SABROE

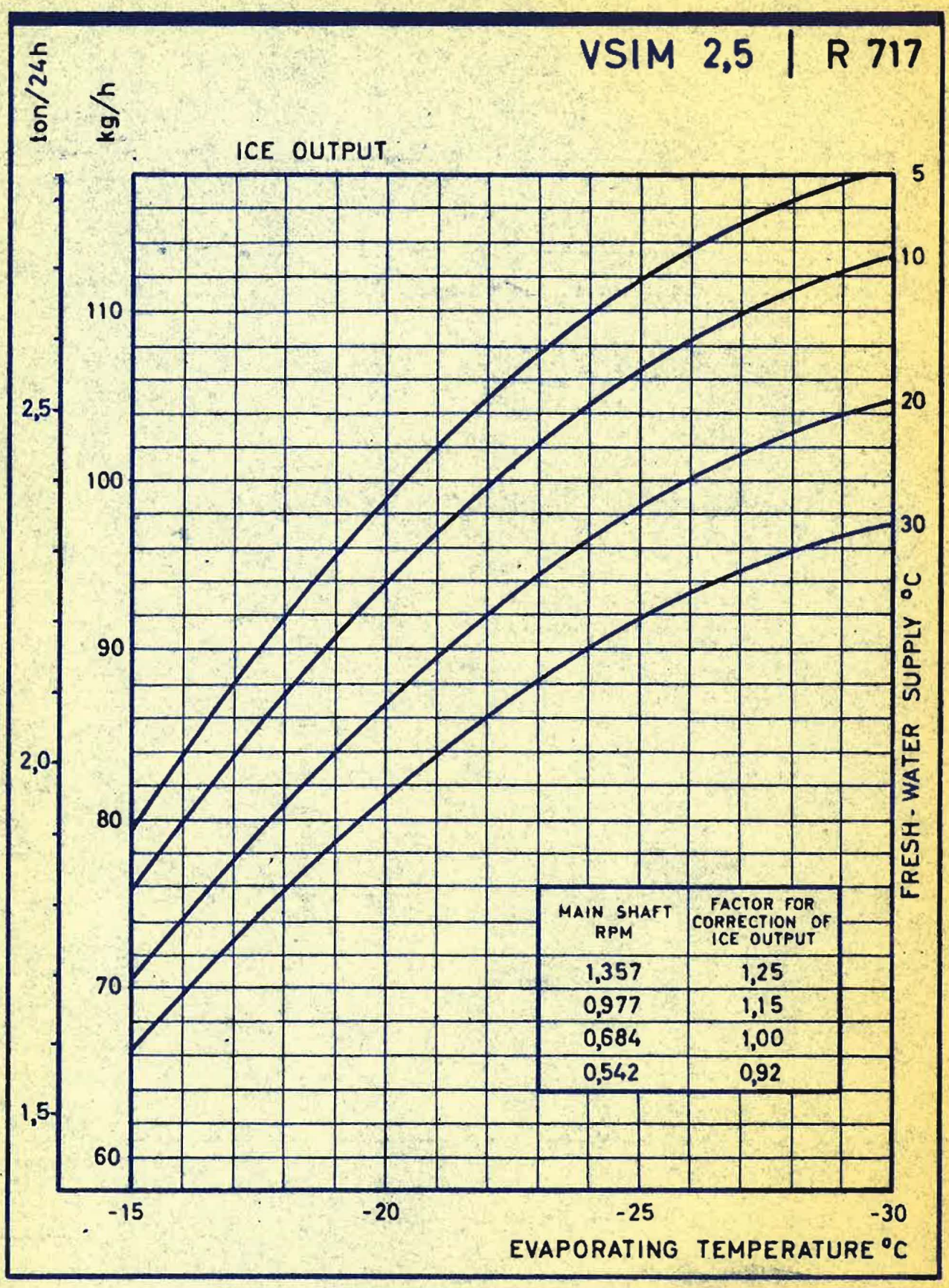
AARHUS C - DENMARK

INSTRUCTION BOOK FOR

USIM 2,5

SHOP NUMBER_____

VSIM 2,5 | R 717



MAIN SHAFT RPM	FACTOR FOR CORRECTION OF ICE OUTPUT
1,357	1,25
0,977	1,15
0,684	1,00
0,542	0,92

RESULTS CALCULATED FROM DIAGRAM 0112-064 BY MULTIPLICATION WITH CYLINDERSURFACE RATIO VSIM 2,5 : 25.
MACHINE OPERATING 120 HOURS AFTER COMPLETE OIL CLEAN-OUT.

SABROE
AARHUS · DANMARK

27 FEB 1969

Målestok	Tegnet af AHM2946
	Revideret af:
	Antaget af:

ISPRODUKTION
SKÆLISMASKINE TYPE VSIM 2,5
KØLEMIDDEL : R717

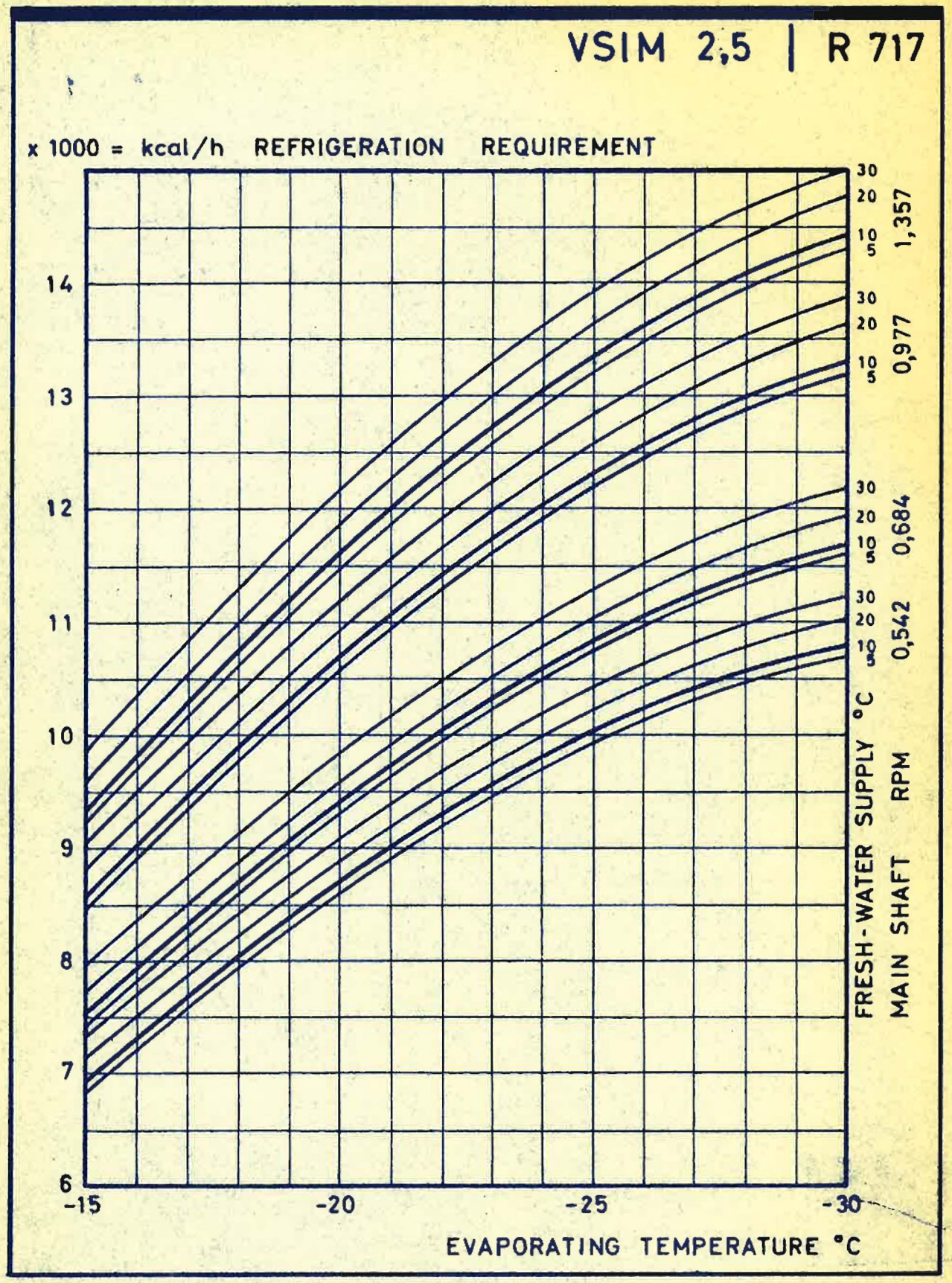
bl.nr.1
af 1

Erstatning for: 0112-009 bl.1

Nr. 0112-071

Erstattet af.

VSIM 2,5 | R 717



RESULTS CALCULATED FROM DIAGRAM 0112-063 BY MULTIPLICATION WITH CYLINDERSURFACE RATIO VSIM 2,5 : 25.
MACHINE OPERATING 120 HOURS AFTER COMPLETE OIL CLEAN-OUT, WITHOUT PRE-COOLER.

SABROE
AARHUS · DANMARK

27 FEB 1969

Målestok	Tegnet af AHM. 1.5.67
	Revideret af:
	Antaget af:

KULDEBEHOV
SKÆLISMASKINE TYPE VSIM 2,5
KØLEMIDDEL: R717

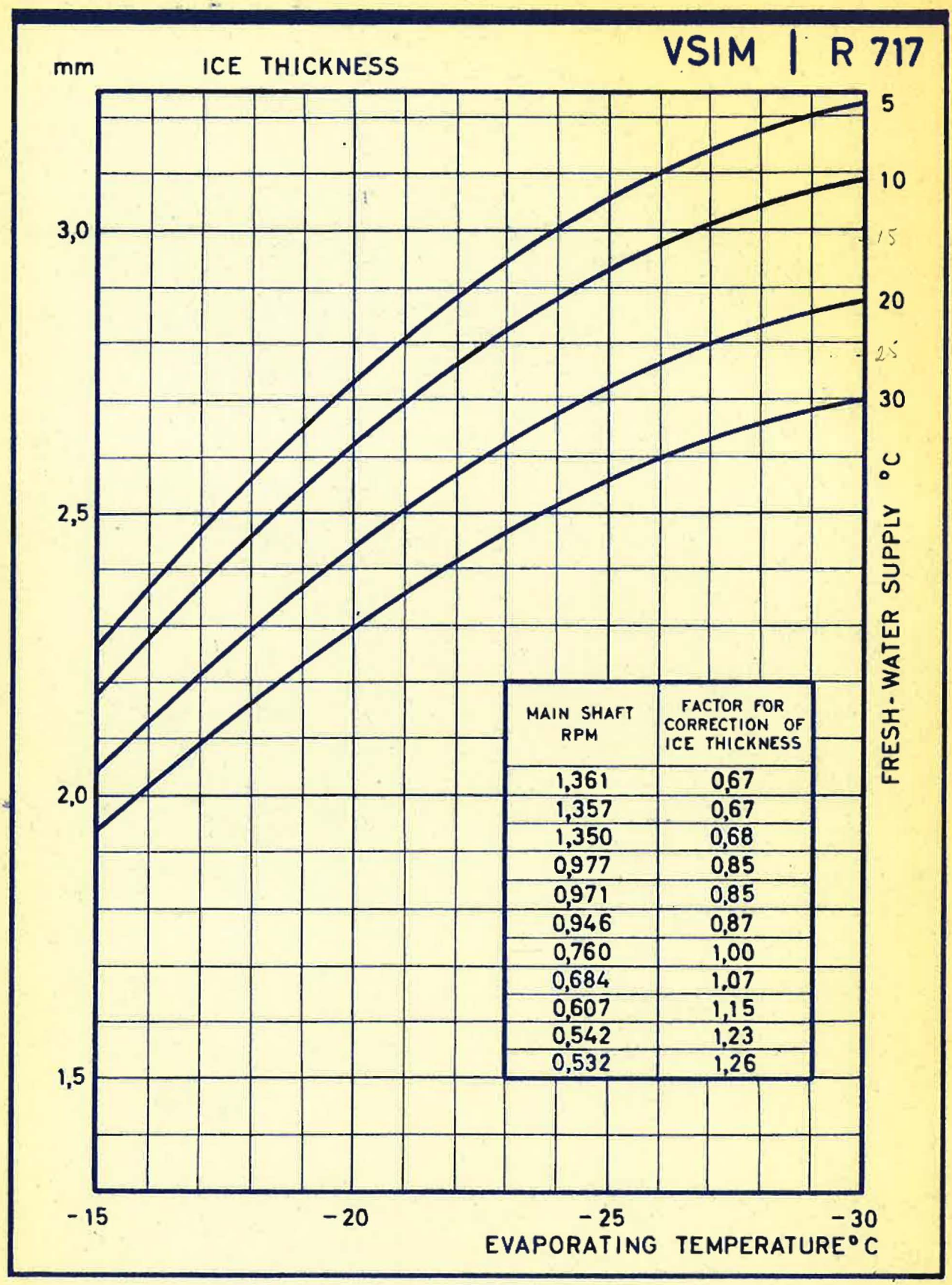
bl. nr. 1
af 1

Erstatning for: 0112-009 bl. 1

Nr. 0112-070

Erstattet af.

