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FREEZMAT SR

INSTRUCTIONS FOR USE AND MAINTENANCE

OUR "FREEZMAT" UNITS ARE THE RESULT OF YEARS OF RESEARCH COMBINED WITH OVER FIFTY YEARS OF EXPERIENCE.

THE "FREEZMAT" UNITS ARE THE BEST THE MARKET OFFERS.

FOR BEST RESULTS, CAREFULLY READ THE INSTRUCTIONS AND RECOMMENDATIONS LAID DOWN IN THIS MANUAL BEFORE USE.



1) DESCRIPTION

The FREEZMAT SR is an enbloc machine for continuous production of industrial ice-cream.

2) STRUCTURE

Steel section structure treated by corrosion-proofing electrolytic zinc-plating and finished with epoxy varnish.

It is supported by vibration-damping stainless steel feet.

The stainless steel panels can be completely opened on three sides, thus facilitating access to all components for routine maintenance.

3) MIXING SYSTEM

It consists of one chamber (Fig.11A) located on top of the machine and refrigerated by direct expansion with R22.

The refrigerating circuit is supplied with thick insulation coating.

The stirrer drive support is insulated from the chamber with possibility of checking for seal losses of the stirrer shaft (Fig. 7A).

Stirrer geared motor (Fig.8B) installed on an adjustable plate designed for belt stretching.

High resistance belt transmission (Fig. 8A).

High efficiency stirrer (Fig. 7) with :

- stainless steel centrifigating whips (Fig. 7E);
- high efficiency scrapers of special steel (Fig. 7-C).

Strong stainless steel door (Fig. 1M) with:

- ice-cream inlet/outlet connections;
- connection for stirrer whip;
- chamber centering ring;
- ice-cream outlet seal.



4) REFRIGERATING CIRCUIT

It consists of:

- Semi-hermetic compressors (Fig. 10D) fitted with oil heater, oil pressure switch (only for version with Oil Pump) and protections.
- Refrigerating system control gauges (Fig. 3B-C).
- Tubular condenser which can be inspected for tube cleaning (Fig. 10E), safety valve and connection with water tower.
- Liquid gas line with ceramic filter (Fig. 10A), indicator (Fig. 13D) and solenoid valve (Fig. 13C).
- Thermostatic expansion valve with external equalizer (Fig. 11B) and expansion distributor (Fig. 11C).
- Direct expansion evaporators in contact with high efficiency mixing chambers.
- Ice-cream consistency control with max. amperometric input (Fig. 5F) of the stirrer motor.
- Hot gas line for ice-cream output decrease and control of ice-cream consistency (Fig. 11D).

5) CONTROLS. ADJUSTMENTS

All the controls are installed high on the machine face .

The electrical equipment is installed inside a waterproof box located on the left side panel.



TECHNICAL SPECIFICATIONS

SR 1000-2

Ice-cream output at (*)	6°C 1000 lt/h
Compressor power	7,5 Kw x 2
Stirrer power	5,5 Kw x 2
Mixture pump motor power	0,74 Kw x 2
Ice-cream pump motor power(version 4L only)	0,74Kw x 2
Total installed power	15 Kw x 2
Tower water consumption (**)	8000 lt/h x 2
Width	130 cm
Depth	168 cm
Height	200 cm
Freezing fluid	R 22
R22 quantity	8 Kg x 2

(*) Output per hour referring to a 100 % volume increase with:

- Mixture input + 4°C
- Ice-cream output - 6°C
- Solid content 35 ... 40%
- Fats 8 ... 10%

() With water input at +15°C, 2 bar min. pressure and 6 bar max. pressure**

- Power feeding 380/3/50
- Max. ambient temperature + 35C
- Compressed air pressure 10 bar, max 12 bar
- Compressed air consumption 1200 lt/h



TECHNICAL SPECIFICATIONS

SR 1000-1

Ice-cream output at (*) -6°C	1000 lt/h
Compressor power	22 Kw
Stirrer power	11 Kw
Mixture pump motor power	0,74 Kw
Ice-cream pump motor power (version 2L only)	0,74 Kw
Total installed power	35 Kw
Tower water consumption (**)	8000 lt/h
Width	130 cm
Depth	155 cm
Height	200 cm
Freezing fluid	R 22
R22 quantity	16 Kg

(*) Output per hour referring to a 100 % volume increase with:

- Mixture input+ 4°C
- Ice-cream output - 6°C
- Solid content 35 ... 40%
- Fats 8 ... 10%

() With water input at +15°C, 2 bar min. pressure and 6 bar max. pressure**

- Power feeding 380/3/50
- Max. ambient temperature + 35°C
- Compressed air pressure 10 bar, max 12 bar
- Compressed air consumption 1200 lt/h



TECHNICAL SPECIFICATIONS

SR 2000-2

Ice-cream output at (*)-6°C	1000 lt/h
Compressor power	22 Kw x 2
Stirrer power	11 Kw x 2
Mixture pump motor power	0,74 Kw x 2
Ice-cream pump motor power (version 4L only)	0,74 Kw x 2
Total installed power	35 Kw x 2
Tower water consumption (**)	8000 lt/h x 2
Width	145 cm
Depth	197 cm
Height	215 cm
Freezing fluid	R 22
R22 quantity	16 Kg x 2

(*) Output per hour referring to a 100 % volume increase with:

- Mixture input+ 4°C
- Ice-cream output - 6°C
- Solid content 35 ... 40%
- Fats 8 ... 10%

() With water input at +15°C, 2 bar min. pressure and 6 bar max. pressure**

- Power feeding 380/3/50
- Max. ambient temperature + 35° C
- Compressed air pressure 10 bar, max 12 bar
- Compressed air consumption 1200 lt/h



7) RECEIPT OF THE UNIT

Upon receipt of the unit make sure that the package is not damaged.

If it is, please send a written notice to the forwarding agent.

Put the unit in place and make sure that the floor can bear the weight of Freezmat.

Check that the compressor cocks are open.

To open the cocks unscrew the safety cap counterclockwise so that the slide bar moves outwards at the end of stroke.

Re-tighten the safety cap.

8) ELECTRICAL CONNECTION

a) Check that voltage, number of phases and frequency of the feeder line comply with the specifications printed on the data plate located on the back side of the machine.

b) Make sure that feeder line, measuring system and automatic switches are adequate to the power of the machine.

c) Check that the machine service cable complies with electrical standards in force in the country of installation.

d) Remove the stirrer from the mixing chamber.

e) Connect the service cable to the network by means of an omnipolar switch fitted with fuses and adequate to the power of the machine (this switch has to be installed by the customer at his expense).

f) Before turning on the power make sure that all controls are off so as to avoid damage and wear.

g) Switch on the machine by means of the main switch, the warning light will light up (Fig. 5A).

h) Push the reset buttons (Fig. 5B) for machine running, the oil heaters will be immediately connected.



i) **Do not start the compressor.** It takes 2 hours at least before the oil reaches the right temperature.

l) Make sure that nobody is near the belts and pulleys.

m) Set the selectors (Fig. 5E) on "stirrer" position to check that pulleys - seen from the back side of the machine - rotate clockwise.

If the direction of rotation is wrong, invert any two phase wires in the switch connection.

9) WATER CONNECTIONS

Connect the delivery side of the cooling tower with the condenser inlet (Fig. 14A) and the return side with the condenser outlet (Fig. 14B).

Be careful not to cause bottlenecks which would reduce efficiency.

10) ROOM VENTILATION

Because of the heat produced by the cooling of the motors and the hot parts of the compressor/s, we suggest ventilating the working room, particularly if it is small and under warm climates.

11) WARNING

Before setting the machine at work it is necessary to connect the freezer with the feeder line for 2 hours at least (warning light on - Fig. 5A) so as to heat the oil in the compressors.

In this way the Freon contained in the oil pan of the compressors can evaporate and lubrication is not compromised.

N.B!!!

Failure to follow the above-mentioned procedure may lead to seizure of the compressor bushes and bearings.

Non-observance of this procedure invalidates your guarantee.

The unit has to be kept constantly connected with the feeder line during stops in production.

The compressors will not be damaged if the resistances stay on for a long time. Before starting production clean/sterilize the machine according to the instructions (see below).



12) STERILE COMPRESSED AIR CIRCUIT

a) Washing valves circuit

The air passes through a lubricating reduction filter (Fig. 6A-B) that is fitted with pressure gauge.

b) Circuit for sterile air to be let into the ice-cream.

The air passes through a reduction filter (Fig. 6E) where it is partially dehumidified and then it is let into the mixture through a sterilizing filter (Fig. 6D). The air flow into the mixture is controlled by a solenoid valve (Fig. 6F) and the inlet quantity can be adjusted by means of the potentiometer (Fig. 5N) of the flowmeter (Fig. 6G).

N.B: Sterile Air Line inlet pressure: 9 - 10 bar



13) LEGEND OF OPERATOR'S CONTROLS / SIGNALINGS LOCATED ON THE CONTROL PANEL

Re: Fig. 5

A Control Panel on lamp

B Reset Push-Button

N.B: this push-button can only be reset if all selectors and push buttons are set to zero and the emergency push-button is reset after use.

C Washing selector in ON position it opens the By Pass Valves automatically. It is also used for timer-controlled starting of the Stirrer and Mix/Ice Pumps.

D Output reduction push button When pressed, it opens the hot gas valves and enables operation of the regulation valve.

E 3-position selector

0 Position

"Stirrer" position: it starts the Stirrer

"Compressor" position: it starts the Compressor.

F Digital ammeter control

During normal operation it continuously displays the power input value of the stirrer motor.

The regulating rheostat **R** it is used to regulate the operating threshold of the ice-cream hardness control.

While turning the rheostat, keep push-button **S** pressed in order to read the threshold value **U** on the display.

When the key **S** is pressed, the hardness control operating threshold value (ampere) is immediately visualized on display **U**.

G Potentiometer for Mixture Pump speed control.

When turned clockwise, it increases speed.

When turned counterclockwise, it reduces speed.

H Mixture Pump push-button

When pressed, it starts the Mix Pump and the relevant speed control potentiometer.

I MIX pump display



K Potentiometer for Ice-cream Pump speed control

When turned clockwise, it increases speed.

When turned counterclockwise it reduces speed.

L Ice-cream Pump push-button

When pressed, it starts the Ice Pump and the relevant speed control potentiometer.

M Ice pump display (for two-pump version only)

N Air l/h control potentiometer

When turned clockwise it increases the air quantity.

When turned counterclockwise, it reduces the air quantity.

O Air push-button

When pressed, it opens the Air solenoid valve and starts the air control potentiometer.

P.EM Emergency push-button

This push-button is used to stop the machine immediately during the working cycle.

N.B: To re-start the machine, set all selectors and push buttons to zero, pull the emergency push-button cap, press reset push-button B and start the machine as usual.



14) RE: FIG 1

A. Mixing chamber pressure gauge

It indicates the pressure of the mixing chamber during working.

Pressure should never exceed 6 bar.

B. Mixture pump by-pass valve.

C. Ice-cream pump by-pass valve

D. Mixing chamber safety valve

This valve opens if pressure in the mixing chamber is higher than the spring calibration value.

Opening pressure can be increased by tightening the knurled screw (L).

Pressure should never exceed 9 bar.

E. Mixture pump

F. Ice-cream output

G. Air non return valve

H. Mixture inlet connection

I. Ice-cream pump

L. Safety valve adjusting knurled screw

M. Mixing chamber door



15) STARTING PROCEDURE

Connect the pump inlet (Fig. 1H) with the mixture vat.

After starting the FREEZER as described in **par. 8/g**, open the mixture cock located on the vat.

Start the mixture pump by means of the push button (Fig. 5H) and adjust its speed with potentiometer (Fig. 5G).

Stop the mixture pump when the chamber pressure reaches 2-3 bar, as indicated by the pressure gauge (Fig. 1A).

To start the stirrer set the selector (Fig. 5E) on "stirrer" and then on "compressor".

If the stirrer is not running, the compressor cannot be started.

As the ice-cream gets thicker, the electrical input of the stirrer motor increases (see ammeter - Fig. 5F)

When the electrical input value is the same as the preset threshold value, start:

- the mixture pump (Fig. 1E)
- the ice-cream pump (Fig. 1I)
- air feeding

Set the output speed and always make sure that the chamber pressure does not exceed 3-4 BAR (see gauge - Fig. 1A).

Adjust the overrun by means of the air regulator .

If the electrical input value is higher than the ammeter calibration value, the response of the hot gas valve is automatic.

Now the machine is running for continuous production.

IMPORTANT: do not set the ammeters to values higher than the ones indicated on the stirrer motor data plate.

RUNNING VALUES

Ice-cream output pressure gauge	4/5 kg/cm ²
Freon high pressure gauge	12.5 kg/cm ²
Freon low pressure gauge	1.2 kg/cm ²
High pressure switch calibration	18 kg/cm ²
Low pressure switch "	0.1/0.3 kg/cm ²
Oil pressure switch "	min. 0.2 kg/cm ²



16) REDUCED PRODUCTION

Our freezers are fitted with a manual device to reduce production down to 50% without altering the ice-cream characteristics.

Start the Freezer as indicated in Chapter 15.

The desired production rate can be obtained by varying the number of the mix feeding pump cycles by means of the potentiometers (Fig. 5G).

Overrun variations can be obtained by acting on the regulator (Fig. 5N), in order to maintain the product characteristics.

Change the ice cream pump speed acting on the potentiometer (Fig. 5K) up to set the pressure at the standard production values inside the freezing chamber. Push the "production reduction" button (Fig. 5D) when reaching the above conditions

Act on the handwheel (Fig. 3A) up to stabilize the amperometric absorption of the beater like the one reached during the normal production condition.

When finding the values which at any production level guarantee the optimal conditions, it is suggested, to make a schedule of the production data.

At the end of work remember to disconnect the reduction push-button (Fig. 5D) and put the handwheel (Fig. 3A) in position of total opening.



17) PRODUCTION END

Set the selector (Fig. 5E) on "stirrer" position

Stop the mixture pump using the push-button (Fig. 5H)

Stop air feeding using the push-button (Fig. 5O)

The ice-cream pump can be stopped using the push-button (Fig. 5L) only after the mixing chamber has been completely emptied (pressure gauge Fig. 1A at 0 pressure value).

Set the selector (Fig. 5E) on zero to stop the stirrer.

N.B: Always disconnect the "production reduction" push button (Fig. 5D) after any adjustment of the output rate.

Do not open the door when the pressure gauge (Fig. 1A) indicates pressure.



18) WASHING

Connect the CIP tubes with the mixture inlet and the ice-cream outlet and set the washing selector (Fig. 5C) in ON position.

Preset the washing time (timer, Fig. 4 KT1-11) according to the kind of washing to be carried out.

N.B. Compressed air feeding must be operating during washing.

After washing, set the selector (Fig. 5C) on "0" position.

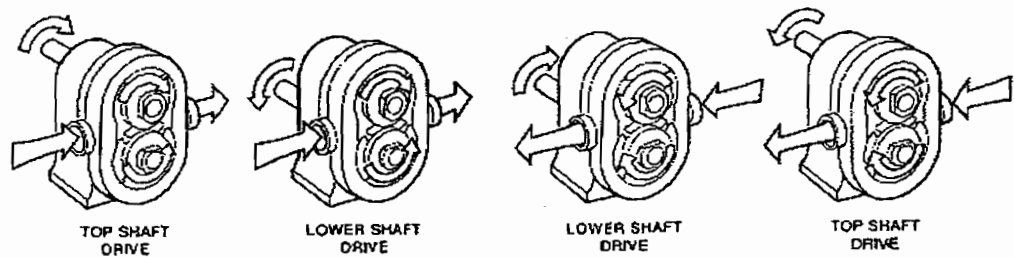


19) READ CAREFULLY BEFORE SETTING THE PUMPS AT WORK

Functional and hydrostatic tests of the pumps are carried out in factory.
Then each pump is disassembled, checked and re-assembled.
We decline all responsibility for damage occurred during transportation.

DIRECTION OF ROTATION

The pumps are volumetric.
They can rotate clockwise or counterclockwise.(See Picture)





CLEANING AND STERILIZATION

The pumps can be easily disassembled for cleaning.

The pump components should be cleaned every day: o'rings, shaft jackets and gaskets

CLEANING PROCEDURE

- 1) Use a plastic container
- 2) Clean each part thoroughly using a brush and luke-warm water (50°C)
- 3) Rinse with 80°C water and let dry
- 4) Disassemble the pumps and sterilize.
If chlorine solutions (200 PPM) are used, these should not contain residues which might settle in the pump.

N.B:

Acid cleaning solutions are highly corrosive.

Therefore, the pump components should not remain in the solutions too long. Every inorganic mineral acid is harmful both for your hands and for the pump components.

We suggest not using the pumps for recycling the acid solutions used for cleaning.

IMPORTANT

Handle cover, rotors, jackets and body with care.

Do not drop them.

If one of these parts is damaged, the pump clearances are altered and efficiency is reduced.

Re-assemble the components in their proper positions.

Remove any burr with a thin file.

Make sure that the gear faces are not rusty.

Use original parts only.

Proper working is not guaranteed if different parts are used.



IMPORTANT

1) Shaft jacket assembling

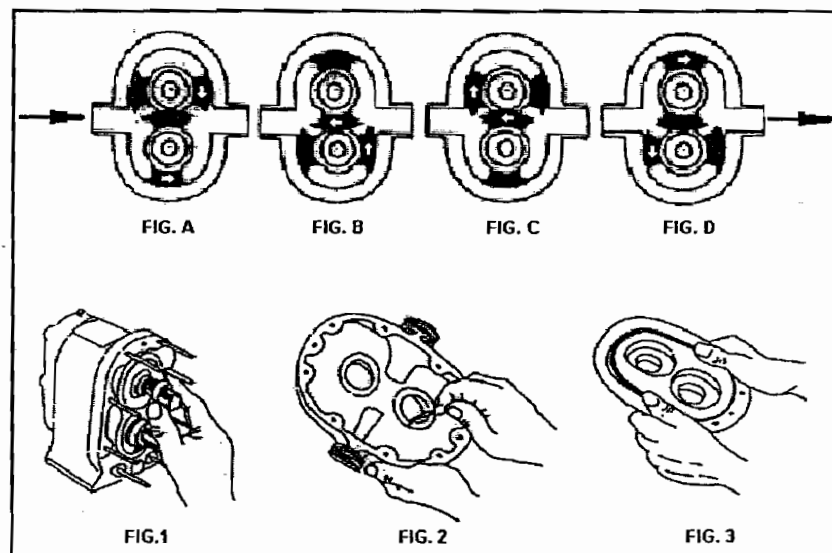
Just refer to the marks on the jacket and to the relative locating pegs on the shaft.

2) O'ring removal

Use a hooked tool.

3) Head seal assembling

You can easily push the seal into the slot with your thumbs.



IMPORTANT

1) The proper position of the slots of each shaft jacket is indicated by the locating pegs on the shafts.

A proper positioning will prevent the rotors from touching the cover after assembling.

2) Before starting the pumps, open all valves, suction and delivery mounths. Failure to do so could damage the line, the motor or both.



PUMP DISASSEMBLING

N.B:

Disconnect all tubes and pipes before going on.

- a) Unscrew wing nuts;
- b) Switch on manually and let the pump rotors perform one complete revolution.
This procedure is used to break the vacuum, thus facilitating removal of the cover;
- c) Remove wing nuts and cover;
- d) Remove the metal rotors loosening the nuts by means of the wrench that is supplied with the pump;
- e) Remove the pump body;
- f) Remove the shaft jackets;
- g) Push the O'ring out of the shaft spline and then carefully remove it from the shaft;
- h) Remove the O'rings from the pump body.

Now the pump is disassembled and ready for cleaning and sterilization.



PUMP REASSEMBLY

1) Fit the large O'rings into the grooves of the pump body.
Lubricate properly to avoid distortion of the O'rings.

2) Fit the small O'rings into the splines of the pump shafts and make sure that they are not distorted.
Installation is easier if you use a proper lubricant.

3) Fit the jackets on the shafts (check for proper centering with reference to the jacket marks and the shaft locating pegs).
If the jackets are not properly centered on the shaft, the cover will touch the rotors and cause wear.

4) Put the pump body on the locating peg and carefully push it against the gearbox.

N.B:

The locating peg is always high.

Make sure that the contact surfaces of the pump and of the gearbox are not rusty or dirty.

5) Assemble the rotors on the shaft.

6) Put the rotors in their proper place and tighten the nuts.

7) Reassemble the head O'ring.
This can be easily done by pushing the O'ring with your thumbs.

8) Fit in the cover with the wing nuts and close tightly.

9) Re-connect pipes.

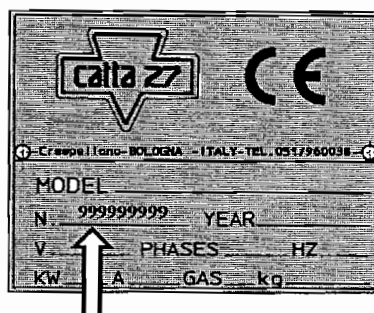
WARNING!!! Strain, the use of levers, or damage of the pump components should be carefully avoided.



20) ORDERING SPARE PARTS

When ordering spare parts always quote the following information:

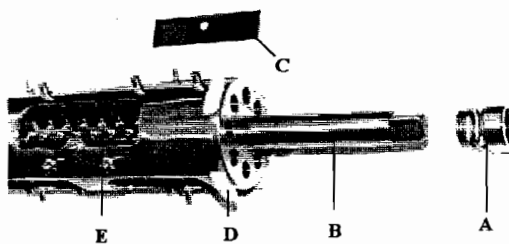
A) Machine serial No. (on the data plate)



B) Photo No. and ref. letter of the part

Example: order for one stirrer stuffing box:

7



For FREEZMAT SR

Serial Number _____ Re: A _____ Photo 7

THE ABOVE-MENTIONED DATA ARE ABSOLUTELY NECESSARY TO IDENTIFY THE PARTS ORDERED.



CATTA 27 S.r.l. DECLINE ALL RESPONSIBILITY FOR DAMAGE TO PEOPLE OR THINGS OCCURRING DURING INSTALLATION, USE OR MAINTENANCE OF ITS MACHINES.

TECHNICAL SPECIFICATIONS AND DRAWINGS HEREBY ENCLOSED ARE MERELY INDICATIVE.

CATTA 27 S.r.l. RESERVE THE RIGHT TO MODIFY THEIR PRODUCTS AT ANY MOMENT WITHOUT CAUSING DAMAGE TO ANYBODY.



21) MAINTENANCE PLAN

(N.B: 4 months = 1 working season)

<u>COMPONENT</u>	<u>CHECK</u>	<u>FREQUENCY</u>
Condenser	chemical or, preferably, mechanical cleaning	1 year (on technician's advice)
Control equipment	Check operation of high pressure, low pressure and oil pressure	4 months (expert technician's only)
Control panel	Check contacts	4 months
Control panel	Fixing of elements	4 months
Pump motor	Check operation and lubrication	4 months
Pump	Disassembling, cleaning and checking of movable parts	see par. 19
Seals	Check	4 months
Stirrer	Check scrapers	15 days
	Check bearings and supports	4 months
	Check bottom seals	
(open the side door and make sure that no mixture is coming out from behind the chamber)		15 days
Belts	Belt tension	1 week
Pulleys alignment		4 months
Stirrer axial support	Bearings and seal	4 months
Stirrer motor	Bearings	4 months
Ammeter calibration		Only after replacement
Compressor	Efficiency of supports and tightness of locking bolts	4 months



<u>COMPONENT</u>	<u>CHECK</u>	<u>FREQUENCY</u>
Freezing circuit	Oil heater	1 year
	Solenoid valves	4 months
Air unit	Drain condensate	daily
	Check oil level in pneumatic circuit	15 days



C.I.P.WASHING CYCLE

1) CIP washing cycle (approx)

The correct washing cycle made by means of C.I.P., may be carried out in the following ways:

1.1) Preliminary washing by means of drinkable water:

- time: approx 2min.
- temperature the one of water supply
- discharge to throw away

1.2) Recycle washing of alkaline solution of scale caustic soda (NaOH)

- time approx. 10 min.
- concentration of solution 1-1,5%
- temperature of solution 65/70°C
- discharge : to throw away or recover in a centralized CIP tank

1.3) Rinse with hot water recycle

- time: approx 2 min.
- temperature: 60/70°C
- discharge to throw away

1.4) Recycling washing with nitric acid solution (HNO₃ at- 65%)

- time: approx 10 min.
- concentration of solution: 0,8 +/- 1% max.
- temperature of solution : 50/55°
- discharge : to throw away or recover in a centralized CIP tank

1.5) Rinse the recycle hot water

- time: approx 2 min.
- temperature 60/70°C
- discharge : to throw away



C.I.P. WASHING CYCLE

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- discharge : to throw away or recover
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1.5) Rinse the recycle hot water

- time: approx 2 min.
- temperature 60/70°C
- discharge : to throw away



CAPITOLI

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FREEZMAT SR

ISTRUZIONI USO E MANUTENZIONE

I NOSTRI "FREEZMAT SR" SONO IL RISULTATO DI LUNGI ANNI DI STUDIO ABBINATI ALLA NOSTRA PIU' CHE CINQUANTENNALE ESPERIENZA.

I "FREEZMAT SR" RAPPRESENTANO QUANTO DI MEGLIO IL MERCATO POSSA OFFRIRVI.

I MIGLIORI RISULTATI LI OTTERRETE SEGUENDO ATTENTAMENTE LE ISTRUZIONI ED I SUGGERIMENTI RIPORTATI SU QUESTO MANUALE, CHE VI CONSIGLIAMO DI LEGGERE PRIMA DI ESEGUIRE QUALSIASI OPERAZIONE SULLA MACCHINA.



1) DESCRIZIONE

Il FREEZMAT SR è un produttore continuo di gelato industriale in versione monoblocco.

2) STRUTTURA

Le strutture in profilati di acciaio sono protette contro la corrosione mediante zincatura elettrolitica più verniciatura epossidica.

Appoggia su piedi inox dotati di antivibranti.

Le pannellature in acciaio inox totalmente apribili su tre lati, facilitano l'accessibilità a tutti i componenti diminuendo i tempi per l'ordinaria manutenzione.

3) SISTEMA MANTECAZIONE

Composto da una camera (Fig. 11A) posta nella parte alta della macchina, refrigerata ad espansione diretta con R22.

Il circuito frigo è coibentato ad alto spessore

Il gruppo supporto movimento agitatore è isolato dalla camera con possibilità di controllo dell'eventuale perdita della tenuta sull'albero agitatore (Fig. 7A).

Motoriduttore movimento agitatore (Fig. 8B) montato su piastra registrabile per tiro cinghie.

Trasmissione a mezzo cinghie (Fig. 8A) ad alta resistenza.

Agitatore ad alta efficienza (Fig. 7) con:

- struttura e fruste centrifugatrici (Fig. 7E) in acciaio inox;
- lame raschiatrici ad alto rendimento in acciaio speciale (Fig. 7C)

Portello (Fig. 1M) a robusta struttura inox con:

- attacchi entrata miscela / uscita gelato;
- innesto per frusta agitatore;
- anello centraggio camera;
- tenuta uscita gelato.



4) CIRCUITO FRIGORIFERO

Composto da:

- Compressori semiermetici (Fig. 10D) completi di resistenza di riscaldamento carter-olio, pressostato olio (solo nelle versioni provviste di Pompa Olio) e protezioni.
- Manometri per il controllo dell'impianto frigorifero (Fig. 3 B-C).
- Condensatore a fascio tubiero ispezionabile per pulizia tubi (Fig. 10E) completo di valvola sicurezza e già predisposto per collegamento acqua di torre.
- Linea gas liquido con filtro di tipo ceramico (Fig. 10A), spia liquido (Fig. 13D) ed elettrovalvola (Fig. 13C).
- Valvola espansione termostatica (Fig. 11B) con equalizzatore esterno e distributore di espansione (Fig. 11C).
- Evaporatori ad espansione diretta a contatto con camere di mantecazione ad alto rendimento.
- Controllo consistenza gelato (Fig. 5F) al massimo assorbimento amperometrico del motore agitatore.

5) ELEMENTI DI COMANDO - REGOLAZIONI

Gli elementi sono situati sul frontale della macchina in alto per quanto riguarda comandi e controlli, mentre le apparecchiature elettriche si trovano in corrispondenza del pannello posteriore macchina protette in cassette a tenuta stagna.



6) CARATTERISTICHE TECNICHE **SR 1000-2**

Produzione gelato a (*)	- 6° C 1000 Lt/h
Potenza compressore	7,5 Kw x2
Potenza agitatore	5,5 Kw x2
Potenza motore pompa miscela	0,75 Kw x2
Potenza motore pompa gelato (solo versione 4L)	0,75 Kw x2
Potenza totale installata	15 Kw x2
Consumo acqua di torre (**)	8000 Lt/h x2
Larghezza .	130 cm
Profondità .	168 cm
Altezza .	200 cm
Fluido frigorigeno	R 22
Quantità di R22	8 Kg x 2

(*)Produzione oraria riferita ad un aumento di volume del 100 % ed alle seguenti caratteristiche:

- Miscela in entrata + 4 °C
- Gelato in uscita - 6 C
- Residuo secco 35.....40 %
- Grassi 8.....10 %

() Con acqua in entrata a + 15 C e pressione minima 2 Bar, massima 6 Bar**

- Alimentazione elettrica: 380/3/50
- Temperatura max ambiente consentita: +35C
- Pressione aria compressa: 10 bar (max 12 bar)
- Consumo aria compressa: 1200 lt/h.



6) CARATTERISTICHE TECNICHE **SR 1000-1**

Produzione gelato a (*)	- 6° C 1000 Lt/h
Potenza compressore	22 Kw
Potenza agitatore	11 Kw
Potenza motore pompa miscela	0,74 Kw
Potenza motore pompa gelato (solo versione 2L)	0,74 Kw
Potenza totale installata	35 Kw
Consumo acqua di torre (**)	8000 Lt/h
Larghezza .	130 cm
Profondità .	155 cm
Altezza .	200 cm
Fluido frigorigeno	R 22
Quantità di R22	20 Kg

(*)Produzione oraria riferita ad un aumento di volume del 100% ed alle seguenti caratteristiche:

- Miscela in entrata + 4 °C
- Gelato in uscita - 6 C
- Residuo secco 35.....40 %
- Grassi 8.....10 %

() Con acqua in entrata a + 15 C e pressione minima 2 Bar, massima 6 Bar**

- Alimentazione elettrica: 380/3/50
- Temperatura max ambiente consentita: +35C
- Pressione aria compressa: 10 bar (max 12 bar)
- Consumo aria compressa: 1200 lt/h.



6) CARATTERISTICHE TECNICHE

SR 2000-2

Produzione gelato a (*)	- 6° C 1000 Lt/h
Potenza compressore	22 Kw x 2
Potenza agitatore	11 Kw x 2
Potenza motore pompa miscela	0,74 Kw x 2
Potenza motore pompa gelato (solo versione 4L)	0,74 Kw x 2
Potenza totale installata	35 Kw x 2
Consumo acqua di torre (**)	8000 Lt/h x 2
Larghezza .	145 cm
Profondità .	197 cm
Altezza .	215 cm
Fluido frigorigeno	R 22
Quantità di R22	20 Kg x 2

(*)Produzione oraria riferita ad un aumento di volume del 100 % ed alle seguenti caratteristiche:

- Miscela in entrata + 4 °C
- Gelato in uscita - 6 C
- Residuo secco 35.....40 %
- Grassi 8.....10 %

() Con acqua in entrata a + 15 C e pressione minima 2 Bar, massima 6 Bar**

- Alimentazione elettrica: 380/3/50
- Temperatura max ambiente consentita: +35C
- Pressione aria compressa: 10 bar (max 12 bar)
- Consumo aria compressa: 1200 lt/h.



7) RICEVIMENTO DELL'UNITA'

All'atto del ricevimento controllare che l'imballo non presenti segni di danneggiamento.

In caso contrario contestare per iscritto al vettore.

Porre l'unità nel posto prescelto controllando in ogni caso che le strutture portanti del pavimento siano in grado di sopportare il peso della macchina.

Controllare che siano aperti i rubinetti dei compressori.

