2) LAVAGGIO
2) WASHING