

DRESTER 120

USE and MAINTENANCE

ENGLISH



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USE and MAINTENANCE

Solvent Distiller

RS120

Original instructions - Rev. 3.00

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The present manual contains instructions for optional devices that might not be installed on the machine.

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CE (DECLARATION OF CONFORMITY)

WARRANTY CERTIFICATE


1. GENERAL INFORMATION

For the safe use of the **FORMECO** distillation units it is obligatory to read the general **Distillation Guide** as well as this manual.

1.1. Distillation unit DT for non flammable solvents

The machines indicated with the first letters **DT**, are equipped with a splash-water proof electrical part (IP44) and can be used only for the distillation of **non-flammable** solvents.

1.2. Distillation unit RS for flammable solvents

The machines indicated with the first letters **RS**, are equipped with an explosion proof electrical part (According to **ATEX** ) and can be used in **ZONE 1** and **ZONE 2** and are suitable to distil both **flammable** and **non-flammable solvents**.

1.3. Operating principle

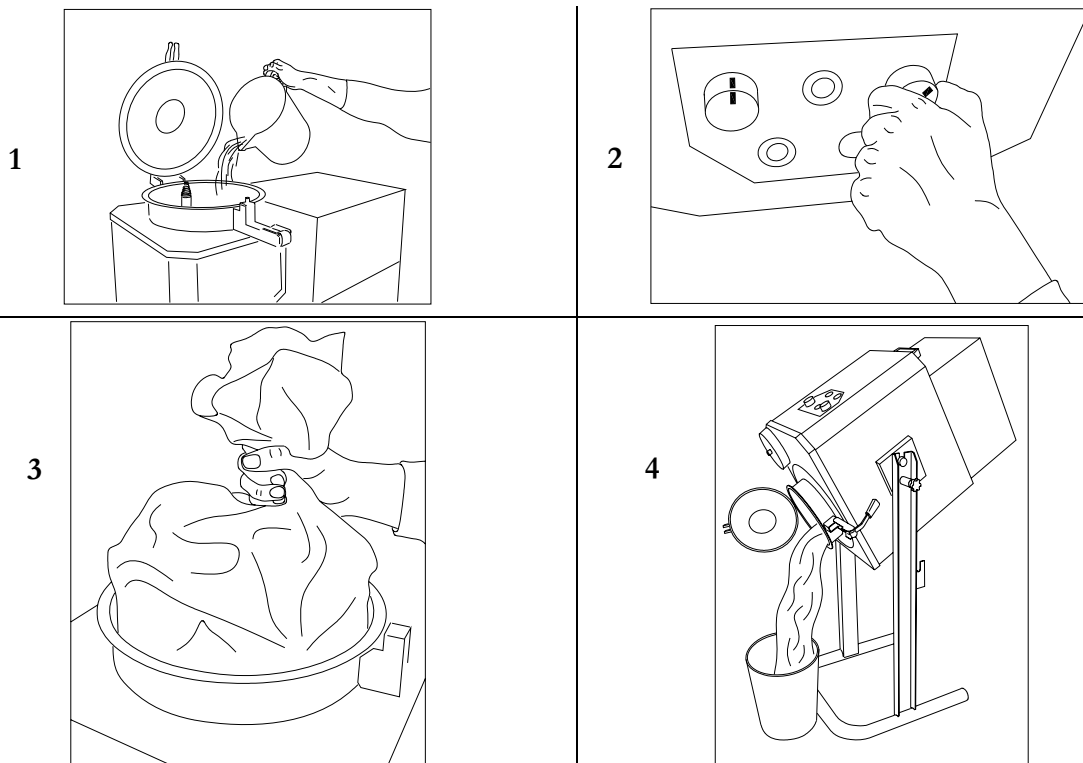
Exploiting the principle of simple distillation, the unit separates the contaminations (such as resins, paints, pigments, ink, oil, grease, etc.) from the original solvent, which, once recycled directly into a tank, can then immediately be used again. The contamination remains on the bottom of the boiler and can easily be unloaded at the end of the cycle.

The boiling of the polluted solvent takes place in a boiler surrounded by a cavity space containing diathermic oil heated by an electric element. The vapour is conveyed to an air cooled condenser and transformed back into a liquid state; the condensed solvent is collected in a tank. The characteristics of the solvents will in no way be altered by the process if the instructions are followed carefully. The number of distillations can hence be repeated indefinitely.

The unit allows the recovery and re-use of solvents with a boiling point between 50 and 180 °C. Using a vacuum unit (optional) solvents with a boiling point up to 220 °C can be recycled.

1.4. Operation

The operation cycle is fully automatic, the intervention of the operator is only necessary for loading the solvent to be distilled (1), setting temperature and distillation time (2) and unloading of the residues (3-4).



1.5. Safety features

The distillation unit operates at atmospheric pressure.

Cases of abnormal high temperature increase or faulty operation of the condenser are signalled and the machine stops automatically.

2. TECHNICAL INFORMATION

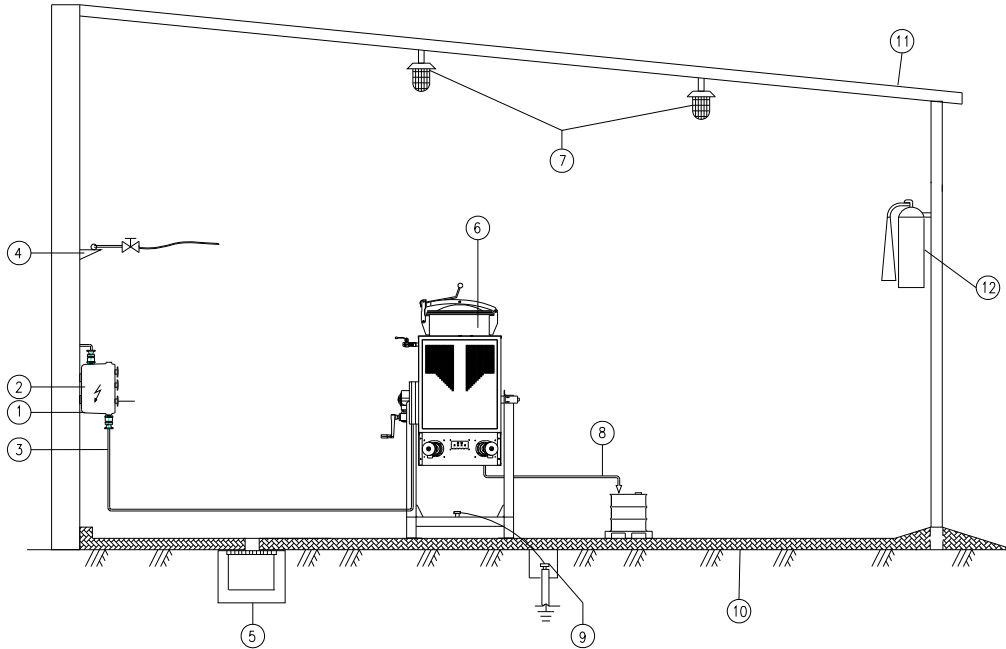
Description	U.M.	RS 120
Installed power	kW	1.06
Heating power	kW	1.0
	kcal/h	868
Voltage	V	230
Frequency	Hz	50
Section mains cable	mm ²	1.5
Fuses or magnet switches	A	4.5
Ground connection	mm ²	6
Maximum surface temperature	°C	195 (for T3 machines) or 225 (for T2 machines)
Sound level	dB (A)	64
Geometric boiler volume	litres	19
Loading volume	liters	12 - 15
Compressed air connection (for vacuum)	BSP ¹	3/8 " F
Pressure min / max	bar	6/8
Diameter of piping	mm	6 x 8
Compressed air consumption	l / 1'	30 – 35
Width	mm	590
Depth	mm	600
Height	mm	1400
Weight	kg	80
Containment bund	mm	2500x2500
Collection drain	mm	500x500x600

¹ BSP = British Standard Pipe (cylindrical Gas thread)

3. INSTALLATION LOCATION

3.1. Installation location

For the correct installation of the distillation unit it is necessary to classify the risk area, and assure a proper ventilation and the use of certified electrical and non-electrical equipment according to ATEX 95 (directive 94/9/EC)



LEGEND

1	Feed box	7	Lighting
2	Fuses or magnet switch	8	Distillate outlet
3	Feeding cable	9	Earth connection
4	Compressed air connection (for optionals)	10	Containment basement
5	Collection reservoir	11	Roof
6	Distillation unit	12	Fire extinguisher

It is necessary to install fire extinguishers (12), in correct places and in adequate number. The extinguishers must be for fires of class B (fires of inflammable liquids) and class C (inflammable gas fires). Warning signs have to be installed bringing attention to the possible dangers.