Per l'apertura dei rubinetti svitare il cappellotto di protezione e ruotare l'asta di guida, in senso antiorario, fino a portarla a fine corsa verso l'esterno.

Rimontare sempre il cappellotto di protezione stringendolo a fondo.

8) ALLACCIAMENTO ELETTRICO

a) Controllare che la tensione, il numero di fasi e la frequenza della linea di alimentazione corrispondano alle caratteristiche elettriche stampigliate sulla targa matricola della macchina posta nella parte posteriore della stessa.

b) Controllare che la linea di alimentazione (nonché il sistema di misurazione e gli interruttori automatici della società di distribuzione di energia elettrica) siano sufficientemente dimensionati alla potenza della macchina.

c) Controllare che il cavo di servizio alla macchina sia conforme alle normative elettriche in vigore nel paese di installazione.

d) Estrarre l'agitatore dalla camera di mantecazione.

e) Collegare il cavo di servizio alla rete interponendo un interruttore onnipolare munito di fusibili adeguato alla potenza della macchina (detto interruttore deve essere installato a cura e spese del cliente).

f) Prima di dare tensione alla macchina assicurarsi che tutti gli azionamenti siano disinseriti onde evitare danneggiamenti.

g) Dare tensione alla macchina chiudendo l'interruttore generale, si accenderà la spia (Fig. 5A) e si inseriranno le resistenze riscaldamento olio.

Premere i pulsanti di reset (Fig. 5B) per abilitare il funzionamento della macchina.

h) **Non tentare di avviare il compressore**, occorre attendere almeno 2 ore perché l'olio raggiunga la giusta temperatura.



i) Assicurarsi che non vi sia alcuna persona in prossimità delle cinghie e delle pulegge e ruotare il selettore (Fig. 5E) in posizione "Agitatore" per verificare che le pulegge, viste dalla parte posteriore della macchina, ruotino in senso orario.

Qualora il senso di rotazione fosse errato, invertire fra loro due conduttori di fase qualsiasi nel collegamento all'interruttore generale.

9) COLLEGAMENTI IDRICI

Collegare la mandata dell'acqua di raffreddamento con l'entrata ai condensatori (Fig.14A) e il ritorno con l'uscita condensatore (Fig.14B), evitando di provocare nell'allacciamento strozzature o riduzioni che penalizzerebbero il rendimento della produzione.

10) VENTILAZIONE AMBIENTE

Poichè il calore prodotto dal raffreddamento dei motori e dalle parti calde del/i compressore/i viene ceduto all'ambiente, si consiglia di ventilare il locale di produzione soprattutto nel caso di locali piccoli o climi caldi.

11) AVVERTENZA

Prima di mettere in moto l'unità occorre lasciare il freezer collegato alla linea elettrica (spia accesa - Fig. 5A) almeno due ore, così da permettere il riscaldamento dell'olio dei compressori.

In tal modo il freon presente nella coppa dell'olio può evaporare e le caratteristiche di lubrificazione allo spunto non saranno compromesse.

ATTENZIONE!!!!

Il mancato rispetto di questa norma può portare al grippaggio delle bronzine di banco e di biella dei compressori.

Questa inosservanza provoca il decadimento della garanzia.

In seguito l'unità dovrà essere costantemente lasciata collegata alla rete elettrica durante gli arresti di produzione.

Lasciare inserite le resistenze anche per lungo tempo non danneggia i compressori.

Prima di mettere in produzione la macchina, provvedere al suo lavaggio/sterilizzazione. (Vedi istruzioni di lavaggio riportate più avanti)



12) CIRCUITO ARIA COMPRESSA

a) Circuito valvole lavaggio

L'aria passa attraverso un gruppo filtro riduttore lubrificatore (Fig. 6AB) con manometro per il controllo della pressione.

b) Circuito aria sterile da immettere nel gelato.

L'aria passa attraverso un normale filtro riduttore (Fig. 6E) dove viene parzialmente deumidificata, poi attraverso un filtro di sterilizzazione (Fig. 6D), viene immessa nella miscela.

L'inserimento dell'aria nella miscela è controllato dall'elettrovalvola (Fig. 6F) e la sua quantità è regolabile con il potenziometro (Fig. 5N) che agisce sul flussimetro (Fig. 6G).

N.B. Pressione ingresso linea aria sterile 9 - 10 bar.



13) LEGENDA DEGLI AZIONAMENTI/SEGNALAZIONI A DISPOSIZIONE DELL'OPERATORE SUL PANNELLO COMANDI

RIFERIMENTO FIGURA 5

A Lampada macchina sotto tensione

B Pulsante abilitazione macchina

C Selettore Lavaggio

In Posizione ON apre automaticamente le valvole By Pass e tramite Timer mette in marcia Agitatore e Pompe Mix/Ice

D Pulsante Riduzione Produzione

Premuto apre l'elettrovalvola gas caldo e abilita il volantino per la regolazione.

E Selettore 3 Posizioni

Posiz. 0

Posiz. Agitatore mette in marcia l'agitatore

Posiz. Compressore mette in marcia il Compressore

F Amperometro digitale

In funzionamento normale segnala, istante per istante, sul display T il valore di corrente assorbita dal motore dell'agitatore.

Ruotando il Reostato R si può variare la soglia di intervento del controllo durezza.

Azionare questo comando tenendo premuto il pulsante S per leggere sul display il valore di soglia impostato.

Il led U indica il raggiungimento della durezza impostata.

G Potenzimetro regolazione velocità Pompa Miscela

Ruotato in senso orario aumenta il numero di giri della pompa.

Ruotato in senso antiorario diminuisce il numero di giri della pompa.

H Pulsante marcia Pompa Miscela

I Display Pompa Miscela

Visualizza il numero di giri della Pompa.

K Potenzimetro regolazione velocità Pompa Gelato

Ruotato in senso orario aumenta il numero di giri della pompa.

Ruotato in senso antiorario diminuisce il numero di giri della pompa.



L Pulsante marcia Pompa Gelato

M Display Pompa Gelato

Visualizza il numero di giri della Pompa.

N Potenziometro regolazione quantità Aria.

Ruotato in senso orario aumenta la quantità di aria immessa nel gelato.

Ruotato in senso antiorario diminuisce la quantità di aria immessa nel gelato.

O Pulsante immissione Aria

P Display Aria

Visualizza la quantità di aria immessa.

P.EM Pulsante Emergenza

Qualora durante il normale ciclo produttivo si rendesse necessario bloccare immediatamente tutte le funzioni della macchina, è sufficiente premere questo pulsante.

N.B. Per poter rimettere in funzione la macchina è necessario riportare a "zero" i selettori e pulsanti, tirare a sé il cappuccio del pulsante di emergenza, quindi premere il pulsante "Abilitazione macchina" (Fig. 5B) e procedere come di consueto a rimettere in funzione la macchina.



14) RIFERIMENTO FIGURA 1

A. Manometro della pressione in camera di mantecazione.
Indica la pressione esistente durante la lavorazione, nella camera di mantecazione.

Non superare mai i 6 bar.

B. Valvola By Pass pompa miscela.

C. Valvole di by-pass pompa gelato.

D. Valvola di sicurezza camera mantecazione.

Queste valvole si aprono quando la pressione nella camera di mantecazione supera il valore di taratura della molla.

Avvitando la vite godronata (L) si aumenta il valore di pressione di taratura.

Non regolare mai oltre i 9 bar.

Diminuendo la pressione, le valvole si richiudono automaticamente senza alcun intervento da parte dell'operatore.

E. Pompa Miscela.

F. Uscita gelato

G. Valvola antiritorno Aria.

H. Attacco entrata Miscela.

I. Pompa Gelato.(Solo nelle versioni in cui è prevista)

L. Vite godronata regolazione valvola sicurezza.

M. Portello camera mantecazione.



15) SEQUENZA OPERAZIONI PER INIZIO DELLA PRODUZIONE

Collegare l'attacco entrata miscela (Fig. 1H) con il tino di conservazione miscela.

Aprire il rubinetto miscela posto sul tino di conservazione

Dopo aver avviato il FREEZER come descritto al **paragrafo 8/g**, mettere in marcia la pompa miscela premendo il pulsante (Fig. 5H) e agire sul potenziometro (Fig. 5G) per regolarne la velocità.

La pompa inizierà a immettere miscela nella camera, quando la pressione sul manometro (Fig. 1A) raggiungerà il valore di circa 3 Bar fermare la pompa.

Ruotare il selettore (Fig. 5E) in posizione Compressore, con l'aumentare della consistenza del gelato, aumenterà il valore degli amperes assorbiti dal motore dell'agitatore visualizzati sul display "T" dell'amperometro (Fig. 5F).

Quando il valore di assorbimento raggiunge il valore di soglia impostato:

- avviare la pompa miscela (Fig. 1E) con il pulsante (Fig. 5H)
- avviare la pompa gelato (Fig. 1I) con il pulsante (Fig. 5L)
- inserire aria regolandone la quantità desiderata.
- regolare la produzione oraria mantenendo nella camera di mantecazione una pressione di 3-4 BAR controllabile sul manometro (Fig. 1A).

A questo punto la macchina è in produzione continua.

Qualora il valore di assorbimento superasse il valore di taratura dell'amperometro, interverrà automaticamente la valvola gas caldo.

Importante: Non impostare assolutamente la taratura dell'amperometro a valori superiori a quelli di targa del motore agitatore.

Il gelato che si può ottenere dal freezer può essere: tenero, semiduro, duro a seconda della necessità e del tipo di prodotto che si deve confezionare.

La variazione dell'overrun si ottiene agendo sul regolatore di immissione aria che permette di variare il rapporto aria-miscela.

VALORI DI MARCIA

Manometro uscita gelato:	4/5 kg/cm ²
Manometro alta freon:	12,5 kg/cm ²
Manometro bassa freon:	1,2 kg/cm ²
Taratura pressostato alta pressione:	18 kg/cm ²
Taratura pressostato bassa pressione:	0,1/0,3 kg/cm ²
Taratura pressostato olio:min.	0,2 kg/cm ² di fabbrica



16) PRODUZIONE RIDOTTA

I nostri freezers sono dotati di un dispositivo, a comando manuale, attraverso il quale si può ridurre la produzione fino al 50%, mantenendo inalterate le caratteristiche del gelato.

Mettere in marcia il Freezer come indicato al **Capitolo 15**.

Mediante la variazione dei giri della pompa di alimentazione della miscela, portare la macchina al valore di produzione desiderato.

L'operazione di riduzione della portata si esegue agendo sul potenziometro regolazione pompa miscela (Fig.5G)

Sarà necessario variare la quantità di aria, agendo sul regolatore (fig. 5N), per mantenere inalterate le caratteristiche del prodotto.

Variare la velocità della pompa Gelato agendo sul potenziometro (Fig.5K) fino a stabilizzare la pressione nella camera di mantecazione ai valori di produzione standard.

Raggiunte le condizioni suddette, premere il pulsante di riduzione produzione (Fig. 5D)..

Agire sul volantino (Fig.3A) fino a stabilizzare l'assorbimento amperometrico dell'agitatore uguale a quello raggiunto nella condizione di produzione normale..

Una volta trovati i valori per cui, ad ogni livello di produzione, sono state raggiunte le condizioni ottimali, è conveniente, se non indispensabile, stilare una tabella con i dati di produzione.

A fine lavoro ricordarsi di disinserire il pulsante di riduzione (Fig.5D) e riportare il volantino (fig.3A) in posizione di apertura totale.



17 FINE PRODUZIONE

Fermare la pompa miscela disinserendo il pulsante (Fig.5H).

Fermare l'immissione aria disinserendo il pulsante (Fig.5O)

Posizionare il selettore (Fig.5E) su Agitatore.

Lasciare la pompa estrazione gelato in marcia fino ad avvenuto scaricamento della camera di mantecazione.

Quando la pressione indicata dal manometro (Fig.1A) è a zero, fermare la pompa gelato disinserendo il pulsante (Fig.5L) e fermare l'agitatore ruotando il selettore (Fig.5E) in posizione 0.

Non cercate di aprire il portello quando il manometro (Fig. 1A) segna pressione.



18 LAVAGGIO

Collegare i tubi di mandata del CIP all'ingresso (Fig.1H) e quelli di ritorno all'uscita (Fig.1F).

Posizionare il selettore (Fig.5C) su Lavaggio.

Regolare il timer del CIP (Fig. 4 KT1-11) a seconda del tipo di lavaggio.

Avviare il CIP.

N.B. Durante il lavaggio l'aria compressa deve essere inserita.

Terminate le operazioni di lavaggio posizionare il selettore (Fig.5C) in posizione Produzione.



19 LEGGERE ATTENTAMENTE PRIMA DI AZIONARE LE POMPE

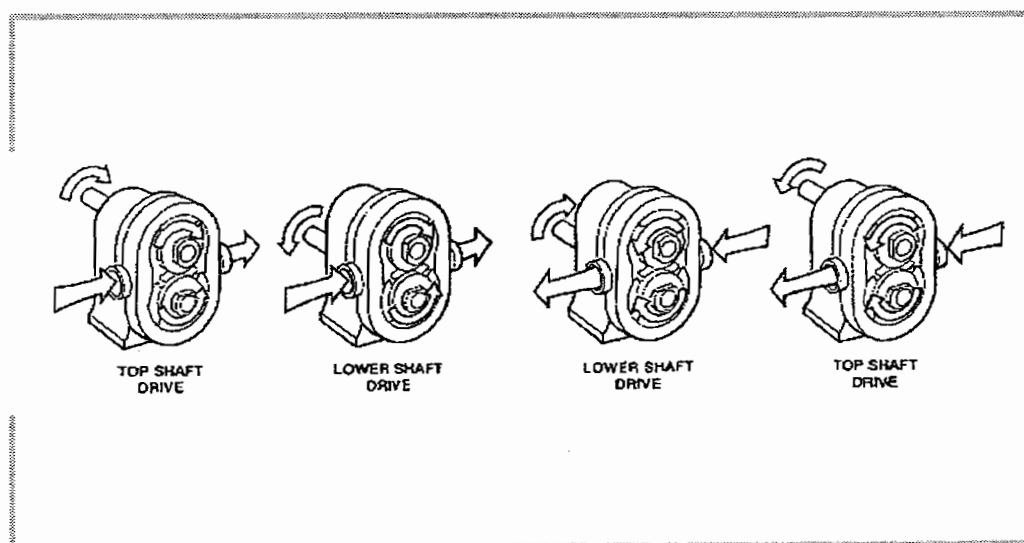
Ogni pompa, prima di lasciare la fabbrica, viene controllata in ogni sua parte e sottoposta a prove funzionali ed idrostatiche.

Dopo le prove, la pompa viene smontata, controllata e rimontata.

Si declina ogni responsabilità per danneggiamenti alla pompa durante il trasporto.

SENSO DI ROTAZIONE.

Le pompe sono di tipo volumetrico, il senso di rotazione può essere orario o antiorario ed il liquido fluirà dalla pompa secondo il senso di rotazione del motore superiore. (**Disegno Allegato**)





PULIZIA E STERILIZZAZIONE POMPE.

Le pompe sono state progettate affinché le operazioni di smontaggio, per la necessaria pulizia, siano semplici e veloci.

Le pompe dovrebbero essere smontate e pulite ogni giorno in tutte le sue parti: o ring, camicie d'albero e guarnizioni.

Come procedere per la pulizia.

- 1) Usare un recipiente di plastica
 - 2) Pulire accuratamente ogni particolare, usando una spazzola e lavando con acqua tiepida (50° C).
 - 3) Risciacquare abbondantemente con acqua a 80°C e lasciare asciugare.
 - 4) Smontare le pompe e sterilizzare in accordo con le normali pratiche di sterilizzazione.
- Qualora venissero usate soluzioni al cloro (200 PPM) queste non dovranno contenere residui che depositandosi possano rimanere nella pompa.

ATTENZIONE!!

Le soluzioni acide usate per la pulizia hanno un alto grado di corrosività, perciò le parti della pompa non devono rimanere a bagno più del necessario.

Ogni acido inorganico a base minerale è nocivo sia alle vostre mani che alle parti della pompa.

Si consiglia di non usare le pompe per il riciclo delle soluzioni acide usate per la pulizia.

IMPORTANTE

Evitare sollecitazioni, evitare l'uso di leve, evitare di segnare o intaccare le parti della pompa.

Maneggiare con cura il coperchio, i rotori, le camicie e il corpo evitando di lasciarli cadere a terra.

Se una di queste parti si danneggia, le tolleranze nella pompa possono variare abbassando il rendimento della stessa.

Rimontare le parti sempre nel medesimo posto da cui sono state rimosse.

Togliere eventuali bave con una lima sottile.

Assicurarsi che le facce degli ingranaggi siano sempre prive di ruggine.

Usare come ricambi solamente parti originali.

Nel caso ciò non avvenga non si assicura il funzionamento.

IMPORTANTE

1) Montaggio camicie d'albero:

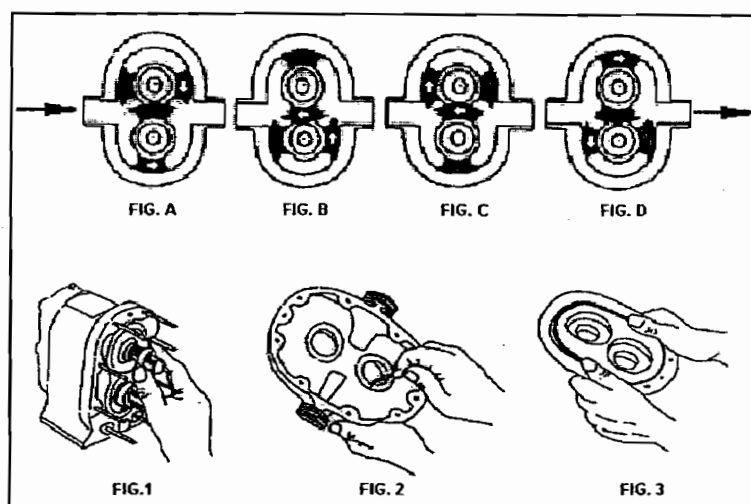
Operazione semplicissima grazie alle tacche sulla camicia ed ai corrispondenti perni di riferimento al posizionamento sull'albero.

2) Rimozione ò ring:

La rimozione è facilitata usando l'apposito utensile dotato di un uncino.

3) Montaggio guarnizione testata:

La guarnizione è facilmente inseribile nella scanalatura facendo pressione con i pollici.



NOTA

1) E' indispensabile che le cave di ognuna delle due camicie dell'albero siano poste in corrispondenza delle rispettive spine di riferimento sugli alberi. L'esatto posizionamento delle camicie preverrà che i rotori, una volta montati, tocchino il coperchio.

2) Prima di far partire le pompe aprire tutte le valvole, le bocche d'aspirazione e di mandata.

Omettere questa operazione può comportare il danneggiamento della linea e del motore.



SMONTAGGIO DELLA POMPA

NOTA:

Staccare tutte le tubazioni e le condutture prima di procedere.

- a) Svitare i galletti;
- b) Rimuovere i galletti ed il coperchio;
- c) Rimuovere i rotori svitando i dadi che li trattengono con l'apposita chiave in dotazione ;
- e) Rimuovere il corpo pompa;
- f) Smontare le camicie d'albero;
- g) Rimuovere con cautela l'ò ring dall'albero;
- h) Togliere gli ò ring dal corpo pompa.



RIMONTAGGIO DELLA POMPA

1) Inserire gli ò ring nelle proprie scanalature del corpo pompa, dopo averli lubrificati .

2) Porre gli ò ring sugli alberi della pompa, accertandosi che mantengano la loro normale forma circolare; anche in questo caso l'installazione viene facilitata usando un lubrificante adatto.

3) Montare le camicie sugli alberi facendo attenzione che la centratura sia corretta (per mezzo delle tacche sulla camicia e delle rispettive spine di riferimento sull'albero).

In caso contrario il coperchio tocca i rotori provocandone eccessivo consumo.

4) Porre il corpo della pompa sulla spina di riferimento e con cautela spingerlo contro la scatola degli ingranaggi.

NOTA:

La spina di riferimento e' sempre in alto.

Assicurarsi che sulle superfici a contatto della pompa e della scatola di ingranaggi, non ci siano ruggine o sporco.

5) Montare i rotori sull'albero e fissarli con gli appositi dadi di serraggio.

6) Rimontare l'ò ring della testata.

L'inserimento si puo' ottenere facilmente esercitando pressione con entrambi i pollici sull'ò ring stesso lungo tutto il suo perimetro.

7) Rimontare il coperchio, rimettendo i galletti e serrandoli con forza.

8) Ripristinare le condutture.



20 COME ORDINARE LE PARTI DI RICAMBIO

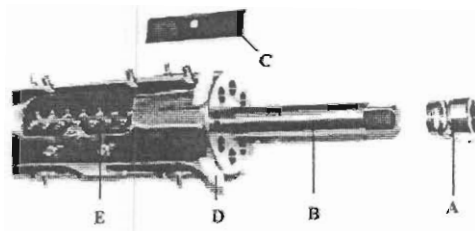
Al fine di evitare qualsiasi equivoco, gli ordini delle parti di ricambio dovranno sempre indicare i seguenti elementi:

A) Numero di matricola della macchina (posto sul retro della macchina);

B) Numero della foto in cui si trova il pezzo e la lettera di riferimento.

Esempio: per ordinare N° 1 pz. **tenuta albero agitatore**, l'ordine dovrà esserci inviato come segue:

7



Per FREEZMAT SR 1000

N. Matricola _____ Rif. A _____ Foto 7 _____

LE INDICAZIONI CITATE SONO ASSOLUTAMENTE INDISPENSABILI PER LA SICURA IDENTIFICAZIONE DEI PEZZI RICHIESTI.



LA CATTA 27 S.r.l. NON RISPONDE DI EVENTUALI DANNI CHE OCCORRANO A PERSONE OD A COSE DURANTE L'INSTALLAZIONE, L'USO E LA MANUTENZIONE DELLE MACCHINE DI SUA PRODUZIONE.

LE CARATTERISTICHE TECNICHE ED I DISEGNI DI CUI AL PRESENTE FASCICOLO HANNO CARATTERE INDICATIVO.

LA CATTA 27 S.r.l. SI RISERVA LA POSSIBILITA' DI APPORTARE IN QUALUNQUE MOMENTO LE VARIAZIONI CHE PIU' RITIENE OPPORTUNE AI SUOI PRODOTTI SENZA CHE CIO' DERIVI DANNO PER ALCUNO.



21 PROGRAMMA DI MANUTENZIONE

(N.B.: 4 mesi equivalgono ad una stagione di funzionamento)

<u>COMPONENTE</u>	<u>CONTROLLO DA ESEGUIRE</u>	<u>FREQUENZA</u>
Condensatore	Pulizia chimica o preferibilmente meccanica	1 anno (su parere di frigorista)
Apparecchiature di controllo	Verifica di intervento di pressostato alta pressione, bassa pressione e olio	4 mesi, solo frigorista esperto
Quadro elettrico	Controllo stato contatti	4 mesi
Quadro elettrico	Fissaggio elementi	4 mesi
Motore pompa	Controllo funzionamento e lubrificazione	4 mesi
Pompa Smontaggio,	Pulizia e verifica organi in movimento	(ved. cap. 19)
Guarnizioni	Controllo ed eventuale sostituzione di quelle usurate.	4 mesi
Agitatore	Verif. coltelli raschiatori	15 gg.
Agitatore	Cuscinetti e supporti	4 mesi
Agitatore	Controllo guarnizioni di fondo (aprire il portello laterale e controllare che non esca mix da dietro la camera)	15 gg.
Tensione cinghie	(1° controllo dopo una settimana)	
Cinghie		1 mese
Allineamento pulegge		4 mesi
Supporto assiale agitatore	Cuscinetti e tenuta	4 mesi



COMPONENTE	CONTROLLO DA ESEGUIRE	FREQUENZA
Motore agitatore	Cuscinetti	4 mesi
Motore agitatore	Taratura amperometro	solo in caso di sostituzione
Compressore		
Efficienza supporti e bloccaggio bulloni di ancoraggio		4 mesi
Circuito frigo	Resistenza riscaldamento olio	1 anno
Circuito frigo	Valvole solenoidi	4 mesi
Gruppo filtro riduttore aria	Scarico condensa	giornaliero
	Livello olio circ. pneumatico	15 gg.



LAVAGGIO C.I.P.

1) Ciclo di lavaggio indicativo CIP

Il corretto ciclo di lavaggio può essere eseguito nel modo seguente:

1.1) Prelavaggio con acqua potabile

- durata : ca,2 min.
- temperatura : quella della rete idrica
- scarico : a perdere

1.2) Lavaggio a ricircolo di soluzione alcalina di soda caustica in scaglie (NaOH)

- durata: ca,10 min
- concentrazione della soluzione : 1 / 1,5 %
- temperatura della soluzione : 65 / 70°C
- scarico : a perdere ,o recupero in serbatoio del C.I.P. centralizzato

1.3) Risciacquo a ricircolo di acqua calda

- durata : ca , 2 min.
- temperatura : 60 / 70°C
- Scarico : a perdere

1.4) Lavaggio a ricircolo di di soluzione acida con acido nitrico (HN03) al 65% .

- durata : ca.10 min..
- concentrazione della soluzione : 0,8 / 1% max
- temperatura della soluzione : 50 / 55°C
- scarico : a perdere ,o recupero in serbatoio del C.I.P. centralizzato

1.5) Risciacquo a ricircolo di acqua calda

- durata : ca. 5 min.
- temperatura : 60 / 70°C
- scarico : a perdere

1.6) Sanitizzazione mediante ricircolo di soluzione sanitizzante che avrà:

- concentrazione
- temperatura
- tempo di permanenza

conformi alle indicazioni fornite dalla ditta produttrice del sanitizzante.

- Durata : consigliato ricircolo ca. 5 min.

si consiglia di lasciare stazionare la soluzione nell'impianto per l'intervallo che intercorre fra la fermata e la ripresa produzione (max. 14 / 16 h)

- scarico : a perdere



1.7) Risciacquo con acqua potabile prima dell'inizio produzione

- | | |
|-----------------|--------------------------|
| - durata : | ca 8 min. |
| - temperatura : | quella della rete idrica |
| - scarico : | a perdere |

2.0) Periodicità lavaggi

2.1) **Giornalmente** è consigliato il lavaggio con soda caustica (NaOH) e sanitizzante.

2.2) **Settimanalmente** è consigliato il lavaggio con soda caustica (NaOH), acido nitrico (HNO_3) e sanitizzante .

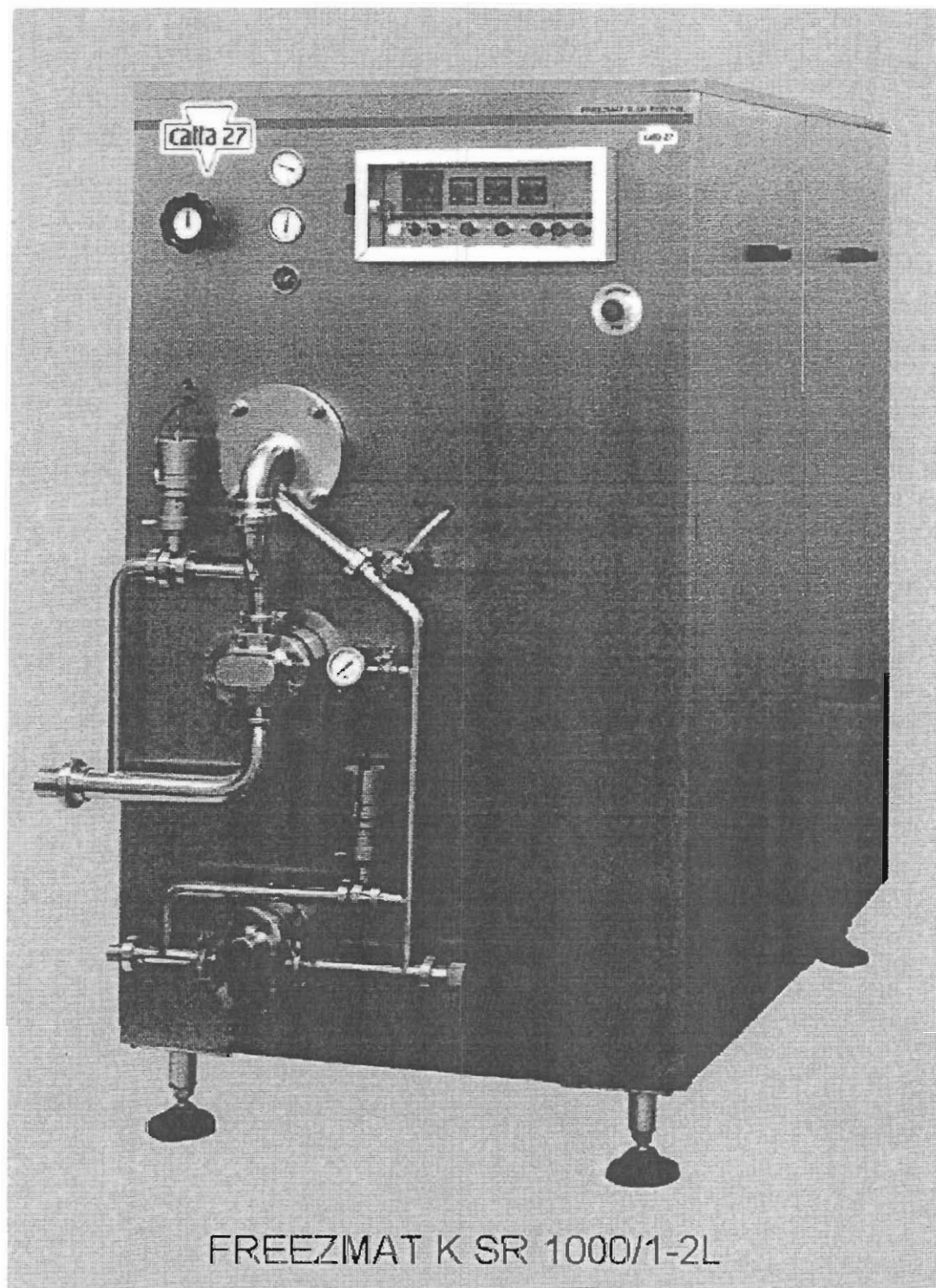
3.0) Controlli

Questi cicli di lavaggio devono essere eseguiti contemporaneamente agli esami batteriologici , in quanto i tempi e le temperature indicate possono variare in funzione di :

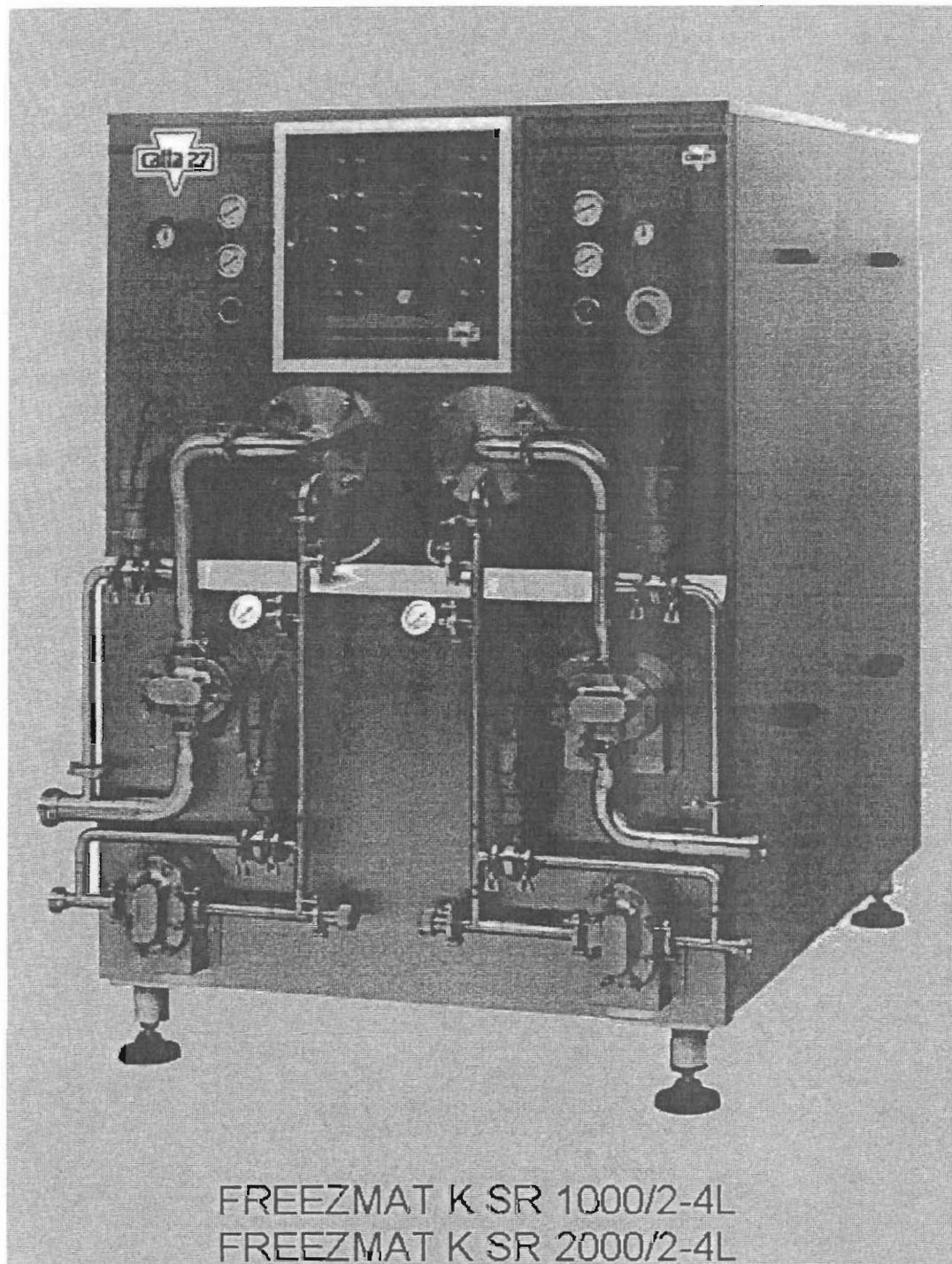
- materie prime
- cicli produttivi
- N° di componenti da lavare contemporaneamente .