VSIM | R 717



MAIN SHAFT RPM	FACTOR FOR CORRECTION OF ICE THICKNESS
1,361	0,67
1,357	0,67
1,350	0,68
0,977	0,85
0,971	0,85
0,946	0,87
0,760	1,00
0,684	1,07
0,607	1,15
0,542	1,23
0,532	1,26

RESULTS BASED ON TEST NO. 168.0189. MACHINE OPERATING 120 HOURS AFTER COMPLETE OIL CLEAN-OUT. CORRECTED TO VARYING SUPPLY WATER TEMPERATURES FROM TEST CONDITION OF 8,6 °C.

SABROE
AARHUS · DANMARK

Målestok	Tegnet af AHM 20.4.67
	Revideret af:
	Antaget af:

ISTYKKELSE
SKÆLISMASKINE TYPE VSIM
KØLEMIDDEL: R 717

bl. nr. 1. af 1

Erstatning for:
Nr. 0112 - 065
Erstattet af.

SABROE

He/VP - 17/10 1958.
St. 1693.

I L L U S T R A T I O N S

Fig. 1a - piping diagram for refrigerant (ammonia)

Fig. 1b - piping diagram for refrigerant (freon)

Fig. 2 - diagram for water pipes

Fig. 3 - section through Scale-Ice Machine

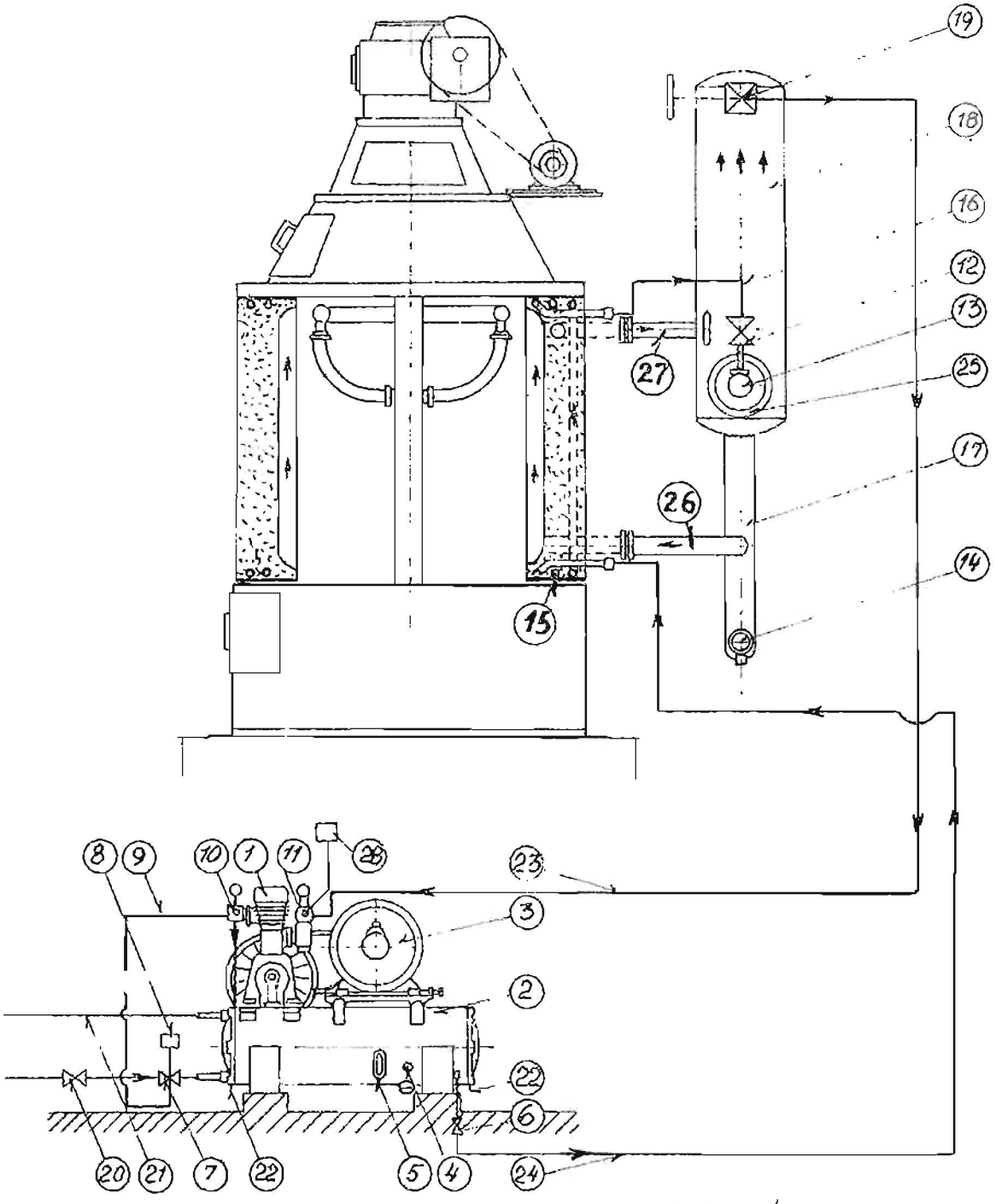
SMC 50.000-4-67 1657-113

Fig. 1 a

- piping diagram for ammonia -

1 - compressor
2 - condenser
3 - motor
4 - oil drain valve
5 - liquid level glass
6 - liquid outlet valve
7 - water valve
8 - high-pressure cut out
9 - connecting piping to high-pressure cut out
10 - delivery stop valve
11 - suction stop valve
12 - stop valve in liquid pipe line
13 - refrigerant strainer
14 - oil drain valve
15 - heat exchanger coil for cylinder flanges
16 - liquid line between heat exchanger coil and float valve in surge drum
17 - stand pipe
18 - surge drum
19 - suction stop valve
20 - condensing water inlet
21 - condensing water outlet
22 - frost drains
23 - suction line
24 - liquid line
25 - float vessel
26 - liquid inlet to freezing cylinder
27 - suction outlet from freezing cylinder
28 - low-pressure cut-out

SABROE



Sabroe/112710

Fig 1a

Fig. 1b

- piping diagram for freon -

1 - compressor
2 - condenser
3 - motor
4 - delivery stop valve
5 - liquid line
6 - freezing cylinder
7 - heat exchanger
8 - thermostatic regulating valve with strainer
9 - feeler
10 - equalizing pipe
11 - suction stop valve
12 - liquid stop valve
13 - water spray pipe
14 - gear
15 - motor for gear
16 - freezing water inlet
17 - automatic water valve with safety switch
18 - condensing water inlet
19 - suction line
20 - stop valve for condensing water
21 - condensing water outlet
22 - drain for use in case of frost

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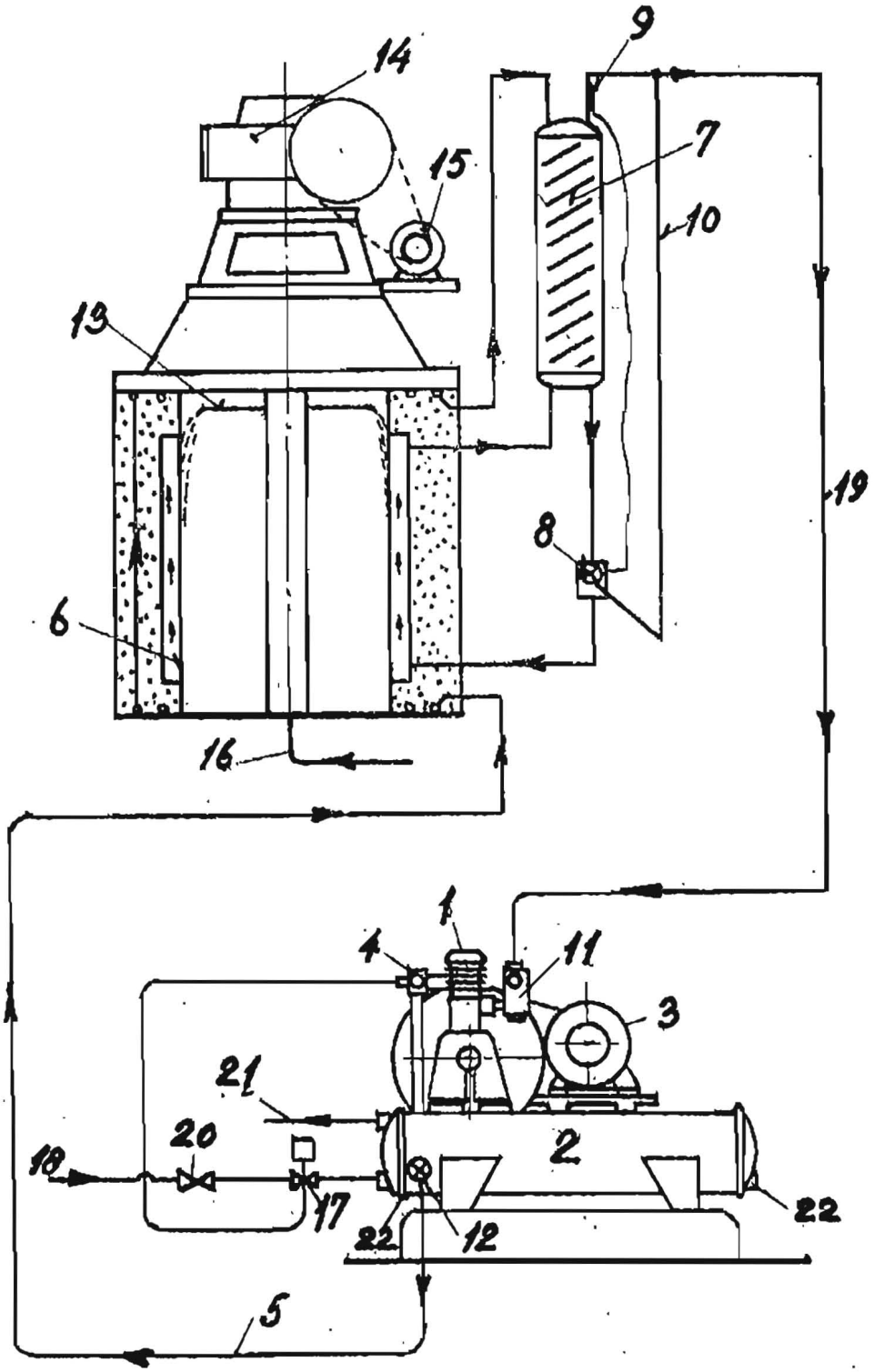

Fig 1.b.

