FM 6000
FILLING MACHINE

This page has been left intentionally blank

INTRODUCTION

We thank you for having chosen our product and recommend you read this manual carefully as it is indispensable for carrying out to the installation, control and maintenance operations required to keep your machine in perfect running condition.
The manual contains tables, drawings and layouts to help you familiarize yourself with all parts of the machine. For the maintenance and overhaul operations not covered by this manual, and for all technical problems, our Service department is at your disposal for information and to coordinate the necessary action.
We will be pleased to receive your suggestions, should you find that any explanation has been omitted or is not exhaustive: we will take them into the greatest consideration in an effort to improve the manual.

⚠ WARNING

- The observance of the limits established to pressure, speed, temperature and voltage as well as other indication given are indispensable for the regular operation and therefore must be respected by the user.

- For the pneumatic components de-humidified compressed air must be used, at the right pressure and in the quantity prescribed, without any trace of oil. The environmental conditions of the installation site must also be taken into consideration.

- The national laws which regulate the use of this type of electrical equipment must also be respected.

- Our company declines any responsability for damages deriving from the lack of respect of above warnings.

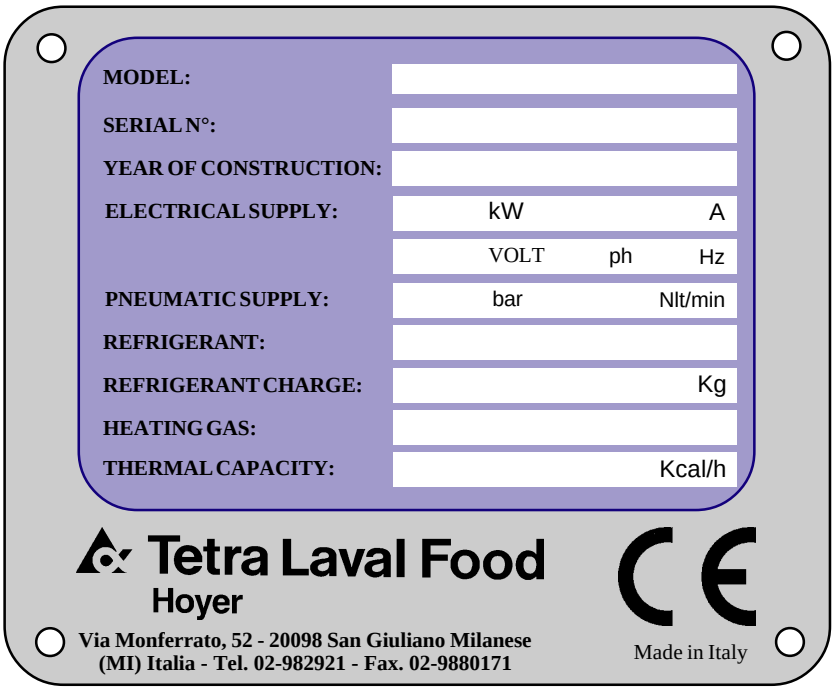
⚠ NOTE

- The data given in this manual can be be varied by Hoyer without prior notice.

- The manual includes instructions for all devices fitted on the standard machine.Please refer to the chapters which show the devices bought by you.

- The machine is covered by guarantee as per purchase contract.The guarantee will automatically expire for any unauthorised repair from Hoyer during the guarantee period.

When calling our Service Department, please supply the following data:



AFTER SALE SERVICE

Tetra Laval Food Hoyer A/S
Søren Nymarks Vej 13
DK- 8270 Højbjerg /Århus
Denmark
Phone: +45 89 39 39 39
Fax: +45 86 29 22 00
Tlx: 6 87 70 alhoy dk

Danice Services A/S
Søren Nymarks Vej 11
DK - 8270 Højbjerg /Århus
Denmark
Phone: +45 86 29 36 33
Fax: +45 86 29 33 30
Tlx: 6 86 49 danis dk

Tetra Laval Food Hoyer S.p.A.
Via Monferrato, 52
I - 20098 San Giuliano Milanese (Milan)
Italy
Phone: +39 2 98 2921
Fax: +39 2 98 80171
Tlx: 315 127 mark i

Tetra Laval Food Hoyer Inc.
201 Broad Street
Lake Geneva, WI 53147
USA
Phone: +1 414 248 8950
Fax: +1 414 248 2883

Tetra Laval Food Hoyer Inc.
US Packaging Division
1104 Industrial Blvd.
Albion, MI 49224
USA
Phone: +1 517 629 2163
Fax: +1 517 629 2166

Tetra Laval Food Hoyer France
Z I le Chêne Sorcier
F - 78340 les Clayes-Sous-Bois
France
Phone: +33 1 30 81 81 81
Fax: +33 1 30 81 81 20

Tetra Laval Food Hoyer Espana
Calle Antonio de Cabezón, 27
P.O. Box 31015
E- 28080 Madrid
Spain
Phone: +34 1 37 90 652
Fax: +34 1 37 90 692

Tetra Laval Food Hoyer U.K.
Interchange Park
GB - Newport Pagnell
Buckshire MK16 9PS
United Kingdom
Phone: +44 908 616 699
Fax: +44 908 617 990

Tetra Laval Food Hoyer Japan
c/o Nihon Tetra Laval Food K.K.
6-20, Higashi-Kojiya 4-chome
Ota-ku
Tokyo 144
Japan
Phone: + 81 3 3741 7641
Fax: +81 3 3741 7241

Tetra Laval Food Hoyer Korea
c/o Alfa Laval Korea Ltd.
49-3, Hamman-Dong
Yongsan-Ku
Seoul 140-210
Korea
Phone: +82 2 749 2291-5
Fax: +82 2 790 8384-5

Tetra Laval Food Hoyer Hong Kong
c/o Tetra Laval Food Ltd.
1/F, Chung Nam Building
1 Lockhart Road, Wanchai,
Hong Kong
Phone: +852 861 1936
Fax: +852 520 2346

Tetra Laval Food Hoyer Bejing
c/o Tetra Pak China Ltd.
Beijing Representative Office
Room 416, Tian An Building
Hua Long Street
Dong Cheng District
Beijing 100006
P.R. China
Phone: +86 1 512 8844 ext. 416
Fax: +86 1 513 2141

Tetra Laval Food Hoyer Shanghai
c/o Tetra Pak China Ltd.
Shanghai Representative Office
Room 701-702, 7/F, Block 3
Nanjing Road (W)
Shanghai 200040
P.R. China
Phone: +86 21 247 3812 or 1086
Fax. +86 21 253 5623

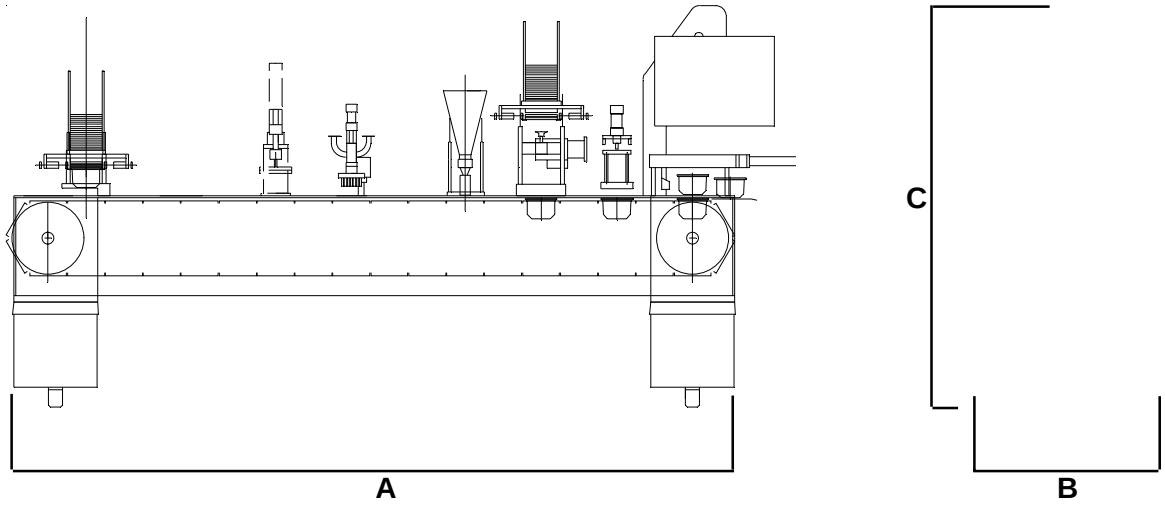
Tetra Laval Food Hoyer Philippines
Service Centre
5th Floor, Jaka 1 Bldg.
6794 Ayala Avenue
Makati, Metro Manila
Philippines
Phone: +63 2 810 1968
Fax: +63 2 815 6693

INDEX

This page has been left intentionally blank

SECTION 1.0
TECHNICAL SPECIFICATION

FIG.1 DIMENSIONS



1.1 TECHNICAL DATA

Electrical characteristics
standard - 380 V 50/60 Hz , 3-phase
on request - 220 or 415 V

Total installed power
- 2.5 kW standard version
- 4 kW version with thermosealing

Main dimensions
dimensions (Fig.1) - A(3650 mm) x B(925 mm) x C(2020 mm)

Shipping Data
Net weight - 1100 kg
Gross weight - 1340 kg

Production capacity

No. of lines	-	3	2	1
Max. capacity (pcs/hour)	-	9000	6000	2000
No. of effective stations	-	25	25	18
Velocity, (strokes/min)	-	50	50	33
Typical contents:				
cones up to (ml)	-	120	200	-
cups up to (ml)	-	120	500	2000

Required air compressed
pressure - 7/10 Bar
working pressure - 6 Bar (87 psi)
consumption - 750 Nlt/min (depending on equipment)

Magazine capacities
(depending on size of container)
cups approx. - 80 pcs per row
cones approx. - 50 pcs per row
lids (paper) - 500 pcs per row
lids (snap-on) - 80 pcs per row

Warning:
The "FM 6000" comes equipped with a small drying filter to de-humidify the compressed air fed to the machine's pneumatic system.
Nonetheless for use in very humid climates customer has to consult a technician to equip the machine with a bigger de-humidifying device suited to local conditions.

We recommend daily draining of condensation from your compressor and weekly cleaning of the air filters.

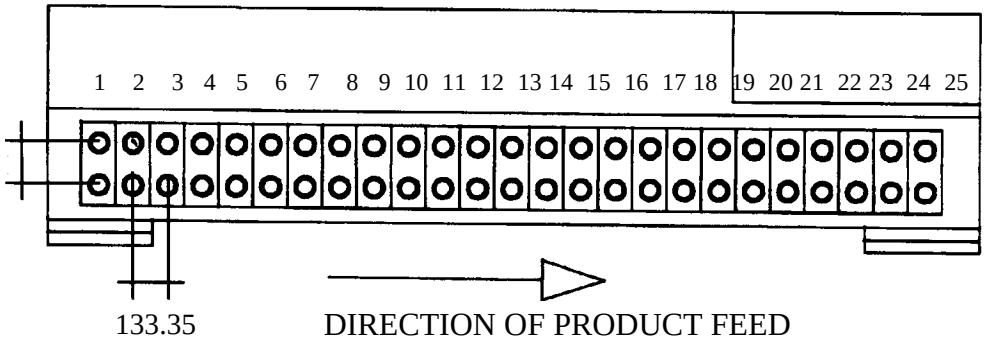
To safeguard the pneumatic components and to ensure a trouble-free running of the machine it is essential that the compressed air be clean and dry.

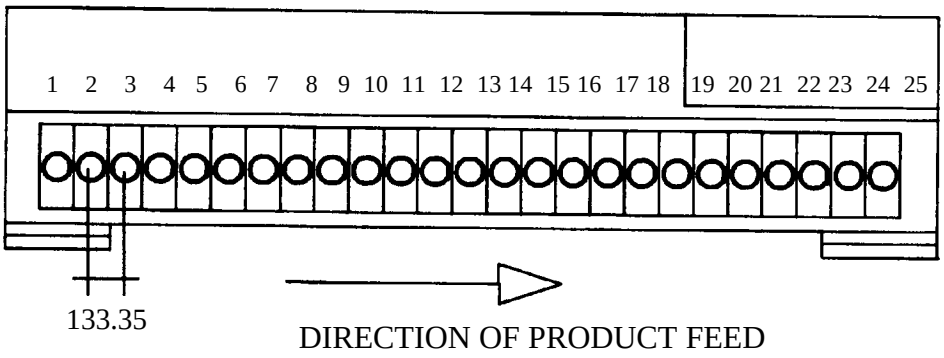
This page has been left intentionally blank

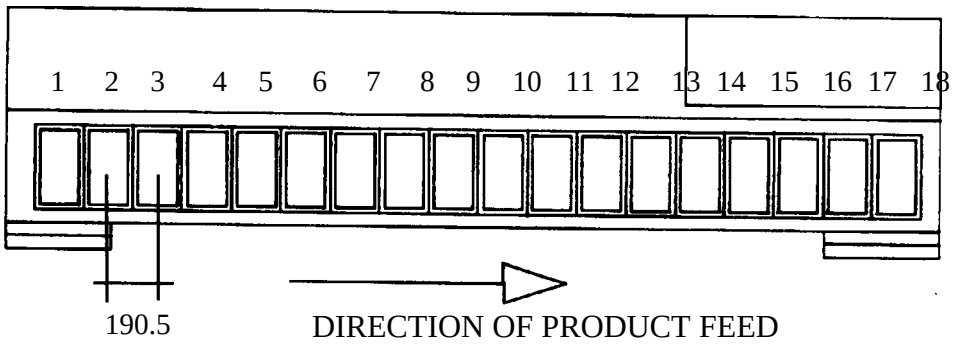
SECTION 2.0
INSTALLATION

2.1 - AVAILABLE SETUPS

FIG.2







NOTE. The FM 6000 machines are available with feed step of 133.35, as in the first two cases for cones/cups, or with a step of 190.5 for bulks.

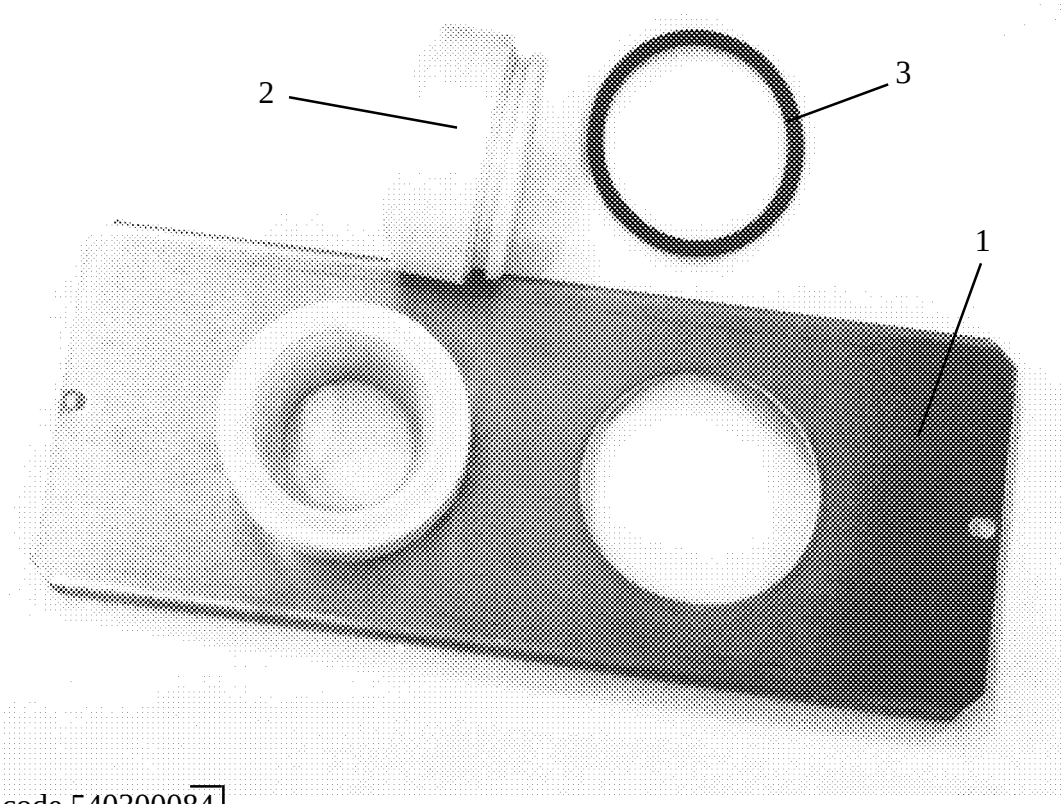
	CONES	CUPS	CUP/TRUFFLE
1	**cone dispensing**	-	-
2	-	**cup dispensing**	**cup dispensing**
3	-	-	-
4	**cone sizing**	-	-
5	**chocolate sprayer**	-	-
6	-	-	-
7	**filling**	**filling**	-
8	-	-	-
9	pencil filler(optional)	-	-
10	-	-	-
11	filling(optional)	filling(optional)	**filling**
12	-	-	-
13	-	-	-
14	**topping device**	topping device(optional)	-
15	-	-	-
16	**dry ingredients dispenser**	dry ingredients dispenser(optional)	**cocoa powder dispenser**
17	-	-	-
18	-	-	-
19	**lid dispensing station**	**lid dispensing station**	**lid dispensing station**
20	-	-	-
21	**crimping unit**	**lid pressing station**	**lid pressing station**
22	-	-	-
23	dater(optional)	dater(optional)	dater(optional)
24	-	-	-
25	-	**ejection station**	**ejection station**
26	-	-	-
27	**ejection station**	-	-

	CUP/TIRAMISU	BULKS
1	-	-
2	**cup dispensing**	**bulk dispensing**
3	-	-
4	**filling**	**filling**
5	-	-
6	**biscuit by fed hand**	-
7	-	filling(optional)
8	-	-
9	**pressing device/liqueur**	-
10	-	-
11	**decoration**	-
12	-	-
13	-	-
14	-	-
15	-	**lid dispensing station**
16	**cocoa powder dispender**	**lid pressing station**
17	-	dater(optional)
18	-	**ejection station**
19	**lid dispensing station**	
20	-	
21	**lid pressing station**	
22	-	
23	dater(optional)	
24	-	
25	**ejection station**	
26	-	
27	-	

NOTE: The position of the station can be changed in according to production.

2.2 - CONTAINER SIZE

FIG.3



1-lamellas	code 540300084	
2-cup seat	code 540300046	cones production
3-o-ring	code 336067905	
1-lamellas	code 540300045	
2-cup seat	code 540300048	cups production
3-o-ring	code 336067905	

DIMENSIONS OF STANDARD CONTAINERS FOR FM 6000

For machine with 133.35 step

CONE	STANDARD	DIAM. 65 X 162 h (PAPER)
	MAX	DIAM. 85 X 240 h (PAPER)
CUPS	MINIMUM	DIAM. 50 X 40 h
	MAX	DIAM.100 X 120 h

STANDARD BOARD LIDS	DIAM. MIN. 50/MAX. 110
STACKABLE ‘SNAP ON’ LIDS	DIAM. MIN. 50/MAX. 110
NON STACKABLE ‘SNAP ON’ LIDS	DIAM. MIN. 70/MAX. 110

NOTE: By max. diam. of cup we mean the max. diameter of the hole we can effect on the tray. In case of cups exceeding these dimensions it will be necessary to assess the feasibility case by case, since the maximum capacities of the upper operating stations are also probably involved.

For machines with 190,5 step

BULK MAX 250 x 150 x 120 H

2.3 - CONNECTION

COMPRESSED AIR CONNECTION

Connect the compressed air line to the connector (Fig.4) using a flexible hose with an internal diameter not less than the connector's.Mount an air check cock on the machine's air feed hose.

⚠ **WARNING. The use of clean dry compressed air is essential to ensure long life for the pneumatic components and trouble free running of the machine.**

POWER CONNECTION

- Check the ID plate to verify that your machine is compatible with local voltage.
- Connect the power supply cable to the electrical panel.
- Turn on main switch, press push-button (Fig. 5, SA1) to feed the pneumatic circuit, then start by short impulses the motor with of the jog switch (Fig. 5, SB5).
- Check rotation direction to be as shown in figure 2.
- Reverse the polarity of the electrical connection if necessary.

⚠ **WARNING: Should the machine feed be reversed, a serious damage may occur.**

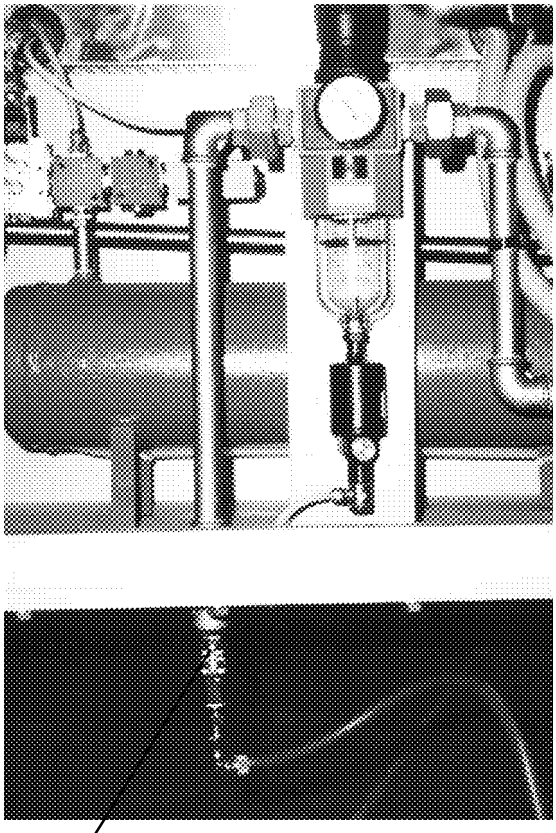
⚠ **WARNING: Make sure that the voltage and the frequency of local power supply is compatible with the machine electrics.**

Connect the three phases to terminals R S T and the earth wire to the appropriate terminals on the terminal board of the electrical panel.

The machines components are electrically protected from short circuits with the appropriate protection, but you are advised to shunt the power from a box which contains a general switch with thermal protection and extra-rapid fuses of adeguate power.

The connection must be effected exclusively by competent technicians who are familiar with the accident- prevention legislation.

FIG. 4

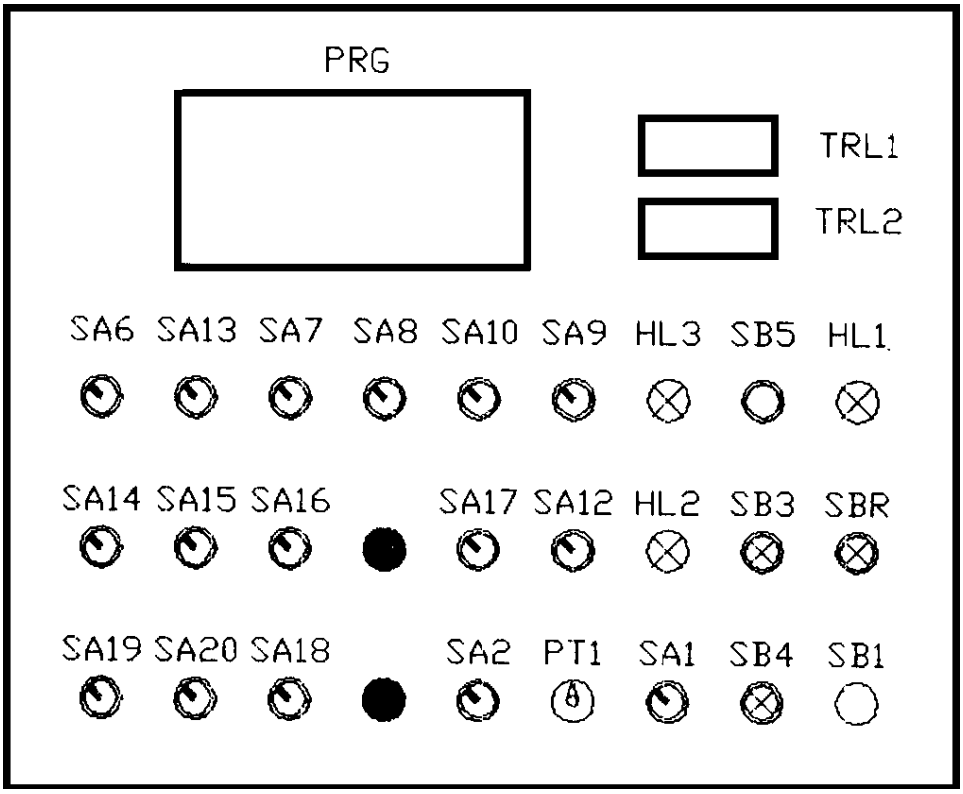


2.4 - ELECTRICAL CONTROLS

HL1- POWER ON
HL2 - LOW AIR PRESSURE
HL3 - THERMAL OVERLOAD TRIPPED
SB1 - EMERGENCY STOP
SB3 - STOP
SB4 - START
SB5 - JOGGING BUTTON
SBR - RESET
SA1 - AIR SUPPLY
SA2 - CHOCOLATE HEATING
SA6 - CUP/CONE DISPENSING
SA7 - CUP SWIRL
SA8 - ICE CREAM FILLING 1
SA9 - ICE CREAM FILLING 2
SA11- THERMOSEALING
SA10- PENCIL FILLER
SA12 - LID PRESSING STATION
SA13 - CHOCOLATE SPRAYER
SA14 - TOPPING
SA15 - DRY INGREDIENTS DISPENSER
SA16 - FOIL DISPENSING STATION
SA17 - LID DISPENSING STATION
SA18 - SELECTOR FOR LID DISPENSING STATION (ROTARY-LINEAR)
SA19 - DATA PRINTER
SA20 - EJECTION STATION
PT1 - SPEED REGULATOR
TRL - CHOCOLATE / LIQUEUR TEMPERATURE
PRG - PROGRAMMER

NOTE:
AS THIS IS A STANDARD MANUAL,USE THE CONTROL PANEL INDICATED OF THE FIG.5,ONLY TO UNDERSTAND THE ELECTRICAL CONTROLS.
FOR THE OPERATION PRINCIPLE REFER TO ELECTRICAL SCHEMA SUPPLIED WITH THE MACHINE.

FIG.5


PRG
TRL1
TRL2
SA6 SA13 SA7 SA8 SA10 SA9 HL3 SB5 HL1
SA14 SA15 SA16 SA17 SA12 HL2 SB3 SBR
SA19 SA20 SA18 SA2 PT1 SA1 SB4 SB1

2.5 - PNEUMATIC DEVICES

1 - FILTER GROUP PRESSURE REDUCER	code 333012049
2 - PRESSOSTAT	code 333010100
3 - PRESSURE GAUGE	code 333021054
4 - PLENUM CHAMBER	code 011945101
5 - AUTOMATIC CONDENSATION DISCHARGE	code 333012302
6 - MANUAL CONDENSATION DISCHARGE	code 016030063
7 - MAIN VALVE	code 333004115
8A - VALVE SET	code 333004074
8B - VALVE SET	code 333004073
8C - VALVE SET	code 333004089 (5 WAY)
8C - VALVE SET	code 333004092 (3 WAY)

FIG.6

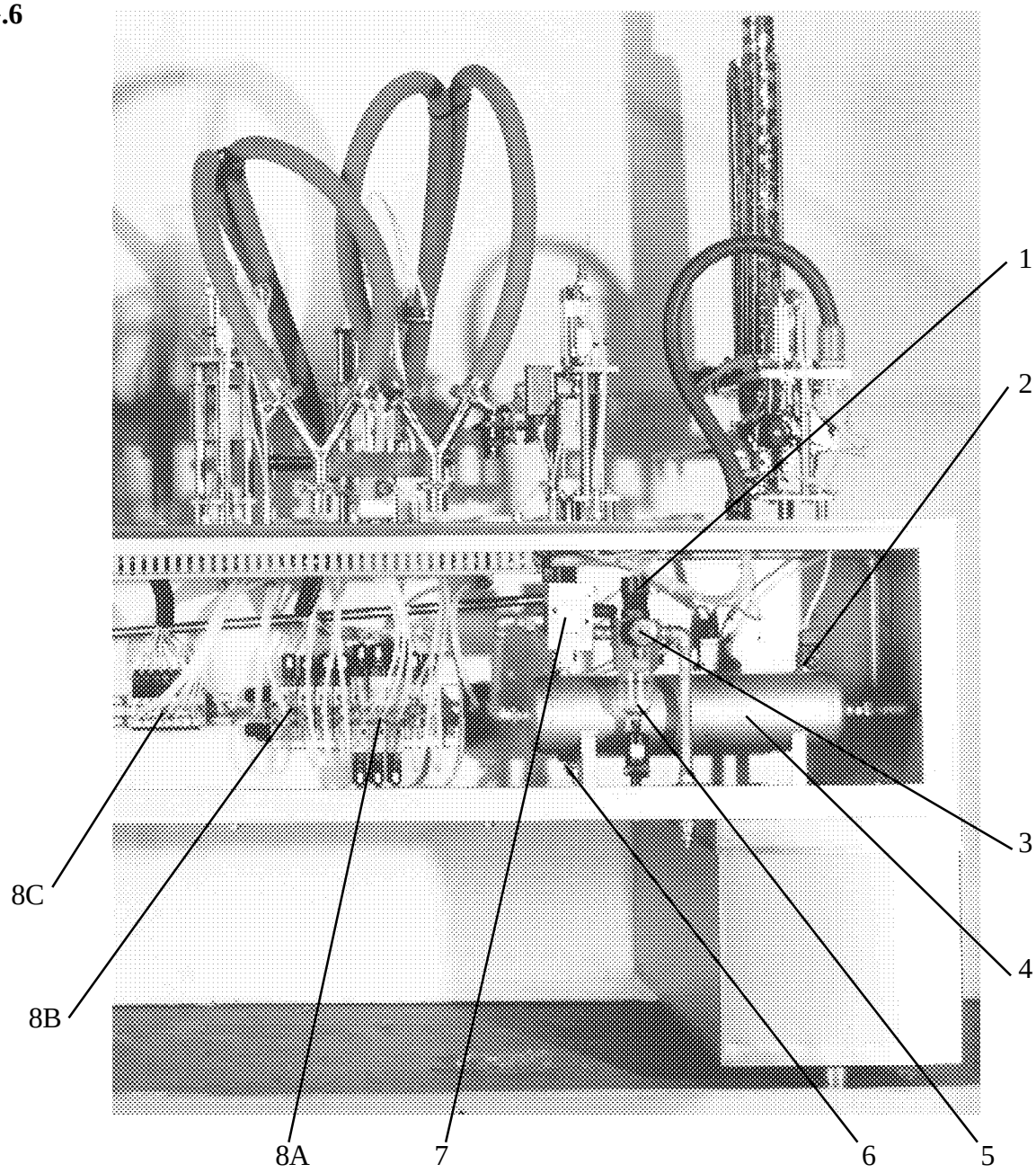
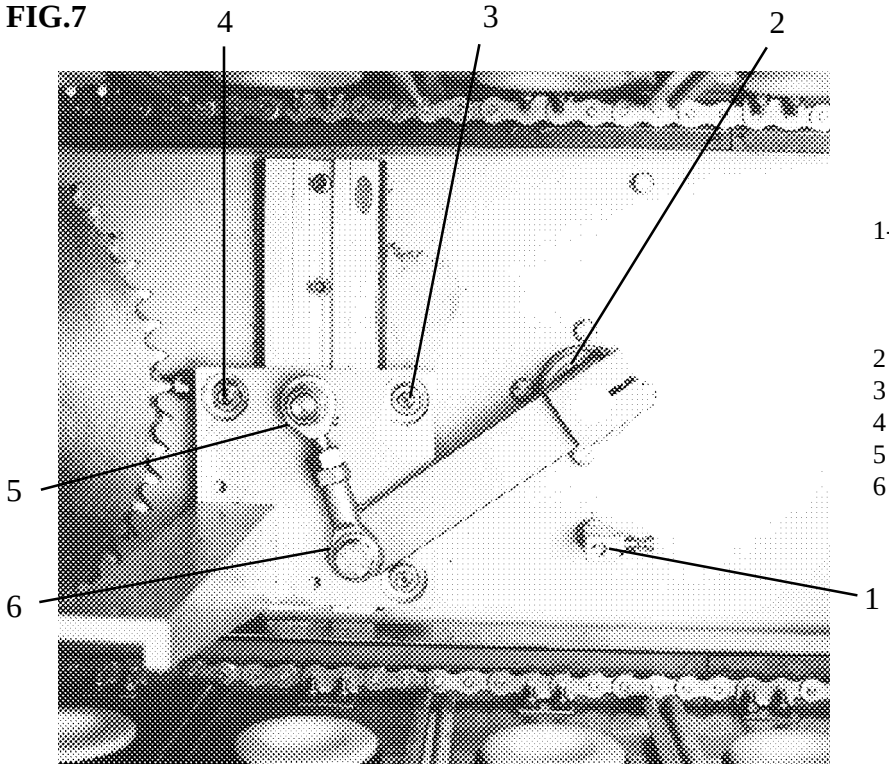