4.0) Note

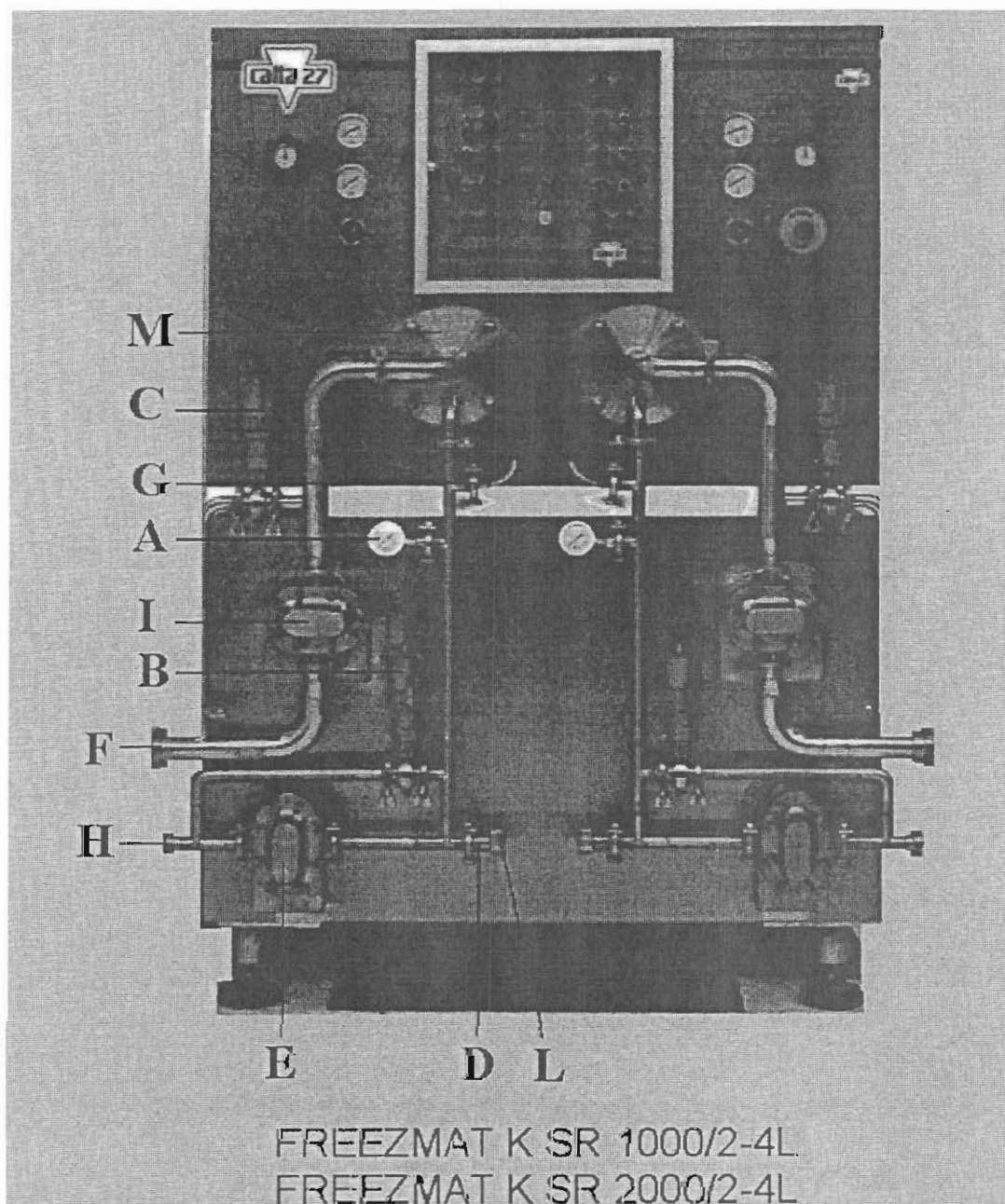
- Nei punti ove indicato "acqua a perdere " la portata oraria delle pompe dovrà essere non inferiore a 6000 lt/h.
- I dati indicati hanno valore puramente indicativo e non si intendono impegnativi.

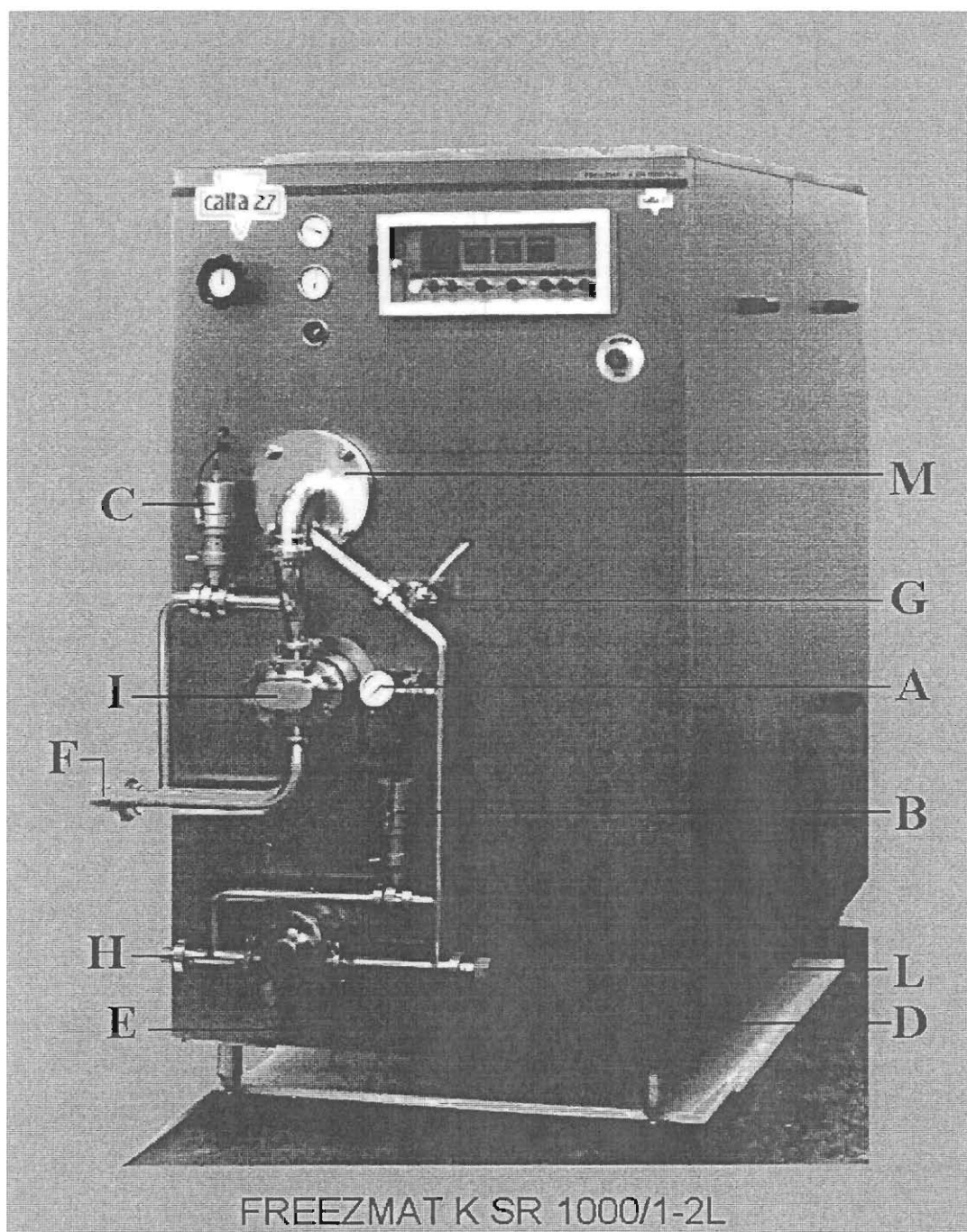


FREEZMAT K SR 1000/1-2L

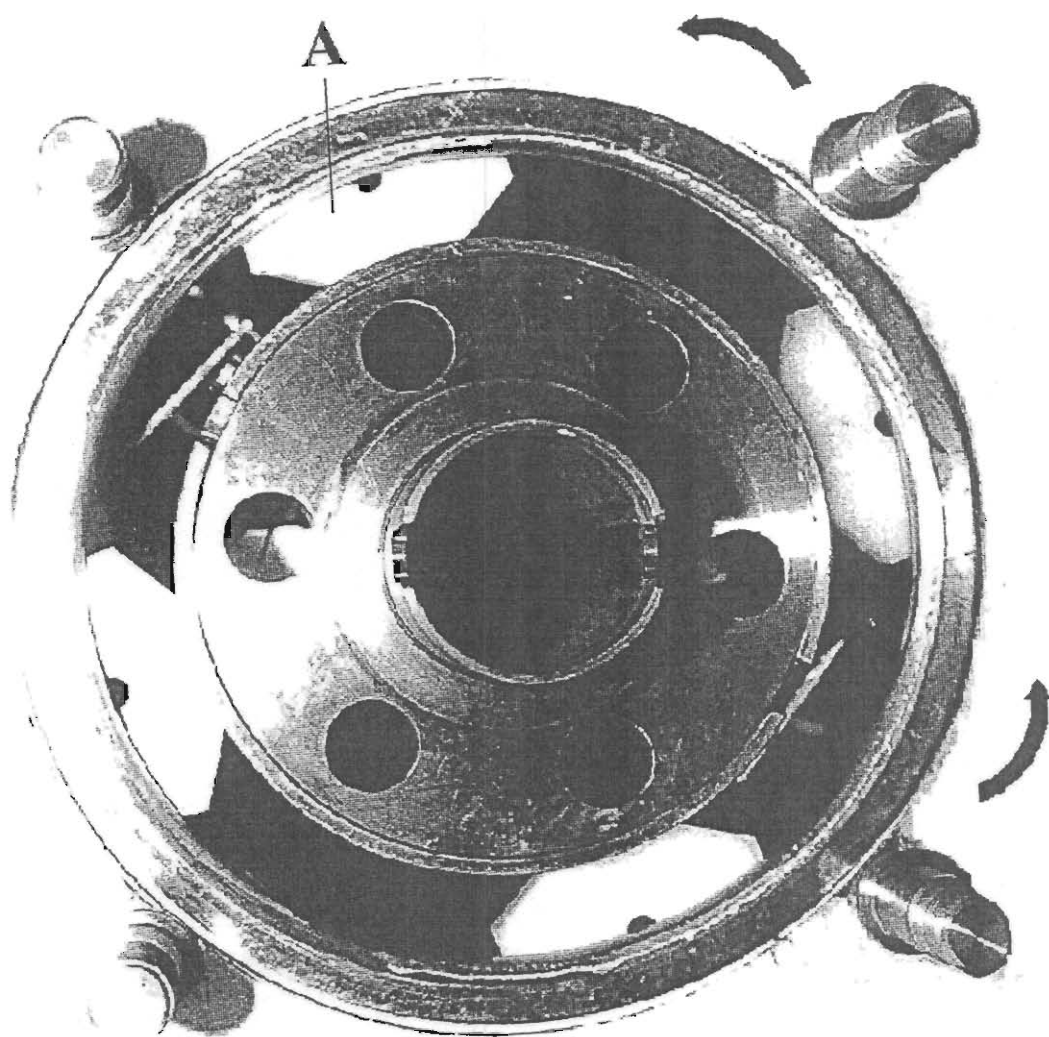


FREEZMAT K SR 1000/2-4L
FREEZMAT K SR 2000/2-4L



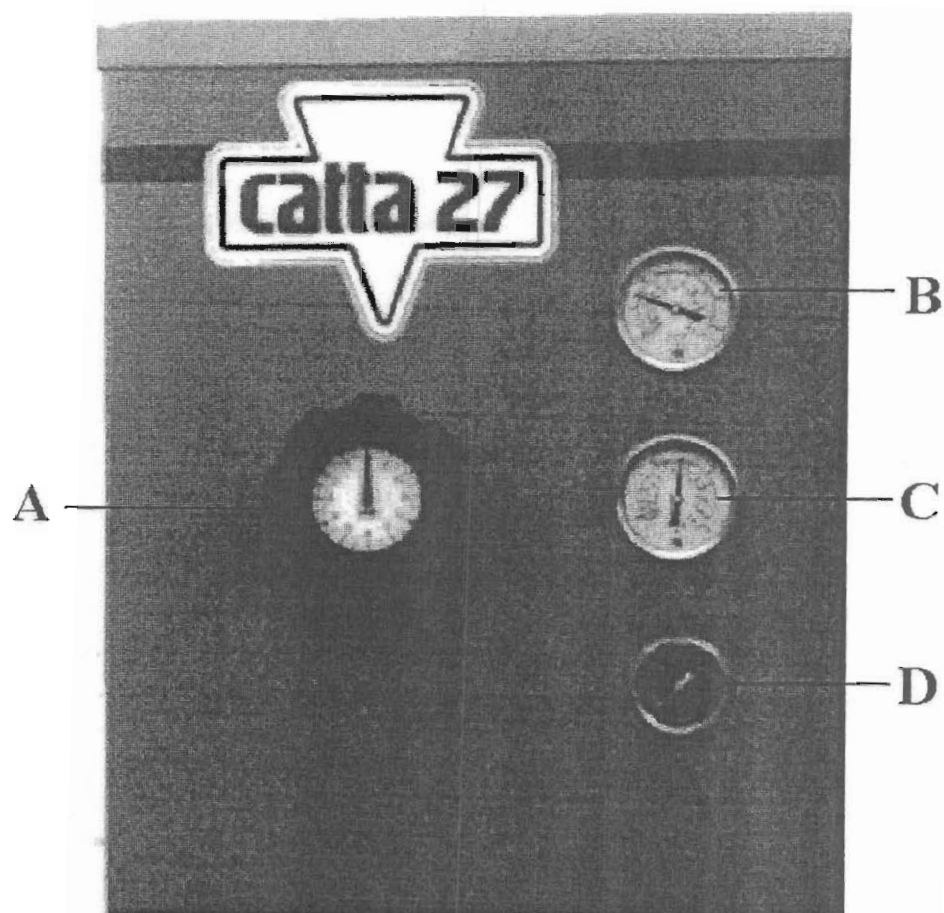


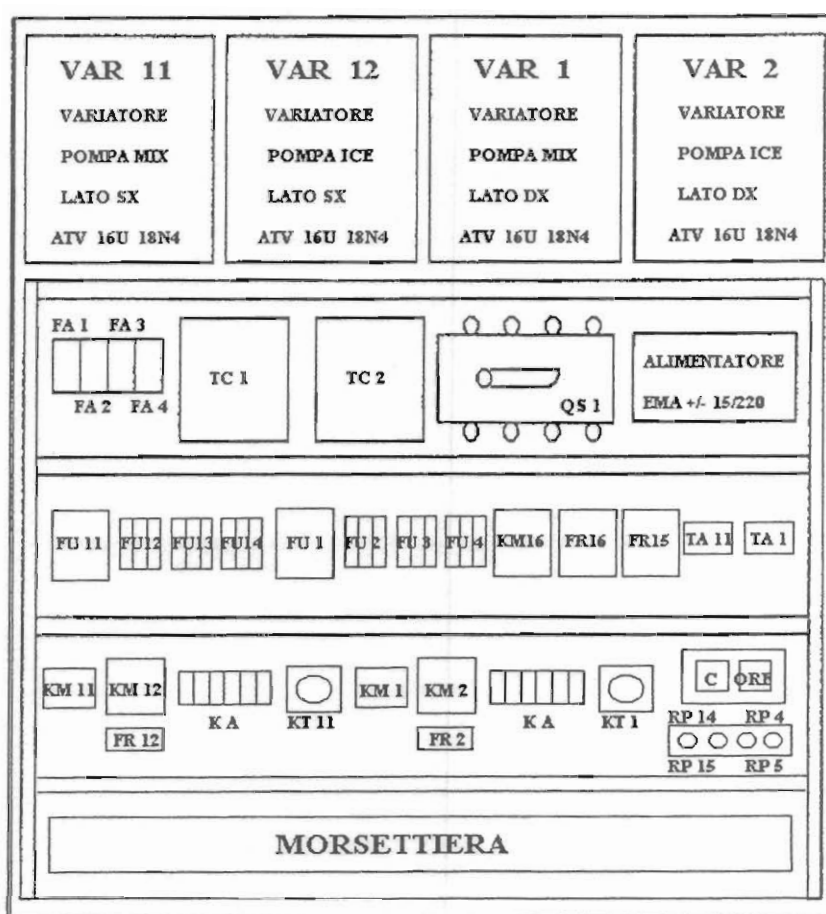
FREEZMAT K SR 1000/1-2L





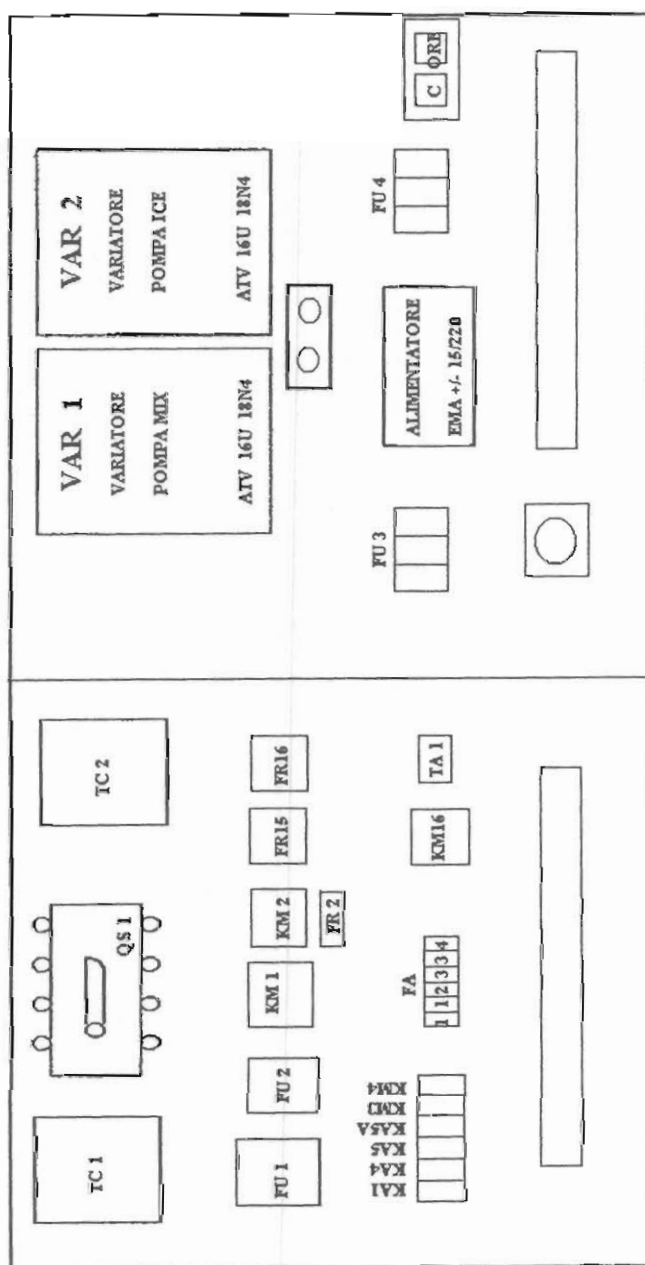
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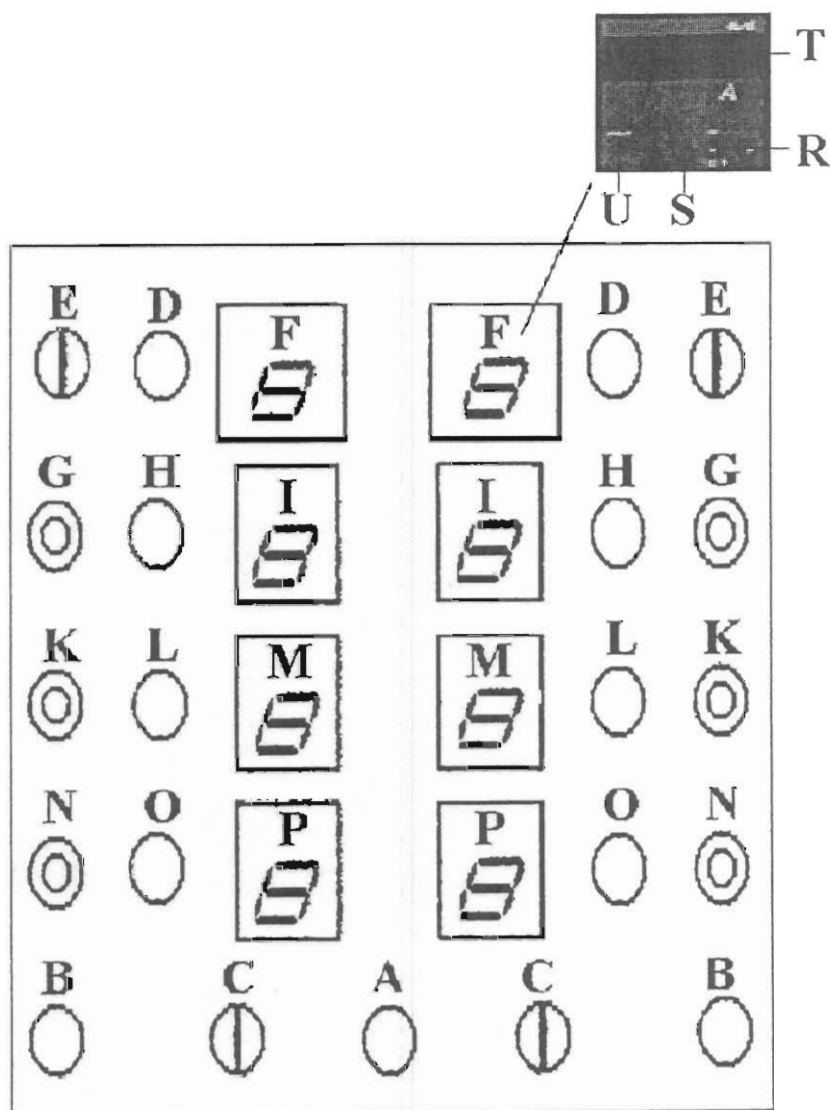




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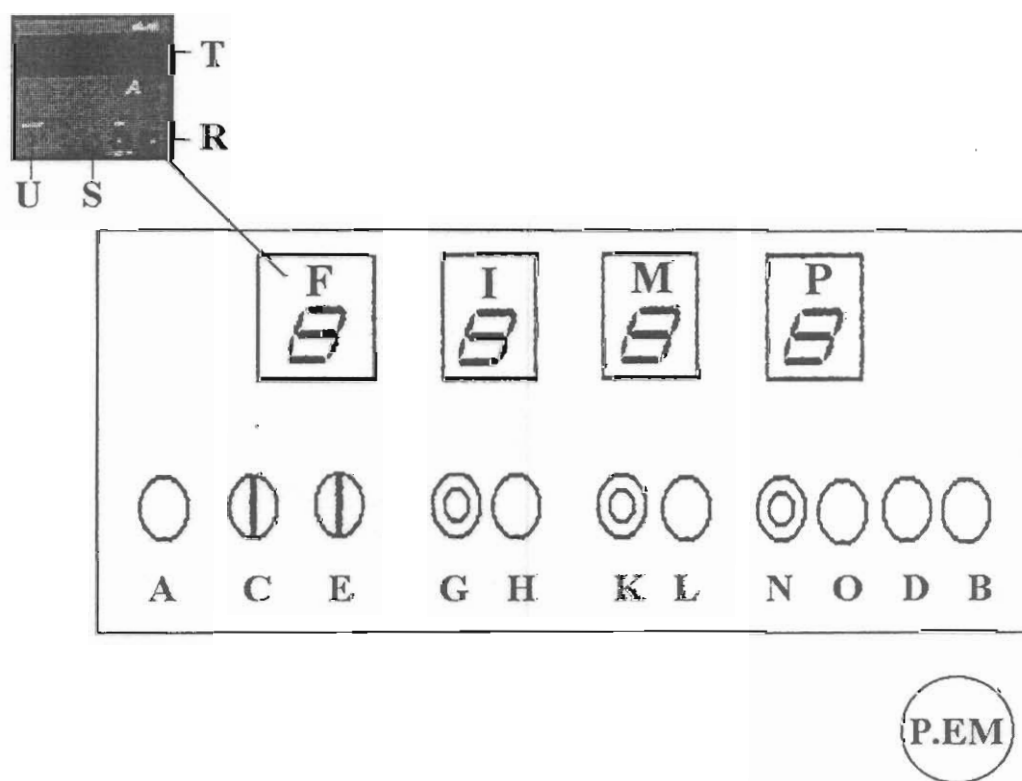
FREEZMAT K SR 1000/1-2L