TEGN.AF: PP 25/6-58	SKALA	Skæl-ismaskine, VSIM.	SABROE
KALK. AF: /	~	F-12 Kørdiagram.	118128
REV AF: /			

Fig. 2
- diagram for water piping -

1 - water pump
2 - couplings for water spray pipes
3 - water spray pipes
4 - surplus water collector
5 - water tank
6 - float valve for water
7 - float
8 - overflow
9 - drain for use in case of frost
10 - water piping
11 - stop valve
12 - suction line
13 - pump motor

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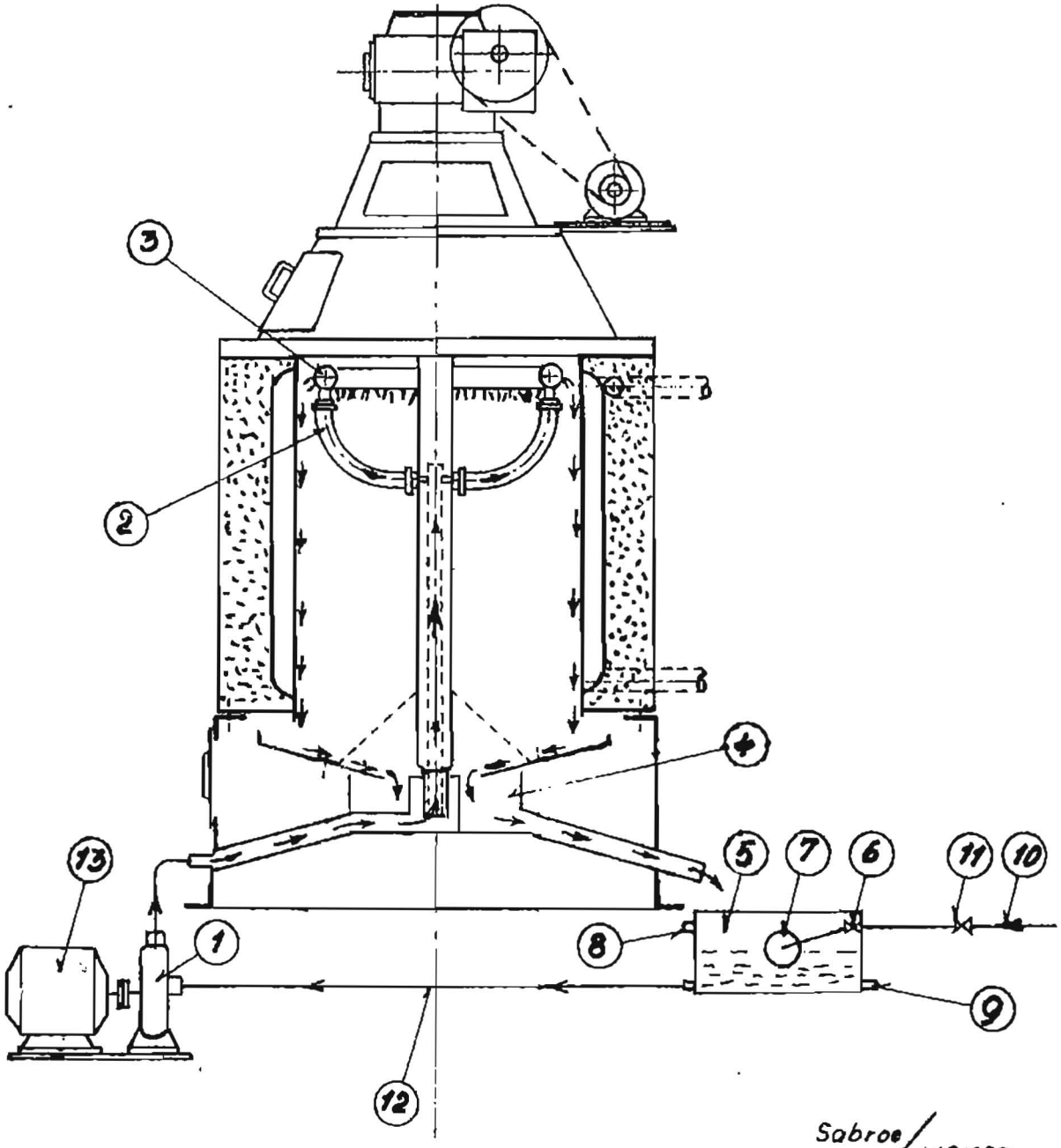

Sabroe/112709

Fig. 2

Fig. 3
- section in Scale-Ice Machine -

1 - gear, manufacture MOSS, type DRV 400 LH (1:725)
2 - coupling
3 - nut
4 - split pin
5 - bushing for shear pin
6 - shear pin
7 - thrust bearing
8 - gear support
9 - grease cup
10 - main bearing bushing
11 - inspection cover
12 - top part
13 - water spray pipe
14 - insulation
15 - covering sheet
16 - freezing cylinder
17 - main shaft
18 - gutter pan
19 - base part
20 - seal ring
21 - locking plate
22 - ice guard
23 - thrust ring
24 - bearing bushing for ice cutter
25 - ice cutter shaft
26 - ice cutter
27 - inlet from surge drum
28 - cutter shaft bearing
29 - rails for motor
30 - motor V-belt pulley
31 - electric motor
32 - V-belt
33 - gear V-belt pulley

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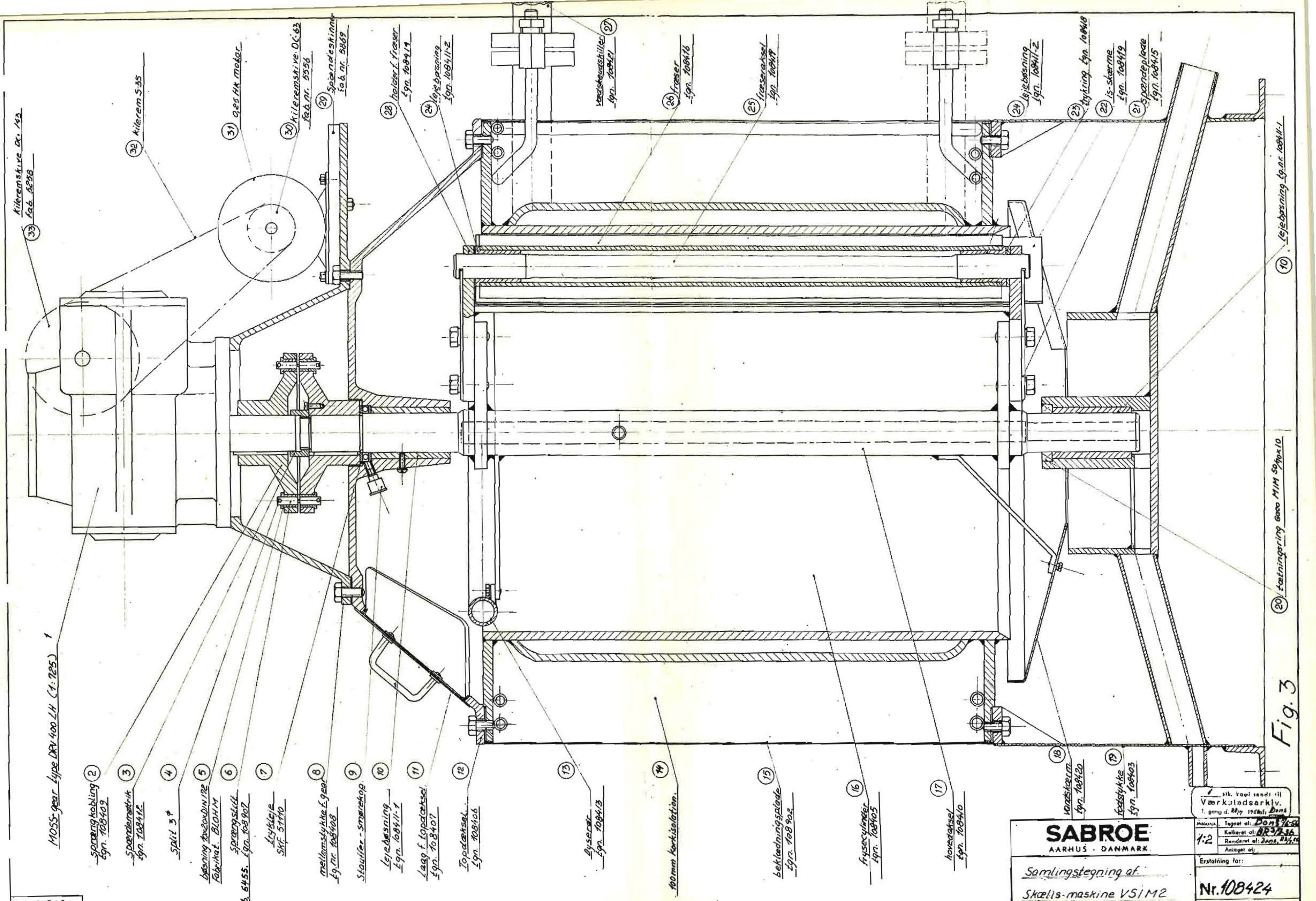

1 stk. kopi sendt til Værkstedsarkiv. 1. gang d. 28/7 1956 af: Dons

SABROE AARHUS · DANMARK	Målestok 1:2	Tegnet af: Dons 8/6-56
		Kalkeret af: BR 3/7-56
		Revideret af: Dons, 23/7-56
		Anlæget af:
Samlingstegning af Skælis-maskine VS1M2		Erstatning for:
		Nr. 108424
		Erstattet af:

Nr. 108424

I N S T R U C T I O N S

for

STARTING AND STOPPING THE "SABROE" SCALE-ICE MACHINE TYPE VSIM 2

TO START:

1) (During frost) - Close all water drain valves.
2) Open the water inlet valve 20 (fig. 1)
3) Start the Scale-Ice Machine.
4) Start the compressor.
5) Open the liquid inlet to the Scale-Ice Machine (valve 12, fig. 1), and run the machine for 10 minutes.
6) Start the freezing water pump.

TO STOP:

1) Stop the freezing water pump so that no water flows down the Scale-Ice Machine. Run the machine for 5 minutes.
2) Close the liquid inlet to the Scale-Ice Machine (valve 12 fig. 1).
3) Stop the compressor.
4) Stop the Scale-Ice Machine.
5) Close the water inlet (valve 20, fig. 1).
6) (During frost) - open all water drain valves.

In case of stopping for a longer period, the drum surface - when completely defrosted and dried - should be greased with a thin layer of pure oil.

PRINCIPLE OF THE "SABROE" SCALE-ICE MACHINE

The Scale-Ice Machine consists of a double-walled cylinder, the freezing cylinder, which is cooled by evaporation of the refrigerant in the annular space between the two walls. The evaporation absorbs heat, and the heat is taken from the inner surface of the cylinder which is thereby cooled.

A rotating device sprays water to the inner, cold surface of the freezing cylinder, and part of the water freezes to ice. The ice is removed by a rotating cutter and falls as scales into a refrigerated store below the machine.

