lamber

DISHWASHERS WITH PULL-THROUGH RACK

M115

INSTRUCTIONS MANUAL

CE

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DECLARATION OF CONFORMITY

The following

hereby declares under full responsability that the following product

RACK CONVEYOR DISHWASHER

mod. **M115**

for which this declaration refers to the conformity of the following standards:

- Safety of household and electrical appliances - General requirements EN60335-1(2002) + A1/A11(2004), A12 (2006) + A2 (2006)
- *Safety of household and electrical appliances - Part 2^ Particular requirements for commercial electric dishwashing machines EN60335-2-58 (2005)*
- *Household and similar electrical appliances – Electromagnetic fields – Methods for evaluation and measurements EN50366(2003) +A1(2006)*
- *Limits and methods of measurement of radio disturbance characteristics of electrical motor-operated and thermal appliances for households and similar purposes, electric tools and similar electric apparatus - EN 55014-1(2000) + A1(2001) + A2(2002)*
- *Limits for harmonic current emissions (equipment input current £ 16 A per phase) - EN 61000-3-2(2000) + A2 (2005)*
- *Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current £ 16 A. EN 61000-3-3(1995) +A1(2001) + A2(2005)*
- *Immunity requirements for household appliances, tools and similar apparatus. Product family standard EN 55014-2(1997) + A1(2001)*
- Safety of machinery Basic concepts, general principles for design - Basic terminology, methodology-ISO 12100-1 (2003).
- Safety of machinery - Basic concepts, general principles for design - Technical principles-ISO 12100-2 (2003).

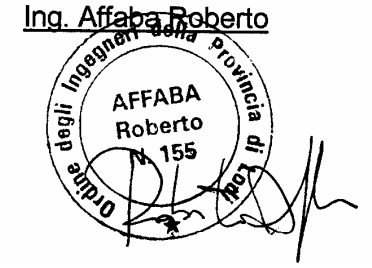
on the basis of what is foreseen by the Directives:

2006/95/CE, 2004/108/CE, 2006/42/CE.
2006/95/EC, 2004/108/EC, 2006/42/EC.

We decline any responsability for injuries or damage derived from machine misuse, abuse by others or improper machine maintenance or repairs.

li 01/01/08
(date)

The administrator
Ing. Affaba Roberto

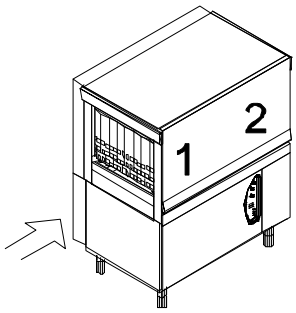
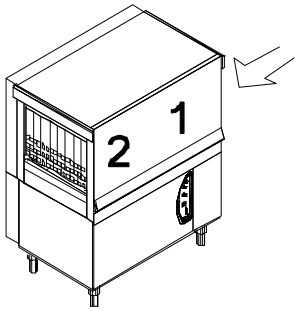


WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT DIRECTIVE (WEEE,RAEE in Italy) 2002/96/EC AND SUBSEQUENT 2003/108/EC

The marking shown below indicates that the product cannot be disposed of as part of normal household waste. Electrical and Electronic Equipment (EEE) can contain materials harmful to health and the environment, and therefore is subject to separate waste collection: it must be disposed of at appropriate waste collection points or returned to the distributor against purchase of new equipment of similar type or having the same functions.
The directive mentioned above, to which make reference for further details, provides for punitive actions in case of illegal disposal of such waste.

LAMBER, manufacturer of this equipment, is enrolled in the Italian WEEE Register – the Register of Producers of Electrical and Electronic Equipment- from the 18th /02/2008 with the number **IT08020000000617.**

MODEL DESCRIPTION

MODEL	MODEL
☐ ***M115 left-right*** 	☐ ***M115 right-left*** 

LEGEND

1	WASHING
2	RINSING

HEATING

☐	ELECTRIC
☐	STEAM

TECHNICAL DATA AND DESCRIPTION

The table reported at page 5 shows the basic models of conveyor dishwashers and identifies the single washing areas to which additional modules can be added to improve their performance.

ACCESSORIES

	COLD PRE-WASHING						
	STEAM CONDENSER - CVM	fan		kW			
	DRYING – ASM - MVM	fan		kW	Heat element		kW
	ADDITIONAL RINSING - RIS						
	AUTOTIMER						
	SPLASH SHIELD (PMC-PMA-PMA/R)						
	BOOSTER PUMP	Motor		kW			

TECHNICAL SPECIFICATIONS

Model:

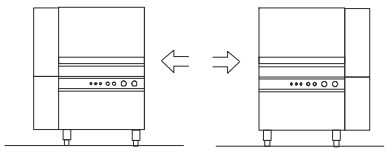
version	**Left-Right**		**Right-Left**	

1st speed	**baskets/hour**		**2nd speed**	**baskets/hour**

ELECTRIC POWER	**kW**
ELECTRICAL INPUT	**A**
ELECTRIC CABLE	**mm²**
CIRCUIT BREAKER	**A**
Icc ELECTRIC INPUT	**6 kA**
VOLTAGE	

PRE-WASHING	TANK ELEMENTS		kW	ELECTRIC PUMP		kW
FIRST WASHING	TANK ELEMENTS		kW	ELECTRIC PUMP		kW
SECOND WASHING	TANK ELEMENTS		kW	ELECTRIC PUMP		kW
THIRD WASHING	TANK ELEMENTS		kW	ELECTRIC PUMP		kW
PRE-RINSING	TANK ELEMENTS		kW	ELECTRIC PUMP		kW
RINSING	BOILER ELEMENT		kW			
	BOILER ELEMENT		kW			
	GEARED MOTOR		kW			

DESCRIPTION



CHARACTERISTICS

* Body and tank in stainless steel construction 18/10 AISI 304,

* Tunnel composition:
  - **1 Wash** - **wash arms : 3 upper + 2 lower**
  - **1 Rinse** - **rinse arms : 1 upper + 1 lower**

* Completely automatic,

* Upper and lower fixed washing (60 °C)
* Upper and lower fixed rinsing (85-90 °C)
* Washing and rinsing arms in **stainless steel** constructions, easy disassembly and interchangeable,
* **Double skin** with thermic and acoustic insulation ;
* **Slanted tank with rounded edges**,
* **Stainless steel autodraining washing pump**,
* **Counterbalanced door**
* Front panel composition ::
  - Main ON/OFF switch;
  - Start pushbutton
  - Stop pushbutton
  - Emergency pushbutton
  - Machine ON indicator
  - Machine ready indicator
- Overload cutout indicator
* Frontal maintenance
* Automatic tank loading
* Rinse economizer
* Tank and pump filters
* Insulated Boiler

SAFETY

* Feet adjustable and strong
* Pressure-switch protection for Heating elements
* Thermic protection for washing pump
* Automatic stopping of pull-through in case of foreign bodies
* Low voltage control circuit (24V) for greater safety during work operation
* Dishes (Stop with End Micro-switch on the exit table)
* Door opening safety device

Contents

INSTRUCTIONS MANUAL DISHWASHING MACHINE

M115

The automatic-rack conveyor dishwashing machines of the M115 series are designed to wash any kinds of dishes .

The modular system and the various optionals available allow the make-up of dishwashing machines with the most appropriate features in order to meet your production,space saving and energy-saving requirements.

GENERAL NORMS ENGLISH

Tank You for purchasing our Dishwashing Machine.

Perfect washing-up results as far as hygiene concerns and a correct operation of the dishwashing machine can be assured only in case the instructions reported in the present manual are carefully followed.
We hope the information reported in the present manual will be helpful to You.
They are based on data and our best updated knowledge.
Carefully read the Instructions reported in the manual, recommendations and suggestions included. Carefully read the terms of sale too, the ones limiting warranty included.

INTRODUCTION AND SAFETY NORMS

INTRODUCTION

This equipment is destined only to the use it has been conceived for: tableware washing such as dishes, glasses, cups, cutlery, trays, etc. Using it to wash machine components or objects whose dimensions are superior to the machine working passage is improper and therefore dangerous.

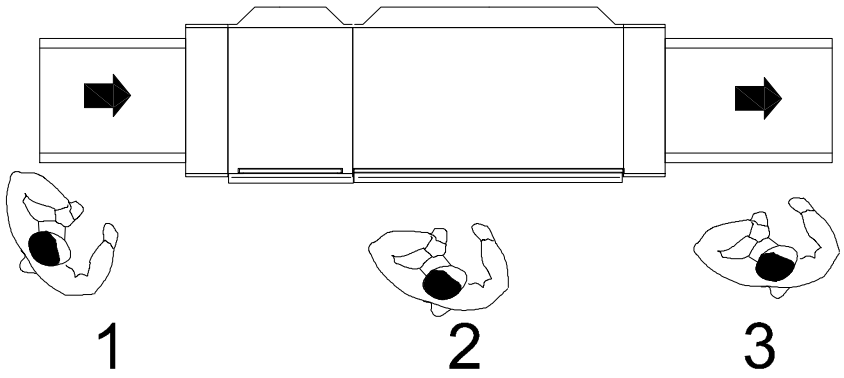
- Equipment in compliance with EEC89/336 directive concerning the suppression of radio interferences and electromagnetic incompatibility.

- In conformity with the EEC directives and the fulfilment laws, our dishwashers are built according to the regulations in force in Italy and abroad.

- The noise of the machine running empty, measured at the working positions (fig. 1) and at 1.6m from the floor, is the following:

	position 1	position 2	position 3
Leq A Level equivalent of sound pressure dB(A)	70	68	70

The level of peak sound pressure Lpc is not declared as it is much inferior to 130dB(C):



PRELIMINARY OBSERVATION

Carefully read the instructions reported in the present user manual, as it gives important indications about safety of installation, operation and maintenance:

- **carefully keep the present manual for further consultations;**
- the illustrations and drawings showing the machine are intended for general reference only and are not necessarily accurate in every particular;
- the dimensions and characteristics of the machine, given in this Manual, are not to be considered binding and may be changed without prior notice;
- having removed the packing material, check that all the equipment is present. If there is any doubt, do not use it and contact qualified personnel. The packing elements (plastic bags, nails, etc.) should be kept away from children, because they are dangerous.