If the machine is installed outside, it has to be protected by a roof (13).

When treating flammable solvents, all electrical equipment present (lighting, sockets, etc.) have to be installed according to the existing norms regarding the areas of explosion risk.

a. Containment bund

The containment bund (10) for machines up to 120 litres can be formed by a metallic bund. For bigger machines the floor can be in cement with a small wall, to contain accidental spillage. The volume of the bund should be at least 1.5 times the amount of solvent in the machine.

The basement should have a slight slope (1%) towards the collection reservoir (5).

b. Collection reservoir

To collect accidental spills.

The collection reservoir should have a size to be able to install a pump to remove the accidentally spilled solvent (e.g.: 500 x 500 x depth 600 mm).

3.2. Electrical connection

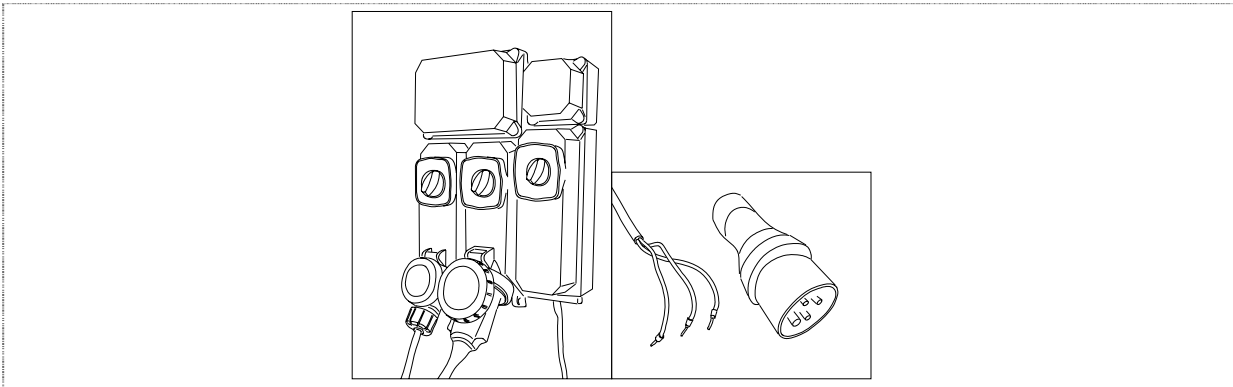
Verify that the electrical circuits of the distillation unit have not been damaged during transport. Check that the screws on the cable connector and of the earth connections are well tightened. Verify that the voltage and the frequency of the power supply coincide with the data on the identification tag of the machine.

Install a power supply (2) together with :

main switch for the machine

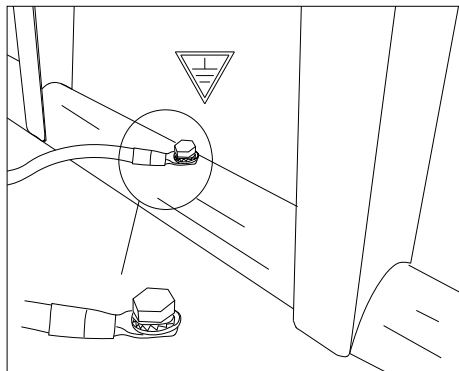
n° 3 fuses or magnet switches set at 50% over the absorbed current of the machine

Connect a plug to the feeding cable of the machine.



a. Earth connection of the machine and the auxiliary vessels

Connect the unit support, the containment basin and connected drums with an isolated earth cable to an efficient earth connection.



4. ASSEMBLY AND INSTALLATION

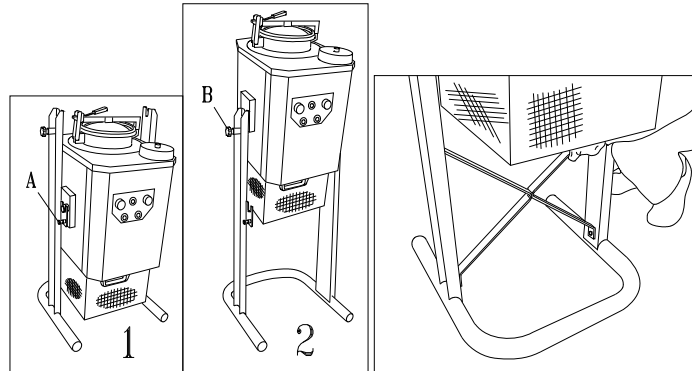
4.1. Frame mounting

Remove the machine from its packing and place it in the required location according to the following instructions.

Allow a free space around the machine of at least 1000 mm, to be able to for the operator and to the maintenance staff to access the machine without any problems. This area should remain free to be able to access all parts of machine if necessary.

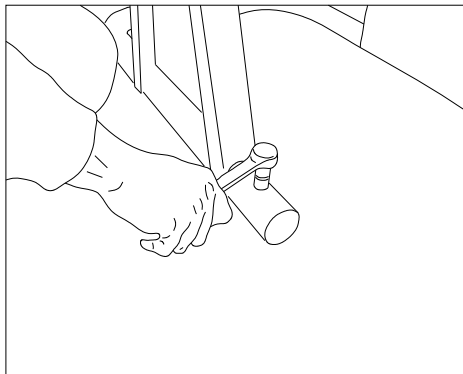
a. Packing

Remove the machine from the transport hole **A** and slide it into hole **B**, install the washer provided. Lock the rotation of the machine with the spring loaded pin. Finally, install the reinforcement cross member with the screws.



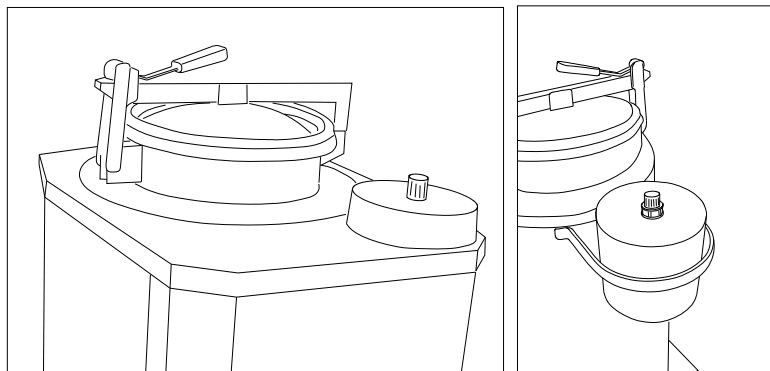
b. Floor fixing

Fix the machine to the floor with screws through the prearranged holes.



c. Bleeding valve

Remove the plastic cap from the oil expansion vessel and screw on the oil bleeding valve provided in place of the cap.



d. Verification of the cover gasket

According to the type of solvent to be distilled, the proper cover gasket must be utilized.

See the table for the used codes.

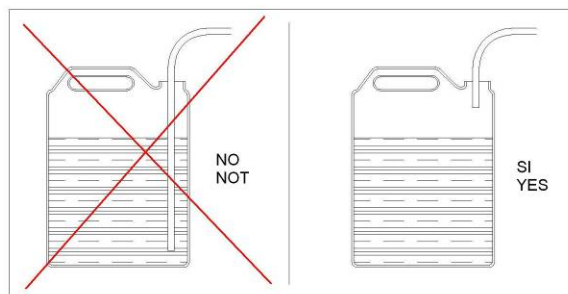
RS 120	Type	Colour	Description
359001	STANDARD	Black	For general use and for solvent mixtures. Unless specified, it is mounted standard on the unit.
359002	ACETONE	Grey	For pure acetone or for diluents with a high percentage of acetone.
359003	VITON	Green	For chlorinated solvents (methylene chloride, Freon, chloroethene, trichloroethylene, perchloroethylene, etc.)
239004	UNIVERSAL	White	Suitable for all solvents.

4.2. Connecting the distillate tank

Put a container of proper size in line with the distillate discharge nozzle. To connect the nozzle with the container, it is advisable to use a solvent-resistant rubber pipe in order to avoid evaporation and possible odours.

The tube must enter the container only for a few centimetres in order that it is never submerged in the distillate. Furthermore the connecting tube should not have bends and curves to avoid over-pressure formation in the boiler and possible vapour escape.

The container should be made of metal and it is necessary to earth it.



