4 3 2 1

FRECH

ELECTRICAL EQUIPMENT

Gruppenlisten-Nr.: 8.550.042.92

Ident. Nr.

Zeichnungs-Nr.:

Ident. Nr.

Blatt-Z.	4	Serien-Nr.:	1093
Blatt-Nr.	1	Typen-Nr.:	DAK h 100
		Masch.-Nr.:	371 101
		Montagestufe:	

Stückzahl:

	Datum	Name
1979		
Geschr.	13.11.	St.
Geprüft		
Normgepr.		

Nr.	AM-Nr	Dat./N.	Nr.	AM-Nr	Dat./N.	Nr.	AM-Nr.	Dat./N.

	Varianten Stückz.	Benennung	Pos.	Ident. Nr. Sach. Nr.	PZ	W/Md.-ID. W./Md.-S.Nr.	Nr. Pz	Abm. Zchng. DIN-Nr.	W N
1		main circuit diagram	1					8.300.000.74	
2		circuit diagram	2					8.300.772.74	
3		circuit diagram	3.					8.300.773.74	
4		circuit diagram	4					8.300.633.74	
5		circuit diagram	5					8.300.774.74	
6		circuit diagram	6					8.300.881.74	
7		U 1 DVP	7					8.300.882.74	
8		U 2 EP	8					8.300.883.74	
9		U 3 EP	9					8.300.884.74	
10		U 4 die closing	10					8.300.885.74	
11		U 4 low pressure closing	11					8.300.780.74	
12		U 5 safety die closing	12					8.300.886.74	
13		U 5 die opening	13					8.300.887.74	
14		U 6 safety cover closing	14					8.300.888.74	
15		U 6 safety cover opening	15					8.300.889.74	
16		U 7 press I	16					8.300.890.74	
17		U 7 press II	17					8.300.891.74	
18		U 8 multistorage	18					8.300.892.74	
19		U 8 piston lubrication	19					8.300.893.74	
20		U 9 ejector backward	20					8.300.894.74	

4 3 2 1

FRECH

ELECTRICAL EQUIPMENT

Gruppenlisten-Nr.: 8.550.042.92

Ident. Nr.

Blatt-Z. 4

Blatt-Nr. 2

Serien-Nr.: 1093

Typen-Nr.: DAK h 100

Masch.-Nr.: 371 101

Montagestufe:

Stückzahl:

Zeichnungs-Nr.:

Ident. Nr.

	Datum	Name
1979		
Geschr.	13.11.	St.
Geprüft		
Normgepr.		

Nr.	AM.-Nr.	Dat./N.	Nr.	AM.-Nr.	Dat./N.	Nr.	AM.-Nr.	Dat./N.

Varianten Stückz.	Benennung	Pos.	Ident. Nr. Sach. Nr.	PZ	W/Md.-ID. W./Md.-S.Nr.	Nr Pz	Abm. Zchng. DIN-Nr.	W N
1	U 10 core puller movable forward	22					8.300.896.74	
2	U 10 core puller movable backward	23					8.300.897.74	
3	U 11 core puller firm forward	24					8.300.898.74	
4	U 11 core puller firm backward	25					8.300.899.74	
5	U 12 spraying	26					8.300.900.74	
6	U 12 blowing air	27					8.300.901.74	
7	U 13 impulse for spray- and shotcounter	28					8.300.902.74	
8	U 13 piston was in front	29					8.300.903.74	
9	U 14 press rejecting valve	30					8.300.904.74	
10	U 14 alarm control unit	31		8	300 940 7		~~8.300.905.74~~	
11	U 15 NP	32					8.300.906.74	
12	U 16 NP	33					8.300.907.74	
13	U 17 NP	34					8.300.908.74	
14	U 18 NP	35					8.300.909.74	
15	U 19 NP	36					8.300.910.74	
16	U 20 stress-time, cooling time, spray-time	37					8.300.911.74	
17	U 21 ejector time, spray time, blowing-time	38					8.300.912.74	
18	start delay time U 22 lubrication time	39		8	300 926 7		~~8.300.913.74~~	
19	U 23 DIP	40					8.300.914.74	
20	U 24 DIP	41					8.300.915.74	

4 3 2 1

FRECH

ELECTRICAL EQUIPMENT

Gruppenlisten-Nr.: 8.550.042.92

Ident. Nr.

Blatt-Z. 4

Blatt-Nr. 3

Serien-Nr.: 1093

Typen-Nr.: DAK h 100

Masch.-Nr.: 371 101

Montagestufe:

Stück-zahl:

Zeichnungs-Nr.:

Ident. Nr.

	Datum	Name
1979		
Geschr.	13.11.	St.
Geprüft		
Normgepr.		

Nr.	AM.-Nr.	Dat./N.	Nr.	AM.-Nr.	Dat./N.	Nr.	AM.-Nr.	Dat./N.

Varianten Stückz.	Benennung	Pos.	Ident. Nr. Sach. Nr.	PZ	W/Md.-ID. W./Md.-S.Nr.	Pz	Nr. Abm. Zchng. DIN-Nr.	W N
1	U 26 DIP	43					8.300.917.74	
2	U 27 DIP	44					8.300.918.74	
3	U 28 DIP	45					8.300.919.74	
4	U 29 DIP	46					8.300.920.74	
5	U 30 DIP	47					8.300.921.74	
6	suppressor	48					8.300.818.74	
7	plug connections	49					8.300.819.74	
8	valves	50					8.300.820.74	
9	valves	51					8.300.821.74	
10	limit switches	52					8.300.822.74	
11	limit switches	53					8.300.823.74	
12	control panel	54					8.300.824.74	
13	control panel	55					8.300.825.74	
14	control panel	56					8.300.826.74	
15	control panel positioning cylinder	57					8.300.669.74	
16	control panel	58					8.300.827.74	
17	instrument panel indicator lights	59					8.300.922.74	
18	instrument panel indicator lights	60					8.300.923.74	
19	instrument panel preselection	61					8.300.830.74	
20	instrument panel preselection	62					8.300.924.74	

4 3 2 1

FRECH

ELECTRICAL EQUIPMENT

Gruppenlisten-Nr.: 8.550.042.92

Blatt-Z. 4 | Blatt-Nr. 4

Serien-Nr.: 1093
Typen-Nr.: DAK h 100
Masch.-Nr.: 371 101
Montagestufe:

Stück-zahl:

Ident. Nr.

Zeichnungs-Nr.:

Ident. Nr.

	Datum	Name
1979		
Geschr.	13.11.	St.
Geprüft		
Normgepr.		

Nr.	AM.-Nr.	Dat./N.	Nr.	AM.-Nr	Dat./N.	Nr.	AM.-Nr.	Dat./N.

	Varianten Stückz.	Benennung	Pos.	Ident. Nr. Sach. Nr.	PZ	W/Md.-ID. W./Md.-S.Nr.	Nr. Pz	Abm. Zchng. DIN-Nr.	W N
1		arrangement of plug on the switch cabinet	64					8.300.835.74	
2		plug st1/st2, 75 pole	65					8.300.836.74	
3		socket st3, 16 pole	66					8.300.587.74	
4		socket st40,41,42,43	67					8.300.837.74	
5		socket st44,45,46,47	68					8.300.838.74	
6		socket st48	69					8.300.839.74	
7		socket st9,10,11,12	70					8.300.938.74	
8		socket st13,14,15	71					8.300.944.74	
9		U31 ZP3 supervisiontime	72					8 300 941 74	
10		balance FW5	73					8 101 313 73	
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

4 3 2 1

FRECH

ELECTRICAL EQUIPMENT

Gruppenlisten-Nr.: 8.550.041.92

Ident. Nr.

Serien-Nr.: 1093

Typen-Nr.: ASE for DAK h

Masch.-Nr.: 371 101

Montagestufe:

Stück-zahl:

Zeichnungs-Nr.:

Ident. Nr.

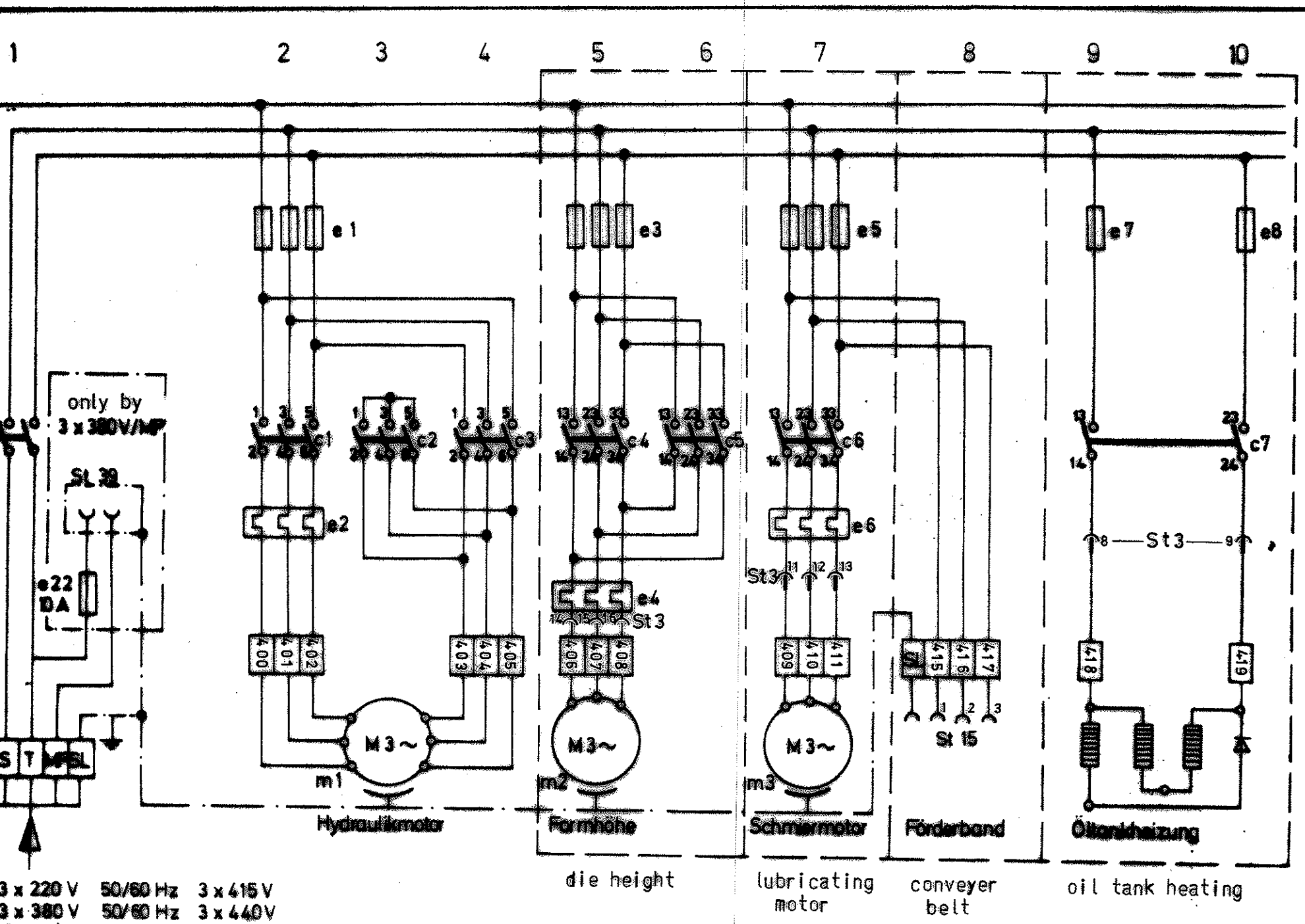
Blatt-Z. 1

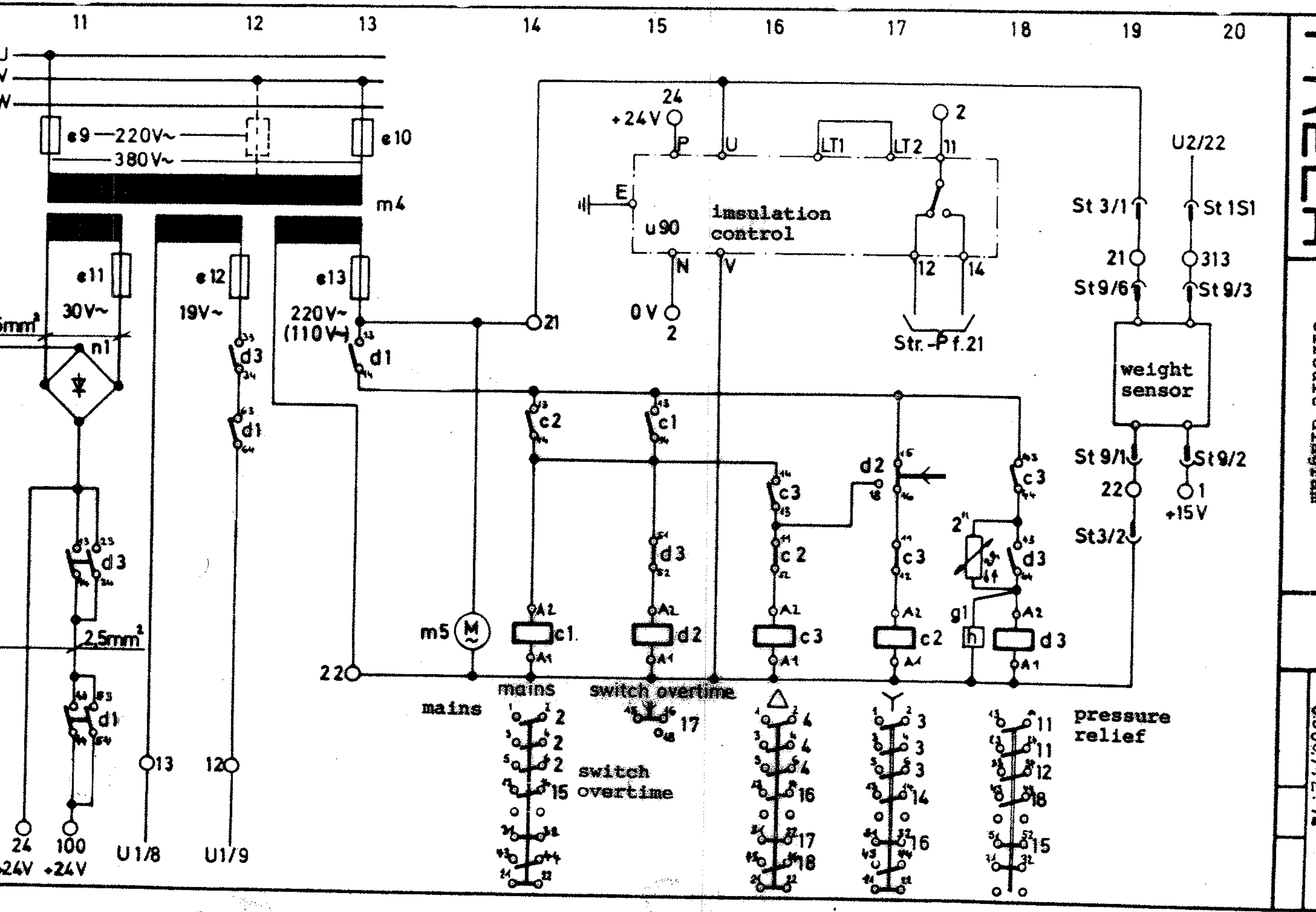
Blatt-Nr. 1

	Datum	Name
Geschr.		
Geprüft		
Normgepr.		

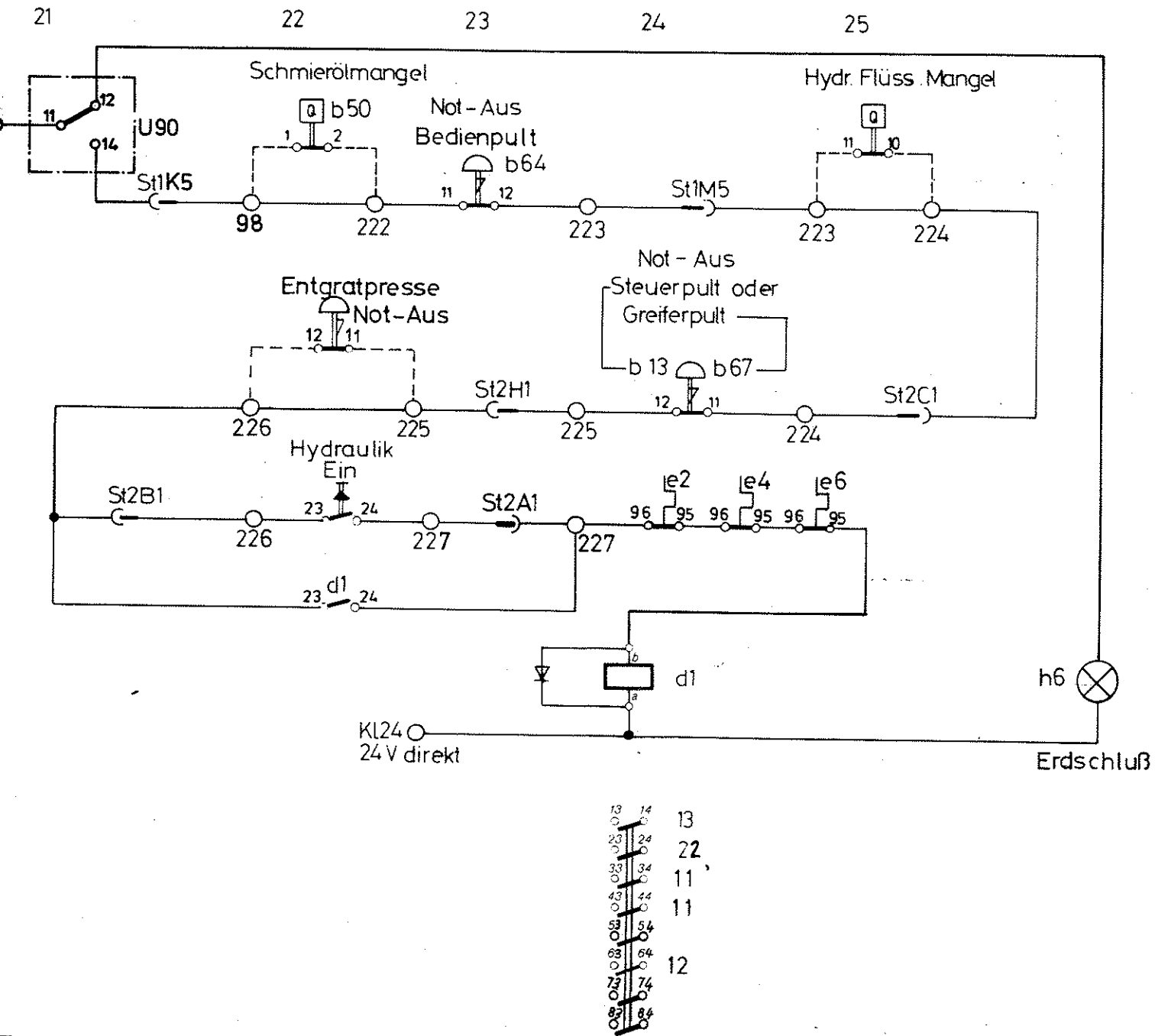
Nr.	AM.-Nr	Dat./N.	Nr.	AM.-Nr	Dat./N.	Nr.	AM.-Nr	Dat./N.

	Varianten Stückz.	Benennung	Pos.	Ident. Nr. Sach. Nr.	PZ	W./Md.-ID. W./Md.-SNr.	Nr. Pz	Abm. Zchng. DIN-Nr.	M N
1		U40 EP	1					8.300.927.74	
2		U41 ladle device forward	2					8.300.928.74	
3		U41 ladle device backward	3					8.300.929.74	
4		U42 ladle device quick	4					8.300.930.74	
5		U42 ladle device tilt	5					8.300.931.74	
6		U43 NP	6					8.300.932.74	
7		U44 immersion time, tilt.-time, waiting time	7					8.300.933.74	
8		U45 DIP	8					8.300.934.74	
9		control panel	9					8.300.935.74	
10		limit switches	10					8.300.936.74	
11		valves	11					8.300.937.74	
12									
13									
14									
15									
16									
17									
18									
19									
20									


1
2
3
4
5
6
7
8
9
10
only by
3 x 380V/MP
St 38
e22
10A
e1
e2
e3
e4
e5
e6
e7
e8
c1
c2
c3
c4
c5
c6
c7
St3
St 15
M3~
m1
m2
m3
Hydraulikmotor
Formhöhe
Schmiermotor
Förderband
Öltankheizung
die height
lubricating motor
conveyer belt
oil tank heating
3 x 220 V 50/60 Hz 3 x 415 V
3 x 380 V 50/60 Hz 3 x 440 V
FRECH
main circuit diagram
DAKh
9.10.78
8.300.000.74



11
12
13
14
15
16
17
18
19
20
U
V
W
e9
220V~
380V~
e10
m4
e11
30V~
n1
e12
19V~
e13
220V~
(110V~)
d1
d3
2,5mm²
13
12
24
100
+24V
U1/8
U1/9
21
22
m5
M
c1
c2
d2
c3
d3
g1
h
+24V
24
P
U
LT1
LT2
11
2
E
u90
insulation
control
N
V
12
14
0V
2
Str.-Pf.21
U2/22
St 3/1
St 1S1
21
313
St9/6
St9/3
weight
sensor
St 9/1
St9/2
22
1
+15V
St3/2
mains
switch overtime
pressure
relief



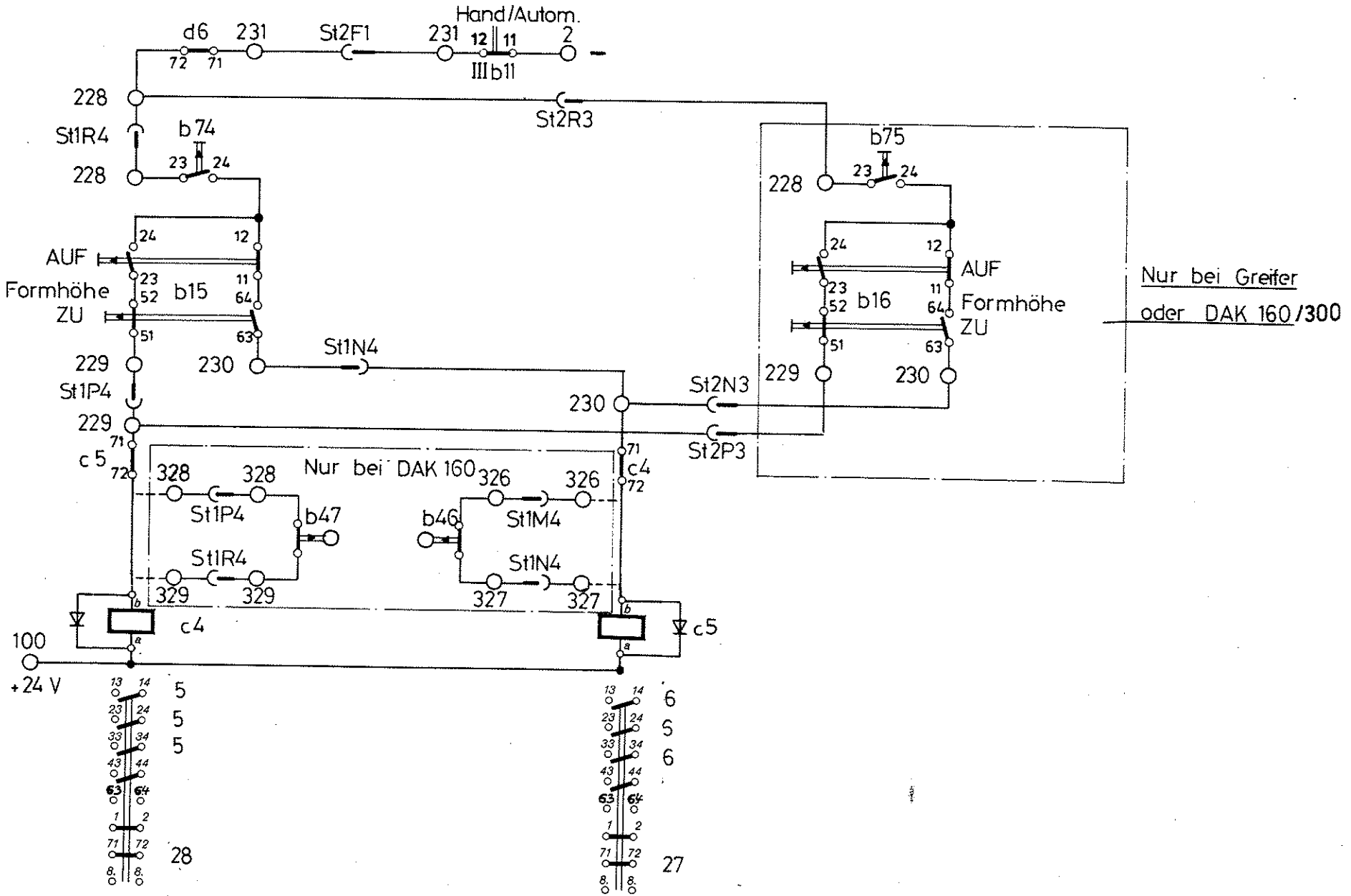
FRECH

Stromlaufplan

DAKh

30.10.78

8.300.773.74



FRECH

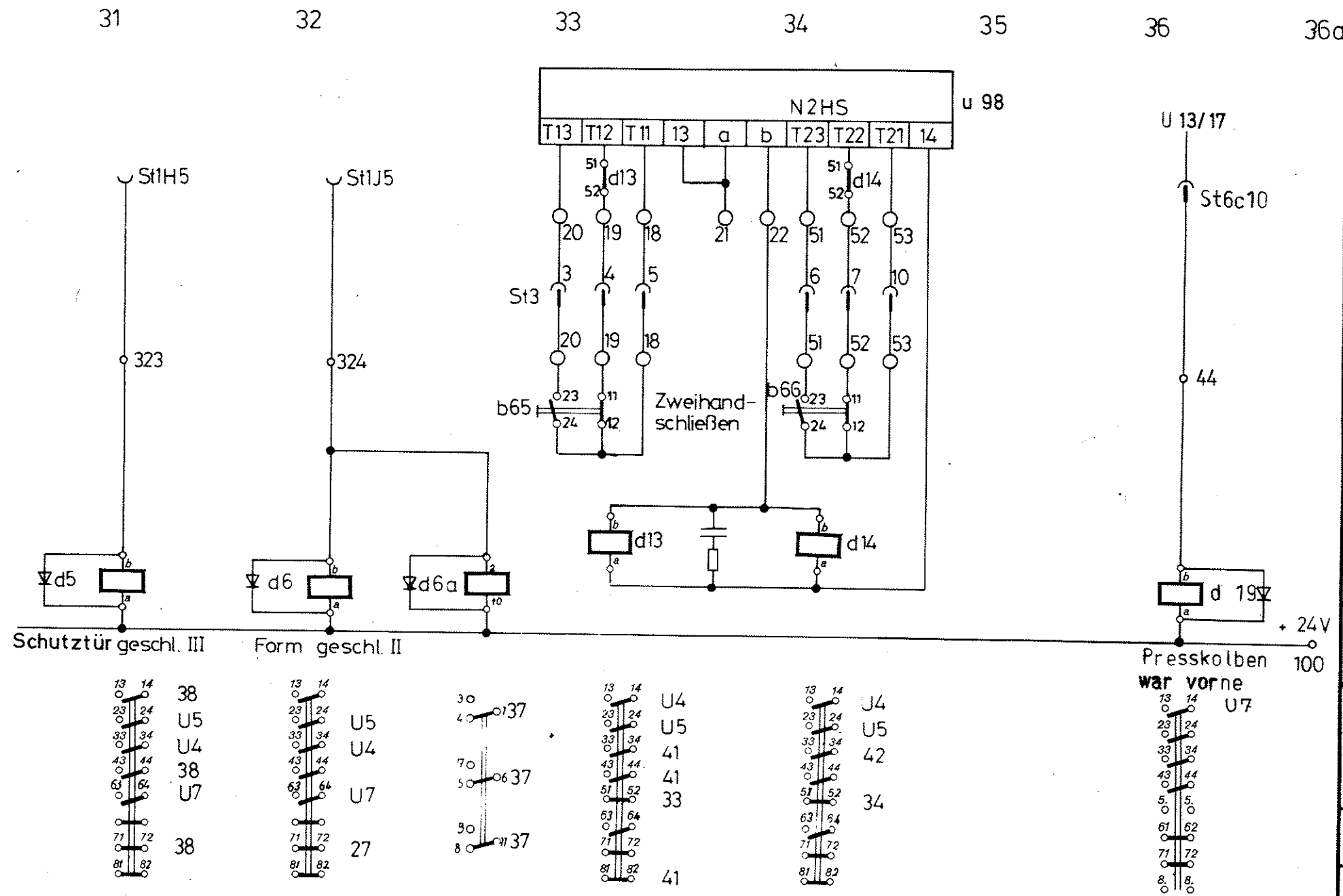
Formhöhenverstellung

DAKh

10.11.76

St.

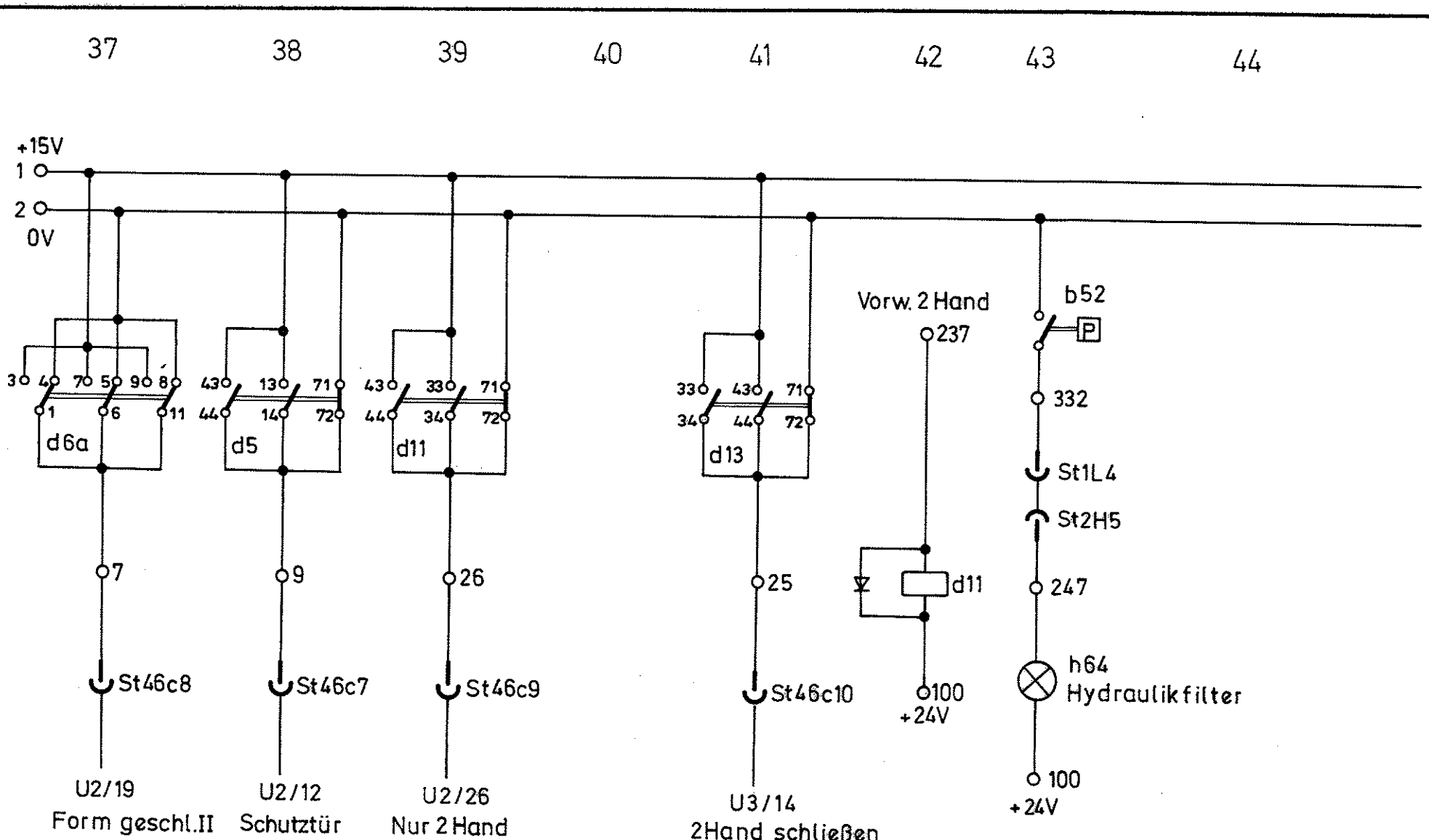
8.300.633.74



FRECH

8.300.774.74

31.10.78



FRECH

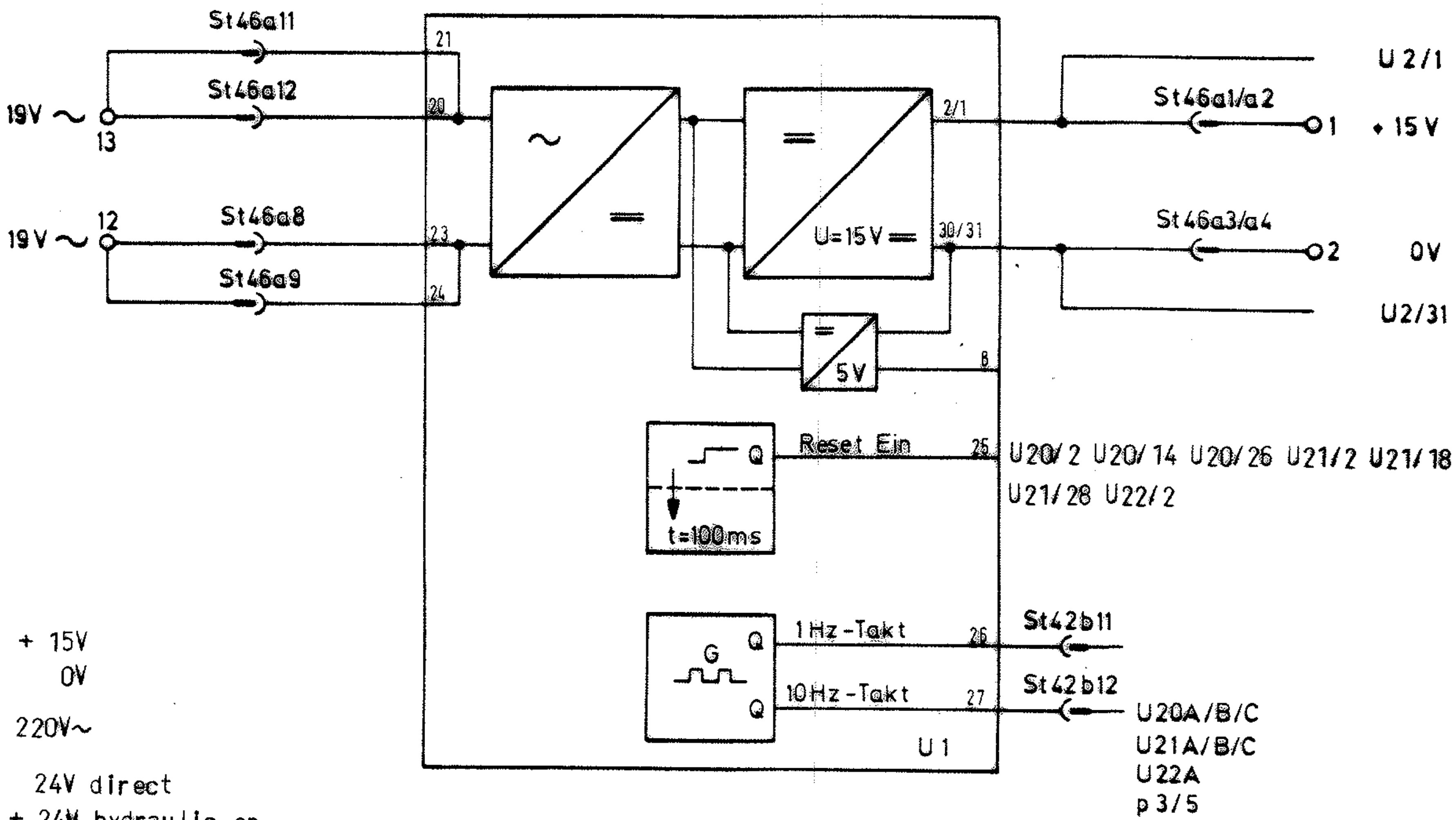
Stromlaufplan

DAKh

01.08.1978

Pr

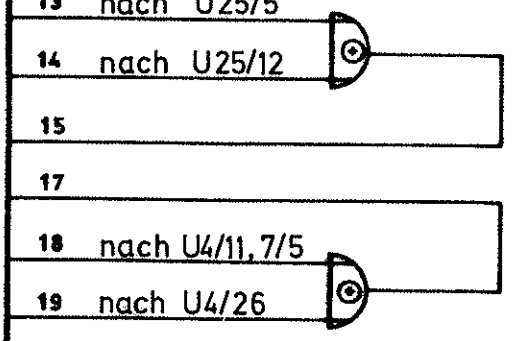
8.300.881.74



.1 + 15V
.2 0V
.21 } 220V~
.22
.24 24V direct
.100 + 24V hydraulic on
.101-199 valves
.200-299 push button
.300-399 limit switches