GENERAL SAFETY REGULATIONS

THIS SAFETY CODE HAS BEEN COMPILED IN YOUR INTEREST. Strict adherence to these rules will reduce the risks of injury both to yourself and to others;
Personnel working with this machine must adhere strictly to all statutory safety regulations as well as the specific rules listed below. Failure to do so may result in personal inyury and damage to the machine;

- DO NOT attempt to move, install, set-up or operate this machine until you have read and fully understood this Manual. If doubt persists, ask your supervisor;
- never leave tools, parts or other loose material on or in the machine;
- Before switching the equipment the equipment on, make sure that the model plate data conforms to that of the electrical and water distribution network;
- remember that even with the mains isolator in the “OFF” position, the incoming cables are still live;
- BEFORE starting machine o cycle, after any maintenance or repair work, make sure all protective are correctly installed;
- be vigilant at all times, remember that your safety and that of your fellow workers depend on you;
- when moving or lifting the machine, care must be taken to comply with all the relevant regulations governing such operations;
- installation should be carried out by qualified personnel according to the manufacturer's instructions.
- this equipment should be destined to the use which it has been conceived for. Any other application should be considered improper and consequently dangerous;
- the equipment should only be used by personnel trained for its use;

SPECIAL SAFETY REGULATIONS

- adjustement and repairs must be carried out only by personnel qualified. Repair carried out by unskilled personnel may be dangerous;
- perfect washing-up results as far as hygiene concerns and a correct operation of the washing machine can be assured only in case the instructions reported in the present handbook are carefully followed;
- the machine must be only used by authorized personnel which must comply with sanitary measures;
- do not leave the machine in environment with temperatures inferior to 0°C;
- the machine protection degree is IP55 for Control board and IP32 for machine, **therefore it should not be washed with direct high pressure jets of water;**

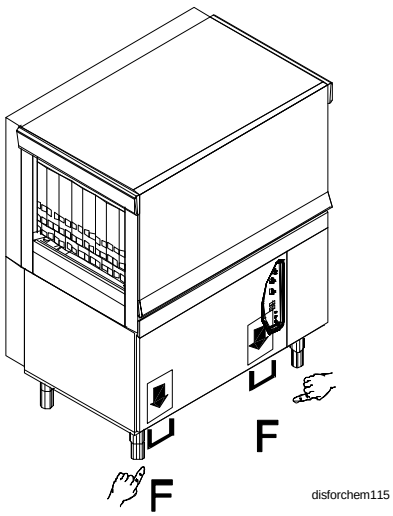
UNPACKING AND DELIVERY CHECKS

When the case with the machine has been received, unpack it as follows:

- Remove the upper cover and the wooden case side walls, take care not to damage the machine,
- Remove possible accessories boxes,
- Remove the protecting cellophane,
- Make sure that the machine has not been damaged during transport,
- Make sure that all covers and panels have been correctly fixed and that no loosen part is present,
- Visually inspect that all electrical components are integral.

TRANSPORT AND INSTALLATION

- To lift and transport the machine, insert the truck forks under the frame connected to the points indicated by the yellow adhesives applied on the machine front side (see draw below).



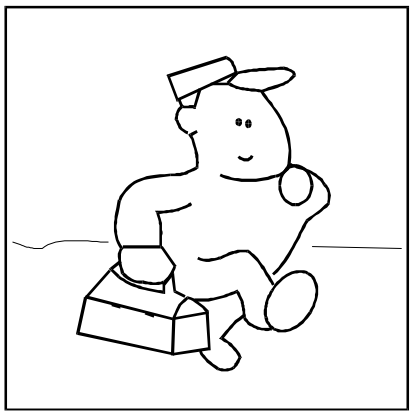
draw "A"*

- Before plugging the machine, make sure that the supply voltage of the domestic wiring system and the water supply from water connection corresponds to the ones reported on the rating plate
- Installation should be carried out by qualified personnel according to the manufacturer's indications

During instalation, it is recommended to level the machine in order to ensure a correct operation.

INSTRUCTIONS FOR THE INSTALLER

The following instructions are addressed to a qualified personnel, the only one authorised to carry-out checks and repair, if any.
The Manufacturer declines any responsibility in the case of interventions made by a non qualified personnel.



2

M115

Second Section - FOR THE INSTALLER

The following instructions are addressed to qualified personnel who is the only one authorized to carry out the inspections and the necessary repairs.

The machine should be installed in “Normal” environment, that is to say, indoors, free of dust, explosion-proof and adequately lit and well aired.

Before installing the machine, it is necessary to arrange the electric and water connections.
See the reported wiring diagram (supplied by the manufacturer) of the selected model as far as the dimensions of pipes, cables and wall-mounted switch are concerned.

In order to prevent damages caused by the escape of vapours from the equipment, make sure that adjacent materials do not deteriorate in their presence.

The Manufacturer cannot assume any responsibility for any damage to persons or property deriving from the non-observance of the above specified norms.

DETERGENTS

The machine should also be equipped with a detergent and brightener dispenser, which shall be supplied by the manufacturer of these products.

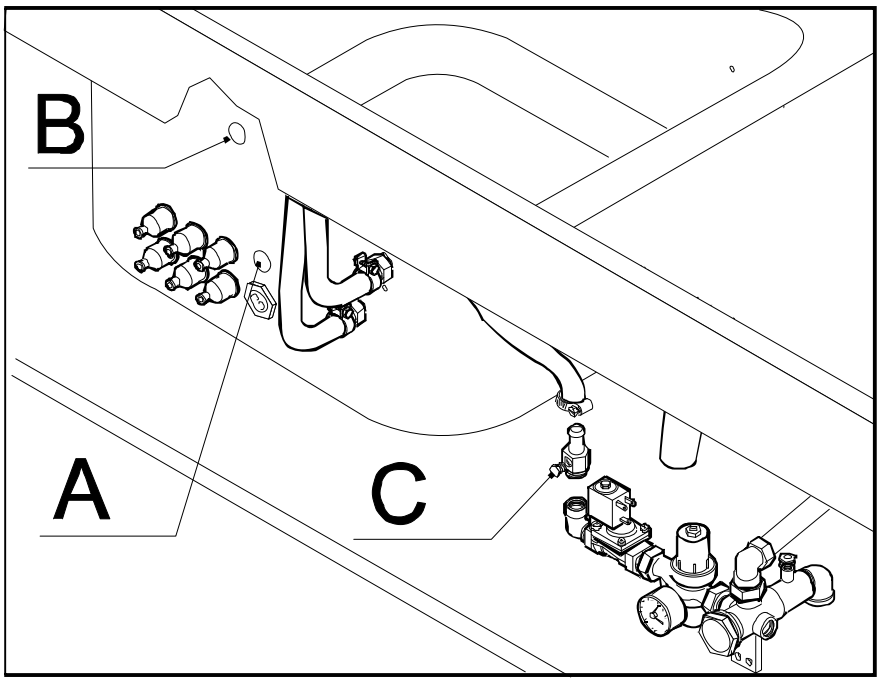
N.B.: If you use chlorinated sanitizers**, it is always advisable to employ an automatic dispenser provided with feeler for the measurement of the detergent concentration,** because brownish spots can form on the surfaces due to chlorine reactions when pouring the detergent directly into the tank. The feeler for the measurement of concentration must be placed on the front side of the tank through the hole **“A”** preset for such operation (see drawing on page 28).

In any case **the LIQUID DETERGENT** shall be introduced through the preset hole **“B”** on the front side of the washing tank.

Choice of the suitable cleansing agent is an essential condition if you want to obtain extremely good washing results as concerns hygienic results.
It is then important to consider some points.
First of all only highly alkaline and chlorine-active antifoam products, especially made for industrial dish-washing machines, must be used and they must be produced by well known reliable Firms. We provide a short list just as an indication: Ecolab-Soilax; Henkel; Lever; Diversey; Relativ.

The average concentration of liquid detergents must be 2÷4g/lter. In any case it is essential that the producer of the detergent rules the dosage properly according to the features of the installation.

As regards the introduction of the **liquid rinse aid product**, use the passage **"C"** , placed near the water inlet group.
This coupling will allow an appropriate introduction of the liquid rinse aid product.
In order to do this use a fitting with non-return valve.



For the electrical connection of these dosing pumps join the ***auxiliary contacts*** of the contactors MT5 (detergent pump) and MT4 (rinse aid pump) into the lower electric box (standard M115 model) or the ***blue terminals*** into the upper electric box (M115 with drying tunnel), marked by special tags.
Note: In order to let cables pass, please use the labelled wire clamp behind the electrical control box.

DISPOSAL

At the end of its life, the machine shall be disposed according to the local laws in force by specialized and acknowledged companies in this field. Its components shall be distinguished as follows:

- metallic components: body, plans, frames, filters;
- electric components: motors, remote control switch, microswitches, wiring;
- plastic components: baskets, connections;
- rubber components: hoses, sleeves.

POSITIONING

During installation, carry out a good levelling of the machine in order to make it correctly work (doors, basket forward feeding).
In order to do so use the adjustable feet.

After removing front panels, position the machine over the connections. Assemble the inlet and outlet shelves for basket loading and unloading. The limit switch FC1 is located on the outlet shelf or on the machine delivery if the shelf is not provided for. The limit switch shall be connected to the outlet shelf.

The machine shall also be equipped with detergent and brightener dispenser, which shall be supplied by the manufacturer of these products.

ELECTRICAL CONNECTION

Before connecting the machine, check to make sure the voltage outlet of the mains is the same as the voltage specified on the data plate of the machine.