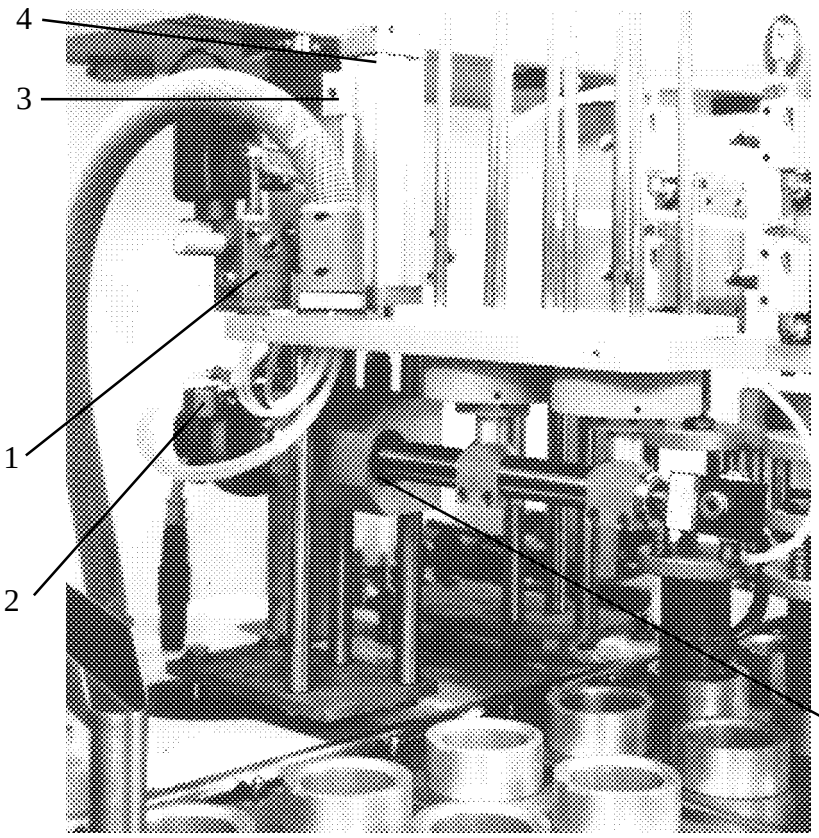
FIG.7



1- Vacuum generator for cup suction consist of:

- solenoid valve	333004001
- vacuum generator	333004052
2 - Bearing	336001443
3 - Roller	336005830
4 - Eccentric adjusting roller	336005831
5 - Joinbal (jam)	336078055
6 - Joinbal (jaf)	336078026

FIG.8



1- Vacuum generator for lid suction consist of:

- solenoid valve	333004054
- vacuostat	333010102
2 -Rotating piston	333001020
3 -Proximity	333001542
4 -Pneumatic cylinder	333001264
5 -Bearing	336001423

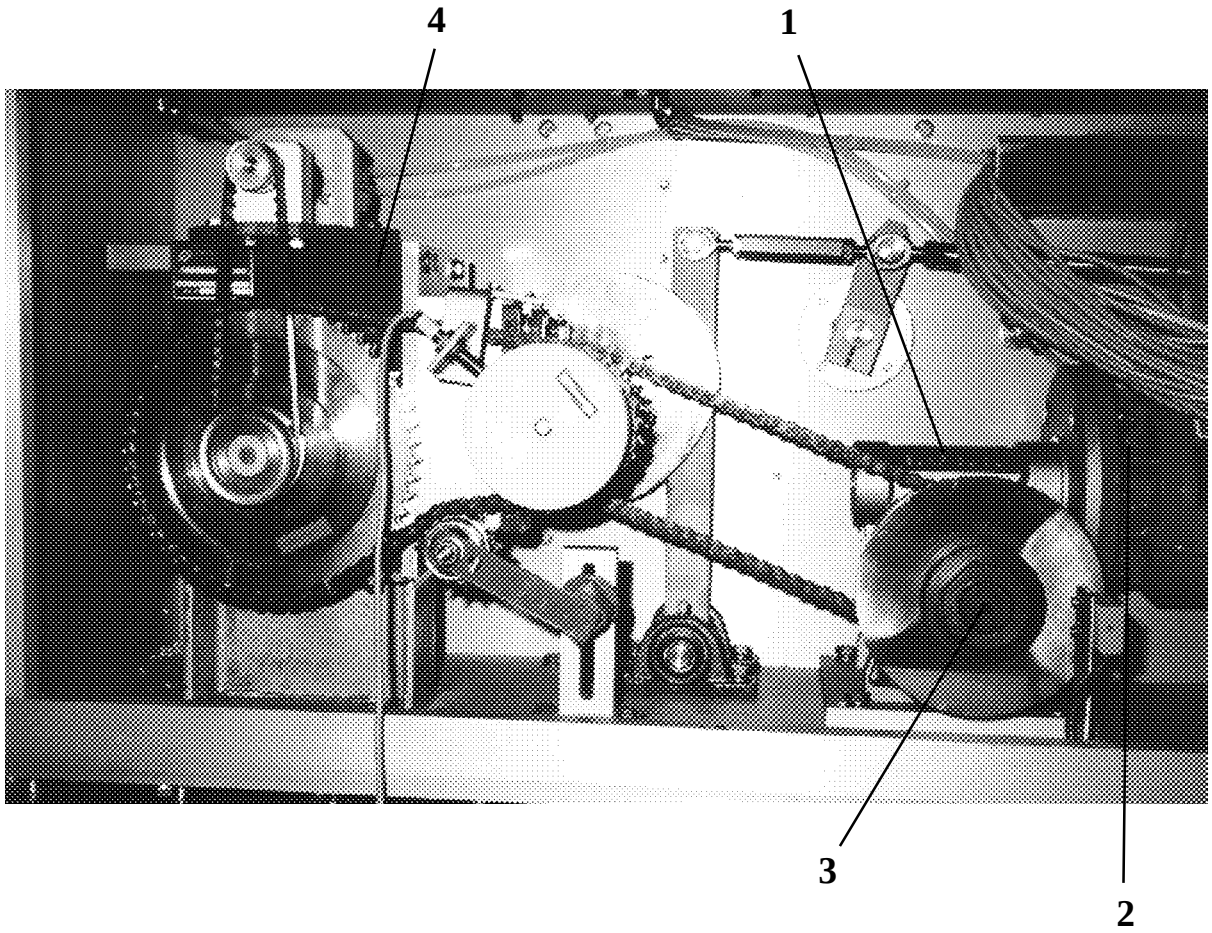
This page has been left intentionally blank

SECTION 3.0
ADJUSTMENT

3.1 - SPEED REGULATION

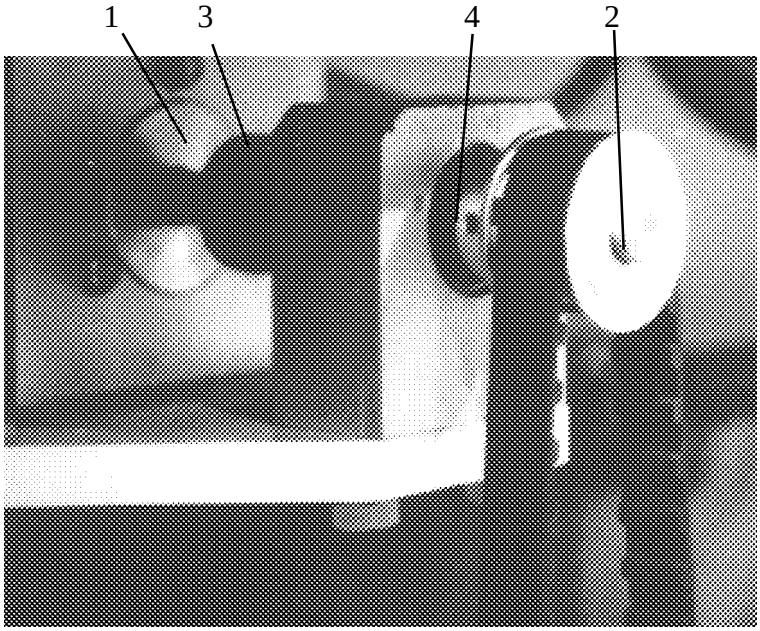
For the drive of the tray-carrying chain the FM 6000 utilizes a special motor speed-variator which is controlled by the relevant electronic card E2RN (see enclosures) located in the electrical panel.
In order to change the speed of the motor speed-variator (Fig. 9) and consequently the chain, turn the speed governor (Fig. 5, PT1) placed on the control panel.
By passing from a low digit (visible in the window of the speed governor) to a higher one, speed increases, and viceversa decreases.
The speed of the machine is expressed in pcs/minute and it can be read, while the machine is operating, in the upper right-hand side of the programmer.

FIG.9



1 - REDUCER	336010125
2 - MOTOR SPEED VARIATOR	014060351
3 - SAFETY COUPLING	336072540
4 - INTERMITTER	336014175

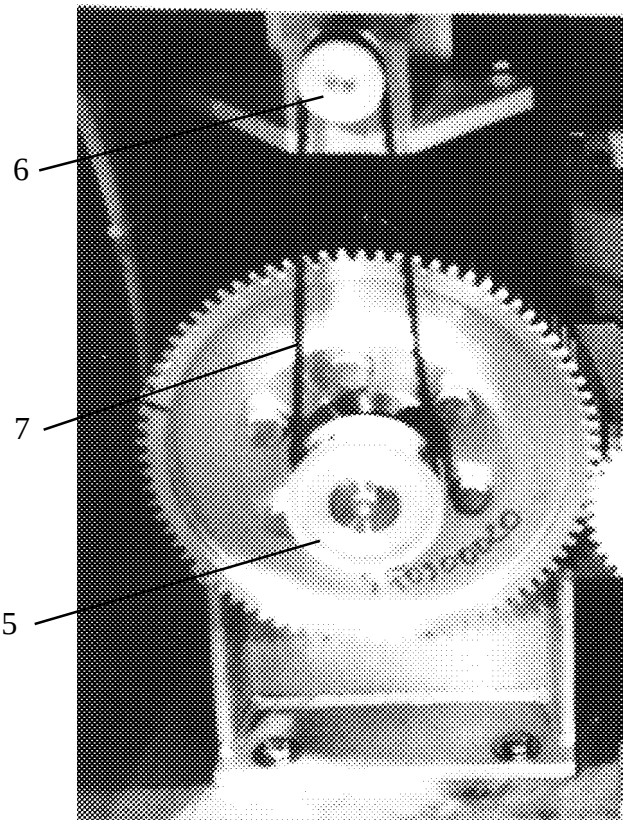
3.2 - “ZERO” POINT TIMING



The machine is delivered the Factory with the setting of the "zero" point.
In case of replacement of encoder, joint , belt, bearing or other machanical component,it is necessary to remake the setting of the "zero" point.
The setting consists of:
1- turn to "ON"main switch,
2- exclude all the operating heads through the selectors on the control panel,
3- with the speed regulator (Fig.5, PT1) to minimum,press the jog push-button with the machine stopped until you find the exact point where as soon as the tray-chain stops just after motion
4- unscrew the dowels of the pulley for jog (Fig.10, 5)
5- turn the pulley for jog until you read "000" on display of the programmer,
6- screw all the dowels ,now the machine is ready.

FIG.10 ENCODER

1 - ENCODER	017087101
2 - ENCODER SHAFT	540300041
3 - JOINT	336072910
4 - BEARING	336001343
5 - PULLEY FOR JOG	540300040
6 - PULLEY FOR ENCODER	540300038
7 - BELT	336019526



3.3 - PROGRAMMER : SETTING THE OPERATING PERIOD OF STATIONS

The movement of the pneumatic operating heads is caused by the pneumatic valves (Fig. 6, 8) which are controlled by the cams of the electronic programmer. (See enclosed manual for cam programming). The machine comes with cards similar to the ones shown hereafter mentioning the factory-set values. Each card concerns a product and the relevant size.
For example: size "01" for cones, "02" for standard cup and so on. To each cam corresponds a function which is described on the side.

PROGRAMMING CARD FOR STANDARD BULK

SIZE NO. 01 CODE 4-5-6

CAM	PHASE 1 ON	PHASE 1 OFF	
1	080	105	BULK RELEASE
2	030	165	BULK VACUUM
3	--	--	
4	--	--	
5	010	130	FILLING DOWNSTROKE
6	005	125	FILLING
7	--	--	
8	030	060	PRESSING STATION SAFETY
9	--	--	
10	--	--	
11	010	080	PRESSING STATION
12	--	--	
13	--	--	
14	--	--	
15	--	--	
16	--	--	

CAM	PHASE 1 ON	PHASE 1 OFF	
17	--	--	
18	--	--	
19	310	320	LID DOWNSTROKE
20	130	140	LID UPSTROKE
21	180	280	ROTATION SAFETY
22	--	--	
23	--	--	
24	--	--	
25	--	--	
26	220	240	EJECTION BACKWARD
27	--	--	
28	--	--	
29	--	--	
30	--	--	
31	265	270	STOP IN-PHASE
32	330	215	SAFETY BY-PASS

NOTE: The values mentioned in above tables are factory-set and therefore may undergo a more fine setting in production.

3.4 - DRY RUN

- Before starting the machine make sure that the stations fitted on the machine are those scheduled for the intended product, that everything is in order and all the screws are locked in place.

- Choose on the programmer the size corresponding to the intended product.

- Turn the pressure control knob (Fig.6, 1) until the pressure gauge (Fig.6, 3) reads 6 BAR.

- Control that all the operating heads are center up against the tray below, otherwise if it is possible to modify the position of the tray-chain by operating on the slotted flange, which is placed between the jogging unit and the main shaft of the chain drive wheels.

- A safety PRESSOSTAT (Fig.6, 2) is mounted inside the machine to stop operation should the pressure drop too low (less than 3,5 BAR). A pilot light (Fig. 5, HL2) on the control panel signals this event.

- After having connected and checked the machine as described in the preceding paragraphs conduct a dry run with the packaging containers only (no ice cream) and verify proper functioning of every single operating head starting from the dispensing station (start of cycle).

- To regulate the speed of the pneumatic cylinders, according to production requirements, gradually turn the adjusting screws which are fitted on the heads of pneumatic cylinders.
  During operation make sure that the pressure remains at 5/6 bar.

Note: Proximity switches are fitted on the ice-cream filling station, pencil filler, 2nd filling or decoration station, lid dispensing station and crimping unit or lid pressing unit, which stop the machine in case the relevant heads did not rise before the tray-chain start.

This page has been left intentionally blank

SECTION 4.0

MACHINE DESCRIPTION AND OPERATION

4.0.1 APPLICATION

Filling of ice cream cups, containers or cones, and filling of other products of similar viscosity into cups. The basic machine is supplied for the production of one product type and optional equipment is available for other product types.

4.0.2 OPERATING PRINCIPLE

The empty cups or confectioned cones are taken from a magazine and placed in the lamellas of the conveyor system. The conveyor then stepwise transports the lamellas containing the empty cups, containers or confectioned cones to the various filling stations mounted above the conveyor. After filling and lidding the products are ejected.

4.0.3 STANDARD DESIGN AND EQUIPMENT

The FM 6000 is built on a sturdy frame and all exposed parts are made of stainless material. Changeover of the rings for the production of different product types and sizes can be carried out easily and quickly.

4.0.4 MAIN DRIVE

The principal motor with electronic variator drives the stainless steel conveyor and the lifter for cup or container ejection. At the same time, through an encoder, it gives a signal to the programmer to activate the pneumatic movements.

4.0.5 COMPRESSED AIR SYSTEM

For hygienic reasons all pneumatic components are designed for non-lubricated air. The standard machine is, however, equipped with a lubricator to reduce wear and tear. All components are of the highest standard and all valves are electrically activated seat valves.

4.0.6 VACUUM SYSTEM

The vacuum for cup or container and lid dispensing is obtained through Venturi valves.

4.0.7 CONTROL SYSTEM

The main operating functions of the FM 6000 are controlled from the centrally placed control panel and regulated by means of an electronic control programmer. The controls include start/stop of the main motor, set switches for opening and closing the time-elapse filling valve and temperature regulation of the heating elements in the chocolate tank and chocolate spray. A jogging switch facilitates adjustment during start-up and in the case of air supply disturbance or motor overload a safety clutch is activated and the machine stops automatically.

4.1 - CONE PRODUCTION

4.1.1 - CONE DISPENSING STATION

4.1.2 - CONE SIZING AND SPRAYER

4.1.3 - FILLER

4.1.4 - CHOCOLATE TOPPING

4.1.5 - DRY INGREDIENTS DISPENSER

4.1.6 - LID DISPENSING STATION

4.1.7 - CRIMPING STATION

4.1.8 - EJECTION STATION

Note: see table section.2.1

4.1.1 - CONE DISPENSING STATION

The coner feeder is essentially consist of:
2 vertical dispensers (Fig. 11, 1) containing cones, 2 jaws (Fig. 11, 2) governed by as many pneumatic cylinders (Fig. 11, 3), two blocks with pins (Fig. 11, 4) anchored to the mobile base (Fig.11, 7), a rotary cylinder (Fig. 11,8) and a cylinder for moving (Fig.11, 9) the mobile base.

The station operates as follows:

- the jaws open and free the rows of cones, which lowers until the bottom cone is positioned into the closed blocks, then they close to hold the rows while the blocks lower,

- the pneumatic cylinders insert the pins in the cone housed in the closed blocks,

- as soon as the tray-chain stops, the blocks lower taking along the 2 cones, then the pins and the blocks open and the conesare introduced in the ring of the tray below,

- the mobile base rises and the blocks close again. Everything is ready for a new cycle.

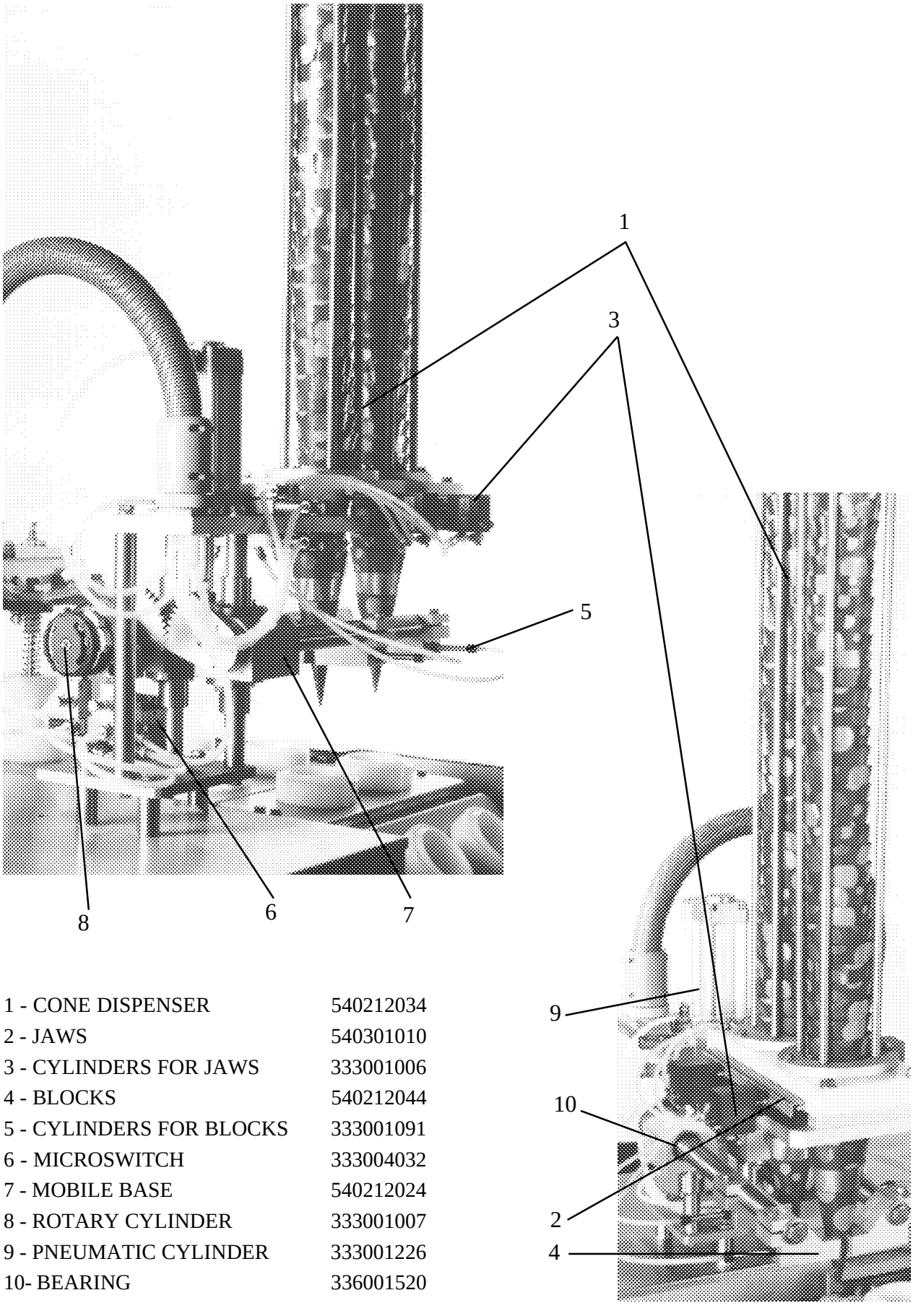
Note: turn the illuminated selector (Fig.5, SA6) to start cone dispensing (the selector is illuminated), The operation of cone feeder is governed by the first three cams of the programmer.

CAM NO.1 - (release) - controls the jaws holding the row of cones.

CAM NO. 2 - (pins) - controls the pins.

CAM NO. 3 - (downstroke) - controls the downstroke of the mobile base and consequently of the blocks.

FIG.11



1 - CONE DISPENSER	540212034
2 - JAWS	540301010
3 - CYLINDERS FOR JAWS	333001006
4 - BLOCKS	540212044
5 - CYLINDERS FOR BLOCKS	333001091
6 - MICROSWITCH	333004032
7 - MOBILE BASE	540212024
8 - ROTARY CYLINDER	333001007
9 - PNEUMATIC CYLINDER	333001226
10- BEARING	336001520

4.1.2 - CONE SIZING AND CHOCOLATE SPRAYER

The cone sizing and chocolate sprayer station is consist of the sizing units (Fig.12, 2) and sprayers (Fig. 12, 1) which, while lowering, open and prepare the mouth of the cone, then covering the waffle with chocolate to impermeabilize it.

The station operates as follows:
- as soon as the tray-chain has stopped, the sizing and sprayer unit lowers,
- the sprayer shutter opens so that the chocolate coming from the tank (Fig.13, 5) by means of the pump (Fig.13, 3) may flow out; at the same time the compressed air (adjustable) is fed to the sprayer so as to have the chocolate sprayed.
- the sprayer shutter closes again,
- the sizing and chocolate sprayer unit rises again,
- everything is ready for a new cycle.

Turn illuminated selector (Fig. 5, SA13) to start the sizing and sprayer unit (the selector is lit),
The operation of the sizing and sprayer unit is controlled by cams 12-13 of the electronic programmer.

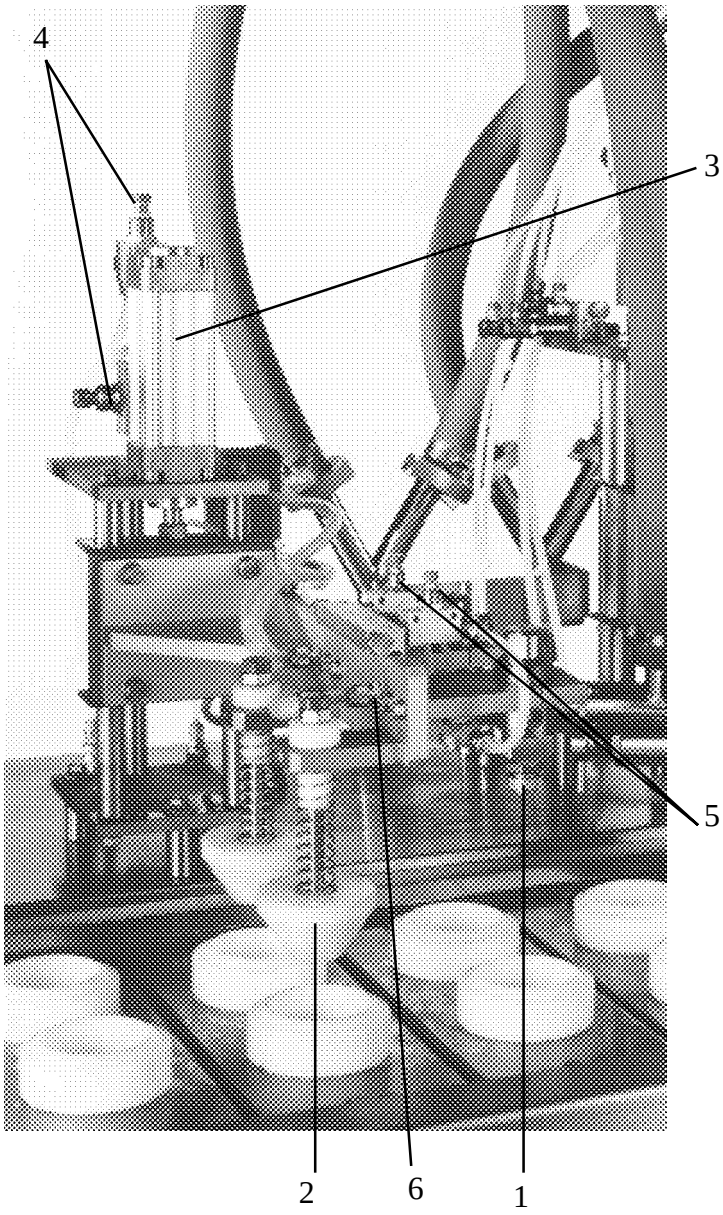
CAM NO. 12 (stations' downstroke) - lowers the sizing and sprayer unit as soon as the chains stops, and lifts it before the chain starts again.

CAM NO. 13 -(chocolate sprayer) - opens the shutter enabling the chocolate sprayer to operate and closes it again.

CHOCOLATE TANK WITH PUMP

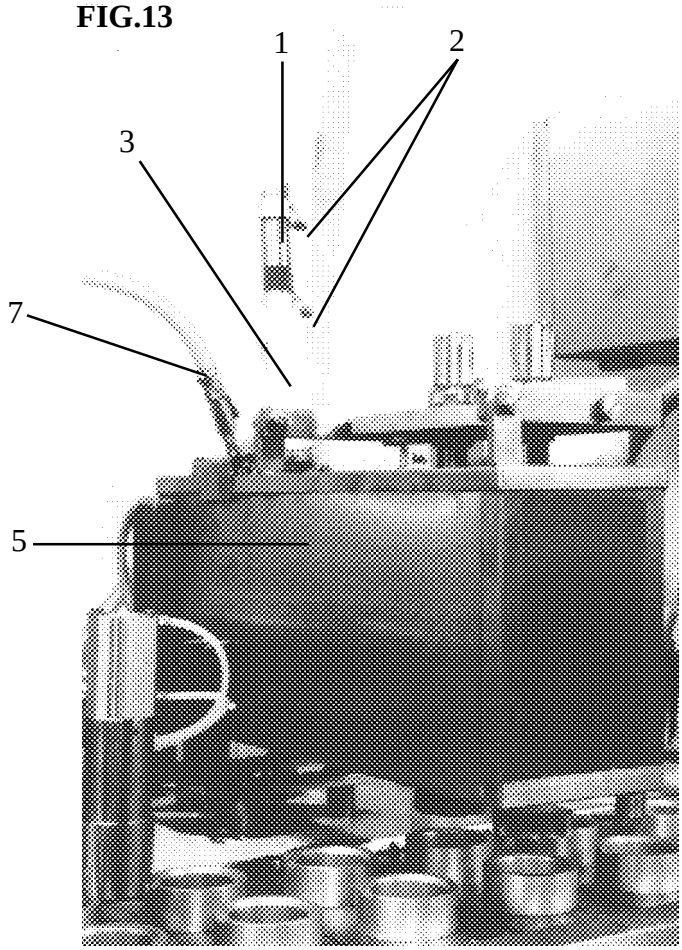
Both chocolate spraying and chocolate topping require chocolate to be liquid, and therefore it should have a temperature of 35 °C (approx.)
In order to have chocolate at the correct temperature, the FM 6000 is equipped with a tank which is fitted with thermostat (Fig.13, 5), jacket and electric heating element code 017075160.
Press the illuminated pushbutton (Fig.5, SA2) to apply voltage to the heating element (the puhsbutton is lit),
When voltage is applied to the heating element, at the same time the chocolate pump (Fig.13, 3) starts, the thermostat (Fig.5, TRL) is activated.
The chocolate pump is actuated by a pneumatic cylinder (Fig.13, 1) governed by a timer located in the control board and works non-stop as long as the pushbutton of chocolate heating is activated.
The chocolate pump serves for the sprayer, in fact it circulates the chocolate from the tank to the sprayer and back again to the tank.
A cock is mounted on the chocolate return line to the tank. By partially closing it a light pressure is created in the sprayer and consequently we have a better chocolate spray.
The thermostat (Fig. 5, TRL) displays the chocolate temperature and enables to modify the selected temperature.

FIG.12



1 - SPRAYER	011070112
2 - SIZING DEVICE	D-FM0607
3 - PNEUMATIC CYLINDER	333001244
4 - SPEED REGULATORS	011045254
5 - SPRAY REGULATOR	011045253
6 - RESISTANCE	017075166

FIG.13



1 - PNEUMATIC CYLINDERS	540209032
2 - SPEED REGULATORS	011045253
3 - CHOCOLATE PUMP	550200000
5 - CHOCOLATE TANK	540305002
7 - COCK ON CHOCOLATE RETURN LINE	016030062

4.1.3 - ICE CREAM FILLER

The ice cream filler is consist of a timer filler (Fig.15, 1) secured to a mobile base (Fig. 15, 5), actuated by the pneumatic cylinder (Fig.15, 4) and by two more pneumatic cylinders opening/closing the filler.

