

Prepamatic

Instruction Manual



Manual No.: 13757004

Date of Release: 19.07.1996



Prepamatic
Instruction Manual

IMPORTANT

Always state Serial No and Voltage/frequency if you have technical questions or when ordering spare parts. You will find the Serial No. and Voltage on the front cover of this manual or on an attached label below. If in doubt consult the rating plate of the machine itself.
We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:

Instruction Manuals: A Struers Instruction Manual may only be used in connection with Struers equipment covered by the Instruction Manual.

Service Manuals; A Struers Service Manual may only be used by a trained technician authorized by Struers. The Service Manual may only be used in connection with Struers equipment covered by the Service Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to changes without notice. The manual may mention accessories or parts not included in the present version of the equipment.

The contents of this manual is the property of Struers. Reproduction of any part of this manual without the written permission of Struers is not allowed.
All rights reserved. © Struers 1996.

Struers A/S
Valhøjs Allé 176
DK-2610 Rødovre/Copenhagen
Denmark
Telephone +45 36 70 35 00
Fax +45 38 27 27 01



Safety Precaution Sheet

To be read carefully before use

1. The operator should be fully aware of the use of the machine according to the Instruction Manual.
2. The machine must be installed by a specially trained service technician from Struers.
3. The actual voltage must correspond to the voltage stated on the side of the machine. The machine must be earthed.
4. The water connections must be leakproof. Cut the water off if the machine stands idle for a longer period.
5. Be careful that the emergency stop and the other safety devices are in order.
6. In case of any malfunction or unusual noise, the machine should be stopped immediately and technical service called.
7. Proper exhaustion facilities over the machine are necessary.

The apparatus/machine is designed for use with consumables supplied by Struers. If subjected to misuse, improper installation, alteration, neglect, accident or improper repair, Struers will accept no responsibility for damage(s) to the user or the equipment.
Dismantling of any part of the apparatus/machine, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

Table of contents		Page
1.	Description	
1.1.	Application	3
1.2.	Functions	3
1.3.	Construction (fig. 1-4)	3
1.4.	Safety	4
1.5.	Technical data	5
1.6.	Specifications	10
1.7.	Accessories and consumables	10
	1.7.1. Accessories	10
	1.7.2. Consumables	11
	1.7.3. Other consumables	14
2.	Unpacking	
2.1.	Removal of the upper packaging	15
2.2.	Packing case contents	16
2.3.	Removal of transport pallet	17
3.	Installation	
3.1.	Placing	18
3.2.	Removal of transport fittings	18
3.3.	Connection, water outlet	18
3.4.	Connection, water supply	18
3.5.	Connection, compressed-air	19
3.6.	Connection, electrical	19
3.7.	Cooling water	19
3.8.	Lubricants and suspensions	20
3.9.	Soap solution and alcohol	20
4.	The Specimen	
4.1.	Preparation methods	22
4.2.	Struers Metalog Guide™	22

Table of contents		Page
5.	Operation	
5.1.	Operating elements	23
5.2.	Display	23
5.3.	Function test/operating examples.....	26
	5.3.1. Function test 1	26
	5.3.2. Function test 2	28
	5.3.3. Function test 3	30
	5.3.4. How to find open programs.....	31
5.4.	What the user must do.....	32
5.5.	Inserting specimens.....	34
5.6.	Placing/changing grinding stone.....	35
5.7.	Placing/changing grinding and polishing discs (pos. 2-5)	35
5.8.	Programming	36
	5.8.1. Fixed programs	36
	5.8.2. User Programs	40
	5.8.3. Hints	41
	5.8.4. The queue system (only if Robomat is installed).....	45
	5.8.5. Cleaning programs.....	46
5.9.	Manual functions.....	47
	5.9.1. Dressing of grinding stone	47
	5.9.2. Adjustment of diamond dresser	47
	5.9.3. Dressing of Petrodisc-M	48
6.	Error list	49
7.	Maintenance	
7.1.	Every morning.....	52
7.2.	Every evening or before breaks of more than 8 hours	52
7.3.	Every second day	52
7.4.	Every week or before breaks of more than 24 hours	53
7.5.	Every month.....	53
7.6.	Display reminder (from machine No. 3750085).....	56
8.	Program Cards (Appendix)	
9.	Spare Parts (Appendix)	
10.	Illustrations (Appendix)	

1. Description

1.1. Application

Prepamatic is a fully automatic, microprocessor controlled machine for total mechanical preparation of metallographic and ceramic specimens, as well as specimens of other materials. Prepamatic grinds, polishes and cleans the specimens automatically and leaves dried specimens - ready for examination in a microscope.

1.2. Functions

Specimen holder

The specimens are placed in a specimen holder head (fig. 2) which rotates during the process and at a preselected force presses the specimens against the grinding/polishing base.

Carrousel

A carrousel with five stations with grinding and polishing discs, as well as a cleaning station, is automatically shifted under the specimen holder head.

Microprocessor

A microprocessor controls all functions during the process, a.o. choice of station, dressing of grinding stone, preparation time or defined stock removal, grinding and polishing pressure, rate and rotation direction, choice of type and dosing quantity of lubricant and suspension as well as kind and duration of the cleaning.

Manual functions

Furthermore, the microprocessor makes it possible to control the mechanical functions manually and to intervene in the process.

1.3. Construction (fig. 1-4)

Prepamatic comprises two sections, an upper and a lower part, which are interconnected by two sturdy columns (fig. 1.1).

Upper part

The upper part contains operating panel with membrane keys and display (fig. 1.2), as well as a motor for operating the specimen holder head at a speed of 125 rpm and another motor for performing the up and down movements of the specimen holder head. Moreover, in connection with this is equipment for measuring and controlling the specimen pressure and the defined stock removal.

Lower part

In the lower part is a carrousel (fig. 3.3) with turntables for grinding and polishing discs as well as the cleaning chamber (fig. 3.4).

Grinding stone

From the factory Prepamatic is equipped with a grinding stone (Pos. 1), which automatically becomes trued-up by a diamond dresser (fig. 10.1). The grinding stone can be replaced by a diamond grinding disc or a Diamond Pad.

Carrousel motor

The carrousel is operated by a motor with a revolution counter, which in connection with the microprocessor ensures a precise positioning.

Main motor

In a central place under the carrousel is the motor for turning the grinding and polishing discs (fig. 3). The discs are operated by means of a belt pulley comprising 6 round belts. The motor is a two speed motor, so that all discs can operate at two speeds.

Thus, it is possible to obtain optimum polishing conditions at all polishing positions, i.e. 150 rpm for the polishing disc and 125 rpm for the specimen holder with the same direction of rotation.

Tubes and cables

A large hose (fig. 1.3) from the middle of the carrousel to one of the walls of the cabinet contains smaller tubes for the cleaning chamber, one tube for cooling water for grinding stones as well as cables to a sensor for the lid over the grinding stone. The cleaning chamber is equipped with 2 x 4 nozzles for feeding pressure water, soap, alcohol and compressed air.

Box for suspension and lubricant bottle

On the left hand side of Prepamatic is a box (fig. 1.4) for two lubricants, four diamond suspensions and a suspension for final polishing.

By means of pumps or ejector nozzles these agents are transported through tubes to the nozzle plate next to the specimen holder head, from where they are sprayed on to the polishing cloths. Type and quantity is controlled by the microprocessor.

The pneumatic control components are placed behind the left-hand side plate (fig. 1.5) and the electric and electronic control elements behind the right hand side plate. At the bottom of Prepamatic is the recirculating cooling unit, as well as containers for soap solution and alcohol (fig. 4). These parts are placed on a "drawer" which is directly accessible through a door on the front side.

1.4. Safety

Prepamatic is equipped with all necessary safety guards for protection of the user. The machine can only work when the guards are closed. Besides, Prepamatic meets the requirements of machine tools (IEC 204 / EN 60204-1 (VDE 0113)).

During polishing and cleaning alcohol is used which is hazardous to breathe. Therefore Prepamatic has been prepared for connection to a suction system. Connecting branch is placed vertically behind the operating box. Branch diameter 50 mm.

Quick stop of Prepamatic can be effected by pressing the emergency button (fig. 1.6).

1.5. Technical data

<i>Electrical supply</i>	Voltage: 3 phase + ground Fuse: max. 25 A
<i>Consumption</i>	Main motor: 750/120 W Sample mover motor: 30 W Carrousel motor: 20 W Pressure, water pump: 180 W Pump for cooling water: 140 W
<i>Compressed air</i>	Pressure: 6 bar \pm 0.2 Consumption: max. 60 l/min Average: 15 l/min
<i>Water</i>	Pressure: 1-10 bar Supply: min. 10 l/min Consumption: approx. 1.5 l per cleaning
<i>Exhaustion</i>	Max. 1000-2000/min.
<i>Noise level</i>	68 dBA
<i>Program data</i>	Number of programs: 3 x 100 Hereof standard programs: 3 x 25 RAM-capacity: 12 K PROM-capacity: 48 K CPU-type: 8085 Battery back-up 3 pcs 1,5 V batteries IEC R 14
<i>EMC-test</i>	Conducted emission: VDE-0871/6.78 limit A Radiation: VDE-0871/6.78 limit B
<i>Display</i>	LCD display, 8 lines of 20 characters each
<i>Keyboard</i>	Touch pad type, splash proof, 41 keys
<i>Specimens</i>	Number of specimens in one specimen holder: 1-3 (\varnothing 20, 30 and 40 mm, 1", 1¼" and 1½") 1 (\varnothing 50 mm, 2") 3-9 (\varnothing 7-15 mm, 8 x 19 mm for inserts for \varnothing 40 mm holes). 3 (\varnothing 12-20 mm, 11 x 23 mm for insert for \varnothing 50 mm hole) Specimen height: min. 12 mm/Max. 32 mm
<i>Specimen holder head</i>	Speed: 125 rpm Grinding/polishing pressure: 3-153 N

Possible specimen
pressure (N)

1 specimen	2 specimens	3 specimens
3	6	9
6	12	18
9	18	27
12	24	36
15	30	45
18	36	54
21	42	63
24	48	72
27	54	81
30	60	90
33	66	99
36	72	108
39	78	117
42	84	126
45	90	135
48	96	144
51	102	153

Grinding/polishing bases

Eccentricity in relation to specimen holder head: 62 mm

Position 1 (plane grinding)

Possible speeds: 500, 1000 rpm
Grinding stone, Ø 200 mm
Dresser: 0.06 mm each time
Diamond grinding disc, Ø 200 mm
Diamond Pad on aluminium disc, Ø 200 mm

<i>Position 2-4</i>	Possible speeds: 150, 300 rpm Disc diameter: 175-200 mm Cloth diameter: 200 mm
<i>Position 5</i>	Possible speeds: 75, 150 rpm Disc diameter: 175-200 mm Cloth diameter: 200 mm
<i>Disc/Cloth types</i>	SiC-paper, Diamond Pad, Diamond grinding disc, Petrodisc, Petrodisc-M, DP-Net, DP-Plan, DP-Pan, Pan-W, DP-Plus, DP-Dur, DP-Mol, DP-Nap, OP-Nap, OP-Chem
<i>Stock removal</i>	Smallest step: 5 µm 0-position error 5-20 µm Grinding error: ±3 µm Max. removal: 1000 µm Reproducibility: ±5 µm
<i>Lubricant</i>	Dosing system: diaphragm pump Dosing steps: 22 Dosing quantity/pulse: 0.13 ml Dosing quantity/min: 0.3-14 ml Predosing: 0-31 sec
<i>DP-Suspension</i>	Dosing system: siphon nozzle Nozzle adjustment: 60 ml/min (water) ¹ Dosing steps: 15 Dosing quantity/min: 1.1-10 ml (water) ¹
<i>OP-Suspension</i>	Dosing system: diaphragm pump Dosing quantity/pulse: 1.5 ml Dosing steps: 15 Dosing quantity/min: 5-30 ml <i>NB</i> Only use pure or water mixed oxide suspensions
<i>Abrasive grit/grain size</i>	y5, y4, y3, y2, y1, grit 80/200 µm, grit 120/125 µm, grit 150/93 µm grit 220/68 µm, grit 320/46 µm, grit 500/30 µm, grit 600/26 µm, grit 800/22 µm, grit 1000/18 µm, grit 1200/14 µm, grit 2400/10 µm, grit 4000/5 µm.

¹Dosing is dependent on viscosity

Cleaning programs

Step	Time/Step	Total time
Program 1		
Water	10 s	
Air	3 s	
Alcohol	10 s	
Air	8 s	31 s
Program 2		
Alcohol	10 s	
Water	14 s	
Air	2 s	
Alcohol	10 s	
Air	8 s	44 s
Program 3		
Soap	12 s	
Water	15 s	
Air	3 s	
Alcohol	12 s	
Air	9 s	51 s
Program 4		
Alcohol	10 s	
Water	20 s	
Air	5 s	
Alcohol	15 s	
Air	20 s	70 s

Cleaning programs

Step	Time/Step	Total time
Program 5		
Water	5 s	
Air	2 s	
Soap	9 s	
Nothing	5 s	
Water	13 s	
Air	5 s	
Alcohol	20 s	
Air	40 s	96 s
Program 6		
Water	35 s	
Air	2 s	
Soap	9 s	
Nothing	5 s	
Water	13 s	
Air	5 s	
Alcohol	20 s	
Air	40 s	126 s

Recirculating cooling tank

Contents: 35 l

Dimensions

Height: 1710 mm
Width: 1030 mm
Depth: 940 mm

Needed extra space: 500 mm on the right hand side, 300 mm on the left hand side of the machine

Weight

400 kg

1.6. Specifications

Specification	Code word
Prepamatic, microprocessor controlled, fully automatic grinding and polishing machine, with recirculating cooling unit, grinding stone, Petrodisc-M, 3 polishing discs Ø 200 mm, a complete set of specimen mover plates, prelevelling device, levelling disc and 1 l concentrated soap solution	PAMAT
Prepamatic as above, but prepared for connection of Robomat	PAMRO

1.7. Accessories and consumables

1.7.1. Accessories

<i>Specimen inserts</i> Specimen insert for 3 specimens, Ø 7-15 mm, for specimen mover plates with holes Ø 40 mm	PAMFI
Specimen insert for 3 specimens, Ø 12-20 mm, for specimen mover plates with hole Ø 50 mm	PAMME
Specimen insert for 3 specimens, 9 x 19 mm for specimen mover plates with holes Ø 40 mm	PAMIK
Specimen insert for 3 specimens, 12 x 23 mm, for specimen mover plates with holes Ø 50 mm	PAMAX
Specimen insert for 1 specimen, 23 x 26 mm, for specimen mover plates with holes Ø 40 mm	PAMON
<i>Straight edge</i> Straight edge, 200 mm, for checking planeness of Petrodisc-M	PAMIL
<i>Water level sensor</i> Water level sensor, for recirculating unit	PAMWA
<i>Polishing discs</i> DP-Polishing disc of aluminium, Ø 200 mm	PAMLA
DP-Polishing disc, as PAMLA, but for Diamond Pad with center hole Ø 60 mm	PAMUL
Shelf for discs not in use, to be mounted under the cover	PAMHY

<p><i>Stand-by Kit</i> Stand-by Kit, comprises a selection of small parts which are exposed to wear, a.o. flange rings and inserts rings for specimen holder discs, pressure feet, diaphragms and check valves for membrane pumps and hoses for lubricant and suspension systems</p>	PAMBY
--	-------

1.7.2. Consumables

<p><i>Grinding stone</i> Grit 150, for general use, Ø 200 mm x 48 mm</p>	PAMST
<p>As PAMST, but grit 120, for hardened materials</p>	PAMDU
<p><i>Diamond grinding discs</i> Diamond grinding discs, grit 120 (180 µm), Ø 200 mm. Alternative to grinding stone</p>	PAMYT
<p>Diamond grinding disc, as PAMYT, grit 220 (65 µm)</p>	PAMTO
<p>Diamond grinding disc, as PAMYT, grit 600 (20 µm)</p>	PAMXI
<p>Diamond grinding disc, grit 220 (65 µm) Ø 175 mm, for mounting on position 2-5</p>	GRABU
<p>Diamond grinding disc, as GRABU, grit 600 (20 µm)</p>	GRADE
<p><i>Diamond Pad</i> Grain size 250 µm, Ø 200 mm Grain size 125 µm, Ø 200 mm Grain size 40 µm, Ø 200 mm Grain size 30 µm, Ø 200 mm Grain size 20 µm, Ø 200 mm with center hole Ø 60 mm, grain size 125 µm, Ø 200 mm with center hole Ø 60 mm, grain size 40 µm, Ø 200 mm With center hole Ø 60 mm, grain size 20 µm, Ø 200 mm</p>	GRAAM GRAMI GRAIF GRAKS GRAYT PAMNI PAMIV PAMWY
<p><i>Petrodisc-M</i> Petrodisc-M, grinding disc for one-step fine grinding, Ø 175 mm</p>	PETNI

*Prepamatic
Instruction Manual*

<p><i>PG-paper</i> PG-paper for plane grinding, self-adhesive, Ø 200 mm, grit 120, 25 pcs.</p>	<p>ZIRTO</p>
<p><i>SiC-paper</i> Silicon carbide paper, Ø 200 mm, high quality, bundle of 100 discs: Grit 80 Grit 120 Grit 180 Grit 220 Grit 320 Grit 500 Grit 800 Grit 1000 Grit 1200 Grit 2400 for ductile materials, bundle of 50 Grit 4000 for soft and ductile materials, bundle of 50</p>	<p>PAPER PAPER PAPER PAPER PAPER PAPER PAPER PAPER PAPER PAPER PAPER PAPER</p>
<p><i>Adhesive tape</i> Double-adhesive tape, for easy adhesion of grinding paper, pack of 10 pcs, Ø 200 mm</p>	<p>PAPUN</p>

Polishing cloths with adhesive
backing,
Ø 200 mm/8"

Application	Cloth	Material	Packing quantity	Code word
Prepolishing, coarse grained diamonds	DP-Net	Woven steel cloth	5 pcs.	NETOT
Prepolishing and final polishing, coarse and fine grained diamonds	DP-Plan	Woven, synthetic	5 pcs.	DEPXA
	DP-Pan	Non-Woven, synthetic	5 pcs.	PANAS
	DP-Dur	Silk	5 pcs.	DEKLU
	DP-Plus	Long nap, synthetic	5 pcs.	DUPTU
	DP-Mol	Wool	5 pcs.	DEKOL
Final polishing, fine grained diamonds	DP-Nap	Short nap, synthetic	5 pcs.	DENKA
Mechanical/chemical polishing, OP-S or OP-U	OP-Chem	Synthetic	5 pcs.	APCHE
Final polishing, OP-S or OP-U	OP-Nap	Short nap, synthetic	5 pcs.	APLOC

Diamond abrasives, DP-Suspension,
250 ml

Nominal grain size µm	Code word
15	SUSFI
9	SUSIN
6	SUSEX
3	SUSTE
1	SUSNO
¼	SUSUQ

1.7.3. Other consumables

	Code word
OP-S Suspension, 5 l	OPSIF
OP-U Suspension, 5 l	OPUFI
DP-Lubricant, blue in polyethylene bottle, 1 l, net 1,0 kg	DEPTI
DP-Lubricant, blue in plastic container, 5 l, net 5,0 kg	DEPIF
DP-Lubricant, red, in polyethylene bottle, 1 l, net 1,1 kg	DEPPO
Concentrated soap solution, 1 l	PAMCO
Disposable waste inserts for the tank, package of 20 pcs.	TREPO

WARNING

Use of aggressive liquids, whether directly or mixed with Struers consumables, may cause damage or malfunction to the equipment. The warranty is only valid when the equipment is used in a normal and proper way with consumables approved by Struers.

2. Unpacking

Prepamatic is fastened on a pallet with bolts. The specimen holder head is supported by a transport protection and the machine is protected with plastic foil and plates of foam plastic against bumps and other mechanical damage. A box without bottom, nailed to the pallet, forms the upper part of the packaging.

2.1. Removal of the upper packaging

Remove the nails at the bottom all the way round. Then lift the packaging vertically until free of the machine. The protective plates of foam plastic and the plastic foil can then be removed.

IMPORTANT

The transport protection under the specimen holder head should not be removed until Prepamatic has finally been placed.

2.2. Packing case contents

see (fig. 5)

- 1 Prepamatic
- 1 Box for loose parts (fig. 5.6)
- 2 Keys for the lock Stand-by/On
- 4 Rubber blocks (fig. 5.1)
- 5 Specimen mover plates (fig. 5.2)
- 3 x 4 Insert rings for specimen mover plates (see section 4 and fig. 5.3).

Quantity	Ring dimensions	For specimen Ø
Flange rings (fig. 5.4)		
4	24 x 32 x 4	25 mm
4	29 x 38 x 4	30 mm
4	38 x 48 x 4	40 mm
4	25 x 32 x 4	1"
4	30 x 40 x 4	1¼"
4	37 x 47 x 4	1½"
Flange rings, metal type (fig. 5.30)		
3	25.8 x 34 x 8	25 mm/1"
3	30.5 x 40 x 8	30 mm
3	32.2 x 40 x 8	1¼"
3	38.5 x 46.5 x 8	1½"
3	40.5 x 48 x 8	40 mm
1	51 x 59 x 8	50 mm/2"

- 2 Hose clamps, 12 mm (fig. 5.20)
- 2 Hose clamps, 25-40 mm (fig. 5.21)
- 1 Grease gun (fig. 5.22)
- 1 Hexagon spanner, 5 mm, for changing grinding stone (fig. 5.23)
- 1 Open-end spanner, 11 mm, for suspension nozzles (fig. 5.24)
- 1 Open-end spanner, 13 mm, for suspension nozzles (fig. 5.25)
- 1 Open-end spanner, 16 mm for changing specimen mover plate (fig. 5.26)
- 1 Inspection mirror (fig. 5.27)
- 3 Polished specimen of free-cutting steel, Ø 30 mm (fig. 5.33)
- 1 Hexagon spanner, 2 mm for flange rings (fig. 5.31)
- 1 Top spanner, 19 mm (fig. 5.29)
- 1 Needle for cleaning nozzles (fig. 5.32)
- 1 Pre-levelling device (fig. 5.5)
- 5 Specimen mover plates (fig. 5.2)
- 1 Levelling disc (fig. 5.7)
- 1 Grinding stone (mounted) (fig. 5.8)
- 1 Petrodisc-M (fig. 5.9)
- 3 Polishing discs (fig. 5.10)
- 4 Splash rings, tall (fig. 5.11)
- 1 Splash ring, for OP polishing (fig. 5.12)
- 1 Cooling tank (fig. 4.1)
- 1 Cover for tank (fig. 4.2)
- 1 Plastic jar, 5 liters, for soap solution (fig. 4.3)
- 1 Plastic jar, 5 liters, for alcohol (fig. 4.4)
- 3 Glass bottles, 1 liter, for lubricants, blue, red and OP-S/OP-U (fig. 7.1+2)
- 4 Plastic bottles, 1 liter, for suspensions (fig. 7.3)
- 1 Liter additive (fig. 5.13)
- 1 Liter concentrated soap solution (fig. 5.14)
- 1 Liter OP-S suspension (fig. 5.15)
- 1 Compressed-air tube (blue), 3 m (fig. 5.16)
- 1 Compressed-air connecting branch (fig. 5.17) mounted on machine
- 1 Discharge tube, 2 m (fig. 5.18)
- 1 Pressure water tube, 3 m (fig. 5.19)
- 1 Funnel (fig. 5.28)

2.3. Removal of transport pallet

- Take out all loose parts of Prepamatic. Take out cooling tank etc. from bottom cabinet.
- With a lifting truck or a fork truck the transport pallet with Prepamatic should be brought close to the place of use.
- Unscrew the bolts which holds Prepamatic to the pallet. When loosened, the bolts automatically drops down on the floor.
- If a crane is not available 4-5 persons can lift the machine off the pallet.

3. Installation

3.1. Placing

Place Prepamatic near water tap, drain, 3-phase current as well as compressed-air. To the right hand side of the machine there must be an open space of about 0.5 m for servicing electronics and to the left hand side there must be about 0.3 m for admission to pneumatics and opening of bottle room.

Prepamatic must not be fixed to the floor. It must be placed horizontally and stand on all four corners. Use the enclosed rubber blocks at the four corners (fig. 5.1).

3.2. Removal of transport fittings

The support block which is placed under the specimen holder head can now be removed and Prepamatic is ready for connection.

3.3. Connection, water outlet

Connect the large outlet tube (fig. 5.18) to the big pipe branch "Water outlet" on the rear side of Prepamatic and lead the tube to outlet. The tube must have an even slope towards the outlet to prevent dirt from settling in a bent piece of the tube, which would otherwise cause clogging of the discharge.

3.4. Connection, water supply

Connect the water tube (fig. 5.19) to the threaded pipe branch "Water inlet" on the rear side of Prepamatic, as well as to the water tap.

Water outlet (fig. 8.1)

Water supply (fig. 8.2)

IMPORTANT

Do not forget to use the two filters in the connecting tube. If the water installations in the laboratory are new it is recommended to flush them thoroughly before connecting Prepamatic.