It is also necessary to check that the counter, the mains and the intake are adequately dimensioned to withstand the required maximum load.

A main switch must be installed between the mains and the machine. This safety measure also requires that the minimum distance between the switch contacts is at least 3 mm and the disconnection on all poles according to **EN 60204 (VDE 113)**.

The mains must be wired to be able to handle the current drawn by the machine.The system must also be provided with a proper ground lead in accordance with the existings norms. The electric cable must be of the following type **H07RN-F**.

For a correct selection of the cable rated cross-section refer to the data reported on the product data plate.
The cable cross-section shall not be inferior to the one indicated in the “Technical data and description” reported in the first page of the present manual.
The cable shall be connected to the terminal L1-L2-L3 and to the adjacent yellow-green terminal,on the electric box, it shall be made passed and stopped by means of the apposite cable grip.

It is necessary to connect the equipment to an effective ground installation, as specified by the electrical safety regulations in force.
Chack that this basic requirement is complied with and, in case of doubt, ask for a careful check of the installation by a qualified personal.
In addition, the equipment shall be part of an equipotential system, the effectiveness of which should be checked according to the regulations in force.
The connection should be made at the screw marked by the respective label located on the equipment lower side (⏚).
It is recommended to make the electric line be checked by your own designer.

THE MACHINE SHALL BE CONNECTED WITH AN EFFECTIVE GROUND CLAMP.

The manufacturer declines any responsibility for any damages caused by lack of an effective ground installation.

WATER CONNECTIONS

Carefully comply with any national or regional regulations in force.

Hot water supply

Arrange a gate valve in an easily accessible place, with a tap having a 3/4"gas thread spout at its end and connect to the water inlet valve (fig.1)

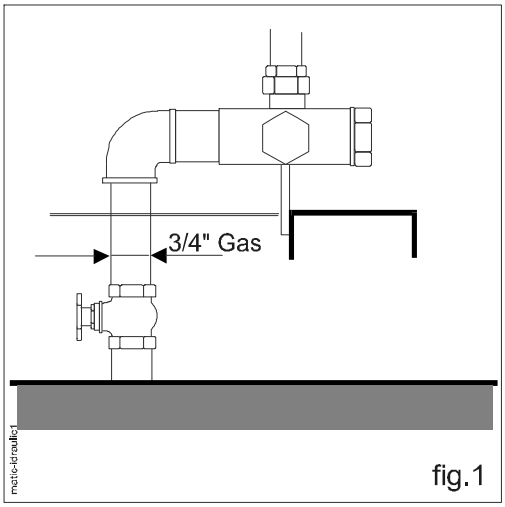


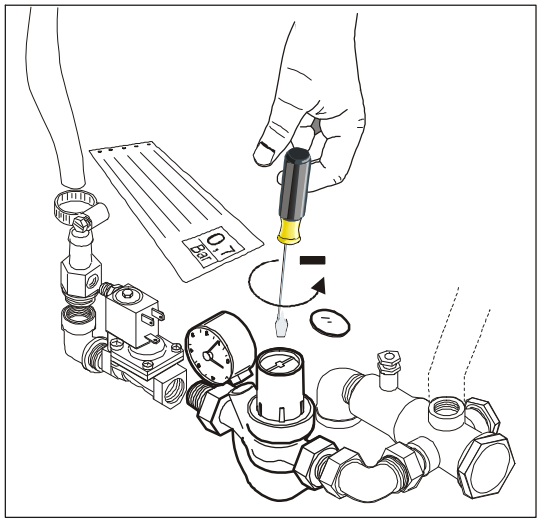
fig.1

- **temperatur** between 55° and 60°C,
- **Dynamic Pressure** 2÷4 bar (200÷400 kPa),
- **Hardness** between **7,2 and 12,5 °F**

N.B.: Each machine is equipped with a pressure reducer. In order to obtain an excellent rinsing, it shall be calibrated according to the data reported on the plate located in connection with the reducer itself.

N.B.: Each machine is equipped with a pressure reducer near the water inlet valves.
In order to obtain an optimum rinse it is necessary to adjust it from 0,6 to 1 bar according to inlet water pressure and temperature.
(remember that the required dynamic pressure must be 2÷4 bar (200÷400kPa) and that inlet water temperature must be 55÷60°C for standard machines).

If a variation of rinse pressure is required while installing, proceed as follows:
1: make the machine work and check that the rinse is activated;
2: Take away the upper protection plug on the reduction gear and turn the proper adjusting screw anti-clockwise in order to decrease pressure or clockwise in order to increase it or to restore the optimum working conditions (see picture 1A).



PIC.1A- PRESSURE REDUCER

Cold water supply

This connection is required only for machine with **steam condenser .**
Water shall be supplied at a temperature ranging from 10÷15°C and at a dynamic pressure of 2÷4 bar (200÷400 kPa).

WATER DRAINING

Reachable from the machine front side after opening the front panel (to do this turn the two front screws out);

Arrange a discharge at floor level provided with siphon and connect to the floor drain by means of a hose provided with an adequate inclination. Make sure the drain hose is not choked in any way.
Make sure the drain hose is resistant to a temperature of 70 °C.

Carefully comply with any national or regional regulations in force.

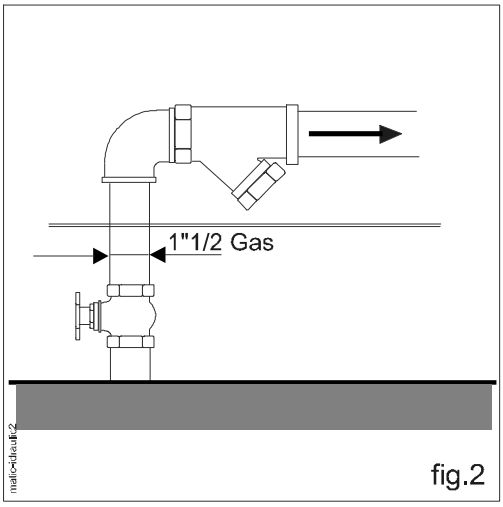


fig.2

STEAM FEEDING *

As far as steam feeding is concerned, connect to the machine fittings indicated in the installation drawings. In order to make the equipment independent from the general steam distribution network, it is necessary to use gate and gas on/off valves (see draw 2 and 3)..

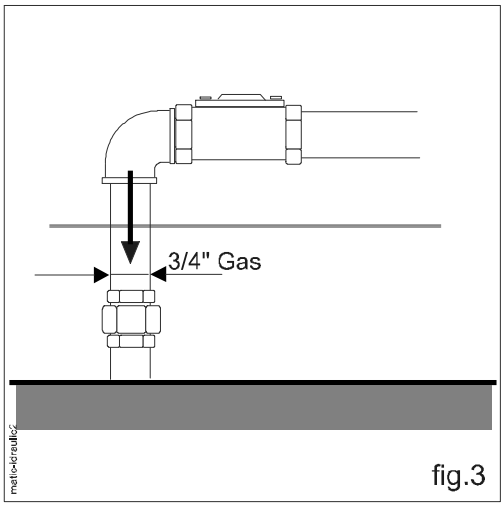


fig.3

This type of feeding should be supplied at a pressure ranging from 1 bar (100°C) to 2 bar (121°C).

The steam used should be absolutely saturated and dry.

STEAM EXHAUST *

The condensed steam exhaust shall have an appropriate slope toward the recovery installation or a blow-by pump, in order to guarantee an autonomous scavenging of the condensed steam.

N.B.: for possible maintenance operations, it is advisable to arrange a gate valve parallel with the discharge so that it is possible to deviate condensation towards a runoff pit.

* for steam machines only

VAPOURS SUCTION

For machines equipped with splashguard with collar or normal collar, carry out the necessary connection as showed in fig. 4.

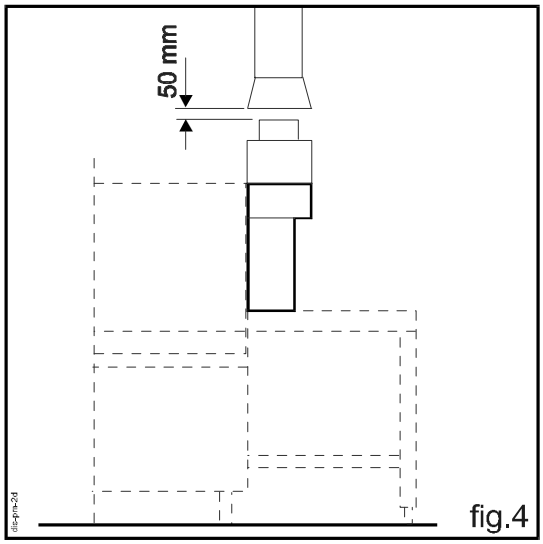


fig.4

In any case it is necessary to provide a way to scavenge steam through a hood or a similar system.

TESTING

Before starting machine:

During the testing operations, prior to switching the dishwashing machine on, check that thermostat of the rinsing boiler (0°-90° C) is set to zero and the direction of rotation of the pumps is correct.

Should the pumps rotate in the reverse direction, reverse two wires of the line .

Make a number of empty racks to pass through, then check that water jets are sprinkled fron the rinsing nozzles then adjust the thermostat of the boiler to 85° C .

WORKING TEMPERATURES

Check that the thermostats are set according to the following working temperatures.

WASHING
The tank thermostat **(CT3)**, also placed near the wash tank, will be set according to the following temperature:
Washing water: 55÷60°C.

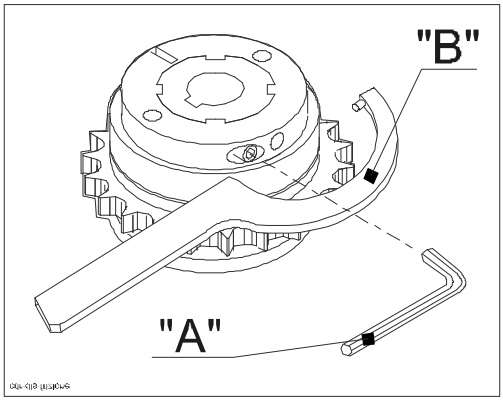
RINSING
The rinsing thermostat **(CT2)** will be set according to the following temperature:
Rinsing water: 80÷85°C.

