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# ATLAS DANMARK

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# INSTRUCTION

for

# ATLAS VERTICAL SLICE ICE MACHINES

Types V-156, V-316, V-619, VD-746 & VD-1206

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DRAWINGS:

# W A R N I N G

We draw attention to the fact that cleaning and flushing with steam or hot water of compressors, condensors, tanks, cooling units and other parts of a refrigeration plant filled with refrigerant may cause a violent explosion, for which reason it is highly dangerous.

Moreover, tanks and cooling coils which may be filled with refrigerant in liquid form, must never be completely closed before making sure that the units in question are not completely filled up with the liquid.

The drums of ice machines connected to pump plants might inadvertently be completely filled with refrigerant. At rise of temperature the generated pressure can burst the drum. Consequently, these ice machines should always be provided with a safety valve.

In order to give the drum surface the best corrosion resistance possible it is coated with a thin metal layer. This layer is resistant to the ice scraping, but cannot stand sporadic mechanical stresses from hard obejcts. Consequently, it is important to check that the knife does not touch the drum at ambient temperature, just as blows etc. on the drum surface must be avoided.

# SLICE ICE MACHINE TYPE V AND VD

## Description

Where no other indications are made, the item numbers in brackets refer to the "sectional drawings" at the back of the book.

Machine type V has a horizontal, slowly rotating freezing drum (17), the rotation direction of which must always be counter clockwise when seen from the top. On machine type VD, which has 2 freezing drums, the left drum rotates clockwise and the right drum counter-clockwise. The drum is cooled internally by the evaporating refrigerant, while the outer surface is sprinkled with water from a distributing pipe (10). On the cold surface of the drum, part of the water is frozen to ice, and the surplus water runs down to a water reservoir (13). A water pump (20) draws the water from the reservoir and forces it to the distributing pipe (10).

Ice machines type VD with two drums are supplied with one water pump for each drum.

In order to obtain a dry, sub-cooled ice, water is not sprinkled on the last part of the surface of the drum direct in front of the knives (2).

The water level in the water reservoir is kept constant by the supply of water through a float valve (12). The water is led through a pipe to the nozzle (11), from where it is sprayed on the under side of the drum, ensuring that the under side of the drum is kept free of ice.

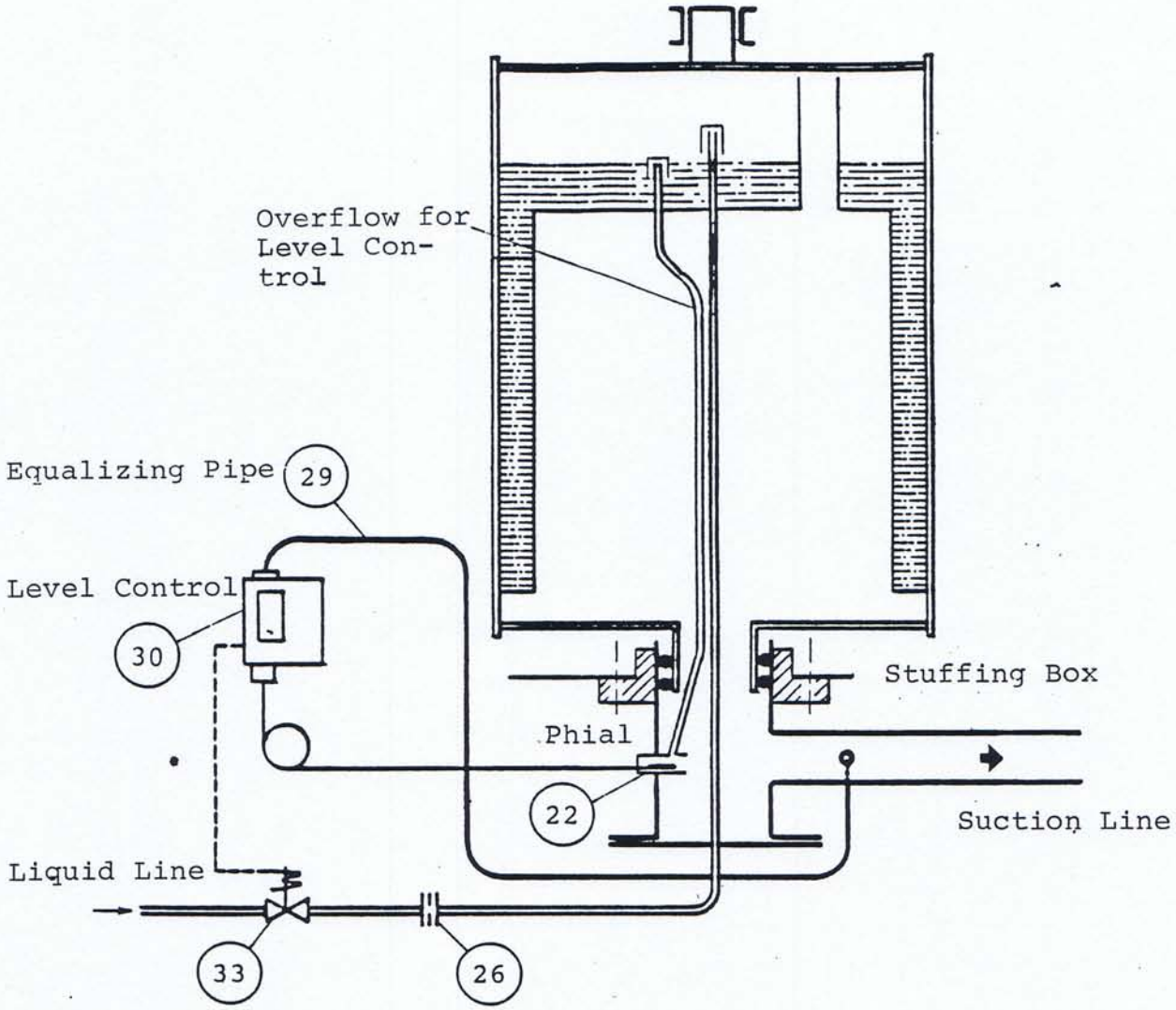
The ice layer on the surface of the drum is removed by means of a row of knives, which are fastened to a vertical knife holder (2) on the front edge of the frame. The ice slips through the ice chute below and leaves the machine.

The drum is driven by an electric motor (7) with a V-belt variator (6) and a worm gear (5), which by a coupling (35) transmits the power to the drum. The number of revolutions can be adjusted continuously during operation with the V-belt variator. (Thickest ice is produced at low speed).

The freezing drum is guided at the top by a spherical ball bearing (36), and below the axial thrust is absorbed by a groove ball bearing (42), which is lubricated with oil from the oil cup (21).

The sealing between the stationary and the rotating part is effected by means of the suction junction (15), which is supplied with special sealing rings (41).

SIMPLYFIED DIAGRAM OF REFRIGERANT CONTROL



The slice ice machine is constructed to be used for ammonia (R717), R12, R22 and R502. (For change of refrigerant please consult ATLAS).

Control of the supply of refrigerant by level control is carried out automatically by means of a level control (30) with external pressure equalizing pipe (29) to the suction junction (15). The level control directs the solenoid valve (33) in the liquid line. The solenoid valve is equipped with a filter (34). In the flange connection (24) after the solenoid valve a nozzle (26) is inserted, where the expansion of the refrigerant takes place.

The phial of the level control is placed in a phial housing (23). The phial (22) is equipped with a built-in electric heating element of 10 watts. The heating element is supplied with current from a transformer (31) with an output voltage of 24 V.

Above the phial housing (23) an overflow pipe is placed leading the refrigerant to the phial, when the drum has obtained the correct charge. (See diagram of refrigeration control on page 3 and drawing "Suction connection branch").

Control of the refrigerant supply by pump circulation is carried out by means of a regulator valve (32) in the liquid line.

## SLICE ICE MACHINES FOR SEAWATER

When producing ice from seawater, the following modifications are made:

The float valves (12) are removed. Instead the water supply is controlled by a valve in the line for the inlet water.

From the water reservoir (13) an overflow pipe (14) on branch "L" has been installed, which partly ensures a constant water level, partly drains off a constant flow from the water reservoir.

The water supply to the machine is adjusted in such a way that the overflow will not exceed 0.2 litre/min., when the machine is operating.

The ice knife is specially made for seawater and suitable for concentrations as low as 0.3%.

As seawater is highly corrosive, attention should be paid to the paragraph dealing with corrosion protection on page 27. Moreover, at standstills exceeding 24 hours the drum must be washed thoroughly with freshwater after the drum has been thawed-off. The thawing-off can be effected at the quickest by allowing pump and drum to run after having stopped the compressor.

## PRODUCTION OF ICE ON SLICE ICE MACHINE

### Ice made from Fresh water

When producing ice, the composition of the water will have a rather great influence on the character of the ice. Consequently, ice produced from soft water (rain water) will be partly clear and stick heavily to the drum, for which reason it will be necessary to add a small amount of salt to the freezing water in order to make it possible for the ice to slip the drum easily.

Very hard water (a high calcium content) will result in calcareous deposits on the drum, which will also make the ice stick to same, whereby the knives will crush a great part of the ice. It is our experience that, when adding a small quantity of salt to the freezing water, the calcareous deposit will diminish and at the same time the ice will get tougher, will not stick to the drum and will fall off in bigger pieces.

In certain cases, it will thus be advantageous to use the salt dosing device which is included in our delivery as additional equipment free of charge, and which is described in the instruction "Salt Dosing Device" page 31. If there is easy access to seawater this may be added direct to the water reservoir.

The quantities of salt required are so insignificant that it cannot be tasted in the ice, and it has no influence on the application of the ice for foodstuffs.

### Ice made from Seawater

When producing ice from seawater, knives of a different type are used, as this ice is soft and tough. It is necessary to apply lower suction temperatures than when producing ice from freshwater, as the seawater ice must be colder when leaving the machine.

In order to avoid high concentration of salt the water reservoir of the ice machine is equipped with an overflow pipe, consequently draining constantly a small amount of water from the machine.

## INSTALLATION DATA

The position indications refer to the enclosed installation drawings and dimension sketches, page 10-14

| | Type | | V-156 | V-316 | V-619 | VD-746 | VD-1206 |
|---|---|---|---|---|---|---|---|
| | Capacity | tons/24 h | 3-8 | 6-16 | 12-30 | 15-38 | 24-60 |
| | Motor kW | Drum | 0,75 | 0,75 | 0,75 | 2x0,75 | 2x0,75 |
| | | Pump | 0,37 | 0,37 | 0,37 | 2x0,37 | 2x0,37 |
| | Refrigerant charge kg | R717 (NH3) | 54 | 95 | 229 | 2x125 | 2x229 |
| | | R12 | 118 | 200 | 504 | 2x274 | 2x504 |
| | | R22 | 110 | 190 | 464 | 2x254 | 2x464 |
| | | R502 | 114 | 195 | 484 | 2x264 | 2x484 |
| | Approx. net weight kg | | 1165 | 1250 | 1900 | 3350 | 4400 |
| A | Liquid line connection with flanges for welding | | 1" | 1" | 1" | 2x1" | 2x1" |
| B | Suction line connection | | 4" | 4" | 4" | 2x4" | 2x4" |
| | | | Delivered with counter-flange with sealing cap protection during shipment. Cap to be cut off before connection | | | | |
| C | Water connection with ext. pipe thread | | 1" | 1" | 1" | 1 1/4" | 1 1/4" |
| L | Branch for draining off surplus sea water, with ext. pipe thread (to be used only on machines for seawater) | | 1 1/2" | 1 1/2" | 1 1/2" | 1 1/2" | 1 1/2" |
| M | Branch for drain from bottom tray with int. pipe thread | | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| N | Branch for drain from water tank | | 3/4" | 3/4" | 3/4" | 3/4" | 3/4" |
| | | | Pipe branch with rubber plug | | | | |
| | Salt dosing | | Salt dosing pump delivered separately (see description page 31). | | | | |

12 Water supply control:

| | |
|---|---|
| Fresh water: | Float valve |
| Seawater: | Throttle valve - not included in the price. |

Necesary pressure of make up water: Seawater/fresh water: 1.0 kg/cm2.

16 Valve for draining of oil from the drum, branch with 7/8" ext. pipe thread.

20 Water pump. The pump is built in, and pipe connections are executed from factory.

21 Oil cup for bottom bearing.

24 External flange connection:

| | |
|---|---|
| For thermostatic level control: | Built-in expansion nozzle |
| For pump circulation: | The supplied throttle valve is to be installed. |

30 Level control.

31 Transformer for heating of phial.

Not included in the Delivery are:

1 Liquid line with stop valve. To be sized for actual refrigeration requirement and refrigerant applied.

2 Suction line with stop valve. To be sized for actual refrigeration equipment and refrigerant applied.

3 Water piping for make-up water and, in case of working with seawater, throttle valve for regulation of the amount of make-up water.

4 Possible screen in front of the machine to conduct the ice down into the outlet hole -see note No. XI, page 9.

7 Piping for drain from bottom of drip tray.

8 Drain pipe with visible overflow for control of surplus seawater.

9 Equipment for salt dosing pump, such as mixing tank and float valve. See page 31.

10 Floor drain

11 Liquid separator with heat exchanger. Necessary for use in installations on board ships. For land installations, the separator is not necessary, but combined with an alarm for too high liquid level, it is an extra precaution for the whole plant.

If more than four drums are working at the same suction line, such a separator is recommended.

For the refrigerants R12, R22, or R502, a heat exchanger, f. inst. a vertical double pipe heat exchanger, in the suction line is recommended.

13 Flange assembly on suction line close to the machine - max. 1 metre (3 ft) -for dismantling, facilitating access.

33 Solenoid valve for refrigerant. To be placed horizontally and at a higher level than the branch A. Max. distance from A 2 metres (6 ft.) May be ordered from ATLAS as additional equipment.

WHEN PROJECTING AND INSTALLING THE SLICE ICE MACHINES THE FOLLOWING SHOULD BE NOTED:

I If space permits, the Slice Ice Machine ought to be placed on a foundation with a height of approx. 150 mm. This is to ensure a good outlet from the bottom tray and drip tray M and of the surplus water L to the floor drain. If space does not permit this height, it can be reduced. The machine may be placed direct on floor.

III Normally, as shown on the sketch, branches and connections are placed on the right-hand side of the Slice Ice Machines type V

On request, the following branches can be delivered placed on the left-hand side of the Slice Ice Machines type V-156,V-316, and V-619:

A Liquid pipe branch

B Suction pipe branch

Note M The branch for drain from bottom tray is placed on both sides as standard

IV The machines must be placed in a room free of frost.

V All piping - especially the suction line - should be supported so that the machine will not be exposed to stresses by tensions in or by the weight of the piping.

VI NOTE:
If the suction line is placed with an upward inclination after having left the slice ice machine, it must be furnished with a liquid lock as illustrated, irrespective of whether R717, R12, R22, or R502 is used as refrigerant.

VIa A suction line smaller than the branch on the slice ice machine should be connected to the bottom of the cross sectional area of the connecting branch.

VII The piping lay-out, as shown in the drawing, serves exclusively as an illustration. The piping should be made in accordance with the regular procedure used for pipe work of industrial refrigeration plants.

VIII The space requirement for inspection and maintenance indicated in the dimension sketches is normal practice.

IX Precautions must be taken to prevent the floor drain from freezing up, if the slice ice machine is placed on top of the ice silo.

XI Recommendations for the design of screens, see sketch page 14:

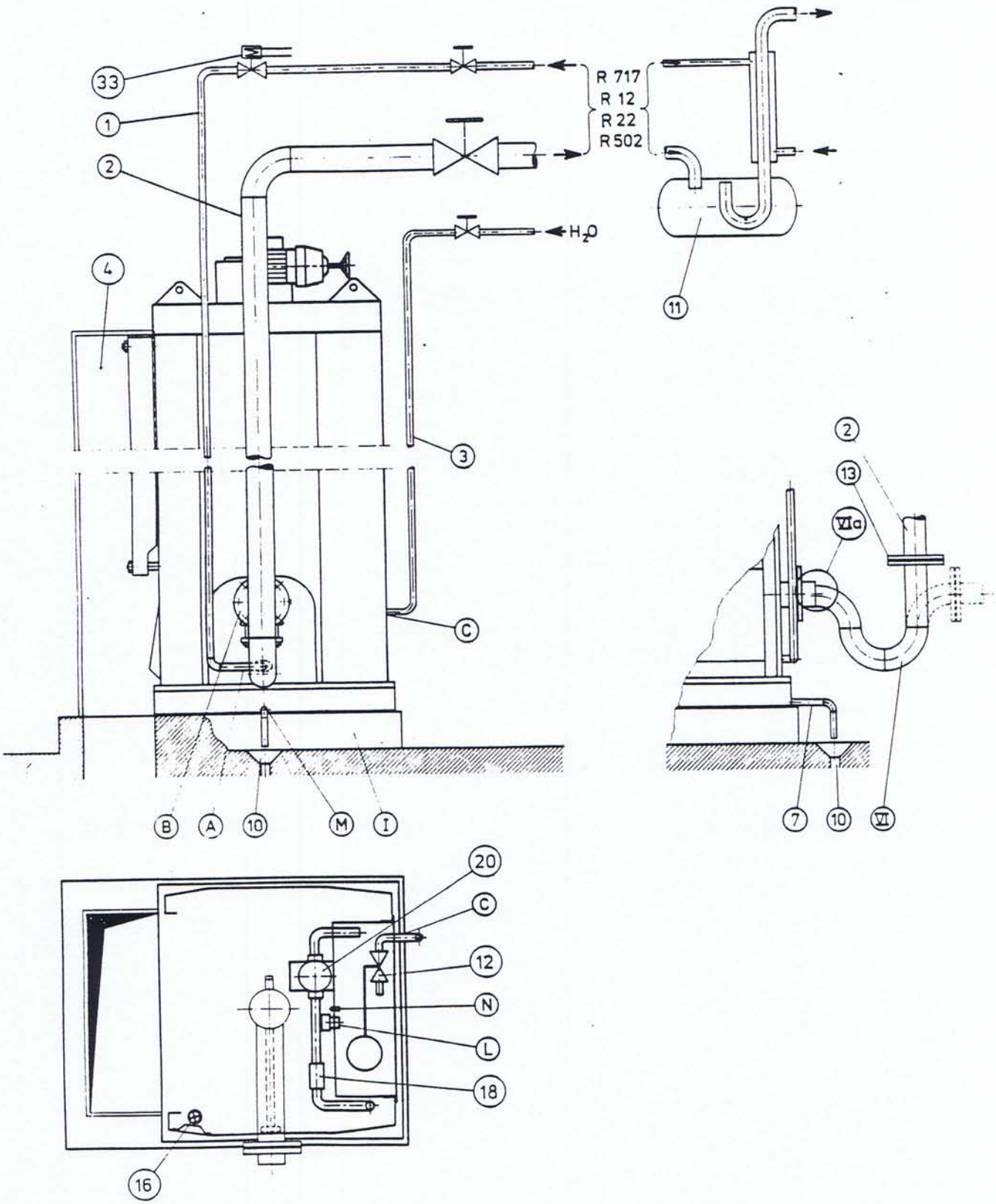
b) If the ice machine is placed above a cooled ice silo the screen should be closed and have the same height as the entire machine. In other cases an open hopper with a height of approx. half of that of the ice machine would be preferable.

c) If the screen is made in sections, the joint between each section must be designed in such a way that ice accumulation is avoided.