FRECH | DVP | 3 300 382 74 | 7 6 79 | U1

von	St40b3 u. St43b2	Form offen	2	nach U5/20,7/11,9/5
von	St40a12 u. St43b3	Preßkolben hinten	3	nach U8/8,25/19,25/31
			4	
von	St43a2	Schutzleiste	5	nach U6/6,15/10,17/2
von	St43a3	Kernzug I bew. vorne	6	nach St41b7
von	St43a4	Kernzug I bew. hinten	7	nach St41 b 6
von	St43a5	Kernzug I fest vorne	8	nach St41 b12
von	St43a6	Kernzug I fest hinten	9	nach St41b 11
von	St43a7	Auswerfer vorne	10	nach St41c2 u. St48a5
von	St43a8	Auswerfer hinten	11	nach St41c4 u. St48a6
von	St46c7	Schutztür geschl. III	12	nach U24/2,25/2
von	St43a10 u. St40a2	Schutztür geschl. I	13	nach U25/5
von	St43a11 u. St42a12	Schutztür geschl. II	14	nach U25/12
nach	U29/8	(Schutztür)	15	
nach	U23/13,29/9	(Form)	17	
von	St43a12 u. St40a8	Form geschl. I	18	nach U4/11,7/5
von	St46c8 u. St42a11	Form geschl. II	19	nach U4/26
von	St43a9	Niederdruck	20	nach U4/24
von	St43a13 u. St40a3	Impuls Waage	21	nach U13/6
von	St45b7	Hand	22	nach St48a8,5/4,8/21
von	St45b8	Automatik	23	nach St48a9,6/20,8/26
von	St45b2	Grundstellung	24	nach St48a10
von	St45b6	Start-Taste	25	nach U5/2,28/2
von	St46c9	nur 2 Hand	26	nach U24/3,25/3,25/6
von	St45a9	Form schließen v. H.	27	nach U25/8
von	St45a10	Form öffnen v. H.	28	nach U26/3
von	St45b5	Pressen II	29	nach U24/11,26/5
von	St43b4	2.Phase Endschalter	30	nach U24/27
		+ 15V	1	
		0V	31	



St45a1	open safety cover manual	2 to U6/22
St45a2	close safety cover manual	3 to U25/11 U30/12
St45a8	ejector forward manual	4 to U27/2
St45a7	ejector backward manual	5 to U26/29
St45a4	core puller movable forward manual	6 to U26/11
St45a3	core puller movable backward manual	7 to U28/5
St45a6	core puller firm forward manual	8 to U24/6
St45a5	core puller firm backward manual	9 to U28/15
St45b3	die spray manual	10 to U29/2
St48a1	gripper ok	11 to U6/9, U25/23, U28/20, U29/24
St48a7	with gripper (connection 1 from St2)	12 to U5/19
St43b1	safety cover opened for gripper	13 to U9/3, U25/16
St46c10	2 handed closing	14 U25/28
		15
		17
St43b6	preselection core puller mov. (plug)	18 to U10/25, U15/2, U27/21
St43b7	preselection core puller firm (plug)	19 to U11/9 . . . .
St43b5	preselection ejector (plug)	20 to U15/17
St41c6	preselection ejector repeating	21 to U19/28
St41c7	preselection die spray without counter	22 to U29/13
St41c8	preselection die spray with ejector	23 to U17/17
St41c9	preselection die spray after ejector	24 to U17/12
St41c10	die spray counter	25 to U12/6
St41b1	preselection safety cover	26 to U6/19
St41b2	preselection repeater	27 to U16/19
St41c5	preselection ejector	28 to U9/20, U16/27, U30/31
St45b9	piston (press I)	29 to U7/12
St43b13	press III	30 to U24/13
	+15V	1
	0V	31

U19/6 $\overline{\text{Öffnen Ventil}}$

U2/18 Form geschlossen I

U4/14 Schließen Ventil
U3/11 Greifer ok
U10/11 Kernzug bew. I vorne
St41c3 Auswerfer hinten
U18/11 Ausblase oben

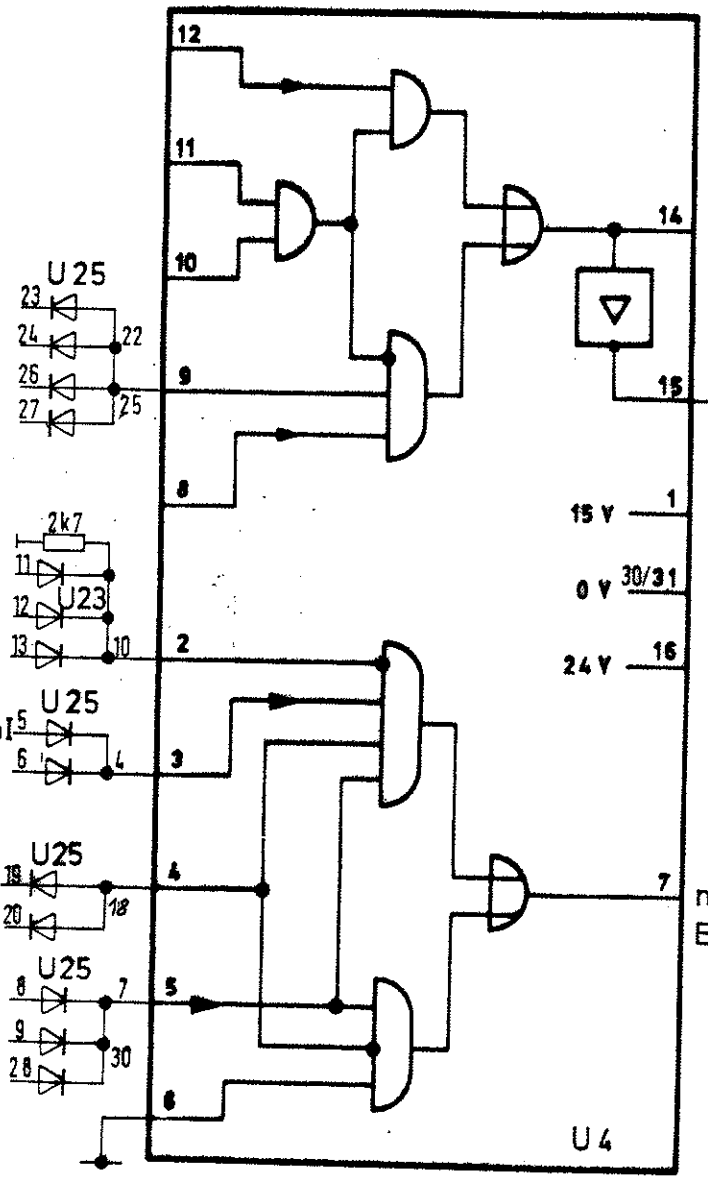
U4/7 Bedingung schließen

U23/22 $\overline{\text{Ausblase oben}}$
U9/29 Auswerfer vor Ventil
U2/17 (Form)

U2/13 Schutztür geschlossen I
U2/26 Nur Zweihand Vorwahl

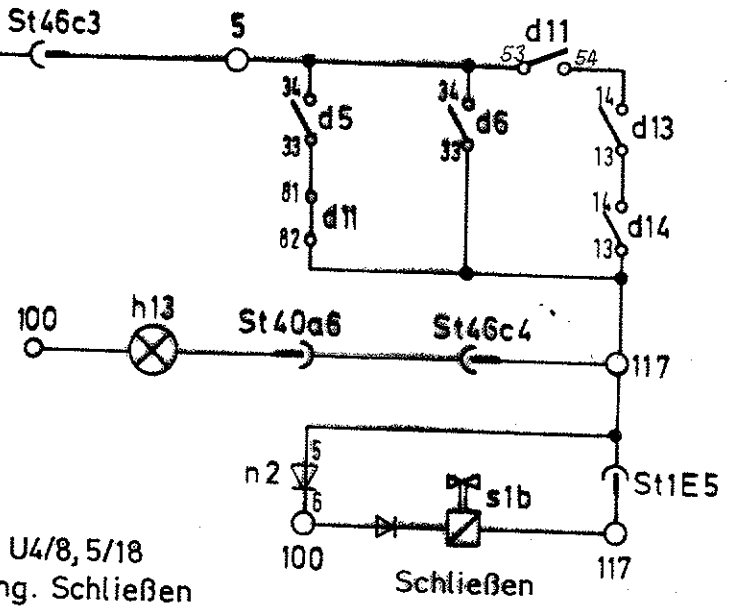
U2/3 Preßkolben hinten
St41b10 Kernzug fest I hinten

U2/27 Schließen
U17/23 Start Automatik
U3/14 2 Hand Schließen
U4/31



nach U4/10, 4/25, 5/11, 16/13, 28/31
Schliessen Ventil

nach U4/8, 5/18
Beding. Schließen



FRECH Schliessen FP11 8 300 885 74 7. 6. 79 Mark U4

U 2/19 Form geschlossen II

U4/14 Schliessen Ventil

U2/20 langsam schliessen

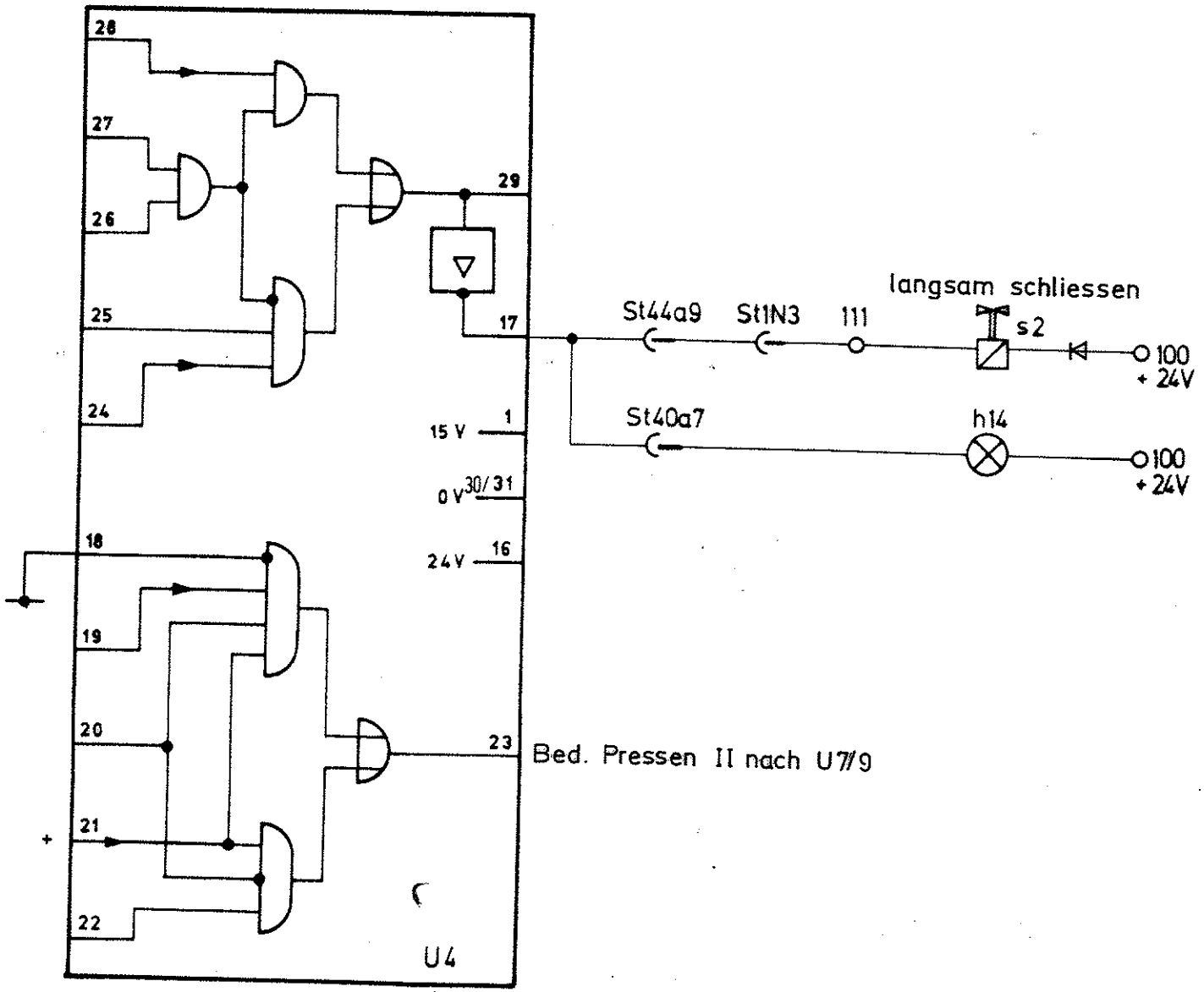
U4/31

U18/23 Bedingung Pressen III

U7/23 Pressen

U4/1

U7/14 Pressen I Ventil



FRECH

Langsam schliessen

FP1.2

8. 300. 780. 74

11. 7. 79

U 4

St41c3 Auswerfer hinten

U4/14 Schliessen Ventil

U18/11 Ausblase oben

U2/25 Start Taste

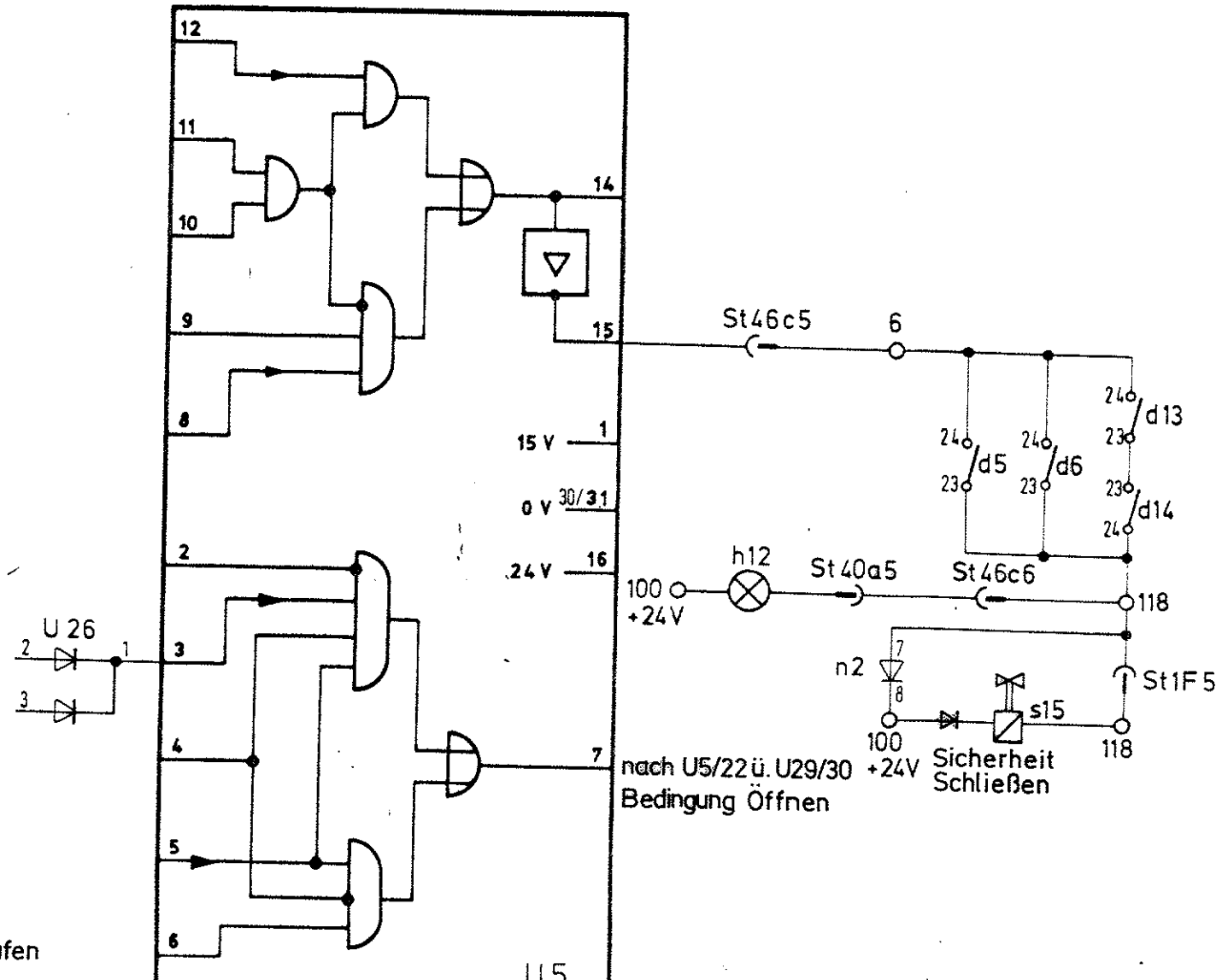
U17/7 Grundst. Funktion

U2/28 Öffnen

U2/22 Hand

U18/11 Ausblase oben

U17/22 Abkühlzeit abgelaufen



FRECH

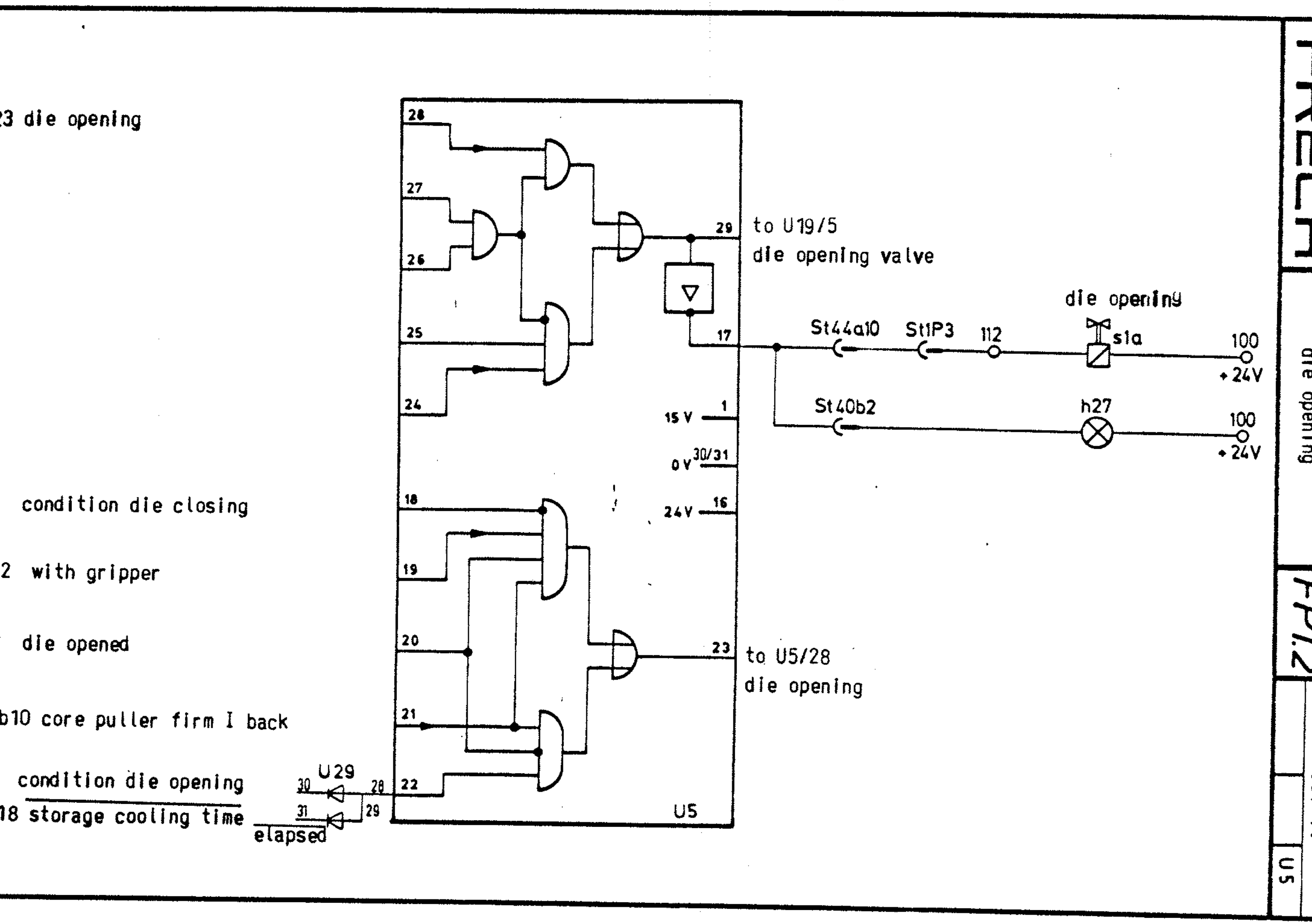
Sicherheit Schließen
Bedingung Öffnen

FP1.1

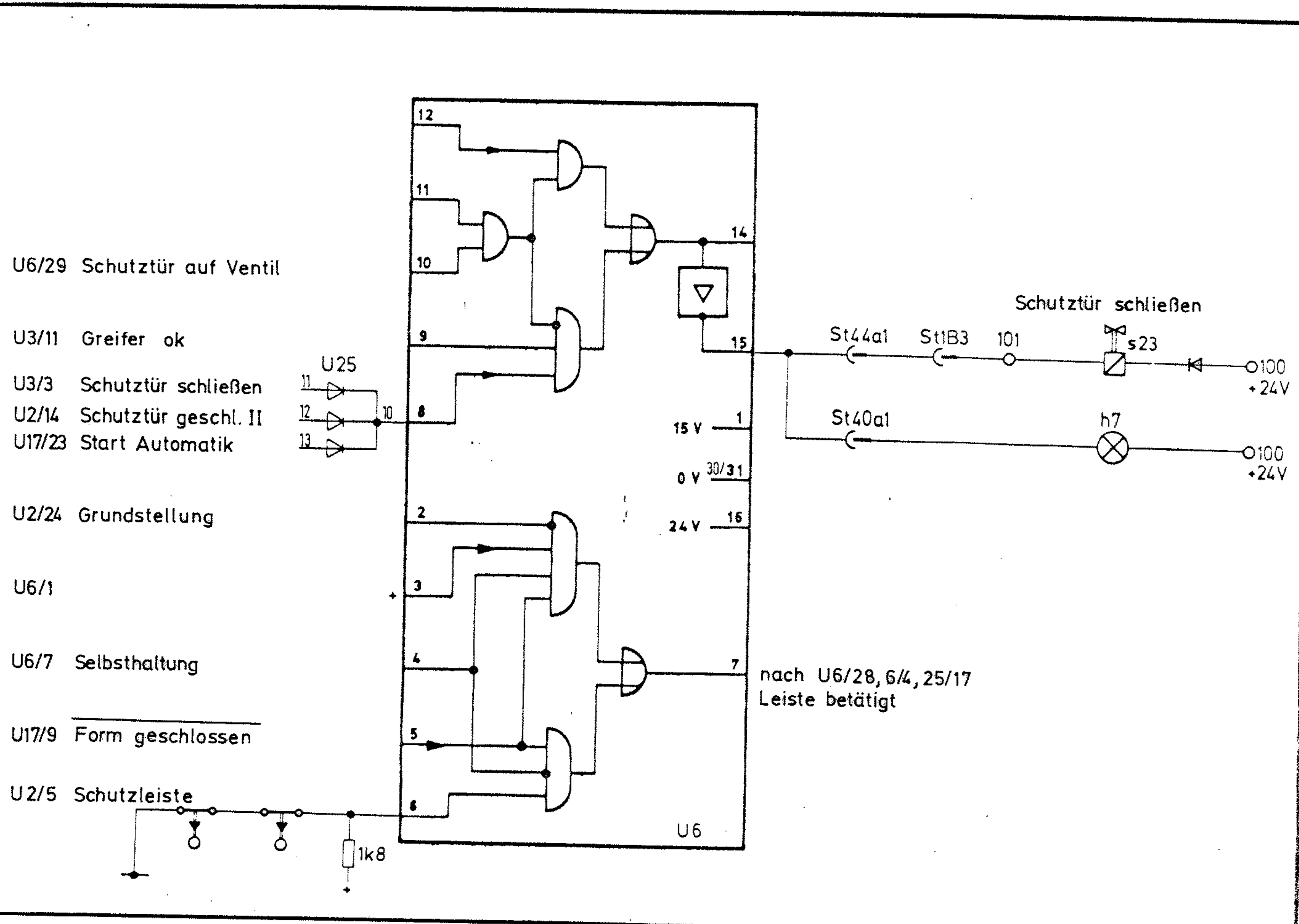
8 300 886 74

7. 6. 79

U5



FRECH
die opening
FP1.2
U5
23 die opening
condition die closing
2 with gripper
die opened
b10 core puller firm I back
condition die opening
18 storage cooling time
elapsed
U29
to U19/5
die opening valve
to U5/28
die opening
St44a10
St1P3
112
die opening
s1a
100
+24V
St40b2
h27
15 V
0 V
24 V
30/31



Leiste betätigt

FP1.1

9. 7. 79

U6

U6/7 Leiste betätigt

U18/4 Form geschl.I u. Nachdruckzeit abgelaufen

U17/23 Start Automatik

U3/3 Haube schliessen

U6/23 Bed. Schutztür auf

U3/13 Schutztür offen

U6/7 Leiste betätigt

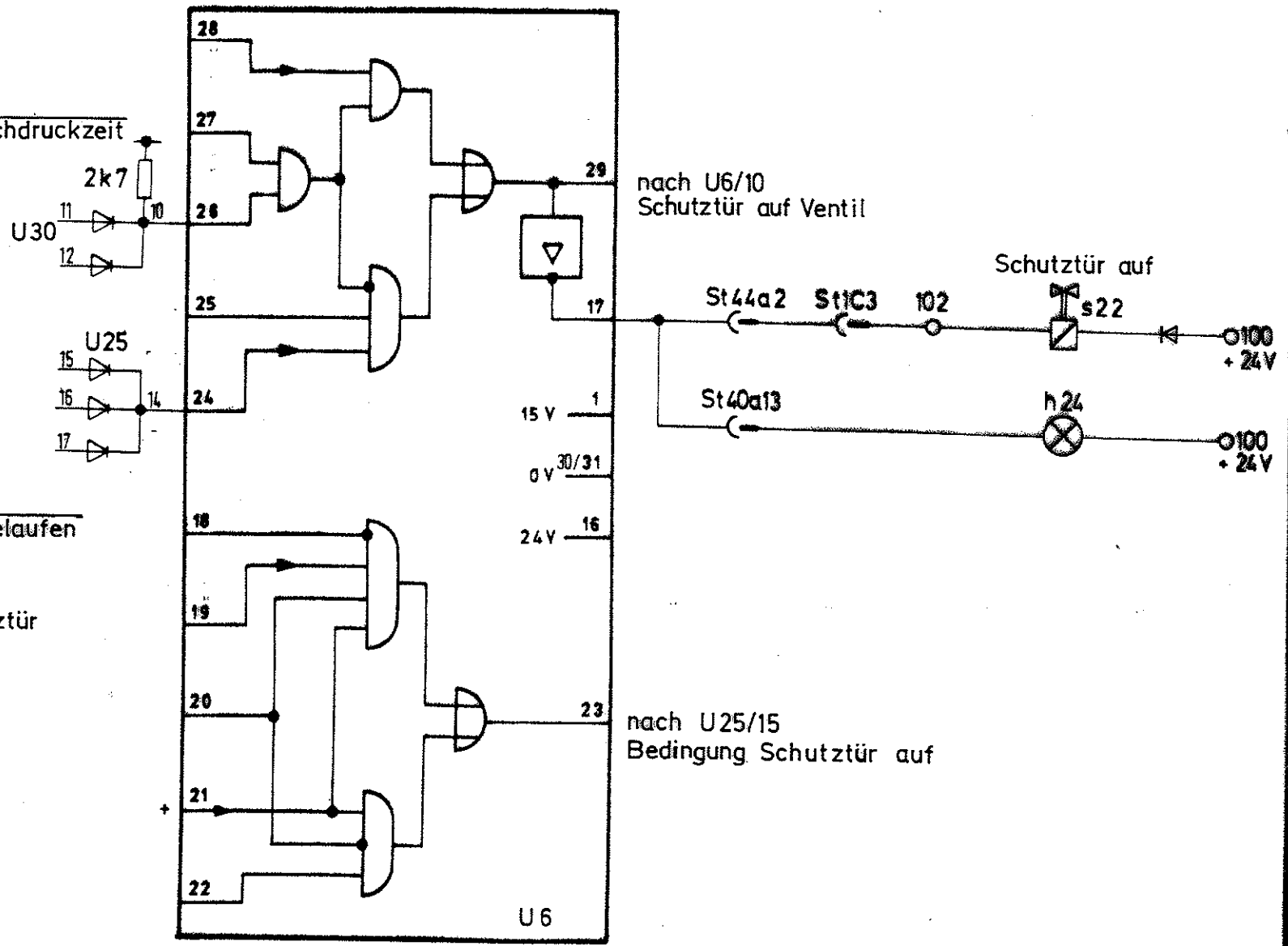
U16/9 Nachdruckzeit abgelaufen

U3/26 Vorwahl mit Schutztür

U2/23 Automatik

U6/1

U3/2 Schutztür auf v. H.