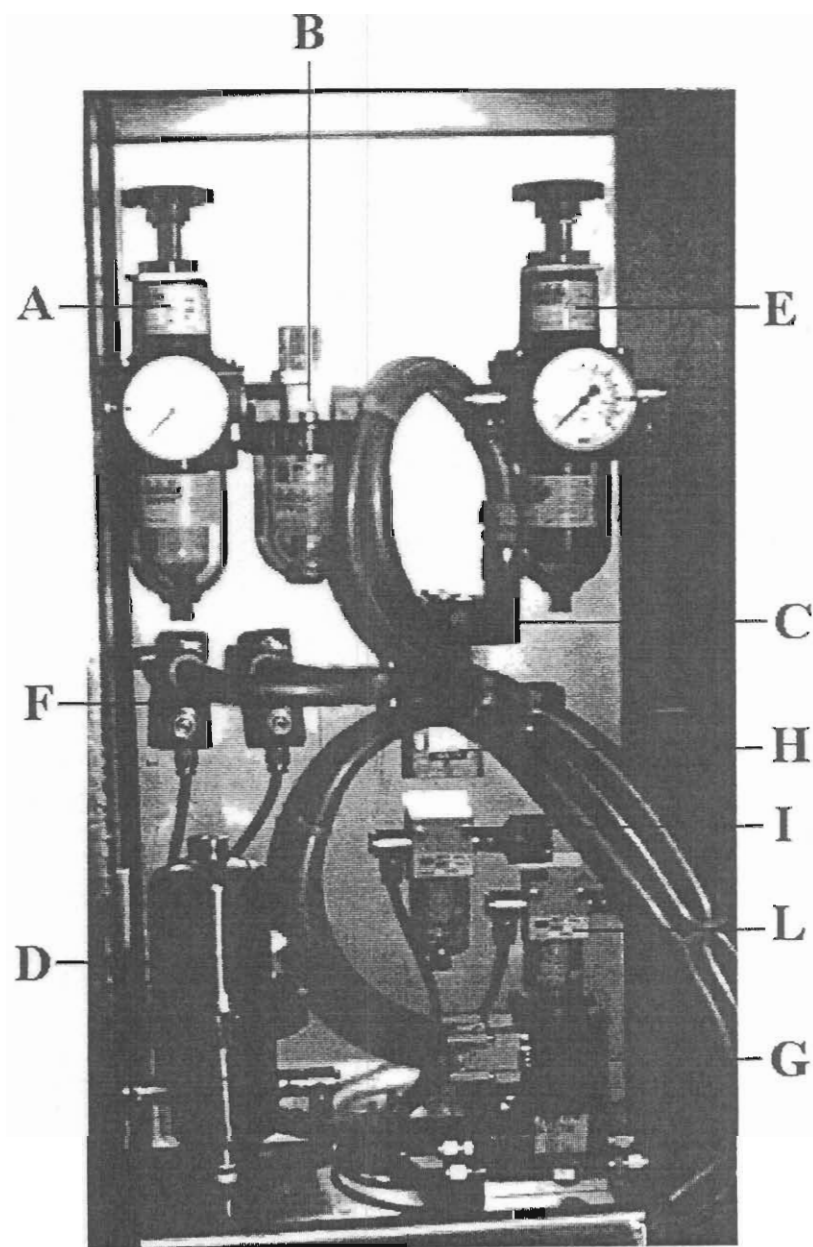


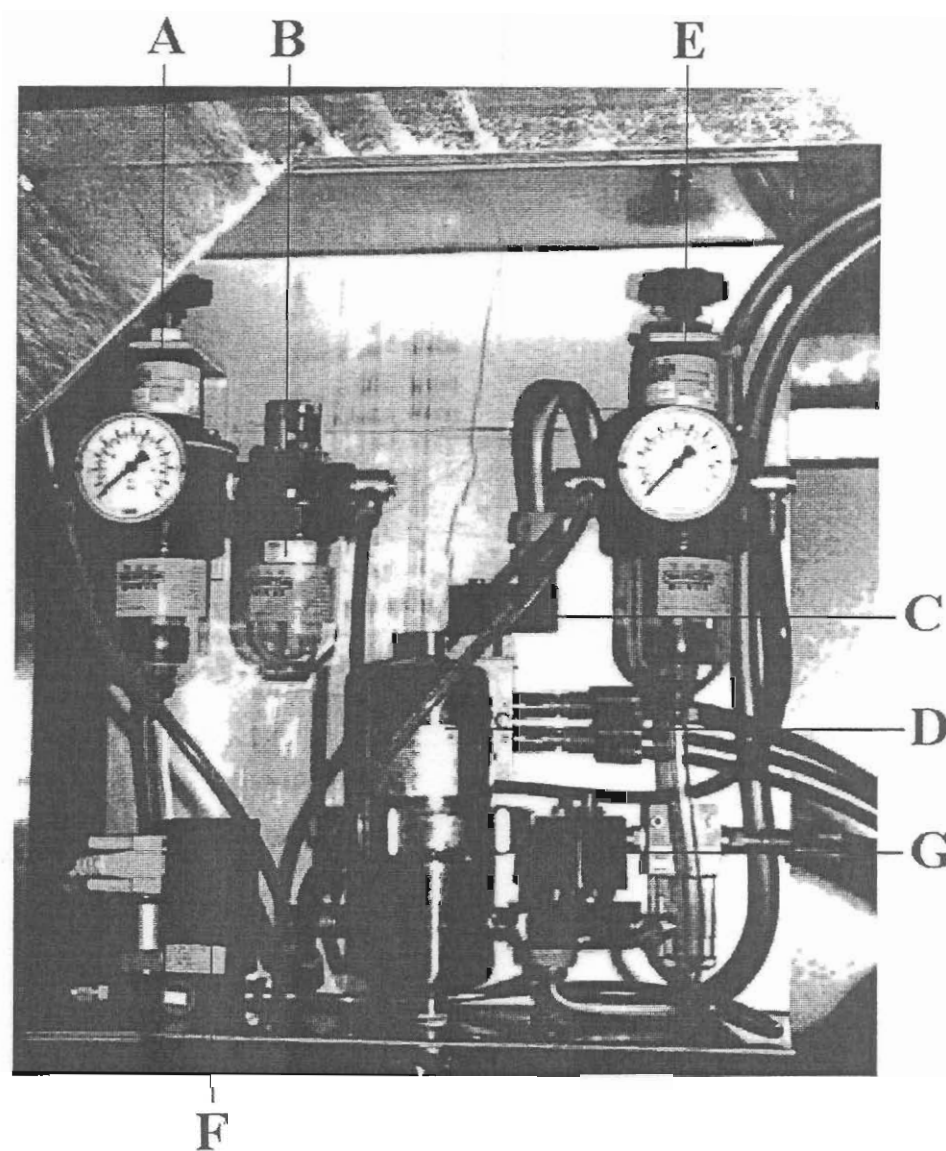
P.EM



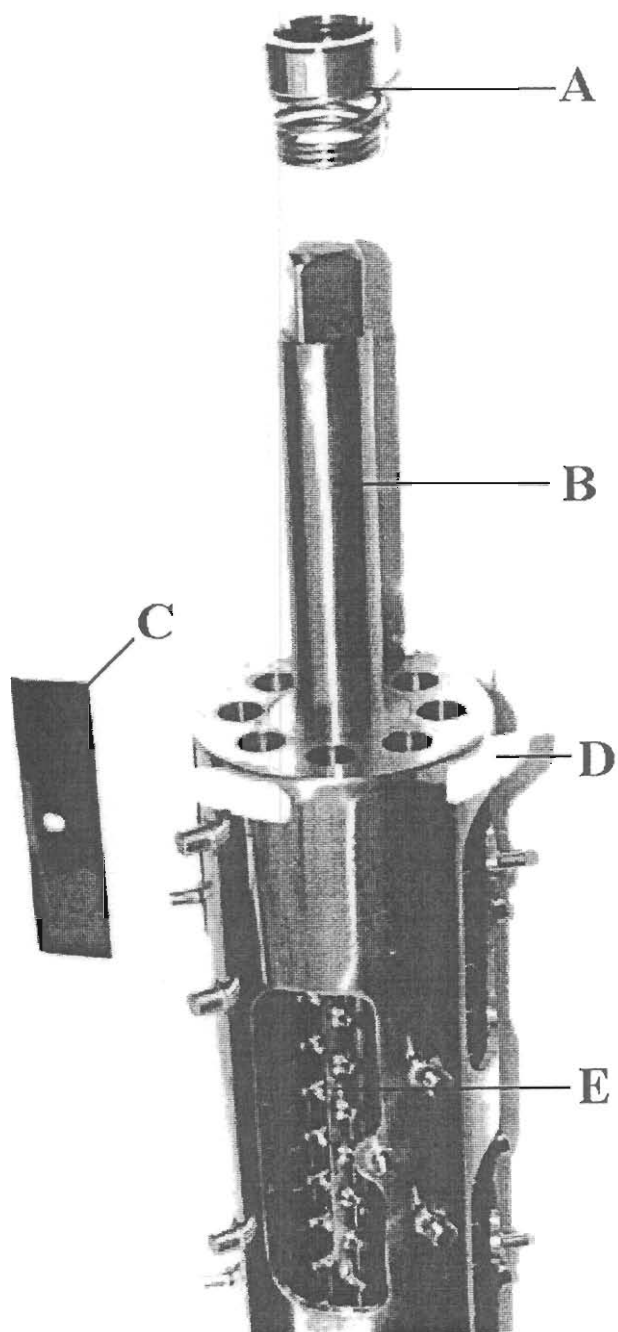
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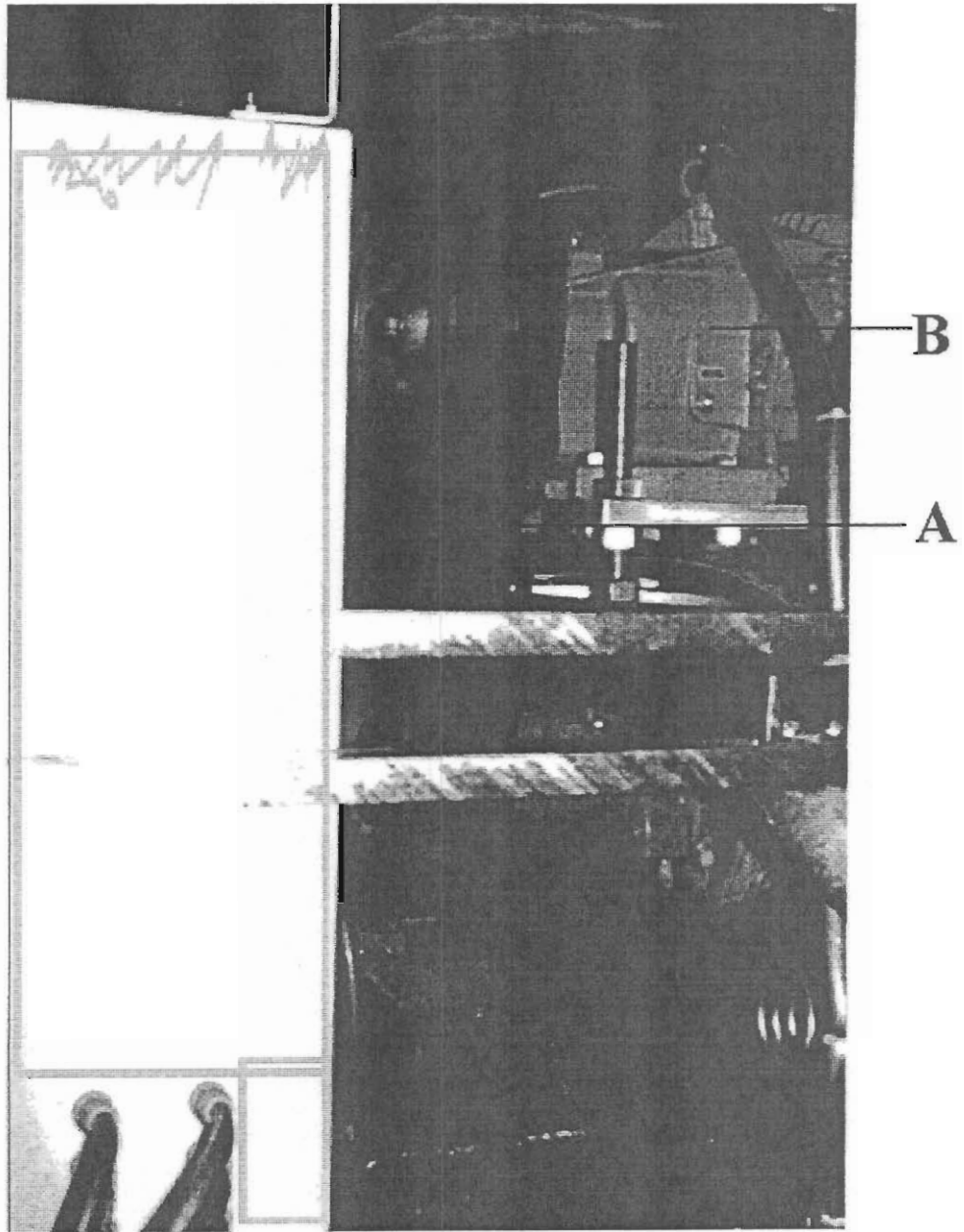


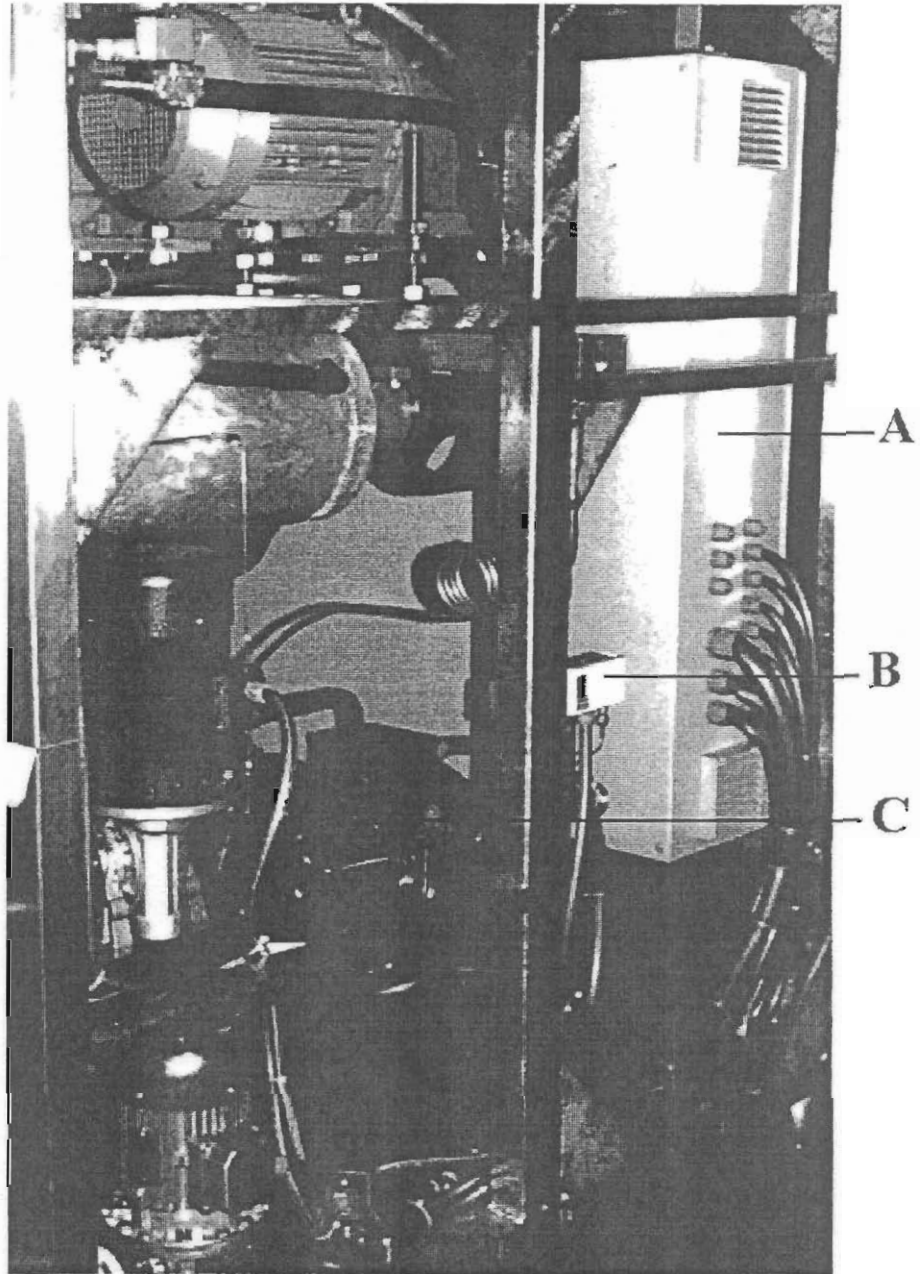


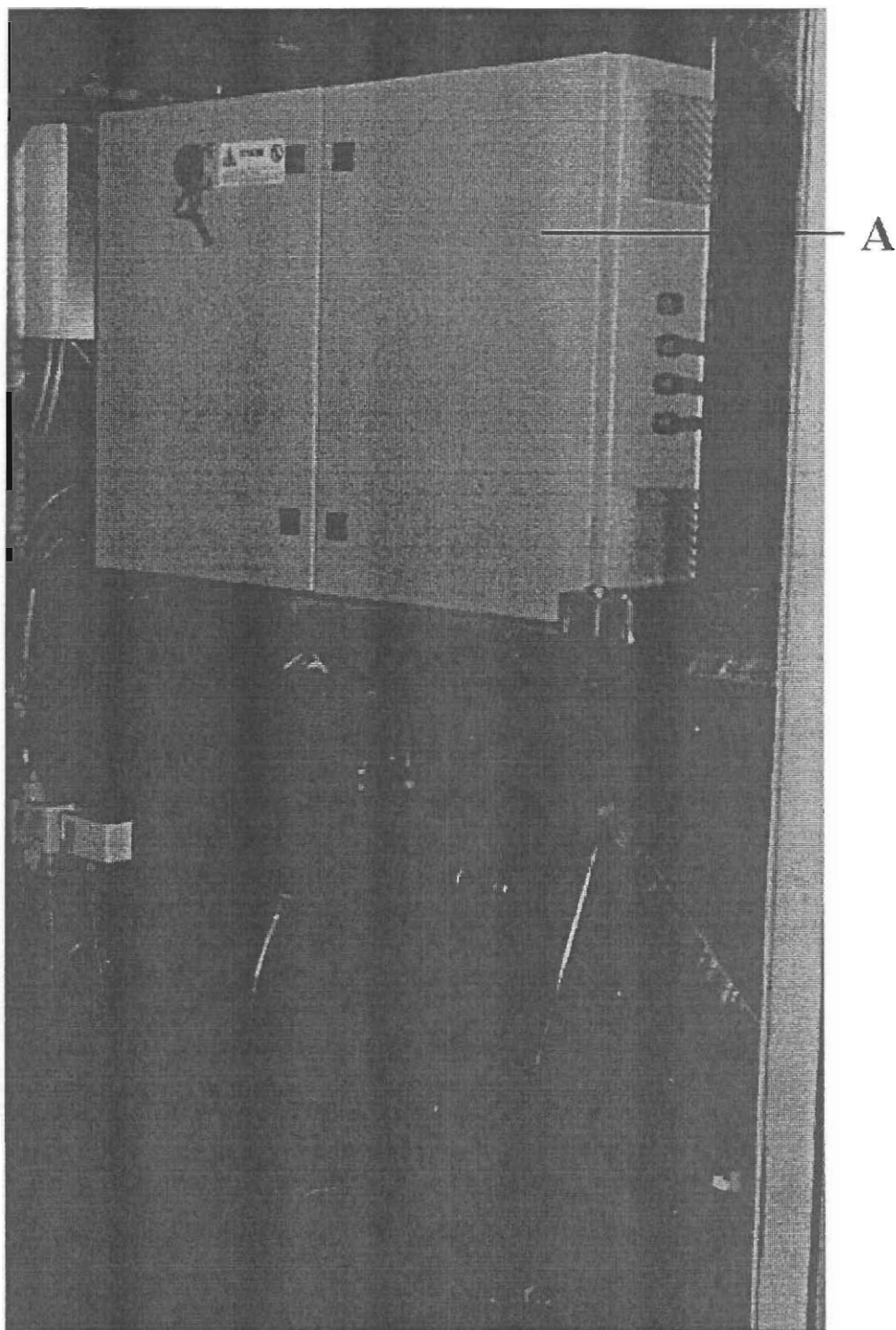


FREEZMAT K SR 1000/1-2L

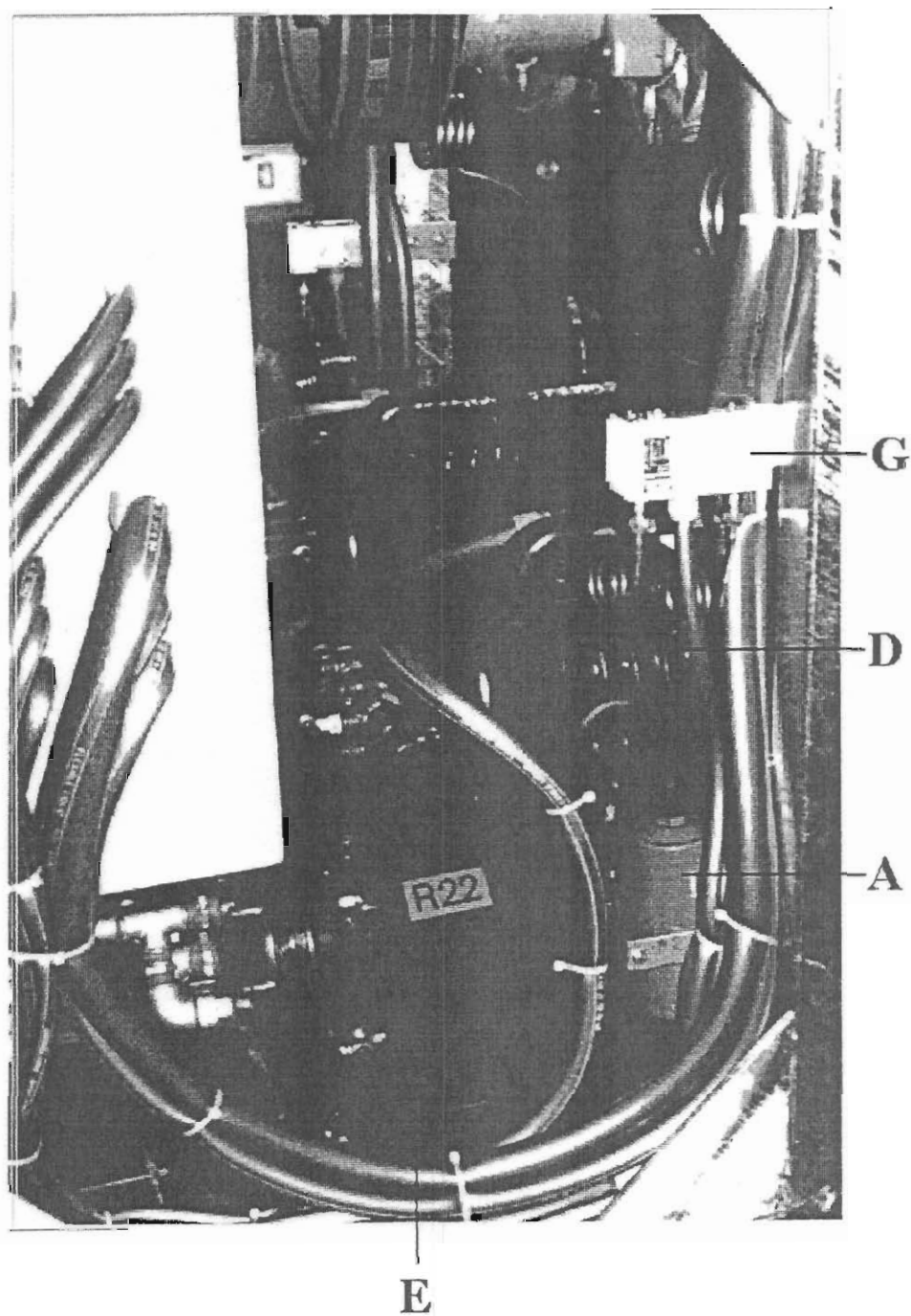


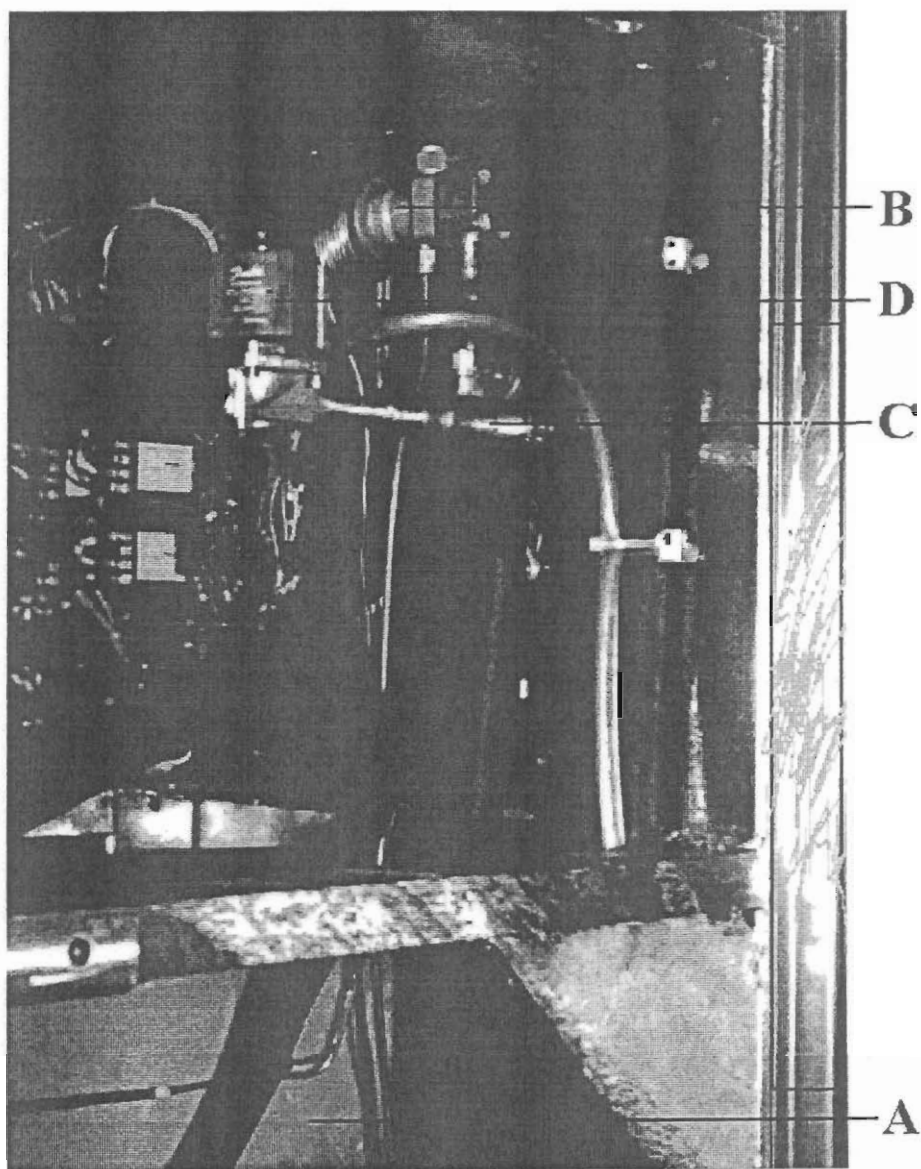






FREEZMAT K SR 1000/





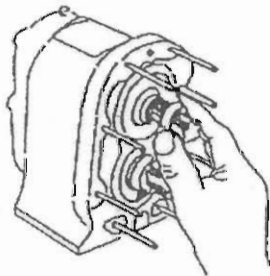
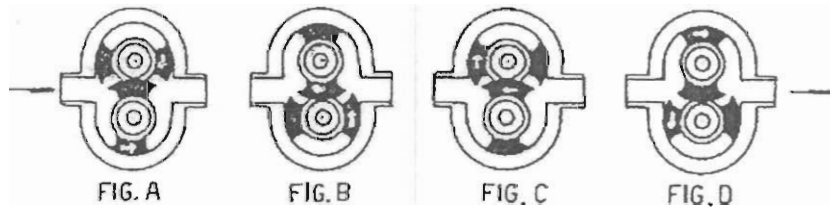


FIG. 1

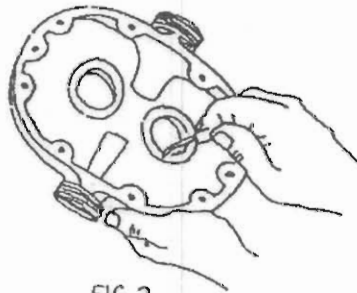
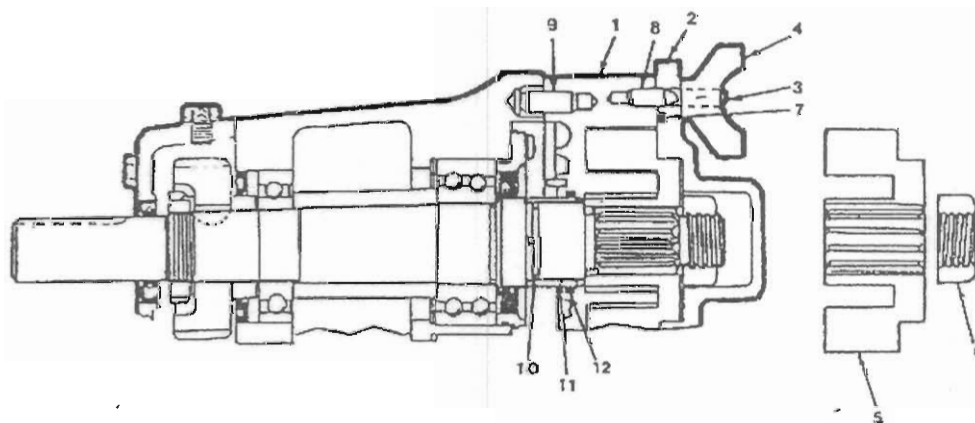


FIG. 2

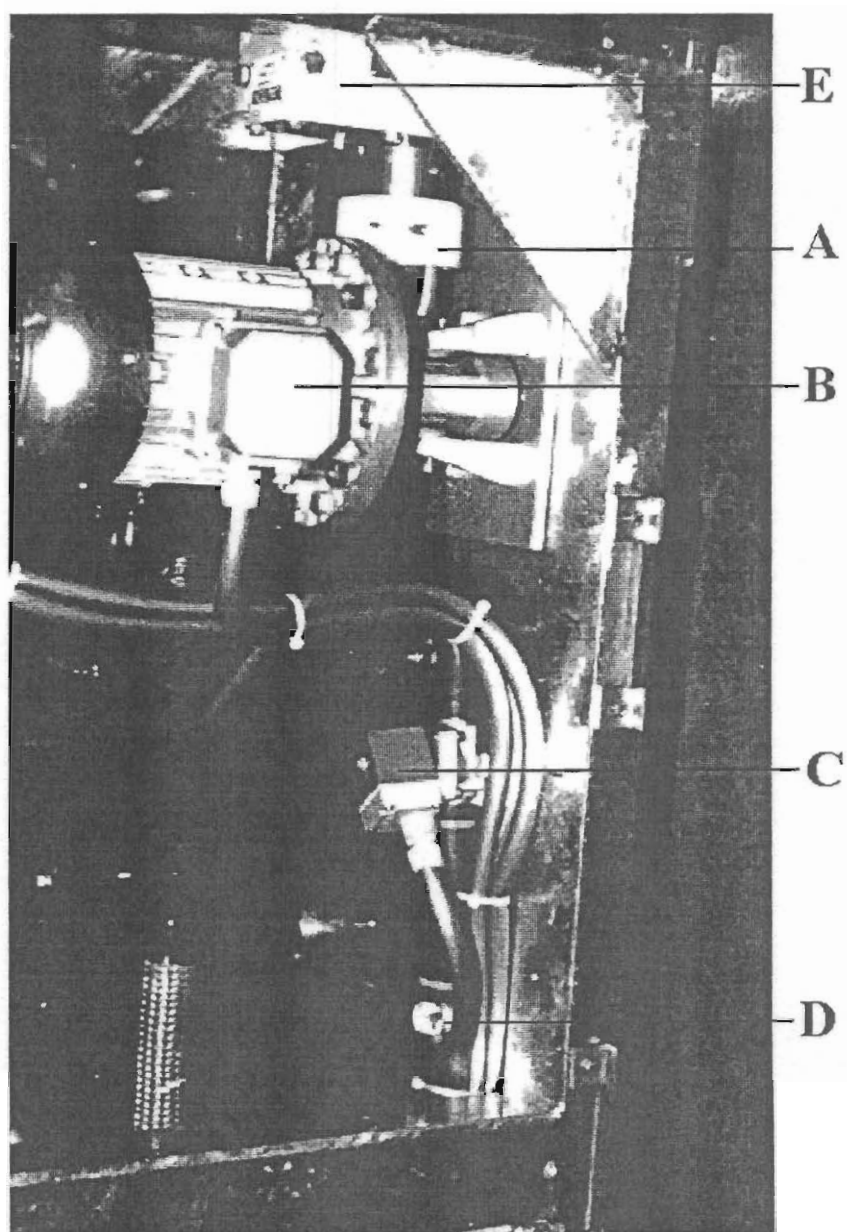


FIG. 3



- 1 - Pump Body
- 2 - Pump Cover
- 3 - Stud
- 4 - Wing Nut
- 5 - Rotor - Twin Blade
- 6 - Rotor Retainer Nut

- 7 - "0" Ring Pump Cover-Buna
- 8 - Dowel - Pin - BDO - 40-1
- 9 - Dowel - Pin - BDO - 40-3
- 10 - "0" Ring - Shaft
- 11 - Sleeve
- 12 - "0" Ring - Body

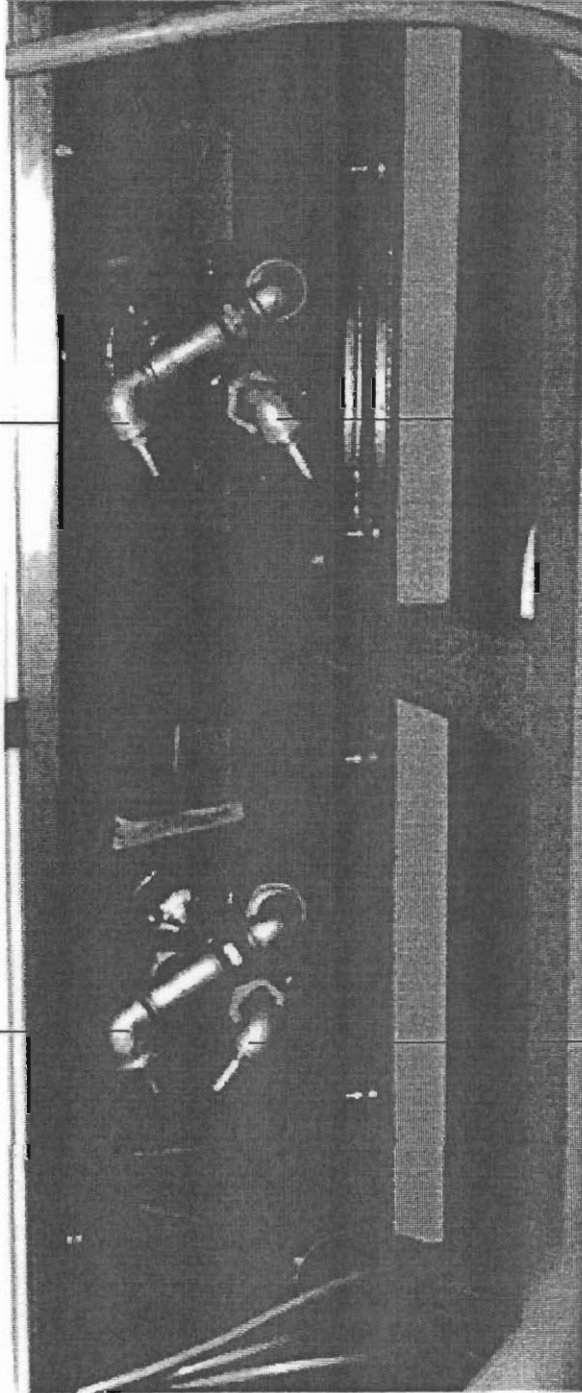


A

B

A

B



KEVIN NESBIT

PAGES

304 MIKE EDMONDS

AVAM

ammeter/voltmeter with max. contact for A.C.

WHAT IT IS

AVAM is a digital A.C. instrument field selectable to be used as ammeter or as voltmeter.

HOW IT IS MADE

- Housing: with plastic ABS, front 72 mm Din
- Depth: 102 mm
- Mounting: panel mount
- Connections: terminal block for ≤ 4 mm² leads
- Relative humidity: from 10% to 90% (no condensing)
- Voltage range: selectable by front keypad from 0 to 99,9 Vac and from 0 to 600 Vac
- Current range: selectable by front keypad from 0 to 5 A (direct) and from 0 to 999 A (through A.T. xxx/5)
- A.T. and decimal point selection: through front keypad
- Max contact relay: relay 8(2) Amp 250 V
- Accuracy: $\pm 0,5\%$ F.S. ± 1 digit
- Resolution: 1/1000 F.S.
- Consumption: 4 VA max
- Power supply: 24 Vac $\pm 10\%$ or 115/230 Vac $\pm 10\%$, 50/60 Hz

MAIN FEATURES

- Three digit display (12,5 mm of height)
- Plastic ABS box 72x72 mm, self-extinguishing
- Panel mount
- Connections through clamp conductor, maximum section ≤ 4 mm²
- Direct insertion of current or through amperometric transformer (A.T.)
- Overload alarm-light
- One relay output.