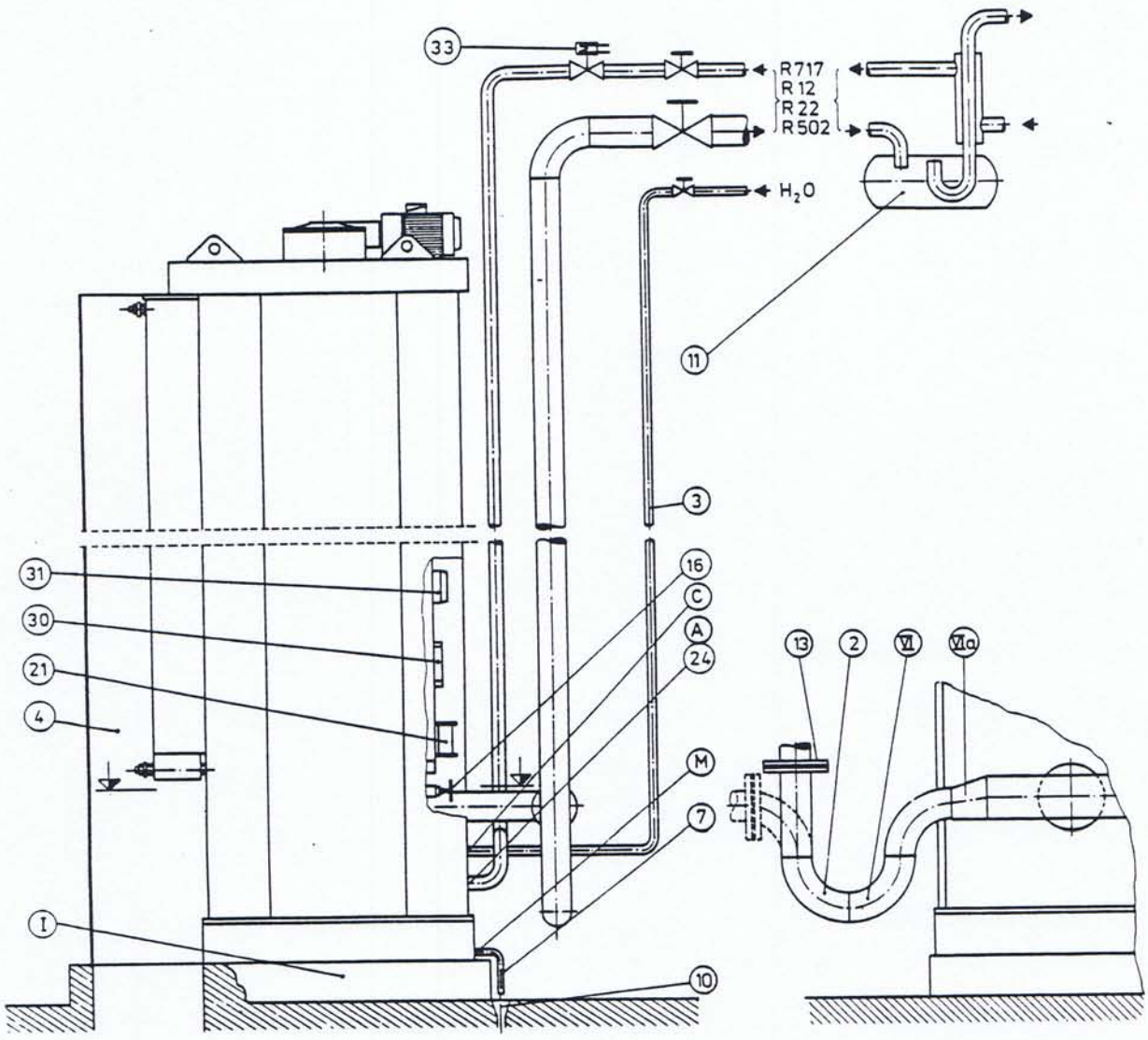
d) The screen should be equipped with inspection hatch.

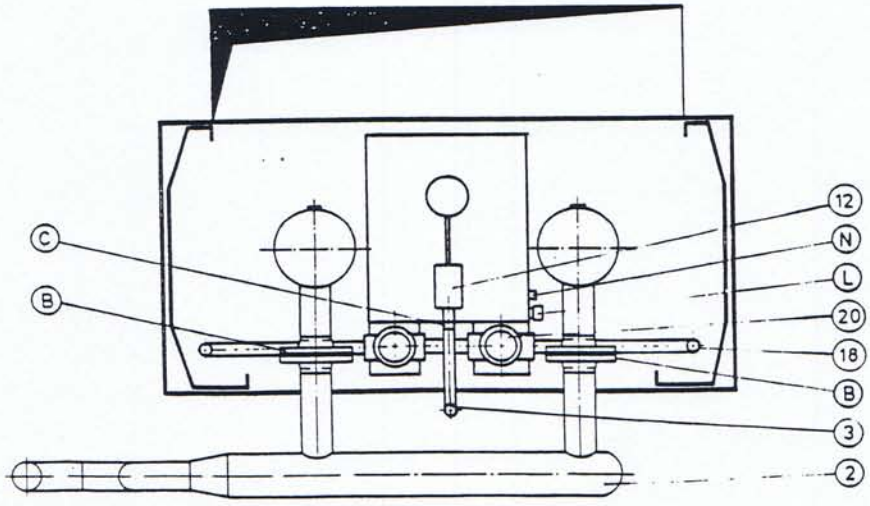
f) The ice outlet must be insulated on all sides. The insulation is covered with a waterproof plate ending below the ceiling in the silo room.

g) In case of condensate on the screen, this may be insulated.

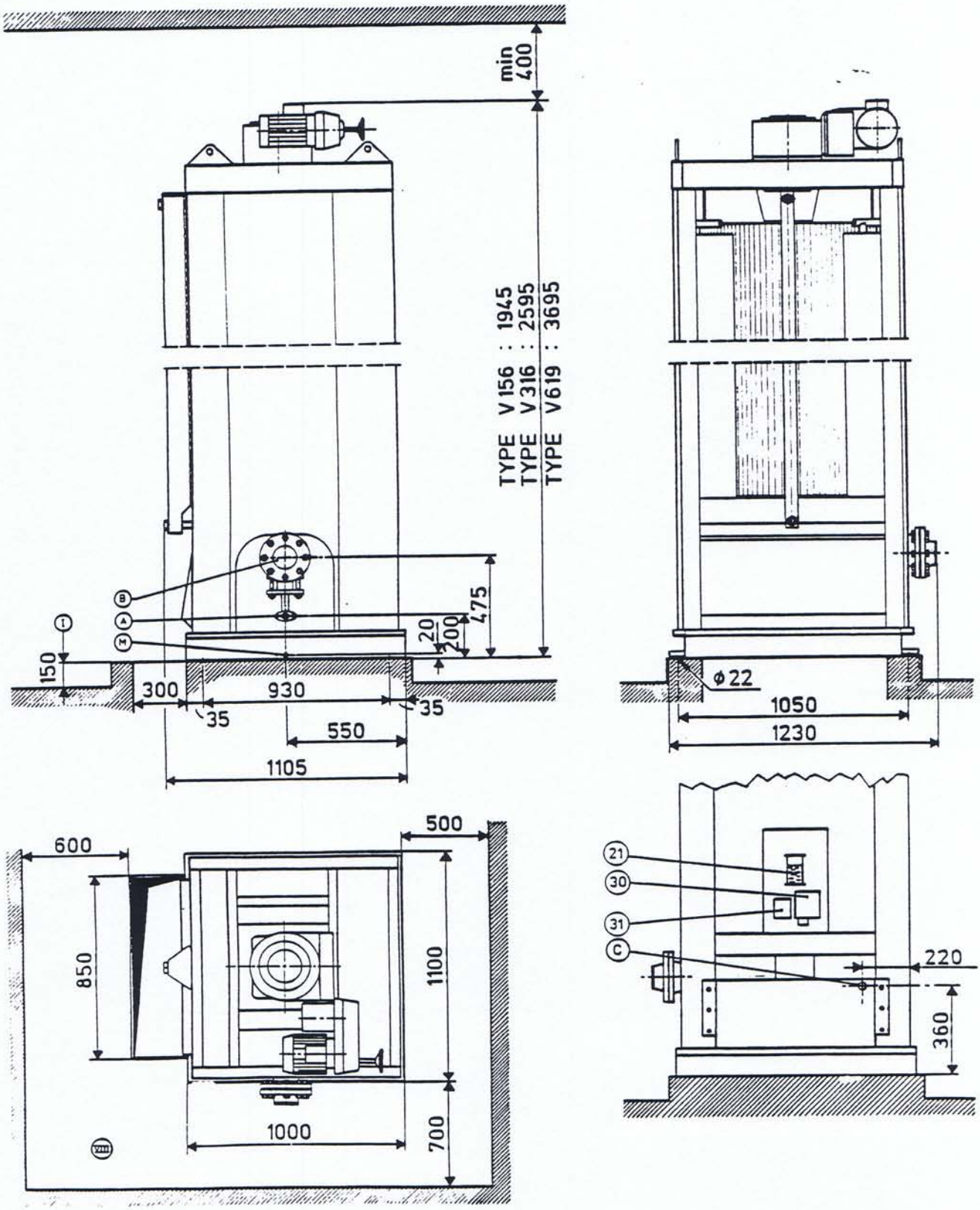



# INSTALLATION SKETCH FOR V156 , V316 AND V619




INSTALLATION SKETCH FOR VD746 AND VD1206




DIMENSION SKETCH FOR V156, V316 AND V619

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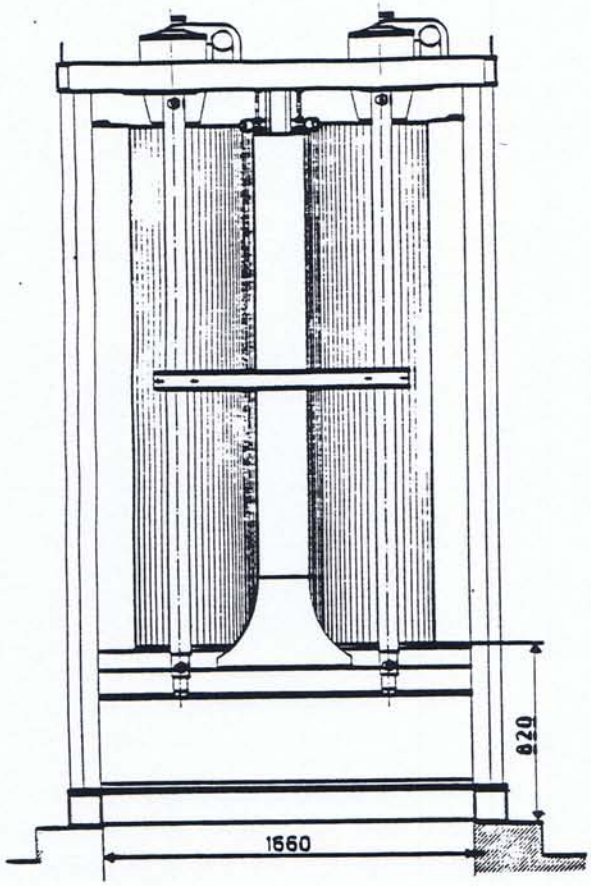