The station operates as follows:
as soon as the tray-chain stops, the fillers lowers until it enters the cone, then they open filling the pre-set ice cream quantity and close just before rising.
For proper operation of the fillers, the continuous freezer linked to the machine must dispense ice cream in a constant way.
At the beginning of production it is necessary to run the unit for some minutes and discharge the ice cream flowing from the filler until the required hardness and overrun are attained.
At the end of production remove the fillers from the mobile base, dismantle them completeley, wash them thoroughly and assemble again everything for the following production run.
It is possible to obtain a twin-flavour ice cream simply connecting two freezers producing two different flavours of ice cream to the two inlets of the fillers.
Nota: it is also possible to meter rippled ice cream utilizing the special nozzle and the special pilot boss (optional).
A magnetic proximity switch (Fig.15, 3) is mounted on the pneumatic cylinder (Fig.15, 4) to stop immediately the machine in case the filler did rise before the start of the tray-chain.

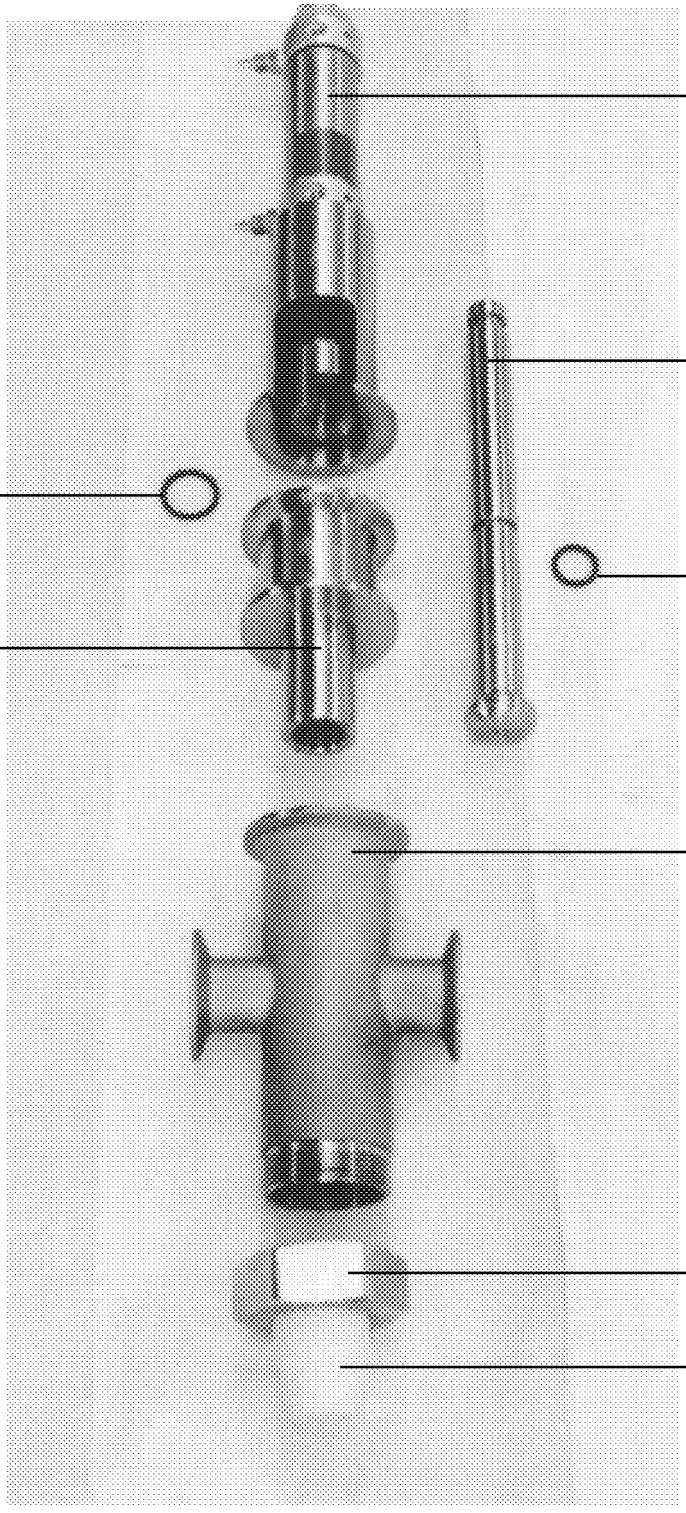
Turn illuminated selector (Fig.5, SA8) to operate the filler (the selector is lit).
The operation of the ice cream filler is governed by the cams no.5 -6 of the electronic programmer.

CAM NO. 5- (stations' downstroke)- lowers the fillers as soon as the tray-chain stops and lifts them before it starts again.

CAM NO. 6 - (filling) - opens and closes the filler to obtain the required metered quantity.

NOTE: the FM 6000 is supplied with two types of filling nozzles (Fig.14, 1); a smooth one which is used for cups and bulks and a toothed one for cones.

FIG.14

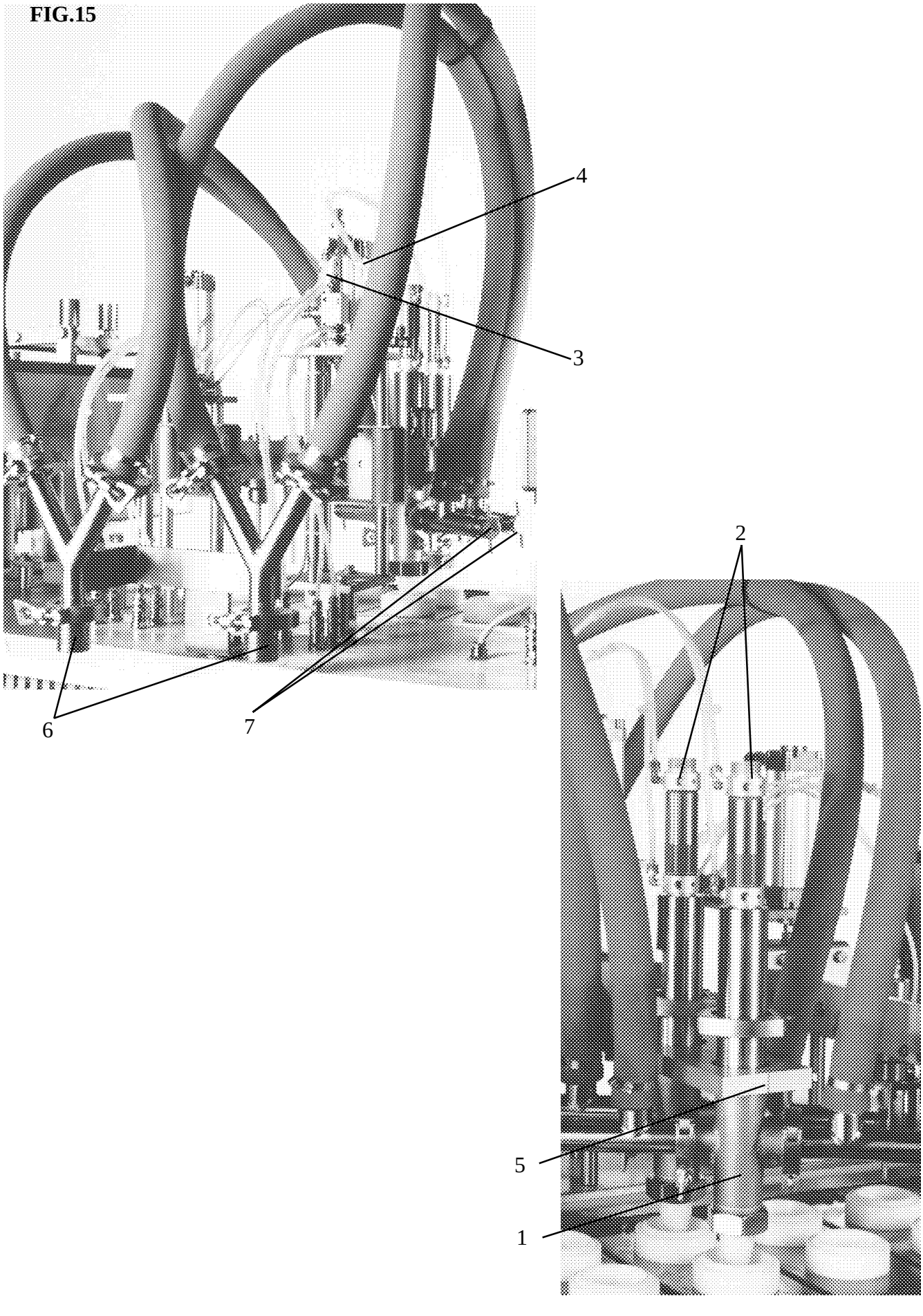


1 - FILLER HEAD	540204063	8 - PILOT BOSS	540204064
2 - FITTING FOR FILLER HEAD	540204055	9 - PILOT BOSS O-RING	336067042
3 - SHUTTER	540204075	11 - PNEUMATIC CYLINDER	333001180
7 - SHUTTER O-RING	336206036	12 - FILLER BODY	540204076

FIG.15

1 - ICE CREAM FILLER	081771000
2 - PNEUMATIC CYLINDER FOR OPENING/CLOSING FILLERS	333001180
3 - MAGNETIC PROXIMITY SWITCH	333001542
4 - PNEUMATIC CYLINDER FOR FILLER'S UPSTROKE/ DOWNSTROKE	333001227
5 - MOBILE BASE	540303001
6 - ICE CREAM INLET FITTINGS	016960009
7 - ICE CREAM REGULATORS	D0IE00131

FIG.15



4.1.4 - CHOCOLATE TOPPING

The station of chocolate topping is consist of the chocolate tank (Fig.18, 1), the chocolate dispensing plate (Fig.18, 2) and the shaft for topping tank (Fig.18, 3) which is actuated by the pneumatic cylinder (Fig.18, 4).

The station operates as follows:
as soon as the tray-chain stops, the pneumatic cylinder lifts the shaft which thus let the chocolate flow from the seats. Then the chocolate, through the dosing plate, gets onto the ice cream of the cone below in a regular and uniformly distributed way.

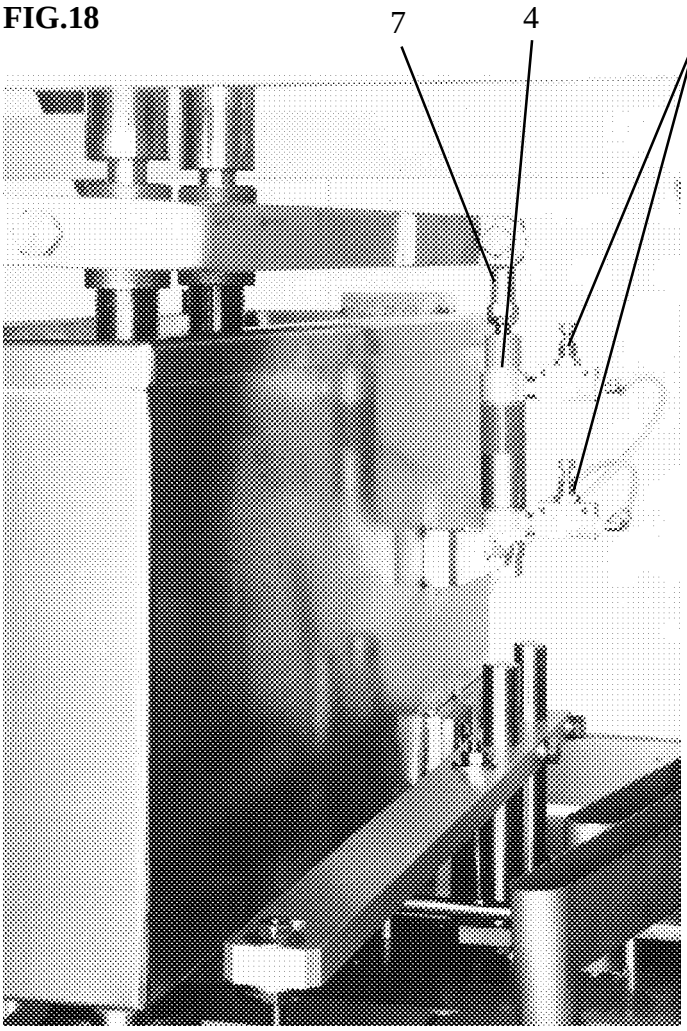
Subsequently the cylinder lowers the nozzle in the seat thus closing the passage of the chocolate.
It is possible to increase or reduce the quantity of metered chocolate by operating on the programmer (longer times correspond to a bigger quantity, while shorter times correspond to a smaller metered quantity), or by means of the regulators (Fig.18, 5) which are located on the pneumatic cylinder, (slowing down the upstroke speed and increasing the downstroke speed, the metered chocolate quantity is reduced, and viceversa it increases).

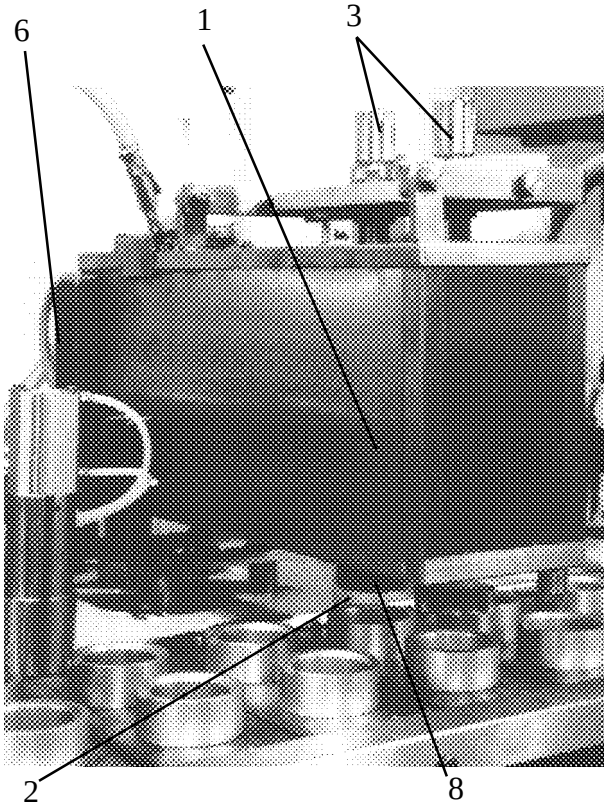
Turn illuminated selector (Fig.5, SA14) to start the topping (the selector is lit).
The operation of the chocolate topping is governed by cam no. 14 of the electronic programmer.

CAM NO. 14 - (chocolate topping) - opens and closes the shaft seat thus enabling the chocolate to be dispensed.

1 - CHOCOLATE TANK	540305002
2 - CHOCOLATE DISPENSING PLATE	540209011
3 - SHAFT FOR TOPPING TANK	D10H00005
4 - PNEUMATIC CYLINDER	333001141
5 - SPEED REGULATORS	011045253
6 - RESISTANCE	017075160
7 - ARTICULATED JOINT	333001644
8 - O-RING 144	336067092
O-RING 119	336067036
O-RING 144	336067100

FIG.18





4.1.5 - DRY INGREDIENTS DISPENSER

The dry ingredients dispenser consists of a hopper for the dry ingredients (Fig.19, 2), a chute (Fig.19, 4) to send the crumbs to center of the cone, a shaker (Fig.19, 1).

The station operates as follows:
as soon as the tray-chain stops, the shaker is activated and with its vibration lets the dry ingredients dispenser fall from the hopper and then through the chute onto the cone.

It is possible to adjust the quantity of dry ingredients in three ways:

a) the programmer: by increasing or reducing the operating times, the quantity of dry ingredients increases or decreases,

b) the pressure regulator: by increasing or reducing the pressure, the quantity of dry ingredients increases or decreases,

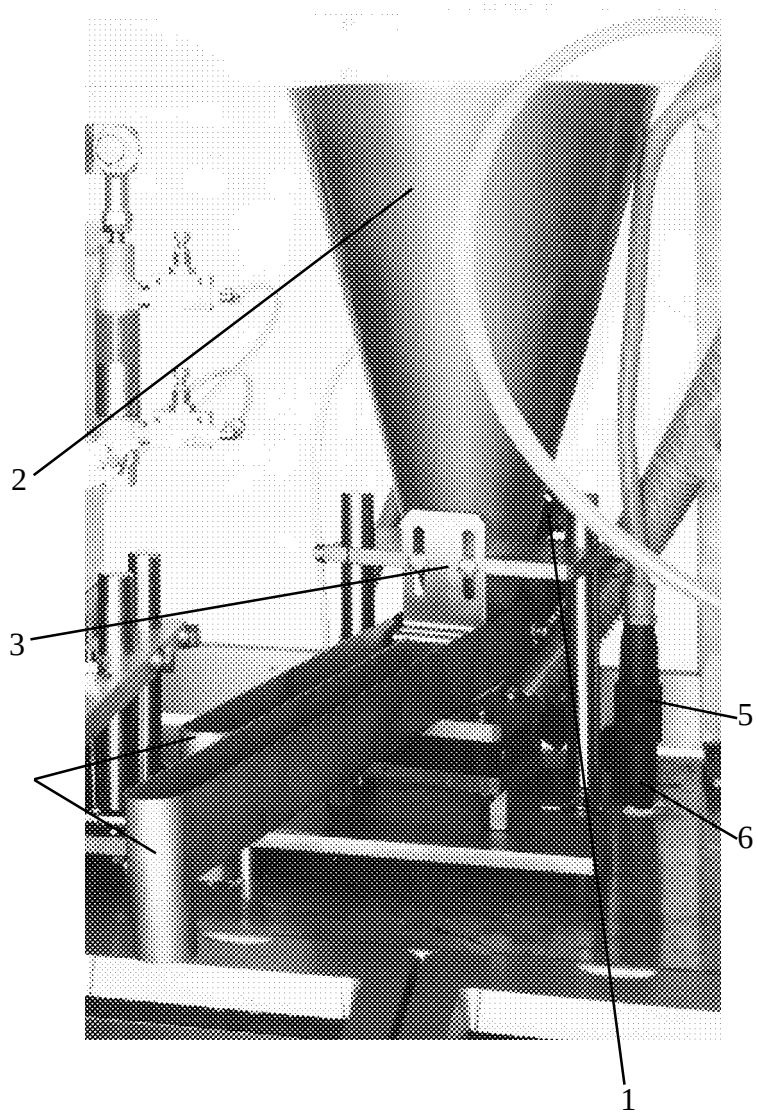
c) the gate mounted between the hopper and the chute: by lifting or lowering it the quantity of dry ingredients increases or decreases.

Turn illuminated selector (Fig.5, SA15) to start the dry ingredients dispenser (the selector is lit).

The operation of the dry ingredients dispenser is governed by the cam no.15 of the electronic programmer.

The CAM NO. 15 - (dry ingredients dispenser) - cuts in the shaker so as to let the crumbs fall as soon as the chain stops and cuts it off before the latter starts again.

FIG.19



1 - SHAKER	336091110
2 - HOPPER	540309002
3 - GATE	D01G00027
4 - CHUTE	540309003
5 - PLUG	017050005
6 - SOCKET	017050006

4.1.6 - LID DISPENSING STATION

It is consist of a pair of suckers (Fig. 20, 1) for lid sucking, two vertical dispensers for lids (Fig. 20, 2) a vacuum generator (Fig. 20, 5), a rotating piston (Fig. 20, 7) for rotating the sucker and a pneumatic cylinder (Fig.20, 3) for the vertical motion of the sucker.

The station operates as follows:
as soon as the tray-chain stops, the lid-sucking phase is started, as well as the downstroke and rotation of suckers to insert the lids into the cones. If the lid dispenser is empty, the vacuostat (Fig.20, 4) notices an insufficient degree of vacuum, therefore it stops the downstroke of the sucker to prevent it from lowering without lids and sucking in ice cream which would soil the whole sucking line.

The sucker rotation is provided by the rotating piston governed by the two magnetic proximity switches (Fig.20, 9).

Once the suckers have placed the lid into the cone, the vacuum is cut off by cam 20; the vacuostat lifts the sucker, which will start the rotation only when the piston is near to the magnetic proximity switch (the same thing occurs during the downstroke), then they continue the upstroke until it is returned to the original position in contact with the lids in the dispenser.

The vacuum is obtained by means of the vacuum generator and is governed by the cams of the electronic programmer.When using this type of lid dispensing station, turn the selector switch (Fig.5, SA18) to “ROT” position.

Turn illuminated selector (Fig.5, SA17) to start the lid dispensing station (the selector is lit).

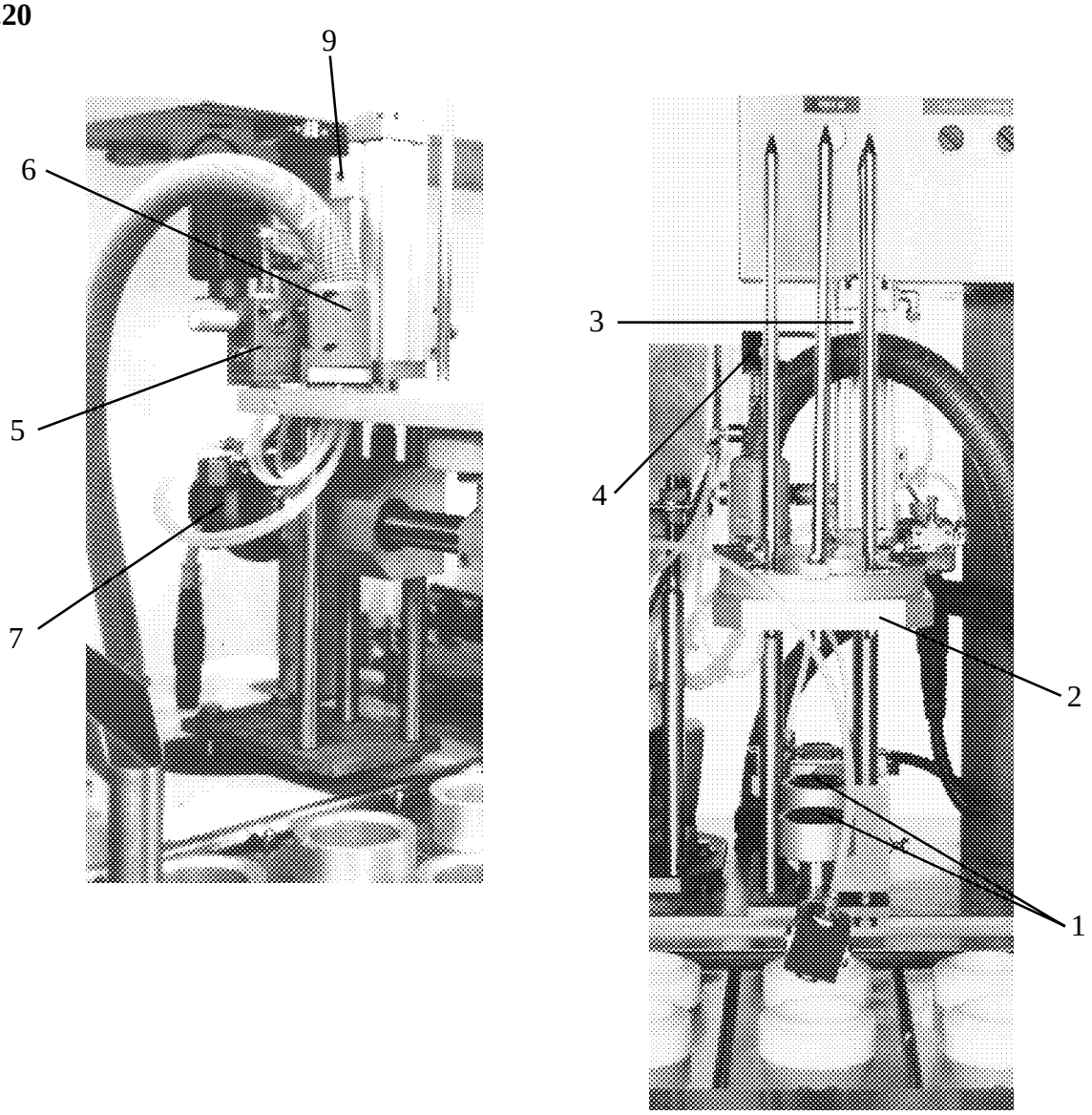
The operation of the lid dispensing station is governed by the cams no. 19- 20- 21 of the electronic programmer.

CAM NO.19 - (vacuum on) - starts the sucking phase and then the downstroke of the lid dispensing station.

CAM NO.20 - (vacuum off) - interrupts the sucking and starts the upstroke of the lid dispensing station.

CAM NO.21 - (lid rotation) - its task is to bring back the sucker to rest position in case the lid dispensing station had lost a lid during the downstroke.
In fact in this case the lid dispensing station would immediately return to the rest position, but with down turned suckers.

FIG.20



1 - SUCKER	011970121
2 - LID DISPENSER	540306014
3 - PNEUMATIC CYLINDER	333001264
4 - VACUOSTAT	333010102
5 - VACUUM GENERATOR	333004054
6 - MULTIPLE SOCKET FOR PNEUMATIC FITTINGS	011045982
7 - ROTATING PISTON	333001020
9 - MAGNETIC PROXIMITY SWITCH	333001542

4.1.7 - **CRIMPING OR PRESSING STATION**

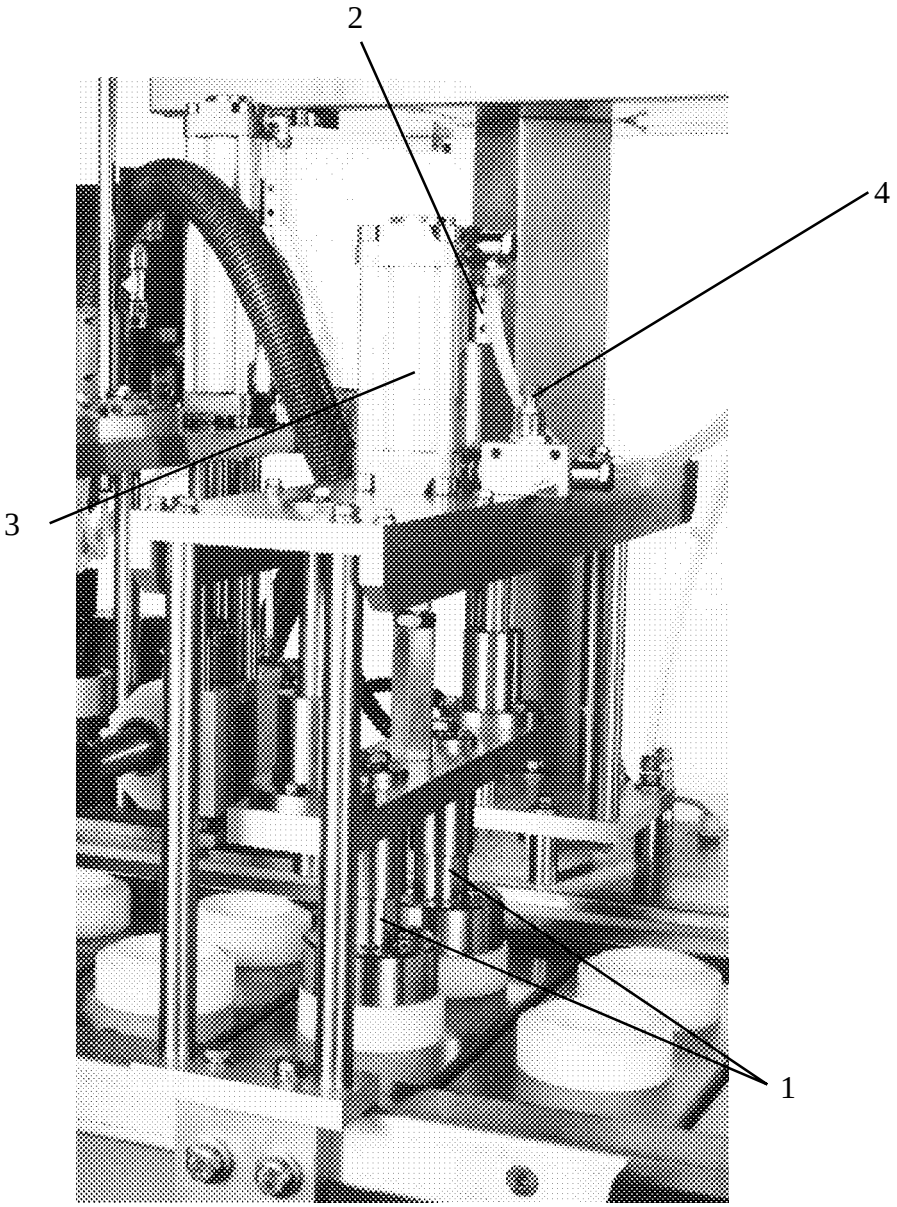
The crimping unit consists of the crimping heads (Fig. 21, 1), a pneumatic cylinder (Fig.21, 4).

The operation of the station is limited to the upstroke and downstroke motion by means of the pneumatic cylinder.

Turn illuminated selector (Fig.5, SA12) to operate the crimping unit (the selector is lit).
The operation of the crimping unit is governed by the cam no. 11 of the electronic programmer.

CAM NO. 11 - (stations' downstroke) - governs the upstroke and the downstroke of the crimping head.

FIG.21



1 CRIMPING HEAD	D01L00056
2 MAGNETIC PROXIMITY SWITCH	333001542
3 PNEUMATIC CYLINDER	333001227
4 SPEED REGULATOR	011045254

4.1.8 - EJECTION STATION

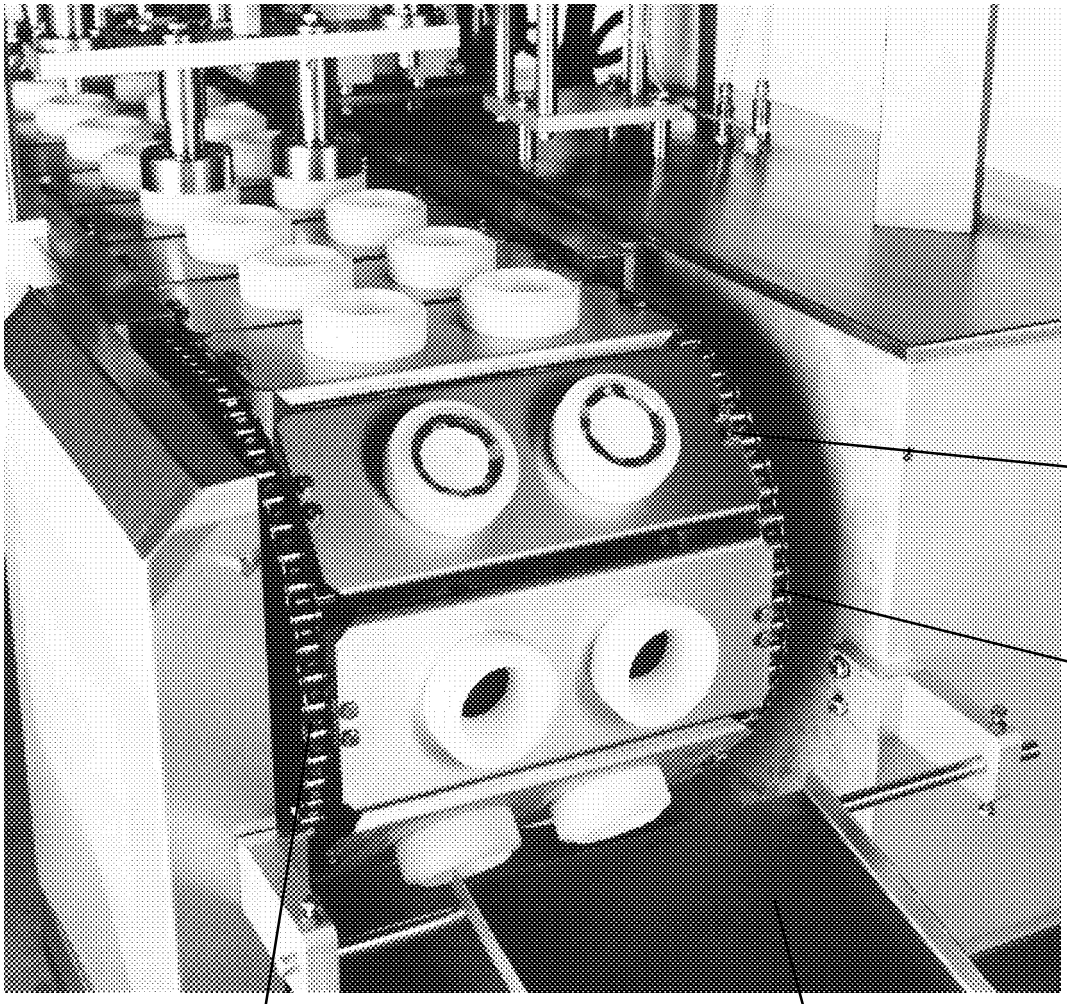
This station ends the cycle and its motion is pneumatic.
It is consist of a pneumatic cylinder (code 333001096), which actuates a braket for the horizontal ejection of cones.
Turn illuminated selector (Fig.5, SA20) to start the ejector (the selector is lit).