DO NOT TAMPER WITH THE THERMOSTAT CALIBRATION

TORQUE LIMITER

The limiter has already been described at paragraph “SAFETY DEVICES”.
It is located in connection with the drawbar and it is calibrated during testing by the manufacturer.
In case it is necessary to calibrate it again, proceed as follows:

1. Switch the machine off ;
2. Remove the protection panel;
3. Load the whole drawbar with baskets full of dishes to be washed;
4. Loose the axial ring nut with the hexagon ring wrench type **“A”;**
5. Disengage the friction with a hooked key type **“B”** so that it slips;
6. At this point clockwise turn until the drawbar manages to carry the whole dishes charge;
7. The device is considered adequately calibrated when the drawbar hardly manages to carry the whole charge in second gear.

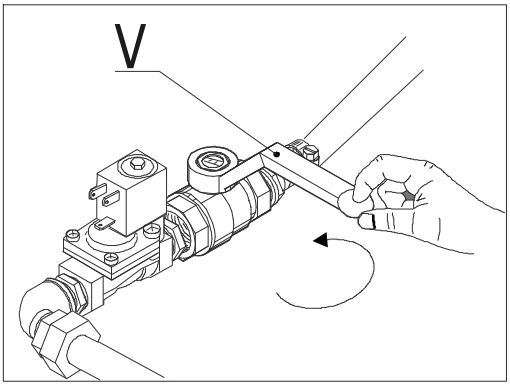


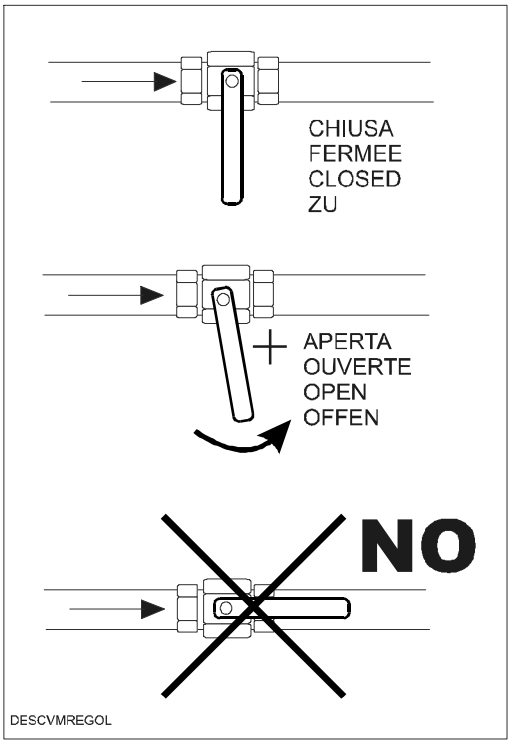
STEAM CONDENSER

As regards the machines provided with "vapour condensing" device, pay attention to the following:

The adjustment of the device is carried out by means of the regulator valve (COCK **"V"**) placed inside the machine base plate and marked with its special label.

The Manufacturer should rule this cock while testing the machine.
Never touch this cock without a specific reason.





This valve rules the water flow in the vapour condensing battery.

If the machine needed a more precise adjustment, under regular conditions, adjust the valve until no more vapour comes out of the "vapour condensing" cap.

Generally it is sufficient to slightly open the valve.

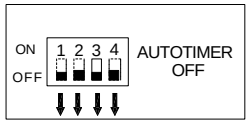
ATTENTION! An excessive opening can cause the cooling of the tank.

WASHING AUTOTIMER

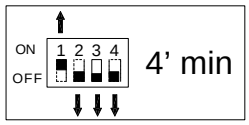
Thanks to the AUTOTIMER device it is possible to reduce water and power consumption when the machine is not used. As default the function 'Autotimer' is disabled. It's possible to program the times of stop of 4'-6'-8' (calculated from when the last rack has come out) by setting up the dip-switch positioned on the electronic card that is in the control box.

Look at the following diagrams:

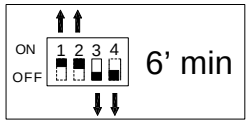
Disabled Autotimer :



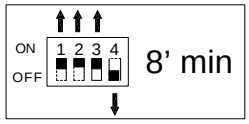
Autotimer after 4' min. :



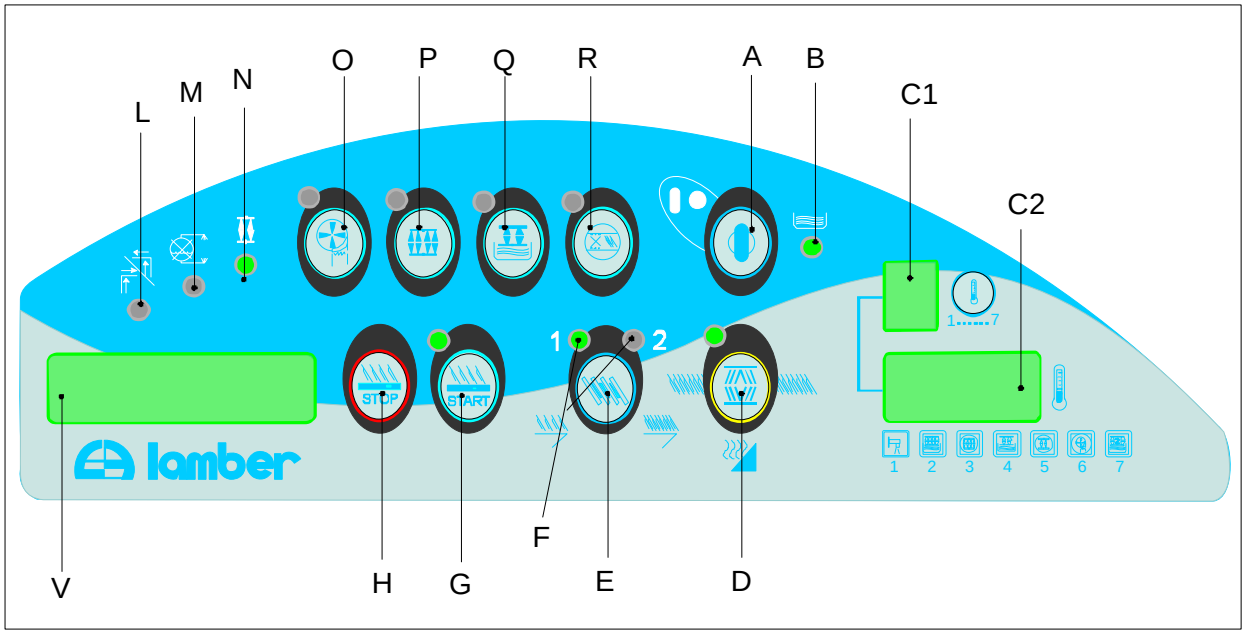
Autotimer after 6' min. :



Autotimer after 8' min. :



MODIFICATION OF PARAMETERS' PROGRAMMING



1. Make sure that the wall switch is on;
2. Give power to the machine by the main selector which is placed on the top of the control box: the thermometer display "C1-C2" will turn on, as well as the information display "V", where **"OFF"** will appear**;**
3. Push on the **"H-G-D"** buttons at the same time : on the display **"PARAMETERS"** will appear ;
4. Push **"G"(start)** in order to see all the parameters in sequence (see complete list on the following page); (with the **"H"(stop)** button it is possible to go back to the previous parameter)
5. Modify the parameter acting on the **"E"** button to reduce and on the **"D"** button to increase the value of this parameter;
6. To validate the value of the modified parameters it is necessary to push the button **"G"(start)** until the last "OFF" appears;
7. Push the **"A"** line button (on the information display you'll see that "ON" will appear);
8. Start the machine and check the right value of the established parameters.

PARAMÈTRES MATIC

Description	Default (Reset)	Paramètres Modifiés
Langue	Italiano	
Pre-rinçage (Oui-Non)	Non	
Start pre-rinçage 1 (0-240s)	2s	
Start pre-rinçage 2 (0-240s)	1s	
Duréé pre-rinçage 1 (0-240s)	2s	
Duréé pre-rinçage 2 (0-240s)	1s	
Séchage (Oui-Non)	Non	
Pompe à chaleur (Oui-Non)	Non	
Debitmètre Rinçage (Oui-Non)	Non	
Vitesse (1-2)	2	
Auto timer(0-20min)	0min	
Chargement surchauffeur (0-10min)	2min	
Stop chargement cuve (0-60s)	30s	
Alarme chargement cuve (0-60min)	20min	
Start rinçage 1 (0-240s)	0s	
Start rinçage 2 (0-240s)	0s	
Stop rinçage 1 (0-240s)	1s	
Stop rinçage 2 (0-240s)	1s	
Temps vidange Cuve (0-15min)	0min	
Start après Fin de Course (0-10s)	3s	
Niveau (0-240s)	10s	
Arrêt Lavage (0-250s)	0s	

Paramètre d'entretien

Service (0-2500)	500	
Blocage machine (Oui-Non)	Non	

RÉTABLISSEMENT DES PARAMÈTRES D'USINE:

1- Presser au même temps les touches **"H (stop)-G (start)- A (I-O)"**

2- En gardant préssées les touches mentionnées ci-dessus, donner tension à la machine en agissant sur le sectionneur général placé sur le panneau de contrôle.