FRECH

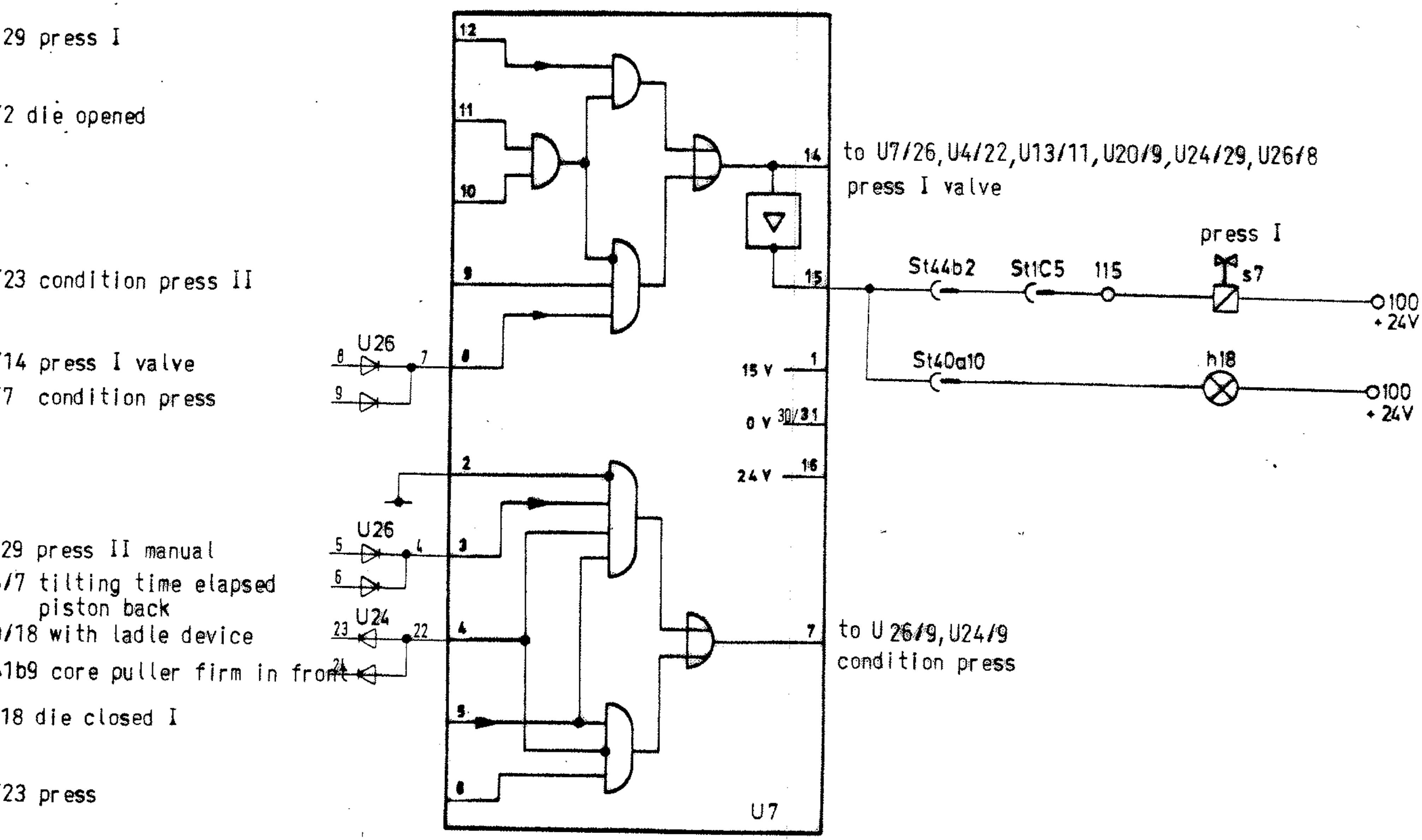
Schutztür auf

FP12

8 300 899 74

9. 7. 79

U6



FRECH
press I
FP1.1
U7

U4/23 Bed. Pressen II

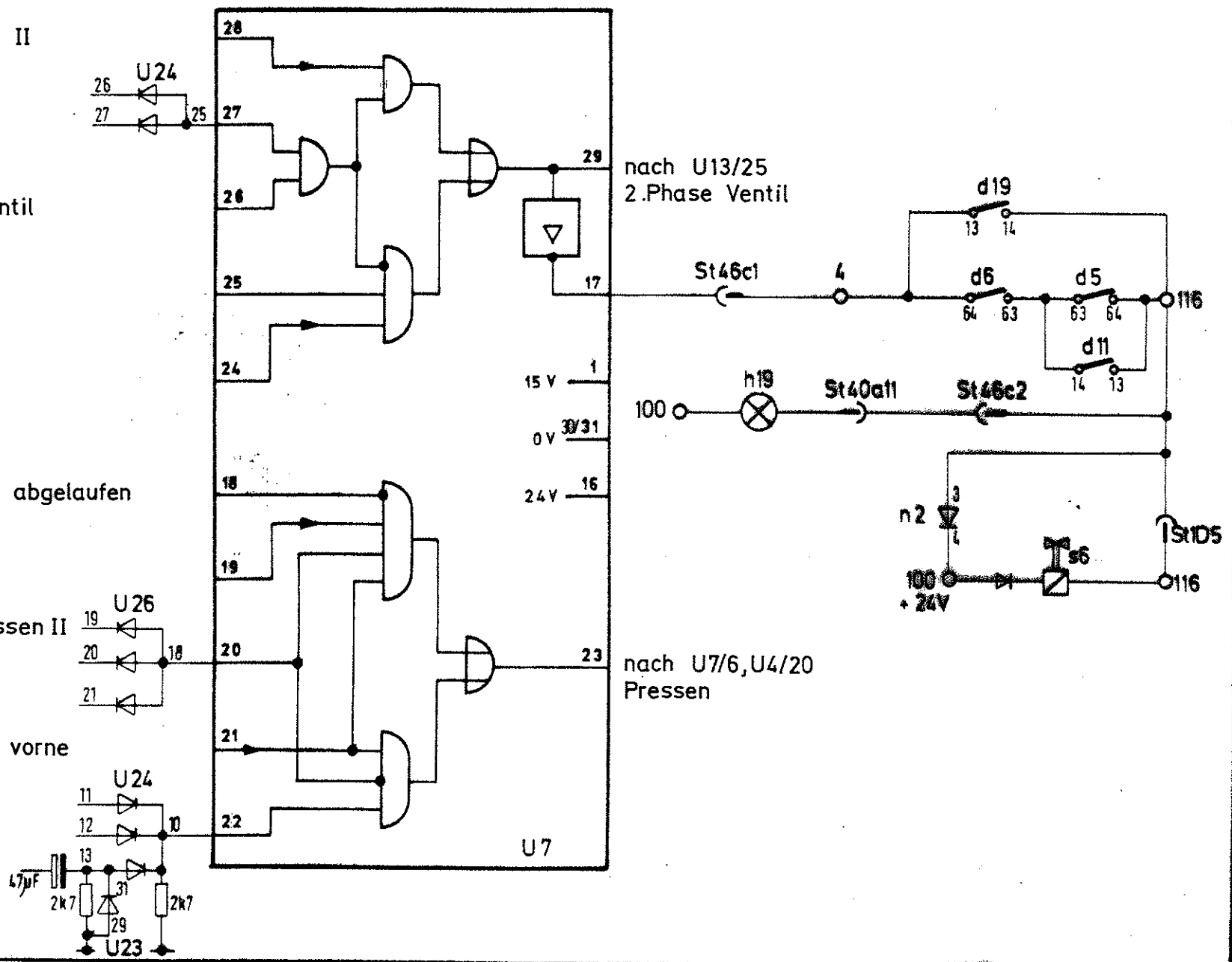
U19/4 Form offen
U2/30 2. Phase

U7/14 Pressen I Ventil

U16/8 Nachdruckzeit abgelaufen

U15/9 Schutzleiste
U2/19 Form geschlossen II
U2/23 Automatik
U7/23 Selbsthaltung
St41b9 Kernzug fest vorne

U2/29 Pressen II
U16/7
U3/30 Pressen III



FRECH

Pressen 2. Phase

FP1.2

11. 7. 79

8 300 691 74

U7

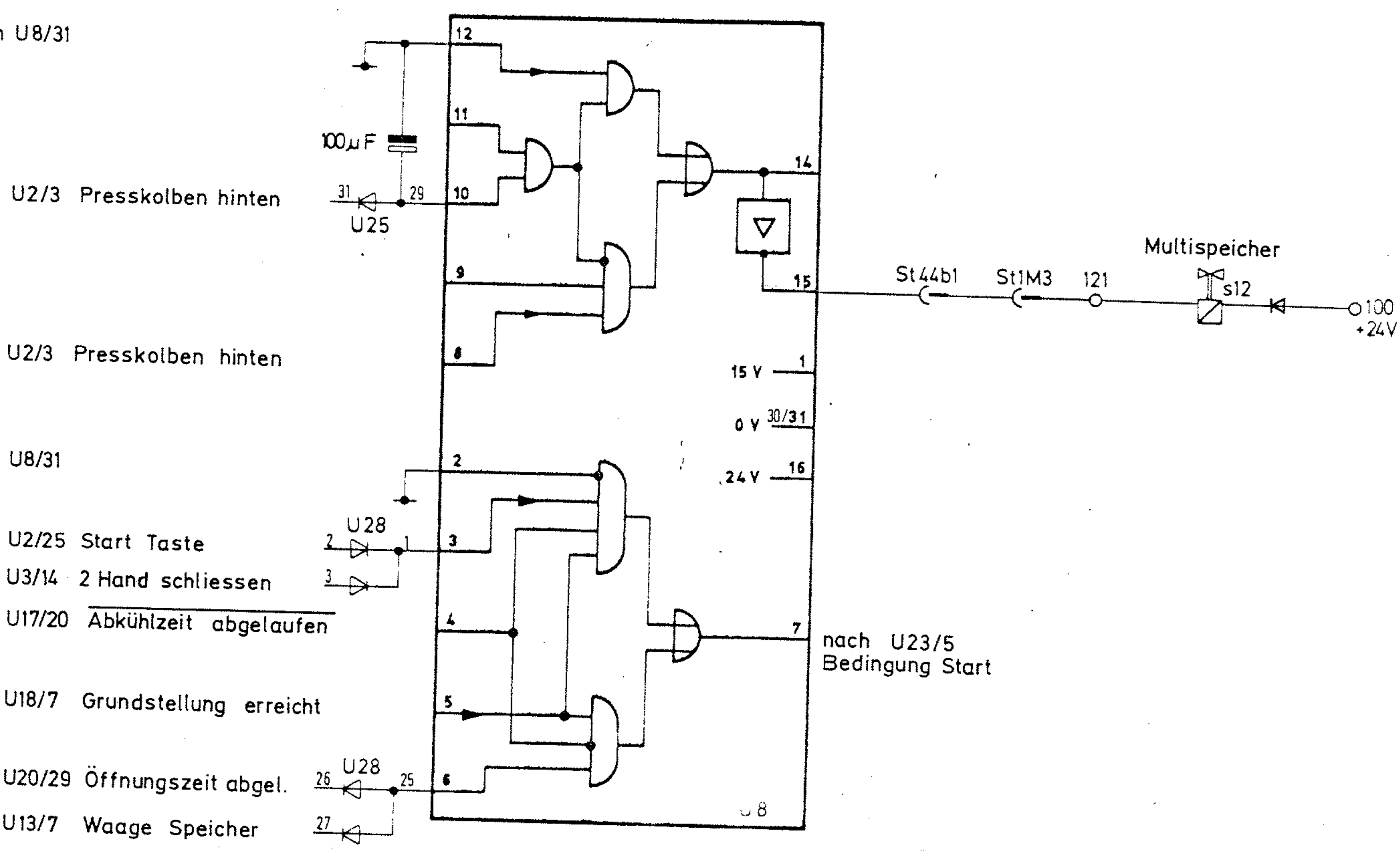
Multispeicher

FP1.1

8 300 892 74

11. 7. 79

U8



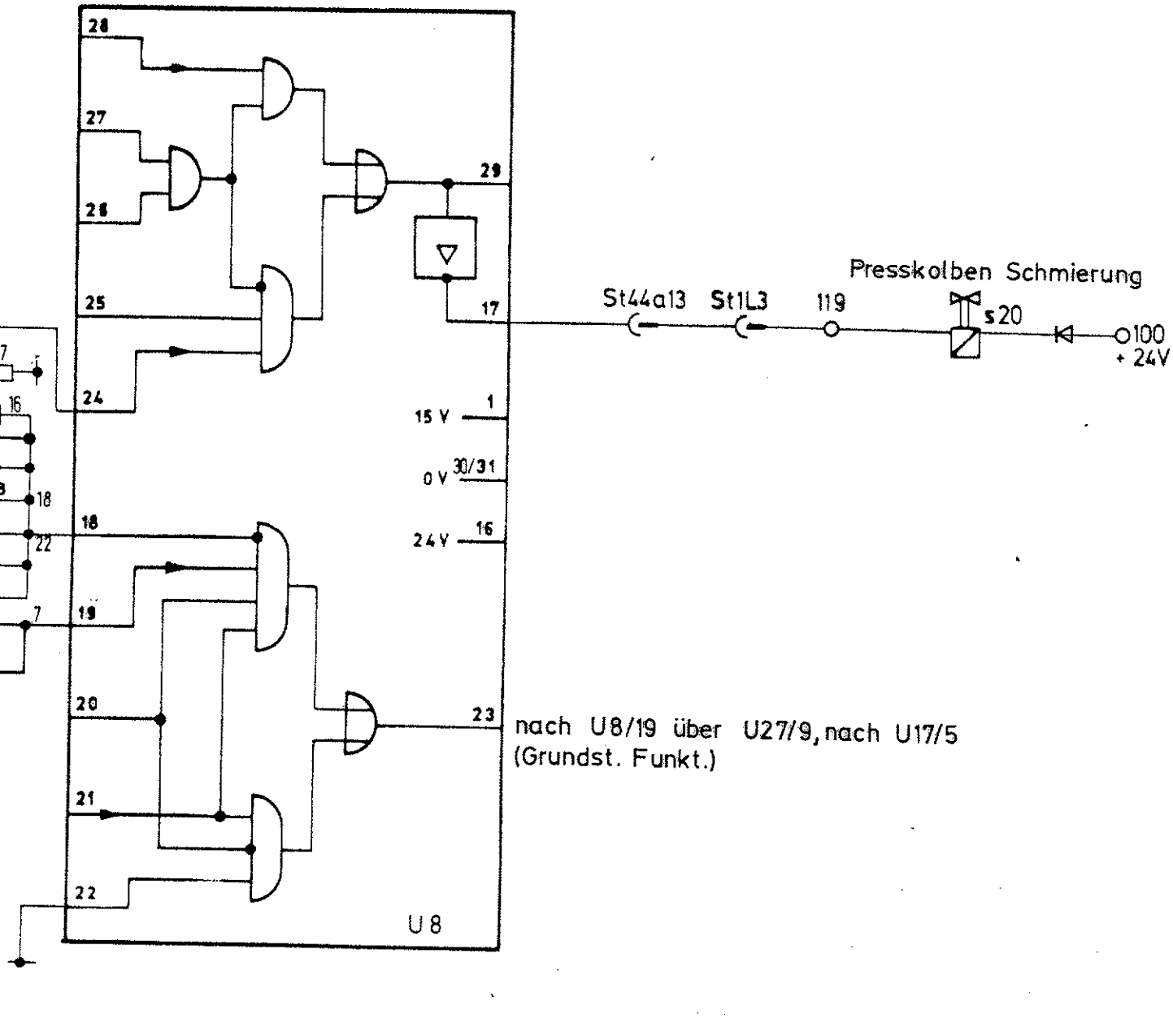
n U22/6 Schmierzeit läuft

n U2/23 Automatik

n St45a13 Presskolbenschmierung
n U45/24 Schöpfer hinten
n U2/23 Automatik
n St41b10 Kernzug fest hinten
n U3/11 Greifer ok
h U18/5 (Grundstellg. erreicht)
St41b5 Kernzug bew. hinten
U2/2 Form offen
St41c3 Auswerfer hinten
U2/24 Grundstellung
U8/23 Selbsthaltung

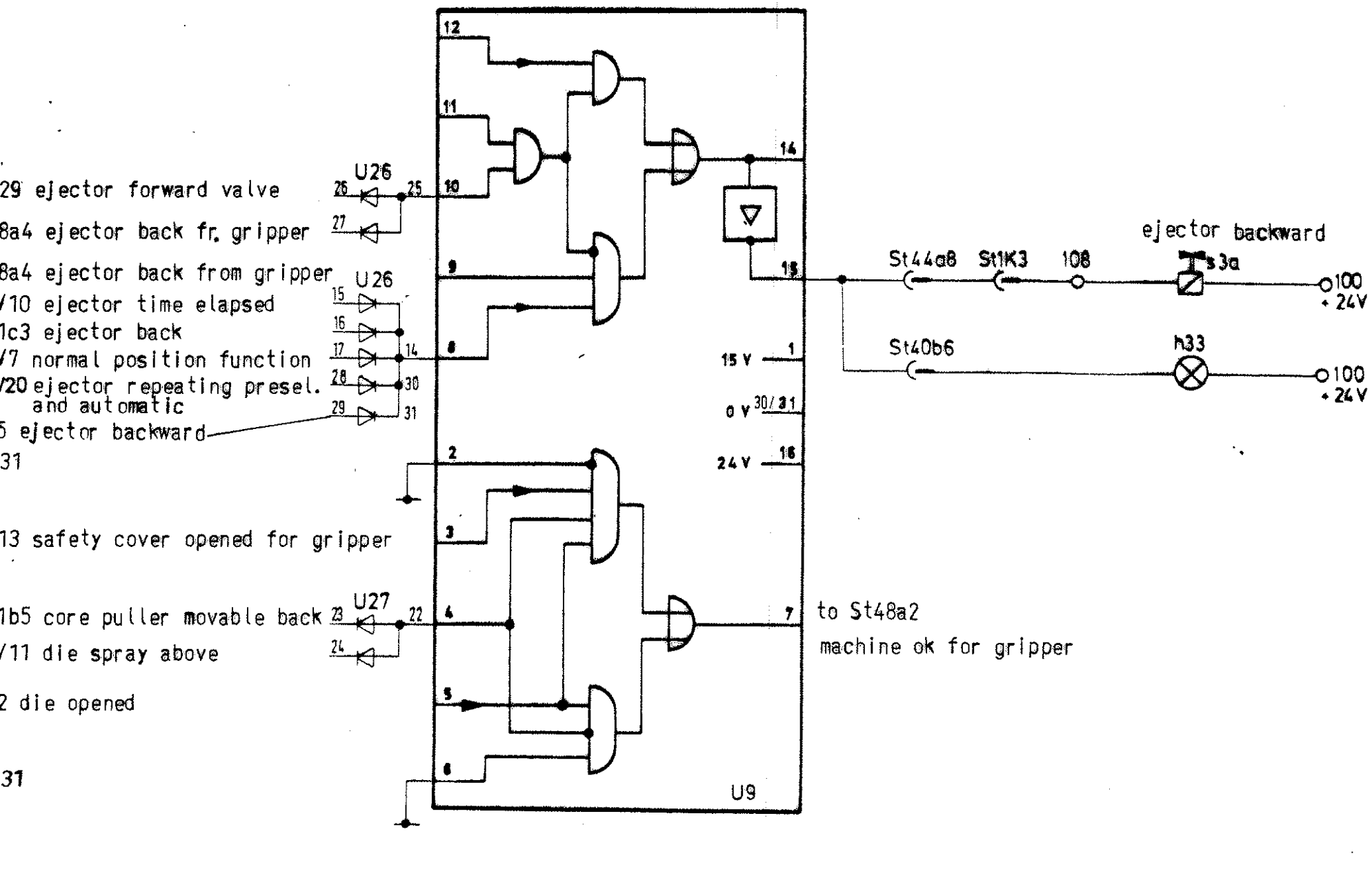
U2/22 Hand

U8/31

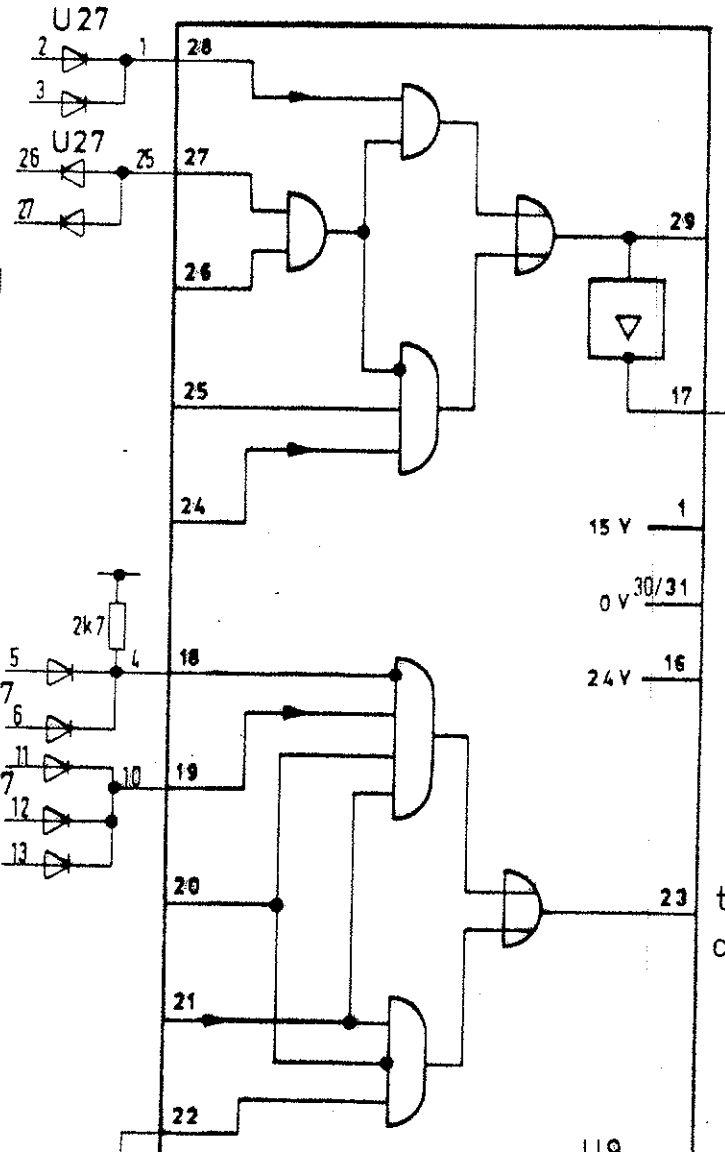


nach U8/19 über U27/9, nach U17/5 (Grundst. Funkt.)

FRELH Presskolbenschmierung FP1.2 11. 7. 79 U8


29 ejector forward valve
8a4 ejector back fr. gripper
8a4 ejector back from gripper
/10 ejector time elapsed
1c3 ejector back
/7 normal position function
/20 ejector repeating presel. and automatic
5 ejector backward
31
13 safety cover opened for gripper
1b5 core puller movable back
/11 die spray above
2 die opened
31
U26
U26
U27
U9
15 V
0 V 30/31
24 V
to St48a2
machine ok for gripper
ejector backward
St44a8
St1K3
108
3a
St40b6
h33
100 + 24V
100 + 24V

/4 ejector forward
5/8 stresstime elapsed
/2 die opened
8a3 ejector forward gripper
23 condition ejector forward



to U26/26
ejector forward valve

ejector forward
St44a7 St1J3 107 s3b
100
+ 24V
St40b5 h31
100
+ 24V

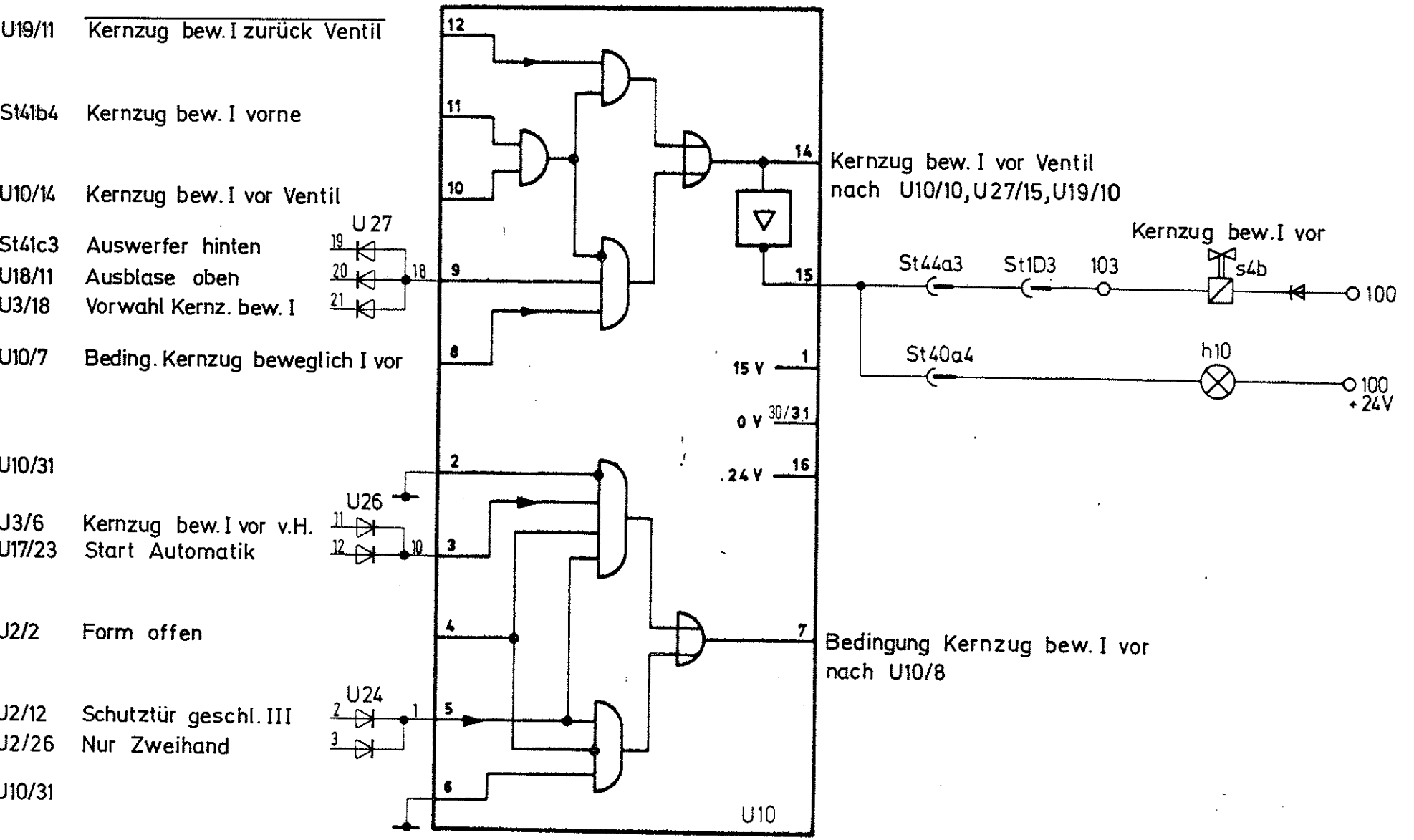
to U9/26
condition ejector forward

1c1 ejector in front
/10 ejector time elapsed
1c3 ejector back
29 ejector forward valve
22 manual
28 preselection ejector

1b5 core puller movable back

31

FRELH
ejector forward
FP1.2
U9



FRECH

Kernzug beweglich I vor

FP1.1

11.7.79

8 300 896 74

U 10

U19/9 Kernzug bew. I vor Ventil

U10/29 Kernzug bew. I zurück Ventil

St41b5 Kernzug bew. I hinten

U3/18 Vorwahl St Kernzug bew. I

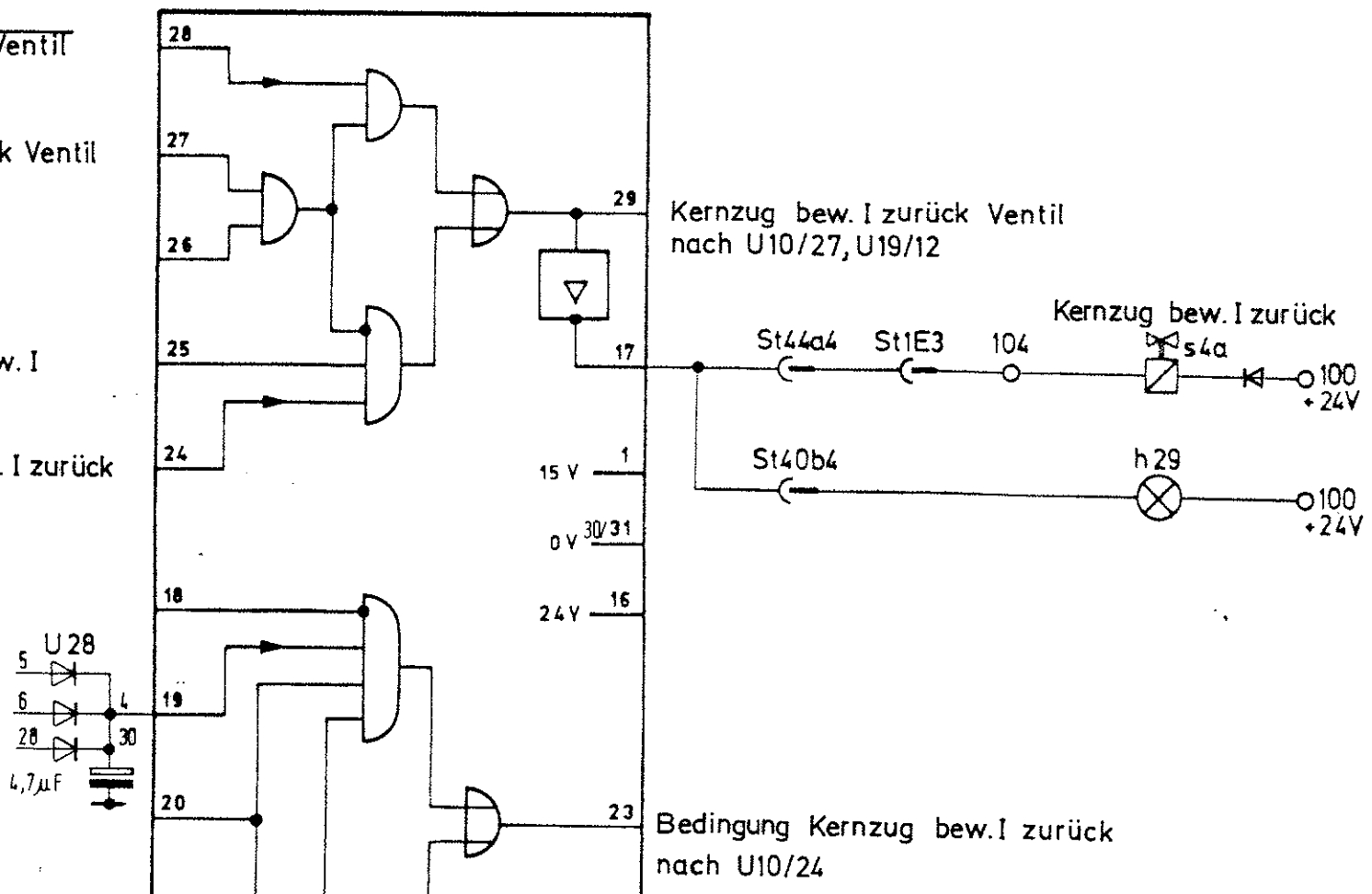
U10/23 Bedingung Kernzug bew. I zurück

U17/23 Start Automatik

U3/7 Kernzug bew. I zurück
U17/7 Grundst. Funktion
U20/20 Abkühlzeit abgelaufen

U2/2 Form offen

U10/31



U19/24 $\overline{\text{Kernzug fest I zurück Ventil}}$

St41b9 Kernzug fest I vorne

U11/14 Kernzug fest I vor Ventil

U3/19 Vorwahl Kernzug fest I

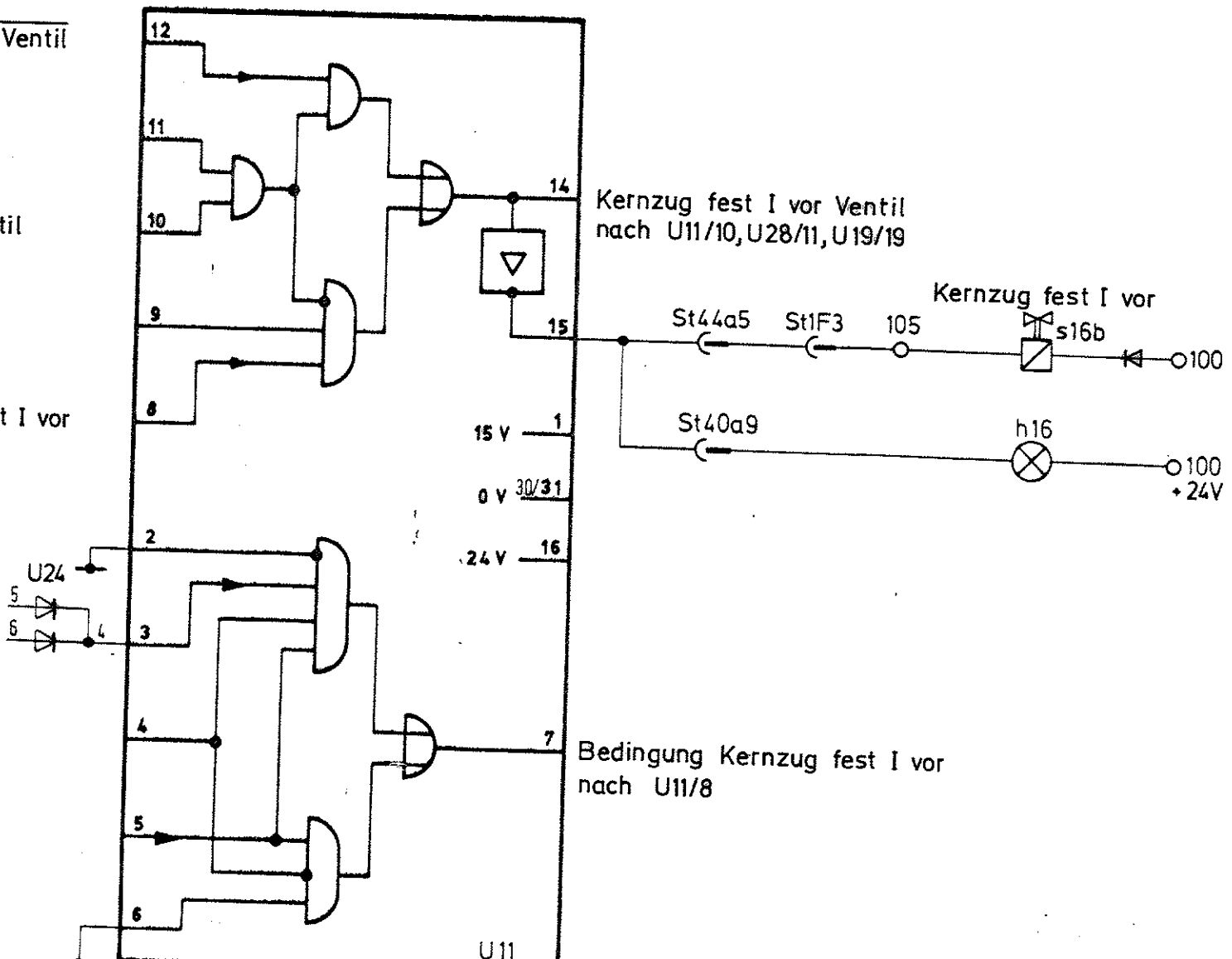
U11/7 Bedingung Kernzug fest I vor

U11/31

U17/23 Start Automatik
U3/8 Kernzug fest I vor v.H.