Compressed-air (fig. 8.3)

3.5. Connection, compressed-air

- Mount the compressed-air tube (fig. 5.16) with the enclosed compressed-air branch (fig. 5.17), press it into the connecting fitting marked "Compressed air" on the rear side of the machine (fig. 8.3) and clamp it with a 12 mm hose clamp (fig. 5.20).
- Connect the other end of the tube to the compressed air supply source and clamp it with a 12 mm hose clamp. The supply pressure must be between 6 and 8 bars.

Electricity (fig. 8.4)



3.6. Connection, electrical

Before connection make sure that Prepamatic type plate (fig. 8.5) is marked with correct voltage and frequency.

- Connect the three phases and the ground lead in the terminal box (fig. 8.4) on the rear side of the apparatus to the mains.

Direction of rotation

The direction of rotation for the grinding and polishing discs must be counter-clockwise. This is checked as follows:

- Check that there is nothing to prevent the carousel from turning (transport protection or the like).
- Switch on main switch on the right hand side.
- Insert key in Stand-by/On switch (fig. 9.7) and turn it to the right. If the safety guards are closed, this will make the carousel turn, so that the positioning of the carousel can be set to zero in the microprocessor.
- Select program 1 by pressing "Select Program" and "1" on the operation panel.
- Then press "Start"  and check the direction of rotation. Press "Stop"  immediately afterwards.

If the direction of rotation is clockwise the voltage should be switched off on the wall switch, whereupon two phases in the terminal box (fig. 8.4) should be interchanged. Then repeat the checking from point 2 to 5.

3.7. Cooling water

- Place the cooling water tank (fig. 4.1) in the bottom cabinet on the "drawer" and turn it so that the grooves in the rim of the tank are at the front.
- Apply 30 l of water - till approx. 7 cm from the brim of the tank, add additive in a quantity which is indicated on the label of the bottle, and stir a little.
- Place the cover (Fig. 4.2) (grooves at front), mount the pump and return tube in the cover.

3.8. Lubricants and suspensions

See fig. 7.

For most preparation programs the contents of the bottles must be as follows:

Bottle No.	Liquid
1	Blue lubricant (1 liter)
2	Red lubricant (1 liter)
3	15 or 9 μm diamond suspension (\square liter)
4	6 μm diamond suspension (\square liter)
5	3 μm diamond suspension (\square liter)
6	1 μm diamond suspension (\square liter)
7	OP-S or OP-U oxide suspension (1 liter)

Never fill the suspension bottle more the 2/3.

3.9. Soap solution and alcohol

Soap solution

Together with Prepamatic is supplied 1 l concentrated soap solution (fig. 5.14) to be used diluted for cleaning of the specimen. One 5 liter plastic jar (fig. 4.3) marked Detergent solution in the bottom cupboard is filled with the recommended concentration: 100 ml concentrated soap solution for 5 liters of water (if possible distilled).

Alcohol

In the other 5 liter plastic jar (fig. 4.4) is poured pure or denaturated alcohol of min 93%. This alcohol is used for cleaning and facilitate drying of the specimens.

IMPORTANT

Connect the tubes to the proper containers.
Black to "Soap solution"
Blue to "Alcohol"
(The lids for the two containers are the same color).

4. The specimen

Specimen mover plates

Together with Prepamatic are supplied 5 specimen mover plates (fig. 5.2) which with the below mentioned plastic insert rings (fig. 5.3) can take the following specimen diameters:

With white plastic insert ring:

25 mm

30 mm

40 mm

With black plastic insert rings:

1"

1¼"

1½"

Without ring:

50 mm/2"

Specimen inserts

Add to this the possibility of having specimen holders for small specimens - see Specimen inserts, section 1.7.1.

Minimum height for the specimens is 12 mm.

Maximum height for the specimens is 32 mm.

Standard size specimens

Prepamatic is based on the preparation of standard specimens with the above mentioned specimen diameters and therefore, in almost all cases there will be a need for embedding the specimens.

Pre-levelling

Before mounting the specimens in the specimen holders the enclosed pre-levelling device (fig. 5.5) for mounting of flange rings must be used. See section 5.5) Inserting specimens.

PG Plane Grinding

4.1. Preparation methods

Plane Grinding (PG) may be carried out on PG-paper, SiC paper or, for hard materials, on Diamond Pad.

SiC paper is used on a wet grinding disc, according to the Knuth-Rotor principle. PG-paper or Diamond Pad is glued to a grinding/polishing disc.

FG Fine Grinding

Fine Grinding (FG) is carried out on a cloth with low resilience such as DP-Plan, DP-Pan or DP-Dur, or on Petrodisc-M. SiC-Paper may also be used.

DP Diamond Polishing

Diamond Polishing (DP) is carried out on a polishing cloth using diamond abrasive and a lubricant. The correct choice of cloth depends on the material.

OP Oxide Polishing

Oxide Polishing (OP) is especially suited for soft and ductile material as a final polishing step.

4.2. Struers Metalog Guide™

Prepamatic is designed for both grinding and polishing. In Struers Metalog Guide™ you will find a detailed description of grinding/polishing for automated mechanical specimen preparation.

 **Metalog Guide**

Struers Metalog Guide™ offers preparation methods for the most common materials, based on a simple analysis of two key properties: hardness and ductility. Finding the right method is easy, including choice of consumables. Always consult Struers Metalog Guide™ for the correct preparation method for the actual specimens.

Struers Metalog Guide™ contains 6 useful chapters:

- **Metalogram:** a quick and safe guide to the right preparation method.
- **Metalog Methods:** a complete catalogue of preparation methods, based on Struers' vast store of materialographic experience, and employing Struers' range of consumables.
- **Preparation Philosophy:** the basics of modern specimen preparation, seen from a professional point of view.
- **Metalog Process:** the materialographic preparation process from start to finish, logically explained.
- **Metalog Master:** a combined trouble-shooting guide and supply of in-depth information on the processes of mechanical preparation, including an expert system for the solving of preparation problems.
- **Metalog Code:** quick access to the relevant consumables for the chosen preparation methods.

Struers Metalog Guide™

A complete guide to materialographic specimen preparation.
Contact your local dealer for a free copy of Metalog Guide™.

5. Operation

5.1. Operating elements

Main switch

Red/yellow switch on the right hand side of the machine.

Emergency stop

Red push button on the front side of the machine (fig. 1.6).

Lock Stand-by/On (fig. 9.7)

The operation panel is switched off when the key is in Stand-by position (vertical). The panel is switched on when the key is turned to On-position.

Operating panel

The keys are placed in 6 groups as shown in fig. 9.

- Program Select: for selecting and deleting of program.
- Program and Step data: for inspection and creation of user's own programs, manual dosing, predosing and cleaning, as well as for calling of display text etc.
- Data Adjust: for setting parameters.
- Start and Stop.
- Manual function for separate dressing of grinding stone, as well as for turning the carrousel.
- Manual function for process intervention.

5.2. Display

8 lines LCD display (fig. 9.8).

Lines 1-7

The lines 1-7 are used to show programs, information on stones, grinding and polishing discs, lubricants, suspensions etc. for the individual programs, as well as parameters for the individual preparation steps.

Line 8

Line 8 is used among other things for information relating to the programming, including operational errors, adjustment and operation instructions, as well as information about confirming instructions, which have been performed.

(Besides, line 8 is used for error messages. See section 6, Error list).

The following pages show a survey of the messages which may be given in connection with the programming and a more detailed description of the same.

Survey of messages on 8th display-line

Message	Description
<i>Program Not Selected</i>	Message is given if one of the keys "Display Program", position 1-5 or "=" is activated and program number has not yet been selected.
<i>Digit Missing</i>	Message is given if one of the keys "Display Program", position 1-5 or "=" is activated and program selection not yet finished. (A program number always consists of 3 digits).
<i>Program Not Created</i>	Message is given when an open (empty) program has been selected (possibly ended by pressing =) and one of the keys "Display Program", position 1-5 or "Start" ◊ has been activated. Further, the message is given if the manual pre-dosing program is activated. Error may be recovered by completing the creating procedure.
<i>Prg Already Exists</i>	Message is given when it is attempted to create a new base program over an already existing "user's program". The message shall prevent unintentional deleting of a program.
<i>Program no. Exceeded</i>	Attempt to select program number larger than 399.
<i>No Open Programs In This Series</i>	This message appears if you have entered a figure from -00 to -24 and means that it is not possible to change in these programs as they are fixed.
<i>Baseprg. Not Created</i>	Message is given when attempt is made to write a "user's program" after another "user's program" (base-program), which has not yet been created.
<i>All Open Programs In This Series Taken</i>	All programs in the 10-groups in question have been used. For example 24- this means that the programs from 240 to 249 have been filled up.
<i>No More Open Programs Available</i>	The message indicates that all programs from -25 to -99 have been used.
<i>Process Running!</i>	Message is given if attempt is made to enter a new program number during performance of a program or is attempt is made to change parameters in the "performing" step.
<i>Not An Open Program</i>	Message is given if attempt is made to change the parameters in a fixed program.
<i>Not Selectable</i>	Message is given in the following cases: <ul style="list-style-type: none">■ Attempt is made to select a bottle number on position 1 (not possible to dose from bottles at this position).■ Attempt is made to select a lubricant or abrasive dosing on position 1.■ Attempt is made to select a lubricant or abrasive dosing, when water has already been selected.
<i>Stops After Step X (X being a digit from 1 to 5)</i>	Message is given as acknowledgement for pressing "Stop After Step".










<i>Stone At Minimum</i>	Message is given when the grinding stone (fig. 3.1) has turned out to be worn after dressing. First time the message is given the procedure may be finished, then the stone has to be replaced before a new performance.
<i>Adjust Dresser Level</i>	Message is given if one of the keys "Start" ◊ , "Continue" ◊ or "Dresser" is activated in the following situations: <ul style="list-style-type: none">■ Cover for dressing adjustment has been opened without finishing the adjusting procedure.■ The cover (fig. 3.2) over the grinding stone has been opened. Parameter "Disc Type" must be selected for "Stone" on position 1. It is not to start the procedure with one of the mentioned keys before the adjusting procedure has been completed. (See section 5.9.2).
<i>Adjustment Completed</i>	Message is given as acknowledgement of completed dresser adjustment.
<i>Water Level Too Low</i>	Message is given if the water level in the recirculation cooling unit is too low. Refill with a correct mixture of water and additive.
<i>Pressure Critically Low</i>	Message is given in removal rate mode where the chosen pressure is less or equal to 21 N.
<i>Battery Low</i>	Message is given in connection with program selection when the batteries for backing-up of user's programs need replacement. The batteries should be replaced soonest possible as otherwise the programs will be damaged. The batteries are placed under the main switch at the rack system.
<i>Stopped By Guard</i>	Message is given one of the safety guards is opened during the process.
<i>Cont. After Dressing</i>	Message is given if in the middle of a step with microstop is becomes necessary to dress the stone once more. The dressing is done automatically and the process continues from the place where it had stopped.
<i>Await Flushing</i>	Message is given if "Stop" is pressed during a step with OP-S dosing. The OP-S nozzle should be flushed with water for 14 seconds, after which the machine stops.
<i>Check Discs And Sups</i>	Message is given in connection with program selection in order to ensure that the user exchanges the proper backings (cloths etc.) and suspensions. This is most easily done by pressing "Display Program" whereby all backings and suspensions can be seen.
<i>End Of Program</i>	Message is given when a program (process) has been performed.

5.3. Function test/operating examples

5.3.1. Function test 1

In order to show you how Prepamatic works, the following will take you through preparing and performing an ordinary preparation procedure. Together with the machine are delivered 3 free-cutting steel specimens Ø 30 mm, which have been polished on Prepamatic at Struers final check. These specimens are to be used at the practical test, which can be carried out at the same time as reading this section.








- Switch on the main switch on the right hand side.
- Turn stand-by key (fig. 9.7) to "On". Now, the Prepamatic carousel will start to turn in order to find the correct starting position.
- Mount a flange ring (fig. 5.4), 29 x 40 x 4 mm around each of the three specimens. Use the prelevelling device (fig. 5.5) as follows: place the specimens in the cut-out for the relevant diameter (surface to be prepared facing downwards) and press the flange ring down around the specimen to the levelling device - the ring will thus be placed approx. 6 mm from the lower edge of the specimen (fig. 13-15). This ring ensures that the specimens do not fall through the mover plate. Instead of using the flange rings it is also possible to use the nickel-plated retaining rings where an Allen screw secures the specimen.
- Mount the levelling disc on the bottom side of the specimen mover plate (fig. 16).
- Lift presser feet one by one and insert the specimens (fig. 17). Lower the presser feet to the specimens so that these are pressed against the levelling disc and then clamp the presser feet with the button (fig. 18).
- Remove the levelling disc (fig. 19).
- Press "Select Program" and enter program 300, whereby the display shows the process time. Then press "Display Program" showing which steps the preparation program comprises.
- The display subtitle "Check discs and suspensions" means that it must be checked that the shown grinding and polishing backings are placed at the correct positions (1-5). From the factory grinding stone is mounted in Pos. 1. Petrodisc-M (P-M) (fig. 5.9) grinding disc, which is a synthetic disc with metal particles, is placed in Pos. 2. A polishing disc (fig. 5.10) with DP-Plus polishing cloth is placed in Pos. 3. Pos. 4 and Pos. 5 are not used in Program 300. In order to facilitate the mounting of the polishing discs the carousel can be turned so that the discs can more easily be changed e.g. from the left hand side. "Check Susp.", means that it must be checked that the correct suspension is in the bottle, but this is not necessary if section 3.8 has been followed.

- If Prepamatic has not been in operation for some days, as well as when taking completely new polishing cloths in use, it is recommended to run a predosing program. This ensures free access for the lubricant and the suspension to the nozzles and ensures that there are diamonds and lubricant on the grinding and polishing supports.
 - a. Press "Select Program" and then "Predosing" . This brings up a special display picture with the heading "Manual Predosing".
 - b. With the keys 2 to 5 (not "Position 2" to "Position 5") can now be chosen where the predosing should be carried out. In Program 300 it is Pos. 2 and 3. Therefore, press 2. This will move Petrodisc-M in position under the sample holder head.
 - c. The predosing is now carried out by pressing "Lubricant"  or "Abrasive" . The dosing continues for as long as one of these keys is pressed. If the tubes from the bottles to the nozzles are completely empty it may be necessary to keep the "Lubricant"  key pressed down for 30-40 sec, whereby all air bubbles are pumped out of the tubes.
 - d. Now press 3 and repeat c.
 - e. In order to finish the predosing program press "Stop" .
- Close the safety guard and press "Start" . The preparation will now be carried out totally automatically:
 - a. The carrousel moves so that the grinding stone (fig. 3.1) is underneath the diamond dresser (fig. 10.1). At the same time the grinding stone (and the other grinding and polishing discs) starts to rotate. Cooling water is started and the diamond dresser moves down to dress the grinding stone.
 - b. Now the specimen holder head (fig. 2) starts rotating and the specimens are pressed down against the grinding stone. On the display is shown that the grinding is proceeding thereby that the requested stock removal is counted down to zero in 5 μm steps. If the removal goes too slowly the stone is automatically dressed and opened (sharpened) after which the grinding continues. In special cases when the operator wants to leave out the dressing of the stone, this can be done by pressing:
"Start"  / "Stop"  / "Continue" .
 - c. After the grinding the cleaning chamber (fig. 3.4) is moved in under the specimens and a cleaning program is carried out consisting of cleaning with soap, pressure-water and alcohol and then drying with compressed air.
 - d. Now the grinding on P-M is carried out. First lubricant is predosed, then the process is started and suspension 6 μm is dosed.
 - e. Another cleaning is carried out in the cleaning chamber.
 - f. Now the specimens are polished on DP-Plus with 3 μm suspension.
 - g. Finally, the samples are cleaned extra well and then they are ready for routine check on microscope.
- The specimens can be taken out when the sliding doors are opened.

5.3.2. **Function test 2**

In the following the individual keys and selection of program as well as the individual display pictures will be covered.

- Turn the key from "Stand-by" to "On". If Prepamatic is switched on for the first time no program number is selected. This is done by entering a three-digit number by means of the keys 0-9.
First digit must be 1, 2 or 3, indicating how many samples are to be polished. The reason for this entering is that Prepamatic gives the best polishing results when pressure, lubricant and suspension have been adapted to the number of samples. The entering of sample number will make the microprocessor adapt the original data hereto.
The next two digits are the program number itself. I.e. that there is room for up to 100 programs starting from 00 to 99. The first 25 programs (00-24) are ready preparation programs, which are fixed in Prepamatic and which cannot be changed. The remaining 75 programs are open programs, into which data can be transferred and in which correction can be made.
If a wrong number is entered, just enter the three correct figures over the wrong ones.
Enter e.g. program 303.
When a program has been entered and you press "Select Program" the total removal quantity and the total process time will be displayed. If you press "Select Program" once again, the remaining removal and the remaining time of the process will be shown. This function can be used at any time during the process by pressing "Select Program".
- Press "Display Program" and the display will show the most important data for the individual steps. First line shows program No. In the brackets may be shown from which program it has been modified. The next 5 lines are numbered 1-5, indicated at which position on the carrousel the preparation step is being carried out, and moreover each line contains the most important data for the step - grinding/polishing support, grain size, lubricant type, time/removal, and finally is marked with an asterisk, if modification have been made in the step. Bottom line is used for information to the operator, e.g. error indications (see section 6).
- With the keys "Position 1-5" (fig. 9.2) all data for the 5 preparation steps are called forward: time, pressure, speed and direction of rotation, stock removal, grinding/polishing support, suspension type, dosing quantities for lubricant and suspension, from which bottles are to be dosed, whether lubricant has to be predosed, whether cooling water should be used, as well as with which cleaning program the step should be finished.
Try to press "Position 1". The steps are divided into two phases, Main and Final, which externally form a whole. The Main and Final phases can be programmed individually with respect to time, pressure, speed and dosing of lubricant and suspension. This makes it possible to get better specimens in a shorter time. E.g. the pressure will often be reduced and the lubricant quantity increased at the end, as this makes the diamonds work more gently, which may save an extra preparation step.

- Each line in the position pictures (1-5) can be displayed by means of the 7 keys below the Position 1-5 keys. Try this for Position 2. These pictures make surveying easier, and if data are requested to be changed, it has to be done in this picture. The up/down arrow keys (fig. 9.3) below the display are then used, as the up/down arrow keys refer to the parameter immediately above. If in program 0-24 (100-124, 200-224, 300-324) the arrow keys are pressed, the information line will show "Not an open program", which means that it is not possible to change data in one of these programs. Try this (see section 5.3.3).
- Below the up/down arrow keys (fig. 9.5) are three keys for manual intervention in the programs. The two horizontal arrow keys turn the carousel in the direction of the arrows as long as the key is activated (max. one turn).
The "Dresser" key is used to dress the grinding stone an extra time, or it is used when adjusting the dresser when mounting a new grinding stone. The "Dresser" key can only be used when the stone grinding program is about to start or is on. Press the key and see what happens.
- To the right hand side of the above three buttons are 4 keys (fig. 9.6) which are used in connection with development of new programs and check of results during the process. The two most important ones are "Stop after Step" and "Continue" .
If "Stop after Step" is pressed during the performance of a program Prepamatic stops, when the step in progress is finished. E.g. during a Petrodisc-M step at Pos. 2 "Stops after Step 2" will be written when pressing "Stop after Step". If there is a cleaning in connection with the step, it will be carried out and the specimens can then be examined by means of the enclosed inspection mirror without taking them out. If the specimens were taken out it would not be possible to remount the specimens at the same level. If "Continue"  is pressed now, the program continues from where it has stopped. If "Stop"  had been pressed, the preparation could also be continued by pressing "Continue"  whereas a press on "Start"  will make Prepamatic start all over again.
With the two other keys "Repeat Step" and "Omit Step" the next step can be omitted or the step which has just been completed can be repeated. On the display this is shown as inserting the time indication for the preceding step and omitting time indication at the next step respectively. Try to remove all the steps in the selected "Display Program"-picture and enter them again.
- The "Start"  key starts the selected program for 1st step, i.e. quite from the beginning.
The "Stop"  key stops the program where the program performance has reached to. In a OP-S or OP-U polishing step Prepamatic will flush with water before stop.

5.3.3. **Function test 3**

In the following change of program and programming of new program will be covered. Sometimes, it may happen that your specimens do not correspond to the standard specimens, and in such cases a program modification will be necessary.

It is not possible to make modifications in a standard program and therefore it has to be transferred into an open program (25-99). This is done as follows:

- Select an open program which has not been used before, e.g. 130, by pressing "Select Program" and "1", "3" and "0".
- If e.g. it is program 103 which should be modified then press "=" and "1", "0" and "3".
- Press "Display Program". The display shows the steps in program "103" stands in brackets after program 130, indicating that it forms the basis for this program. As basic program can be used all 300 programs, i.e. previous self-made programs can be used to develop new programs.
- If the stock removal in the Petrodisc-M step, i.e. Position 2, has to be changed press the key "Position 2" and then the "Time/Removal" key. With the up/down arrow keys below the display the removal can now be changed.
- If faster stock removal is requested at the Petrodisc-M step the direction of rotation for the sample holder head can be changed to counter-rotation. This is done by pressing the "Pressure/Rotation" key.
- When a program is being modified and a new one being developed it is wise to fill in a "Program Card", indicating basic program No. (the number in brackets) as well as the entered modifications, i.e. not all data have to be filled in as these appear from the standard program cards (n00 to n24).
By getting the "Display Program" picture out on the display it can be seen in which steps data have been modified as these are marked with an asterisk in front of Pos. No.
When user's own program has been developed it is entered in one of the lists under section 5.8.2, where it is easy to find for later use.
- If the user wishes to "tidy up" in his own programs, they can be moved about, and the programs which are no longer used, can be deleted. Deleting a program is done by selecting this program and press "=", and then "Delete Program".

5.3.4. How to find open programs

When Prepamatic is started, the message - "Prg. xxx is open", find next by pressing "Select Program" - is shown.

By continuing to press "Select Program" you will get a survey over all open programs from 25 to 99.

The programs are divided into 10-groups e.g. the 40-group, the 50-group etc. The advantage of these 10-groups is that you may for example give different users a number of 10-groups or you can split the 10-groups into materials.

If you want to work e.g. in the 40-group, press 1+4 and first open program from No. 140 to 149 is shown. For 2 or 3 specimens press 2+4 or 3+9.

Example

If we select program 142 and press "=" we come to the selected base program. After this the procedure is as described in chapter 5.3.3.

If you have entered a program number by mistake, press "Delete Program" and the last entered figure will be deleted. Thus you have to press three times, if you want to delete the whole number.

5.4. What the user must do

Although Prepamatic is a fully automatic machine it needs some help before the process can start. The following is left to the operator:

Selecting program

See section 5.8.1 on material and programs.

Placing grinding/polishing discs

The "Display Program" picture tells which grinding and polishing discs are to be placed at the 5 positions. Replacement of the discs is facilitated if the carousel is turned with the "Position Change" keys, so that replacement is done from the right or left hand side of Prepamatic.

*Filling/refilling lubricants,
DP-suspensions, oxide suspensions,
cooling water, alcohol
and soap solution*

It is best to refill lubricant, diamond suspension and oxide suspension before the bottles are empty, as otherwise air would get into the tubes, which have to be flushed to make the dosing accurate. The air can be flushed by applying a predosing procedure. Press "Select Program" and enter the used program. Then press the key "Predosing/Cleaning" and then one of the keys 2-5, depending on the pre-dosing position. Now press the Lubricant (or Abrasive) key until all air has been flushed out and the dosing spray is short and is spread correctly. The suspension nozzles are checked at the same time.

*Supplying the specimens
with flange ring
Levelling specimens*

See fig. 13-15. and section 5.5.

See fig. 16-19 and section 5.5.

*Predosing and checking
of dosing systems*

When starting on a new polishing cloth or a new Petrodisc-M it is recommended to predose suspension and possibly lubricant. Suspension is dosed for 10-15 sec and lubricant until the cloth is just damp.

*Cleaning discharge,
cleaning chamber etc.*

See section 7.

*Replacement of worn
polishing/grinding discs*

Prepamatic will not register when a polishing cloth should be discarded or a disc is unplane. Therefore, the operator has to check this at regular intervals, so that replacements can be carried out in time, to prevent damaging the samples.

Modification of programs

In order to be able to adapt and modify one of the fixed programs (No. 0-24) transfer the program into an open program (No. 25-99), in which the modification can be done. It is recommended to use program card B for entering the modification in relation to the basic program. Moreover, it is recommended to keep a record of the open programs which have been used - use form C, 'User Programs'.

Extra cleaning at test runs

If an operator works on adapting a program to special samples there will often be a need for cleaning the samples at arbitrary times. The procedure for this is as follows.

When the "Display Program" picture is on and the process stops by pressing "Stop" or "Stop after Step", press the "Cleaning" button after which the display asks which cleaning the operator wants. One of the figures 1-6 just has to be pressed and the cleaning will be carried out. When finished with the cleaning or when pressing "Stop" the "Display Program" reverts.

Increasing cleaning number gives longer/better cleaning.

5.5. Inserting specimens

Embedded specimens

Before insert in Prepamatic the specimen must be equipped with a flange ring (fig. 5.4) which ensures that each individual sample can hang in the hole of the specimen mover plate. The ring must be situated 6 mm from the surface to be polished. In order to ensure this measurement a pre-levelling device is used (fig. 5.5). Put the specimen, the surface to be polished facing downwards, into the pre-levelling device (fig. 13) and push the flange ring down over the specimen (fig. 14) until it makes contact with the upper plate. Now the ring is placed correctly (fig. 15).