FRONT KEYPAD

SET: to select/modify the setpoint and to have access to programming.

UP: value increase key.

DOWN: value decrease key.

RESET: manual reset key (if enabled).

PARAMETERS PROGRAMMING

Push the "SET" key for 5 seconds to enter the programming mode. The "PAS" label will be shown (the "PAS" default value is 000).

To enter the correct password number use the "SET" key to shift the next figures, the corresponding led situated on the right low corner of the figure will blink, then push the "UP" and "DOWN" arrow keys to modify the figure.

Use the "UP" and "DOWN" arrow keys to select a parameter label, use the "SET" key to display / exit the parameter value; use the "UP" and "DOWN" arrow keys to modify a parameter value.

Wait for 5 seconds without pushing any

key to exit the programming.

PARAMETERS DESCRIPTION

dP: it select the decimal point.

n = whole number; *y* = decimal point.

SET: setpoint value.

The range is between 0 and 999.

tA: type of the amperometric transformer.

The range is between 5 and 1000, step 5.

PAS: password number to access to the parameter programming.

The range is between 0 and 999.

dI: differential (hysteresis).

The range is between 1 and 999.

od: output delay.

The relay will switch after the time set in this parameter; the range is between 5 and 999 tenths of a second.

rES: manual reset.

n = no manual reset; *y* = manual reset.

AMMETER FUNCTION

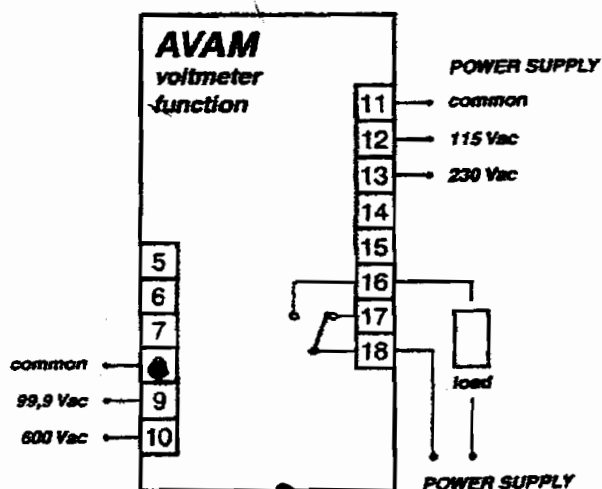
Close with a jumper the terminals number 5 and 6.

After switching on the power supply, the display shows for 2 seconds the value of the "tA" parameter and then the input signal on terminals 7 and 8.

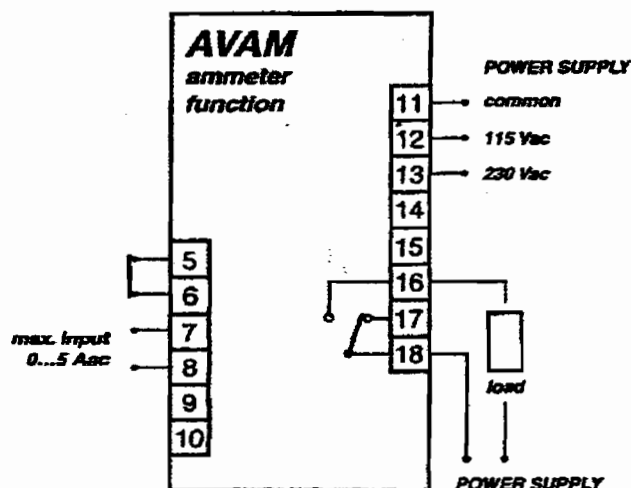
Push and release the "DOWN" arrow key to display the amperometric transformer value ("tA" parameter); it can not be modified.

Wait for 5 seconds without pushing any key to exit the amperometric transformer set value.

CONNECTIONS



(2)

CONNECTIONS**VOLTMETER FUNCTION**

For the terminals number 5 and 6 open.
To select the range between 0 and 99,9,
enter the programming and set the
"dp = y"; to select the range between 0
and 999, enter the programming and set
"dp = n".

The "IA" parameter is not available.

USER INFORMATION

Push and release the "SET" key to display
the setpoint ("SET" parameter); the setpoint
can not be modified.

Wait for 5 seconds without pushing any
key to exit the set value.

After turning on the power supply the relay
output will be energized and the terminal
16 and 18 will be closed. When the input
signal is higher than the "SET" value, the re-
lay output will be de-energized and the ter-
minals 16 and 18 will be opened.

No manual reset: if the probe signal goes
lower than the "SEt - dl" the system restart
automatically.

Manual reset: to restart the system push
the "SET" key.

Resolution: 1/1000 F.S.

Consumption: 4 VA max.

Power supply: 24 Vac or 115/230 Vac
±10%, 50/60 Hz.

Eliwell S.p.A.

via dell'Artigianato, 65
Zona Industriale
32010 Pieve d'Alpago (BL)
Italy

Telephone +39 (0)437 986111

Facsimile +39 (0)437 989066

A Siebe Group Company

TECHNICAL DATA

Housing: with plastic ABS, front 72x72
mm Din.

Depth: 102 mm.

Mounting: panel mount.

Connections: terminal block for ≤ 4 mm²
leads.

Ambient temperature: -5...55 °C.

Storage temperature: -30...75 °C.

Relative humidity: from 10% to 90% (no
condensing).

Voltage range: selectable by front keypad
from 0 to 99,9 Vca and from 0 to 600 Vca.

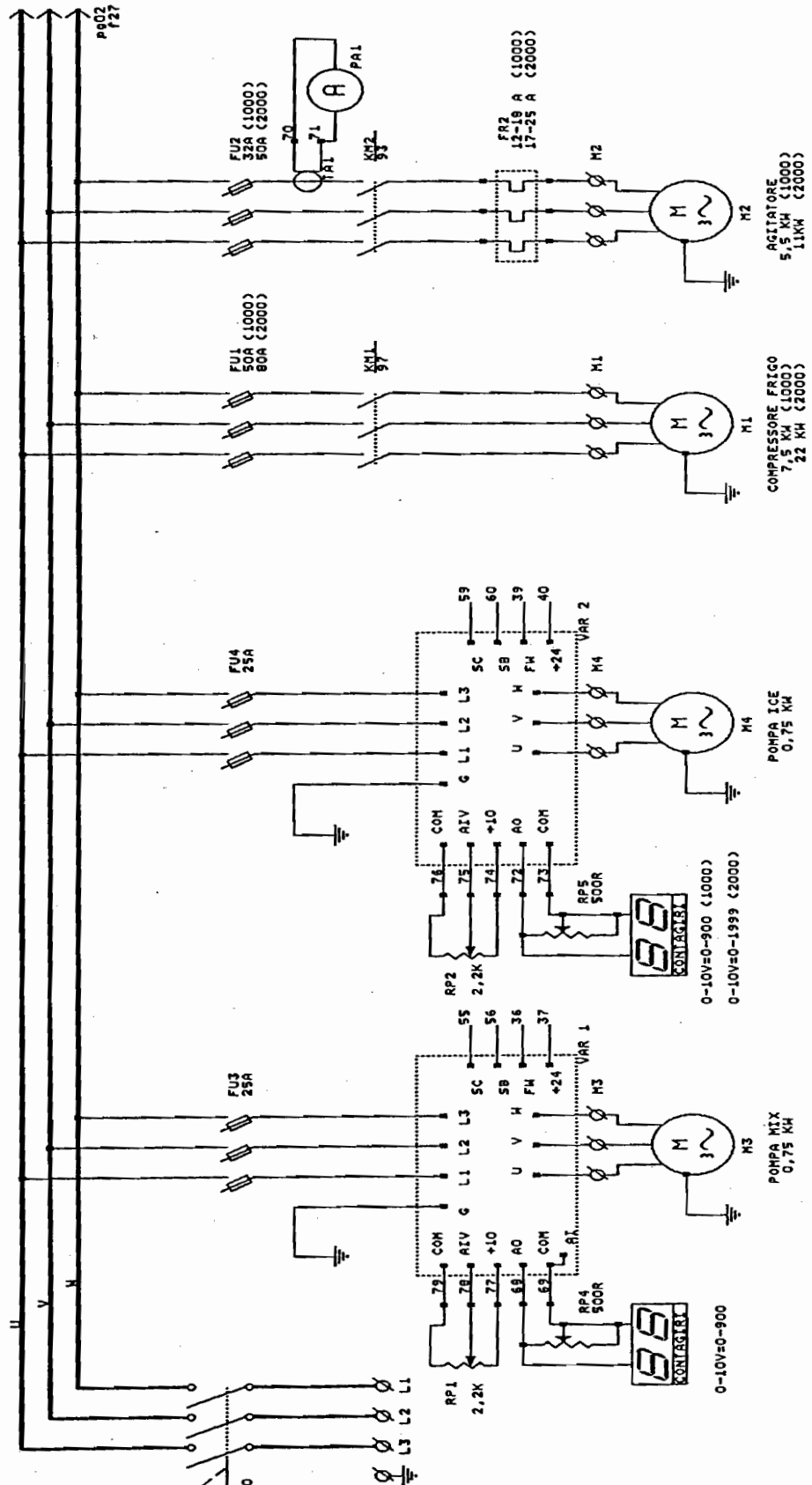
Current range: selectable by front keypad
from 0 to 5 A (direct) and from 0 to 999 A
(through A.T. x100/5).

A.T. and decimal point selection:
through front keypad.

Max contact relay: relay 8(2) Amp 250 V.

Accuracy: ±0,5% F.S. ±1 digit.

QS1
BLOCCO
PORTA



POMPA MIX
0,75 KW

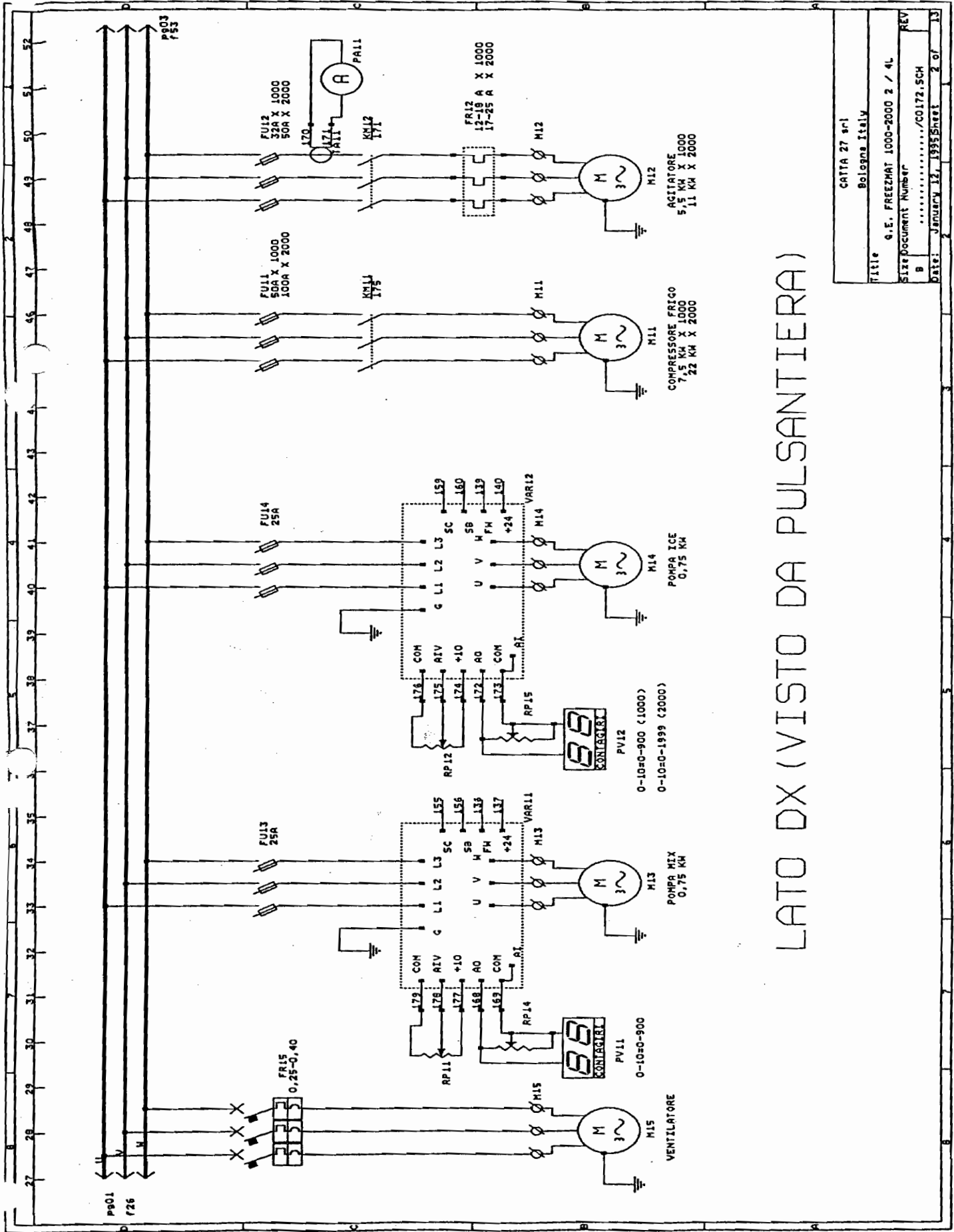
POMPA ICE
0,75 KW

COMPRESSORE FRIGO
7,5 KW (1000)
22 KW (2000)

AGITATORE
5,5 KW (1000)
11 KW (2000)

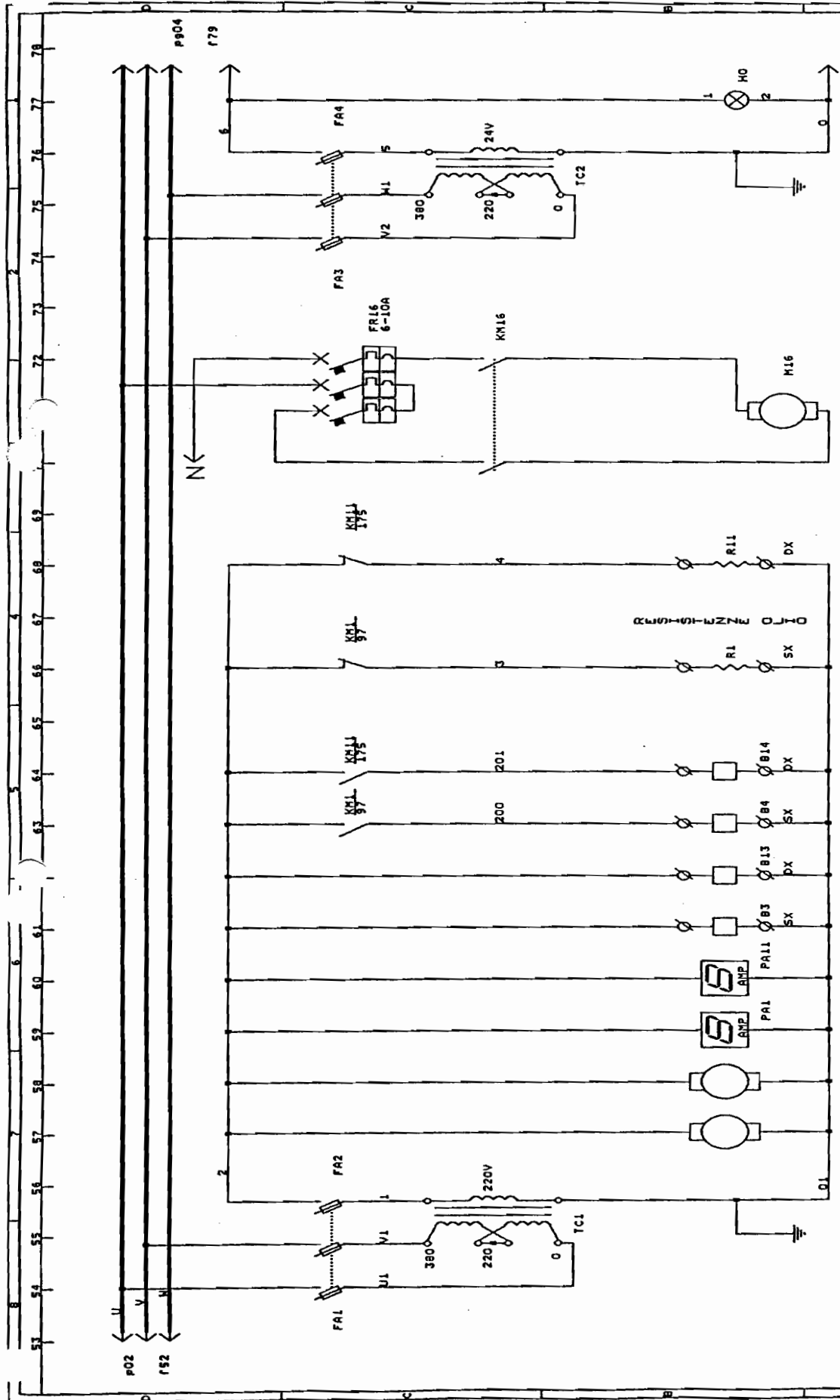
LATO SX (VISTO DA PULSANTIERA)

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Size	Document Number
REV	8
Date	January 12, 1995
Sheet	1 of 13



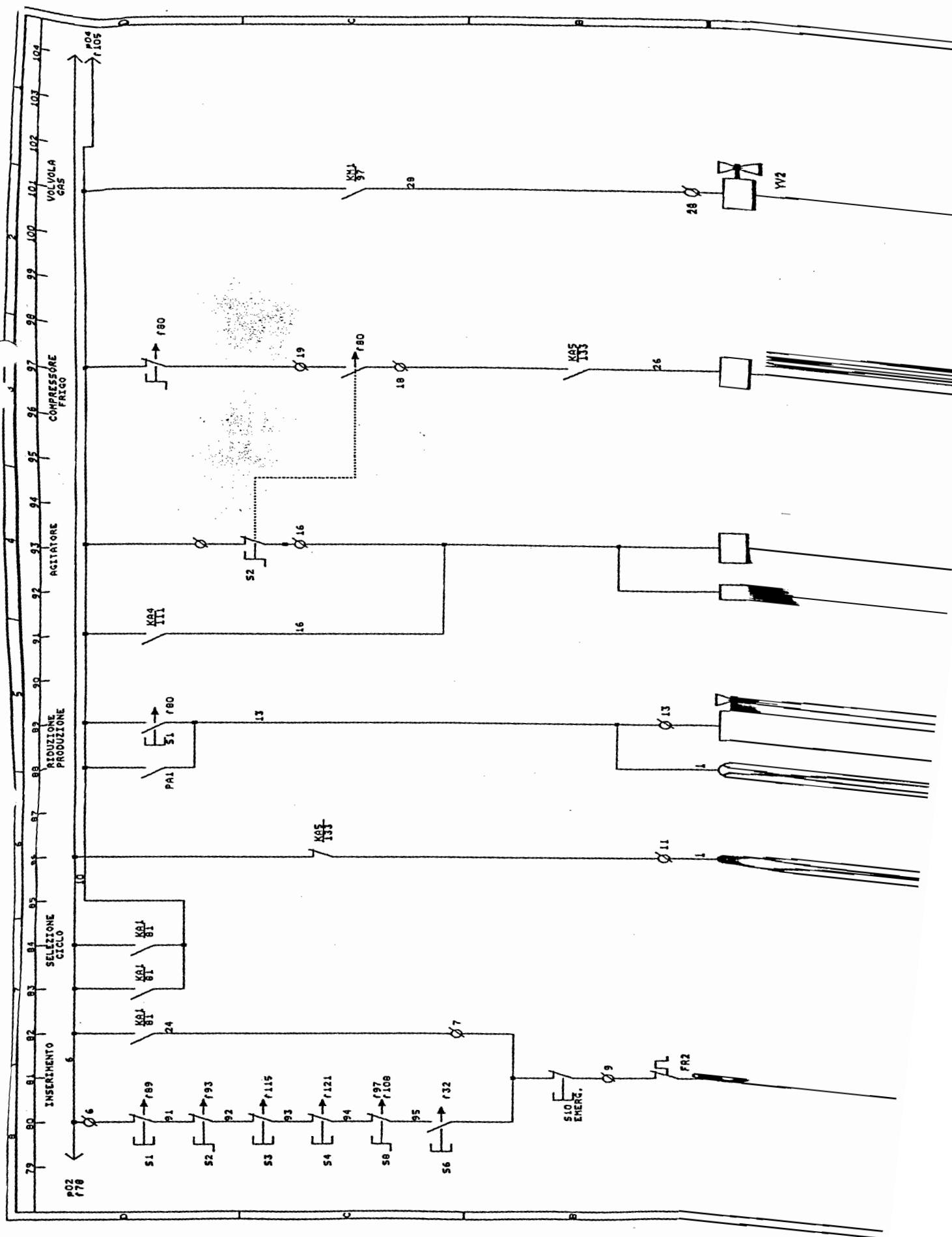
LATO DX (VISTO DA PULSANTIERA)

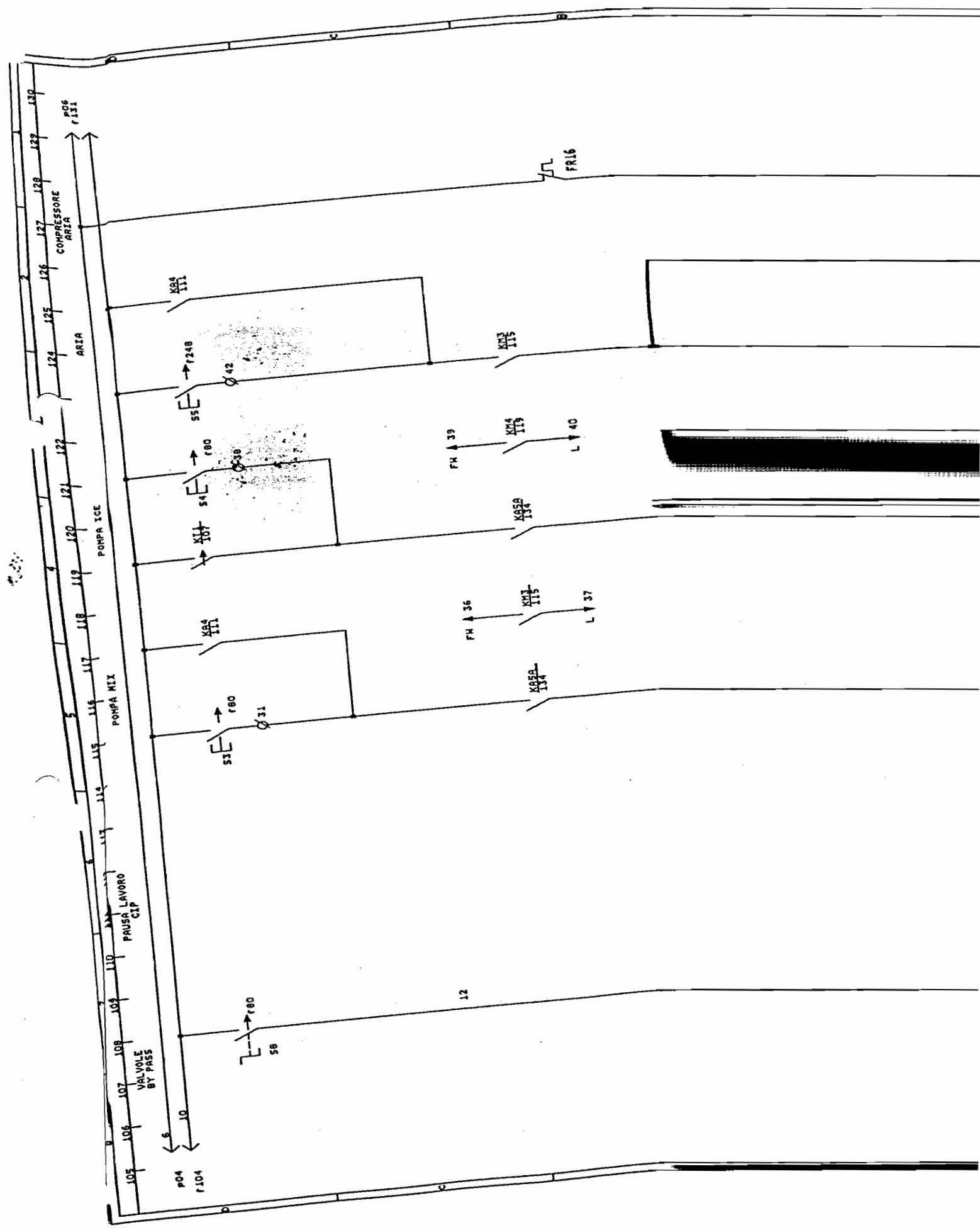
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Size/Document Number	/COL172.SCH
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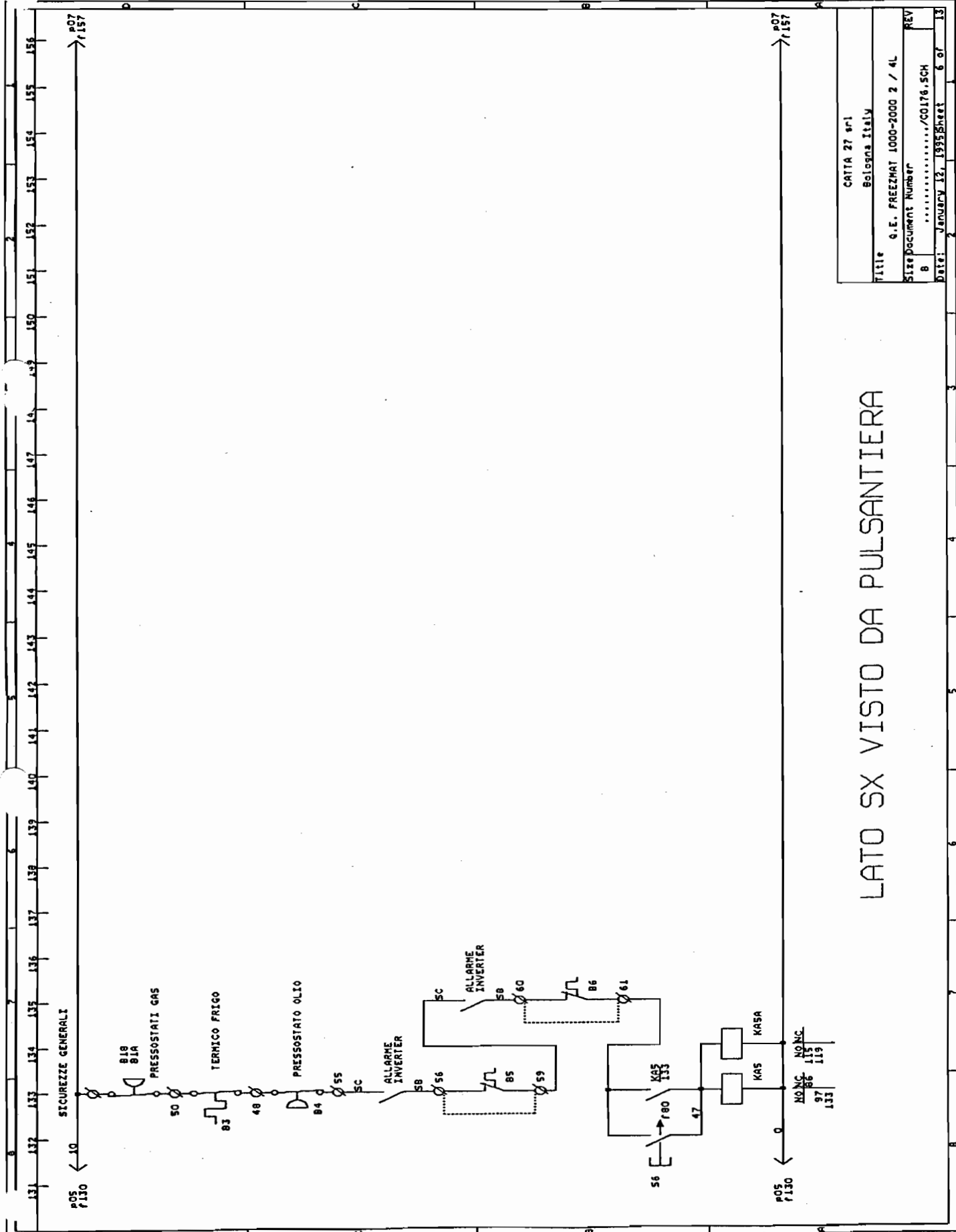


SX = LATO SINISTRO VISTO DA PULSANTIERA
 DX = LATO DESTRO VISTO DA PULSANTIERA

CATTI 27 srl	
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Title	q.E. FREEZMAT 1000-2000 2 / 4L
Size	Document Number
REV	B
Date	January 12, 1995
Sheet	3 of 13