The operation of the ejector is governed by the cam no.26 of the electronic programmer and by proximity PX4.

CAM NO.26 - (ejector) - controls the back motion of the ejector.

PX4 - (ejector) - controls the forward motion of the ejector.

FIG.22



4.2 - FORMAT CHANGE PROCEDURE FROM CONE TO CUP

To assemble and dismantle the operating heads work on the various lock nuts and screws and pneumatic connections.
The heads must be placed as described in section 2.1 (AVAILABLE SETUP).

1 - Remove the brackets of the ejection plunger for cones and mount the one for cups.

2 - Substitute cone-holding rings with cup rings.

3 - Substitute the cone dispensing unit with the cup's.

4 - Dismantle the suckers for cones and disconnect the vacuum piping from the vacuum generator by means of the quick-release connector.

5 - Substitute the lid dispenser for cones with the one for cups.

6 - Remove the crimping plunger and mount the lid pressing plunger

7 - When switching from the cup to the cone mode and viceversa, it is not necessary to disassemble the chocolate tank, nor the topping device, the sizing unit, the chocolate spray, the dry ingredients dispenser or the filling units.

4.3 - STANDARD CUP PRODUCTION

4.3.1 - CUP DISPENSING STATION

4.3.2 - ICE CREAM FILLER (see section 4.1.3)

4.3.3 - LID DISPENSING STATION (see section 4.1.6)

4.3.4 - LID PRESSING STATION

4.3.5 - EJECTION STATION

Note: see table section.2.1

4.3.1 - CUP DISPENSING STATION

This station starts the cycle and is essentially consists of two cup dispensers (Fig.26, 1), which are fastened to a plate adjustable by means of a knob (Fig.26, 3), of the jaws which are actuated by the relevant cylinders and of the cup suckers (Fig.25, 1).

The station operates as follows:
As soon as the tray-chain stops, the suckers rise and attain the maximum height at a few millimeters from the cup bottom; the distance of the sucker from the cup bottom is crucial because when the jaws open, the two rows of cups lowers until they comes in contact with the suckers, then the jaws close again and if the distance from the cup bottom is correct they hold the whole row of bulks, except the first one, which is seized by the sucker and taken into the hole of the tray below.

Otherwise if the distance from the cup bottom is not correct, the jaws could close between the second and the third cup instead of between the first and the second, thus two cups would be placed in the same tray.

It may also happen that the jaws close under the first cup, thus preventing from seizing and put it into the tray .

Therefore the height of the cup feeder must be adjusted before the production start by means of the knob (Fig.26, 3).

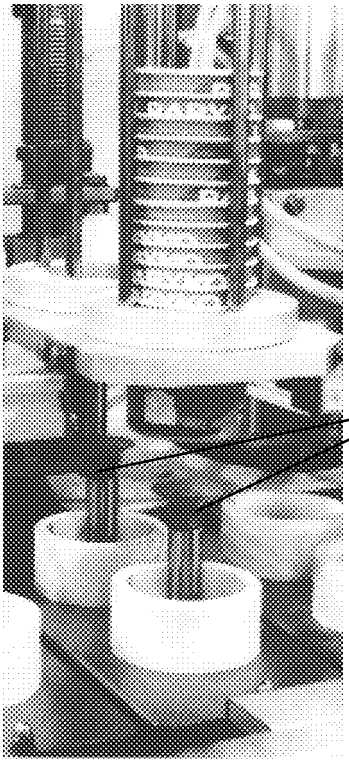
Turn illuminated selector (Fig.5, SA6) to start the cup dispensing station (the selector is lit).

The vacuum to suck cups is obtained through the vacuum generator (Fig.7) and is governed by the cam no. 1-2 of the electronic programmer.

CAM NO. 2 - (vacuum for cups) - controls the start and the end of cup sucking.

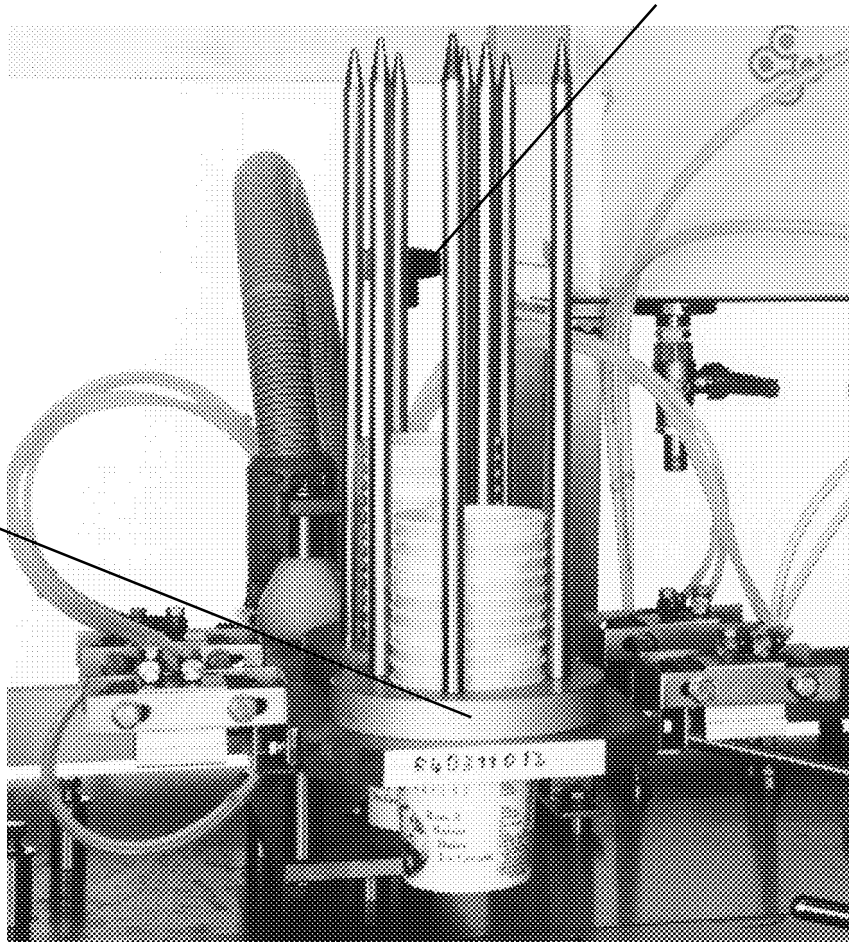
CAM NO. 1 - (open/close jaws) -

FIG.25



1 - CUP SUCKERS 011970121

FIG.26



1 - CUP DISPENSER 540311016

3 - KNOB FOR ADJUSTING HEIGHT OF CUP DISPENSER 540203021

4.3.4 -LID PRESSING STATION

After the lid dispensing station we have the lid pressing device.

It consists of the plungers (Fig.28, 1), and a pneumatic cylinder (Fig.28, 2).

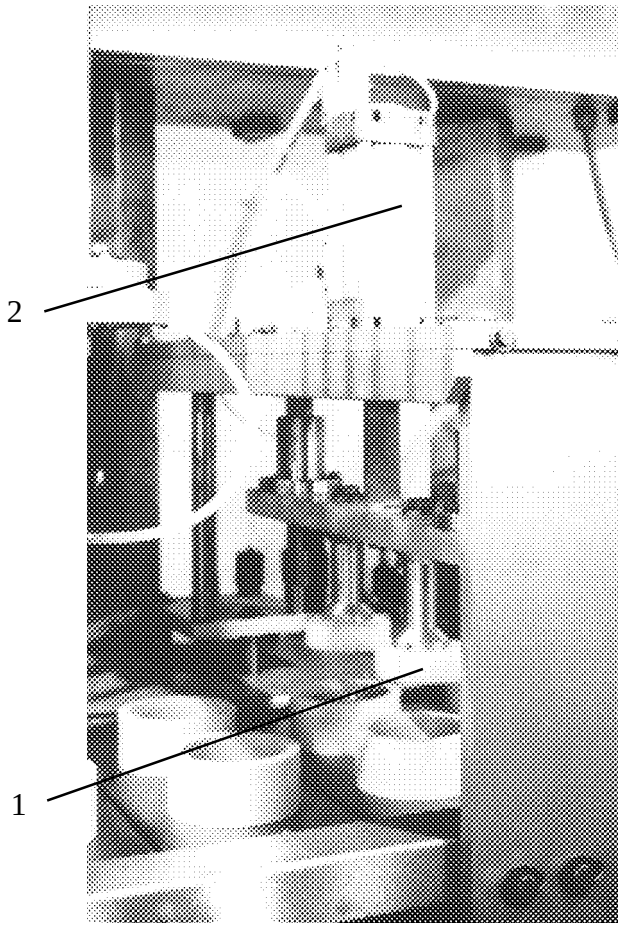
The operation is limited to the downstroke and upstroke by means of the pneumatic cylinder.

Turn illuminated selector (Fig.5, SA12) to start the pressing station (the selector is lit).

The operation of the pressing station is governed by the cam no.11 of the electronic programmer.

CAM NO.11 - (stations' downstroke) - controls the upstroke and downstroke of the pressing station.

FIG.28



1 - PRESSING PLUNGER	540307016*
2 - PNEUMATIC CYLINDER	333001227

*it depends of the product type

4.3.5 - EJECTION STATION

This station ends the cycle with the ejection of the finished product.
It essentially consists of two ejection plungers (Fig.30, 3), two pullers (Fig.31, 4) guided by a pneumatic cylinder (Fig.31, 5) and an unloading chute (Fig.31, 6).

The station operates as follows:
As soon as the tray- chain stops, the ejection plungers lift the cups and take them completely out of the tray. Then the pullers start and remove the cup from the ejection plungers and bring them onto the ejection chute.

The mechanical motion of ejection plungers is obtained by means of a set of levers.
The lever (Fig.30,1) during its upward motion brings the plungers (3) to the lower and upper dead centers.
It is possible to adjust the height of the ejection plungers by means of the joinbal (Fig.30, 2).

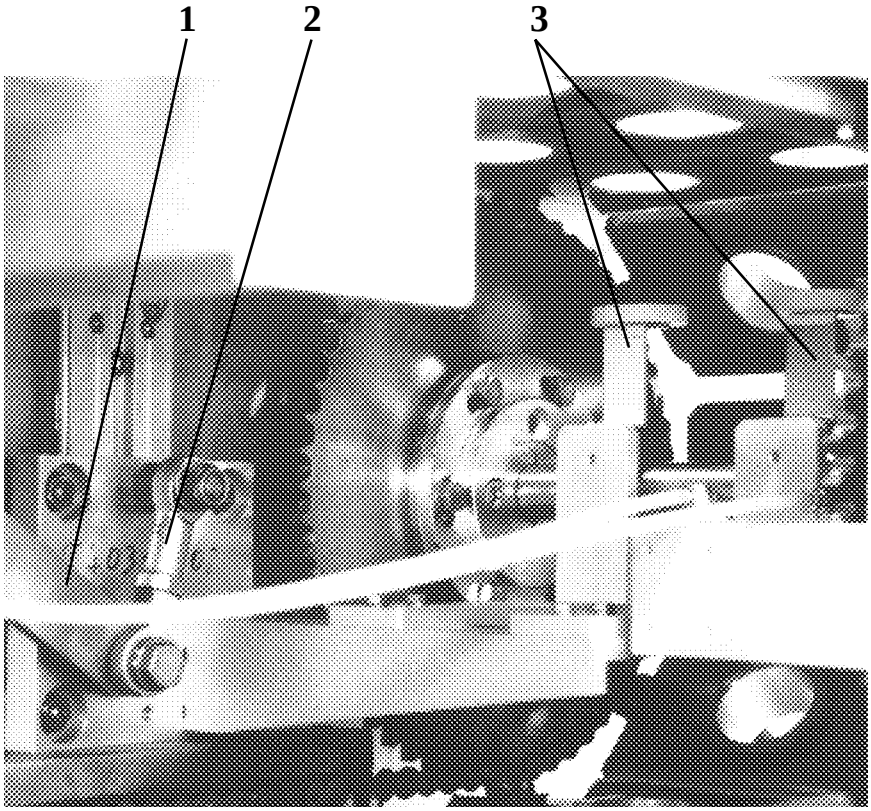
Turn illuminated selector (Fig.5, SA20) to operate the ejection (the selector is lit).

The operation of the ejection unit is partly mechanic and partly pneumatic and is governed by the cam no.26 of the electronic programmer and proximity PX4.

PX4 - it controls the ascent of the puller, which removes the cup from the ejection plunger and brings it to the ejection chute.

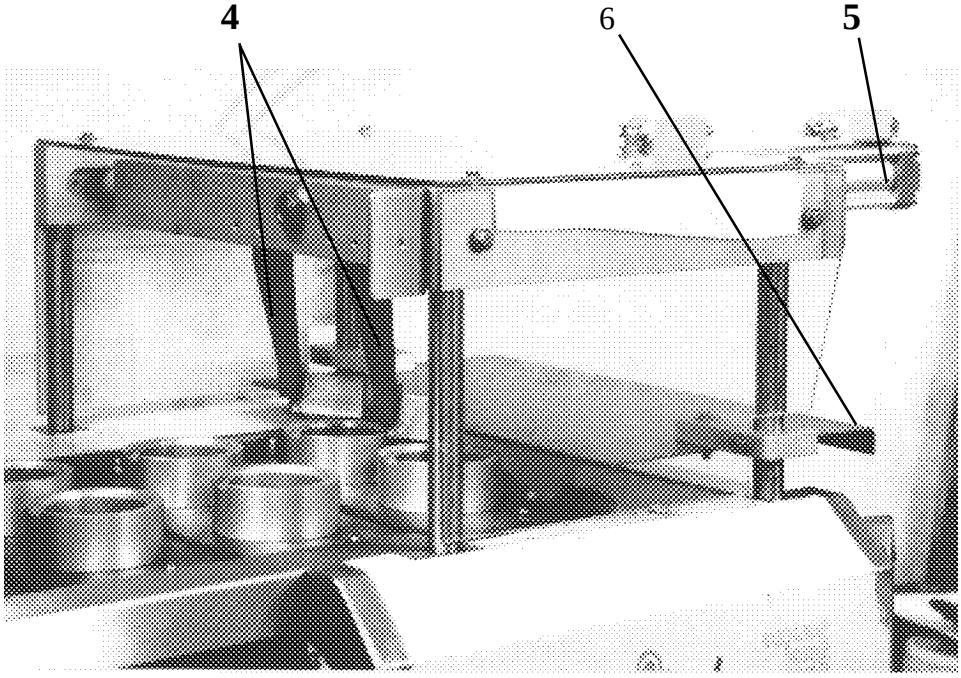
CAM NO. 26 - it controls the descent of the puller.

FIG.30



1 - LEVER 540311003
2 - JOINBAL (JAM 336078026) (JAF 336078055)
3 - EJECTION PLUNGERS 540312009*
*it dipendes of the product type

FIG.31



4 - PULLERS D10Q10077
5 - PNEUMATIC CYLINDER 333001267
6 - UNLOADING CHUTE D10Q10058

This page has been left intentionally blank

4.4 - CUP/TRUFFLE PRODUCTION

4.4.1 - CUP DISPENSING STATION (see section 4.3.1)

4.4.2 - ICE CREAM FILLER (see section 4.1.3)

4.4.3 - COCOA POWDER DISPENSER

4.4.4 - LID DISPENSING STATION (see section 4.1.6)

4.4.5 - LID PRESSING STATION (see section 4.3.4)

4.4.6 - EJECTION STATION (see section 4.3.5)

Note: see table section.2.1

4.4.3 - COCOA POWDER DISPENSER

The cocoa powder dispenser consists of a hopper (Fig.32, 1) with filter (Fig.32, 5) at the base, a shaker (Fig.32, 2) which is regulate through the pressure regulator (Fig.32, 3) and two conveyors (Fig.32,4).

The station operates as follows:
As soon as the tray-chain stops, the compressed air arrives to the pressure regulator dispensing the shaker. The latter by means of its vibrations lets the cocoa powder fall from the hopper and then through the conveyor onto the container.

It is possible to adjust the quantity of cocoa powder in two ways:

a) the programmer: by increasing or reducing the operating times, the quantity of cocoa increases or decreases.

b) the pressure regulator: by increasing or reducing the pressure, the quantity of cacao increases or decreases.

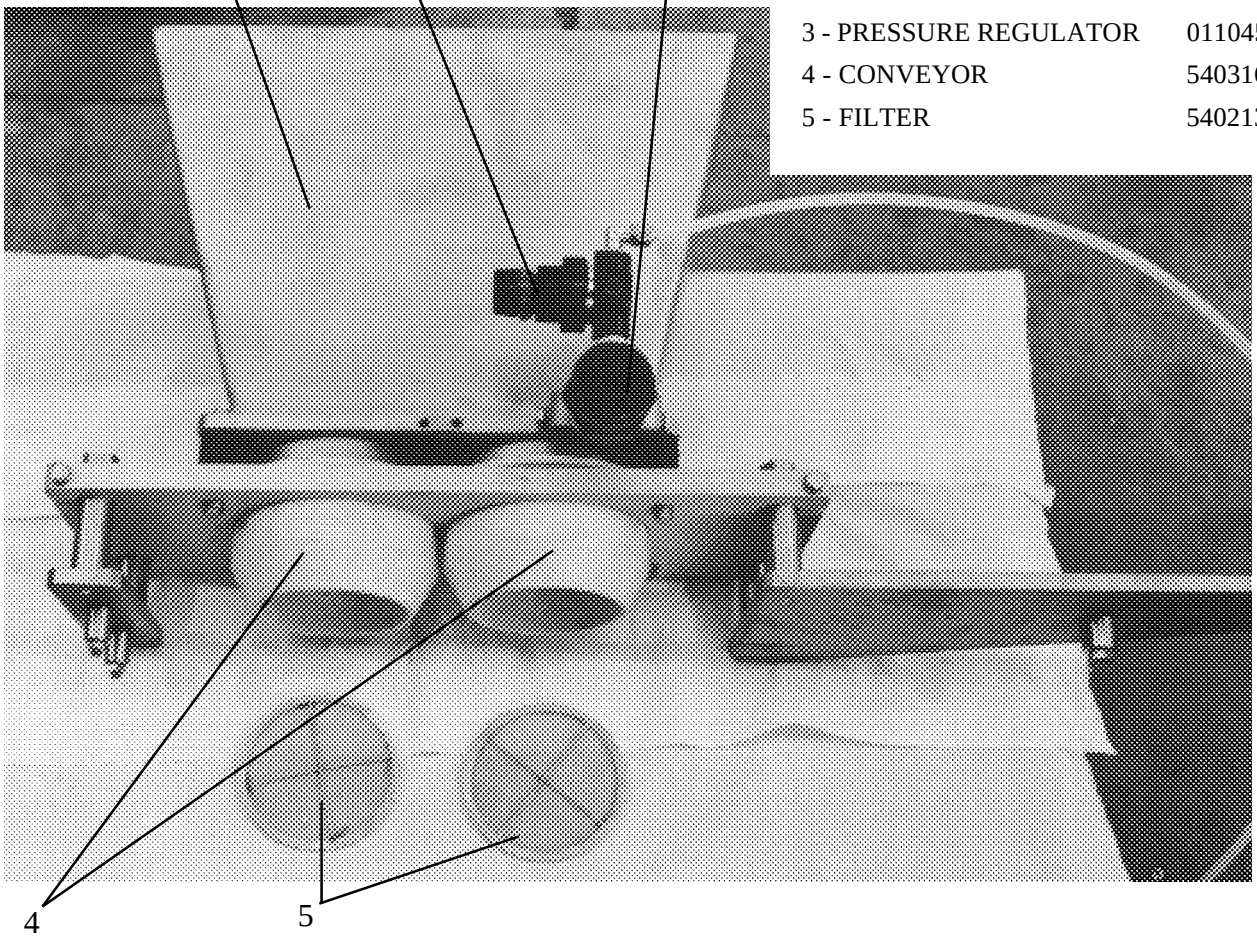
Turn illuminated selector (Fig.5, SA15) to start the cocoa powder dispenser (the selector is lit).

The operation of the cocoa powder dispenser is governed by the cam no.15 of the electronic programmer.

CAM NO.15 - (cocoa powder) - cuts in the shaker so as to let the cocoa fall as soon as the chain stops and cuts it off before it starts again.

Note: it is not possible to use at the same time the cocoa dispenser and the dry ingredients dispenser dispenser since they are designed to be fitted in the same position.

FIG.32



1 - HOPPER	540316001
2 - SHAKER	336091001
3 - PRESSURE REGULATOR	011045257
4 - CONVEYOR	540316006
5 - FILTER	540213050

This page has been left intentionally blank

4.5 - CUP/TIRAMISU PRODUCTION

4.5.1 - CUP DISPENSING STATION (see section 4.3.1)

4.5.2 - ICE CREAM FILLER (see section 4.1.3)

4.5.3 - PRESSING DEVICE/LIQUEUR

4.5.4 - DECORATION STATION

4.5.5 - COCOA POWDER DISPENSER (see section 4.4.3)

4.5.6 - LID DISPENSING STATION (see section 4.1.6)

4.5.7 - LID PRESSING STATION (see section 4.3.4)

4.5.8 - EJECTION STATION (see section 4.3.5)

Note: see table section.2.1

4.5.3 - LIQUEUR STATION

For the production of “Tiramisu’” cups, after having positioned the cup into the tray, effected a test ice cream filling and positioned a piece of biscuit on the ice cream it is necessary to soak the biscuit with ripple or liqueur and at the same time to even up the biscuit with a light pressure.

To obtain this a liqueur dispensing device is utilized.
This essentially consists of two dispensing plates, two dispensers.

The station operates as follows:
As soon as the tray-chain stops, the dispensers open, the liqueur which is sent by a special pump comes out of the holes of the plate and soakes the biscuit . Next the dispenser close and the the chain starts again.

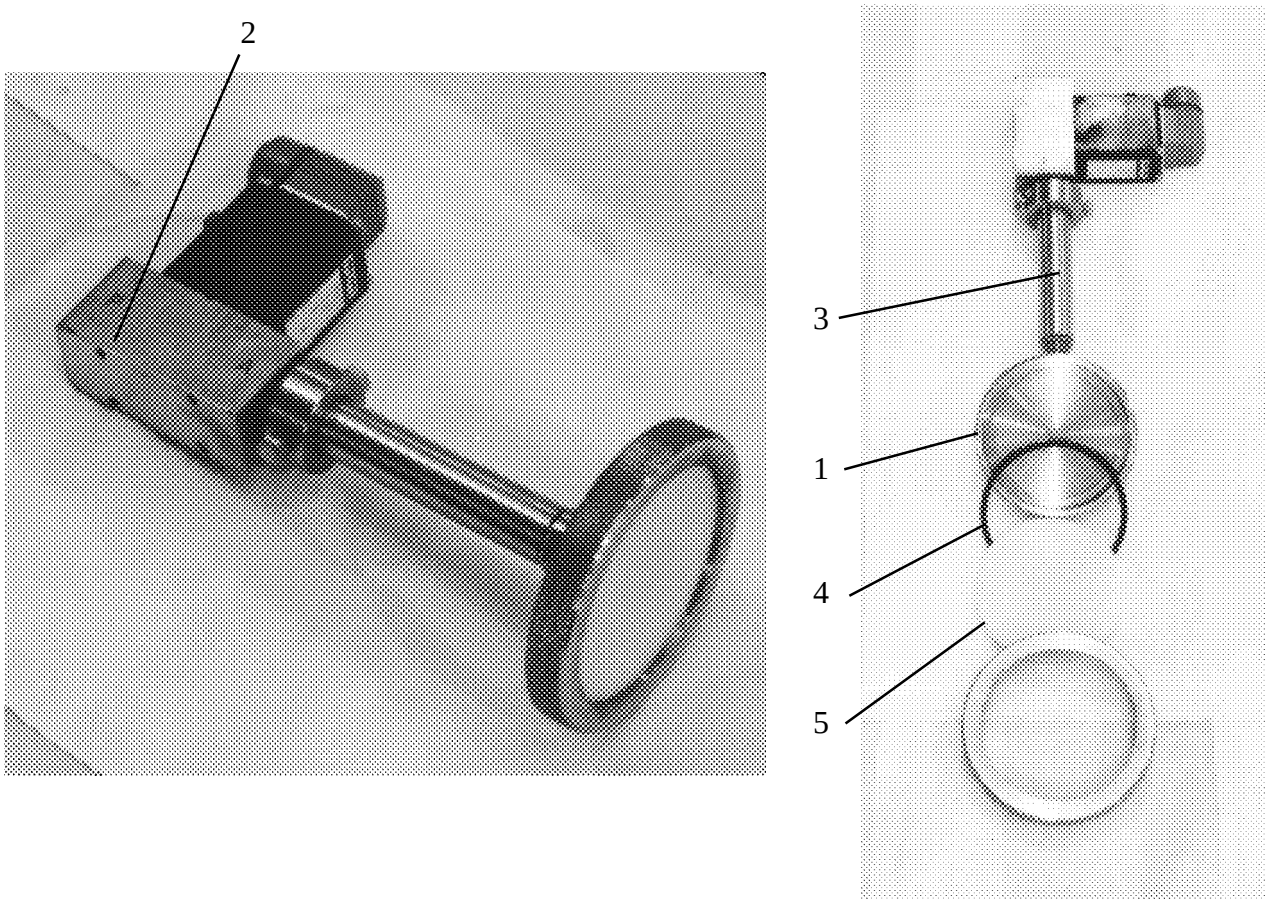
Turn illuminated selector (Fig.5, SA10) to operate the pressing/dispensing device (the selector is lit).

The operation of the pressing/dispensing device is governed by the cams 9 of the electronic programmer.

CAM NO.9 - (pencil filler / liqueur) - opens and closes the dispenser to carry out the filling of liqueur.

Note: it is not possible to use at the same time the pencil filler and the liqueur/pressing unit.

FIG.33



1 - NOZZLE	D10D10007
2 - SOLENOID VALVE	016020348
3 - LIQUEUR DISTRIBUTION PIPE	D10D10010
4 - O-RING	336067078
5 - LIQUEUR DISTRIBUTION PLATE	D10D10009

4.5.4 - SECOND FILLING OR DECORATION

The second ice cream filling or decoration consists of a timed filling device (Fig.15, 1) secured to a mobile base (Fig.15, 5) actuated by the pneumatic cylinder (Fig.15, 4) and by a second pneumatic cylinder opening/closing the filler and a decorating plate (Fig.17,2), in case the station is used as decorator.

The station operates as follows:
As soon as the tray-chain stops, the filler lowers, then it opens filling the exact pre-set quantity of ice cream and closes just before rising again.

For proper operation of the filler the continuous freezers linked to the machine should dispense the ice cream in a constant way.

At the start of the production run it is necessary to discharge for some minutes the ice cream flowing from the filler until the required hardness and overrun are obtained.

At the end of production remove the filler from the mobile base, dismantle it completely, wash it throroughly and assemble everything for the next production run.

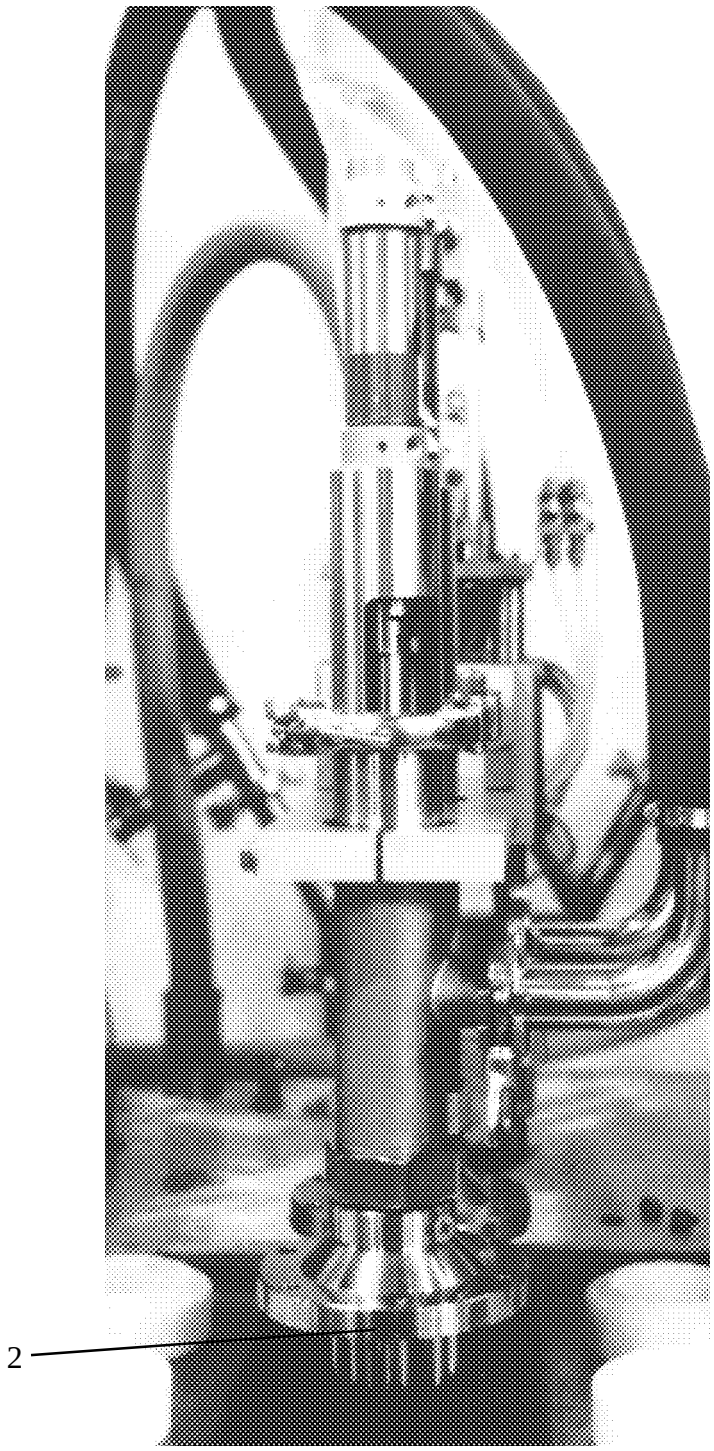
Turn illuminated selector (Fig.5, SA9) to start the filler (the selector is lit).

The operation of the filler is governed by the cams no. 5 - 7 of the electronic programmer.