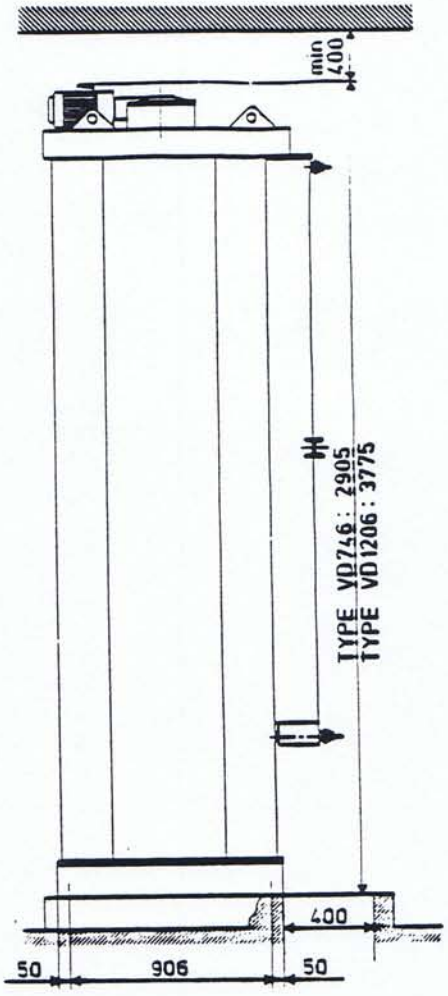


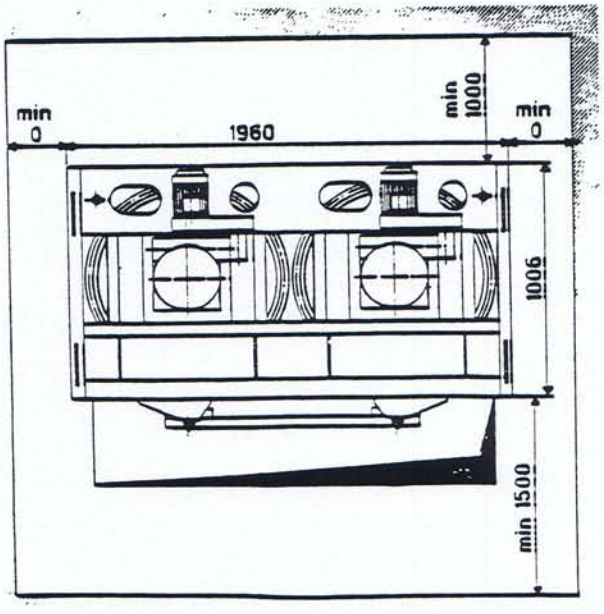


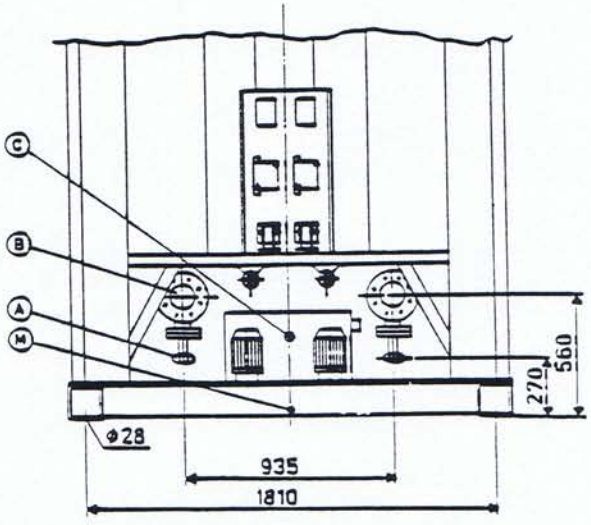


DIMENSION SKETCH FOR VD746 AND VD1206

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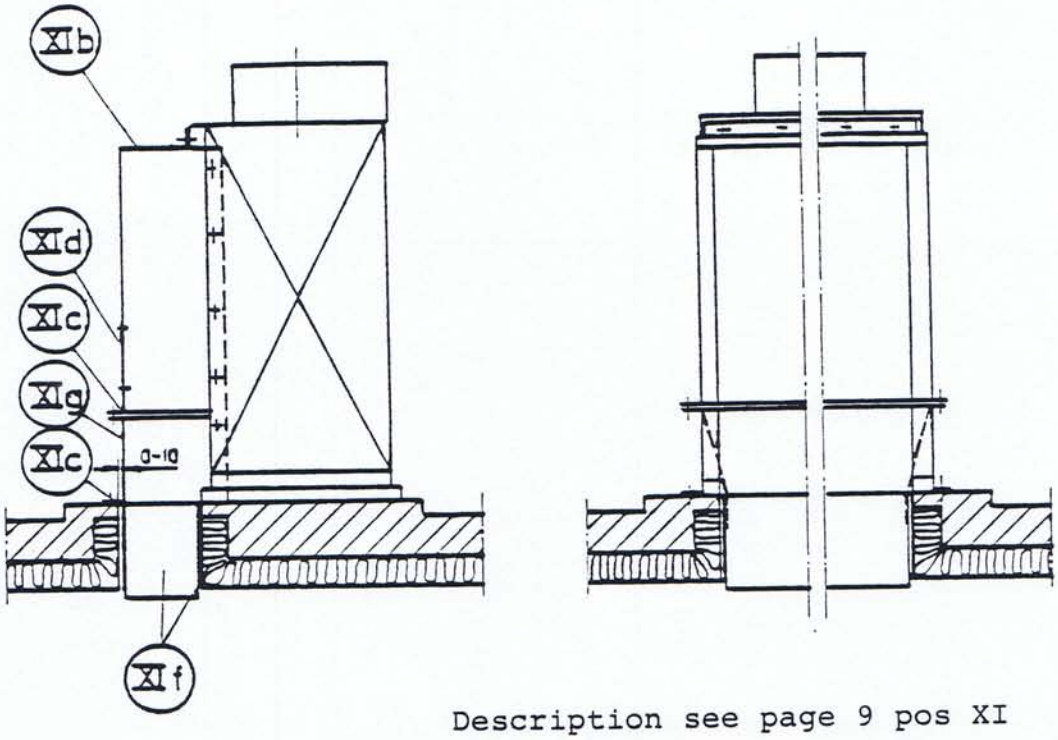
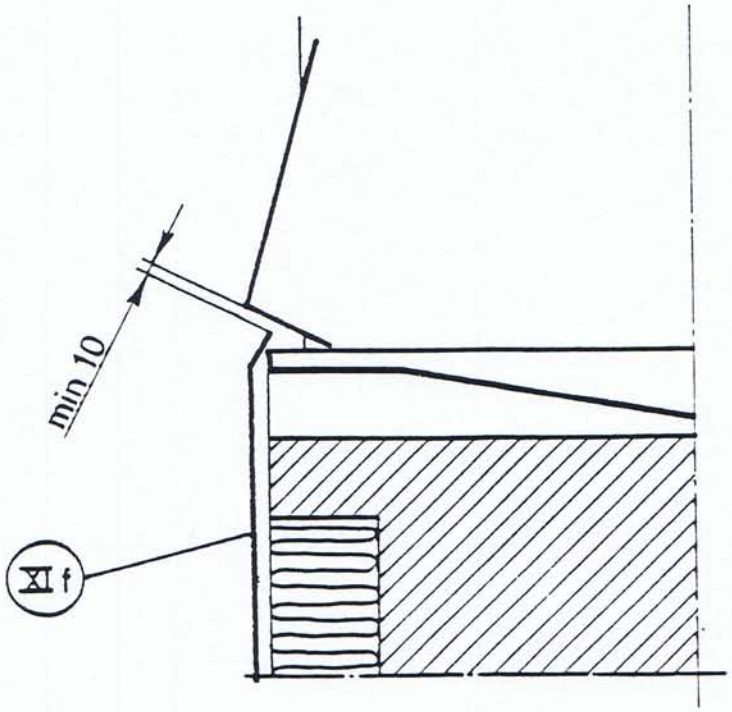
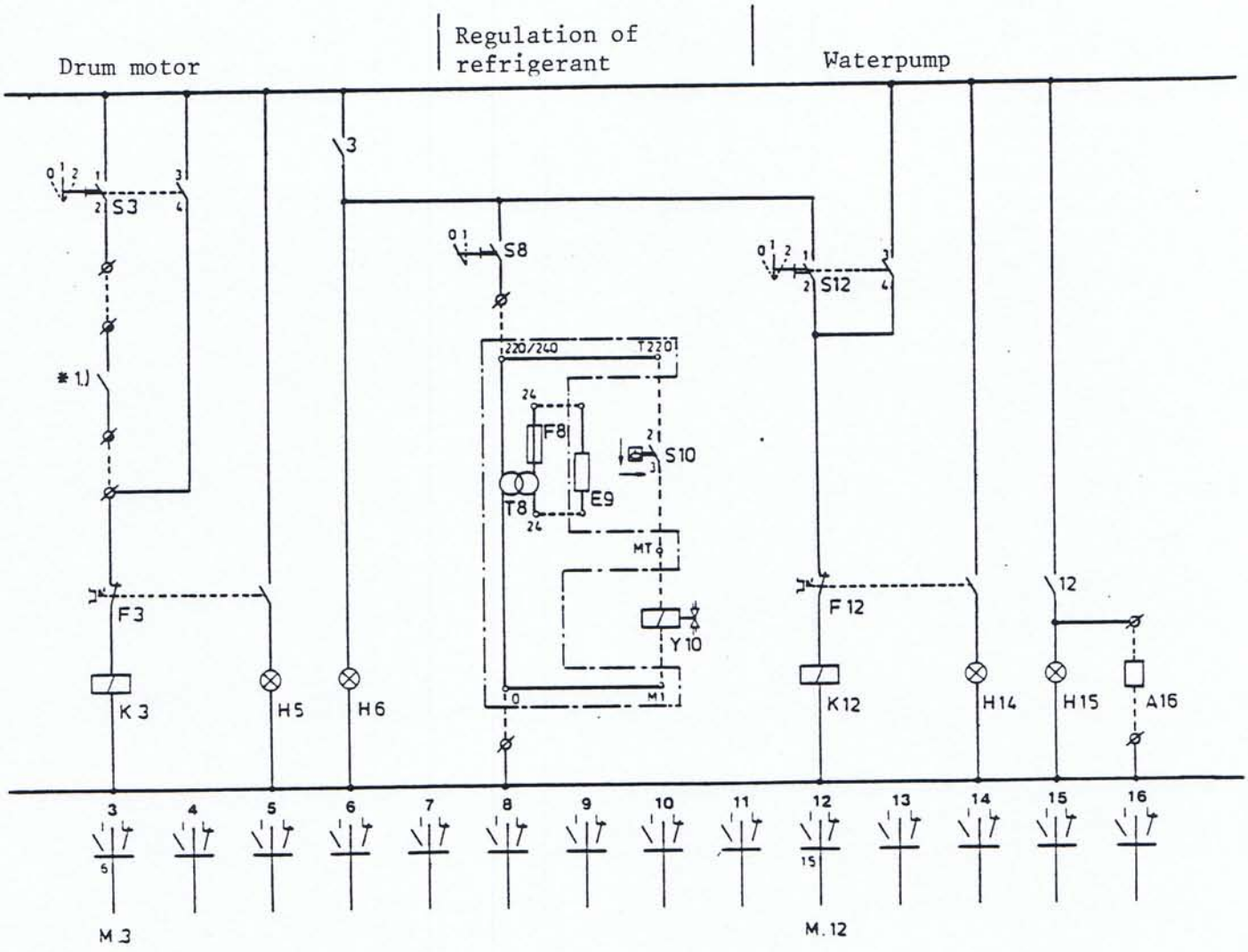
# DESIGN OF SCREEN




Description see page 9 pos XI

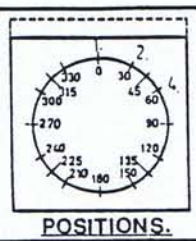


El-diagram for Slice Ice Machines




Switch operation

| Selector no.: S3 & S12 | | | |
|---|---|---|---|
| Symbol. | Description. | | |
| × | Contact Closed. | | |
| ⁜ | Contact Continuously Closed Over Several Positions. | | |
| ⌐ | Return When Released. | | |



| POSITIONS. | | | |
|---|---|---|---|
| 0. | 1 | | |
| Aut. | 2 | X | |
| | 3 | X | X |
| Man. | 4 | | X |

## ELECTRICAL KEY DIAGRAM

The diagram on page 15 shows a proposal for operation of slice ice machine type V-156, V-316 or V-619. For slice ice machines type VD-746 and VD-1206 having two drums, two level controls, and two water pumps, the control for each drum is made as shown in the diagram. Note: All machines are only equipped with one salt dosing pump A16.

For slice ice machines with pump circulation of the refrigerant the circuits 8, 9, and 10 are left out.

In an existing plant the diagram can be extended, but it should be ensured that water pump and refrigerant supply is interrupted in position "automatic operation", if the drum motor stops.

If the ice machine delivers ice to a silo, it might be advantageous to delay the cutting-in of the water pump, in order to avoid getting wet ice in the silo. In these cases a timing relay or a suction-pressure pressostate is inserted in the control circuit of the pump for automatic operation.

The diagram has been drawn in accordance with IEC-norms and following circuits will be described more detailed:

3 Control circuit for drum motor.
With the change-over switch S3 in position 2 "Man" the drum is running constantly. In position 1 "Autom" the ice machine is started and stopped by an external control signal *1). The signal may come from f. inst. a level sensor in the ice silo or from the cooling compressor.

5 H4 red lamp: "Overload drum motor"

6 H6 white lamp: "Running"

8 T8 transformer 220-240 V/24 V placed on the ice machine

9 E9 heating element in the sensor of the level control, 10 W - 24 V

10 S10 level control placed on the ice machine

Y10 solenoid valve for control of refrigerant supply to the ice machine

12 Control circuit for water circulation pump

14 H14 red lamp: "Overload water pump"

15 H15 white lamp: "Running"

16 A16 salt dosing pump. 1 phase 200-270 V, 50-60 Hz, 35 W. Placed at the ice machine. (The pump is left out if the ice machines have to make ice from seawater.)

Datas for electric motors

The electric motors are three-phased squirrel-cage motors in complete enclosed execution.

Freezing drum 50 Hz

| | |
|---|---|
| IEC-type: | MT80B |
| Protection class: | IP54 |
| Number of revolutions: | 1,400 r.p.m. |
| Power: | 0.75 kw |
| Voltage: | 380-420 V/220-240 V |
| Rated current: | 2.1 A/3.6 A |

Water pump 50 Hz

| | |
|---|---|
| Protection class: | IP44 |
| Number of revolutions: | 2,900 r.p.m |
| Power: | 0.37 kw |
| Voltage: | 380 V/220 V |
| Rated current: | 1.05 A/1.8 A |

Note: The ice machines type VD-746 and VD-1206 with two drums do also have two drum motors and two water pumps.

# ERECTION AND START-UP

## ERECTION

The Slice Ice Machine is erected, and the pipe connections are made in accordance with the instructions given under "Installation Data" page 6-9.

NOTE! The ice chute made of stainless steel, guiding the ice from the machine, has a flanged edge below leading possible water drops to the bottom tray of the machine. Therefore, the chute must not be turned outwards when the machine is running, but must be kept in the position in which it was delivered.

It should be ensured that the pipe connections are adequately supported so that the machine will not be exposed to inadmissible stress.

During building activities the machine should be covered to avoid impurities in the water system.

For machines with level control, additionally, the following parts have to be mounted:

- Mount the expansion nozzle (26) into the external flange connection (24). Please check by means of the table below that the machine is delivered with the correct nozzle. The number stated indicates the nozzle diameter in 1/10 mm.

| Ice Machine | Nozzle No. for Refrigerant | | | |
|---|---|---|---|---|
| Type | R12 | R22 | R502 | R717 |
| V-156 | 45 | 35 | 40 | 17 |
| V-316 | 63 | 49 | 58 | 24 |
| V-619 | 87 | 68 | 79 | 35 |
| VD-746 | 68 | 54 | 63 | 27 |
| VD-1206 | 87 | 68 | 79 | 35 |

NOTE! The nozzle is dimensioned for a liquid pressure corresponding to a condensing temperature of 25°C. If the temperature differs very much from this - for instance in plants with two-step expansion - the nozzle must be changed. Please contact ATLAS.

- The electric cable from the solenoid valve (33) is connected to the terminal row in the transformer box (31) as shown in the drawing "Wiring Diagram for Regulation of Refrigerant".

- An electric cable is connected from the level control (30) to the terminal row in the transformer box (31). See drawing "Wiring Diagram for Regulation of Refrigerant".

  At the same time check that the level control is adjusted to the correct refrigerant.

Control

Check that gear and lower drum bearing have the correct oil charge:

Fill up the gear with oil until the oil is half visible in the oil level glass when the drum is stopped. Suitable oil types are mentioned on page 24.

The air-relief screw (43) of the lower drum bearing is unscrewed and the bearing is filled with oil through the oil cup (21) until the oil flows out of the hole at (43).

Let at least one cup of oil run out to make sure that all air has been relieved. Repeat the airing operation, if necessary.

For transport reasons, the vent holes in the oil cup and the gear box can be capped, for which reason it should be checked that there is free passage through the vent holes.

Water Pump

The direction of rotation of the pump is of no importance.

Before the initial start-up, the water pump should be aired by means of the air screw (37) on the pump housing.

Operation Instructions

I The machine is started in the following working order

a) The compressor is started.

b) All valves in the suction line from the machine are opened.

c) All stop valves in the liquid line from the machine are opened.

d) By automatic level control the electric current to the transformer is switched on.

By pump circulation and manual control the liquid circulation pump is started.

e) The drum motor is started.

f) All stop valves in the water supply are opened.

g) When the drum is cold the water pump and the salt dosing pump, if any, are started.

II Adjustment

a) It is important that the ice is dry about 100 mm before the knives, which is seen by the ice becoming opaque on the surface.

The water spraying on the drum is regulated by covering holes in the water distributing pipe as required.

If the ice does not leave when the drum is started, the water supply should be interrupted until the ice has been scraped off.

b) The water supply to the water distributing pipe (10) is regulated by means of a valve (19) in the water line between the pump and the distributing pipe. When the machine is run in this valve is to be set once and for all in such a way that the water does not spray over the edge of the drum but is kept about 5 mm below the edge.

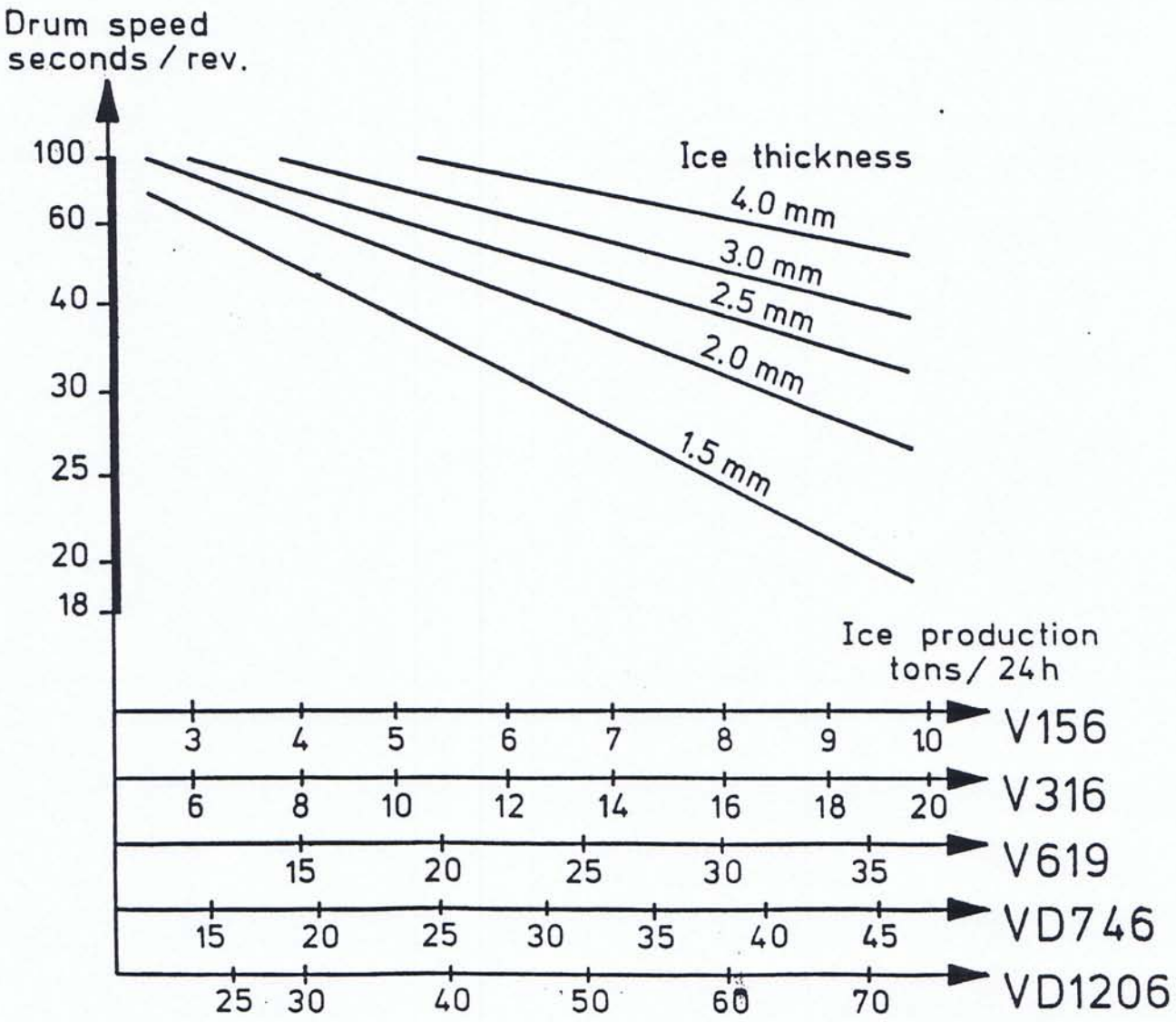
Note

The filter (18) between water pump and the water distributing pipe, eliminating unnecessary blocking of the nozzles, must be cleaned frequently during the running-in period.

c) The drum speed is adjusted by means of the variable speed pulley until the ice has the desired thickness. (Low speed makes the thickest ice, but also a smaller ice production).

Note

It is the capacity of the refrigerating plant, i.e. the temperature of the freezing drum - for a given ice thickness - which is decisive for the ice production which the machines can make. See capacity graph at the end of the book under "Drawings".



## Adjustment of RT280 level control

See drawing "Refrigerant control" page 3.

1) At too little refrigerant charge in the drum (thin ice or no ice at all on the upper part of the drum) the liquid charge should be increased by adjusting the red indicator upwards on the RT280-scale.

2) At too violent overflow from the ice machine, it can be reduced by adjusting the red indicator downwards on the RT280-scale.

3) At correct adjustment the liquid injection is closed 1-3 minutes at each regulation period.

## Adjustment of refrigerant, especially for pump system

The supply of refrigerant is controlled by means of the regulating valve (32). On the VD-types, each drum has one regulating valve.

It is important that the regulating valve is not opened too much out of regard for the other evaporators in the system. Therefore, it is recommended to make the adjustment in the following way:

1) When all evaporators in the system are in operation, the regulating valve should be opened so much that closing by 1/2 - 1 turn will cause the slice ice machine to release the ice on the upper part of the drum. After each adjustment the effect should be observed for about half an hour.

2) In case the slice ice machine does not produce ice all over the drum, even if the regulating valve is open, this is due to the fact that other evaporators receive too much liquid or that the circulation pump yield an insufficient amount of liquid.

3) If several slice ice machines are receiving liquid from the same pump, the regulating valves should be adjusted identically, so that a change of the adjustment takes place simultaneously on all machines.

Slice ice machines for sea water:
Adjustment of make-up water supply

The supply of water to the machine is regulated so that the overflow reaches max. 0.2 l/min, when the machine is in operation.