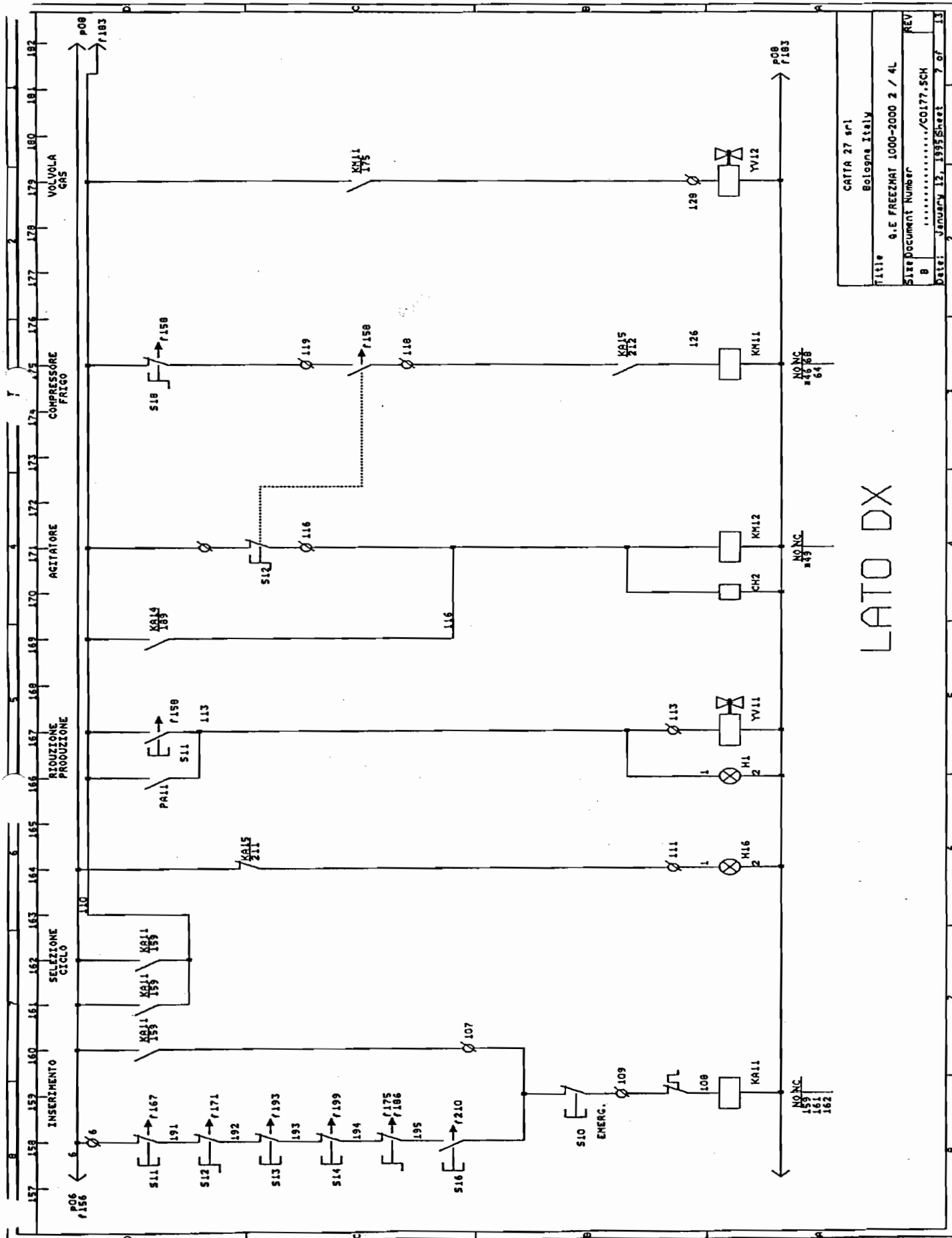






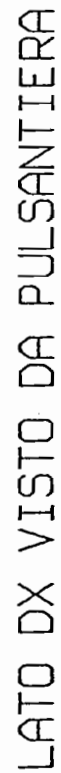
LATO SX VISTO DA PULSANTIERA

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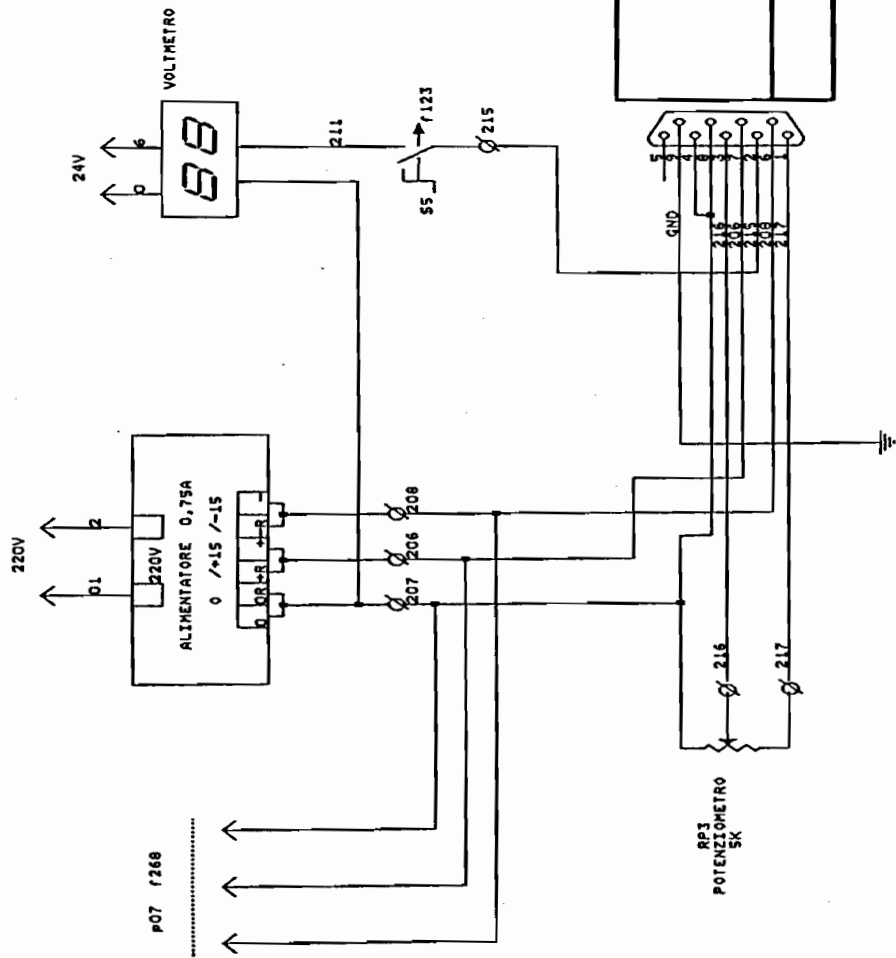


LATO DX

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Size Document Number	REV
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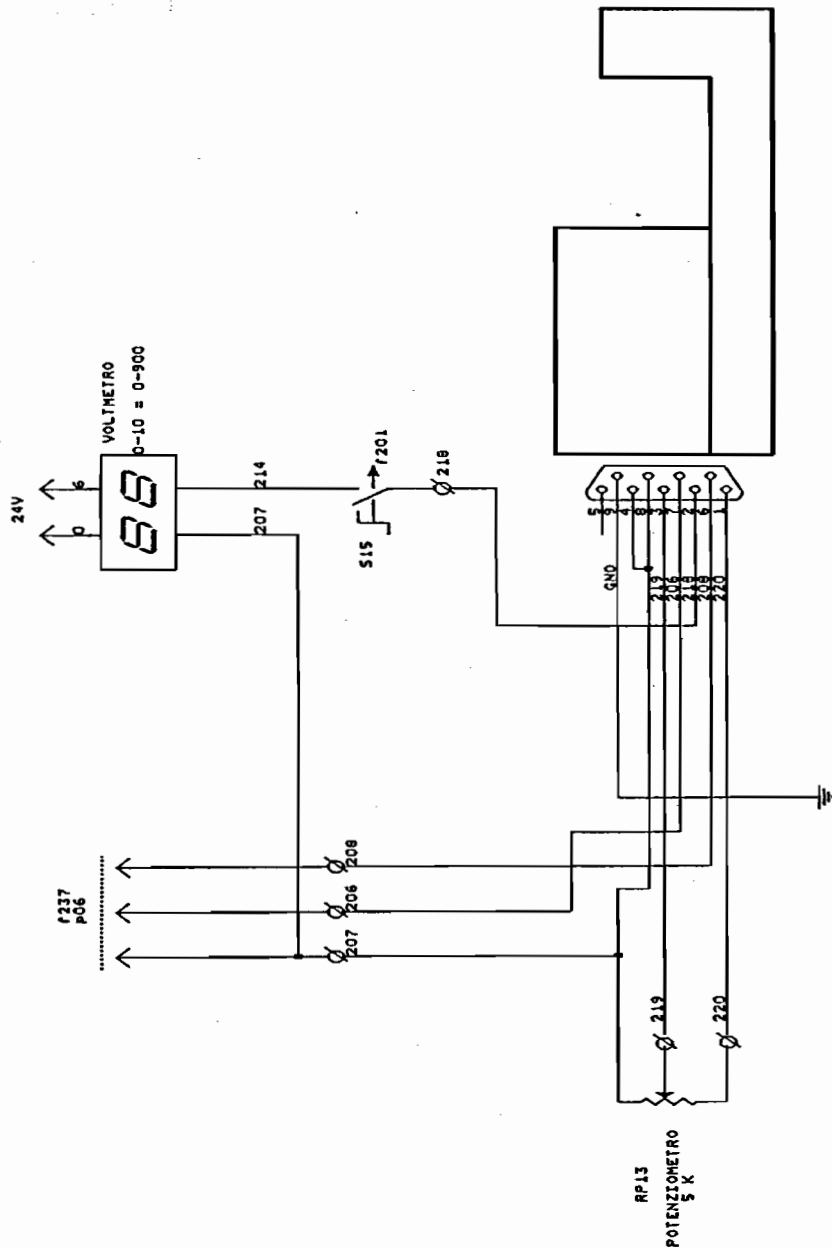


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Date: January 12, 1995 Sheet 9 of 13		REV
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MISCELATORE ARIA SX VISTO DA LATO PULSANTIERA

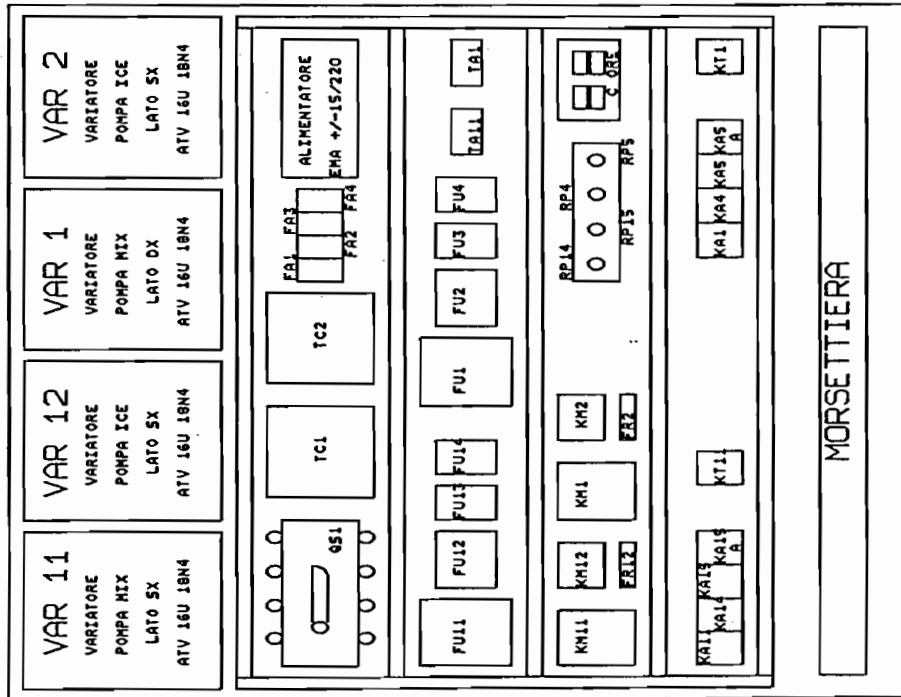
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Date:	January 12, 1995 Sheet 10 of 13



MISCELATORE ARIA DX VISTO DALLA PULSANTIERA

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Size Document Number	REV
B	CO168.SCH
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CASSA QUADRO ELETTRICO



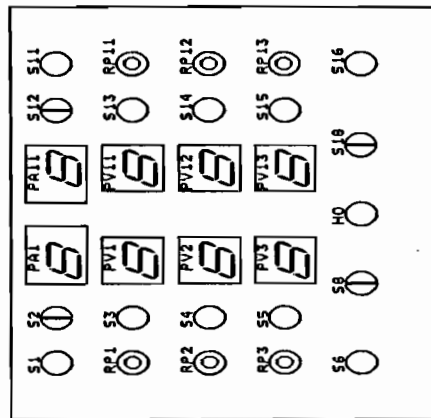
DESCRIZIONE

RIF	DESCRIZIONE
Q51	CASSA 1200X1000X300 SEZIONATORE 160A BREIER
FU1-11	FUSIBILI COMPRESSORE FRIGO PCH 3X51 50A (1000) PCH 3X58 100A (2000)
FU2-12	FUSIBILI AGITATORE PCH 3X38 32A (1000) PCH 3X51 50A (2000)
FU3-13	FUSIBILI POMPA MIX PCH 3X38 25A
FU4-14	FUSIBILI POMPA ICE PCH 3X38 25A
TA1-2	TRASFORMATORE AMPEROMETRICO 50/5
KN1-11	CONTATORE COMP. FRIGO LCI.D25.10.87 TLM4 (1000) LCI.D25.11.87 TLM4 (2000)
KN2-12	CONTATORE AGITATORE LCI.D18.10.87 TLM4 (1000) LCI.D25.10.87 TLM4 (2000)
FR2-12	RELE' TERMICO AGITATORE 12-18 A (1000) 17-25 A (2000)
TC1	TRASFORMATORE 450VA 0-220-380/220V
TC2	TRASFORMATORE 330VA 0-220-380/24V
FA1	FUSIBILI PROTEZIONE TRASFORMATORE TC1 10,3X38
FA2	" " " " TC1 "
FA3	" " " " TC2 "
FA4	" " " " TC2 "
RP4-15	POTENZIOMETRO MULTIGIRI 500 Ohm
KA..	RELE' AUSILIARI OMRON MY3
KT1-11	TEMPORIZZATORE PAUSA LAVORO CIP OMRON H3B-F
C.ORE	CONTAORE REC
B1-11	PRESSOSTATO GAS FRIGO
B3-13	PROTEZIONE TERMICA FRIGO
B4-14	PRESSOSTATO OLIO

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Title
G.E. FREEZMAT 1000-2000 2 / 4L
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PANNELLO COMANDI



RIF	DESCRIZIONE
H0	LAMPADA G.E. SOTTO TENSIONE
PA1-2	AMPEROMETRO AGITATORE
PV1-11	CONTAGIRI POMPA MIX
PV2-12	CONTAGIRI POMPA ICE
S1-11	PULSANTE RIDUZIONE PRODUZIONE
S2-12	SELETTORE AGITATORE COMPRESSORE
S3-13	PULSANTE POMPA MIX
S4-14	PULSANTE POMPA ICE
S5-15	PULSANTE ARIA
S6-16	PULSANTE INSERIMENTO
S9-19	PULSANTE AZZERAMENTO
S8-18	SELETTORE CIP/PRODUZIONE
RP1-3	POTENZIOMETRO POMPA MIX 2K
RP2-4	POTENZIOMETRO POMPA ICE 2K
RP5-6	POT. 5K REGOLAZIONE ARIA
PV3-13	VISUALIZZATORE ARIA EV48X48
BS-15	PROTEZIONE TERMICA POMPA MIX
B6-16	PROTEZIONE TERMICA POMPA ICE

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Title	G.E. FREEZMAT 1000-2000 2 / 4L
Size Document Number	REV
B	/G0261.SCH
Date:	January 12, 1995 Sheet 12 of 13



SECTION IV TROUBLESHOOTING A PUMPING SYSTEM

Once a pump is properly selected and installed in a system, operation should be trouble free. However, in existing systems, or as pump and system conditions change, problems may develop. Following are some troubleshooting hints to help identify and solve problems.

WARNING

TO AVOID SERIOUS INJURY, DO NOT
INSTALL OR SERVICE PUMP UNLESS
ALL POWER IS OFF AND LOCKED OUT.

WARNING

TO AVOID POSSIBLE SERIOUS INJURY,
SHUT OFF AND DRAIN PRODUCT FROM
PUMP PRIOR TO DISCONNECTING PIPING.

Problem	Probable Causes	Solutions
No flow, pump not turning	Drive motor not running	Check resets, fuses, circuit breakers
	Keys sheared or missing	Replace
	Drive belts, power transmission components slipping or broken	Replace or adjust
	Pump shaft, keys, or gears sheared	Inspect; replace parts
No flow, pump turning	Wrong direction of rotation	Reverse
No flow, pump not priming	Valve closed in inlet line	Open valve
	Inlet line clogged or restricted	Clear line, clean filters, etc.
	Air leaks due to bad seals or pipe connections	Replace seals; check lines for leakage (can be done by air pressure or by filling with liquid and pressurizing with air)
	Pump speed too slow	Increase speed. Filling inlet lines with fluid may allow initial start-up. Foot valve may solve start-up problems permanently.
	Liquid drains or siphons from system during off periods	Use foot valve or check valves



Problem	Probable Causes	Solutions
No flow, pump not priming	"Air" lock. Fluids which "gas off," or vaporize, or allow gas to come out of solution during off periods	Manual or automatic air bleed from pump or lines near pump
	Extra clearance rotors, worn pump	Increase pump speed, use foot valve to improve priming
	Net inlet pressure available too low	Check NIPA, NIPR*, recalculate system. Change inlet system as needed.
	On "Vacuum" inlet system: On initial start-up, atmospheric "blow back" prevents pump from developing enough differential pressure to start flow.	Install check valve in discharge line
No flow	Relief valve not properly adjusted, or held off seat by foreign material (flow is being recirculated to inlet)	Adjust or clear valve
Insufficient flow	Speed too low to obtain desired flow	Check flow-speed curve
	Air leak due to bad seals or pipe connections	Replace seals, check inlet fittings.
Fluid vaporization ("starved" pump inlet)	Strainers, foot valves, inlet fittings or lines clogged	Clear lines. If problem continues, inlet system may require change
	Inlet line size too small, inlet line length too long. Too many fittings or valves. Foot valves, strainers too small.	Increase inlet line size. Reduce length, minimize direction and size changes, reduce number of fittings.
	NIPA too low	Raise liquid level in source tank
	NIPA too low	Increase by raising or pressurizing source tank

*NIPA - Net Inlet Pressure Available at Pump
 NIPR - Net Inlet Pressure Required by Pump



Problem	Probable Causes	Solutions
Fluid vaporization ("starved" pump inlet)	NIPA too Low	Select larger pump size with smaller NIPR
	Fluid viscosity greater than expected	Reduce pump speed and accept lower flow, or change system to reduce line losses.
	Fluid temperature higher than expected (vapor pressure higher)	Reduce temperature, reduce speed and accept lower flow or change system to increase NIPA
Insufficient flow, fluid being bypassed somewhere	Relief valve not adjusted or jammed	Adjust or clear
	Flow diverted in branch line, open valve, etc.	Check system and controls
Insufficient flow, high slip	Hot (HC) or extra clearance rotors on "cold" fluid, and/or low viscosity fluid	Replace with standard clearance rotors
	Worn pump	Increase pump speed (within limits). Replace rotors, recondition pump.
	High pressure	Reduce pressure by system changes
Noisy operation	• Cavitation	
	High fluid viscosity. High vapor pressure fluids. High temperature	Slow down pump, reduce temperature, change system
	NIPA less than NIPR	To increase NIPA or reduce NIPR, see Engineering Manual
	• Air or gas in fluid	
	Leaks in pump or piping	Correct leaks
	Dissolved gas or naturally aerated products	Minimize discharge pressure. Also see "Cavitation" above.
	• Mechanical noises	
	Rotor to body contact	
	Improper assembly	Check clearance with shims. See pages 42 and 43.



Problem	Probable Causes	Solutions
Noisy operation	• Rotor to body contact Distortion of pump due to improper piping installation	Reassemble pump or re-install piping to assure free running
	Pressure higher than rated	Reduce pressure if possible
	Worn bearing	Rebuild with new bearings, lubricate regularly
	Worn gears	Rebuild with new gears, lubricate regularly
	• Rotor to rotor contact Loose or mis-timed gears, twisted shaft, sheared keys, worn splines	Rebuild with new parts
	• Relief valve chattering	Re-adjust, repair or replace
Pump requires excessive power (overheats, stalls, high current draw, breakers trip)	• Drive component noise—gear trains, chains, couplings, bearings.	Repair or replace drive train
	• Higher viscous losses than expected	If within pump rating, increase drive size
	• Higher pressure than expected	Reduce pump speed, increase line sizes
	• Fluid characteristics Fluid colder than expected, viscosity high	Heat fluid, insulate or heat trace lines. Use pump with more running clearances.
	Fluid sets up in line and pump during shut down	Insulate or heat trace line. Install "soft start" drive. Install recirculating bypass system. Flush with other fluid.
	Fluid builds up on pump surfaces (example, latex, chocolate, fondants)	Use pump with more running clearance
"Short" pump service life	High corrosion rate	Upgrade material of pump
	Pumping abrasives	Larger pumps at slower speeds can help
	Speeds and pressures higher than rated	Reduce speeds and pressures by changes in system
	Worn bearings and gears due to lack of lubrication	Set up and follow regular lubrication schedule
	Misalignment of drive and piping. Excessive overhung load or misaligned couplings.	Check alignment of piping. Check drive alignment and loads.



SECTION V OPERATION

NORMAL OPERATION

Normal operation covers a speed range of 0-600 RPM and pressure range of 0-200 PSI. Temperature range with standard rotors is -40° to 180° F and with hot clearance rotors, 180° to 300° F. (For operation at higher temperatures, consult factory.)

WARNING

STOP PUMP AND LOCK OUT
ALL POWER PRIOR TO SERVICING

LUBRICATION

The gears are factory lubricated with Micro-Plate No. 140 oil at the quantity shown for top or bottom shaft mounts. (14, 34, 64, 134, 224 and 324 are filled for side mount.) If you mount your pump other than top or bottom shaft drive, check oil level.

The bearings are factory greased with Micro-Plate #555 grease.

Change oil every 500 hours. If pump is installed where moisture and condensation are heavy, change oil more frequently.

Bearings must be greased every 250 hours or less depending on moisture and condensation conditions. Excess grease will accumulate in the gear case and can be removed through the cleanout hole covered with plastic plug.

NOTE: For hot or cold extremes use appropriate lubricant as shown in the following table.

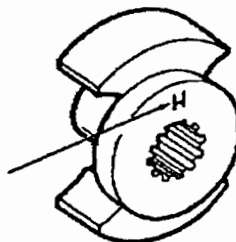
OIL	OIL
Micro-Plate #140 (-10° to 350° F)	QUALSIASI MARCA ANY BRAND SAE 120 - 140
GREASE	
Normal Type for Bearings	
Silicone (-20° to +5° F)	
Micro-Plate #555 (+5° to +350° F)	
SKF LGLT 2/1	
SNR LUB MS	

DRIVE LUBRICATION

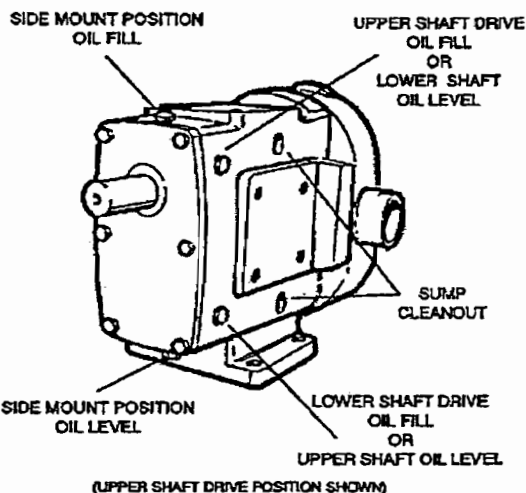
Refer to drive manufacturer's manual shipped with unit.

CLEANING

The Waukesha pump is designed to be completely disassembled for thorough and easy cleaning. Clean the pump every day or at the end of a process. Disassemble the fluid head as outlined. Remove and clean the O-rings, sleeves and pump seals. Cleaning the pump "in-place" is not recommended, except for the self-cleaning CIP pump series (Model 12, 22, 32, 62, 132 and 222)



NOTE: All hot clearance rotors are identified with a stamped letter "H" on rotor hub.

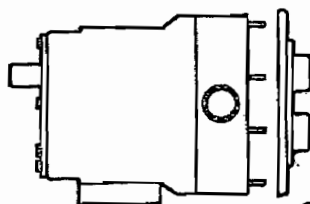
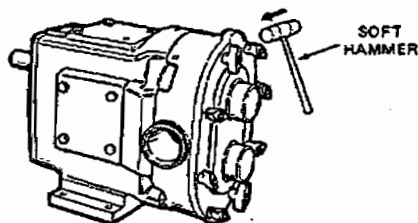


OIL CAPACITY (GEARS)		
MODEL	TOP OR BOTTOM SHAFT	SIDE MOUNT
6,12,14, 15, 18,22	1.3 oz.(40 ml)	3.3 oz.(100 ml)
30,32,33A,34	2 oz.(60 ml)	4 oz.(120 ml)
60,82, 64	6 oz.(170 ml)	9.5 oz.(280 ml)
130 132,133A,134	6 oz.(170 ml)	9.5 oz.(280 ml)
220,222,223A,224	11 oz.(320 ml)	20 oz.(600 ml)
320,324,323A	17 oz.(500 ml)	44 oz.(1300 ml)

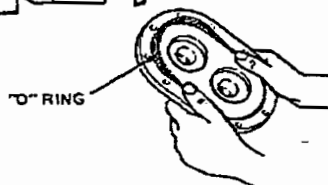


FLUID HEAD DISASSEMBLY - ALL MODELS

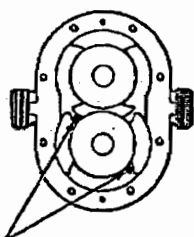
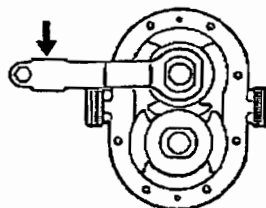
1. Shut off power and isolation valves and disconnect inlet and discharge lines.
2. Remove wing nuts using soft hammer to loosen them.



3. Remove cover. If it is stuck, loosen it with a soft hammer. Remove and discard cover "O" ring.

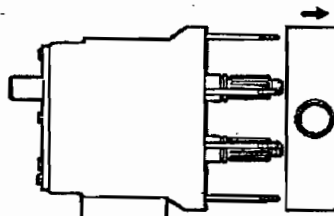


4. Remove rotor retaining nuts. Use the special wrench supplied with pump and hit it sharply with a soft hammer to loosen nuts.



5. Orient rotors perpendicular to each other and remove rotor with both wings exposed first. Handle rotors with care to avoid knicks and scratches. If it is stuck tight, use a gear puller or hardwood lever behind rotor hub to force it off spline.

6. Remove pump body by pulling it straight off studs. Use a soft hammer to assist if body is stuck tight.
7. See Section VI for seal disassembly procedure.
8. Clean and inspect body thoroughly.



CAUTION: Body must be reassembled on bearing housing from which it was removed. Both are identified with same serial number.



SEAL MAINTENANCE

NOTE: To service seals it is necessary to disassemble fluid head. See FLUID HEAD DISASSEMBLY-ALL MODELS in Section V for procedure.

1. O-Ring Service

- a. Remove and discard body O-rings.

NOTE: Use O-ring removal tool furnished with pump.

- b. Remove shaft sleeves and shaft O-rings.

- c. Thoroughly clean and inspect grooves, shafts and sleeves. DO NOT re-use sleeves that are grooved or scratched.

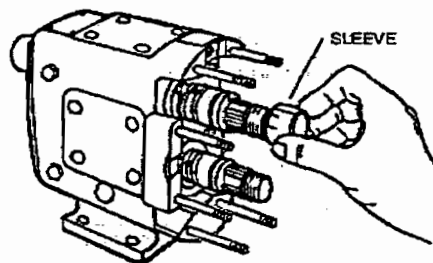
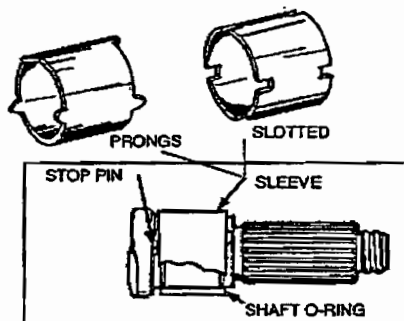
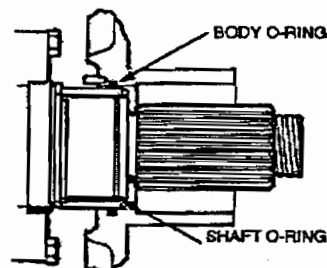
Assembly

- a. Apply an approved O-ring lubricant to NEW O-rings and insert them into body grooves and shaft grooves. Shaft O-rings should be installed into the front shaft groove (closest to the shaft spline) when using O-ring seals.

NOTE: Sleeves may be either slotted or have prongs.

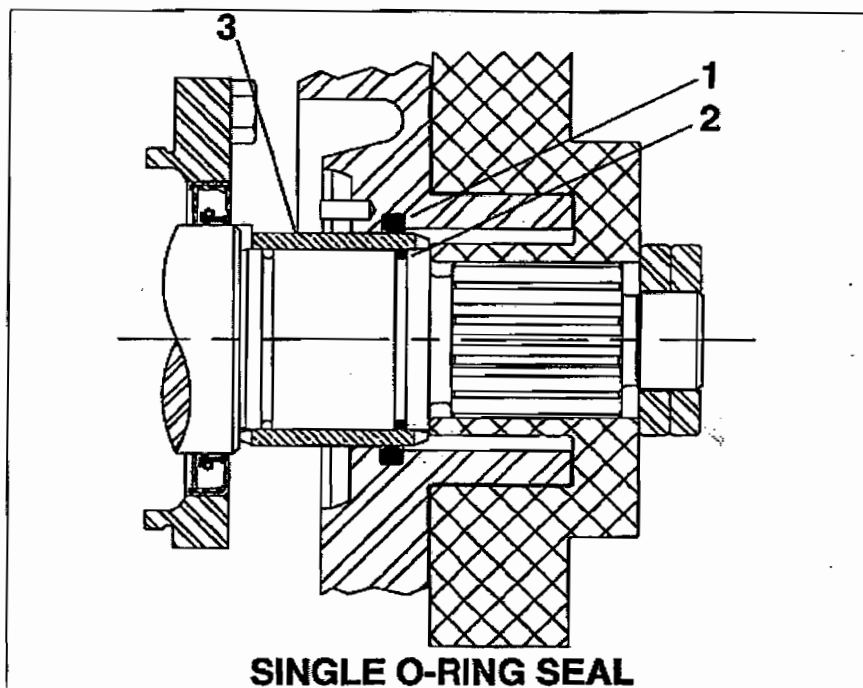
- b. Assemble shaft sleeves against shaft shoulder being sure the sleeve prongs DO NOT line up with the drive pin on shaft. However, do place the slotted sleeve over the pin if you have that type of sleeve.

- c. See Section V for fluid head assembly procedure.