Now the levelling disc, which has a bayonet closure, is fixed on the specimen mover plate (fig. 16), and then the specimen can be inserted. Loosen the pressure feet and lift them one by one insert the specimens with the surface to be polished facing downwards (fig. 17). Slide the pressure feet down towards the specimens so that they are pressed against the levelling disc. Do not use any force as the spring in the pressure feet hold the specimens in place. Then clamp the pressure feet (fig. 18). The specimens will now be at almost the same level. (When grinding on the stone the small differences in level will be removed completely). Then the levelling disc is removed again and Prepamatic can be started (fig. 19).

Small specimens in insert

Place the insert, e.g. PAMFI, fig. 21, in the pre-levelling device, flange turning downwards. The three specimens are clamped in the insert - the specimen surface will thus be 6 mm from the flange of the insert, which can now be placed in Prepamatic. See the description for embedded specimens.

Changing specimen mover plate

5 different specimen mover plates (fig. 5.2) are delivered with Prepamatic, and with different plastic insert rings (fig. 5.3) they can take specimens of different diameters: 25, 30 and 40 mm white rings, as well as 1", 1¼" and 1½" black rings (see section 4).

Exchange of specimen mover plate:

- Loosen with the 16 mm opened spanner the 3 nuts placed on top of the plastic flange on the specimen mover head, ½-1 turn (fig. 22).
- The specimen mover plate with the three stags can now be pulled off with a vertical downward movement (fig. 23).
- The new specimen mover plate is placed and tightened with the 3 nuts. Make sure that the stags go all the way up and make contact with the bottom side of the plastic flange. The three nuts should not be tightened too hard (fig. 24).

5.6. Placing/changing grinding stone

When the grinding stone (position 1) is worn down to approx. 25 mm thickness Prepamatic writes "Stone at minimum" and prevents further grinding. Continued grinding can only take place after the grinding stone has been replaced. This is done as follows:

- Put Prepamatic at Stand-by but do not switch off the main switch.
- Remove the cover (fig. 11.1) over the grinding stone (and the cleaning chamber) after removing the 4 finger screws (fig. 11.2).
- Loosen the Allen screws with the 5 mm hexagon key (fig. 5.23) and remove the stone (fig. 12.1).
- Before placing the new stone, clean the rubber washer preventing the stone from breaking. Replace the stone and screw the flange (fig. 12.2) on again.
- Remount the cover.
- The diamond dresser (fig. 10) should be adjusted to the height of the new stone, see section 5.9.1 and 5.9.2.

5.7. Placing/changing grinding and polishing discs (pos. 2-5)

- Place the disc on the turntable so that the three legs fit into the three holes in the turntable.
- The disc must be plane against the turntable in order not to buckle. The result might otherwise be that the pressure system is unable to set the pressure correctly and the process will not start.

5.8. Programming

5.8.1. Fixed programs

A survey of the 25 fixed preparation methods can be found at the end of this section. The methods are based on the use of Struers High Quality consumables.

The survey comprises the following information:

Version number

The version number must correspond to the number which is shown on the display for 5 to 10 seconds when activating the main switch on Prepamatic. Only the last figure is of interest for the preparation programs.

Program number

The numbers in the left column indicate the program number, where n must be replaced by 1, 2 or 3 for preparation of 1, 2 or 3 specimens respectively at a time.

For which materials

The two last figures give suggestion to types of material best suited for the program. When determining a program for the individual specimen type it is recommended to test all the programs under the relevant material group (ferrous metals, non-ferrous metals, plastics and composites, non-ferrous ductile metals, printed circuit boards, sintered carbides, ceramics, plasma spray coatings), as the requirements to the specimens are different.

Ferrous metals

Programs n00 to n07 are for ferrous metals.

Non-ferrous materials

Programs n08 to n11 are combination programs developed for materials which cannot withstand grinding on Petrodisc-M, because they contain hard and brittle inclusions or phases, or because Petrodisc-M makes the diamonds stick in the surface (especially the case with Al and Cu). If grain 4000 in program n09 cannot be used it is recommended to stop at step 4 and start program n11 on 6 µm Dur. If grain 4000 can be used program n11 can be started at the 3 µm Mol step.

Programs n12 to n14 are for materials which can be ground with a good result on Petrodisc-M.

Non-ferrous ductile metals

Programs n15 and n16 are for very ductile alloys and metals, especially Ti, but can also be used for some types of stainless steel, high temperature alloys, forged steel, Mo, Ta and the like.

Printed circuit boards

Program n17 and n18 are for preparation of through plated prints where it is a request to grind to the center of the lead-in holes.

In program n17 the stone grinding is set to 500 µm removal and must be repeated until the center of the holes has almost been reached (use the keys "Stop after Step" and "Repeat Step"). The last bit of the way to the center of the holes is handled with 1200 µm SiC in steps of 100 µm. Polishing is then carried out at the remaining two steps. If the specimens can be embedded so that there is a precise distance from the specimen surface to the center of the holes program n17 can be transferred into an open program and once for all the correct removals for step 1 and 2 can be found in order that the grinding can be reproduced.

The same grinding technique as for program n17, for obtaining preset depths, can be used for program n18.

Sintered Carbides

Both program n19 and n20 should be tried. n19 gives the best finish.

Ceramics

Programs n21 to n22 are ceramics. There is an infinite number of ceramic types and therefore we recommend to try both programs. Programs n20 and n21 use diamond grinding discs on Pos. 2 and therefore require that the embedding is made in Resin 4 or 5 - otherwise the grinding disc will clog up with resin.

Plasma spray coating

Both programs n23 and n24 should be tried.

Program cards: section 8 (Appendix)

*Prepamatic
Instruction Manual*

Prepamatic Program index/Version --6		Step				
Program No.	Materials	Pos 1	Pos 2	Pos 3	Pos 4	Pos 5
Ferrous metals						
n00	Routine program for steel	Stone	P-M	DP-Plus	-	-
n01	Steel	Stone	P-M	DP-Pan	DP-Mol	DP-Nap
n02	Steel (large specimens)	Stone	DP-Net	DP-Pan	DP-Dur	DP-Nap
n03	Steel with inclusions	Stone	P-M	DP-Pan	DP-Pan	DP-Nap
n04	Cast iron	Stone	DP-Plan	DP-Pan	DP-Dur	DP-Nap
n05	Cast iron	Stone	P-M	DP-Pan	DP-Mol	OP-Chem
n06	Stainless steels	Stone	P-M	DP-Dur	DP-Dur	OP-Chem
n07	Super alloys	Stone	P-M	DP-Dur	DP-Dur	DP-Nap
Non-ferrous metals, plastics and composites						
n08	Al and Cu alloys, plastics and composites	-	DIADI	DP-Pan	DP-Mol	OP-Chem
n09 ¹	Pure metals (Al, Cu)	-	220	500	1200	4000
n10 ¹	Polishing program after grinding with n09	-	DP-Pan	DP-Pan	DP-Dur	OP-Chem
n11 ¹	Polishing program after grinding with n09	-	DP-Dur	DP-Mol	DP-Mol	OP-Chem
n12	Brass and bronze	Stone	P-M	DP-Dur	DP-Mol	DP-Nap
n13	Brass and bronze	Stone	P-M	DP-Dur	DP-Nap	OP-Chem
n14	Hard aluminium alloys (AlSi)	Stone	P-M	DP-Dur	DP-Mol	OP-Chem
Non-ferrous metals, ductile						
n15	High ductility metals and alloys (Ti 6Al 4V)	Stone	P-M			OP-Chem
n16	High ductility metals and alloys	Stone	DP-Pan			OP-Chem
Printed circuit boards						
n17	PCB	Stone	SiC	DP-Pan	DP-Mol	-
n18	PCB	Stone	SiC	DP-Pan	DP-Pan	DP-Nap
Sintered carbides						
n19	Sintered carbides	Diam	P-M	DP-Plan	DP-Pan	-
n20	Sintered carbides	Diam	P-M	DP-Pan	DP-Pan	DP-Nap
Ceramics						
n21	Ceramics	Diam	Diam	P-M	DP-Plan	DP-Plan
n22	Ceramics	Diam	Diam	DP-Plan	DP-Plan	DP-Plan
Plasma spray coatings						
n23	Plasma spray coatings	Stone	P-M	DP-Pan	DP-Pan	OP-Chem
n24	Plasma spray coatings	Stone	DP-Plan	DP-Pan	DP-Pan	DP-Nap

¹n09 Grinding program for n10 and n11 or to replace the Petrodisc-M step in any other program. n10 and n11 are polishing programs which are used in connection with n09.

Conditions:

- Dimensions of specimens: Ø 30 mm embedded.
- The program consists of three figures where n is equal to 1, 2 or 3 for the preparation of 1, 2 or 3 specimens simultaneously.

P-M= Petrodisc-M

Diam= Diamond grinding disc

DIADI= Diamond Pad

Special programs

--1 for testing the direction of rotation

--2 for manual levelling/dressing of P-M or Diam on Pos. 2

IMPORTANT

- DP-Pan now replaces DP-Mat¹ and Pan-W in all polishing steps.
- The order of the software grinding/polishing discs is now:
DP-Net, DP-Plan, DP-Pan, Pan-W.

5.8.3. Hints
Stock removal, general

Prepamatic cannot distinguish whether stock removal is taken from the sample or from the grinding stone. This often results in less removal than programmed. To compensate you must experiment with a certain extra stock removal, as the removal depends on the sample material. If a precise stock removal is desired, we recommend that you only prepare one sample at a time.

A source of unprecise removal stems from 0-setting of the measuring system, as the setting only takes place after 1 turn of the sample holder head (13 turns if "Stone" is not specified). If the sample is very soft, a certain removal will take place during the turn. If the above measuring series is carried out, this inaccuracy will be compensated for.

In general, we recommend using grinding pressure and cloth/grain sizes with slow stock removal, i.e. more than 20 seconds on grinding stones or more than 100 seconds on Petrodisc-M.

In stock removal mode there are limits for max. and min. grinding pressure. If the programmed pressure is beyond these limits, the pressure automatically adjusts itself to the limit pressure. The display shows the message "Pressure decreased".

When grinding on grinding stone the stock removal can be larger than the stone can manage without being dressed (opened). Therefore an automatic dressing of the grinding stone takes place, when the removal has decreased to less than 15 µm per 10 sec. If many dressings have to be carried out, the precision is likely to drop.

If a programmed removal, f.ex. on Petrodisc-M, is too big and too time consuming - maybe even unattainable - the step will be stopped automatically after 20 minutes.

Defined stock removal

In many cases it is a request to be able to control exactly how much is ground off the sample, e.g. when examining scratch distribution, pores, and fine mechanical electric components. For this purpose, Prepamatic is equipped with a measuring system which communicates with the microprocessor and thereby can zero-set the measuring by itself and stop the grinding, when the requested removal has taken place. Especially at the grinding it is necessary to measure the removal. At polishing the removal is so small that it cannot be measured during the process. Switching from time control of the grinding to removal mode is done as follows (only possible in open programs, i.e. programs with program numbers higher than n24):

- Press Position key for which step the removal should be controlled.
- Press the "Time/Removal" key.
- With the right hand set of arrow keys below the display the removal can now be set at 5 µm intervals. The time for the main and final phases are automatically set on 0. The original time can be called forward again, if the removal is set to 0 µm.

E.g., set Pos. 1 to 200 µm (= 0.2 mm) and mount the sample in Prepamatic. Thus, the set thickness will be ground off the sample in first step, while the rest of the steps will prepare the sample as before. If after the grinding there are only polishing steps, the removal will be almost insignificant. If on the other hand, there is also a Petrodisc-M step, the requested removal can be divided between these steps, e.g. 150 µm for grinding on the grinding stone and 50 µm on Petrodisc-M.

During the removal the display counts the set µm-indication down to 0, after which the step stops. The count-down starts when the computer has zero-set the measuring system and when the sample has contact with the grinding base.

Error sources

Prepamatic cannot distinguish whether the stock removal takes place on the sample or on the grinding stone. Therefore, a smaller stock removal than the set one will take place. In order to compensate for this a bigger removal can be set - how much bigger only tests can show, as the removal is dependent on the sample material. Therefore, where a very accurate stock removal is requested, it is recommended to make a series of grindings and then measure the removal. Where an accurate removal is requested, it cannot be recommended to prepare more than one sample at a time.

WARNING

When working with a diamond disc on station 1 you must never use the settings for grinding stone as this will damage your diamond disc and the dresser system. This applies to both Prepamatic and Robomat.

Another source of inaccurate stock removal is the zero-setting of the measuring system, as this does not take place until after one rotation of the sample holder head (13 rotations, when grit sizes finer than or equal to 2400 is specified). If the sample is very soft a certain removal will take place during the rotation. This inaccuracy can be compensated for if the above mentioned measuring series is carried out.

In general it is recommended to use grinding pressures and grinding bases/grain sizes which give relatively slow removals, i.e. more than 20 seconds when grinding on stone or more than 180 seconds on Petrodisc-M.

At the stock removal mode the grinding pressure must be min. 21 N. If the pressure is under the limit, the text "Press. critically low" is shown on the display.

When grinding on stone the set stock removal may be bigger than that which the stone can grind off without dressing (opening). Therefore, an automatic dressing of the grinding stone takes place when the stock removal has fallen to less than 15 µm per 10 sec. If many dressings are necessary a fall in the accuracy must be anticipated.

If a set stock removal e.g. on Petrodisc-M is too big and therefore will take a very long time (and is maybe even impossible to obtain) the grinding stops automatically after 20 minutes.

Calibration curves

The error sources and their contribution to inaccuracy in the stock removal cannot be sorted out individually. Therefore, it is necessary to collect some statistic material. From this a calibration curve can then be made for the actual sample. On the curve is then found the display value to be set in order to get the requested stock removal.

In order to get a reasonably accurate curve it is recommended to perform about 20 test measurements. Be sure that the measuring points are chosen in the requested work area.

The following variables must be maintained during the measuring and the subsequent application of the curves:

- sample diameter
- sample material
- sample test material area
- grinding base
- grinding pressure
- embedding material
- grain size/dosing
- lubricant dosing

See example on curve sheet.

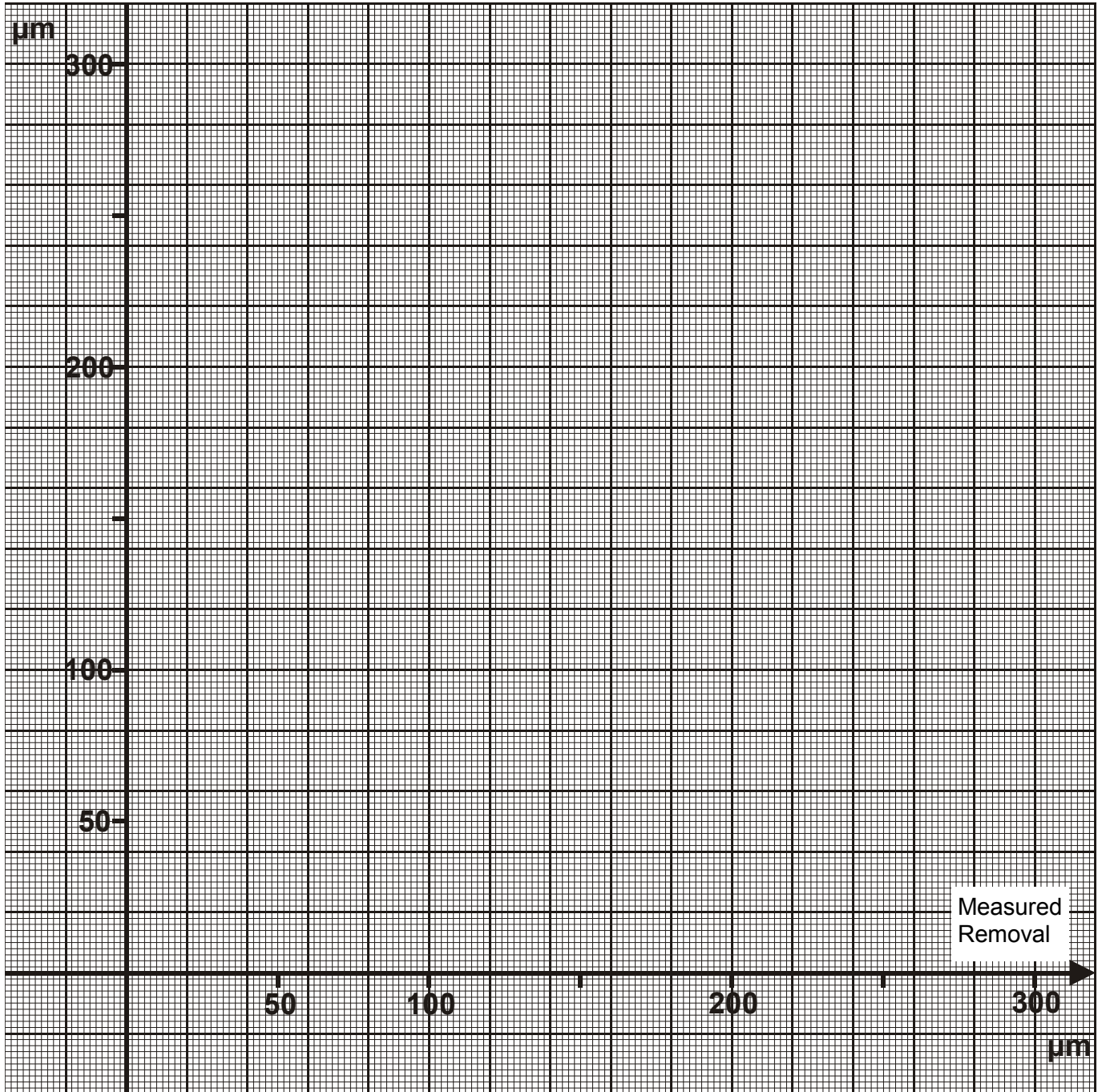
Prepamatic

Microstop Calibration Curve

Ref:

Date:

Display Indication



Material:

Material area: mm

Embedding material/ diameter: / mm

Disc type/ grain size: / µm

Pressure: N

5.8.4. The queue system (only if Robomat is installed)

- QUEUE screen** After installation of Robomat a double click on the key DISPLAY PROGRAM activates the QUEUE screen. The screen shows the preparation programs for each carriage in Robomat. It is now possible to prepare all 12 specimen holders with individual programs.
- Queue status** The QUEUE screen shows the status of the carriages using the following code letters:
- **W** (waiting) Specimen holder waiting to be prepared
 - **A** (active) Specimen holder being prepared
 - **P** (processed) Specimen holder preparation finished
- Queue settings** Type the no. of the desired carriage (01-12) and the QUEUE SETTINGS screen appears. You can change the following parameters:
- Change the program no.
 - Change the status to **W**(aiting) or **P**(rocessed). You cannot however activate the process from the menu **A**(ctivate)).
 - Change MODE. You can choose between MODE=NORMAL and MODE=QUEUE. In QUEUE mode you can have a separate program no. for each carriage.
- Synchronizing the carriages** When connecting Robomat to Prepamatic you must synchronize the no. of the carriages to fit the queue-structure. This should only be performed once.
- Press ADVANCE until carriage no. 12 is placed in front of the feed arm
 - Change to the QUEUE screen and press DELETE PROG
- Prepamatic have now registered all indexations on the Robomat.

5.8.5. Cleaning programs

Program no. 1-6 and program no. 7-9 are edited the same way, but only program no. 7-9 are saved. Program no. 1-6 will be overwritten with the default values after a cold boot of the machine.


- Choose the desired preparation step no. for the new cleaning program (the keys for step 1 to step 5).
- Choose the parameters predose/cleaning
- Choose the desired cleaning no. to edit or create for the preparation step.
- Press predose/cleaning again and the CLEANING PROGRAM SETUP screen appears.

In the CLEANING PROGRAM SETUP screen you can alter the parameter with the 6 arrow keys. A cleaning program consists of 10 steps. For each step you can choose a valve no. and a process time in seconds. The valve no. defines whether Prepamatic uses high pressure water, soap, alcohol or compressed air for the cleaning system.

5.9.1. Dressing of grinding stone

5.9. Manual functions

When "Stone" has been selected on pos. 1, Prepamatic is programmed so that a diamond dresser makes the grinding stone plane and sharpens it. If on the other hand, position 1 is used for grinding on diamond grinding disc or Diamond Pad and "Diam" is selected disc-text the dresser will not begin to function.

The dressing takes place before the grinding starts, immediately after pressing "Start"  .

If a grinding times has been programmed the grinding stone will only become dressed before start. If on the other hand "Removal" has been selected and a defined stock removal has been programmed, Prepamatic will automatically carry out a dressing when the removal is too slow (see the section 5.8.3).

If the grinding stone requires extra dressing, e.g. if very soft materials have been ground on it, Prepamatic carries out a dressing when the "Dresser" key is pressed.

5.9.2. Adjustment of diamond dresser

When changing grinding stone it is necessary to adjust the diamond dresser and Prepamatic helps remembering this. Therefore, prior to change of stone the main switch should not be switched off, but the machine only put in Stand-by position. If the main switch is switched off, there is a risk of damaging the new grinding stone and the dresser. Prepamatic can help because it is equipped with a sensor which watches whether the cover for the grinding stone is taken off. It will regard this as a change of stone and demand an adjustment of the dresser. Prepamatic will also demand an adjustment of the dresser, if the door (fig. 10.2) for the adjustment handle (fig. 10.3) is opened. This door is placed to the right hand side of the keyboard and can be opened with a small coin or a screwdriver by turning the screw $\frac{1}{4}$ turn.

Adjustment of the dresser takes place by first turning the dresser quite up, activating the dresser with the "Dresser" key and then turning the dresser down to contact with the new grinding stone.

When Prepamatic demands an adjustment of the dresser the display will indicate the procedure. Moreover, on the inside of the door for the adjustment handle an instruction is stuck (fig. 10.4).

**5.9.3. Dressing of
Petrodisc-M**

In order to keep the grinding time on Petrodisc-M lowest possible it is important that it is plane. This should be checked when the disc has been in operation for approx. 2 hours. A straight edge is used for this. The straight edge is held against the Petrodisc-M coating and by looking towards a light source (window or light in the ceiling) it can be seen if the straight edge touches Petrodisc-M on the whole diameter. If there are approx. 2-3/10 mm from the disc to the straight edge Petrodisc-M should be dressed. This can be done mechanically on a plane grinding machine, or on Prepamatic by means of the small dressing stick, supplied together with Petrodisc-M. Let the disc rotate slowly (at approx. 150 rpm) with a little water and hold the dressing stick down against the parts of Petrodisc-M which touched the straight edge.

When Prepamatic is used a special manual program number "2" gives the rotation and the water on position 2.


The need for dressing will be reduced if the wear is spread by changing, at regular intervals, between co- and counter-rotation, as counter rotation gives the greatest wear on the outside of Petrodisc-M, whereas co-rotation gives wear at the middle.







6. Error list

Prepamatic
Version -.20.- (=0.18.-)

Indication	Explanation/Cause	Action
ERROR 1	May be indicated when START \diamond CONTINUE \diamond or DRESSER is activated, or when door for dresser is opened. Cause: one or more of the 4 transparent protective screens is not closed	Close all protective screens so that the relevant micro switches become activated, and re-start the requested process. (Dresser adjustment procedure is re-started by closing and then opening the door).
ERROR 2	Dresser has not only slowly moved down at the start of the trueing-up.	Check the compressed air supply and the free movement of the dresser.
ERROR 3	The dresser is not or only slowly moving upwards after the trueing-up, or the dresser is only almost up.	Check the free movement of the dresser.
ERROR 5	Specimen holder head moves downward while the carrousel is turning. Cause: fault in pressure regulating system.	Call service technician.
ERROR 6	Specimen holder head has not come all the way up after operation on stone or polishing discs.	Check that the specimen holder head moves freely upwards. If necessary, lubricate spindle trough lubricating nipple (fig. 10.6) in the dresser room. If necessary, adjust play in main spindle.
ERROR 7	The specimen holder head has not reached down onto the grinding disc, the polishing disc or into the cleaning chamber.	Check that the specimen holder head moved freely, whether the levelling disc has been removed from the specimen holder plate, or whether the cleaning chamber is blocked by specimens which have been dropped.
ERROR 8	Specimen holder head has not come up after the cleaning is finished.	Check that the specimen holder head moves freely upwards (a specimen may have been stuck between the specimen mover disc and the cover). If necessary, lubricate spindle through lubricating nipple (fig. 10.6) in the dresser room. If necessary, adjust play in main spindle.