III The machine is stopped by following working order

a) The stop valve in the liquid line to the ice machine is closed.

b) The water pump is stopped (after 5-10 minutes on machines with level control operation).

c) The motor for the drum is stopped when all the ice has been removed from the surface.

d) The suction valve is closed.

e) The water supply is stopped.

# MAINTENANCE INSTRUCTIONS FOR SLICE ICE MACHINE

## Lubrication of the gear

The gear (5) is lubricated with special gear oil, f.inst. one of the following types:

| | |
|---|---|
| B.P. Oil: | GRXP-320 |
| Castrol: | ALPHA-SP320 |
| Chevron: | Non-leadet gear compound-320 |
| Esso: | Spartan EP-320 |
| Gulf: | EP-lubricant HD-320 |
| Mobil Oil: | Mobilgear-632 |
| Shell: | Omala Oil-320 |
| Texaco: | Meropa-320 |

The oil level should be controlled at least once a month. There should be so much oil in the gear that half of it is visible in the oil level glass, when the drum is stopped.

The first renewal of the oil should take place after approximately two months' operation, and then once a year at eight hours' operation. The oil is drained out when it still has operation temperature, and the gear is cleaned with rinsing oil, if necessary.

The filler plug (38) is equipped with a venthole. Is must be controlled regularly that this hole is not clogged up.

The upper bearing of the gear is lubricated with ball bearing grease through the lubricator nipple.

The inlet gear and the variable speed pulley have been greased for life.

## Lubrication of bearings of the freezing drum

The upper ball bearing (36) has been filled with frost-proof ball bearing grease by the factory and, therefore, it does not need extra lubrication.

On the other hand, the groove ball bearing (42) under the drum must be lubricated with the same oil as used for lubrication of the compressors, as the bearing is running at a very low temperature. The lubricating tube from the bearing is led to an oil cup (21) on the rear side of the frame.

Charging of oil must be carried out with great care as no oil must get into the water tray out of consideration for the purity of the ice.

At least once a year it should be controlled that there is connection between the oil cup and the bottom bearing. This is done by unscrewing the air-relief screw (43) and filling oil into the oil cup until the oil runs out of the venthole.

Lubrication of electric motor (7)

The electric motor on the ice machine has been lubricated by the factory and does not require any further lubrication.

Lubrication of water pump (20)

The bearings of the water pump have been lubricated by the factory and do not require any further lubrication.

Lubrication of coupling (35)

The coupling has been lubricated by the factory and does not require any further lubrication.

Oil draining from the freezing drum

On ammonia plants oil will deposit inside the freezing drum, having the effect that the ice production is reduced, and therefore, at intervals, oil draining must be carried out:

1) The machine is evacuated of refrigerant. Then wait for a period, preferably till the next day, allowing the oil to sink to the bottom of the drum.

2) The oil drain valve (16) is placed inside the frame under the drum. By turning the spindle a little to the left the valve is opened, - NB: it is of great importance that the valve is opened just a little so that the oil get forced out, due to the positive pressure in the drum.

In order to prevent the oil from polluting a hose must be connected to the connecting piece. The hose is led to a bucket with water. When the oil has been drained out the oil drain valve must be closed immediately again, as otherwise you risk to suck water into the drum. In order to remove as much oil as possible the operation should be repeated a couple of times at intervals of about one hour.

If there is not enough pressure to force out the oil, it is possible to let in ammonia through the suction line provided there is positive pressure in the line.

Note

For freon plants there should always be a blind cap on the exhaust branch of the oil drain valve.

Cleaning of the external surface of the drum

On the external surface of the drum a calcareous deposit might occur, which partly reduces the production of ice and partly makes the ice detachment from the drum more difficult.

This deposit can be removed by using a fine abrasive or acid, which, when mixed with additives, does not attack zinc, chrome, or aluminium.

It is recommended to follow the suppliers' instructions.

Note

For all media it applies that the personnel ought to attend to normal precautionary measures when working with corrosive liquids.

Furthermore, all corrosive media have a tendency to attack the galvanized parts.

Therefore, it is recommended to keep the drum turning, keep the float valve open, and then flush the water tray with a water hose simultaneously with the water reservoir being drained.

Then the liquid is applied by means of a rag or a brush so that the surface is moistened. After this treatment the water pump is started and the system is flushed as mentioned above.

Besides, it is our experience that, with plants having special extensive calcareous deposits, it might be useful to add a little salt to the freezing water, and for this purpose ATLAS can supply a salt dosing device when the machine is meant to produce fresh-water ice.

## Corrosion protection of the drum

In case the machine is to stand idle for some time, it is recommended to use a corrosion resistant medium for the surface, f.inst. "Rustban 392" (Esso), "Castrol DW Fluid No 1" or a similar product. These anti-corrosive agents can be applied to the surface by use of an insect sprayer. The liquid solidifies at -10°C, and for that reason the drum should have room temperature and the surface should be dry.

The anti-corrosive agent is not poisonous, and at start up of the machine it is removed after a few rotations; the ice, which has been produced during the first rotations, can be removed if necessary. If it is considered necessary the protective coating can also be removed with normal mineral terpentine.

Note

If the machine works with salt water, the surface of the drum should be rinsed with freshwater and protected against corrosion as mentioned above, when the machine is taken out of operation for a period of more than 24 hours.

## Cleaning of water distribution pipe

At suitable intervals, the nozzles in the water distribution pipe (10) should be checked and cleaned, as blocked nozzles cause a reduced ice production and irregular freezing of ice on the drum. The ends of the pipe can be unscrewed which will facilitate the cleaning process.

Likewise, the filter before the water valve should be cleaned at regular intervals.

## Setting of ice knives

The distance between the freezing drum and the knife (2) shall be approximately 0.1 mm, when the drum has obtained a normal room temperature i.e. approx. 20°C.

The drum is never a hundred per cent round and before the knife can be adjusted the drum should be turned until the highest points are opposite to the knife. This point is found most easily by reading on a dial meter placed different places on the knife holder, while the drum is turning.

The knives are set in the following order: loosen the bolts holding the clamping flange on top of the knive holder (3); then adjust the holder by means of the upper and lower nuts on the bolts (1) until the distance is 0.1 mm. After the fastening the distance is checked by means of a feeler gauge.

Defrosting of ice on the drum

If defrosting is necessary, it is recommended to close the liquid supply valve and the valve in the suction line and to keep the machine running with the water circulation and the drum working until the surface is free of ice.

It should be mentioned that this method may cause a little water to drip on the ice outlet tray below.

NOTE Hot water or open fire must never be used for removing the ice from the drum, as this may give risk to high pressure in the drum and a consequent risk of bursting.

Evacuation of the drum

When evacuating, close the valve in the liquid supply line and keep the machine running with the water circulation and the drum working, until no more ice is being formed on the surface of the drum.

Draining of water

Should the temperature in the operation room of the slice ice machine fall below freezing point, the machine should be stopped and the water drained from the water reservoir and from the water supply line.

The water pump should also be drained.

Normally, it would be the easiest to install a small heating element in the room to keep it frostfree during the winter.

Check-up of the suction junction

Should any leakages be observed in the suction junction (15), this must be taken apart for checking, but at first you should make sure that the leakage actually comes from the sealing rings (41) in the suction junction, and not from one of the nearby pipe and flange connections.

NOTE Leakages in the sealing rings (41) are only shown when the refrigerant blows oil out of the oil cup (21).

Dismantling of the suction junction
for replacing sealing rings, ball bearing, simmer ring or for taking the drum out.

Item number in brackets refers to the sectional drawing of the suction junction.

Stop the machine and evacuate the drum.

The motor of the drum is to be secured against erroneous start.

Support the drum between drum bottom and supporting profiles in the lower bearing foundation.

Remove the water reservoir and ice chute in order to facilitate admission to the stuffing box.

Any excess pressure (and oil) can be blown out through the oil drain valve. Then dismantle the connectiong pipe at (44).

Dismount feeler and equalizing pipe of RT280 (if level control is used).

Dismantle flange of the liquid inlet pipe (45) and thereby the intermediate pipe (46). Be careful not to damage the oil drain pipe (47) which may fall down when removing the intermediate piece.

Drain the oil of the bearing at the air-relief plug (43) and remove the connecting pipe for oil cup.

Dismantle the vertical flange connection of the suction junction and take off the four bolts (48) in the horizontal connection.

NOTE When centering the drum, the factory used small metal plates (49) between bearing housing (50) and foundation plate. Be careful not to mix up these plates when removing the four bolts (48) which fasten the suction junction (51) and bearing housing (50) to the foundation plate.

The suction junction can now be taken out be means of dismantling screws in their M12 threaded holes. Take out feed pipe (52) and oil drain pipe (47).

It is now possible to approach the upper O-ring seal (53) of the feed pipe. The O-ring seal is placed on a cast iron ring (54), which is kept in position by a Seeger ring (55).

When taking out the bearing (42), remove the two conical guide pins which keep the bearing housing in position in the base plate. The guide pins are equipped with M8 threads for extraction. Screw out the lower stay bolt of the knife column of the bearing housing (50).

Take-off the Seeger ring (56) fixing the ball bearing (42). Then the bearing housing (50) with bearing can be removed from the shaft. For this purpose two M12 holes are drilled in the bearing housing for the dismantling screws.

Now the ball bearing can be removed from the bearing housing, and the Simmer ring (57) be taken out. Also the V-ring (60) can be taken off the shaft end.

Remounting is undertaken in the reverse order, as the faces of joint and fitting are inspected for any damages, which, if found, must be repaired.

All parts are to be cleaned carefully for impurities and all faces of joint are to be lubricated with pure refrigeration machine oil. It is recommended to exchange all packings with new ones, although the actual packings do not show any sign of wear.

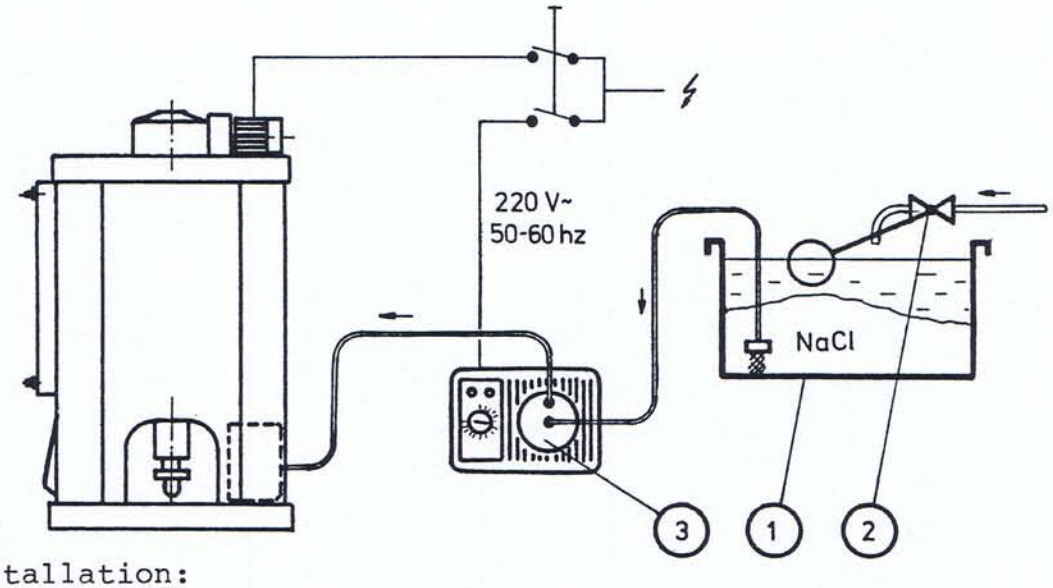
NOTE By remounting the intermediate ring item (65) it is important that the ring is turned so that the cutout is placed above the hole for oil inlet.

By remounting of the suction junction the nylon ring item (63) must be placed on the axle journal so that the sealing rings item (41) are guided in position undamaged.

## SALT DOSING DEVICE

By means of this device small amounts of salt are added to the freezing water, which causes the ice to fall off in larger pieces, at the same time reducing the calcareous deposit, which always occurs on the surface.

The quantity of salt to be added rates from 0-500 gram/ton ice or 0-0.05%. This salt content cannot be tasted and it has no influence on the applicability of the ice for cooling of food.




Installation:

Item 1 Mixing Tank

The mixing tank is to made of salt water resistant material, f. inst. plastic. The size of the mixing tank depends on the type of machine in question, number of machines, and desired frequency of salt refilling.

As dimension indication, the belôw table can be used, but it must be noted that the figures are only approximate:

| Type of machine | | V-156 | V-316 | V-619 | VD-746 | VD-1206 |
|---|---|---|---|---|---|---|
| Basic size, litres | 1) | 15 | 20 | 30 | 35 | 60 |
| Suppl. volume, litres | 2) | 2 | 4 | 7.5 | 9 | 15 |

1) The basic size is based on daily refilling of salt for one ice machine.

2) The supplementary volume indicates the volume to be allowed for the time interval (number of days) between each refilling.

Examble

For a V-619 ice machine, refilling is desired once a week. How many litres is the mixing tank to contain?

30 + 6 x 7.5 = 75 litres.

Item 2 Float valve to be fitted in the mixing tank and connected to the water pipe.

Item 3 The dosing pump(s) to be mounted in close proximity to and below the water level in the mixing tank to prevent valves and pump bellow from drying up during standstill.

The dosing pump to be connected so that it only works when its ice machine is working, see page 15.

The salt water pipe from the pump is to be fitted in the water reservoir of the ice machine in question, using the supplied non-return valve, which has been screwed into the connecting branch.

The suction filter of the pump is to be fitted to the bottom of the mixing tank. There is no need to make hole in the tank, the filter can just be put down into the tank. However, as it has a tendency to float, it is recommended to fasten it to a rustproof ring, or the like, in order to keep it down.

# CENTRAL SALT DOSING PLANT

## Principle

Salt and water are mixed in a tank, the size of which depends on the amounts of ice produced, the actual hydrologic conditions, and the intervals wanted between each filling with salt. A float valve ensures continuous dissolution of the salt.

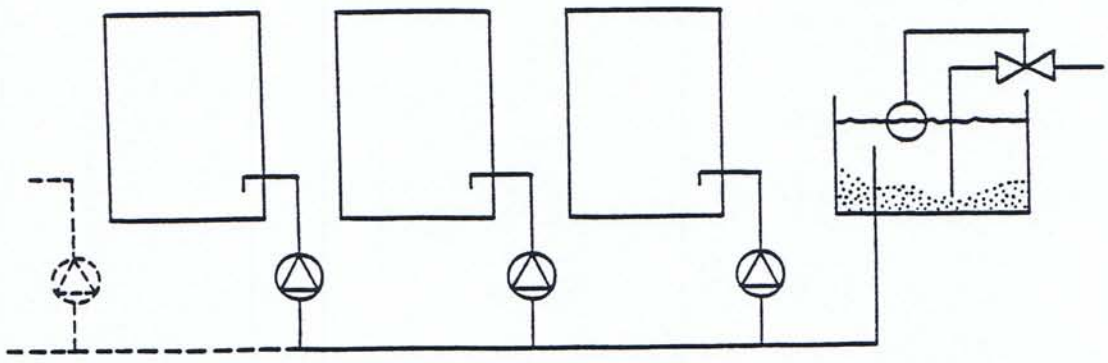
Each dosing pump is equipped with a variable timer for dosing the required quantity of salt solution to the slice ice machine in question.

If the slice ice machine is not in operation, the dosing pump will stop, as the ice machine and the dosing pump must work at the same time.

In cases where machines are placed in a high and not easily accessible position, e.g. above a silo, the mixing tank and the dosing pumps can be placed at a convenient point below the ice machine, f. inst. on the ground floor, in order to facilitate salt refilling.

The dosing pumps should always be filled with salt solution which is easiest secured by placing these under the level of the mixing tank.

Experience has shown that the required amount of salt rates from 0-500 grams per ton ice, corresponding to 0-2.2 litres saturated salt solution per ton ice.



## INTERRUPTIONS OF OPERATION

In below table some of the operational difficulties, which might arise, are shown together with the effects they have on the machine and remedies for possible defects.