MATIC PARAMETERS' DESCRIPTION

Description	*Parameter functioning*
Language	Select the language to use: Italian-French-English-German-Spanish.
Pre-rinsing (Yes-No)	Select YES only for machines with pre-rinsing. This function can be activated or not by pressing ''P'' button.
Pre-rinsing Start 1 (0-240s)	a: (for machines with Pull-through rack) lag at the pre-rinsing pump start from the moment of the basket contact with the rinsing economizer at the first speed . b: (for Belt-towing machines) lag at the pre-rinsing pump start from the moment of the basket or dish passage between the entry's photoelectric cells at the first speed.
Pre-rinsing Start 2 (0-240s)	a: (for machines with Pull-through rack) lag at the pre-rinsing pump start from the moment of the basket contact with the rinsing economizer at the second speed . b: (for Belt-towing machines) lag at the pre-rinsing pump start from the moment of the basket or dish passage between the entry's photoelectric cells at the second speed.
Pre-rinsing duration 1 (0-240s)	a: (for machines with Pull-through rack) lag at the pre-rinsing pump stop from the moment of the exit of the basket contact with the rinsing economizer at the first speed. b: (for Belt-towing machines) lag at the pre-rinsing pump stop from the moment of the dish or basket exit from the entry's photoelectric cells at the first speed.
Pre- rinsing duration 2 (0-240s)	a: (for machines with Pull-through rack) lag at the pre-rinsing pump stop from the moment of the basket contact with the pre-rinsing economizer at the second speed. b: (for Belt-towing machines) lag at the pre-rinsing pump stop from the moment of the dish or basket exit from the entry's photoelectric cells at the second speed.
Drying (Yes-No)	Select YES only for machines with drying tunnel. This function can be activated or excluded by ''O'' button.
Heat pump (Yes-No)	Select YES only for machines with heat pump. This function can be activated or excluded by ''Q'' button.
Flow-meter (Yes-No)	Select YES only for machines with flow-meter. It checks the rinsing water quantity. Lamp ''M'' is lighted up when the rinsing functioning is regular; when the water quantity is inadequate lamp ''M'' flashes and the display shows ''RINSING ALERT''.
Speed (1-2)	Select -1- for machines with only one speed and select -2- for machines with two speeds. ''E'' button allows to select the conveyor's or belt-towing 's speed. The corresponding lamp ''F'' will be lighted up.
Autotimer (0-20min)	Only for machines with autotimer. Select a time from 1 to 20 minutes to activate it. This function anyway can be activated or excluded by ''R'' button. It stops the machine after the selected time from when the last basket or dish has passed by the rinsing economizer.
Boiler filling (0-10min)	At every daily start, before filling the tanks, the rinsing system is activated to guarantee the water presence in the boiler. Regulate the time according to the single needs or boiler dimensions.
Tank filling stop (0-60s)	Time during which the tank filling has to continue after having reached the level of the level switch to reach immediately the optimal functioning level.

Tank filling alert (0-60min)	Maximum time for the tank filling, after which the machine stops and the display shows this trouble. Alert in case of lack of water or anomaly on the machine drain system.
Rinsing Start 1 (0-240s)	a: (for machines with Pull-through rack) lag at the rinsing start from the moment of the basket contact with the rinsing economizer (at the first speed) . b: (for Belt-towing machines) lag at the rinsing start from the moment of the basket or dish passage between the entry's photoelectric cells (at the first speed).
Rinsing Start 2 (0-240s)	a: (for machines with Pull-through rack) lag at the rinsing start from the moment of the basket contact with the rinsing economizer (at the second speed) . b: (for Belt-towing machines) lag at the rinsing start from the moment of the basket or dish passage between the entry's photoelectric cells (at the second speed).
Rinsing duration 1 (0-240s)	a: (for machines with Pull-through rack) lag at the rinsing stop from the moment of the exit of the basket contact with the rinsing economizer (at the first speed). b: (for Belt-towing machines) lag at the rinsing stop from the moment of the dish or basket exit from the entry's photoelectric cells (at the first speed).
Rinsing duration 2 (0-240s)	a: (for machines with Pull-through rack) lag at the rinsing stop from the moment of the basket contact with the rinsing economizer (at the second speed). b: (for Belt-towing machines) lag at the rinsing stop from the moment of the dish or basket exit from the entry's photoelectric cells (at the second speed).
Tank drain time (0-15min)	Only for machines with automatic drain valve. It fixes the time of the drain cycle.
Start after the conveyor limit stop (0-10s)	Lag time for the restart of the conveyor or of the belt-towing after the stop by the conveyor limit stop to allow to clear the exit table. This lag is activated also at the start of the washing or of the conveyor.
Level (0-240s)	Waiting time for the tank level reset at the washing pumps' start. It can be useful if the machine is equipped with Autotimer and subject to frequent stops and restarts.
Washing stop (0-250s)	Washing stop at limit stop. It allows to stop the washing after some time, from the moment of the baskets stop at the limit stop. The parameter can be set from 0 to 250 seconds.
CALL SERVICE (500-2500)	It allows to fix after how many hours of utilization the dishwasher's maintenance has to be done. The parameter can be regulated from 0 to 2500 hours.
STOP MACHINE (YES-NOT)	This parameter allows to stop the machine after 50 hours of working since the flashing word ''CALL SERVICE'' appeared on the display.

A LIST OF DRAWBACKS POSSIBLY OCCURRING WITH THE USE OF THE DISHWASHING MACHINE, THEIR CAUSES AND POSSIBLE REMEDIES

1 - Lamp D (LS1) does not turn on upon switching the machine on

A - Check that the wall-mounting swith is ON and the respective fuses are not burnt.
B - Maybe lamp LS1 has burnt. In this case, replace it. The machine can work anyway .

2 - Lamp M (LS3) of overload cutout devices, ON

A - Chek that the overload cutouts of the individual remote switches and replace those disconnected . If such a drawback occurs several times in the same device, it is suggested to increase the current rate through the graduated cursor.
B - Check that the power supply voltage is not subjected to variations in ecces of 10% of the nominal value .
C - Check, by using an ammeter, that the current drained by the motor does not exceed the rated values .

3 - The tank don't fill, lamp G (LS2) does not turn on

A - Check that pressures switches CP1-CP2 (those existing) are effective and calibrated.
B - Check that the feeding water intercept is open and water is present in the piping system .
C - Check that the overflows are in their housing.
D - Check that the solenoid valve EV2 is effective and gets tension.

4 - The racks don't step up, feeding rod still

A - Check that nothing is resting on limit switch micro FC1 and this is in good operating conditions .
B - Check that there are no objects got stuck inside the tunnel between the feeding group and the fixed part of the machine.
C - Check that the locking ringnut of the friction clutch in speed reducer M01-M01A1 is not slackened, if otherwise tighten it slowly until the feeding system operates.
D - Check that the overload cutout RM01 is not triggered, otherwise restore it. This drawback is displayed by lamp M (LS3) being ON .
E - Check that the remote switch coil MT04 is effective.
F - Check that speed reducer M01 is in good operating conditions .

5 - The racks don't step up, feeding rod moving

A - Check whether one or several pawles are blocked .
B - Check that the central rack of the rack is effective .

6 - The racks don't stop at end of stroke

A - Check that the wheel of micro FC1 projects sufficiently from the bracket and is operated by the shelf.
B - Check that micro FC1 is effective and the respective cable is connected correctly.

7 - The tanks don't stop being filled upon reaching the desired level

A - Check that the trap of the pressure switch has no porosities and the connection pipe is not disconnected .
B - Check that the pressure switch is in good conditions and is calibrated .
C - Check that there is no dirty in the solenoid valve. This drawback can be noted because the machine continues to load water, whilst the main on/off switch is off .

8 - Insufficient washing

A - Check that the detergent is effective, of the type for industrial dishwashing machines, and is proportioned for the right concentration .
B - Check that the detergent container is not empty and operates correctely .
C - Check that the jets of the washing and pre-rinsing arms are not clogged. If necessary, clean them.
D - Check that the dishes are placed in the respective racks. Soup plates have to be mandatorily placed in rack type P12-16.
E - Check that the temperatures in the tanks are the specified ones.
F - One or several pumps don't operate, in this case check that:
- the overload cutuot didn't switch the pump in question and, if necessary,restore it (this drawback is displayed by lamp M (LS3) being ON)
- the coil of the respective remote switch are not broken
- finally, the pump is not blocked, the motor is effective and rotates in the right direction.

PUMPS ELECTRICAL COMPONENTS

1st wash

PUMP	M02
CONTACTOR	MT5
CUTOUT	RM2

H - Shadings or spots present on dishes,specially on glasses, may be caused by minerals present in the water. In such an event, it is suggested to analyze the water used. The contents of calcium and magnesium in the water should not exceed 10°F. The presence of iron should not exceed 0,1 ppm. If these values are exceed, it is suggested to treat the water as appropriate .
I - A preliminary softening is suggested prior to washing knives, forks and spoons

9 - Temperatures insufficient in one or several tanks

A - Check that the thermostats are effective and calibrated .
B - Check that the temperature of the feeding water is from 50° to 60° C, as specified .
C - Check that the thermostats relevant to the tanks are set to the right temperatures and operate correctely .
D - Check that the fuses and the coil of the remote switch are not broken .
E - Check that the heater elements are effective .

HEATER ELECTRICAL COMPONENTS

	1st wash
TEMPERATURE	50°-60°C
HEATERS	R2
THERMOSTATS	CT3
CONTACTORS	MT2

10 - Rinsing insufficient

An effective rinsing also depends on correct washing operations . Therefore, prior to checking the rinsing system, make sure that washing took place correctly, and specifically look at item X in the respective paragraph. Having ascertained that washing was made correctly, check that :
A - The dynamic pressure of the feeding water is not less than 2 bars. Should the pressure be insufficient, install rinse buster pump M07 in order to increase pressure .
B - The nozzles are not clogged by calcareous residuals and they are oriented to the right direction .
C - Water inlet solenoid valve EV1 operates correctly.
D - The water input filter is not clogged
E - Energy-saver microswitch FCE1 and FCP9 are effecteive .
F - The curtain of the last tank is in the right position and does not cover the rinsing nozzles when dishes pass there .
G - The boiler is not scaled to such an extent as to limit the water flow rate.

