Tetra Pak
Hoyer

We hope that this Hoyer manual will be of assistance to you. Should you have any comments or questions please do not hesitate to contact your local representative or a Hoyer office.

Machine type Hoyer KF Freezer

Production no. Z5332/69 HOLIDAY ICE

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Tetra Pak
Hoyer

1 KF- Freezer

2 Spare Parts

3 Appendix

4

5

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 134o

P R E F A C E

To our clients

In all inquiries concerning the freezer we ask you to state the serial number of the freezer. You can find this number on the name plate on the frame of the freezer. The same number must also be stated when ordering spare parts for the freezer.

When in doubt please contact our local representative or our factory. We shall, of course, be very happy to provide any supplementary information you may wish. You will find our address on the front page.

Yours faithfully,

H O Y E R

HOYER
Aarhus · Denmark

Fkp. nr.1062

KF 2001 - KF 2002 - KF 2003.

KF 1101 - KF 1102 - KF 1103.

Indholdsfortegnelse - Contents - Inhaltsverzeichnis.

Indholdsfortegnelse (fortsat)
Contents (continued)
Inhaltsverzeichnis (fortgesetzt)

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 1012

Indledning - Introduction - Einleitung.

HOYER kontinuerlige iskremfrysere type KF 1100 fremstilles i tre størrelser med typebetegnelser henholdsvis KF 1101, KF 1102 og KF 1103. Sidste ciffer angiver antallet af frysecylindre. Fryseren er konstrueret til direkte fordampning af kølemediet. Den leveres i standardudførelse til ammoniak som kølemedium, men kan på bestilling leveres til et andet kølemedium. Fryserens ammoniaksystem kan leveres i to udførelser indrettet til henholdsvis enten:
Cirkulation af kølemediet ved hjælp af en injektor, der er indbygget i fryseren, eller
Cirkulation af kølemediet ved hjælp af en pumpe, som opstilles uden for fryseren.
I begge tilfælde kan fryserens ammoniaksystem leveres enten uden eller med instant stop-start system.
Fryseren leveres normalt uden luftkompressor. Man skal da benytte trykluft fra iskremfabrikens trykluftsystem. På bestilling kan fryseren dog leveres med luftkompressor.

The HOYER continuous ice cream freezers KF 1100 are made in three sizes with the type indication KF 1101, KF 1102, and KF 1103 respectively. The last figure gives the number of freezing cylinders.
The freezer is designed for direct evaporation of the refrigerant. It is delivered in a standard design for ammonia as refrigerant, but on order it can be delivered for another refrigerant.
The ammonia system of the freezer can be delivered in two designs planned for either:
Circulation of the refrigerant by means of an injector, which is built-in in the freezer, or
Circulation of the refrigerant by means of a pump, which is placed outside the freezer.

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In both cases the ammonia system of the freezer can be delivered with or without instant stop-start system.
The freezer is normally delivered without air compressor.
Then you have to use compressed air from the pneumatic system of the ice cream factory.
However, on order the freezer can be delivered with air compressor.

HOYER kontinuierliche Eiskremfreezers, Typ KF 1100 werden in drei verschiedenen Grössen hergestellt, mit den Bezeichnungen KF 1101, KF 1102 bzw. KF 1103. Die letzte Ziffer gibt die Anzahl der Gefrierzylinder an. Der Freezer ist für direkte Verdampfung des Kältemittels konstruiert. Es ist in Standardausführung für Ammoniak als Kältemittel geliefert, kann aber gemäss Bestellung für ein anderes Kältemittel geliefert werden.
Das Ammoniaksystem des Freezers kann in zwei Ausführungen geliefert werden, für entwerder:
Umwälzung des Kältemittels mittels eines Injektors, der im Freezer eingebaut ist,
oder
Umwälzung des Kältemittels mittels einer Pumpe, die ausserhalb des Freezers aufgestellt wird.
In beiden Fällen kann das Ammoniaksystem des Freezers entwerder mit oder ohne einem "Instant Stop-Start-System" geliefert werden.
Der Freezer wird gewöhnlicherweise ohne Luftkompressor geliefert. Man soll dann Druckluft vom Druckluftsystem der Eiskremfabrik verwenden. Laut Bestellung kann der Freezer aber mit Luftkompressor geliefert werden.

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Fkp. nr. 1014

Emballage, vægte og mål:
Packing, weights and dimensions:
Verpackung, Gewichte und Masse:

Fryseren med dens tilbehør vil normalt blive afsendt i en solid trækasse.
The freezer together with its accessories will normally be dispatched in a strong wooden box.
Der Freezer mit Zubehör ist gewöhnlicherweise wärend des Versands in einer soliden Holzkiste verpackt.

KF 1101

Bruttovægt-Gross weight-Bruttogewicht		kg.	lb
Mål	Længde - Length - Länge	cm	in
Dimensions	Bredde - Width - Breite	cm	in
Masse	Højde - Height - Höhe	cm	in
Nettovægt (med hovedmotor) Net. weight (with main motor) Nettogewicht (mit Hauptmotor)		kg	lb

KF 1102

Bruttovægt-Gross weight-Bruttogewicht		2300 kg.	5,000 lb
Mål	Længde - Length - Länge	265 cm	105 in
Dimensions	Bredde - Width - Breite	160 cm	63 in
Masse	Højde - Height - Höhe	200 cm	79 in
Nettovægt (med hovedmotor) Net. weight (with main motor) Nettogewicht (mit Hauptmotor)		2000 kg	4,400 lb

KF 1103

Bruttovægt-Gross weight-Bruttogewicht		2800 kg	6,100 lb
Mål	Længde - Length - Länge	265 cm	105 in
Dimensions	Bredde - Width - Breite	160 cm	63 in
Masse	Højde - Height - Höhe	245 cm	97 in
Nettovægt (med hovedmotor) Net. weight (with main motor) Nettogewicht (mit Hauptmotor)		2400 kg	5,300 lb

Fryserens hovedmål og dens udseende er vist på Fig. 1.
The main dimensions and the appearance of the freezer is shown in Fig. 1.
Die Hauptmasse und das Aussehen des Freezers gehen aus Fig. 1 hervor.

Refrigeration load.

Normally, the average refrigeration load from the freezer will be 25 kilocalories per litre of ice cream with 100% overrun. (Approx. 450 BTUs per imp. gall.).

At maximum output the refrigeration load from the freezer will therefore be:

	KF 1101	KF 1102	KF 1103
Kilocalories per hour	16.500	33.000	49.500

The compressor of the refrigerating plant must have the above-stated capacity at a suction pressure corresponding to an evaporating temperature in the freezer of minus 30° C (minus 22° F). The freezer will generally work with a somewhat higher evaporating temperature, indeed, but as it will be explained in a following passage, a constant back pressure regulator is mounted in the suction line, which automatically will prevent the evaporating temperature from falling below a predeterminated temperature independent of the possible variations in the actual load.

This constant back pressure regulator can only fulfil its purpose as a temperature regulator if there is a sufficiently big difference between the pressure respectively before and after the regulator. This is the reason why the capacity of the refrigerating compressor must be calculated corresponding to the above-stated evaporating temperature.

However, if you wish to freeze a very hard ice cream, that is to say with an outlet temperature of minus 5° C (23° F) or perhaps a little lower, the capacity of the refrigerating compressor must be calculated for an even lower evaporating temperature, i.e. minus 35° C (minus 31° F) to minus 40° C (minus 40° F) dependent on the desired outlet temperature.

Output of the freezer.

The output of the freezer can be varied infinitely between the limits stated below:

	KF 1101	KF 1102	KF 1103
Litres of ice cream per hour	160 to 660	160 to 1320	160 to 1980
Imp. gall. per hour	35 to 145	35 to 290	35 to 435

These outputs are valid for ice cream with 100% overrun and frozen ordinarily hard. If you want to freeze a very hard ice cream the maximum outputs stated will be somewhat reduced.

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Fkp. nr. 17o1

B. I-3

Uncrating

The freezer should be transported direct to the erection place in the dispatch crate.

When opening the crate you shall in the first place remove the lid and thereafter one of the sides. This work is of course to be done with care, so that the contents of the crate are not damaged.

The accessories contained in the crate are taken out and checked against the packing list. If by a regretable mistake something is missin we kindly request you to inform us immediately, after which the missing parts will be forwarded to you.

After that the freezer is to be inspected carefully to see whether it has been damaged during the transport. If so, please inform the forwarding agent who is responsible for the transport, or the transport company if a forwarding agent has not been used.

In case of damage you must also inform the insurance company, and you should not continue the uncrating until the insurance company has allowed you to do it.

However, if no damage has been found, which is normally the case, the freezer can be taken out of the crate. In order to do so you must first remove the bolts which attach the freezer to the bottom of the crate.

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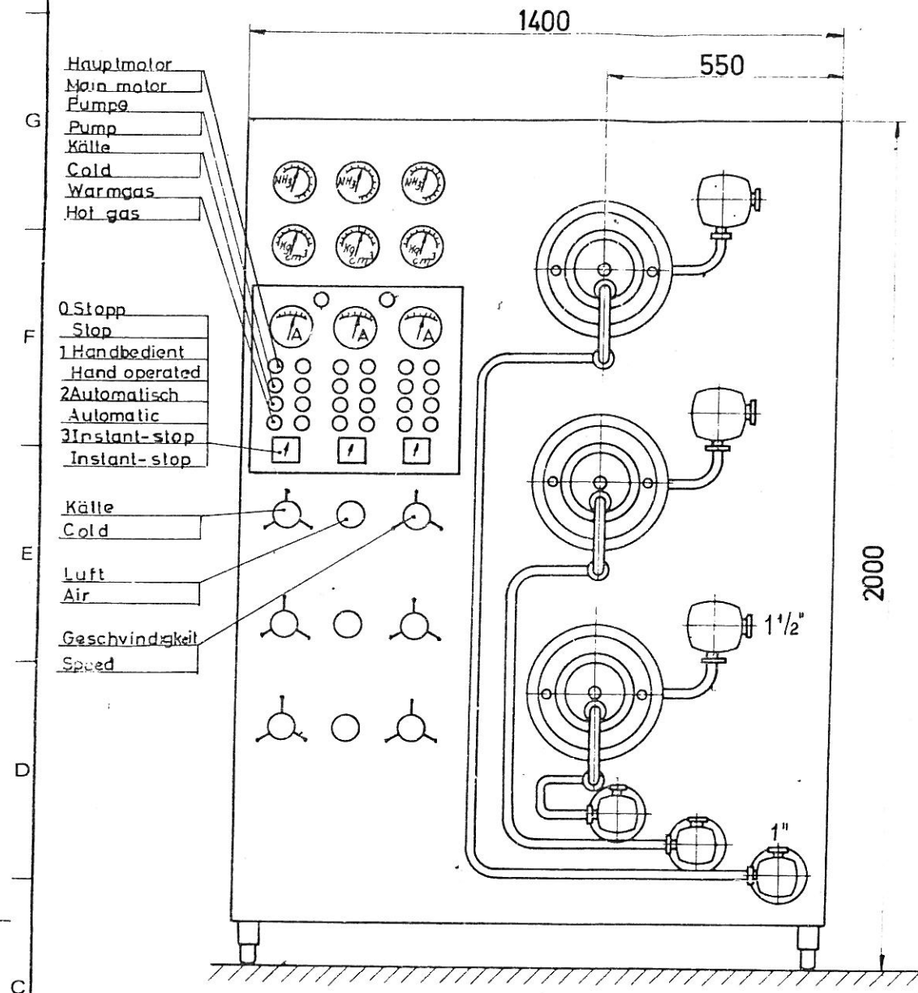
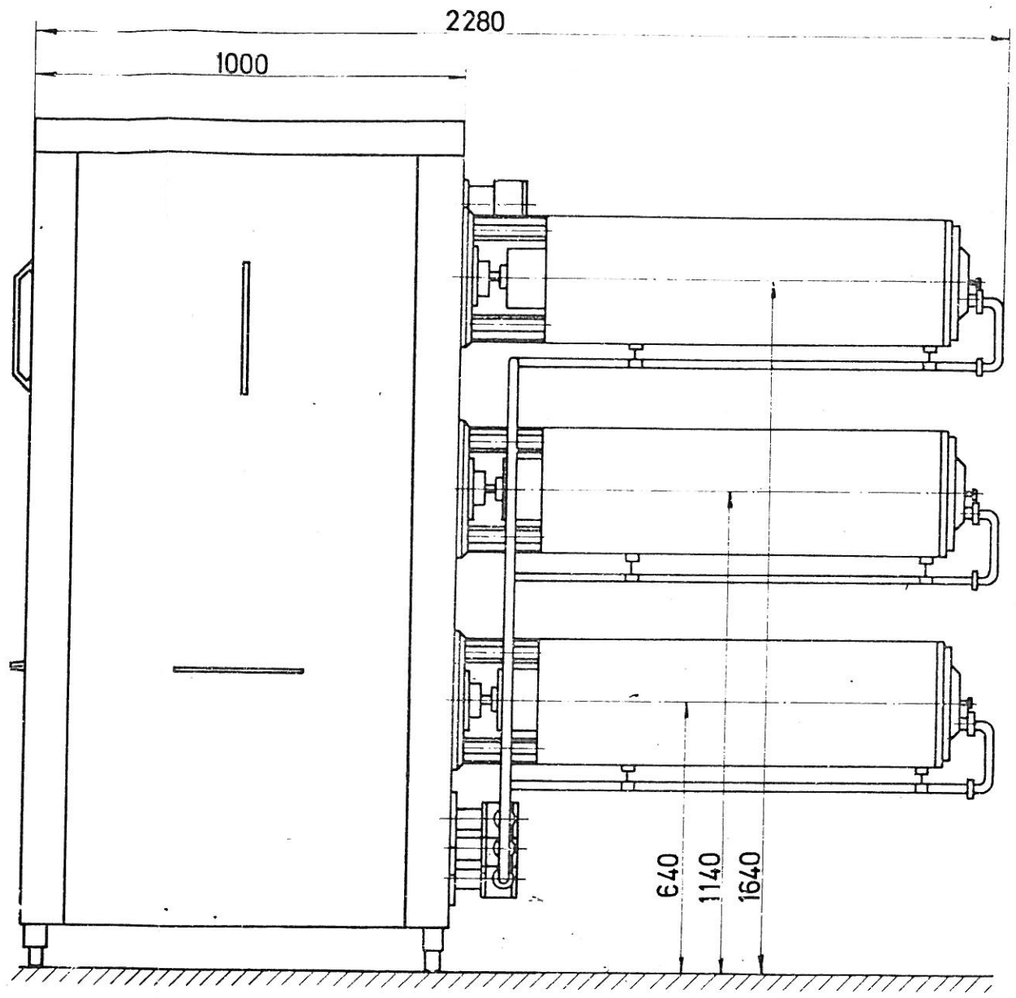
Fkp. nr. 1017

KF 1101, KF 1102 og KF 1103

Tegninger - Drawings - Zeichnungen

		KF 1101	KF 1102	KF 1103
Fig. 1	Målskitse Dimensioned sketch Masskizze		106 B 059	106B056
Fig. 2A	Fryseren set forfra Front view of the freezer Freezer von vorne gesehen		106 U 109	106U106
Fig. 2B	Fryseren set bagfra Rear view of the freezer Freezer von hinten gesehen		106 U 110	106U107
Fig. 2C	Længdesnit Longitudinal Section Längesschnitt		106 U 111	106U105
Fig. 2D	Snit gennem pumpekonsoller Section through the pump brackets Schnitt durch den Pumpen-Konsolen		106 U 112	106U108
Fig. 3	Iskrem- og luftsystem The ice cream and air system Das Eiskrem- und Luftsystem		106 D 012	106D011





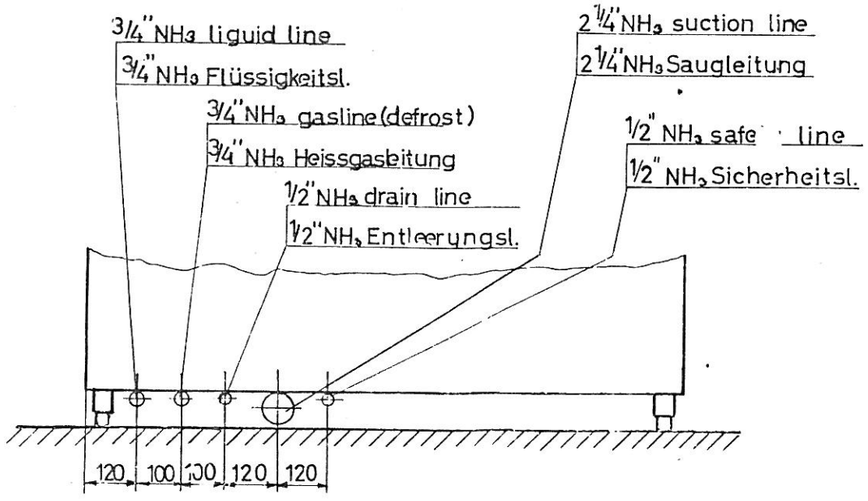


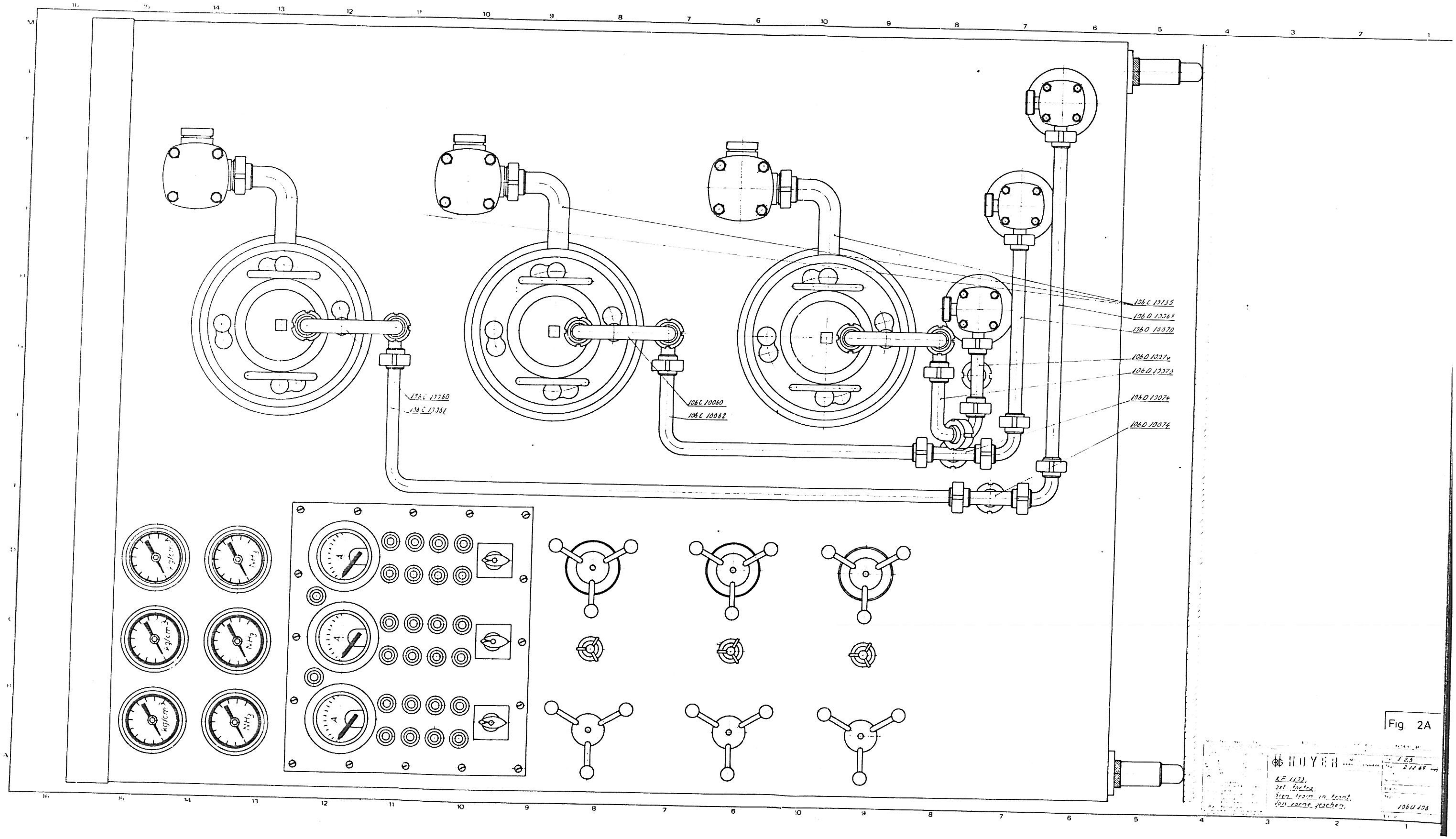
Fig. 1

Mat.	Ændring	Ordr. Serie	Bemærkninger
	Dim. Mod.		

HOYER MFG. CO. AARHUS DENMARK

ICE CREAM FREEZER KF 1103
EISKREMGEFRIERER KF 1103
ISKREMFRYSER KF 1103

Mål 1:10
Tegn 13170 DK
Godk
Normpr.
Erst. for
Tegn. nr. 106 B056
Erst. af



106 C 13135
106 D 13369
106 D 13370
106 D 13374
106 D 13373
106 D 13074
106 D 10074
HOYER
1:2,5
2.12.69
KF 1133,
Set tortra,
Sign train in front,
von vorne gesehen,
106 U 106

Fig. 2A

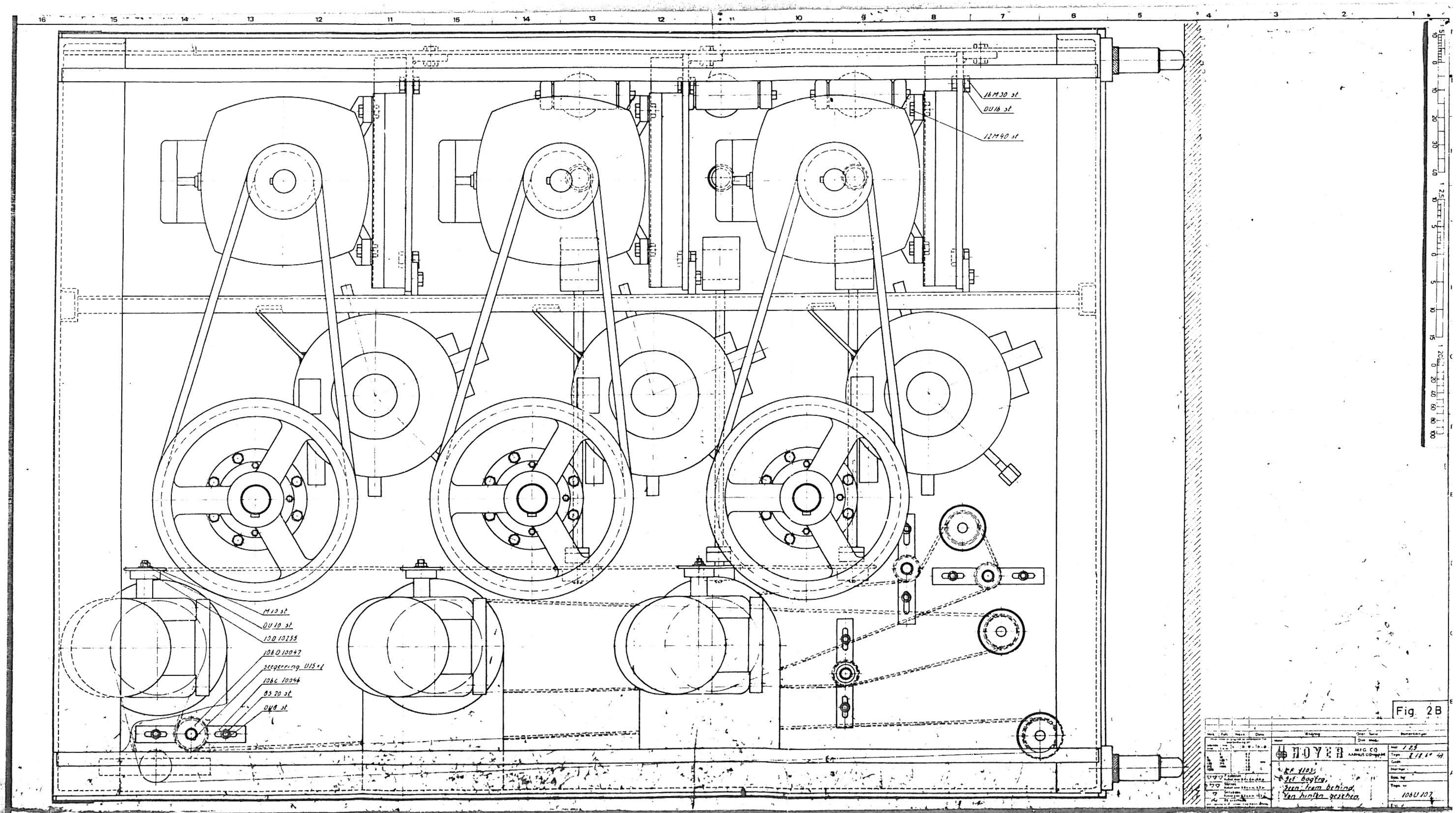

16M30 st
DU16 st
12M40 st
M10 st
DU10 st
10D 10255
10BD 10047
seegerring U15x1
106C 10046
B5 20 st
DU8 st
HOYER MFG. CO
KF 1103,
Set bagfra,
Seen from behind,
Von hinten gesehen,
1:2,5
106U 107

Fig. 2B

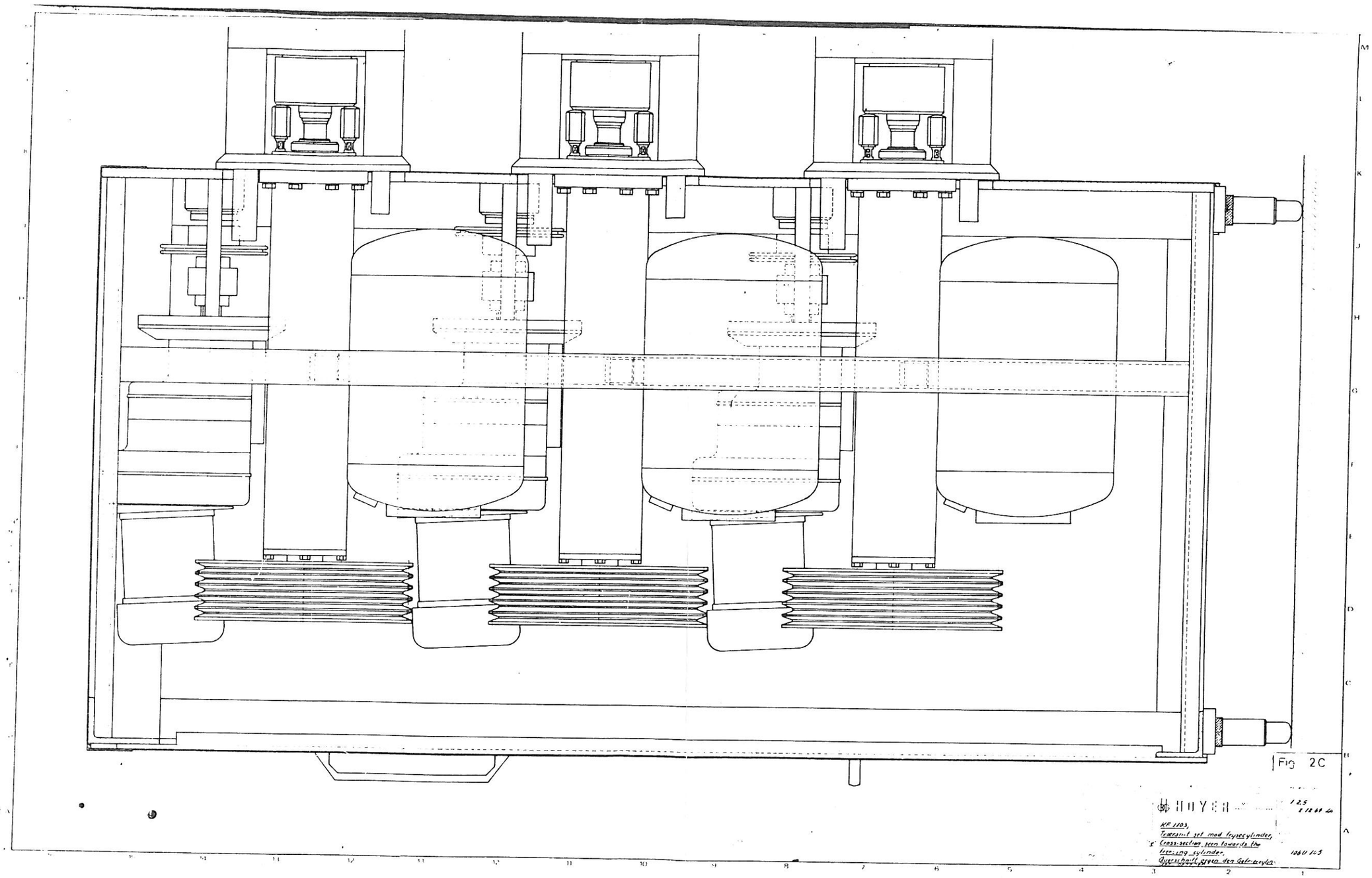


Fig 2C

KF 1103,
Tværsnit set mod frysecylinder,
Cross-section seen towards the freezing cylinder.
Querschnitt gegen den Gefrierzylinder.

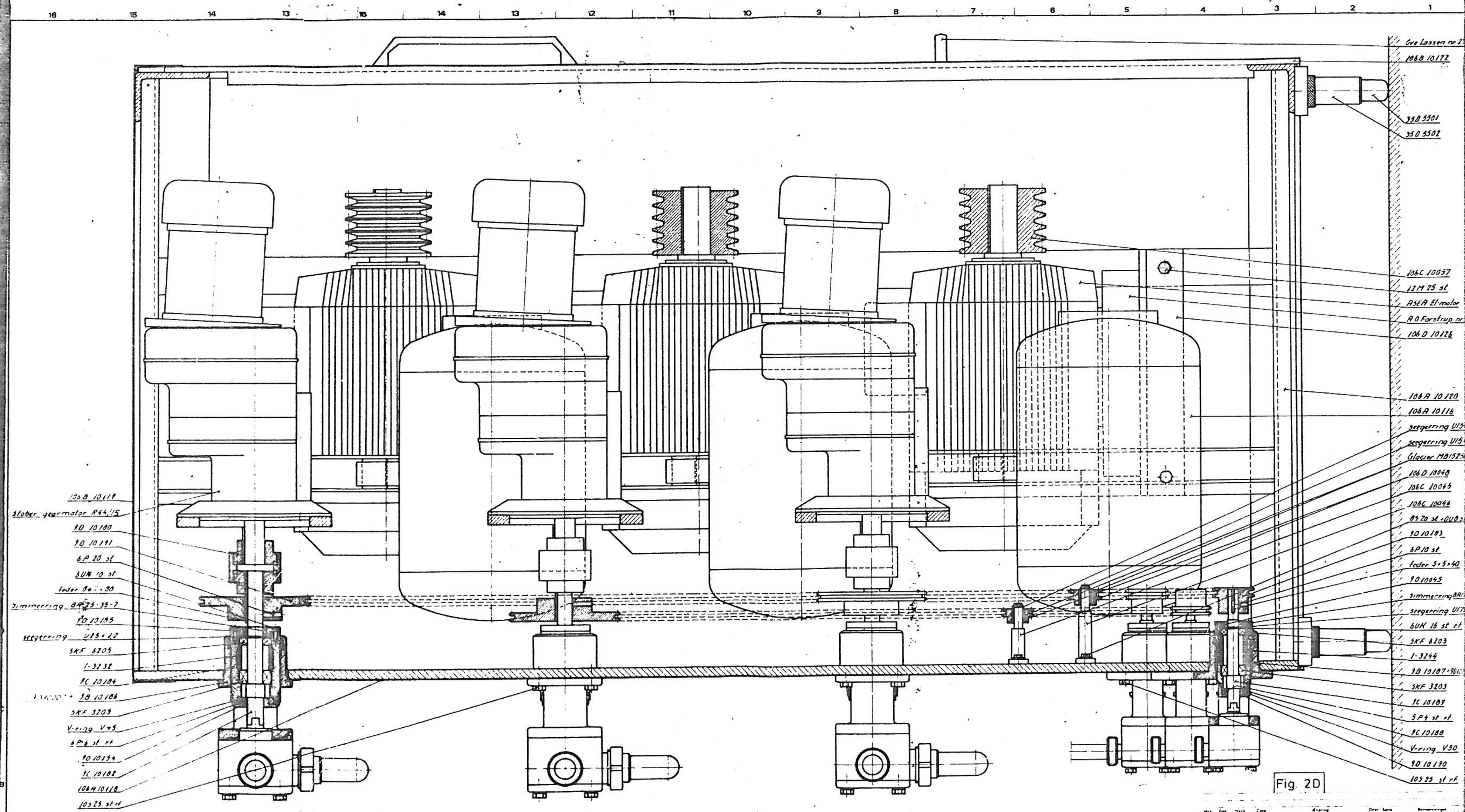


Fig. 2D

HOYER MFG CO AARHUS-DENMARK

1:2,5 — 3.12.69

KF 1103,
Tværsnit, snit gennem pumpekonsol,
Section through pump brackets,
Schnitt durch die Pumpenkonsol,

106U 108

(18) Leveres kun til frysere med instant stop - start system.
Delivered only for freezers with instant stop-start system.
Nur für Freezers mit instant stop - start System geliefert.

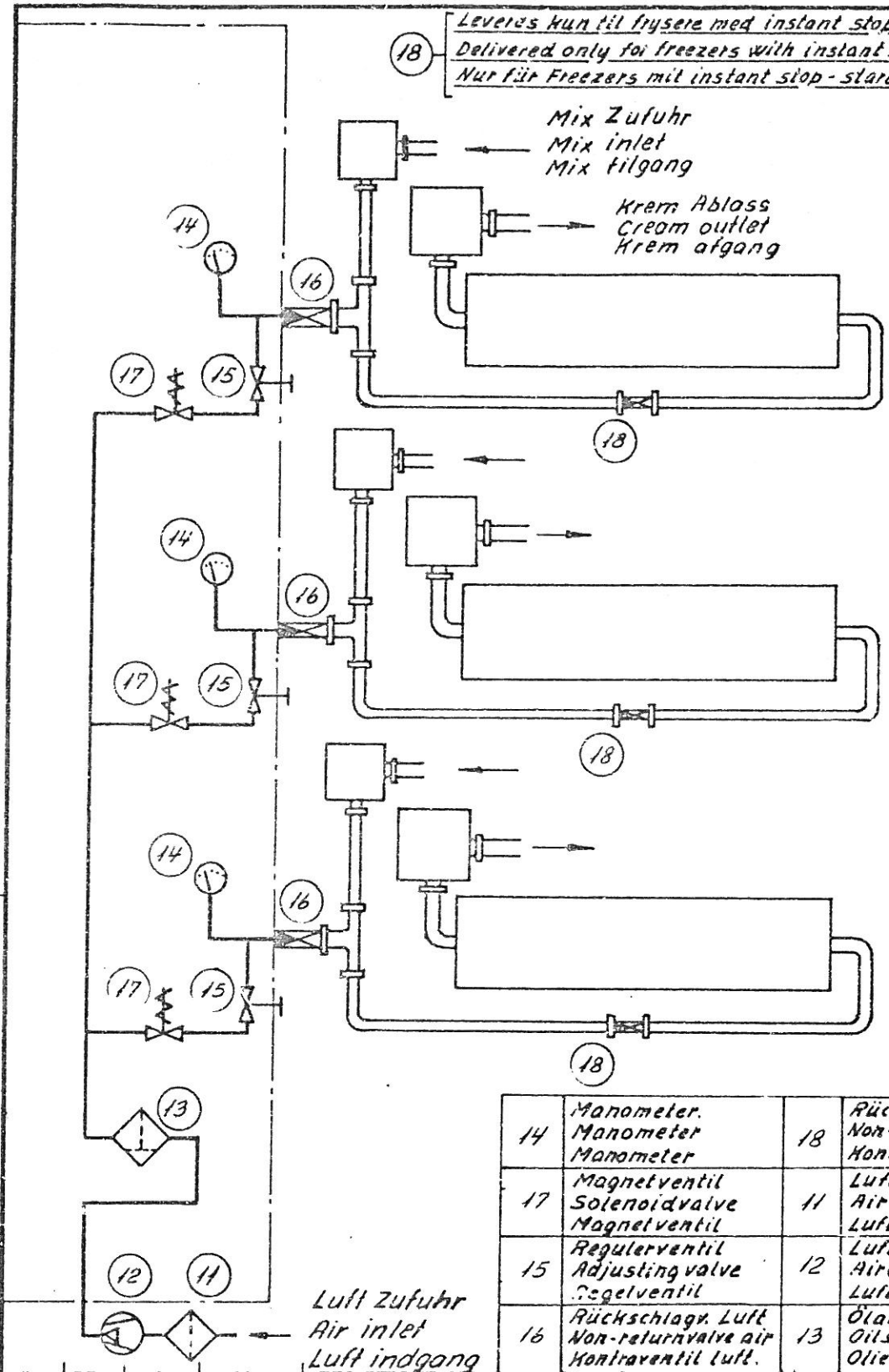


Fig 3.

14	Manometer. Manometer Manometer	18	Rückschlagventil Mix Non-returnvalv Mix Kontraventil Mix
17	Magnetventil Solenoidvalve Magnetventil	11	Luftfilter Airfilter Luftfilter
15	Regulerventil Adjusting valve Regelventil	12	Luftkompressor Aircompressor Luftkompressor
16	Rückschlagv. Luft Non-returnvalve air Kontraventil luft.	13	Ölabscheider Oilseparator Olieudskiller

Mrk.:	Felt.:	Navn:	Dato:	Ændring:	Ordr.: Serie:	Bemærkninger:

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m	L. ±	D. Ø +	D v Ø -
	6		0.2	
6	30		0.5	
30	120		0.8	mm
120	315		1.2	
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes — Ruhed over 0,4 t.o.m. 0,8 µ

▽▽ Slettes — Ruhed over 0,8 t.o.m. 6,3 µ

▽ Skrubbes — Ruhed over 6,3

~ Rå overflade

evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

Matr.: | Dim.:/Mod.:

HØYER O. G. HØYER A/S AARHUS DENMARK

KF 1103 - KF 2003

Iskrem- og Luftsystem.

The Ice Cream - and Air system.

Das Eiskrem - und Luftsystem

Mål:	~	
Tegn.:	9.4.70	AO
Godk.:	13/4 - 70	BKP
Normpr.:		
Erst. for:		
Tegn. nr.:	106 D 0 11	
Erst. af:		

HOYER

Aarhus · Denmark

Fkp. nr. 1018

	KF 1101	KF 1102	KF 1103
Fig. 4. Rørdiagram Piping diagram Rohrschema			
Med injektor, men uden instant stop-start system With Injector but without Instant Stop-Start System Mit Injector, aber ohne Instant Stop-Start System		106B003	106B007
Med injektor og instant stop-start system With Injector and Instant Stop-Start System Mit Injector und Instant Stop-Start System		106B002	106B005
Med pumpecirkulation, men uden instant stop-start system With Pump Recirculation but without Instant Stop-Start System Mit Pumpenumwälzung, aber ohne Instant Stop-Start System		106B001	106B006
Med pumpecirkulation og instant stop-start system With Pump Recirkulation and Instant Stop-Start System Mit Pumpenumwälzung und Instant Stop-Start System		106B004	106B008
Fig. 5. Svømmerventil Low-Pressure Float Valve Schwimmerregelventil	40C117	40C117	40C117
Fig. 6. Injektor Injector Injektor	106C114	106C114	106C 114
Fig. 7. Snit gennem frysecylinder Section through the Freezing Cylinder Schnitt durch den Gefrierzylinder	106A102	106A102	106A102

Lukteventil	Shut-off valve	Verschliessventil
Magnetventil	Solenoid valve	Solenoid Ventil
Sikkerhedsventil	Safety valve	Sicherheitsventil
Kontraventil	Non-return valve	Kontra ventil
Svømmerventil	Float valve	Schwimmerventil
Væskestandsregulator	Liquid level regulator	Flüssigkeitstandregler
Konstanttrykventil	Constant pressure valve	Konstantdruckventil

Tryktontrol	Pressure control	Drucktontrolle
Viserinstrument	Pressure gauge	Indikator
Filter	Filter	Filter
Ejektor	Ejector	Ejector
Drøvleventil	Throttle valve	Drosselventil
Ekspansionsventil	Exponsion valve	Exponsionsventil
Væskeindikator	Liquid indicator	Flüssigkeitsindikator

Fig. 4

231- 391 og 461 påført 15/2-71 - RF
Væskeindikator påført 21/9-70-RF

Ændring	Ordr Serie	Bemærkninger
Vatr	Dim Mod	

HOYER MFG CO AARHUS-DENMARK

KF 1103,
NH_3 diagram med
Ejektor uden
Instant stop- start,

Mal	2
Tegn	8.12.69 49
Godk	
Normpr	
Erst. for	
Tegn. nr	106B007
Erst. af	

RED.