For all types of slice ice machines

| Effect | Cause | Remedy |
|---|---|---|
| Uneven formation of ice, especially in vertical stripes. | Insufficient water supply. | Control float valve and water supply line. Clean distribution pipe (10). |
| The ice is crushed due to difficulties with the ice slipping the drum. | Calcareous deposit on the drum. | Clean the drum. See instruction book under "Maintenance", page 26. |
| | Water to be frozen too soft. | Use the salt dosing device. |
| The movements of the drum are irregular and take place in small jerks. | Ice has formed under the drum around the shaft and the stuffing box; this brakes the movements of the drum. | Stop the machine and the compressor.<br>Defrost by flushing with a water hose under the drum. |
| | Nozzle (11) set in a position where the make-up water does not reach the whole underside of the drum. | Correct the position of nozzle (11). |
| | Too low make-up water temperature. | |
| | Water to be frozen too soft. | Use the salt dosing device. |
| | | Do not start the machine before the ice under the drum has melted away, as otherwise the gear might break |

| Effect | Cause | Remedy |
|---|---|---|
| Refrigerant blows oil out of the oil cup (21). | Stuffing box is leaking | Replace packing rings (41). See instruction page 29. |

FOR PLANTS USING R717 (NH3) ONLY

| | | |
|---|---|---|
| Reduced production of ice. Spots with thinner ice occur on the surface of the drum. | Oil in freezing drum. | Drain out the oil. See instruction under "Maintenance" page 25. |

FOR SLICE ICE MACHINE WITH PUMP CIRCULATION OF REFRIGERANT ONLY

| | | |
|---|---|---|
| No ice on the upper part of the drum. | Insufficient supply of refrigerant. | Control liquid level in receiver and separator. Regulating valve (32) is adjusted. See page 22. |

## FOR ICE MACHINES WITH LEVEL CONTROL ONLY

For adjustment of level control: see page 22.

| Effect | Cause | Remedy |
|---|---|---|
| No ice production. Suction pressure is very low. The sensor is hot. | Burnt coil on solenoid valve (33). Cracked capillary tube on the level control (22). | Replace all faulty parts. |
| No ice on the upper part of the drum. | Insufficient refrigerant supply. The filter of the solenoid valve (34) is clogged up. Level control set for the wrong refrigerant. Nozzle too small or clogged. | Control liquid level in receiver and liquid supply Evacuate the machine, dismount filter and nozzle and clean them. Control the size of the nozzle. Check the adjustment of the level control. See page 22. |
| The ice disappears periodically from the upper part of the drum, and suction pressure is falling simultaneously. | Impurities in the regulation devices (the sprinkling pipe of the phial). Outlet from container around the phial is clogged up. | Remove the phial (22). Clean phial pocket and sprinkling pipe. |
| Machine is overcharged with liquid. The compressor gets cold and liquid hammer will occur. The level control works irregularly. | The liquid flow from overflow pipe does not hit the phial. The phial is soiled with oil and dirt. | Place overflow pipe at the right position above the phial. Remove the phial and clean it. |
| The ice disappears periodically or there is no ice production. Suction pressure is very low. Phial is cold. | Lack of heat for the phial (22). Current supply cut off. Defect heating element or transformer. | Replace defect parts. |

# SPARE PARTS LIST

FOR

## ATLAS VERTICAL SLICE ICE MACHINE

Type V-156, V-316, V-619
VD-746 & VD-1206

Note:
The first figure in the spare parts number indicates the position number of the spare part on the sectional drawing.

| Pcs. per drum | Item | Code | Type/ drawing | To be used for | Spare part no |
|---|---|---|---|---|---|
| 1 | V-belt | | | Variable speed pulley | 06-62 |
| 1 | Water pump | Smede-gård type 200T | G191941 | | 20-63 |
| 1 | Packing | Danfoss | 32E0677 | Phial pocket | 23-15 |
| 1 | Packing Ø44/32 | 3609AN | 11/0911 | Liquid supply | 25-26 |
| 1 | Toothed coupling | 4010015 | E195906 | Upper bearing | 35-61 |
| 1 | Spherical ball bearing | 4100006 | SKF 1222 110x200x38 | Upper bearing | 36-16 |
| 1 | Seegering | 3361060 | U110x4 | Upper bearing | 39-17 |
| 1 | Simmer ring | 3622003 | BA 110x140x12 | Upper bearing | 40-18 |
| 2 | Shamban-packing rings | 3622035 | S-59941-1105-109-S | Suction junction | 41-60 |
| 1 | Groove ball bearing | 4100008 | SKF 6030 150x225x35 | Lower bearing | 42-12 |
| 2 | O-ring for R717, R12 | 3645AN | Gaco RM 0493-57 P5 red dot | Feed pipe | 53-04 |
| | | | | Feed pipe | 53-05 |
| 2 | O-ring for R22, R502 | 3640AN | Gaco RM 0493-57 G75 green dot | | |

SPARE PARTS LIST

| Pcs. per drum | Item | Code | Type/ drawing | To be used for | Spare part no |
|---|---|---|---|---|---|
| 1 | Supporting ring | 7461069 | G152632 | Feed pipe | 54-06 |
| 1 | Seegering | 3360005 | IV65x2,5 | Feed pipe | 55-07 |
| 1 | Seegering | 3361075 | U152x4 | Lower bearing | 56-11 |
| 1 | Simmerring | 3622005 | BA 160x190x15 | Lower bearing | 57-13 |
| 2 | O-ring for R717, R12 | 3645AN | Gaco RM 0116-24 P5 red dot | Oil drain pipe | 58-02 |
| 2 | O-ring for R22, R502 | 3640AN | Gaco RM 0116-24 G75 green dot | Oil drain pipe | 58-03 |
| 1 | O-ring | 3628002 | Gaco R4875 P5, no marking | Suction junction | 59-10 |
| 1 | V-ring | 3622010 | NR-V-160 | Lower bearing | 60-14 |
| 2 | Flat packing Ø68,5/52x1 | 3610069 | | Intermediate piece | 61-01 |
| 1 | Flat packing 25/100 | OIL SPEC 3600AN | | Suction flange | 62-27 |

SPARE PARTS LIST

| Pcs. per drum | Item | Code | Type/ drawing | To be used for | Spare part no |
|---|---|---|---|---|---|
| **Especially for machines for Freshwater ice** | | | | | |
| (1) | Float valve with ball | 5855AN | 309A spec. G198694 | Water reservoir | 12-64 |
| **Especially for machines with Level Control** | | | | | |
| 1 | Level control | RT280A | 17D0040 | Suction junction | 30-35 |
| 1 | Transformer | Lübcke | T142-K19325 | Phial | 31-36 |
| 1 | Heating element | Danfoss | 68G0037 | Phial | 22-37 |
| 1 | Packing | Danfoss | 32E0677 | Phial | 23-15 |

* Figures in brackets indicate number per ice machine.

## SUMMARY OF THE ITEM NUMBERS IN THE INSTRUCTION

□ = only in types with level control

○ = only in types with pump circulation

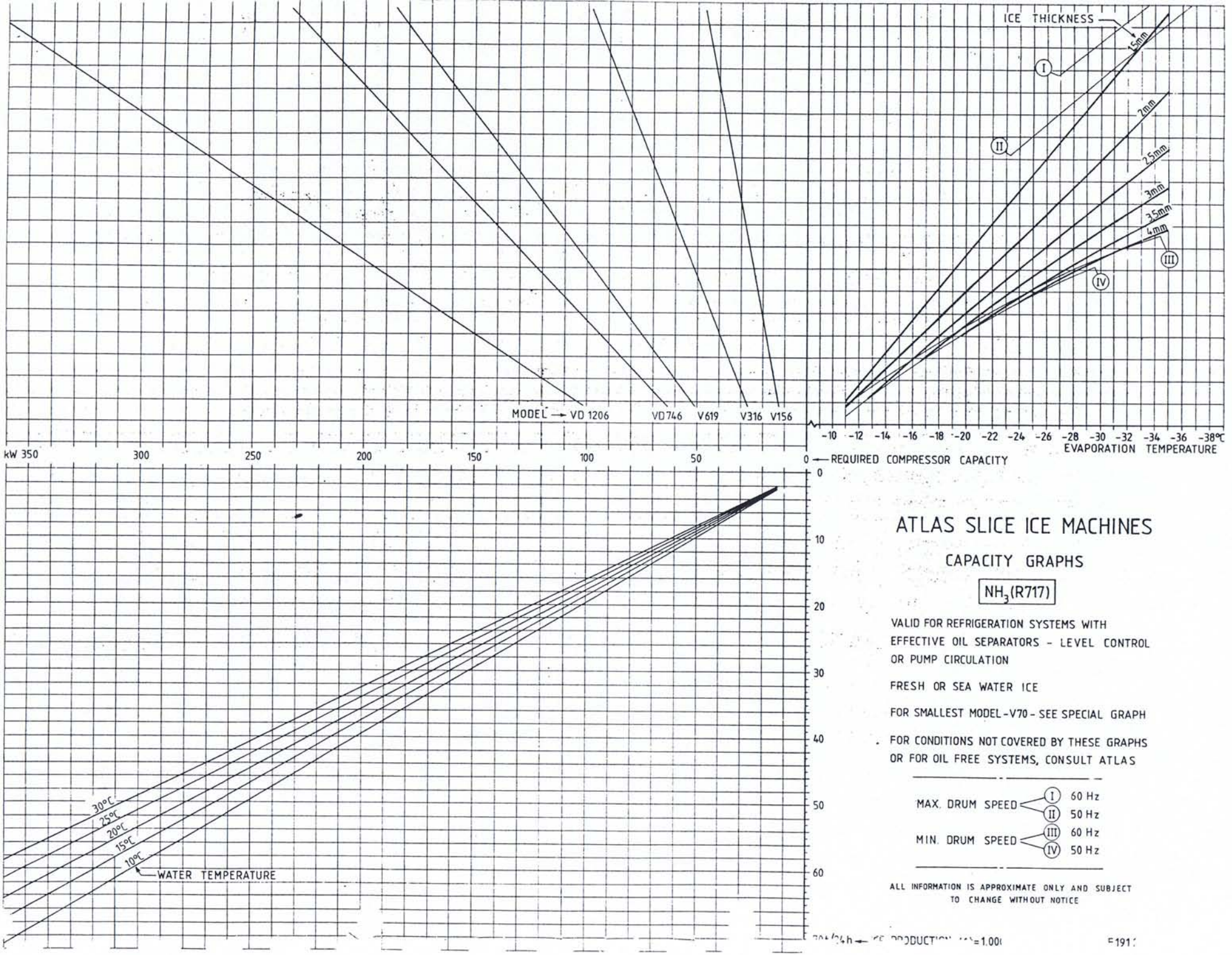
| Item No | Subject | Drawing |
|---|---|---|
| 1 | Adjusting nut f. knife stanchion | Sectional drawing |
| 2 | Knife holder | Sectional drawing |
| 3 | Fastened screws for do. | Sectional drawing |
| 5 | Worm gear | Sectional drawing |
| 6 | Variable speed pulley | Sectional drawing |
| 7 | Drum motor | Sectional drawing |
| 10 | Water distribution pipe | Sectional drawing |
| 11 | Nozzle for water under drum | Sectional drawing |
| 12 | Float valve | Sectional drawing |
| 13 | Water reservoir | Sectional drawing |
| 14 | Overflow for salt water | Sectional drawing |
| 15 | Suction junction | Sectional drawing |
| 16 | Oil drain valve | Sectional drawing |
| 17 | Freezing drum | Sectional drawing |
| 18 | Filter for water distribution pipe | Sectional drawing |
| 19 | Regulation valve for water distribution | Sectional drawing |
| 20 | Water pump | Sectional drawing |
| 21 | Oil cup for bearing | Sectional drawing |
| □ 22 | Phial with heating element | Sectional drawing |
| 23 | Phial pocket | Sectional drawing |
| 24 | Flange for liquid supply | Sectional drawing |
| 25 | Packing for do. | Sectional drawing |
| □ 26 | Nozzle for liquid supply | Sectional drawing |
| □ 27 | Counter flange for nozzle | Sectional drawing |
| ○ 28 | Counter flange at pump circulation | Sectional drawing |
| □ 29 | Pressure equalizing pipe for level control | Sectional drawing |
| □ 30 | Level control | Sectional drawing |
| □ 31 | Transformer for heating element | Sectional drawing |

POSITION NUMBERS

| Item No | Subject | Drawing |
|---|---|---|
| (32) | Regulating valve | Sectional drawing |
| [33] | Solenoid valve ) not included in delivery | Sectional drawing |
| [34] | Filter for do.) | |
| 35 | Toothed coupling for drum gear | Upper bearing |
| 36 | Spherical ball bearing | Upper bearing |
| 37 | Air escape screw on water pump | Upper bearing |
| 38 | Oil charging screw for gear | Upper bearing |
| 39 | Seegering for upper bearing | Upper bearing |
| 40 | Simmerring for do. | Upper bearing |
| 41 | Shamban packing rings in suction junction | Stuffing box |
| 42 | Grooved ball bearing (lower bearing) | Stuffing box |
| 43 | Oil drain screw (lower bearing) | Stuffing box |
| 44 | Screwed connection for oil drain pipe | Stuffing box |
| 45 | Flange for liquid supply | Stuffing box |
| 46 | Intermediate piece | Stuffing box |
| 47 | Internal oil drain pipe | Stuffing box |
| 48 | Bolt for suction junction | Stuffing box |
| 49 | Lining plates | Stuffing box |
| 50 | Bearing housing (lower bearing) | Stuffing box |
| 51 | Suction junction | Stuffing box |
| 52 | Feed pipe | Stuffing box |
| 53 | O-rings for feed pipe | Stuffing box |
| 54 | Supporting ring for do. | Stuffing box |
| 55 | Seegering for do. | Stuffing box |
| 56 | Seegering for lower bearing | Stuffing box |
| 57 | Simmerring for lower bearing | Stuffing box |
| 58 | O-rings for oil drain pipe | Stuffing box |
| 59 | O-ring for packing for suction junction | Stuffing box |
| 60 | V-ring under drum | Stuffing box |
| 61 | Flat packing for intermediate piece | Stuffing box |
| 62 | Flat packing for suction flange | Stuffing box |

POSITION NUMBERS

| Item No | Subject | Drawing |
|---|---|---|
| 63 | Auxiliary ring for stuffing box | Stuffing box |
| 64 | Intermediate ring in stuffing box | Stuffing box |
| 65 | Fastening ring in stuffing box | Stuffing box |
| 66 | Supporting ring for V-ring | Stuffing box |
| 67 | Allen screws in stuffing box | Stuffing box |




# ATLAS SLICE ICE MACHINES

## CAPACITY GRAPHS

$NH_3$ (R717)