11 - Insufficient Rinsing temperature
The temperature of the rinsing water should range from 80° to 90° C.
Should it be lower.check that :
A - The thermometer is effective and calibrated .
B - The temperature of the feeding water ranges from 50° to 60° C specified (excluding machines with drain heat recovery unit) .
C - The dynamic pressure of the feeding water does not exceed 2 bars. If so, calibrate the pressure reducer incorporated in the machine.
D - The rinsing nozzles have not been unduly widened or replaced.
E - The thermostats relevant to boiler CT2 is set to the right temperature and operate correctly.

If the drawback is not due to any of the causes listed hereabove,proceed as follows :

<u>for machines with electric heating</u>
- check that the coil of remote switch MT03 is not broken
- check all elements of boiler heaters R1
- check the security thermostat CT1 is on

<u>for machines with steam heating</u>
- check that the steam inlet gate is open and it is present with a pressure not less than 0,5 bars,
- check that the filter of the condensated steam drainage is not clogged;
- check that steam solenoid valve EV7 operates correctly,
- check that the input steam filter is not clogged to such an extent as to prevent the normal flow rate,
- check that the condensated steam outlet pipe can freely drain by drop,
- check that the pipe-coil of the boiler is not scaled to such an extent as to limit the heat exchange thereof .

12 - Insufficient drying

An effective drying is strictly related to an effective washing and rinsing. Prior to checking the drying system, check whether washing and rinsing have been made correctly. Then check that :

A - The rinse agent liquid container is not empty and the respective proportioner operates correctly.

B - The air suction holes located on the upper panel are not clogged by foreign bodies.

C – The Overload cutout is not triggered. If so, restore it. This drawback is displayed by lamp M (LS3) being ON.

D - Fuses and remote switch coil MT09 are not broken.

E - Motor M05 is not blocked and rotates in the right direction.

F - Using a maximum thermometer, check that the temperature of the hot air jet is at least 80° C. Should it be lower, proceed as follows :

<u>for machines with electrical heating</u>
- check that thermostat CT6 is set to the right position and operates correctly.
- check that fuses and remote switch coil MT07 are affective.
- check that heater element R3 are effective.

<u>for machines with steam heating</u>
- check that the steam inlet gate is open and is present with a pressure not less than 0,5 bars,
- check that the filter of the condensated steam drainage is not clogged;
- check that steam solenoid valve EV7 operates correctly,
- check that the input steam filter is not clogged to such an extent as to prevent the normal flow rate,

- check that the condensated steam outlet pipe can freely drain by drop.

12 - Insufficient aspiration and steam condensation

A - Check whether foreign bodies obstruct the upper air exhaust hole .

B - Check that the filter of the condenser battery is not clogged by fat residuals. In such an event, wash it with boiling water and detersive. Rinse thoroughly.

C - Check that overload cutout is not triggered. If so, restore it. This drawback is dispalyed by lamp M(LS3) being ON .

D - Check that fuses and remote switch coil MT16 are not broken.

E - Check that motor M08 is not blocked nor burnt and rotates in the right direction

F - Check that the cold water feed cock is open and water is present at a pressure of at least 2 bars.

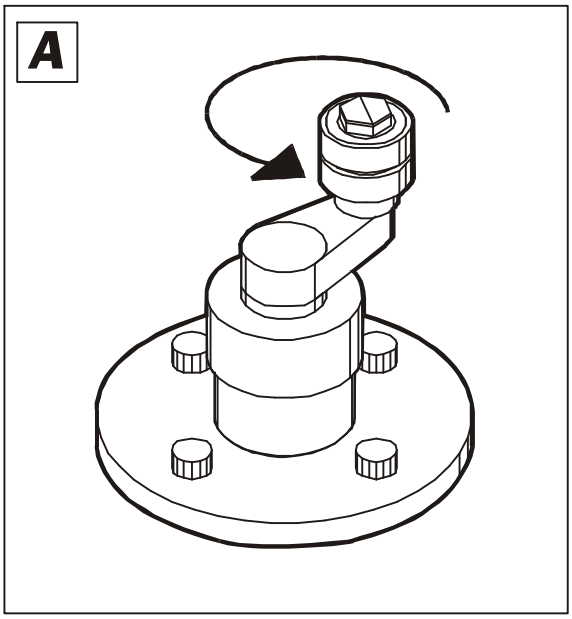
G - Check that cold water inlet filter D is not clogged to such an extent as to limit the flow rate.

The manufacturer declines any responsibility for any misprints contained in this booklet. The Manufacturer also reserves the right to make any modifications to its products that don't affect the basic characteristics thereof.

ATTENTION !

ENGLISH

FOR A CORRECT WORKING OF THE MACHINE (PUMPS, FANS, ETC.), PLEASE CHECK THAT THE **PULL-THROUGH CRANK** INSIDE THE MACHINE (FIG."A") TURNS ANTICLOCKWISE, OR THAT THE **DRIVE MOTOR** SHAFT UNDER THE WASHING TANK (FIG."B") TURNS IN THE DIRECTION INDICATED BY THE YELLOW ARROW ON THE MOTOR BODY.



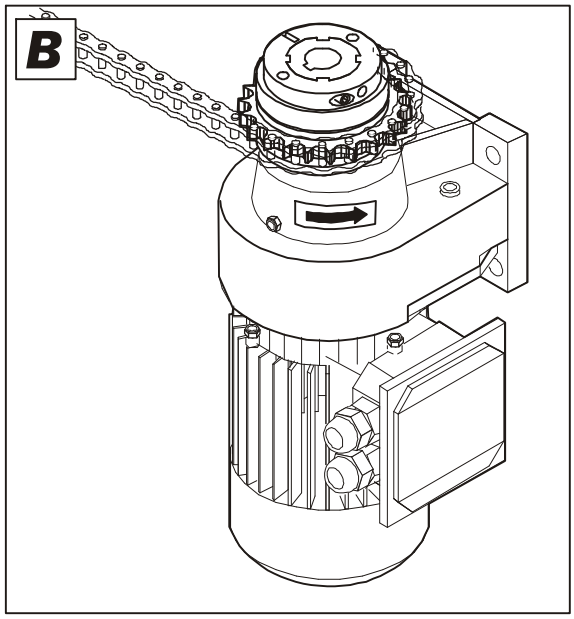
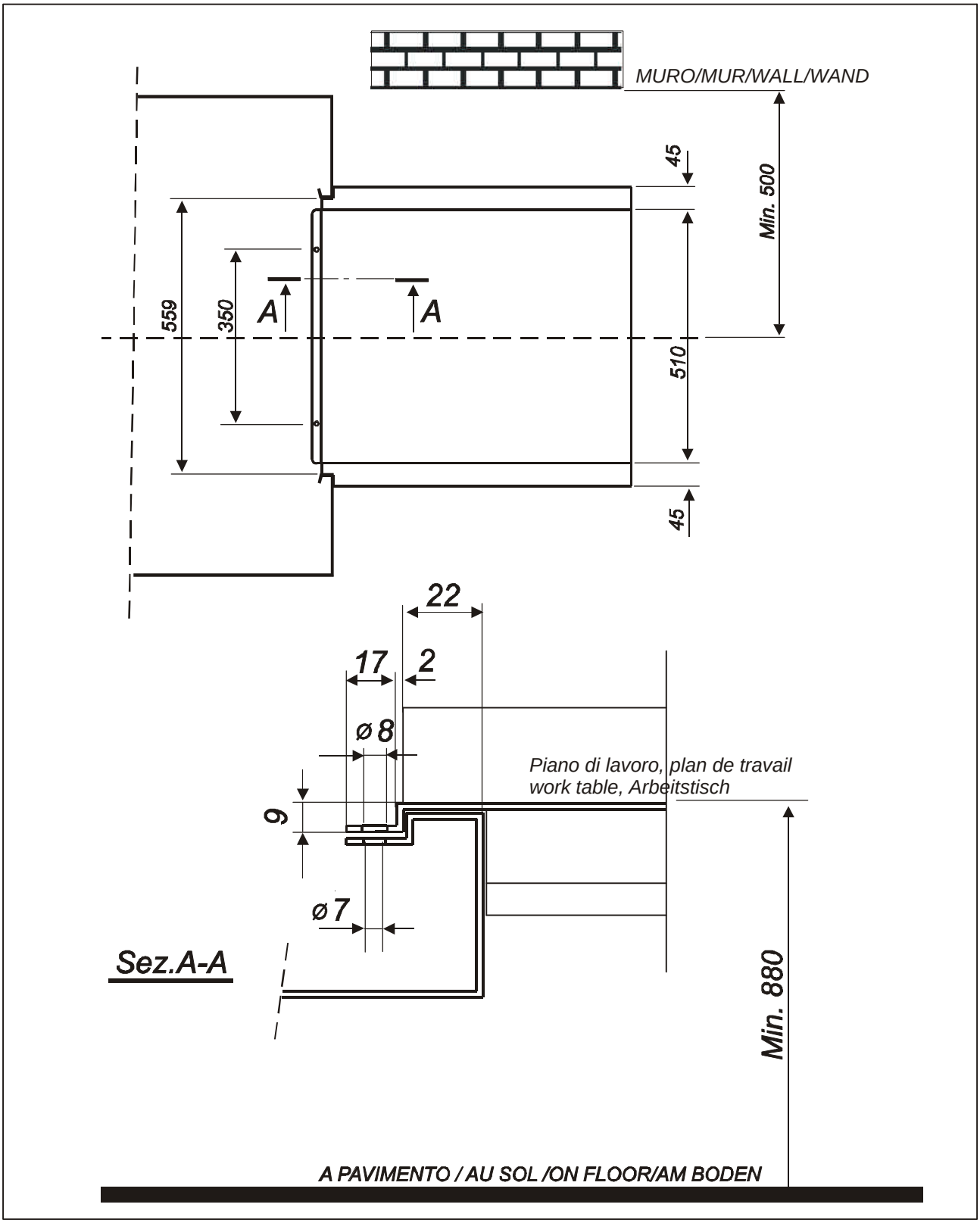