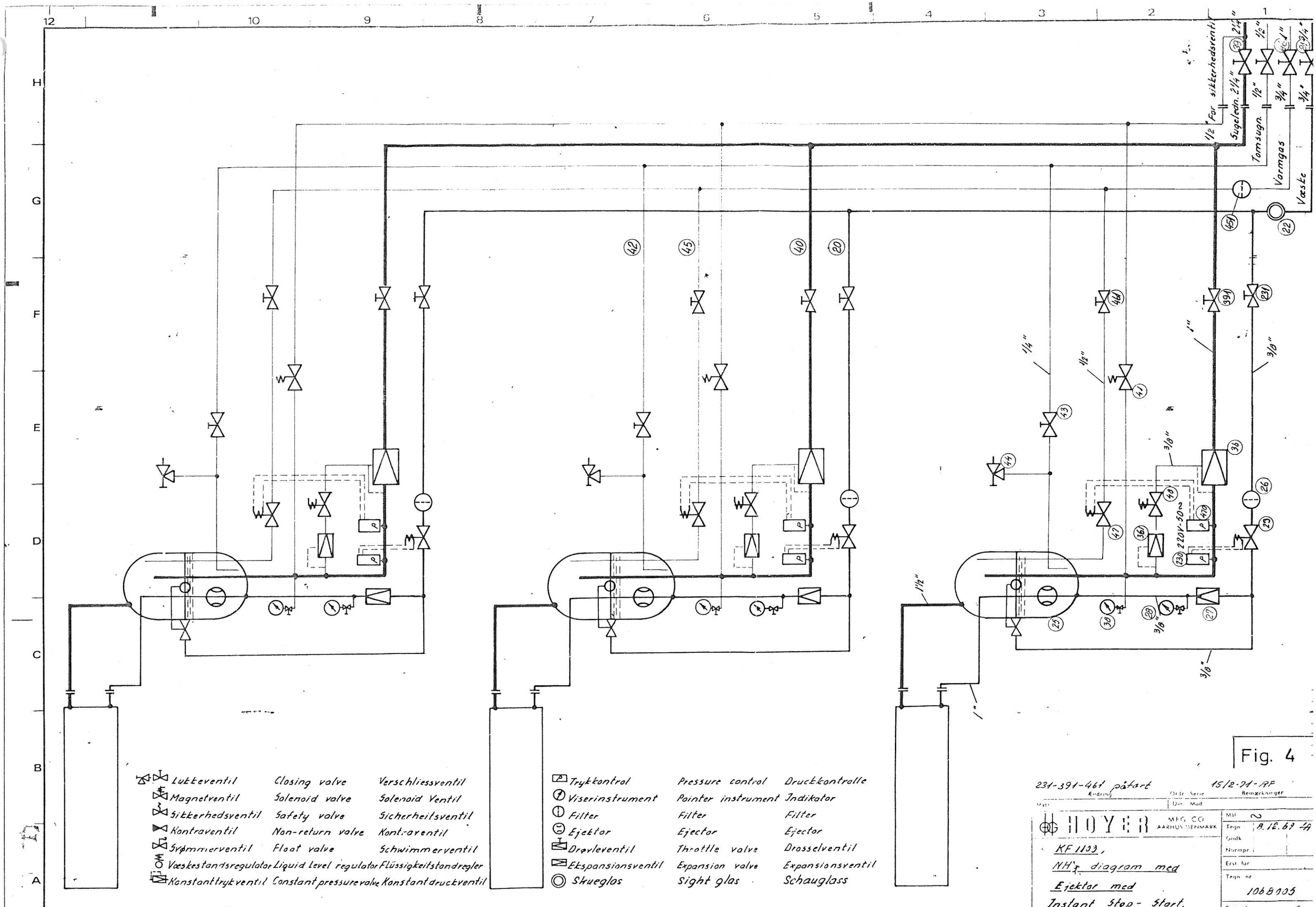


Fig. 4

231-391-461 påført 15/2-71-JPF

Ændring | Ordr. Serie | Bemærkninger

Mat: | Dim. Mod

HOYER MFG. CO AARHUS-DENMARK

KF 1103,
NH₃ diagram med
Ejektor med
Instant Stop - Start,

Mål 2
Tegn 8.12.69 HA
Godk
Normpr.
Erst. for
Tegn. nr. 1068105
Erst. af

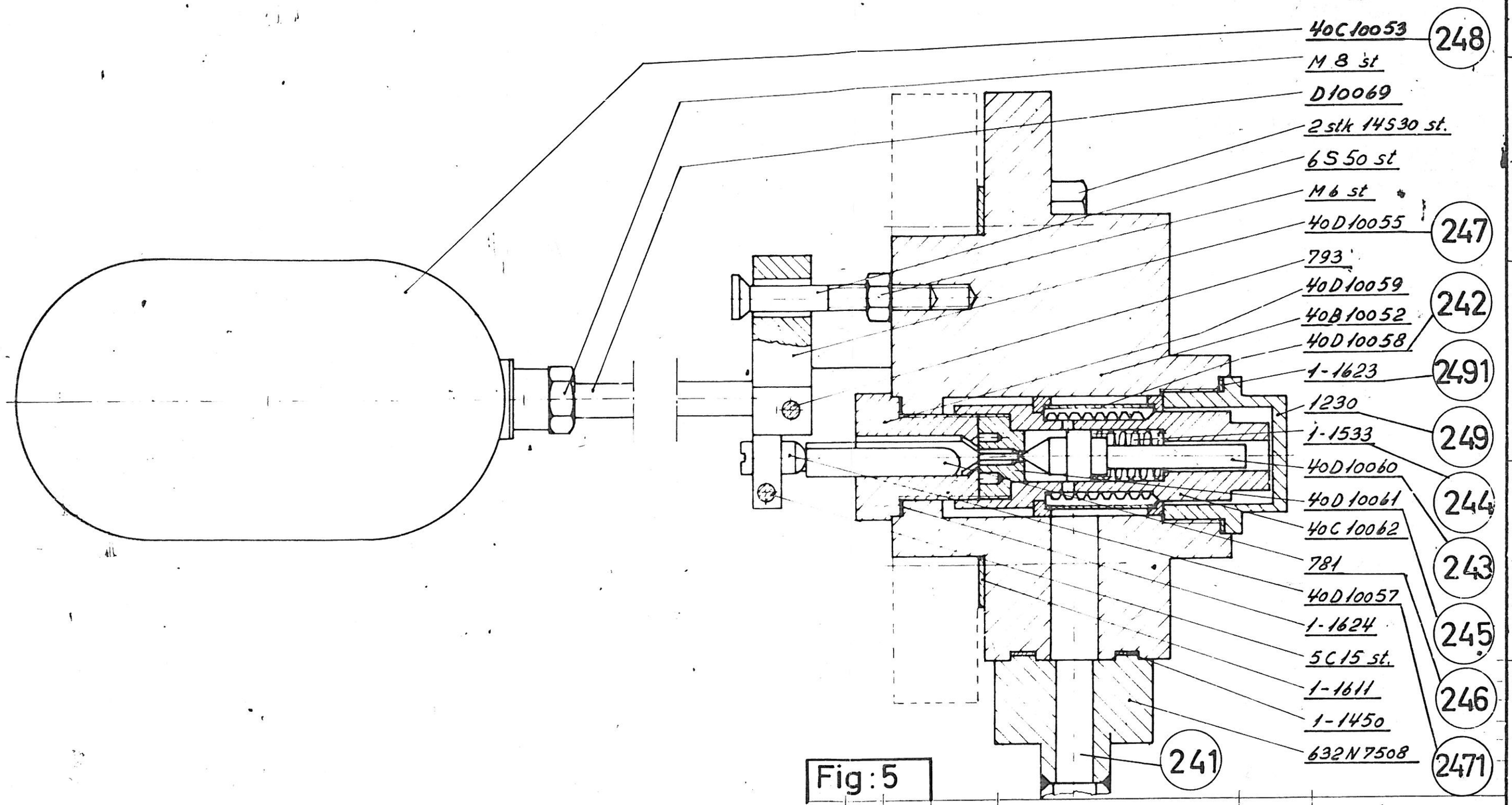


Fig: 5

Mrk	Felt.	Navn:	Dato:	Ændring:	Ordr.: Serie:	Bemærkninger:
				Matr.:	Dim.: Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af:

område - mm over	t o m	L	D i Ø -	D u Ø
	6		0.2	
6	30		0.5	
30	120		0.8	mm
120	315		1.2	
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes Ruhed over 0,4 t o.m. 0,8 µ

▽▽ Slettes Ruhed over 0,8 t o.m. 6,3 µ

▽ Skrubbes Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade

evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

Lavtrykssvømmerventil
Low pressure float valve
Niederdruck schwimmerventil.

Mål:	1:1
Tegn.:	29/8-68 BKP
Godk.:	
Normpr.:	
Erst. for:	
Tegn. nr.:	40C117
Erst. af:	

Lukkeventil	Closing valve	Verschliessventil
Magnetventil	Solenoid valve	Solenoid Ventil
Sikkerhedsventil	Safety valve	Sicherheitsventil
Kontraventil	Non-return valve	Kontraventil
Svømmerventil	Float valve	Schwimmerventil
Væskestandsregulator	Liquid level regulator	Flüssigkeitsstandregler
Konstanttrykventil	Constant pressure valve	Konstantdruckventil
Trykkontrol	Pressure control	Druckkontrolle
Viserinstrument	Pointer instrument	Indikator
Filter	Filter	Filter
Ejektor	Ejector	Ejector
Drøvleventil	Throttle valve	Drosselventil
Ekspansionsventil	Expansion valve	Expansionsventil

231-391 og 461 påført — 15/2-71 - RF

Ændring | Ordr Serie | Bemærkninger

Mat | Dim Mod

HOYER MFG CO AARHUS-DENMARK

KF 1103

NH3 diagram for pumpecirkulation, u. Instant stop- start,

Mal 2

Tegn 8.12.69 AA

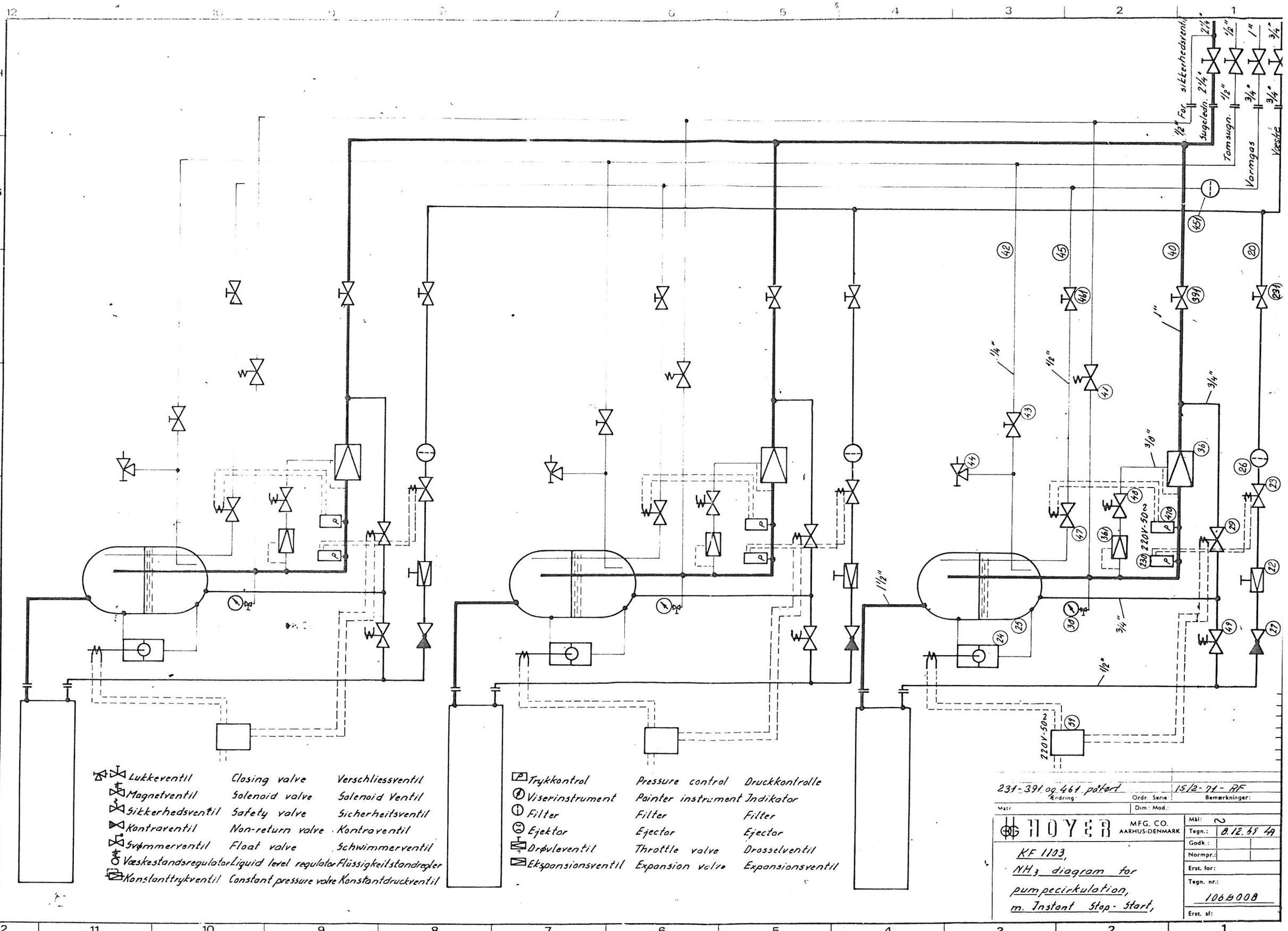
Godk

Normpr

Erst. for

Tegn nr 1068006

Erst af


12 11 10 9 8 7 6 5 4 3 2 1
H G F E D C B A
½" For sitterhedsvrenk
2¼" Sugeledn.
1½" Tomsugn.
¾" Varmgas
¾" Væske
1"
¼"
½"
3/8"
¾"
1½"
1"
220V-50~
Lukkeventil Closing valve Verschliessventil
Magnetventil Solenoid valve Solenoid Ventil
Sikkerhedsventil Safety valve Sicherheitsventil
Kontraventil Non-return valve Kontraventil
Svømmerventil Float valve Schwimmerventil
Væskestandsregulator Liquid level regulator Flüssigkeitstandregler
Konstanttrykventil Constant pressure valve Konstantdruckventil
Trykkontrol Pressure control Druckkontrolle
Viserinstrument Pointer instrument Indikator
Filter Filter Filter
Ejektor Ejector Ejector
Drøvleventil Throttle valve Drosselventil
Ekspansionsventil Expansion valve Expansionsventil
231-391 og 461 påført
15/2-71-RF
Ændring
Ordr. Serie
Bemærkninger:
Matr
Dim: Mod.:
HOYER MFG. CO. AARHUS-DENMARK
KF 1103,
NH3 diagram for
pumpecirkulation,
m. Instant Stop-Start,
Mål: 2
Tegn.: B.12.69 LA
Godk.:
Normpr.:
Erst. for:
Tegn. nr.: 106B008
Erst. af:

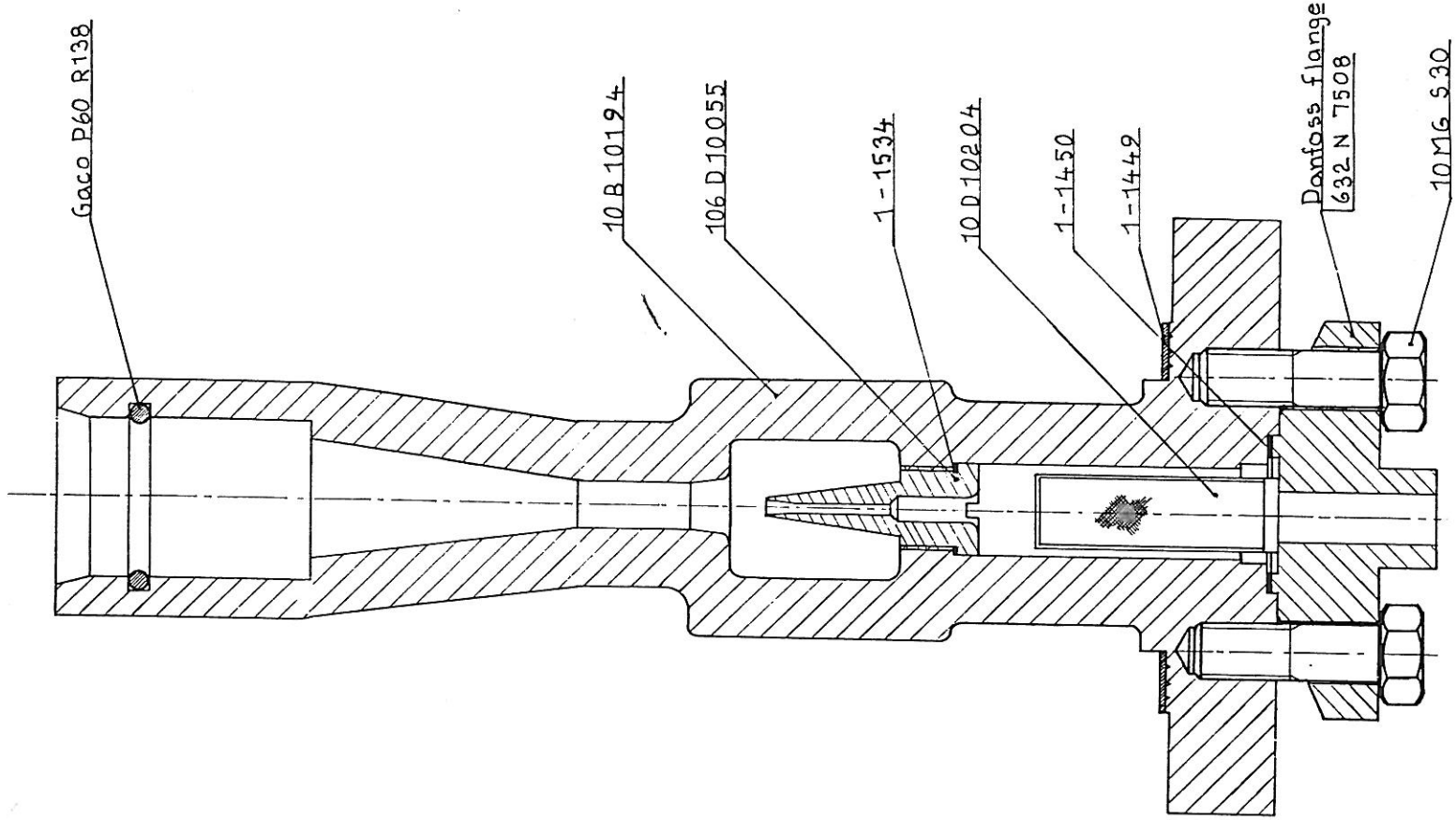


Fig. 6

Mrk.:	Felt.:	Navn:	Dato:	Ændring:	Ordr.: Serie:	Bemærkninger:
				Matr.:	Dim.; Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L ±	D.i Ø +	D.u Ø −
6	30		0.2	
30	120		0.5	
120	315		0.8	mm
315	1000		1.2	
1000			2.0	
			3.0	

▽▽▽ Finslettes Ruhed over 0.4 t.o.m. 0.8 µ

▽▽ Slettes Ruhed over 0.8 t.o.m. 6,3 µ

▽ Skrubbes Ruhed over 6,3 t.o.m. 12,5 µ

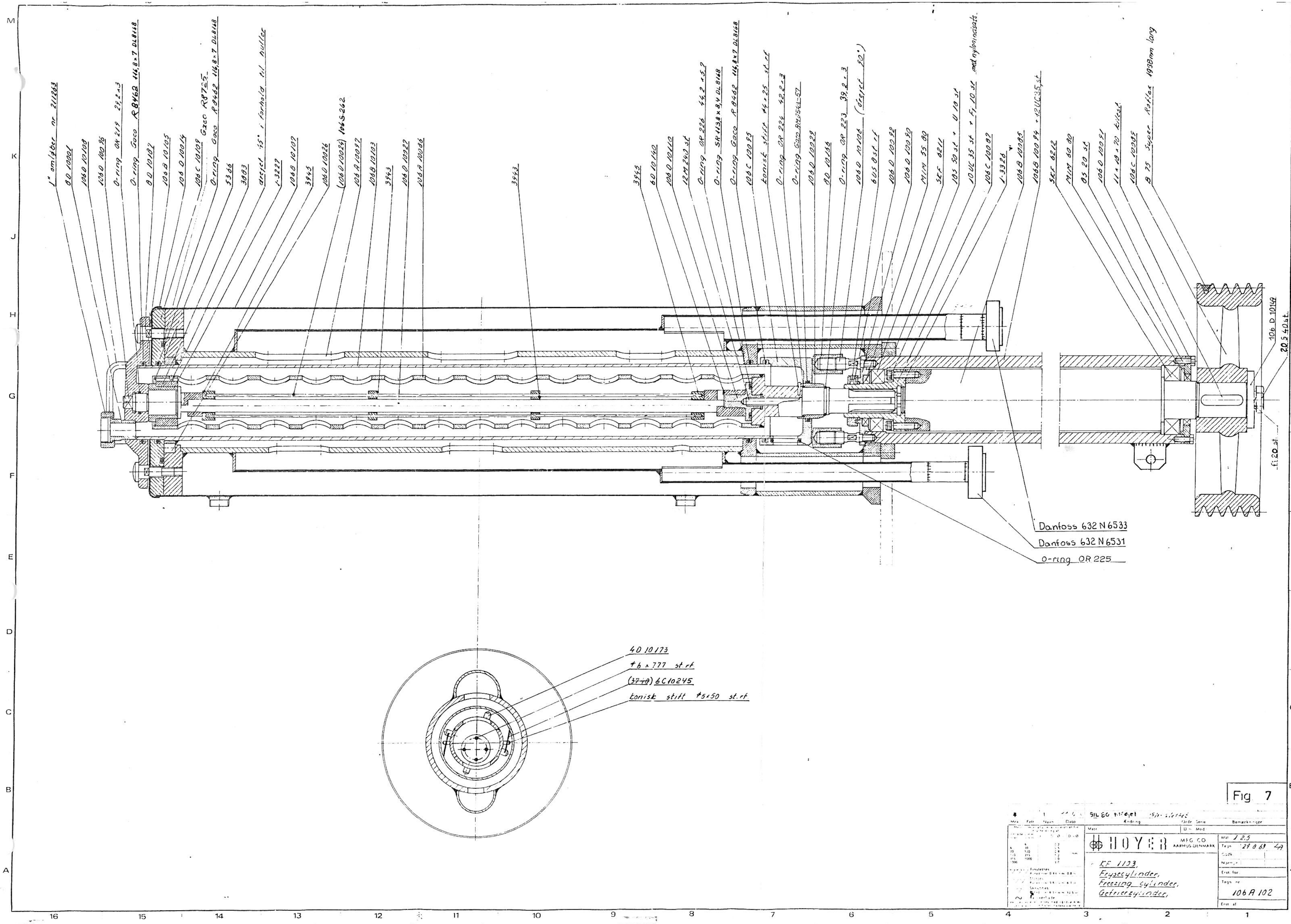
~ Rå overflade
evt. jævnet eller renset med håndværktøj. Ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

KF 1103

Injektor

Mål:		
Tegn.:	19-6-70	4F
Godk.:		
Normpr.:		
Erst. for:		
Tegn. nr.:	106 C 114	
Erst. af:		



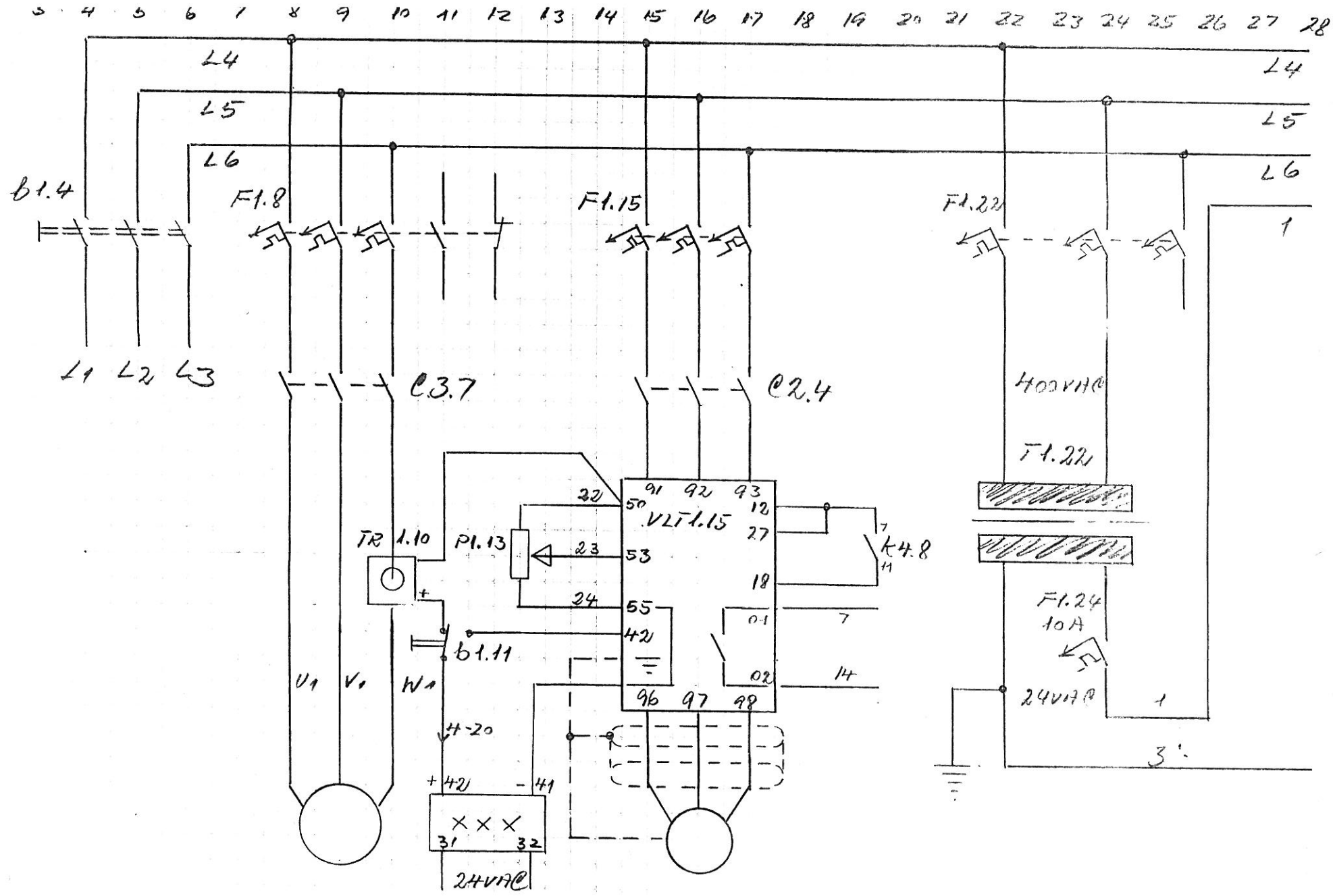
1" omløber nr 211863
80 10001
106 D 10108
106 D 10096
O-ring OR 219 29,2x3
O-ring Goco R8462 114,8x7 DL8168
80 10102
106 B 10105
106 D 10014
106 C 10109
Goco R8725
O-ring Goco R8462 114,8x7 DL8168
5368
3883
drejet 45° i forhold til huller
1-3222
106 B 10107
3945
106 D 10026
(106 D 10024) 106 S 262
106 A 10097
106 B 10103
3943
106 D 10022
106 A 10086
3943
3945
80 10140
106 D 10110
12 M 240 st
O-ring OR 226 44,2x5,7
O-ring SR 1138x8,4 DL8168
O-ring Goco R8462 114,8x7 DL8168
106 C 10093
konisk stift ø4x25 st.rf
O-ring OR 224 42,2x3
O-ring Goco RM0543-57
106 D 10029
80 10136
O-ring OR 223 39,2x3
106 D 10106 (drejet 90°)
6U 5 05t rf
106 D 10092
106 D 10090
MIM 55 80
SKF 6211
105 50 st x U 10 st
10 UC 35 st x Fj 10 st med nylonindsats
106 C 10087
1-3326
106 B 10085
106 B 10094 x 12 UC 35 st
SKF 6212
MIM 60 80
05 20 st
106 D 10091
11x18x70 kilest
106 C 10088
B 75 Super Roflex 1938 mm lang
106 D 10149
20,5 40 st
f 20 st
Danfoss 632 N 6533
Danfoss 632 N 6531
O-ring OR 225
40 10.173
ø6x777 st.rf
(37-8) 6C 10245
konisk stift ø5x50 st.rf
SIL 80 tilføjet 15/1 slettet
Mrk Felt Navn Dato
Ændring
Ordre Serie
Bemærkninger
Matr
HOYER MFG CO AARHUS-DENMARK
Mål 1:2,5
Tegn 29 8 61
KF 1133, Frysecylinder, Freezing cylinder, Gefrierzylinder,
Tegn nr 106 A 102

Fig 7

Fkp.nr. 1019

Fig. 8. El.diagram Electric Wiring Diagram Schaltschema	KF 1101	KF 1102	KF 1103
Driftsspænding: 3x380 V. 50 perioder og med nulleder Power Supply: 3x380 V. 50 Cycles and with Neutral Wire Netzspannung: 3x380 V. 50 Hz. und mit Nulleiter			
Hovedmotor med direkte start Main Motor with Direct On-line Start Hauptmotor mit Anlass-Schalter			
Med injektor, men uden instant stop-start system With Injector but without Instant Stop-Start System Mit Injektor, aber ohne Instant Stop-Start System		24A329	24A331
Med injektor og instant stop-start system With Injector and Instant Stop-Start System Mit Injektor und Instant Stop-Start System		24A332	24A334
Med pumpecirkulation, men uden instant stop-start system With Pump Recirculation but without Instant Stop-Start System Mit Pumpenumwälzung, aber ohne Instant Stop-Start System			
Med pumpecirkulation og instant stop-start system With Pump Recirculation and Instant Stop-Start system Mit Pumpenumwälzung und Instant Stop-Start System		24A333	24A335
Specielt diagram, f.eks.: med luftkompressor eller for en anden driftsspænding. Special Diagram, e.g.: with Air Compressor, or for Different Power Supply. Spezial-Schaltschema,z.B.: mit Luftkompressor, oder für eine andere Netzspannung.			