U2/19 Form geschlossen II

U1/31



FRECH

Kernzug fest I vor

FP1.1

8 300 898 74

11. 7. 79

U11

U19/20 Kernzug fest I vor Ventil

U11/29 Kernzug fest I zurück Ventil

St41b10 Kernzug fest hinten

U3/19 Vorwahl Kernzug fest I

U11/23 Bedingung Kernzug fest I zurück

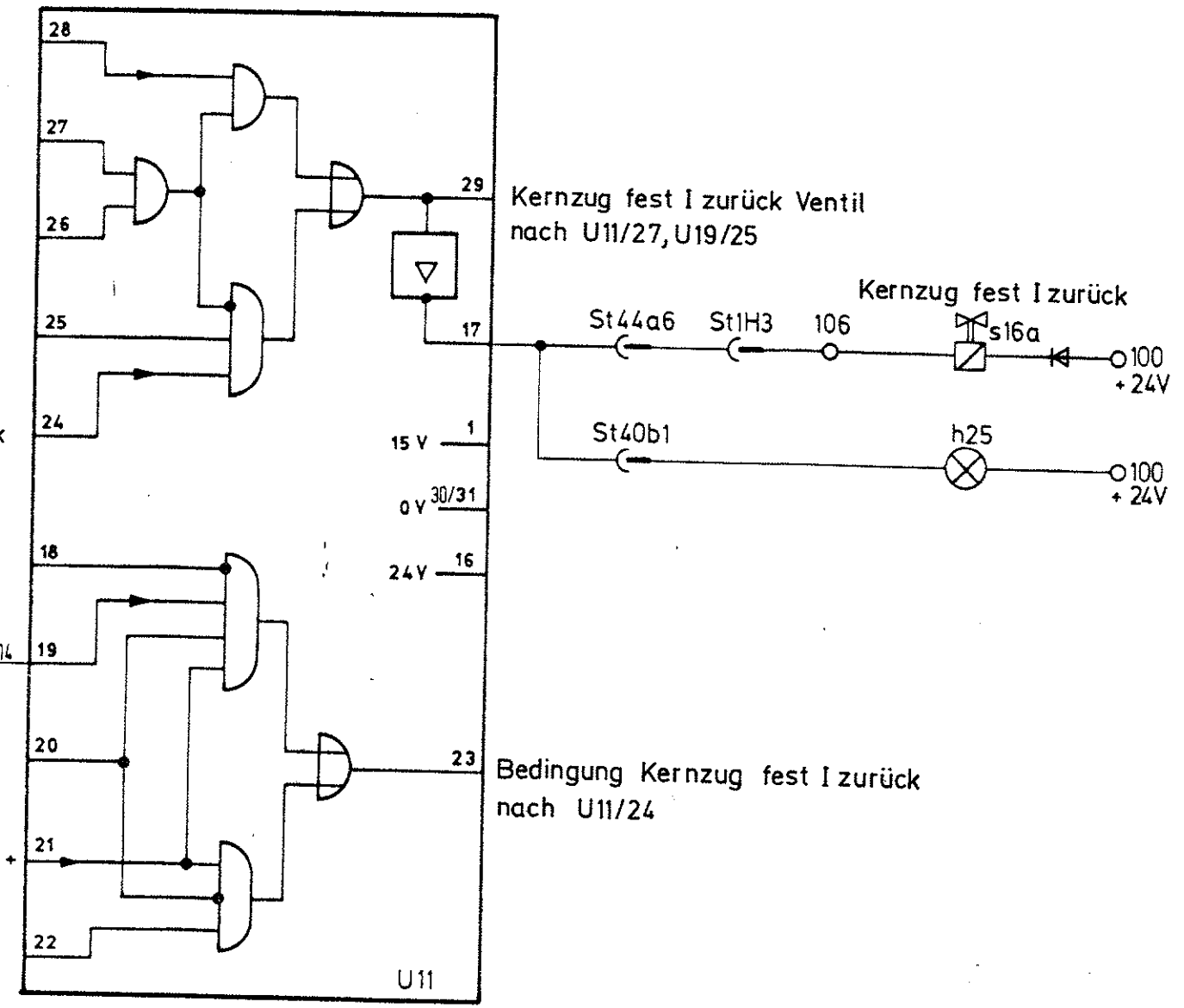
U14/7 Speicher Abkühlzeit läuft

U3/9 Kernz. fest I zurück v. H.
U17/7 Grundstellg. Funktion

U2/22 Hand

U11/1

17/22 Abkühlzeit abgelaufen



FRECH

Kernzug fest I zurück

FP1.2

8 300 899 74

12. 7. 79

U11

1 die spray above

3 spraytime runs

storage spraycounter

manual

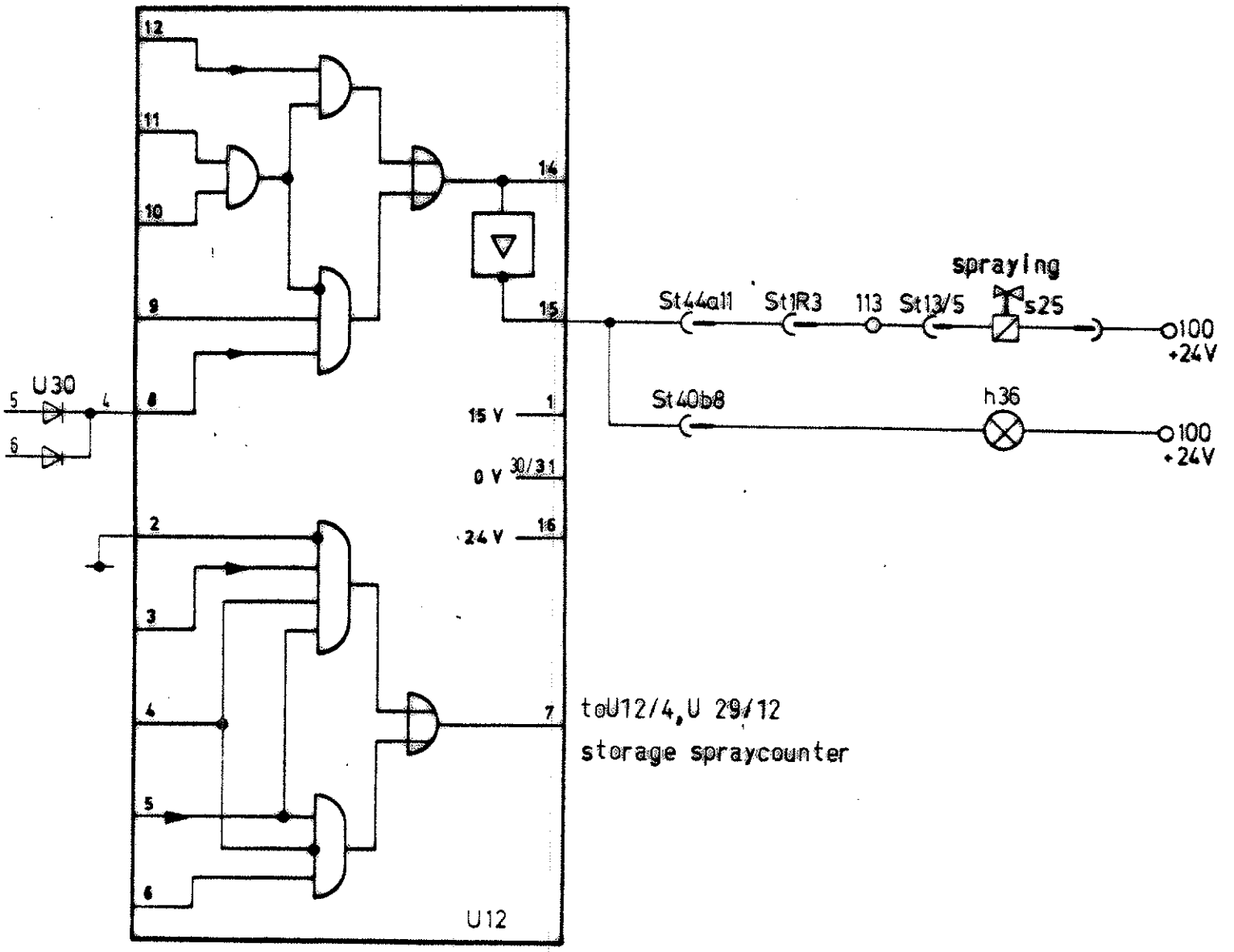
1

1 reset repeater

self holding

automatic

impulse die spraycounter



FRECH

spraying

FP11

8 300 900 74

U12

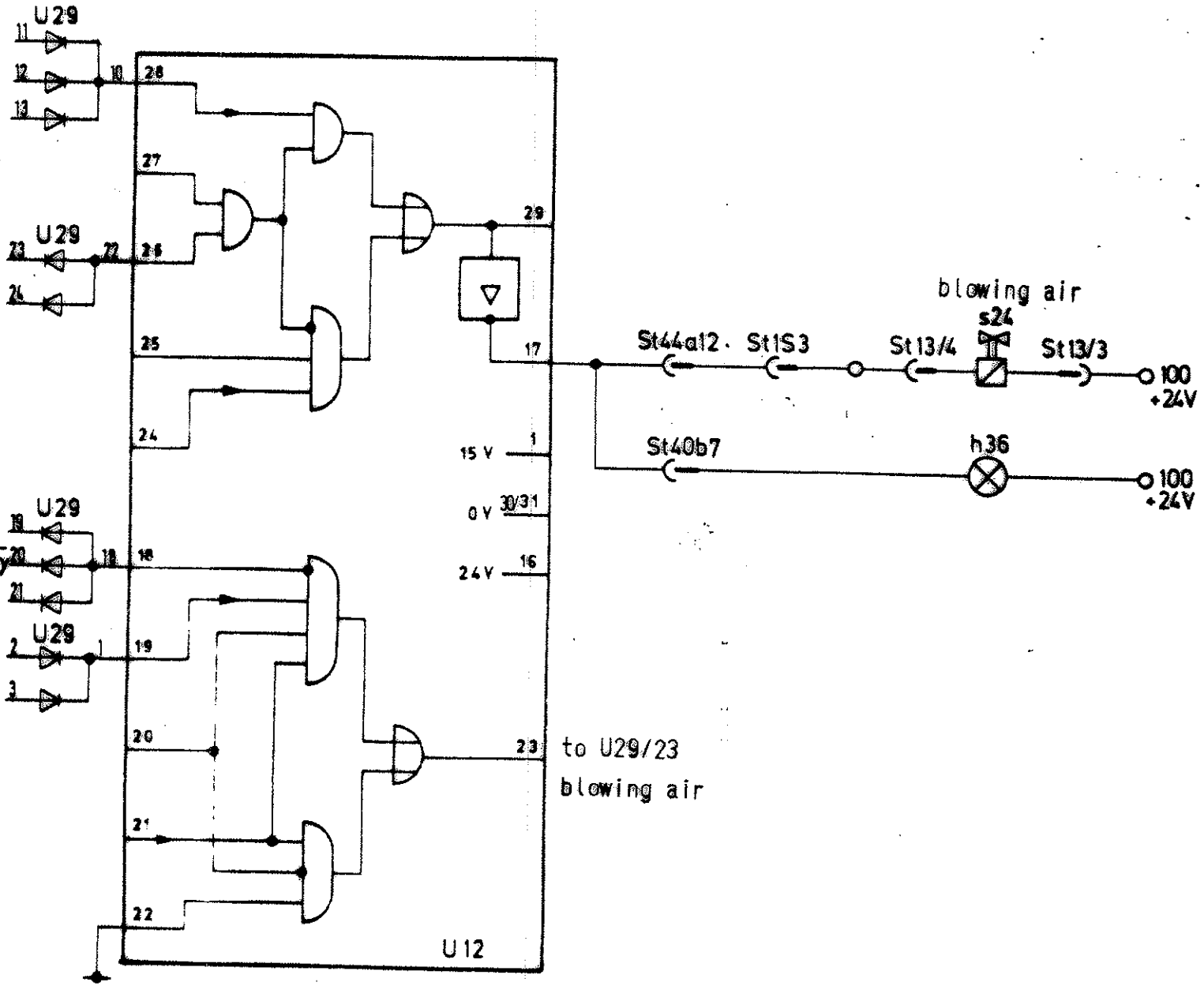
2 manual
7 storage spray counter
2 die spray without counter
b5 core puller movable back

23 blowing air
1 gripper ok

1 automatic
18 die opened with die spray
11 die spray after ejector
1 die spray manual
3 stresstime elapsed
blowing time elapsed

die opened

2



FRECH

blowing air

FP1.2

8 300 901 74

U12

23 start automatic

4 press I valve

piston back

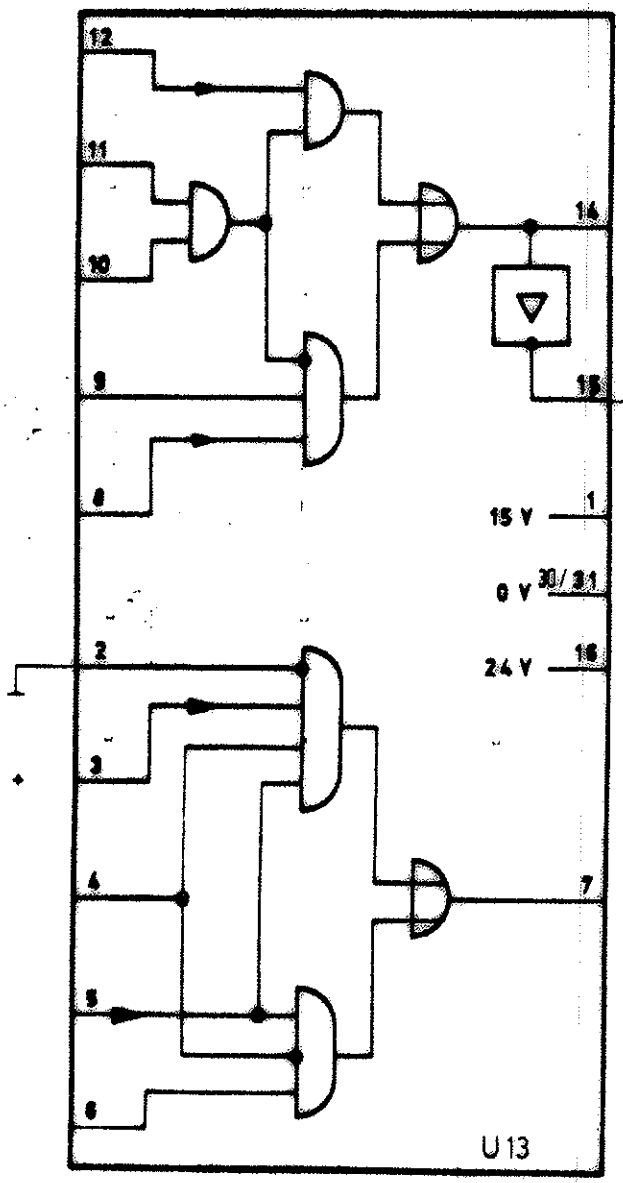
31

1

7 self holding

die opened

1 impulse balance



to St41c12
input impuls for die spray counter

shot counter
p1

St41c11

100
+24V

St46a13

15

to U13/4 U28/27
storage balance

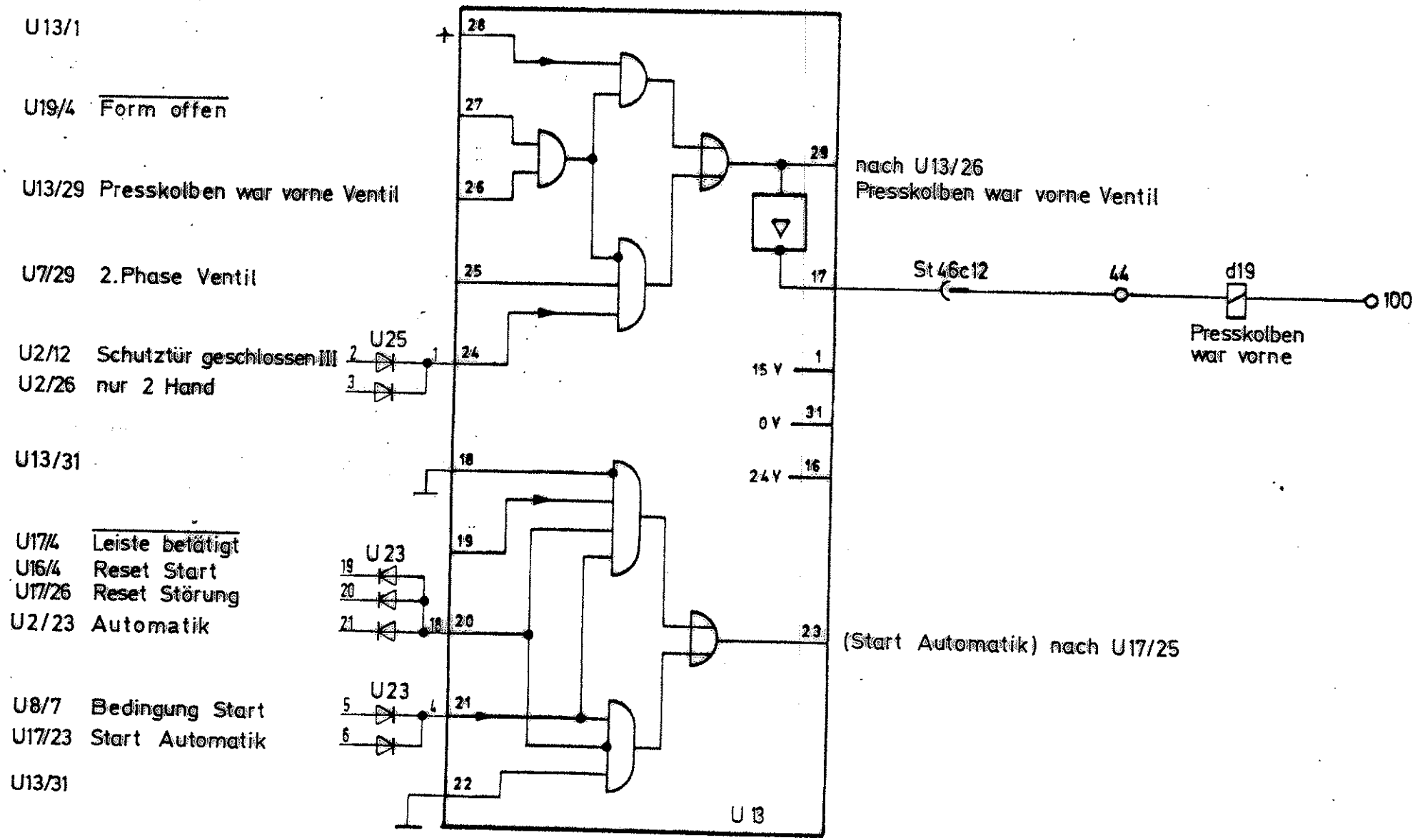
FRECH

Impulse for spray-and shot counter

FP1.1

0 300 902 74

U13

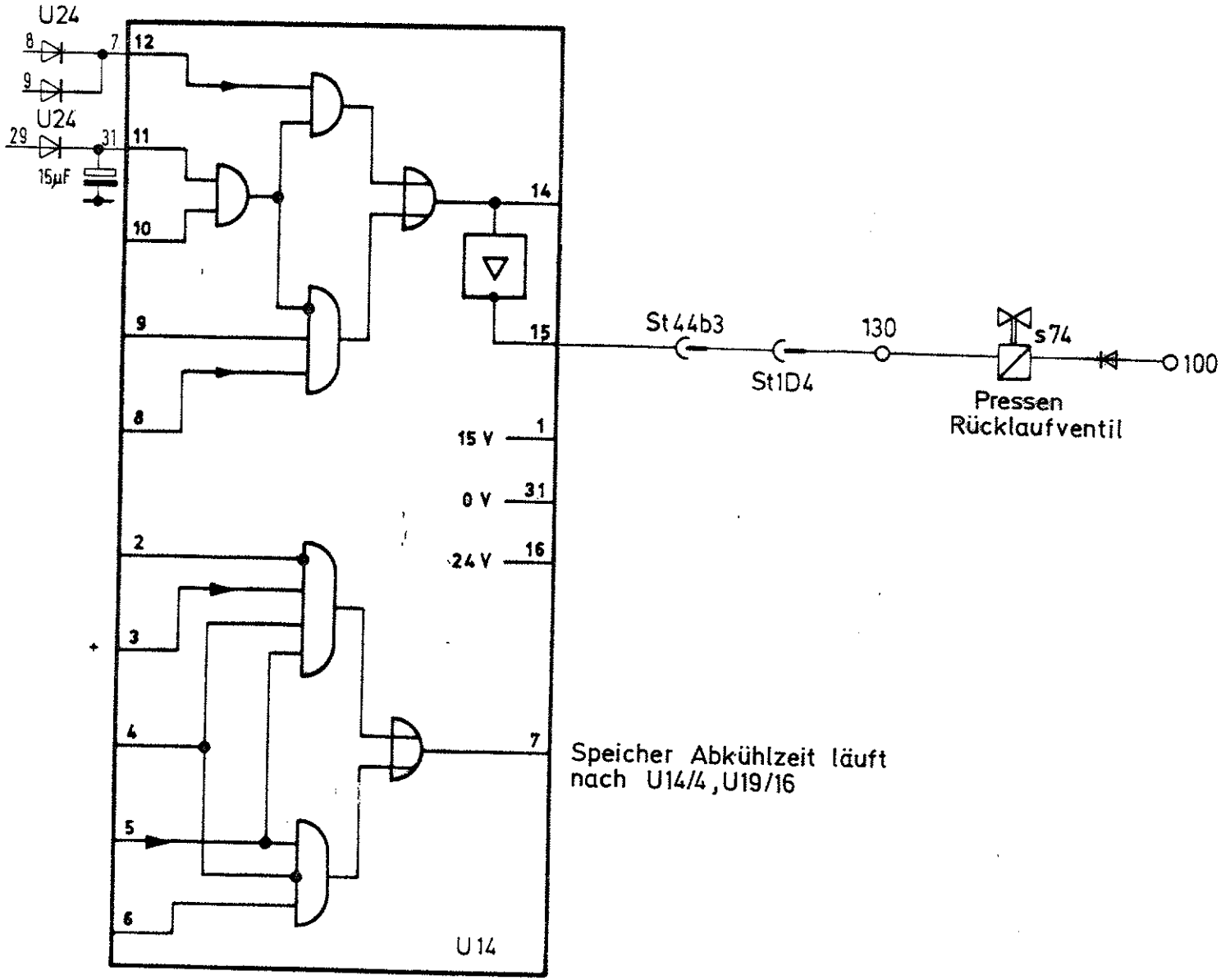


FRECH | FP12 | 8 300 903 74 | 12. 7. 79 | U13

U3/29 Presskolben Pressen

U7/7 Bedingung Pressen

U7/14 Pressen I Ventil



U20/20 Abkühlzeit abgelaufen

U14/1

U14/7 Selbsthaltung

U19/4 $\overline{\text{Form offen}}$

U20/6 Nachdruckzeit läuft

Speicher Abkühlzeit läuft
nach U14/4, U19/16

FRECH

FP11

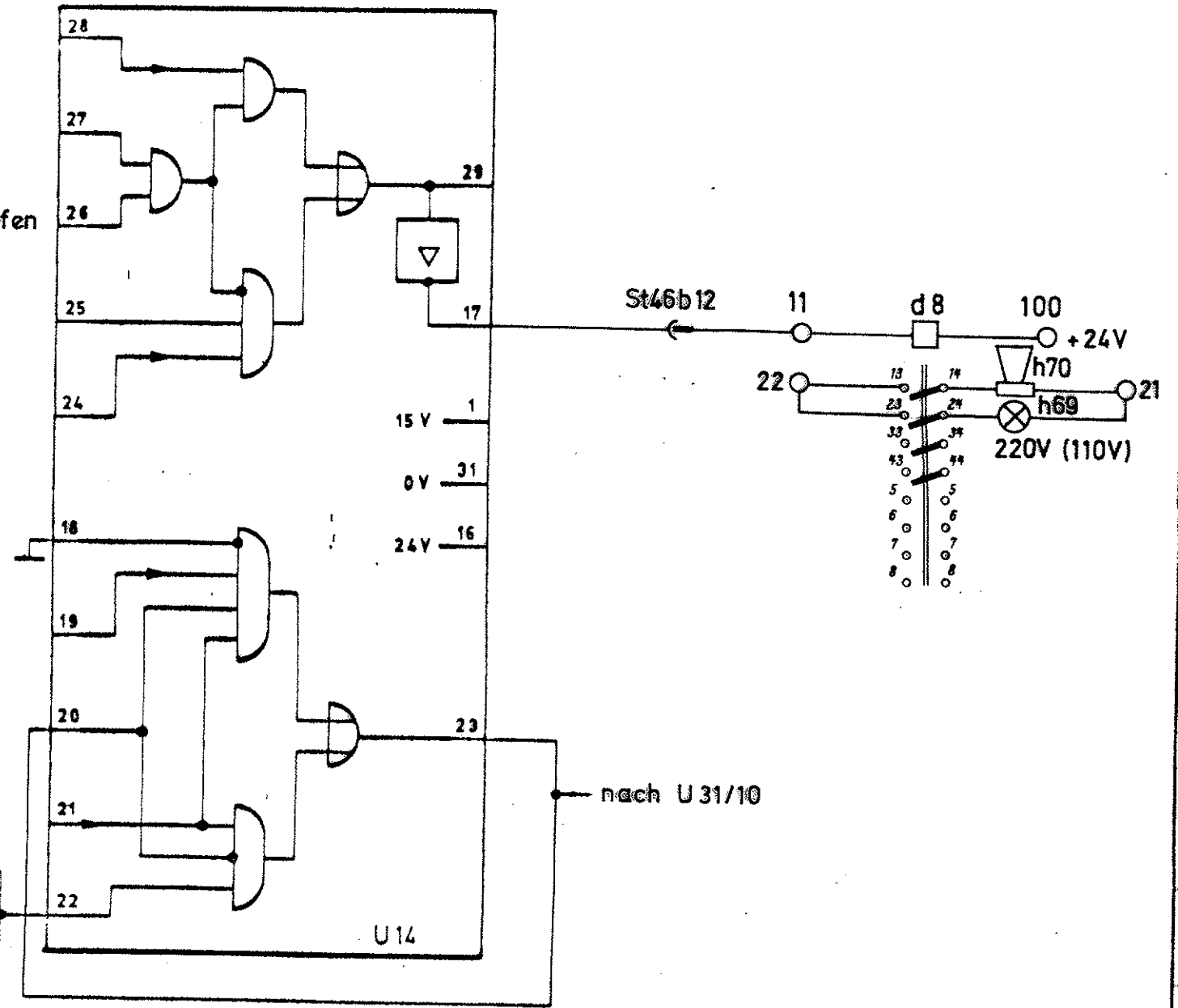
8 300 904 74

12. 7. 79

U14

von U2/23 Automatik

von U31/11 Zykluszeitüberwach. abgelaufen



U14/31

U2/23 Automatik

U16/11 Reset Durchlauf

U17/23 Start Automatik

U4/14 Schließen Ventil

U3/27 Vorwahl Durchlauf

von U3/18 Vorwahl Kernzug beweglich

von U15/4 $\overline{\text{Vorwahl Kernzug beweglich}}$

von U2/23 Automatik

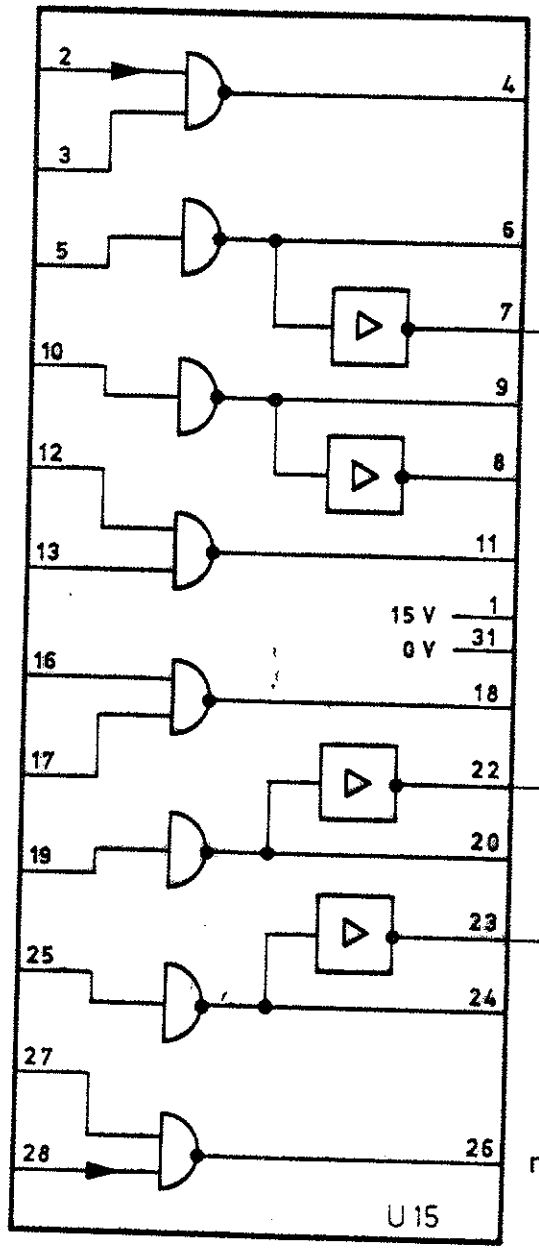
von U21/20 Blasluftzeit abgelaufen

von U3/20 Vorwahl Auswerfer

von U15/18 $\overline{\text{Vorwahl Auswerfer}}$

von U15/26 $\overline{\text{Vorwahl Kernzug fest}}$

von U3/19 Vorwahl Kernzug fest



nach U15/5 $\overline{\text{Vorwahl Kernzug beweglich}}$
U 27/16

St 41 b3 — $\overline{\text{Vorwahl b19 Kernzug beweglich}}$

nach U18/28 $\overline{\text{Automatik u. Blasluftzeit abgel.}}$
über U30/8

nach U15/19 $\overline{\text{Vorwahl Auswerfer}}$

St 41 b13 — $\overline{\text{Vorwahl b21 Auswerfer}}$

St 41 b8 — $\overline{\text{Vorwahl b20 Kernzug fest}}$

nach U15/25 $\overline{\text{Vorwahl Kernzug fest}}$
U 28/12

12. 7. 79 Mod U15

18 die closed I

/20 cooling time elapsed

/9 tilt back

/20 tilting time elapsed

/10 stresstime elapsed

2 die opened

14 die closing valve

2 die opened

1b5 core puller movable back

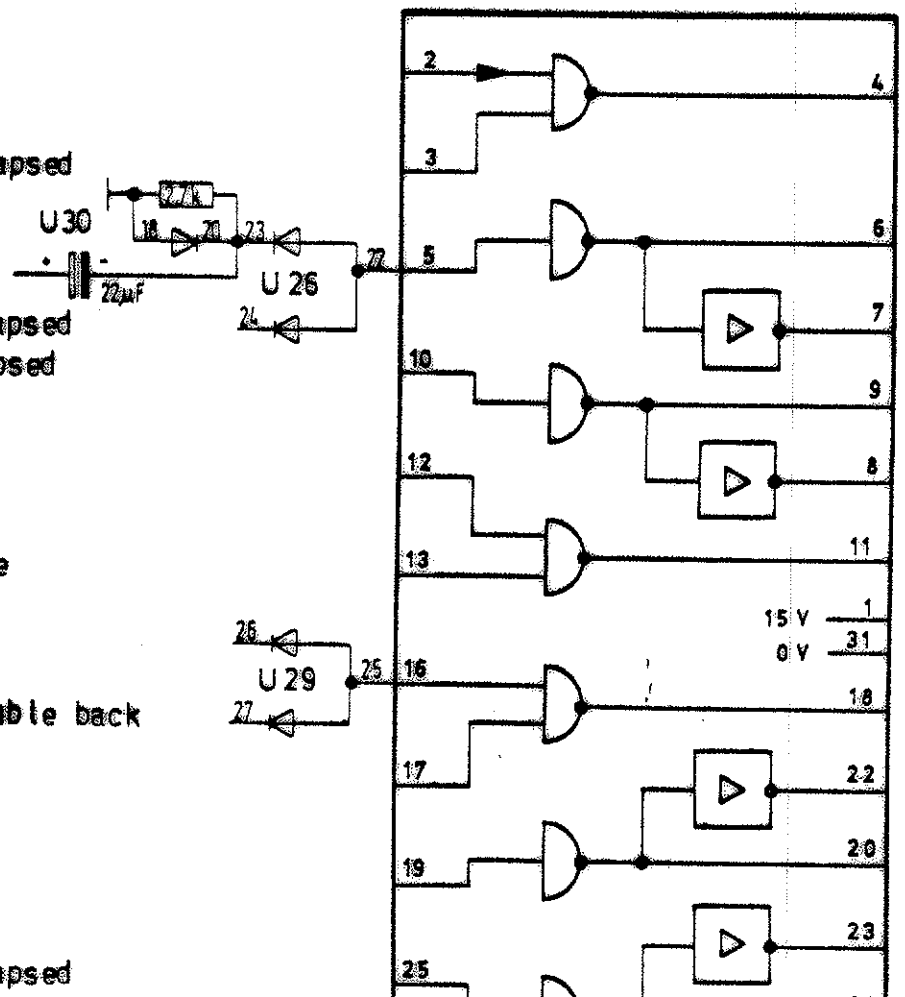
/20 $\overline{\text{repeater}}$

27 repeater

/10 ejector time elapsed

28 preselection ejector

/24 $\overline{\text{ejector time elapsed}}$



to U27/30 reset start

to U24/12 U26/6
tilt and tilting time

to U6/18 U17/3 $\overline{\text{stresstime elapsed}}$

to U7/18 U18/2 U29/6 stresstime elapsed

to U12/3 U20/5 U20/18 reset repeater

to U20/16 reset single cycle

to U16/17 $\overline{\text{repeater}}$

to U16/28 $\overline{\text{ejector time elapsed}}$

to U20/25 start for opening time

U16

5 safety strip

/9 $\overline{\text{stresstime elapsed}}$

/23 normal position function

18 die closed I

24 die spray after ejector

/10 ejector time elapsed

2 die opened

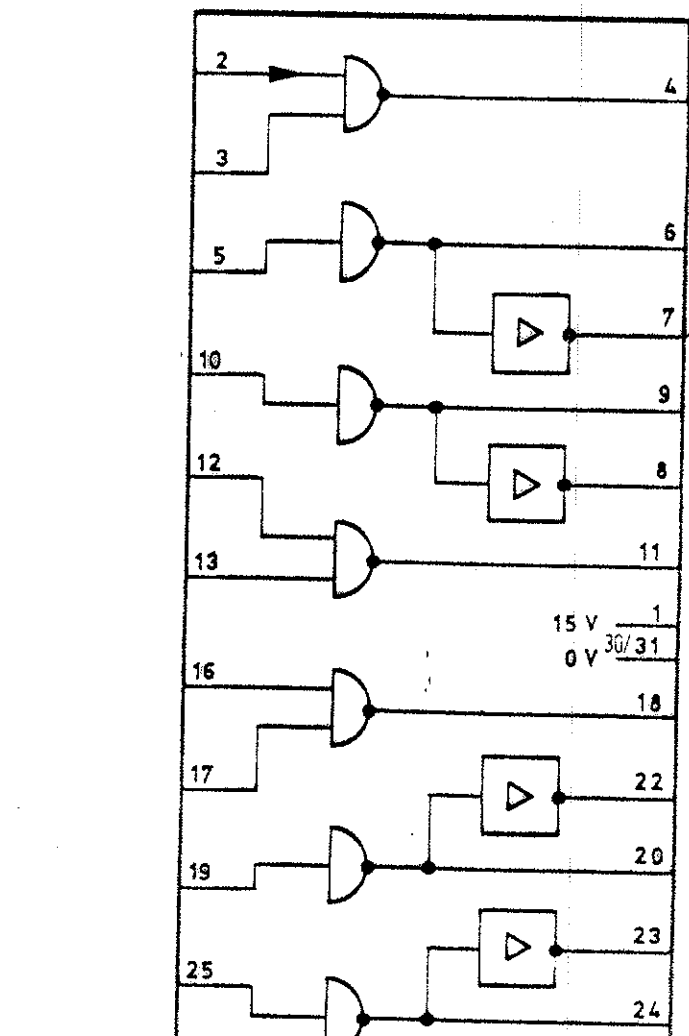
23 die spray with ejector

/20 cooling time elapsed

/23 (start automatic)