CAM NO.5 - (stations' downstroke) - lowers the filler as soon as the tray-chain stops and lifts it before it starts again.

CAM NO.7 - (filling) - opens and closes the second filler to obtain the required metered quantity of ice cream.

FIG.17



This page has been left intentionally blank

4.6 - OPTIONAL STATION

4.6.1 - PENCIL FILLER

4.6.2 - VOLUMETRIC FILLER

4.6.3 - THERMOSEALING

4.6.4 - ICE CREAM FILLING

4.6.5 - CUTTING WIRE

4.6.6 - DATER

4.6.1 PENCIL FILLER

The pencil filler consists of a pneumatic cylinder (Fig. 16, 1) for the upstroke and downstroke of the unit, the filler (Fig. 16,2) and the stuffing nozzle (Fig.16, 4).

The station operates as follows:
As soon as the tray-chain stops, the cylinder lowers the stuffing unit so as to let the nozzle penetrate the ice cream and attain the desired depth; then it opens and the jam flows from the stuffing nozzle, while the latter rises again. Then the filler closes and everything is ready for a new cycle.

Turn illuminated selector (Fig. 5, SA10) to start the pencil filler (the selector is lit).

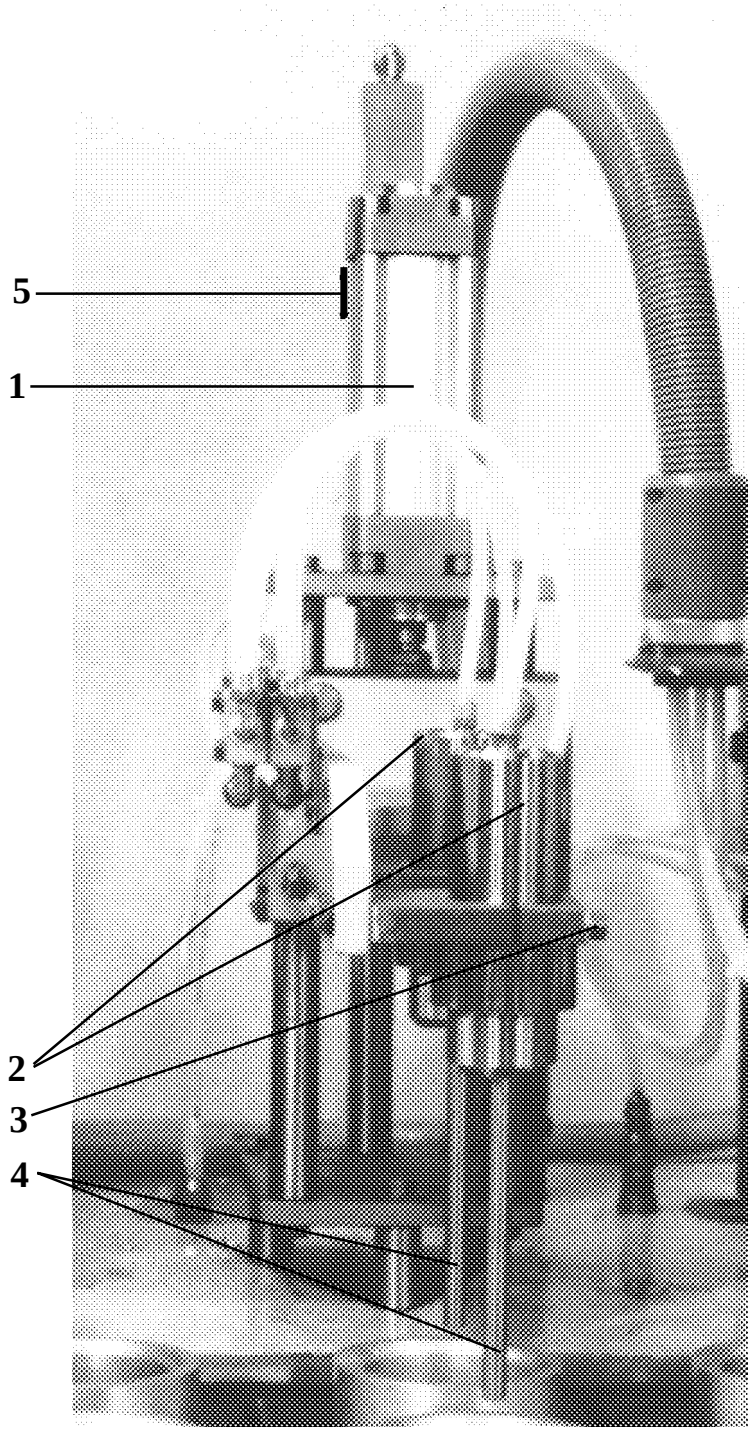
The operation of the pencil filler is governed by the cams no.8 - 9 of the electronic programmer.

CAM NO.8 - (stations' downstroke) - lowers the stuffing unit, as soon as the chain stops and lifts it before it starts again.

CAM NO.9 -(pencil filler) opens and closes filler allowing the jam to be injected into the ice cream.

1 - PNEUMATIC CYLINDER
2 - FILLER
3 - HOSE-HOLDER FOR JAM INLET
4 - STUFFING NOZZLE
5 - MAGNETIC PROXIMITY SWITCH

FIG.16



4.6.2 VOLUMETRIC FILLER

The ice cream filling station consists of : two volumetric fillers (Fig.27, 1) actuated by as many pneumatic cylinders, two rotating pistons, two hoppers and two filling nozzles.

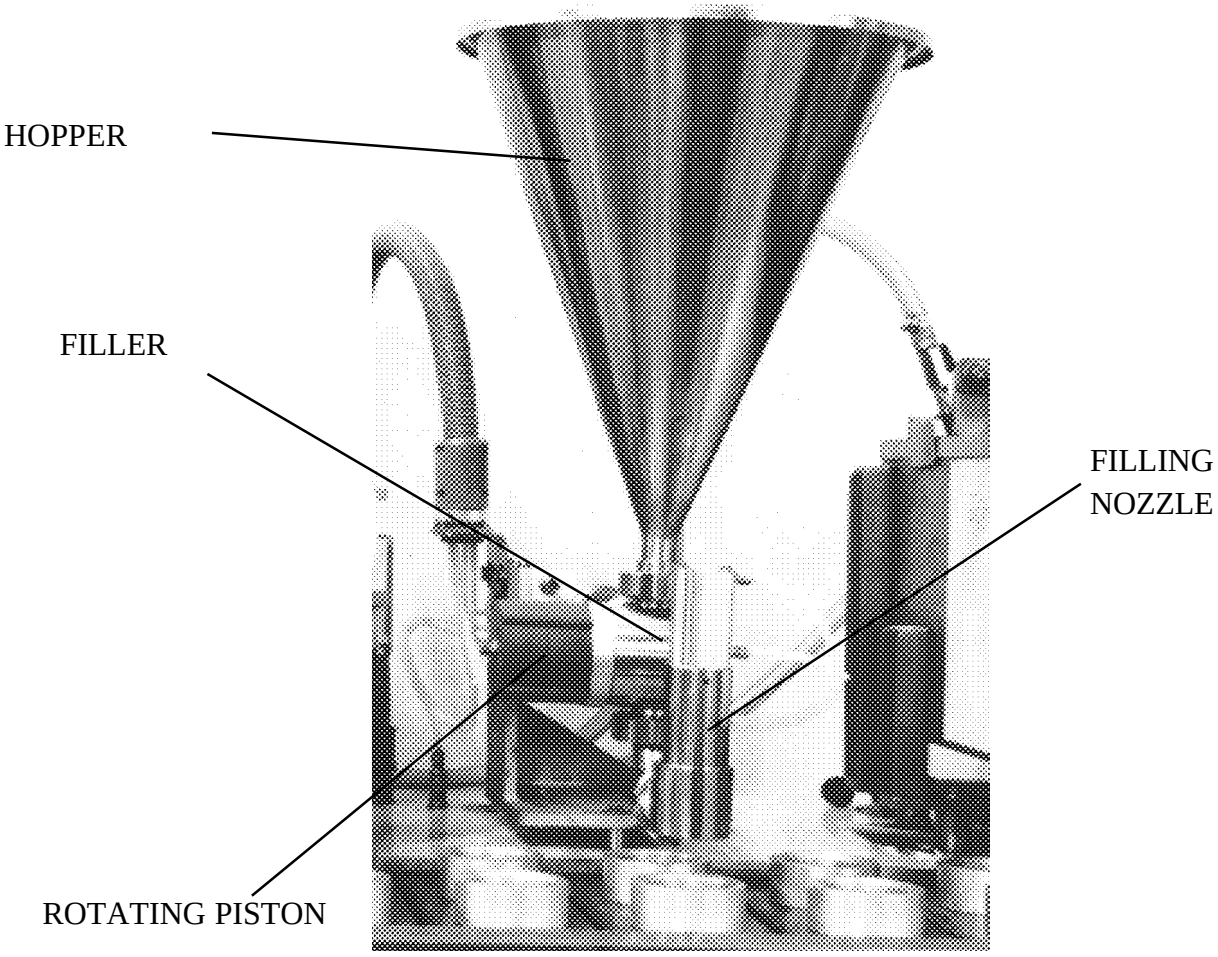
The operation of the station is as follows:
The rotating pistons connects the hopper with the filler (by closing the filling nozzle); the pneumatic piston sucks in the liquid to be metered from the hopper filling the filler body.
As soon as the tray-chain stops, the rotating piston connects the filler with the filling nozzle, the latter opens, then the pneumatic piston starts the return stroke, pushing the liquid, which was in the filler body through the filling nozzle, into the bulk below.

Carefully adjust the filling pistons speed by means of the speed regulators which are located on the pneumatic cylinders in order to avoid a rough filling, with splashes of product on the edge of the cup, or a slow filling motion which would not enable the filler to carry out a complete stroke.

Once the ice cream has been metered the nozzle closes and everyting is ready for the next cycle.

Note: further information is contained in the enclosed manual.

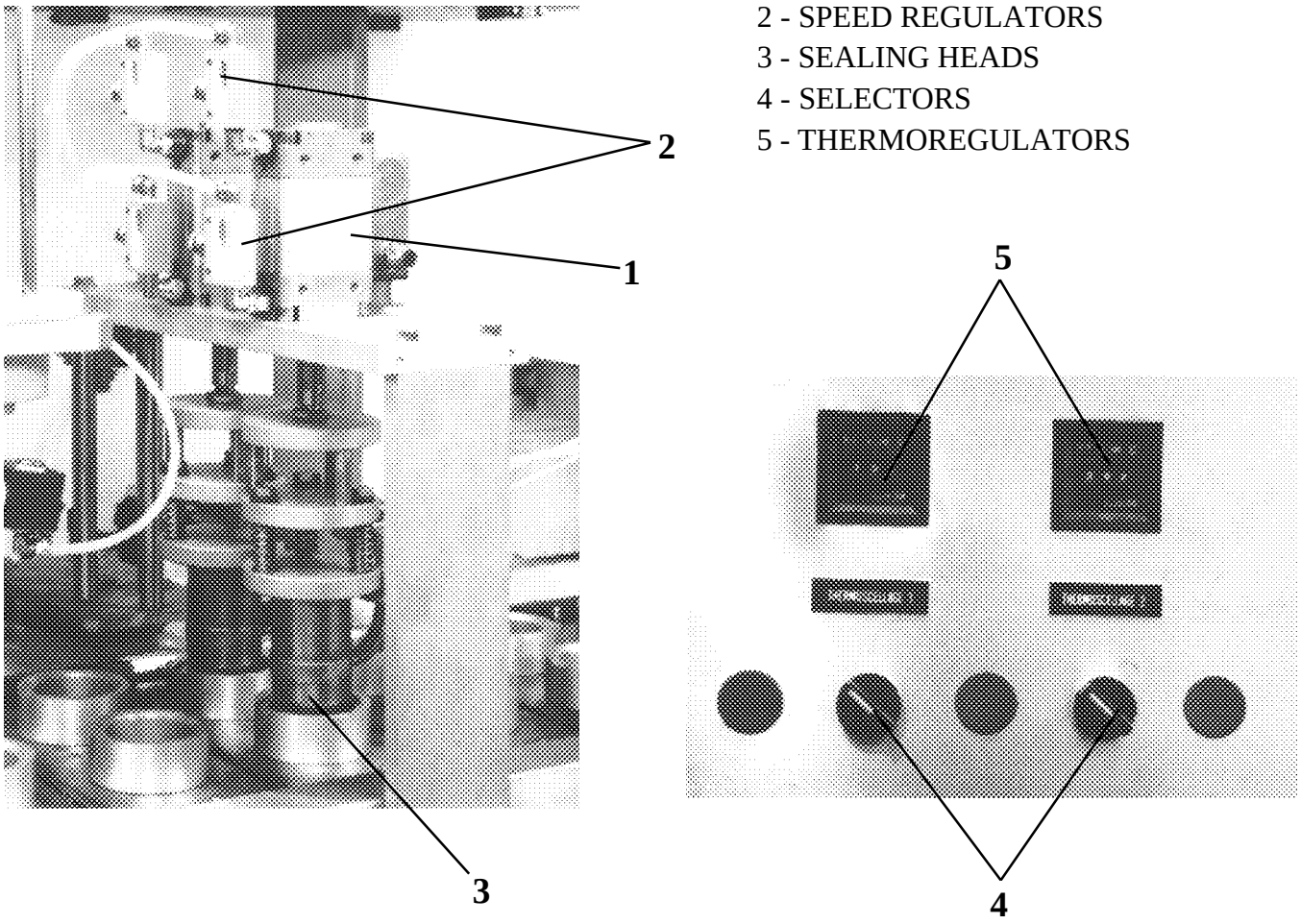
FIG.27



4.6.3 THERMOSEALING

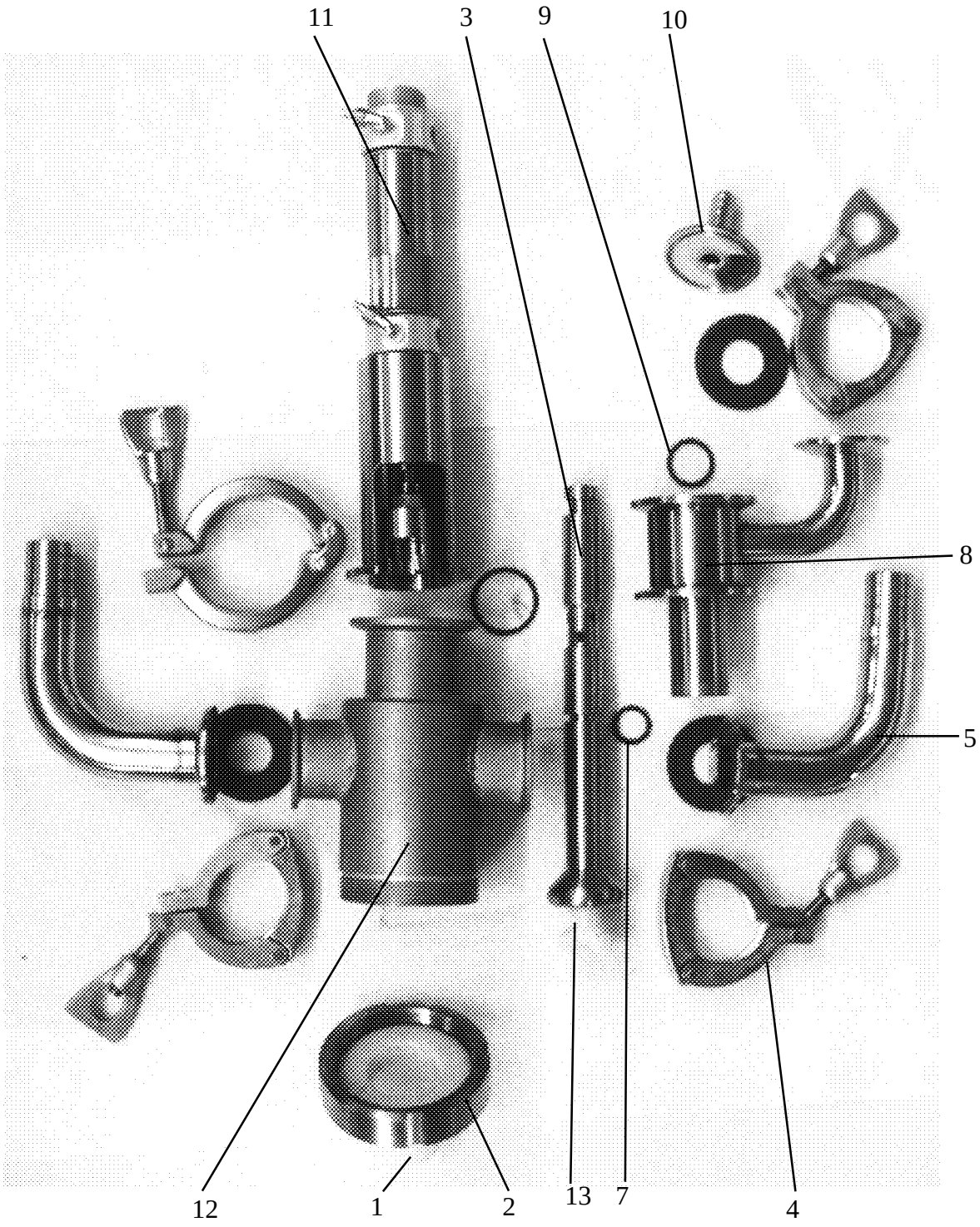
After the lid dispensing station it is possible to fit the sealing station in ALTERNATIVE to the pressing unit.
It is consist of two pneumatic cylinders (Fig.29, 1), two sealing heads (Fig.29, 3).
By means of selectors (Fig. 29, 4) apply tension to the sealing heads which will heat up.
Set the working temperature of the heads with the thermoregulators (Fig.29, 5).(The temperature will depend on the type of lids and the production speed).
The usual temperature is 200 °C, which can subsequently be modified during the operation according to the requirements.
The operation of the station is limited to the upstroke and downstroke movements of the sealing heads. A magnetic proximity switch is fitted on each of the two pneumatic cylinders, which stops the machine in case one or both the heads did not rise completely before the tray-chain start.

FIG.29



4.6.4 ICE CREAM FILLING

It is possible to meter rippled ice cream utilizing the special nozzle and the special pilot boss .



1 - FILLER HEAD
2 - FITTING FOR FILLER HEAD
3 - SHUTTER
7 - SHUTTER O-RING
4 - CLAMP
6 - CLAMP GASKET
13 - RIPPLE NOZZLE
8 - PILOT BOSS
9 - PILOT BOSS O-RING
11 - PNEUMATIC CYLINDER
12 - FILLER BODY
5 - ICE CREAM INLET PIPING
10 - HOSE-HOLDER FOR RIPPLE INLET

4.6.5 - CUTTING WIRE

The cutting wire consists of:
- Two pneumatic cylinders (Fig. 1.1) which adjust the horizontal closing and opening of the cutting wire (Fig.2.1).
- Two pneumatic cylinders (Fig.2.2) which adjust the cutting movement and the ice cream detaching.
- Pressure regulator (Fig. 1.2).
- Pneumatic motor for ripple (Fig.1.4).(optional)
- Extruder (Fig.1.3).

Functioning of the cutting wire:
- As soon as the tray-chain stops, the jaws of the cutting are open completely.
- Ice cream descends through the extruder.
- The ice cream slice is cut horizontally and is detached by a vertical movement.
- Then the ice cream slice is positioned into the container below.
- The cutting wire returns to original position.

FIG.1

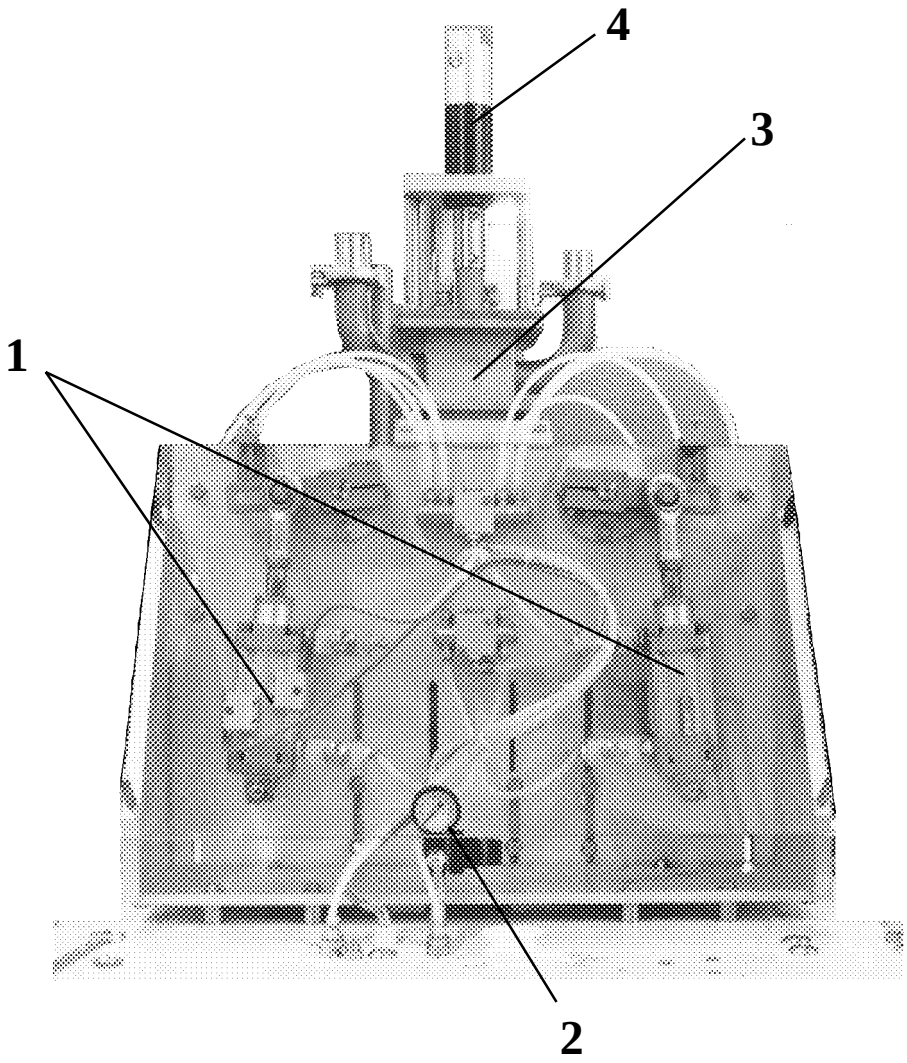
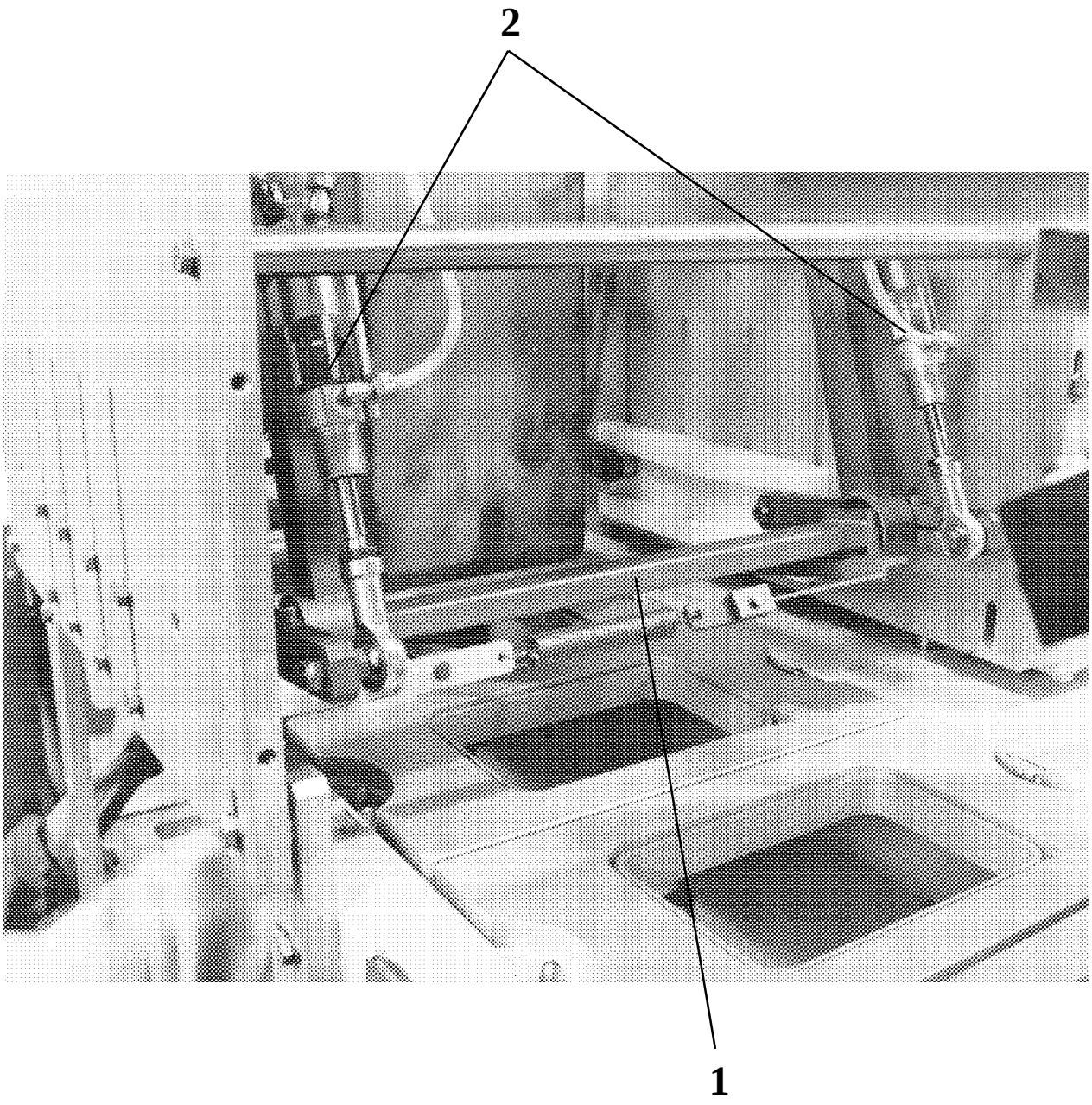
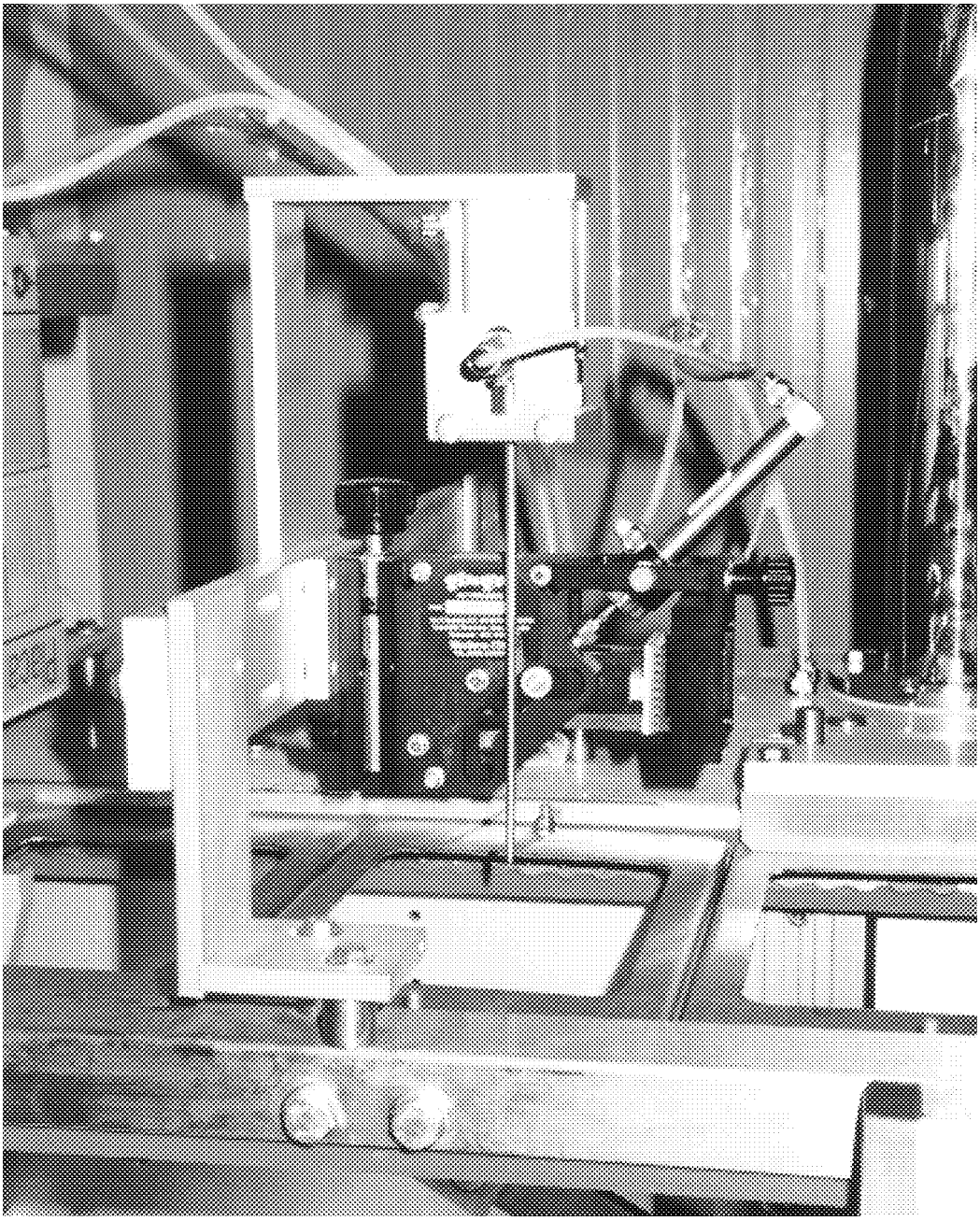


FIG.2



4.6.6 DATER

It is mounted immediately after the lid pressing device and works in series with it, utilizing the same controls and pushbuttons, and is therefore controlled by the same cam of the programmer.
Consult the enclosed manual for use and maintenance instructions of dater.



SECTION 5.0
TROUBLESHOOTING

5.1 - TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
The machine won't start	- power supply	- check electric connections and voltage
	- compressed air	- check pneumatic connections and pressure
	- safety coupling open	- reset the safety coupling (see section 10)
	- motor thermal relay automatic switches	- open control panel and reset
	- One or more pneumatic pistons with lagging upstroke and therefore the proximity switches, which are fitted, operate.	- increase upstroke speed - check the regulation of pressing device and pencil filler
	- electronic card out of order or incorrectly set	- check the setting (consult setting instructions of E2NR card)
One or more stations do not operate or operate incorrectly	- Programmer	- check'zero' point (see section 3.2) - check cam timing
	- pneumatic valves	- check operation
	- pneumatic cylinders	- check gaskets and wear
The machine does not reach maximum operating speed	- card E2RN	- check timing and regulations
The machine operates only at maximum speed	-speedometer dynamo	- replace
No chocolate from chocolate sprayer or topping	- chocolate tank and piping	- check chocolate to be liquid and if possible without clots
	- chocolate sprayer and topping	- check for presence of hardened chocolate and wash
	- chocolate pump	- check pneumativ cylinder - check timer on control panel

PROBLEM	PROBABLE CAUSE	REMEDY
Lids won't drop	- vacuostat	- lack of lids in dispenser, or lids are incorrectly placed
	- insufficient vacuum	- check vacuum generator/silencer/sucker/ piping to be clean
	- programmer	- check cams 11 - 12
The cups won't fall into the tray rings or fall more than one	- programmer	- check timing of cams no. 1 - 2
	- insufficient vacuum	- check vacuum generator/silencer/sucker/ piping to be clean
	- height of operating head	- lower the operating head if more than one cup falls, lift it if no one falls
The cups spring from tray rings when being fed	- programmer	- check cam no.2 by reducing the programmed time
	- vacuum	- reduce vacuum of generator

This page has been left intentionally blank

SECTION 6.0
MAINTENANCE

6.1 - EXPENDABLE MATERIALS

The following material are required for machine maintenance:

Material	Can be found
1 Common ball bearing grease	commercially
2 Vaseline oil or equivalent	commercially
3 Neutral detergent	commercially
4 Disinfectant non-corrosive detergent	commercially
5 Thinner (gasoline or other petroleum distillate)	commercially

6.2 -TOOLS AND EQUIPMENT

No special tools or equipment are needed for start-up and maintenance.