FREEZER KF1103 Z5332/69 21.10.2003 DIMI

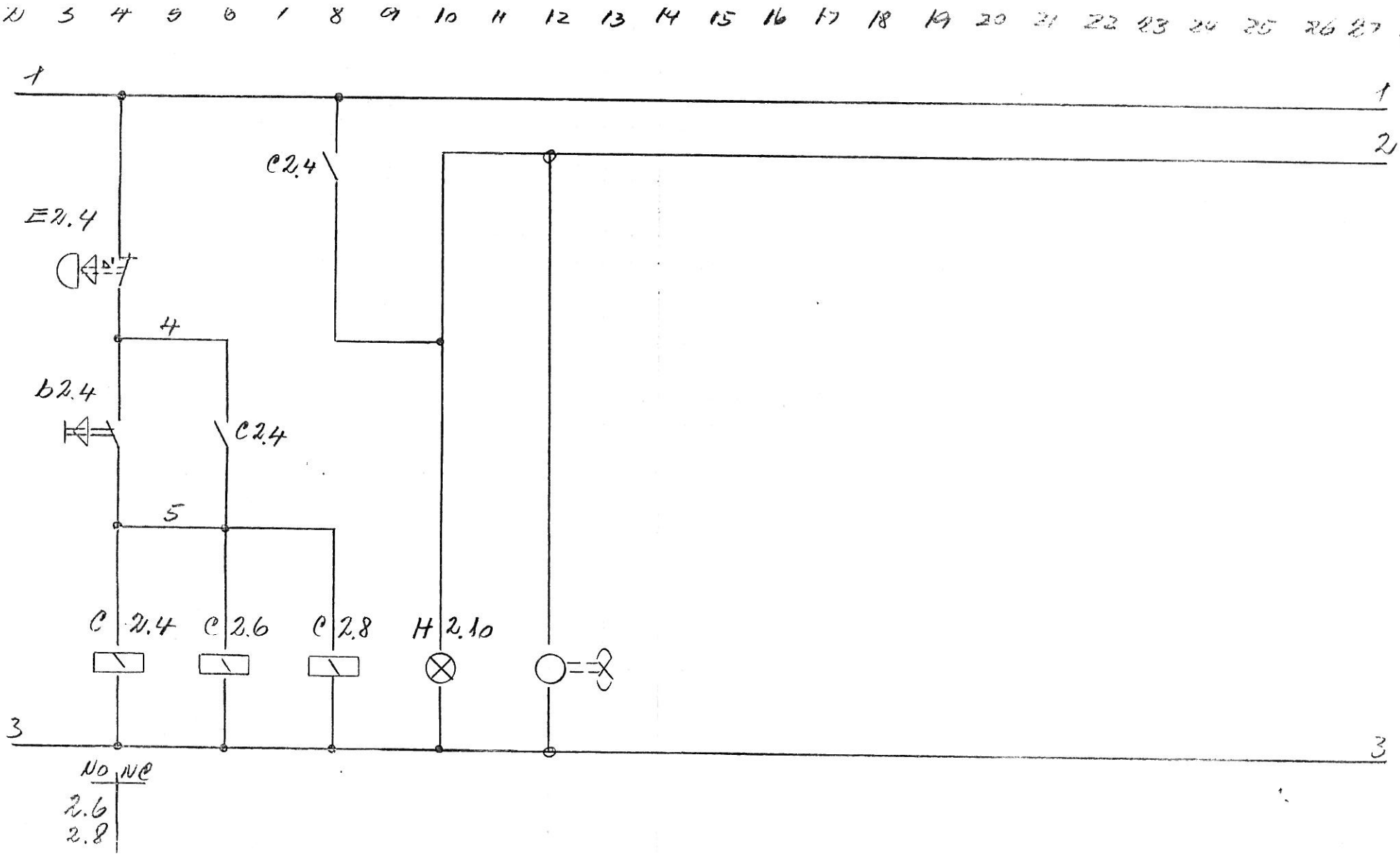


MAIN MOTOR1

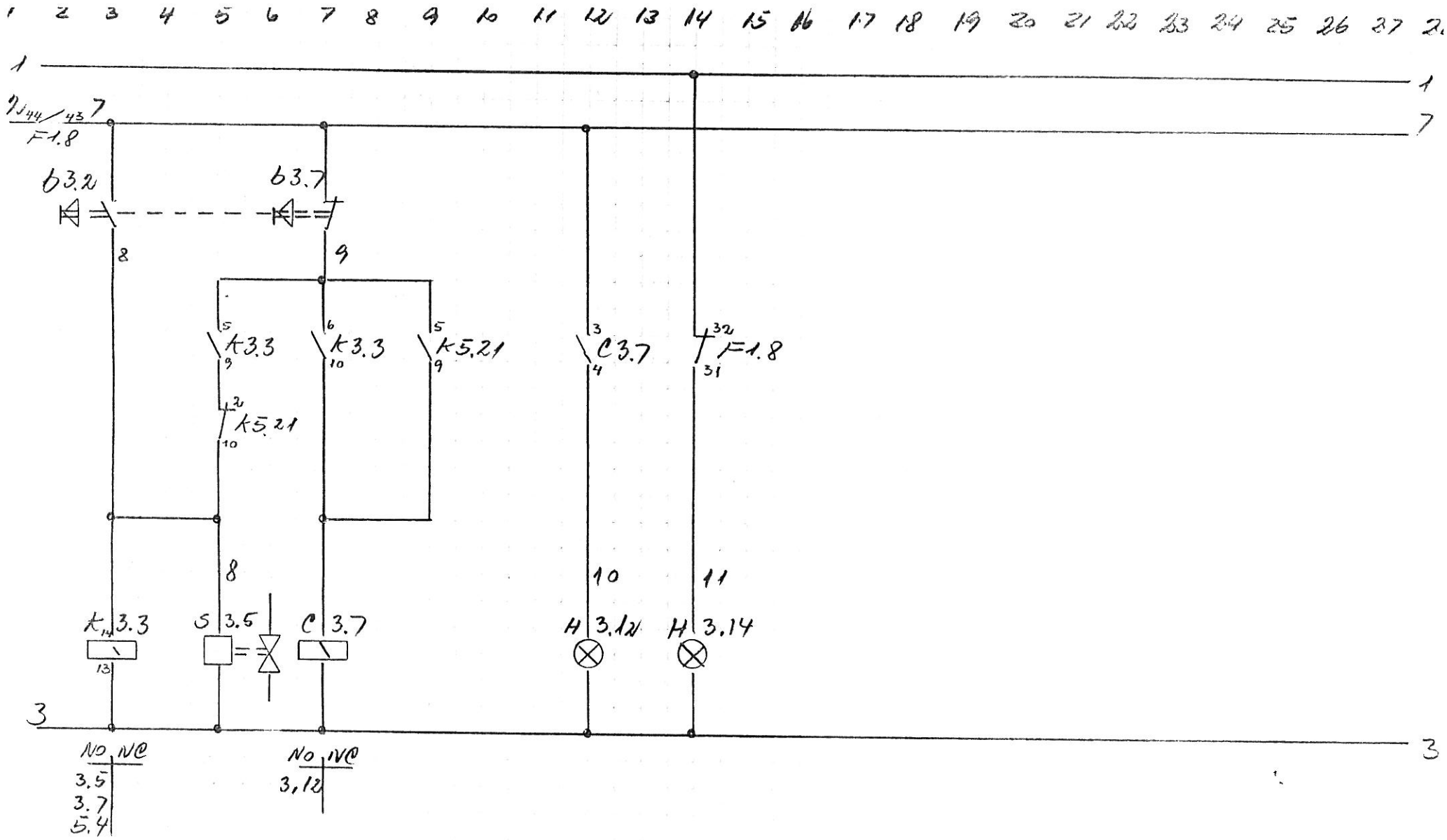
DISPLAY
4–20MA=0–50.0

GEAR

FREEZER 1



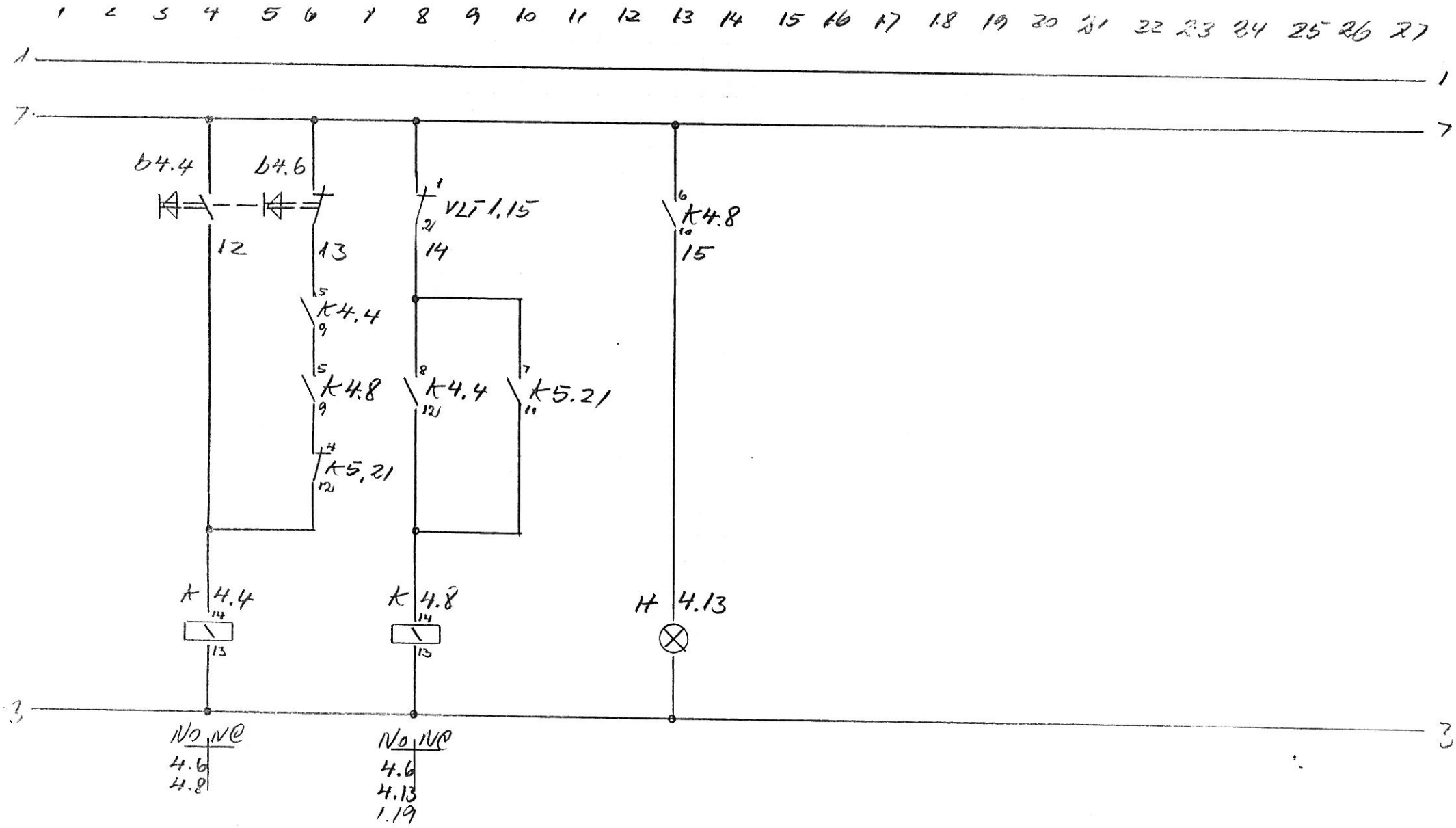
EMERGENCY STOP



O.R.VALVE

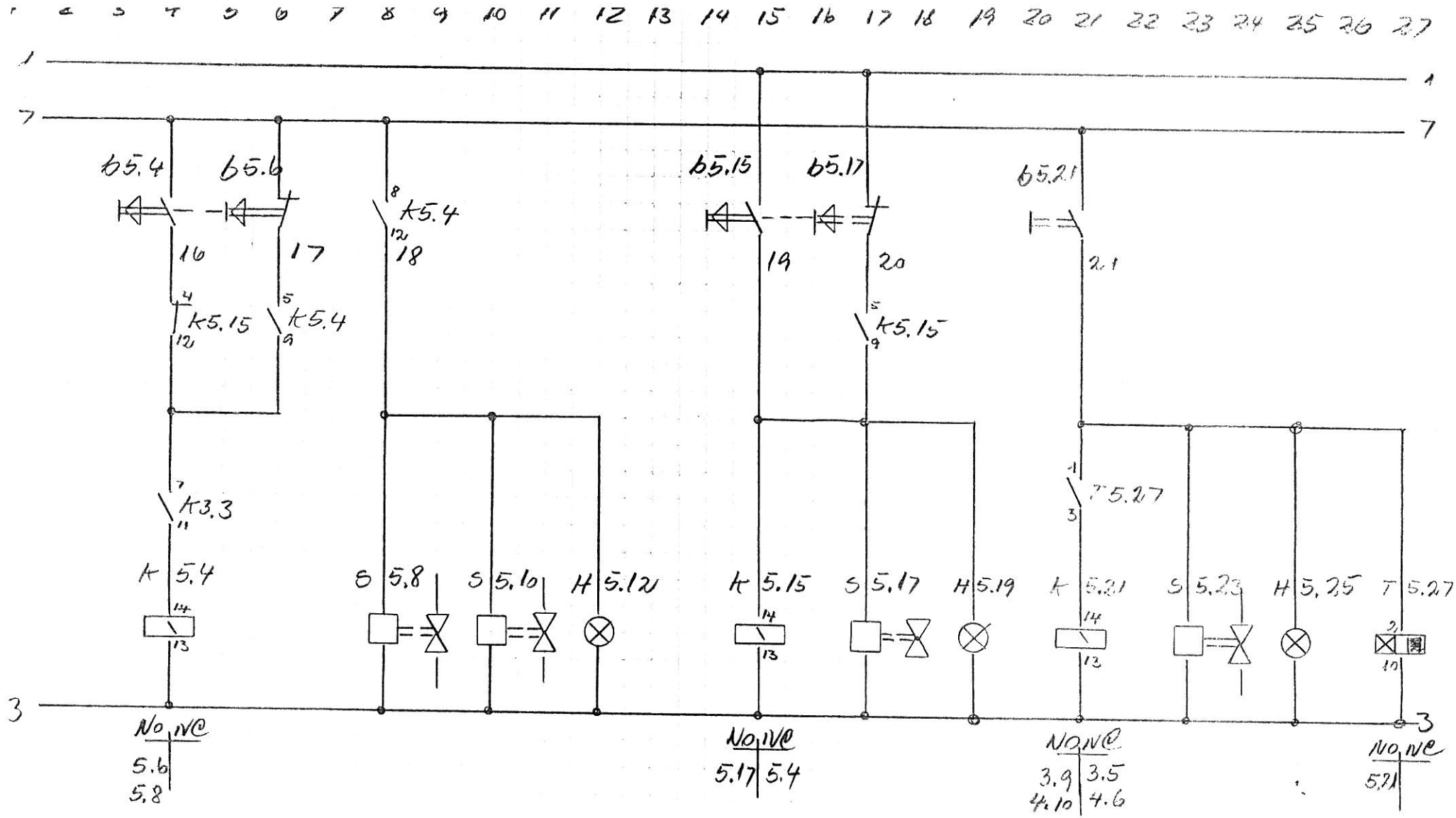
MAIN MOTOR

FREEZER 1



GEAR

FREEZER 1



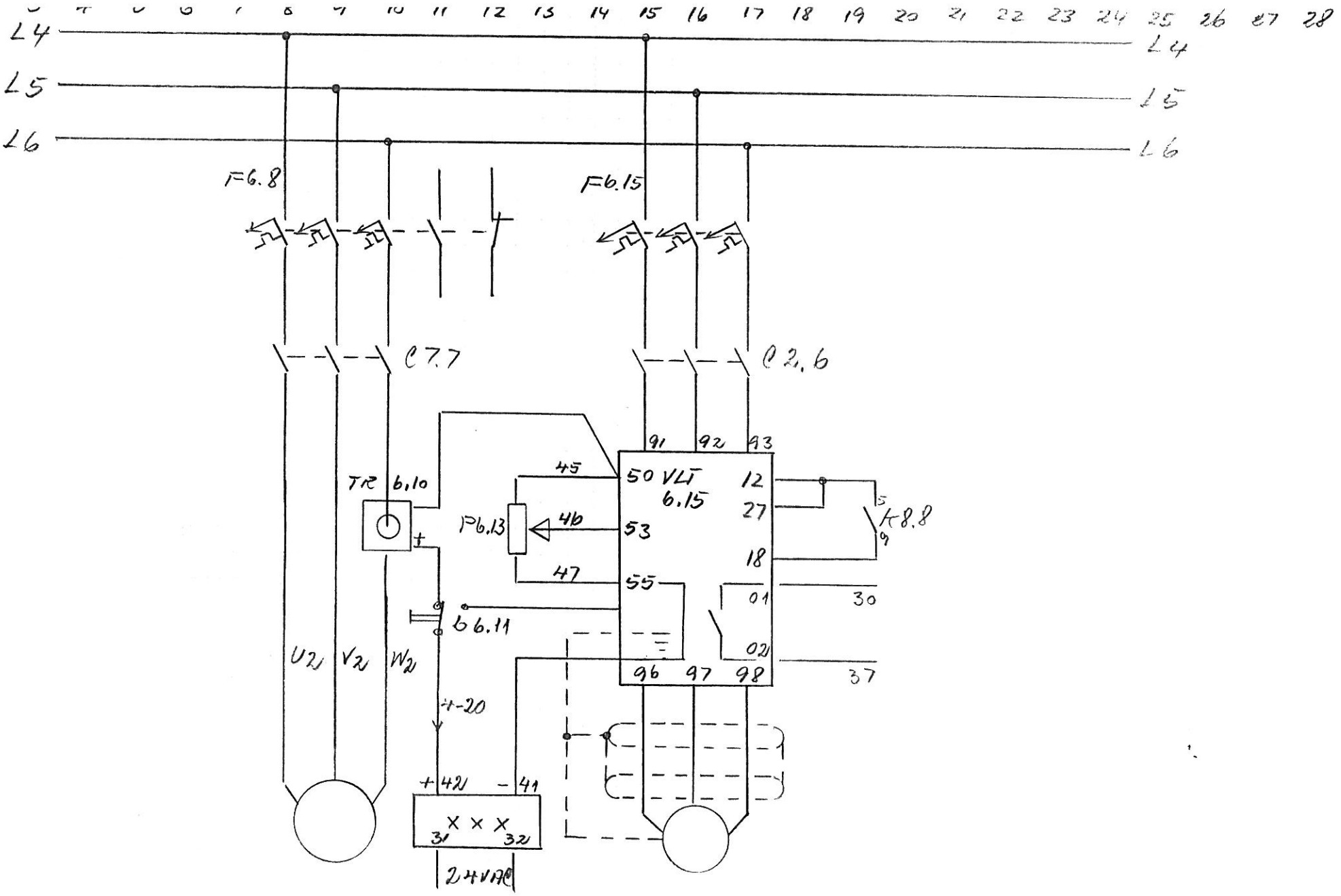
PILOT VALVE FOR MAIN VALVE

LIQUID VALVE

HOT GAS VALVE

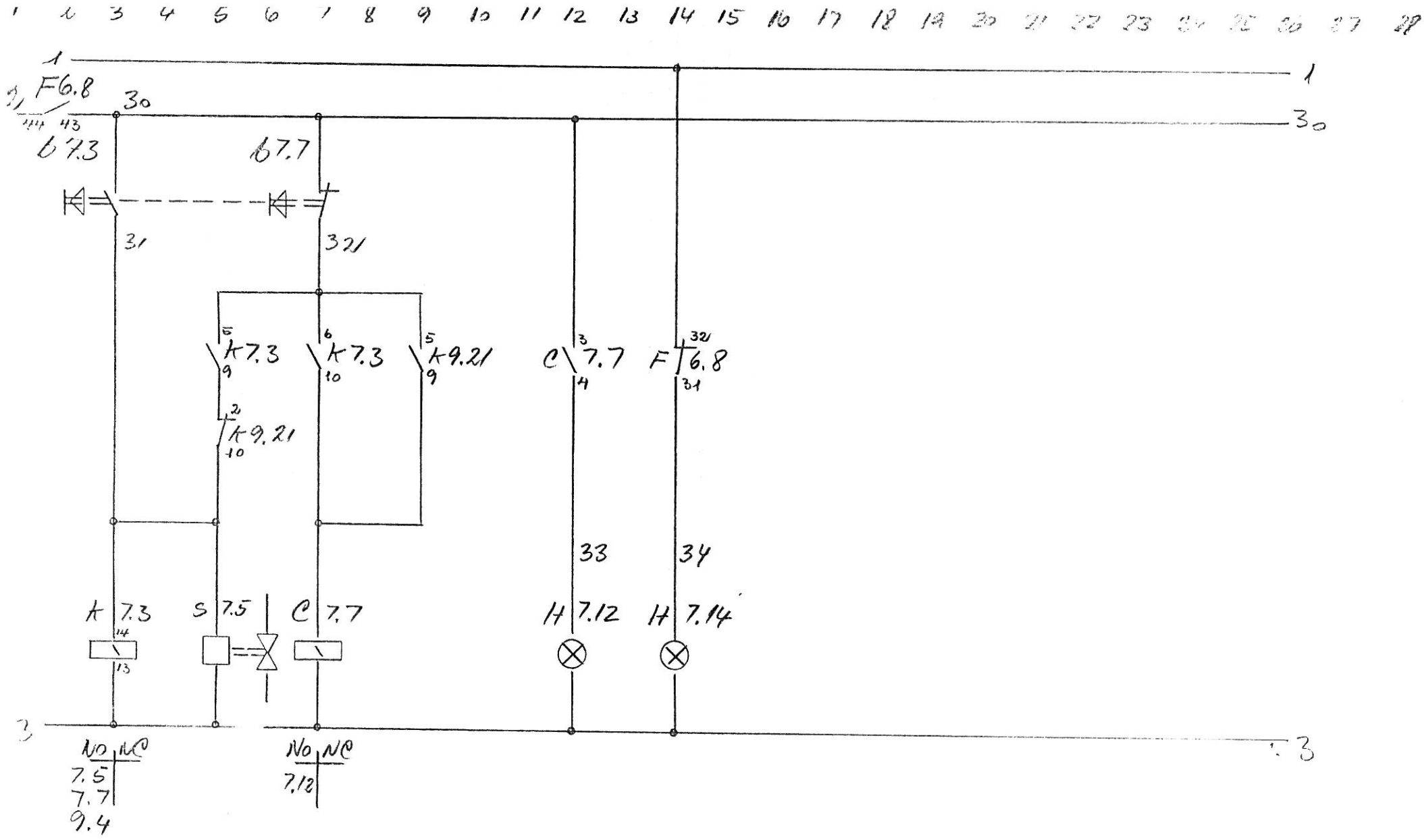
CIP

FREEZER 1



MAIN MOTOR2 DISPLAY 4-20MA=0-50.0 GEAR

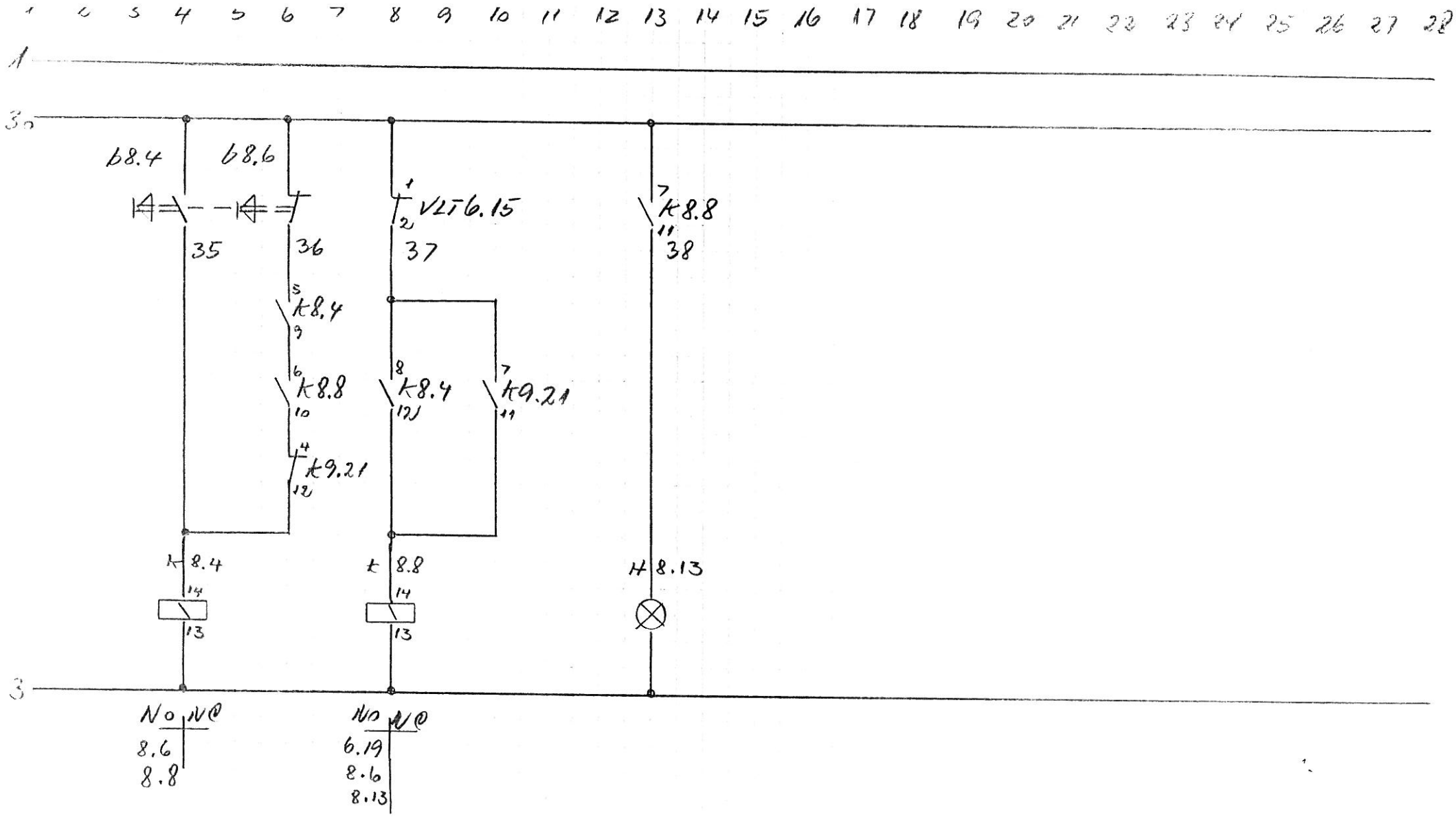
FREEZER 2



O.R.VALVE

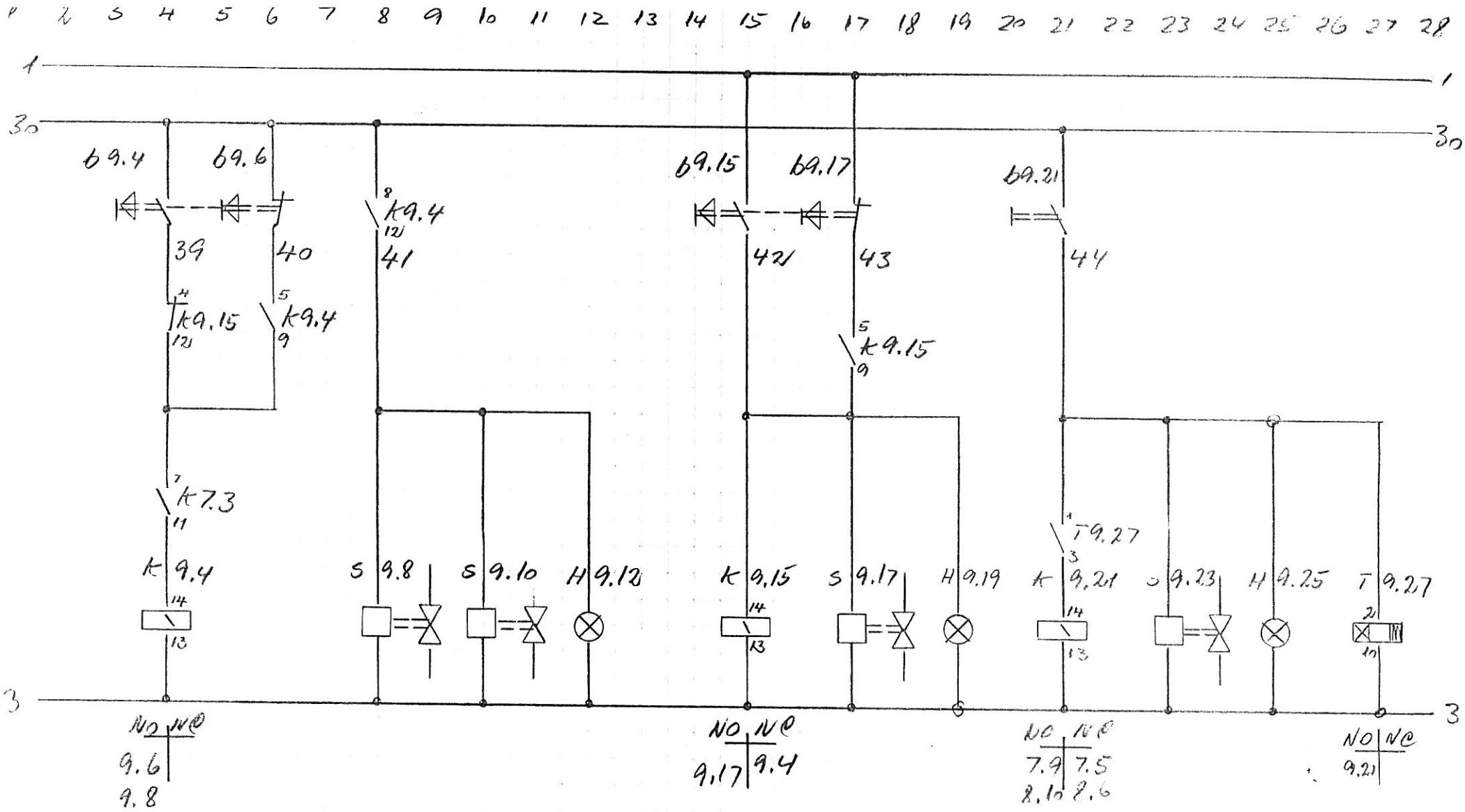
MAIN MOTOR

FREEZER 2

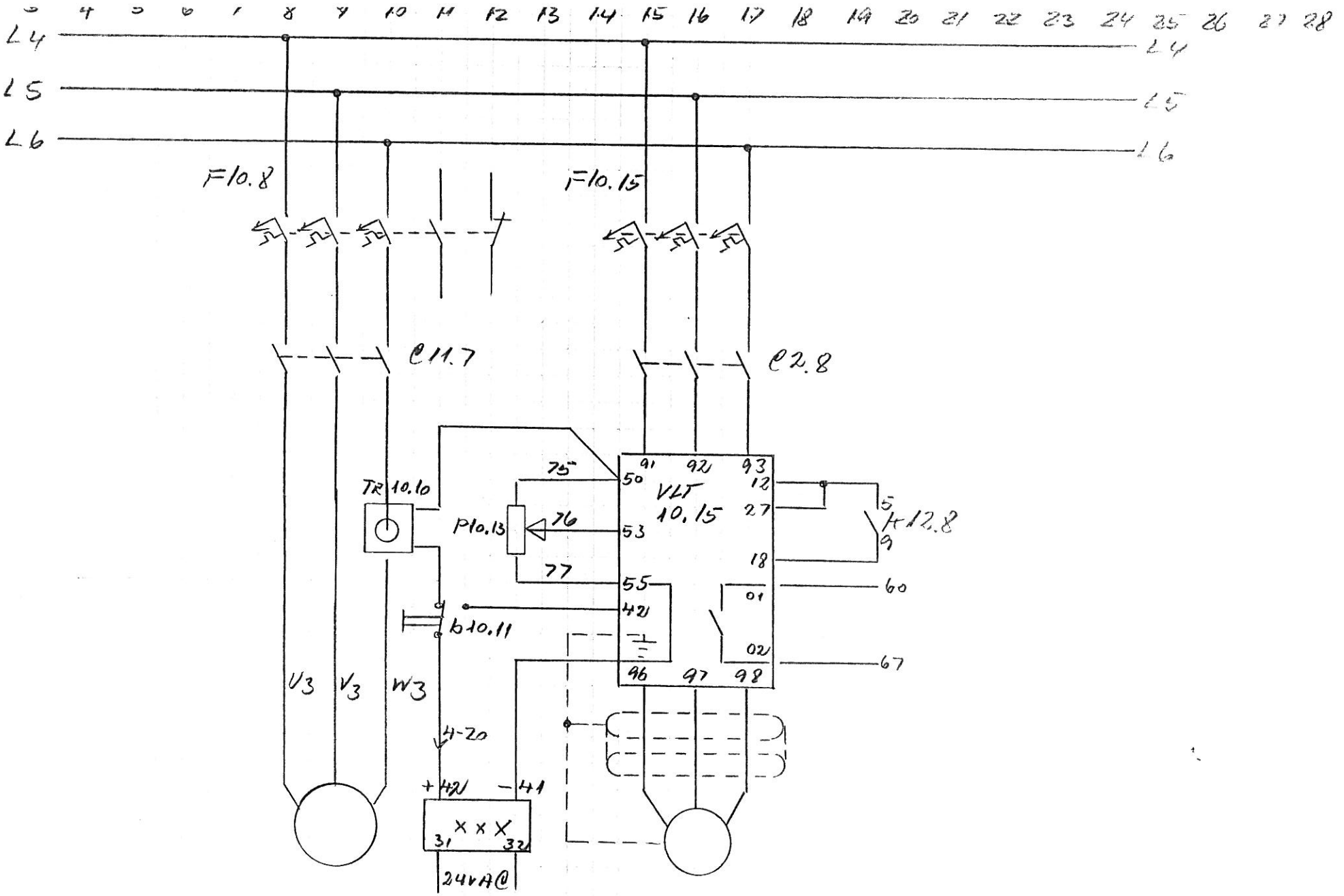


GEAR

FREEZER 2


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
1
30
69.4
69.6
69.15
69.17
69.21
39
40
41
42
43
44
k9.4
k9.15
k7.3
T9.27
K 9.4
S 9.8
S 9.10
H 9.12
K 9.15
S 9.17
H 9.19
K 9.21
9.23
H 9.25
T 9.27
3
NO NC
9.6
9.8
NO NC
9.17 9.4
NO NC
7.9 7.5
8.10 8.6
NO NC
9.21
PILOT VALVE
FOR MAIN VALVE
LIQUID VALVE
HOT GAS VALVE
CIP

FREEZER 2

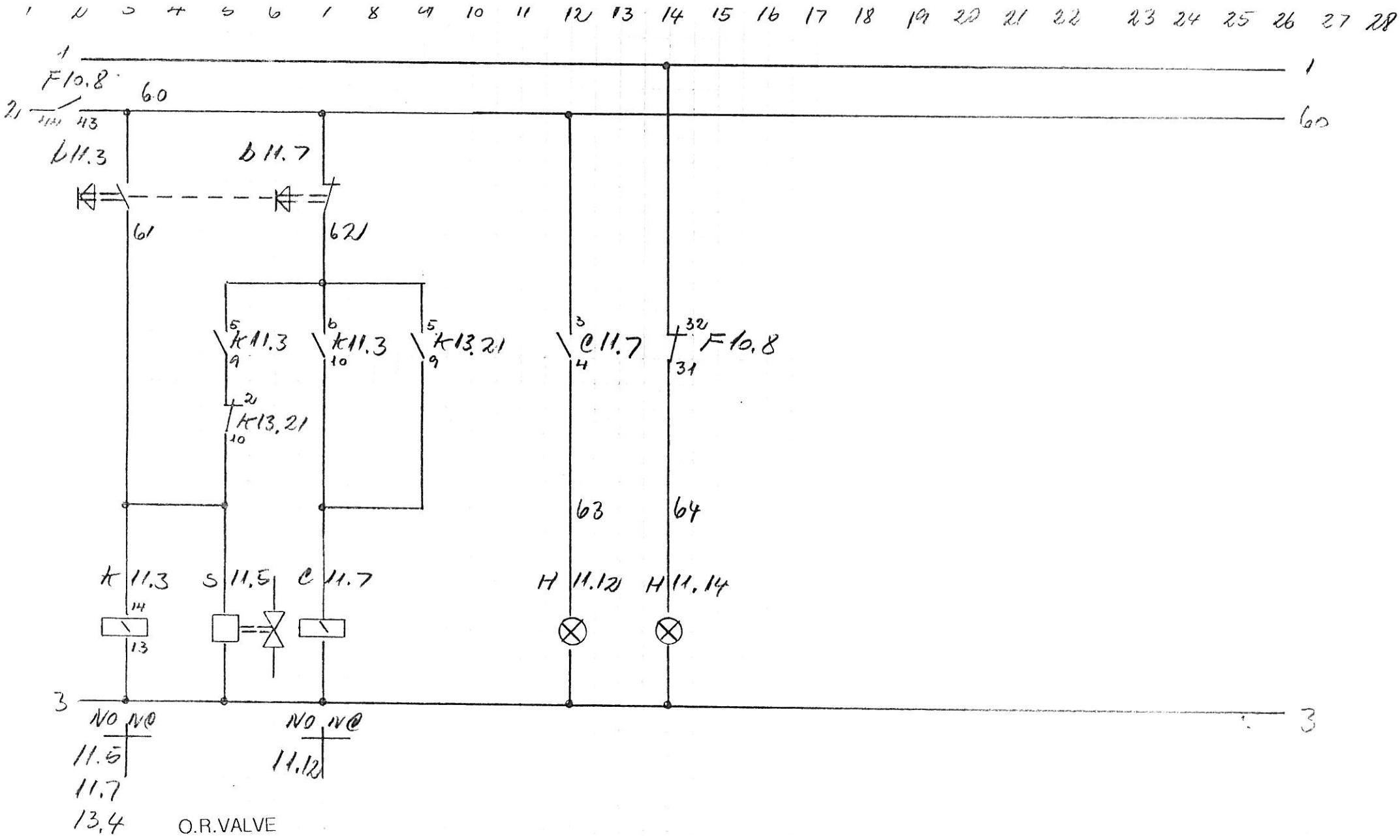


MAIN MOTOR3

DISPLAY
4–20MA=0–50.0

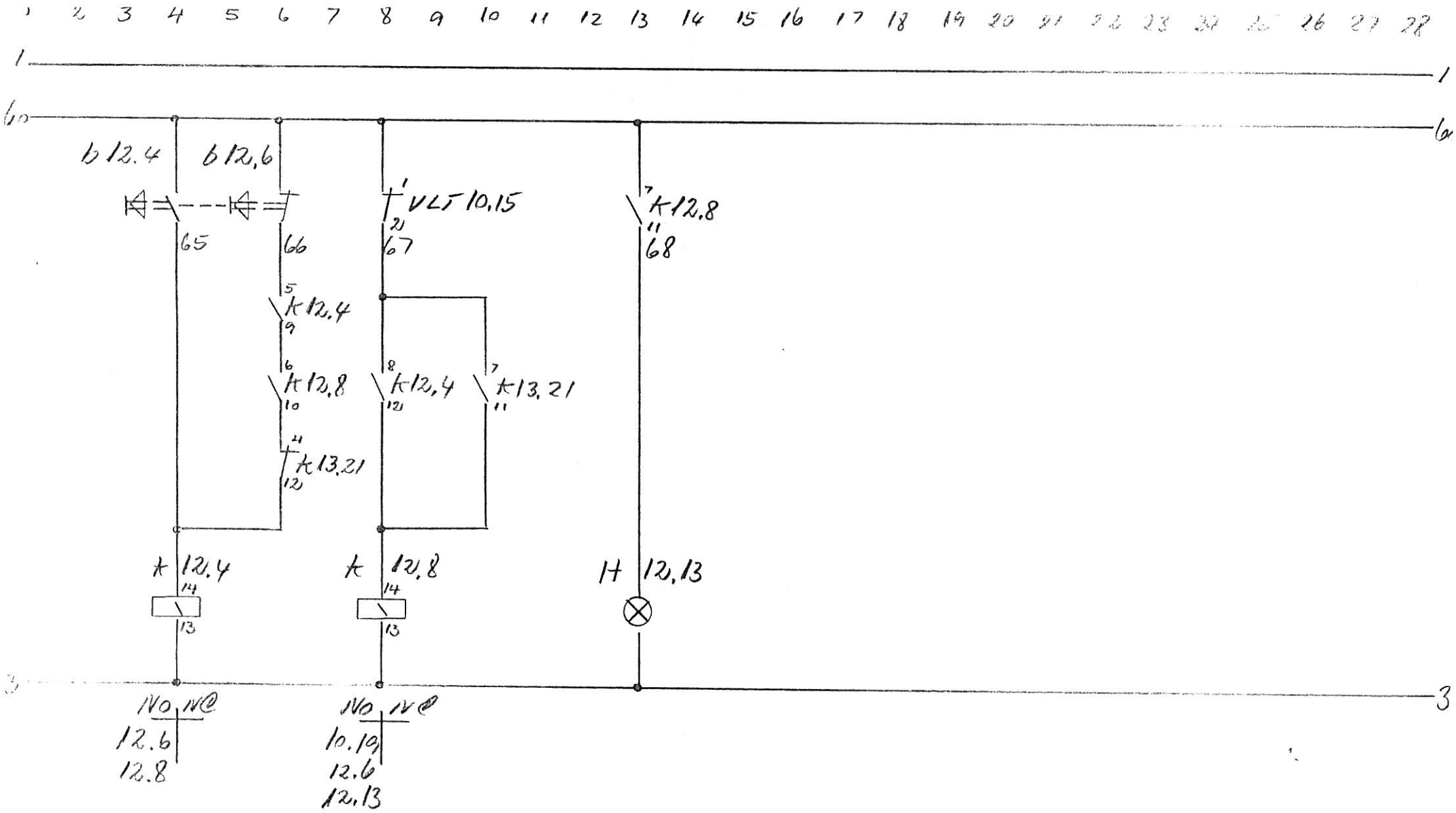
GEAR

FREEZER 3



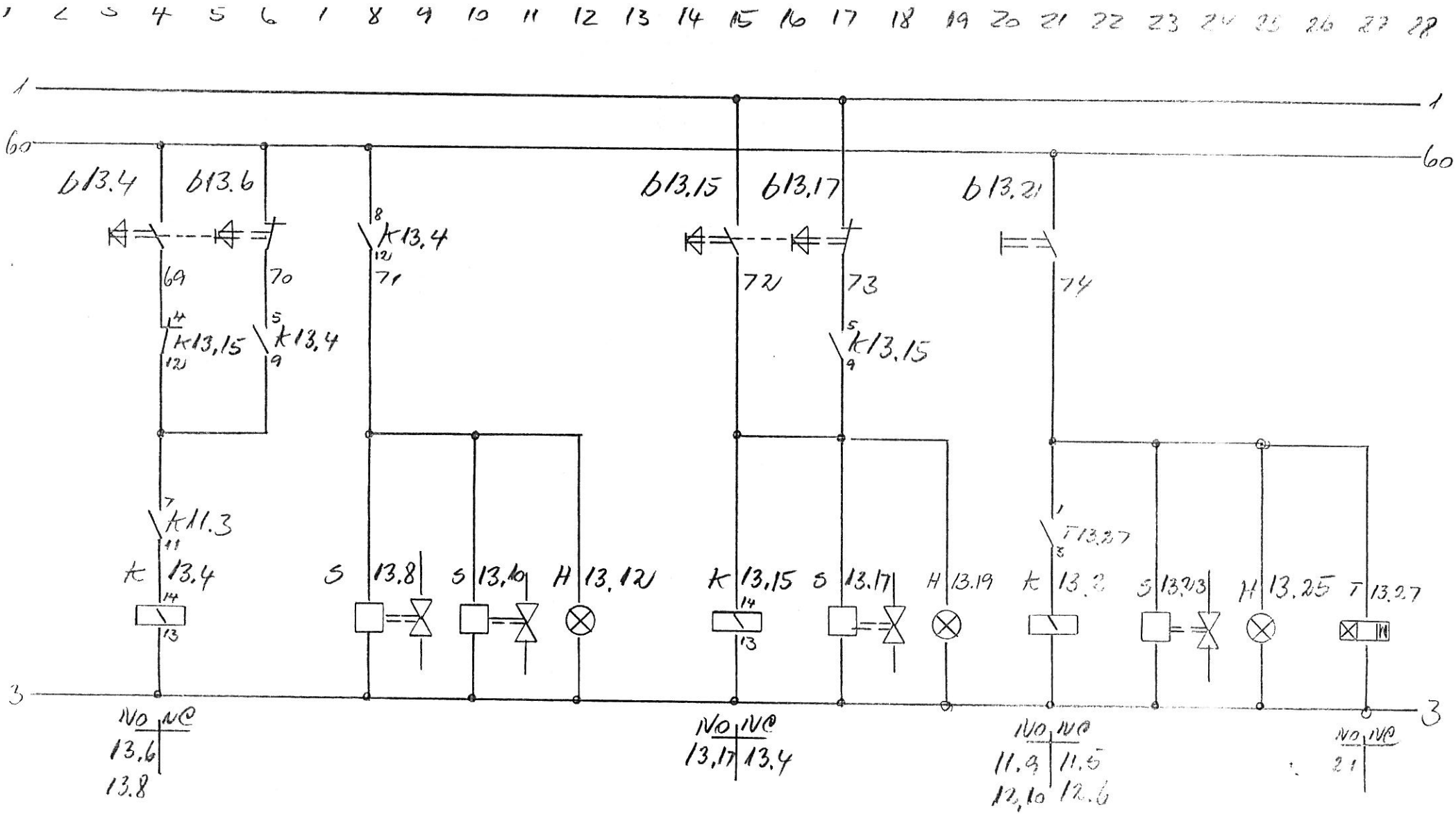
MAIN MOTOR

FREEZER 3



GEAR

FREEZER 3



PILOT VALVE FOR MAIN VALVE

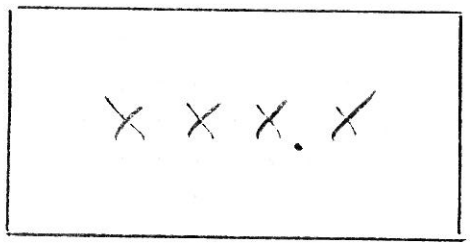
LIQUID VALVE

HOT GAS VALVE

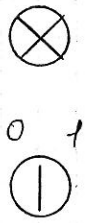
CIP

FREEZER 3

SPEED/AMP



MAIN MOTOR



GEAR

SPEED

FREEZING

SPEED AMP

HOT GAS

CIP

EMG.STOP

RESET/LAMP

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 1021

Fig.

12	Kontraventil for luft Non-return Valve for Air Rückschlagventil für Luft	10D114
13	Krempumpe Ice Cream Pump Krempumpe	9B139
14	Mixpumpe Mix-Pump Mixpumpe	9C153
15	Konstanttrykventil Constant-pressure Valve Konstantdruckventil	4D005
16	Instruktion for tilfiling af skrabeknive Instruction for Overhauling of the Scraper Blades Anweisung für Nachfeilen der Schabemesser	4D006
17	Stillingen af skrabeknivene i fryserøret under drift Position of the Scraper Blades in the Freezing Tube during Operation Stellung der Schabemesser im Gefrierrohr während der Arbeit	4D007
18	Essenskar Flavour Vat Essensgefäss (Vorlaufwanne)	7226

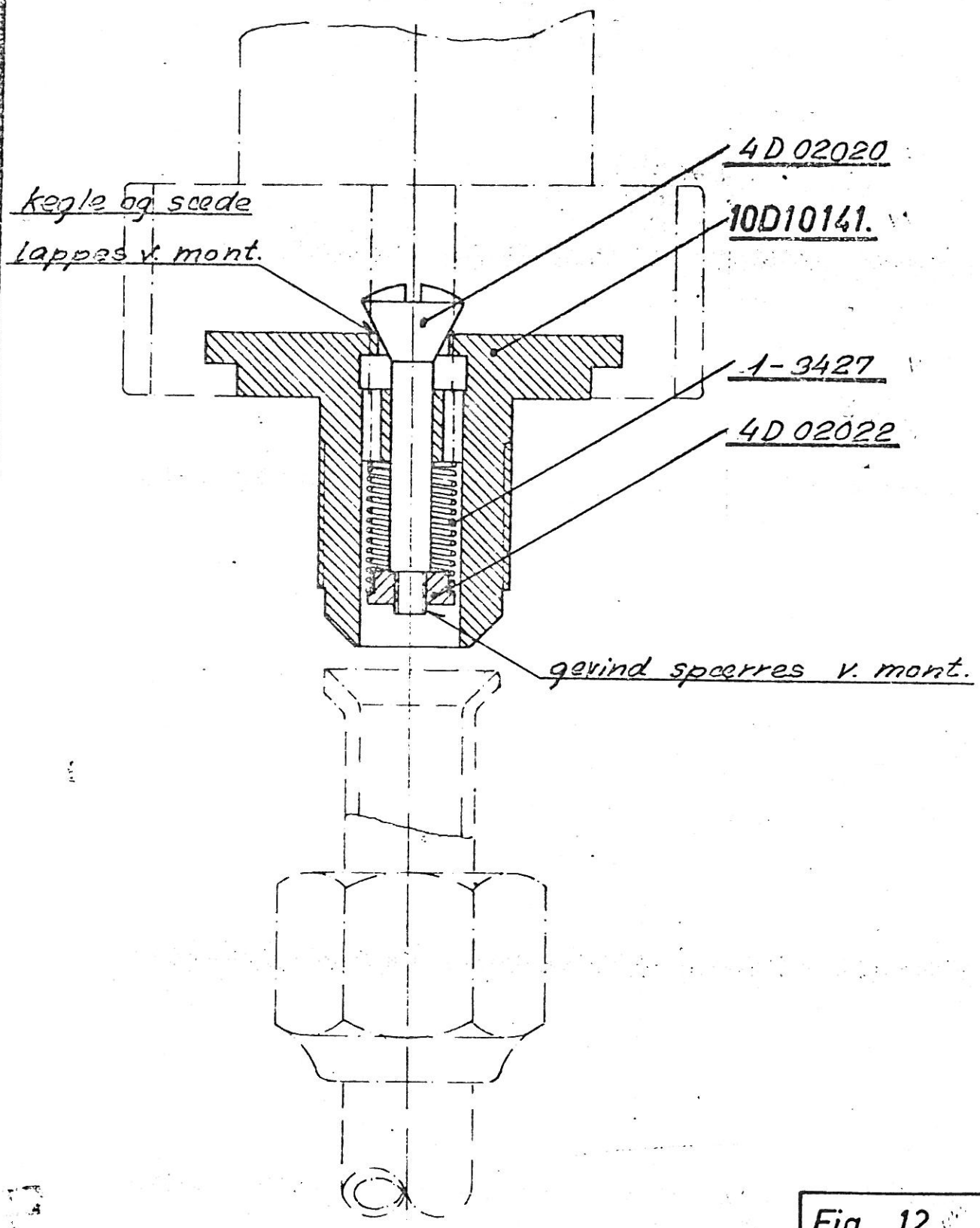
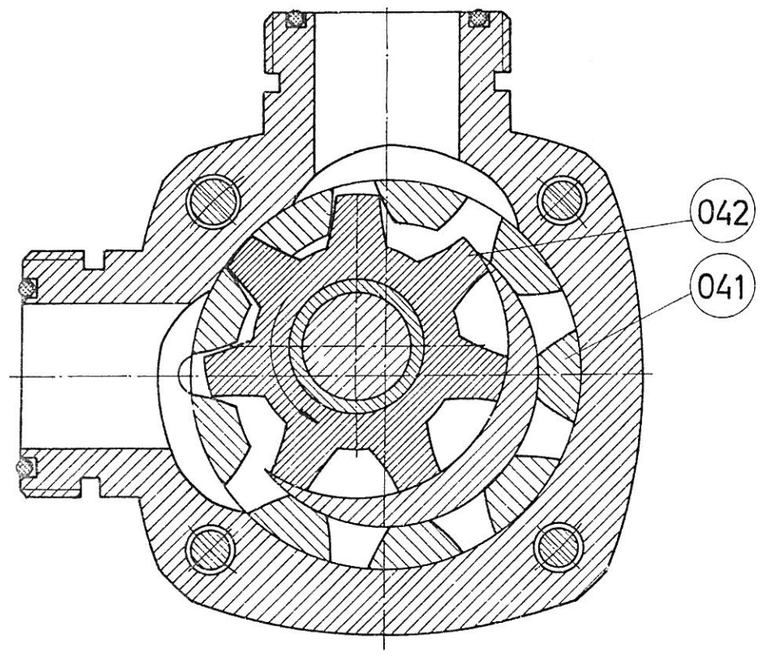


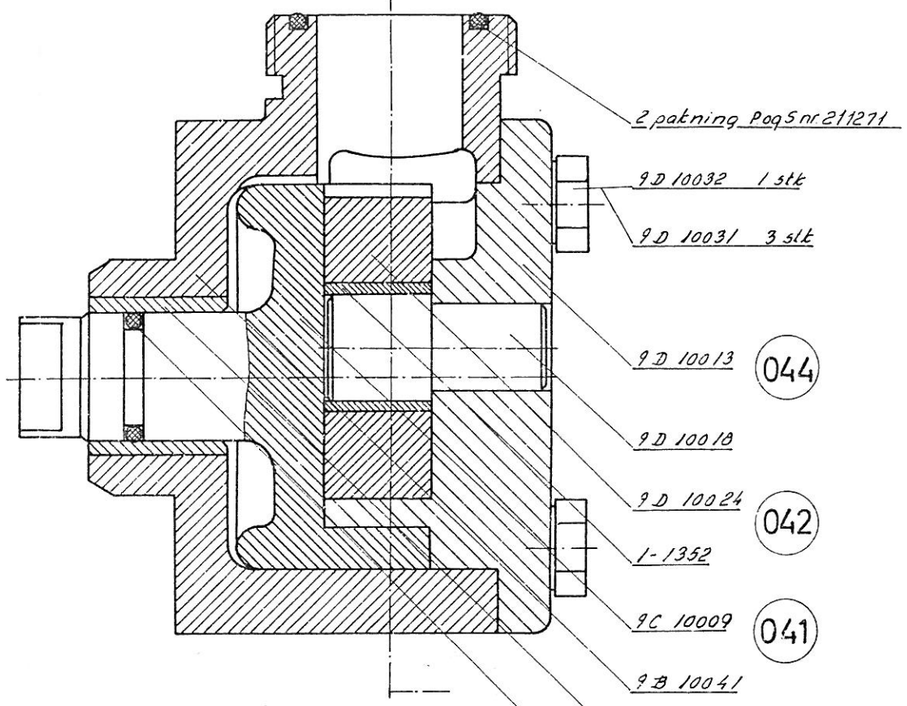
Fig. 12

Hvor intet er angivet er tolerancer for bearbejdn af diam og længdemaal for indv maal 0.5 mm udv maal 0.5 mm ~ Renses Skrubbes Slettes Finslettes	Maalestok 2:1 Tegn 3-4-62 SH Godk Anv til	Matr · Dim HOYER MFG CO AARHUS DENMARK KF.1000. Check Valve. Rückschlagventil. Kontraventil.	Rettelser Nr. 10D 114

A-A



A



KF: 2001	KF: 1101
Fig: 14	Fig: 13

Mrk.:	Fejl.:	Navn:	Dato:	Ændring:	Ordr.:/Serie.:	Bemærkninger:
				Matr.:	Dim.:/Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	D.i.Ø +	D.u.Ø +
4	6	0.2	
6	30	0.5	
30	120	0.8	
120	315	1.2	mm
315	1000	2.0	
1000		3.0	

▽▽▽ Finslettes Ruhed over 0,4 t.o.m. 0,6 µ

▽▽ Slettes Ruhed over 0,8 t.o.m. 4,3 µ

▽ Skrubbes Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade evt. Jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

KF 2001 — Mix Pump — Mix pumpe — Blandingspumpe

KF 1101 — Cream pump — Krempumpe — Krempumpe

Mål:	1:1
Tegn.:	13.10.87 44
Godk.:	
Normpr.:	
Erst. for:	
Tegn. nr.:	9B 139
Erst. af:	9B 154

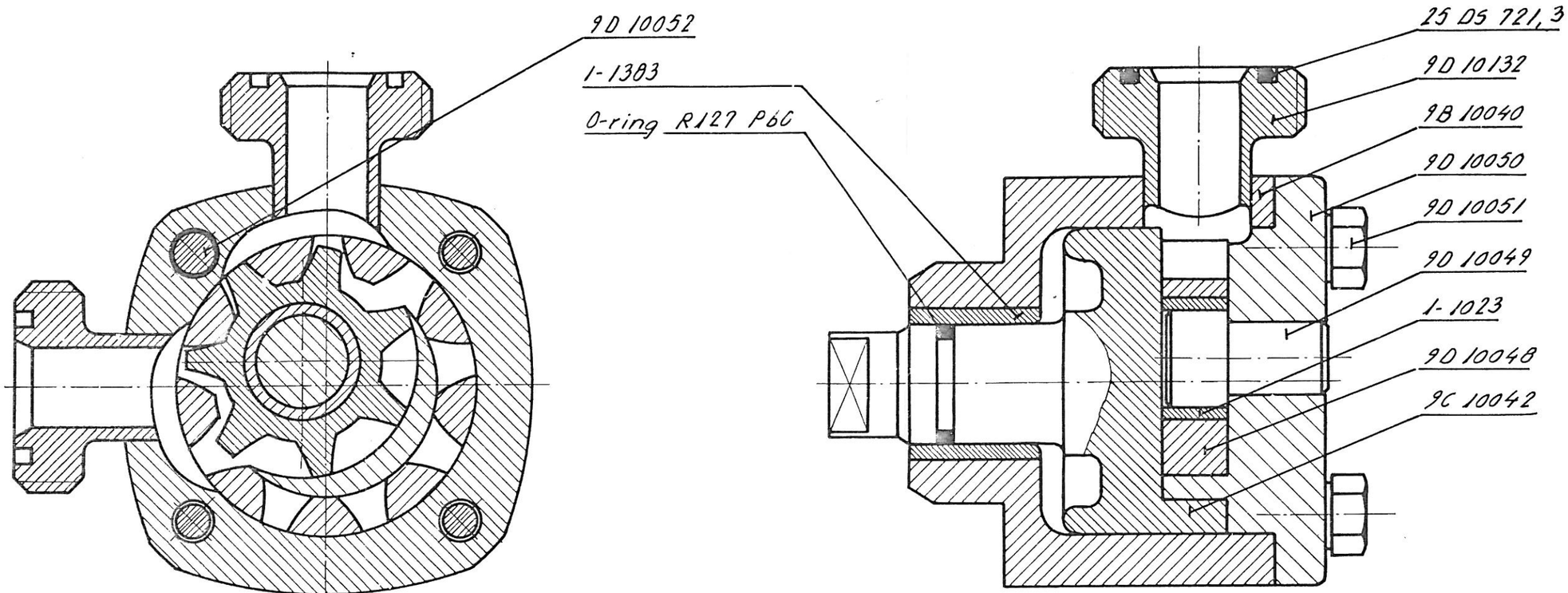


Fig. 14

Mrk.:	Felt.:	Navn:	Dato:	Ændring:	Ordr.:/Serie:	Bemærkninger:

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L. -	D.i Ø +	D.u.Ø -
	6		0,2	
6	30		0,5	
30	120		0,8	
120	315		1,2	mm
315	1000		2,0	
1000			3,0	