SMC 50.000-4-67 1657-113

Piping diagram (ammonia) - fig. 1a:

The compressor is marked 1, the condenser 2, and the electric motor 3. More detailed description of these parts is given in the instruction for the "SABROE" compressor.

Through the suction line 23 the compressor draws the vapours from the Scale-Ice Machine, compresses them and discharges them through the delivery stop valve 10 into the condenser 2.

In the condenser the vapours are cooled and condensed to liquid which collects in the lower part of the condenser (the receiver).

Through the liquid line 24, the heat exchanger coil 15, the liquid line 16, and the strainer 13, the liquefied refrigerant flows to the float vessel 25 which contains the float valve (the regulating valve of the plant).

Through the float valve the refrigerant passes from the high-pressure side to the low-pressure side of the system. During operation the low-side temperature will be about minus 20°C, and for that reason the Scale-Ice Machine with surge drum must be insulated.

The vapours developed in the Scale-Ice cylinder are returned to the compressor from the top of the surge drum (marked 18) through the suction line 23.

In the freezing cylinder part of the liquid evaporates. These vapours, together with unevaporated liquid, will leave the Scale-Ice Machine, and return to the surge drum through the outlet pipes 27.

Through the stand-pipe 17 the liquid entrained will be led to the lower part of the surge drum, whereas the vapours are drawn into the compressor, and then the cycle is completed.

SMC 50,000-4-67 1657-113

Piping diagram (freon) - fig. 1b:

The compressor is marked 1, the condenser 2, and the electric motor 3. More detailed description of these parts is given in the instruction for the "SABROE" compressor.

The refrigerant vapours pass from the suction line 19 through the suction stop valve 11 into the compressor where the vapo rs are compressed, and then, through the delivery stop valve 4, discharged into the condenser 2.

In the condenser the vapours are cooled and condensed to liquid which collects in the lower part of the condenser (the receiver).

From the receiver the refrigerant passes through the liquid line 5 to the coil surrounding the freezing cylinder, and further through the heat exchanger to the thermostatic expansion valve which controls the amount of liquid supplied to the freezing cylinder.

The freezing water gives off heat which evaporates the refrigerant and the vapours are drawn through the heat exchanger into the compressor thus completing the cycle.

During operation the temperature will be about minus 20°C in the low pressure side for which reason the freezing cylinder and the cold pipes should be insulated.

Water piping diagram - fig. 2:

In the Scale-Ice Plant water is utilized for two purposes:

1) the cooling of the condenser in the compressor unit, and
2) the production of Scale-Ice.

The condenser cooling water should be fairly clean and preferably cold. The freezing water used for the production of Scale-Ice must be clean, fresh, and not too hard. If the water from the water main at the place of erection is very hard (contains much lime), it may be necessary to use a water softening plant to remove the salts in solution. However, the diagram in figure 2 does not assume the use of such a device.

The condenser cooling water - fig. 1 - passes from the supply main to the condenser 2, and leaves the condenser through the pipe line 21. (The water is clean, lukewarm, and may possibly be used for other purposes, but the condenser outflow must be free).

Often the water inlet pipe to the condenser is fitted with an automatic regulating water valve. The task of this valve is to economize with the water so that the condenser will only be supplied with the quantity of water necessary. In order to be able to regulate according to the pressure in the system, the water valve is connected to the pressure side of the plant. If the pressure exceeds a certain limite. see the compressor instruction - the high-pressure cut-out will switch off the current to the compressor motor.

The water for the Scale-Ice Machine passes through the pipe line 10, stop valve 11, and a float maintains a constant level in the water tank 5.

In case of a leaking float, the water flows through an overflow pipe, leading to the sewer. The tank is fitted with a drain 9 for use in case of frost.

The overflow pipe from the float vessel should have visible outlet, in order that it can be controlled if water is running from the pipe, and thus ascertained if the float valve is in order.

The freezing water pump 1 draws from the water tank 5 and delivers the water through the hollow shaft of the Scale-Ice Machine to the spray pipe 3, and from there it is distributed over the cylinder wall in the machine. Part of the water will be frozen to ice on the cold cylinder, whereas the remainder flows down into the collector 4 below the Scale-Ice Machine, and from here it returns to the water tank.

SMC 50.000-4-67 1657-113

The water spray pipes, marked 3 in fig. 2, must be kept clean. By means of the couplings 2 the water spray pipes are easily removable.

Water drains for use in case of frost:

In order to avoid damage by frost, it is very important to drain the machinery of water when the plant is off, and there is any danger that so low temperatures may occur where the machine is located that the water may freeze in pipes and water passages.

The normal water drains in the plant are shown in fig. 1, marked 22, and fig. 2, marked 9. In case the water pipes should be so laid that they will not be emptied through the drains shown, additional drains must be arranged at suitable low points.

The cutter in the scale-ice machine - fig. 3:

The ice is removed from the freezing cylinder by means of a cutter marked 26 in fig. 3.

With a view to the dispatch the cutter distance from the freezing cylinder is not factory set, and during the erection the distance has to be set to 0.4 - 0.6 mm. The setting and the possible later adjustment have to be undertaken by a qualified erector.

How to arrange a scale-ice plant:

It is preferable to place the scale-ice machine over the room intended as a store for the scale-ice, and, as the scale-ice slides easily, preferably at a level so that the ice from here can be carried by chute to a truck.

The direction of rotation of the scale-ice machine is clockwise when looking down into the machine, and the speed about 1 revolution per minute.

Installing the scale-ice machine:

The scale-ice machine must be placed on a foundation made according to the drawing accompanying the machine.

The foundation may be built of clinkers set in cement mortar of 4 cement to 6 sand, or, cast in concrete of 1 cement to 4 sand to 6 gravel. The foundation bolts are placed.

When the foundation has set hard, the scale-ice machine can be put in its place, and the foundation bolts can be tightened up. It is important that the scale-ice machine is accurately lined up when erected, and space for possible withdrawing the main shaft with cutter should be foreseen.

When the scale-ice machine has been put into its place, the compressor can be erected (see the instruction book for the compressor), and the connecting pipes can be laid.

Connecting pipes: it is of great importance that the connecting pipes like the other part of the refrigerating plant are absolutely dry and clean inside. Before leaving our factory, the scale-ice machine, compressor, and condenser, and the other parts, are carefully cleaned and blown out with steam, and then, while still warm, with dry air. With the same care the locally bent connecting pipes should be cleaned after welding and bending.

LUBRICATION:

It is of utmost importance that the thrust bearing of the Scale-Ice Machine is well lubricated, and therefore it has a grease-cup which should always be well supplied with a cup-grease of suitable quality for low-temperature operation.

When every month the cup-cover is screwed down a couple of turns, the bearing will be sufficiently lubricated.

The other bearings in the Scale-Ice Machine are self-lubricating.

For the compressor should be used an oil having its pour point lower than the lowest temperature of evaporation found in the working machine.

Use a neutral mineral oil, free of water and acid, without components that may saponify or form slush. See also the instruction book for the compressor.

For the gear of the Scale-Ice Machine should be used a suitable gear oil, for example:

Vacuum Oil Co.	Compound DD
Wakefield	Alpha 717
Esso	Pen-o-Led E.P.3
Shell	Vitrea Oil 79

When the machine stands still, the oil is to be between the upper and the lower mark on the oil level indicator.

The oil charge of the gear is: 1.75 litres.

The gear oil is recommended changed first time after about 150 hours' operation; then for each 1500 hours' operation. This corresponds to the oil being changed first time after a production of 13 tons of ice, and then for each 130 tons of ice production.

There is no oil in the gear at delivery.

Oil drainage (only for Scale-Ice Machines with ammonia as a refrigerant):

Part of the oil with which the compressor is lubricated may from time to time make its way into the annular space between the walls of the Scale-Ice Machine, and this, although an oil separator is fitted. At suitable intervals, the oil should be drained off the Scale-Ice Machine, as otherwise it will reduce the capacity.

It appears from fig. 1 that the plant is provided with oil drain valves at the low points where, in an ammonia plant, oil may collect. The condenser drain is marked 4, and the Scale-Ice Machine drain is marked 14. The oil is drained by only cracking the valve

so that the oil creeps out, slowly. Opening the valve too much results in blowing off liquid refrigerant. The oil is best drained after an off period.

After filtering, the oil may be used again.

Precaution in case of overloading.

The coupling between gear and Scale-Ice Machine is fitted with 2 shear pins, which will be clipped in case of overloading the Scale-Ice Machine, thus protecting the machine against damage.

After inserting new shear pins it should be controlled that the shaft rotates easily, before the machine is started again.

Care and inspection of the Scale-Ice Plant.

During the daily work, watch the following:

1) See that all rotating parts are well lubricated.
2) Drain the freezing cylinder of oil.
3) Purge the plant of accumulated air. (See the compressor instruction).
4) The refrigerant charge should be sufficient, that is, liquid should be visible 1/3 up approx. in the liquid level glass on the receiver, when the machine is running.
5) Look for correct water supply.
6) Keep the various filters clean.
7) Test at intervals the high-pressure and low pressure cut-outs.
8) At intervals, clean the machine of accumulated ice.

SABROE

He/VP - 30/11 1960.
St. 1390.

Instruction for SABROE Low-Pressure Refrigerant Float Valve (Regulating Valve) - Fig. 100

In the following numbering the first three figures refer to the number of the drawing, and the following two figures indicate the number of the parts shown on same.

10001 - liquid inlet branch (connecting piece)
10002 - packing
10003 - cap nut
10004 - packing
10005 - packing
10006 - socket spanner enveloping woven wire strainer
10007 - valve body
10008 - guide for needle valve
10009 - needle valve
10010 - valve seat
10011 - gasket
10012 - push rod
10013 - lock nut
10014 - adjusting screw
10015 - pin
10016 - float
10017 - hex.head screw
10018 - fulcrum pin
10019 - float chamber
10020 - liquid inlet, high-pressure
10021 - vapour outlet, low-pressure
10022 - liquid outlet, low-pressure

The flow of liquid refrigerant to the evaporator is so regulated by the low-pressure float valve that the evaporator receives the correct quantity to ensure the full effect of the evaporator, which again means that the float maintains a nearly constant liquid level in the evaporator.

A compressor will work perfectly with more evaporators, each having a float valve, and, conditions may be so that one float valve can be common for more evaporators, provided they are installed and connected appropriately.

The liquid arriving from the receiver or direct from the condenser enters at 10020, flows through the strainer 10006 to the seat 10010, and from here it expands into the float chamber 10019. The pressure drop causes formation of vapour (flash gas) which ascends through 10021, and the remaining cold liquid descends through 10022 into the evaporator.

SMC 50.000 7-64 F.43

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A rising liquid level in the float chamber lifts the float 10016 so that the condenser pressure forces the needle valve 10009 against its seat and closes to the liquid inlet.

Conversely, a sinking float presses the push rod 10012 until it opens the needle valve, thus allowing more liquid to enter the float chamber.

Where to install the float valve.

Fig. 101 shows a typical arrangement of a float when connected to an evaporator.

Insert the float valve in its chamber 10019 with the fulcrum 10018 upwards, as shown in Fig. 100. See that the float 10016 moves freely in the float chamber; if not, loosen the lock nut 10013 and adjust the screw 10014.

When at high level the float must be clear of the float chamber, and the pin 10015 be a little clear of the adjusting screw 10014.

It should also be checked that the float has not been damaged during the transport, and, that no impurities have entered the valve.

Controlling the float valve.

With the plant working under normal conditions check that the float valve operates correctly. The pipe leading refrigerant from the evaporator to the surge drum should be covered with frost, and, at low temperatures, also the suction pipe leading from the surge drum to the compressor may frost. No frost should appear on the machine cylinders.