UNIVERSAL PUMP



SINGLE O-RING SEAL

Model 6-14-15-18

Item	Description	Qty.	Part No.
1	O-Ring, Body	2	AD0 079 000
2	O-Ring, Shaft	2	N70022
3	Sleeve, Stainless Steel	2	015 098 000
	Sleeve, Ceramic	2	015 098 003

Model 30 - 34

Item	Description	Qty.	Part No.
1	O-Ring, Body	2	N70327
2	O-Ring, Shaft	2	N700289
3	Sleeve, Stainless Steel	2	030 098 000
	Sleeve, Ceramic	2	030 098 003

Model 60 - 64 - 130 - 134

Item	Description	Qty.	Part No.
1	O-Ring-Body	2	N70331
2	O-Ring-Shaft	2	N70131
3	Sleeve, Stainless Steel	2	060 098 000
	Sleeve, Ceramic	2	060 098 003

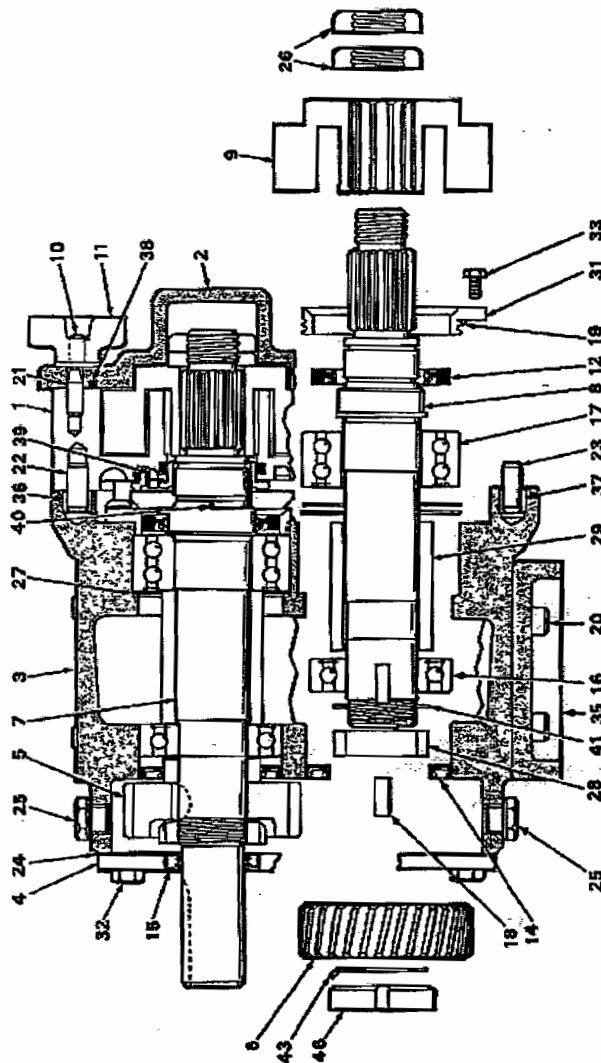
Model 220 - 224

Item	Description	Qty.	Part No.
1	O-Ring-Body	2	N70338
2	O-Ring-Shaft	2	N70144
3	Sleeve, Stainless Steel	2	220 098 000
	Sleeve, Ceramic	2	220 098 003

(Quantities are per pump)



UNIVERSAL PUMP MODEL 15



UNIVERSAL PUMP MODEL 15

Item	Description	QTY	Part No.	Item	Description	QTY	Part No.	Item	Description	QTY	Part No.
1	Pump Body - Flushing	1	015 001 010	19	Silicone Sealant	1	000 142 501	36	Stop Pin, Seal	2	015 128 000
2	Pump Cover, Flushing	1	015 001 011	20	Silicone Sealant	4	STD 039 000	40	Drive Pin	2	CD0 128 000
3	Pump Cover, Vented	1	AD0 002 500	21	Drive Pin - Cover, Upper	1	AD0 040 000	41	Spacer Seal	2	015 127 000
4	Pump Cover, Jacked	1	AD0 002 100	22	Drive Pin - Cover, Lower	1	AD0 040 100	42	Lockwasher, Gear	2	STD 138 005
5	Gear Case	1	AD0 002 110	23	Drive Pin - Gear Case, Upper	1	AD0 040 300	43	Lockwasher, Gear Retainer Assembly	2	STD 238 005
6	Gear Case Cover	1	020 105 000	24	Drive Pin - Gear Case, Lower	1	AD0 040 400	44	Stud Retainer Assembly	1	020 004 000
7	Gear, Drive Shaft	1	015 007 001	25	Silicone Sealant	1	000 142 501	45	Oil, Microplate #140	1	000 140 000
8	Gear, Drive Shaft	1	015 007 002	26	Hex Cap Screw, Fl, Drain, Level	8	000 046 002	46	1 Gallon Can	1	000 141 000
9	Drive Shaft	1	015 008 000	27	Shim, Front Bearing	4	AD0 002 001	47	Grease, Microplate #590	1	000 142 000
10	Short Shaft	1	015 009 000	28	Spacer, Gear	2	015 055 000	48	O-Ring Removal Tool	1	AD0 098 001
11	Wing Nut	2	015 010 000	29	Spacer, Bearing	2	015 065 001	49	O-Ring, Not Shown	1	AD0 098 001
12	Stud	1	AD0 011 000	30	Filter Washer	2	015 060 000	50	See Vented Cover Section Page 44 for Assembly Options		
13	Grease Seal, Front Brg, Retainer	2	000 050 016	31	Bearing Retainer	2	015 065 000	51	See Vented Cover Section Page 44 for Assembly Options		
14	Oil Seal, Gear Case Rear	2	000 030 017	32	Hex Cap Screw, Gear Case Cover	8	30-285	52	See Vented Cover Section Page 44 for Assembly Options		
15	Oil Seal, Gear Case Rear	2	000 030 016	33	Hex Cap Screw, Bearing Retainer	4	800 052 000	53	See Vented Cover Section Page 44 for Assembly Options		
16	Bearing, Rear	2	015 035 000	34	Grease Fitting	1	000 110 000	54	See Vented Cover Section Page 44 for Assembly Options		
17	Bearing, Front	2	015 035 000	35	Gear Case Base	1	AD0 116 000	55	See Vented Cover Section Page 44 for Assembly Options		
18	Key, Gear	2	AD0 037 000	36	Dowel Bushing, Upper	1	AD0 116 000	56	See Vented Cover Section Page 44 for Assembly Options		
				37	Dowel Bushing, Lower	1	AD0 116 100	57	See Vented Cover Section Page 44 for Assembly Options		
				38	O-Ring Cover, Buna N	1	NT0232	58	See Vented Cover Section Page 44 for Assembly Options		

NOTE: See Pages, 60-64 for Seal Option Identification. 163



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INSTRUCTIONS

EVR, Normally Closed (NC)
EVR, Normally Open (NO)



032R9638
032R9639

R 12, R 22, R 502

EVR 2, 3, 6 (NC) **EVR 8, 10, 15 (NO)**

EVR 15 (NC) **EVR 15, 20, 25 (NC)**

EVR 15 (NC) **EVR 25 (NC)**

12 W a.c. ~
20 W d.c. —

Min. medium temperature: -40°C (-40°F)
Max. medium temperature: 120°C (250°F)
Max. working pressure: PB 35 bar / MWP 500 psig
Max. opening diff. pressure (MOPD): 4.6 bar eff. (650 psig)
Test max.:

9 W a.c. EVR 2 42N t_{max} 40°C (105°F)
10/12 W a.c. 18Z t_{max} 80°C (175°F)
20 W d.c. 18Z t_{max} 50°C (120°F)
10 W a.c. 18Z t_{max} 55°C (130°F)
EVR (NO) t_{min} -40°C (-40°F)

Code no.
— V — 1/2" (a.c.)
— W — 1/2" (d.c.)
— Hz

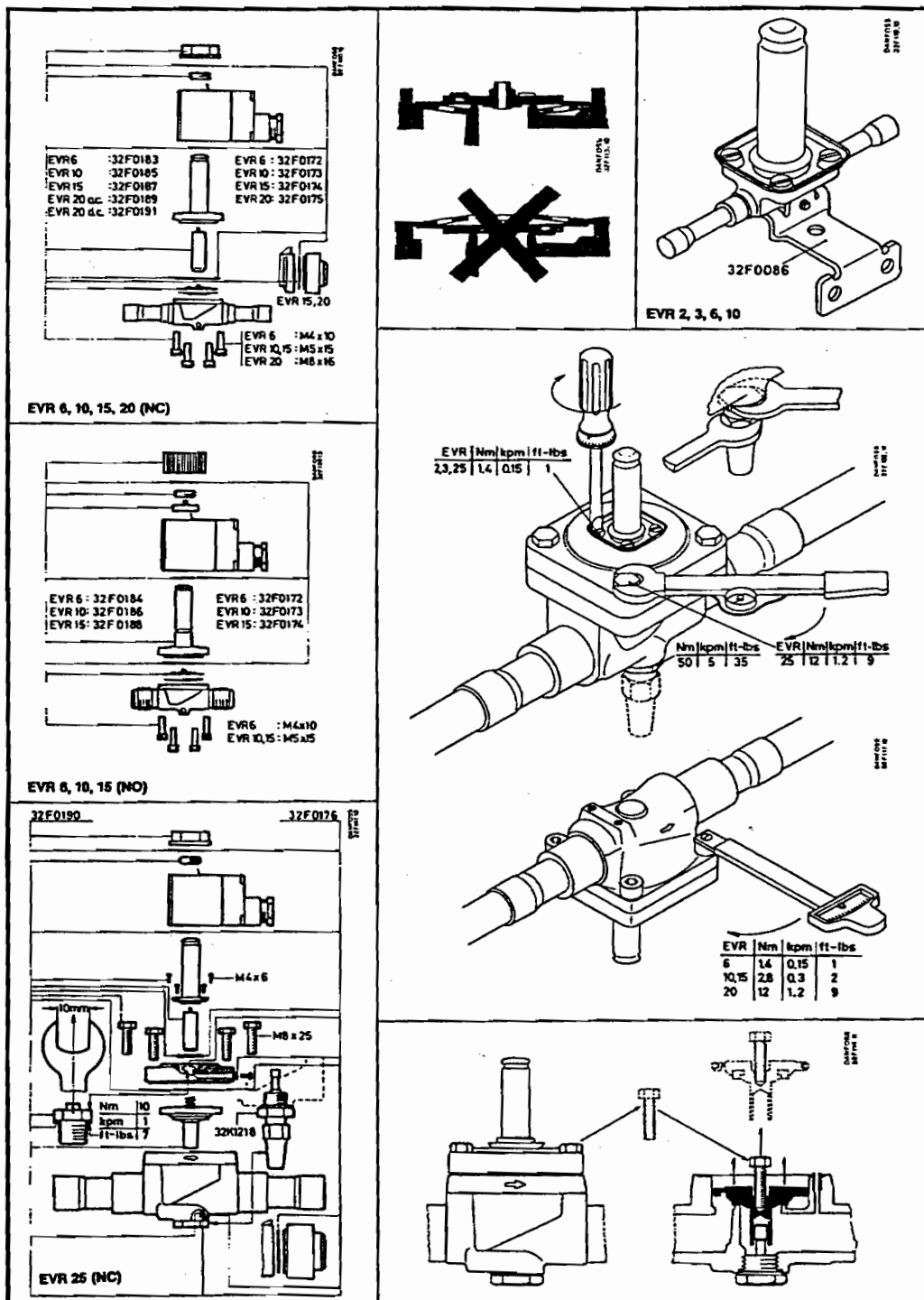
32FD180 **32FD181** **32FD171**

EVR 2 (NC) **EVR 3 (NC)**

Max 700°C (1300°F) **Max 150°C (300°F)**

32FD180 **32FD181** **32FD171**

EVR 2 (NC) **EVR 3 (NC)**





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INSTRUCTIONS

KP 15, 15A, 17W, 17B



060R8753

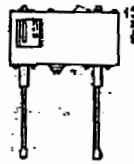
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KP 15, 17W, 17B: R 12, R 22, R 500, R 502
KP 15A: R 717 (NH₃)

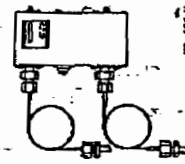


Fig. 1

KP 15, 17



KP 15, 17



KP 15A

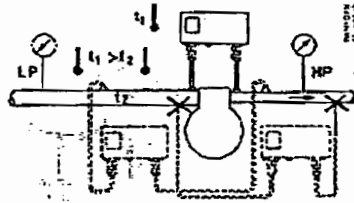


Fig. 2

KP 15: -40°C (-40°F)
KP 17: -25°C (-13°F)
t₁ max.: 65°C (150°F)

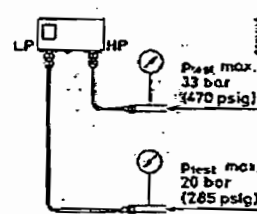


Fig. 3

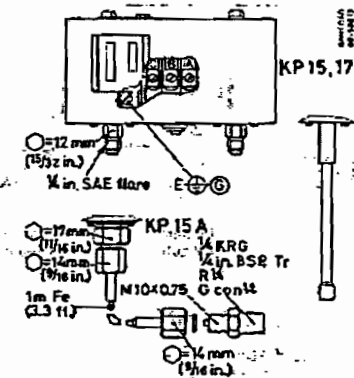


Fig. 4

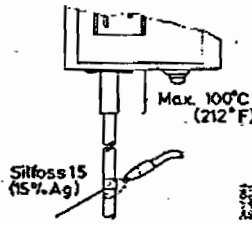


Fig. 5

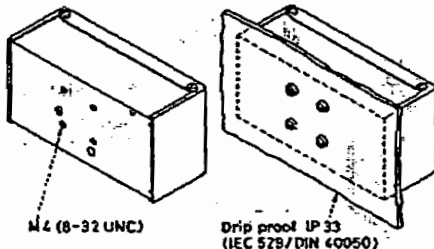


Fig. 6

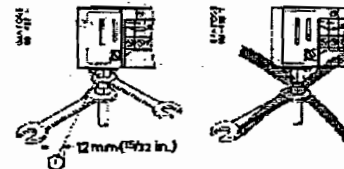
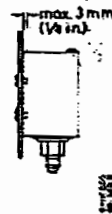
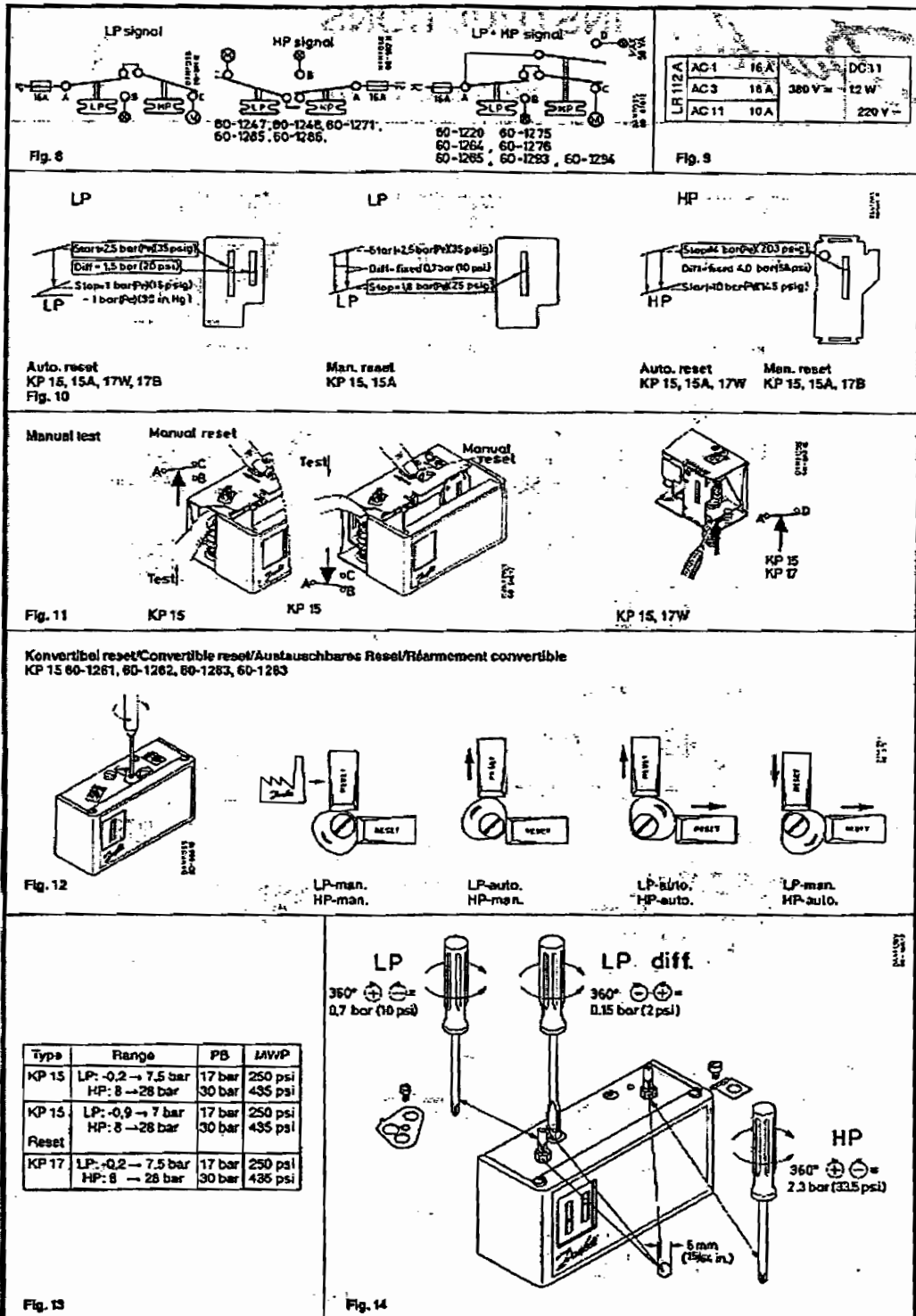
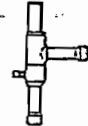


Fig. 7



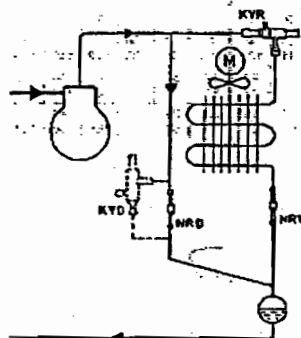
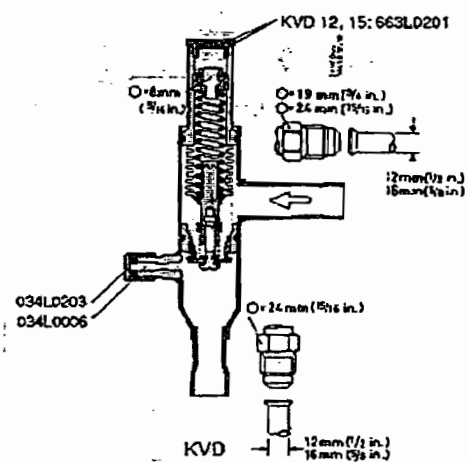
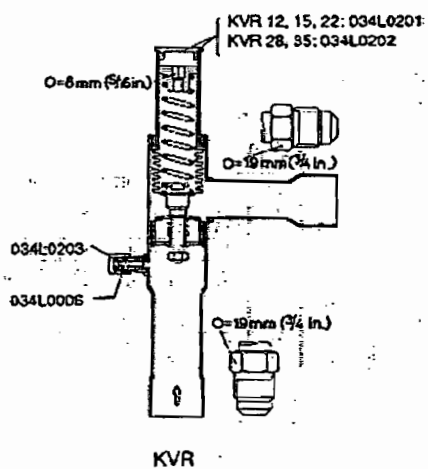
INSTRUCTIONS

KVR, KVD



R 12, R 22, R 502

KVR 12, 15, 22: $p_s = 5 \rightarrow 20$ bar (70 $\rightarrow$ 290 psig)
 KVR 28, 35: $p_s = 5 \rightarrow 17.5$ bar (70 $\rightarrow$ 250 psig)
 KVD 12, 15: $p_s = 3 \rightarrow 20$ bar (45 $\rightarrow$ 290 psig)



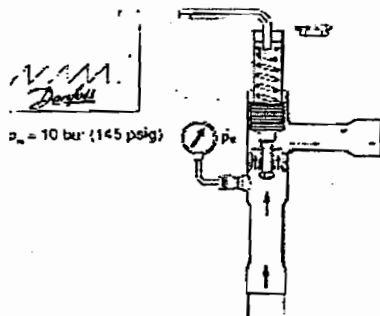
KVR, KVD:
 t_{max} (R 12, R 22, R 502) = +100 °C (212 °F)
 t_{min} (R 12, R 22, R 502) = -45 °C (-50 °F)

KVR 12, 15, 22:
 PB (MWP) = 28 bar p_s (310 psig)
 p_{max} = 31 bar p_s (400 psig)

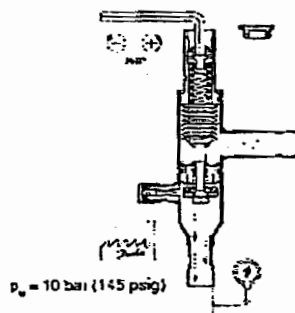
KVR 28, 35:
 PB (MWP) = 28 bar p_s (280 psig)
 p_{max} = 31 bar p_s (360 psig)

KVD:
 PB (MWP) = 28 bar p_s (400 psig)
 p_{max} = 31 bar p_s (440 psig)

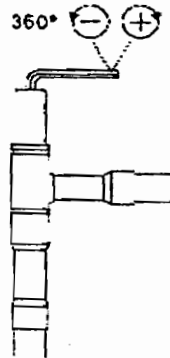




KVR



KVD



KVR 12 15 22
KVD 12 15

350°C - 2.5 bar (36 psi)

	psi bar	2 5	10 7.5	15 10	20 12.5	25 16	30 20	35 25	40 30	psi bar
380°	1	2	1	0	1	2	3	4	360°	1
R 12	C	22	35	46	54	62	69	75	C	R 12
	F	72	86	95	99	104	106	107	F	
R 12	C	6	14	27	35	42	48	53	C	R 22
	F	43	48	51	55	58	61	62	F	
R 502	C	2	14	23	31	38	44	50	C	R 502
	F	35	57	73	88	100	111	122	F	

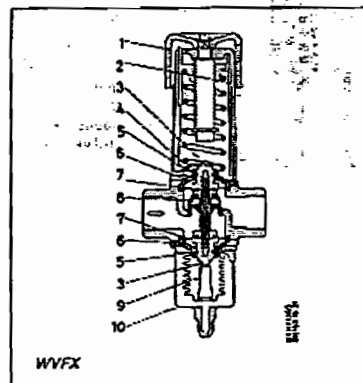
Design

General

Water side connections are internal BSP and the compressor discharge side connection is 1/2 in./6 mm flare.

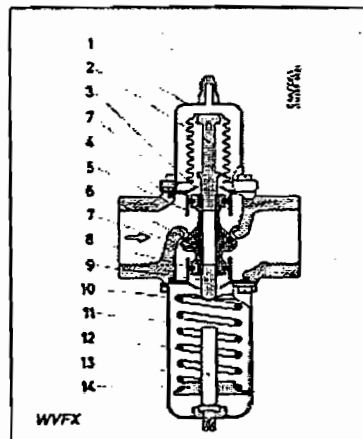
All external valve parts are surface-treated to resist corrosion from condensate, etc.

1. Handwheel
2. Spring housing
3. Spindle guide
4. Spring retainer
5. O-ring
6. Guide bush
7. Diaphragm
8. Valve plate
9. Thrust pad
10. Bellows element



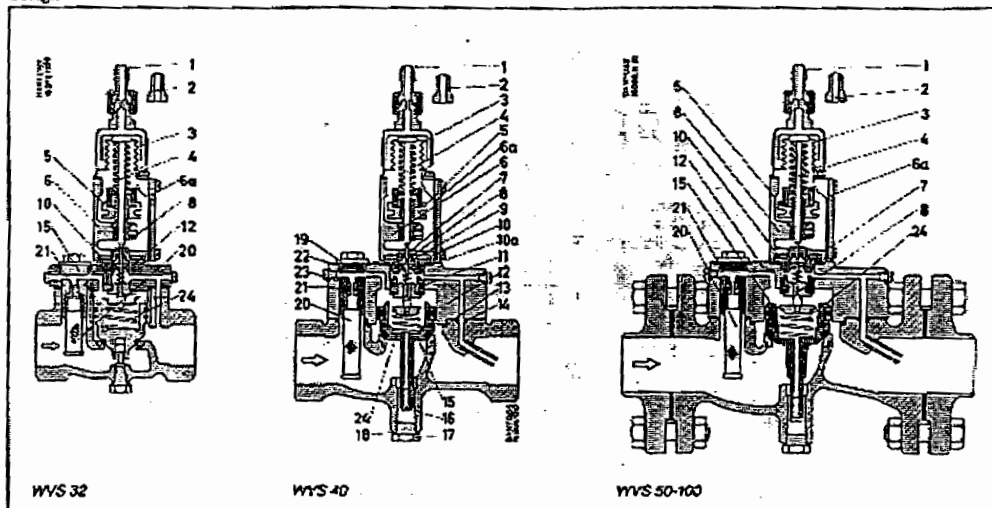
The valve body is made of hot-stamped brass. The valve plate (8) consists of a brass plate to which is vulcanized a layer of special rubber to form an elastic seal against the valve seat. The valve is externally sealed by the diaphragms (7). The top and bottom of the valve plate holder are extended by a guide that is fitted with O-rings (5) to ensure the internal operating parts move correctly. These O-rings, fitted in conjunction with the diaphragms, also provide extra protection against external leakage. The valve seat is made of stainless steel and is swaged to the valve body. The spring housing (2) is of aluminium and has a guide slot for the spring holder that is extended in the form of an indicating pointer. An associated indicator label is riveted to the housing and is graduated from 1 to 15.

1. Bellows element
2. Upper pressure spindle
3. Top plate
4. Guide bush gland
5. Guide bush
6. T-ring
7. Valve cone
8. O-ring
9. Lower pressure spindle
10. Spring retainer
11. Spring housing
12. Regulating spring
13. Regulating spindle
14. Spring holder



The valve body is made of cast iron. The valve cone (7) is made of brass with a T-ring (6) of artificial rubber forming a flexible seal against the valve seat. The O-rings (8) are external seals for the cooling water. The valve cone guide bushes (5) are specially treated to counteract lime deposits from the cooling water inside the cylinder, and also to reduce friction in the valve to a minimum. The valve seat is made of stainless steel and is swaged to the valve body. The regulating spindle (13) is mounted in a guide in the spring housing which has a notch for the spring holder (14). The spring holder also acts as an indicator.

Design



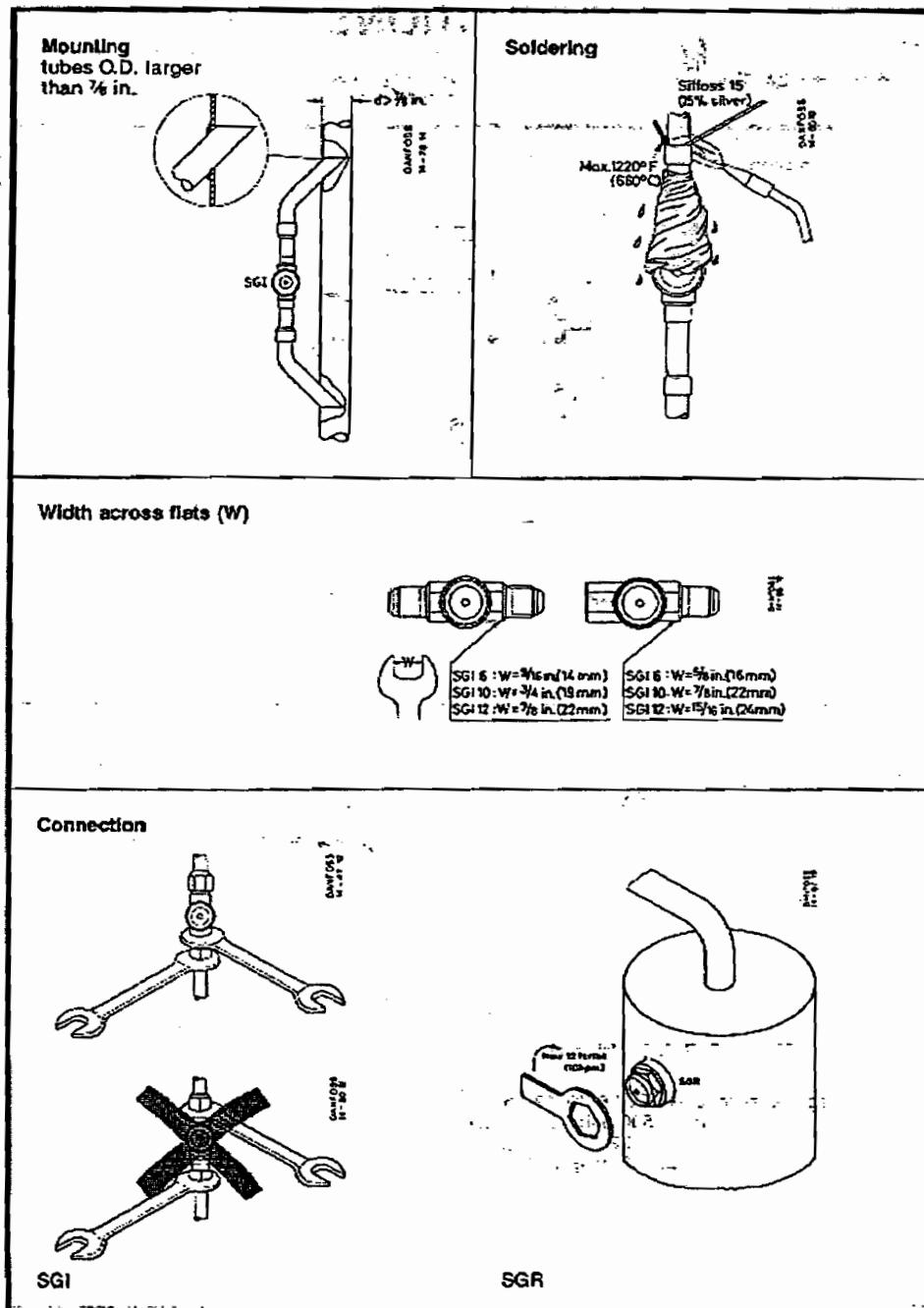
1. Pressure connection (flared nipple)
2. Pressure connection (weld nipple)
3. Bellows element
4. Push rod
5. Regulating nut
6. Spring housing
- 6a. Cover
7. Pilot assembly
8. Spindle for pilot cone
10. Insulating gasket
12. Valve cover
15. Servo piston
20. Self-cleaning strainer assembly
21. Pilot orifice
24. Servo spring

WVS 32-40 valves have internal BSP connections, while WVS 50-100 can be obtained with either BSP connections or weld flanges. Connection to the plant condenser can be made by copper tube or steel tube, the valves being supplied with both a flared nipple for 1/4 in. (6 mm) copper tube and a weld nipple for Ø6 mm/Ø10 mm steel tube.

The valve consists of three main components:
 1) *Main valve with servo piston*
 The main valve body is made of cast iron with a pressed-in bronze seat. The servo piston is of gunmetal and has a sleeve and a profiled rubber seal ring.

2) *Pilot valve*
 The pilot valve is made of gunmetal, the pilot cone and seat of stainless steel and the pilot orifice of K-monel. These materials are particularly resistant to water corrosion. However, the valve is not resistant to sea water. The strainer ahead of the pilot orifice is made of nickel gauze. The degree of opening of the pilot valve (which corresponds to the increase in condensing pressure above the set opening pressure) determines the degree of opening of the main valve and thereby the size of the water flow.

3) *Bellows unit with connection to condenser*
 The bellows unit is made of aluminium and corrosion-proofed steel.





DISPOSITIVI DI
REGOLAZIONE

ROTARY CONTROLS

elesa
CLAYTON

DISPOSITIF DE
REGULATION

STELLUNGSANZEIGER

Installation instructions

1. HANDWHEELS/HANDKNOBS

- 1.1 Where a handwheel/knob requires modification to suit the shaft or securing arrangement for the control spindle, please refer to the appropriate catalogue page for details and advice.

2. GRAVITY INDICATORS

- 2.1 Separate indicator and handwheel installation is as follows:
- 2.1.1 Lock the handwheel to the spindle by means of a pin or socket head grub screw.
- 2.1.2 Zero set the spindle, by rotating the handwheel.
- 2.1.3 Turn the indicator until the pointers are zero set.
- 2.1.4 Fit the zeroed indicator into the handwheel and uniformly tighten the radial securing screws with a moderate torque to prevent distortion of the case and thus locking the movement.

2.2 Indicators integral with handknobs installation is as follows:

- 2.2.1 Zero set the spindle.
- 2.2.2 Turn the indicator until the pointers are zero set.
- 2.2.3 Tighten the integral indicator to the spindle with the socket head grub screw and check both zero set positions.

3. POSITIVE DRIVE INDICATORS

- 3.1 Zero set the spindle.
- 3.2 Turn the external planet pinion of the indicator, until the pointers are zero set.
- 3.3 Take the handwheel/knob with the hole for the indicator planet pinion at 12 o'clock and turn the back gear disc until its anchor stud is in the correct position to locate into the machine frame.
Gently fit the zeroed indicator into the handwheel, inserting the planet pinion smoothly into the corresponding hole. Gently adjust the back disc until the planet pinion is geared to the crown gear wheel. Recheck the zero and ensure that the anchor stud position is correct. Uniformly tighten the radial securing screws with a moderate torque to prevent distortion of the case and thus locking the movement.
- 3.4 Fit the standard anchor pin (or similar), to extend the anchor stud such that it can be inserted in a hole on the frame of the machine. Adjust the height of the anchor pin (or similar) so that no undue strain is caused to the back disc in operation. Tighten the locknuts.
- 3.5 Fit the indicator handwheel assembly to the spindle, check the reference position, and lock to the spindle using the socket head grub screws.
- 3.6 Check operation of unit over the rotation range.

Montagehinweise

1. HANDRÄDER / DREHKNÖPFE

- 1.1 Verschiedene Ausführungen der Handräder / Drehknöpfe erfordern zur Montage maschinenseitig einige Vorkehrungen; Einzelheiten sind aus dem Katalog zu entnehmen.

2. STELLUNGSANZEIGER MIT FUNKTIONSPRINZIP PENDELSYSTEM

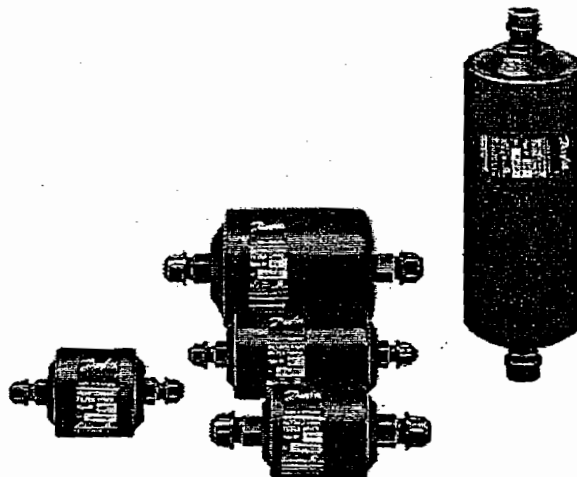
- 2.1 Vorgehensweise, wenn der Stellungsanzeiger nicht im Handrad / Drehknopf integriert ist, d.h. beide Teile liegen getrennt vor:
- 2.1.1 Handrad / Drehknopf auf die Spindel montieren.
- 2.1.2 Spindel in Ausgangsstellung (O-Stellung) drehen.
- 2.1.3 Stellungsanzeiger "von Hand", d.h. in nicht montiertem Zustand in O-Stellung bringen.
- 2.1.4 Stellungsanzeiger in Handrad / Drehknopf einbauen, und mit Druckschraube sichern. Nicht unnötig stark anziehen, um eine Verformung des Gehäuses zu vermeiden.