▽▽▽ Finslettes
Ruhed over 0,1 t.o.m. 0,8 μ

▽▽ Slettes
Ruhed over 0,8 t.o.m. 6,3 μ

▽ Skrubbes
Ruhed over 6,3 t.o.m. 12,5 μ

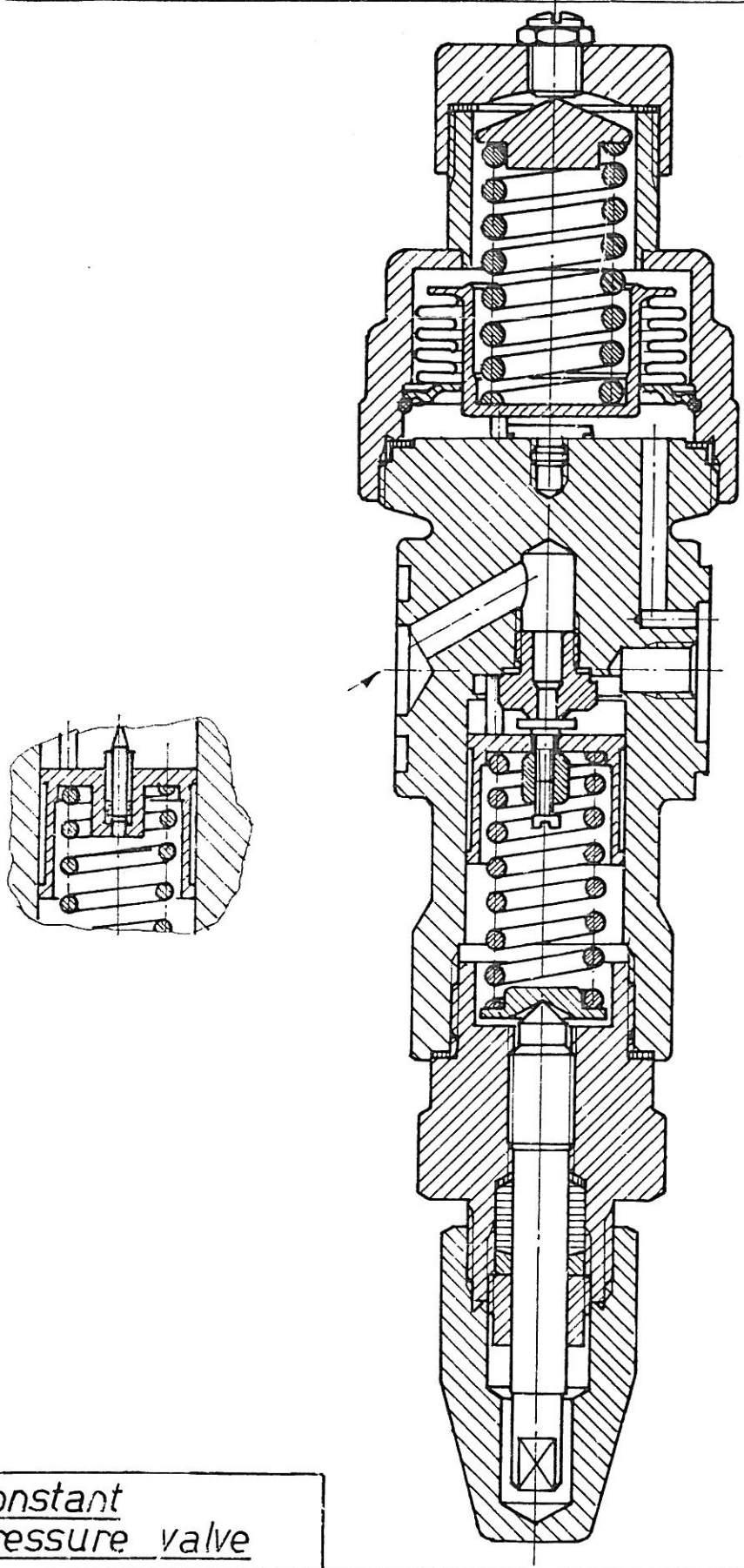
~ Rå overflade
evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

Matr.: | Dim.:/Mod.:

HOYER MFG. CO. AARHUS-DENMARK

Blandepumpe,
Mix pump,
Mixpumpe,

Mål:	1:1
Tegn.:	1.12.69 LA
Godk.:	
Normpr.:	
Erst. for:	
Tegn. nr.:	9C153
Erst. af:	9C156



Constant pressure valve

Konstant-druckventil

Hvor intet er angivet er tolerancer for bearbejdning af diam. og vinkelmaal for: indv. mcal 0,5 mm udv. mcal 0,5 mm ~ Rømes ▽ Skrabbes ▽▽ Slibes ▽▽▽ Finslibes	Maalestok: Tegn. 17/10-61 VL. FH. Godk.	Matr.	Dim.: HOYER MFG. CO. AARHUS DENMARK	Rettelser: Fig. 15
	Anv. til	Reduktionsventil for KF Danfoss type RVA 1-4.		Erst. for: Nr. 4D 005

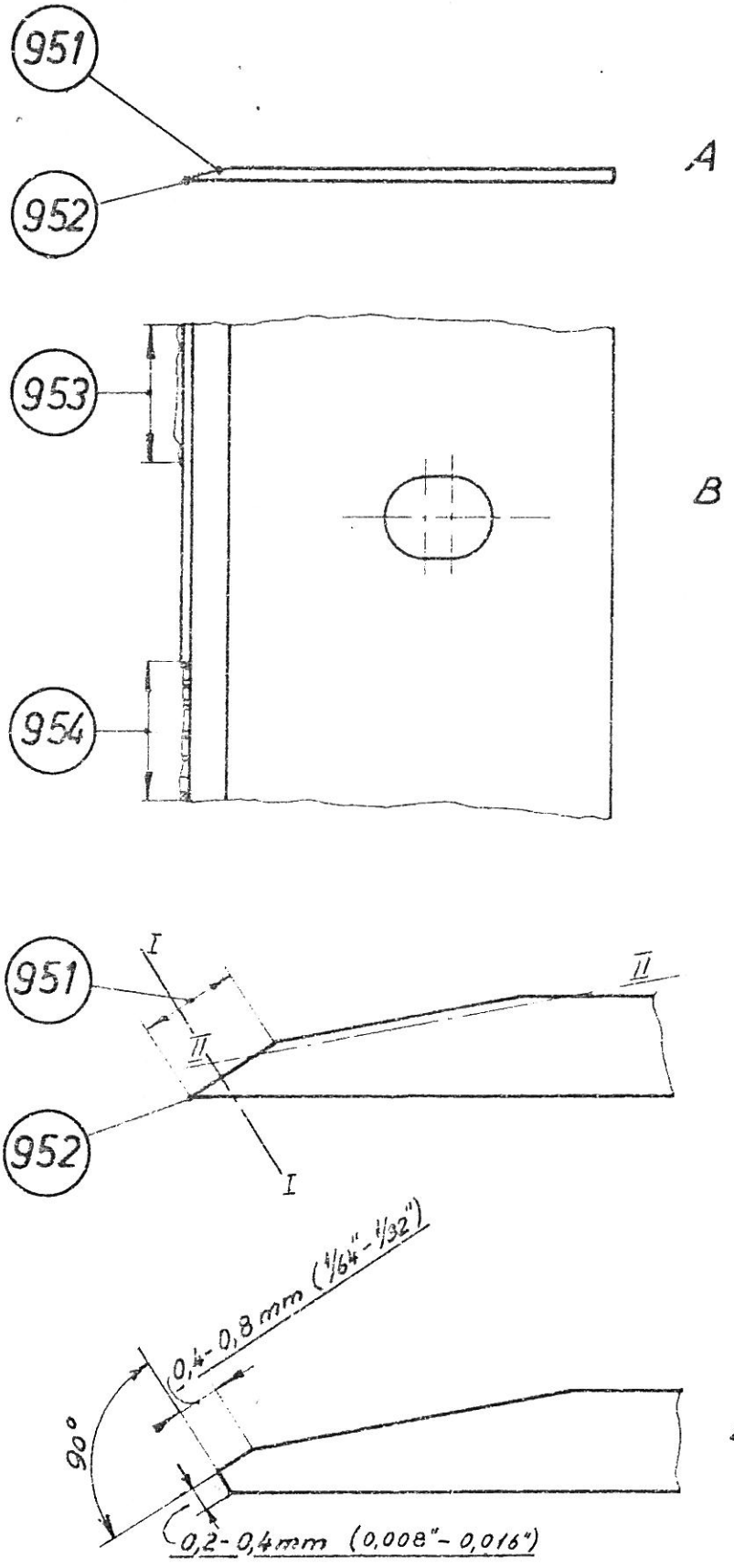
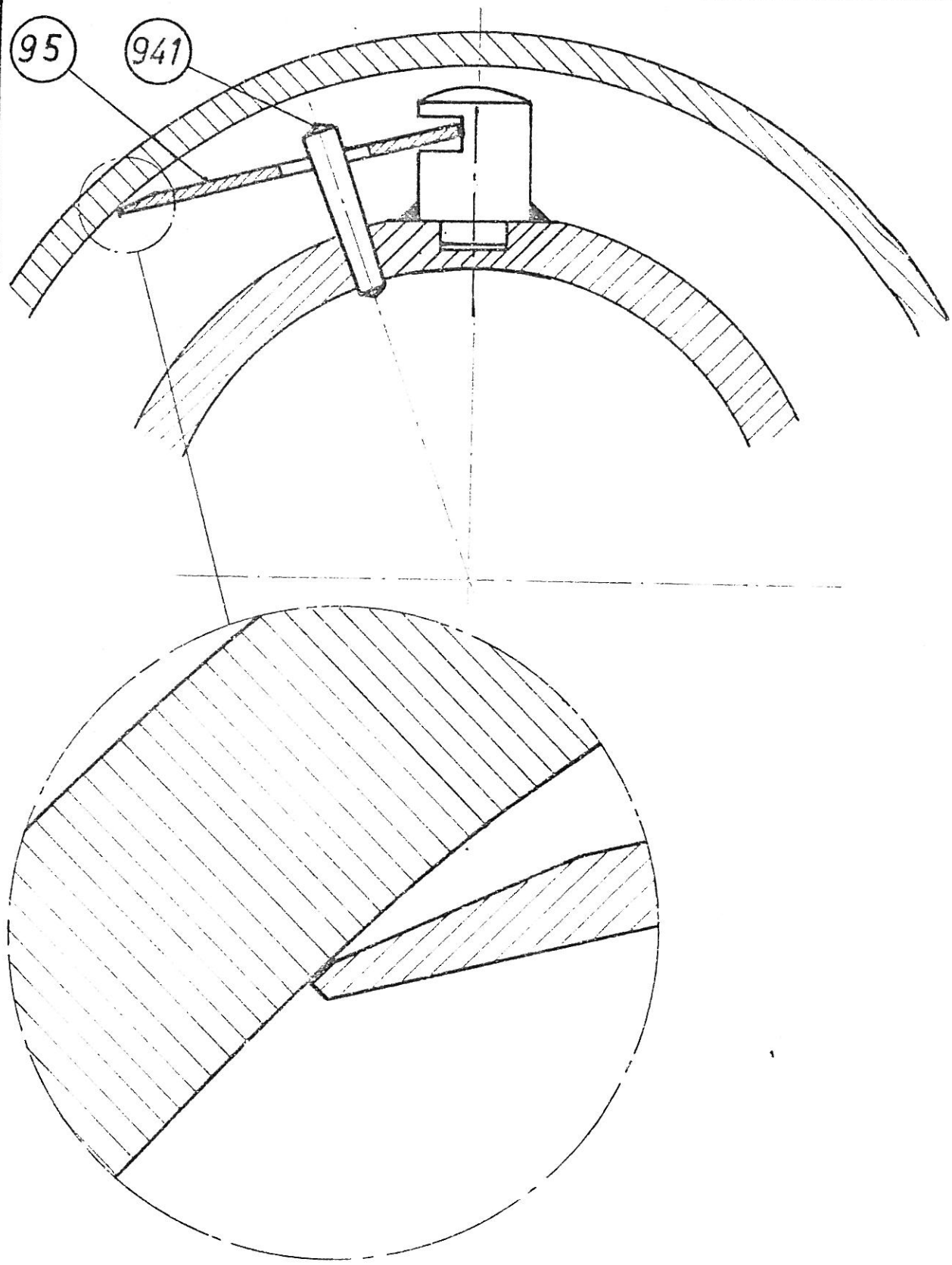


Fig. 16

Hvor intet er angivet er tolerancen for bearbejdn. af diam.- og længdemaal for indv. maal + 0,5 mm udv. maal − 0,5 mm	Maalestok:	Matr.:	Dim.:	Rettelser:
	Tegn.. 23-1-62	HOYER MFG. CO. AARHUS · DENMARK		
	Godk.: F.H.			
~ Renses	Anv. til:	Instruction for filing the scraper blade over.		Erst. for:
▽ Skrubbes		Nachfeilen der Schabemesser.		Nr. 4D006
▽▽ Slettes		Tilfiling af skrabekniv		
▽▽▽ Finsleites				Erst. af:



Skrabeknivens stilling_

Fig. 17

Hvor intet er angivet er tolerancen for bearbejdn. af diam.- og længdemaal for
indv. maal + 0,5 mm
udv. maal − 0,5 mm

∿	Renses
▽	Skrubbes
▽▽	Slettes
▽▽▽	Finslettes

Maalestok:

Tegn.: 23-1-62 F.

Godk.: F.H.

Anv. til:

Matr.:

Dim.:

HOYER MFG. CO. AARHUS · DENMARK

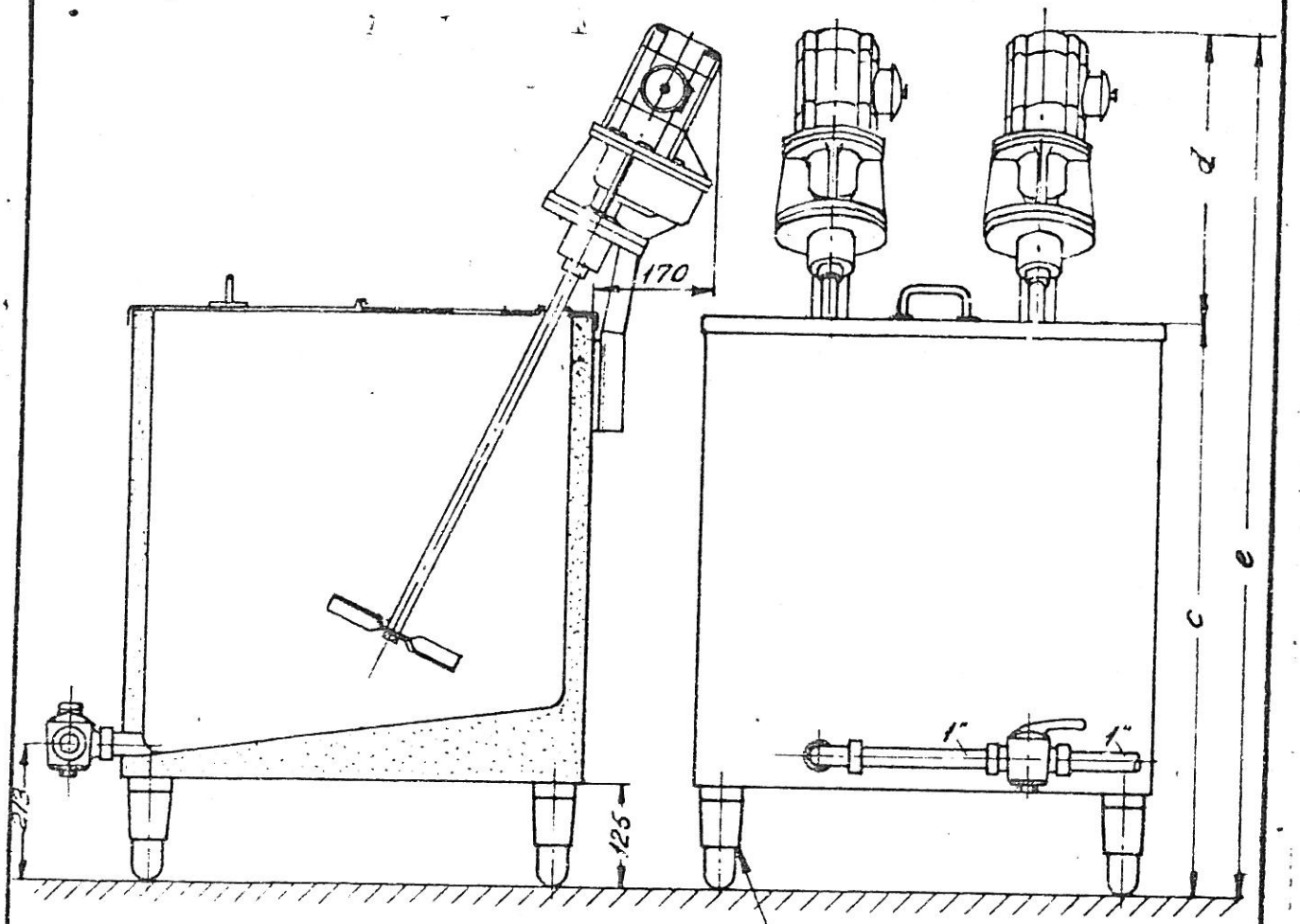
Position of the scraper blade in the freezing tube.
Stellung der Schabemesser im Gefrierrohr

Rettelser:

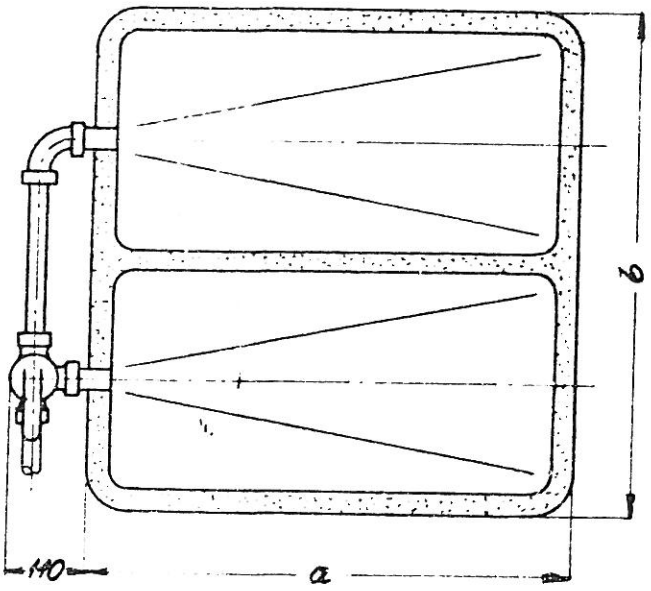
Erst. for:

Nr. 4 D007

Erst. af:



Indstillelige ben.
Adjustable legs.



Tank Capacity	a	b	c	d	e
2×100l	770	770	800	400	1200
2×150l	845	845	890	400	1290
2×200l	920	920	960	400	1360
2×250l	1025	1025	960	400	1360

All measures in millimetres.
Supersedes Drawings No. 2227 & 2234.

Erstatn. f. tg nr 4287
d: 20-11-58.

	Essenstank Målskitse Flavor Mixing Tank. Dimension Sketch.	Skala 1:10. 24-8-54. Fig. 14a. 7226.

Fkp. nr. 1022

Positionsnumre - Reference Numbers - Positionsnummern.

I denne betjeningsvejledning er benyttet et system af positionsnumre f. eks. i beskrivelsen af kølesystemet og på de tilhørende tegninger. De vigtigste af disse numre er:

In this instruction manual is used a system of reference numbers, for example in the description of the refrigerating system and on the belonging drawings. The most important of these numbers are:

In dieser Bedienungsanleitung ist ein Positionsnummersystem verwendet, z.B. in der Beschreibung des Kältesystems. Die wichtigsten von diesen Nummern sind:

For luftsystemet - For the air system - Für das Luftsystem

11) Luftfilter - Air filter _ Luftfilter
12) Luftkompressor - Air compressor - Luftkompressor
13) Olieudskiller for trykluft - Oil separator for compressed air - Ölabscheider für Druckluft
14) Lufttryksmanometer - Air-pressure gauge - Manometer für Druckluft
15) Reguleringsventil for trykluft - Air-pressure regulating valve - Luftdruck-Regelventil
16) Kontraventil for trykluft - Non-return valve for compressed air - Rückschlagventil für Druckluft
17) Magnetventil for trykluft - Solenoid valve for compressed air - Elektromagnetisches Absperrventil für Druckluft
18) Kontraventil - Non-return valve - Rückschlagventil

Pos. nr. 17) og 18) leveres ikke til alle frysere.
Ref. Nos. 17) and 18) are not delivered for all freezers.
Pos. Nr. 17) und 18) werden nicht für alle Freezers geliefert.

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 1023 C. II - 2

For ammoniaksystemet (Frysere med injektor, men uden instant stop-start system)

For the ammonia system (Freezers with injector, but without instant stop-start system)

Für das Ammoniaksystem (Freezers mit Injektor, aber ohne instant stop-start System)

20) Væskeledning - Liquid line - Flüssigkeitsleitung
21) Hovedstopventil i væskeledningen - Master valve for liquid ammonia - Hauptabsperrventil für Ammoniak-Flüssigkeit
23) Magnetventil i væskeledningen - Solenoid valve for ammonia liquid - Elektromagnetisches Absperrventil für Ammoniak-Flüssigkeit
24) Lavtryks-Svømmerventil - Low-pressure float expansion valve Niederdruck-Schwimmerregelventil
25) Væskeudskiller og akkumulator - Liquid separator and accumulator - Flüssigkeitsabscheider und Flüssigkeitssammler
27) Konstanttryksventil for flydende ammoniak - Constant pressure valve for liquid ammonia - Konstantdruckventil für Ammoniak-Flüssigkeit
28) Manometer for ammoniak - Ammonia pressure gauge - Manometer für Ammoniak
29) Injektor - Injector - Injektor
30) Væsketilgangsrør til frysecylinderen - Tube for ammonia feed to the freezing cylinder - Rohre für Ammoniakzufuhr zum Gefrierzylinder
34) Returrør fra frysecylinderen - Ammonia flow return tube - Rücklaufrohr vom Gefrierzylinder
35) Sugerør - Suction pipe - Saugrohr
36) Jævntryksventil - Back-pressure regulator - Saugdruckregler
361) Pilotventil til jævntryksventilen 36) - Pilot valve for the back-pressure regulator 36) - Steuerventil für den Saugdruckregler 36)
37) Håndtag til regulering af sugetrykket - Handle for adjustment of the back-pressure regulator - Handgriff für die Einstellung des Saugdruckreglers
38) Sugetryksmanometer - Section pressure gauge - Saugdruckmanometer
39) Sugestopventil - Suction stop valve - Saugabsperrventil
40) Sugeledning - Suction line - Saugleitung

41) Sikkerhedsventil - Safety valve - Sicherheitsventil
42) Tomsugningsledning - Drainage line - Leersaugungsleitung
43) Stopventil i tomsugningsledningen - Stop valve in the drainage line - Absperrventil in der Leersaugungsleitung
44) Olieaftapningsventil - Oil drain valve - Olablassventil
45) Varmgasledning - Hot ammonia gas line - Heissgasleitung
46) Stopventil i varmgasledningen - Stop valve in the hot gas line - Absperrventil in der Heissgasleitung
47) Magnetventil i varmgasledningen - Solenoid valve in the hot gas line - Elektromagnetisches Absperrventil in der Heissgasleitung
48) Magnetventil i pilotledningen til 36) - Solenoid valve in the pilot line for 36) - Elektromagnetisches Absperrventil in der Steuerleitung für 36)

Hvis fryseren er leveret med instant stop-start system, er yderligere følgende positionsnumre benyttet:

If the freezer has been supplied with instant stop-start system the following reference numbers are further used:

Wenn der Freezer mit instant stop-start System geliefert ist, sind die folgenden Positionsnummern ferner benutzt:

230) Pressostat til 23) - Pressure control for 23) - Pressostat für 23)
362) Pilotventil til jævntryksventilen 36). Denne pilotventil er indbygget i jævntryksventilen
Pilot valve for the back-pressure regulator 36). This pilot valve is built-in in the back-pressure regulator.
Steuerventil für den Saugdruckregler 36). Dieses Steuerventil is in dem Saugdruckregler eingebaut.
470) Pressostat til 47) - Pressure control for 47) - Pressostat für 47)

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Fkp. nr. 1025 C. II - 4

For det elektriske system - For the electric system - Für das elektrische System.

50) Elektromotor (Hovedmotor) - Electric motor (Main motor) - Elektromotor (Hauptmotor)
51) Motorværn til hovedmotoren - Starting relay with thermal overload relay for the main motor - Motorschutzschalter für den Hauptmotor
52) Ampéremeter - Ammeter - Ampéremeter
53) Kontroltavle - Control panel - Schalttafel
54) Transformator til ampéremeteret - Transformer for the ammeter - Transformator für den Ampéremeter
55) Relæer (Muligvis med undernumre 551), 552) o.s.v.)
Relays (Possible subnumbers 551), 552) etc.)
Relais (Möglicherweise Unternummern 551), 552) u.s.w.)
56) Elektromotor til træk af pumperne (med trinløst variabelt gear)
Electric motor for driving the pumps (With infinitely variable gear)
Elektromotor für Antrieb der Pumpen (Stufenlos regulierbarer Getriebemotor)
57) Motorværn til 56) - Starting relay with thermal-overload relay for 56) - Motorschutzschalter für 56)
58) Drejeomskifter (Kun for frysere med instant stop-start)
Rotary switch (Selector switch) (Only for freezers with instant stop-start)
Drehumschalter (Nur für Freezers mit instant stop-start System)
59) Elektromotor til træk af luftkompressoren - Electric motor for driving the air compressor - Elektromotor für Antrieb des Luftkompressors
591) Motorværn til 59) - Starting relay with thermal overload relay for 59) - Motorschutzschalter für 59)

For det mekaniske system - For the mechanical system - Für das mechanische System.

78) Håndtag til ydeevneregulering - Handle for regulation of the capacity - Handgriff für Leistungsreglung

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Fkp. nr. 1702 D. I-1

The ice Cream- and Air System

Please refer to Figs. 3 and 12.
The mix flows into the mix pump through the mix pipe line and is pumped into the freezing cylinder.
Freezers supplied with "instant stop-start" system have a non-return valve 18) mounted in the delivery pipe of the mix pump.
The ready frozen ice cream leaves the freezing cylinder through the suction line of the cream pump and is pumped out through the discharge pipe. In this pipe a three-way cock is generally mounted. When this cock is in the overflow position the ice cream is pumped through the overflow pipe into a milk can, which is placed below the overflow pipe. When the three-way cock is in the working position the ice cream is pumped through the outlet pipe direct to the place of consumption. The three-way cock is delivered only on special order and against an additional price.
The freezer is normally delivered without air compressor. It must then be connected direct to the compressed air system of the factory. It is absolutely necessary that the compressed air is completely free from oil.
On order and against an additional price the freezer can, however, be supplied with a separate air compressor. The atmospheric air is then sucked in by the air compressor 12) through an air filter 11). The compressed air passes an oil separator 13) before it is led to the compressed air system of the freezer.
In the air inlet pipe of each of the freezing cylinders of the freezer a solenoid valve 17) is mounted. This is opened at the same time as the main motor is started. (this applies only to freezers with more than one freezing tube).
The compressed air is then passing an adjustable air pressure regulating valve 15). (pressure reducing valve). By means of this it is possible to keep a constant and desired air pressure after the valve. The air pressure can be read on the pressure gauge 14). Through the non-return valve 16) the compressed air flows into the mix inlet pipe of the freezing cylinder.
The air filter should be cleaned when necessary. Please also remember to drain oil from the oil separator when necessary.

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Wkp. nr 1703 D.I-2

The quantity of air mixed into the frozen ice cream increases the volume. The proportion between the increase in the volume of the ice cream leaving the freezer, and the volume of mix used, is called the overrun. The overrun is stated in percentages of the volume of the mix. If for instance you have 190 litres of ice cream out of 100 litres of mix, the overrun is said to be 90%.
The overrun can be regulated by adjusting the air pressure by means of the air pressure regulating valve 15). The higher the air pressure the more air will be mixed into the mix, and the overrun will consequently be increased, and vice versa, a lower air pressure will give a decreased overrun.

THE AMMONIA SYSTEM

Concerning freezers with injector but without "Instant stop-start" system.

Please refer to Fig. 4.

Liquid ammonia from the receiver of the refrigerating plant enters the freezer through the main liquid line which is equipped with a master valve 21) for liquid ammonia.

If the freezer is equipped with more than one freezing tube, it has an ammonia-system for each tube. These systems are exactly alike, and the following description relates to each of these systems.

The main liquid line branches off with liquid lines 2o) for each system. A solenoid valve 23) is built into the liquid line. Having passed the solenoid valve the liquid line bifurcates. One branch then feeds the low-pressure float valve 24). In the other branch is mounted a constant pressure valve 27). Having passed this valve the liquid flows into the injector 29), which is built into the liquid separator 25). The injector recirculates the liquid ammonia from the liquid separator through the inlet tube 3o) into the ammonia jacket surrounding the freezing tube.

The ammonia gas and the not yet evaporated liquid ammonia return to the liquid separator through the tube 34).

In the liquid separator the ammonia gas is separated from the liquid ammonia. The liquid collects at the bottom of the separator from which it can be re-circulated through the jacket surrounding the freezing tube. The ammonia gas leaves the liquid separator through the suction pipe 35), where a pilot controlled back pressure regulator 36) is installed. The suction line 4o) is connected to the common main suction line from all freezing tubes and a main suction stop valve 39) is mounted in this main suction line.

By means of the constant pressure valve 27) it is possible to keep the pressure of the liquid ammonia flowing into the injector at a somewhat reduced but constant value, independent of variations of the pressure before the valve. The pressure after the valve can be read on the pressure gauge 28). The correct adjustment of the valve is

mainly dependent on the size of the nozzle in the injector and the refrigeration load of the freezer. No more liquid must be supplied to the liquid separator than the quantity which at any time can be evaporated in the ammonia jacket of the freezing tube.

If, for some time, an excess amount of liquid ammonia is supplied, the liquid separator will gradually be completely filled up. Consequently, the liquid will enter the suction line and run to the refrigerating compressor together with the ammonia gas.

The consequence would be surge impact in the compressor and this must absolutely be avoided, as it may thereby be damaged. On the other hand the pressure before the injector must not be reduced so much that the re-circulating effect of the injector will be insufficient.

The constant pressure valve is shown on Fig. 15 and in an instruction leaflet at the back of this instruction manual. How this valve is to be adjusted will be described in a later paragraph.

The back pressure regulator 36) is pilot controlled by the pilot valve 361). By means of the handle 37) the pilot valve can be adjusted and then also the back pressure regulator to keep the requested evaporating temperature. In the pilot line a solenoid valve 48) is installed. The evaporating pressure is read on the pressure gauge 38), and as the evaporating temperature is only dependent on the pressure, also the evaporating temperature can be read on the pressure gauge.

The low pressure float valve is shown on Fig. 5. The purpose of this valve is to keep a constant liquid level in the liquid separator.

The liquid ammonia enters through the in-let tube 241), and then flows through a strainer 242). The valve is shown in a closed position on the drawing. The valve needle 243) is pressed tightly against the valve seat 245) by means of the spring 244). The needle is lifted from the valve seat by means of the push needle 246) when the float 248) which is connected to the lever 247) sinks down, because the liquid level in the liquid separator sinks.

The screw 2471) will then press the push needle inwards. When this happens the liquid ammonia will flow through the nozzle of the valve

seat and along the push needle into the liquid separator. The liquid level in the separator will consequently rise and when the requested level has been reached, the float has been lifted so high that the valve needle is once more pressed against the valve seat and the flow of the liquid stops.

When the float is to be taken out in order to be cleaned or repaired, it is necessary to empty the liquid separator. This is done through the emptying line 42). In this line a stop valve 43) is installed, and in the common emptying line a main stop valve is installed. Behind this the main emptying line is connected to the main suction line after the main suction stop valve 39).

The oil that will gradually accumulate in the liquid separator is drained through the oil draining valve 44).

If the rotor by chance should freeze up in the freezing tube, it should be possible to loosen it by means of hot ammonia gas. The ammonia system is therefore equipped with a hot gas line 45). In this line a solenoid valve 47) is installed. In the common main line for hot gas a stop valve 46) is installed. The other end of the hot gas line is to be connected to the delivery line of the refrigerating compressor between the oil separator and the condenser.

Finally, the ammonia system is equipped with a safety valve 41). It is installed in a line which at one end is connected to the suction line 35) before the back pressure regulator. The other end of the common line is to be connected to the main suction line after the suction stop valve 39).

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THE AMMONIA SYSTEM

Concerning freezers with injector and with "instant stop/start" System.

As previously mentioned the freezer can be supplied with "instant stop/start" system. The main principle of the ammonia system is the same as described above, but the system is furthermore equipped with two pressure switches 23o) and 47o), which have both been connected to the suction line 35) before the back pressure regulator 36). The pressure switch 23o) opens and closes the solenoid valve 23), while the pressure switch 47o) opens and closes the solenoid valve 47).

Furthermore, the back pressure regulator 36) is equipped with another pilot valve 362), which is built into the back pressure regulator and therefore will not be shown on the piping diagram. Besides the supplementary parts for the ammonia system mentioned here, also the electrical system will be extended. We refer to the description of that system.

We would only mention here, that the electrical system is equipped with a rotary switch 58) with four positions: 0 - 1 - 2 - 3.

Position 3 is used for instant stop. When during normal operation the rotary switch is turned into position 3, both the main motor 5o) and the pump motor 56) are stopped.

As regards the ammonia system the following happens: The solenoid valve 48) closes. Then also the back pressure regulator 36) will close. Consequently, the suction from the freezer will cease and the freezing process stops.

The solenoid valve 23) also closes. Then the flow of the liquid into the freezer stops. The solenoid valve 47) opens. Provided that the stop valve 46) is open, hot ammonia gas will now flow into the freezer. Consequently, the temperature and also the pressure in the freezer will rise.

When the temperature has risen to approx. minus $5^{o}C$ ($23^{o}F$), the pressure switch 47o) will close the solenoid valve 47) and the in-flow of hot gas will cease.

However, the temperature in the freezer will increase even more. When it has reached approx. minus 4°C (25°F), the pressure switch 23o) will open the solenoid valve 23), and the refrigerant will therefore flow into the freezer again. Nevertheless the temperature increases even more. When it has reached approx. minus 2°C (28°F), the pilot valve 362) which is built into the back pressure regulator will start to open. Then also the back pressure regulator will open a little. The compressor now will start sucking from the freezer once more. Consequently, the freezing tube is cooled a little, so that the ice cream in the freezing tube does not completely melt but is kept in a semi-frozen condition.

The pilot valve 362) is to keep the evaporating temperature at a constan level around minus 2°C (28°F). It is important, that the evaporating temperature does not sink too low, as you may then run the risk that the mutator freezes up in the freezing tube, so that the main motor cannot make it go around, when you want to start the freezer for normal operation.

The adjustment of the system and the operation of it will be explained in a later paragraph.

The instant stop/start system is used for intermittent stop of the operation. The advantage of this system is, that the ice cream in the freezing tube does not melt during the intermittent stop and will not be wasted. Immediately after the stop you can run a normal production again.

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Pkp. nr. 1704 D. IV-1

The Electric System.

For Freezers with Injector but without "Instant Stop-Start" System.

Please refer to Fig. 8

The electric system is controlled from the control panel which is mounted on the front of the freezer.

If the freezer is equipped with a separate air compressor a set of start-stop push button switches for the air compressor motor 59) and a pilot lamp are mounted on the control panel, and the pilot lamp will be switched on when this motor has been started.

Furthermore four sets of start-stop push button switches are mounted for each of the freezing cylinders. Each set of switches is equipped with a pilot lamp.

Beginning at the top and proceeding downwards these switches are used for the following:

1) Start and stop of the main motor 50), and opening and closing of the solenoid valve 17) if this has been supplied.
2) Start and stop of the pump motor 56).
3) Opening and closing of the solenoid valves 23) and 48). This switch is marked: "Freezing" on the control panel.
4) Opening and closing of the solenoid valve 47). This switch is marked: "Hot Gas" on the control panel.

Moreover, for each freezing cylinder is mounted a rotary switch 58), but this is not used for freezers without the instant stop-start system.

Finally an ammeter indicating the power consumption of the main motor in question is mounted for each freezing cylinder.

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Tkp. nr. 1705 D. IV-2

The Electric System:

For Freezers with Injector and with"Instant Stop-Start System".

The control panel of the freezer is provided with equipment corresponding to that previously described, and in this case you also use the rotary switch 58). It has four positions: 0 - 1 - 2 - 3. In position 0 the current for the push button switches has been cut out, for which reason the freezer cannot be started.
In position 1 the current for the push button switches on and the freezer can therefore be started by means of these, and the procedure is similar to the one that applies to freezers without instant stop-start system.
In position 2 the current for the push button switches has been cut out again, but if the freezer has already been started in the usual way it will go on working automatically. When the rotary switch is in position 2 it cannot be stopped by the push button switches.
Position 3 is used for instant stop. In the paragraph about the ammonia system is explained what happens now and when the instant stop-start system is to be used. As it is stated in the description mentioned the pressure control switches 230) and 470) must be very accurately adjusted in order that the system may work satisfactorily. To help you with this adjustment three pilot lamps with glas in different colours are built into the casing of the freezer. These lamps will be switched on when the current to the solenoid valve in question has been switched on and for which reason the valve is now open.
The red lamp belongs to the solenoid valve 47)
- blue - - - - - - 23)
-yellow - - - - - - 48).
In a subsequent paragraph it will be expalined how to adjust these pressure control switches.

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Fkp. nr. 1706 E. I - 1

Installation.

Erection

The freezer does not require any special foundation, but can be placed directly on a hard floor. The freezer should be placed so that the distance between the rear side and a possible wall is at least 500 mm, to allow enough space for taking off the back covers for access to the internal parts.
If the connecting pipes for the refrigerating plant are led up behind the freezer, there ought to be a distance of at least 500 mm between these pipes and a possible wall.
When the freezer has been placed on the wanted site, the legs, which has been used during despatch, must be replaced by the delivered, adjustable legs.
When the legs are to be adjusted in the height, the counter nuts with the protection jacket should be screwed as far down as possible. It is then possible to turn the legs by means of a heavy screw-driver or a piece of round steel, which is put into the hole, that is drilled through the threaded part on each leg.
The freezer should be lined up so that it is exactly horizontally in the transverse direction. In the longitudinal direction the freezing tube should on the other hand have a quite small inclination towards the front end. By this you secure that the water can runs out of the freezing tube after the cleaning, if you use the method of cleaning where you remove the rotor from the freezing tube during the cleaning.
When the freezer is lined up correctly, the counter nuts should be screwed as far up as possible and tightened.
Each pressure gauge is equipped with a little plastic plug. During despatch this was pressed as far in as possible. When the freezer has been placed, these plugs are to be pulled about 2 mm backwards.

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Electrical Connections.

Please refer to Fig. 9.

The electrical connections between the freezer and the power supply installation should be carried out by an authorized power current electrician and according to the regulations and instructions in force on the installation site. This work will always be carried out on charge of the customer and on his responsibility.
The entire electric system of the freezer is built-in in the casing and the internal electrical connections are made when the freezer is delivered.
The main cable with the dimension shown in Fig. 9 should be connected as shown in the electric diagram. The other end of the main cable should be connected to the electric power installation of the factory through a main switch with belonging melting fuses. However, these parts as well as the main cable are not included in our order.
When the main cable has been connected, the main motor must not be started before you are sure that the direction of rotation is correct.
This takes place in the following way:
The mutator should be taken out of the freezing tube.
Then the main motor is started. When you from the front end of the freezing tube looks into this, the direction of rotation of the main shaft should be anti-clock-wise. Normally one of the V-belt pulleys are marked with an arrow, which indicates the correct direction of rotation.
If the direction of rotation should be wrong you must exchange two of the phase connections to the main motor, and then the direction of rotation will be correct.

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Fkp. nr. 1708 E. III - 1

Connecting Pipes for Ammonia

Please refer to Figs. 1 and 4.

All pipes and valves which are to be used for the ammonia piping should be clean and dry. Further the parts must of course satisfy the regulations and rules, which are valid for the parts to be used for ammonia refrigerating plants.
When the piping system has been welded, but before it is connected to the freezer, all the welded joints should be hammered in order to loosen all slag from the weldings. Then the piping system should be blown through by dry compressed air and then by ammonia gas.
When you are quite sure that the piping system is clean, you remove the blind flanges on the connections of the freezer and connect these to the piping system. This work should be carried out by a skilled refrigeration installation engineer, who has experience with the erection of ammonia refrigerating plants.
The freezer is to be connected to the refrigerating plant in the same way as any other ammonia evaporator with hot gas defrosting. The internal ammonia connections of the freezer are shown in Fig. 4, and the dimensions of the external ammonia connecting pipes are shown in Fig. 1.
The hot gas line is to be connected to the top of the condenser of the refrigerating plant or to the connecting pipe between the oil separator and the condenser. The stop valves for ammonia should be mounted in the line in a convenient and easy accessible place.
If the freezer is to be connected to a refrigerating compressor, which is also connected to other evaporators, the suction line from the freezer should be connected to the top side of the common main suction line to avoid that the liquid refrigerant , which is possibly flowing back from these evaporators, is collecting in the freezer.
It is very important that the liquid line to the freezer always is absolutely filled with liquid ammonia, when the freezer is operating. The receiver of the refrigerating plant should always contain so much liquid ammonia, that bubbles are not flowing through the liquid line.

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Fkp. nr. 1427 E. III-2

Many refrigerating plants are operated with a too small refrigerant charge, because this causes less trouble with possible leaking expansion valves, whether they are float valves or thermostatic expansion valves.

However, this involves a poor efficiency of the plant and when you have connected a continuous freezer under-charging should definitely be avoided. If there are leaky expansion valves in the plant, these should immediately be repaired in order to avoid over-flooding of the evaporator.

When the freezer is connected to a two-stage plant, the liquid refrigerant to the freezer must not be taken from the interstage cooler, because the pressure in it, is not always sufficiently high to feed the injector in the freezer.

Strongly sub-cooled refrigerant should not be used either, although it is under condenser pressure. The freezer should preferably have its own refrigerant liquid line directly from the receiver.

The suction line should also be as direct as possible. If the length of the suction line from the freezer to the compressor exceeds 15 to 20 metres the next larger pipe dimension should be used.

The line connected to the safety valve 41) is to be connected to the main suction line after the suction stop valve 39) as shown on Fig. 4. It can be dangerous to forget this.

Also the ½" drain line must be connected to the suction line after the suction stop valve 39).

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IV d) Mix and ice cream pipings

Figs. 1, 3 and 18.

The suction side o1) of the mix pump o2) must be connected to the mix supply vat, whether it is an aging vat or a special flavouring vat in which the flavours are added to the mix before freezing. The first arrangement is the most convenient if large enough quantities of mix of the same flavour are run at a time to empty one or more aging vats. The flavours are then added to the mix while in the aging vat. If this is not possible a special two-section flavouring vat as shown in fig. 18 is most convenient to use. The two separate vats can then be linked with the mix pump as desired by means of a three-way cock.

The main advantage of having two vats is that one vat can be filled with mix from the aging vats and flavour added, while the other one is being emptied by the freezer. In this way it is possible to freeze batch by batch without stopping the freezer.

If the mix level in the aging vat or in the flavouring vat is lower than the level of the mix pump, air may be sucked into the mix through possible leaks in the mix line. In this way control of the overrun will be impossible and for this reason any leakage in the mix line must be avoided. The ice cream line must be as short as possible, and never made of pipe of smaller dimensions than shown in fig. 1 to avoid an excessive pressure drop in the line.

A set of seal rings for the pipe-couplings must always be available as a spare to avoid working with leaky pipe-couplings.

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Fkp. nr. 1709 F. I-1

Starting-up and Operation

The Initial Starting-up and Adjustment of the Freezer.

Please refer to Figs. 3, 4 and 7.

When the mutator has to be put into or taken out of the freezing tube you should always use the tray of stainless steel sheet, which is delivered for this purpose.

The mutator is placed on the tray which is pushed into the freezing tube. In this way you avoid damaging the inside surface of the freezing tube with the pins which are placed on the mutator. When the mutator has been pushed as far into the freezing tube as possible you carefully pull the tray out again, holding the mutator on its place in the freezing tube.

Then you turn the mutator a little forwards and backwards and at the same time you push it a bit further in. When you can feel that the spline end of the rotor shaft is in mesh with the spline hub in the end of the main shaft you push the mutator all the way in. Then you place the front cover on the freezing cylinder and turn it as far as possible anti-clockwize, by which it is locked.

The mix pump and the ice cream pump are taken apart when the screws that tighten the cover on each pump has been screwed off. The cover is removed, and the pump wheels are carefully taken out. Be careful not to damage any of the parts of the pumps, as these are machined to a very fine tolerance.

The pumps and the connecting pipes are then cleaned very carefully to remove all dirt and oil which have collected during the dispatch and the erection of the freezer. All the parts which come in contact with the ice cream are to be cleaned very carefully before the freezer is put into operation.

Before the pumps are reassembled the internal parts should be lubricated with salad oil.

If it has not been done previously you should check the internal connecting pipes of the freezer to find possible leaks.

The solenoid valve 23) in the liquid line is opened and by opening the main stop valve 21) in the liquid line a little refrigerant is led into the liquid separator. Both valves mentioned are then closed again. Possible leaks in the system are detected by brushing the connections with soap water. Then you check with leak test paper in the usual way as for ammonia refrigerating plants.
By Freon plants a leak-detector is used. When all the preparations have been carefully made and the system has been checked and found in order the freezer is ready for the initial starting-up.
It is presumed that the necessary mix is disposable and that all the valves in the system and in the pneumatic system are closed before starting up.

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Tkp. nr. 1711 F. II-1

How to start a Freezer with Injector, but without "Instant Stop-start" System.