It is good practice to close the stop valve on the liquid outlet from the receiver (the condenser) a quarter of an hour before stopping the compressor.

In cases where the plant is working automatically it is advantageous to have a solenoid valve in the liquid line to prevent any flow of liquid into the evaporator during off-periods.

Cleaning the strainer and inspecting the float valve.

To prevent possible impurities from obstructing the float valve a strainer of woven wire 10006 is built in in front of the float valve. At intervals, clean the strainer as follows - see Fig. 101:

Close the valves A and C and run the plant for a quarter of an hour. Then, close the valve B and open the valve C (observe the correct sequence). The remaining vapour in the float chamber is then pumped out by operating in this way for a quarter of an hour. Rags soaked with luke-warm water and placed on the float chamber will accelerate the process.

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The float chamber is then practically empty of refrigerant, and the cap nut 10003 can be unscrewed and the strainer taken out for cleaning with steam or kerosene. If the valve seat and the remaining parts need overhaul, this can conveniently be done on the same occasion.

After the inspection the stop valves should be re-set, i.e., the valves, A, B and C totally open. However, this must not be done until the air which entered the open float chamber has been blown out by loosening the cap nut 10003 and opening the valve C for a moment. When the refrigerant has replaced the air, re-tighten the cap nut 10003.

Insulating the float chamber.

If the float valve is situated outside the cold room or off a tank with liquid to be cooled, the float chamber should be insulated. It must be observed, however, that the float valve and the filter can be taken out without damaging the insulation.

Spare parts for the low-pressure float valve.

Where a needle 10009 or seat 10010 is worn they will leak. After removing the cap nut 10003 put a rod through the two holes in the socket spanner 10006 and unscrew the guide 10008.

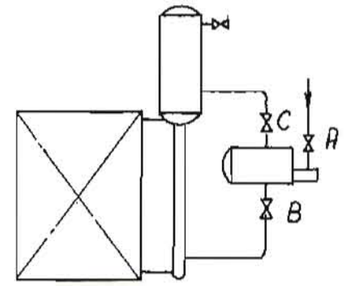


Fig 101.

Fig. 100.

SABROE

He/BJH/hs/EJ - 14.8.1963
St.No. 2292

WIRING DIAGRAM FOR SCALE ICE PLANT

- drawing No. 129672 -

1 - motor starter for compressor
2 - high pressure cut-out for compressor motor
3 - low pressure cut-out for compressor motor
4 - compressor motor
5 - motor starter for scale ice machine
6 - motor for scale ice machine
7 - motor starter for freezing water pump
8 - motor for freezing water pump
9 - switch
10 - safety thermostat
11 - heating element
12) cut out for heating element
12 a)

The scale ice plant is started and stopped manually.

The pilot cables to the circuit breakers are connected in such a way that the freezing water pump 8 cannot be started unless the compressor 4 is working.

Nor can the compressor 4 be started unless the gear of the scale ice machine is in operation.

In case the condenser pressure exceeds a certain limit or the suction pressure becomes too low, the high pressure cut-out 2 or the low pressure cut-out 3, respectively, will cut off the pilot current to the compressor motor and the pump motor.

Further, the plant is equipped with a safety thermostat 10 which stops the compressor and the freezing water pump in case the evaporating temperature should fall more than a few degrees below the normal temperature.

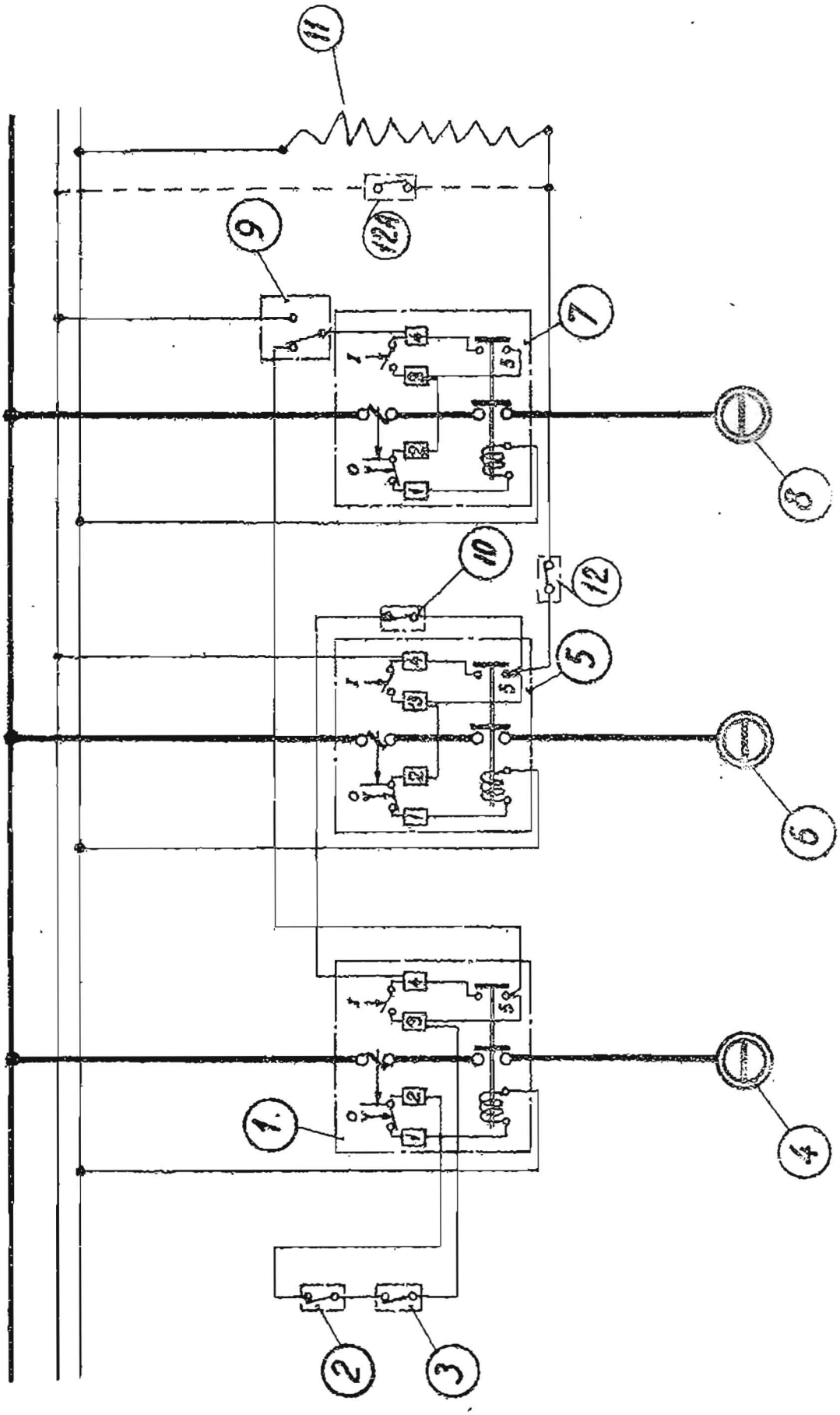
The diagram shows the position of the switch 9 during normal operation.

When the switch 9 is in the other position, the freezing water pump can be operated independently of the other components, which makes it possible to use the pump for thawing off the ice deposits in the scale ice machine.

The heating element installed to prevent ice deposits on the screens at the bottom of the machine, will normally heat, when the ice machine is started.

In case the heating element should be served manually, the cut-out 12 a is to be connected, as shown with dotted lines, and the cut-out 12 is not connected.

SMC 50.000 7-64 F.43



Sabroe 129672.

SABROE

BJH/AMC - 29.6.1966
Stencil 2703-En.

REMOVAL OF
LIME DEPOSITS IN ICE MACHINES

Directions for use of CSCO Ice Machine Cleaner Powder:

1) Cut off the refrigeration, flush and refill the system.

2) Dissolve 1 bag of CSCO Ice Machine Cleaner Powder for each 2.5 U.S. gallons = 9.5 litres of water in the system.

3) Start the circulating pump and let run until slime and all other deposits are removed.

4) Apply the solution with a brush to those contaminated areas which do not normally come in contact with the solution.

5) Remove the solution and flush out the whole system with fresh water.

6) Put the machine back into normal operation.

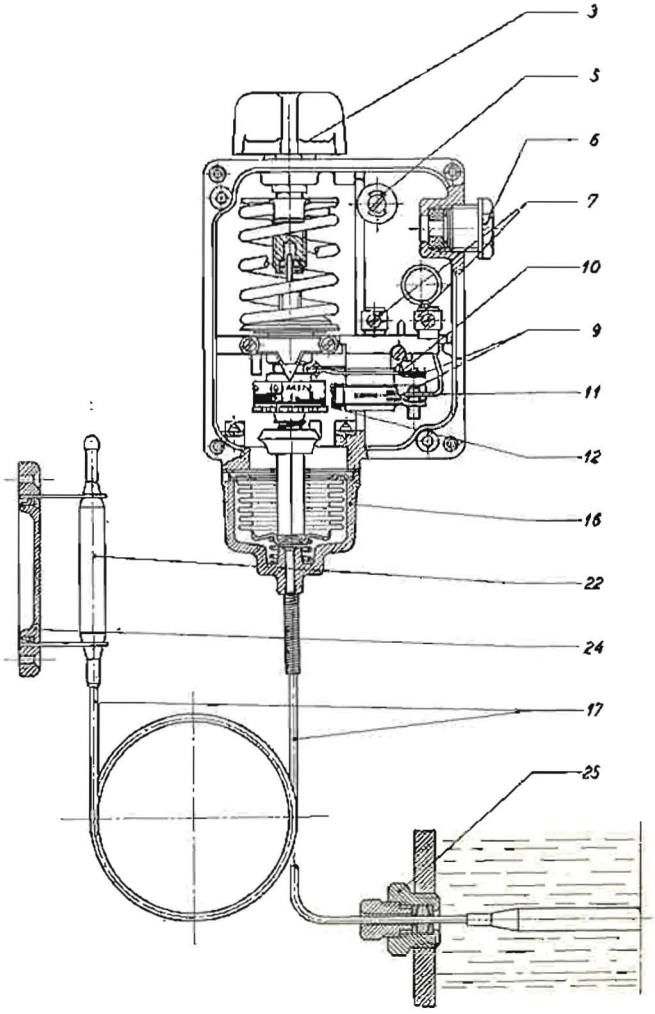
The water systems of the VSIM machines contain approx.:

VSIM	2.5:	8	U.S. gallons	=	30	litres	of water
VSIM	5- 6:	18.5	- -	=	70	- -	- -
VSIM	12-15:	32	- -	=	120	- -	- -
VSIM	25:	40	- -	=	150	- -	- -

The cleaner is normally in stock, designated CSCO, article No. 10607 (bags each of 8 oz = 225 grammes).

E **INSTRUCTIONS**

Room Thermostats Type RT 3, 9 and 10



3. Knob adjusting stop temperature
5. Loop terminal
6. Cable entries
7. Terminals
9. Contacts
10. Armature
11. Permanent magnet
12. Differential dial for adjusting start temperature
16. Bellows housing
17. Capillary tube
22. Bulb
24. Bulb holding bracket
25. Seal for brine tank

Fitting

Brine tank: (applies to type RT 3 only). The phial (22) is submerged in the brine and clamped there appropriately, but it must not touch the cooling coil.

The capillary tubing (17) can be provided with a stuffing gland (25) at extra cost so that it can be introduced below brine level through a hole tapped ½ in pipe thread.