The container must not be sealed in order to allow a free air circulation. Provide a flame block on the air outlet when distilling flammable solvents.

5. STARTING OPERATIONS

5.1. Solvent loading

The solvent loading has to be done manually with the help of a container, or with through a loading pump. Make sure not to pour solvent into the vapour manifold: the first distillate would come out dirty

a. WITH LIQUID CONTAMINANTS (oil, ink, etc.)

Pour the solvent to be distilled into the boiler up to the reference sign which indicate the maximum level.

b. WITH SOLID CONTAMINANTS (paints, polyester resins, etc.)

Always use the non re-usable 'RecBag'. In this way the unit will always work with the maximum efficiency, the cleaning will be facilitated and the operator will not have to breathe in noxious vapours.

5.2. Rec-Bags

The Formeco Rec-Bags are tested according:

- EC Type Examination Certificate TÜV-SUD – TPS 05 ATEX 2 163 X
- EPH Test Certificate

The formulation of the material of the Rec-Bag has been studied and approved for the use in potentially explosive atmospheres of Zone 0, 1 and 2 and Gas Group IIA. They cannot be used for group IIB and IIC.

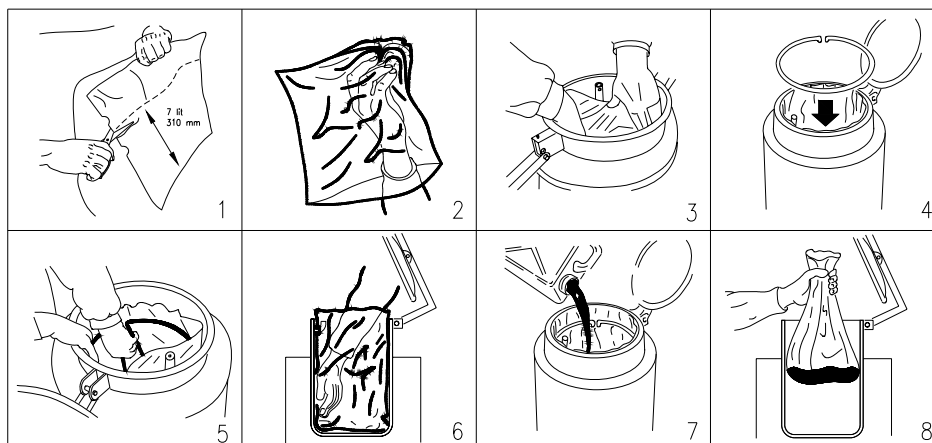
The use of non-original bags can provoke fire or explosion risks due to the accumulation of electrostatic charge on the bags during distillation.

It is therefore prohibited to use non-original bags. The use of non-original bags voids the warranty on the machine as well as the ATEX certification. Formeco declines any responsibility for possible damages that, directly or indirectly, may be caused to persons or property as a consequence of the use of non-original bags.

The Rec-Bags are made to work with neutral solvents up to a temperature of 160 °C and can be used for only one distillation/drying cycle. For working temperatures up to 180-200 °C, ask for the 'RecBag T'. In cases where it is not possible to use the RecBag, we advise to use some Formeco detaching product to enable the easy removal of the residue.

5.3. Positioning of the Rec-Bag

- Pull the bottom corners inward and place the Rec-Bag in the boiler, making sure that the bag adheres perfectly to the boiler wall. Air bubbles between the bag and the boiler surface have to be avoided.
- Insert the Ring-Bag in the boiler
- Block the Rec-Bag using the stop ring 'Ring Bag'.



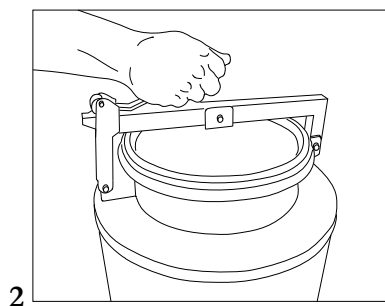
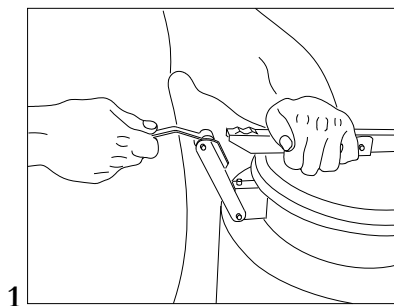
5.4. Solvent loading

Pour the solvent to be distilled into the boiler up to the reference sign which indicate the maximum level. Make sure not to pour solvent into the vapour manifold: the first distillate would come out dirty. The machine is equipped with a lateral loading pipe for easy connection to the washing booth.



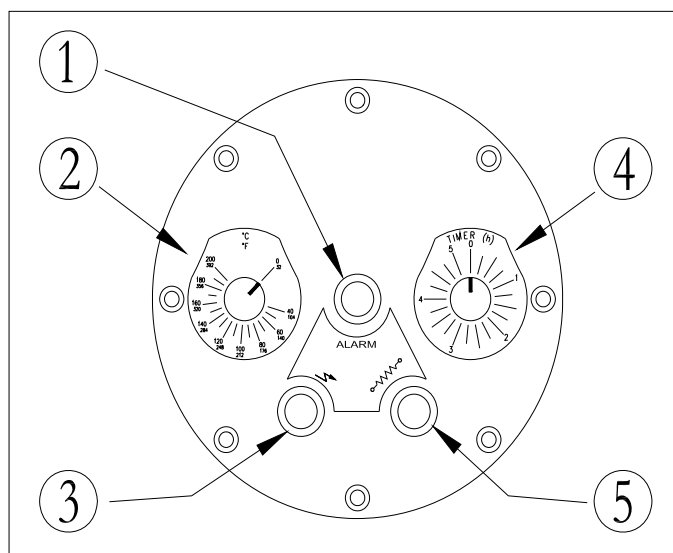
5.5. Cover closing

1. Hook the cover closing handle over the cover bar. When closing the cover, pay attention not to damage the cover seal.
2. Rotate the cover closing handle to complete the cover closure.



5.6. Programming of the working cycle

a. Command panel RS 120



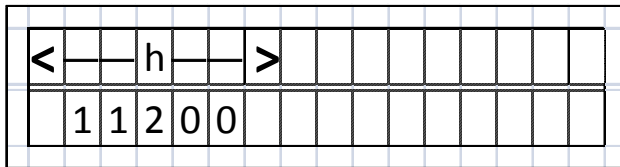
1	Red light: Alarm
2	Working thermostat
3	Green light: Power ON
4	Cycle timer
5	Green light: Heating ON

b. Control board RS 120 LCD



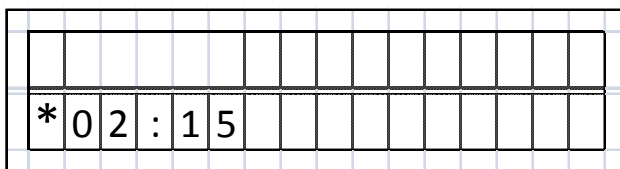
1	ON-OFF + Setting of process time
2	Liquid Crystal Display
3	Setting of process temperature

LCD managing



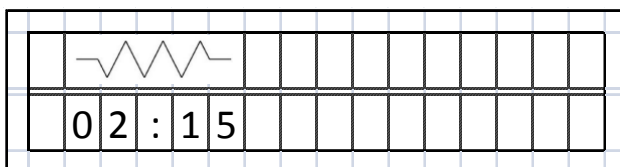
Machine stopped

In the display is indicated the total process time of the plant.




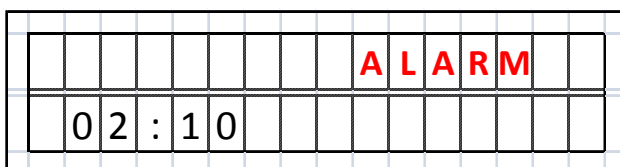
Time setting

On the left bottom side the symbol * flashes for 8 seconds till the required process time will be settled. For setting a new process time, place the knob in the position "OFF" and repeat the setting operation above.



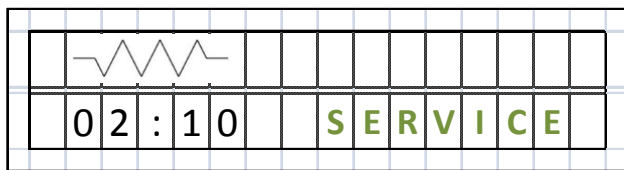
Machine working

In the display is indicated the active heating by the symbol  and the countdown of the settled time.