TABLE CONNECTION SCHEME



ABBR.	COMPONENT
AD1	ANTI-JAMMING FILTER
BS1	BOILER SAFETY AUTOMATIC SWITCH RELEASE COIL
BS2	DRYING SAFETY AUTOMATIC SWITCH RELEASE COIL
BS3	SAFETY AUTOMATIC SWITCH RELEASE COIL FOR ADDITIONAL BOILER
BS4	SAFETY AUTOMATIC SWITCH RELEASE COIL FOR ADDITIONAL DRYING UNIT
CP1	LOWER PRESSURE SWITCH FOR MAIN WASHING
CP2	UPPER PRESSURE SWITCH FOR MAIN WASHING
CP3	PRE-WASH PRESSURE SWITCH
CP4	PRESSURE SWITCH FOR SECOND WASHING
CP5	PRE-RINSE PRESSURE SWITCH
CP6	PRESSURE SWITCH FOR SECOND PRE-WASHING
CP7	PRESSURE SWITCH FOR THIRD WASHING
CP8	PRESSURE SWITCH FOR RECYCLE PUMP
CP9	PRESSURE SWITCH FOR PRE-WASHING DRAIN
CP10	PRESSURE SWITCH FOR WASHING DRAIN
CP11	PRESSURE SWITCH FOR DRAIN PU MP M115
CT01	BOILER SAFETY THERMOSTAT
CT02	BOILER THERMOSTAT
CT03	THERMOSTAT FOR MAIN WASH TANK
CT04	MAXIMUM TEMPERATURE THERMOSTAT FOR PRE-WASH TANK
CT05	DRYING SAFETY THERMOSTAT
CT06	DRYING THERMOSTAT
CT07	THERMOSTAT FOR PRE-RINSE TANK
CT08	THERMOSTAT FOR SECOND WASH TANK
CT09	THERMOSTAT FOR PRE-WASH TANK HEATING
CT10	SAFETY THERMOSTAT FOR ADDITIONAL BOILER
CT11	THERMOSTAT FOR ADDITIONAL BOILER
CT12	THERMOSTAT FOR HEAT RECOVERER
CT13	THERMOSTAT FOR SECOND PRE-WASH HEATING
CT14	THERMOSTAT FOR THIRD WASHING
CT15	SAFETY THERMOSTAT FOR ADDITIONAL DRYING
CT16	THERMOSTAT FOR ADDITIONAL DRYING
CT17	DRYING STOP THERMOSTAT
CT18	ECONOMY THERMOSTAT
EV01	LOADING SOLENOID VALVE
EV02	RINSE SOLENOID VALVE
EV03	PREWASH COOLING SOLENOID VALVE
EV04	STEAM CONDENSER SOLENOID VALVE
EV05	HEAT RECOVERER ENTRY SOLENOID VALVE
EV06	HEAT RECOVERER EXIT SOLENOID VALVE
EV07	BOILER STEAM SOLENOID VALVE
EV08	STEAM SOLENOID VALVE - HEATED WATER IN THE MAIN WASH TANK
EV09	DRYING STEAM SOLENOID VALVE
EV10	STEAM SOLENOID VALVE - HEATED WATER IN THE SECOND WASH TANK
EV11	COLD PREWASH SOLENOID VALVE
EV12	STEAM SOLENOID VALVE - HEATED WATER IN THE MAIN PRE-WASH TANK
EV13	GAS-FIRED BOILER ENTRY SOLENOID VALVE (FROM RCL)/RECOVERER EXIT SOLENOID VALVE
EV14-15-16/A	SELF-WASHING AREAS SOLENOID VALVES
EV17	SELF-WASHING SYSTEM SOLENOID VALVE
EV18	TANK DRAIN SOLENOID VALVE

EV19	HEAT PUMP SOLENOID VALVE
EV20	PRE-WASHING LOADING SOLENOID VALVE
EV21	RINSE HEATING SOLENOID VALVE CVCP
EV22	TANK HEATING SOLENOID VALVE CVCP
FC1	LIMIT SWITCH FOR EXIT TABLE
FC2	LIMIT SWITCH FOR BASKET UNLOADING
FC3	SAFETY LIMIT SWITCH FOR BASKET UNLOAD CHAIN
FC4	SAFETY LIMIT SWITCH TOP 1 UNLOAD CHAIN
FC5	SAFETY LIMIT SWITCH
FCE1	RINSING ECONOMIZER
FCE2	PRE-RINSE ECONOMIZER
FCE3	WASHING ECONOMIZER (SELF-TIMING)
FCE4	MICROSWITCH FOR BUSY CORNER PREWASH AREA
FCE5	MICROSWITCH FOR BUSY LOADING ENTER AREA
FCE6	COLD PREWASH ECONOMIZER
FCECL1	MAIN WASH DRAIN OPENING CONTROL
FCECL2	PRE-WASH DRAIN OPENING CONTROL
FCECL3	SECOND WASH DRAIN OPENING CONTROL
FCL1	PHOTOELECTRIC CELL FOR CORNER UNLOADING SYNCHRONISM
FCL2	PHOTOELECTRIC CELL 1 CORNER UNLOADING
FCL3	PHOTOELECTRIC CELL 2 CORNER UNLOADING
FCL4	PHOTOELECTRIC CELL FOR LINEAR SELF-TIMER EMITTER
FCL4A	PHOTOELECTRIC CELL FOR LINEAR SELF-TIMER RECEIVER
FCP01/01A	MAIN WASHING DOOR LIMIT SWITCH
FCP02/02A	PRE-WASH DOOR LIMIT SWITCH
FCP03/03A	PRE-RINSE DOOR LIMIT SWITCH
FCP04/04A	SECOND WASHING DOOR LIMIT SWITCH
FCP05/05A	CORNER DRYING UNIT AND RCL DOOR LIMIT SWITCH
FCP06/06A	DOOR LIMIT SWITCH FOR ENTRY LINEAR BELT
FCP07/07A	DOOR LIMIT SWITCH FOR EXIT LINEAR BELT
FCP08/08A	SECOND PRE-WASH DOOR LIMIT SWITCH
FCP09/09A	DOOR LIMIT SWITCH FOR TANK LOADING M115
FCP10/10A	THIRD WASHING DOOR LIMIT SWITCH
FCP11/11A	DOOR LIMIT SWITCH FOR ADDITIONAL DRYING TUNNEL
FCP12/12A	DOOR LIMIT SWITCH FOR PREWASH-WASH NEUTRAL INTERMEDIATE
FCP13/13A	DOOR LIMIT SWITCH FOR WASH-RINSE NEUTRAL INTERMEDIATE
FCP14/14A	DOOR LIMIT SWITCH FOR LINEAR ENTRY TABLE FILTER
FCP15	FOURTH WASHING DOOR LIMIT SWITCH
FCSC1	PREWASH DRAIN MICROSWITCH
FCSC2	MAIN WASHING DRAIN MICROSWITCH
FLS1	RINSE FLOWMETER
FS1-2-3	MAIN SWITCH FUSES
FS4	PRIMARY TRANSFORMER FUSES FOR DETERGENT PUMP
FS5	PRIMARY TRANSFORMER FUSES FOR RINSE AID PUMP
FS6	FUSES FOR DETERGENT PUMP
FS7	FUSES FOR RINSE AID PUMP
FS8	PRIMARY TRANSFORMER FUSES FOR TEMPERATURE RECORDER
IA01	AUTOMATIC SWITCH PRIMARY TRANSFORMER
IA02	AUTOMATIC SWITCH SECONDARY TRANSFORMER
IA03	AUTOMATIC SWITCH FOR BOILER HEATING ELEMENT
IA04	AUTOMATIC SWITCH FOR MAIN TANK ELEMENT
IA05	AUTOMATIC SWITCH FOR PRIMARY TRANSFORMER FOR DOORS

IA06	AUTOMATIC SWITCH FOR SECONDARY TRANSFORMER FOR DOORS B191
IA07	AUTOMATIC SWITCH FOR DRYING HEATING ELEMENT
IA08	AUTOMATIC SWITCH FOR PRE-RINSE HEATING ELEMENT
IA09	AUTOMATIC SWITCH FOR SECOND TANK HEATING ELEMENT
IA10	AUTOMATIC SWITCH FOR PREWASH HEATING ELEMENT
IA11	AUTOMATIC SWITCH FOR ADDITIONAL BOILER HEATING ELEMENT
IA12	AUTOMATIC SWITCH FOR SECOND PREWASH HEATING ELEMENT
IA13	AUTOMATIC SWITCH FOR THIRD TANK HEATING ELEMENT
IA14	AUTOMATIC SWITCH FOR ADDITIONAL DRYING HEATING ELEMENT
IA15	AUTOMATIC SWITCH FOR DRAIN VALVES PROTECTION
IN0	MACHINE GENERAL ISOLATOR WITH FUSES
IN1	MACHINE START SWITCH 0-1-2
IN2	PRE-RINSE SWITCH
IN3	DRYING SWITCH 9KW
IN4	SELF-TIMER SWITCH
IN5	ADDITIONAL DRYING UNIT SWITCH
IN6	INVERTER SWITCH
LIV1	DETERGENT LEVEL
LIV2	RINSE AID LEVEL
LS1	TURN-ON LAMP
LS2	TANK LEVEL LAMP
LS3	OVERLOAD CUTOUT LAMP
LS4	LAMP FOR FREE CORNER PRE-WASH AREA
LS5	EMERGENCY LAMP FOR RINSING FLOWMETER
LS6	SELF-WASHING SYSTEM CYCLE LAMP
LS7	AUTOTIMER LAMP
LS8	START LAMP
LS9	DETERGENT LEVEL ALARM LAMP
LS10	DRAIN LAMP
M01	TOWING GEARED MOTOR V1
M01A	TOWING GEARED MOTOR V2
M02	MAIN WASH PUMP
M03	PRE-WASH PUMP
M04	FAN MOTOR
M05	MOTOR FAN FOR DRYING UNIT
M06	RINSE PUMP
M07	BOOSTER PUMP
M08	STEAM CONDENSER FAN MOTOR
M09	SECOND WASH PUMP
M10	HEAT RECOVERER FAN MOTOR
M11	GEARED MOTOR FOR MOTORIZED CURVE V1
M11A	GEARED MOTOR FOR MOTORIZED CURVE V2
M12	SECOND PRE-WASH PUMP
M13	GEARED MOTOR FOR RACK UNLOAD TABLE
M14	THIRD WASH PUMP
M15	RECYCLE PUMP
M16	ADDITIONAL MOTOR FAN FOR DRYING UNIT
M17	MACHINE SELF-WASHING PUMP
M18	DRAIN PUMP
M19	HEAT PUMP COMPRESSOR
M20	PUMP FOR DRAIN PUMP KIT M115
MT01	LEVEL CONTROL CONTACTOR