Cold room: The thermostat should be fitted outside the room in which the temperature is to be controlled, and at such a point that the thermostat case is always at least 4 to 5°F (2 to 3°C) warmer than the phial.

If such an arrangement is not obtainable with type RT 3, we recommend to use type RT 4, Leaflet 17-.1.01.02, instead, provided the desired temperature range permits.

The capillary tubing (17) must not be passed through any room colder than the one in which the phial (22) is fitted; nor must it be run through the same sleeve as the suction line.

The best way of passing the capillary tubing through the wall of the cold room is by way of a grouted-in sleeve having at least ⅜ in bore. The sleeve can be pluged with the two rubber plugs supplied with the instrument.

The phial (22) is fixed to the wall of the cold room by means of the phial holder (24).

Care should be taken so that iron filings do not get into the instrument during installation, as such filings will be attracted by the permanent magnet (11) and thus lessen the proper clearance between armature (10) and magnet.

Adjustment

The thermostat is set by means of the knob (3) to cut out at the desired temperature, which can be read from the scale on the cover of the instrument.

The temperature differential desired for the operation of the plant is set by the differential adjusting nut (12) inside the case, which is likewise provided with an adjustment scale. Next, the plant is started and the setting checked.

If, for instance, the knob on the cover is set for a scale value of 21°F (—6°C) and the differential adjusting nut for 4°F (2°C), the instrument will start the plant at 25°F (—4°C) and stop it again at 21°F (—6°C).

When the knob (3) is turned, the upper and lower temperature limits will move simultaneously either upwards or downwards, whereas of the differential adjusting nut (12) will only alter the starting temperature.

SABROE

Bulletin 2029 EN

FBP/KBS 7.8.1967

INSTRUCTION OF RADICON GEAR FOR SCALE ICE MACHINES

ILLUSTRATIONS:

SABROE drawing No. 153.721: Radicon gear lubrication
DAVID BROWN publication No. F 687 16/12: parts list 1. reduction
DAVID BROWN publication No. F 687 16/14: parts list 2. reduction

GENERALLY:

Double reduction gear built together of 2 separate worm gears.

Make: RADICON - DAVID BROWN GEAR DIVISION, HUDDERSFIELD, ENGLAND.

Designation: original type designation: VD = vertical double-reduction with British inch dimensions of shafts.

Furthermore, ultimo 1966, an execution with metric shaftdimensions appeared and now the gear is as follows:
BVD with British inch dimensions of shafts
CVD with metric dimensions of shafts

Additional designation for shaft positions: R/LY

Spare parts: are ordered after designation of above DAVID BROWN publications and in any case stating the gear type according to the name plate of the gear, and the serial number of the scale ice machine.

Spare parts will usually be easily accessible from local agents for DAVID BROWN.

OILS RECOMMENDED:

For use in scale ice machines DAVID BROWN GRADE 6 is recommended which covers the following makes a.o.:

B.P.: Energol CS 425
GR 425 E.P.

SMC 60.000-8-68 1657-113

CALTEX:	Regal oil Meropa No. 4
CASTROL:	Alpha 617 Alpha LS 4
ESSO:	Teresso V 117 Teresso 120 Pen-O-Led E.P.3
GULF:	Gulf Harmony 121
MOBIL:	Compound DD D.T.E. AA
SHELL:	Vitrea 75 Macoma 75
REVOL:	Voler Reductol V 95
VALVOLINE:	E.T.C. 60

OIL CHARGE:

The gear is sent without oil charge, with the quantity necessary for 1. charge separately (ESSO: Pen-O-Led E.P.3).

Before starting fill in as follows (see drawing No. 153.721)

1. reduction: Remove oil plugs 1 and 2 and pour through 1 till overflow from 2 which indicates the right oil level. Put on plugs 1 and 2 after controlling that the ventilation opening in plug 1 is free.

2. reduction: Pour through opening 4 to correct oil level in oil level indicator 5. Control that the ventilation opening in covgr 4 is free.

The gear must not be filled to overflowing as this can involve high oil temperature and oil leakage.

The oil is changed after 1500 operation hours. Under very moist conditions of operation or in chemical active steams oil change is recommended with intervals from 1 to 3 months.

The gear is claculated for operation with maximal oil temperature to 93°C.

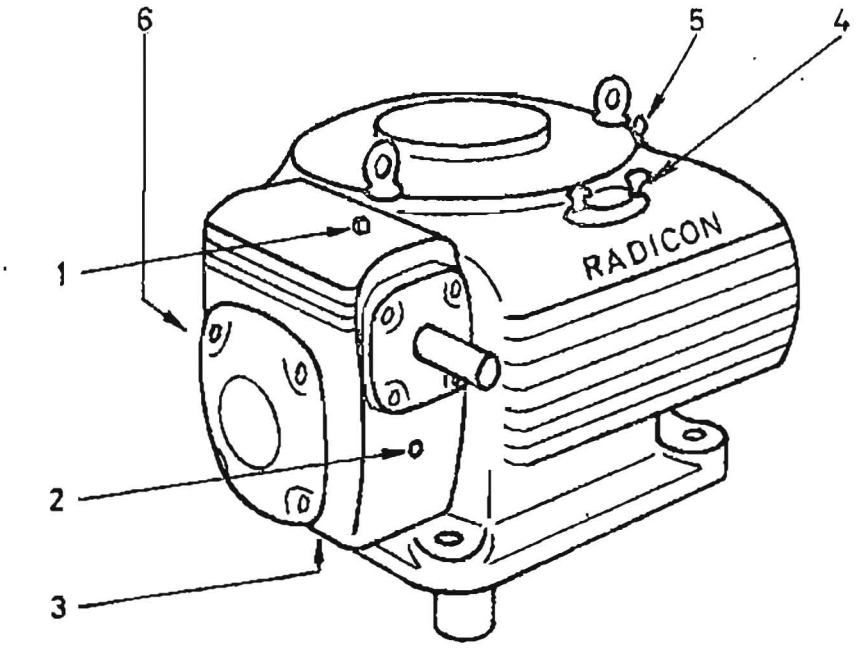
SMC 60.000-8-68 1657-113

CHARGE:

The following oil quantities are valid for the gear types used:

Scale ice machine type	Radicon gear type	1. reduction liter	2. reduction liter
VSIM 2,5	VD BVD 400 CVD	o,57	2,3
VSIM 6	VD BVD 500 CVD	0,57	3,4
VSIM 15	VD BVD 600 CVD	1,1	4
VSIM 25	VD BVD 800 CVD	2,9	10

	4	5	6
2. Reduktion	Oliepåfyldning og ventilation	Oliestandsmåler	Olieaftapning
2nd. Reduction	Oil charging and vent. plug	Oil dipstick	Oil drain plug
2. Reduktion	Öleinfüll und ventilation	Ölstandmesser	Ölablass
Réduction 2	Chargement d'huile et ventilation	Indicateur de niveau d'huile	Vidange d'huile



	1	2	3
1. Reduktion	Oliepåfyldning og ventilation	Oliestands prop	Olieaftapning
1st. Reduction	Oil charging and vent. plug	Oil level plug	Oil drain plug
1. Reduktion	Öleinfüll und ventilation	Ölstandmesser	Ölablass
Réduction 1	Chargement d'huile et ventilation	Indicateur de niveau d'huile	Vidange d'huile

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AARHUS · DANMARK

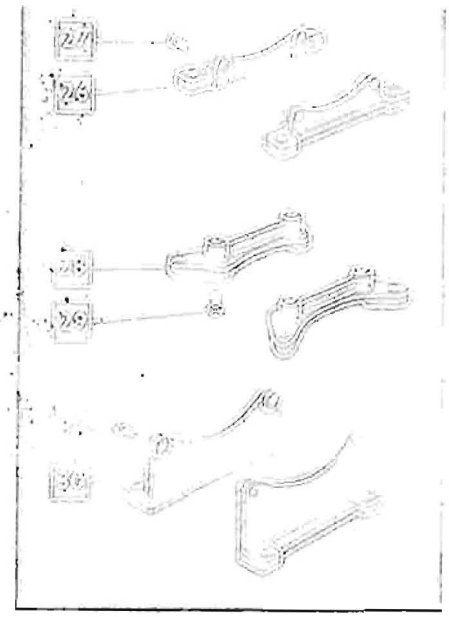
Målestok | Tegnet af FBP/TM 7-6-
Revideret af:
Antaget af:

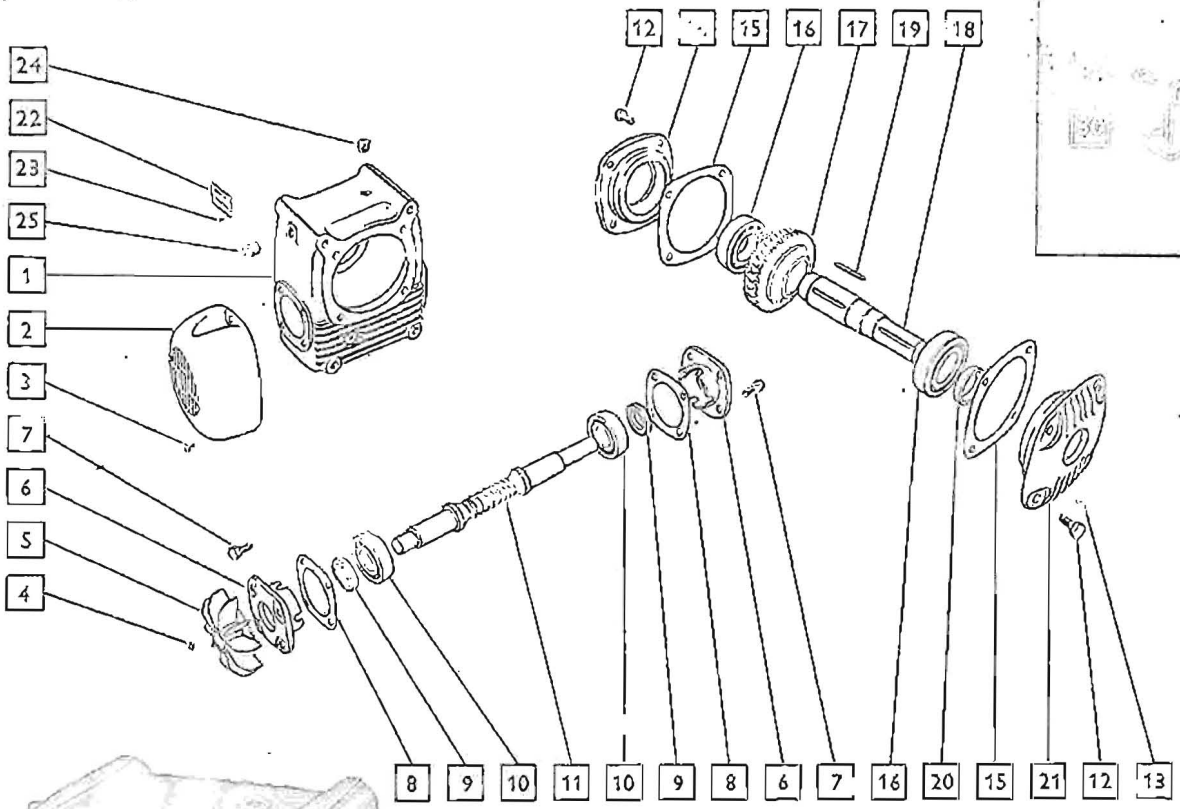
RADICON GEAR TIL SKÆLISMASKINER - SMØRING

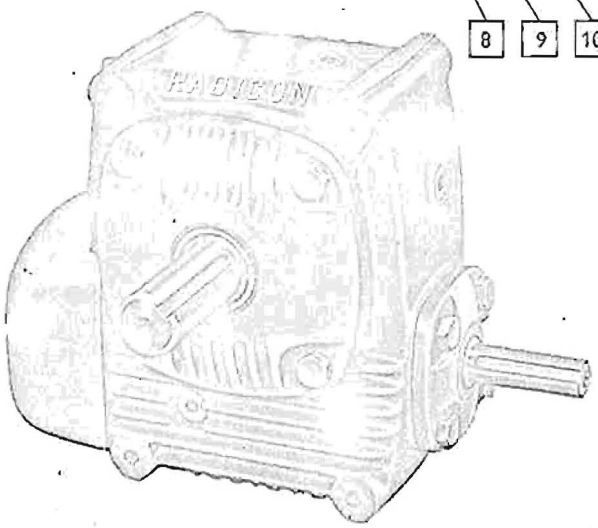
Erstatning for:
Nr. 153721
Erstattet af.