*Prepamatic
Instruction Manual*

Indication	Explanation/Cause	Action
ERROR 9	<p>Indication of error is given when the door to the dresser is closed, or if STOP is activated before the dresser adjustment procedure is finished.</p> <p>Cause: the adjustment procedure for the dresser has not been finished.</p>	<p>Repeat the dresser adjustment procedure by opening the door and carrying out all the points of the procedure. If ERROR 9 is still indicated when the door is closed, then check whether the height of the stone is less than or equal to approx. 50 mm, as it is not possible to use a higher grinding stone.</p>
ERROR 10	<p>Cleaning has stopped because of too low water pressure.</p>	<p>Check that water inlet is connected to the machine and that all hoses in the machine are in order. If the water supply has been interrupted, there may be air in the hoses. Therefore, re-start 2-3 times on CONTINUE . If necessary, also check the direction of rotation as the phase leads to the machine may be wrongly connected.</p>
ERROR 11	<p>The specified stock removal has not been reached within maximum time (safety time) of 20 min.</p>	<p>The specified stock removal must be reduced or the pressure must be increased.</p>
ERROR 13	<p>Attempt is made to true-up or make a dressing adjustment on a disc type which is <u>not</u> specified as STONE</p>	<p>If a stone is mounted on Pos. 1 the disc text must be changed to STONE.</p>
ERROR 14	<p>This indication of errors occurs when entering an "open program", if a data error has been made in that part of memory where the program is. Normally it would be an error in the RAM-circuits on the CPU-module.</p>	<p>If the indication BATTERY LOW has been ignored for some time this may also be the cause. Then change batteries immediately, as all "open programs" are in danger of being destroyed.</p>
ERROR 15	<p>The specified stock removal has not been obtained, as the pressure has become too low.</p>	<p>Start the process with a higher initial pressure or reduce the specified stock removal.</p>
ERROR 16	<p>The carrousel moves too slowly, is possible blocked and has not found its position. Besides the position counter on the carrousel motor or the motor itself may be defective.</p>	<p>Check that the carrousel moves freely and remove a possible hindrance. For this purpose use the keys for the manual position change.</p> <p>Possibly repair the position counter or the carrousel motor.</p>

Indication	Explanation/Cause	Action
ERROR 17	<p>Indication of error is given when START , CONTINUE , or DRESSER is activated, or at "manual pre-dosing" or "manual cleaning", as well as when the door of the dresser is opened.</p> <p>Cause: the cover over the grinding stone is missing or it is not screwed completely tight.</p> <p>Cause: one or more of the 4 transparent protective screens is not closed</p>	<p>Check that the blue sensor is placed at a maximum of 1 mm below the cover. Tighten the finger screws.</p>
ERROR 18	<p>Indication of error is given when START , CONTINUE , or DRESSER is activated, or at "manual pre-dosing" or "manual cleaning", as well as when the door of the dresser is opened.</p> <p>Cause: the dresser is not quite in top position or the black handle is screwed up completely (level "worn stone") or down completely (level "new stone"). Thereby the dresser level is outside the normal working sphere.</p>	<p>Open the door of the dresser, if not already open. Check that the ram with the dresser diamond is in top position. By means of the spring power the ram should be able to go all the way up. If this function is not working, call service technician.</p> <p>If the up-movement of the dresser is OK, proceed as follows: turn the black handle to level "new stone" by pulling the locking pawl and turning counter-clockwise until the handle cannot be turned any more. Then turn the handle about 5 turns in the opposite direction, whereby the dresser with certainty is within its normal working sphere. Close the door and the requested process can be started. (A correct adjustment of the dresser must be carried out before running POS. 1). If the described procedure does not make ERROR 18 disappear, call service technician.</p>
ERROR 19	<p>Indication of error is given when START , CONTINUE , or DRESSER is activated, or at "manual pre-dosing" or "manual cleaning", as well as when the door of the dresser is opened.</p> <p>Cause: sample holder head is not in its top position.</p>	<p>Check that the upwards movement of the sample holder head is unhindered. If necessary, lubricate the spindle through the lubricating nipple (fig. 10.6) in the dresser room. If necessary, adjust the play in main spindle.</p>

7. Maintenance

7.1. Every morning

Cleaning of polishing cloths

Brush the cloth with a clean, soft nail brush under hot running water. Thereafter, rinse with distilled water. When starting again do not forget to pre-dose with diamond suspension. Worn-out cloths should be replaced.

Checking Petrodisc-M

Petrodisc-M becomes unplane during use, and therefore the planeness should be checked daily in order to prevent poor results. The planeness is checked with a straight edge - see instruction manual for Petrodisc-M and section 5.9.3.

Refilling of suspension and lubricant bottles

The suspension and lubricant bottles are refilled if the level is below the plate in which the bottle is placed. Do not fill the suspension bottles more than 2/3 as they are bubbled through with compressed-air when the "Stand-by" key is turned to "On".


IMPORTANT

Clean the OP-S/OP-U suspension bottle before refilling in order to avoid clogging of the system due to sedimentation.

Switch on water supply.

7.2. Every evening or before breaks of more than 8 hours

Clean and empty the oxide suspension tube, pump and valves

- Take off the disc on Pos. 5 and select a program using oxide suspension on Pos. 5.
- Activate pre-dosing program (see section 5.3.1).
Fill an extra 1 l glass bottle with lukewarm water and insert it instead of the oxide suspension bottle. Place cap on the oxide suspension bottle.
- Press 5 (for Pos. 5) and press "Abrasive"  until tube and nozzle are flushed through.
- At the next run with oxide suspension the bottle of water is just to be replaced by oxide suspension. Switch off the water supply.

7.3. Every second day

Refilling of alcohol can

- Refill the alcohol can (fig. 4.4) in the bottom drawer.
Use Ethanol or possibly Propanol.

Refilling of soap can

- Refill the soap can (fig. 4.3) in the bottom drawer.
Concentration as stated on the bottle.

Refilling of recirculating tank

- Refill recirculating tank (fig. 4.1) in the bottom drawer.
Add Additive as stated on the bottle.

*Cleaning of suspension
nozzles (fig. 6)*

7.4. Every week or before breaks of more than 24 hours

- Take two bottles of lukewarm water, one bottle for the diamond suspensions and one for the oxide suspension.
- Replace the 1 µm suspension bottle with one of the water bottles.
- Press "Select Program" and choose no. 110.
- Press "Predosing/Cleaning".
- Press "4" for Pos. 4 where 1 µm suspension is used.
- Press "Abrasive/Grain size" and hold a beaker under the nozzle to avoid water splashing on the cloth. Press for 5-10 seconds.
- Move the bottle from 1 µm suspension to 3 µm suspension. Press "3" for Pos. 3, where 3 µm suspension is used. Repeat the above.
- Repeat the above for 6 µm suspension, Pos. 2.
- Replace the OP-Suspension bottle with the second bottle water.
- Press "5" for Pos. 5, where OP-Suspension is used. Press "Abrasive/Grain Size" until pump and hoses are emptied of OP-Suspension and only clean water is coming out.
- Press "Stop" \diamond to stop procedure.

Refilling of OP-Suspension bottles

Clean the OP-Suspension bottles before refilling in order to avoid clogging of the system due to sedimentation.

*Disassembling and cleaning
of suspension nozzles*

7.5. Every month

Two tubes lead to each nozzle (fig. 6.4), one blue for compressed-air (fig. 6.1) and one for clear (fig. 6.3) or black for suspension. The nuts (fig. 6.2) are loosened completely and both tubes can now be pulled off.

When disassembling the nozzles the nut should not be screwed as it is locked with glue after adjustment of the nozzle. Use the two open end spanners measuring 11 and 13 mm respectively in order to disassemble the nozzles (fig. 5.24 + 5.25).

Remove all suspension residues in the nozzle before assembling and mounting in Prepamatic. Then flush through with warm water and alcohol. Use the pre-dosing program.

Emptying/checking air filter

Behind the left side screen are two air filters - one coarse and one fine filter. In the side screen are holes (fig. 1.7) through which the condition of the filters can be checked and the valve at the bottom of the filter can be activated so that any water/oil can be emptied. The filters must not be heavily discolored.

*Cleaning of grinding stone
and cleaning chamber*

- Take off the screen (fig. 11.1) above the grinding stone and cleaning chamber.
- Remove accumulated grinding grains and grinding dust from the stone chamber (fig. 12.3).

IMPORTANT

Must be done from the left hand side of the machine, so that the rinsing fluid runs into the sewer and not into the recirculating cooling tank.

Cleaning of spill pans for Pos. 2-5

- Take out the grating (fig. 12.4) and wash it with a brush and soap. Clean the chamber (fig. 12.5) and the screen on the inside with brush and soap and rinse with little water.
- Replace the grating and put the screen back. At "Start" ◊ Prepamatic will now require and adjustment of the diamond dresser. This is for safety reasons as it "thinks" that the stone has been exchanged. Carry out the adjustment as described in section 5.9.2.
- Only little water must be used for the cleaning as the drain underneath the carousel (apart from the outlet at the specimen holder head) is only dimensioned to take drips from the spill pan. Carry out the cleaning from the left hand side of Prepamatic so that the rinsing fluid runs into the sewer.
- Take off polishing/grinding discs and splash rings from Pos. 2-5.
- Remove accumulated grinding/polishing waste with a rounded scraper.
- Clean the spillpan with a small brush and a little water.
- Wash the splash rings.

*Cleaning of outlet underneath
the carousel*

- Remove the inspection door (fig. 1.8) of the outlet tank (2 snap-action locks) and the two covers over the hexagon cleaning holes (corresponding to fig. 3.5 and 3.6) in the top part of the carousel.
- Scrape the outlet with a long, rounded scraper. Start from the rear part through the two holes - turn the carousel in position by means of the "Position Change" arrow keys. The front part of the outlet can be cleaned from the front.
- If necessary, the outlet can be cleaned with a brush and a little water and soap.
- Remount the two covers and the inspection door on the top part of the carousel.

Cleaning of plastic guards

Use a soft wrung cloth and ordinary window cleaning agent.

Cleaning of painted surfaces

Use a wrung cloth and water with a dash of ordinary household detergent (dish washing type).

IMPORTANT

Do not use alcohol, acetone or similar solvents.

*Changing water in the
recirculating cooling tank*

Clean the container for the recirculating unit and remove all slugs.
Change water and additive to avoid bacterial vegetation which can give an unpleasant smell.
It is recommended to use a disposable bag (TREPO) to collect the slugs.

7.6. Display reminder (from machine No. 3750085)

This function will help the user to remember to maintain the machine:

When the key, on the front plate, is switched from "On" to "Stand-by", the normal "Stand-by" display will change to the new "Maintenance" display, showing that the operator must remember to maintain the machine before the end of the working day. After about 1 minute, the display will return to the normal "Stand-by" display.

<p>MAINTENANCE</p> <ol style="list-style-type: none">1. Clean abr. 3.4.5.6.2. Clean OP-S system3. Check alcohol/soap4. Check/clean drain5. Check recirc. tank <p>Total time: xxxh</p>

On basis of some fixed criterions, the program determines which points to be displayed, however, the line "Total time: xxxh" will always be there, as this parameter shows the total process time. This parameter is a maintenance reminder for the user and the technician.

Once the operator has read the display, the following has to be done:

Switch the key back to "On", clean the parts to be cleaned, and check the commands, as described above, then switch the key back to "Stand-by" position to make the maintenance display appear on the screen again. Finally, confirm that the commands have been carried out, by pressing the numerical key corresponding to the line numbers shown on the screen. As confirming is carried out, the lines confirmed will disappear from the screen. For instance, if you press key 1, the line "1. Clean abr. 3.4.5.6." on display will disappear.

Prepamatic

Program Cards
and Spare Parts



Manual No.: 13757004

Date of Release: 19.07.1996



Table of Contents	Page
1. Program Cards	2
2. Spare Parts	32
3. Photos, Drawings and Diagrams	42

IMPORTANT

Always state *Serial No* and *Voltage/frequency* if you have technical questions or when ordering spare parts. You will find the *Serial No.* and *Voltage* on the front cover of this manual or on an attached label below. If in doubt consult the rating plate of the machine itself.

We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:

Instruction Manuals: A Struers Instruction Manual may only be used in connection with Struers equipment covered by the Instruction Manual.

Service Manuals: A Struers Service Manual may only be used by a trained technician authorized by Struers. The Service Manual may only be used in connection with Struers equipment covered by the Service Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to changes without notice. The manual may mention accessories or parts not included in the present version of the equipment.

The contents of this manual is the property of Struers. Reproduction of any part of this manual without the written permission of Struers is not allowed.

All rights reserved. Struers 1996.

Struers A/S
Valhøjs Allé176
DK-2610 Rødovre/Copenhagen
Denmark
Telephone +45 36 70 35 00
Fax +45 38 27 27 01

1. Program Cards

Prepamatic program card No. 00

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> >
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Predosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Predosing	2		Cleaning time	3

Pos. 3	Main	Final		
Process time	120	60	Stock removal	-
Pressure	42/84/126	36/72/108	Rotation	> >
rpm	150	150	Disc type	DP-Plus
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Predosing	5		Cleaning time	5

Pos. 4	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Predosing			Cleaning time	

Pos. 5	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Predosing			Cleaning time	

Material

Routine program for steel
Routine Programm für Stahl
Programme de routine pour acier

Comments

3 steps method
3-Schritt-Methode
Méthode à trois étapes

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Plus	3 µm	B	3	180
			4	
			5	

Prepamatic program card No. 01

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Predosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	>>
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Predosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	120	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Predosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Predosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Predosing	5		Cleaning time	5

Material

Steel
Stahl
Acier

Comments

Number of specimens (= n)

n = 1 n = 2 n = 3
XXX / XXX / XXX

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	180 s
DP-Mol	3 µm	B	4	120 s
DP-Nap	1 µm	B	5	60 s

Prepamatic program card No. 02

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	39/78/117	-	Rotation	> <
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	DP-Net
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	15	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	-

Pos. 3	Main	Final		
Process time	240	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	> >
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	90	30	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> >
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material

Steel (large specimens)
Stahl (grosse Proben)
Acier (gros échantillons)

Comments

Number of specimens (= n)

n = 1 n = 2 n = 3
XXX / XXX / XXX

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
DP-Net	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	300 s
DP-Dur	3 µm	B	4	180 s
DP-Nap	1 µm	B	5	120 s

Prepamatic program card No. 03

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	>>
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	180	120	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	Pan-W
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 5	Main	Final		
Process time	90	30	Stock removal	-
Pressure	30/60/90	24/48/117	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material

Steel with inclusions
Stahl mit Einschlüen
Acier à inclusions

Comments

Number of specimens (= n)

n = 1 n = 2 n = 3
XXX / XXX / XXX

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	300 s
Pan-W	3 µm	B	4	180 s
DP-Nap	1 µm	B	5	120 s

Prepamatic program card No. 04

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	180	120	Stock removal	-
Pressure	45/90/135	36/72/118	Rotation	>>
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	9 µm
Lubricant dosing	2	2	Water on/off	OFF
Abrasive bott.no.	3		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 3	Main	Final		
Process time	120	120	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 4	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material

Cast iron
Gußeisen
Fonte

Comments

Hard clothes used to avoid relief
Hartes Tuch zur Vermeidung von Relief
Des draps durs sont utilisés
pour éviter du relief

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
DP-Plan	9 µm	B	2	300 s
DP-Pan	6 µm	B	3	120 s
DP-Dur	3 µm	B	4	120 s
DP-Nap	1 µm	B	5	60 s

Prepamatic program card No. 05

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> >
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	180	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	180	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	> >
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> <
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-U
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	1
Pre dosing	10		Cleaning time	5

Material

Cast iron
Gußeisen
Fonte

Comments

Number of specimens (= n)

n = 1 n = 2 n = 3
XXX / XXX / XXX

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	240 s
DP-Mol	3 µm	B	4	240 s
OP-Chem	OP-U	B	5	120 s

Prepamatic program card No. 06

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	30/60/90	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	180	120	Stock removal	-
Pressure	51/102/153	30/60/90	Rotation	>>
rpm	150	150	Disc type	P-M
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	2	2	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	180	120	Stock removal	-
Pressure	36/72/108	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	180	120	Stock removal	-
Pressure	36/72/108	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	240	180	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	><
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-U
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

Stainless Steels
Rostfreier Stahl
Aciers inoxydables

Comments

Slight relief from OP-U step acceptable if etching is carried out
Leichte Relief-Bildung von OP-U zulässig, wenn eine Ätzung nachgeschaltet ist
Un léger relief de l'étape d'OP-U est acceptable si l'on désire attaquer l'échantillon

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	300 µ
DP-Dur	6 µm	B	3	300 s
DP-Dur	1 µm	B	4	300 s
OP-Chem	OP-U	B	5	420 s

Prepamatic program card No. 07

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> <
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	240	120	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> >
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	180	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> >
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	> >
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material

Superalloys
Super-Legierungen
Superalliages

Comments

Program can be stopped after step 4. Step 5 is used to remove any "caps" over the pores
Das Programm kann nach Schritt 4 beendet werden. Schritt 5 wird angewandt, um die Überschmierung von Poren zu beseitigen
Le programme peut être stopper après l'étape 4. L'étape 5 est utilisé pour éliminer les déformations autour des pores

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Dur	6 µm	B	3	360 s
DP-Dur	1 µm	B	4	300 s
DP-Nap	1 µm	B	5	120 s

Prepamatic program card No. 08

Pos. 1	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 2	Main	Final		
Process time	30	30	Stock removal	-
Pressure	15/30/45	9/18/27	Rotation	>>
rpm	150	150	Disc type	Diamond Pad
Abrasive dosing	-	-	Grain size	20 µm
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	1

Pos. 3	Main	Final		
Process time	120	120	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	15 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	3		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	120	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	60	60	Stock removal	-
Pressure	21/42/63	15/30/45	Rotation	><
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

Al and Cu alloys,
plastics and composites
Al und Cu Legierungen,
Kunststoff und
Verbundmaterialien
Alliage de Cu et Al,
Plastiques et composites

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
			1	
Diamond Pad	20µm	W	2	100µ
DP-Pan	6µm	B	3	240s
DP-Mol	3µm	R	4	240s
OP-Chem		OP-S	5	120s

Prepamatic program card No. 09

Pos. 1	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 2	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	30/60/90	-	Rotation	> <
rpm	300	-	Disc type	SiC-Papier
Abrasive dosing	-	-	Grain size	200
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	-

Pos. 3	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	15/30/45	Rotation	> <
rpm	300	300	Disc type	SiC
Abrasive dosing	-	-	Grain size	500
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	-

Pos. 4	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	15/30/45	Rotation	> <
rpm	300	300	Disc type	SiC
Abrasive dosing	-	-	Grain size	1200
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	-

Pos. 5	Main	Final		
Process time	30	30	Stock removal	-
Pressure	45/90/135	36/72/108	Rotation	> <
rpm	150	150	Disc type	SiC
Abrasive dosing	-	-	Grain size	4000
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	3

Material

Pure metals (Cu, Al)
Reine Metalle (Cu, Al)
Métaux purs (Cu, Al)

Comments

Grinding program for n10 and n11 ro to replace the Petrodisc-M step in any other program
Schleifprogramm für n10 and n11 oder als Ersatz für Petrodisc-M in jedem beliebigen Programm
Programme de prépolissage pour les programme n10 et n11 ou pour remplacer l'étape du Petrodisc-M dans tout autre programme

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
			1	
SiC	220	W	2	200 µ
SiC	500	W	3	60 s
SiC	1200	W	4	60 s
SiC	4000	W	5	60 s

Prepamatic program card No. 10

Pos. 1	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Predosing			Cleaning time	

Pos. 2	Main	Final		
Process time	180	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Predosing	3		Cleaning time	3

Pos. 3	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Predosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Predosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	10	5	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	><
rpm	75	75	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Predosing	10		Cleaning time	5

Material

Polishing program after grinding with n09
Polierprogramm nach Schleifen mit n09
Programme de polissage avec n09

Comments

In conjunction with grinding program n09 where Petrodisc-M can not be used and maximum edge retention is retention is required
In Verbindung mit Schleifprogramm n09, wenn Petrodisc-M nicht angewandt werden kann und hohe Randschärfe erforderlich ist
Utilisé en relation avec le programme de prépolissage n09 lorsque le Petrodisc-M ne peut être utilisé et que l'on désire une planéité des bords maximum

Number of specimens (= n)

Disc	Grit	Lub	Pos	S/µ
			1	
DP-Pan	6 µm	B	2	240 s
DP-Pan	3 µm	B	3	120 s
DP-Dur	1 µm	B	4	120 s
OP-Chem	OP-S		5	15 s

Program view

Prepamatic program card No. 11

Pos. 1	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 2	Main	Final		
Process time	240	120	Stock removal	-
Pressure	24/48/72	18/36/54	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 3	Main	Final		
Process time	180	180	Stock removal	-
Pressure	24/48/72	18/36/54	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	3

Pos. 4	Main	Final		
Process time	60	60	Stock removal	-
Pressure	24/48/72	18/36/54	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	3

Pos. 5	Main	Final		
Process time	60	60	Stock removal	-
Pressure	24/48/72	18/36/54	Rotation	><
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

Polishing program after grinding with n09
Polierprogramm nach Schleifen mit n09
Programme de polissage avec n09

Comments

In conjunction with grinding program n09
In Verbindung mit Schleifprogramm n09
Utilisé en relation le programme de prépolissage n09

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
			1	
DP-Dur	6 µm	B	2	360 s
DP-Mol	3 µm	R	3	360 s
DP-Mol	1 µm	R	4	180 s
OP-Chem	OP-S		5	120 s

Prepamatic program card No. 12

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	21/42/63	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	120	180	Stock removal	-
Pressure	42/84/126	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	10	10	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	180	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	240	240	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	3

Pos. 5	Main	Final		
Process time	120	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	5

Material
Brass and bronze
Messing und Bronze
Laiton et bronze

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
DP-Pan	6 µm	B	2	300 s
DP-Dur	6 µm	B	3	240 s
DP-Mol	3 µm	R	4	480 s
DP-Nap	1 µm	R	5	180 s

Prepamatic program card No. 13

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	21/42/63	-	Rotation	> >
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	120	180	Stock removal	-
Pressure	42/84/126	21/42/63	Rotation	> >
rpm	150	150	Disc type	P-M
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	10	10	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	180	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> >
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	180	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> >
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	3

Pos. 5	Main	Final		
Process time	240	60	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> <
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material
Brass and bronze
Messing und Bronze
Laiton et bronze

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	300 s
DP-Dur	6 µm	B	3	240 s
DP-Nap	3 µm	R	4	300 s
OP-Chem	OP-S		5	300 s

Prepamatic program card No. 14

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	30/60/90	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	120	180	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	P-M
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	10	10	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	-

Pos. 3	Main	Final		
Process time	120	120	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Dur
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	120	120	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	15	15	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	60	60	Stock removal	-
Pressure	21/42/63	15/30/45	Rotation	><
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

Hard aluminium alloys eg. Al-Si
Harte Aluminium legierungen z.b. Al-Si
Alliages d'aluminium durs par ex. Al-Si

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	300 s
DP-Dur	6 µm	B	3	240 s
DP-Mol	3 µm	R	4	240 s
OP-Chem	OP-S		5	120 s

Prepamatic program card No. 15

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> <
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	120	180	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	> <
rpm	150	150	Disc type	P-M
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	10	10	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 3	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 4	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 5	Main	Final		
Process time	180	180	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	> <
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

High ductility metals and alloys
Sehr duktile Metalle und Legierungen
Alliages et metaux tres ductiles

Comments

Especially for Ti₆Al₄V
Speziell für Ti₆Al₄V
Spécialement pour Ti₆Al₄V

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	300 s
			3	
			4	
OP-Chem	OP-S		5	360 s

Prepamatic program card No. 16

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	36/72/108	-	Rotation	> <
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	360	240	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	15 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	3		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 3	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 4	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 5	Main	Final		
Process time	480	120	Stock removal	-
Pressure	30/60/90	24/48/72	Rotation	> <
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	-	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material

High ductility metals and alloys
Sehr duktile Metalle und Legierungen
Alliages et métaux très ductiles

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
DP-Pan	15 µm	B	2	600 s
			3	
			4	
OP-Chem	OP-S		5	600 s

Prepamatic program card No. 17

Pos. 1	Main	Final		
Process time	-	-	Stock removal	500 µm
Pressure	30/60/90	-	Rotation	> >
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	100 µm
Pressure	21/42/63	-	Rotation	> <
rpm	300	-	Disc type	SiC
Abrasive dosing	-	-	Grain size	1200
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	1

Pos. 3	Main	Final		
Process time	60	60	Stock removal	-
Pressure	30/60/90	15/30/45	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	5

Pos. 4	Main	Final		
Process time	20	30	Stock removal	-
Pressure	30/60/90	15/30/45	Rotation	> >
rpm	150	150	Disc type	DP-Mol
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	2
Pre dosing	7		Cleaning time	5

Pos. 5	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Material
Print Circuit Board (PCB)
Gedruckte Schaltungen Leitungen
Circuit imprimé

Comments
Repeat steps 1 and 2 until desired position is reached
Schnitt 1 und 2 wiederholen bis die gewünschte
Position erreicht ist
Répéter l'étape 1 et 2 jusqu'à ce que la position désirée
soit obtenue

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	500 µ
SiC	1200	W	2	100 s
DP-Pan	6 µm	R	3	120 s
DP-Mol	1 µm	R	4	50 s
			5	

Prepamatic program card No. 18

Pos. 1	Main	Final		
Process time	-	-	Stock removal	300 µm
Pressure	39/78/117	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	5	5	Stock removal	-
Pressure	15/30/45	9/18/27	Rotation	>>
rpm	300	300	Disc type	SiC
Abrasive dosing	-	-	Grain size	1000
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	2		Cleaning time	2