1) Open the stop cock in the mix supply line. Place a milk can below the overflow pipe for ice cream and turn the three-way cock in the outlet line into the overflow position.
2) The pump motor is started by pressing the start push button on the control panel, and the mix is pumped into the freezing tube. As soon as the mix starts to run out of the overflow pipe the pump motor is stopped again by pressing the stop push button on the control panel.
3) The main motor is started by pressing the start push button on the control panel.
4) Open the suction stop valve 39).
   The solenoid valve 23) in the liquid line and the solenoid valve 48) in the pilot line are opened by pressing the opening push button, which is marked: "freezing" on the control panel.
   The back pressure regulator 36) is opened by means of the handle 37), which opens the pilot valve 361).
5) Open the stop valve 21) in the liquid line.
   The constant pressure valve 27) is adjusted so that the ammonia pressure gauge 28) shows a pressure of 3,5 to 4 kg/cm^2.
   A hissing noise from the liquid separator indicates that the ammonia is now being circulated through the refrigerating jacket of the freezing tube by means of the injector, and the freezing has started.
6) During the starting up of the freezer the evaporating temperature, which can be read on the suction pressure gauge 38), should not be lower than about minus 20° C (minus 4° F).This temperature should be sufficiently high to avoid a freezing-up during the starting-up and the adjustment. The temperature of evaporation is regulated by means of the handle 37), as previously mentioned.

7) Keep an eye on the ammeter which indicates the power consumption of the main motor. Until the full refrigerating effect has been obtained, and this takes a couple of minutes, the power consumption will vary somewhat. Gradually the ice cream in the freezing tube is frozen harder, and the power consumption increases.
When the power consumption has increased to about 70% of the power consumption at full load, i.e. at
mains voltage 3 x 380 V to about 13 amp. and
mains voltage 3 x 220 V to about 22 amp.
the pump motor is started again.
(If the mains voltage is different from the one here stated the electrician will be able to calculate at which power consumption the pump motor is to be started again).
If the freezer is equipped with separate air compressor, this is started by pressing the start push button of the control panel.
If not the stop valve in the main line for compressed air to the freezer is opened.
The regulating valve 15) is opened and adjusted so that the pressure gauge 14) shows an air pressure of about 2 kg/cm^2.

8) The number of revolutions of the pumps are adjusted to about half capacity by means of the handle.
If the ice cream should be frozen too hard, which results in a strongly increased power consumption of the main motor, you must increase the number of revolutions of the pumps by means of the handle . If the ice cream is not frozen hard enough, you must lower the tempereture of evaporation by means of the handle 37).
A lowering of the temperature should always be made very carefully and step by step to avoid a freezing-up of the rotor in the freezing tube. If this should happen the main motor will be overloaded and stop because the thermal relay in the starting relay will cut out. What to do in this case will be explained in the following paragraph.

A change in the temperature of evaporation of only 2° will have a marked influence on the stiffness of the ice cream and on the power consumption of the main motor.
After every new adjustment of the handle 37) you have to wait a few minutes and see what happens before you make the next adjustment. The effect is not visible at once.

9) Check the weight of the ice cream. The weight can be altered by adjusting the air pressure in the freezing tube. This is done by means of the air pressure regulating valve 15).
The higher the pressure is the more air will be mixed inte the ice cream, and consequently its weight will decrease.
At a lower air pressure the weight will increase. The air pressure regulating valve should therefore be adjusted so that you obtain the desired overrun. When the freezer has been adjusted so that the ice cream is frozen suitably hard and has the desired overrun, the three-way cock is turned into the working position, and the freezer is now working normally.

10) If necessary you readjust the constant pressure valve 27). Normally an adjustment equal to a pressure on the pressure gauge of about 3.5 to 4 kg/cm^2 will be suitable, as stated earlier under point 5.

As a control you check the formation of frost on the short pipe between the valve and the liquid separator. If there is no frost to be seen you close the valve a little bit more and wait a few minutes while you supervise if the frost appears. This is repeated until the frost appears. Then you carefully open the valve a little bit again, but only so much that the frost just disappears. Now you have found the correct adjustment.
If the constant pressure valve is opened too much more liquid ammonia will flow into the liquid separator than can be evaporated in the refrigerating jacket.
The liquid separator will therefore graduallybe filled with liquid ammonia, and this will finally flow into the suction pipe. The consequence will be surge impact in the compressor, and this must, as earlier pointed out, absolutely be avoided.
If the freezer often has to work at strongly reduced capacity it might be wise to adjust the constant pressure valve to a pressure which is a little lower than earlier stated.
On the other hand the constant pressure valve must not be closed more than absolutely necessary, as inadequate flow will reduce the recirculation of the ammonia in the freezer and consequently its capacity.

As you will understand from this the correct adjustment of the constant pressure valve is of the greatest importance, and this work must therefore be carried out very carefully.
Nevertheless, if after some hours of operation the refrigerating compressor should turn out to be working with too cold suction line the constant pressure valve is to be closed a little bit more.

11) If you want to increase the amount of frozen ice cream the number of revolutions of the pumps must be increased. This is done by means of the handle 48).
When the capacity is increased you must at the same time lower the temperature of evaporation to obtain the same stiffness of the ice cream. The adjustment of the capacity, and especially when it is lowered, must always be done step by step, until the desired capacity has been reached. If you have not sufficient practise and experience in operating the freezer you will generally be liable to freeze the ice cream too hard. Through this the main motor may be overloaded, and the thermal relay in the starting relay will cut out and cut off the power supply to the main motor, which immediately stops. In a few seconds the immobile rotor will freeze up in the freezing tube, so that it cannot be loosened by the hand. These freezing-ups should of course be avoided, and this can actually be done if you always adjust the capacity and the temperature of evaporation step by step. At the same time you will have to keep an eye on the ammeter, and if it is necessary to make another adjustment you wait until the hand of the ammeter is fairly quiet.
If in spite of all precautions the rotor should freeze up you will have to do the following at once:

1) Press the stop push button for the main motor.
Press the stop push button for the pump motor.
Press the closing push button for the solenoid valves 23) and 48).
(It is marked "freezing" on the control panel).

2) Open the stop valve 46) in the hot gas line.
Press the opening push button for the solenoid valve 47).
(It is marked "hot gas" on the control panel).

Hot ammonia gas from the discharge side of the refrigerating plant will now flow into the refrigerating jacket of the freezer, where it is condensed. The heat of condensation will warm up the freezing tube and thaw the frozen layer of the ice cream on the inside of the tube. After some minutes you try if the rotor can be turned round when pulling the main V-belts with your hands. As soon as the rotor is easily turned round in this way you close the solenoid valve 47) by pressing the closing push button marked: "hot gas" on the control panel. The freezer is then ready to be started again.

WARNING!
Never use mechanical tools of any kind to loosen the rotor. This must always be done by means of hot ammonia gas.

A very common cause of freezing-ups is that the mix tank during the operation has been emptied of mix. If the supply of mix for some reason fails the ice cream in the freezing tube will be frozen very hard in a few seconds, and the result is a freezing-up. Therefore you must always have enough mix at your disposal.
If the freezer is equipped with more than one freezing tube you use excactly the same method when starting up the other freezing tubes. However, the starting up of the air compressor (under point 7) repeals, as it was started at the same time as the first freezing tube. However, you must remember that the air pressure regulating valve 15) must be closed during the first part of the starting up. As earlier stated it must not be opened and adjusted until under point 7).

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Fkp. nr. 1716

F. III-1

How to stop a freezer with injector but without "instant stop-start" system.

1) Press the close push button for the solenoid valves 23) and 48). (It is marked "freezing" on the control panel).
2) Turn the three-way cock into the overflow position.
3) Wait until unfrozen mix is coming out of the overflow pipe, and the ammeter shows idle load of the main motor.
   Press the stop push button for the main motor.
   Press the stop push button for the pump motor.

On a freezer with more than one freezing tube this method is used when each of them has to be stopped.
If the whole freezer is to be stopped you also have to:

4) Stop the air compressor by pressing the stop push button. Of course this only applies to freezers with separate air compressor. If this is not the case you close the stop valve in the inlet line for compressed air to the freezer.

If the freezer has to be stopped for a rather short time you can leave the stop valves 21), 39) and 46) open. On the other hand these valves must always be closed when the day's work is over. In this way the liquid separator can be defrosted during the night.
When the freezer has to be started again the next morning the suction stop valve 39) must be carefully opened to avoid a surging of the rather hot liquid in the liquid separator.

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Fkp. nr. 1717

The procedure of starting a freezer with injector and with"instant stop-start" system.

The starting of a freezer is done in excactly the same way as described earlier in connection with a freezer without instant stop-start system.

However, under point 1) should be added:
The rotary switch 58) is turned into position 1.
Before this is done the freezer cannot be started.

Moreover the operation of the freezer in case of a freezing-up of the rotor is somewhat different from what is described under point 11).

The paragraph in question must be amended as follows:

1) Turn as quickly as possible the rotary switch 58) into position 0. By this both the main motor and the pump motor are stopped. Furthermore the solenoid valves 23) and 48) will be closed.
2) Turn the rotary switch into position 1 once again.
3) Open the stop valve 46) in the hot gas line. Press the opening push button for the solenoid valve 47). (It is marked "hot gas" on the control panel).

The loose-thawing of the rotor will now take place in excactly the same way as described under point 11).
However, we presume that no freezing-up of the rotor will take place during the starting up and the adjustment when the described method is followed.
When the freezer has been adjusted to the desired capacity and is working normally it is possible to switch over to automatic working by turning the rotary switch into position 2.
Then you open the stop valve 46) in the hot gas line, if it has not been opened earlier. The freezer is then ready for using the"instant stop-start"system, if you want.

"Instant stop" (This only applies to freezers which are provided with "instant stop-start" system).

When the freezer is working normally and you want to stop it intermittently you turn the rotary switch 58) into position 3: Instant stop. In the preceding description of the ammonia system it is explained how this system works.
However, together with the first starting up of the freezer you must adjust the two pressure switches 230) and 470) as well as the pilot valve 362), which is built-in in the constant back pressure regulator 36). If the freezer is erected by one of our erectors he will of course make all the necessary adjustments. If the customer himself erects and starts the freezer the adjustments mentioned should only be made by a person who is completely familiar with the prenciples in the system and the adjustment of it. The pressure switch 470) must be adjusted so that it cuts out when the pressure in the freezer has reached about 2.5 ato., corresponding to a temperature of evaporation of minus 5° C. The pressure switch is equipped with a pressure scale, and the temperature of evaporation is indicated by the pressure gauge 38). The pressure switch 230) must be adjusted so that it cuts in at a pressure of about 2.7 ato., corresponding to a temperature of evaporation of about minus 4° C.
The pilot valve 362), which is built-in in the constant back pressure regulator 36), has to be adjusted so that the constant pressure valve keeps a pressure in the freezer of about 3 ato., corresponding to a temperature of evaporation of about minus 2° C.
However, these statements must only be regarded as a guide. The temperature of evaporation during instant stop should usually be as low as possible, but of course not so low that the rotor freezes up in the freezing tube. This is not likely to happen at the temperatures stated here. However, it is possible that in some cases you can adjust to an even lower temperature without any risks of a freezing-up of the rotor. If you want to obtain the lowest possible temperature of evaporation during instant stop you must carefully try step by step to lower the temperature by adjusting the pilot valve 362). During this it may also be necessary to change the adjustment of the pressure switches.

You must always make sure that the pressure switch 470) cuts out before the pressure switch 230) cuts in. Furthermore the pressure switch 230) must cut in at a lower pressure than the one by which the pilot valve 362) is adjusted to open the constant back pressure regulator.

After each lowering of the temperature of evaporation you wait a couple of minutes, and then you turn the rotary switch into position 1. After that you press the start push button of the main motor. As long as the main motor is able to start without difficulties the temperature of evaporation is not too low. Only when the main motor has difficulties in starting or is not able to start at all the temperature of evaporation has become too low. If the rotor should happen to be frozen up in the freezing tube you must of course defrost it in the previously described way. Then you have to adjust the pilot valve 362) back to a somewhat higher temperature of evaporation and try to start again. When you are quite sure that the rotor is not going to freeze up the adjustment of the pilot valve is in order. The two pressure switches must then be adjusted in accordance with this as described before.
As a help when adjusting the pressure switches the electric system is equipped with some pilot lamps which are built-in in the casing of the freezer.
In the previous chapter giving the description of the electric system is stated which colours of the pilot lamps belong to the solenoid valve in question.

Instant start.

When after an intermittent stop using the instant stop system you have to start the freezer again, you just turn the rotary switch back into position 2. The freezer will then work normally again.

Freezing-up of the rotor during automatic operation.

Of course a freezing-up of the rotor may also occur during automatic operation. If this should happen you must immediately turn the rotary switch into position 0. The thawing of the rotor must then be made in accordance with the description that apply to the manual operation of the freezer.

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Fkp. nr. 172o

F. V-1

How to stop a freezer with injector and with"instant stop-start"system.

1) Turn the three-way cock into the overflow position.
2) If the freezer is operating automatically, i.e. with the rotary switch in position 2 you first turn it into position 3. Thereby the main motor as well as the pump motor will stop, and the solenoid valves 23) and 48) will be closed. After that the freezing immediately stops. At the same time the solenoid valve 47) in the hot gas line is opened. After a couple of minutes you quickly turn the rotary switch into position 1, after which both motors are started again by means of the start push buttons belonging to them. But if the freezer is operated manually the rotary switch is already in position 1, and both motors are working.
3) Press the closing push button for the solenoid valves 23) and 47). (It is marked "freezing" on the control panel).
   If the rotary switch as mentioned under point 2) has been turned from position 3 into position 1 these two solenoid valves have automatically been closed, however.
4) Wait until unfrozen mix comes out of the overflow pipe, and the ammeter shows idle load of the main motor.
   Press the stop push button for the main motor.
   Press the stop push button for the pump motor.
   In case of a freezer with more than one freezing tube the same method is used for stopping each of these.
   If the whole freezer must be stopped you also have to:
5) Stop the air compressor by pressing the stop push button. This only applies to freezers equipped with a separate air compressor. If this is not the case you close the stop valve in the inlet line for the compressed air to the freezer.
   Regarding the closing of the stop valves 21), 39) and 46) the instructions are equal to those given in the last part of the paragraph about how to stop a freezer without "instant stop-start" system.

Subsequent startings.

The instructions earlier described have been worked out with special reference to the initial starting of the freezer.

In connection with the subsequent startings you fundamentally proceed in quite the same way, but only the stop valves which have been closed at the previous stopping must now be reopened in the same sequence as earlier described.

When the constant pressure valve 27) has been correctly adjusted at the initial starting you ought not readjust this valve.

Only when the freezer must operate with strongly reduced capacity it may be necessary to readjust the constant pressure valve to a pressure somewhat lower than earlier indicated.

The ammeter should be read at suitable intervals, and the load of the motor should be kept as constant as possible. This is very important to obtain a uniform texture of the ice cream. A readjustment of the constant back pressure regulator 36) by means of the handle may sometimes be necessary. In this way you can for instance compensate for variations in the temperature of the mix, if any.

The overrun should be checked frequently. Any deviations from the desired overrun can be compensated by readjusting the air pressure in the freezing tube. (Cf. point 9) above.

Remember to drain the oil from the ammonia system at least once a week. We refer to the following paragraph about oil in the freezer.

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Fkp. nr. 1439

C L E A N I N G

The freezer can be cleaned in two in principle different ways:

A) Manual cleaning

B) Cleaning in place (abbreviated to C.I.P.)

The decisive factor of which method should be used is naturally whether or not the freezer is cleaned sufficiently.

The first method is the most efficient and it is gentle with the freezer, but is requires considerable manual labour and is rather time consuming.

When using the latter most manual labour is avoided. However, this method requires an installation for C.I.P. in the factory.

Each of these two methods will give a satisfactory result.

Manual Cleaning

All pipelines for mix and ice cream are to be dismounted. Remove the frontcover of the freezing tube. Take out the mutator by means of the tray as described above. Remove both pump covers and take out the wheels.

The freezing tube and the mutator as well as all other parts that have touched the ice cream and the mix,are washed carefully with a brush in cold water. Then all parts are washed with hot water with a suitable detergent of the type approved for use in Dairies, so that all traces of ice cream and butter fat is removed. The parts are rinsed with clean hot water. The mutator is reinserted in the freezing tube and the front cover is remounted. Then the freezing tube is sterilized with steam.

The heating of the freezing tube also has the very advantageous effect, that the oil, which has collected on the outside of the freezing tube, will drip off. This will greatly improve the heat transmission.

After the sterilization the front cover is removed again, in order that the condensed water can escape, and in order that the freezing tube can dry.

Pipelines, fittings and pumpparts must also be steam sterilized. This should be done, as soon as the day's work is over. The parts should be stored in a dry place.

Before the freezer is started up the next day, the steam sterilization ought to be repeated. Before the mutator is put into the freezing tube, the rotary seal is to be greased with a little coconut fat.

C.I.P. Cleaning

1) The pump covers are removed and the wheels are taken out. The plugs supplied are inserted in the holes where the shafts have been. The pump covers are remounted.

2) The freezer is rinsed through with clean, lukewarm water (approx. 40° C) until the drain water is clear. During this thorough rinse the main motor is started a couple of times, but every time only a few seconds (max. 5 sec.).

3) The freezer is connected to the C.I.P. installation of the factory and the cleaning liquid is circulated through the freezer. No detergent containing acids must be used. Also during this thorough rinse the main motor is started once as described in item 2.

4) When the cleaning liquid has circulated through the freezer for 15-20 minutes at a temperature of 80 - 85° C the circulation is stopped and the freezer is rinsed through with clean, cold water.

5) Then the freezer is disinfected with a suitable non-corrosive disinfectant which is circulated through the freezer.

6) The dismantled pump parts are carefully cleaned and are kept in a disinfectant liquid until the next day. Before they are remounted they are carefully rinsed with clean water. Before the freezer is started up the next day, item 5) is repeated.

The freezer is rinsed through with clean water and the dismantled pump parts are remounted.

The freezer is now ready to work. Although the C.I.P. method is used the mutator ought to be taken out at least once a week and cleaned manually. Also the freezing cylinder should be cleaned manually once a week. At the same time the rotary seal should be greased with coconut fat.

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Fkp. nr. 1441 G. I - 3

Some ice cream manufacturers do not take the pumps apart, but use these to pump as well water as detergent through the freezer. Before you do that, the screws which fasten the pump covers should be loosened a little.

However, we would not fail to warn against this procedure, as the pumps will be subjected to great wear and tear.

If it is done all the same to save manual labour, it should be noted that the pumps will have to be replaced considerably more frequently than would otherwise be necessary.

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Fkp. nr. 1722 H. I-1

Maintenance

Lubrication.

All shafts and other rotating parts of the freezer are running in ball bearings or in self-lubricating bushes.
The ball bearings are greased with ball bearing grease. At delivery they are filled with a special ball bearing grease, and during approx. one year they need not be refilled.
After about one year of operation the ball bearings must be checked, cleaned carefully and filled with new ball bearing grease. If one of the ball bearings appears to be too much worn it must be replaced.

If the main motor is provided with greasing nipples it must be greased in accordance with the instructions given on a label on the motor, or in the lubrication instructions supplied.
The "Stöber" geared electric motor must be lubricated as indicated in the direction for operation, which is found at the back of this instruction manual.
The chains for driving of the pumps ought to be lubricated once a month during the season. At the same time the bushes of the chain wheels must be given 1 or 2 drops of oil.

V-belts and Chains.

The main motor is mounted on a special base plate, which can be slided horizontally by means of a spindle. When using this device it is possible to give the V-belts a suitable tension. They must of course be tightened so much that they do not slide on the V-beltspulleys. On the other hand they ought not be tightened more than necessary.
The V-belts normally have a rather long life, but in the course of time they may wear out and must then be replaced. When fixing new V-belts you have to make sure that they all have excactly the same length. The chains for driving of the pumps are equipped with chain tensioners for the purpose of tightening the chains sufficiently.

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X

Fkp. nr. 1723 H. I-2

The Rotary Shaft Seal.

Please refer to Fig. 7.
As shown in Fig. 7 the rotary shaft seal is equipped with 4 o-rings. The housing 106 C 10095 is pressed against the end of the freezing tube by means of two special nuts 8 D 10166.
It is very important that these two nuts are equally tightened, as otherwise the housing will have a false position, which would cause an excessive wear of the rotary shaft seal.
The o-ring Gaco R 8462 seals between the freezing tube and the housing.

The bush 106 D 10029 rotates together with the rotor shaft. The o-ring OR 228 54.2x5.7 seals between the rotor shaft and the bush. The two last mentioned o-rings OR 224-42.2x3 seal between the rotor shaft and the bush.
Especially the o-ring OR 228 will be worn during the operation, and therefore it must be replaced from time to time in order to maintain a perfect sealing. For that reason you must always have some of these o-rings among your spare parts.
As mentioned in the paregraph concerning the cleaning of the freezer the shaft seal must frequently be greased with a little coco-nut grease when the rotor has been taken out. This would reduce wear of the o-ring.

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Tkp. nr. 4776 H. I-3

The Pumps.

Please refer to Figs. 13 and 14.

The two gear-wheel pumps are different in size, but otherwise of identical design.
A section of the pumps is shown on Figs. 13 and 14. The working parts are the two gear-wheels 041) and 042). The shaft seal consists simply of the o-ring 043).
The end clearance, which is the clearance between the cover 044) and the gear-wheels 041) and 042), is adjustable in order to ensure a good tightening even after a long period in service. The end clearance can be adjusted by turning the ball bearing housing. This housing is screwed into the pump bracket by means of a thread. In this way the pump shaft is pushed a little forwards and backwards. The locking screw prevents the housing from turning round when the adjustment has been completed.
If it is necessary to adjust the end clearance to compensate for possible wear the procedure is as follows:

1) The pump is assembled and the four screws fastening the cover 044) are tightened.
2) The chain that drives the pump is taken off. The pump shaft must then be easy to turn round by the hand.
3) The locking screw is loosened.
4) Turn the ball bearing housing slowly clockwise until a slight resistance can be noticed when turning the pump shaft. This means that the gear-wheels are now touching the cover 044). The ball bearing housing must then be turned back a very little bit, i.e. counter-clockwise, but only so much that the resistance against the turning of the shaft just disappears.
5) The locking screw is then tightened again in order to keep the ball bearing housing in place. When this has been done you must check whether the pump shaft still can be turned easily and without difficulty. If not the adjustment must be made once again.

It is very important that the parts of the pumps are handled with the utmost care when you take apart and assemble the pumps, because the parts are machined to a high degree of precision and can easily be damaged if they are handled carelessly.

Please also refer to page No. F. I - 1.

To remove the Freezing Tube

Please refer to Fig. 7.

The freezer has a removable freezing tube. However, before the freezing tube can be removed, the freezer must be drained of ammonia. How to do this will be explained in a following section of these instructions.

When the mutator has been removed in the usual way, the screws which fasten the flange at the end of the freezing cylinder to the cylinder are loosened and the flange is removed.

The special nuts mentioned in the paragraph about the shaft seal are unscrewed as far as possible so that the shaft seal housing can be removed from the freezing tube.

You have to use a round wooden block with the same diameter as the outer diameter of the freezing tube and with a length so that it can just be placed between the end of the freezing tube and the two special nuts instead of the shaft seal housing.

When the nuts are screwed forward the freezing tube will be pressed out of the cylinder and can then be completely removed.

The freezing tube can now be cleaned of any oil which has possibly congealed on the outer surface of the tube.

Please investigate if the O-rings, which are tightening between the freezing tube and the cylinder, are all right and replace them if they are defective.

If everything is found to be in order the freezing tube can be replaced and fastened to the cylinder. During this operation you have to take care that the O-rings are placed correctly, so that they are not damaged. The same procedure is used if the freezing tube is to be removed for repair or if it is to be replaced by another one.

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Ekp. nr. 1725 J. I-1

Useful Information.

It is very important that the ice cream is frozen stiff enough to keep the air mixed with it. Therefore the outlet temperature of the ice cream must be sufficiently low. If this is not the case the overrun will be too small and the texture of the ice cream will be coarse.
If the freezing is insufficient it may have several reasons. The most important reasons are:

a) The capacity of the refrigerating plant is too small.
The refrigerating plant must be able to maintain a back pressure corresponding to a temperature of evaporation, which is some degrees lower than the temperature necessary in the freezer.
The constant back pressure regulator controls the difference in pressure and consequently the temperature of evaporation in the freeze
However, if there is no difference in pressure available the regulator is kept quite open all the time, which means that there is no control of the temperature of evaporation in the freezer.

b) The ammonia charge of the refrigerating plant is insufficient.
The importance of always having a sufficient flow of liquid ammonia into the freezer cannot be emphasized strongly enough. In a refrigerating plant with several evaporators connected to the same compressor the bad consequences of a too small charge of ammonia in the plant may temporarily be compensated in the following way, however:
Close the stop valves in the liquid lines to the other evaporators, but let the suction stop valves remain open.
As the compressor goes on working part of the charge in these evaporators will be evaporated and sucked back to he compressor. When the ammonia gas has been compressed and condensed the liquid will be collected in the receiver, from where it will flow into the freezer.

Hardening room coils usually contain considerable charges of ammonia. However, this should only be a temporary solution. The plant must be recharged with ammonia as soon as possible.

c) The low-pressure float valve.

Troubles with the low-pressure float valve are not common, but if this valve is to be checked the liquid separator 25) must be emptied of ammonia.

If the freezer is only equipped with one freezing tube (KF 1101 and KF 2001) it is done as follows:

The freezer is stopped normally. The suction stop valve 39) and the main stop valve 21) in the liquid line are closed. The main stop valve in the drainage line is opened.

While the compressor is still working the stop valve 43) in the drainage line is very carefully opened a little. Formation of frost on this valve indicates that liquid ammonia now flows through the drainage line.

Surge impact in the compressor must of course be avoided. If you hear a hammer in the valves of the compressor the stop valve 43) is opened too much, and it must therefore be closed a little.

As long as there is still liquid ammonia in the liquid separator the suction pressure will not fall very much. Only when the liquid separator is quite empty the suction pressure will suddenly fall considerably. When this has happened you wait a couple of minutes more, after which you close the stop valve 43) and the main stop valve in the drainage line.

If the freezer is equipped with two or three freezing tubes it is possible to empty a liquid separator even if it is necessary to freeze the ice cream in the other tubes. In that case, of course, you cannot close the suction stop valve 39).

However, the pilot controlled constant back regulator 36), belonging to the liquid separator that is to be emptied, will close when you stop the freezing tube mentioned and close the solenoid valve 48). At the same time the solenoid valve 23) in the liquid line belonging to it will close as well.

Certainly the constant back pressure regulator is provided with a built-in pilot valve 362), but as earlier mentioned this is going to be adjusted so that it only opens the constant back pressure regulator when the temperature of evaporation in the liquid separator is higher than about minus 2° C. Therefore it is possible to empty the liquid separator mentioned without stopping the whole freezer.

However, if it is not absolutely necessary to

continue freezing ice cream in the other freezing tubes, we must strongly recommend you to stop the whole freezer while emptying a liquid separator. In case of a leak in one of the solenoid valves 23) and 48) it may be impossible to drain the liquid separator completely.
Besides, if anyone by a mistake should open the solenoid valve 23) while the float valve is being removed a serious accident may be the result.

When the liquid separator in question is quite empty the float valve may be taken out. You start with loosening the float flange from the liquid separator. This must be done with special precautions, following the good rule for service engineers, which is: Not to loosen all screws at once, but let two diametrically opposite screws remain fastened, while the others are removed. Then the two last screws are loosened a little bit, after which the float flange is carefully loosened by means of a screwdriver. Only when you are sure that the difference in pressure between the pressure in the liquid separator and the atmospheric pressure is equalized you may remove the remaining two screws. After that the supply tube 241) is disconnected and the whole float valve taken out. During the removal of the float valve you should always use protective goggles.
When you screw off the cap 249) there will be free access to the interior parts of the float valve. These may be taken out all at once, when you screw out the cartridge comprising the

strainer, valve needle, spring, and valve seat 242) to 245).

Please first check whether the strainer has come clogged, and if it is clean it carefully with petrol. Then check whether the valve seat 245) with its orifice and the valve needle 243) have become corroded so much that the valve leaks even if the spring 244) presses the needle tightly on to the seat. For some defects the parts must of course be replaced. Check further whether the gasket 2491) is in good condition. If everything is found to be correct the parts can be reassembled.

Then check that the push needle 246) can move freely and smoothly when the float 248) is moved up and down. The needle must never move with difficulty or be jammed. If this is so the spring 244) will not be able to press the needle tight to the valve seat and the float valve will leak. The movement of the needle should be at least about 3/32" (2 mm) when the float is moved from the lowest position to the position where the screw 2471) just loses contact with the needle. You can then be sure that the valve is fully open.

On the other hand the valve must, of course, close fully when the float is in the horizontal position. At the factory the valve has been adjusted so that the screw just loses its touch with the needle when the float is horizontal. If a readjustment should be necessary it can be done by means of the screw 2471). When the screw is turned clockwise the valve will close later and vice versa.

The float must be leakproof. Possible leaks can be detected by submerging the float in a bucket filled with very hot water. If there are leaks small air bubbles will rise from the float. The leaks must, of course, be repaired before the float is reinstalled. Be sure that the float is completely dry before it is reinstalled. Please also make sure that the gasket of the flange is in good condition so that the joint can be perfectly tight.

When you have finished the remounting of the float valve you should examine in the same way as earlier mentioned if there should be any leak at the float flange or at the liquid supply line, before you use the freezer again.

d) The strainer in the liquid line.

The solenoid valve 23) in the liquid line is equipped with a strainer. If this should be clogged you must take it off and clean it carefully in petrol.

Before this can be done it is necessary to empty the liquid separator of ammonia, as earlier described.

If the freezer is equipped with more than one freezing tube it is necessary to stop the whole freezer. The main stop valve 21) in the liquid line must always be closed when a strainer has to be taken off. Therefore it would be wise to clean all the strainers at the same time. Especially during the first time you have started using a new freezer it may be necessary to clean the strainers a couple of times, as dirt and iron scales from the connecting pipes for ammonia will be collected in the strainers.

e) Oil in the system.

There will always be a little oil in the liquid ammonia which is flowing into the freezer. The ammonia evaporates, and the gas is sucked back into the compressor while the oil remains in the freezer. The oil is not dissolved in the ammonia, and as it is heavier than the ammonia it will collect at the lowest parts of the ammonia system. Therefore it is possible to drain the oil from the bottom of the liquid separator through the oil drain valve 44). However, the oil will also deposit a layer of oil on all parts that are in touch with the ammonia, i.e. the outside surface of the freezing tube. This layer of oil reduces the heat transfer and consequently the capacity of the freezer. Therefore, before you drain oil from the freezer you ought to heat the freezing tube by steam, as described in the paragraph about cleaning. Of course you must always use a refrigerating machine oil with a viscosity being suitable for the low working temperatures.

VII f) The scraper blades need an overhaul

The purpose of the scraper blades is to scrape off the thin layer of ice cream frozen on the inner side of the freezing tube as soon as it has been formed, to allow the unfrozen mix to come into contact with the surface and be frozen.

The efficiency of the freezer depends to a great extent on the condition of the scraper blades and for this reason it is very important to keep the scraper blades in good condition.

When the cutting edge of the blades wears, the heel in contact with the inner wall of the freezing tube will gradually become wider. Such a blade does not scrape the surface clean, but allows some of the frozen mix to adhere to the surface and act as an insulator. The overall coefficient of heat transfer will thereby be reduced and thus the efficiency of the freezer decreased. To freeze the same quantity of ice cream the evaporating temperature must be lowered which means that the freezer is working uneconomically. As a certain degree of wear cannot be avoided it is necessary to inspect the condition of the blades occasionally and if necessary to renew the cutting edge.

Fig. 16, illustrations A and B, shows a worn scraper blade. The heel, 951), which during operation is contacting the inner wall of the freezing tube, is too wide and the cutting edge 952) is too sharp. At some points even a burr or feathered edge 953) or serrated edge 954) may have developed. In both cases the blade can damage the inner wall of the freezing tube and this must of course be avoided. Therefore always please see that the scraper blades are overhauled before the cutting edge has become too sharp.

If you can see that the edge has worn too sharp the scraper blade must be filed to its correct shape as shown by illustration D. Proceed as follows:

The scraper blade is clamped in a vice of a convenient size. Be careful to file only that part of the scraper blade actually held within the vice jaws to avoid bending the blade. It is very important for the blade to be exactly straight. For this reason it will be necessary to move the blade in the jaws as the work proceeds.

First the razor edge should be removed by filling at the angle I - I as shown by illustration C. The sharp edge should be dressed down to a width of 0.008" to 0.016" (0,2 to 0,4 mm) as indicated by illustration D. It must never be so sharp that it can cut ones finger.

Thereafter reduce the width of the heel 951) by filing at the angle II - II as shown by illustration C till the heel is 0.016"to 0.032" (0,4 to 0,8 mm) wide. Please be careful not to destroy the original angle of the bevel. Filing at the angle I - I reduces also the width of the heel. It will therefore often be unnecessary to reduce the width of the heel further. For this reason dressing of the cutting edge should be done before anything of the heel is removed. All the heel must not be removed, because it has shaped itself to the freezing tube and the blade would then fail to contact the cylinder over its entire length.

Please always use a suitable fine file and be careful that the vice is sufficiently well lit that the width of the heel can be seen clearly at any time, to avoid filing away too much of it.

Fig. 17 shows a scraper blade in working position in the freezing tube. From the enlarged illustration you can see how the correctly dressed blade contacts the inner wall of the freezing tube when the freezer is operating.

Please always handle the scraper blades with the utmost care to avoid any damage when they are to be installed or removed. Avoid bumping them against the freezing tube and do

not drop them on the floor.

When the rotor has been taken out, please always place it in the rack delivered with the freezer for this purpose. If a scraper blade should have been bent by, for example, careless handling, it must immediately be straightened. Support the blade with a straight iron bar and tap it with a wooden or rubber mallet. The blade should be checked with a straight edge.

VII g) The consequences of working with dull blades.

When a very dull blade is used on a mutator with the other blade in proper condition it causes an uneven load on the mutator, which often results in violent vibrations of the mutator and of the freezing tube. Poor scraping can also be the result if the blade is not flexible on the pins 941), fig. 17. A bent blade, or pins knocked out of alignment, are often causes of a blade being tight on the pins. This means that the blade does not contact the wall of the freezing tube in the correct way and so its scraping ability has been lost.

A dull blade does not scrape the freezing surface clean, but allows some of the frozen mix to adhere to the surface and act as an insulator. The thickness of this layer increases rapidly and it can happen that a blade occasionally scrapes through the layer to the surface of the freezing tube causing uneven freezing and an uneven power load.

The uneven power load will be indicated by the pointer of the ammeter. The reading of the ammeter will, with blades in proper condition, be fairly constant. When working with worn blades, which do not scrape the freezing tube clean, the pointer of the ammeter will make rapid swings backwards and forwards. This is a safe indication that the scraper blades need an overhaul.

HOYER
ALFA-LAVAL GROUP

St.nr. 117.

If the layer of ice cream on the surface is too thick and if the scraper blades have a razor or serrated edge, the blades can be driven against the freezing tube causing a nick or gash in the cylinder wall. Should this happen the freezing tube must be removed as explained under section VI f) and sent to our factory for repair.

- - o o o O o o o - -

HOYER
ALFA-LAVAL GROUP

To our clients,

Even if a HOYER Continuous Ice Cream Freezer is a very sturdy and reliable machine some of its parts will inevitably be worn during their service. Now and then it may therefore be necessary to exchange a worn or damaged part of the freezer. A troublefree and efficient service of the machine can, of course, only be expected if all its parts are in perfect order.

Some of the parts are naturally worn sooner than other. For this reason we recommend you always to have a set of the most commonly used spare parts at disposal to avoid a possible and perhaps very costly interruption of the production.

To facilitate your ordering of spare parts we have prepared the following parts lists with drawings of the main parts of the freezer.

The two first pages comprise a list of the spare parts which our many years' experiences have proved always should be at disposal. Such a set is, however, not sufficient to cover all imaginable requirements. In some cases you will have to order an extra spare part from our factory.

By means of the following lists and drawings you will easily be able to find the correct term of the parts you possibly need. In that way any error could be avoided and you will always receive a part exactly like the one initially delivered.

Please assist us in avoiding errors by always giving the serial number of the freezer in question when ordering extra spare parts. You can find the number on the name plate on the front of the machine.

It is of greatest importance that the parts used fit the freezer exactly. Therefore always use only our original spare parts.

Please find our address on the front page of this catalogue.

Yours faithfully,

HOYER MANUFACTURING COMPANY

SMC 20 000-10-69

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 1070 side 1

Spare Parts Catalogue for HOYER Freezer Type KF 1102.
Ersatzteilkatalog für Hoyer Freezer Typ KF 1102.

CONTENTS - INHALTSVERZEICHNIS

Drawing and List no. / Zeichnung und Liste Nr.

HOYER
ALFA-LAVAL GROUP

106 C 103	Mechanism for Speed Control Mechanismus für Geschwindigkeitreglung
106 C 104	Control Mechanism for the Back Pressure Regulierungsmechanismus für den Saugdruck
106U 107 106U 108	Pump Driving Device Antriebsmechanismus der Pumpen
106 C 114	Injector Injektor

HOYER

Aarhus · Denmark

Fkp. nr. 1073 KF 1101 - KF 1102 - KF 1103 9 B 139

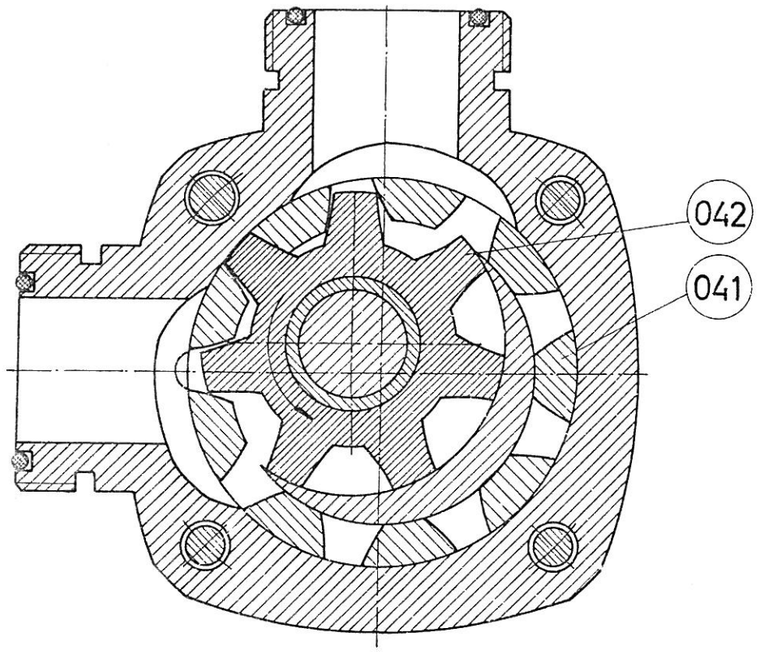
Parts List
for
Ice Cream Pump

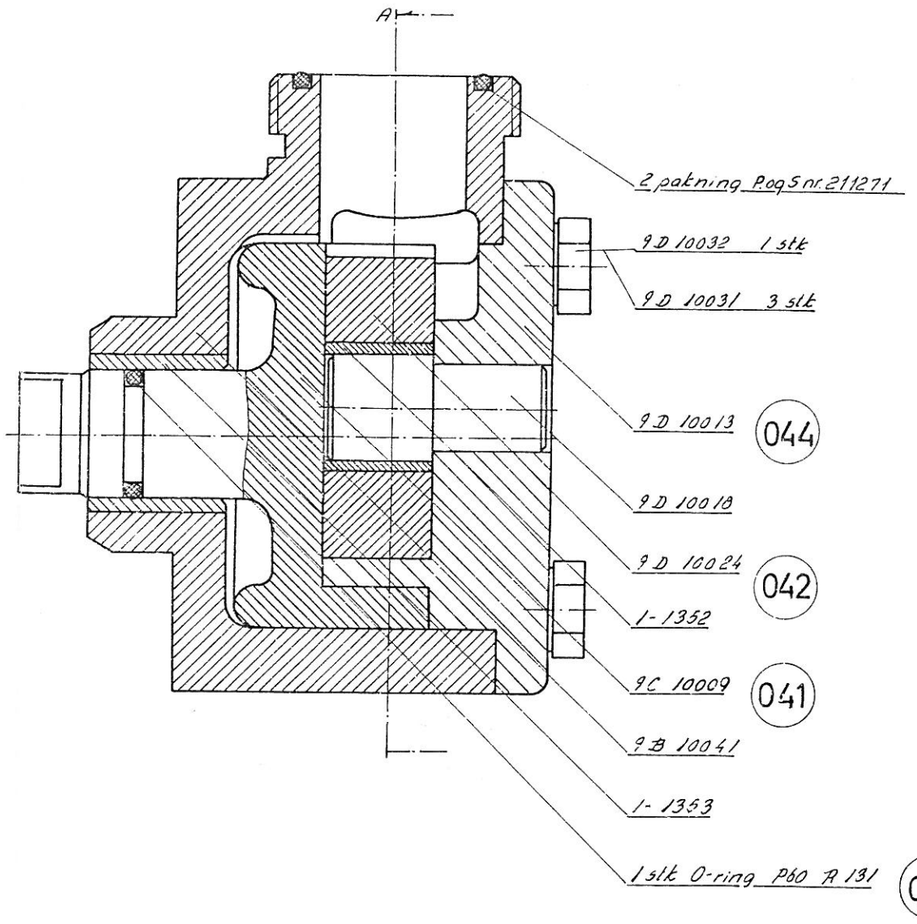
Ersatzteile
für
Krem-Pumpe

Drawing No. - Zeichnung Nr. 9 B 139

Term Bezeichnung	Part	Teil
P&S Nr.211271	Seal ring (2 req)	Dichtungsring (2 Stück)
9 D 10032	Screw	Schraube
9 D 10031	Screw (3 req)	Schraube (3 Stück)
9 D 10013	Cover	Deckel
9 D 10018	Shaft	Welle
9 D 10024	Idler gear	Sternrad
1-1352	Bush	Buchse
9 C 10009	Rotor	Laufrad
9 B 10041	Housing	Gehäuse
1-1353	Bush	Buchse
P60 R131	O-ring	O-Ring

A-A





KF: 2001	KF: 1101
Fig: 14	Fig: 13

Mrk.:	Forh.:	Navn:	Dato:	Ændring:	Ordr.:/Serie:	Bemærkninger:
				Matr.:	Dim.:/Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L..	D..Ø +	D..Ø −
6	30		0,2	
30	120		0,5	
120	315		0,8	
315	1000		1,2	mm
1000			2,0	
			3,0	

▽▽▽ Finslettes Ruhed over 0,4 t.o.m. 0,6 µ

▽▽ Slettes Ruhed over 0,8 t.o.m. 4,3 µ

▽ Skrubbes Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade evt. jævnes eller rentes med håndværktøj, ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

KF 2001	KF 1101
Mix Pump	Cream pump
Mix pumpe	Krempumpe
Blandingspumpe	Krempumpe

Mål: 1:1
Tegn.: 13.10.87. AA
Godk.:
Normpr.:
Erst. for:
Tegn. nr.: 98 139
Erst. af: 98 154

HOYER

Aarhus · Denmark

Fkp. nr. 1074

9 C 153

Parts List
for
Mix Pump

Ersatzteile
für
Mix-Pumpe

Drawing No. - Zeichnung Nr. 9 C 153

Term Bezeichnung	Part	Teil
First column, left Erste Reihe, links		
9 D 10052	Screw	Schraube
1-1383	Bush	Buchse
R127 P60	O-ring	O-Ring
Second column Zweite Reihe		
25 DS 721.3	Seal ring (2 req)	Dichtungsring (2 Stück)
9 D 10132	Socket (2 req)	Stutzen (2 STück)
9 B 10040	Housing	Gehäuse
9 D 10050	Cover	Deckel
9 D 10051	Screw (3 req)	Schraube (3 Stück)
9 D 10049	Shaft	Welle
1-1023	Bush	Buchse
9 D 10048	Idler gear wheel	Sternrad
9 C 10042	Rotor	Laufrad

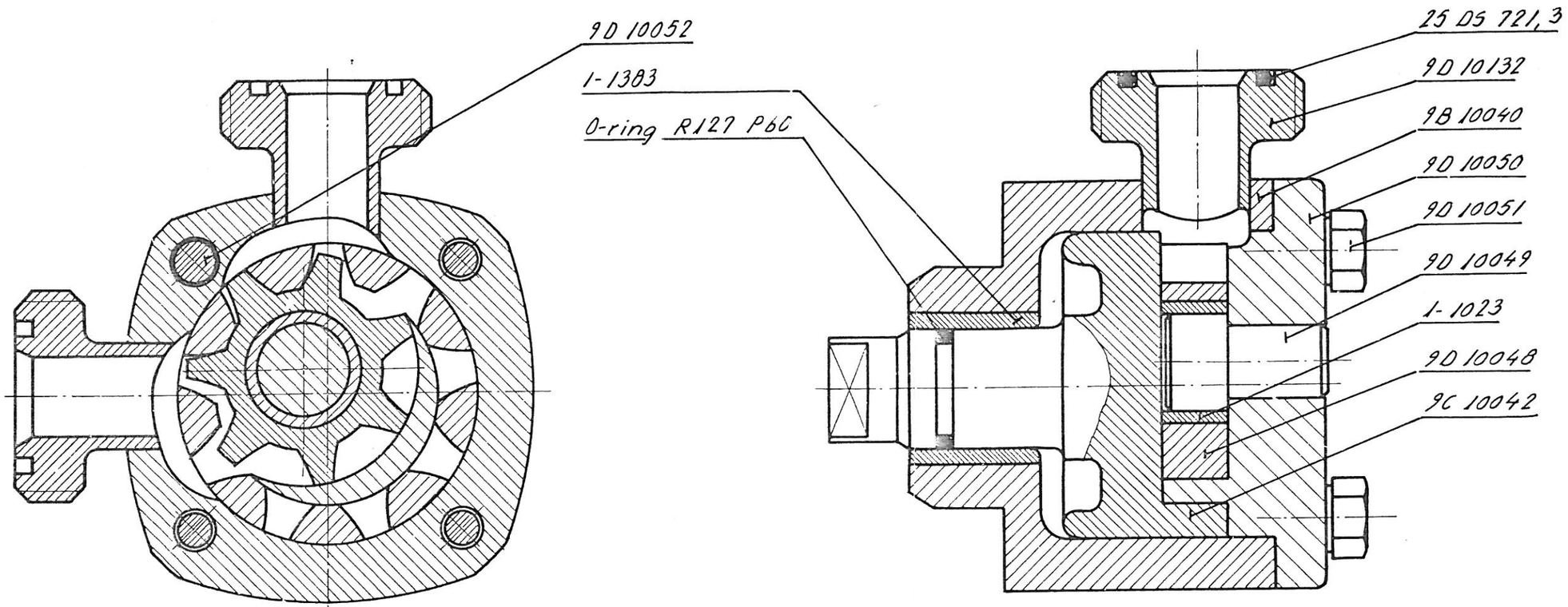


Fig. 14

Mrk.:	Felt.:	Navn:	Dato:	Ændring:	Ordr.:/Serie:	Bemærkninger:

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L. -	D.i.Ø +	D.u.Ø ÷
	6		0,2	
6	30		0,5	
30	120		0,8	mm
120	315		1,2	
315	1000		2,0	
1000			3,0	

▽▽▽ Finslettes
Ruhed over 0,4 t.o.m. 0,8 µ

▽▽ Slettes
Ruhed over 0,8 t.o.m. 6,3 µ

▽ Skrubbes
Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade
evt. jævnet eller renses med håndværktøj.
Ingen krav til overfladeruhedens størrelse.