DAVID BROWN
RADICON SPEED REDUCERS

Standard 'Adaptable' Units
Series 6







1. Case
2. Cowl
3. Screw for cowl
4. Locking screw for fan
5. Fan
6. Oil catcher for wormshaft
7. Bolt for wormshaft oil catcher
8. Shim for wormshaft oil catcher
9. Oil seal for wormshaft
10. Bearing for wormshaft
11. Wormshaft
12. Bolt for wheelshaft end cover
*13. Copper washer for end cover bolt
14. End cover for wheelshaft
15. Shim for wheelshaft covers
16. Bearing for wheelshaft
17. Wormwheel
18. Wheelshaft
19. Key for wheelshaft
20. Oil seal for wheelshaft
21. Oil catcher for wheelshaft
22. Nameplate
23. Rivet for nameplate
24. Oil level and drain plug
25. Breather plug
26. No. 1 foot
27. Bolt for No. 1 foot
28. No. 2 foot
29. Bolt for No. 2 foot
30. No. 3 foot
31. Bolt for No. 3 foot

* The copper washer, item 13, is fitted to each of the lower wheelshaft end cover bolts for unit sizes 112, 133, 162 and 200 only.

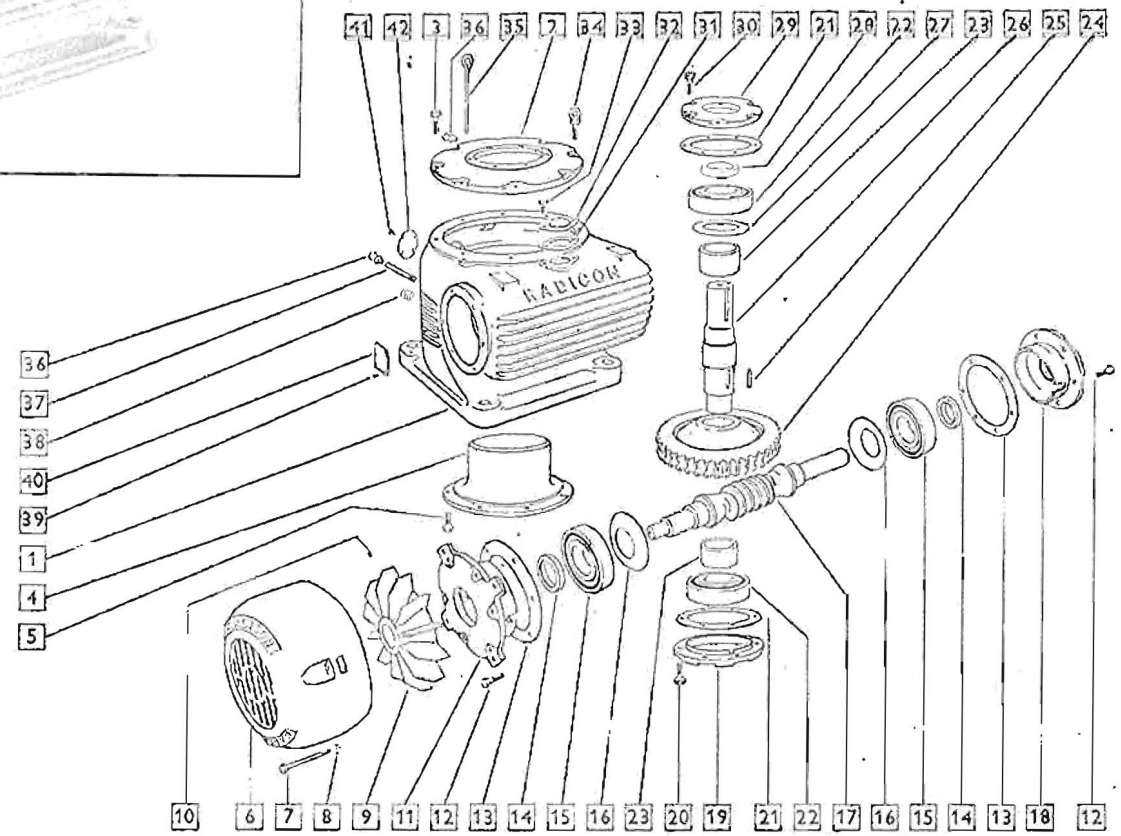
Note.—The wormwheel, item 17, was solid on its shaft for all units prior to the introduction of Series 6.*

NAMEPLATE DETAILS ESSENTIAL FOR CORRECT IDENTIFICATION OF SPARES

Printed in England

F687.16/12

DAVID BROWN
RADICON SPEED REDUCERS
Standard Single Reduction Units
Type 'V'



1. Case
2. Upper bearing housing for wheelshaft
3. Bolt for upper bearing housing
4. Lower bearing housing for wheelshaft
5. Bolt for lower bearing housing
6. Cowl
7. Bolt for cowl
8. Spring washer for cowl bolt
9. Fan
10. Locking screw for fan
11. Oilcatcher for wormshaft (fan end)
12. Bolt for wormshaft oilcatcher
13. Shim for wormshaft oilcatcher
14. Oil seal for wormshaft
15. Bearing for wormshaft
16. Oil flinger for wormshaft
17. Wormshaft
18. Oilcatcher for wormshaft (open end)
19. End cover for wheelshaft
20. Bolt for wheelshaft end cover
21. Shim for wheelshaft covers
22. Bearing for wheelshaft
23. Distance piece for wheelshaft
24. Wormwheel
25. Key for wheelshaft
26. Wheelshaft
27. Grease baffle for upper wheelshaft bearing
28. Oil seal for wheelshaft
29. Oil catcher for wheelshaft
30. Bolt for wheelshaft oilcatcher
31. Ventilator packing
32. Ventilator
33. Screw for ventilator
34. Eyebolt
35. Dipstick
36. Grease nipple for wheelshaft bearings
37. Extension piece for lower grease nipple
38. Drain plug
39. Rivet for nameplate
40. Nameplate
41. Bolt for inspection cover
42. Inspection cover

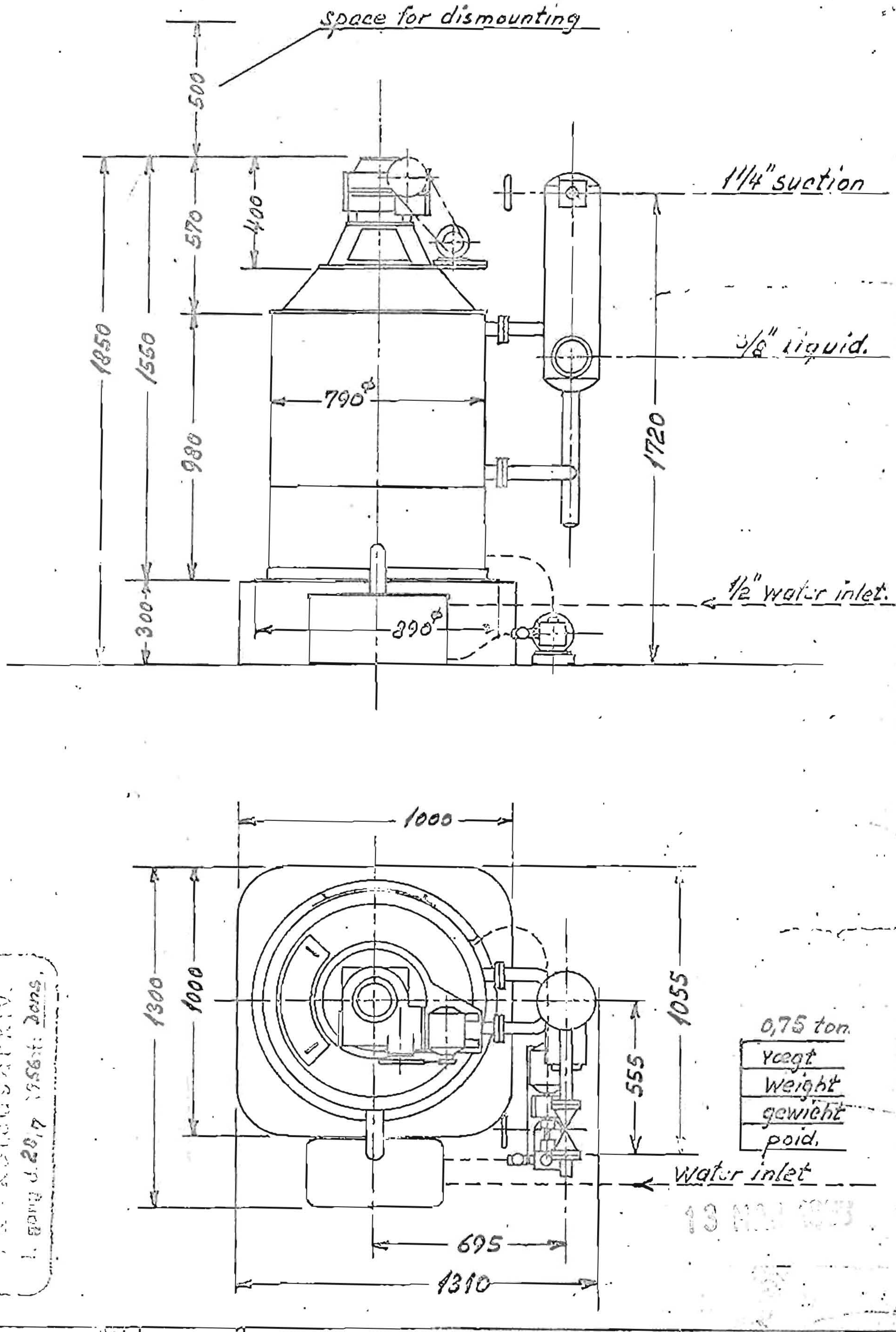
NAMEPLATE DETAILS ESSENTIAL FOR CORRECT IDENTIFICATION OF SPARES

Printed in England

F687.16/14

VSIM2,5 brutto vægt : 0,9 ton.

shipping vol.: 1 kasse 1050×1050×1750 = 1,92 m³ + 1 kasse 1400×800×800 = 0,9 m³.