Pos. 3	Main	Final		
Process time	60	60	Stock removal	-
Pressure	36/72/108	27/54/81	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5	5	Grain size	6 µm
Lubricant dosing	8	8	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	2
Pre dosing	5		Cleaning time	3

Pos. 4	Main	Final		
Process time	45	30	Stock removal	-
Pressure	36/72/108	27/54/81	Rotation	>>
rpm	150	150	Disc type	Pan-W
Abrasive dosing	5	5	Grain size	3 µm
Lubricant dosing	8	8	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	2
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	30	45	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5	5	Grain size	1 µm
Lubricant dosing	10	10	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	2
Pre dosing	10		Cleaning time	5

Material

Print Circuit Boards
Leiterplatten
Plaque de circuits imprimés

Comments

For examination of via-holes
Zur Untersuchung der Löcher
Pour l'examen des trous

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	300 µ
SiC	1000	W	2	10 s
DP-Pan	6 µm	R	3	120 s
Pan-W	3 µm	R	4	75 s
DP-Nap	1 µm	R	5	75 s

Prepamatic program card No. 19

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> <
rpm	1000	-	Disc type	Diam
Abrasive dosing	-	-	Grain size	120
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	60	60	Stock removal	-
Pressure	45/90/135	39/78/117	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 4	Main	Final		
Process time	180	120	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	> >
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	5

Pos. 5	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Material

Sintered Carbides
Hardmetall
Carbures frittés

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Diam	120	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	120 s
DP-Pan	3 µm	B	4	300 s
			5	

Prepamatic program card No. 20

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	>>
rpm	1000	-	Disc type	Diam
Abrasive dosing	-	-	Grain size	220
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	31

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	>>
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	240	240	Stock removal	-
Pressure	30/60/90	27/54/81	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	180	60	Stock removal	-
Pressure	30/60/90	27/54/81	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 5	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material

Sintered Carbides
Hardmetall
Carbures frittés

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Diam	220	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	240 s
DP-Pan	3 µm	B	4	240 s
DP-Nap	1 µm	B	5	60 s

Prepamatic program card No. 21

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> <
rpm	1000	-	Disc type	Diam
Abrasive dosing	-	-	Grain size	120
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> <
rpm	300	-	Disc type	Diam
Abrasive dosing	-	-	Grain size	600
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	2		Cleaning time	1

Pos. 3	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	> >
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 4	Main	Final		
Process time	300	300	Stock removal	-
Pressure	51/102/153	45/90/135	Rotation	> >
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 5	Main	Final		
Process time	300	300	Stock removal	-
Pressure	51/102/153	45/90/135	Rotation	> >
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	5

Material

Ceramics
Keramiken
Céramiques

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Diam	120	W	1	200 µ
Diam	600	W	2	75 µ
P-M	6 µm	B	3	75 µ
DP-Plan	6 µm	B	4	600 s
DP-Plan	3 µm	B	5	600 s

Prepamatic program card No. 22

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	51/102/153	-	Rotation	> <
rpm	1000	-	Disc type	Diam
Abrasive dosing	-	-	Grain size	120
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	60	60	Stock removal	-
Pressure	51/102/153	30/60/90	Rotation	> <
rpm	300	300	Disc type	Diam
Abrasive dosing	-	-	Grain size	600
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	3		Cleaning time	1

Pos. 3	Main	Final		
Process time	300	300	Stock removal	-
Pressure	51/102/153	45/90/135	Rotation	> >
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	9 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	3		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 4	Main	Final		
Process time	300	300	Stock removal	-
Pressure	51/102/153	45/90/135	Rotation	> >
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 5	Main	Final		
Process time	300	300	Stock removal	-
Pressure	51/102/153	45/90/135	Rotation	> >
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	1	1	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	5

Material

Ceramics
Keramiken
Céramiques

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Diam	120	W	1	200 µ
Diam	600	W	2	200 s
DP-Plan	9 µm	B	3	600 s
DP-Plan	6 µm	B	4	600 s
DP-Plan	3 µm	B	5	600 s

Prepamatic program card No. 23

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	21/42/63	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	-	-	Stock removal	75 µm
Pressure	51/102/153	-	Rotation	>>
rpm	150	-	Disc type	P-M
Abrasive dosing	5/6/7	-	Grain size	6 µm
Lubricant dosing	2	-	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	-

Pos. 3	Main	Final		
Process time	120	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	210	150	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 5	Main	Final		
Process time	10	40	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	><
rpm	150	150	Disc type	OP-Chem
Abrasive dosing	10/11/12	10/11/12	Grain size	OP-S
Lubricant dosing	-	1	Water on/off	OFF
Abrasive bott.no.	7		Lubr. bottle no.	-
Pre dosing	10		Cleaning time	5

Material
Plasma sprayed coatings
Plasma Spritzschichten
Revêtements par jet de plasma

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
P-M	6 µm	B	2	75 µ
DP-Pan	6 µm	B	3	180 s
DP-Pan	3 µm	B	4	360 s
OP-Chem	OP-S		5	50 s

Prepamatic program card No. 24

Pos. 1	Main	Final		
Process time	-	-	Stock removal	200 µm
Pressure	21/42/63	-	Rotation	>>
rpm	1000	-	Disc type	Stone
Abrasive dosing	-	-	Grain size	150
Lubricant dosing	-	-	Water on/off	ON
Abrasive bott.no.	-		Lubr. bottle no.	-
Pre dosing	-		Cleaning time	1

Pos. 2	Main	Final		
Process time	180	120	Stock removal	-
Pressure	45/90/135	39/78/117	Rotation	>>
rpm	150	150	Disc type	DP-Plan
Abrasive dosing	5/6/7	5/6/7	Grain size	9 µm
Lubricant dosing	2	2	Water on/off	OFF
Abrasive bott.no.	3		Lubr. bottle no.	1
Pre dosing	2		Cleaning time	3

Pos. 3	Main	Final		
Process time	120	60	Stock removal	-
Pressure	39/78/117	30/60/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	6 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	4		Lubr. bottle no.	1
Pre dosing	3		Cleaning time	3

Pos. 4	Main	Final		
Process time	210	150	Stock removal	-
Pressure	39/78/117	30/160/90	Rotation	>>
rpm	150	150	Disc type	DP-Pan
Abrasive dosing	5/6/7	5/6/7	Grain size	3 µm
Lubricant dosing	6	6	Water on/off	OFF
Abrasive bott.no.	5		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	3

Pos. 5	Main	Final		
Process time	30	30	Stock removal	-
Pressure	30/60/90	21/42/63	Rotation	>>
rpm	150	150	Disc type	DP-Nap
Abrasive dosing	5/6/7	5/6/7	Grain size	1 µm
Lubricant dosing	18	18	Water on/off	OFF
Abrasive bott.no.	6		Lubr. bottle no.	1
Pre dosing	5		Cleaning time	5

Material
Plasma spray coatings

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/µ
Stone	150	W	1	200 µ
DP-Plan	9 µm	B	2	300 s
DP-Pan	6 µm	B	3	120 s
DP-Pan	3 µm	B	4	120 s
DP-Nap	1 µm	B	5	60 s

Prepamatic program card No.

Pos. 1	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 2	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 3	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 4	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Pos. 5	Main	Final		
Process time			Stock removal	
Pressure			Rotation	
rpm			Disc type	
Abrasive dosing			Grain size	
Lubricant dosing			Water on/off	
Abrasive bott.no.			Lubr. bottle no.	
Pre dosing			Cleaning time	

Material

Comments

Number of specimens (= n)

Program view

Disc	Grit	Lub	Pos	S/ μ
			1	
			2	
			3	
			4	
			5	

Cleaning Programs

PROGRAM NO. 1				Total Cleaning Time: __:__			
Step	Valve	Media	Time	Step	Valve	Media	Time
1				6			
2				7			
3				8			
4				9			
5				10			

PROGRAM NO. 2				Total Cleaning Time: __:__			
Step	Valve	Media	Time	Step	Valve	Media	Time
1				6			
2				7			
3				8			
4				9			
5				10			

PROGRAM NO. 3				Total Cleaning Time: __:__			
Step	Valve	Media	Time	Step	Valve	Media	Time
1				6			
2				7			
3				8			
4				9			
5				10			

PROGRAM NO. 4				Total Cleaning Time: __:__			
Step	Valve	Media	Time	Step	Valve	Media	Time
1				6			
2				7			
3				8			
4				9			
5				10			

PROGRAM NO. 5				Total Cleaning Time: __:__			
Step	Valve	Media	Time	Step	Valve	Media	Time
1				6			
2				7			
3				8			
4				9			
5				10			

Valves = Cleaning Media 0=Valves off 1=Air 2=Alcohol 3=Soap 4=Water

Cleaning Programs

PROGRAM NO. 6				Total Cleaning Time: __:__				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. 7				Total Cleaning Time: __:__				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. 8				Total Cleaning Time: __:__				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. 9				Total Cleaning Time: __:__				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

Valves = Cleaning Media 0=Valves off 1=Air 2=Alcohol 3=Soap 4=Water

Cleaning Programs

PROGRAM NO. __				Total Cleaning Time: __: __				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. __				Total Cleaning Time: __: __				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. __				Total Cleaning Time: __: __				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

PROGRAM NO. __				Total Cleaning Time: __: __				
Step	Valve	Media	Time		Step	Valve	Media	Time
1					6			
2					7			
3					8			
4					9			
5					10			

Valves = Cleaning Media 0=Valves off 1=Air 2=Alcohol 3=Soap 4=Water

2. Spare Parts

The drawings are not to scale. Some of the drawings may contain position numbers not used in connection with this manual.

Figure	Pos.	Description	Part No.
		<i>Body sheets</i>	
(Figure 1)	5	Cover, left	13759052
		Self adhesive labels, complete set.....	375 MP 006
		Cover, right upper	13759054
		Cover, right lower	13759053
	8	Cover plate	13759055
(Figure 7)	8	Rear plate	13759050
(Figure 8)	6	Cover plate, rear	13759051
		<i>Front plate</i>	
(Figure 9)		Display frame	375 MP 011
	8	Display glass	375 MP 012
(Figure 10)	2	Door.....	13759057
	9	Front plate	13759056
	10	Lock for door	375 MP 013
		<i>Box for lubricants/suspensions</i>	
(Figure 7)	2	Bottle, 1000 ml	13760263
	4	Cap plate for 1000 ml bottle	375 MP 028
	6,V6	Water valve	375 MP 026
	9	Bottle tray	375 MP 014
	10	Cover plate, right.....	13759061
		Cover plate, left	13759060
		Plastic screen.....	375 MP 016
		Thumb screw.....	375 MP 254
	11	Cap plate for 300 ml bottle	375 MP 029
		Suspension bottle, 300 ml.....	375 MP 027
(Figure C1)		OP-S pump, complete.....	375 MP 017
		Lubricant pump, complete.....	375 MP 025
	1	Diaphragm, OP-S pump.....	375 MP 018
	1	Diaphragm, lubricant pump	375 MP 052
	2	Piston, OP-S pump	375 MP 019
	2	Piston, lubricant pump.....	375 MP 053
	3	Spring, OP-S/lubricant pump	375 MP 020
	4	Nipple	375 MP 022
	5	Banjo connection.....	375 MP 023
	6	Check valve.....	375 MP 024
	7	Screwed connection.....	375 MP 292

Figure	Pos.	Description	Part No.
<i>Nozzle holder</i>			
(Figure 6)	4	DP-suspension nozzle, complete.....	375 MP 031
	5	Lubricant nozzle, complete	375 MP 032
	6	OP-S/OP-U suspension nozzle, complete.....	375 MP 033
	10	Nozzle holder plate	375 MP 030
(Figure C2)	1	Lubricant nozzle head	375 MP 035
(Figure C3)	1	DP-suspension nozzle head	375 MP 034
	3	DP-suspension nozzle screw.....	375 MP 039
(Figure C4)	1	OP-S/OP-U suspension nozzle head.....	375 MP 040
(Figure C2/C4)	2	O-ring Ø 3 x 1 for lubricant and OP-S/OP-U nozzle head.....	375 MP 036
(Figure C2/C4)	3	Lubricant and OP-S/OP-U nozzle screw.....	375 MP 038
(Figure C2/C3/C4)	4	O-ring Ø 4.48 x 1.78 for nozzle screw	375 MP 037
	5	Guide ball for nozzle	375 MP 270
	6	O-ring Ø 16 x 2 for guide ball.....	422 MP 015
<i>Top</i>			
(Figure 1.9)		Top cover	13759064
<i>Main spindle</i>			
(Figure E1)		Spindle, assembled.....	375 MP 042
	1	Shaft	375 MP 043
	2	Key	375 MP 044
(Figure E1/Figure 2)	3/5	Bellow with housing.....	375 MP 045
(Figure E1)	4	Bearing LR 200 NPPU	375 MP 048
	5	Bearings, 2 pcs, 6004-2RS	375 MP 049
	6	Bearing, 6205-2Z	375 MP 050
	7	Belt, HTD5 75 x 15 mm.....	375 MP 051
	8	Counter wheel	375 MP 350
	9	Brass bearing, top	375 MP 351
	10	Brass bearing, complete, bottom	375 MP 352
	11	Bearing nut	375 MP 353
	12	Bearing nut plug	375 MP 354
<i>Lift for spindle</i>			
(Figure E2)	1	Spring with strain gauge.....	375 MP 054
	2	Toothed rack	375 MP 055

Figure	Pos.	Description	Part No.	
<i>Nozzle holder</i>				
(Figure 6)	4	DP-suspension nozzle, complete.....	375 MP 031	
	5	Lubricant nozzle, complete	375 MP 032	
	6	OP-S/OP-U suspension nozzle, complete.....	375 MP 033	
	10	Nozzle holder plate	375 MP 030	
(Figure C2)	1	Lubricant nozzle head	375 MP 035	
(Figure C3)	1	DP-suspension nozzle head	375 MP 034	
	3	DP-suspension nozzle screw.....	375 MP 039	
(Figure C4)	1	OP-S/OP-U suspension nozzle head.....	375 MP 040	
(Figure C2/C4)	2	O-ring Ø 3 x 1 for lubricant and OP-S/OP-U nozzle head.....	375 MP 036	
(Figure C2/C4)	3	Lubricant and OP-S/OP-U nozzle screw.....	375 MP 038	
(Figure C2/C3/C4)	4	O-ring Ø 4.48 x 1.78 for nozzle screw	375 MP 037	
	5	Guide ball for nozzle	375 MP 270	
	6	O-ring Ø 16 x 2 for guide ball.....	422 MP 015	
<i>Top</i>				
(Figure 1.9)		Top cover	13759064	
<i>Main spindle</i>				
(Figure E1)		Spindle, assembled.....	375 MP 042	
	1	Shaft	375 MP 043	
	2	Key	375 MP 044	
(Figure E1/Figure 2)	3/5	Bellow with housing.....	375 MP 045	
(Figure E1)	4	Bearing LR 200 NPPU	375 MP 048	
	5	Bearings, 2 pcs, 6004-2RS	375 MP 049	
	6	Bearing, 6205-2Z	375 MP 050	
	7	Belt, HTD5 75 x 15 mm.....	375 MP 051	
	8	Counter wheel	375 MP 350	
	9	Brass bearing, top.....	375 MP 351	
	10	Brass bearing, complete, bottom	375 MP 352	
	11	Bearing nut.....	375 MP 353	
	12	Bearing nut plug	375 MP 354	
	<i>Lift for spindle</i>			
	(Figure E2)	1	Spring with strain gauge.....	375 MP 054
		2	Toothed rack	375 MP 055

Figure	Pos.	Description	Part No.	
<i>Specimen holder head</i>				
(Figure E3/Figure 2)	1/1	Head	375 MP 056	
	2/4	Plate	375 MP 058	
(Figure E3)	3	Stay for spring	375 MP 059	
	4	Spring	375 MP 060	
	5	Pressure foot	375 MP 061	
	6	Thrust pad	375 MP 062	
	7	Collet bush	375 MP 064	
	8	Disc for collet	375 MP 065	
	9	Nut for collet	375 MP 066	
	10	Stopper	375 MP 067	
	12	Thumb screw	375 MP 069	
	13	"Lid" with V-ring	375 MP 070	
	14	V-ring VA-130	260 MP 184	
	<i>Diamond dresser</i>			
	(Figure 10)	1	Diamond	PLAMT
	(Figure E4/Figure 10)	1/11	Cylinder	375 MP 072
2/12		Cylinder nut	375 MP 073	
6/3		Handle	375 MP 081	
(Figure E4)	3	Spindle nut	375 MP 074	
	4	Disc	375 MP 075	
	5	Ring with bush	375 MP 077	
	7	Friction element	382 MP 028	
	8	Free-wheel bearing with teeth	375 MP 076	
(Figure E5)	1	Pawl	375 MP 078	
	2	Pawl pin	375 MP 079	
	3	Spring	375 MP 080	
	4	Pin	375 MP 082	
	4	Pin	375 MP 087	
	5	Sensor plate	375 MP 083	
	6	Grip	375 MP 085	
7	Plate housing	375 MP 088		

Figure	Pos.	Description	Part No.
<i>Carrousel</i>			
(Figure 3)	5/6	Cover for cleaning holes	375 MP 290
		Snap fastener	375 MP 291
	2	Lid for grinding and cleaning chamber	13758048
	3	Carrousel screen, new design color.....	13759068
(Figure 11)		Drip catcher for dresser.....	375 MP 268
		Drain tray, pos. 2-5.....	375 MP 094
(Figure 12)	3	Drain tray, pos. 1	375 MP 095
	4	Grate	375 MP 092
(Figure B1)	1	Stay for carrousel plate	375 MP 089
	2	Support for carrousel plate.....	375 MP 090
(Figure B1/Figure 12)	3/5	Grinding/cleaning chamber	375 MP 091
(Figure B1/Figure 11)	4/1	Lid for chamber	375 MP 093
		Brake pad for cylinder	375 MP 271A
		Rubber curtain for stone cover.....	375 MP 269
		Rubber curtain for dresser track	375 MP 275
	5/2	Thumb screw.....	375 MP 096
<i>Cleaning nozzles</i>			
(Figure B2/Figure 12)	1/7	Air nozzle.....	375 MP 099
	2/10	Water nozzle	375 MP 100
	3/8+9	Soap/alcohol nozzle, complete	375 MP 098
<i>Carrousel drain</i>			
(Figure 3)	7/8/9	Lid for sensor box.....	375 MP 106
(Figure B3)	1	Holder for groove	375 MP 102
	2	Groove.....	375 MP 103
(Figure B4)	1	Drain	375 MP 104
	2	Drain hose, 2 m.....	375 MP 105
<i>Carrousel wheel</i>			
(Figure B5)	1	Bearing, spherical 1210	375 MP 107
(Figure B6)	1	Round belt (No. 5/50 Hz)	375 MP 108
	1	Round belt (No. 5/60 Hz)	375 MP 110
	2	Round belt (No. 2/50 Hz)	375 MP 109
	2	Round belt (No. 2/60 Hz)	375 MP 111
	3	Round belt (No. 3+4).....	375 MP 112
	4	Round belt (No. 1)	375 MP 113
	5	Round belt (No. 6).....	375 MP 114
		Set of round belts (50 Hz)	375 MP 097
		Set of round belts (60 Hz)	375 MP 101
	6	Tooth belt	375 MP 115
	7	Pulley for tooth belt (motor).....	375 MP 116

Figure	Pos.	Description	Part No.
<i>Turntables</i>			
(Figure B7)		Turntable bearing unit, complete (pos. 4)	375 MP 122
		Turntable bearing unit, complete (pos. 5)	375 MP 123
	1	Turntable	300 MP 026
	2	Belt pulley (large)	375 MP 117
	3	Belt pulley (small)	375 MP 118
	4	Bearing (2 pcs, 6004-2RS).....	300 MP 028
	5	Thrust collar.....	300 MP 029
	6	Seeger ring U20x1.2	300 MP 030
(Figure B8)		Grinding stone bearing unit.....	375 MP 124
	1	Turntable for grinding stone	375 MP 121
	2	Rubber plate	375 MP 125
	3	Flange for grinding stone	375 MP 126
	4	Screw for grinding stone	375 MP 127
(Figure B9)		Intermediate stage	375 MP 119
		Turntable bearing unit, complete, (pos. 2.3)	375 MP 120
<i>Bottom cabinet</i>			
(Figure 4)	1	Tank, 35 l.....	253 MP 003
	2	Lid for tank.....	375 MP 130
	3/4	5 l container.....	375 MP 129
	9	Cap for 5 l container with connection.....	375 MP 131
		Thumb screw, rack.....	375 MP 254
	10	Drawer slide	375 MP 128
	11	Door.....	375 MP 132
<i>Miscellaneous</i>			
(Figure 5)	2	Specimen mover plate (25/1").....	375 MP 133
	2	Specimen mover plate (30/1¼").....	375 MP 134
	2	Specimen mover plate (40/1½").....	375 MP 135
	2	Specimen mover plate (50/2").....	375 MP 136
	2	Specimen mover plate (25/30/40)	375 MP 137
	3	Insert rings, 25 mm (4 pcs)	375 MP 140
	3	Insert rings, 30 mm (4 pcs)	375 MP 141
	3	Insert rings, 40 mm (4 pcs)	375 MP 142
	3	Insert rings, 1" (4 pcs)	375 MP 143
	3	Insert rings, 1¼" (4 pcs)	375 MP 144
	3	Insert rings, 1½" (4 pcs)	375 MP 145
	4	Flange ring, 25 mm/1" (4 pcs).....	375 MP 154
	4	Flange ring, 30 mm (4 pcs)	375 MP 155
	4	Flange ring, 1¼" (4 pcs)	375 MP 156
	4	Flange ring, 1½" (4 pcs)	375 MP 157
	4	Flange ring, 40 mm (4 pcs)	375 MP 158
	4	Flange ring, 50 mm (2 pcs.)	375 MP 159
	5	Pre-levelling device	375 MP 139
	6	Box	375 MP 147
		Nozzle cleaning needle	375 MP 148
	Filter insert, water.....	375 MP 149	

Figure	Pos.	Description	Part No.
<i>(Miscellaneous, figure 5 continued)</i>			
	7	Levelling disc.....	375 MP 138
	11	Splash ring, tall.....	375 MP 160
		Splash ring, pos. 5	375 MP 161
	12	Splash ring, low	300 MP 017
	16	Compressed air tube (3 m)	375 MP 256
	17	Connection branch	375 MP 255
	19	Pressure water tube (2.5 m).....	375 MP 150
	21	Clamping table, 32-50	2NS
	24	Open end spanner 11 mm	375 MP 151
	25	Open end spanner 13 mm	375 MP 152
	26	Open end spanner 16 mm	375 MP 153
	27	Inspection mirror	375 MP 146
	30	Flange ring, metal type, 25 mm/1", (1 pc).....	375 MP 278
		Flange ring, metal type, 30 mm (1 pc)	375 MP 279
		Flange ring, metal type, 1¼" (1 pc).....	375 MP 280
		Flange ring, metal type, 1½" (1 pc).....	375 MP 281
		Flange ring, metal type, 40 mm (1 pc)	375 MP 282
		Flange ring, metal type, 50 mm/2" (1 pc).....	375 MP 283
		Flange ring, rubber type 50 mm/2" (1 pc.)	2IQ04225
<i>Screens</i>			
<i>(Figure E6)</i>	1	Rear sheet.....	375 MP 162
<i>(Figure E7)</i>	1	Stop, small.....	375 MP 163
	2	Stop, large (adjustable)	375 MP 164
<i>(Figure E8)</i>	1	Side screen, left, fixed.....	375 MP 165
	2	Side screen, right, fixed.....	375 MP 166
	3	Front screen, fixed	375 MP 167
	4	Slide screen.....	375 MP 168
	5	Tilting screen, left	375 MP 169
	6	Tilting screen, right.....	375 MP 170
	7	Box for safety switch	375 MP 171
		Slide screens support set.....	375 MP 300
		Front screens support set	375 MP 301
		Side screens support set.....	375 MP 302
		Tilting screens support set	375 MP 303
<i>Pneumatics, water (see pneumatics diagram)</i>			
		Hose, black PU 3 (1 m)	376 MP 081
		Hose, blue PU 3 (2 m).....	375 MP 172
		Hose, ENFT 21 (1.2 m)	375 MP 173
		Hose, ENFT 23 (1 m)	375 MP 174
		Suspension hose (1 m)	376 MP 080
<i>(Figure B5)</i>	2,Cy1	Brake cylinder.....	375 MP 179
		Brake pad for cylinder	375 MP 271
		Double hose	375 MP 180
<i>(Figure G1)</i>		High pressure pump, complete, but without motor (M1).....	375 MP 195
	1	High pressure pump.....	375 MP 196
	2	Pressure switch.....	375 MP 197

Figure

(Figure E4)