6.3 - WASHING

Remove the following components from the machine:
- chocolate sprayer
- ice cream fillers
- chocolate dispenser and pump
- pencil filler
- hazelnut crumb/cocoa powder bulk

These components will be washed separately.

Carefully clean all the machine's devices and external surfaces using hot water and detergent. Dry with compressed air. To clean in depth (usually at start of season) remove all the tray rings and wash them separately.

To clean filling units, the tank and the dry ingredients dispenser bulk, use a disinfectant detergent.
Before remounting, lubricate the locking spindles.
Once washing is completed lubricate the operating heads' vertical guides.

WARNING
- Avoid spraying the control panel with the water hose so as not to cause water infiltration.
- Take care not to lose filler components during washing, and reassemble carefully according to exploded views.

6.4 - SCHEDULED MAINTENANCE

OPERATION /MACHINE PART INVOLVED	REQUIRED MATERIAL
1) Start of season	
Wash/lubricate all external surfaces and moving parts (see par. 6.3)	water - detergent detergent - disinfectant-oil
2) Daily (before starting production)	
- Check for leakage in compressed air lines	water - detergent
- Wash/Lubricate all external surfaces and moving parts (see par. 6.3)	detergent - disinfectant - oil
3) Monthly	
- Clean:	
- silencers	water - compressed air
- drying filter	water - compressed air
- lid dispensing station vacuum manifold	water - compressed air
- Clean and lubricate:	
- crimping unit	thinner - grease
-Lubricate:	
- conveyor chain	oil
- lever system for ejection	grease
-Check wear:	
- operating head sleeves	
4) End of season	
- Clean and lubricate	
- safety coupling	thinner - grease
- Lubricate (only when changing gaskets)	
- pneumatic cylinders	vaseline

6.5 RECOMMENDED REPLACEMENTS AND SERVICING

MACHINE PART	OPERATION
1) Every 1500/2000 hours	
- pneumatic cylinders	check and replace gasket if necessary
- lid dispensing station vacuum manifold	replace o-ring
- suckers	replace
2) every 5000 hours	
- operating heads sleeves	replace
- pneumatic valves	replace

6.6 PNEMATIC SYSTEM

6.6.1 De-humidifying filter

To clean:
- unscrew cup (Fig.6, 1)
- remove float, by unscrewing lock nut
- remove the internal float
- clean all parts with water and detergent, dry with compressed air

Warning:
DO NOT USE ALCOHOL OR SOLVENTS to clean.

6.6.2 Silencers

Unscrew by hand and clean with warm water. Dry with compressed air.

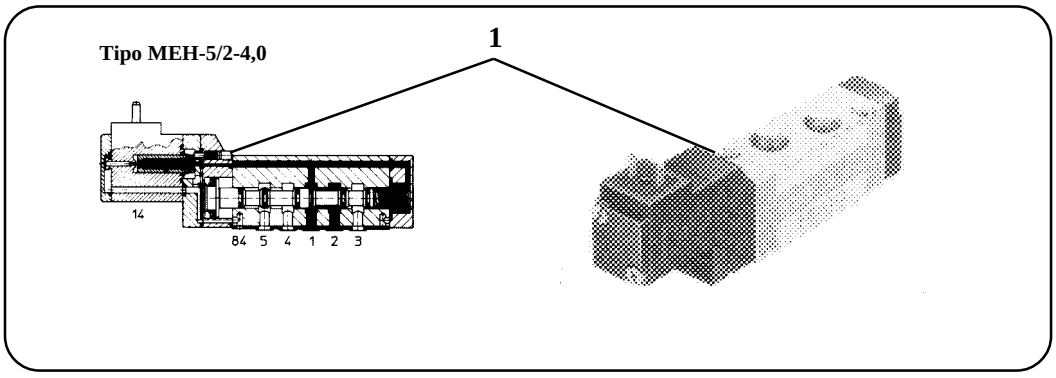
6.6.3 Pneumatic cylinders

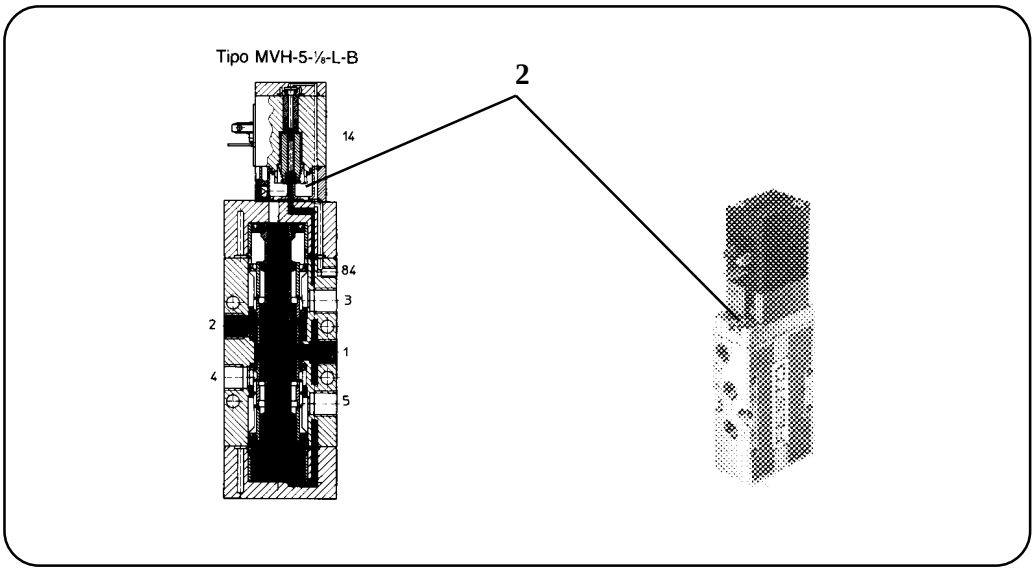
- remove the holding screws
- unscrew cylinder head
- unscrew cylinder body
- check wear of gasket and if necessary replace (lubricate the new gasket before mounting it)

To check wear of pneumatic valves (Fig.33):

- stop the machine with operating heads at the bottom dead center
- by disconnecting pipes from the various heads you will notice an escape of air from one of the holes of the valves themselves
- by manually operating the control valve (i.e. by pressing the test pushbutton) an escape of air will be noticed from the other discharge hole.
- otherwise it must be replaced after removing the holding screws.

Fig.33





6.6.4 Vacuum Generator

To clean disconnect pneumatic connectors, and clean with and compressed air the air passages.

6.7 MECHANICAL COMPONENTS

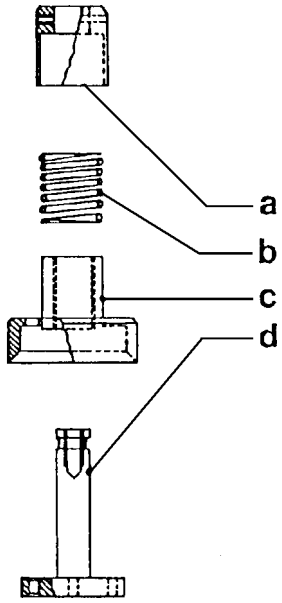
6.7.1 Vertical guides and operating heads

To lubricate:
- shut off compressed air intake
- put a few drops of oil on the guide rods
- lift and lower the heads manually: this procedure should not required any effort.

In case of marked wear of the sleeves excessive play and irregular movement of the heads will be noticed. If so:
- remove the heads by unscrewing the appropriate fixing bolts and then replace the sleeves.

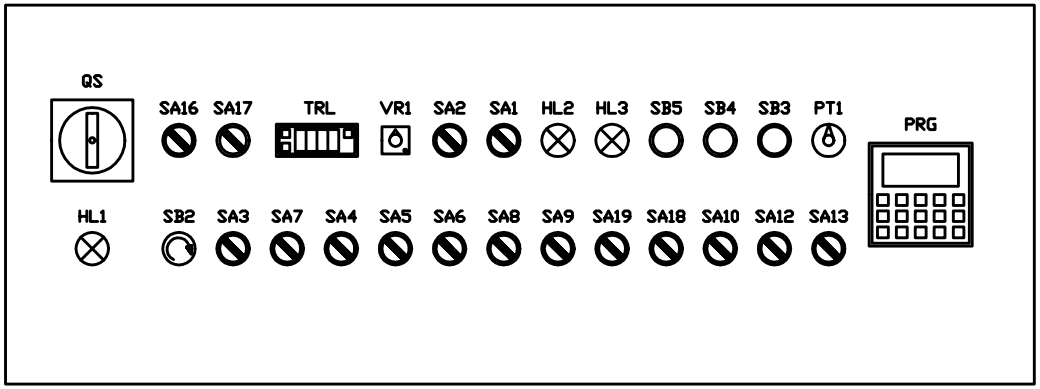
6.7.2 Crimping units

Regards the machine equipped for cone filling.
To lubricate.
- unscrew the knob and remove the crimping unit
- remove the spring holder (a) and after having loosened the screws
- remove plunger (d) and clean all the parts
- lubricate plunger stem (d)
- reassemble and remount

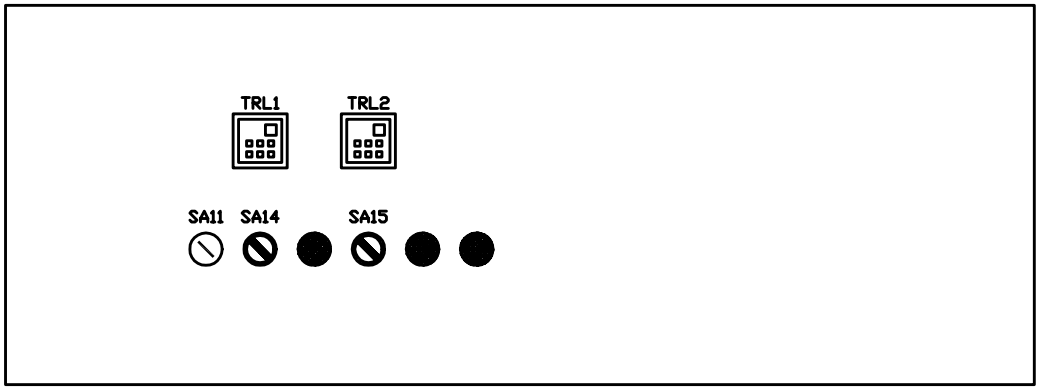


SECTION 7.0
ELECTRIC AND PNEUMATIC DIAGRAM

PANNELLO FRONTALE - FRONTAL PANEL



PANNELLO POSTERIORE - REAR PANEL



QS	INTERRUTTORE GENERALE	MAIN SWITCH
HL1	PRESENZA TENSIONE	POWER ON
HL2	MANCANZA ARIA	AIR LOW PRESSURE
HL3	INTERVENTO TERMICO	OVERLOAD TRIPPED
SB2	EMERGENZA	EMERGENCY STOP
SB3	ARRESTO	STOP
SB4	MARCIA	START
SB5	INTERMITTENZA	JOG
SA1	ALIMENTAZIONE ARIA	AIR SUPPLY
SA2	RISCALDO CIOCCOLATO	CHOCOLATE HEATING
SA3	CARICO CONI/COPPE	CONES/CUPS FEEDER
SA4	DOSATORE 1	FILLER 1
SA5	FARCITORE	PENCIL FILLER
SA6	DOSATORE 2	FILLER 2
SA7	SPRUZZATORE CIOCCOLATO	CHOCOLATE SPRAYER
SA8	COPERTURA	TOPPING
SA9	GRANELLA	DRY NUTS
SA10	POSACOPERCHI	LIDDING UNIT
SA11	POSACOPERCHI ROT./LIN.	ROT./LIN. LIDDING UNIT
SA12	AGGRAFFATORE/PRESSINO	CRIMPER/LID PRESSING
SA13	ESPULSORE	EJECTOR
SA14	TERMOSALDANTE 1	WELDING UNIT 1
SA15	TERMOSALDANTE 2	WELDING UNIT 2
SA16	DATARIO	DATER
SA17	GIRA COPPE	CUP SWIRL
SA18	TERMOSALDANTE	WELDING UNIT
SA19	POSA FOGLIETTI	ALU-FOIL DISPENCER
TRL	TEMPERATURA CIOCCOLATO	CHOCOLATE TEMPERATURE
TRL1	TERMOSALDANTE 1	WELDING UNIT 1
TRL2	TERMOSALDANTE 2	WELDING UNIT 2
VR1	COMANDO RESISTENZA SPRUZZO	SPRAYER HEATER CONTROL
PRG	PROGRAMMATORE ELETTRONICO	ELECTRONIC PROGRAMMER
PT1	REGOLAZIONE VELOCITA'	SPEED CONTROL

SA14-SA15-TRL1-TRL2 SONO OPTIONAL
SA14-SA15-TRL1-TRL2 ARE OPTIONAL

Tetra Laval Food

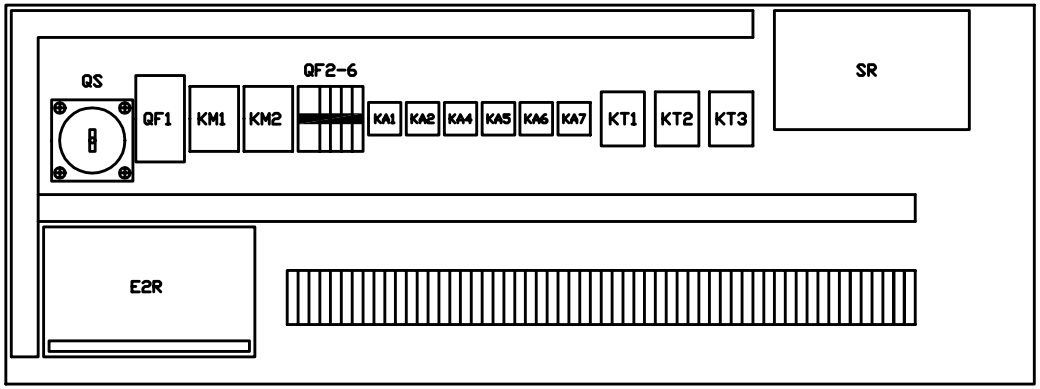
HOYER S.p.A.

CLIENTE:

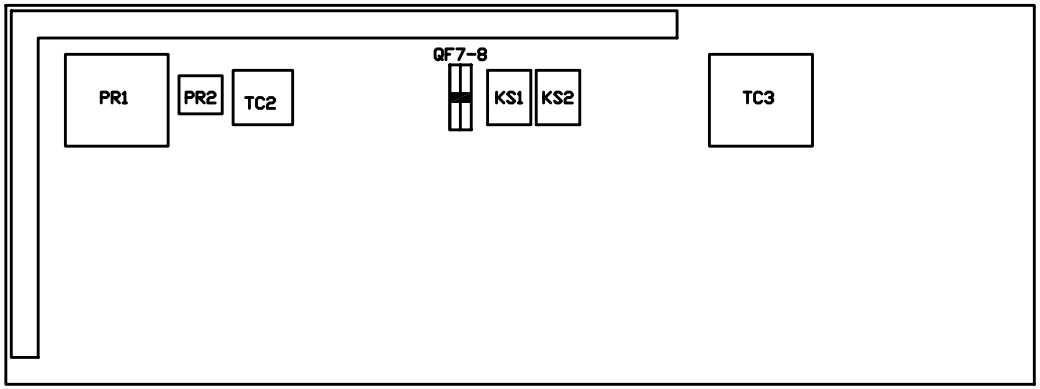
OGGETTO: FILLMARK 6000

FOGLIO	DATA	DISEGNATO	SCALA	DISEGNO N.
01 DI 21	14.07.94	L.D.	//	46.09.85.03

VISTA INTERNA FRONTALE - FRONTAL INTERNAL VIEW



VISTA INTERNA POSTERIORE - REAR INTERNAL VIEW



QF7-QF8-KS1-KS2 SONO OPTIONAL
QF7-QF8-KS1-KS2 ARE OPTIONAL

QS	INTERRUTTORE GENERALE	MAIN SWITCH
QF	INTERRUTTORE AUTOMATICO	AUTOMATIC SWITCH
TC	TRASFORMATORE AUSILIARI	AUXILIARY TRANSFORMER
PR	PONTE RADDRIZZATORE	RECTIFIER
SR	SCHEDA RELE'	RELAIS CARD
E2R	SCHEDA COMANDO MOTORE	MOTOR CONTROL CARD
V	VARIATORE	SPEED VARIATOR
G	GENERATORE DI SEGNALE	SIGNAL GENERATOR
PT	POTENZIOMETRO	POTENTIOMETER
VR	VARIATORE DI TENSIONE	POWER VARIATOR
KA	RELE' AUSILIARIO	AUXILIARY RELAY
KM	TELERUTTORE	CONTACTOR
KS	RELE' STATICO	STATIC RELAY
HL	LAMPADA DI SEGNALAZIONE	SIGNAL LAMP
SA	SELETTORE	SELECTOR SWITCH
SB	PULSANTE	PUSH-BUTTON
PS	PRESSOSTATO	PRESSURE SWITCH
YV	ELETTROVALVOLA	SOLENOID VALVE
TRL	TERMOREGOLATORE	THERMOREGULATOR
S	SONDA DI TEMPERATURA	TEMPERATURE PROBE
EH	RESISTENZA	HEATER
SQ	FINECORSA	LIMIT SWITCH
PX	INTERRUTTORI DI PROSSIMITA'	PROXIMITY SWITCH
	MORSETTI QUADRO ELETTRICO	ELECTRIC PANEL TERMINALS

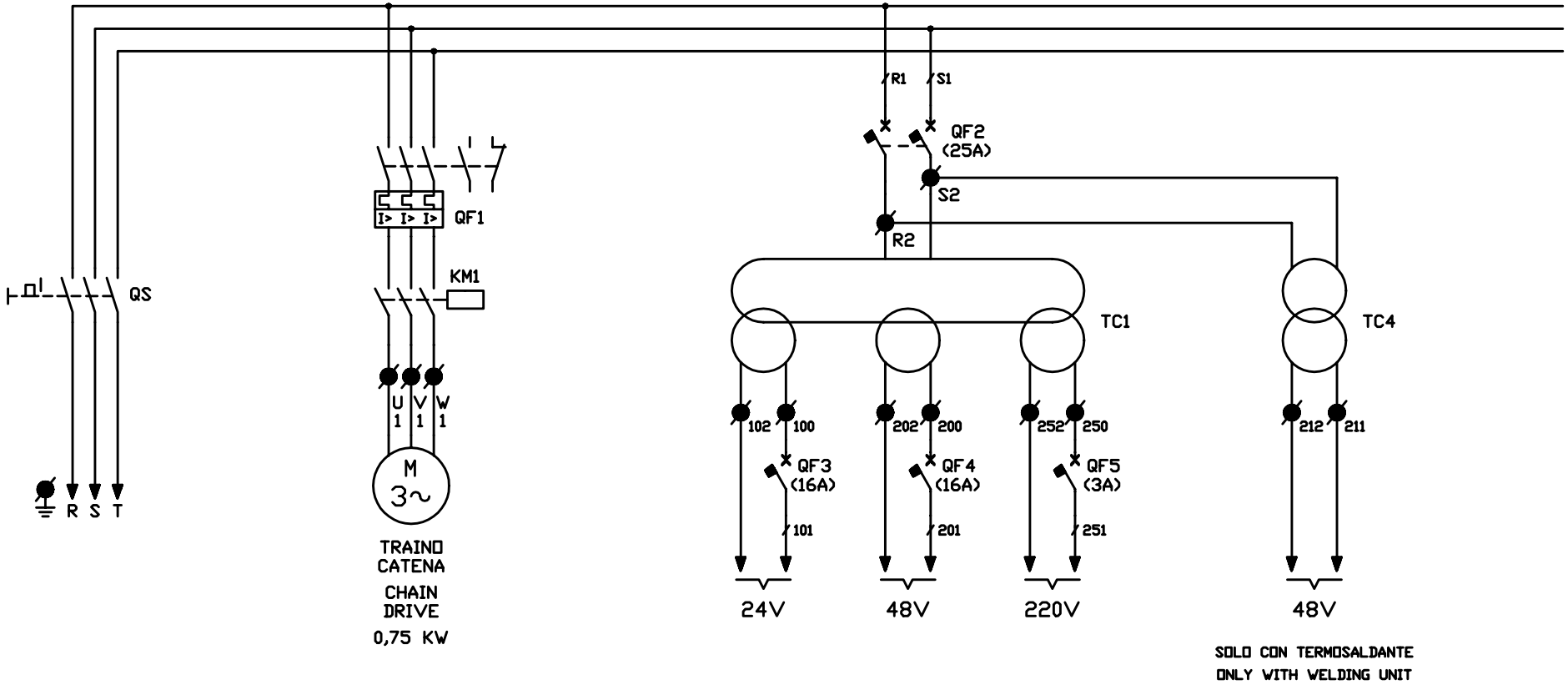
Tetra Laval Food

HOYER S.p.A.

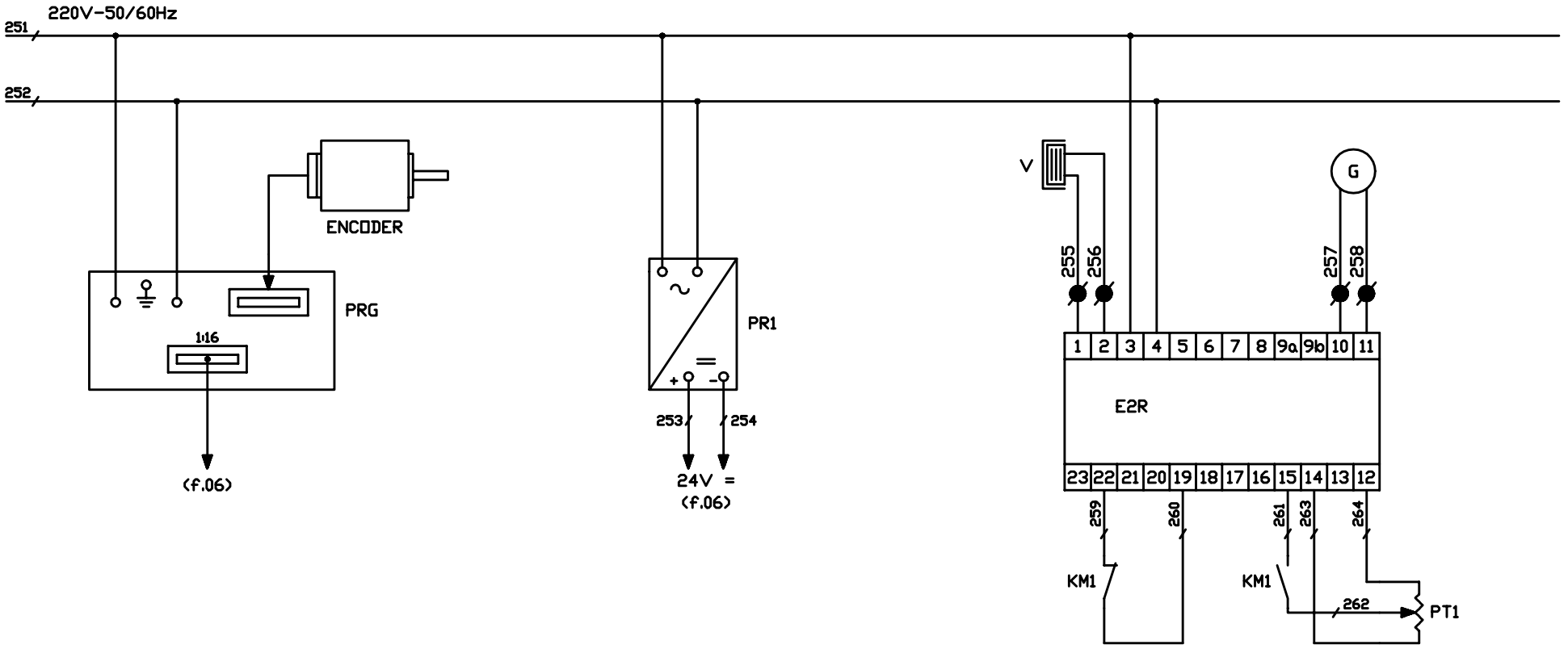
CLIENTE:

OGGETTO: FILLMARK 6000

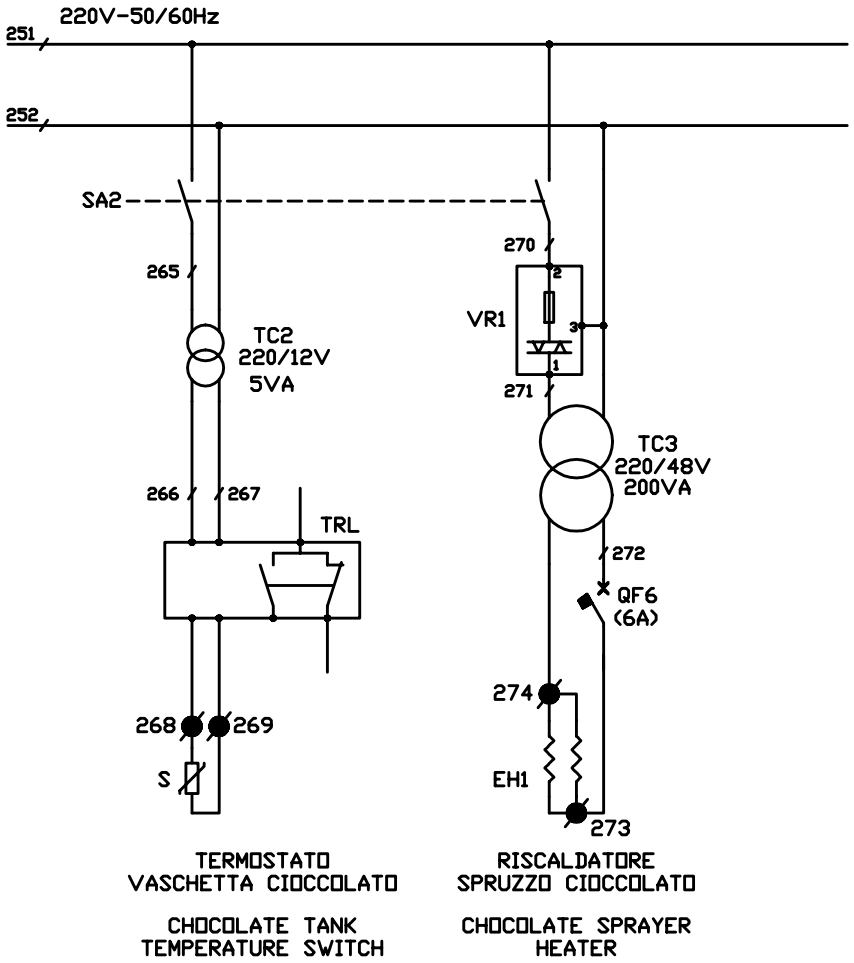
FOGLIO	DATA	DISEGNATO	SCALA	DISEGNO N.
02 DI 21	14.07.94	L.D.	//	46.09.85.03

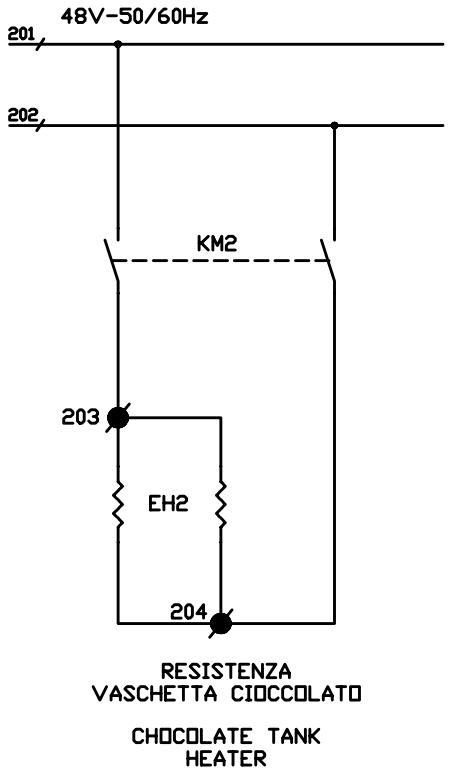


Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 03 DI 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03

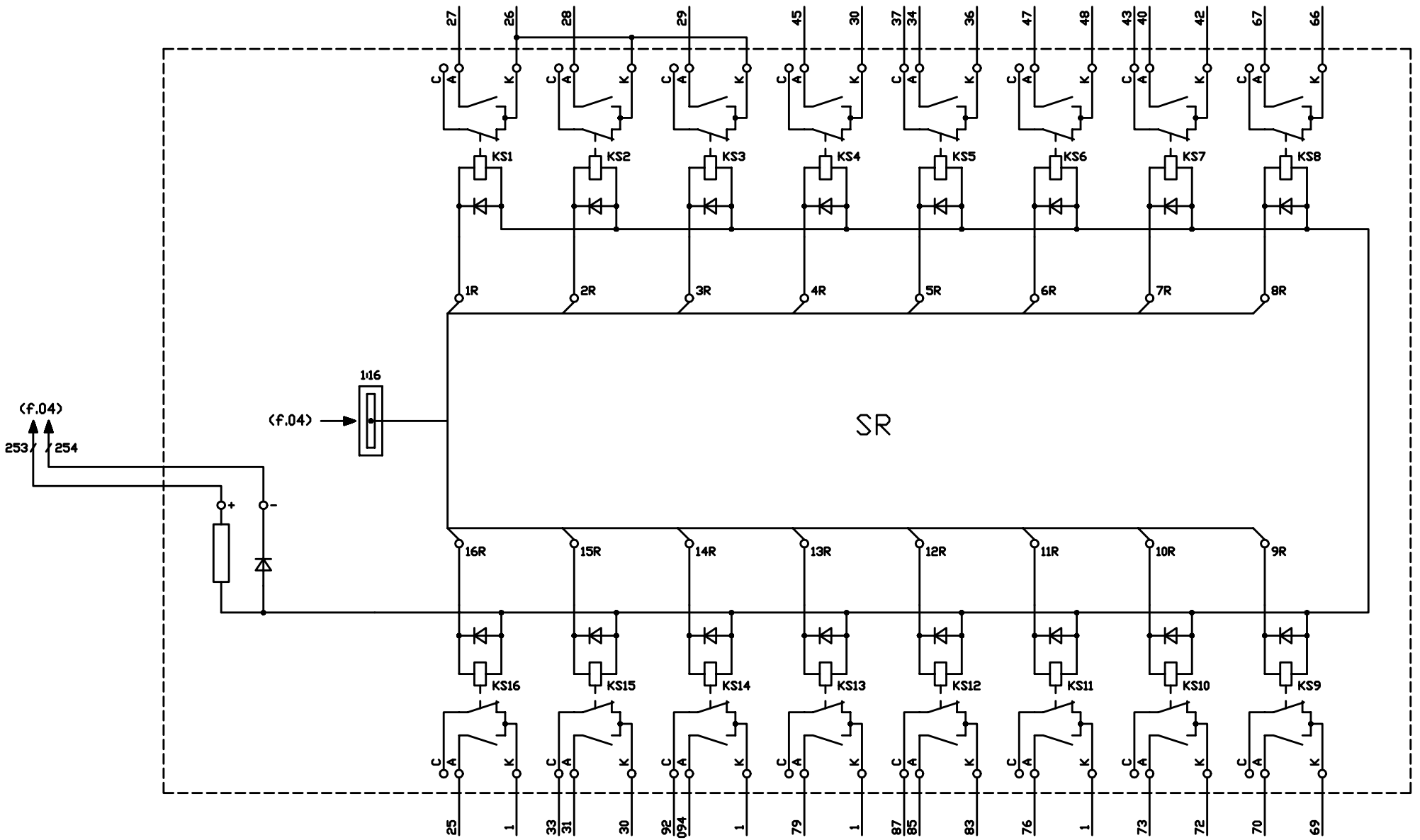


Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 04 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03