Alarm

In the display is indicated the alarm state by the flashing words "ALARM". During this event the machine passes, automatically, to the cooling phase for 20 minutes. Ventilation fan activated and heaters deactivated. At the end of the cooling time, reset the plant (see specific chapter in the instruction manual).



Service

In the display is indicated also the word "SERVICE" which flashes when 2000 working hours have been reached; it is time to replace the thermal oil.

After having replaced the oil, re-set the plant switching 8 times the knob "ON/OFF" (see specific chapter in the instruction manual).

c. Temperature setting

Set the working thermostat to a temperature of 20-30 °C higher than the boiling temperature of the solvent to be distilled. In the case of Nitro based products or Synthetics set the working temperature at 160 °C.

If the residue has to be dried, the working thermostat has to be set to 170-180 °C.

For more information on distillation temperatures, see the specific tables in the **General Handbook**.

Some solvents (e.g. halogenated solvents) are thermally unstable. Pay attention to the working temperature, otherwise the product will acidify. Set the thermostat on the working temperature as reported in Table of Non-flammable Solvents.

d. Timer setting

The first time, set the distillation timer at the maximum setting; the time between the beginning of the cycle and the moment in which no more distillate comes out of the unit will be considered the optimal time. This time is to be set for successive distillation cycles.

Normally a cycle lasts for 3-4 hours. For drying the residue this time can be prolonged with 15-30 minutes.

Distillation time depends on the type of solvent distilled as well as the degree of contamination. The indicated distillation times are therefore to be regarded as purely indicative and they refer to a distillation cycle with cold machine start up. In case of more consecutive distillation cycles, the time of the cycles after the first can be reduced with about 30 minutes.

e. Start of the unit

Switch on the power to the machine with the main switch. The Mains green indicator light and operation green indicator light will switch on: thus the cycle begins.

The distillate will start to flow out after about 40-50 minutes.

At the beginning of the distillation, check the correct out flow of solvent from the distillation unit to the collection tank.

The correct functioning of the distillation unit has to be checked at least every 90 minutes.

5.7. Stop of the unit

At the end of the preset time the heating will stop automatically. The condenser air-fan will operate for another 20 minutes.

To stop the unit manually, rotate the timer knob to 0 (zero).

5.8. Residue unloading

Before proceeding with the removal of the distillation residue, wait until the diathermic oil temperature is below 50 °C. Turn the power by turning the main switch.

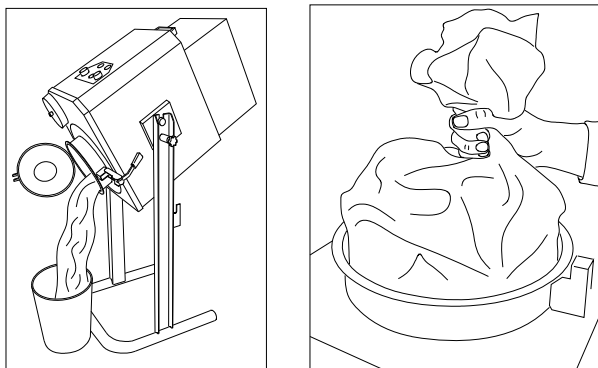
Provide a container for the collection of the residue and open the cover by:

1. Rotating the locking lever to unlock the cover

2. Unhook the eccentric lever from its position

In the presence of **liquid residues**, rotate the machine using the handle. For the model RS120 it is necessary to unlock the machine with the knob on the side of the machine. The machine can be locked with the same knob in the unloading position.

In the presence of **solid residue**, remove the retaining ring and remove the Rec-Bag inside the boiler paying attention not to break it. The small amount of solvent that might have formed on the bottom of the boiler can be removed like described above.



5.9. Important advice

Do not rotate or shake the unit once loaded or when operating.

Clean the oil expansion vessel only with a 'wet' rag to avoid generating sparks.

Opening the cover sooner than one hour after the distillation cycle has finished will cause the cover gasket to swell.

Some solvents during the distillation phase create such a quantity of foam that a correct separation of the solvent from the polluting product is not possible. In these cases the distillate will be dirty. This inconvenience can be overcome by using the optional antifoam kit.

Model	RS 120
ANTIFOAM KIT	301900

6. SAFETY SYSTEMS AND ALARMS

6.1. Temperature safeties

The distillation unit is equipped with safety features to control the proper working temperature.

A safety thermostat is also installed on the distillate outlet, to assure the proper working conditions.

a. Working temperature

Distillation unit in Temperature Class T2		
ST1	Working thermostat	50 - 210 °C
Distillation unit in Temperature Class T3		
ST1	Working thermostat	50 - 185 °C

b. Maximum temperature diathermic oil

Distillation unit in Temperature Class T2		
ST4	Maximum thermostat (fixed setting)	225 °C
Distillation unit in Temperature Class T3		
ST4	Maximum thermostat (fixed setting)	190 °C

The maximum safety thermostat has a manual reset. To reset the thermostat it is necessary to:

1. isolate the power from the machine using the main switch;
2. open the control box of the machine;
3. verify the reason for the thermostat intervention, if necessary replace the defective thermostat;
4. push the reset button on the thermostat to reset it

c. Distillate temperature

ST3	Maximum thermostat on condensate (fixed setting)	40 °C
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When the distillate temperature rises above 40°C, this thermostat momentarily blocks the heating of the machine.

Verify the reason for the alarm, replacing the thermostat if necessary.

d. Temperature alarm

In case the maximum thermostat **ST4** or the condenser thermostat **ST3** go in alarm, the red alarm light comes on.

6.2. Over pressure safety

The working cycle of the machine is performed at atmospheric pressure or under vacuum (for the models equipped with optional vacuum group).

The cover of the boiler acts as over-pressure valve. The safety valve intervenes at 0,1 bar above atmospheric pressure.

In case of overpressure formation in the boiler, the machine has to be stopped and the cause for the overpressure has to be removed.

Do not interfere with the spring of the cover to prevent the outflow of vapour.

7. DEFECTS AND SOLUTIONS

DEFECTS	CAUSES	REMEDIES
During automatic loading the machine does not reach the level controller (optional)	The set loading time is too short	Augment loading time
	Low compressed air pressure	Higher the air pressure to increase the loading speed of the pump
The unit is 'ON' but does not heat	Working thermostat at zero	Set working temperature
	Electrical resistance burned out	Change the electrical resistance
	One of the thermostats is faulty	Change the faulty thermostat
The distiller heats but does not distil	Boiler is dirty	Clean the boiler
	Solvent boiling temperature is higher than the one set on working thermostat	Set a higher temperature on the working thermostat
	Solvent boiling point is higher than distiller maximum working temperature	Change the solvent with one that has a lower boiling point or distil under vacuum with suitable kit (optional)
	Diathermic oil is worn out	Change the diathermic oil
	Lack of diathermic oil	Top up the diathermic oil till the minimum level when the machine is cooled down
The unit distils only part of the dirty solvent	Insufficient operating time	Increase the operating time
	The undistilled fraction has a boiling temperature higher than the set temperature on the working thermostat	Set a higher temperature on the working thermostat
	Solvent boiling point is higher than distiller maximum working temperature	Change the solvent with one that has a lower boiling point or distil under vacuum with suitable kit (optional)
	The working thermostat is defect	Change the working thermostat
Distillation time is much longer than the maximum setting time	There is a considerable percentage of water in the dirty solvent	Replace the solvent
	Lack of diathermic oil	Top up the diathermic oil till the minimum level when the machine is cooled down
	Diathermic oil is worn out	Change the diathermic oil
	The electrical resistance is scaled	Take out the diathermic oil and clean the electrical resistance
The cycle does not stop at the time set on the working timer	Cycle timer is defect	Replace cycle timer
The distillate comes out dirty	Unit has been loaded with a quantity higher than the maximum	Load the exact quantity
	Solvent foams	Load with a lower quantity
		Use the anti-foam kit
		Reduce working temperature
Temperature set on working thermostat too high	Reduce working temperature	
Vapour manifold or vapour condenser dirty	Wash manifold and condenser by pouring in clean solvent with a funnel or by blowing in compressed air	
Distillate takes on a greenish colour	Condenser is corroding	The solvent is acid, replace the copper condenser with a stainless steel one
		The temperature setting is too high and the solvent acidifies: set a lower working temperature
		If the temperature set on the working thermostat is correct, acidification has occurred before the distillation. Replace the solvent immediately.