Pos.	Description	Part No.
3	Cap for pressure switch	375 MP 198
V1,V2	Filter/reduction valve unit – SMC (from app. no. 3750028).....	375 MP 199
V2	Reduction valve.....	368 MP 330
V3	Fine filter unit, SMC (from app. no. 3750028).....	375 MP 200
	Filter glass for 375 MP 199 and 375 MP 200.....	381 MP 435
V4,V5	Needle valve.....	394 MP 059
9/V8	Throttle valve.....	375 MP 175
	Hose, black PU-4 (2 m).....	375 MP 176
	Hose, blue PU-4 (2 m)	375 MP 177
	Hose, blue, 6 mm (2 m).....	375 MP 178
Y1	Valve housing, Danfoss ¼"	375 MP 191
Y1,Y2	Solenoid, Danfoss, 50 Hz.....	375 MP 192
Y1,Y2	Solenoid, Danfoss, 60 Hz.....	375 MP 193
Y1,Y2	Plug for Danfoss solenoid	375 MP 194
Y2	Valve housing, Danfoss 1/8"	375 MP 190
Y3-Y8	Solenoid	375 MP 184
Y3-Y8	Base plate	375 MP 185
Y3-Y8	Plug	375 MP 186
Y9-		
Y16	Solenoid valve	375 MP 187
Y9-		
Y16	Plug for 375 MP 187	375 MP 188
<i>Motors</i>		
M1	High pressure pump motor (M1)	
	3 x 220 V, 50 Hz	
	3 x 220 V, 60 Hz	
	3 x 380 V, 50 Hz	
	3 x 440 V, 60 Hz.....	375 MP 210
	3 x 415 V, 50 Hz/3 x 480 V, 60 Hz.....	375 MP 211
	3 x 500 V, 50 Hz.....	375 MP 212
M2	Recirculating pump (M2)	
	3 x 220-415 V; 50/60 Hz	253 MP 001
	3 x 420-480 V; 50/60 Hz	253 MP 022
	3 x 500-580 V; 50/60 Hz	253 MP 023

Figure	Pos.	Description	Part No.
		<i>(Motors continued)</i>	
	M3	Specimen holder motor (M3) 3 x 220 V, 50/60 Hz..... 3 x 380 V, 50 Hz 3 x 415 V, 50 Hz 3 x 440 V, 60 Hz 3 x 500 V, 50 Hz.....	375 MP 201 375 MP 202
	M4	Disc motor (M4) Please state app.no. and/ or motor shaft diameter (19 or 24 mm) 3 x 220 V, 50 Hz..... 3 x 220 V, 60 Hz..... 3 x 380 V, 50 Hz/3 x 440 V, 60 Hz..... 3 x 415 V, 50 Hz/3 x 480 V, 60 Hz..... 3 x 500 V, 50 Hz.....	375 MP 205 375 MP 206 375 MP 207 375 MP 208 375 MP 209
	M5	Carrousel motor (M5) 24 V (with sensor box).....	375 MP 204
	M6	Lift motor (M6) 24 V	375 MP 203
		<i>Electric parts</i>	
(Figure 1)	2	Membrane switch board, English version Membrane switch board, German version.....	13750088 13750102
(Figure 3/Figure 10/Figure 12)	7-9/ 5/6	Sensor Potentiometer "View Angle" Switch element for emergency stop (S2) Emergency stop push button (S2)	375 MP 214 375 MP 215 381 MP 440 381 MP 439
(Figure 8)	4 (4)	Main cable connection box..... Noise filter (L1-L3)..... Main switch (SO)..... Transformer, T1 Fuse holder (F5-F9) Contactor K1-K6, Danfoss Auxiliary switch block for K1..... Barring device for contactors	375 MP 216 394 MP 045 260 MP 135 375 MP 219 381 MP 220 375 MP 260 381 MP 237 381 MP 239
(Figure 9)	7 7	Key switch from s/n up to 3750136..... Key switch for s/n from 3750137..... Key Display with glass plate.....	375 MP 258 2SA80001 375 MP 259 375 MP 218
(Figure 10)	8	Micro switch..... Thermo relay, F1 (please state voltage) Thermo relay, F2 (please state voltage) Thermo relay, F3 (please state voltage) Battery holder Male plug for water sensor..... Female plug for water sensor	375 MP 217 375 MP 261 375 MP 262 375 MP 263 375 MP 220 375 MP 276 375 MP 277

Figure

Pos.	Description	Part No.
<i>Circuit boards</i>		
	Keyboard, Display and Strain Gauge Amplifier (A1)	375 MP 223
	CPU-module (pos. 101)	375 MP 224
	Parallel Output Interface (pos. 102)	375 MP 225
	Parallel Output Interface (pos. 103)	375 MP 238
	Parallel Input Interface (pos. 105)	375 MP 226
	Parallel In/Output Interface (pos. 107)	375 MP 227
	Parallel In/Output Interface (pos. 108)	375 MP 253
	Power supply (pos. 116)	375 MP 228
	Connector board (pos. 116, 201-210)	375 MP 229
	SMP-Bus (pos. 101-110)	375 MP 230
	Output (pos. 201)	375 MP 231
	Output (pos. 202)	375 MP 232
	Input for inductive and optical switches (pos. 204)	375 MP 233
	Rev. table driver (pos. 207)	375 MP 284
	Pressure control unit (pos. 208)	375 MP 235
	Relay control for emergency and stand-by sign. (pos. 209)	375 MP 236
	Power supply (pos. 210)	375 MP 237
	Overvoltage protection circuit	375 MP 267
	Slotted optical board, B8, B9, B10-13	375 MP 239
	Set of program V1.27.7, English version, 3 pcs.	13750123
	Set of program V1.27.7, German version, 3 pcs., V1.27.7G	13750123
	Test prom 1.3R	13753295
<i>Cables</i>		
	Main cable, WO	375 MP 240
	High pressure pump cable, W1	375 MP 241
	Recirculation pump cable, W2	375 MP 242
	Specimen holder motor cable, W3	375 MP 243
	Disc motor cable, W4	375 MP 244
	Solenoid valve cable (Y1-16) W5	375 MP 245
	Lift motor cable, W6	375 MP 246
	Display/keyboard cable, W7	375 MP 247
	Strain gauge cable, W8	375 MP 248
	Flat cable, pos. 102-201, 207, W102	375 MP 249
	Flat cable, pos. 103-202, W103	375 MP 250
	Flat cable, pos. 105-204, W105	375 MP 251
	Flat cable, pos. 107-208, W107	375 MP 252