15 fault safety cover

7 fault die closed



to U13/19 $\overline{\text{safety strip actuated}}$

St 45b4

220

to U26/2,U26/17 normal position function

to U6/5,U18/17,U21/9 $\overline{\text{die closed}}$

to U29/21 $\overline{\text{die spray after ejector}}$

to U29/20 $\overline{\text{die opened with die spray}}$

to U8/4 $\overline{\text{cooling time elapsed}}$

to U10/18,U23/6, U24/5,U25/9,U25/13,U26/12,U30/11
start automatic U20/8

to U23/20 reset fault

U17

/8 stresstime elapsed

8 die closed I

8 normal position reached

20 blowing time elapsed

22 die spray above

2 manual

9 die closed I

26

4 closing valve

puller movable forward valve or

election core pull movable

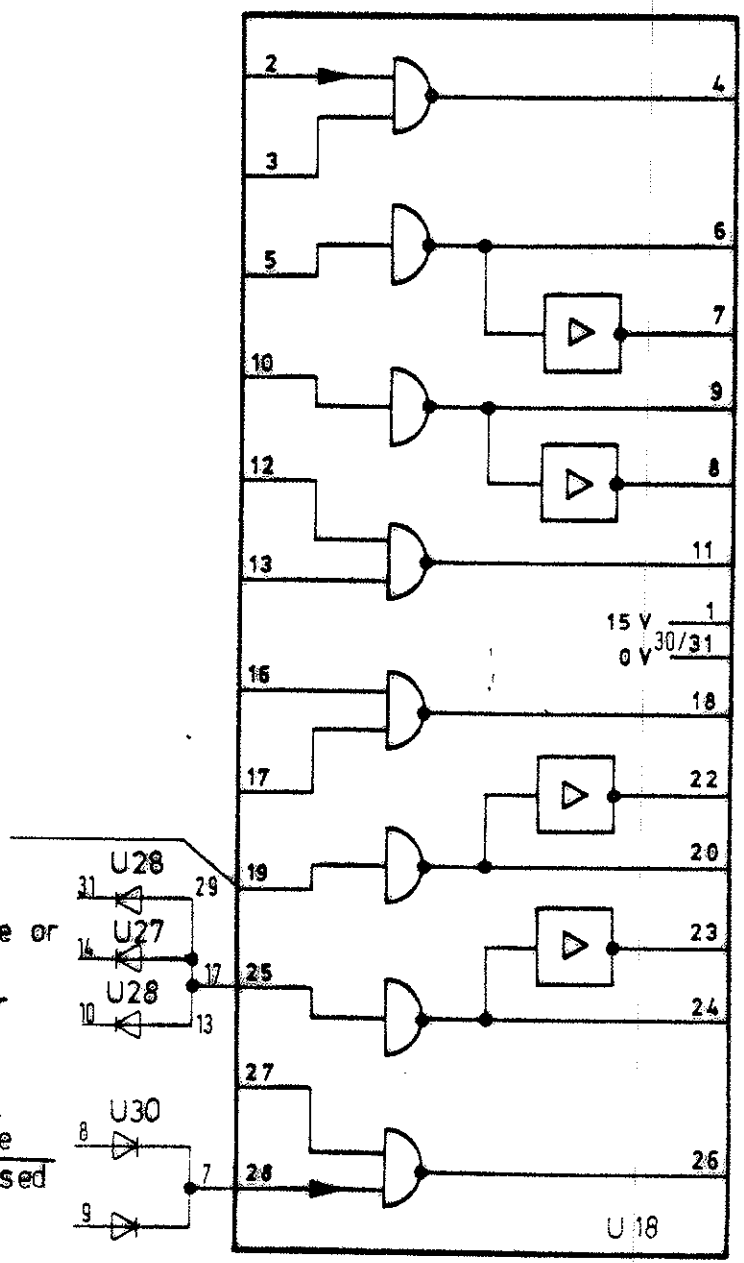
puller firm forward valve or

election core puller firm

11 die spray above

11 automatic and blowing time elapsed

9 die closed II



to U6/27

die closed I and stresstime elapsed

to U8/5 normal position reached

to U12/20 blowing time elapsed

to U5/5, U5/10, U12/10, U18/27, U27/20, U27/24, U23/26 die spray above

to U20/3, U28/7 reset stresstime

to U26/28 ejector repeating and automatic

to U4/19 condition press III

to U21/15 reset blowing time

FRELH

NP1

U18

U2/2 Form offen

U5/29 Öffnen Ventil

U10/14 Kernzug bew. I vor Ventil

U10/29 Kernzug bew. I zurück Ventil

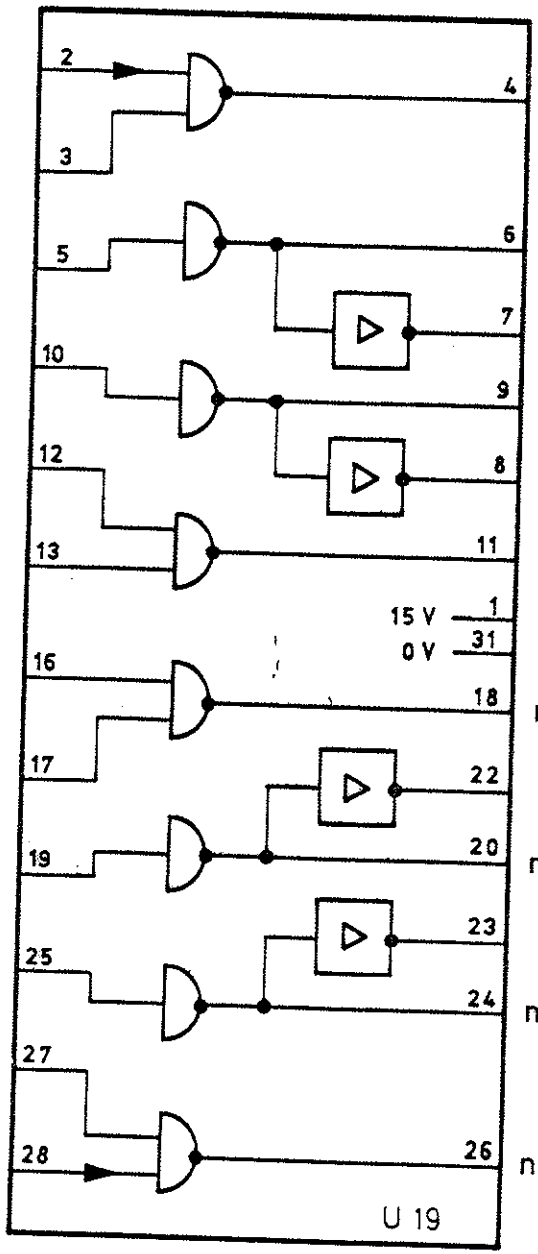
U14/7 Speicher Abkühlzeit läuft

U11/14 Kernzug fest I vor Ventil

U11/29 Kernzug fest I zurück Ventil

U2/23 Automatik

U3/21 Vorwahl Ausw.-Wiederholung



nach U24/26,U13/27,U14/5 $\overline{\text{Form offen}}$

nach U4/12 $\overline{\text{Öffnen Ventil}}$

nach U10/28 $\overline{\text{Kernzug bew. I vor Ventil}}$

nach U10/12 $\overline{\text{Kernzug bew. I zurück Ventil}}$

nach U29/31 $\overline{\text{Speicher Abkühlzeit läuft}}$

nach U11/28 $\overline{\text{Kernzug fest I vor Ventil}}$

nach U11/12 $\overline{\text{Kernzug fest I zurück Ventil}}$

nach U18/19

FRECH

NP1

8 300 910 74

18. 7. 79

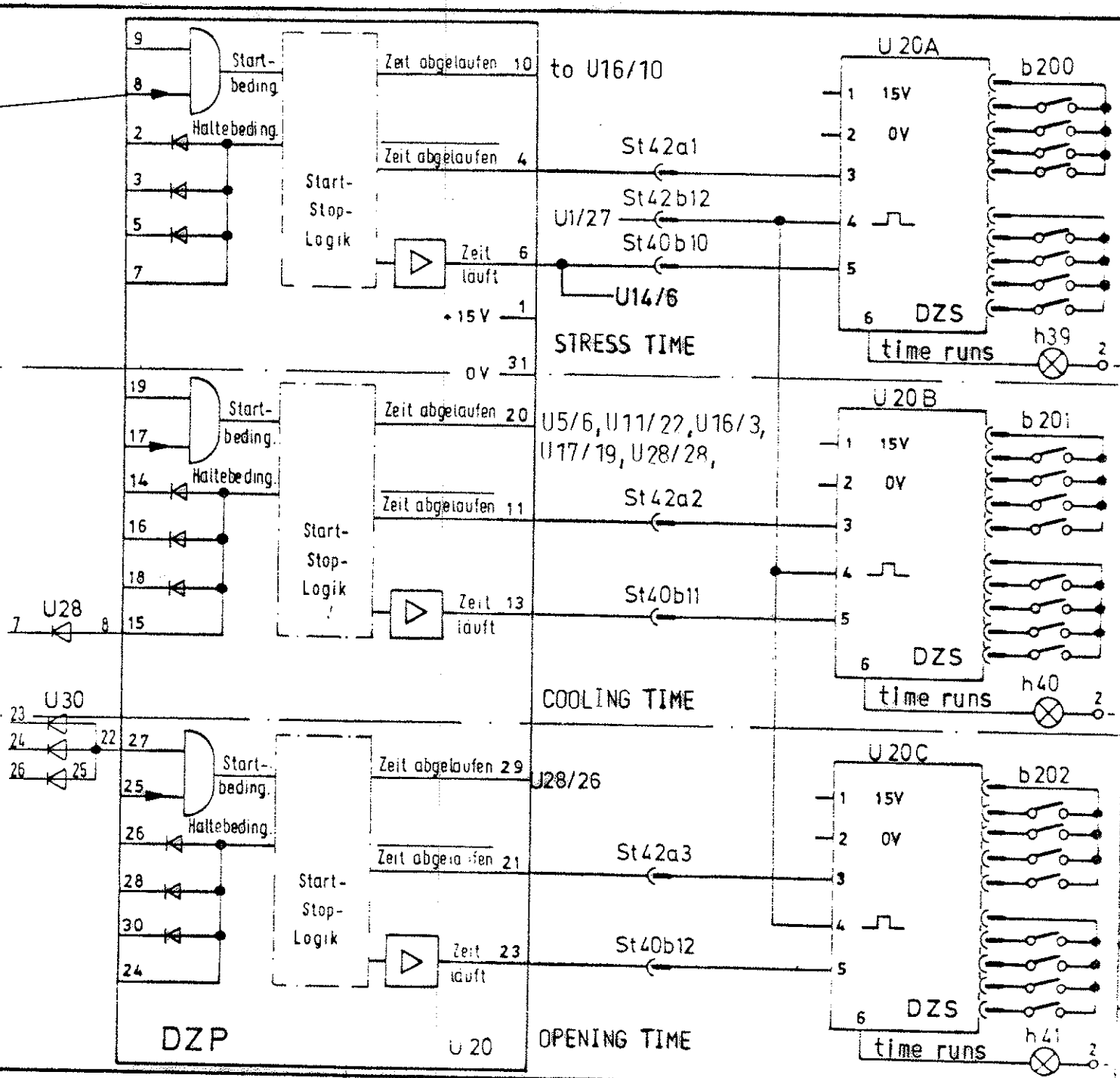
U 19

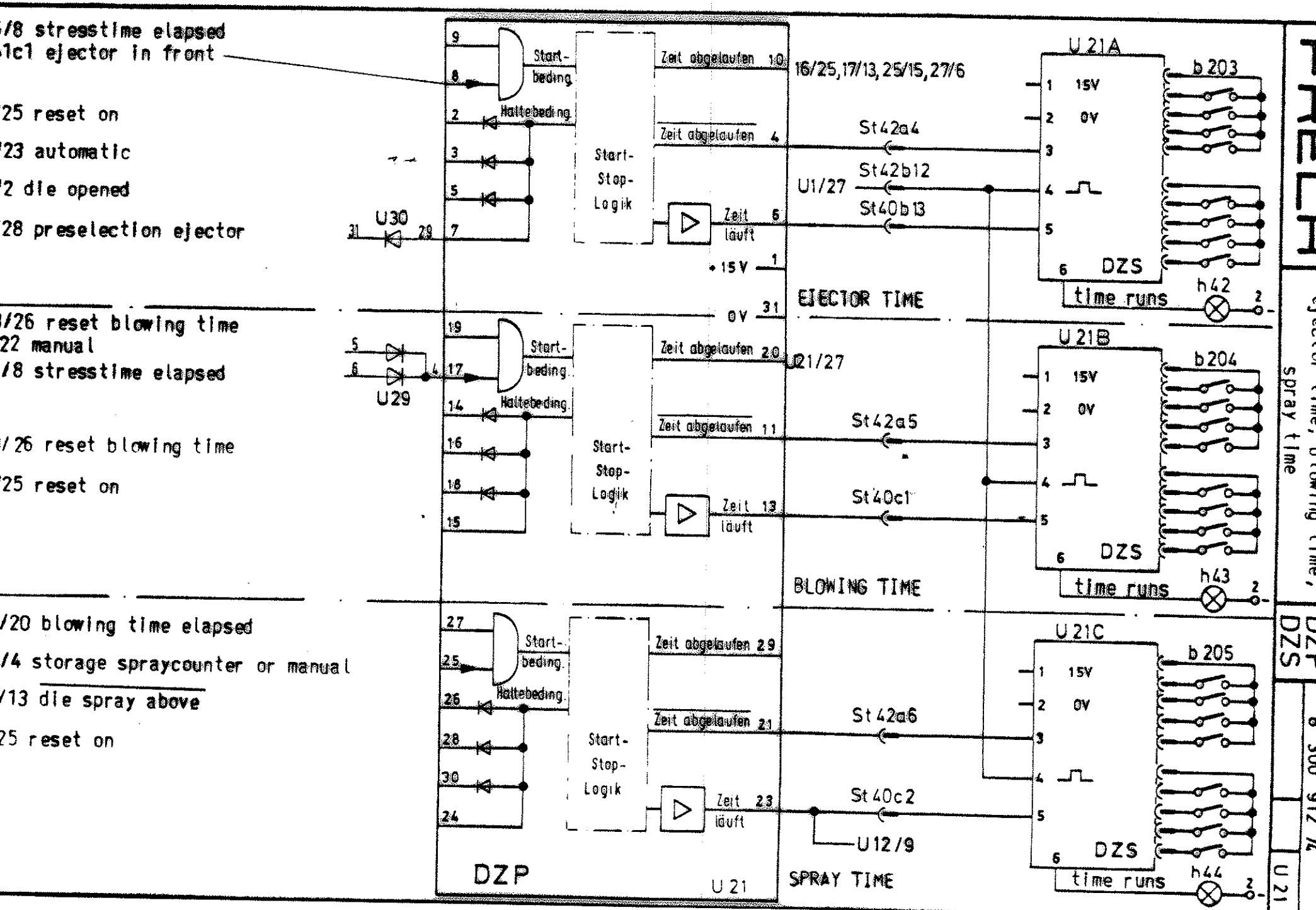
14 press I valve

/23 start automatic
25 reset on
/18 reset stresstime
/11 reset repeater

18 die closed I
/8 stresstime elapsed
25 reset on
/18 reset single cycle
/11 reset repeater
/18 reset stresstime

2 die opened
1b5 core puller movable back
/8 stresstime elapsed
/26 start for opening time
25 reset on
23 automatic
/9 die closed

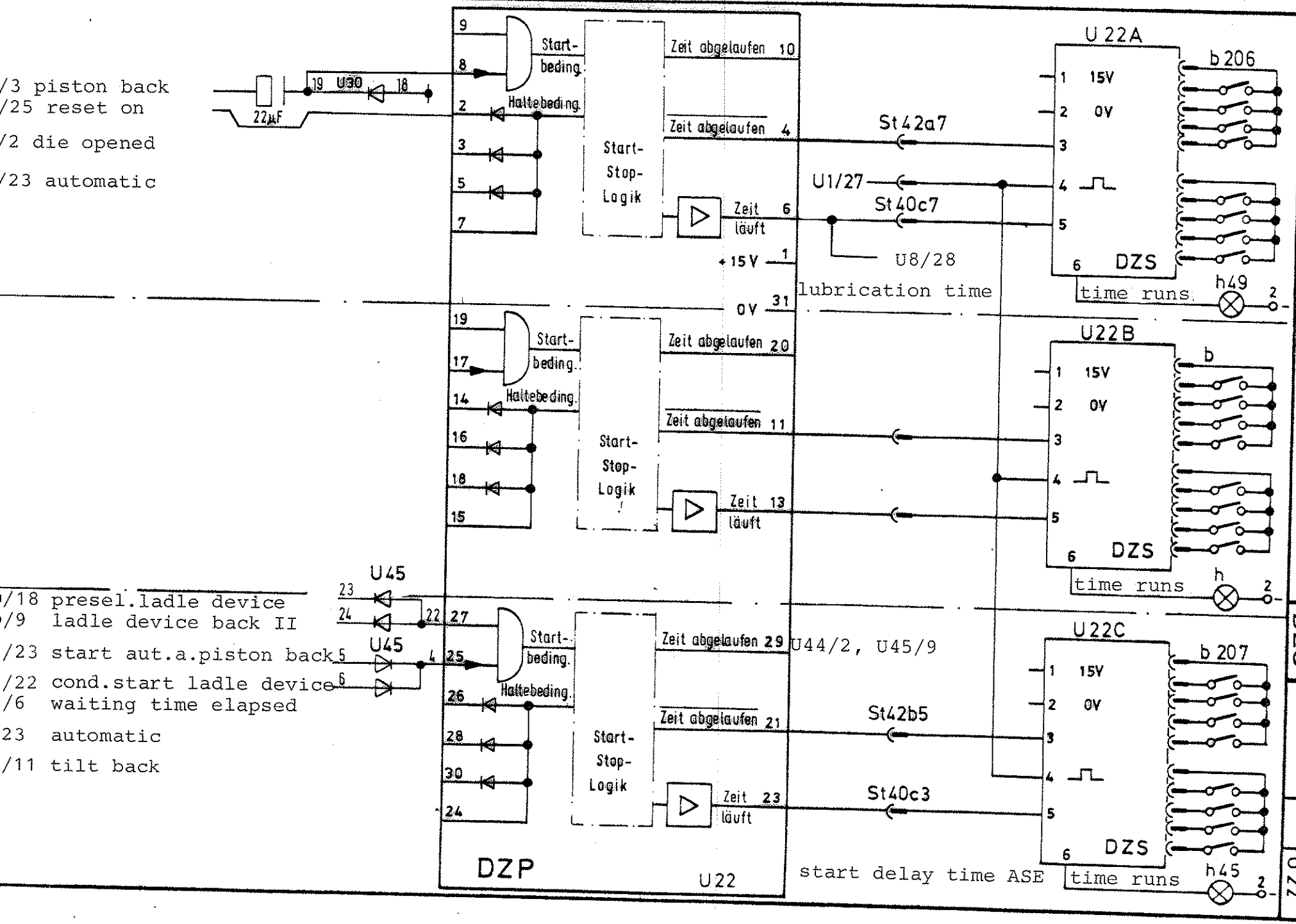



/8 stresstime elapsed
1c1 ejector in front
25 reset on
23 automatic
2 die opened
28 preselection ejector
U30
Start-beding
Haltebeding
Start-Stop-Logik
Zeit abgelaufen 10
Zeit abgelaufen 4
Zeit läuft 6
+15V 1
0V 31
16/25,17/13,25/15,27/6
St42a4
U1/27
St42b12
St40b13
U21A
b203
1 15V
2 0V
3
4
5
6 DZS
time runs
h42
EJECTOR TIME
/26 reset blowing time
22 manual
/8 stresstime elapsed
U29
Zeit abgelaufen 20
U21/27
Zeit abgelaufen 11
Zeit läuft 13
St42a5
St40c1
U21B
b204
BLOWING TIME
h43
/26 reset blowing time
25 reset on
/20 blowing time elapsed
/4 storage spraycounter or manual
/13 die spray above
25 reset on
Zeit abgelaufen 29
Zeit abgelaufen 21
Zeit läuft 23
St42a6
St40c2
U12/9
U21C
b205
SPRAY TIME
h44
DZP
U21
spray time
DZS
U21