DEFECTS	CAUSES	REMEDIES
The solvent bleeds out of the cover	Worn out gasket	Replace the gasket
	Vapour manifold is clogged	Wash manifold and condenser by pouring in clean solvent with a funnel or by blowing in compressed air
	Vapour condenser is clogged	Replace the condenser
	The distillate outflow is blocked	Wash the discharge line by pouring clean solvent in the vapour manifold with a funnel and blow with compressed air Check that the discharge line is not under the distillate level in the collection vessel
The 'RecBag' is damaged	Working temperature too high	Reduce the working temperature Use 'RecBag T'
	The solvent is acid	Distil only neutral solvents
Cover gasket swells	The boiler cover is opened when the machine is still hot	Wait until the oil temperature has sunk under 50 °C, before opening the cover
	The cover gasket is not suitable for the type of solvent treated	Mount the suitable gasket
Smoke comes out from under the cover	Overheating of the polluting products or presence of nitrocellulose	Reduce the working time and/or temperature. Possibly distil under vacuum with the suitable kit (optional)
	Worn out gasket	Replace the gasket
The red indicator light switches on "ALARM"	Diathermic oil temperature is higher than the maximum allowed one: thermostat of maximum temperature intervenes	Replace the working thermostat and reset the maximum thermostat by pushing the reset button of the thermostat
	Distillate temperature is over 60 °C	Verify the correct functioning of the condenser and its fan
	Ambient temperature is too high	Ventilate the room or do not work at very warm days
	Ventilator motor burnt out	Replace ventilator motor
	Vapour condenser dirty on the outside	Clean with a compressed air jet
The red indicator light flashes "ALARM"	The security thermostat of the condenser is defected	Call the producer for the setting or replacement of the thermostat
	The machine has reached 2000 working hours	Replace the oil and clean the heating element

8. MAINTENANCE

The maintenance has to be performed by specialised personnel that are adequately trained.

For the annual maintenance and for the changing of the diathermic oil it is advised to request assistance from an authorised service centre or to the manufacturer.

8.1. Periodic ATEX verification

The electrical installations in areas with explosion risks have specific characteristics that make them apt to operate in such areas. It is essential, for safety reasons, during the lifecycle of the apparatus, to maintain these characteristics; therefore a periodic control is necessary that is at least once every three years (EN 60079-). This control has to be performed by qualified personnel.

In the occasion of maintenance or repair on the machine, the qualified personnel can perform the necessary checks.

8.2. Daily maintenance

a. Cleaning of the boiler

Clean daily the inside of the boiler, removing crusts and deposits that might have been formed. In that way the heat exchange between diathermic oil and solvent remains at its optimum.

b. Check diathermic oil

Check the diathermic oil level in the oil expansion vessel when the unit is cold. If necessary top up the level.

8.3. Weekly maintenance

a. Cleaning of the condensation circuit

Blow with compressed air into the vapour manifold to remove deposits that might have been formed by entrainment or boiling over.

Clean the outside of the condensation section with compressed air.

8.4. Maintenance every 2000 working hours

After 2000 working hours the red alarm light will start to blink. Replace the diathermic heating oil and clean the electrical heating element. This maintenance should be done with a cold machine.

After this maintenance the hour counter will have to be reset.

The machine has to be disconnected from the main power when performing the following maintenance.

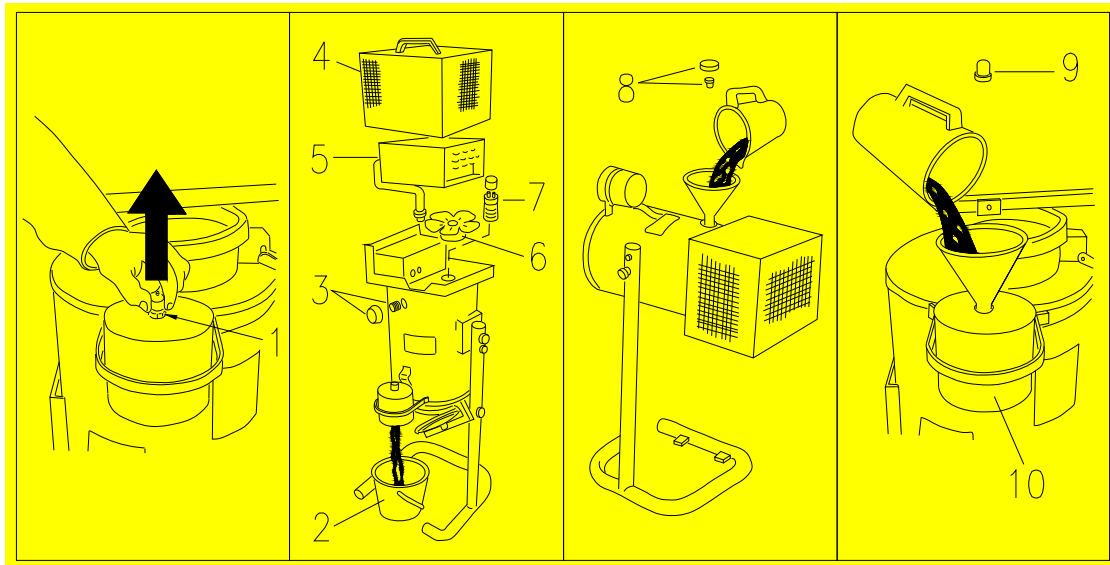
a. Diathermic oil change

Set up a collecting container under the machine to collect the used diathermic oil.

Oil type: FORMECO LT200, MOBILTHERM 605, ESSOTHERM 500, SHELL ThermiaB, TOTAL Seriola 1510. For different brands, use diathermic oil with a cracking temperature higher than 320 °C and a viscosity of about 31 cSt at 40 °C and 5,3 cSt at 100 °C.

b. Diathermic oil change RS 120 machines

Model	RS120
Oil quantity (litres)	6,5

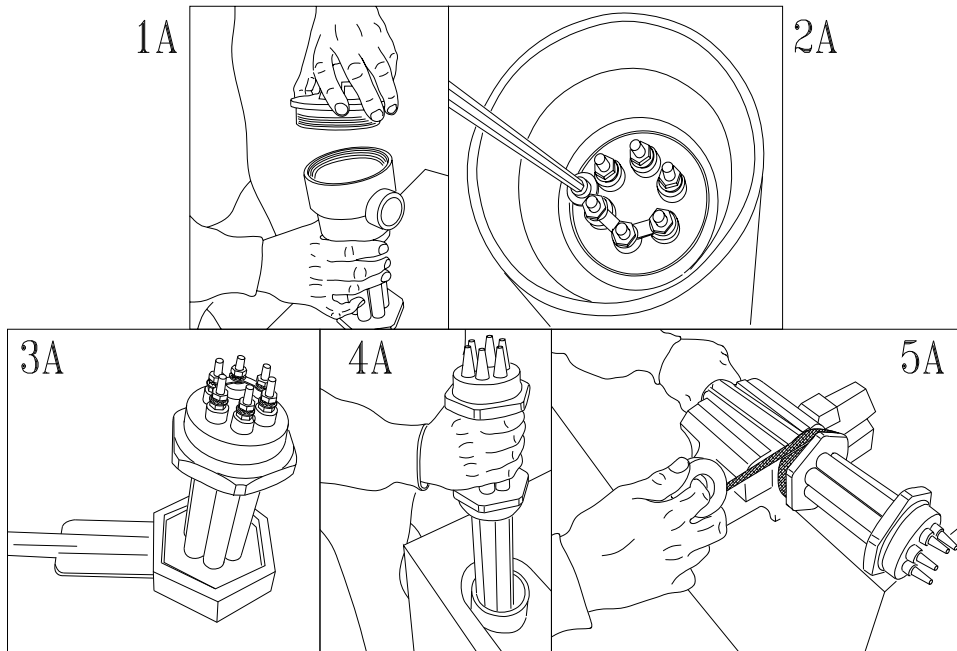


1. Remove, by unscrewing, the oil bleeding valve (1);
2. Place the collecting container (2) and rotate the machine; remove the cover and unscrew the loading plug of the oil (3) to let the oil flow out.
3. Blow dry compressed air (4 ÷ 6 bar) in the plug to remove any formed debris.
4. Put the machine in a horizontal position and fill up the machine with new oil through the loading plug, using a funnel. Leave about 0,5 litres of oil behind for the final top-up of the machine.
5. Insert the plug and the cover again (8), and place the machine upright again
6. Without installing the bleeding valve (9) and without loading the machine, turn the unit on at maximum temperature. Having reached the maximum temperature, add slowly (in two or three times) the remaining oil in the expansion vessel until the expansion vessel (10) is at the right level.
7. Turn off the machine, and when is has cooled down, reinsert the bleeding valve (9).