3. Photos, Drawings and Diagrams

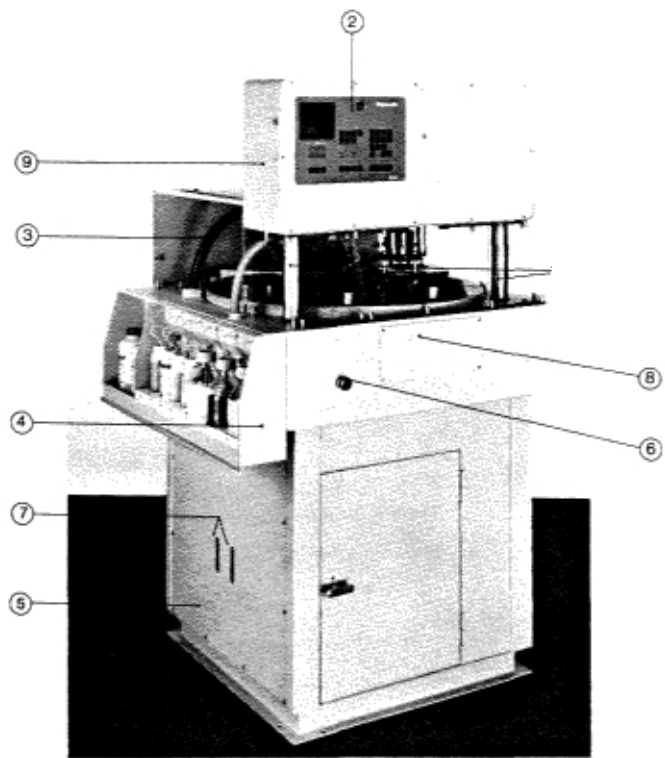


Fig. 1

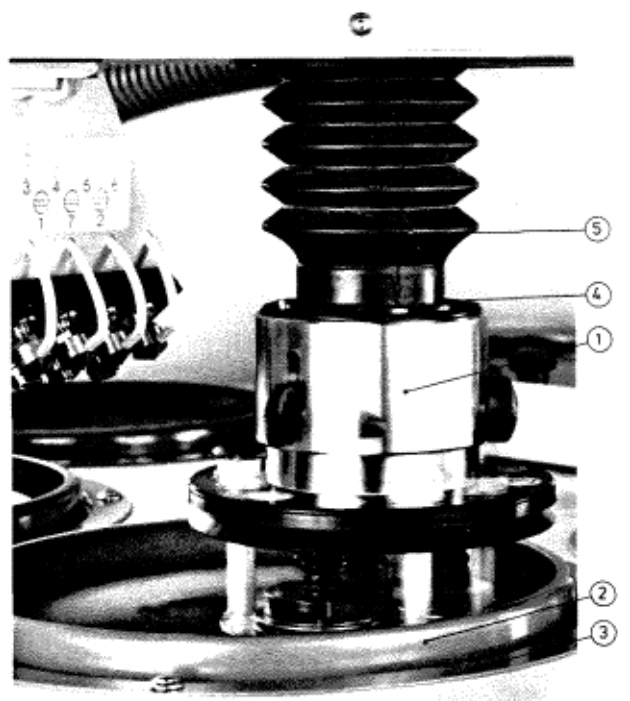


Fig. 2

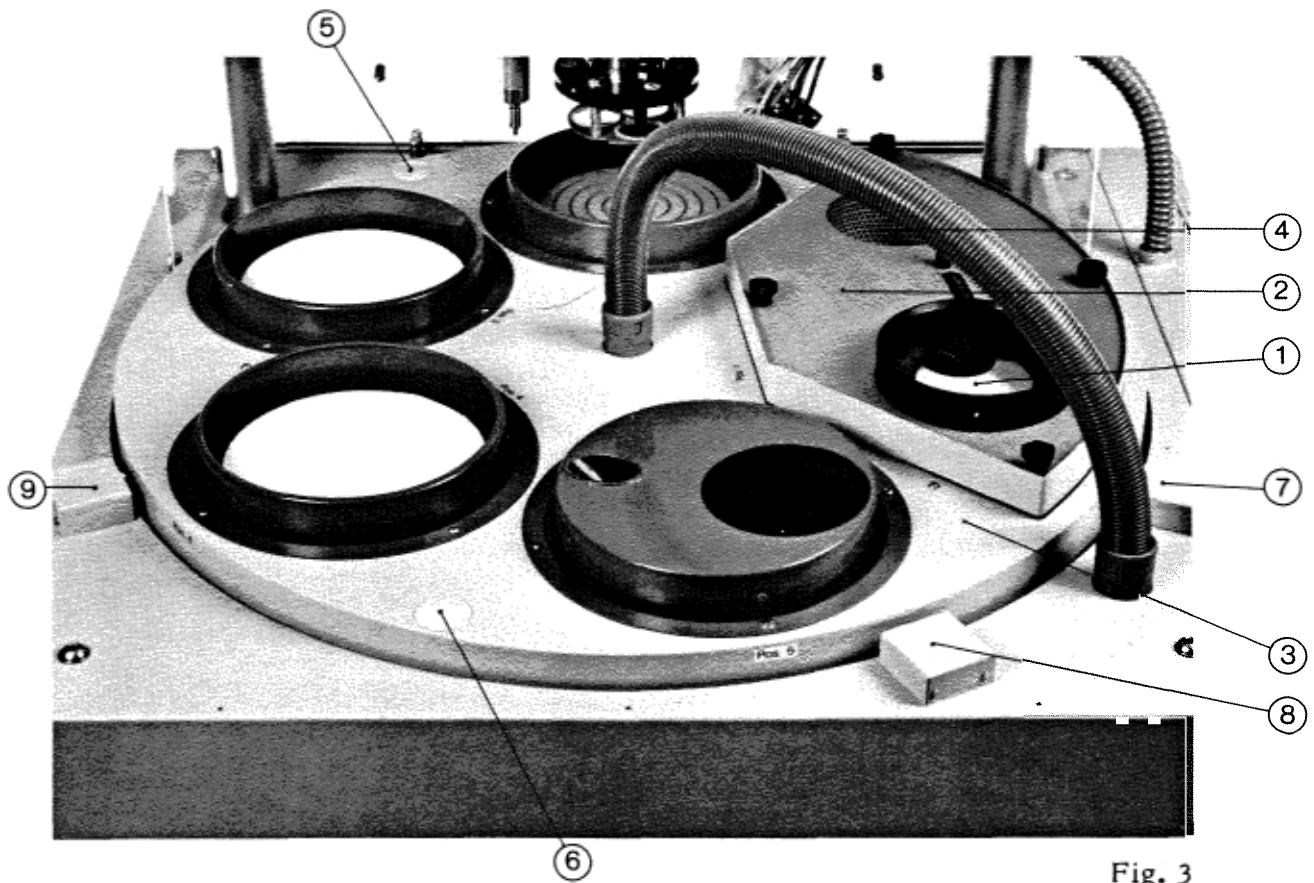


Fig. 3

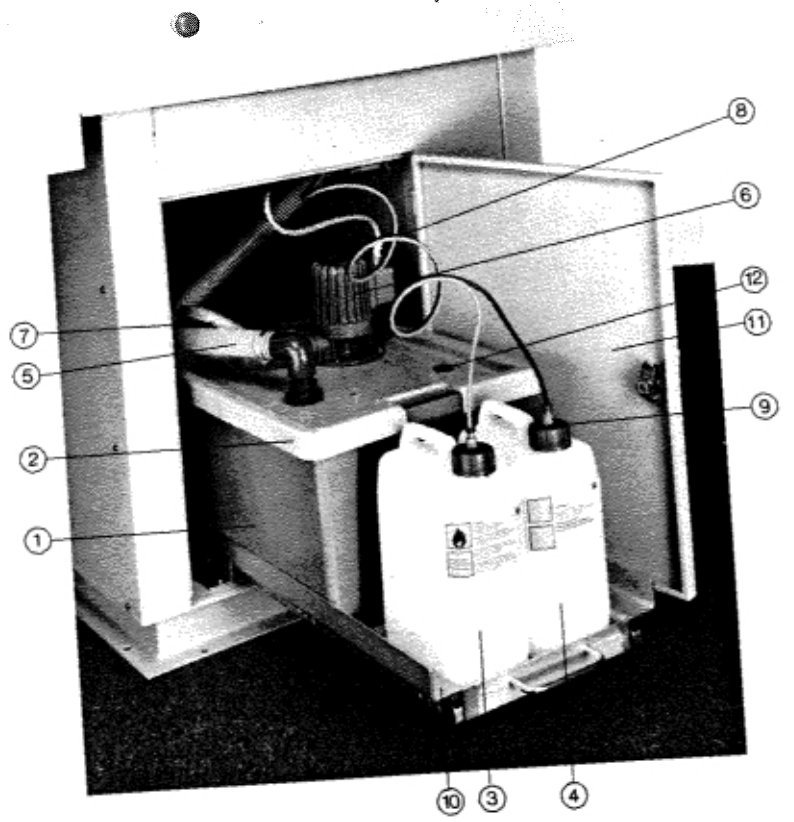


Fig. 4

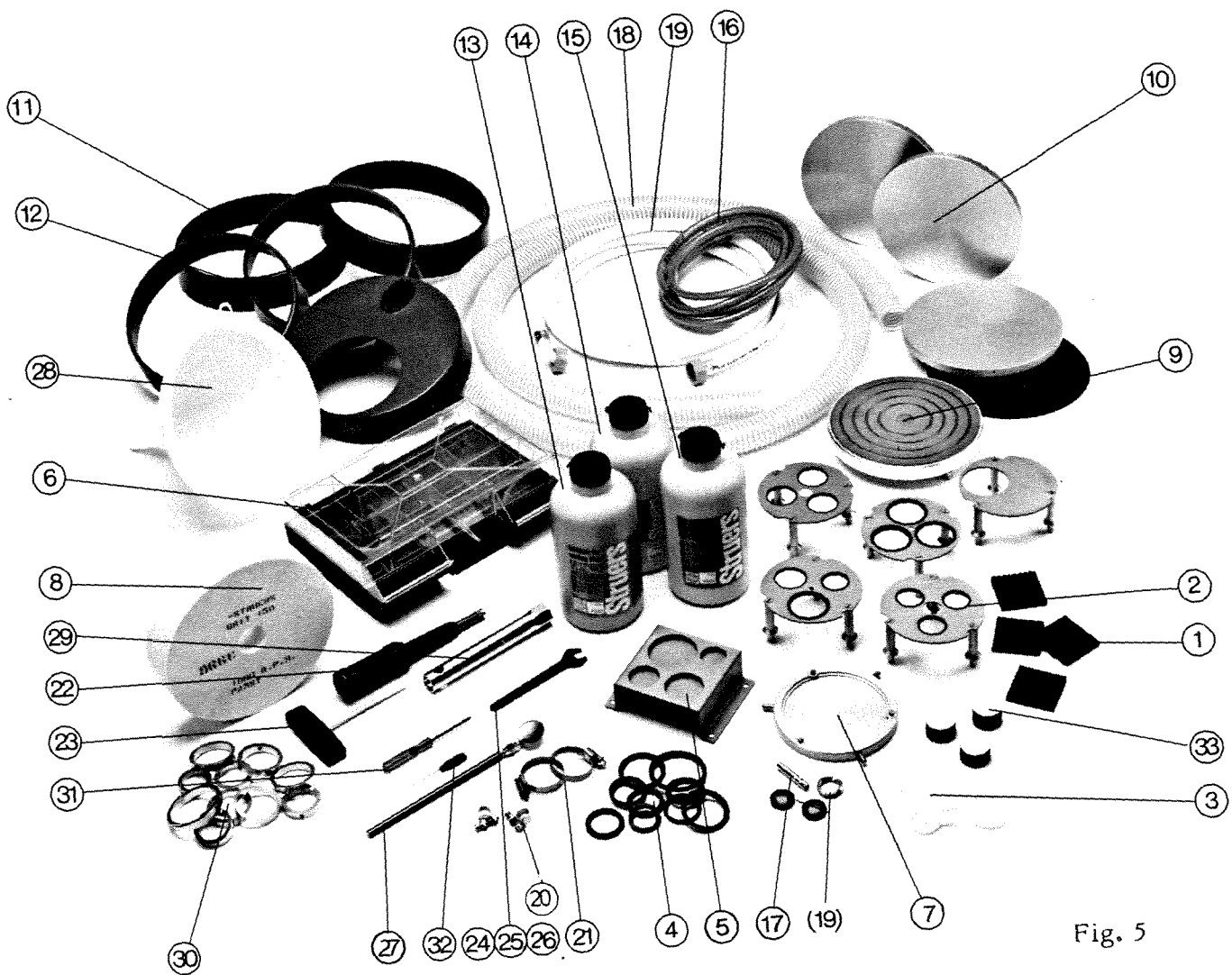


Fig. 5

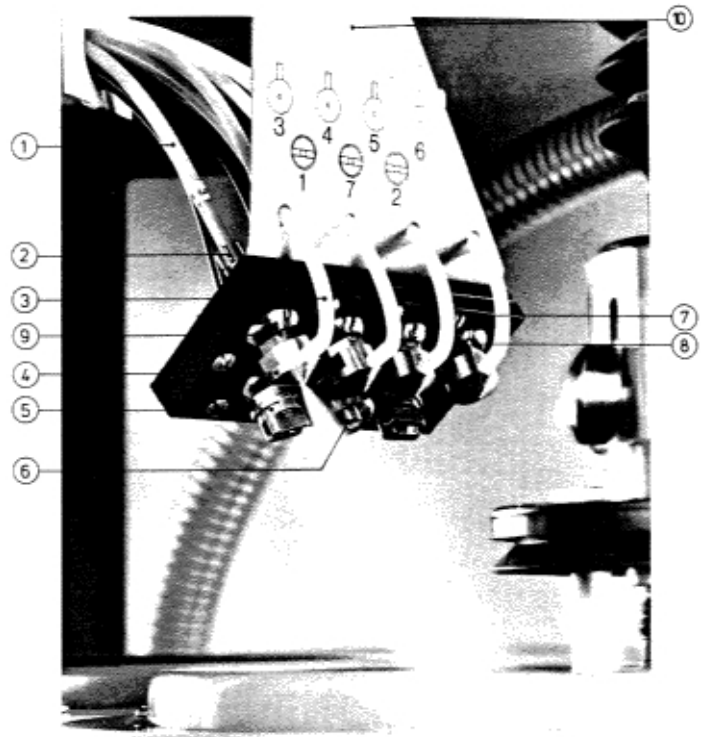


Fig. 6

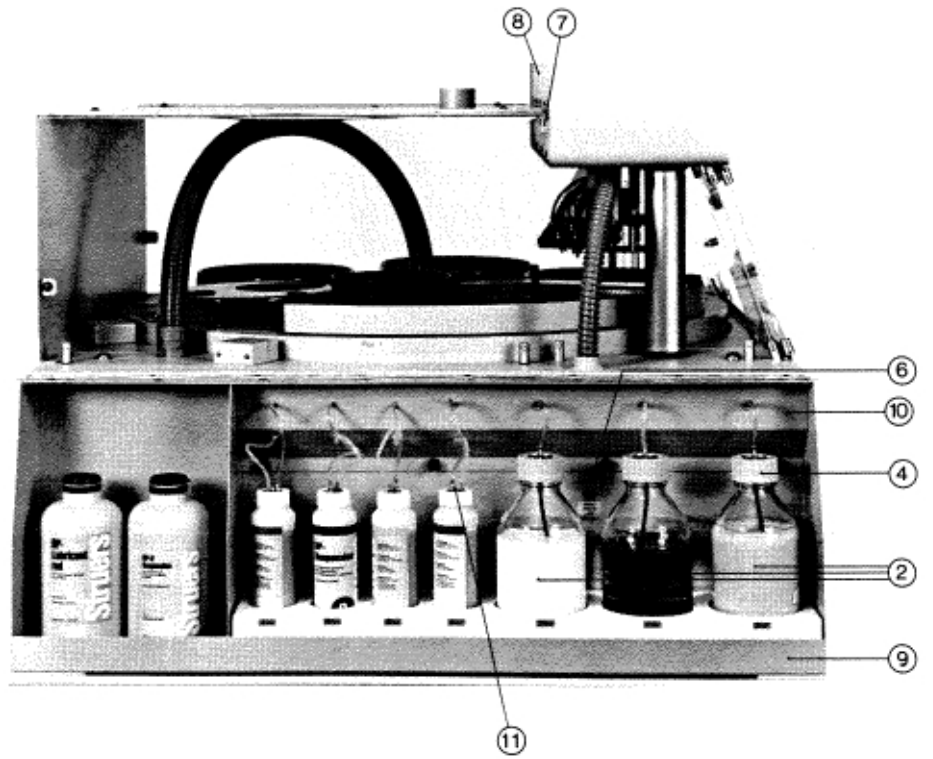


Fig. 7

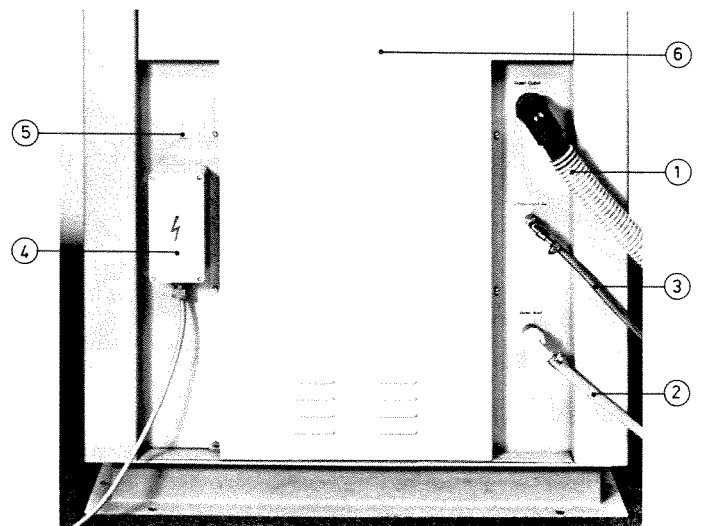


Fig. 8

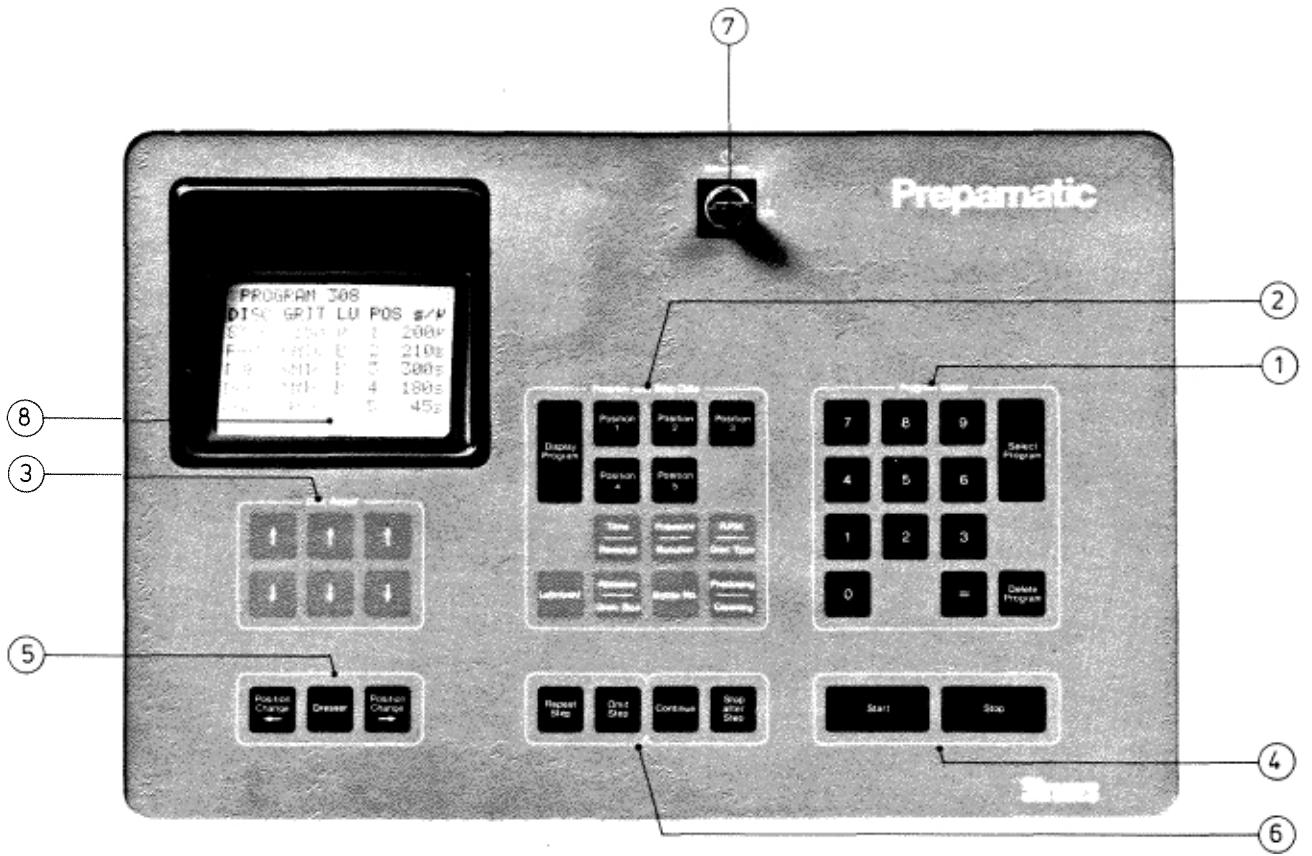


Fig. 9

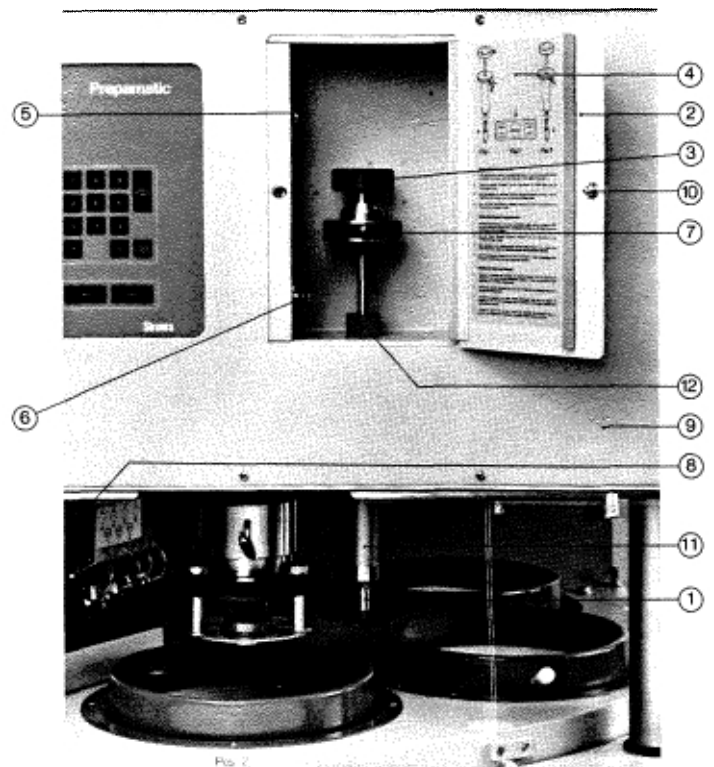


Fig. 10

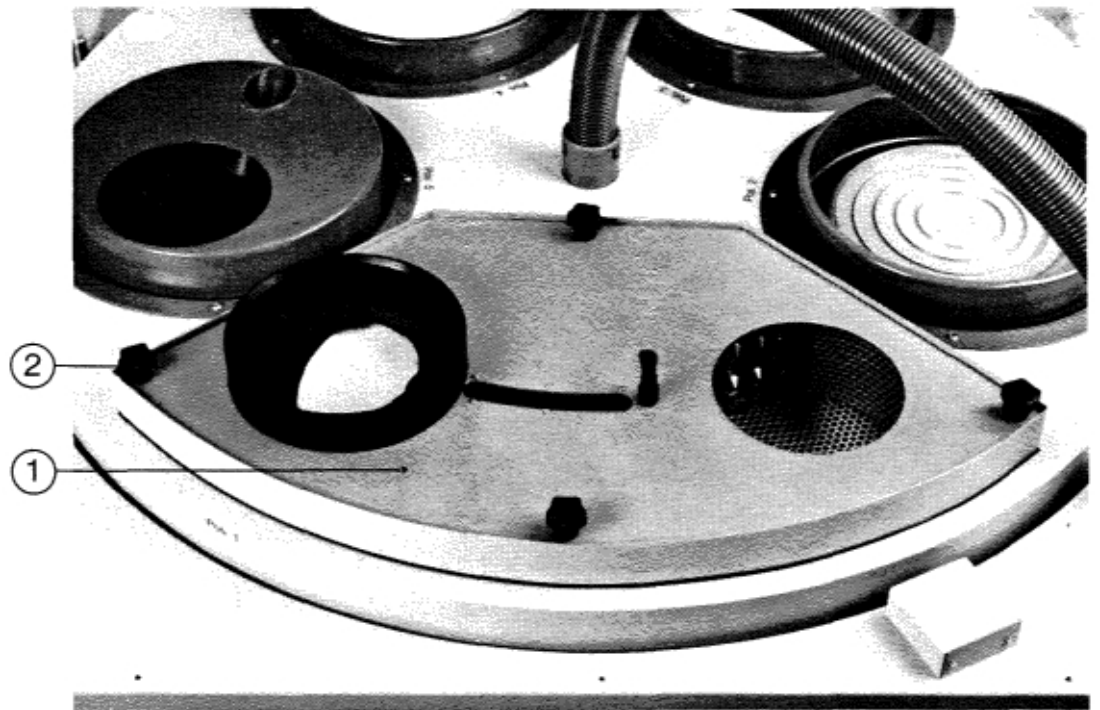


Fig. 11

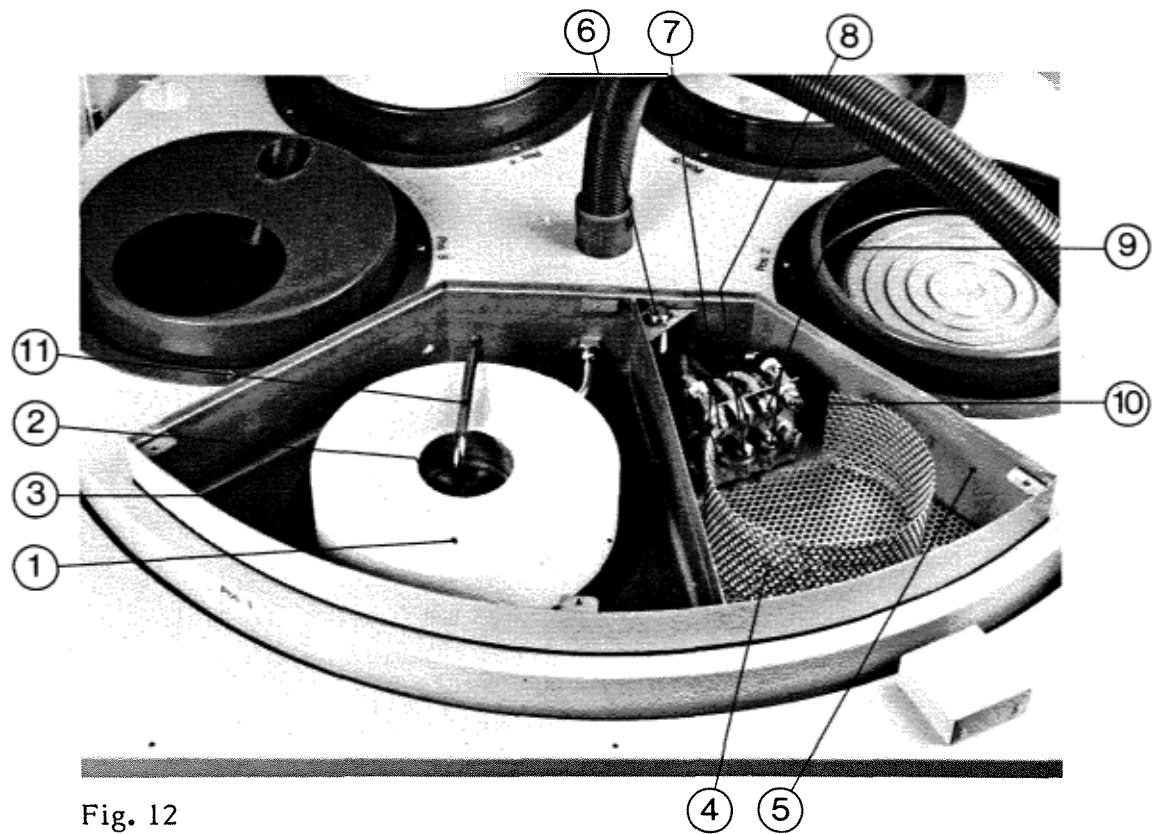


Fig. 12

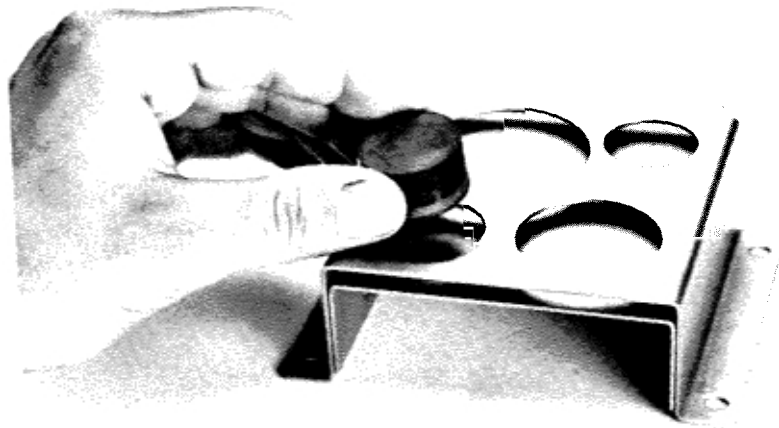


Fig. 13

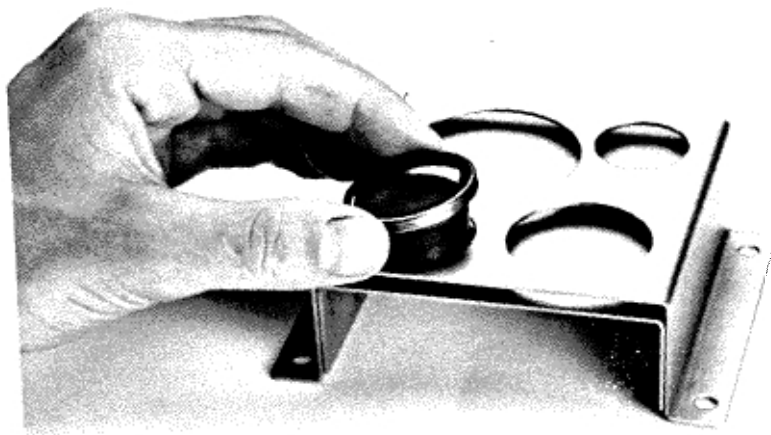


Fig. 14

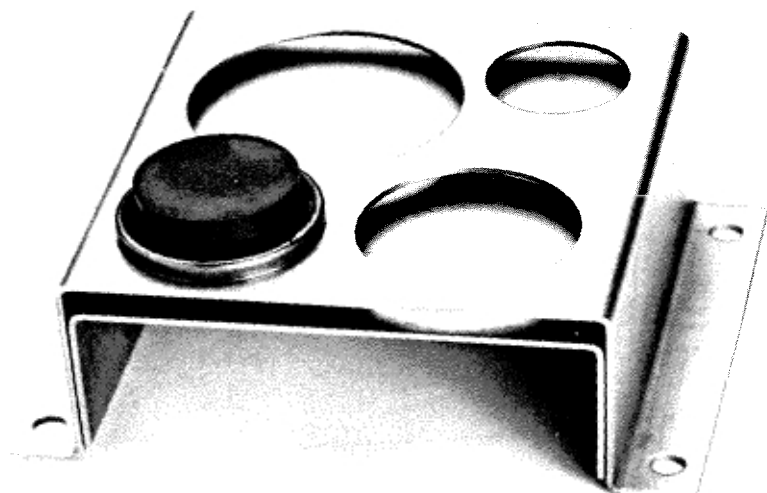


Fig. 15



Fig. 16

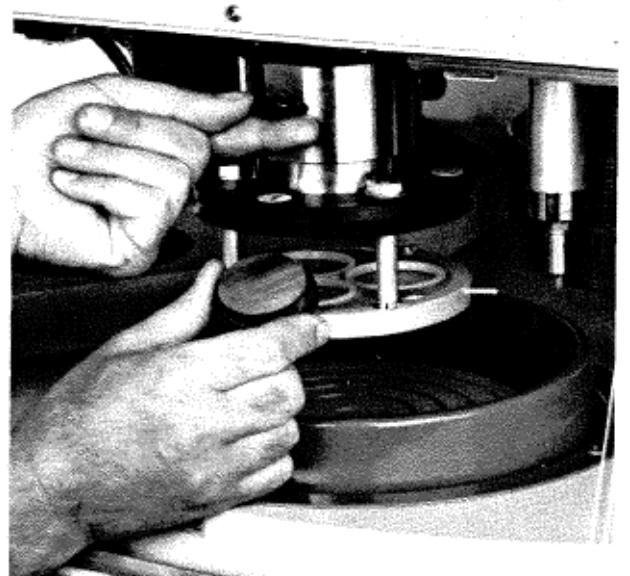


Fig. 17



Fig. 18



Fig. 19

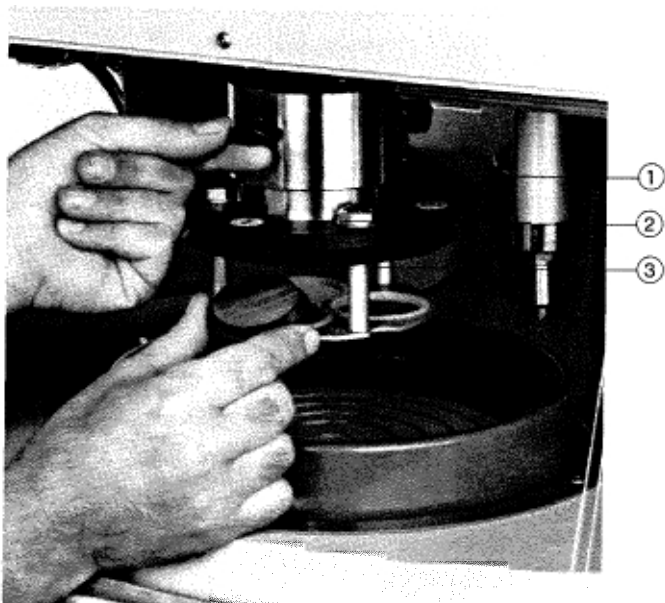


Fig. 20

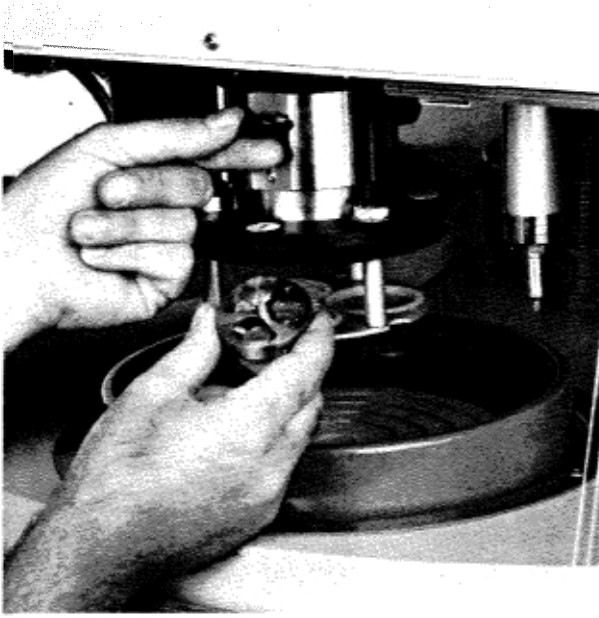


Fig. 21



Fig. 22

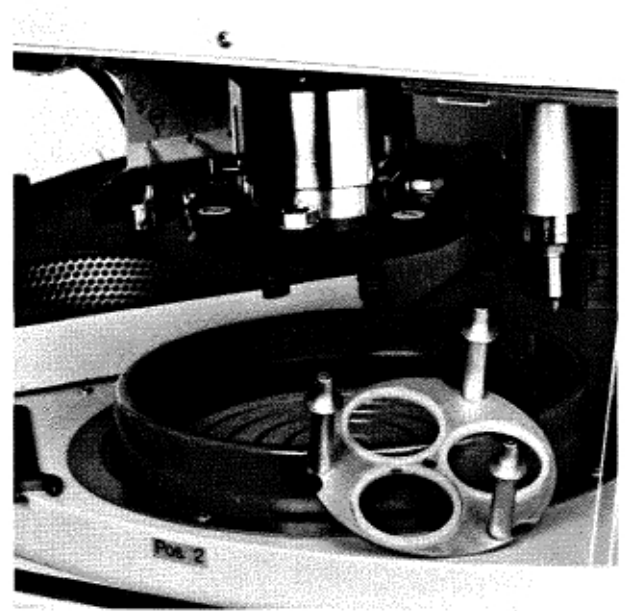


Fig. 23



Fig. 24

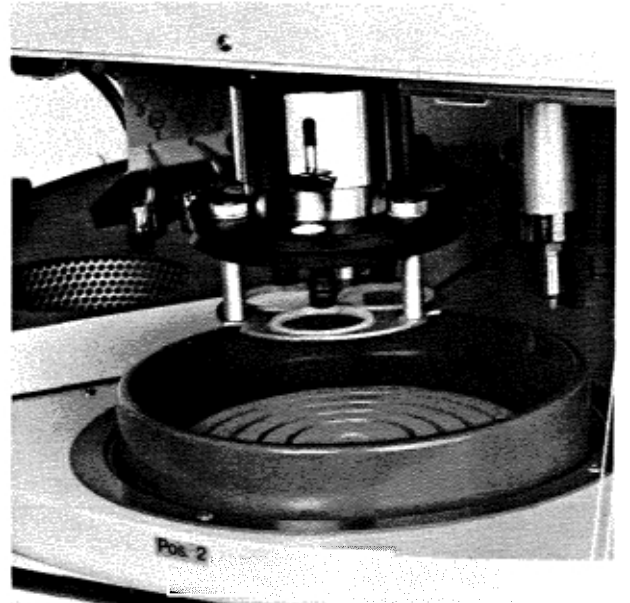


Fig. 25

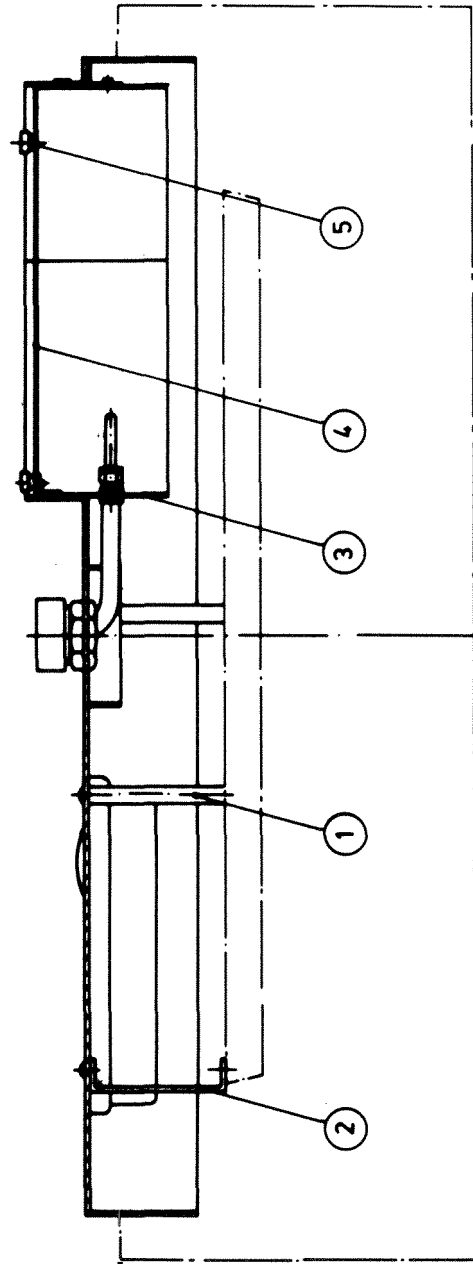


Fig. B1

Struers Prepamatic • 3751051 • 87.12

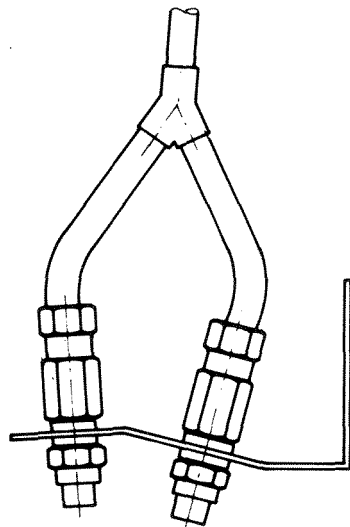
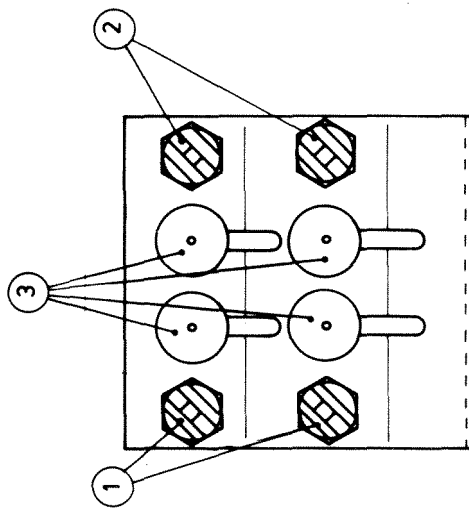
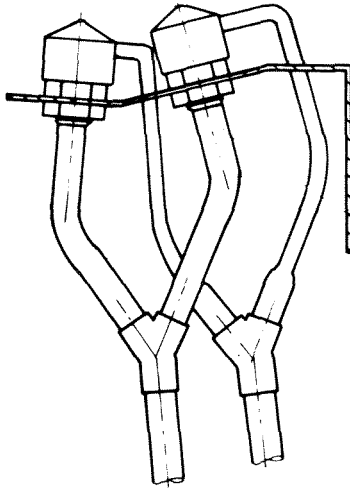