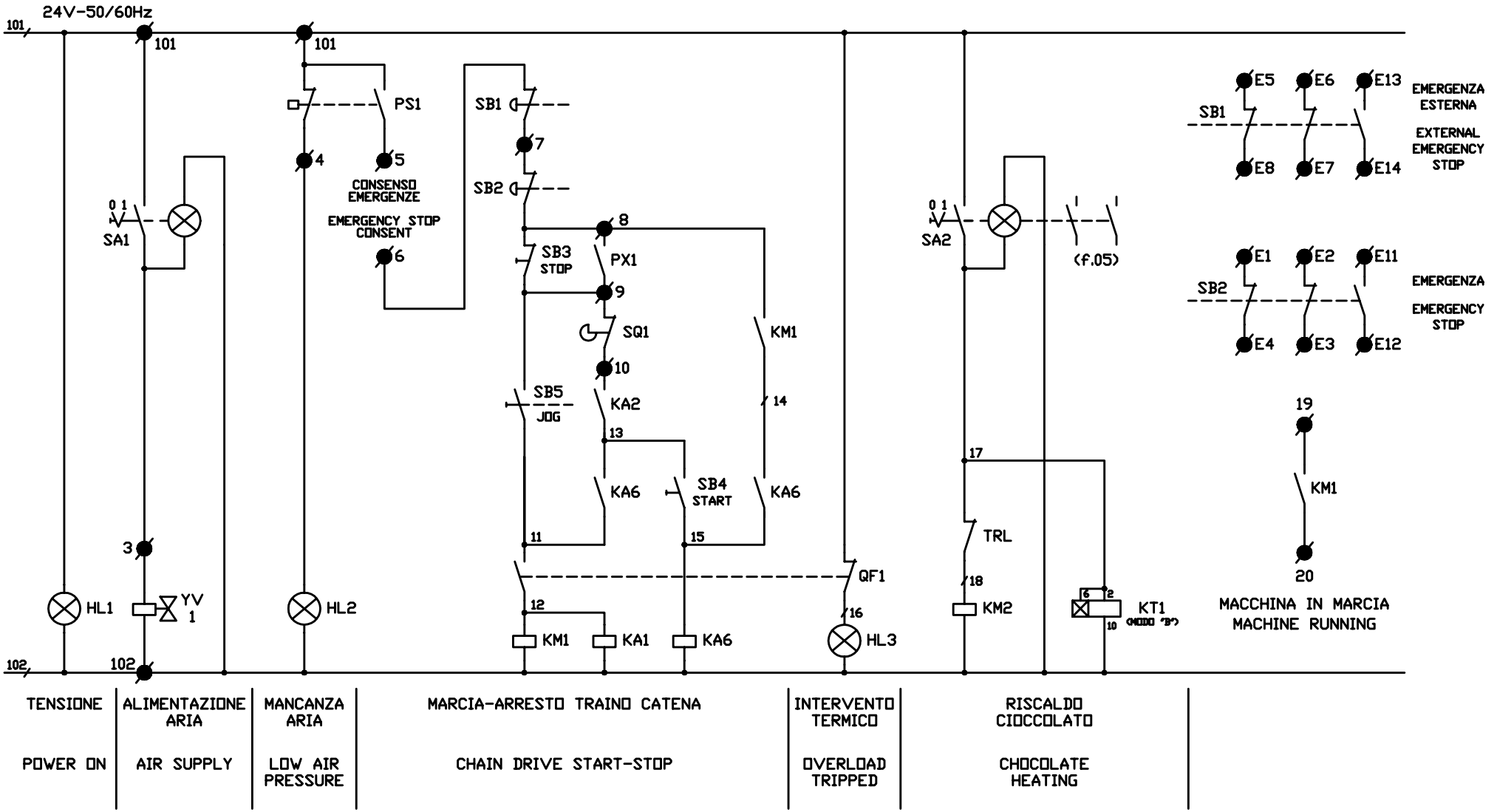




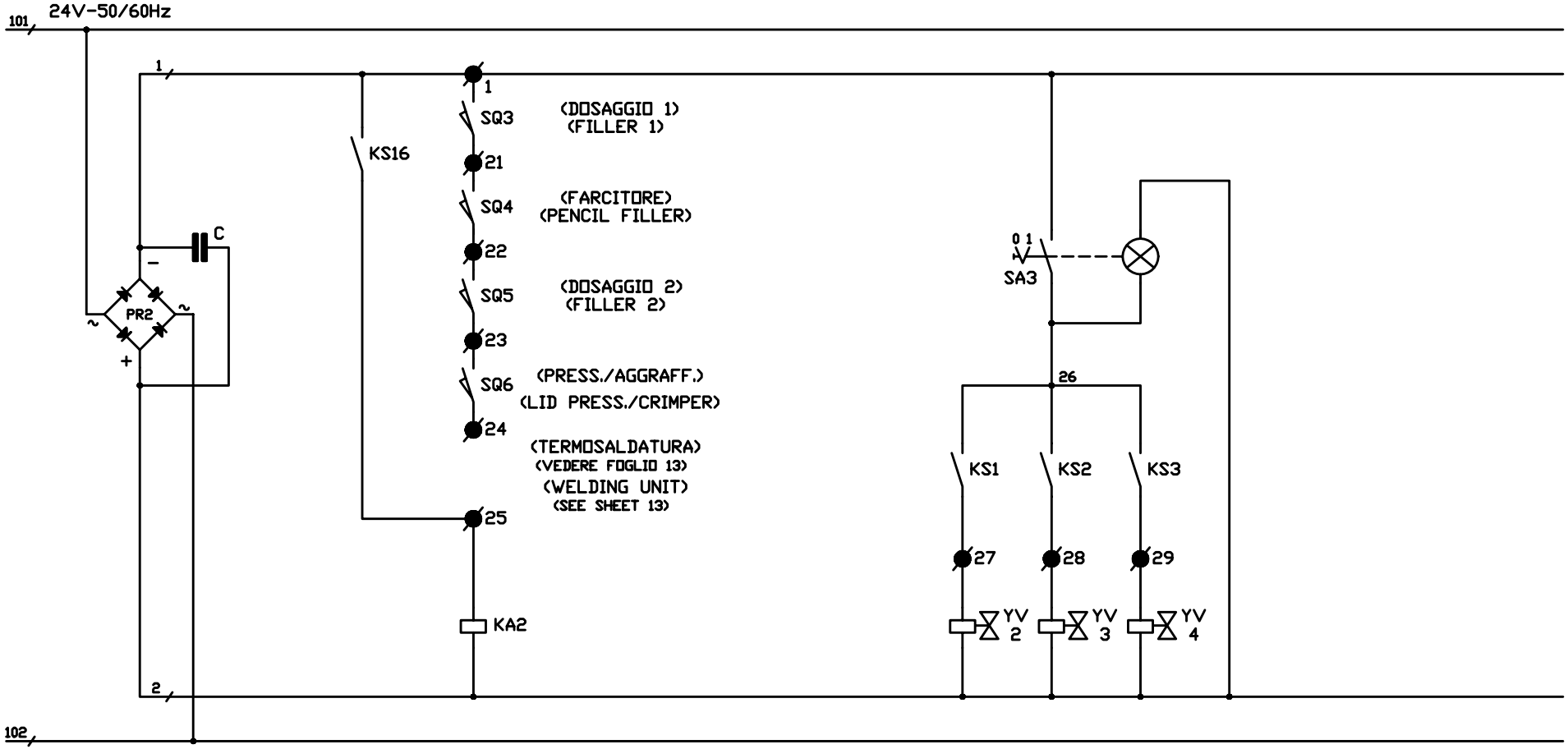
Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 05 DI 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 06 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



Tetra Laval Food HOYER S.p.A.	CLIENTE:			
	OGGETTO: FILLMARK 6000			
FOGLIO 07 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



SICUREZZE

SAFETIES

CARICO COPPE - CUPS FEEDER

RILASCIO / RELEASE	VUOTO / VACUUM

CARICO CONI - CONES FEEDER

RILASCIO / RELEASE	FERMO / STOP	DISCESA / DOWN

CARICO CALIPPO - CALIPPO FEEDER

RILASCIO / RELEASE	PRESA / PICK DOWN	FERMO / STOP

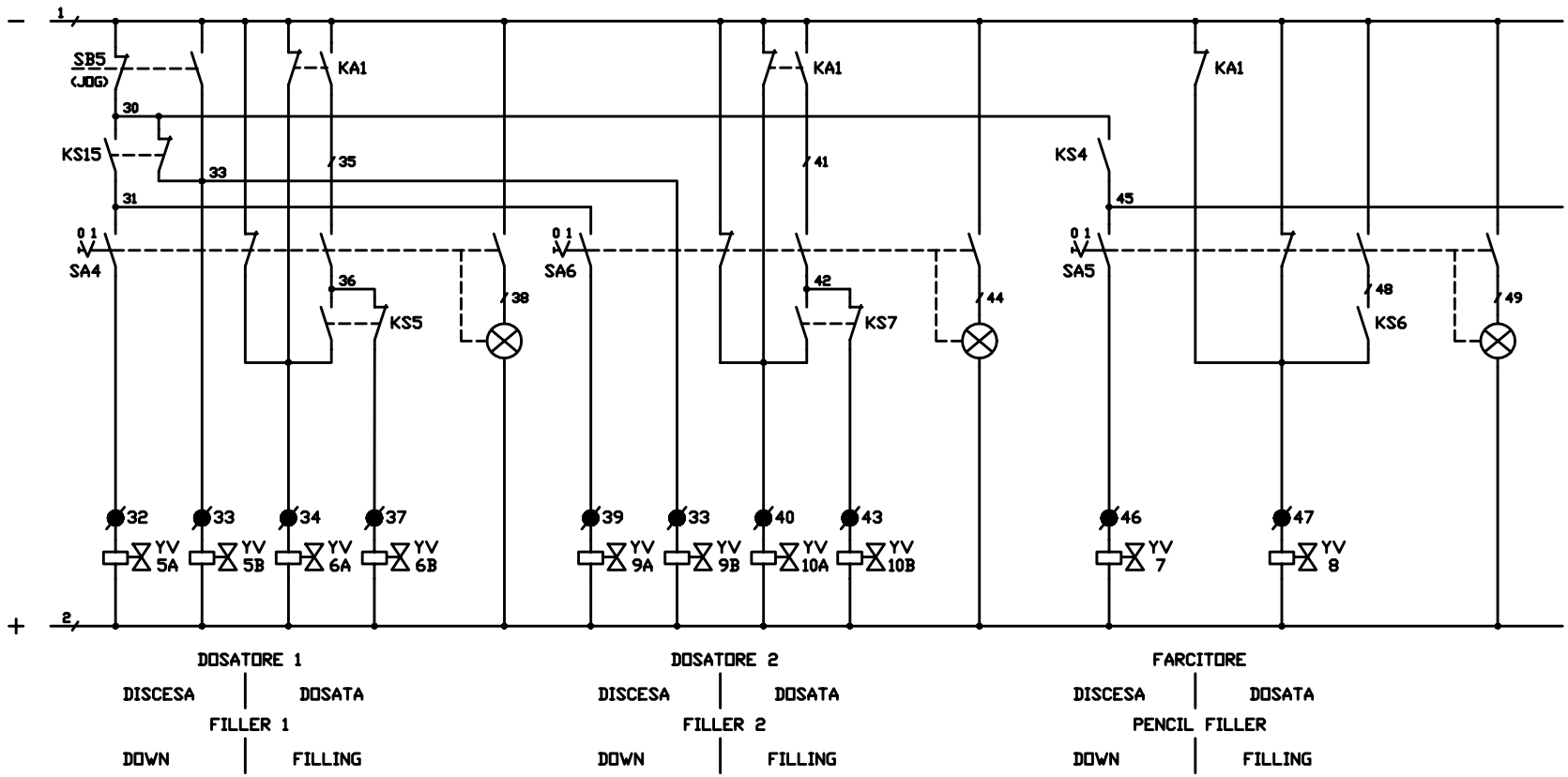
Tetra Laval Food

HOYER S.p.A.

CLIENTE:

OGGETTO: FILLMARK 6000

FOGLIO	DATA	DISEGNATO	SCALA	DISEGNO N.
08 di 21	14.07.94	L.D.	//	46.09.85.03



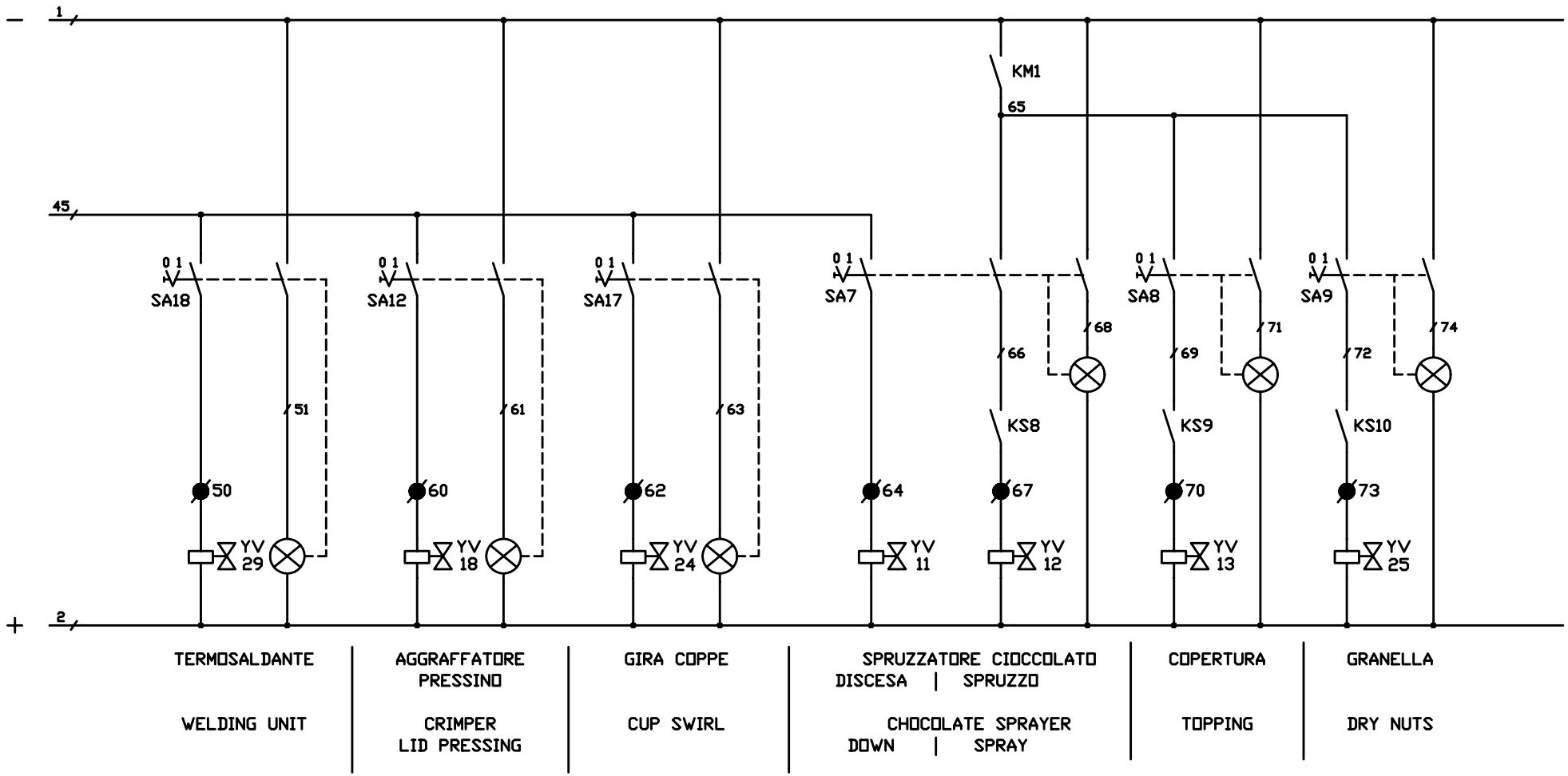
Tetra Laval Food

HOYER S.p.A.

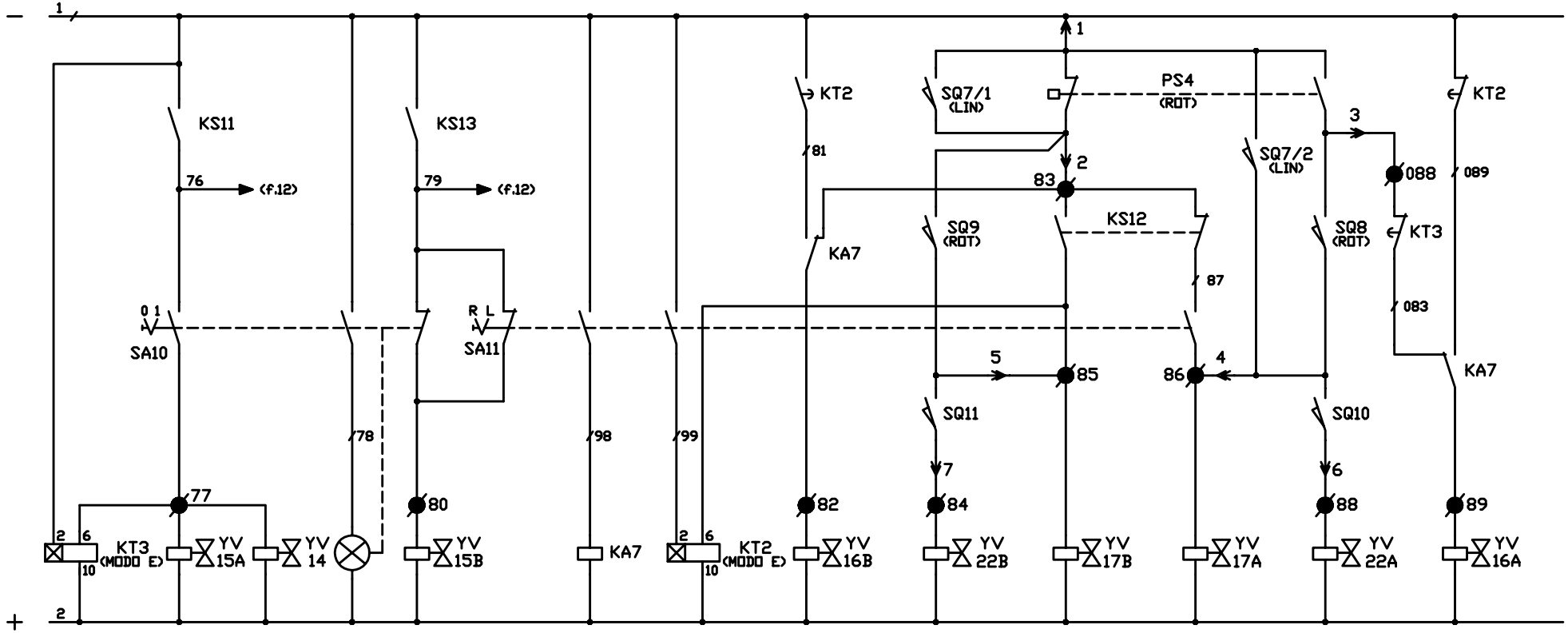
CLIENTE:

OGGETTO: FILLMARK 6000

FOGLIO	DATA	DISEGNATO	SCALA	DISEGNO N.
09 - 21	14.07.94	L.P.	//	46.09.8



Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 10 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



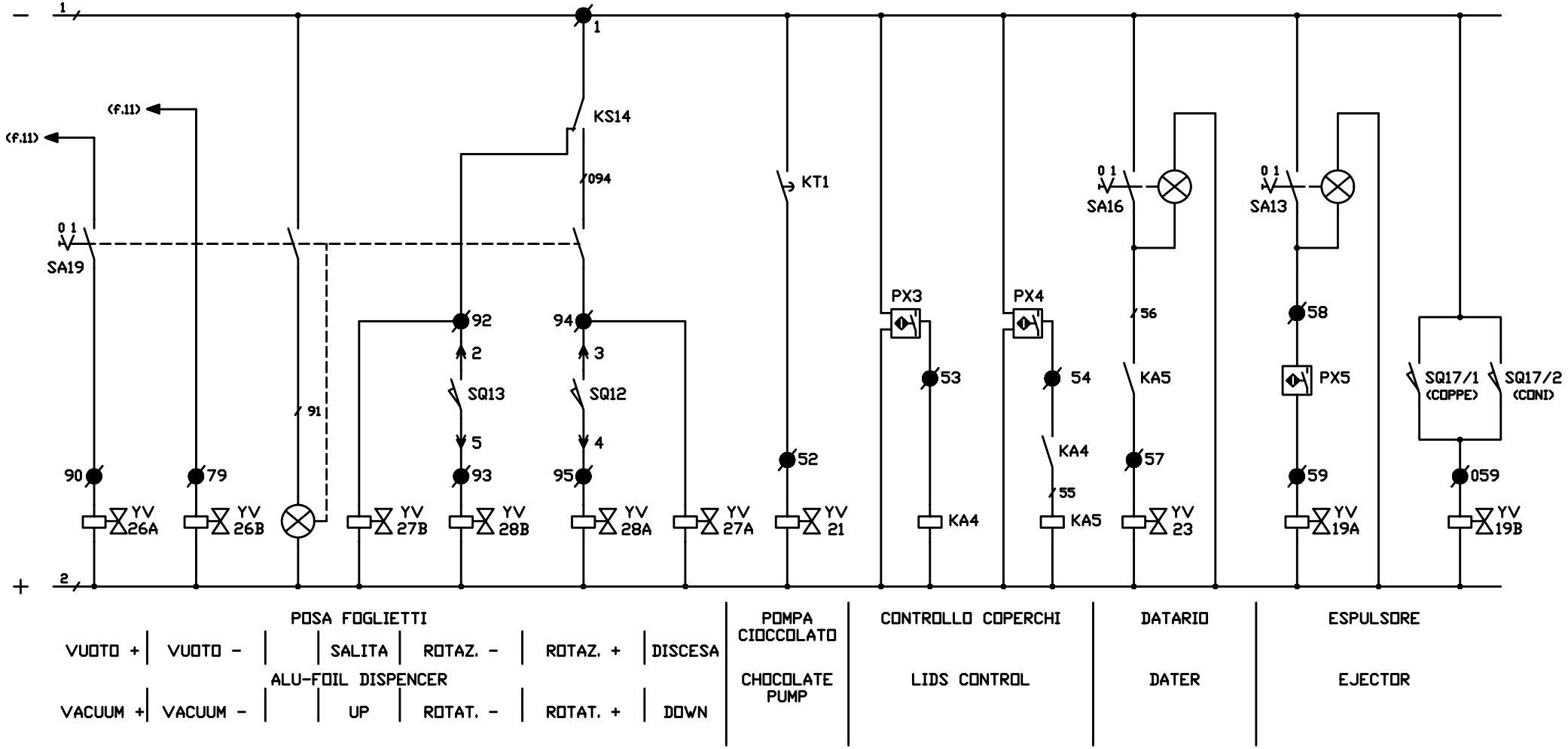
POSA COPERCHI A ROTAZIONE - ROTATION LIDDING UNIT

VUOTO + VACUUM +	RILASCIO RELEASE	VUOTO - VACUUM -		SALITA 1 UP 1	SALITA 2 UP 2	ROTAZIONE - ROTATION -	ROTAZIONE + ROTATION +	DISCESA 2 DOWN 2	DISCESA 1 DOWN 1

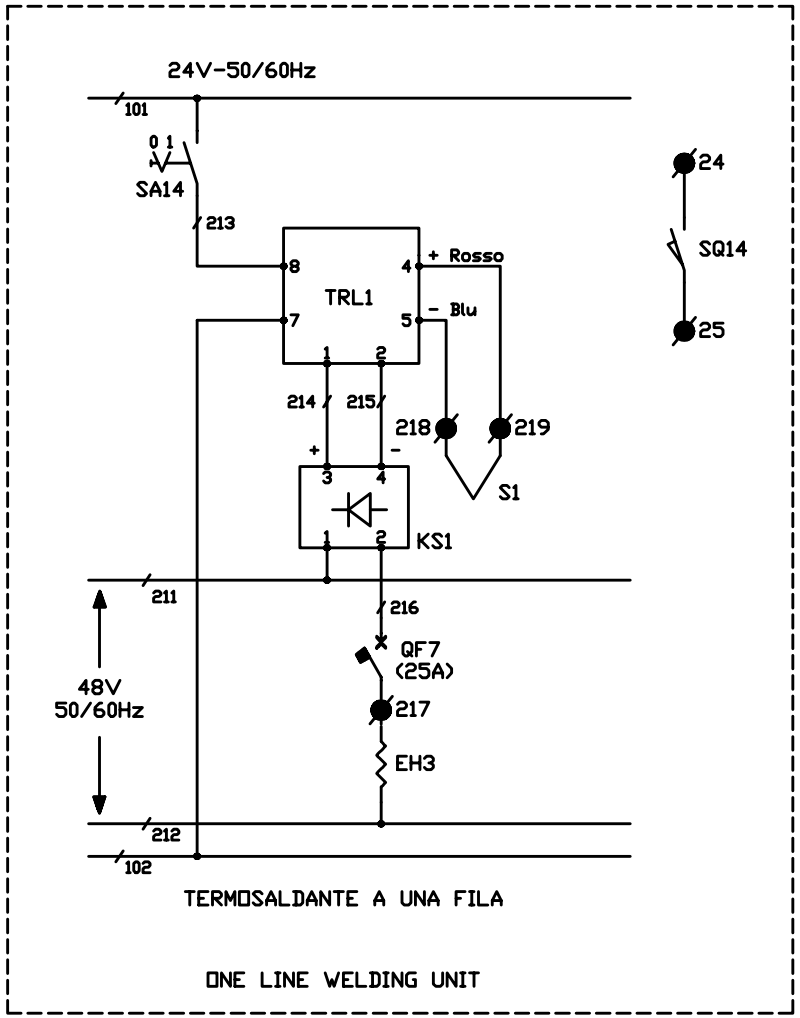
POSA COPERCHI LINEARE - LINEAR LIDDING UNIT

DISCESA DOWN		SALITA UP		FERMO + STOP +		PRESSINO + PRESSING +	PRESSINO - PRESSING -		FERMO - STOP -

Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO: 11 di 21	DATA: 14.07.94	DISEGNATO: L.D.	SCALA: //	DISEGNO N.: 46.09.85.03

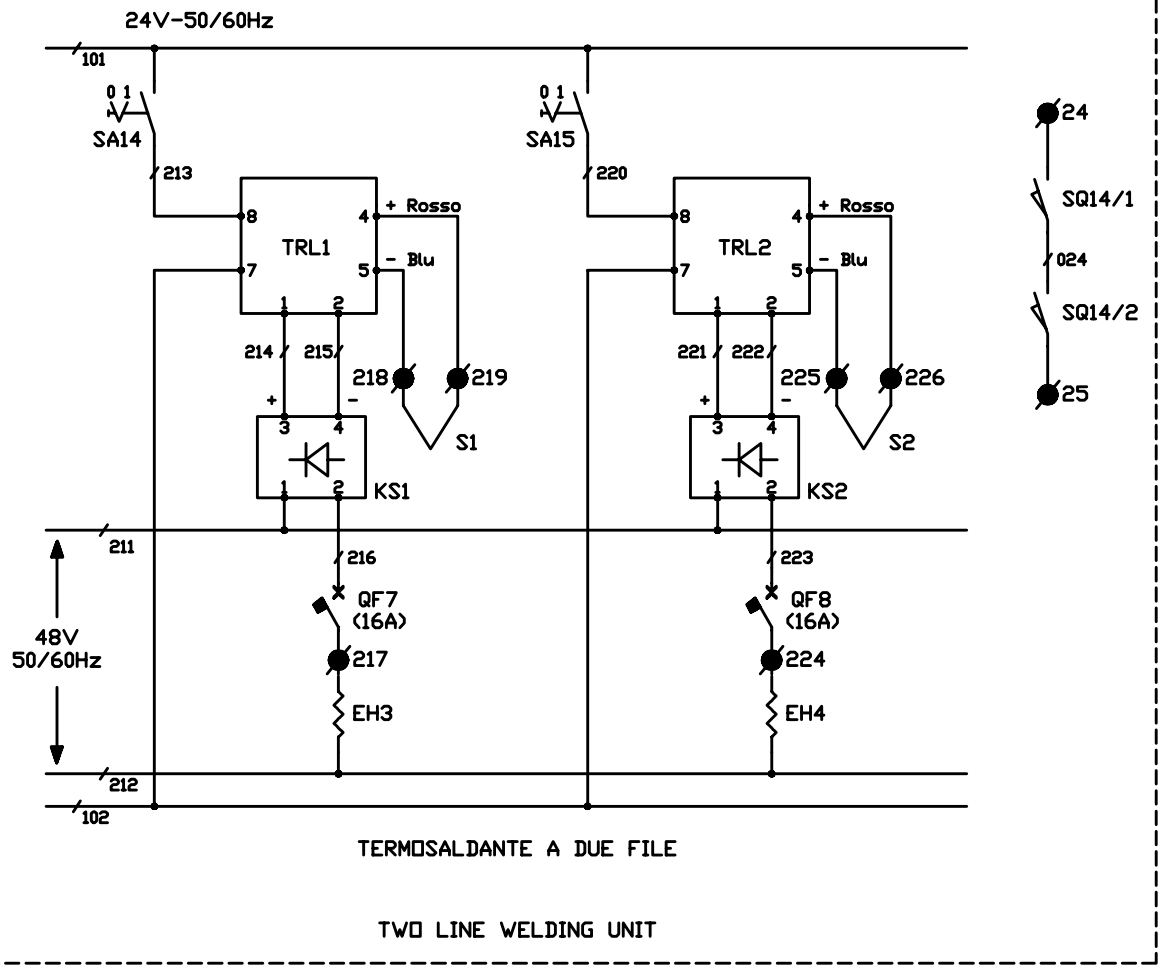


Tetra Laval Food HOYER S.p.A.	CLIENTE:			
	OGGETTO: FILLMARK 6000			
FOGLIO: 12 di 21	DATA: 14.07.94	DISEGNATO: L.D.	SCALA: //	DISEGNO N.: 46.09.85.03