MT02	HEATING ELEMENT CONTACTOR FOR MAIN WASH TANK
MT03	BOILER HEATING ELEMENT CONTACTOR
MT04	CONTACTOR FOR TOWING MOTOR
MT04A	CONTACTOR FOR TOWING MOTOR (SECOND SPEED)
MT04B	CONTACTOR FOR TOWING MOTOR (THIRD SPEED)
MT05	CONTACTOR FOR MAIN WASH PUMP
MT06	CONTACTOR FOR PRE-WASH PUMP
MT07	CONTACTOR FOR FAN MOTOR
MT08	CONTACTOR FOR HEATING ELEMENT OF DRYING UNIT
MT09	CONTACTOR FOR DRYING UNIT MOTOR FAN
MT10	CONTACTOR FOR PRE-RINSE PUMP
MT11	CONTACTOR FOR PRE-RINSE HEATING ELEMENT
MT12	CONTACTOR FOR DOOR MAGNETIC SWITCH (MATIC M39-49-59/LINEAR)
MT13	CONTACTOR-RELAY FOR RINSE ECONOMIZER (MATIC BOOSTER PUMP)
MT14	BOOSTER PUMP CONTACTOR
MT15	SECOND WASH PUMP CONTACTOR
MT16	CONTACTOR FOR STEAM CONDENSER FAN MOTOR
MT17	CONTACTOR FOR SECOND WASH TANK ELEMENT
MT18	CONTACTOR FOR HEAT RECOVERER FAN MOTOR
MT19	CONTACTOR FOR ADDITIONAL BOILER
MT20	CONTACTOR FOR MOTOR V1 MOTORIZED CURVE
MT20A	CONTACTOR FOR MOTOR V2 MOTORIZED CURVE
MT21	CONTACTOR FOR PRE-WASH HEATING ELEMENT
MT22	CONTACTOR FOR LINEAR RINSE ECONOMIZER
MT23	CONTACTOR-RELAY FOR PHOTOELECTRIC CELL 1 BASKET UNLOADER
MT24	CONTACTOR-RELAY FOR PHOTOELECTRIC CELL 2 BASKET UNLOADER
MT25	CONTACTOR-RELAY FOR SYNCHRONISM PHOTOELECTRIC CELL (BASKET UNLOADER)
MT26	CONTACTOR FOR BASKET UNLOADER GEARED MOTOR
MT27	RINSE CONTACTOR
MT28	CONTACTOR FOR BASKET UNLOADER START
MT29	SECOND PRE-WASH PUMP CONTACTOR
MT30	SECOND PRE-WASH HEATING ELEMENT CONTACTOR
MT31	CONTACTOR FOR THIRD WASH PUMP (LINEAR 80)
MT32	CONTACTOR FOR THIRD WASH HEATING ELEMENT
MT33	CONTACTOR FOR RECYCLE PUMP
MT34	CONTACTOR FOR ADDITIONAL DRYING UNIT ELEMENT
MT35	CONTACTOR FOR ADDITIONAL DRYING UNIT MOTOR FAN
MT36	CONTACTOR FOR COUPLING OF AUTOTIMER-COLD PREWASH
MT37	CONTACTOR FOR LINEAR AUTOTIMER CONVEYOR
MT38	CONTACTOR FOR LINEAR AUTOTIMER PHOTOELECTRIC CELLS
MT39	AUTOWASHING PUMP CONTACTOR
MT40	START CONTACTOR FOR INDEPENDENT DRYING TUNNEL
MT41	DETERGENT PUMP LEVEL CONTACTOR
MT42	RINSE AID PUMP LEVEL CONTACTOR
MT43	RINSING FLOWMETER CONTACTOR
MT44	DRAIN PUMP CONTACTOR
MT45	AUTOTIMER START CONTACTOR
MT46	CONTACTOR FOR HEAT PUMP COMPRESSOR
MT47	RELAY FOR HEAT PUMP LEVELS
MT48	RELAY EV5 FOR ENTRY SOLENOID VALVE RC
PS01	START PUSHBUTTON
PS02	STOP PUSHBUTTON

PS03	EMERGENCY PUSHBUTTON
PS04	LOADING TABLE EMERGENCY PUSHBUTTON
PS05	UNLOADING TABLE EMERGENCY PUSHBUTTON
PS06	RACK UNLOADER EMERGENCY PUSHBUTTON
PS07	ENTRY TABLE START PUSHBUTTON
PS08	EXIT TABLE START PUSHBUTTON
PS09	ENTRY TABLE STOP PUSHBUTTON
PS10	EXIT TABLE STOP PUSHBUTTON
PS11	LINEAR CONVEYOR START PUSHBUTTON WITH AUTOTIMER
PS12	SELF-WASH CYCLE START PUSHBUTTON
PS13	DRAIN PUSHBUTTON
R01	BOILER HEATING ELEMENT
R02	MAIN WASH HEATING ELEMENT
R03	DRYING UNIT HEATING ELEMENT
R04	PRE-RINSE HEATING ELEMENT
R05	SECOND WASH HEATING ELEMENT
R06	PRE-WASH HEATING ELEMENT
R07	ADDITIONAL BOILER HEATING ELEMENT
R08	SECOND PRE-WASH HEATING ELEMENT
R09	THIRD WASH HEATING ELEMENT
R10	ADDITIONAL DRYING UNIT HEATING ELEMENT
RM01	AUTOMATIC THERMIC RELAY FOR TOWING MOTOR V1
RM01A	AUTOMATIC THERMIC RELAY FOR TOWING MOTOR V2
RM02	AUTOMATIC THERMIC RELAY FOR MAIN WASH PUMP
RM03	AUTOMATIC THERMIC RELAY FOR PRE-WASH PUMP
RM04	AUTOMATIC THERMIC RELAY FOR FAN MOTOR
RM05	AUTOMATIC THERMIC RELAY FOR DRYING UNIT FAN MOTOR
RM06	AUTOMATIC THERMIC RELAY FOR PRE-RINSE PUMP
RM07	AUTOMATIC THERMIC RELAY FOR BOOSTER PUMP
RM08	AUTOMATIC THERMIC RELAY FOR STEAM CONDENSER MOTOR FAN
RM09	AUTOMATIC THERMIC RELAY FOR SECOND WASH PUMP
RM10	AUTOMATIC THERMIC RELAY FOR HEAT RECOVERER MOTOR FAN
RM11	AUTOMATIC THERMIC RELAY FOR MOTOR V1 (MOTORIZED CURVE)
RM11A	AUTOMATIC THERMIC RELAY FOR MOTOR V1 (MOTORIZED CURVE)
RM12	AUTOMATIC THERMIC RELAY FOR MOTOR V2 (MOTORIZED CURVE)
RM13	AUTOMATIC THERMIC RELAY FOR SECOND PRE-WASH PUMP
RM14	AUTOMATIC THERMIC RELAY FOR THIRD WASH PUMP
RM15	THERMIC RELAY FOR RECYCLE PUMP
RM16	THERMIC RELAY FOR ADDITIONAL DRYING UNIT MOTOR FAN
RM17	THERMIC RELAY FOR SELF-WASH PUMP
RM18	THERMIC RELAY FOR DRAIN PUMP
RM19	THERMIC RELAY FOR HEAT PUMP
S1	SIREN FOR LINEAR CONVEYOR BELT START
SL1	SPEED SELECTOR 1-0-2
SL2/2A	MACHINE SELF-WASHING SYSTEM SELECTOR
T1	THERMOMETER FOR WATER INLET
T2	THERMOMETER FOR PRE-WASH CYCLE
T3	THERMOMETER FOR MAIN WASH CYCLE
T4	THERMOMETER FOR RINSING CYCLE
T5	THERMOMETER FOR SECOND WASH CYCLE
T6	THERMOMETER FOR DRYING UNIT
T7	THERMOMETER FOR THIRD WASH CYCLE

TM1	TIMER FOR LINEAR CONVEYOR BELT START
TM2	AUTOTIMER
TM3	TIMER FOR AUTOTIMER START
TM4	TIMER FOR LINEAR RINSE ECONOMIZER
TM5	TIMER FOR SELF-WASHING SYSTEM
TM6	TIMER FOR DRAIN
TR01	TRANSFORMER
TR02	TRANSFORMER FOR RINSE AID PUMP SYSTEM
TR03	TRANSFORMER FOR DOOR SYSTEM
TR04	TRANSFORMER FOR WATER INLET THERMOMETER
TR05	TRANSFORMER FOR PRE-WASH THERMOMETER
TR06	TRANSFORMER FOR MAIN WASH THERMOMETER
TR07	TRANSFORMER FOR RINSE THERMOMETER
TR08	TRANSFORMER FOR SECOND WASH THERMOMETER
TR09	TRANSFORMER FOR DRYING UNIT THERMOMETER
TR10	TRANSFORMER FOR TEMPERATURE RECORDER