Matr.: | Dim.:/Mod.:

HOYER MFG. CO. AARHUS-DENMARK

Blandepumpe,
Mix pump,
Mixpumpe,

Mål: 1:1
Tegn.: 1.12.69 LA
Godk.:
Normpr.:
Erst. for:
Tegn. nr.: 9C153
Erst. af: 9C156

HOYER

Aarhus · Denmark

Fkp. nr. 1075

Parts List
for
The Electrical System

Ersatzteile
für
Das elektrische System

24 A 332
2 Pages - Seiten

Drawing Nr. - Zeichnung Nr. 24 A 332

Qty. Anzahl	Part Teil	Term Bezeichnung
2	Main Motor Haupt Motor	ASEA type M160M, 15 HP-PS 1500 rpm - Umd/min. 3x380/660 V, 50 cycles - Hz.
2	Motor for the Pump Pumpenmotor	Stöber type R44/10, 1 HP-PS 36/180 rpm. - Umd/min. 3x220/380 V, 50 cycles - HZ.
2	Ammeter Ampéremeter	HM type EBI 130
2	Transformer for ammeter Transformator für Ampéremeter	HM
2	Starting relay Motorschutz	Danfoss nr. 44 E 0047, 220 V.
1	Starting relay Motorschutz	Danfoss nr. 47 B 1225, 220 V.
2	Starting relay Motorschutz	Danfoss nr. 47 B 1226, 220 V.
4	Relay Relais	Danfoss nr. 37 B 0151, 220 V.
9	Push Button switch Druckknopschalter	Klöckner-Moeller nr.LT/AK/T
9	-do-	Klöckner-Moeller nr.DT-r/AK/GR
2	Rotary switch Drehschalter	Klöckner-Moeller nr.T2b-2-142/e
2	Shield for ammeter Schirm für Ampéremeter	HOYER 106 D 10077
4	Seal ring for ammeter Dichtung für Ampéremeter	HOYER 1-3337
2	-do-	HOYER 1-3338
8	Clip Haltebügel	Wexöe nr. 1911 kr.G
8	Fuse Schmelzsicherung	FG 3/250G

HOYER

Aarhus · Denmark

Fkn. nr. 1076

Parts for the Instant stop-start system:
Teile für das "Instant Stop-Start System":

Qty. Anzahl	Part Teil	Term Bezeichnung
3	Relay Relais	Danfoss nr. 37 B 0151, 220 V.
2	-do-	Danfoss nr. 37 B 0162, 220 V.
4	Socket for pilot lamp Fassung für Kontrollampe	Jautz nr. J 3003
4	Pilot bulb Kontrollampe	Klöckner-Moeller nr.SGL 220 V

HOYER
ALFA-LAVAL GROUP

St.Nr. 2021

KF 1000 KF 2001

4o C 117

Parts List
for
Low Pressure Float Expansion Valve.

Ersatzteile
für
Niederdruck-Schwimmerregelventil

Drawing No. - Zeichnung Nr. 4o C 117.

Term Bezeichnung	Part	Teil
4o C 1oo53	Float	Schwimmerblase
M 8 st.	Nut	Mutter
4o D 1oo69	Float rod	Stange für Schwimmerblase
14 S 3o st.	Screw (2 req.)	Schraube (2 Stück)
6S5o st.	Special screw	Spezialschraube
M 6 st.	Nut	Mutter
4o D 1oo55	Lever	Gewichtsstange
793	Pin	Zapfen
4o D 1oo59	Special nipple	Spezialnippel
4o B 1oo52	Valve body	Ventilgehäuse
4o D 1oo58	Strainer	Filter
1 - 1623	Gasket	Dichtung
123o	Cap	Haube
1 - 1533	Compression spring	Druckfeder
4o D 1oo6o	Valve needle	Ventilnadel
4o D 1oo61	Valve seat	Ventilsitz x
4o C 1oo62	Guide for valve needle	Führung für Ventilnadel x
781	Push needle	Stossnadel
4o D 1oo57	Adjusting screw	Einstellschraube
1 - 1624	Gasket	Dichtung
5 C 15 st.	Screw	Schraube
1 - 1611	Gasket	Dichtung
1 - 145o	Gasket	Dichtung
632 N75o8	"Danfoss"welding flange	"Danfoss" Schweissflansch

Not indicated:
Nicht markiert:

14 S 5o st.	Screw for 4o B 1oo52 (2 req.)	Schraube für 4o B 1oo52 (2 Stück)
1o S 35 st.	Screw for Danfoss flange (2 req.)	Schraube für Danfoss Flansch (2 Stück)
6 P 2o st.	Pointed screw	Spitzenschraube
1 - 3139	Spacer ring for 6S5ost.	Distanzring für 6S5o st.

SMC 20,000 9-68

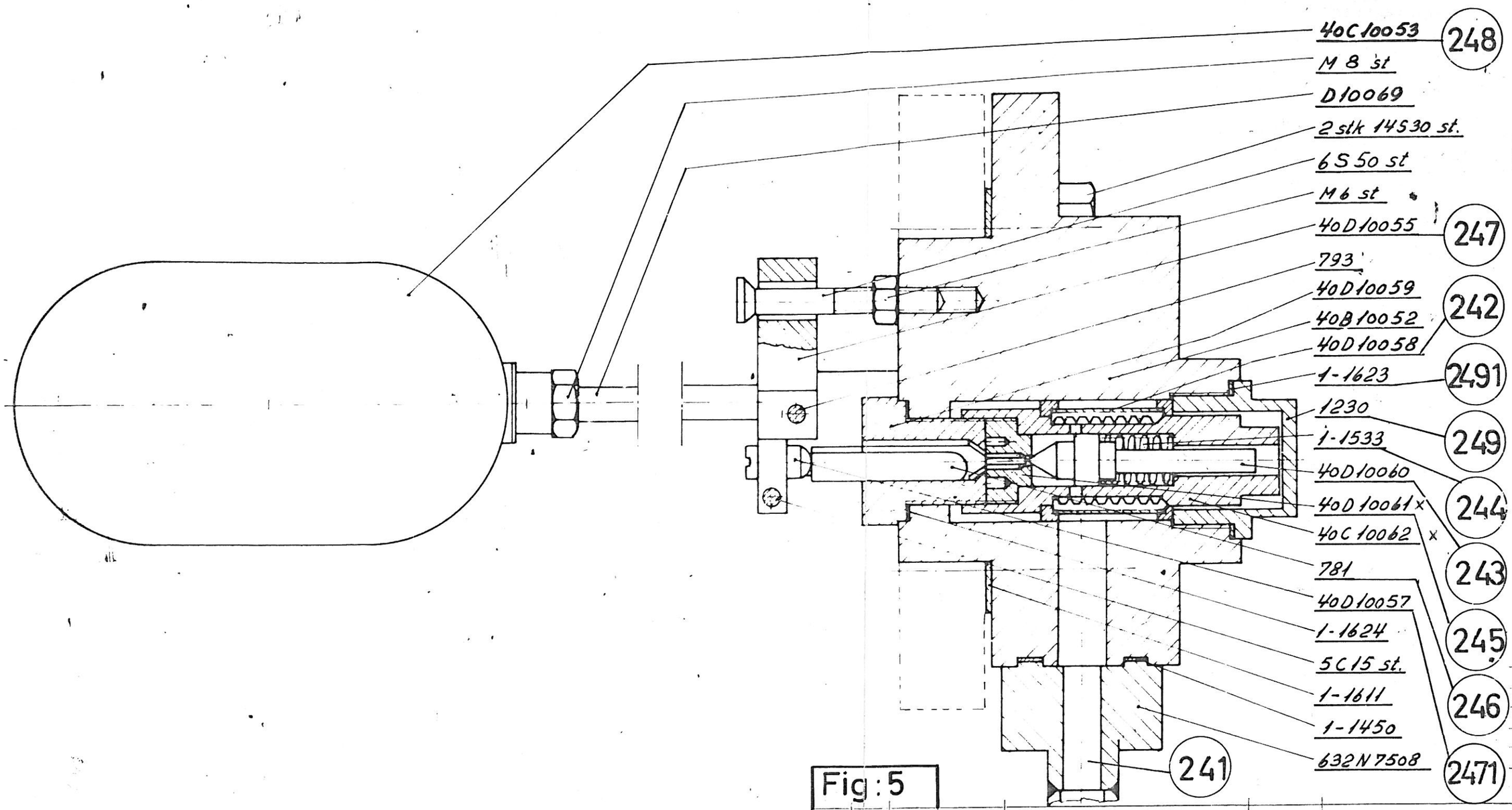


Fig: 5

Mrk	Felt.	Navn.	Dato	Ændring:	Ordr.: Serie:	Bemærkninger:
				Matr.:	Dim.: Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af

område i mm over	t.o.m	L	D i Ø	D u Ø
	6		0.2	
6	30		0.5	
30	120		0.8	
120	315		1.2	mm
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes Ruhed over 0.4 t.o.m. 0.8 µ

▽▽ Slettes Ruhed over 0.8 t.o.m. 6.3 µ

▽ Skrubbes Ruhed over 6.3 t.o.m. 12.5 µ

~ Rå overflade evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

Lavtrykssvømmerventil
Low pressure float valve
Niederdruck schwimmerventil.

Mål: 1:1

Tegn.: 29/8-38 BKP

Godk.:

Normpr.:

Erst. for:

Tegn. nr.: 40 C 117

Erst. af:

HOYER

Aarhus · Denmark

Fkp. nr. 1077

Parts List
for
The Ammonia System

106 B 002
2 Pages - Seiten

Ersatzteile
für
Das Ammoniak System

Drawing No. - Zeichnung Nr. 106 B 002

Ref. No. Pos. Nr.	Part Teil	Term Bezeichnung
21)	Stop valve (liquid line) Absperrventil (Flüssigkeitsleitung)	Sabroe F 7712
23)	Solenoid valve Magnetventil	Danfoss EVSA10 nr.32-251
230)	Pressure control Pressostat	Danfoss RT1A nr. 17-2020
24)	Float expansion valve Schwimmerregelventil	Please refer to list No. 40 C 117 Beachten Sie bitte Liste Nr. 40 C 117
27)	Constant-pressure valve Konstantdruckventil	DanfossRVA3-5°C to+13°C
28)	Ammonia pressure gauge Ammoniak Manometer	Metro nr.1-01-133.05-05-06-09-19-21
29)	Injector Injektor	Please refer to list No. 106 C 114 Beachten Sie bitte Liste Nr.106C114
36)	Back-pressure regulator Saugdruckregler	Danfoss PHSC 25 nr. 26 H 1346
361)	Pilot valve Pilot-Ventil	Danfoss CVA10 nr. 26 D 0023
38)	Suction-pressure gauge Saugdruckmanometer	Metro nr. 1-01-733-05-06-09-12-19
39)	Stop valve (suction line) Absperrventil(Saugleitung)	Sabroe F 7838
41)	Safety valve Sicherheitsventil	HOYER 43 S 100
43)	Stop valve Absperrventil	Sabroe F 7783
44)	Oil drain valve Olablassventil	Sabroe F 7783
46)	Stop valve Absperrventil	Sabroe F 7712
47)	Solenoid valve Magnetventil	Danfoss EVSH10 nr.32-0208
470)	Pressure control Pressostat	Danfoss RT1A nr.17-2020
48)	Solenoid valve Magnetventil	Danfoss EVJA3 nr.32 K 2525

HOYER

Aarhus · Denmark

Fkp. nr. 1078

The Ammonia System (continued)
Das Ammoniak System (fortgesetzt)

Parts without reference number
Teile ohne Positionsnummer

Stop valve for the pressure gauge Absperrventil für Ammoniak-Manometer	Sabroe F 5698 (2 req-Stück)
Union nut for the pressure gauge Überwurfmutter für Ammoniak-Manometer	Sabroe F 2262 (2 req-Stück)
Nipple för the pressure gauge Nippel für Ammoniak Manometer	Sabroe nr.498 (2 req-Stück)
Nipple for 36) Nippel für 36)	HOYER 106 D 10147
Connector for 36) Rohrverschraubung für 36)	Sabroe nr. 3983

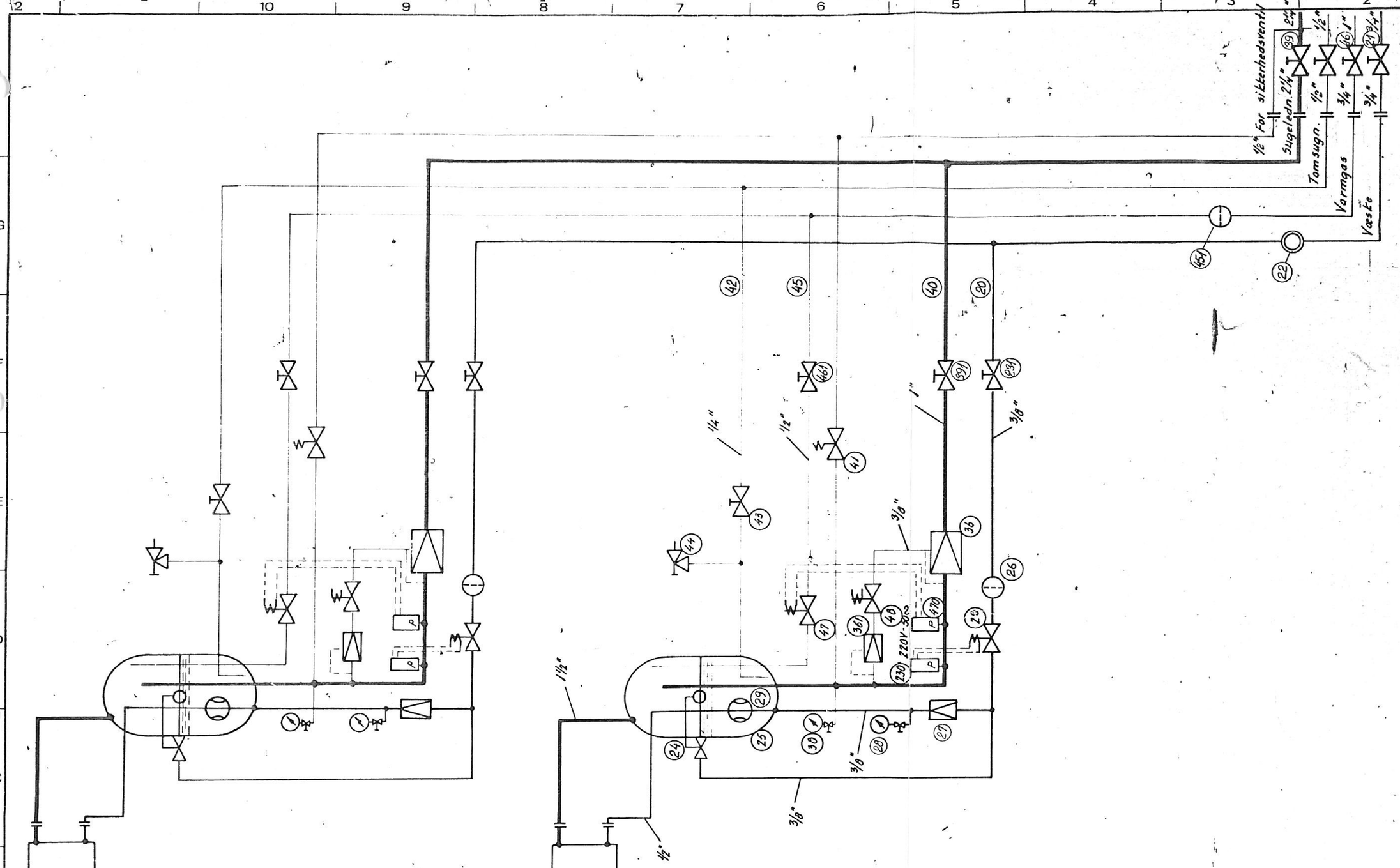


Fig. 4

231-391 og 461 på tegn. 15/2-71 - RF

Ændring | Ordr. Serie | Bemærkninger

Mstr | Dim. Mod

HOYER MFG CO AARHUS-DENMARK

KF 1102,
NH₃ diagram med
Ejektor med
Instant Stop - Start,

Mål 2
Tegn 8.12.69 AP
Kontr
Normpr
Erst. for
Tegn nr 1068002
Erst. af

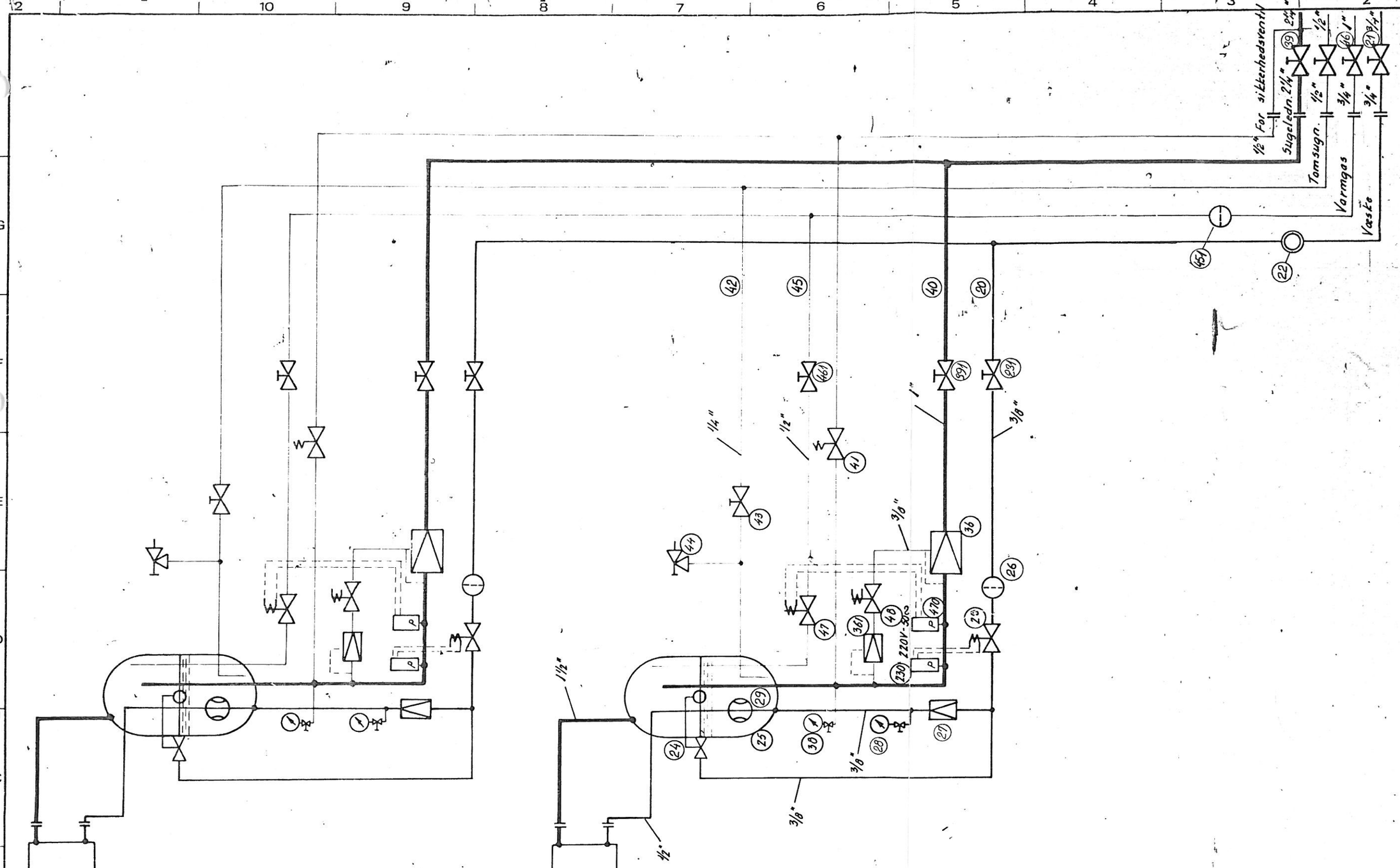


Fig. 4

231-391 og 461 på tegn. 15/2-71 - RF

Ændring | Ordr. Serie | Bemærkninger

Mstr | Dim. Mod

HOYER MFG CO AARHUS-DENMARK

KF 1102,
NH₃ diagram med
Ejektor med
Instant Stop - Start,

Mål 2
Tegn 8.12.69 AP
Kontr
Normpr
Erst. for
Tegn nr 1068002
Erst. af

HOYER

Aarhus · Denmark

Fkp. nr. 1079

Parts List
for
The Ice Cream- and Air System

106 D 012
2 Pages - Seiten

Ersatzteile
für
Das Eiskrem- und Luft-System

Drawing No. - Zeichnung Nr. 106 D 012

Ref No. Pos. Nr.	Part Teil	Term Bezeichnung
11)	Air filter Luftfilter	Cuno type 1B1
12)	Air compressor Luftkompressor	Stenhöj type KA 4 F 50
13)	Oil separator Olabscheider	Wilkerson 1137-4CMG
14)	Air pressure gauge Luftdruck-Manometer	Metro ϕ100, 0-6 kg/cm^2 (2 req - 2 Stück)
15)	Air pressure reducing valve Luftdruck-Regelventil	Teknova 230-061 (2 req - 2 Stück)
16)	Non-return valve Rückschlagventil	HOYER 10 D 114 (2 req - 2 Stück)
17)	Solenoid valve Magnetventil	Lucifer 121 A 01 (2 req - 2 Stück)
18)	Non-return valve Rückschlagventil	Alfa-Laval 31341-0075 (2 req - 2 Stück)
	Union nut Überwurfmutter	Alfa-Laval 190613 (2 req - 2 Stück)
	Socket Stutzen	Alfa-Laval 190627 (2 req - 2 Stück)

Parts without reference number:
Teile ohne Positionsnummer:

Nipple Nippel	HOYER 106 D 10111 (2 req - 2 Stück)
Union nut for 106 D 10111 Überwurfmutter für 106 D 10111	Danfoss NS 4-8 (2 req - 2 Stück)
Union nut Überwurfmutter	HOYER 871-10000 (2 req - 2 Stück)

HOYER
Aarhus · Denmark

Fkp. nr. 1080

Tube fittings:
Fittings:

Qty. Anzahl	Term Bezeichnung	
1	Enots	Z 163
1	-	K 26-8
1	-	Y 718
1	-	Z 160
1	-	Z 374-3
4	-	Z - 21
4	-	Z 407
1	SCS	nr. 245
1	SCS	nr. 1a
1	Enots	Y 395
1	-	Z 21
1	-	Z 407
8	-	Z 18
8	-	Z 404
1	-	Z 325-20
2	-	Z 164
2	-	Z 373-2
2	-	Y 35
4	-	Z 325-9
4	-	Z 24
4	-	Z 402
2	-	Z 180
4	-	Z 167
4	-	Z 21
4	-	Z 407
1	Tema	2500

Piping:
Rohre:

5/16"	Copper tube Kupferrohr
1/2"	-do-
3/16"	-do-

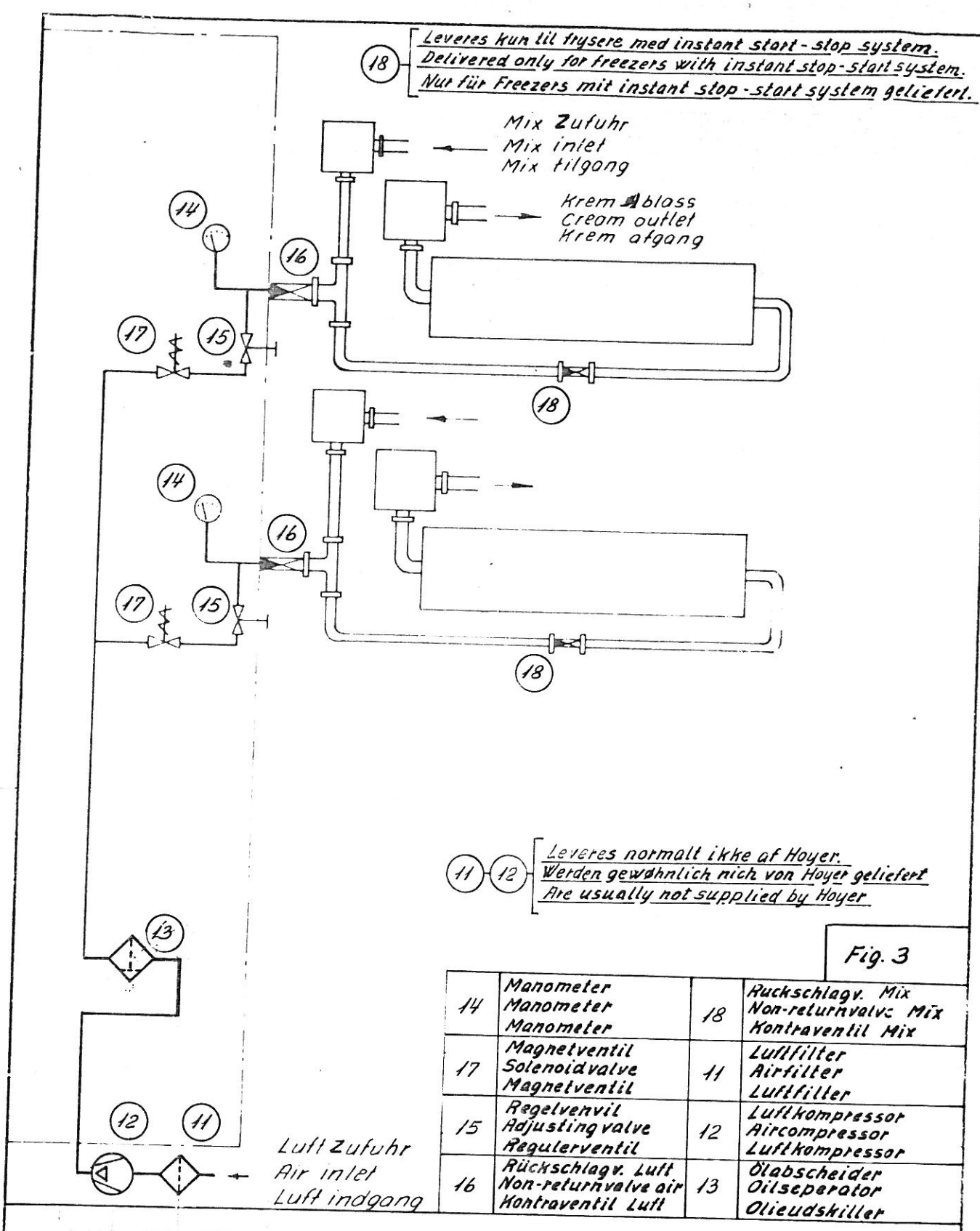


Fig. 3

14	Manometer Manometer Manometer	18	Rückschlagv. Mix Non-returnvalve Mix Kontraventil Mix
17	Magnetventil Solenoidvalve Magnetventil	11	Luftfilter Airfilter Luftfilter
15	Regelvenvil Adjusting valve Regulerventil	12	Luftkompressor Aircompressor Luftkompressor
16	Rückschlagv. Luft Non-returnvalve air Kontraventil Luft	13	Ölabscheider Oilseperator Olieudskiller

Finslettes
Slettes
Skrubbes
Ra overflade

HOYER A/S

KF 1102 – KF 2002 2
Iskrem- og Luftsystem
The Ice Cream- and Airsystem
Das Eiskrem- und Luftsystem

Tegn 9.4.70 AD
Godk 13/4-70 BKP
Tegn nr 106 D 012

HOYER

Aarhus · Denmark

Fkp. nr. 1081 KF 1101 - KF 1102 - KF 1103 106 A 102

2 Pages - Seiten

Parts List
for
Freezing Cylinder and Mutator

Ersatzteile
für
Gefrierzylinder und Rotor

Drawing No. - Zeichnung Nr. 106 A 102

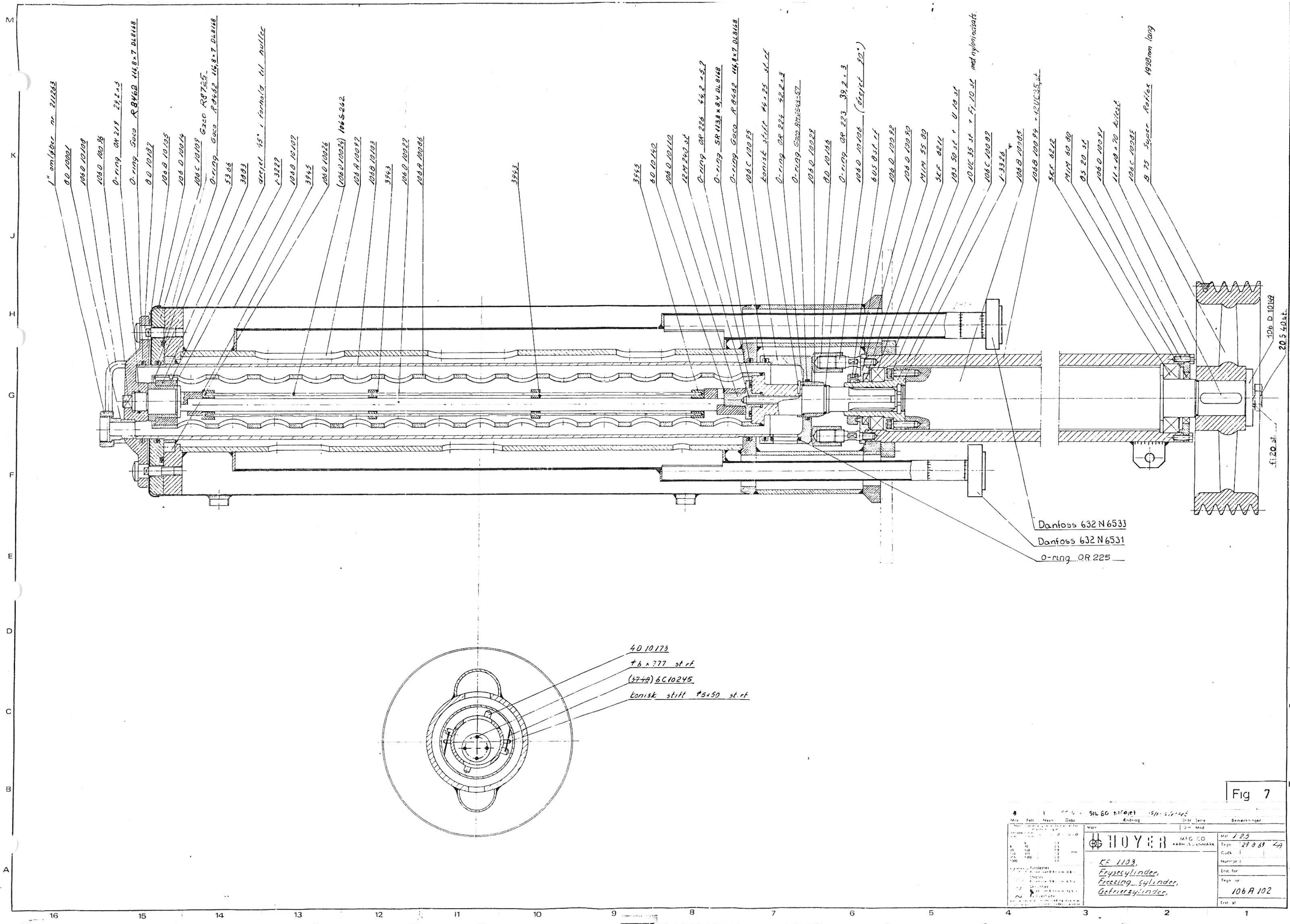
Term Bezeichnung	Part	Teil
1" nr.211263	Union nut	Überwurfmutter
8 D 10001	Socket	Stutzen
106 D 10108	Handle (2 req)	Handgriff(2 Stück)
106 D 10096	Journal	Wellenzapfen
X OR219 29.2x3	O-ring	O-Ring
Gaco R8462	O-ring P5	O-Ring P5
8 D 10187	Pin (4 req)	Zapfen (4 Stück)
106 B 10105	Frontcover	Deckel
106 D 10014	Cover	Deckel
106 C 10109	Cover	Deckel
Gaco R8725	O-ring SIL 80	O-Ring SIL 80
Gaco R8462	O-ring SIL 80	O-Ring SIL 80
5366	Spring ring	Federring
3883	Hub	Nabe
1-3227	Bush	Buchse
106 B 10107	Coating	Verkleidung
3945	Hub	Nabe
106 D 10026	Pin	Zapfen
106 D 10024	Mutator	Schlagwelle
106 A 10097	Jacket	Kühlmantel
106 B 10103	Freezing tube	Gefrierrohr
3943	Hub	Nabe
106 D 10027	Shaft	Welle
106 A 10086	Rotor	Rotor
3943	Hub	Nabe
3945	Hub	Nabe
6 D 10140	Hub	Nabe
106 D 10110	Journal	Wellenzapfen
12M240 st.	Screw	Schraube
OR226 44.2x5.7	O-ring	O-Ring

0045-86510500

Term Bezeichnung	Part	Teil
Gaco R8462	O-ring SIL 80	O-Ring SIL 80
Gaco R8462	O-ring	O-Ring
106 C 10095	Housing f. shaft seal	Gehäuse für Wellendichtung
Ø4x25 st.rf.	Taper pin	Kegelstift
OR224-42.2x3	O-ring	O-Ring
OR228-54.2x5.7	O-ring	O-Ring
106 D 10029	Bush	Buchse
8 D 10166	Special nut (2 req)	Spezialmutter (2 Stück)
OR223-39.2x3	O-ring	O-Ring
106 D 10106	Stud bolt (2 req)	Stiftschraube (2 Stück)
6US8 st.rf.	Pointed screw	Spitzenschraube
106 D 10092	Ring	Ring
106 D 10090	Cover	Deckel
MIM 55.80	Seal ring	Dichtungsring
SKF 6211	Ball bearing	Kugellager
18S50 st.	Screw (4 req)	Schraube (4 STück)
U18 st.	Washer (4 req)	Unterlegscheibe (4 STück)
10UC35 st.	Screw (6 req)	Schraube (6 Stück)
Fj.12 st.	Spring washer (6 req)	Federscheibe (6 Stück)
106 C 10087	Spline hub	Vielnutnabe
1-3326	Washer	Unterlegscheibe
106 B 10085	Main shaft	Hauptwelle
106 B 10094	Housing f. bearings	Lagergehäuse
SKF 6212	Ball bearing	Kugellager
MIM 60.80	Seal ring	Dichtungsring
8S20 st.	Screw (4 req)	Schraube (4 Stück)
106 D 10091	Cover	Deckel
11x18x70	Key	Passfeder
106 C 10089	V-belt pulley	Keilriemenscheibe
B75Super Roflex	V-belt (5 req)	Keilriemen (5 STück)
4 D 10173	Pin (34 req)	Zapfen (34 Stück)
3740	Scraper blade (2 req)	Schabemesser (2 Stück)
Ø5x50 st.rf.	Taper pin (4 req)	Kegelstift (4 Stück)

Not indicated:
Nicht markiert:

OR225-44.2x3	O-ring for the ice cream discharge pipe	O-Ring für Eiskrem-Auslassrohr


Danfoss 632 N 6533
Danfoss 632 N 6531
O-ring OR 225
40 10173
(3749) 6C 10245
konisk stift
106 D 10149
Fig 7
HOYER
KF 1103,
Frysecylinder,
Freezing cylinder,
Gefrierzylinder,
106 A 102

HOYER

Aarhus · Denmark

Fkp. nr. 1083 — Parts List for Mechanism for Speed Control — 106 C 103

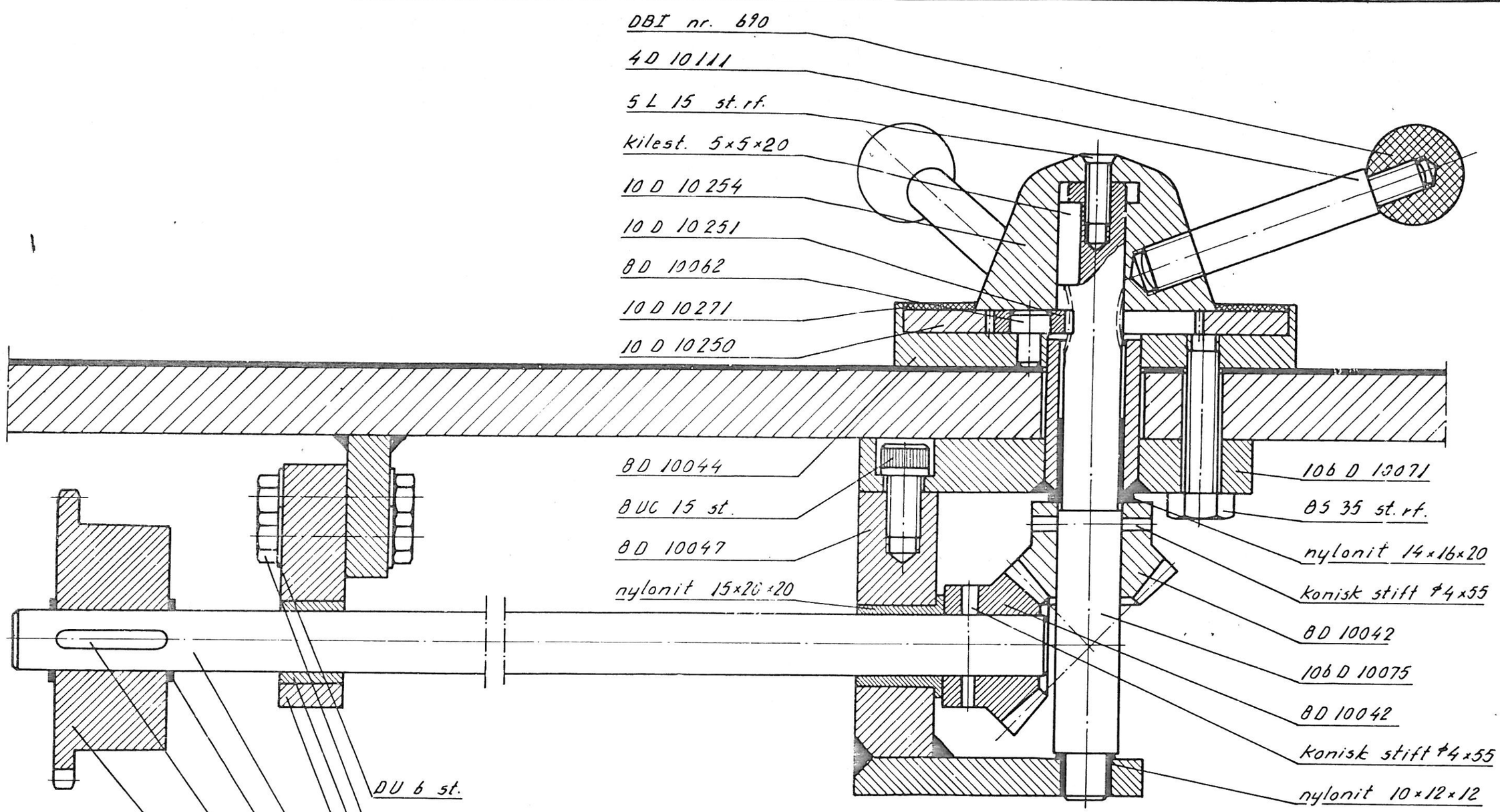
Ersatzteile für Mechanismus für Geschwindigkeitsregelung

Drawing No. - Zeichnung Nr. 106 C 103

Term Bezeichnung	Part	Teil
DBI nr.690	Ball handle (3 req)	Kugelhandgriff (3 Stück)
4 D 10111	Handle (3 req)	Handgriff (3 Stück)
5L15 st.rf.	Screw	Schraube
5 x 5 x 40	Key	Passfeder
10 D 10254	Hub	Nabe
10 D 10251	Gear wheel	Zahnrad
8 D 10062	Shaft	Welle
10 D 10271	Disc	Sc heibe
10 D 10250	Gear rim	Zahnkranz
8 D 10044	Housing	Gehäuse
8UC15 st.	Screw (2 req)	Schraube (2 Stück)
8 D 10047	Bracket	Konsole
15x20x20	"Nylonit"-bush	"Nylonit"-Buchse
DU 6 st.	Washer (2 req)	Unterlegscheibe(2 Stück)
6M35 st.	Bolt and nut(2 req)	Schraube und Mutter (2 Stück)
15x20x15	"Nylonit"-bush	"Nylonit"-Buchse
8 D 10045	Bearing	Lager
106 D 10044	Shaft	Welle
UG15x1.5	"Seeger"-ring(2 req)	"Seeger"-Ring (2 Stück)
5x5x28	Key	Passfeder
8 D 10043	Chain wheel	Kettenrad
106 D 10071	Bracket	Konsole
8S35 st.rf.	Screw (3 Req)	Schraube (3 Stück)
14x16x20	"Nylonit"-bush	"Nylonit"-Buchse
⌀4 x 55	Taper pin	Kegelstift
8 D 10042	Bevel gear	Kegelzahnrad
106 D 10075	Shaft	Welle
8 D 10042	Bevel gear	Kegelzahnrad
⌀4 x 55	Taper pin	Kegelstift
10x12x12	"Nylonit"-bush	"Nylonit"-Buchse

Not indicated:
Nicht markiert:

10 D 10255	Chain wheel	Kettenrad
Renold nr.110038	Chain (Simplex)	Kette (Simplex)



Mrk:	Felt.:	Navn:	Dato:	Ændring:	Ordr.: Serie	Bemærkninger:
				Matr.:	Dim.: Mod.:	

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m	L. -	D. i Ø +	D. u Ø -
	6		0.2	
6	30		0.5	
30	120		0.8	
120	315		1.2	mm
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes — Ruhed over 0.4 t.o.m. 0.8 µ

▽▽ Slettes — Ruhed over 0.8 t.o.m. 6.3 µ

▽ Skrubbes — Ruhed over 6.3 t.o.m. 12.5 µ

~ Rå overflade — evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

HOYER MFG. CO. AARHUS-DENMARK

KF 1103,
Hastighedsregulering,
Speed control,
Geschwindigkeitsregelung,

Mål:	1:1
Tegn.:	19.11.69 AA
Godk.:	
Normpr.:	
Erst. for:	
Tegn. nr.:	106C 103
Erst. af:	

HOYER

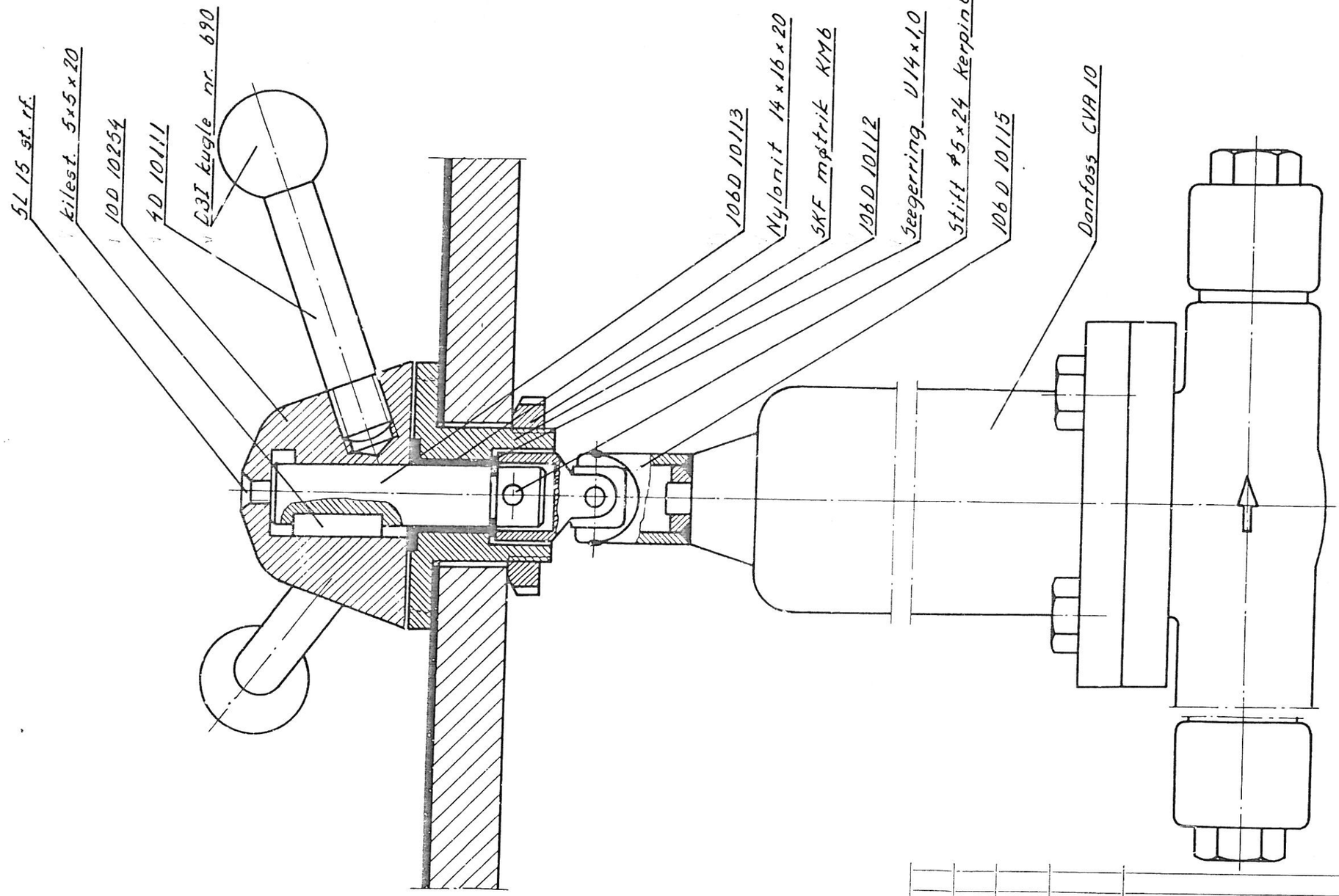
Aarhus · Denmark

Fkp. nr. 1084 — Parts List for Control Mechanism for the Back-Pressure — 106 C 104

Ersatzteile
für
Regulierungsmechanismus für den Saugdruck

Drawing No. - Zeichnung Nr. 106 C 104

Term Bezeichnung	Part	Teil
5L15 st.rf.	Screw	Schraube
5 x 5 x 20	Key	Passfeder
10 D 10254	Hub	Nabe
4 D 10111	Handle (3 req)	Handgriff (3 Stück)
DBI nr.690	Ball handle (3 req)	Kugelhandgriff (3 Stück)
106 D 10113	Shaft	Welle
14x16x20	"Nylonit"-bush	"Nylonit"-Buchse
SKF KM6	Nut	Mutter
106 D 10112	Housing	Gehäuse
U 14 x 1.0	"Seeger"-ring	"Seeger"-Ring
Ø5x24 Kerpin80	Pin	Stift
106 D 10115	Universal joint	Kreuzgelenk
Danfoss CVA10	Constant pressure valve	Konstantdruckventil



Mrk:	Felt:	Navn:	Dato:	Ændring:	Ordr.: Serie:	Bemærkninger:

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L.	D i Ø ±	D u Ø ±
	6		0.2	
6	30		0.5	
30	120		0.8	
120	315		1.2	mm
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes
Ruhed over 0,4 t.o.m. 0,8 µ

▽▽ Slettes
Ruhed over 0,8 t.o.m. 6,3 µ

▽ Skrubbes
Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade
evt. jævnes eller rentes med håndværktøj. Ingen krav til overfladeruhedens størrelse.