2.2 Vorgehensweise, wenn der Stellungsanzeiger in den Drehknopf integriert ist:

- 2.2.1 Spindel in Ausgangsstellung (O-Stellung) drehen.
- 2.2.2 Drehknopf mit Stellungsanzeiger "von Hand", d.h. in nicht montiertem Zustand in O-Stellung bringen.
- 2.2.3 Drehknopf auf die Spindel montieren und mit der Druckschraube befestigen. Durch Drehen des Drehknopfes prüfen, ob Ausgangsstellung der Spindel und O-Stellung der beiden Zeiger übereinstimmen.

3. STELLUNGSANZEIGER MIT FUNKTIONSPRINZIP FESTHALTESYSTEM (zwangsläufiger Antrieb)

- 3.1 Spindel in Ausgangsstellung (O-Stellung) drehen.
- 3.2 Stellungsanzeiger durch Drehen des außen liegenden Zahnrades in O-Stellung bringen.
- 3.3 Handrad / Drehknopf so halten, daß die Bohrung für das Zahnritzel in "12-Uhr-Stellung" ist, und das Kronenrad drehen, bis der Ankerstift in der Position der Aufnahmebohrung am Maschinenkörper ist. Stellungsanzeiger vorsichtig in Handrad / Drehknopf einsetzen, daß das Zahnritzel in das Kronenrad eingreift; dazu ist das Kronenrad eventuell etwas zu verstellen. Stellungsanzeiger mit der Druckschraube sichern; dabei nicht unnötig stark anziehen, um eine Verformung des Gehäuses zu vermeiden.
- 3.4 Länge des Ankerstiftes einstellen und mit Sechskantmutter sichern; dabei beachten, daß der Stift nach der Montage des Handrades / Drehknopfes nicht im Bohrungsgrund aufliegt.
- 3.5 Handrad / Drehknopf mit dem eingebauten Stellungsanzeiger auf die Spindel montieren und mit der Druckschraube befestigen.
- 3.6 Durch Drehen des Handrades / Drehknopfes prüfen, ob Ausgangsstellung der Spindel und Nullstellung der beiden Zeiger übereinstimmen.



Introduction

Filter drier type DX with a solid core is for use in liquid lines in refrigeration and air conditioning plant with fluorinated refrigerants.

Features

- Removes moisture from the refrigerating system rapidly and effectively
- Effective protection against moisture and acid in the refrigeration plant
Mixture of silicagel, molecular sieve and activated aluminium oxide.
- Greatest possible retention of impurities from the refrigeration plant
New type of solid core composed of grains of uniform size.
- Only slight pressure drop
- Can be installed in any position provided the arrow is in the direction of flow.
- Refrigerants
R 12, R 22, R 502.

Technical data and capacities

Type	Max. working pressure PSA/MPa	Liquid capacity in kW on pressure drop $\Delta p = 0.14$ bar			Drying capacity in g H ₂ O* at 24°C			Surface cm ²	Volume cm ³
		R 12	R 22	R 502	R 12	R 22	R 502		
DX 002	35 bar/ 500 psig	7.4	9.7	6.4	2.9	1.8	1.9	60	50
DX 002.5		11.5	15	10					
DX 003		19	26.3	17.1					
DX 002		7.5	9.8	6.5					
DX 003	28 bar/ 400 psig	21.9	28.0	19.2	4.6	2.7	3.0	75	65
DX 002		7.4	9.7	6.4					
DX 003		22.7	29.8	19.8					
DX 004		32.7	43	28.6					
DX 162	28 bar/ 400 psig	7.5	9.8	6.5	15.4	8.8	8.9	175	225
DX 163		23.3	30.8	20.3					
DX 164		33.4	43.9	29.2					
DX 165		49.9	65.6	43.6					
DX 303	35 bar/ 500 psig	24.8	32.6	21.7	26.3	15.4	16.9	330	480
DX 304		36.8	48.3	32.1					
DX 305		58.5	76.6	60.9					
DX 307		99.4	125	82.7					

* Table values are based on ARI standard 710-65.



TCLE, TJRE, TERE, TIRE, THRE

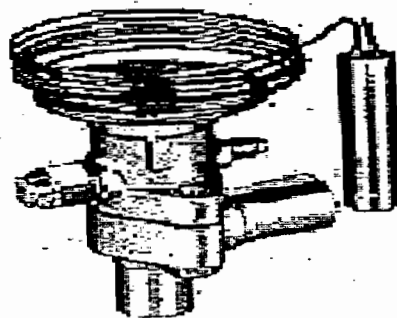
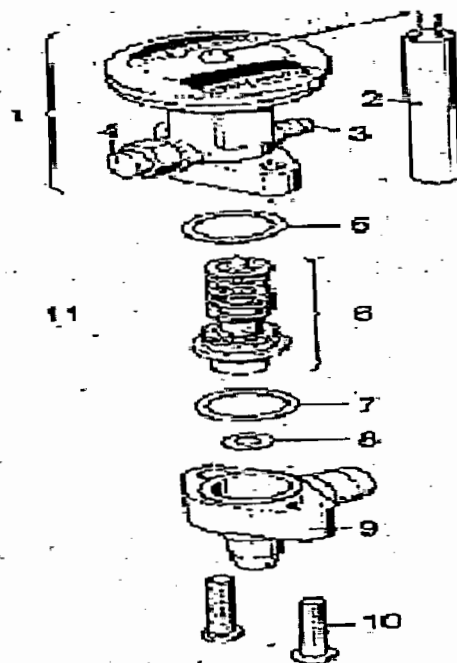


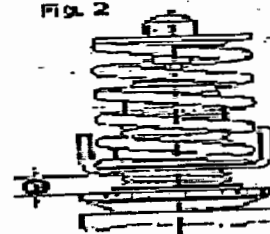
Fig. 1



Tab. 1

Q	R 22 R 502 R 1273		R 12 R 500	
	Q	Q	Q	Q
X 22440 X 11673	4.7	6.9	3.7	5.5
X 9117 X 9106 X 9124	6	9.0	5	7.6

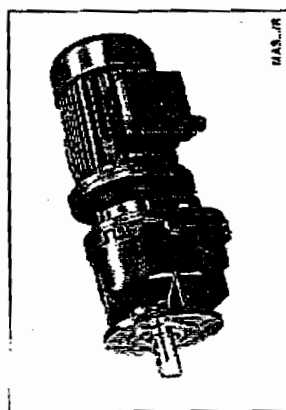
Fig. 2



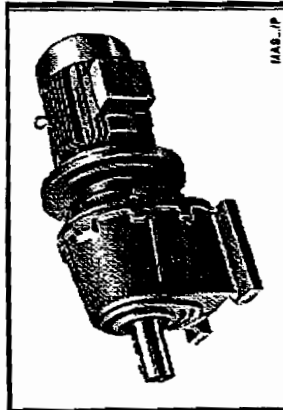


MASS

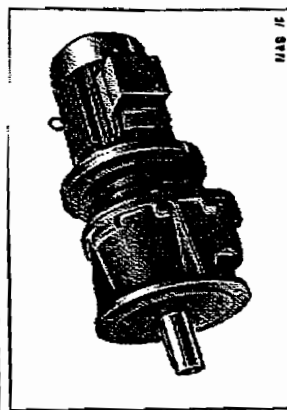
16÷35



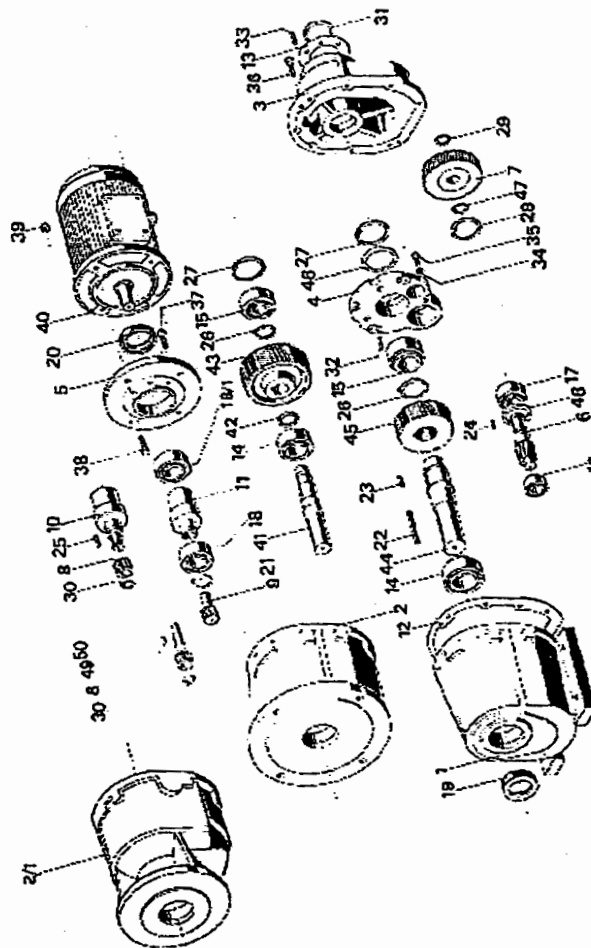
MAS.../P



MAS.../P



MAS.../E

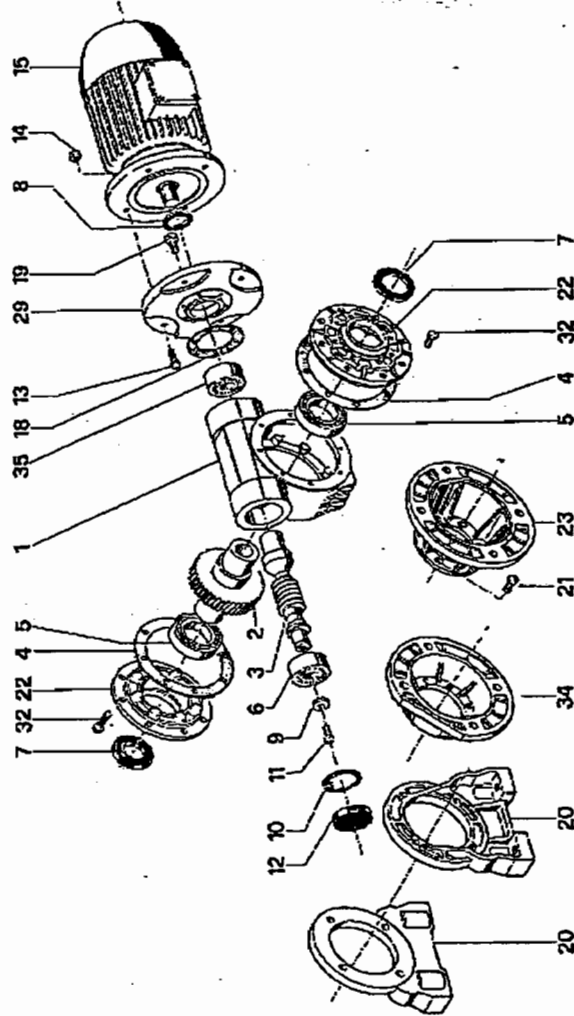
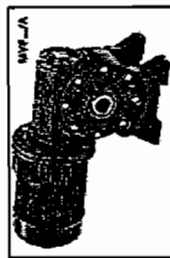


MAS...	Uscirelli - Brastep - Thickens - Kapselger - Rodamir/Box							Anelli di tenuta O-ring Chassis Dichtung Hülse	
	14	15	16	17	18	18/1	19	20	
16	6003 17/35/10	6201 12/32/10	6000 10/25/8	6200 10/00/9	6203 17/40/12	6005-2R6 23/47/12	20/30/7	25/35/7	
20	6204 20/47/14	6202 18/35/11	6201 18/32/10	6301 12/37/12	6205 25/52/15	6007-2RS 35/62/14	25/40/7	40/52/7	
25	6205 25/52/15	6204 20/47/14	6301 13/37/12	6302 13/42/13	6205 25/52/15	6007-2R6 35/62/14	30/47/7	40/52/7	
30	6008A-ETN9 40/58/15	6006 30/55/13	6204 20/47/14	6205 25/52/16	6206 30/62/16	6009-2R6 45/76/16	40/62/7	45/66/8	
35	32008 40/58/19	30208 30/55/17	30204 20/47/15,25	30205 25/52/16,25	6200 30/62/10	6009-2R3 40/70/16	40/62/7	45/66/8	

MAS...	N.	Denominazione	Description	Denominazione	Benennung	Denominazione
16-20-25-30-35	1	Cassa con pila	Casing with leaf	Cassa con pila	Gehäuse mit Flansch	Cassa con pila
25-30-35	2	Cassa con flangia	Casing with flange	Cassa con flangia	Gehäuse mit Flansch	Cassa con flangia
	2/1	Cassa con flangia ridotta	Casing with reduced flange	Cassa con flangia ridotta	Gehäuse mit Flansch Reduzierung	Cassa con flangia ridotta
	3	Copertina	Cover	Copertina	Deckel	Copertina
	4	Supporto interno	Internal support	Supporto interno	Innen Stütz	Supporto interno
	5	Flangia attacco motore	Motor flange	Flangia motore	Motorflansch	Flangia motore
	6	Pignone 2° riduzione	2nd red. pinion	Pignone 2° rid.	Pinion 2. Red.	Pignone 2° rid.
	7	Pignone 1° riduzione	1st red. gearwheel	Pignone 1° rid.	Zahnrad 1. Red.	Pignone 1° rid.
	8	Pignone 1° riduz. con foro	Flanged 1st red. pinion	Pignone 1° rid. con foro	Zahnrad 1. Red. mit Bohrung	Pignone 1° rid. con foro
	9	Pignone 1° riduz. con giunto	Extended 1st red. pinion	Pignone 1° rid. con giunto	Zahnrad 1. Red. mit Gelenk	Pignone 1° rid. con giunto
	10	Albero veloce con gambo	Extended input shaft	Albero veloce con gambo	Welle 1. Red.	Albero veloce con gambo
	11	Albero veloce con foro	Flanged input shaft	Albero veloce con foro	Welle 1. Red. mit Bohrung	Albero veloce con foro
	12	Guarnizione	Gasket	Guarnizione	Abdichtung	Guarnizione
	13	Guarnizione	Gasket	Guarnizione	Abdichtung	Guarnizione
	14	Cuscinetto	Bearing	Cuscinetto	Lager	Cuscinetto
	15	Cuscinetto	Bearing	Cuscinetto	Lager	Cuscinetto
	16	Cuscinetto	Bearing	Cuscinetto	Lager	Cuscinetto
	17	Cuscinetto	Bearing	Cuscinetto	Lager	Cuscinetto
	18	Cuscinetto	Bearing	Cuscinetto	Lager	Cuscinetto
	19	Anello di tenuta	O-ring	Anello di tenuta	Ring	Anello di tenuta
	20	Anello di tenuta	O-ring	Anello di tenuta	Ring	Anello di tenuta
	21	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	22	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	23	Linguetta	Key	Linguetta	Key	Linguetta
	24	Linguetta	Key	Linguetta	Key	Linguetta
	25	Linguetta	Key	Linguetta	Key	Linguetta
	26	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	27	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	28	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	29	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	30	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	31	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	32	Spina cilindrica	Cylindrical pin	Spina cilindrica	Zylinderstift	Spina cilindrica
	33	Spina cilindrica	Cylindrical pin	Spina cilindrica	Zylinderstift	Spina cilindrica
	34	Rosetta zigrinata	Washer	Rosetta zigrinata	Wellenring	Rosetta zigrinata
	35	Vite a testa esagonale	Hex. head screw	Vite a testa esagonale	Schraube	Vite a testa esagonale
	36	Vite a testa esagonale	Hex. head screw	Vite a testa esagonale	Schraube	Vite a testa esagonale
	37	Vite a testa esagonale	Hex. head screw	Vite a testa esagonale	Schraube	Vite a testa esagonale
	38	Vite a testa esagonale	Hex. head screw	Vite a testa esagonale	Schraube	Vite a testa esagonale
	39	Dado esagonale	Hexagonal nut	Dado esagonale	Mutter	Dado esagonale
	40	Molice	Molice	Molice	Motor electric	Molice
	41	Albero lento	Output shaft	Albero lento	Abtriebswelle	Albero lento
	42	Albero lento	Output shaft	Albero lento	Abtriebswelle	Albero lento
	43	Corona 2° riduzione	2nd red. gearwheel	Corona 2° rid.	Zahnrad 2. Red.	Corona 2° rid.
	44	Albero lento	Output shaft	Albero lento	Abtriebswelle	Albero lento
	45	Corona 2° riduzione	2nd red. gearwheel	Corona 2° rid.	Zahnrad 2. Red.	Corona 2° rid.
	46	Distanziale	Spacer ring	Distanziale	Abtriebswelle	Distanziale
	47	Seal esterno	Seal	Seal esterno	Seal	Seal esterno
	48	Distanziale	Spacer ring	Distanziale	Abtriebswelle	Distanziale
	49	Linguetta	Key	Linguetta	Key	Linguetta
	50	Albero 1° rid.	Shaft 1st red.	Albero 1° rid.	Welle 1. Red.	Albero 1° rid.

12

MVF
63+72



Component Designation Accessories Accessories	MVF...	
	63	72
5	6008 40/62/16	6009 45/72/16
6	BAQ8431418 20/62/16	30308 30/62/17,25
35	6007 35/62/14	BT1832970 45/72/18,25
Accessories Accessories Accessories Accessories	MVF...	
7	63	72
8	40/62/7	45/62/8
	35/52/7	45/62/8

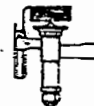
12

Versioni	MVF...	N.	Denominazione	Denomination	Benennung	Denominación
N-A P-FC V-P	63-72	1	Cassa	Housing	Getriebegehäuse	Caja
		2	Corona elicoidale	Wormwheel	Schneckenrad	Corona
		3	Vite senza fine	Wormshaft	Schnecke	Vis atri fin
		4	Guarnizione cassa	Gasket	Dichtung	Junta
		5	Cuscinetto	Bearing	Kugellager	Rodamiento
		6	Cuscinetto	Bearing	Kugellager	Rodamiento
		7	Anello di tenuta	O-ring	Stimmring	Retén
		8	Anello di tenuta	O-ring	Stimmring	Retén
		9	Flaila	Spacer ring	Lagerschale	Distancador
		10	Seeger	Seeger	Seeger	Seeger
		11	Vite a testa esagonale	Hexagonal head screw	Schraube	Tornillo hexagonal
		12	Coppellotto in gomma	Robber cap	Gummideckel	Sottoretella de caucho
		13	Vite a testa esagonale	Hexagonal head screw	Schraube	Tornillo hexagonal
		14	Dado esagonale	Hexagonal nut	Mutter	Tuerca
		16	Motore elettrico	Electric motor	El. motor	Motor elettrico
		18	Guarnizione flangia motore	Gasket motor	Dichtung	Junta
		19	Vite a testa esagonale	Hexagonal head screw	Schraube	Tornillo hexagonal
		20	Coperchio con piedi	Foot cover	Fußdeckel	Tapa con pies
N-A-V	63-72	21	Vite a testa esagonale	Hexagonal head screw	Schraube	Tornillo hexagonal
P-FC	63-72	22	Coperchio pendolare	P cover	P Deckel	Tapa P
N-A-F FC-V-P	63-72	23	Coperchio con flangia	Flange cover	Flanschdeckel	Tapa con brida
P	63-72	29	Flangia attacco motore	Motorflange	Motorflansch	Brida para motor
N-A F-FC V-P	63-72	32	Vite a testa esagonale	Hexagonal head screw	Schraube	Tornillo hexagonal
FC	63-72	34	Coperchio con flangia corta	FC Cover	FC deckel	Tapon con brida corta
N-A-F FC-V-P	63-72	35	Cuscinetto	Bearing	Kugellager	Rodamiento

Danfoss

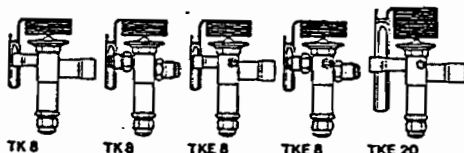
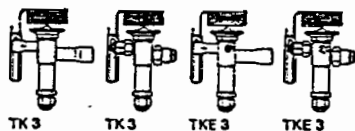
INSTRUCTIONS

TK 3/TKE 3
TK 8/TKE 8, TKE 20



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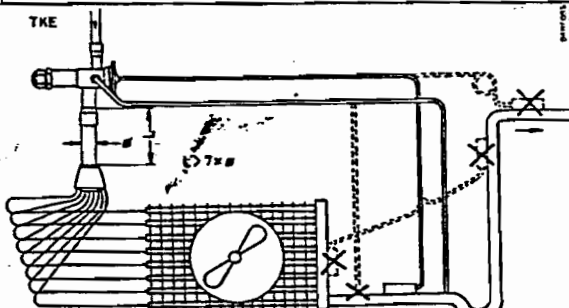
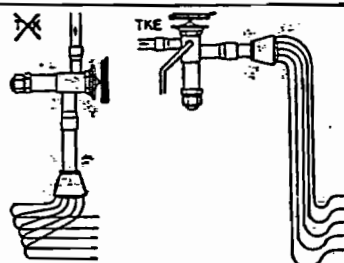
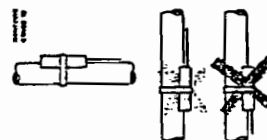
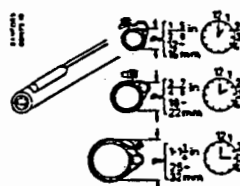
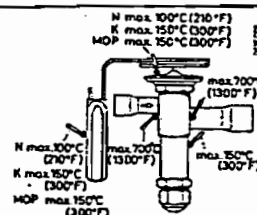
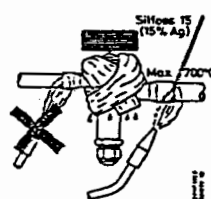
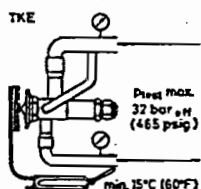
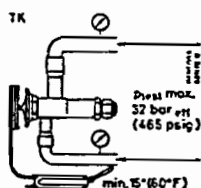


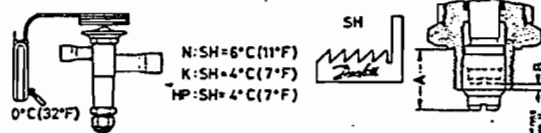
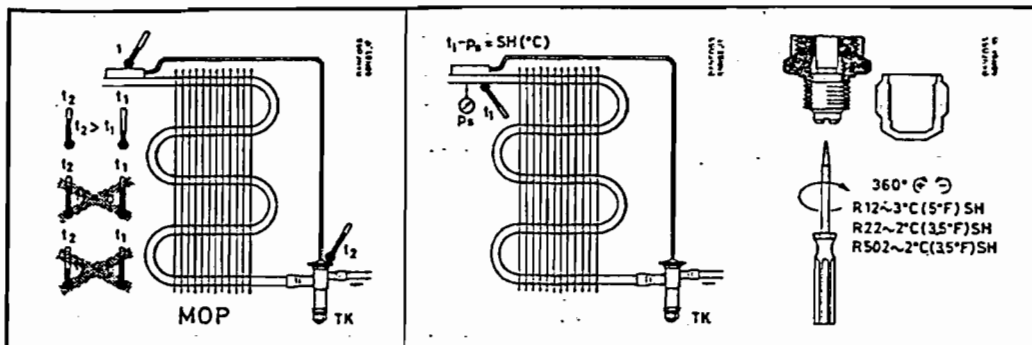
	R 12	R 22	R 502	MOP
N	-40 → +10°C -40 → +50°F	-50 → +10°C -60 → +50°F	-50 → +10°C -60 → +50°F	
K		-5 → +10°C +25 → +50°F		+15°C +60°F
HP*	-25 → +10°C -15 → +50°F	-25 → +10°C -15 → +50°F	-25 → +5°C -15 → +40°F -25 → +10°C -15 → +50°F	+10°C +50°F +15°C +60°F

			kW** (kJ/s)	kcal/h**	TR** (tons)
N HP*	TKF/TKEF	3-2	7	6 000	2.0
	TKF/TKEF	3-2	10.5	9 000	3.0
	TKF/TKEF	8-5	17.5	15 000	5.0
	TKF/TKEF	8-8	28.0	24 000	8.0
	TKEF	20-12 20-20	42.0 70.0	36 000 60 000	12.0 20.0
N K HP*	TKU/TKEU	3-3	10.5	9 000	3.0
	TKU/TKEU	3-5	17.5	15 000	5.0
	TKU/TKEU	8-8	28.0	24 000	8.0
	TKU/TKEU	8-12	42.0	36 000	12.0
	TKEU	20-18 20-30	63.0 105.0	54 000 90 000	18.0 30.0
N HP*	TKY/TKEY	3-2	7.0	6 000	2.0
	TKY/TKEY	3-3	10.5	9 000	3.0
	TKY/TKEY	8-5	17.5	15 000	5.0
	TKY/TKEY	8-8	28.0	24 000	8.0
	TKEY	20-12 20-20	42.0 70.0	36 000 60 000	12.0 20.0

* HP = heat pump

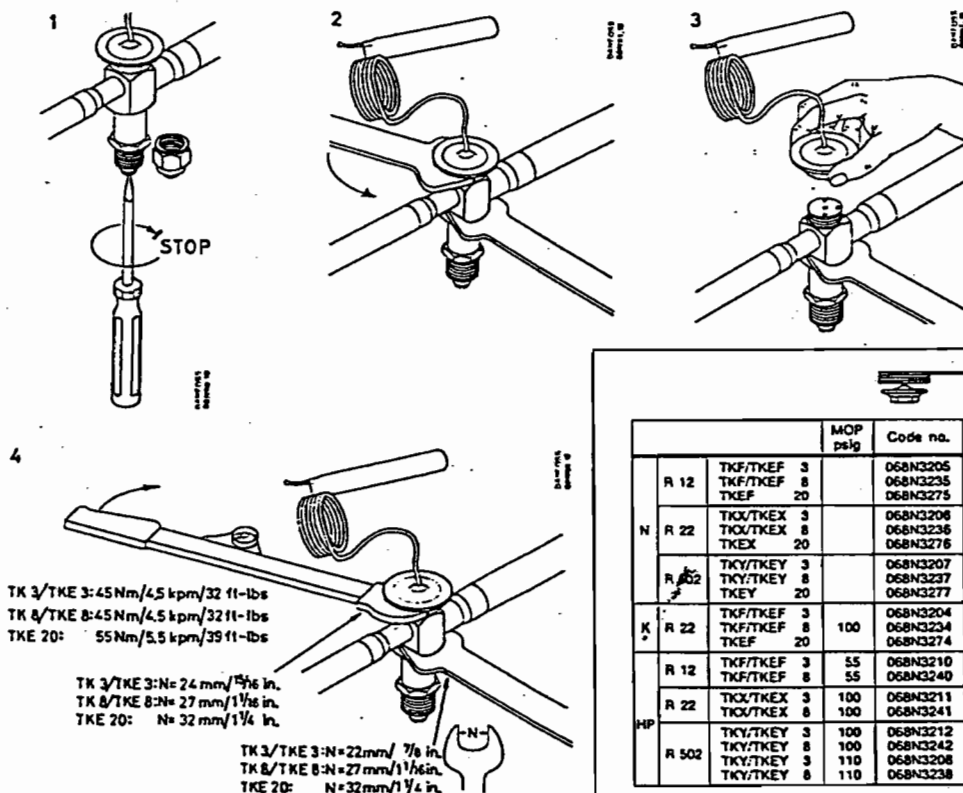
** t_a = +5°C, t_e = +32°C
(t_a = +40°F, t_e = +90°F)





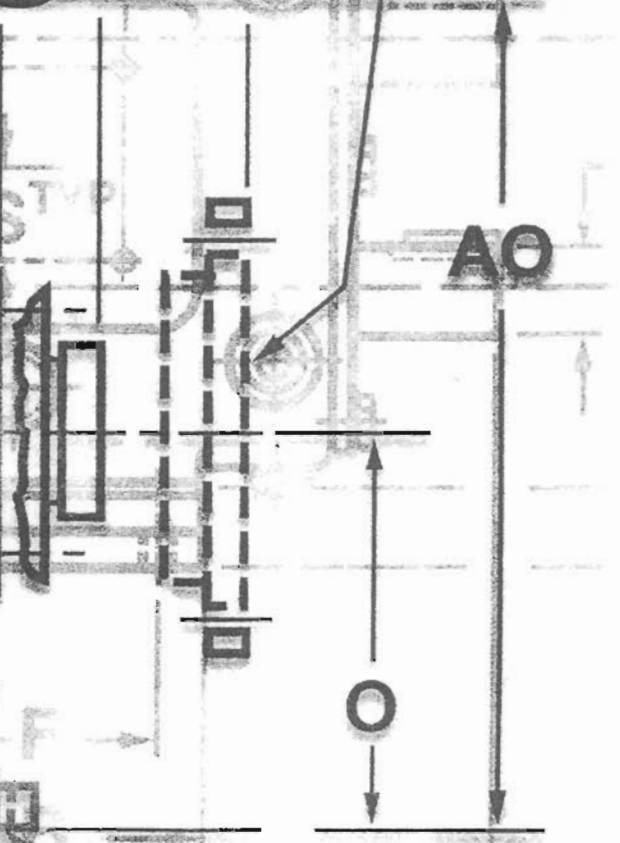
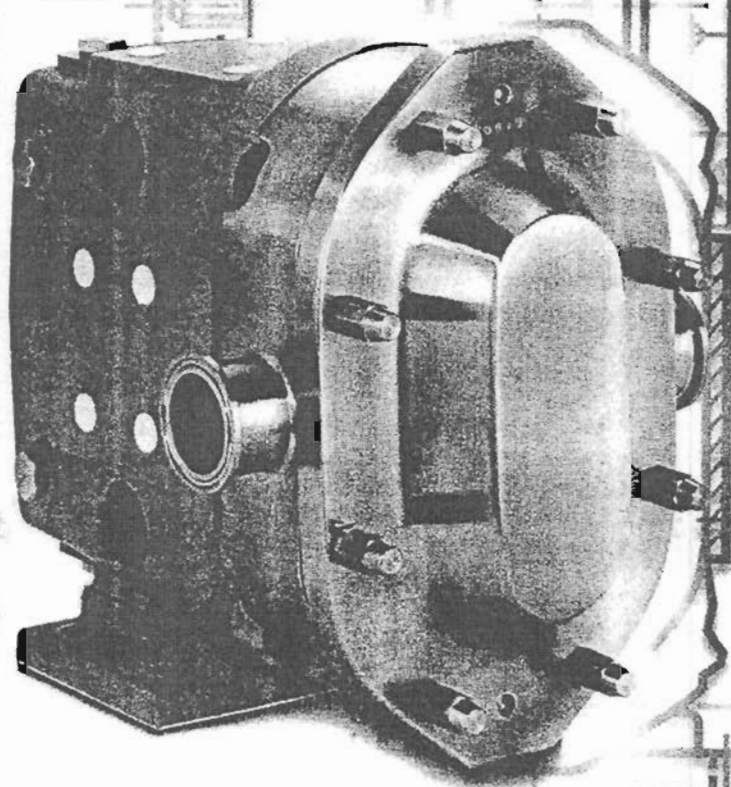
		A	
		mm	in.
R 12	TKF/TKEF 3	10.5	0.41
	TKF/TKEF 8	13.0	0.51
R 22	TKX/TKEX 3	9.5	0.37
	TKX/TKEX 8	11.5	0.45
R 502	TKY/TKEY 3	9.0	0.35
	TKY/TKEY 8	11.5	0.45

		B	
		mm	in.
R 12	TKEF 20	1.5	0.06
R 22	TKEF 20	3.5	0.14
R 502	TKEY 20	4.0	0.16



SIDE
MOU

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The versatile new PD with the latest in fatigue-life and sanitary engineering

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The new UNIVERSAL II raises these levels again with advanced design elements that extend pump life and improve sanitary performance:

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