/3 piston back
/25 reset on

/2 die opened

/23 automatic



/18 presel.ladle device
/9 ladle device back II

/23 start aut.a.piston back

/22 cond.start ladle device
/6 waiting time elapsed

23 automatic

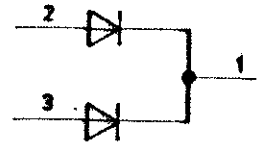
/11 tilt back

lubrication time
start delay time

DZP
DZS

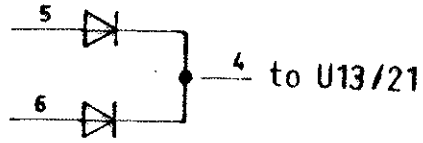
8 300 926 74

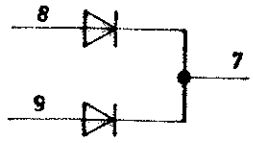
U22



U8/7 condition start

U17/23 start automatik

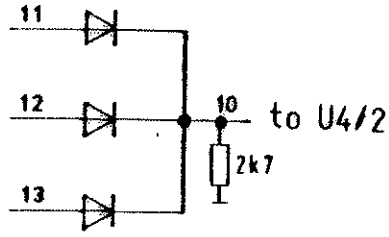


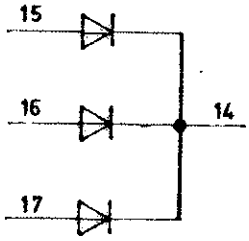


U23/22 $\overline{\text{die spray above}}$

U9/29 ejector forward valve

U2/17 fault die closed

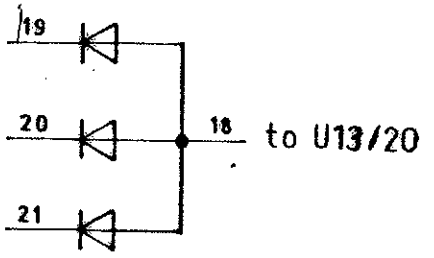




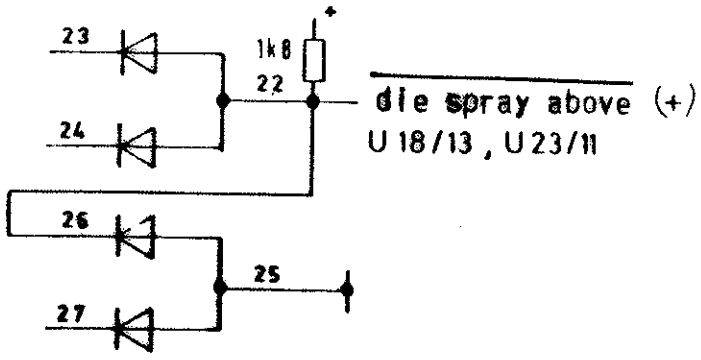
U16/4 reset start

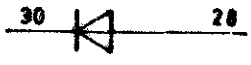
U17/26 reset fault

U2/23 automatic

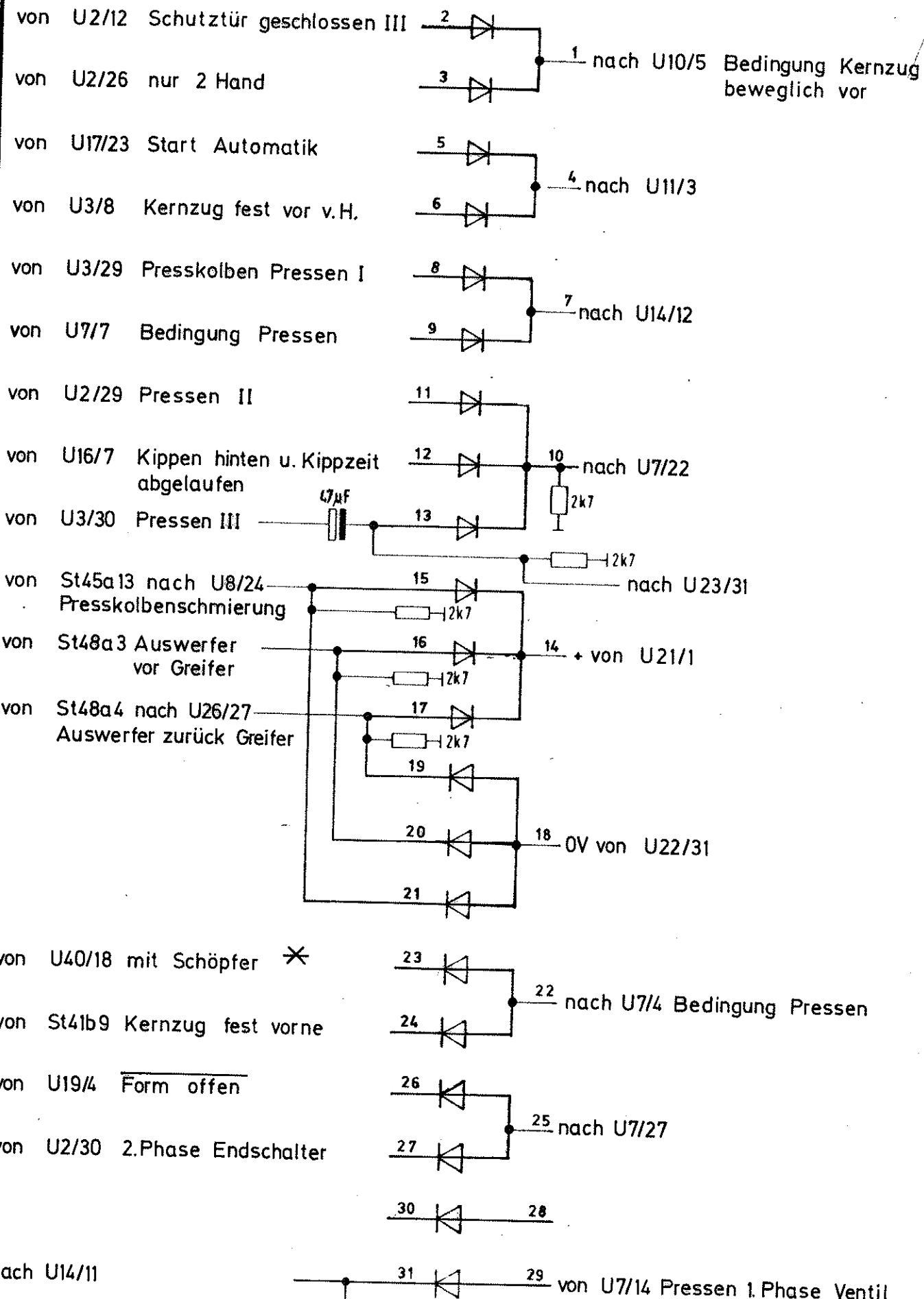


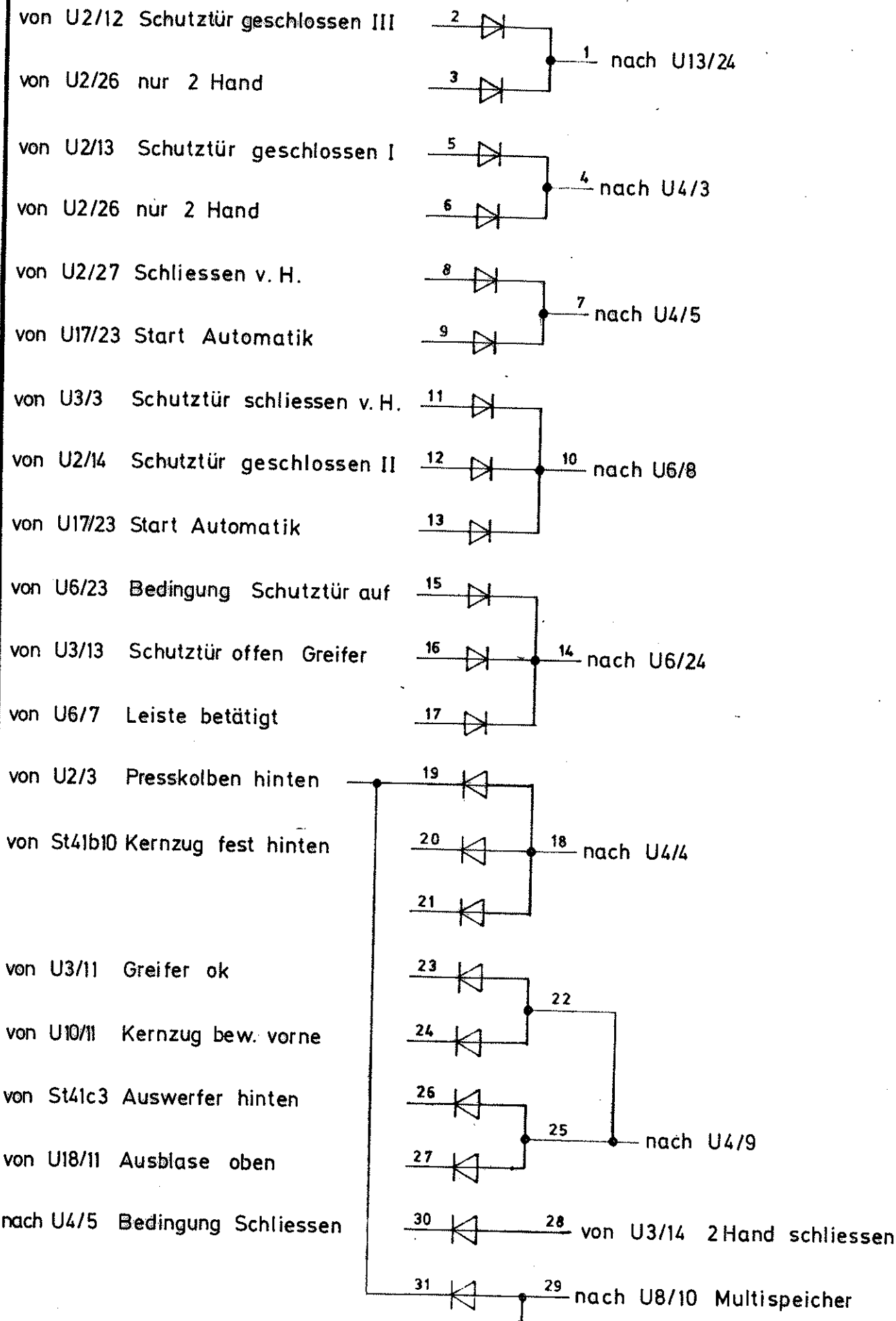
St43a1 die spray above

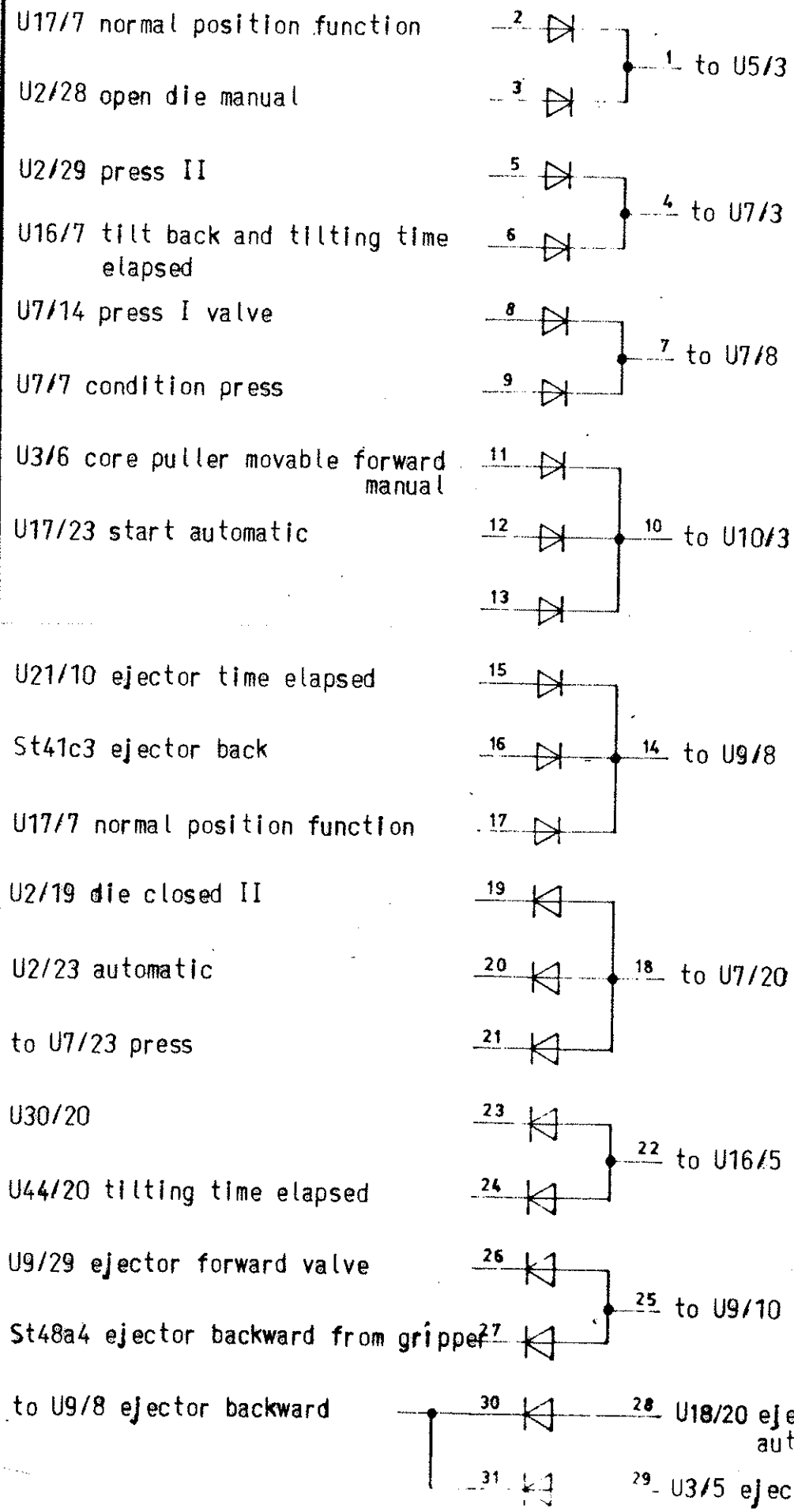


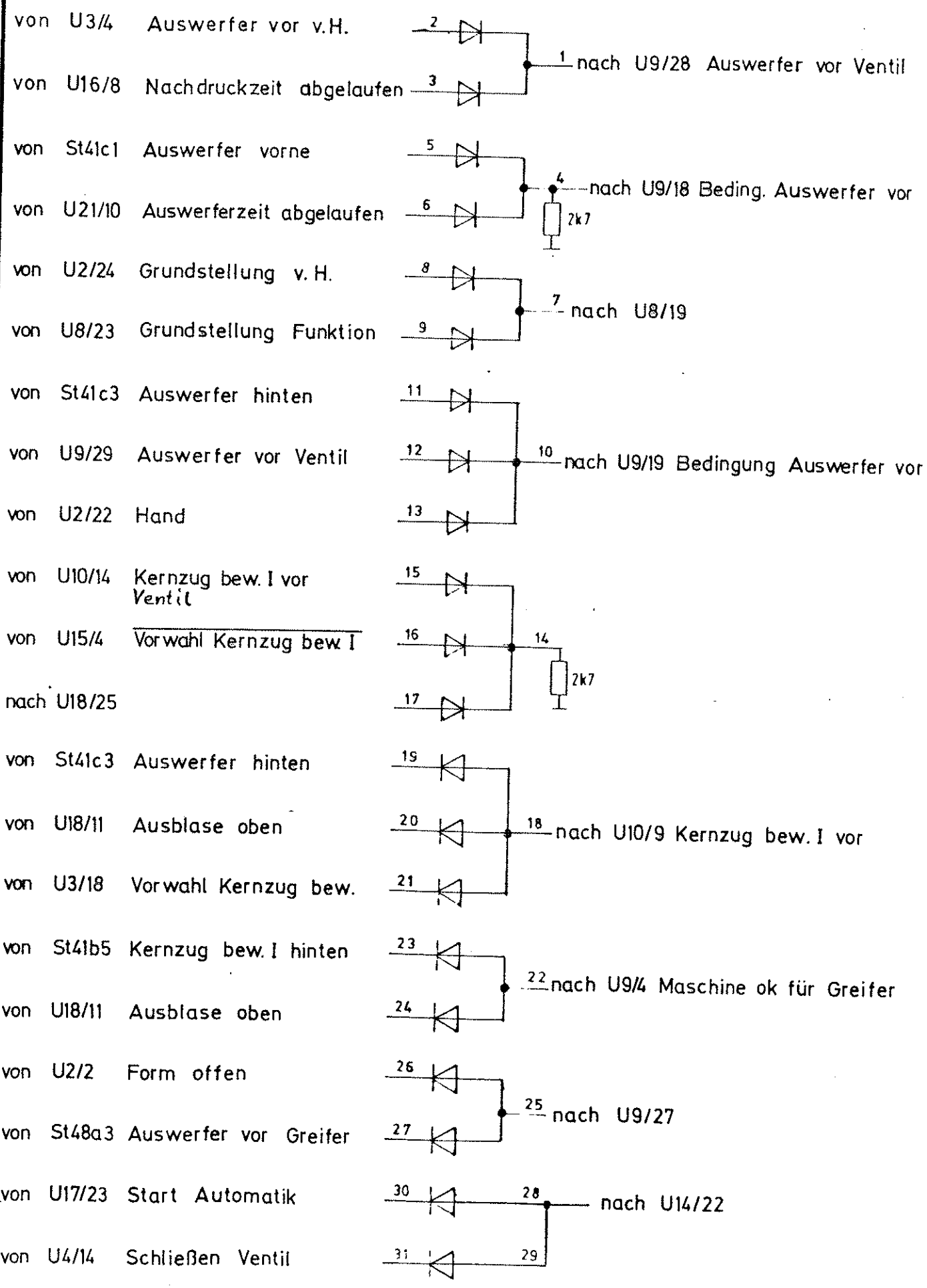


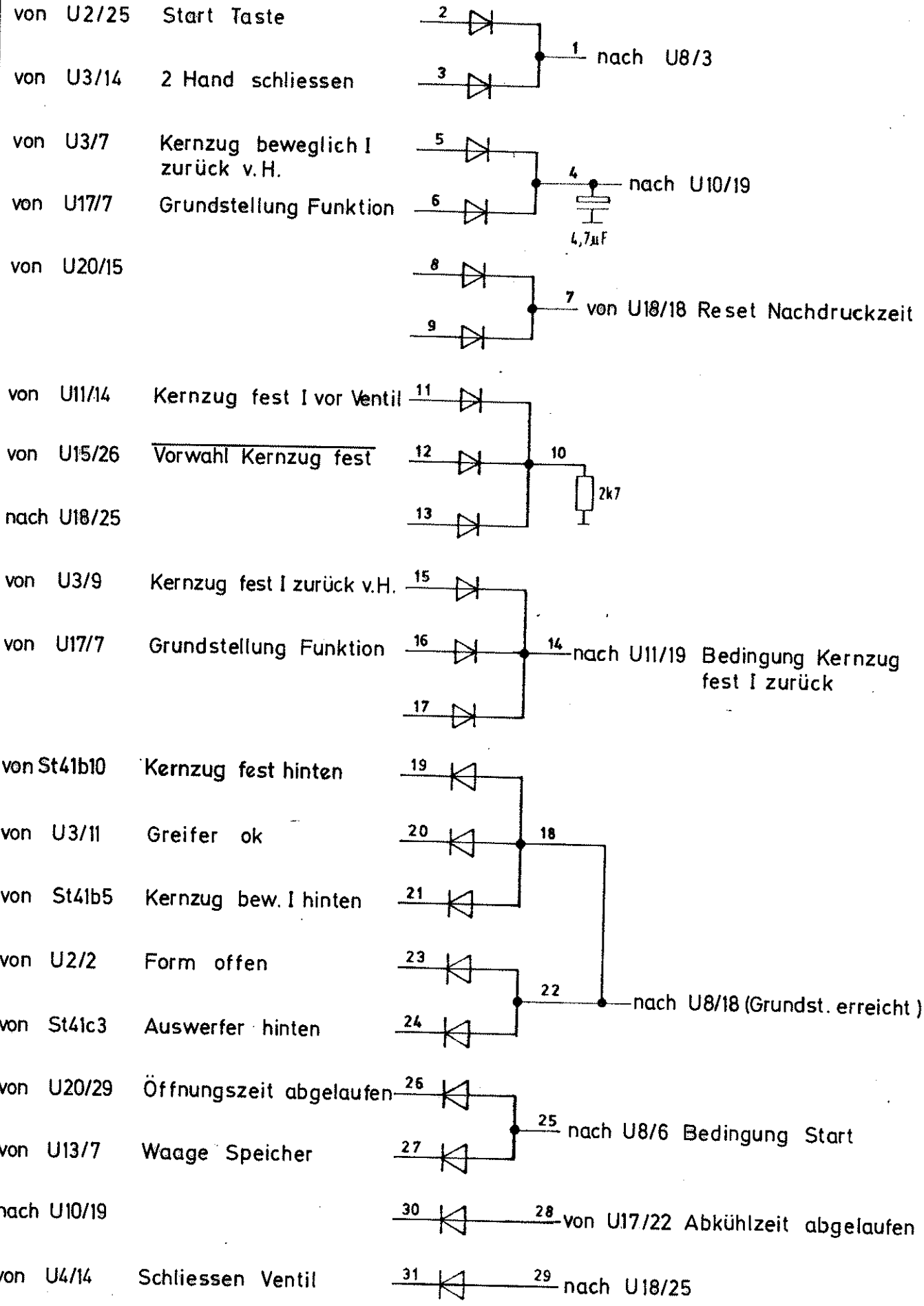
U24/13

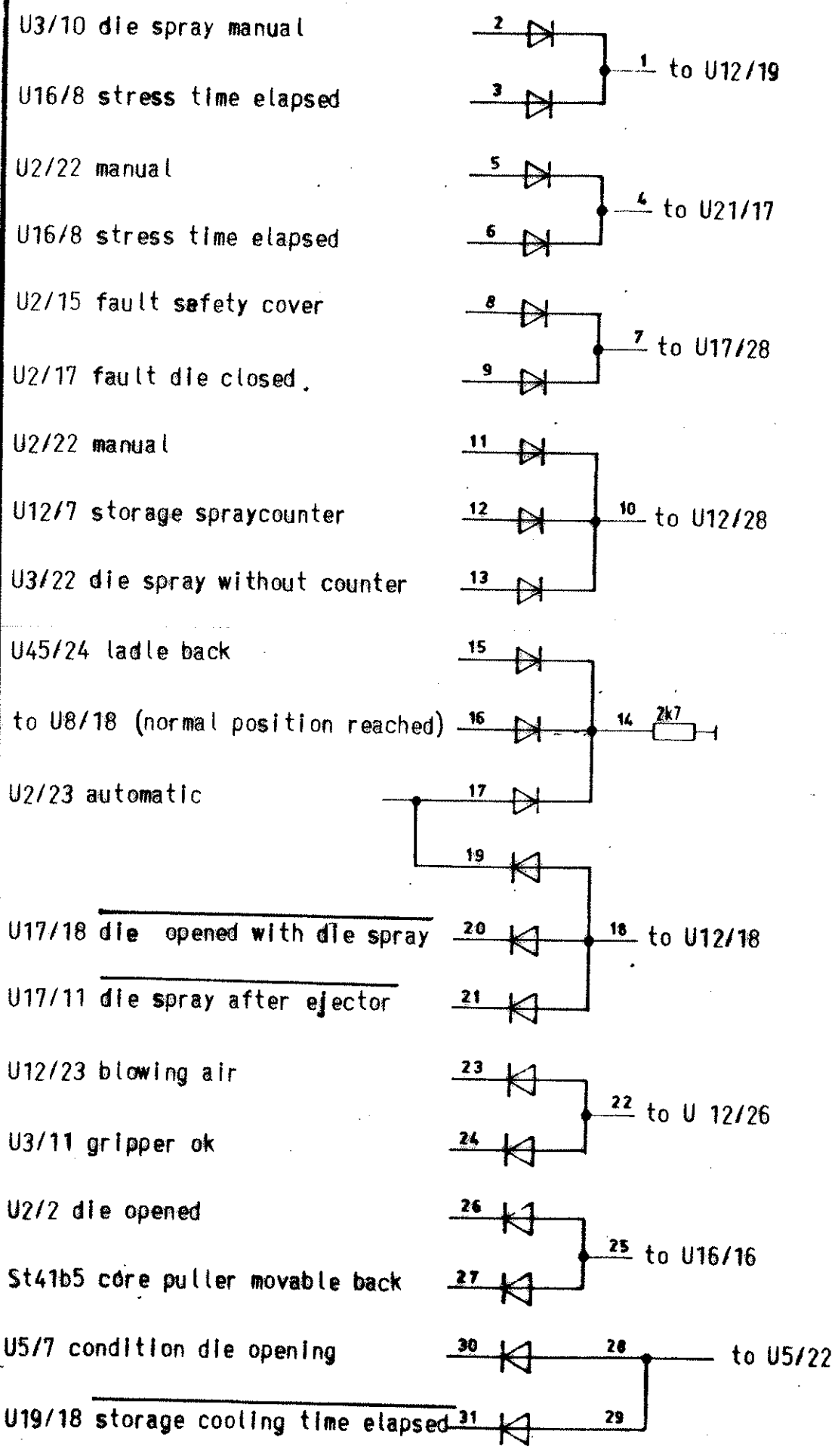

von U2/12 Schutztür geschlossen III
von U2/26 nur 2 Hand
2
3
1
nach U10/5 Bedingung Kernzug beweglich vor
von U17/23 Start Automatik
von U3/8 Kernzug fest vor v.H.
5
6
4
nach U11/3
von U3/29 Presskolben Pressen I
von U7/7 Bedingung Pressen
8
9
7
nach U14/12
von U2/29 Pressen II
von U16/7 Kippen hinten u. Kippzeit abgelaufen
von U3/30 Pressen III
11
12
13
10
nach U7/22
47µF
2k7
2k7
nach U23/31
von St45a13 nach U8/24 Presskolbenschmierung
von St48a3 Auswerfer vor Greifer
von St48a4 nach U26/27 Auswerfer zurück Greifer
15
16
17
19
20
21
14
+ von U21/1
18
0V von U22/31
von U40/18 mit Schöpfer *
von St41b9 Kernzug fest vorne
23
24
22
nach U7/4 Bedingung Pressen
von U19/4 Form offen
von U2/30 2.Phase Endschalter
26
27
25
nach U7/27
30
28
nach U14/11
31
29
von U7/14 Pressen 1. Phase Ventil

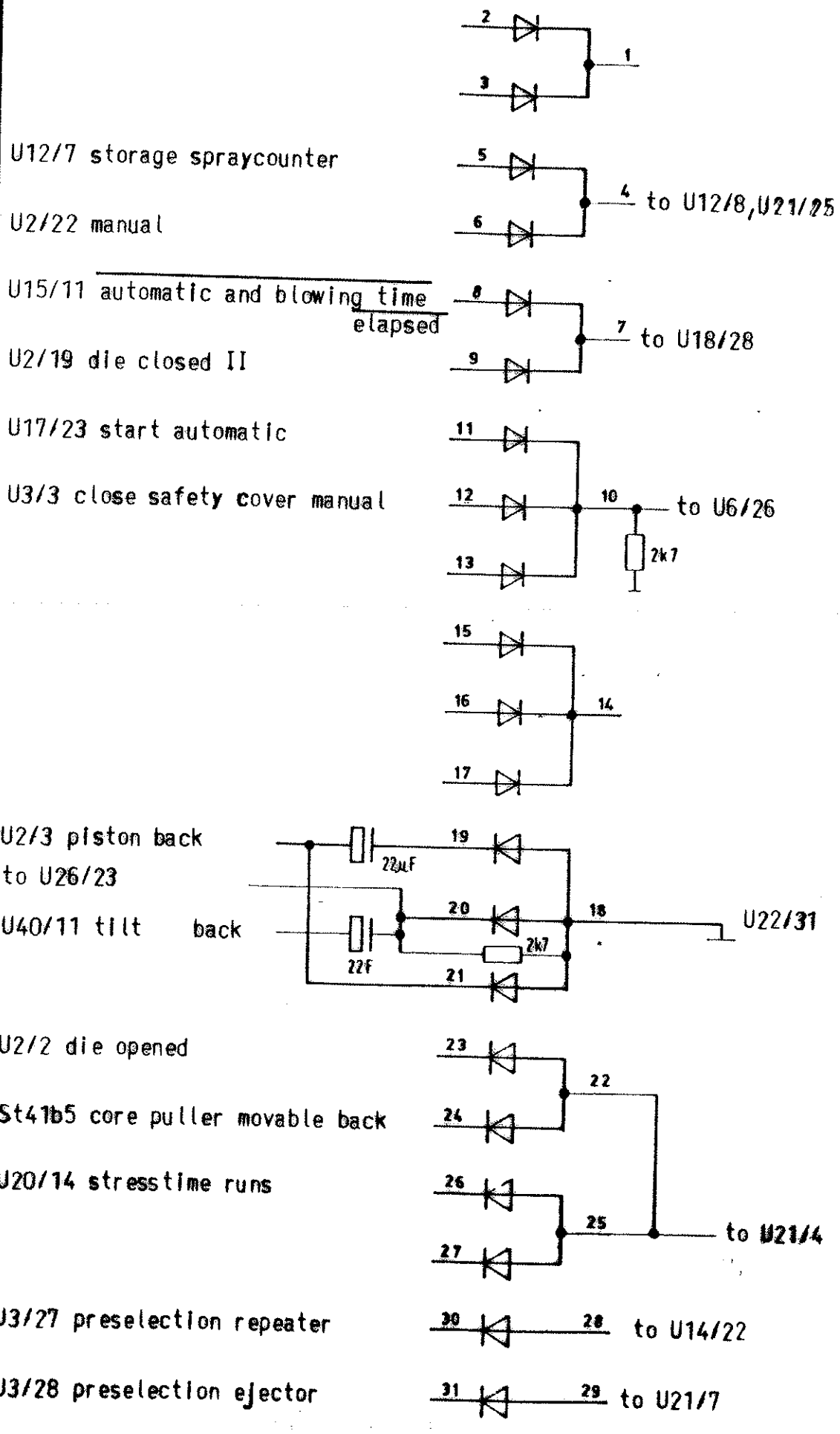

von U2/12 Schutztür geschlossen III
von U2/26 nur 2 Hand
2
3
1
nach U13/24
von U2/13 Schutztür geschlossen I
von U2/26 nur 2 Hand
5
6
4
nach U4/3
von U2/27 Schliessen v. H.
von U17/23 Start Automatik
8
9
7
nach U4/5
von U3/3 Schutztür schliessen v. H.
von U2/14 Schutztür geschlossen II
von U17/23 Start Automatik
11
12
13
10
nach U6/8
von U6/23 Bedingung Schutztür auf
von U3/13 Schutztür offen Greifer
von U6/7 Leiste betätigt
15
16
17
14
nach U6/24
von U2/3 Presskolben hinten
von St41b10 Kernzug fest hinten
19
20
21
18
nach U4/4
von U3/11 Greifer ok
von U10/11 Kernzug bew. vorne
von St41c3 Auswerfer hinten
von U18/11 Ausblase oben
23
24
26
27
22
25
nach U4/9
nach U4/5 Bedingung Schliessen
30
28
von U3/14 2 Hand schliessen
31
29
nach U8/10 Multispeicher


U17/7 normal position function
U2/28 open die manual
2
3
1
to U5/3
U2/29 press II
U16/7 tilt back and tilting time elapsed
5
6
4
to U7/3
U7/14 press I valve
U7/7 condition press
8
9
7
to U7/8
U3/6 core puller movable forward manual
U17/23 start automatic
11
12
13
10
to U10/3
U21/10 ejector time elapsed
St41c3 ejector back
U17/7 normal position function
15
16
17
14
to U9/8
U2/19 die closed II
U2/23 automatic
to U7/23 press
19
20
21
18
to U7/20
U30/20
U44/20 tilting time elapsed
23
24
22
to U16/5
U9/29 ejector forward valve
St48a4 ejector backward from gripper
26
27
25
to U9/10
to U9/8 ejector backward
30
31
28
U18/20 ejector repeating and automatic
29
U3/5 ejector backward manual

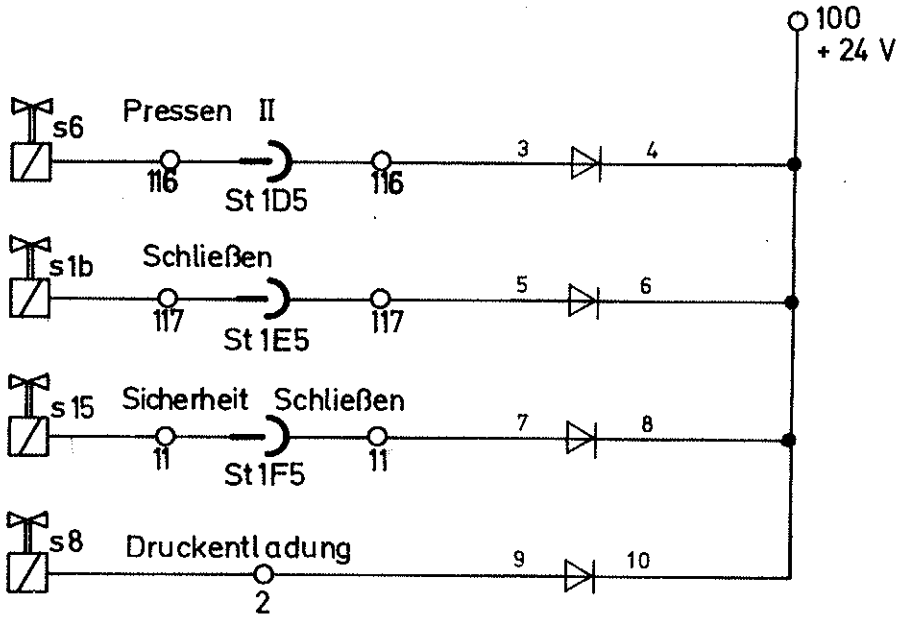

von U3/4 Auswerfer vor v.H.
von U16/8 Nachdruckzeit abgelaufen
2
3
1
nach U9/28 Auswerfer vor Ventil
von St41c1 Auswerfer vorne
von U21/10 Auswerferzeit abgelaufen
5
6
4
2k7
nach U9/18 Beding. Auswerfer vor
von U2/24 Grundstellung v. H.
von U8/23 Grundstellung Funktion
8
9
7
nach U8/19
von St41c3 Auswerfer hinten
von U9/29 Auswerfer vor Ventil
von U2/22 Hand
11
12
13
10
nach U9/19 Bedingung Auswerfer vor
von U10/14 Kernzug bew. I vor Ventil
von U15/4 Vorwahl Kernzug bew. I
nach U18/25
15
16
17
14
2k7
von St41c3 Auswerfer hinten
von U18/11 Ausblase oben
von U3/18 Vorwahl Kernzug bew.
19
20
21
18
nach U10/9 Kernzug bew. I vor
von St41b5 Kernzug bew. I hinten
von U18/11 Ausblase oben
23
24
22
nach U9/4 Maschine ok für Greifer
von U2/2 Form offen
von St48a3 Auswerfer vor Greifer
26
27
25
nach U9/27
von U17/23 Start Automatik
von U4/14 Schließen Ventil
30
31
28
29
nach U14/22

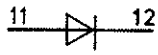

von U2/25 Start Taste
von U3/14 2 Hand schliessen
2
3
1
nach U8/3
von U3/7 Kernzug beweglich I zurück v.H.
von U17/7 Grundstellung Funktion
5
6
4
nach U10/19
4,7µF
von U20/15
8
9
7
von U18/18 Reset Nachdruckzeit
von U11/14 Kernzug fest I vor Ventil
von U15/26 Vorwahl Kernzug fest
nach U18/25
11
12
13
10
2k7
von U3/9 Kernzug fest I zurück v.H.
von U17/7 Grundstellung Funktion
15
16
17
14
nach U11/19 Bedingung Kernzug fest I zurück
von St41b10 Kernzug fest hinten
von U3/11 Greifer ok
von St41b5 Kernzug bew. I hinten
19
20
21
18
von U2/2 Form offen
von St41c3 Auswerfer hinten
23
24
22
nach U8/18 (Grundst. erreicht)
von U20/29 Öffnungszeit abgelaufen
von U13/7 Waage Speicher
26
27
25
nach U8/6 Bedingung Start
nach U10/19
30
28
von U17/22 Abkühlzeit abgelaufen
von U4/14 Schliessen Ventil
31
29
nach U18/25

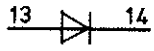

U3/10 die spray manual
U16/8 stress time elapsed
2
3
1
to U12/19
U2/22 manual
U16/8 stress time elapsed
5
6
4
to U21/17
U2/15 fault safety cover
U2/17 fault die closed
8
9
7
to U17/28
U2/22 manual
U12/7 storage spraycounter
U3/22 die spray without counter
11
12
13
10
to U12/28
U45/24 ladle back
to U8/18 (normal position reached)
U2/23 automatic
15
16
17
14
2k7
19
U17/18 die opened with die spray
U17/11 die spray after ejector
20
21
18
to U12/18
U12/23 blowing air
U3/11 gripper ok
23
24
22
to U 12/26
U2/2 die opened
St41b5 core puller movable back
26
27
25
to U16/16
U5/7 condition die opening
U19/18 storage cooling time elapsed
30
31
28
29
to U5/22

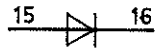

2
1
3
U12/7 storage spraycounter
5
4
to U12/8,U21/25
U2/22 manual
6
U15/11 automatic and blowing time elapsed
8
7
to U18/28
U2/19 die closed II
9
U17/23 start automatic
11
U3/3 close safety cover manual
12
10
to U6/26
2k7
13
15
16
14
17
U2/3 piston back
to U26/23
22µF
19
U40/11 tilt back
20
18
U22/31
2k7
22F
21
U2/2 die opened
23
22
St41b5 core puller movable back
24
U20/14 stresstime runs
26
25
to U21/4
27
U3/27 preselection repeater
30
28
to U14/22
U3/28 preselection ejector
31
29
to U21/7

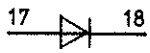
FRECH	Löschdioden n 2	DAKh	8. 300. 818 .74
			6.10.78 Sel.

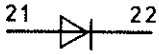










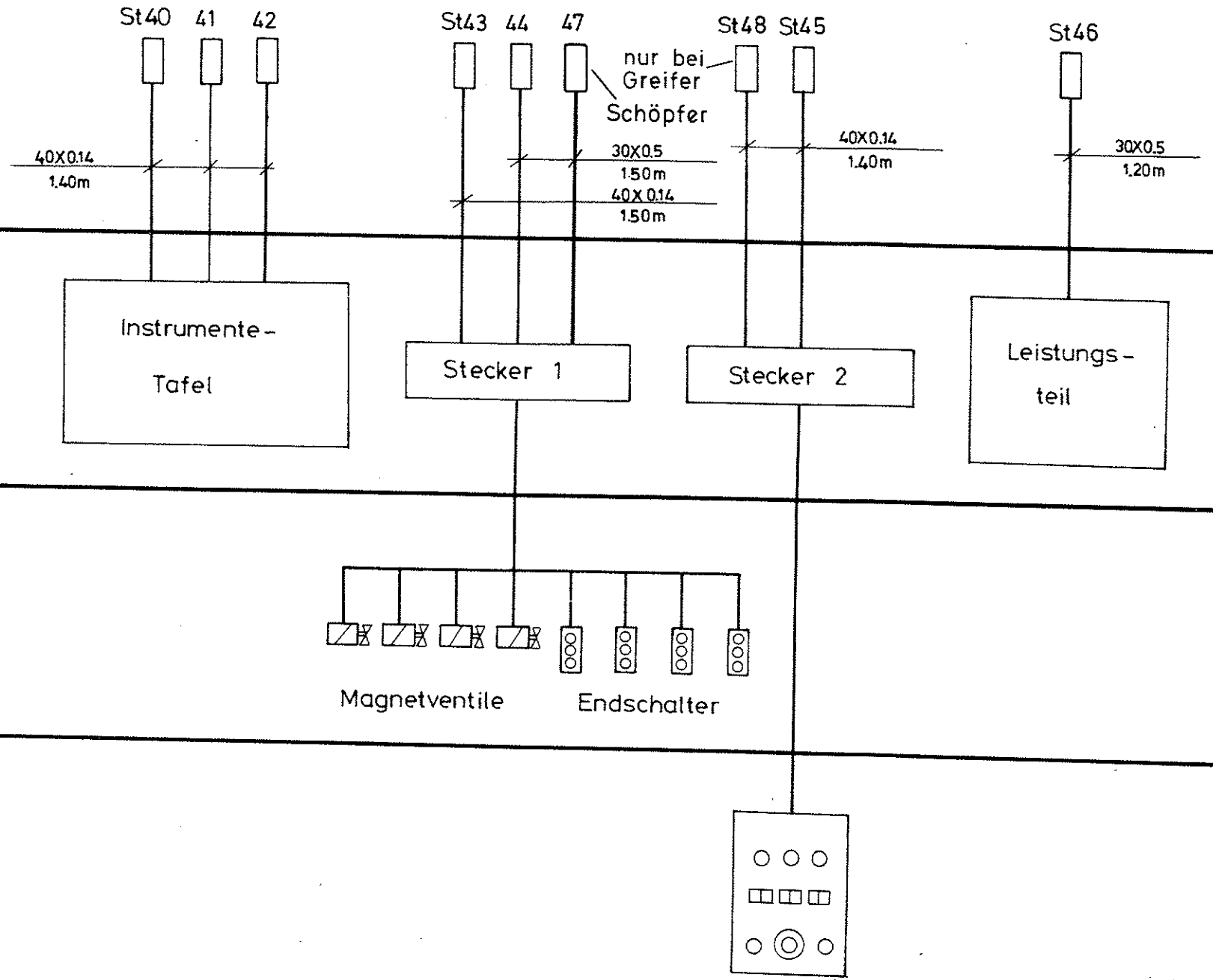


lektronik-
Steuerung

Schalt-
schrank

aschine

edien-
pult



FRECH

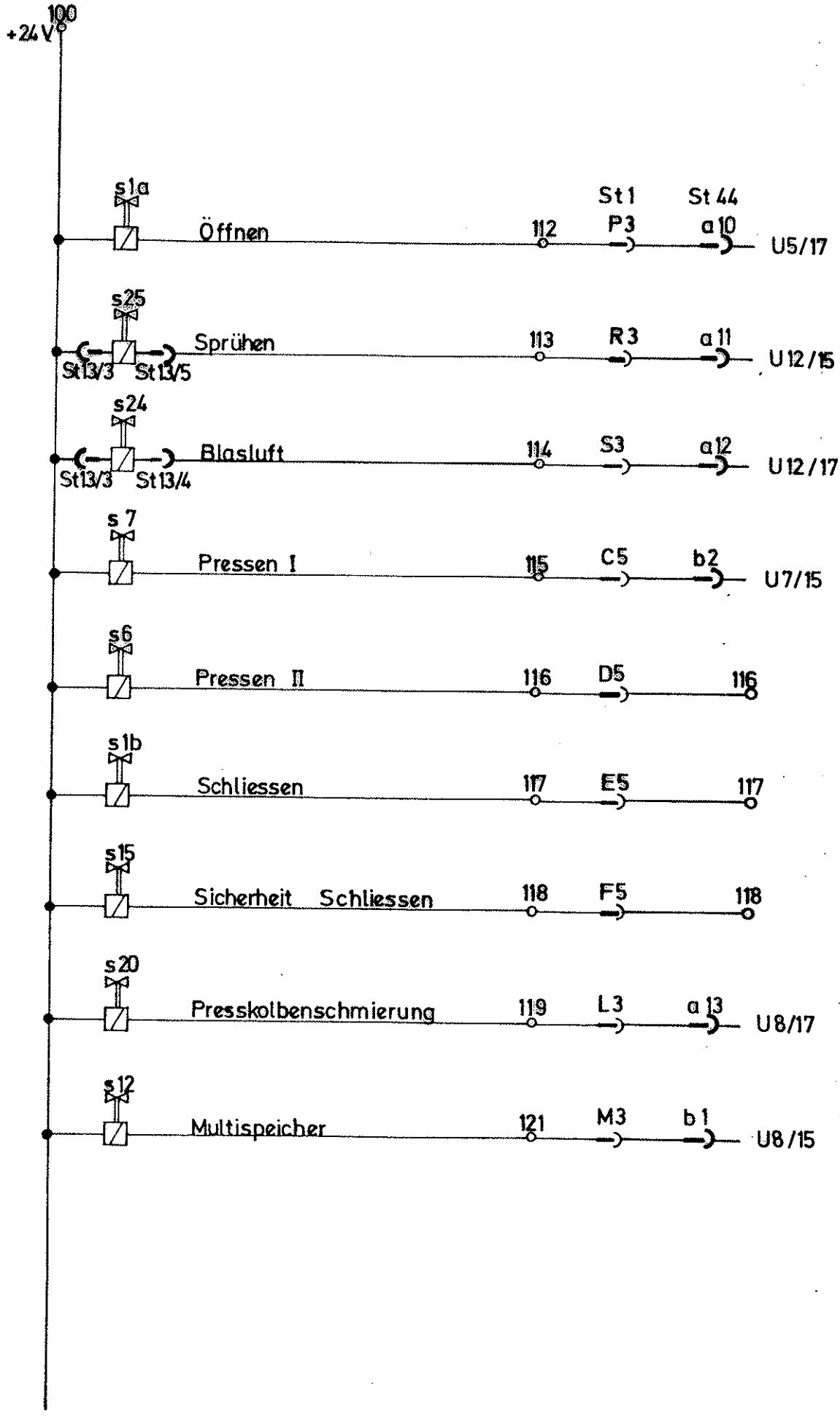
Verkabelung

DAKh

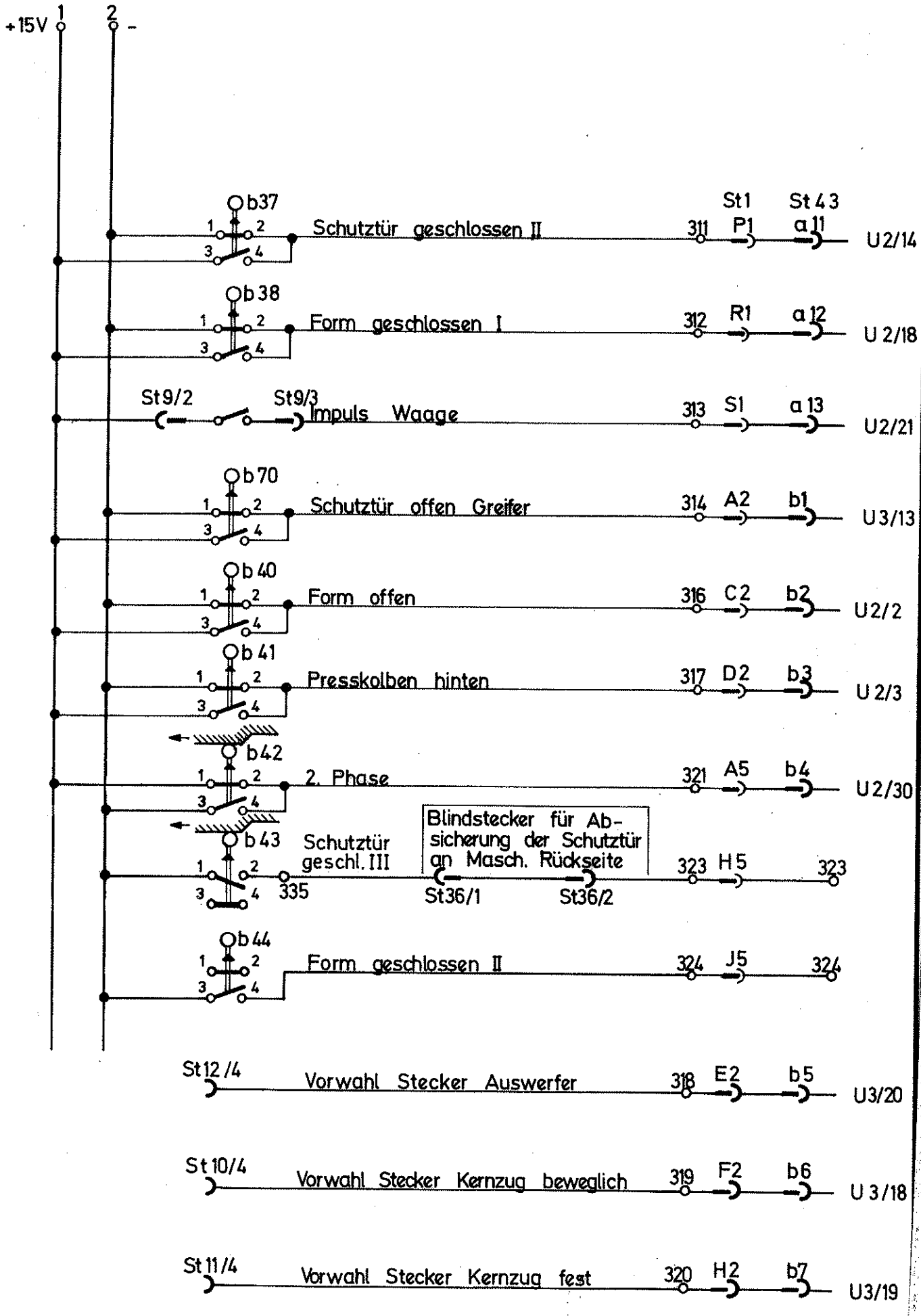
23.12.76

8.300.819.74

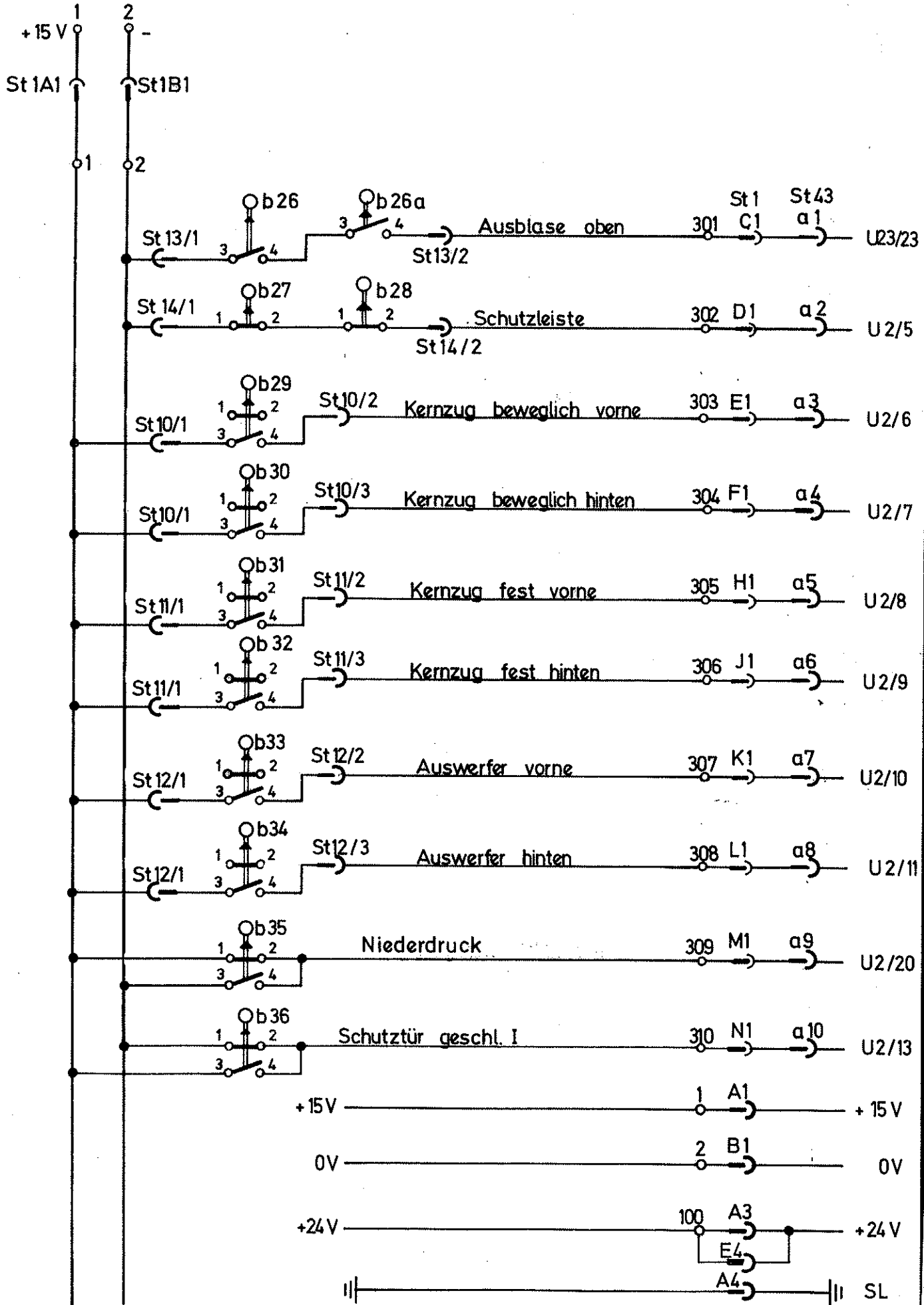
Pr.