Matr.: | Dim.: Mod.:

HOYER MFG. CO. AARHUS-DENMARK

KF 1103,
Regulering af sugetryk,
Control for suction pressure,
Regelung für Saugdruck,

Mål: 1:1
Tegn.: 19.11.69 KA
Godk.:
Normpr.:
Erst. for:
Tegn. nr.: 106C 104
Erst. af:

HOYER
ALFA-LAVAL GROUP

Fkp. nr. 1085

Parts List
for
Driving Mechanism for the Pumps

106 U 112
2 Pages - Seiten

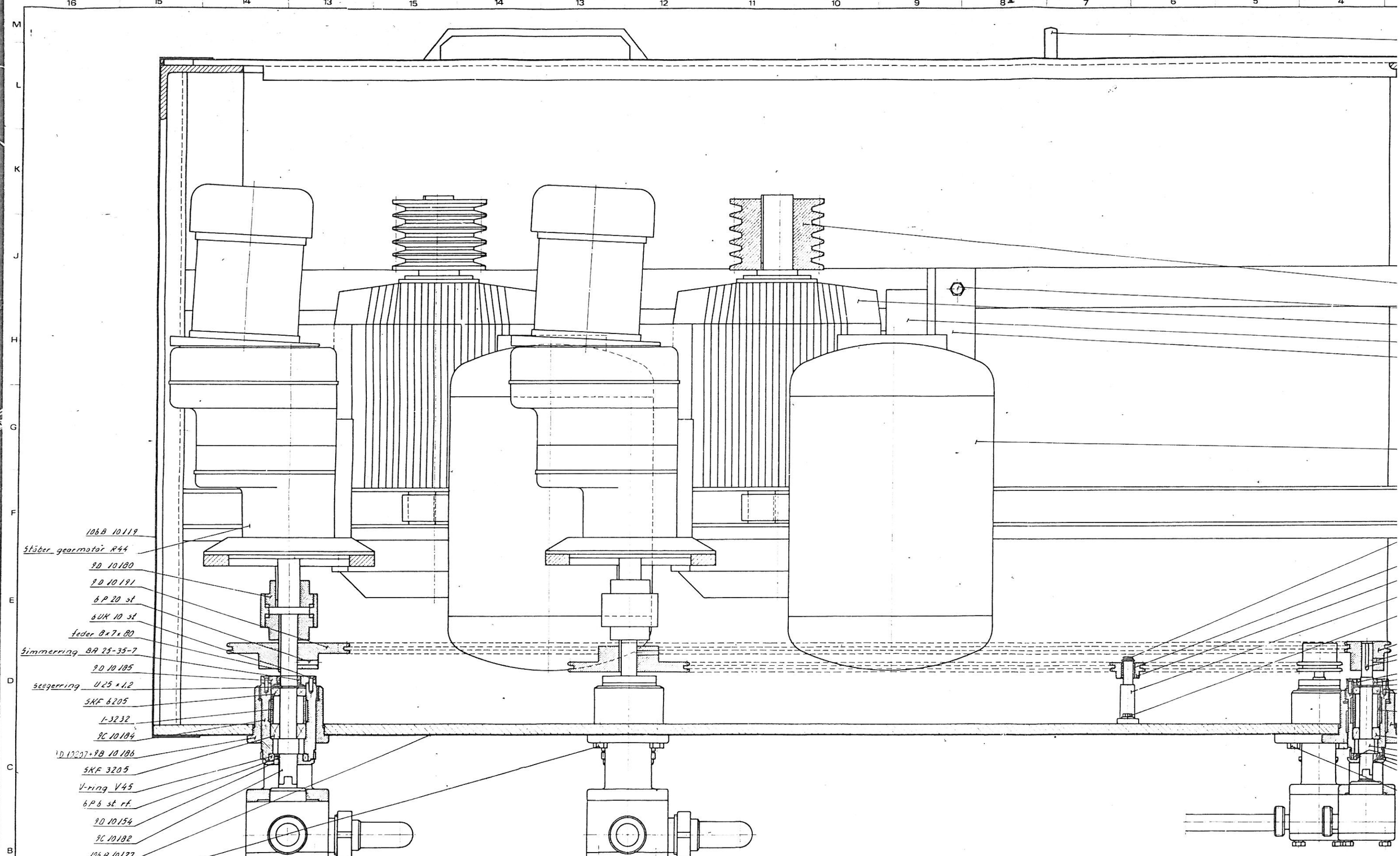
Ersatzteile
für
Antriebsmechanismus der Pumpen

Drawing No. - Zeichnung Nr. 106 U 112

Term Bezeichnung	Part	Teil
First column, left Erste Reihe, links		
106 B 10119	Cover	Deckel
Stöber R44/10	Pump motor (2 req)	Pumpen-Motor(2 Stück)
9 D 10180	Coupling (2 req)	Kupplung (2 Stück)
9 D 10191	Chain wheel (2 req)	Kettenrad (2 Stück)
6 P 20 st.	Pointed screw (2 req)	Spitzenschraube (2 Stück)
6 UK 10 st.	Screw (4 req)	Schraube (4 Stück)
8 x 7 x 80	Key	Passfeder
BA 25-35-7	"Simmer"-ring	"Simmer"-Ring
9 D 10185	Cover	Deckel
U25 x 1.2	"Seeger"-ring	"Seeger"-Ring
SKF 6205	Ball bearing	Kugellager
1-3232	Spacer bush	Distanzbuchse
9 C 10184	Housing for bearings	Lagergehäuse
9 B 10186	Bracket f. cream pump	Konsole für Krempumpe
SKF 3205	Ball bearing	Kugellager
V 45	V-ring	V-Ring
6P6 st.rf.	Pointed screw	Spitzenschraube
9 D 10154	Seal ring	Dichtungsring
9 C 10182	Shaft	Welle
106 A 10127	Covering	Verkleidung
8S25 st.rf.	Screw (4 req)	Schraube (4 Stück)
Second column Zweite Reihe		
nr. 276	Handle (8 req)	Handgriff (8 Stück)
106 B 10122	Cover (2 req)	Deckel (2 Stück)
35 D 5501	Leg (4 req)	Bein (4 Stück)
35 D 5502	Lock nut (4 req)	Gegenmutter (4 Stück)
106 C 10057	V-belt pulley (2 req)	Keilriemenscheibe (2 Stück)
12M25 st.	Bolt and nut (8 req)	Schraube und Mutter(8 Stück)

HOYER
ALFA-LAVAL GROUP

Term Bezeichnung	Part	Teil
Second column (continued) Zweite Reihe (fortgesetzt)		
El-Motor	Main Motor(Please refer to the electric parts list).	Hauptmotor(Beachten Sie bitte Ersatzteilliste f.die elektrische Teile)
A.O.Farstrup nr.3 106 D 10126	Bottom Plate(2 req)	Bodenplatte (2 Stück)
106 A 10120	Frame	Gestell
106 A 10116	Liquid separator	Flüssigkeitsabscheider
U15 x 1	"Seeger"-ring(3 req)	"Seeger"-Ring (3 Stück)
Glacier MB1525DU	Bush(3 req)	Buchse (3 Stück)
106 D 10048	Chain Wheel	Kettenrad
106 C 10045	Chain tensioner	Kettenspanner
8 S 20 st.	Screw (6 req)	Schraube (6 Stück)
DU 8 st.	Washer (6 req)	Unterlegscheibe (6 Stück)
9 D 10183	Chain wheel (2 req)	Kettenrad (2 Stück)
5 P 10 st	Pointed screw(2 req)	Spitzenschraube (2 Stück)
5 x 5 x 40	Key	Passfeder
9 D 10045	Cover	Deckel
BA 17-30-7	"Simmer"-ring	"Simmer"-Ring
U17 x 1	"Seeger"-ring	"Seeger"-Ring
6UK16 st.rf.	Screw (4 req)	Schraube (4 STück)
SKF 6203	Ball bearing	Kugellager
1-3244	Spacer bush	Distanzbuchse
9 B 10187	Bracket f. mix pump	Konsole f. Mix-Pumpe
SKF 3203	Ball bearing	Kugellager
9 C 10189	Shaft	Welle
5P4 st.rf.	Pointed screw	Spitzenschraube
9 C 10188	Housing f. bearings	Lagergehäuse
V 30	V-ring	V-Ring
9 D 10190	Seal ring	Dichtungsring
8S25 st.rf.	Screw (4 req)	Schraube (4 Stück)
Not indicated Nicht markiert		
9 D 10207	Special screw f.9B10186	Spezialschraube f.9B10186
9 D 10206	-do- f.9B10187	-do- f.9B10187
Renold nr.114038	Chain,3/8" Duplex	Kette, 3/8", Duplex
Renold nr.26	Connecting link(3 req)	Sammelglied (3 Stück)


106B 10119
Stöber gearmotor R44
9D 10180
9D 10191
6P 20 st
6UK 10 st
feder 8x7x80
Simmerring BA 25-35-7
9D 10185
seegerring U25x1.2
SKF 6205
I-3232
9C 10184
9D 17207+9B 10186
SKF 3205
V-ring V45
6P6 st rf.
9D 10154
9C 10182
106A 10127
105 25 st rf

MIKRODAN

HOYER

Aarhus · Denmark

Fkp. nr. 1087

Parts List for The Injector

106 C 114

Ersatzteile für Injektor

Drawing No. - Zeichnung Nr. 106 C 114

Term Bezeichnung	Part	Teil
Gaco P60R138	O-ring	O-Ring
10 B 10194	Diffusor	Diffusor
106 D 10055	Nozzle	Düse
1-1534	Seal ring	Dichtungsring
10 D 10204	Strainer	Fitter
1-1450	Gasket	Dichtung
1-1449	Gasket	Dichtung
Danfoss flange 632 N 7508	Flange	Flansch
10MGS30 st.	Screw (2 req)	Schraube (2 Stück)
Not indicated Nicht markiert		
12S35 st.	Screw (6 req)	Schraube (6 Stück)

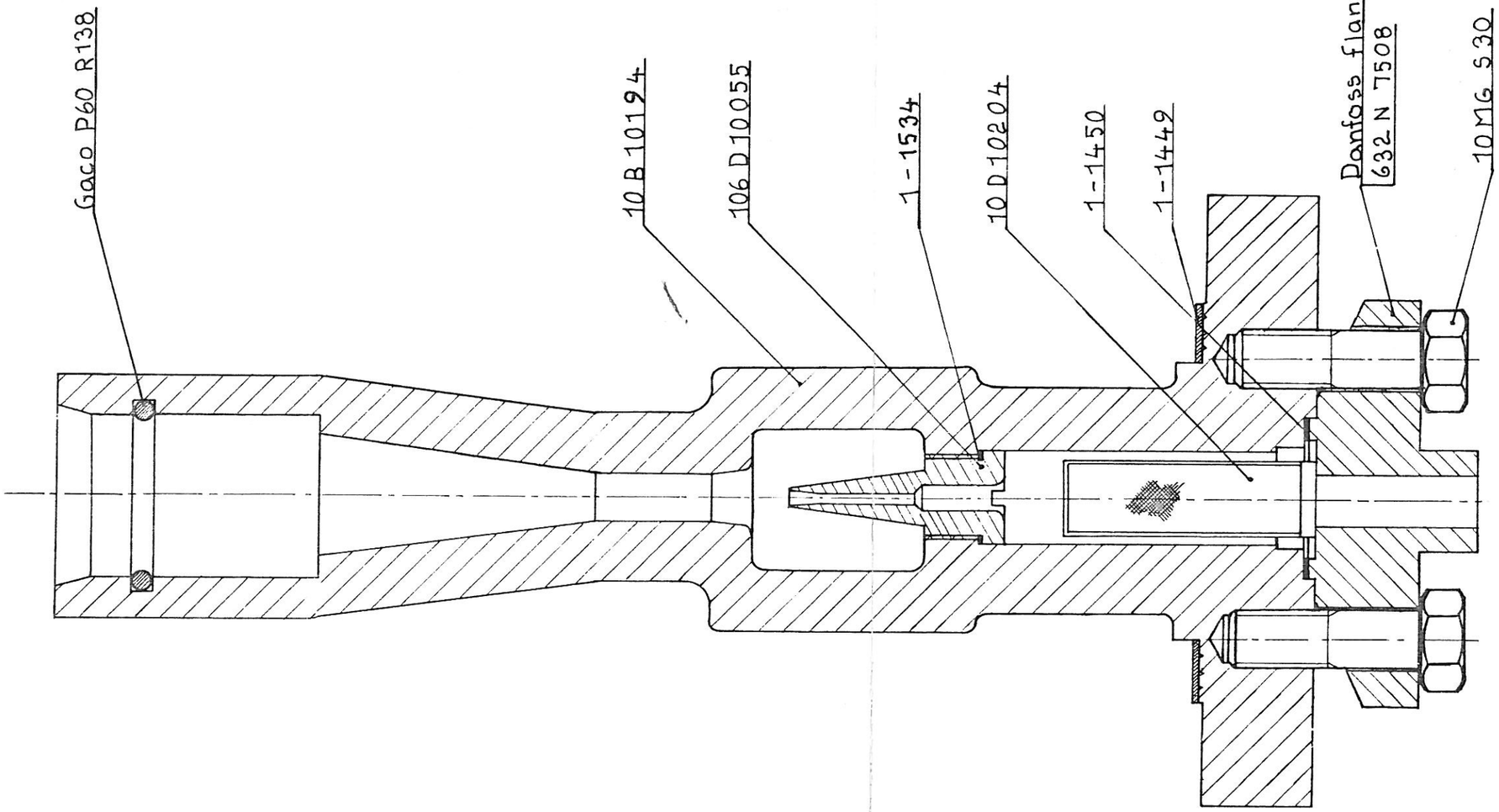


Fig. 6

Mrk.:	Felt.:	Navn:	Dato:	Ændring:	Ordr.: Serie:	Bemærkninger:

Hvor intet er angivet er tolerancer for bearbejdning af:

område i mm: over	t.o.m.	L. ±	D. i Ø ±	D. u. Ø ±
	6		0.2	
6	30		0.5	
30	120		0.8	mm
120	315		1.2	
315	1000		2.0	
1000			3.0	

▽▽▽ Finslettes — Ruhed over 0,4 t.o.m. 0,8 µ

▽▽ Slettes — Ruhed over 0,8 t.o.m. 6,3 µ

▽ Skrubbes — Ruhed over 6,3 t.o.m. 12,5 µ

~ Rå overflade — evt. jævnes eller renses med håndværktøj. Ingen krav til overfladeruhedens størrelse.

Matr.: | Dim.: Mod.:

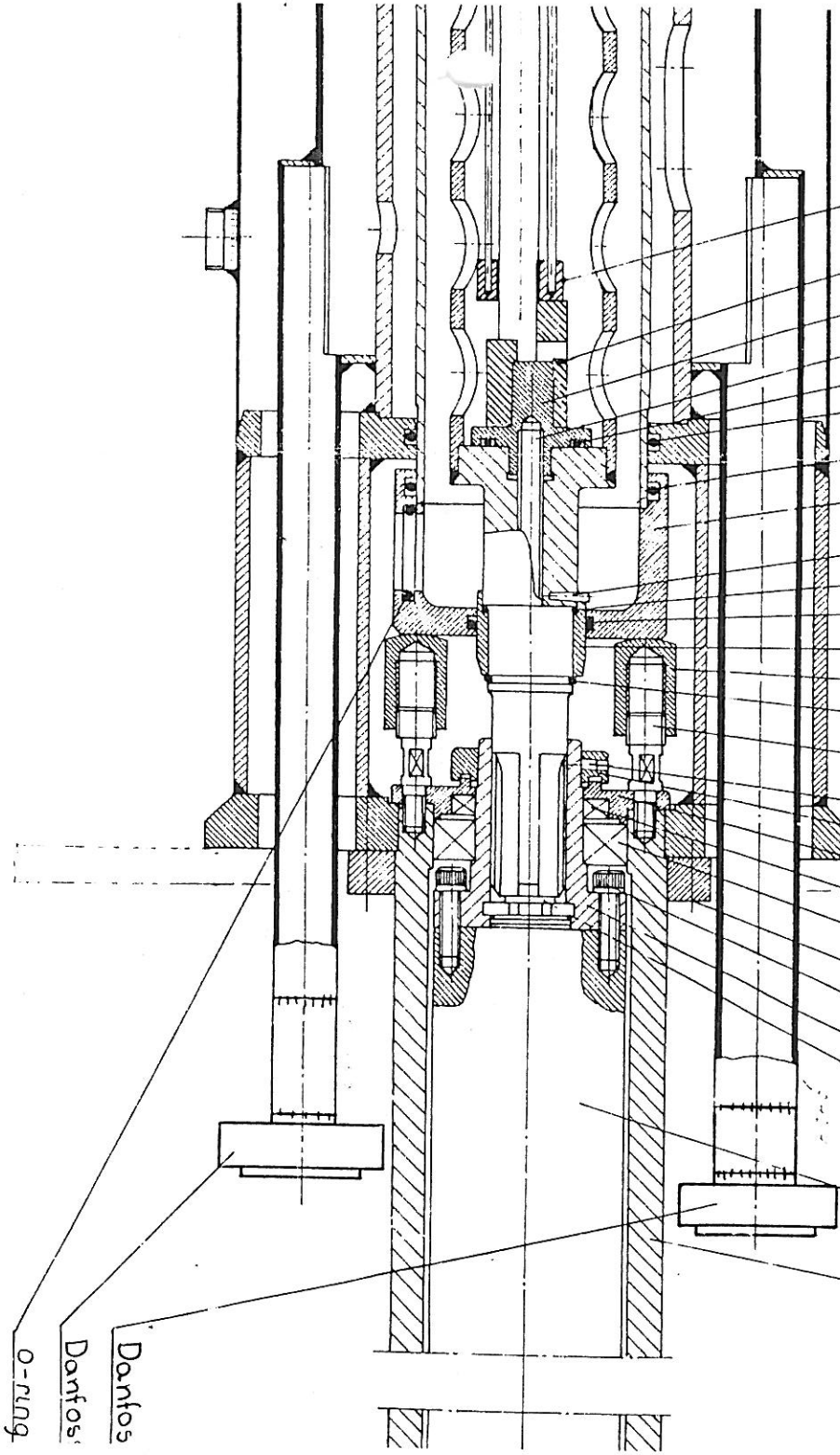
HOYER MFG. CO. AARHUS-DENMARK

KF 1103

Injektor

Mål:		
Tegn.:	19-6-70	4F
Godk.:		
Normpr.:		
Erst. for:		
Tegn. nr.:	106 C 114	
Erst. af:		

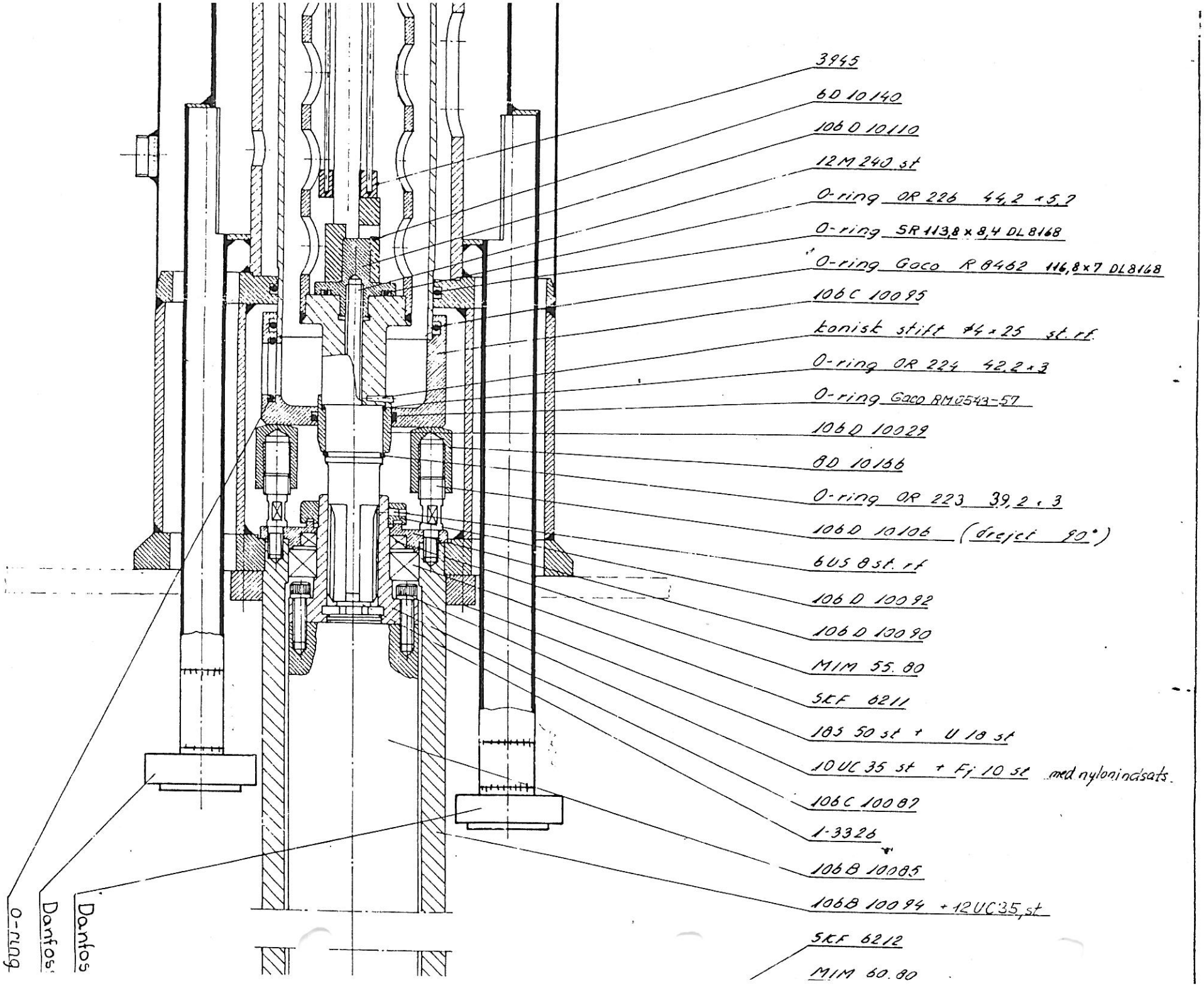
40 10173

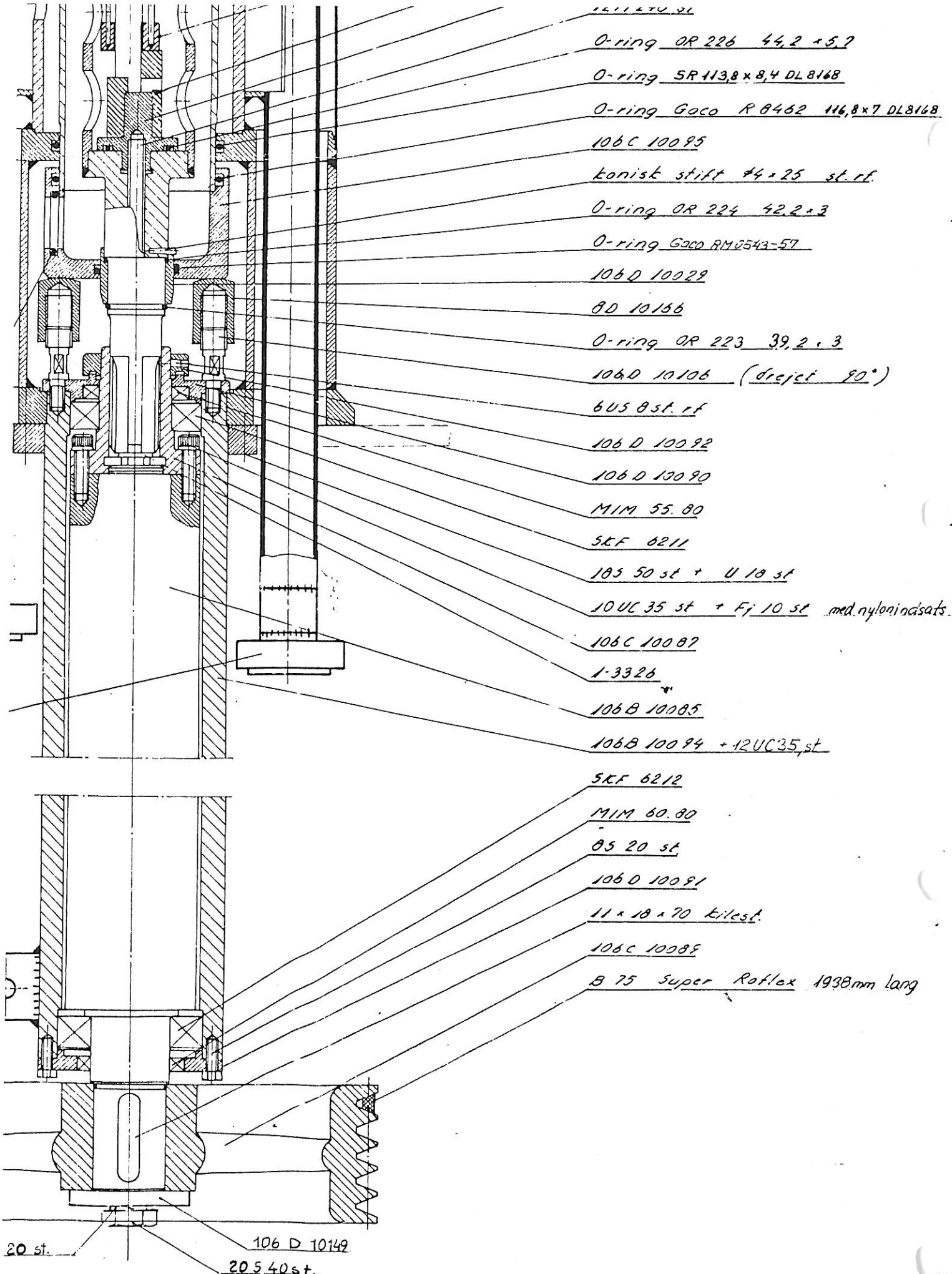


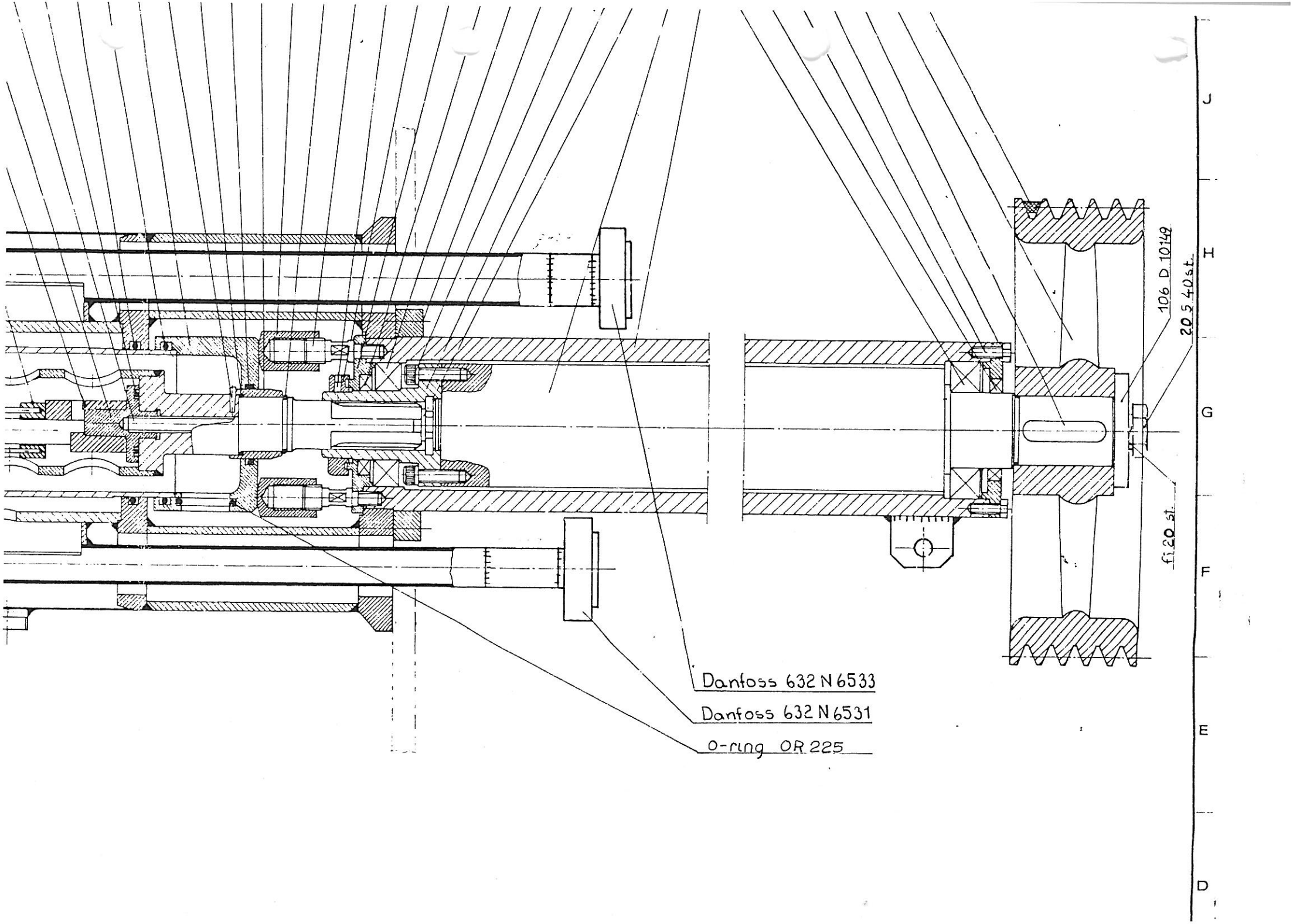
3945
6D 10140
106 D 10110
12M 240 st
O-ring OR 226 44,2 × 5,7
O-ring SR 113,8 × 8,4 DL 8168
O-ring Goco R 8462 116,8 × 7 DL 8168
106 C 10095
konisk stift ø4 × 25 st. rf.
O-ring OR 224 42,2 × 3
O-ring Goco RM 0543-57
106 D 10029
8D 10166
O-ring OR 223 39,2 × 3
106 D 10106 (drejet 90°)
6US 8 st. rf
106 D 10092
106 D 10090
MIM 55.80
SKF 6211
185 50 st + U 18 st
10 UC 35 st + Fj 10 st med nyloninsats
106 C 10087
1-3326
106 B 10085
106 B 10094 + 12 UC 35 st
SKF 6212
MIM 60.80

O-ring
Danfos
Danfos

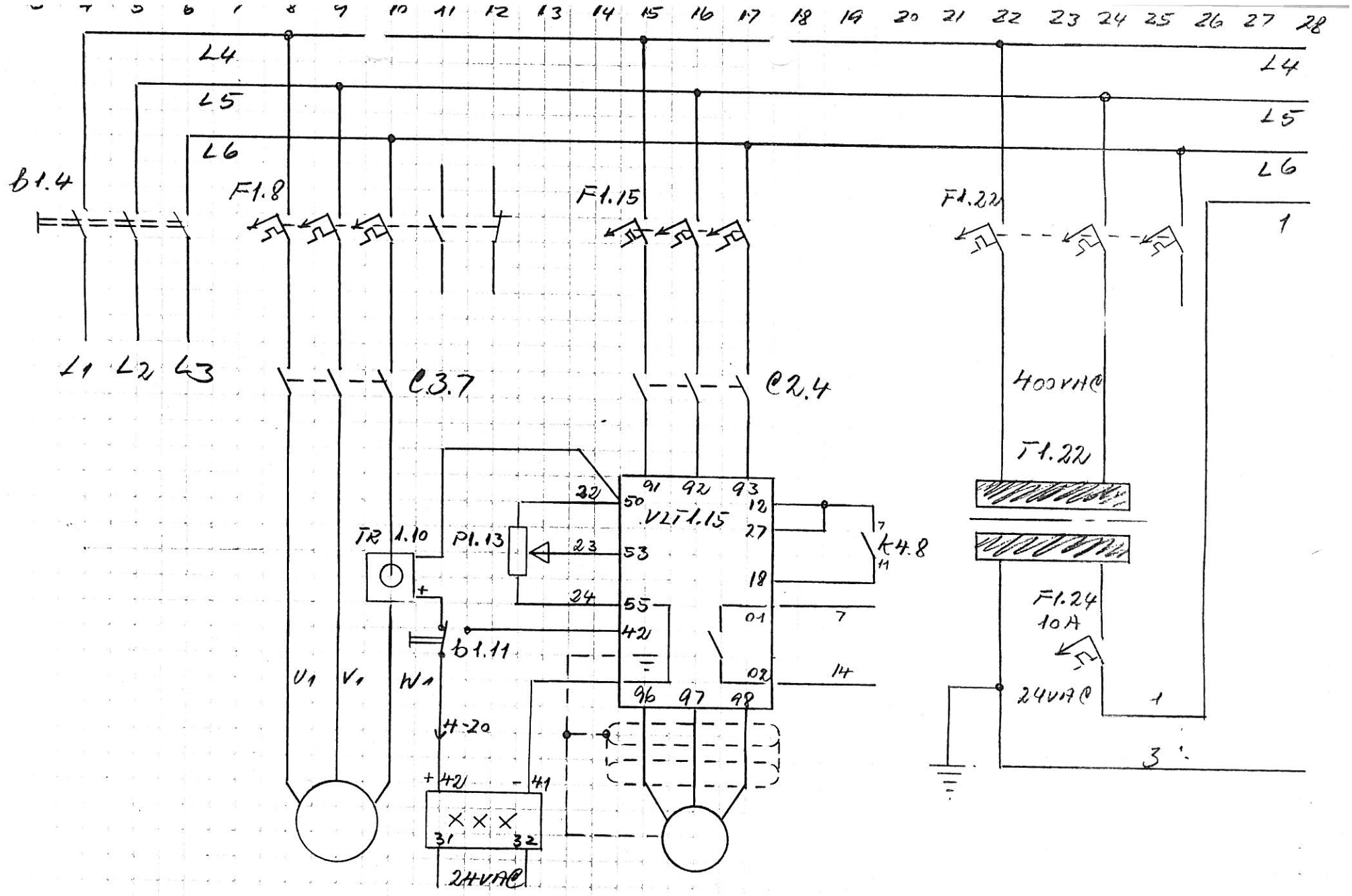
40 10 173


3945
60 10 140
106 D 10 110
12 M 240 st
O-ring OR 226 44,2 x 5,7
O-ring SR 113,8 x 8,4 DL 8168
O-ring Goco R 8462 116,8 x 7 DL 8168
106 C 10095
konisk stift ø4 x 25 st. rf.
O-ring OR 224 42,2 x 3
O-ring Goco RM 0549-57
106 D 10029
80 10 156
O-ring OR 223 39,2 x 3
106 D 10 106 (drejet 90°)
6 US 8 st. rf
106 D 10092
106 D 10090
MIM 55.80
SKF 6211
10 S 50 st + U 10 st
10 UC 35 st + Fi 10 st med nylonindsats
106 C 10087
1-3326
106 B 10085
106 B 10094 + 12 UC 35 st
SKF 6212
MIM 60.80
O-ring
Danfos
Danfos


1211 ETO st
O-ring OR 226 44,2 × 5,7
O-ring SR 113,8 × 8,4 DL 8168
O-ring Goco R 8462 116,8 × 7 DL 8168
106 C 10095
konisk stift Ø4 × 25 st. rf.
O-ring OR 224 42,2 × 3
O-ring Goco RM 0543-57
106 D 10029
80 10166
O-ring OR 223 39,2 × 3
106 D 10106 (drejet 80°)
6US 8 st. rf
106 D 10092
106 D 10090
MIM 55.80
SKF 6211
185 50 st + U 10 st
10 UC 35 st + Fj 10 st med nylonindsats
106 C 10087
1-3326
106 B 10085
106 B 10094 + 12 UC 35 st
SKF 6212
MIM 60.80
85 20 st
106 D 10091
11 × 18 × 70 filtest.
106 C 10088
B 75 Super Roflex 1938 mm lang
20 st.
106 D 10149
20 S 40 st.