TERMOSALDANTE A UNA FILA

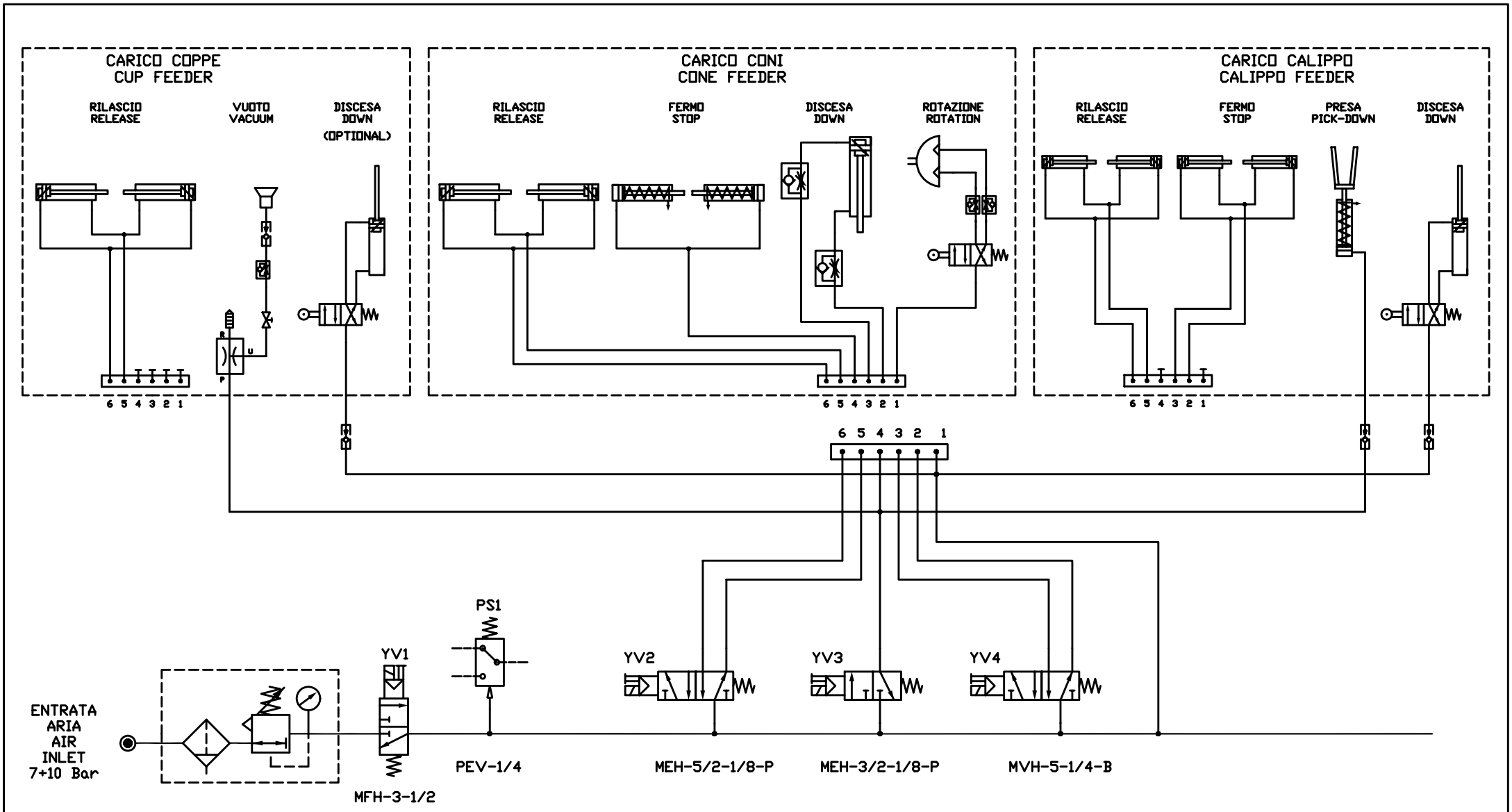
ONE LINE WELDING UNIT



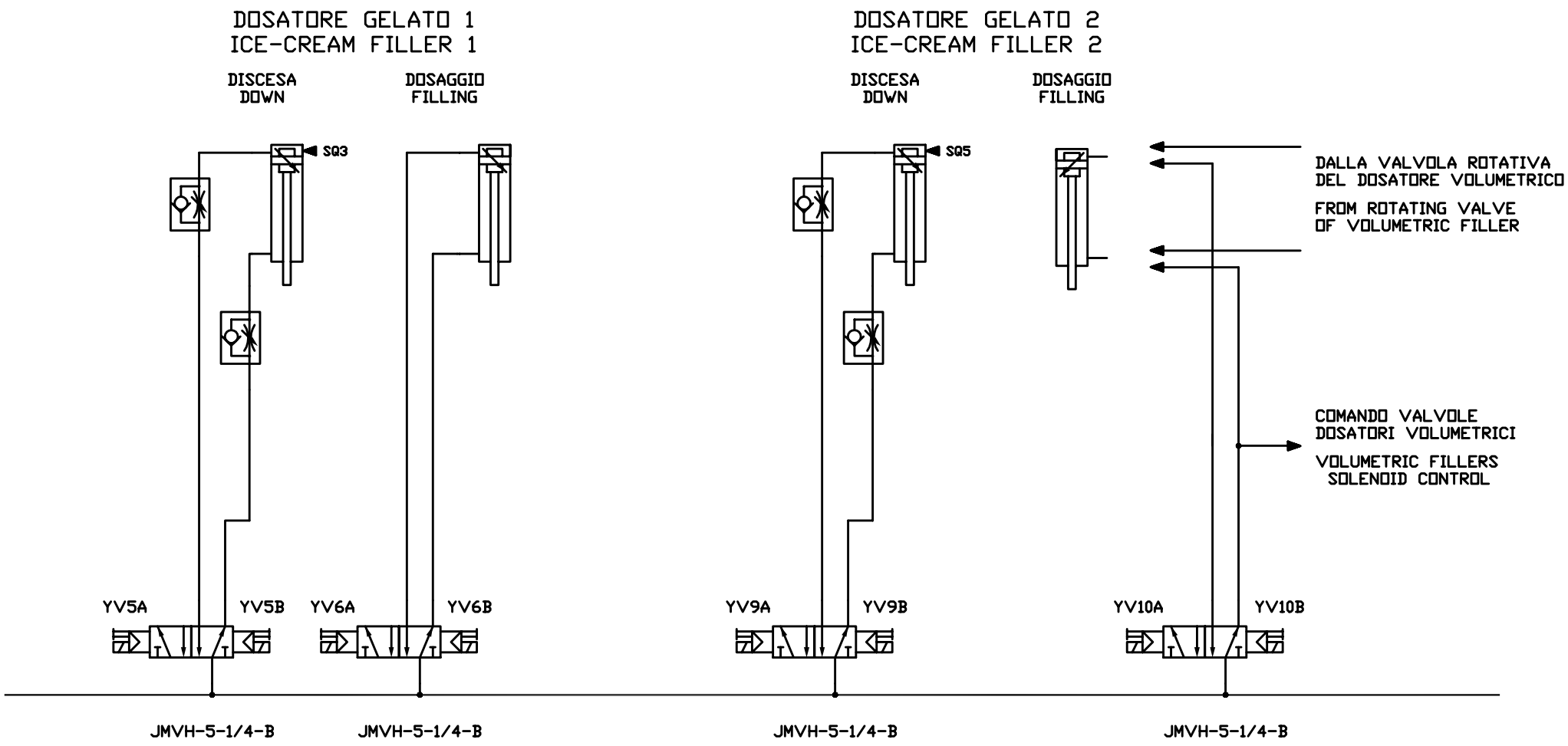
TERMOSALDANTE A DUE FILE

TWO LINE WELDING UNIT

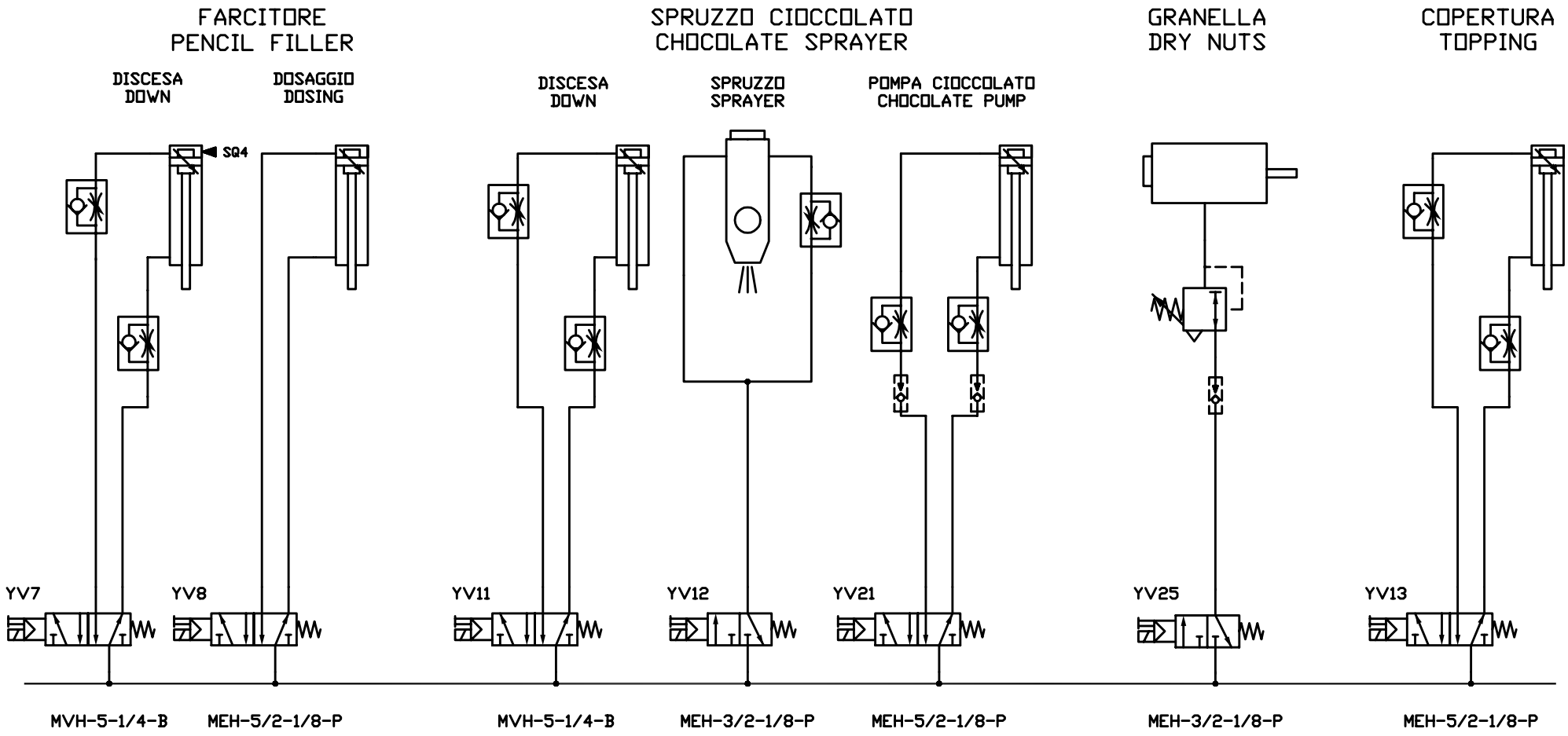
Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 13 DI 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



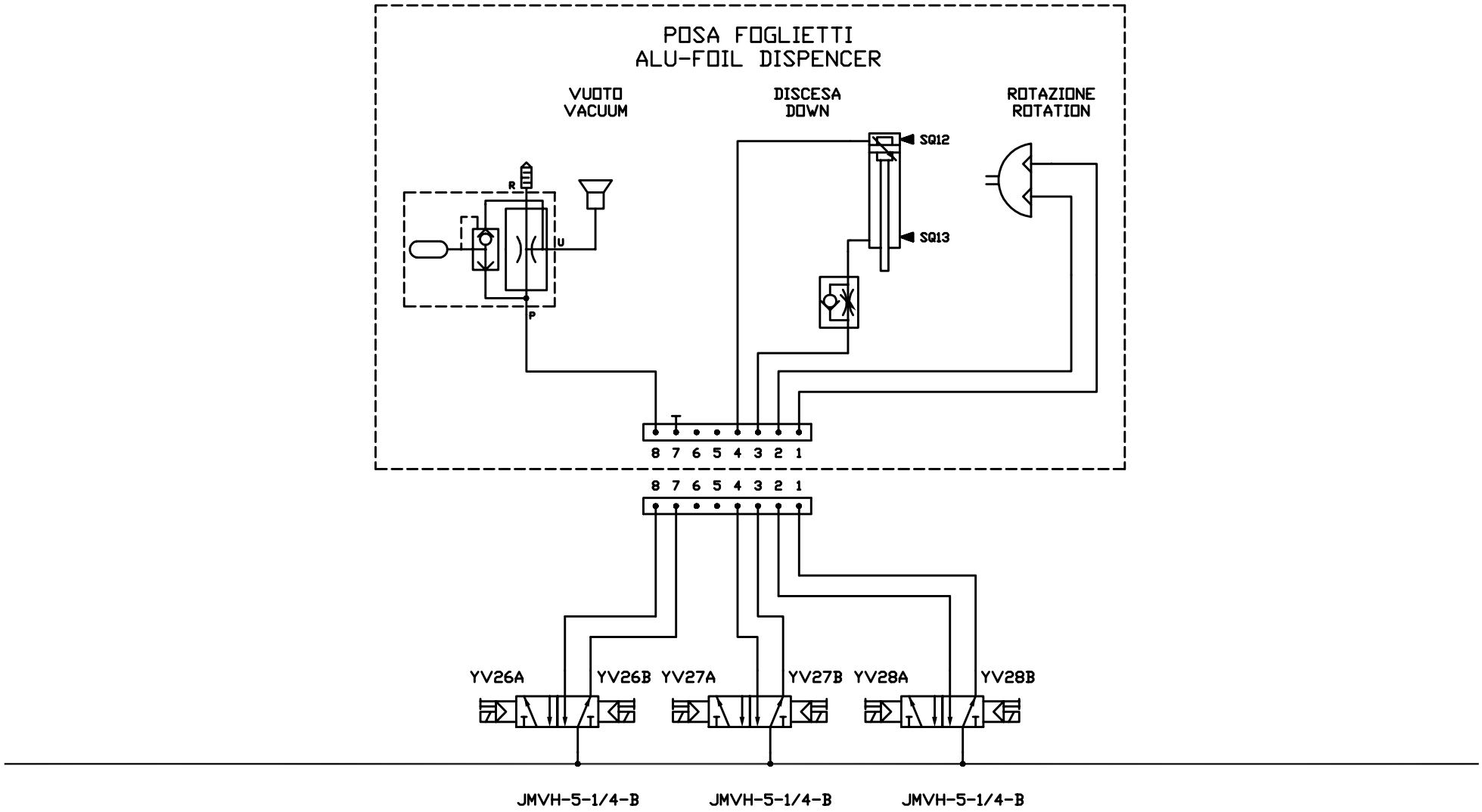
Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 14 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 15 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



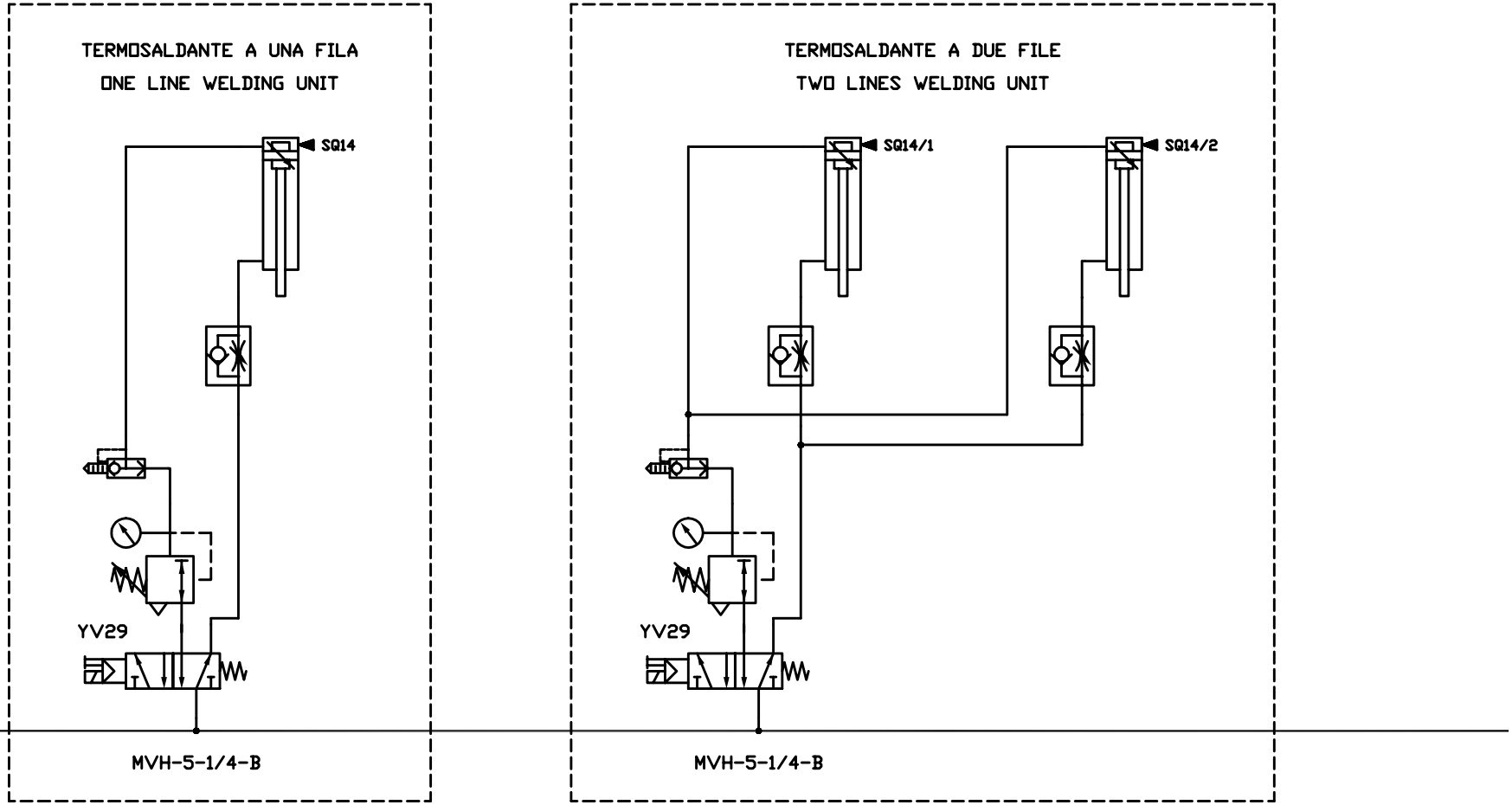
Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 16 DI 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



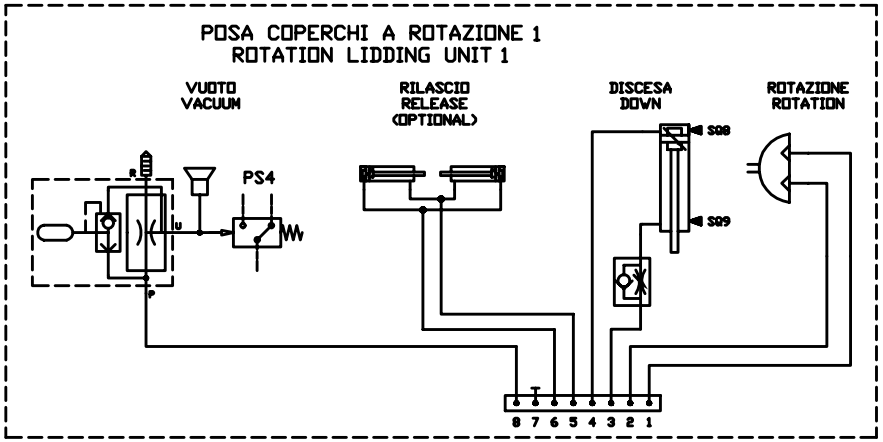
Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 17 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03

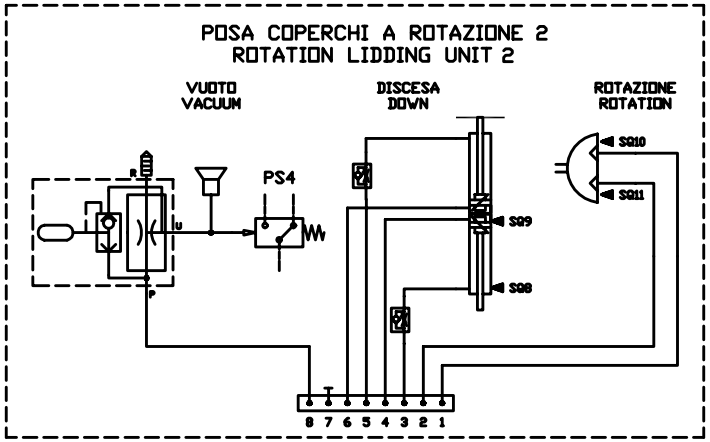
TERMOSALDATURA

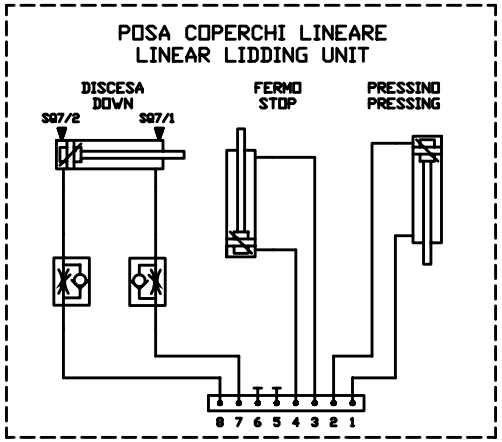
WELDING UNIT

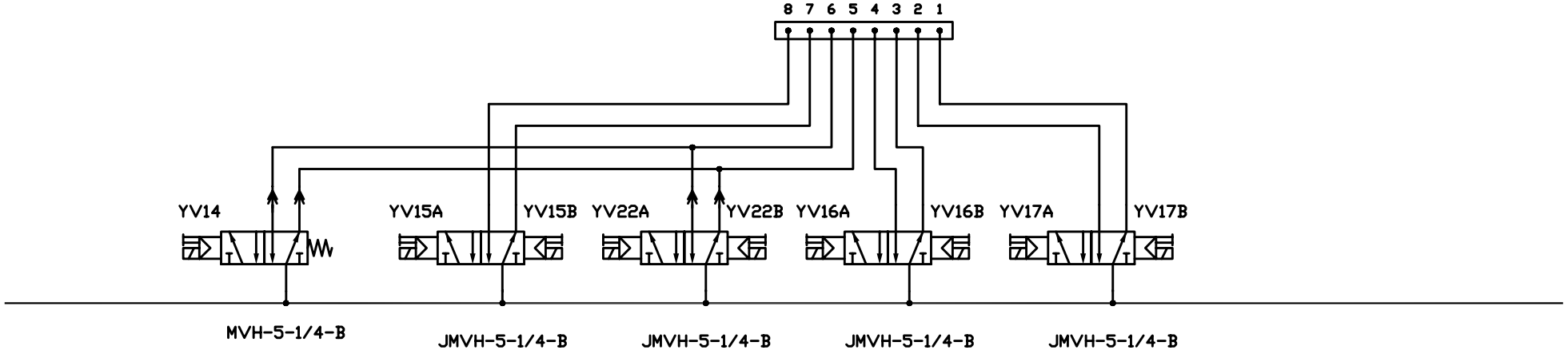


Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 18 DI 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03









SOLO PER POSACOPERCHI
A ROTAZIONE 1

ONLY FOR ROTATION
LIDDING UNIT 1

SOLO PER POSACOPERCHI
A ROTAZIONE 2

ONLY FOR ROTATION
LIDDING UNIT 2

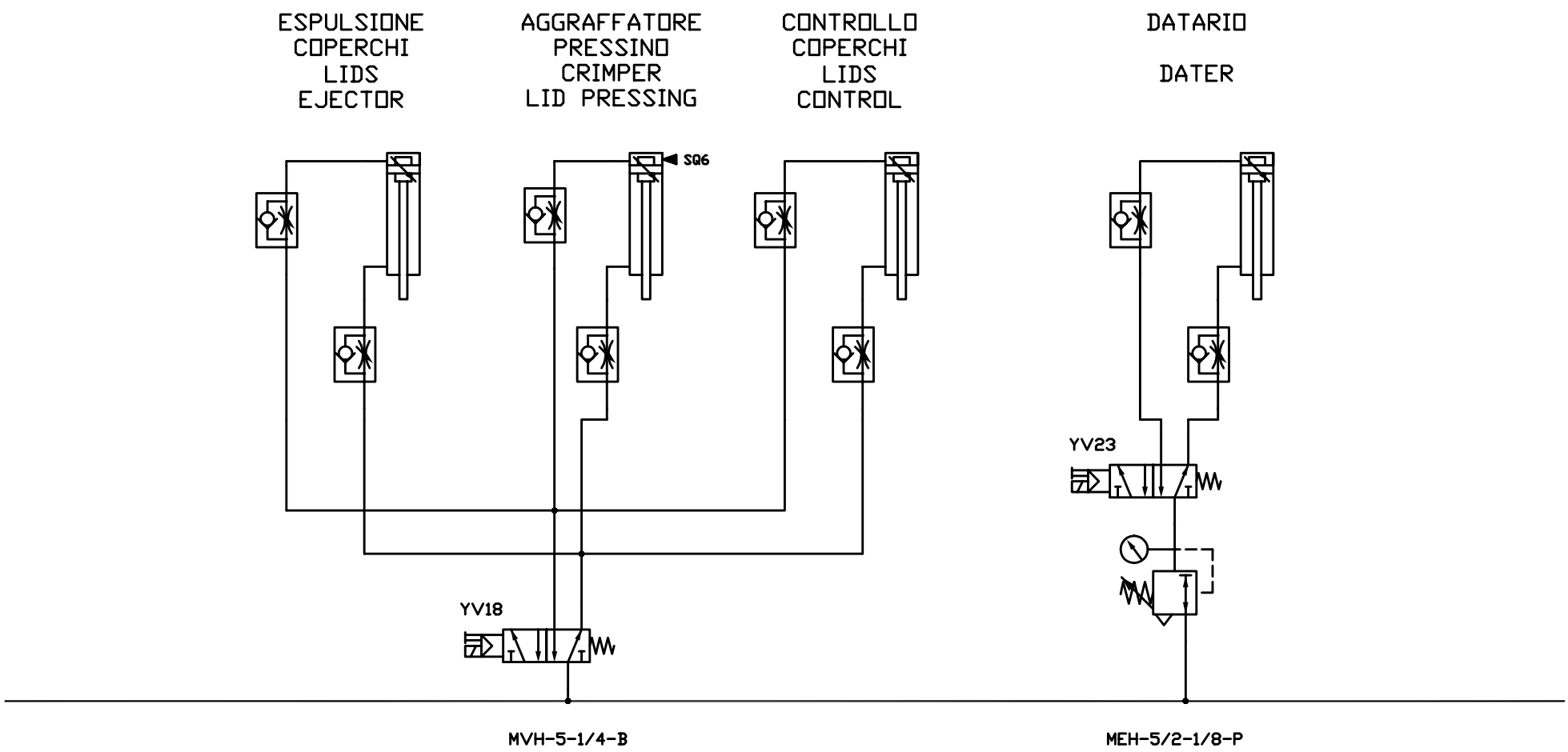
Tetra Laval Food

HOYER S.p.A.

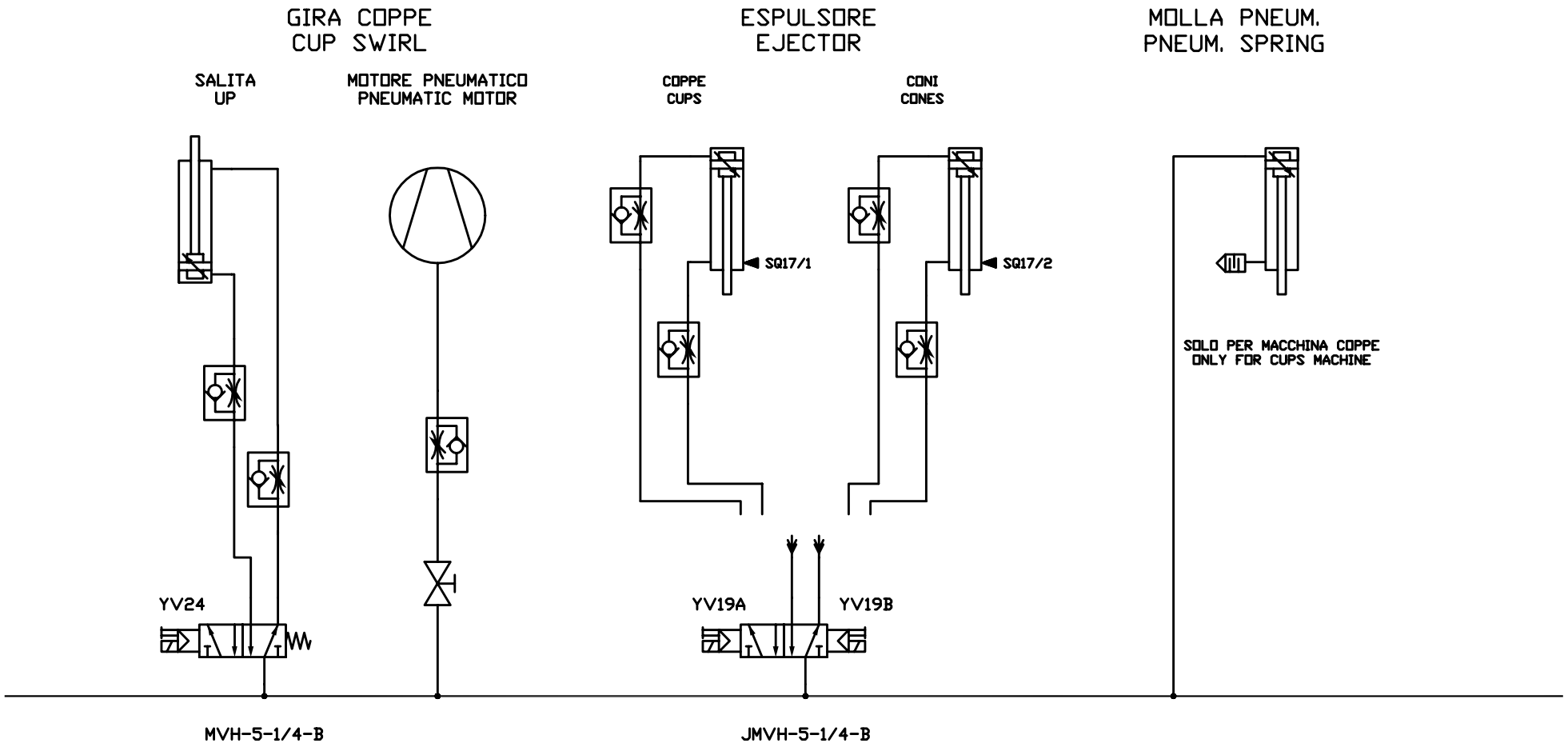
CLIENTE:

OGGETTO: FILLMARK 6000

FOGLIO	DATA	DISEGNATO	SCALA	DISEGNO N.
19 DI 21	14.07.94	L.D.	//	46.09.85.03



Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 20 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03



Tetra Laval Food HOYER S.p.A.	CLIENTE:				
	OGGETTO: FILLMARK 6000				
	FOGLIO 21 di 21	DATA 14.07.94	DISEGNATO L.D.	SCALA //	DISEGNO N. 46.09.85.03