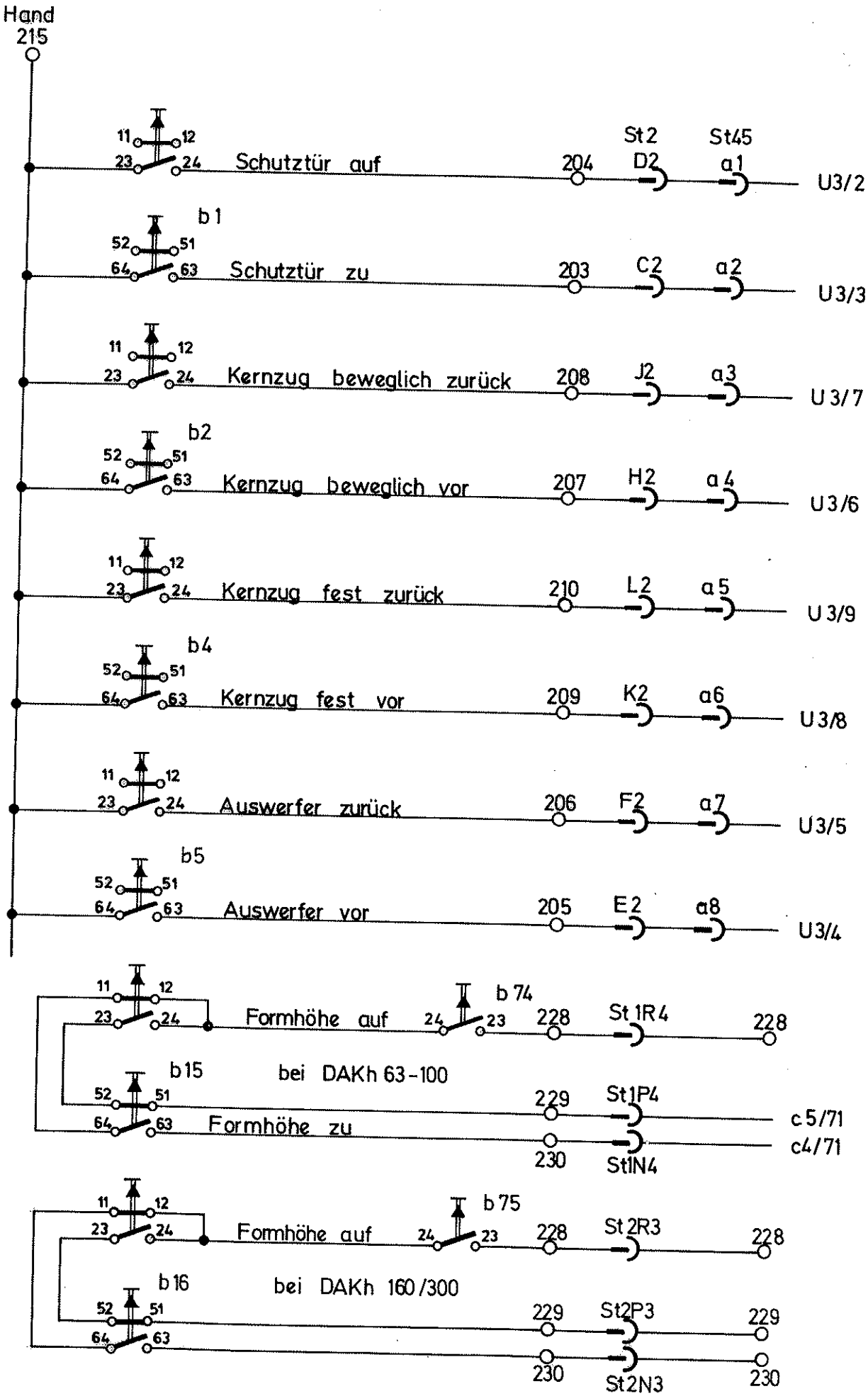
FRECH	Endschalter	DAK h	8.300.822.74	
			10.10.78	fel.



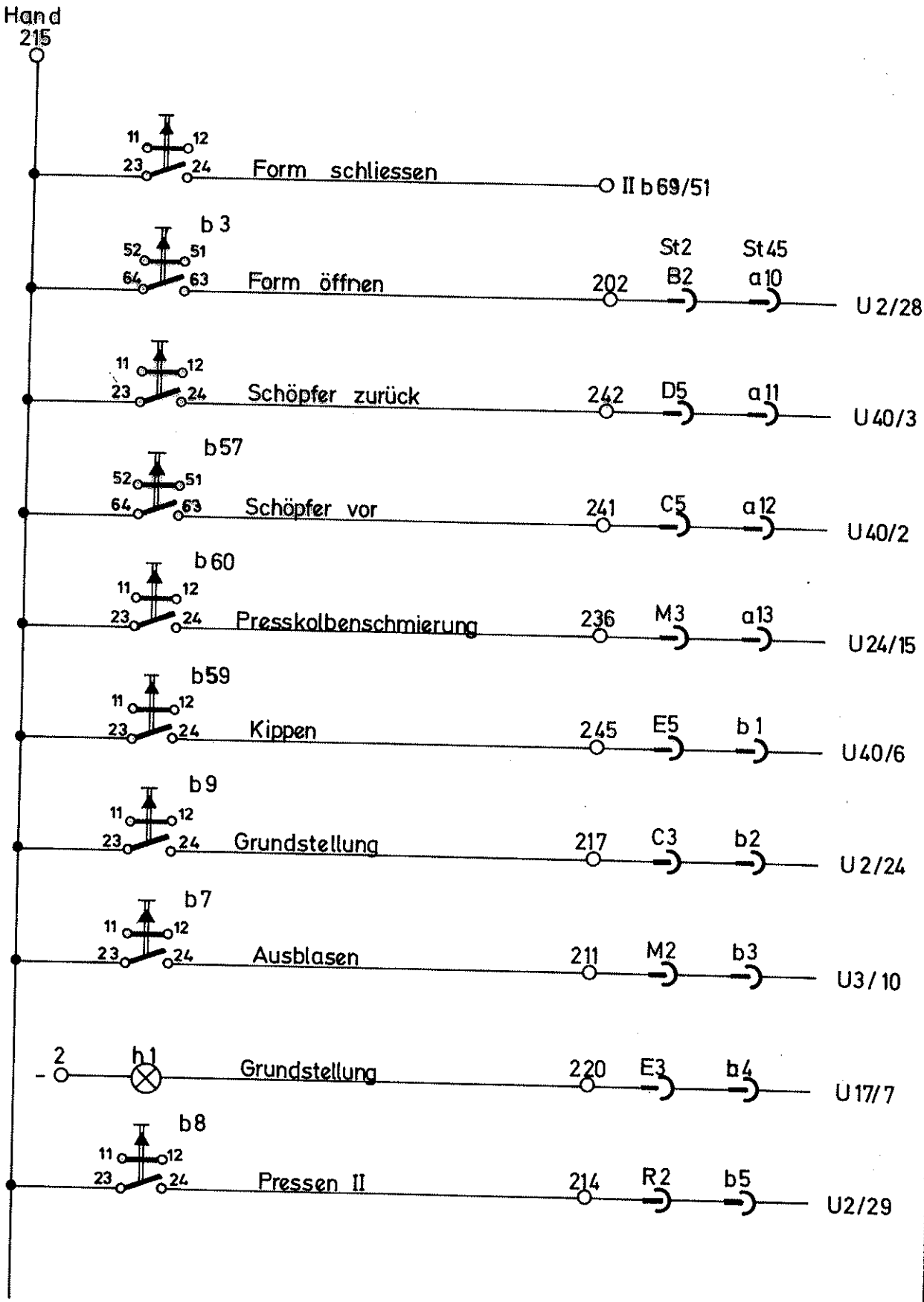
FRECH	Endschalter	DAKh	8.300.823.74	
			10.10.78	Sel.

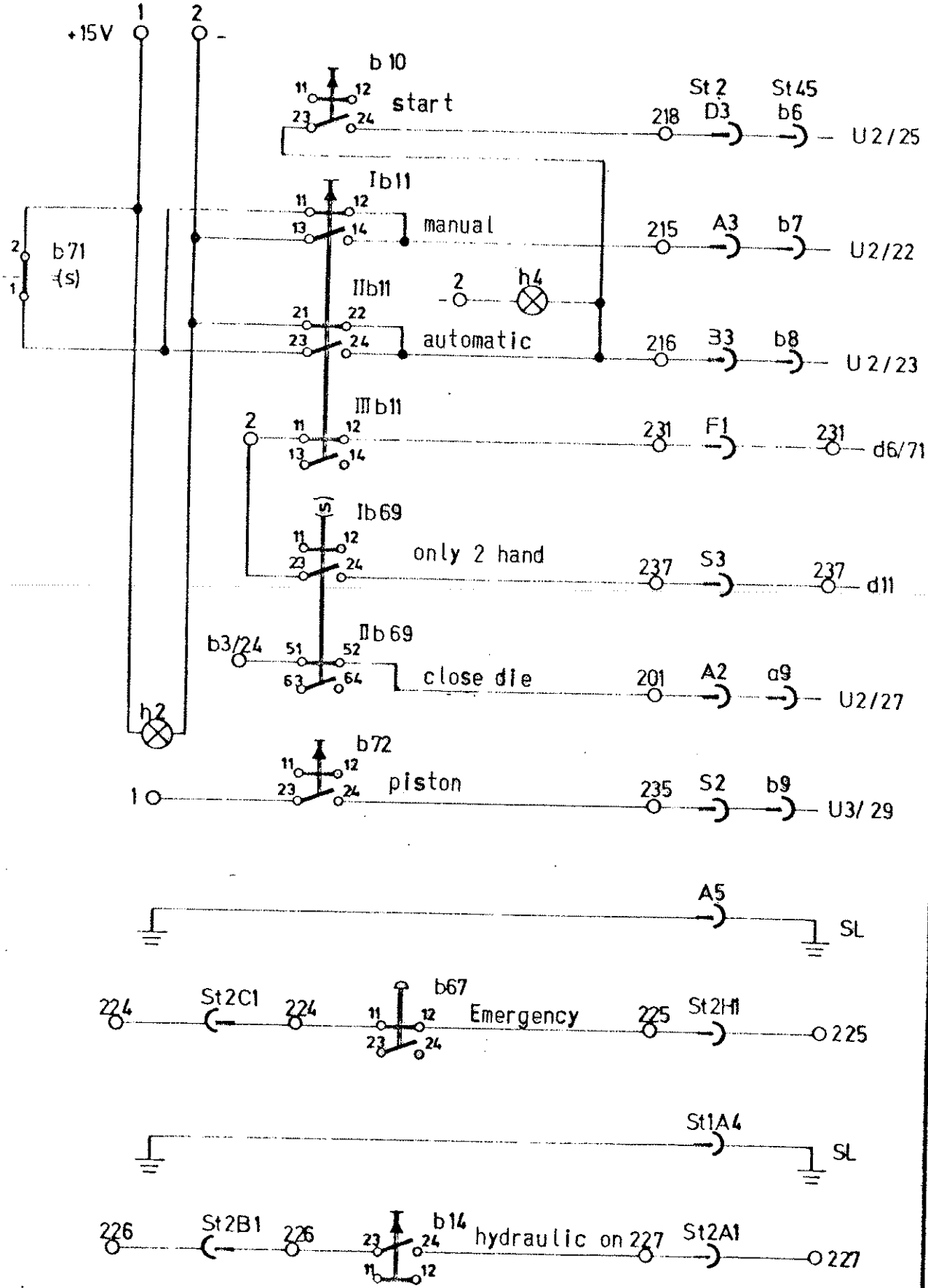


FRECH	Steuerpult mit Schöpfer	DAK h	8.300.824.74	
			11.10.78	Sel.

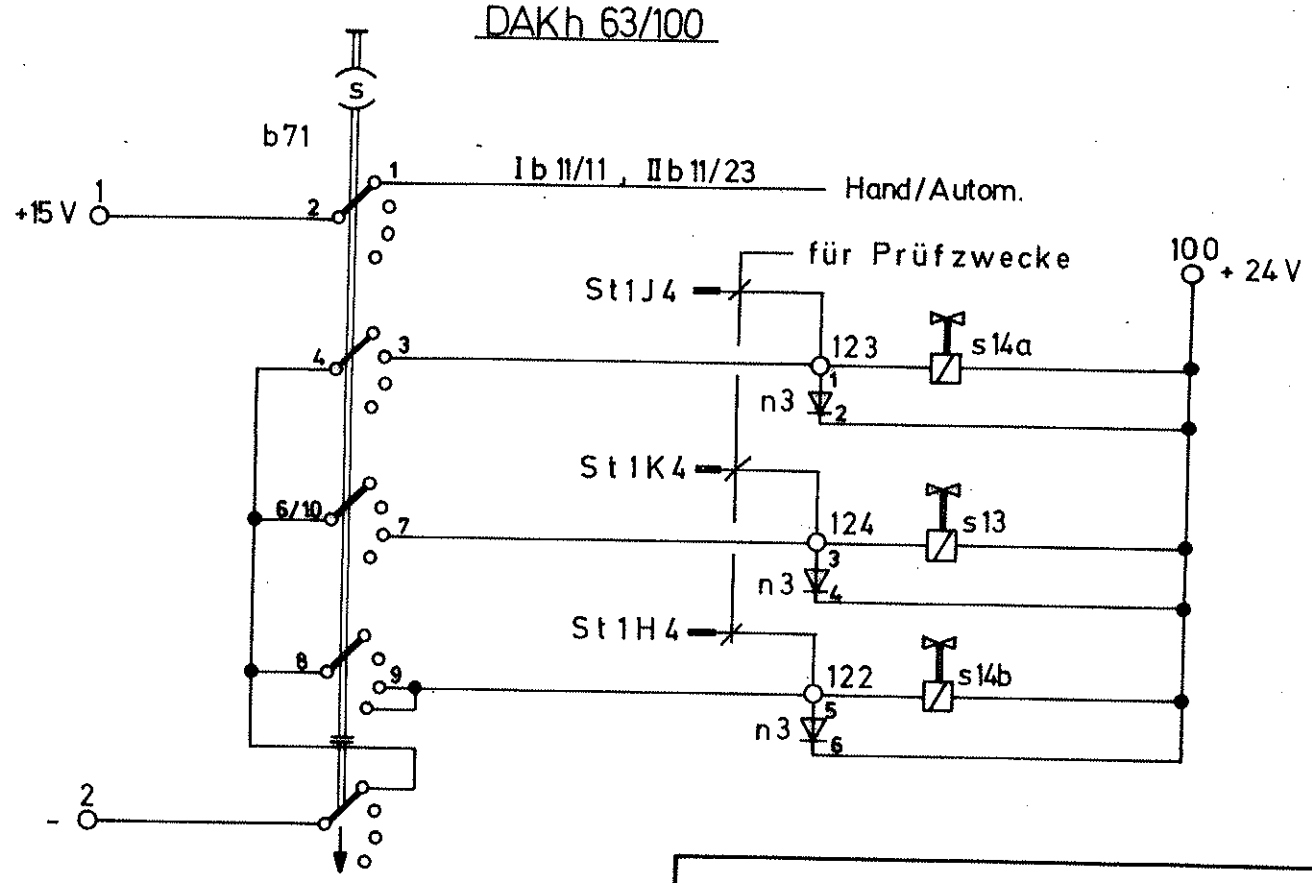


FRECH	Steuerpult mit Schöpfer	DAK h	8.300.825.74
			13.10.78 Sel.




+15V
1
2
-
b 10
start
St 2
St45
218
D3
b6
U2/25
Ib11
manual
215
A3
b7
U2/22
b71
(s)
IIb11
h4
automatic
216
B3
b8
U2/23
IIIb11
231
F1
231
d6/71
Ib69
only 2 hand
237
S3
237
d11
b3/24
IIb69
close die
201
A2
a9
U2/27
h2
b72
piston
235
S2
b9
U3/29
A5
SL
224
St2C1
b67
Emergency
225
St2H1
St1A4
SL
226
St2B1
b14
hydraulic on
227
St2A1

DAKh 63/100

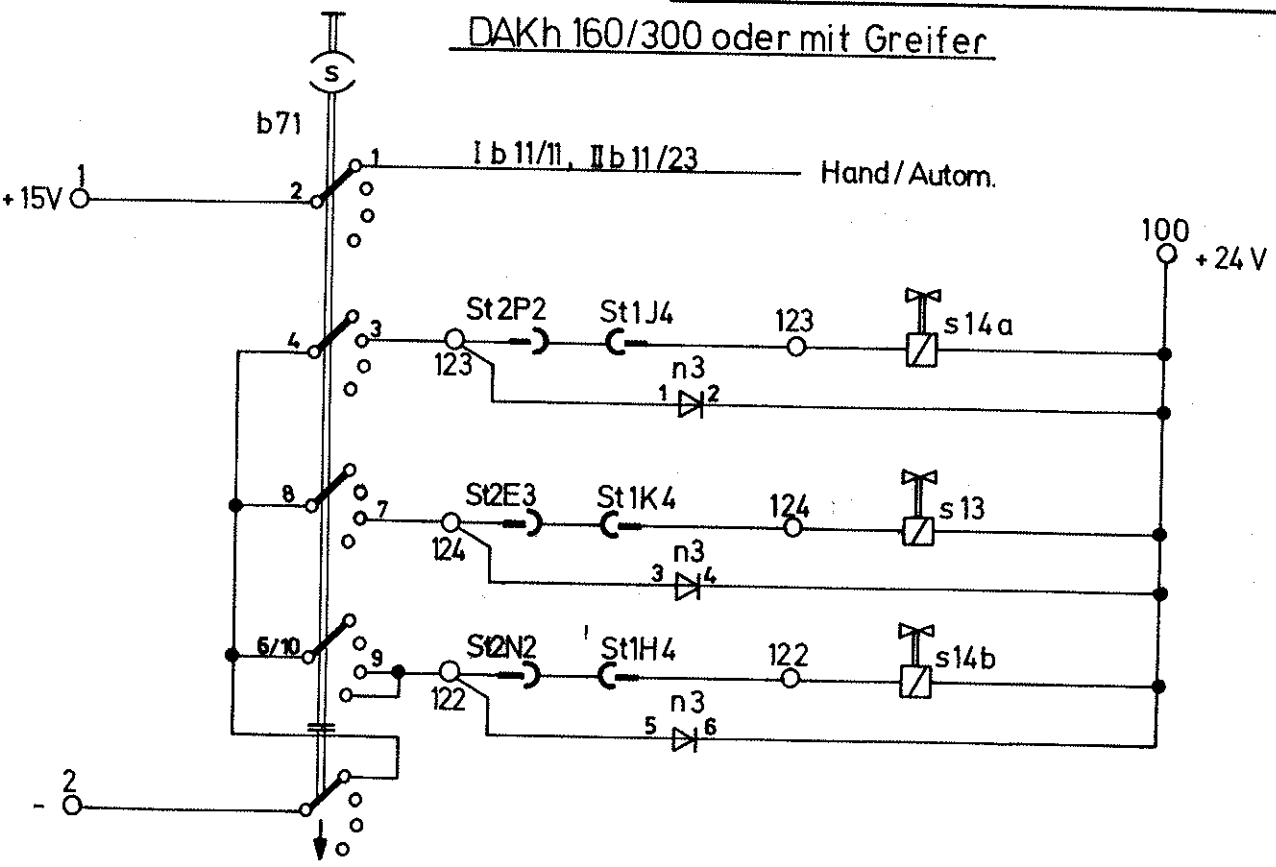


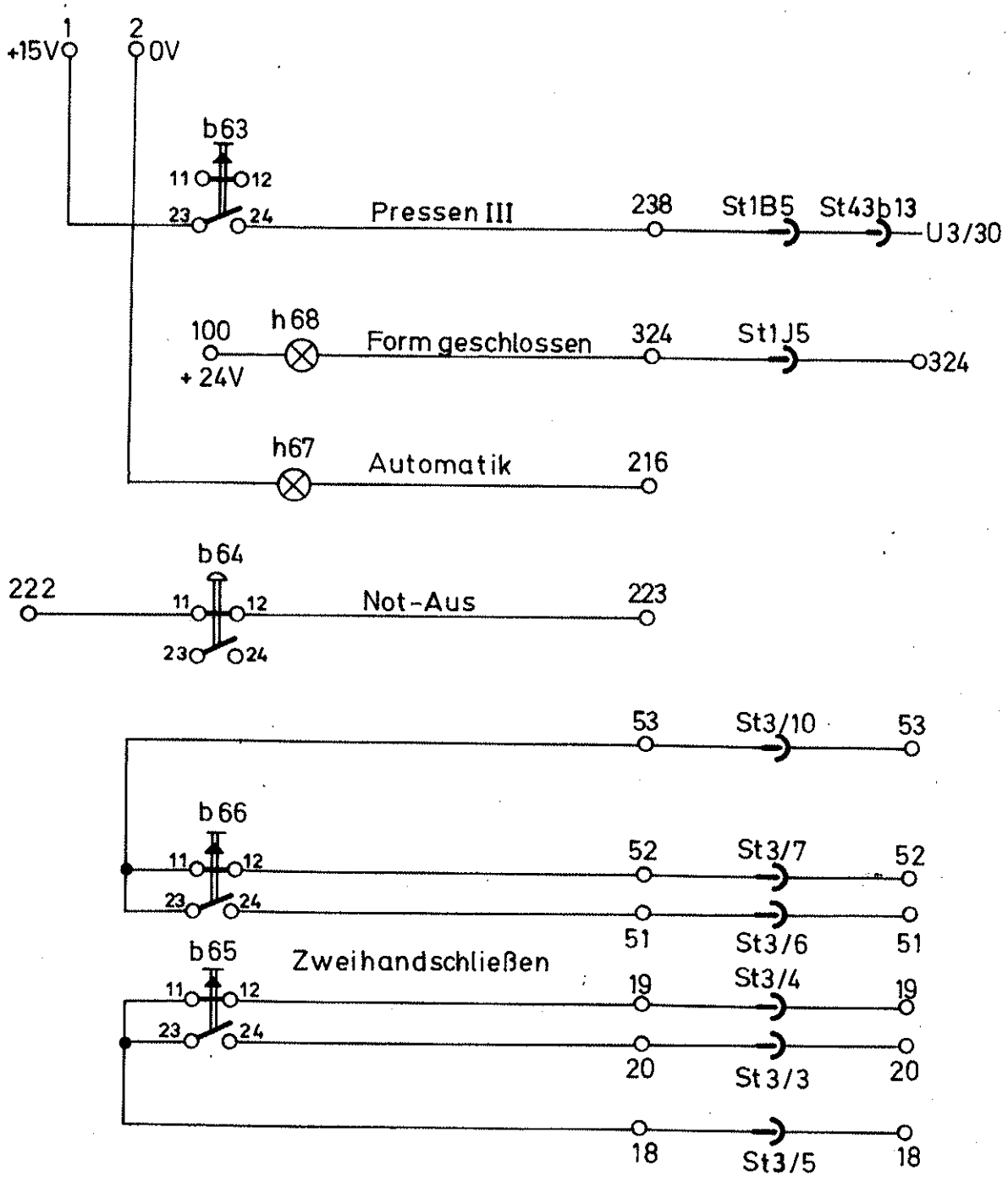
Position 1 = untere Angußstellung = s 14 a

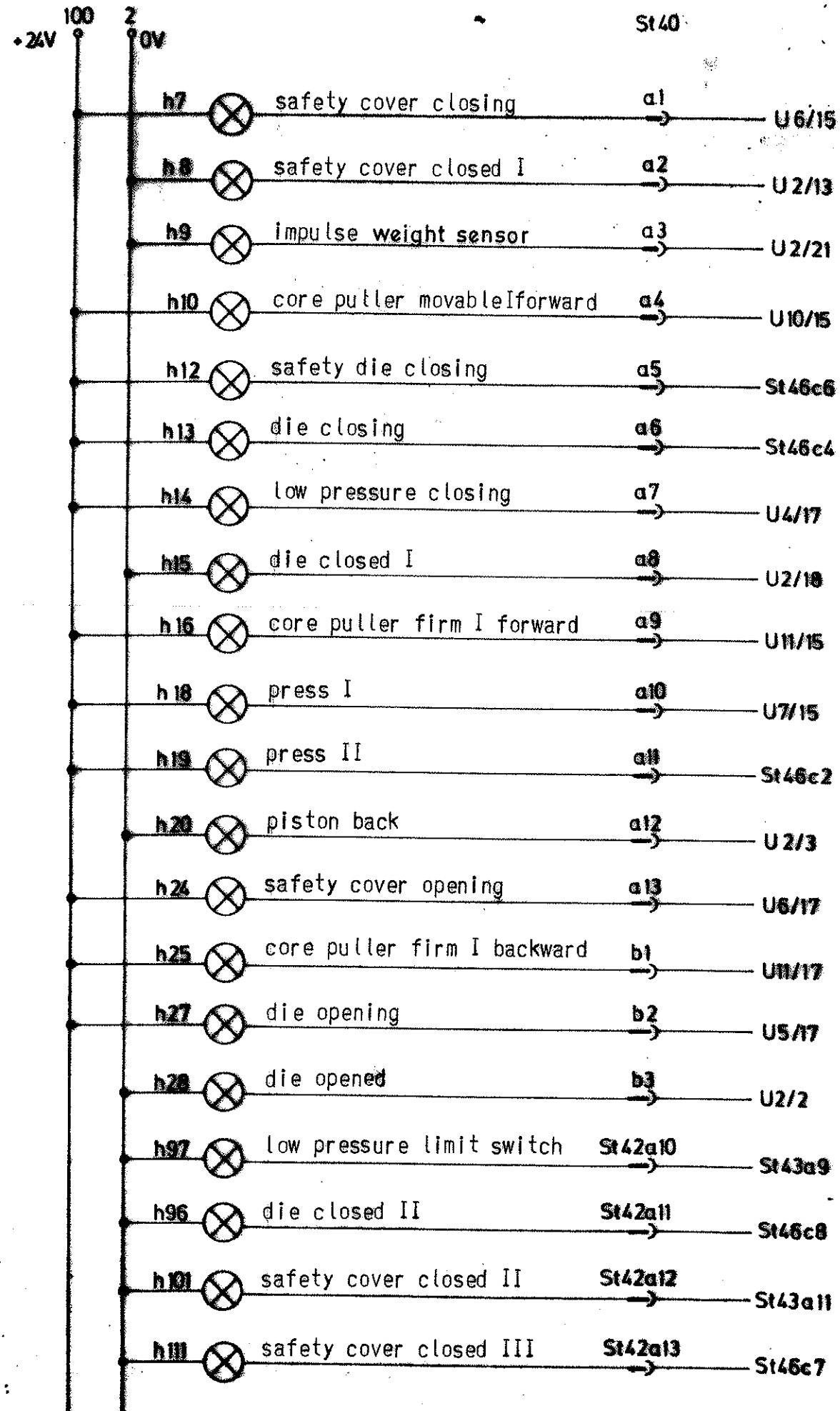
Position 2 = mittlere Angußstellung = s14b+s13

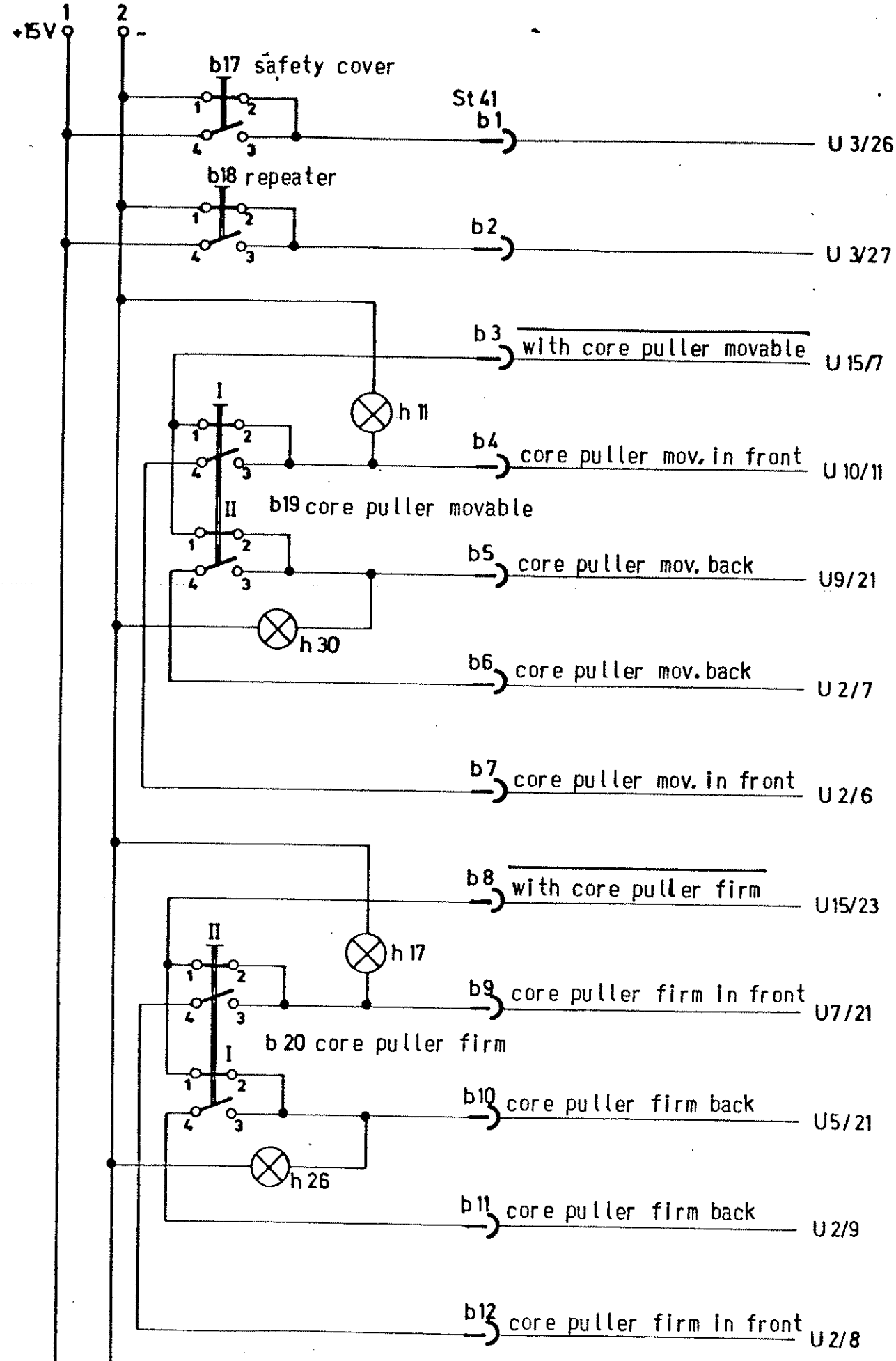
Position 3 = obere Angußstellung = s14b

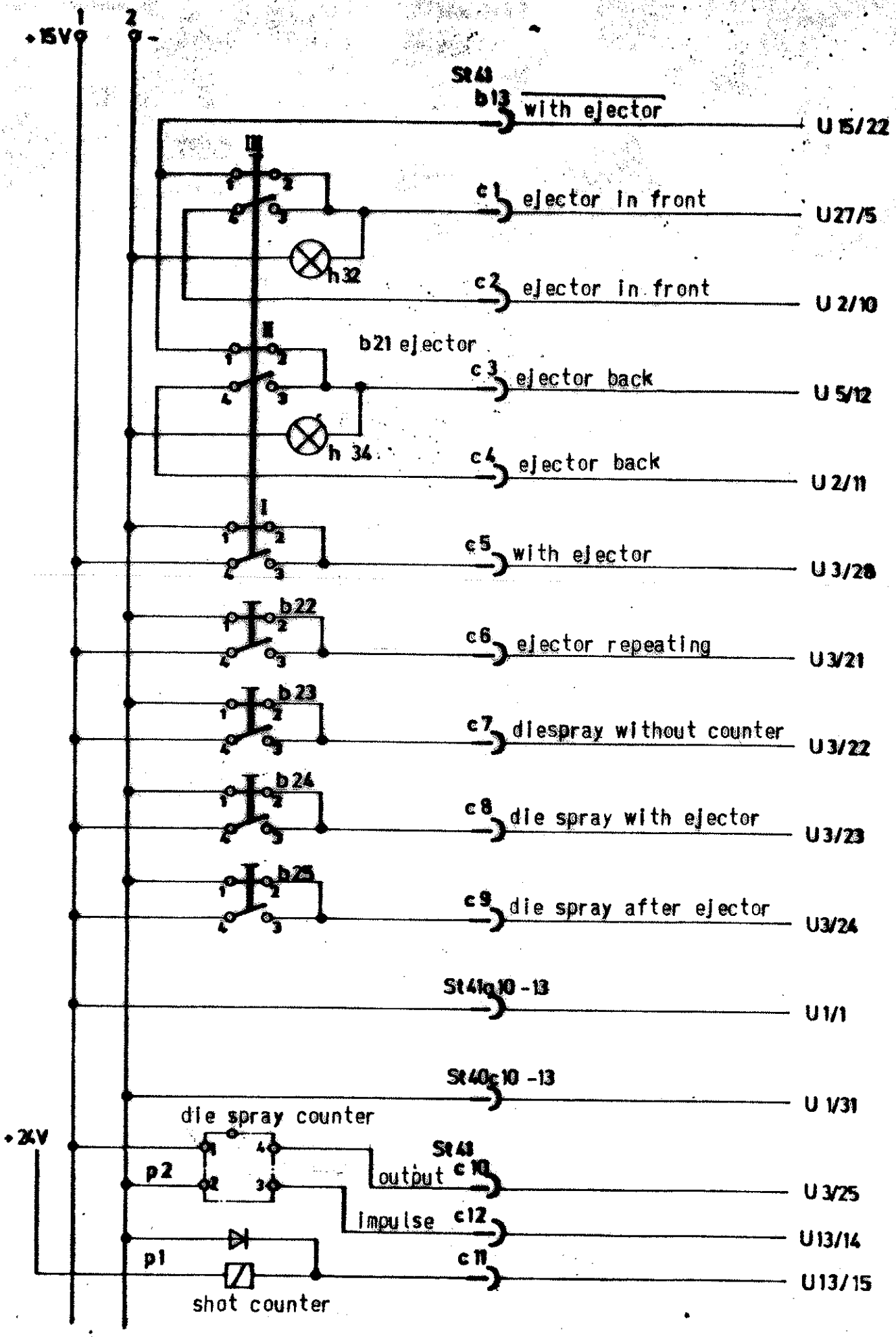
DAKh 160/300 oder mit Greifer

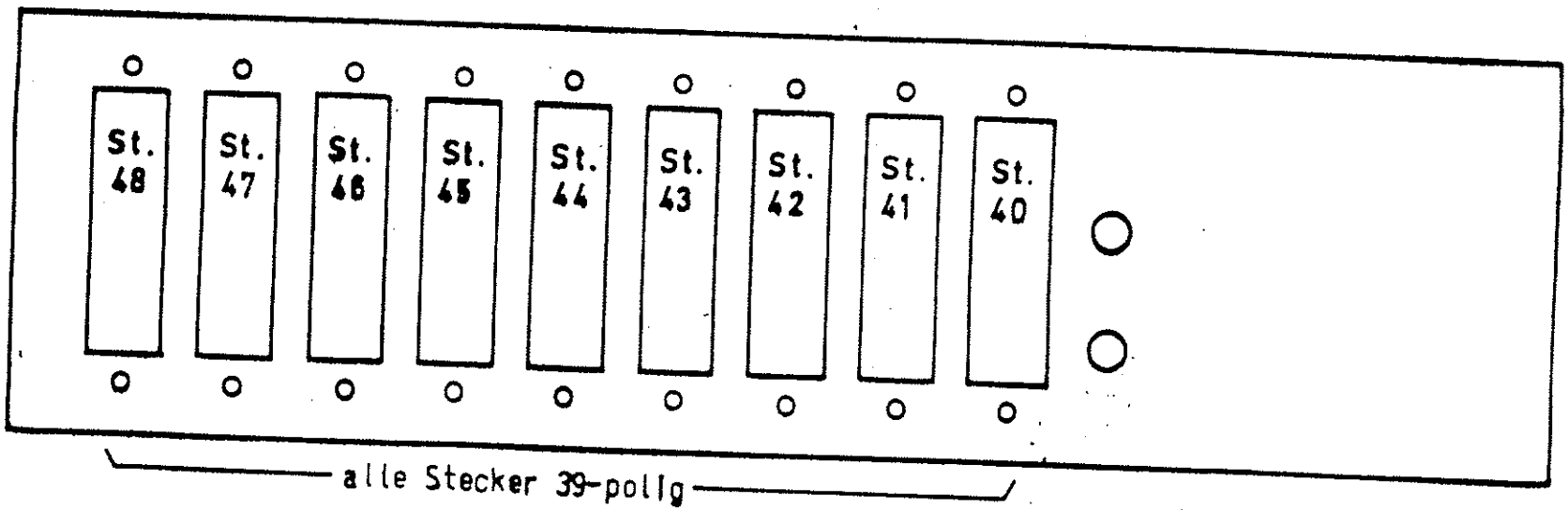



1
+15V
2
0V
b63
11
12
23
24
Pressen III
238
St1B5
St43b13
U3/30
100
+ 24V
h68
Form geschlossen
324
St1J5
324
h67
Automatik
216
b64
222
11
12
23
24
Not-Aus
223
53
St3/10
53
b66
11
12
23
24
52
St3/7
52
51
St3/6
51
b65
Zweihandschließen
11
12
23
24
19
St3/4
19
20
St3/3
20
18
St3/5
18