At every oil change, the oil breather valve on the expansion vessel must be changed.

c. Cleaning the electrical heater element

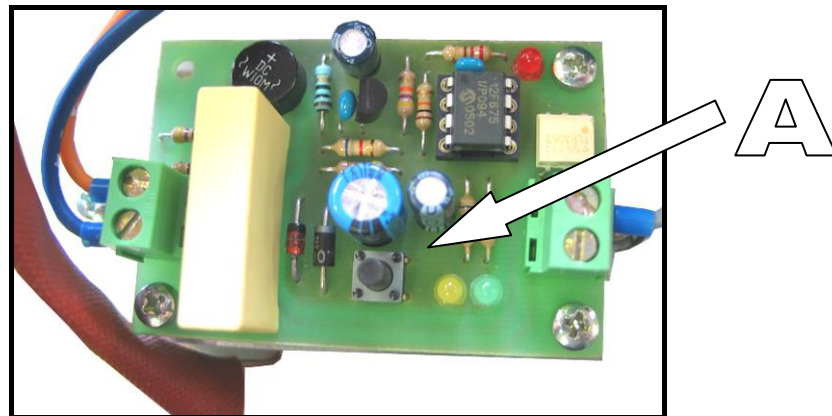
1. Rotate the unit 90°. Remove the lid of the heater unscrewing the security dowel using a hexagonal key of 2 mm **(1A)**;
2. Disconnect the electrical wires using a box spanner **(2A)**;
3. Unscrew the element using a spanner of 90 mm. **(3A)**;
4. Remove and clean the electrical heater element **(4A)**;
5. Reinstall the electrical element using a Teflon ribbon for the sealing **(5A)**.



Normally when cleaning the element it is convenient to also change the diathermic oil and in this case it can be poured directly into the hole of the element.

d. Reset the hour counter

1. Open the control box
2. Push the button **A** for resetting the hour counter.



9. VACUUM GENERATOR (OPTIONAL)

9.1. General description

Using vacuum inside the boiler lowers the boiling point of the solvents being distilled.

Vacuum distillation is used:

- preferably for solvents with a boiling point above 160 °C;
- obligatory with solvents with a boiling point over 200°C (the **FORMECO** distillation units operate at a maximum temperature of 200°C);
- when treating substances with a boiling point close to the auto-ignition point, for example mineral spirit with a boiling range of 150-195°C and an auto-ignition point of 254 °C
- when re cycling thermally unstable solvents, where the boiling point can be above the temperature where the solvent decomposes (acidifies)
- when the contaminants decompose or carbonize at the working temperature under atmospheric pressure.

Vacuum distillation can provoke also undesired phenomena like foam formation during the boiling phase. Furthermore maintenance will have to be done on the vacuum group as well.

Solvents with a boiling lower than 100 °C cannot be distilled under vacuum with a machine with an air cooled condenser, because the solvents under vacuum will have such a low condensation point that complete condensation cannot be guaranteed. In this case a water cooled condenser will have to be applied.

Manual vacuum: at the start of the distillation unit, the operator opens the manually the compressed air line that goes towards the vacuum group. At the end of the cycle, the compressed air has to be closed manually and the vacuum has to be discharged manually.

Automatic vacuum: at the start of the distillation unit the distiller activates automatically the vacuum unit. At the end of the cycle, the compressed is stopped and the vacuum is unloaded automatically.

9.2. Technical details vacuum group

Description	U.M.	RS120
Geometric capacity vacuum vessel	litres	18
Dimensions (Length x Depth x Height)	mm	600 x 250 x 400
Weight	kg	15

9.3. Connections

Connect the vacuum vessel (12) to the distillate outlet of the distillation unit, using an anti-solvent hose provided with the unit. Bends and curves in the connection piping have to be avoided. Connect the vessel using the quick connector (6).

The pressure of the compressed air feeding line should be 5 ÷ 6 bar ; the compressed air consumption is about 30 ÷ 35 litres/min.

- In case of a manual vacuum group, connect the vacuum group with a 6x8 mm tube through a pressure reducer to the compressed air inlet (5).
- In case of an automatic vacuum group, connect the compressed air with a 6x8 mm piping and a pressure reducer to the compressed air inlet of the machine (3) and the outlet (4) of the solenoid valve to the air inlet of the of the vacuum group (5) with the spiral tube provided with the unit.

Always verify the earth connection of the distillate vessel (12).

9.4. Testing

Verify the proper sealing of the vacuum group, **without loading solvent** into the distiller:

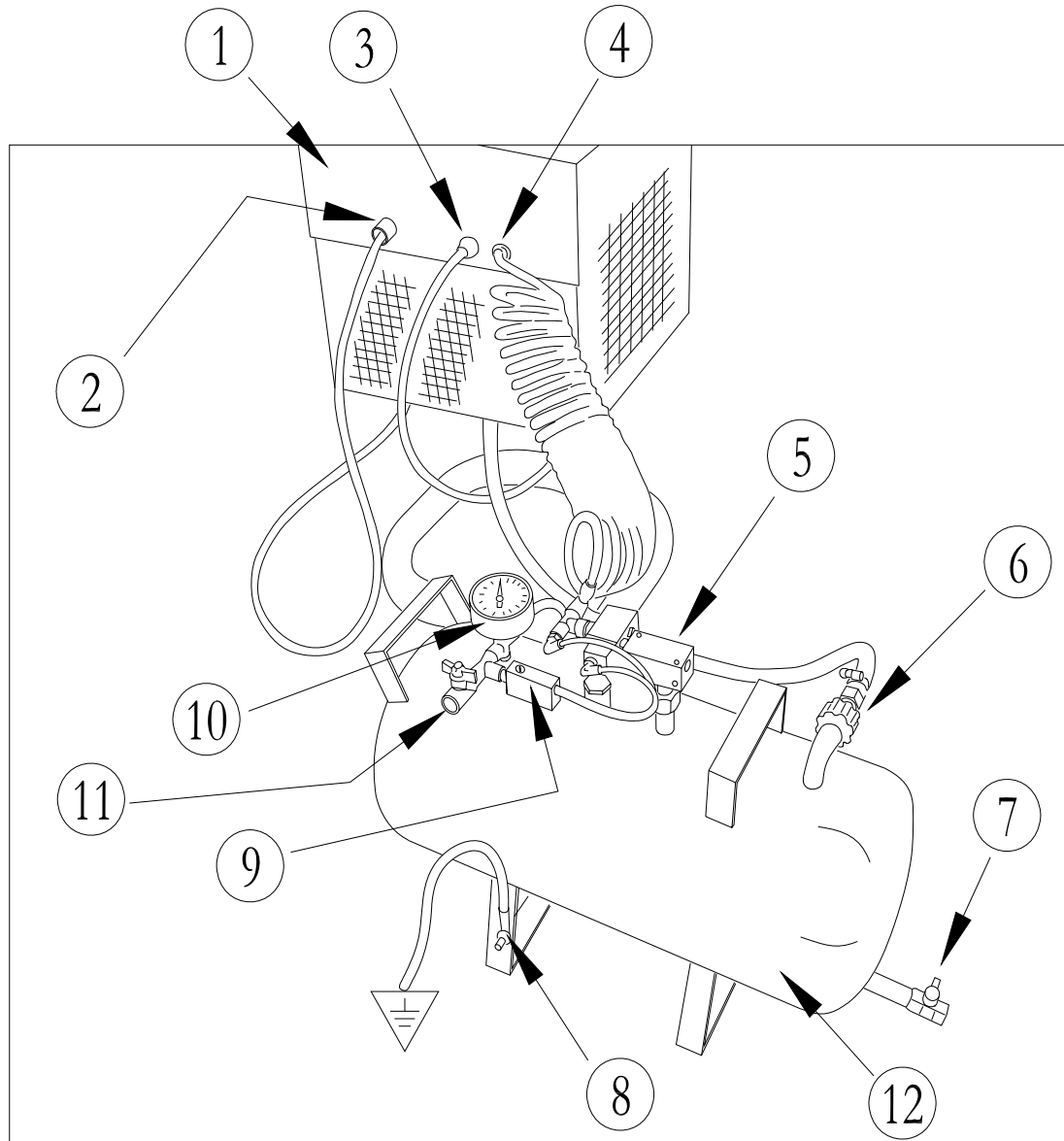
1. Close the cover of the distillation unit and the inlet valves and outlet valves of the distillate (7);
2. Open the compressed air line and regulate the pressure at 5 ÷ 6 bar ; for the automatic vacuum group it is necessary to set about 30 minutes on the distillation unit, to let the vacuum group run. Set the working thermostat to zero.