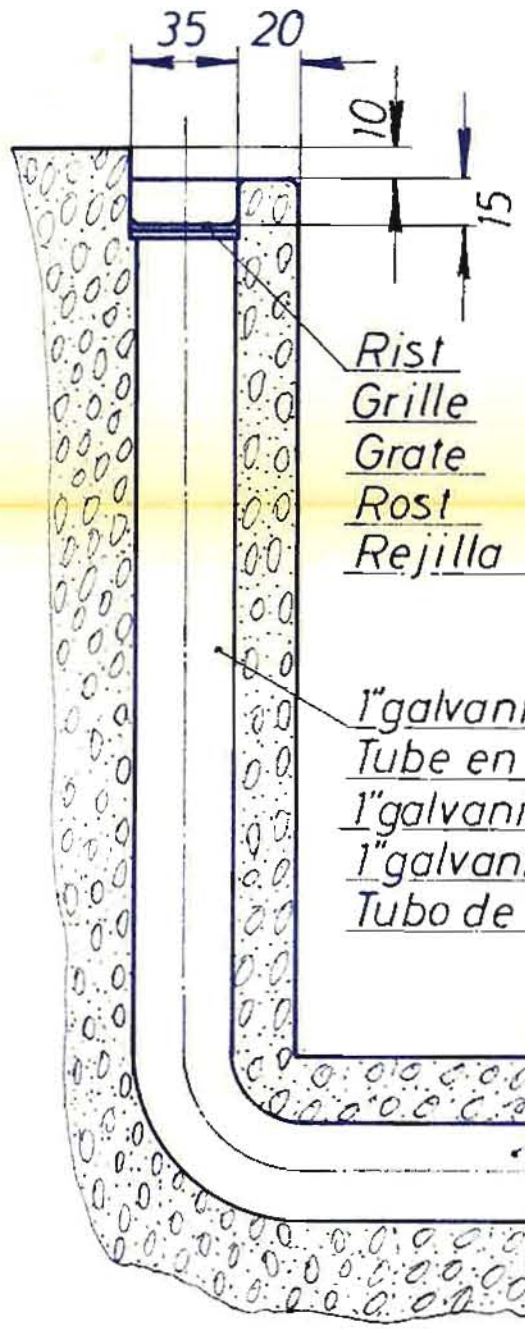
TEGN AF: Dons / 30/3 55.	SKALA	Type VSIM2,5	maalskitse	SABROE
KALK. AF: /	1:20		dimension sketch.	106079
REV. AF: /			massskizze	
			dimension d'encombrement	

støbes først ved montage
ne coulé qu'au montage
p not cast before the erection
d er st bei der montierung gegossen
ba no es fundido hasta el montaje

k
au
nk
ank
ara agua

sionsbolte
ion 1/2"×100
on bolts
nsionsbolzen
expansion 1/2"×100
boltehuller
ir des trous des boulons
l around bolt holes
armieren
a alrededor de los agujeros

Snit a-a 1:2,5



13 MAJ 1968

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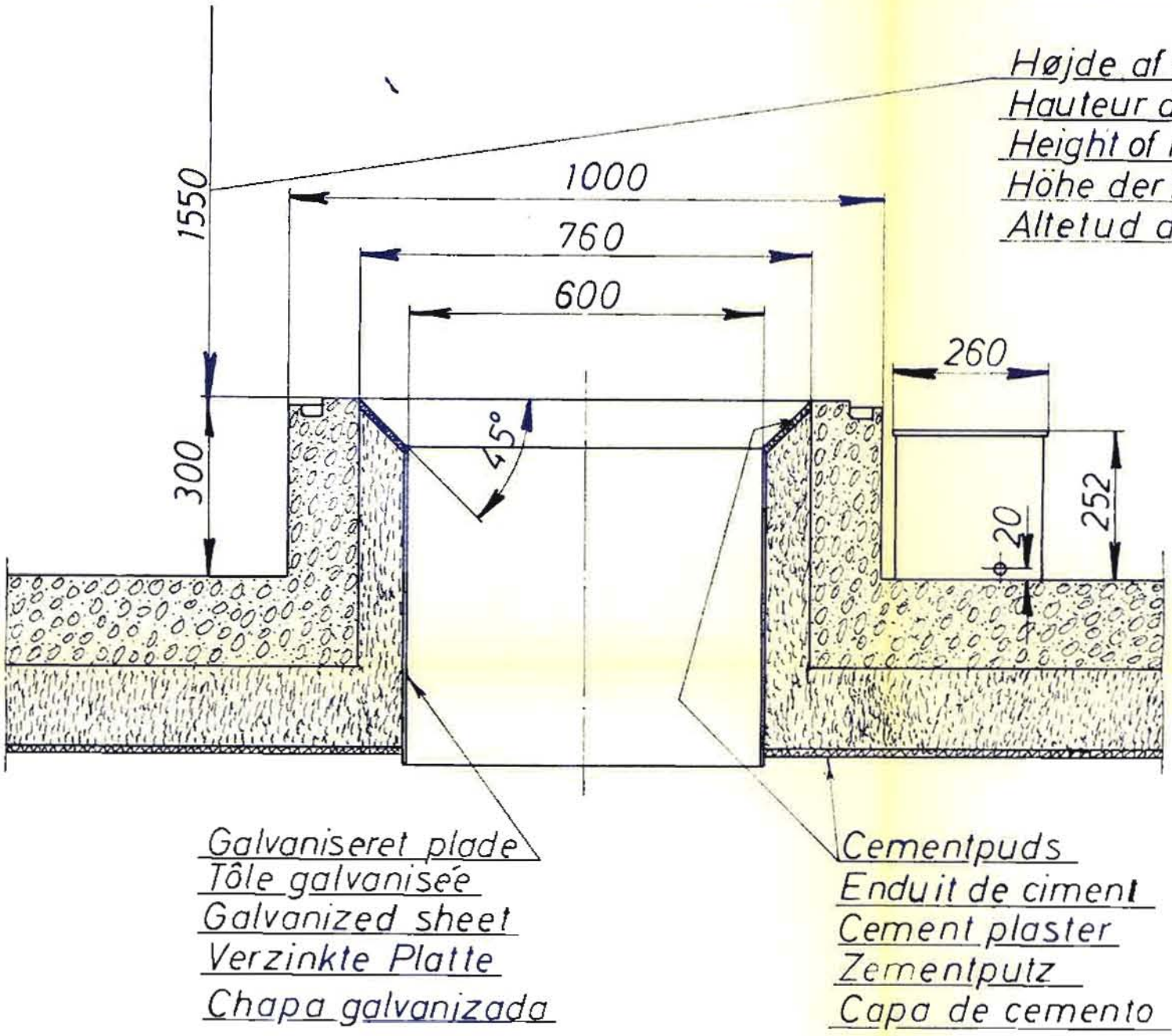
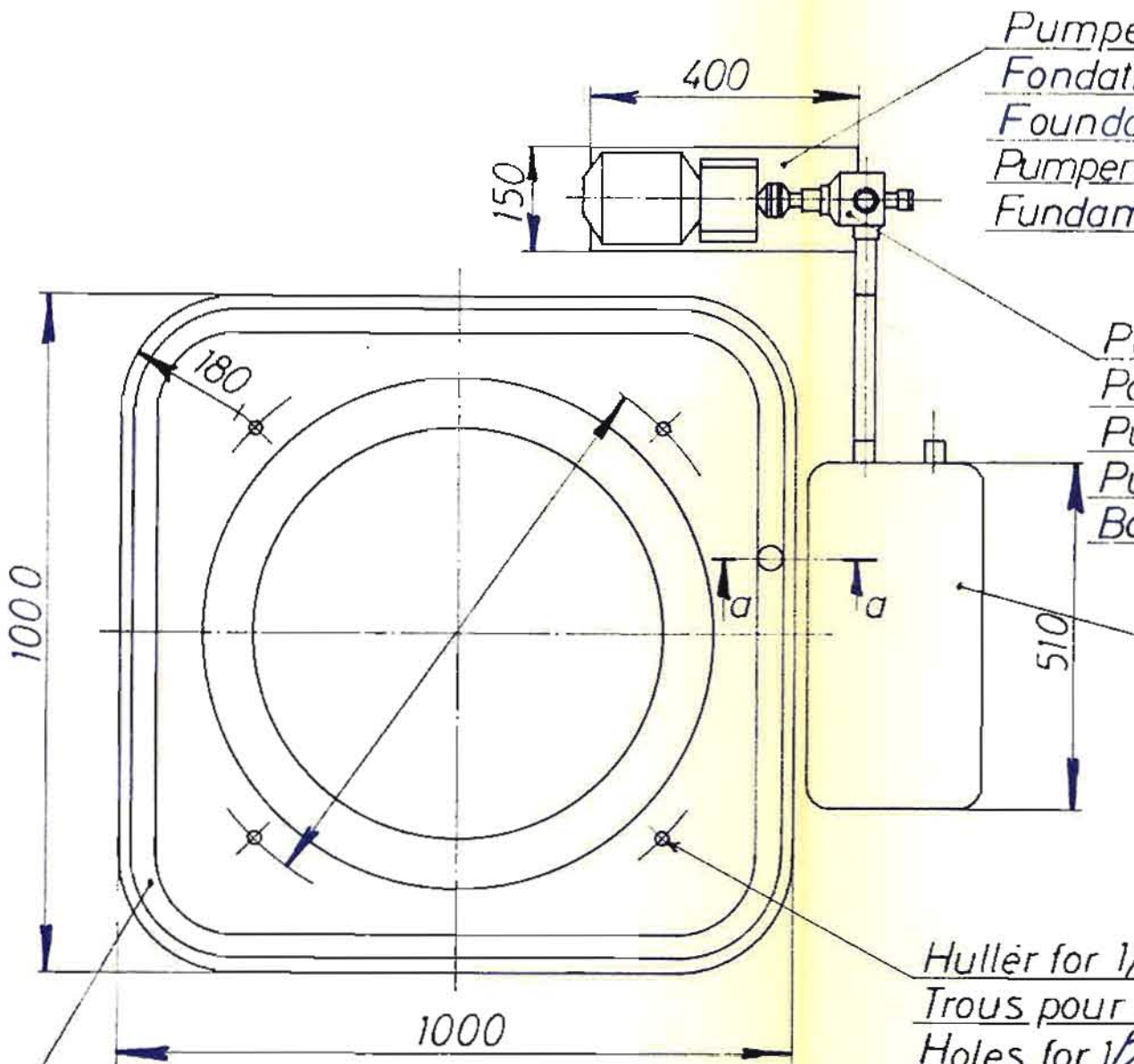
VSIM 2,5, plan over fundament
VSIM 2,5, plan de fondation
VSIM 2,5, plan of the foundation
VSIM 2,5, Plan über das Fundament
VSIM 2,5, plano de fundamento

Modelstok	Tegnet af: AA 24.11.67
1:10	Kalkeret af: —"—
1:25	Revideret af.
	Antaget af:
Erstatning for: 113028	
Nr. 157425	
Erstattet af:	


1550
1000
760
600
260
300
45°
252
20
Højde af maskine
Hauteur de la machine
Height of machine
Höhe der Maschine
Altetud de máquina
Galvaniseret plade
Tôle galvanisée
Galvanized sheet
Verzinkte Platte
Chapa galvanizada
Cementpuds
Enduit de ciment
Cement plaster
Zementputz
Capa de cemento


400
150
180
1000
a
a
510
1000
Pumpefundament, st
Fondation de pompe
Foundation for pump
Pumpenfundament wird
Fundamento de bomb
Pumpe
Pompe
Pump
Pumpe
Bomba
Vandtank
Bac à ea
Watertan
Wassert
Tanque p
Huller for 1/2" x 100 ekspans
Trous pour vis à expansi
Holes for 1/2" x 100 expansio
Löcher für 1/2" x 100 Expan
Agujeros pára pernos de
N.B. Beton armeres omkring b
Massif à renforcer autou
Concrete to be reinforced
Beton bei Bolzenlöchern
El hormigón se refuerza
Kanal for kondensvand
Rigole pour l'eau de condensation
Drain for condensing water
Kanal für Kondenswasser
Desagüe para el agua de condensacion