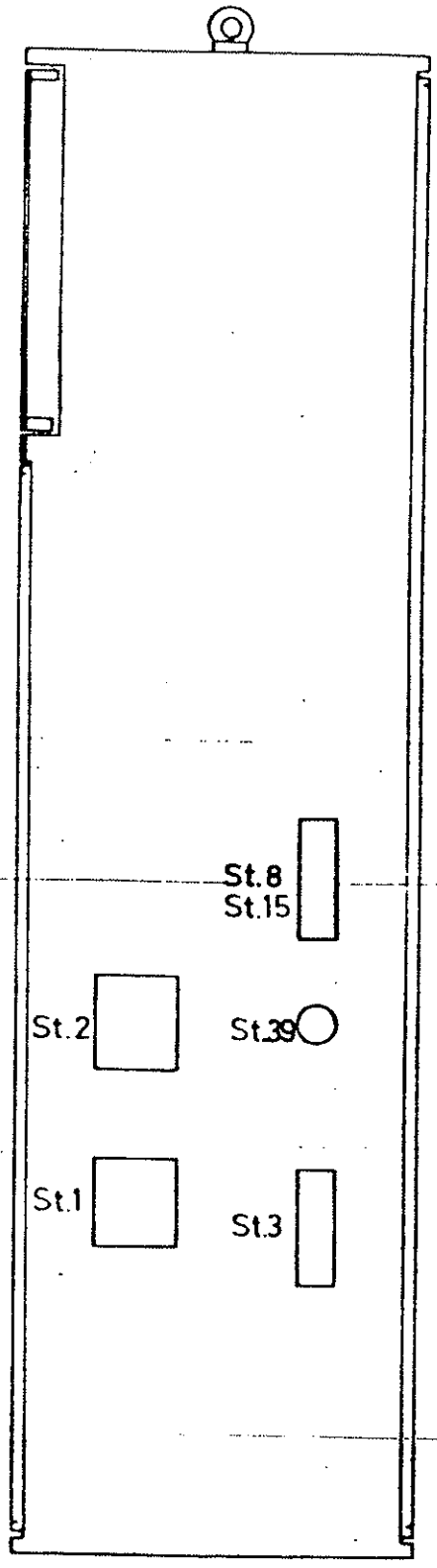

+24V
100
2
0V
St40
h7
safety cover closing
a1
U6/15
h8
safety cover closed I
a2
U2/13
h9
impulse weight sensor
a3
U2/21
h10
core puller movableIforward
a4
U10/15
h12
safety die closing
a5
St46c6
h13
die closing
a6
St46c4
h14
low pressure closing
a7
U4/17
h15
die closed I
a8
U2/18
h16
core puller firm I forward
a9
U11/15
h18
press I
a10
U7/15
h19
press II
a11
St46c2
h20
piston back
a12
U2/3
h24
safety cover opening
a13
U6/17
h25
core puller firm I backward
b1
U11/17
h27
die opening
b2
U5/17
h28
die opened
b3
U2/2
h97
low pressure limit switch
St42a10
St43a9
h96
die closed II
St42a11
St46c8
h101
safety cover closed II
St42a12
St43a11
h111
safety cover closed III
St42a13
St46c7


+15V
1
2
-
b17 safety cover
St 41
b1
U 3/26
b18 repeater
b2
U 3/27
b3
with core puller movable
U 15/7
h 11
b4
core puller mov. in front
U 10/11
b19 core puller movable
b5
core puller mov. back
U9/21
h 30
b6
core puller mov. back
U 2/7
b7
core puller mov. in front
U 2/6
b8
with core puller firm
U15/23
h 17
b9
core puller firm in front
U7/21
b 20 core puller firm
b10
core puller firm back
U5/21
h 26
b11
core puller firm back
U 2/9
b12
core puller firm in front
U 2/8


+15V
1
2
-
St41
b13 with ejector
U 15/22
II
c1 ejector in front
U27/5
h32
c2 ejector in front
U 2/10
II
b21 ejector
c3 ejector back
U 5/12
h 34
c4 ejector back
U 2/11
I
c5 with ejector
U 3/28
b22
c6 ejector repeating
U3/21
b23
c7 diespray without counter
U3/22
b24
c8 die spray with ejector
U3/23
b25
c9 die spray after ejector
U3/24
St41a 10 -13
U1/1
St40c 10 -13
U 1/31
die spray counter
+24V
p2
St41
output c10
U 3/25
impulse c12
U13/14
p1
c11
U13/15
shot counter



Steckerplatte an der Rückseite des Baugruppenträgers befestigt.



rechte Schaltschrankseite

St.1 Maschine

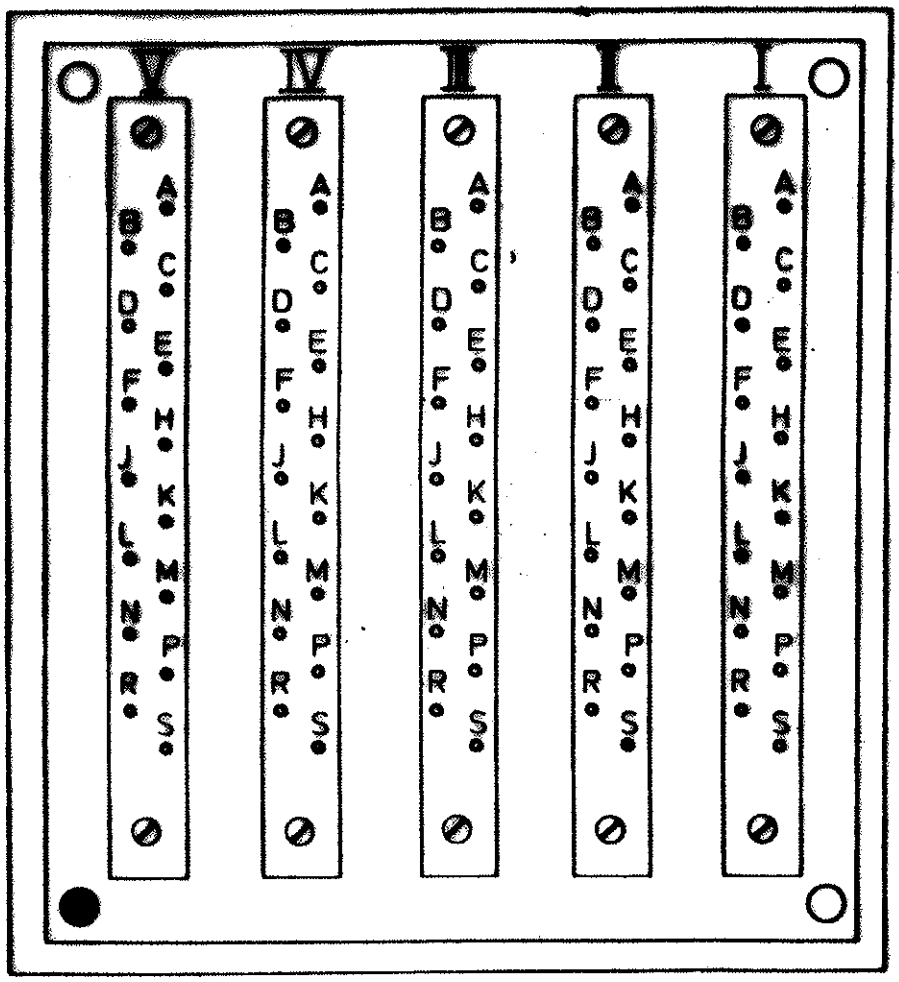
St.2 Steuerpult

St.3 Waage, Schmiermotor, Verstellmotor für Formhöhe

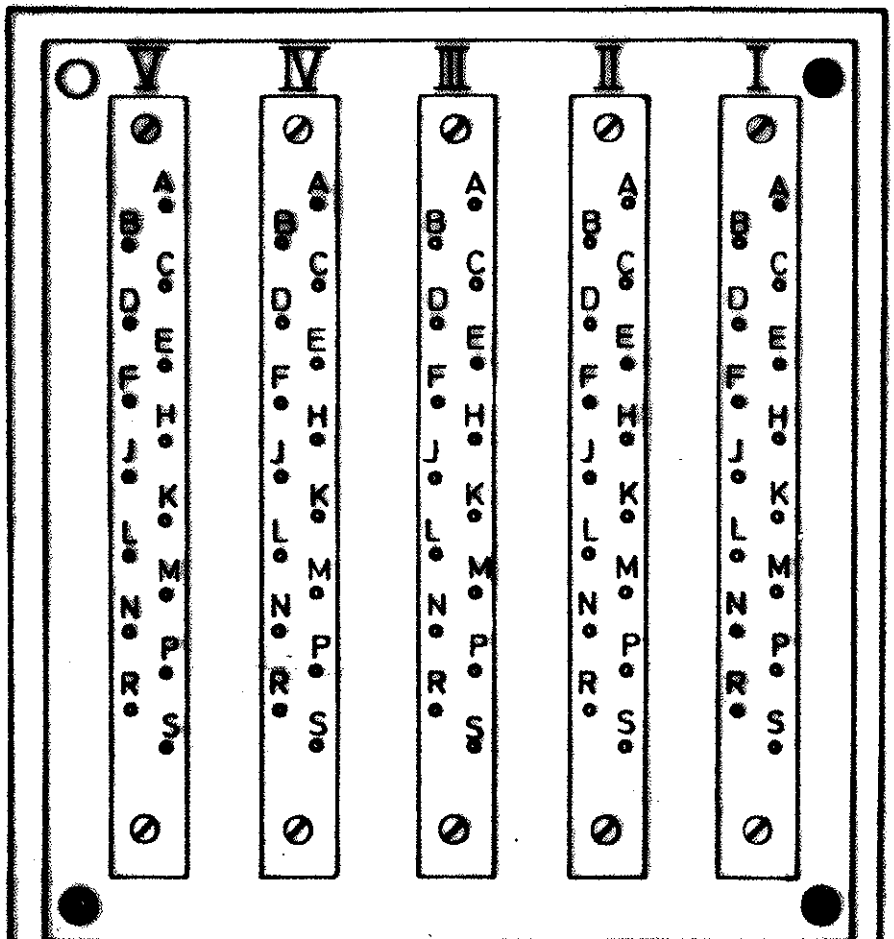
St.8 Entnahmeeinrichtung

St.15 Förderband

St.39 Steckdose 220V~



St.1
machine



St.2
control panel

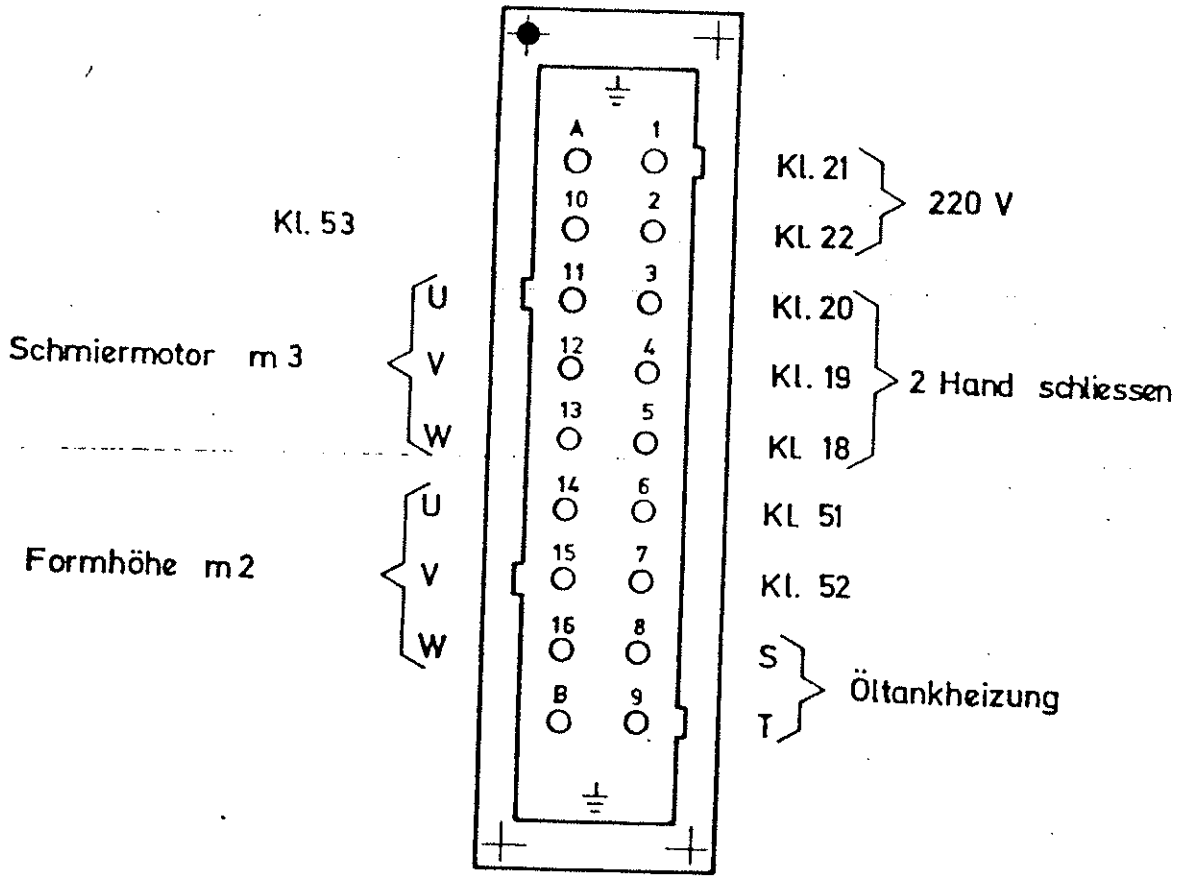
○ socket

● pin

● Stift

○ Hülse

St 3



PRELA

Steckdosen

39 - polig

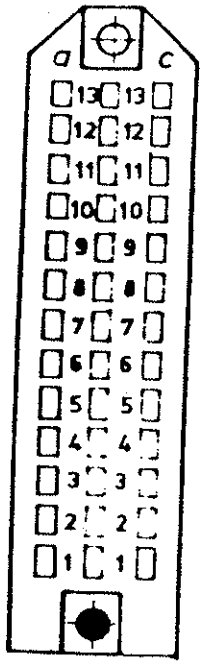
8.300.837.24

30.10.78 Sd.

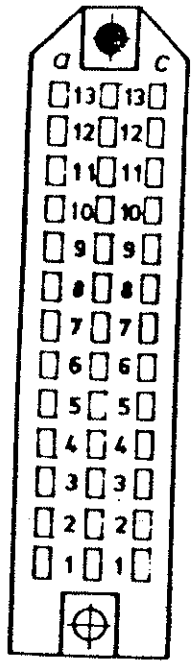
● Stift

○ Hülse

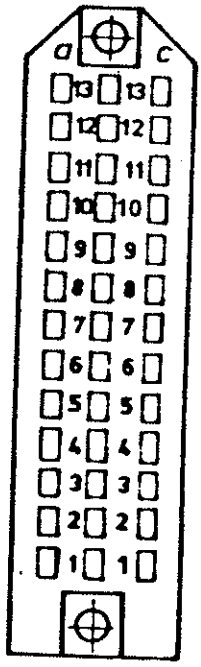
St 40



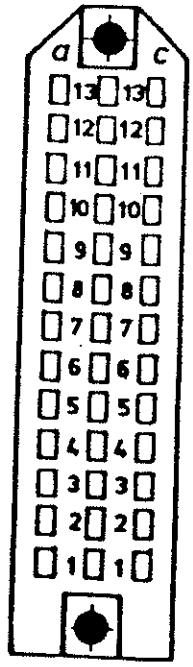
St 41



St 42



St 43



FRECH

Steckdosen

39 - polig

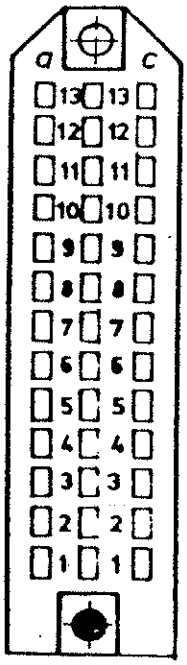
8.300.838.74

30.10.78

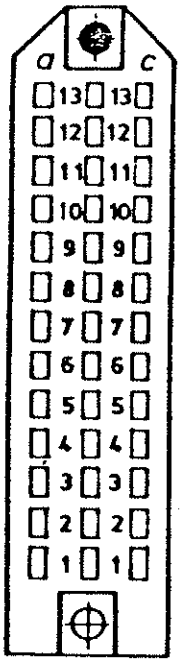
Stift

Hülse

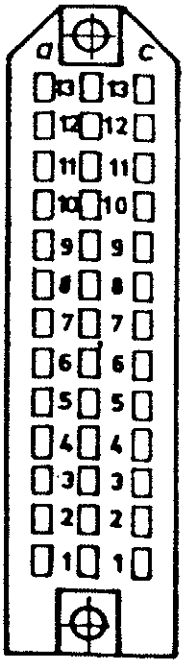
St 44



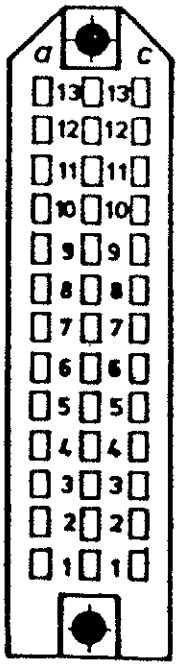
St 45



St 46



St 47



FRECH

Steckdosen

39 - polig

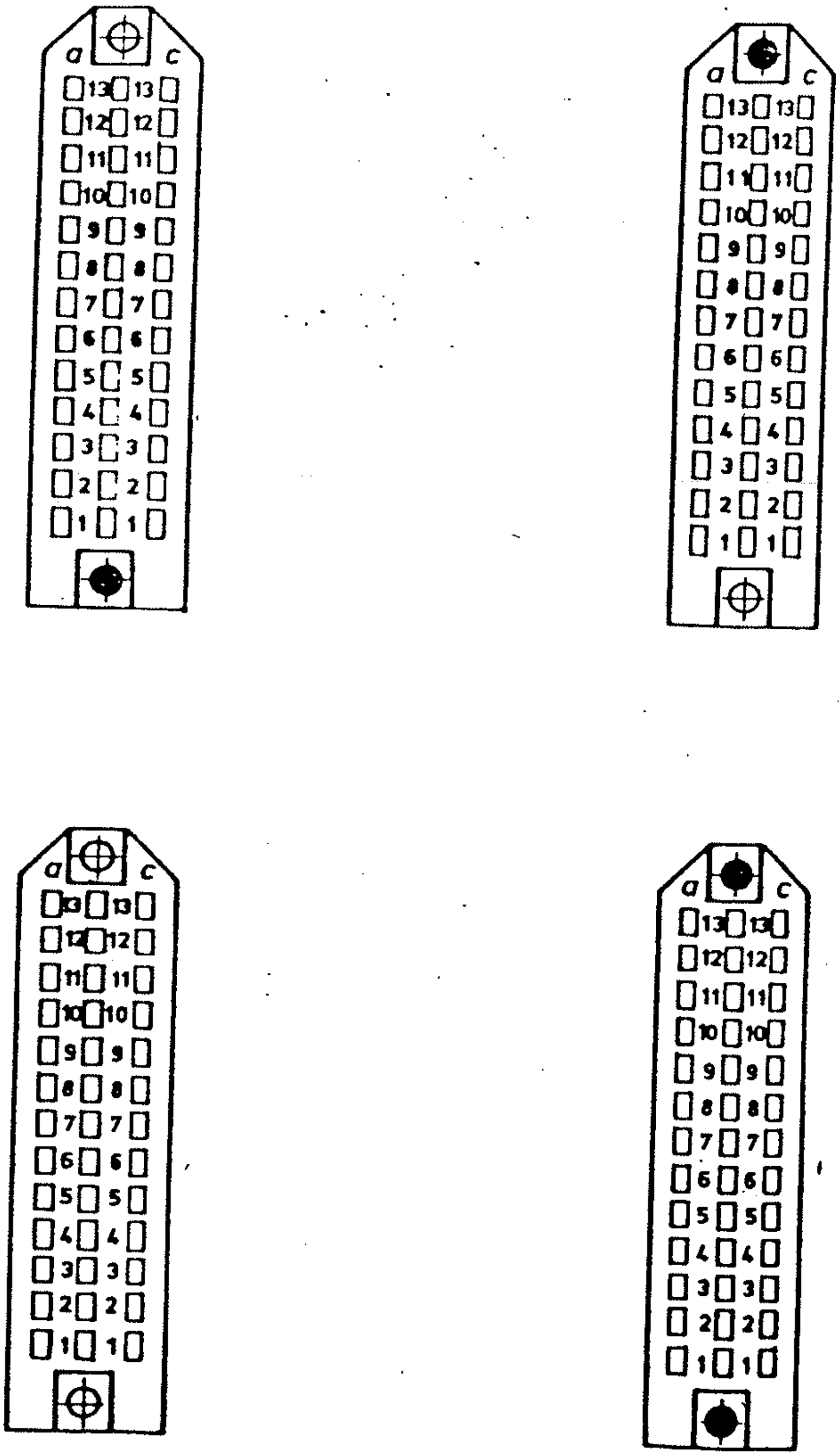
8.300.839.74

30.10.78

● Stift

○ Hülse

St48

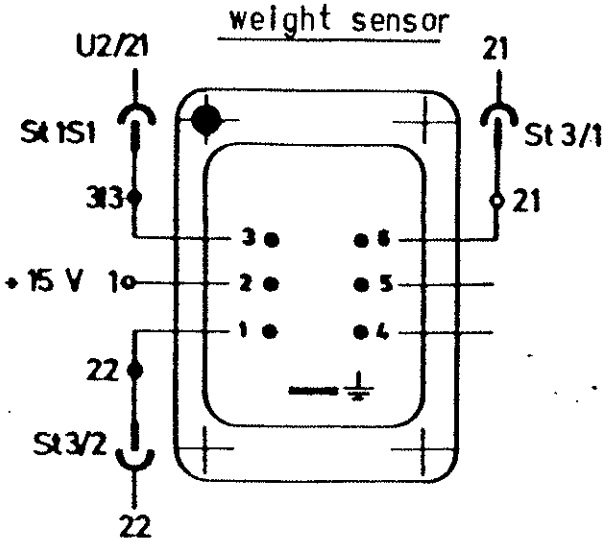


● pin

○ socket

St 9

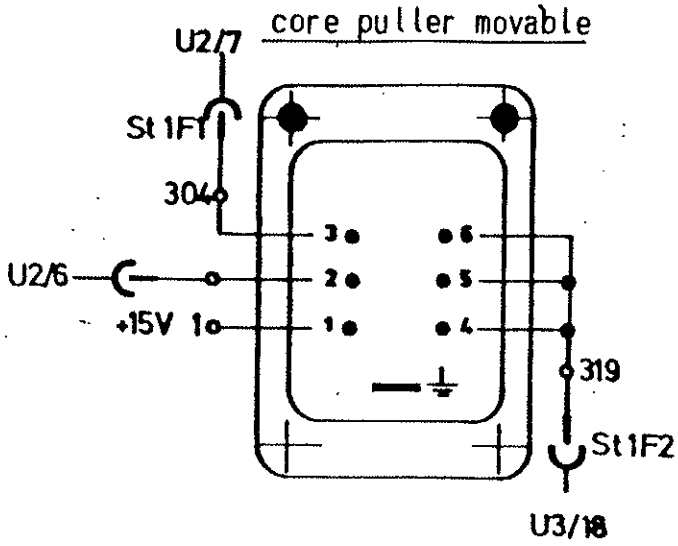
weight sensor



bridge 2+3 in blind plug

St 10

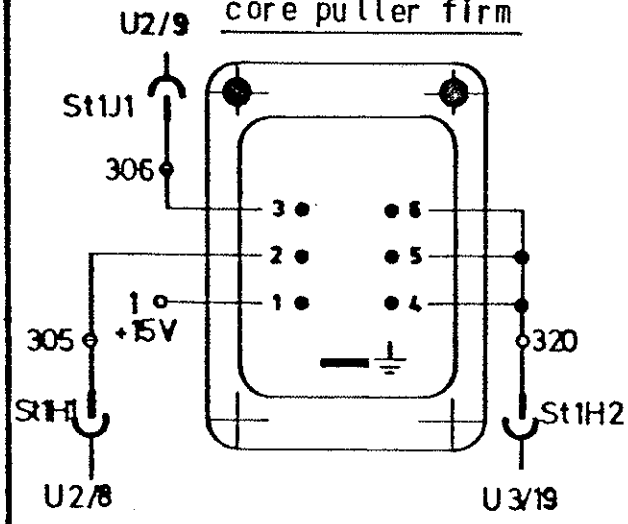
core puller movable



bridge 1+4 in plug

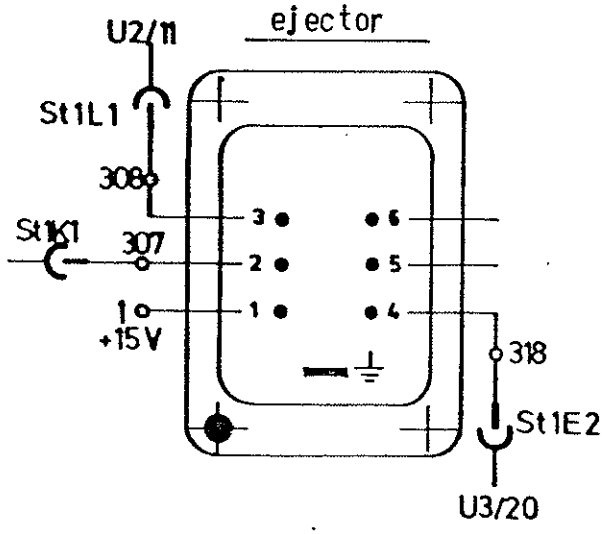
St 11

core puller firm



St 12

ejector



bridge 1+4 in plug

Socket with locking pin viewed from front
always replace missing plug pins

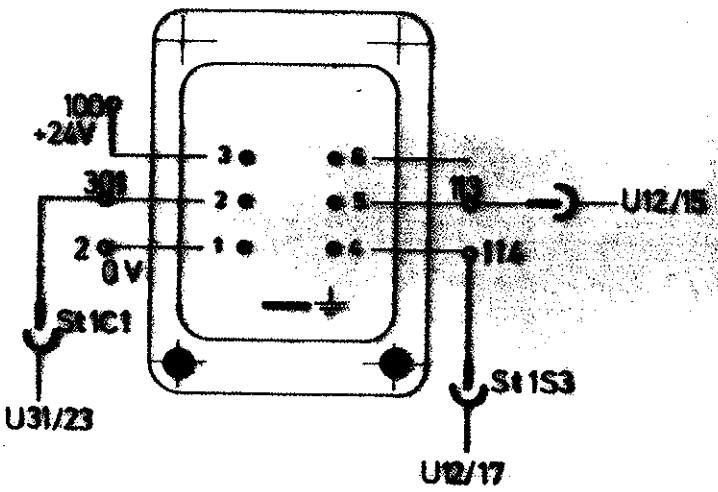
FRECH	socket 6 pole	DAKh	8.300.944.74
			6.10.78

pin

socket

St 13

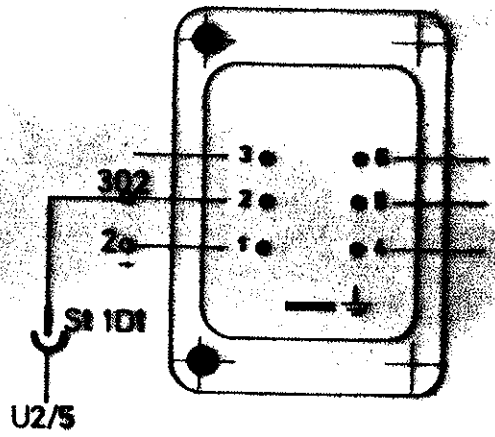
die spray



1+2 bridge in blind plug

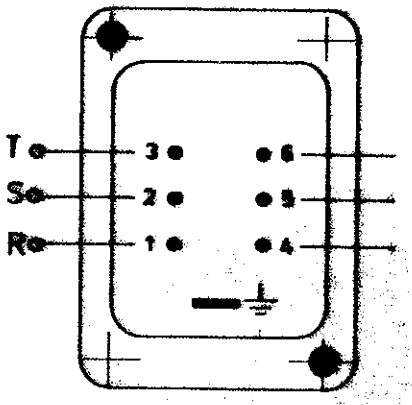
St 14

safety cover



St 15

conveyer belt



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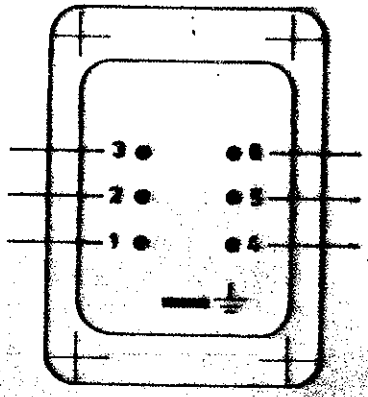
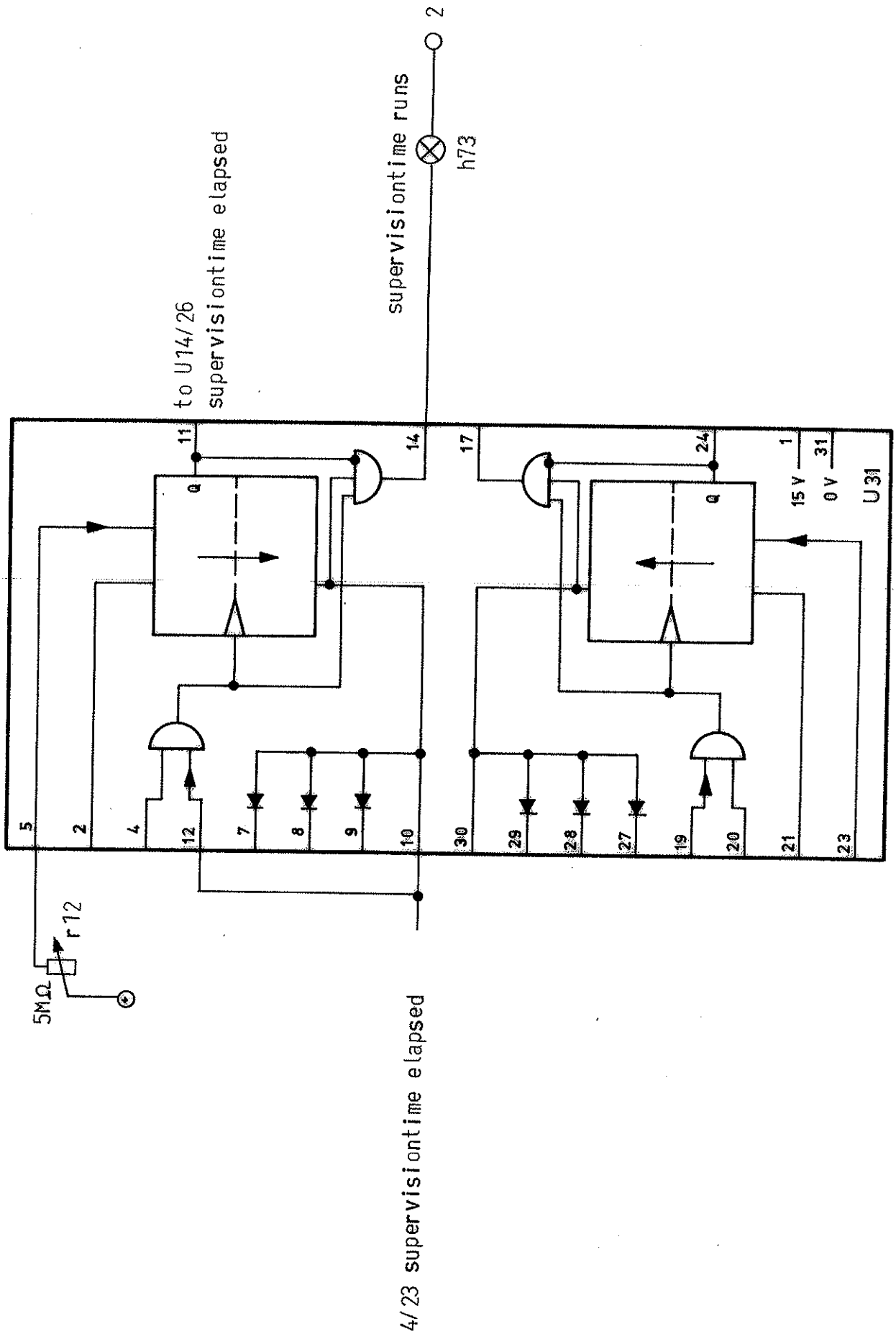


Socket with locking pin viewed from front
always replace missing plug pins


from U14/23 supervisiontime elapsed
5MΩ
r12
5
2
4
12
7
8
9
10
11
14
17
24
1
31
15 V
0 V
U31
30
29
28
27
19
20
21
23
to U14/26
supervisiontime elapsed
supervisiontime runs
h73
2