VALID FOR REFRIGERATION SYSTEMS WITH EFFECTIVE OIL SEPARATORS - LEVEL CONTROL OR PUMP CIRCULATION

FRESH OR SEA WATER ICE

FOR SMALLEST MODEL - V70 - SEE SPECIAL GRAPH

FOR CONDITIONS NOT COVERED BY THESE GRAPHS OR FOR OIL FREE SYSTEMS, CONSULT ATLAS

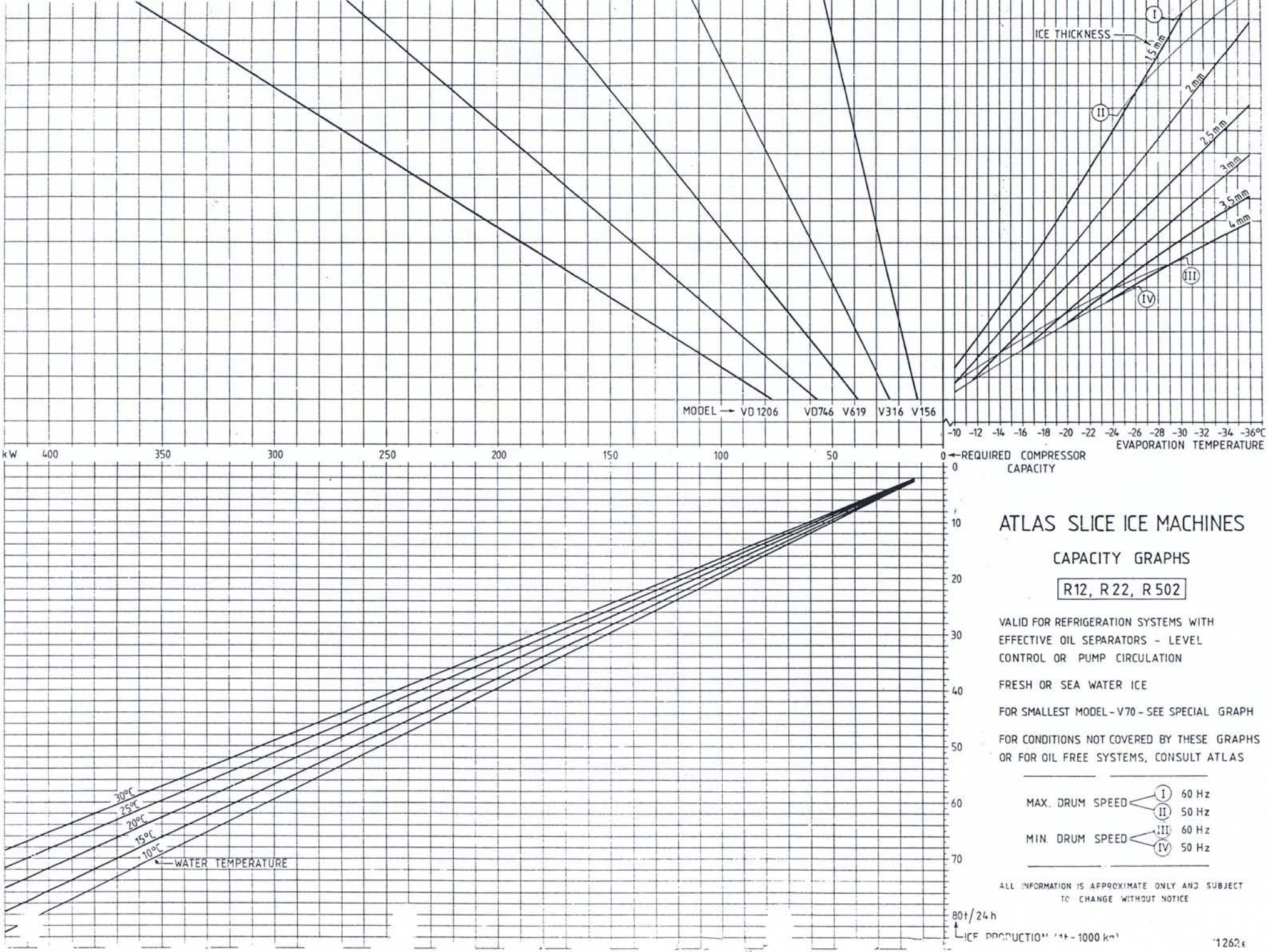
MAX. DRUM SPEED — I 60 Hz; II 50 Hz

MIN. DRUM SPEED — III 60 Hz; IV 50 Hz

ALL INFORMATION IS APPROXIMATE ONLY AND SUBJECT TO CHANGE WITHOUT NOTICE

kg/24h ← ICE PRODUCTION ... =1.00(

F191




# ATLAS SLICE ICE MACHINES

## CAPACITY GRAPHS

R12, R 22, R 502

VALID FOR REFRIGERATION SYSTEMS WITH EFFECTIVE OIL SEPARATORS - LEVEL CONTROL OR PUMP CIRCULATION

FRESH OR SEA WATER ICE

FOR SMALLEST MODEL - V70 - SEE SPECIAL GRAPH

FOR CONDITIONS NOT COVERED BY THESE GRAPHS OR FOR OIL FREE SYSTEMS, CONSULT ATLAS

MAX. DRUM SPEED — I 60 Hz; II 50 Hz

MIN. DRUM SPEED — III 60 Hz; IV 50 Hz

ALL INFORMATION IS APPROXIMATE ONLY AND SUBJECT TO CHANGE WITHOUT NOTICE

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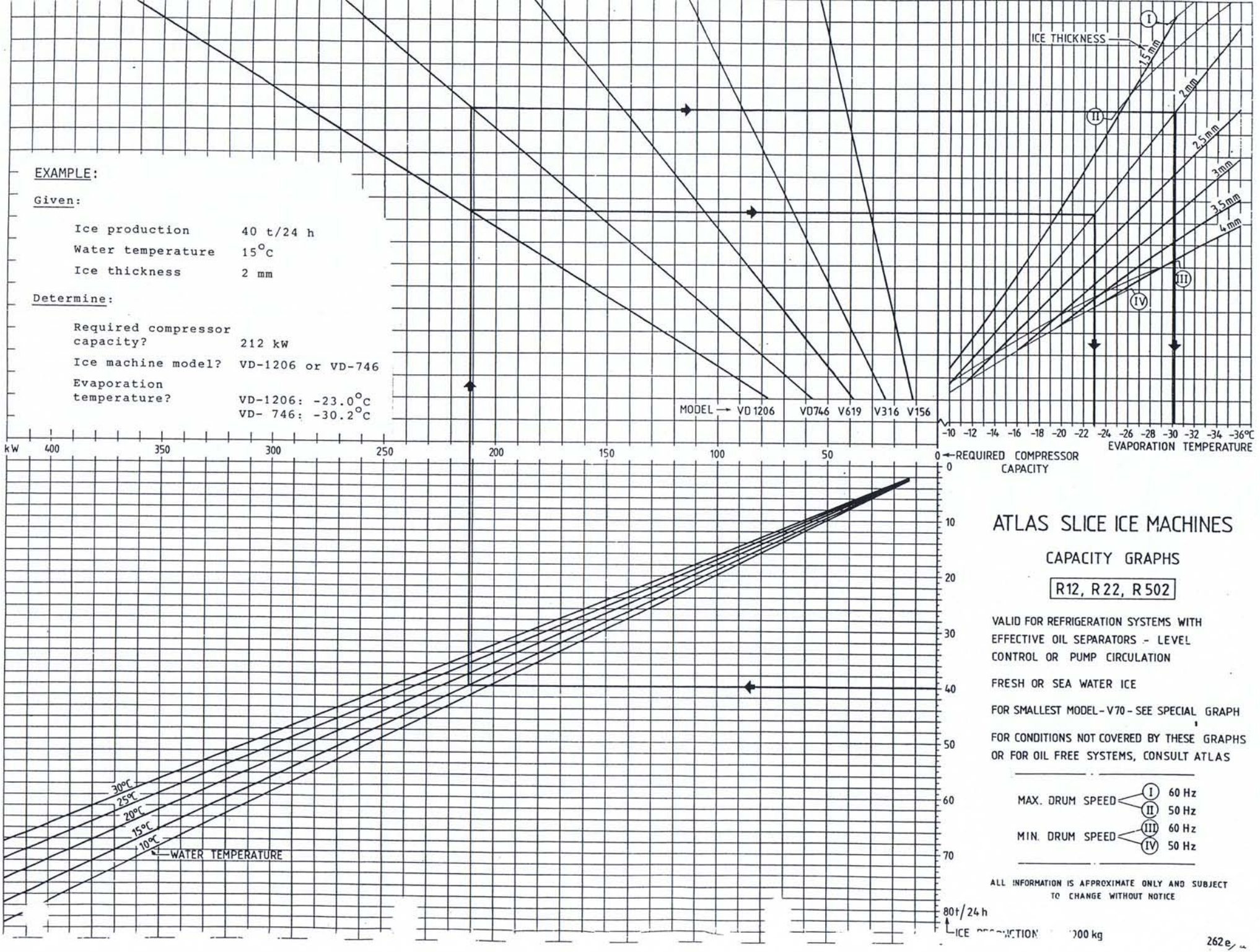



# ATLAS SLICE ICE MACHINES

## CAPACITY GRAPHS

R12, R22, R502

VALID FOR REFRIGERATION SYSTEMS WITH EFFECTIVE OIL SEPARATORS - LEVEL CONTROL OR PUMP CIRCULATION

FRESH OR SEA WATER ICE

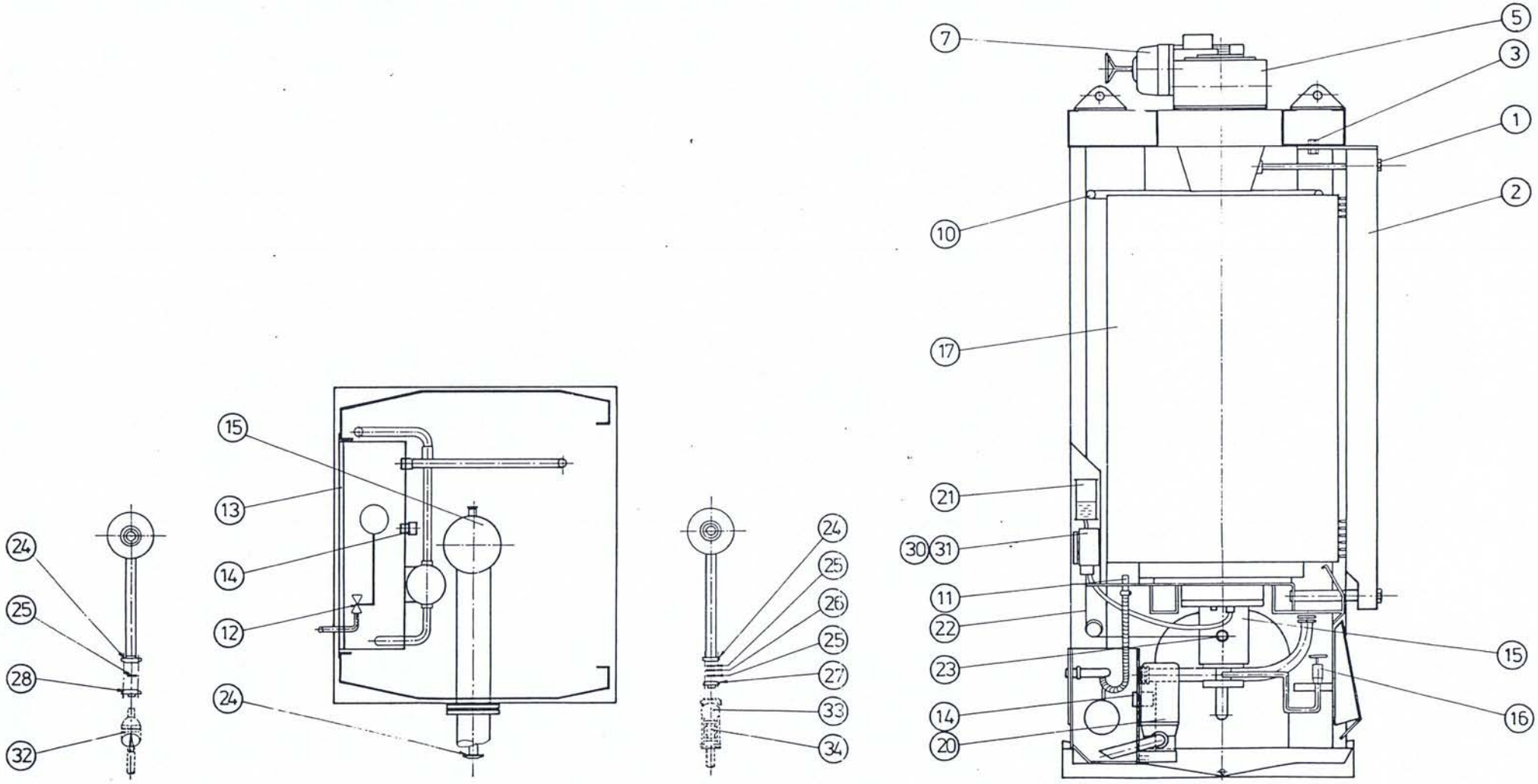
FOR SMALLEST MODEL - V70 - SEE SPECIAL GRAPH

FOR CONDITIONS NOT COVERED BY THESE GRAPHS OR FOR OIL FREE SYSTEMS, CONSULT ATLAS

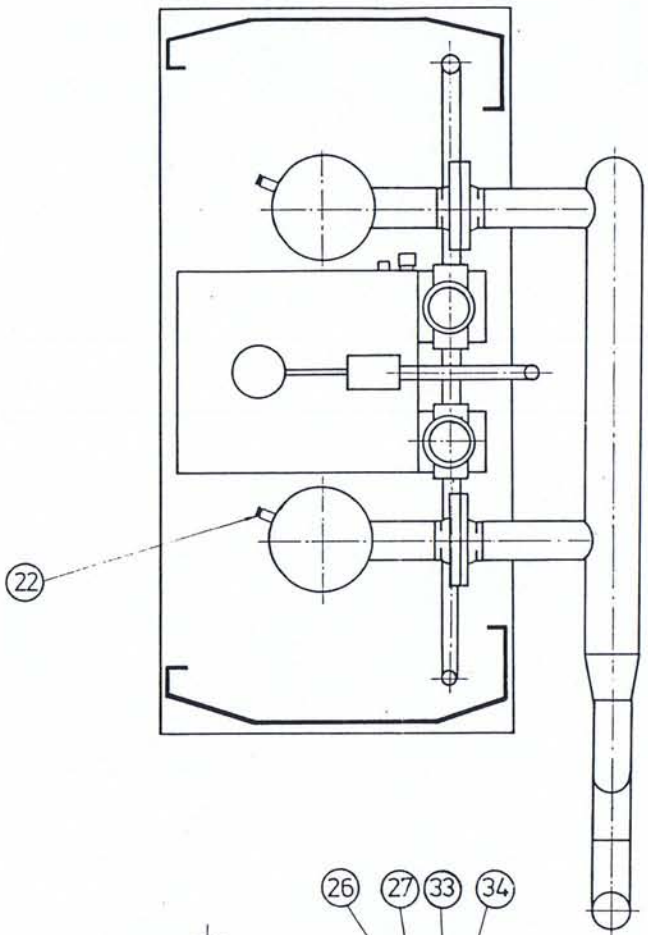
MAX. DRUM SPEED — I 60 Hz, II 50 Hz

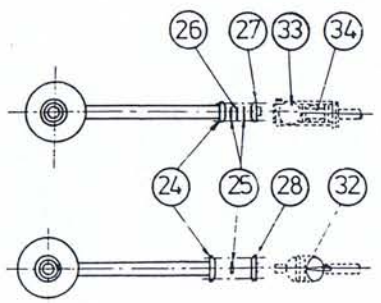
MIN. DRUM SPEED — III 60 Hz, IV 50 Hz

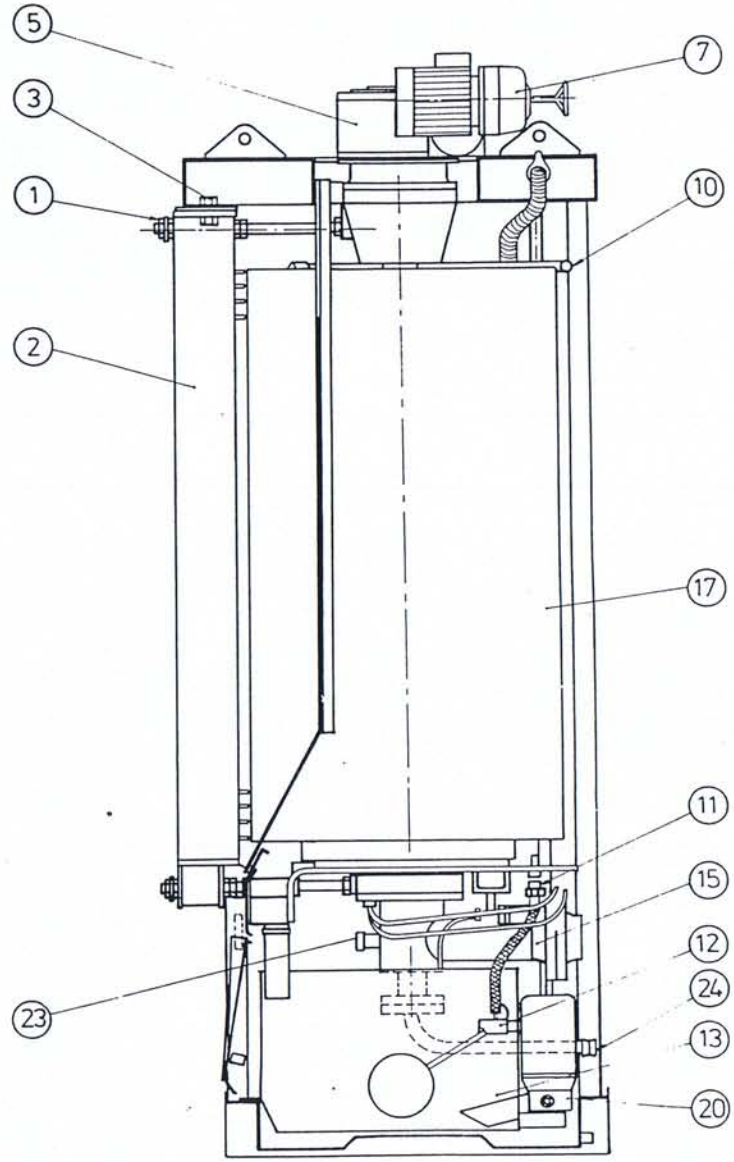
ALL INFORMATION IS APPROXIMATE ONLY AND SUBJECT TO CHANGE WITHOUT NOTICE



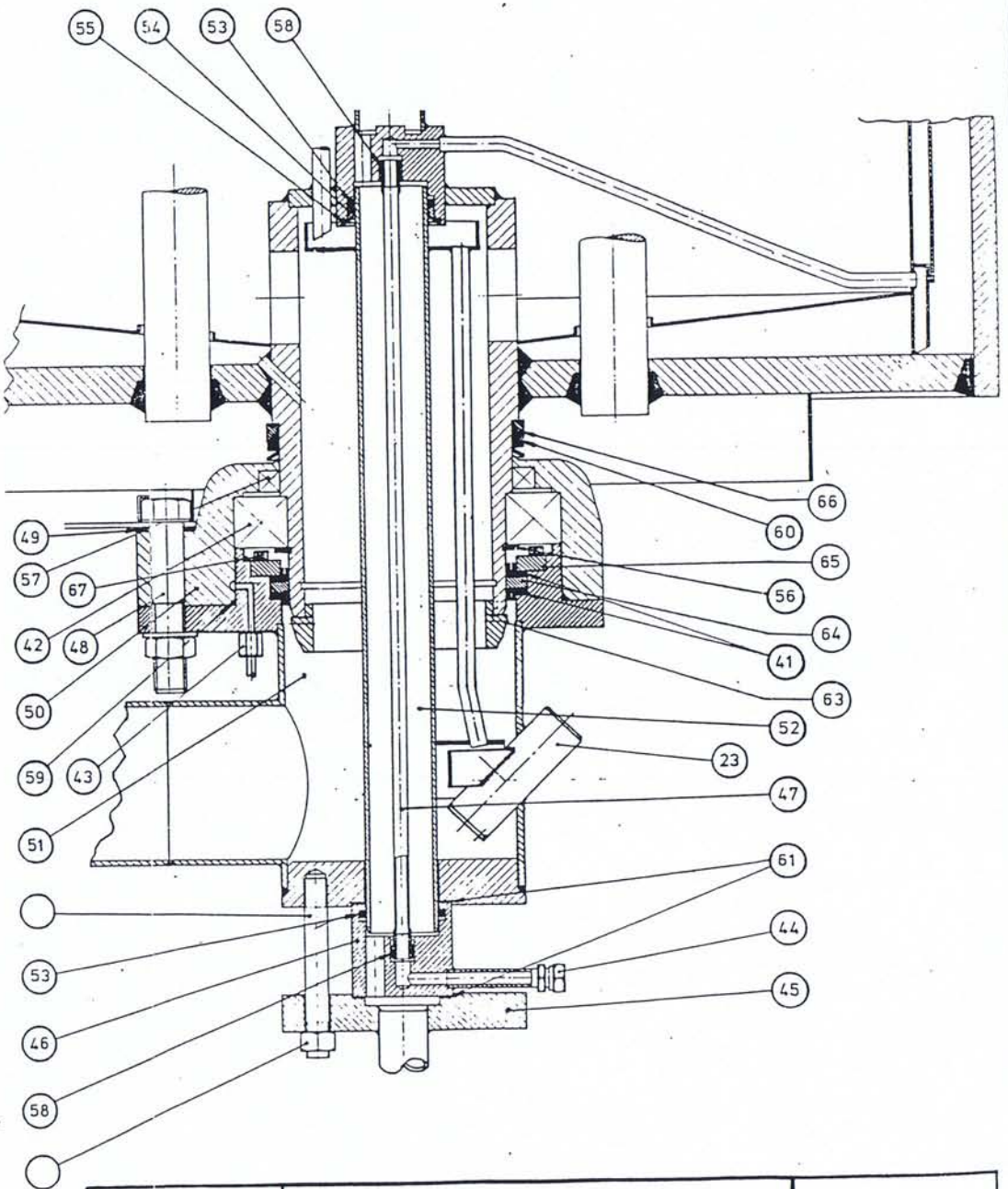

| | | |
|---|---|---|
| ATLAS DANMARK | SNITTEGNING BRUDISMASKINE TYPE V<br>SECTIONAL DRAWING<br>SCHNITTBILD<br>PLAN-COUPE<br>DIBUJO DE CORTE | ATLAS DANMARK |
| 83.12 JPC | | F 200885 |