3. After about 10 minutes, the vacuum meter (10) should indicate the under pressure value at about $-0.70 \div -0.76$ bar; if the vacuum is lower, verify the connections to find the air leak.
4. It is possible to reduce the noise generated by the compressed air venturi, by connecting a 10x12 mm tube with a maximum length of 5 metres to the outlet of the economizer (5) ; this can reduce the yield of the vacuum group and limit the vacuum creation.

9.5. Vacuum switch

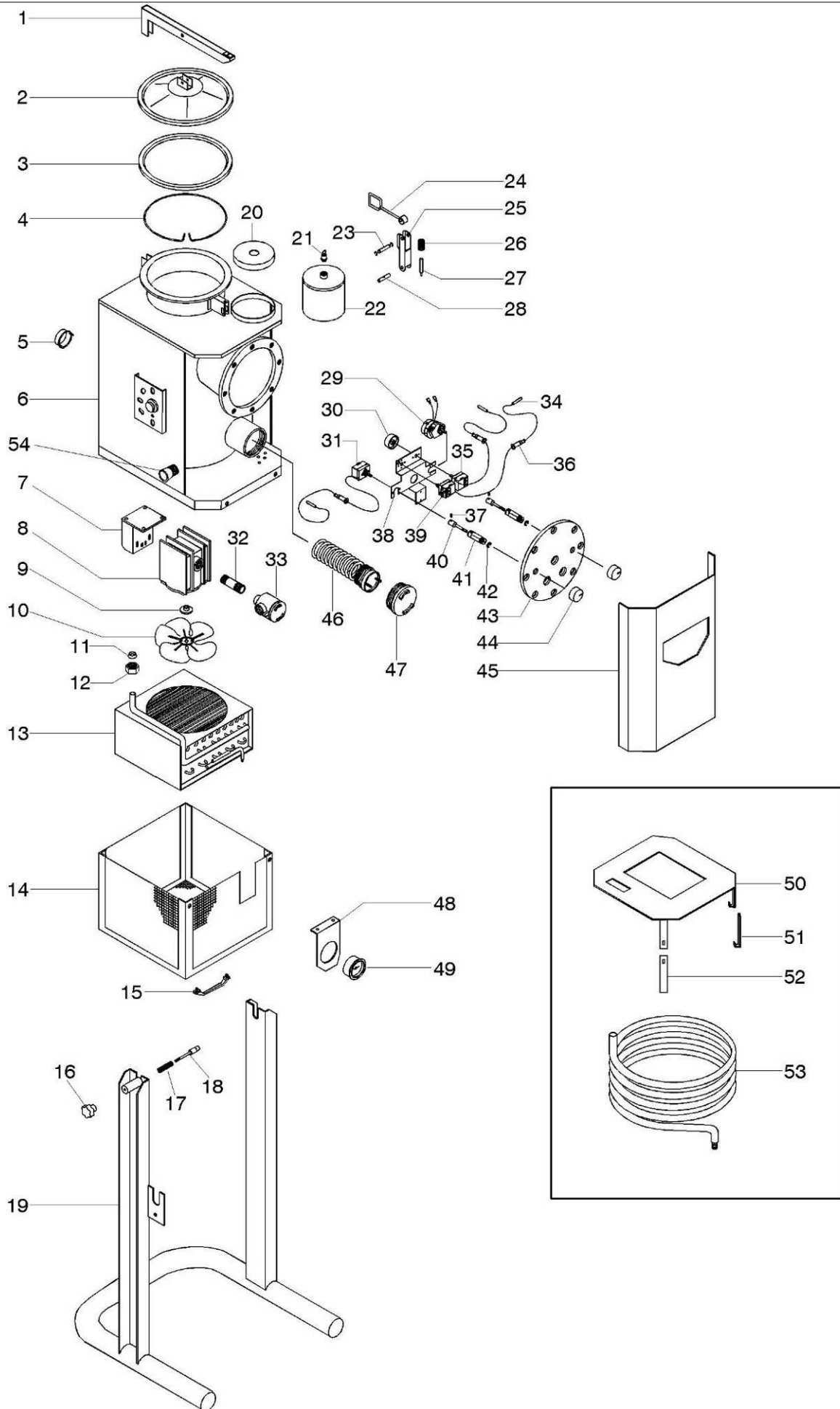
The vacuum switch (optional) allows the reduction of compressed air consumption, because the vacuum ejector is turned off, when reaching a set vacuum degree.

Through the setting screw on the vacuum switch, the setting point of the vacuum can be regulated.



1 – Distiller	7 – Distillate outlet
2 – Inlet power	8 – Earth connection
3 – Inlet compressed air	9 – Vacuum switch
4 – Outlet compressed air	10 – Vacuum meter
5 – Economiser	11 – Manual vacuum discharge
6 – Distillate inlet	12 – Vacuum vessel

10. SPARE PARTS



N	RS120	DESCRIPTION
1	359023	Cover bar
2	359022	Boiler cover
3	359001	Boiler cover gasket : standard
	359002	Boiler cover gasket : for acetone
	359003	Boiler cover gasket : for chlorinated solvents
	239004	Boiler cover gasket : universal
4	429004	Ring - Bag / ring for placement of RecBag
5	351401	Cover of oil drain
6	-----	Boiler
7	38Z7003	Support fan motor
8	475000	Fan motor
9	466149	Fan ring
10	466101	Fan (for Copper condenser)
	466102	Fan (for Stainless steel condenser)
11	430300	Ogive for condenser
12	430150	Fastening nut for condenser
13	384022	Copper air cooled condenser
14	301106	Protecting grid of condenser
15	429000	Unit rotation handle
16	427000	Knob for locking the rotation of the boiler
17/18	354000	Pin for locking the rotation of the unit
19	357009	Support structure
21	384000	Oil bleeding valve
22	380021	Expansion vessel diathermic oil
23/28	384002	Cover closing kit
23	354639	Upper pin of cover handle
24	429002	Cover handle
25	357403	Forked brace
26	353702	Spring for boiler cover
27	354641	Guide pin for spring
28	354640	Lower pin of cover handle
29	385007	Timer (0-5 hours)
31	384018	Working thermostat (50-210°C) for T2 machines
	384009	Working thermostat (50-185°C) for T3 machines
32	-----	Tube electrical connection fan motor
33	-----	Ex shunt box
34	-----	Capillary of thermostat
35	384008	Condenser safety thermostat
36	-----	Gland to electrical control box
37	-----	Screw
38	-----	Support for electrical components
39	384020	Maximum thermostat (225°C) for T2 machines
	384021	Maximum thermostat (195°C) for T3 machines
40	350000	Little shaft
41	350903	Bush for shaft
42	-----	Seeger washer
43	-----	Front panel of the electrical control box
44	425002	Knob
46	466403	Electrical resistance
47	472100	Cover of the electrical resistance box
49	433713	Diathermic oil thermometer
50	302024	Fixing plate for stainless steel condenser
51	302123	Fastening rod for condenser
53	383022	Air cooled stainless steel AISI304 condenser

11. DISASSEMBLY AND DEMOLITION

11.1. Disassembly

In case the machine has to be moved or disposed of, it is necessary to disassemble the machine first. The various phases are:

- disconnect the power supply;
 - empty the boiler;
 - wash the machine;
 - empty the distillate collection tank(s) if present;
 - disconnect the machine from the various supplies;
 - disconnect the various blocks of the machine (if present).
-