106 D 10149
20,5 40 st.
fi 20 st.
Danfoss 632 N 6533
Danfoss 632 N 6531
O-ring OR 225
J
H
G
F
E
D

FREEZER KF1103 Z5332/69 21.10.2003 DIMI

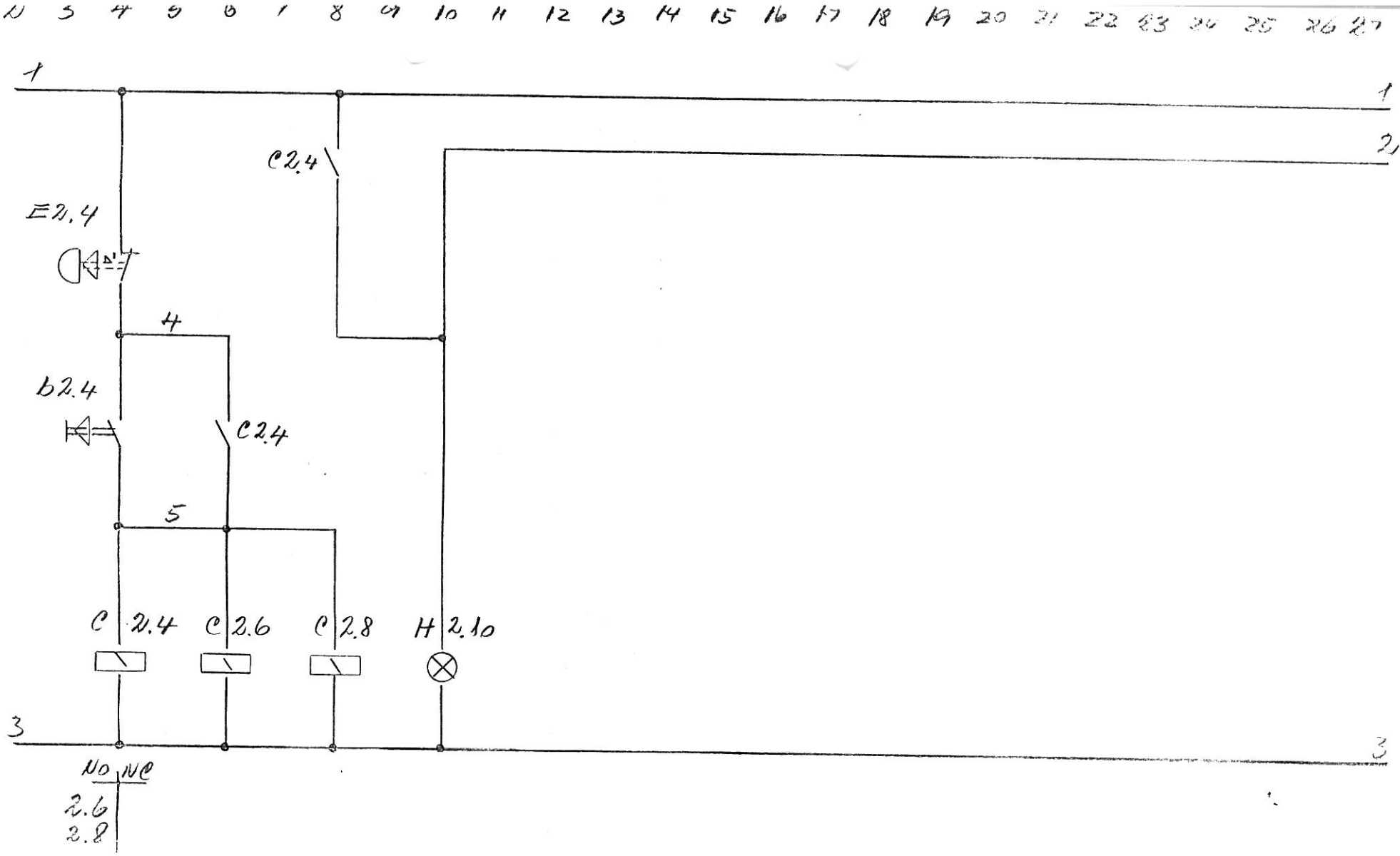


MAIN MOTOR1

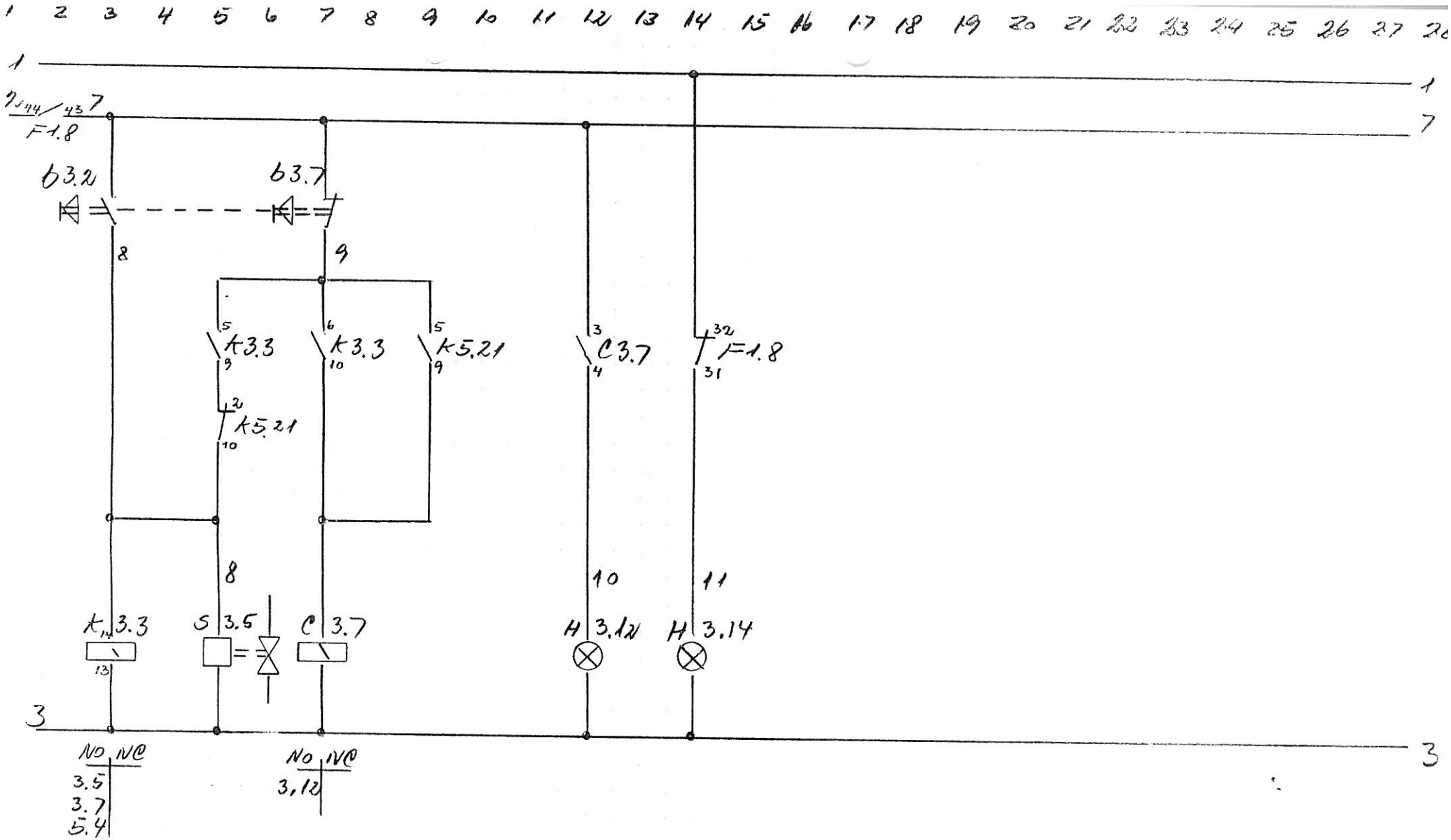
DISPLAY
4–20MA=0–50.0

GEAR

FREEZER 1



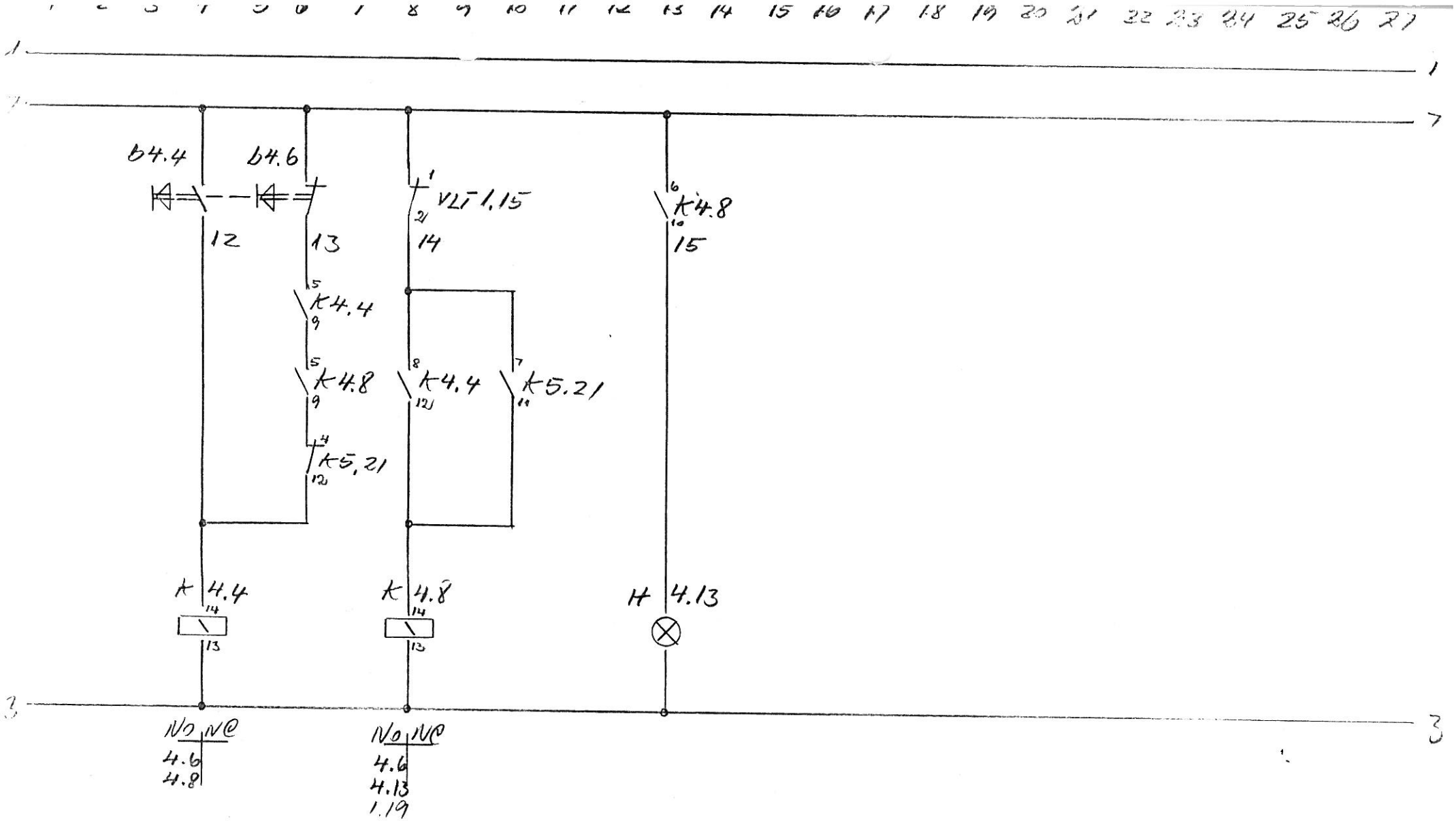
EMERGENCY STOP



O.R.VALVE

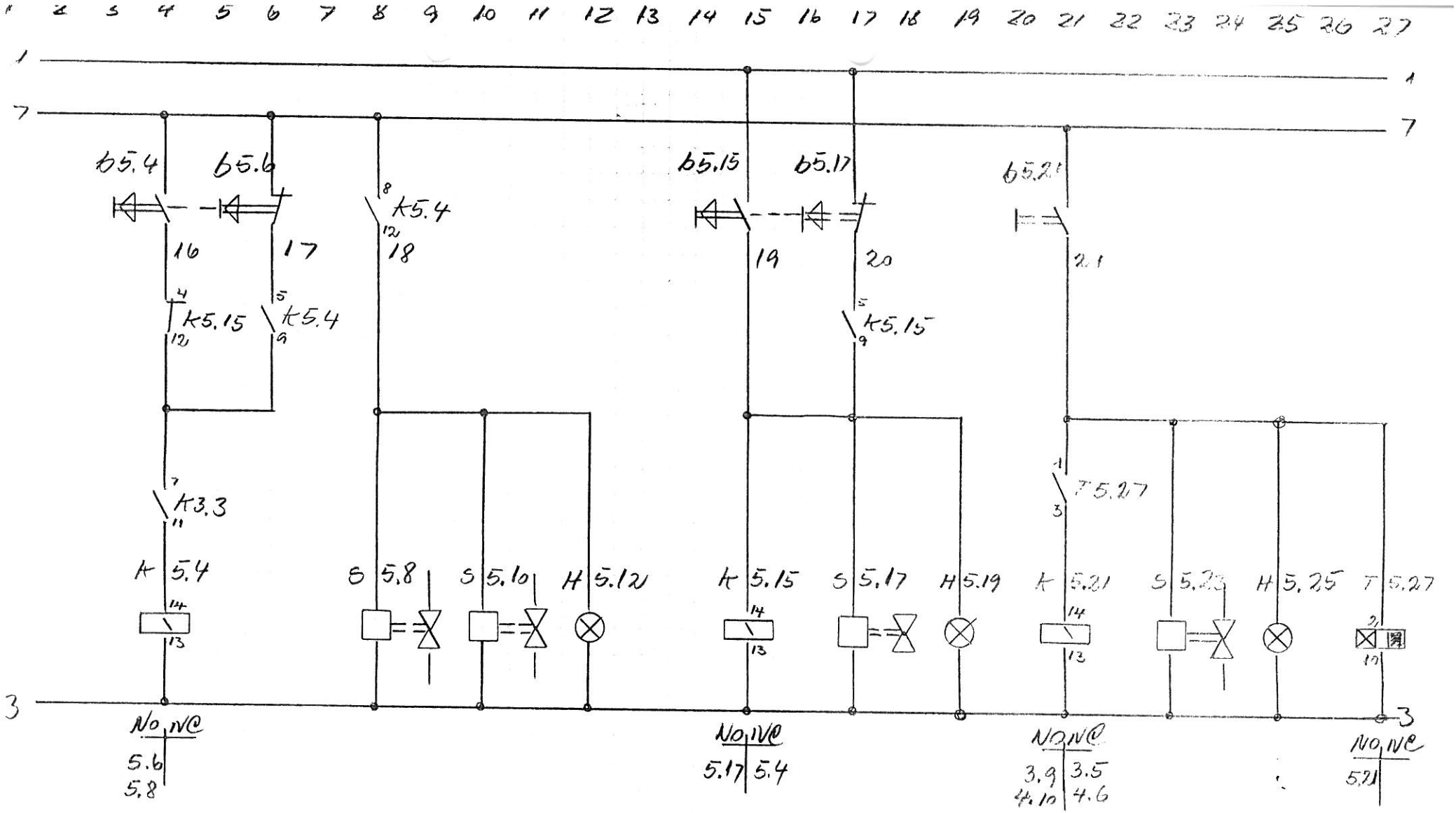
MAIN MOTOR

FREEZER 1



GEAR

FREEZER 1



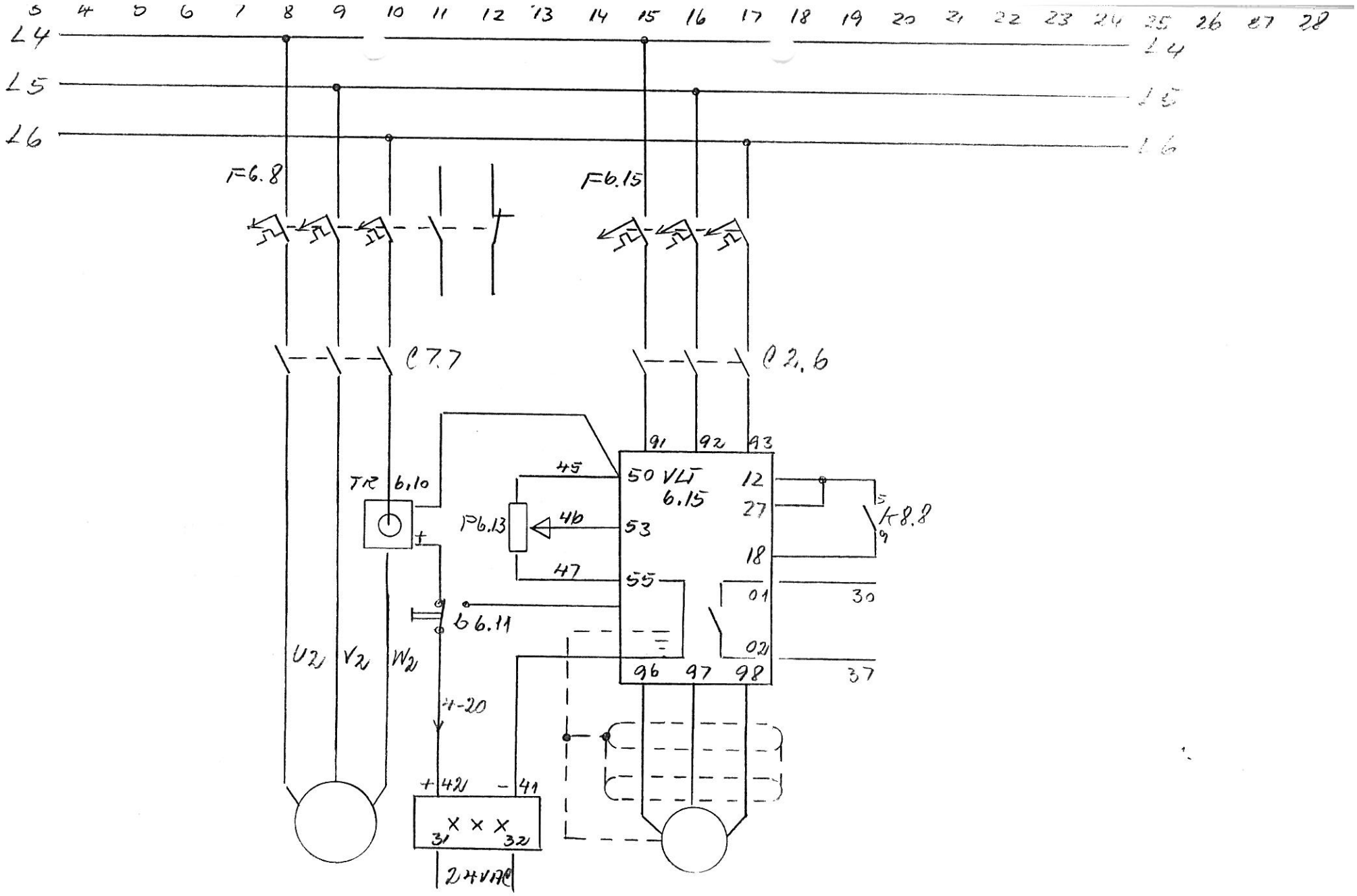
PILOT VALVE FOR MAIN VALVE

LIQUID VALVE

HOT GAS VALVE

CIP

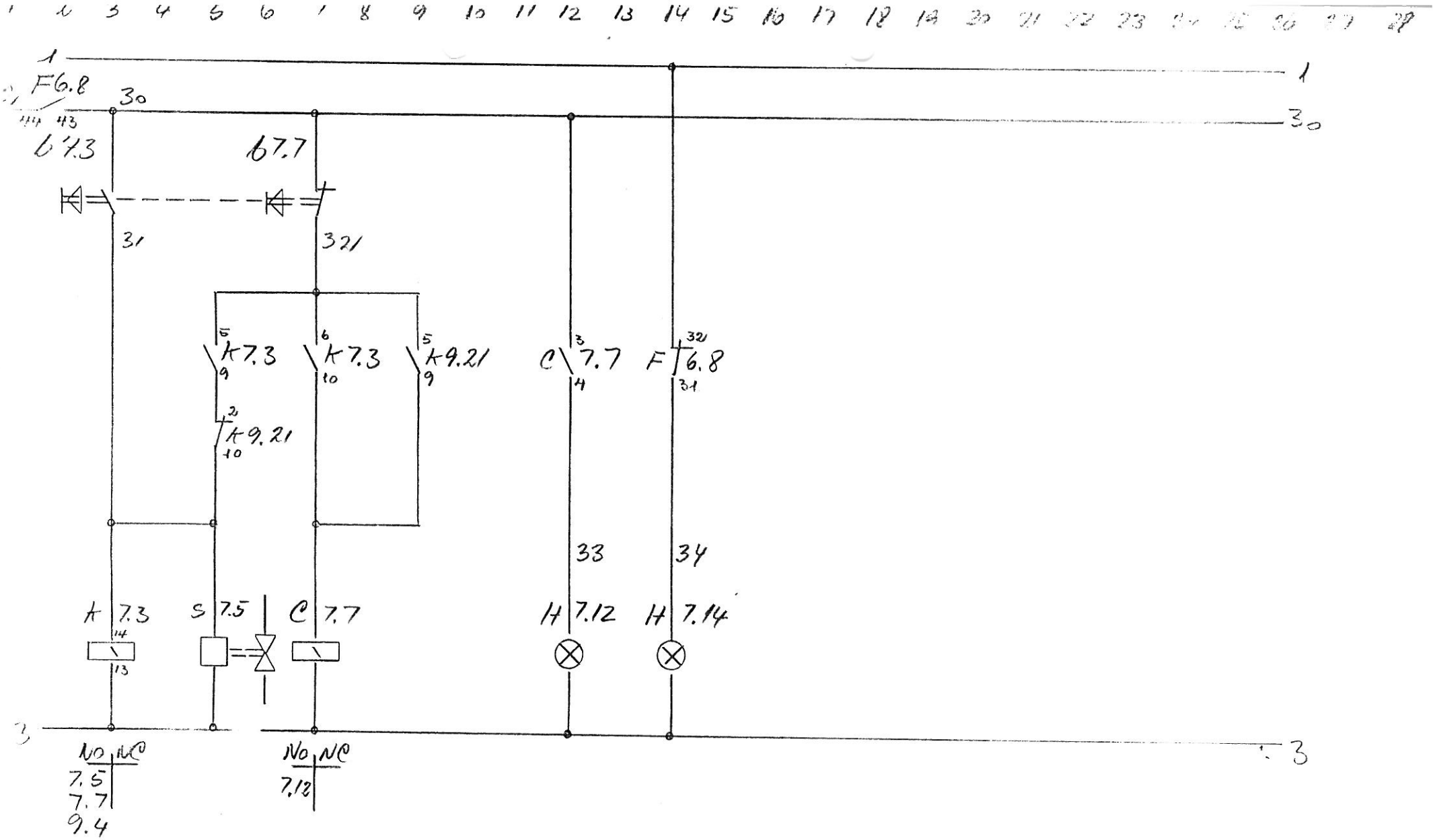
FREEZER 1



MAIN MOTOR2 DISPLAY 4–20MA=0–50.0

GEAR

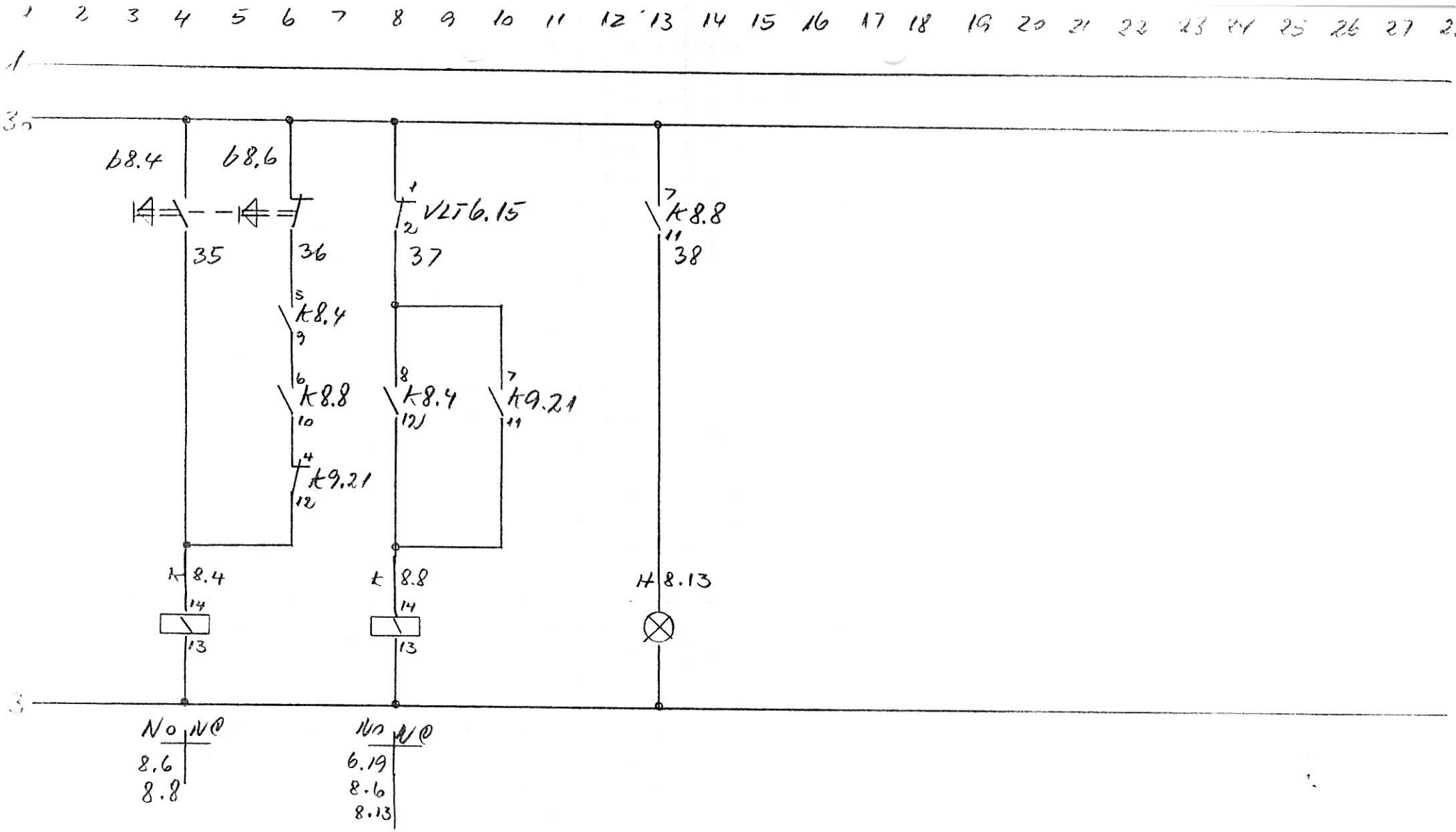
FREEZER 2



O.R.VALVE

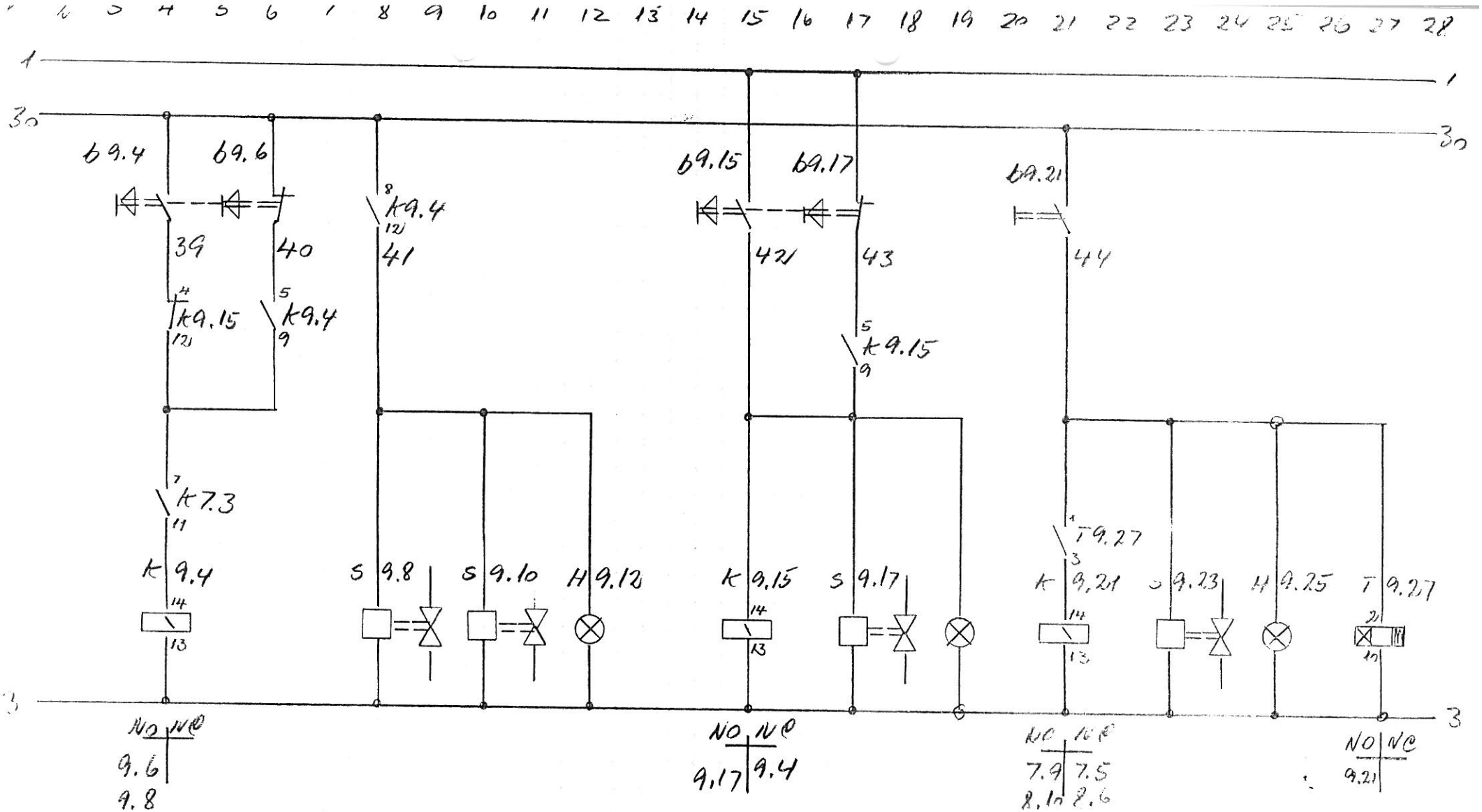
MAIN MOTOR

FREEZER 2



GEAR

FREEZER 2



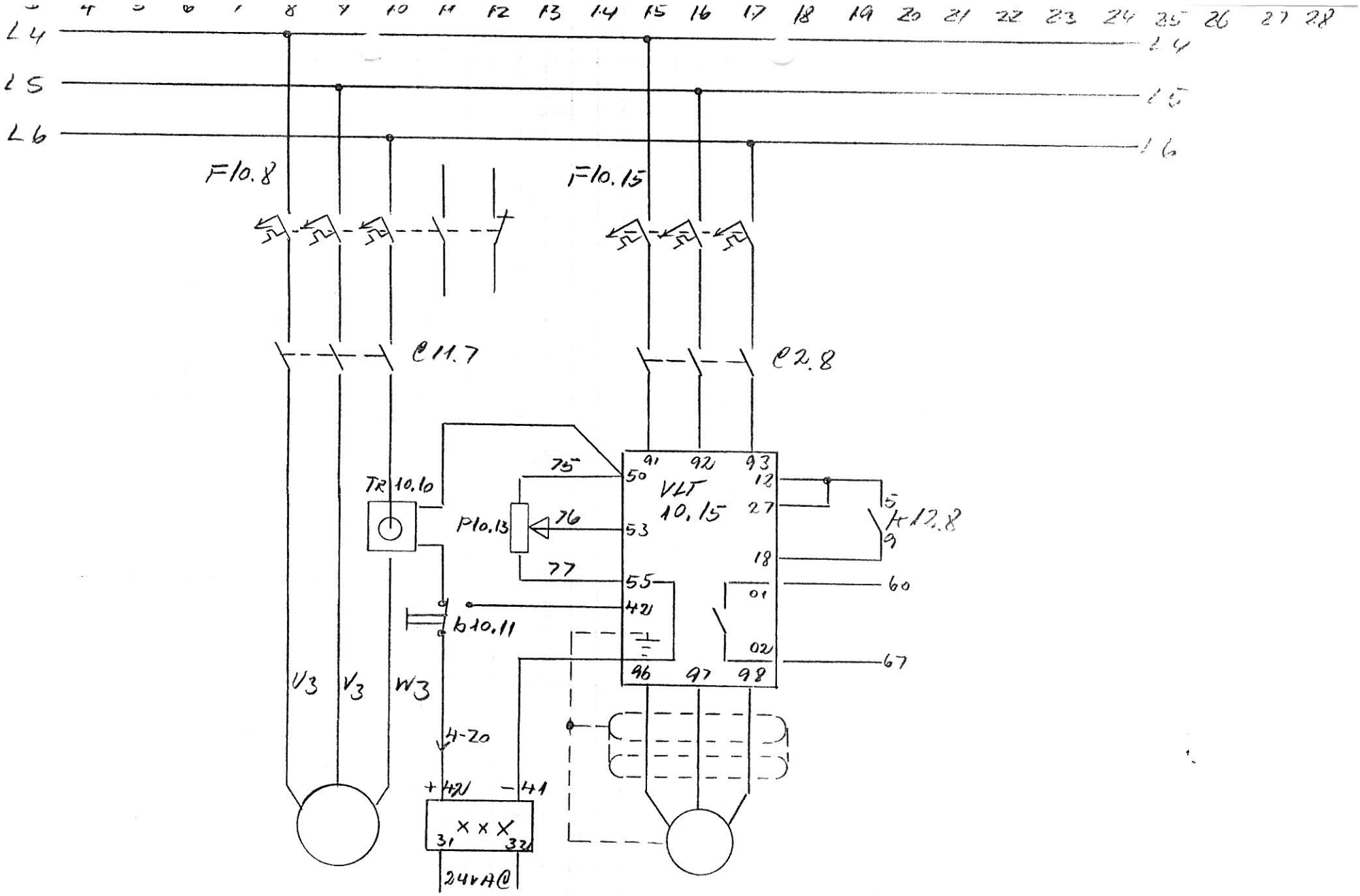
PILOT VALVE FOR MAIN VALVE

LIQUID VALVE

HOT GAS VALVE

CIP

FREEZER 2

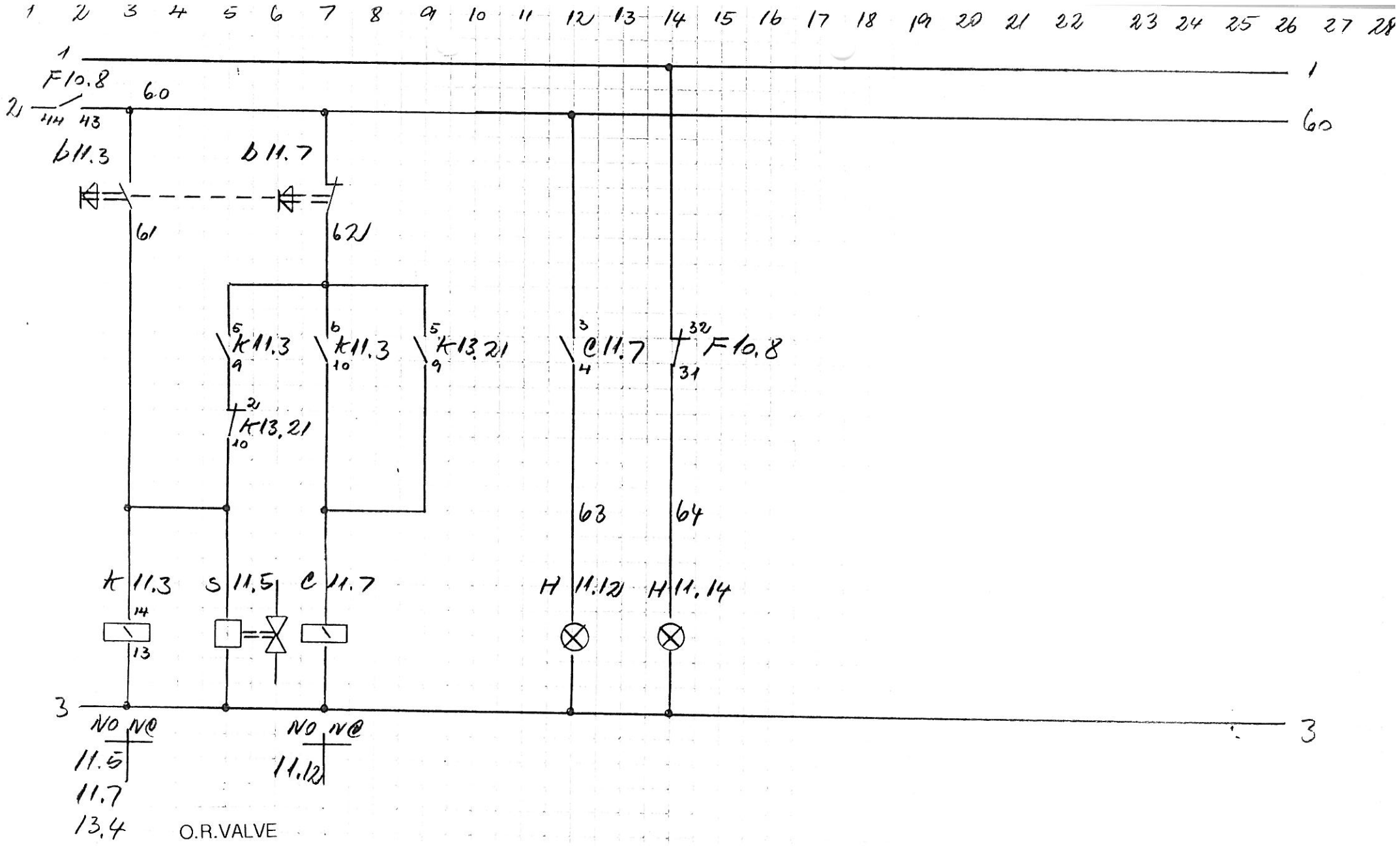


MAIN MOTOR3

DISPLAY
4–20MA=0–50.0

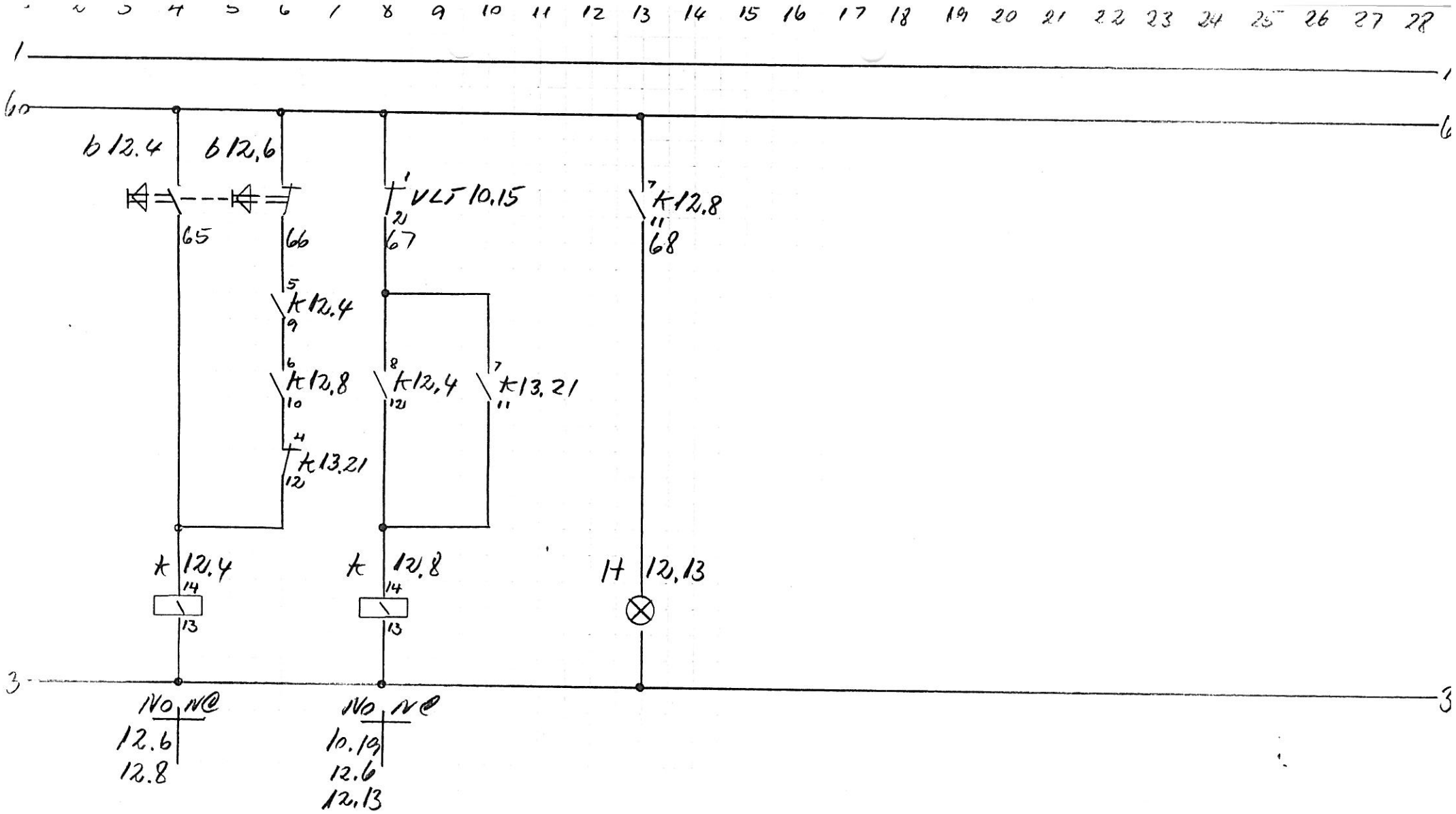
GEAR

FREEZER 3



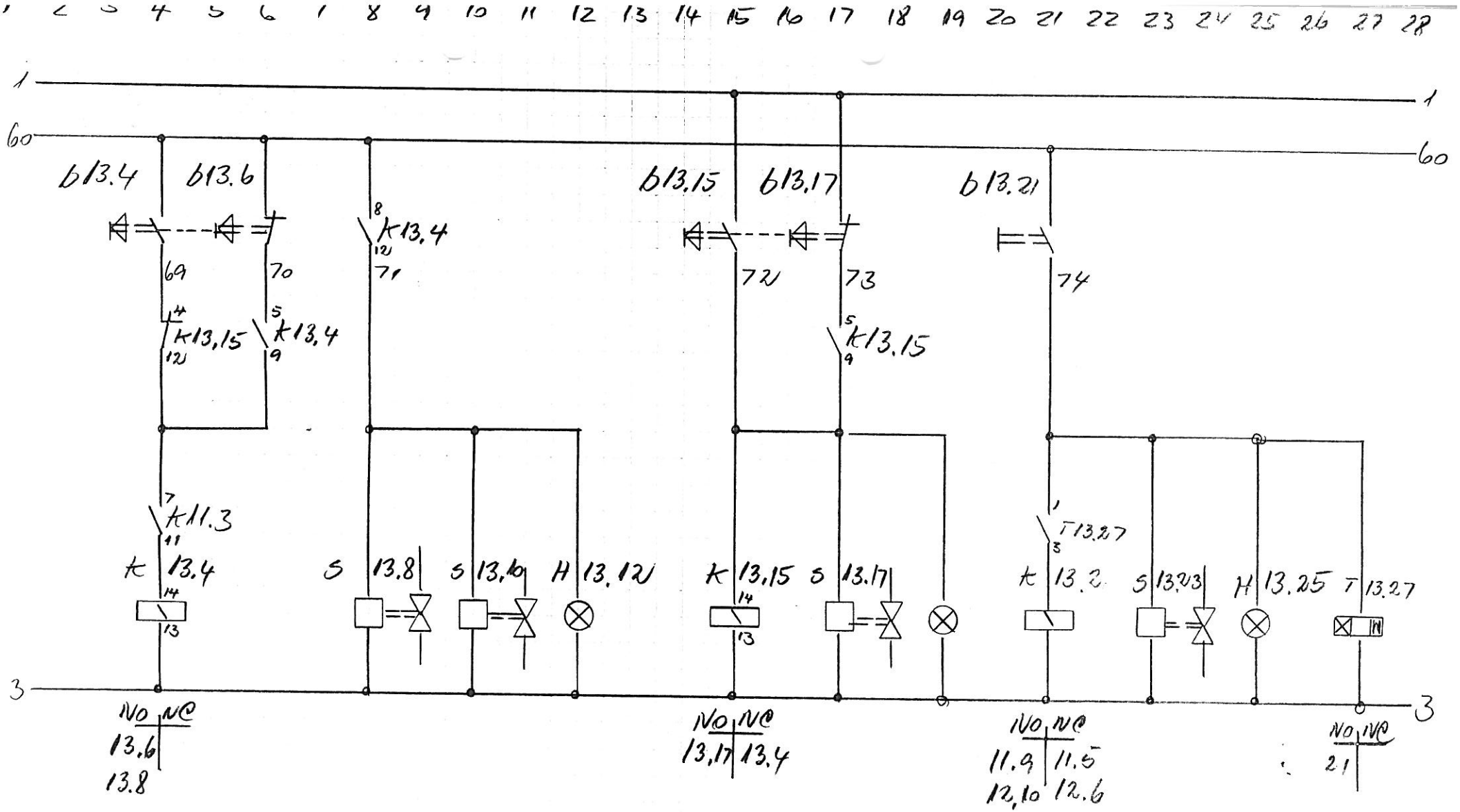
MAIN MOTOR

FREEZER 3



GEAR

FREEZER 3



PILOT VALVE FOR MAIN VALVE

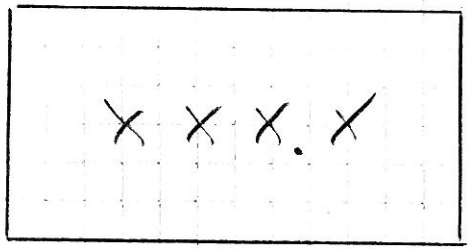
LIQUID VALVE

HOT GAS VALVE

CIP

FREEZER 3

SPEED/AMP



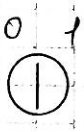
MAIN MOTOR

GEAR

FREEZING

HOT GAS

EMG.STOP



SPEED

SPEED AMP

CIP

RESET/LAMP