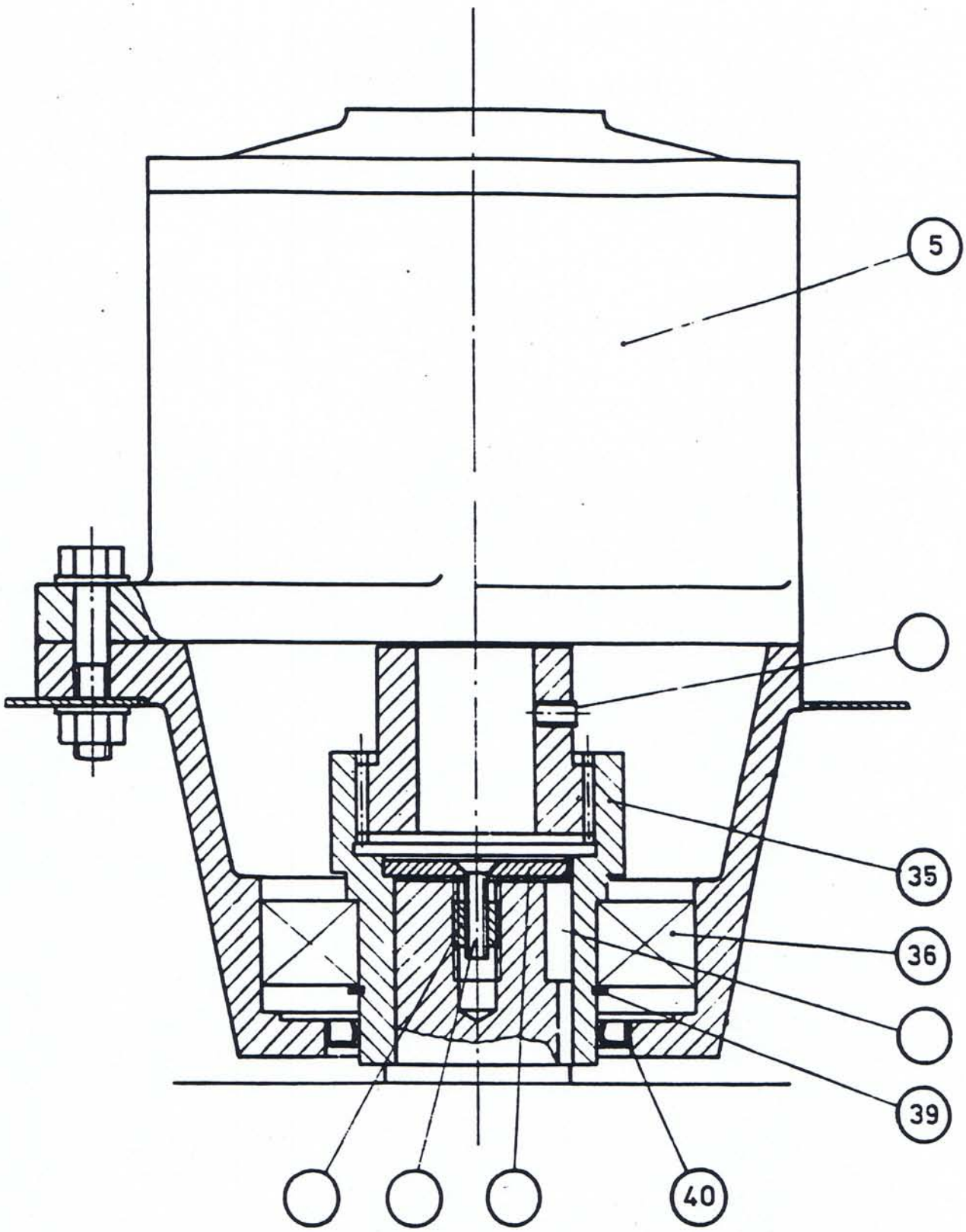

| | | |
|---|---|---|
| 83.12 JPC | SNITTEGNING BRUDISMASKINE TYPE VD<br>SECTIONAL DRAWING<br>SCHNITTBILD<br>PLAN-COUPE<br>DIBUJO DE CORTE | ATLAS DANMARK<br>F 200886 |




ATLAS DANMARK

SUGESAMLESTYKKE BRUDISMASKINE
SUCTION CONNECTION BRANCH
SAUGSAMMELSTÜCK
DISTRIBUTEUR D'ASPIRATION
COLLECTOR DE SUCCIÓN

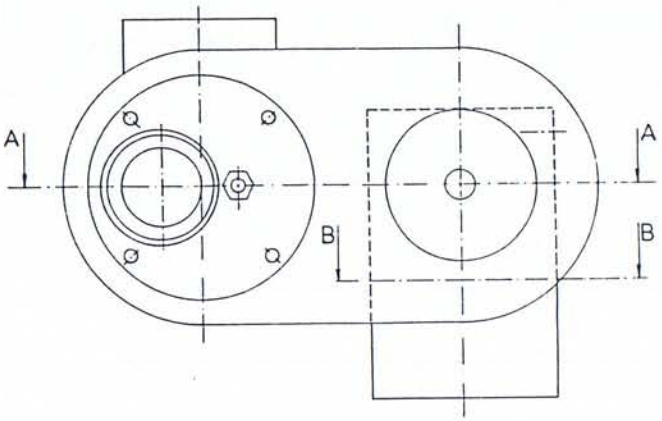
F 200887



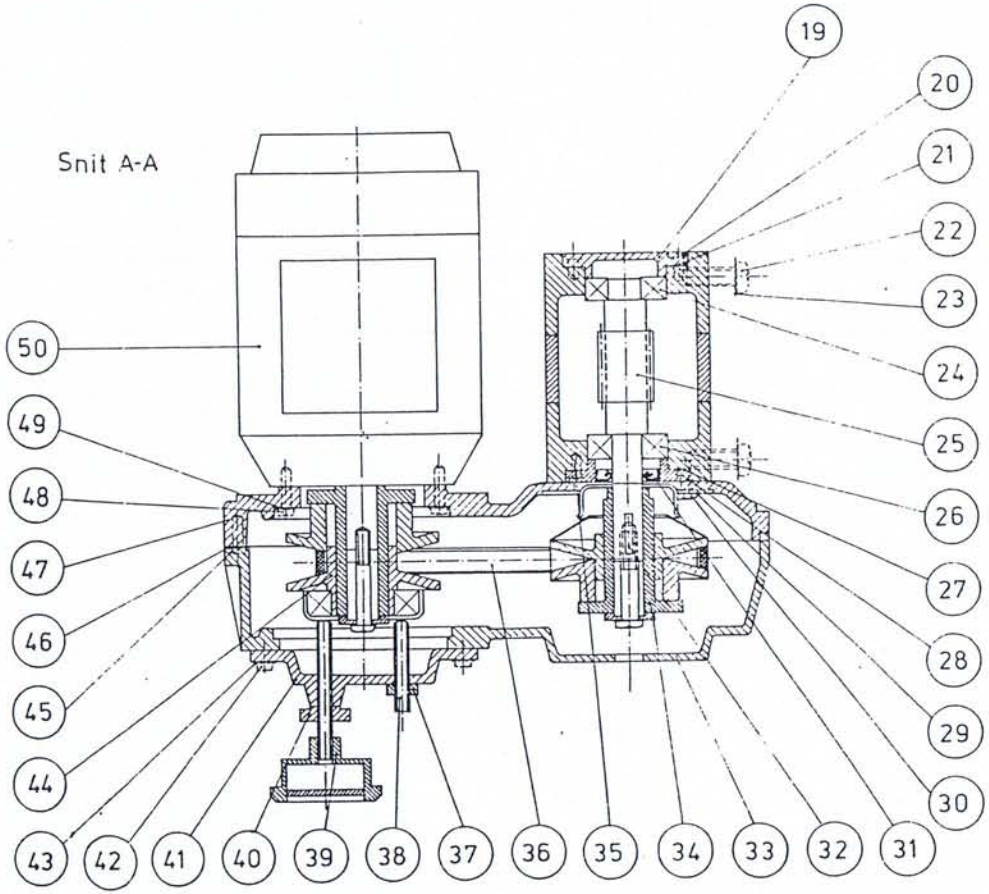

ATLAS DANMARK

SNITTEGNING AF ØVERSTE LEJE OG KOBLING
SECTIONAL DRAWING OF TOP BEARING AND COUPLING
QUERSCHNITTZEICHNUNG VON OBERLAGER UND KUPPLUNG
DESSIN DE SECTION DE PALIER SUPERIEUR ET ACCOUPLEMENT
Dibujo de corte del cojinete superior y acoplamiento

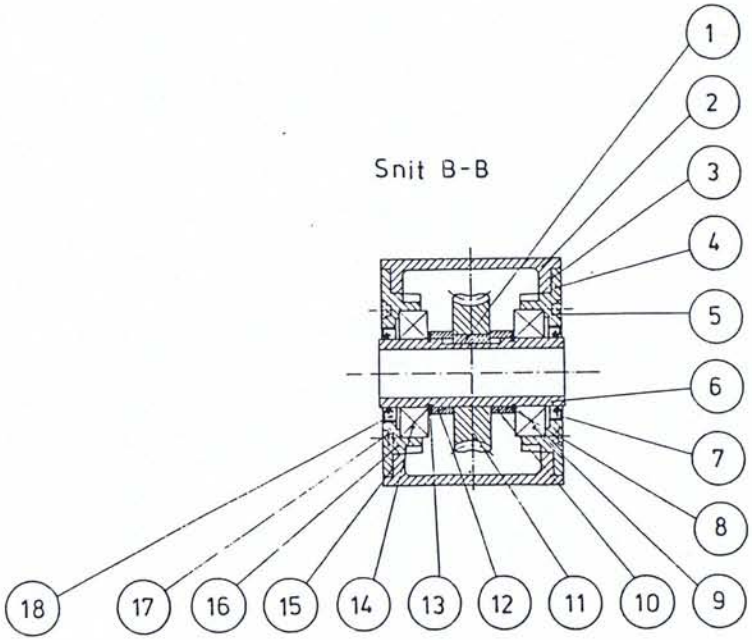
F 200888




Snit A-A



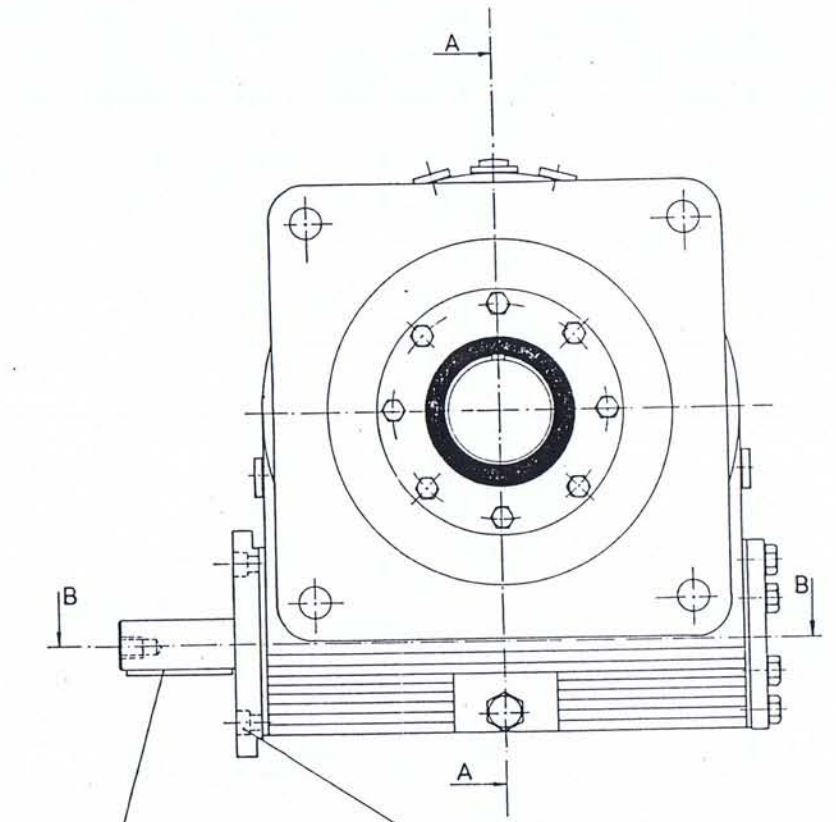

Snit B-B



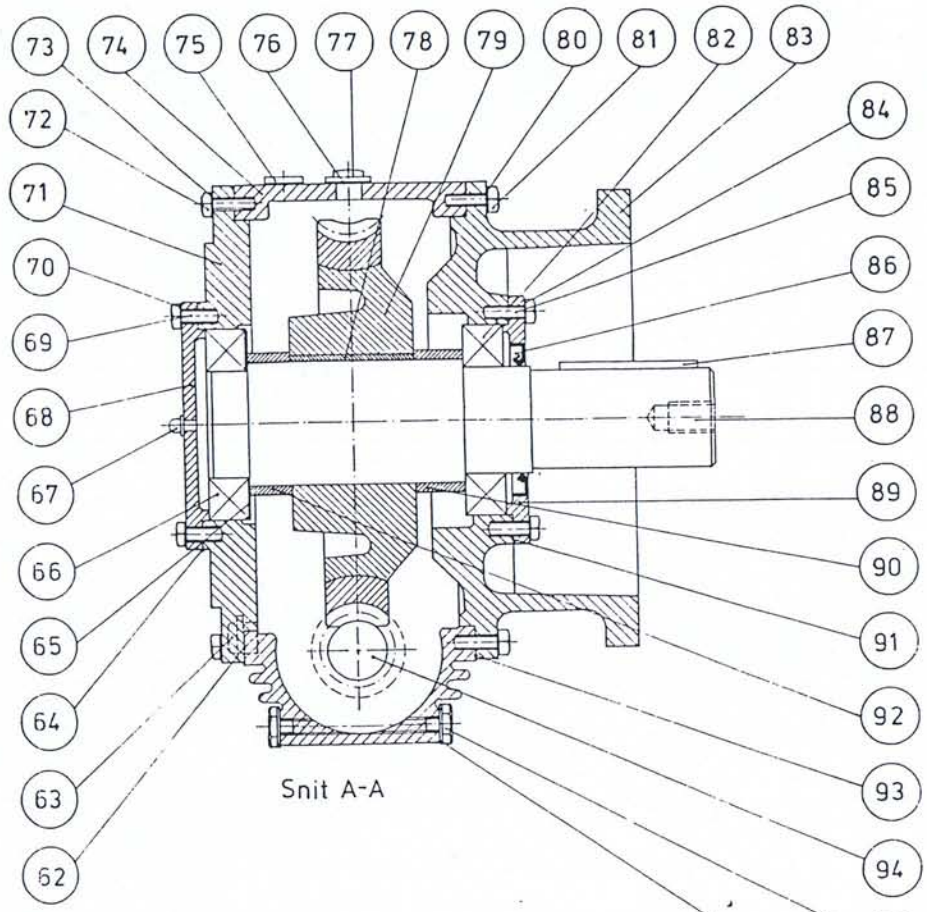

ATLAS DANMARK

VARIATOR TYPE SE-13 OG GEAR TYPE SU 250 A
VARIATOR TYPE SE-13 AND GEAR TYPE SU 250 A
VARIATOR TYP SE-13 UND GETRIEBE TYP SU 250 A
VARIATEUR TYPE SE-13 ET ENGRENAGE TYPE SU 250 A
Rueda variable de correa trapecial SE13 e engranaje SU250A

F 201030




Snit B-B




Snit A-A

ATLAS DANMARK

SNITTEGNING AF SNEKKEGEAR TYPE SVF 600 L
SECTIONAL DRAWING OF WORM GEAR TYPE SVF 600 L
QUERSCHNITTZEICHNUNG VON SCHNECKENGETRIEBE
DESSIN DE SECTION D'ENGRENAGE A VIS SANS FIN
DIBUJO DE CORTE DE ENGRANAJE HELICOIDAL SVF600L

F 201031

# S P A R E  P A R T S

Worm gear types SVF 600 L and SU 250 A

Variable speed pulley type SE-13 spec.

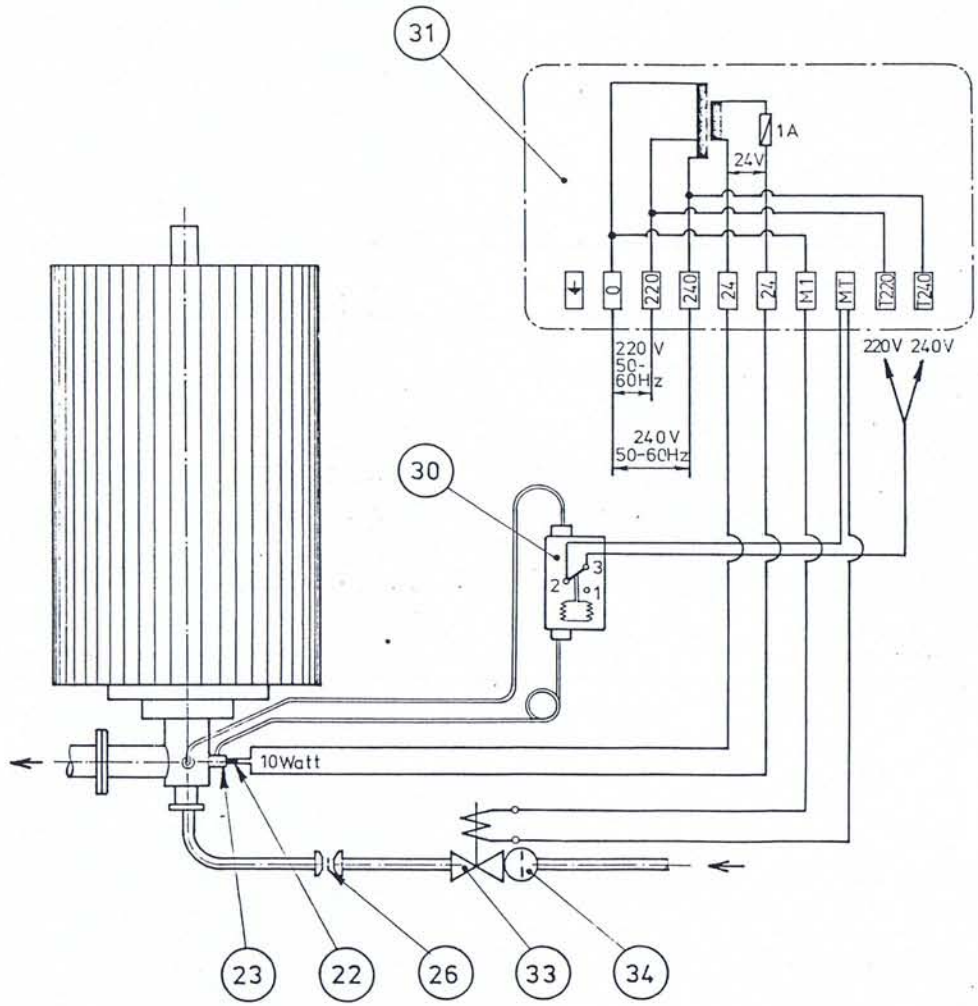
When ordering spare parts please state:

Type, size, and number of gear as well as transmission ratio. These are stated on the plate of the gear.