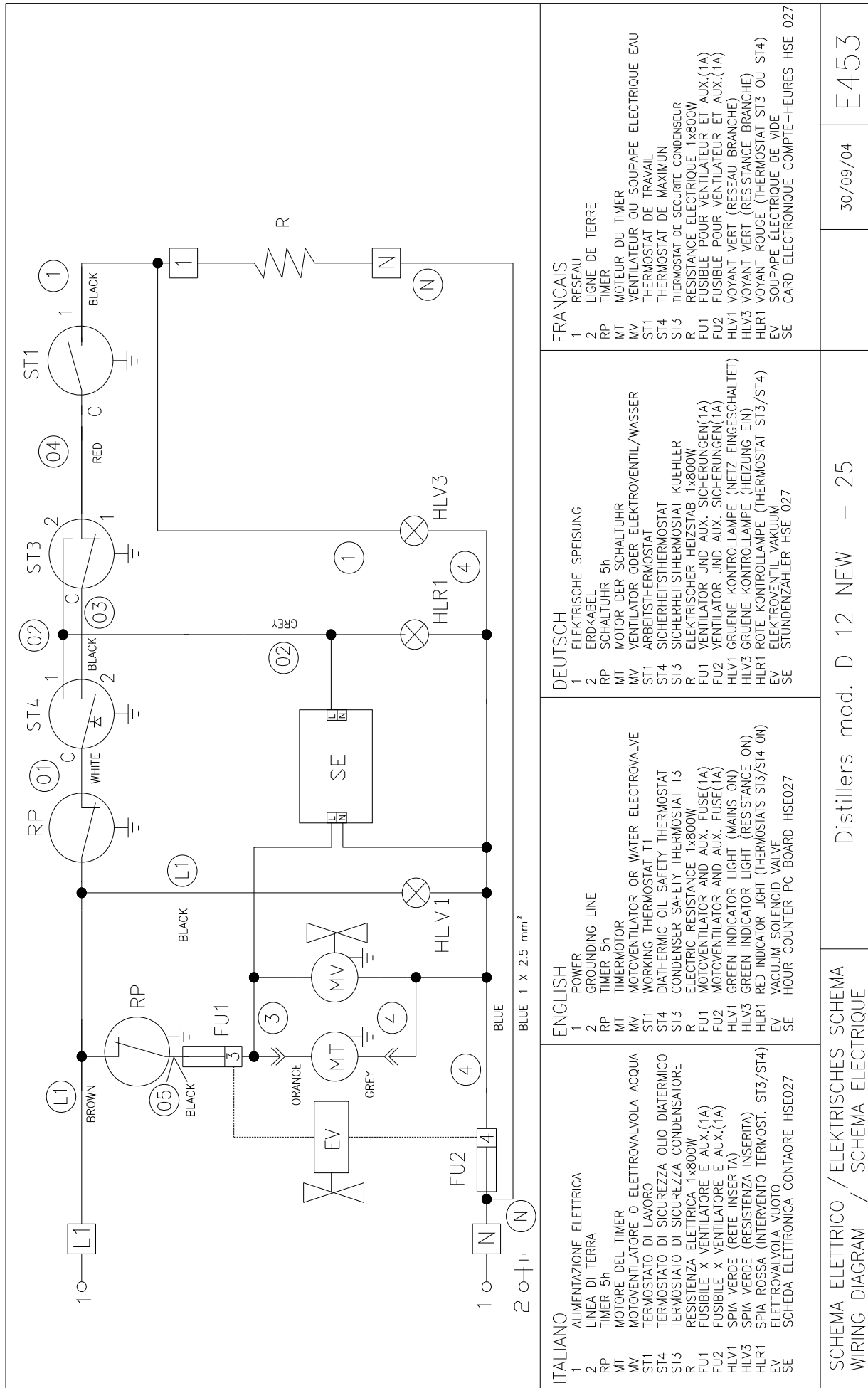
11.2. Demolition

In case the machine has to be disposed of, it is necessary to follow the instructions as to minimize the environmental impact of the waste disposal.

Do as follows:

- Recover the heating fluid of the machine.
 - The heating fluid can be reused after being recovered.
 - Store the oil in a jerry can or drum and dispose of it separately using specialized waste disposal for oil.
- Remove and dispose separately the battery of the PLC (if present).
 - Batteries of the HMI or the PLC are special waste and have to be disposed of following the appropriate procedures.
 - Batteries have to be stored in a cool and dry place (temperature between 20-25 °C, relative humidity 40-60%), away from heating sources and flammable material.
 - Do not try to recharge the battery: it can overheat or explode.
 - Do not open, puncture or break the battery: risk of explosion or contact with flammable, toxic substances.
 - Do not burn batteries or expose them to high temperatures: risk of explosion.
 - Do not short-circuit the batteries: risk over overheating.
 - Do not throw away batteries with normal waste.
- Remove and destroy CE marking tag;
- Dispose of the structure of the machine.
 - Once the fluids and batteries are removed from the machine, use the proper channels to dispose of the metallic parts of the machine

12. WIRING DIAGRAMS



ITALIANO
 1 ALIMENTAZIONE ELETTRICA
 2 LINEA DI TERRA
 RP TIMER 5h
 MT MOTORE DEL TIMER
 MV MOTORENTILATORE O ELETTROVALVOLA ACQUA
 ST1 TERMOSTATO DI LAVORO
 ST4 TERMOSTATO DI SICUREZZA OLIO DIATERMICO
 ST3 TERMOSTATO DI SICUREZZA CONDENSATORE
 R RESISTENZA ELETTRICA 1x800W
 FU1 FUSIBILE X VENTILATORE E AUX.(1A)
 FU2 FUSIBILE X VENTILATORE E AUX.(1A)
 HLV1 SPIA VERDE (RETE INSERITA)
 HLV3 SPIA VERDE (RESISTENZA INSERITA)
 HLR1 SPIA ROSSA (INTERVENTO TERMOST. ST3/ST4)
 EV ELETTROVALVOLA VUOTO
 SE SCHEDA ELETTRONICA CONTATORE HSE027

ENGLISH
 1 POWER
 2 GROUNDING LINE
 RP TIMER 5h
 MT TIMERMOTOR
 MV MOTORENTILATOR OR WATER ELECTROVALVE
 ST1 WORKING THERMOSTAT T1
 ST4 DIATHERMIC OIL SAFETY THERMOSTAT
 ST3 CONDENSER SAFETY THERMOSTAT T3
 R ELECTRIC RESISTANCE 1x800W
 FU1 MOTOVENTILATOR AND AUX. FUSE(1A)
 FU2 MOTOVENTILATOR AND AUX. FUSE(1A)
 HLV1 GREEN INDICATOR LIGHT (MAINS ON)
 HLV3 GREEN INDICATOR LIGHT (RESISTANCE ON)
 HLR1 RED INDICATOR LIGHT (THERMOSTATS ST3/ST4 ON)
 EV VACUUM SOLENOID VALVE
 SE HOUR COUNTER PC BOARD HSE027

DEUTSCH
 1 ELEKTRISCHE SPEISUNG
 2 ERDKABEL
 RP SCHALTUHR 5h
 MT MOTOR DER SCHALTUHR
 MV VENTILATOR ODER ELEKTROVENTIL/WASSER
 ST1 ARBEITSTHERMOSTAT
 ST4 SICHERHEITSTHERMOSTAT
 ST3 SICHERHEITSTHERMOSTAT KUEHLER
 R ELEKTRISCHER HEIZSTAB 1x800W
 FU1 VENTILATOR UND AUX. SICHERUNGEN(1A)
 FU2 VENTILATOR UND AUX. SICHERUNGEN(1A)
 HLV1 GRUENE KONTROLLAMPE (NETZ EINGESCHALTET)
 HLV3 GRUENE KONTROLLAMPE (HEIZUNG EIN)
 HLR1 ROTE KONTROLLAMPE (THERMOSTAT ST3/ST4)
 EV ELEKTROVENTIL VAKUUM
 SE STUNDENZAEHLER HSE 027

FRANCAIS
 1 RESEAU
 2 LIGNE DE TERRE
 RP TIMER
 RP MOTEUR DU TIMER
 MV VENTILATEUR OU SOUPEPE ELECTRIQUE EAU
 ST1 THERMOSTAT DE TRAVAIL
 ST4 THERMOSTAT DE MAXIMUM
 ST3 THERMOSTAT DE SECURITE CONDENSEUR
 R RESISTANCE ELECTRIQUE 1x800W
 FU1 FUSIBLE POUR VENTILATEUR ET AUX.(1A)
 FU2 FUSIBLE POUR VENTILATEUR ET AUX.(1A)
 HLV1 VOYANT VERT (RESEAU BRANCHE)
 HLV3 VOYANT VERT (RESISTANCE BRANCHE)
 HLR1 VOYANT ROUGE (THERMOSTAT ST3 OU ST4)
 EV SOUPEPE ELECTRIQUE DE VIDE
 SE CARD ELECTRONIQUE COMPTE-HEURES HSE 027

SCHEMA ELETTRICO / ELEKTRISCHES SCHEMA
 WIRING DIAGRAM / SCHEMA ELECTRIQUE

Distillers mod. D 12 NEW - 25

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