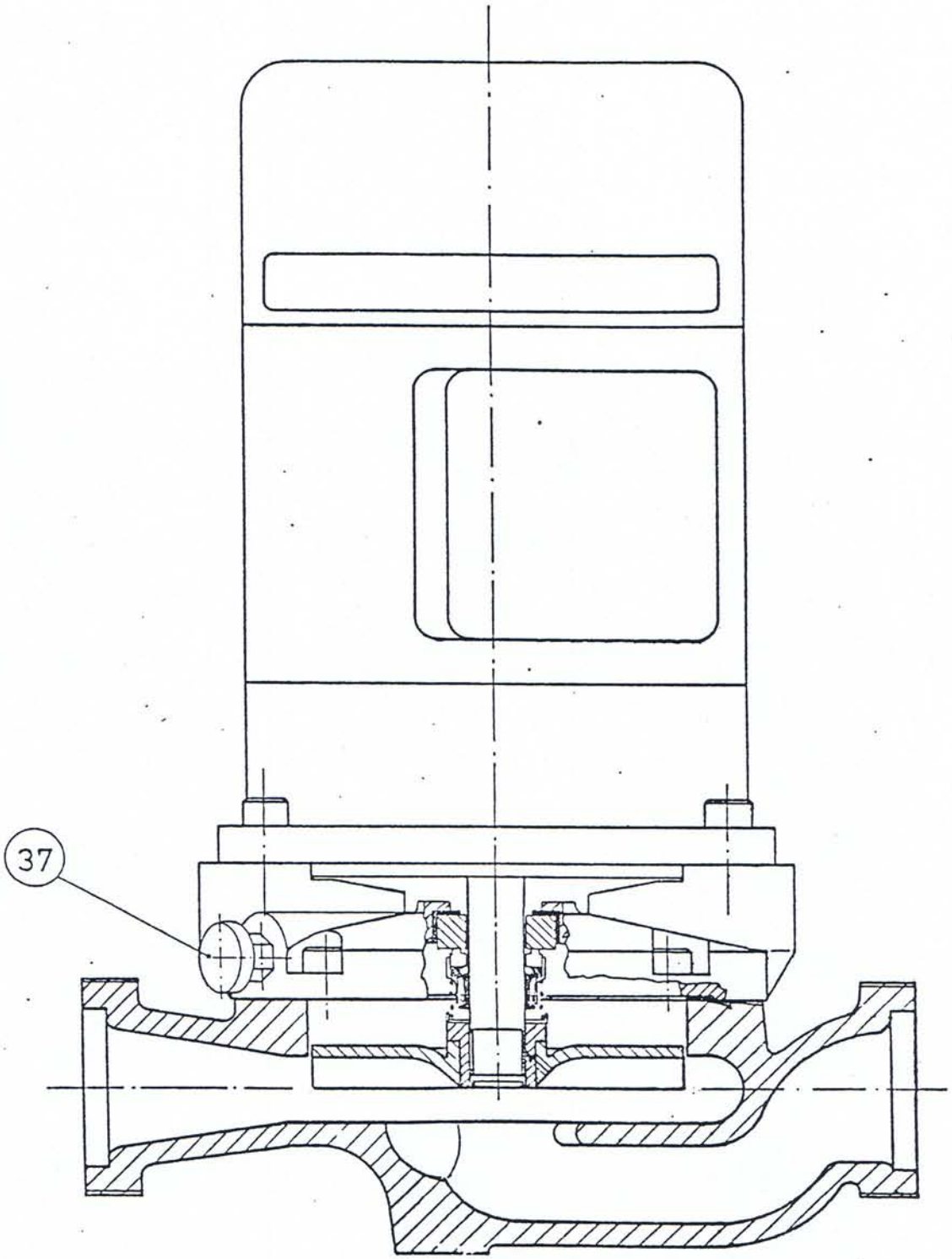
If the gear plate is no longer there, the number of the gear has been stamped into the gearbox near the driving shaft or the fan end. The transmission ratio is stamped into the shaft end of the worm (driving part).

The position numbers refer to the sectional drawings of the gears, nos F201030 and F201031.

| Position | Part |
|---|---|
| 7 and 18 | Sealing ring 42 62 10 BA |
| 9 and 14 | Ball bearing 6209 |
| 11 | Worm wheel S-256/20 |
| 24 and 26 | Ball bearing 6304 |
| 25 | Worm S-257/20 |
| 31 | Sealing ring 20 47 10 BA |
| 36 | Rubber belt 22/610 |
| 39 | Handwheel with spindle |
| 50 | Electric motor MT 80 B 14 |
| 51 | Sealing ring 40 72 10 BA |
| 55 and 57 | Taper roller bearing 30308 |
| 66 and 82 | Taper roller bearing 30214 |
| 79 | Worm wheel S 616.150 |
| 86 | Sealing ring 70 100 10 BA |
| 94 | Worm S 620 A 50 |




| | | |
|---|---|---|
| Dato: 8.3.-77<br>Sign.: TON | EL-DIAGRAM FOR KØLEMEDIEREGULERING<br>WIRING DIAGRAM FOR REGULATION OF REFRIGERANT<br>SCHALTSCHEMA FÜR KÄLTEMITTELREGELUNG<br>DIAGRAMA ELECTRICO PARA REGULACION DEL MEDIO REFRIGERANTE<br>SCHEMA DES CONNEXONS POUR REGLAGE DE ELUIDE FRIGORIGENE | A/S ATLAS DANMARK<br>Tegn. nr.<br>F 162537 |




ATLAS DANMARK

SNITTEGNING OF VANDPUMPE TYPE 200 T
SECTIONAL DRAWING OF WATER PUMP TYPE 200 T
QUERSCHNITTZEICHNUNG VON WASSERPUMPE
DESSIN DE SECTION DE POMPE A EAU TYPE 200 T
DIBUJO DE CORTE DE BOMBA DE AGUA, 200T

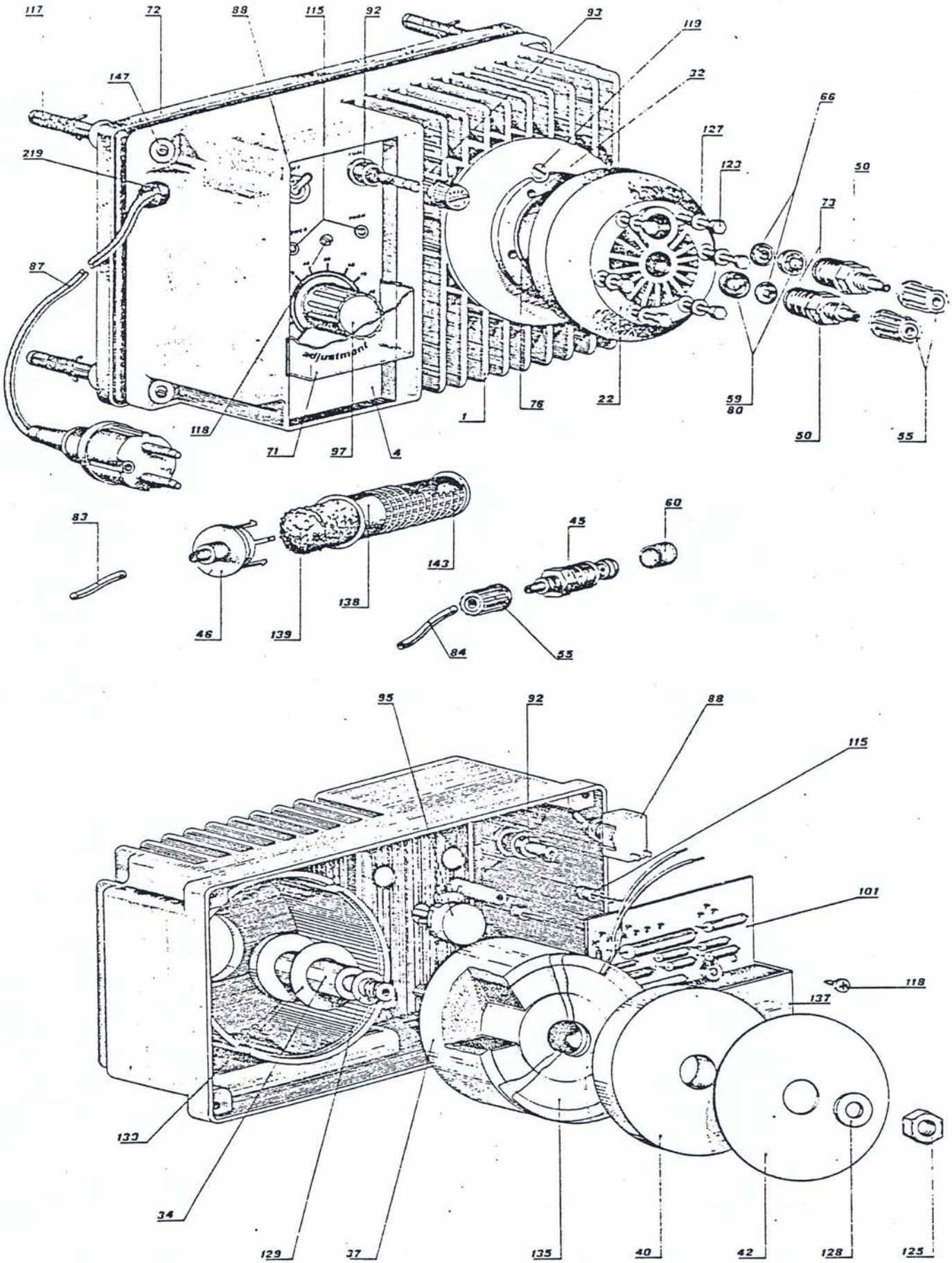
G 201033

# S P A R E  P A R T S

## Salt Dosing Pump Type C 05 10

The position numbers refer to the sectional drawing of the salt dosing pump, no G201282.

| Position | Part |
|---|---|
| 32 | Diaphragm C |
| 37 | Magnet C |
| 45 | Dosage nipple AP |
| 46 | Filter fixture |
| 50 | Nipple AB |
| 55 | Union nut AB |
| 59 | Valve |
| 60 | Dosing valve AP |
| 66 | Valve seat |
| 73 | O-ring AB |
| 80 | O-ring |
| 83 | Suction hose |
| 84 | Pressure hose |
| 93 | Fuse 0.315 A |
| 101 | Circuit board C |
| 138 | Filter fixture |
| 139 | Suction strainer |
| 143 | Weight |




ATLAS DANMARK

SALTDOSERINGSPUMPE TYPE C 05 10
SALT DOSING PUMP TYPE C 05 10
SALZDOSIERUNGSPUMPE TYP C 05 10
POMPE DE DOSAGE DE SEL TYPE C 05 10
BOMBA DE DOSIFICACIÓN DE SAL, C 05 10

G 201034

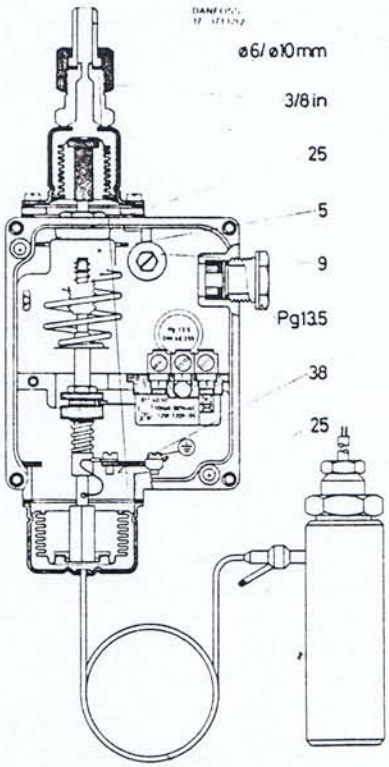



Fig. 1

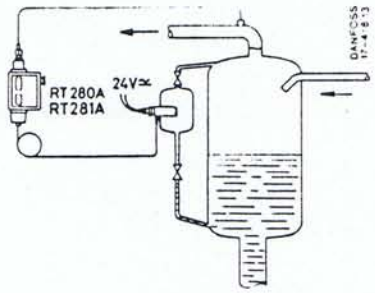



Fig. 2

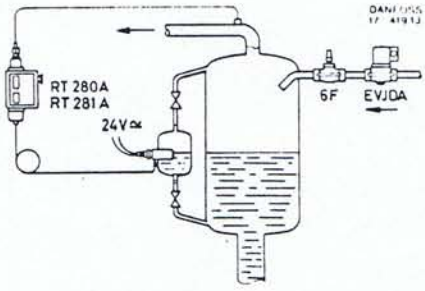



Fig. 3

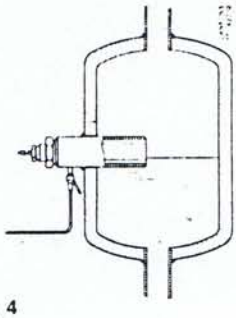
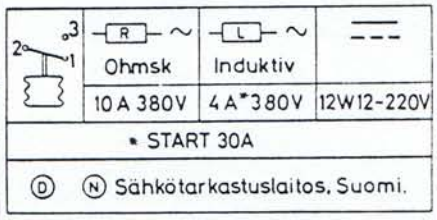


Fig. 4



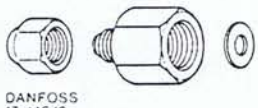

DANFOSS
17-447.10

Fig. 5

DANFOSS
17-149.10

Pg 13,5 × ⅜ in – UNF:
**631X4547**

Fig. 6



DANFOSS
17-146.10

⅜ in × ¼ in: **993N3551**

Fig. 7

## ENGLISH

## Safety cut-out Liquid level control

### Technical data

**1. General**
Refrigerants: R 12, R 22, R 502, R 717 ($NH_3$)
**Function ranges for RT 280 A:**
R 12: −50°C to +10°C
R 22, R 717: −50°C to 0°C
R 502: −65°C to − 5°C

**Function range for RT 281 A:**
R 717: −30°C to +20°C
Liquid level differential: Max. ± 40 mm (± 1½ in)
Enclosure: IP 66 to IEC 144 and DIN 40050.
Rating: See Fig. 5. START 30A = max. rating during inrush.
The switch complies with conditions as specified in VDE, Class II.*

* VDE = Verband Deutscher Elektrotechniker.

**2. Power element**
Adsorption charge
2 m (6.6 ft) capillary tube
Max. permissible bulb temperature:
+60°C (+140°F)

**3. Heat-sensing element**
Electric heater 10 W for 24 V d. c. and a. c. 1.5 m (5 ft) cable.

**4. Pressure element**
Pressure connection: ⅜ BSP with ø6/ø10 mm (ø15/64 to ø13/32 in) weld nipple.
Max. test pressure: 25 bar (356 psig).

### Fitting. See Figs. 2, 3, and 4

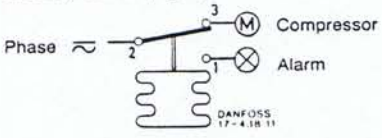
Use the mounting holes (25).
The weld bushing should be mounted vertically so that the lower edge of the bulb is at the same height as the max. permissible liquid level (Fig. 2) or, when used as a liquid level control, at the same height as the liquid level required (Fig. 3).

The electric bulb heater should be connected to 24 V d. c. or a. c. When 24 V d. c. or a. c. is not available it will, therefore, be necessary to use a transformer.
**Important: The electric bulb heater must be constantly cut in when the current supply to the system is on.**
To start up the system after standstill, it is recommended that the electric heater should be cut in for a few minutes before starting the refrigeration compressor.
If the evaporating temperature – and with it the reference pressure – is greater than the max. range temperature, RT units will register this as if the liquid level were too high.
The pressure element should be connected in such a way that the element pressure (reference pressure) corresponds to the pressure in the vessel in which the heat-sensing element is located.
To take into account pulsations originating from the liquid injection, the pressure connection should be located as far away from the liquid supply pipe as possible.
It is recommended that the connection should be direct on the top of the vessel or the upper side of the suction line immediately after the vessel.
Under conditions where strong pulsations may occur, it is recommended that a damping orifice should be inserted in the delivery line to the element.

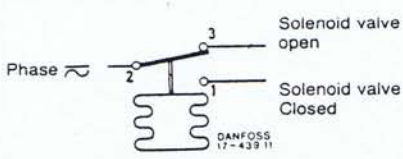
### Accessories. See Figs. 6 and 7

### Mains connection

a. Safety cut-out (Fig. 2):




b. Liquid level control (Fig. 3):




Cable diameter: 6 to 14 mm (15/64 to 9/16 in).
The earth terminal (38) should be connected to earth.

### Adjustment

Adjustment to the refrigerant required is effected by setting the internal setting disc (5) at the mark indicating the refrigerant in question on the scale (9).

## DEUTSCH

## Sicherheitsschalter Niveauregler

### Technische Daten

**1. Allgemeines**
Kältemittel: R 12, R 22, R 502, R 717 ($NH_3$)
**Funktionsbereiche für RT 280 A:**
R 12: −50°C bis +10°C
R 22, R 717: −50°C bis 0°C
R 502: −65°C bis − 5°C

**Funktionsbereich für RT 281 A:**
R 22, R 502, R 717: −30°C bis +20°C
Niveaudifferenz: max. ± 40 mm

Schutzart: IP 66 nach IEC 144 oder DIN 40050.
Kontaktbelastung: Siehe Abb. 5. START 30A = max. Belastung beim Einschalten des Motors.
Das Kontaktsystem genügt den Bedingungen der Prüfklasse II nach VDE.

**2. Das thermostatische Element**
Adsorptionsfüllung
2 m Kapillarrohr
Max. zul. Fühlertemp.: +60°C

**3. Heizkörperfühler**
Heizkörper: 10 W, für 24 V Gleich- und Wechselstrom.
1,5 m Anschlusskabel.

**4. Druckelement**
Druckanschluss: R ⅜ mit ø6/10 mm Schweissnippel.
Max. Prüfdruck: 25 bar.

### Montage: Siehe Abb. 2, 3 und 4

Montagelöcher benutzen (25).
Die Schweissbuchse ist waagerecht zu montieren, wobei die Unterkante des Fühlers in der Höhe des max. zulässigen Flüssigkeitsniveaus (Abb. 2) oder, bei Verwendung als Niveauregler, in der Höhe des ge-