Fig. B2

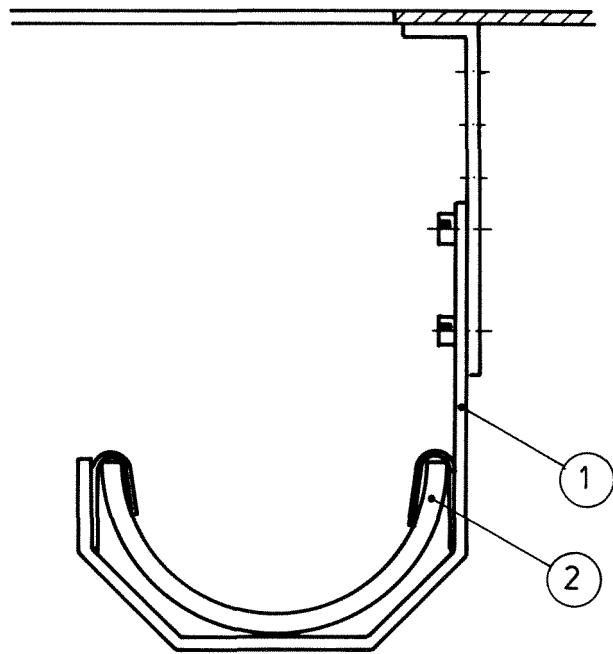


Fig. B3

Struers Prepamatic • 3751053 • 87.12

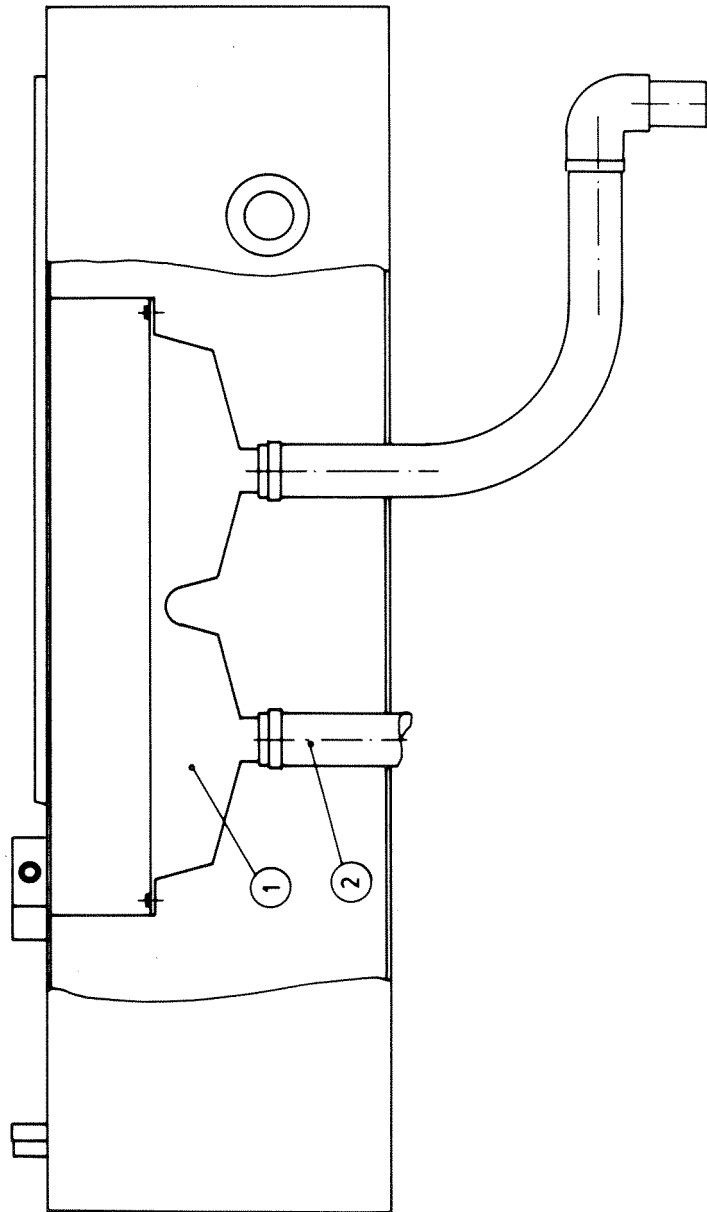


Fig. B4

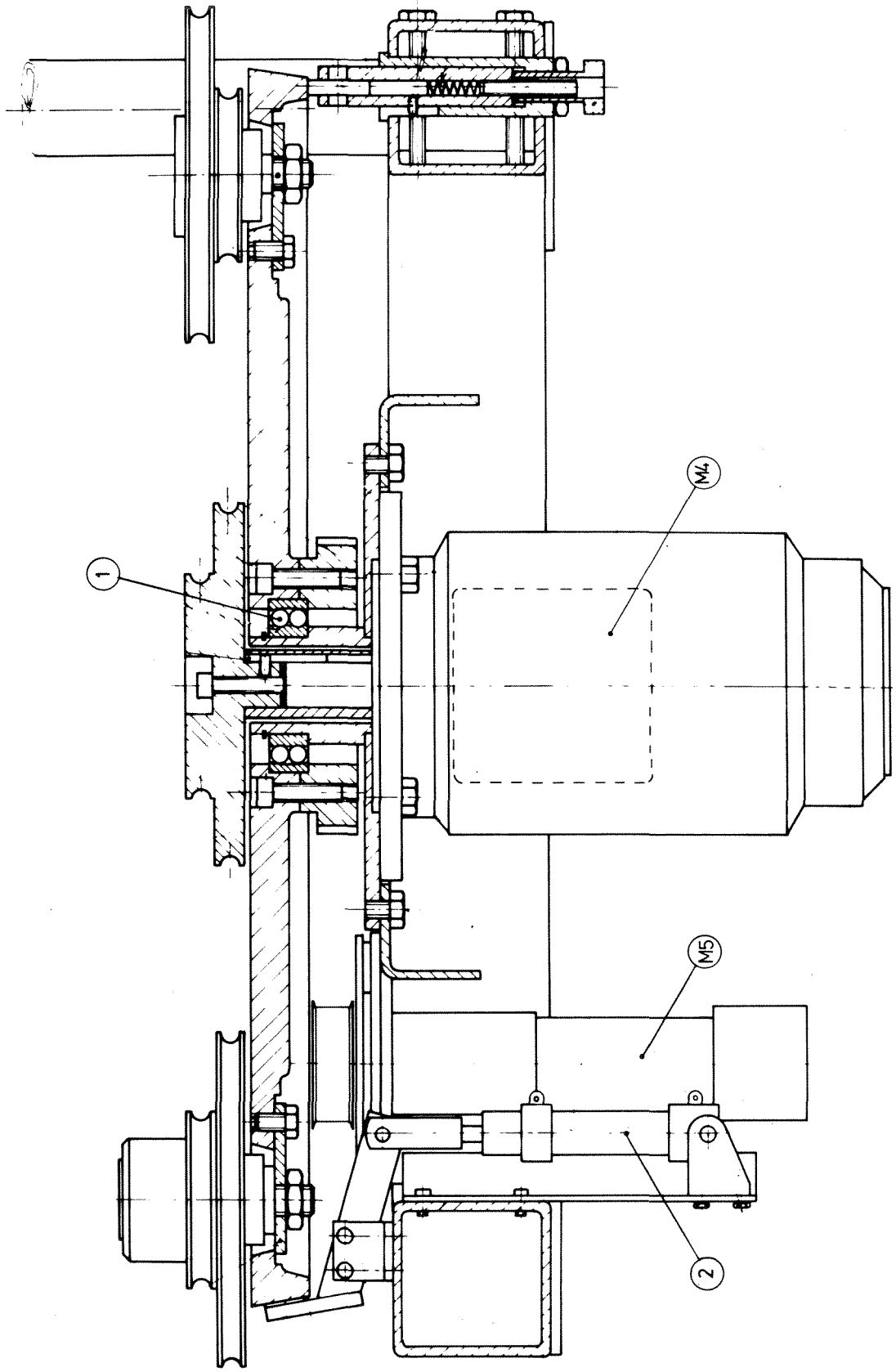


Fig. B5

Struers Prepamatic • 3751055 • 87.12

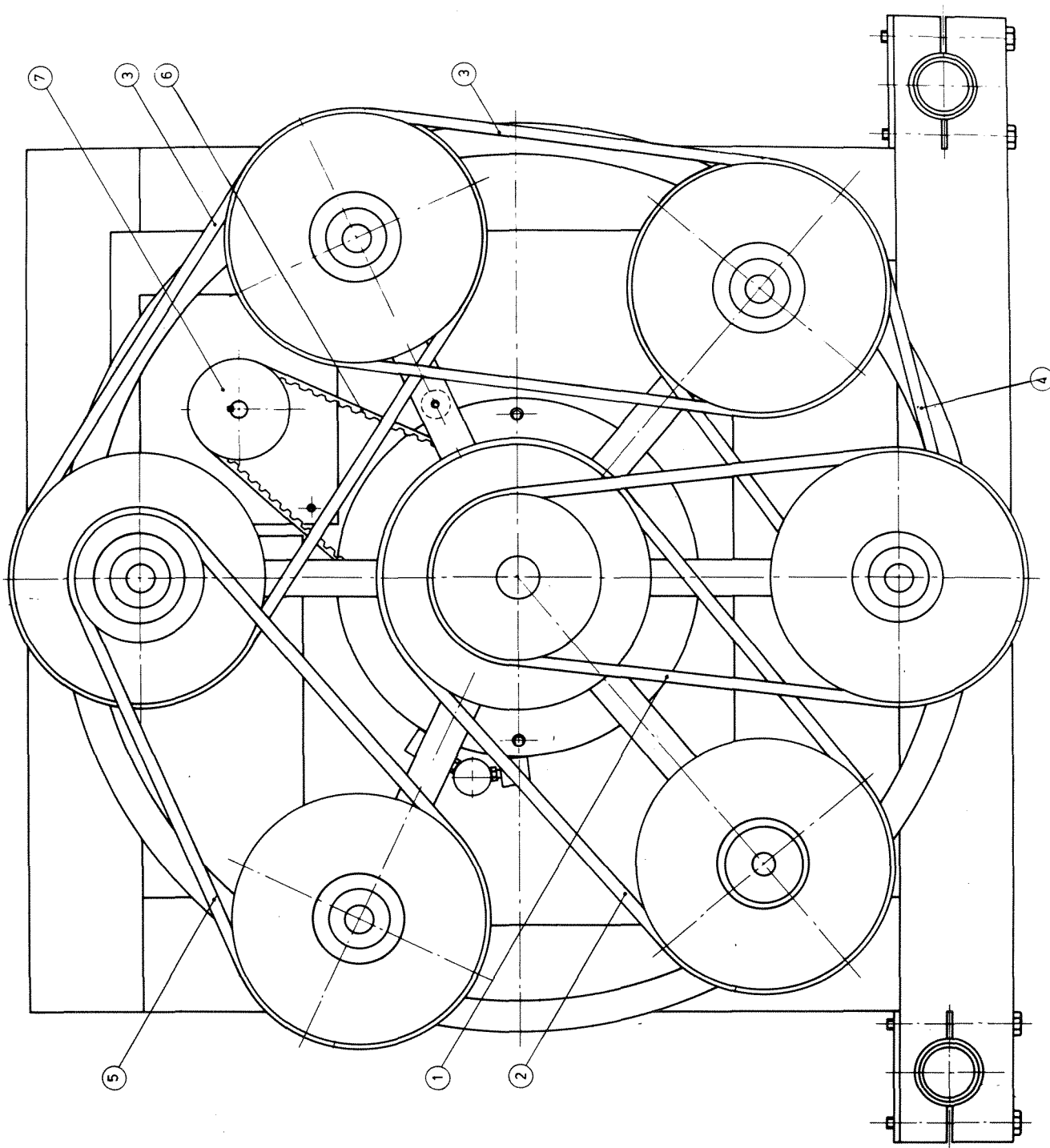


Fig. B6

Struers Prepamatic • 3751056 • 87.12

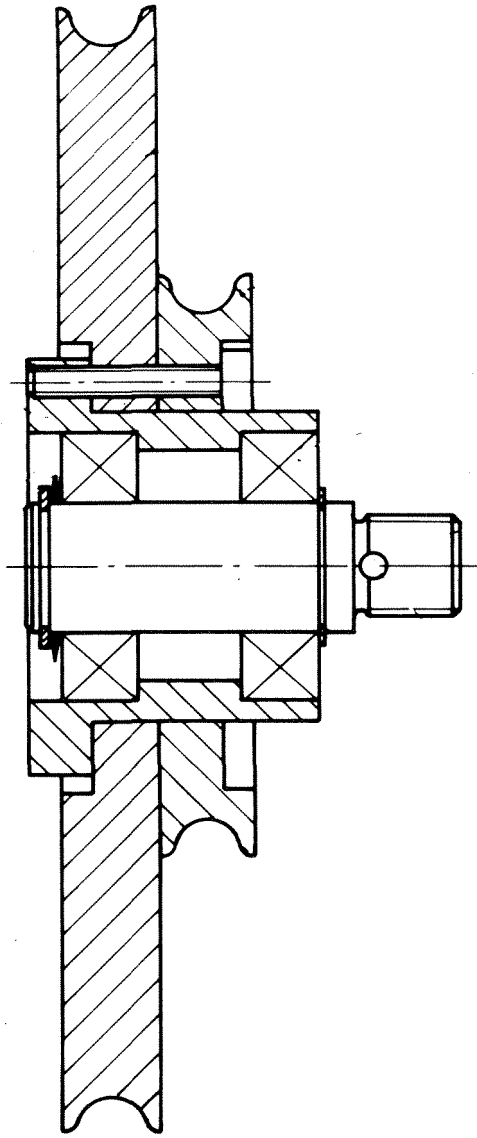


Fig. B9

Struers Prepamatic • 3751059 • 87.12

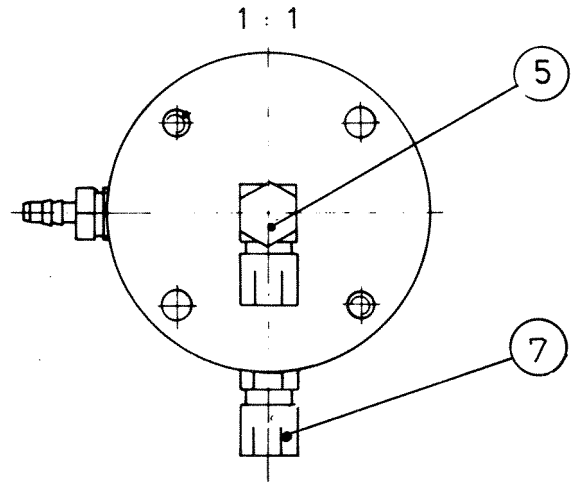
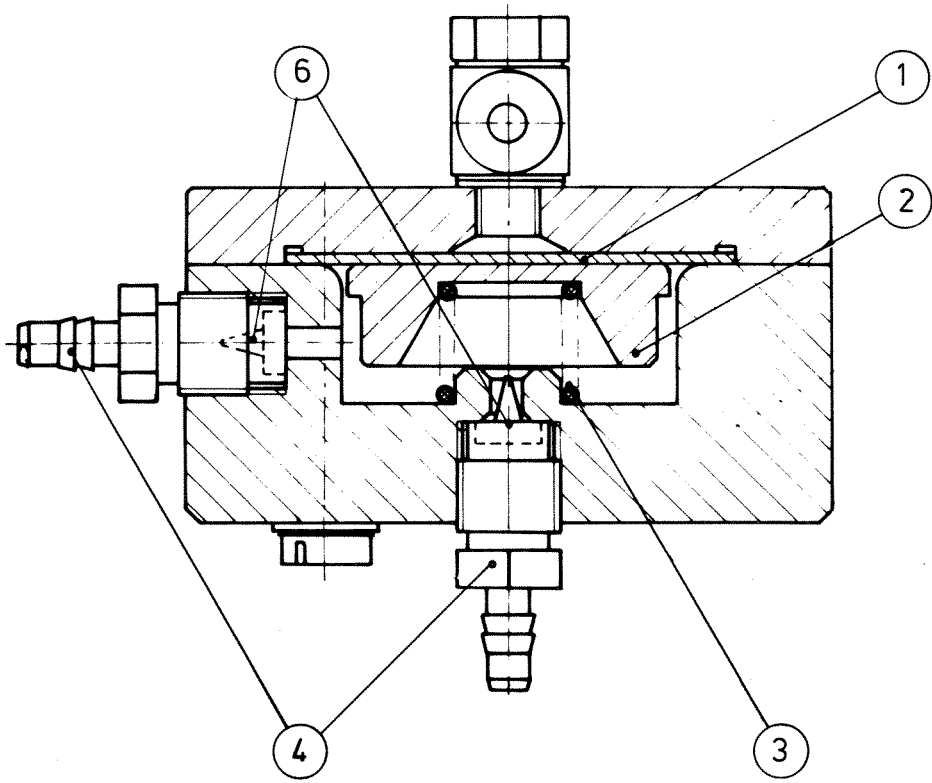


Fig. C1

Struers Prepamatic · 3751060 · 01.91

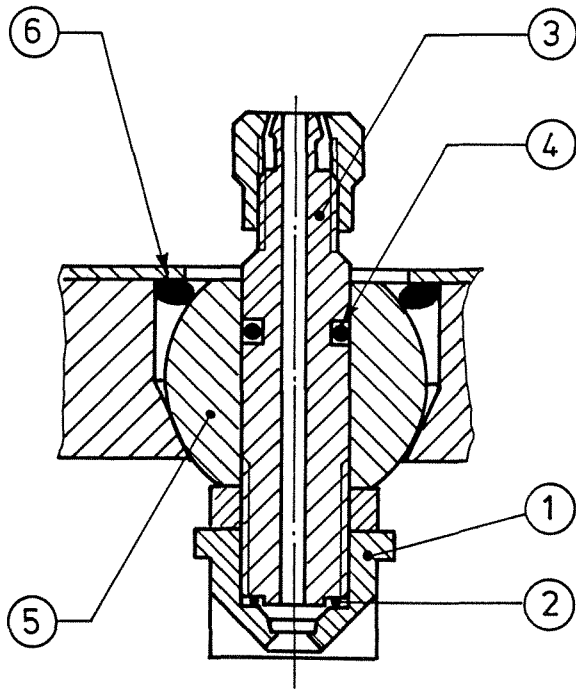


Fig. C2
Lubricant nozzle

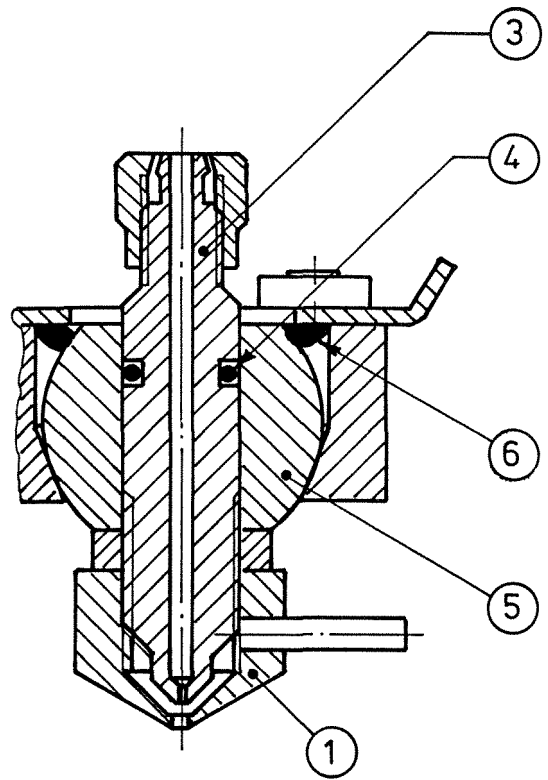


Fig. C3
DP-suspension nozzle

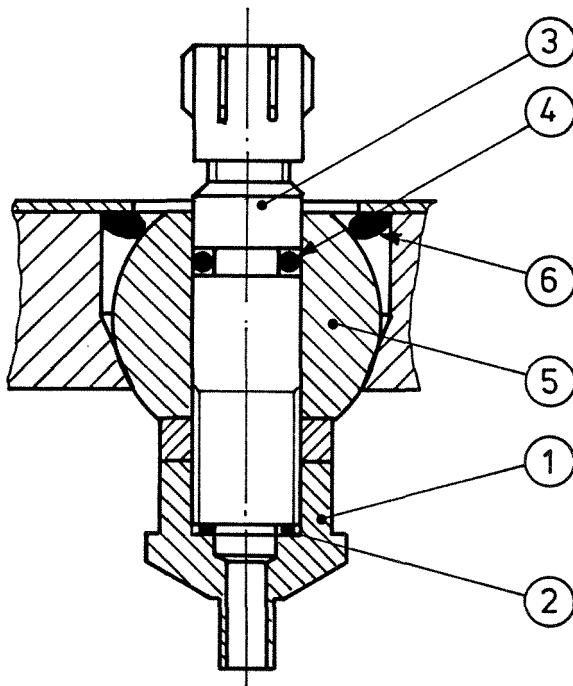


Fig. C4
Oxid Suspension nozzle

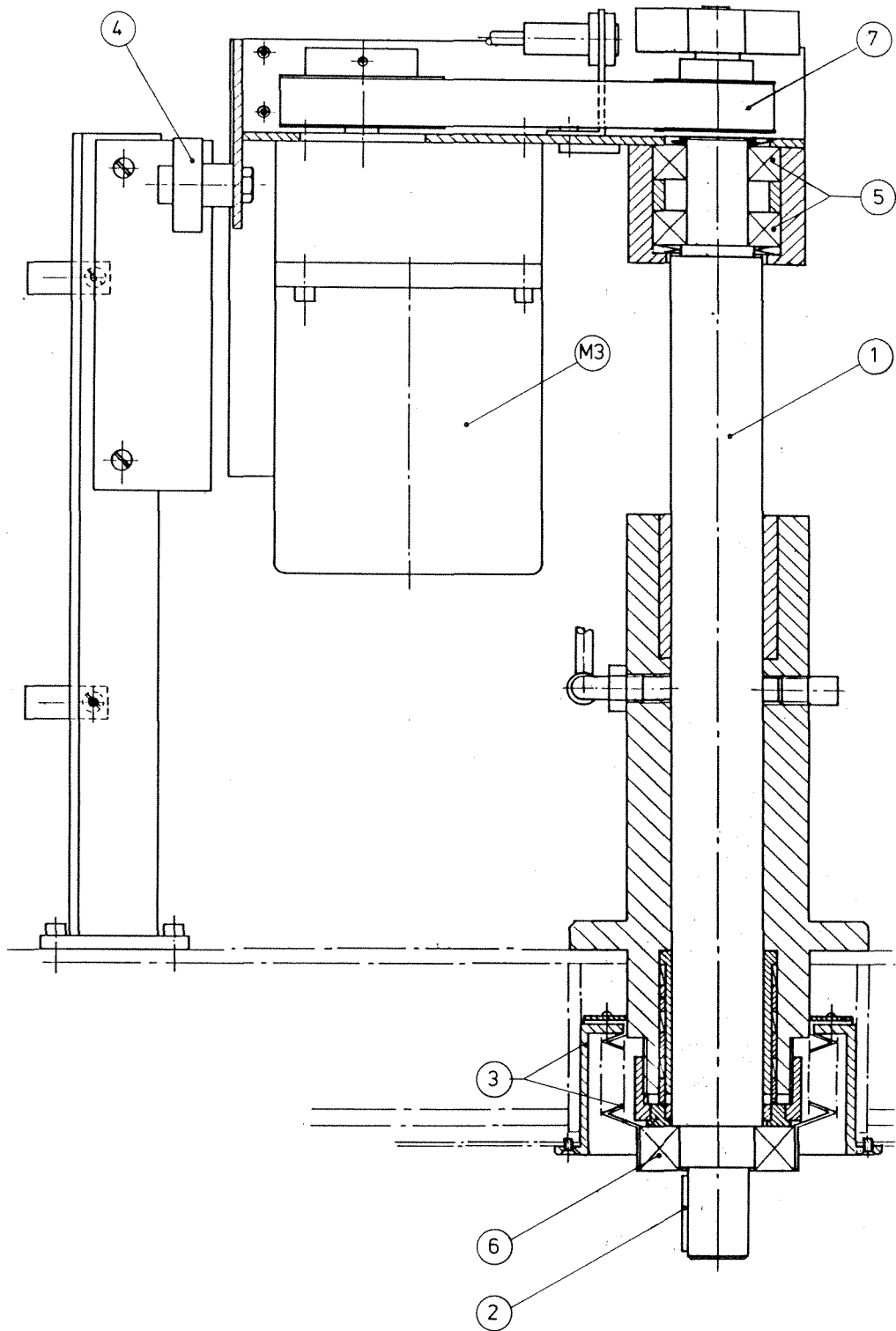


Fig. E1

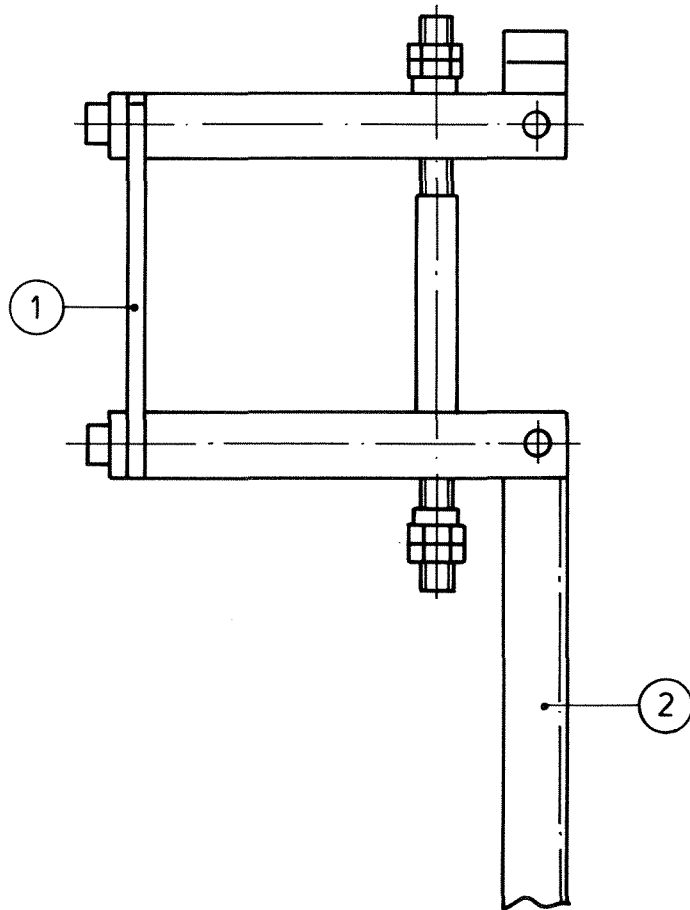


Fig. E2

Struers Prepamatic • 3751062 • 87.12

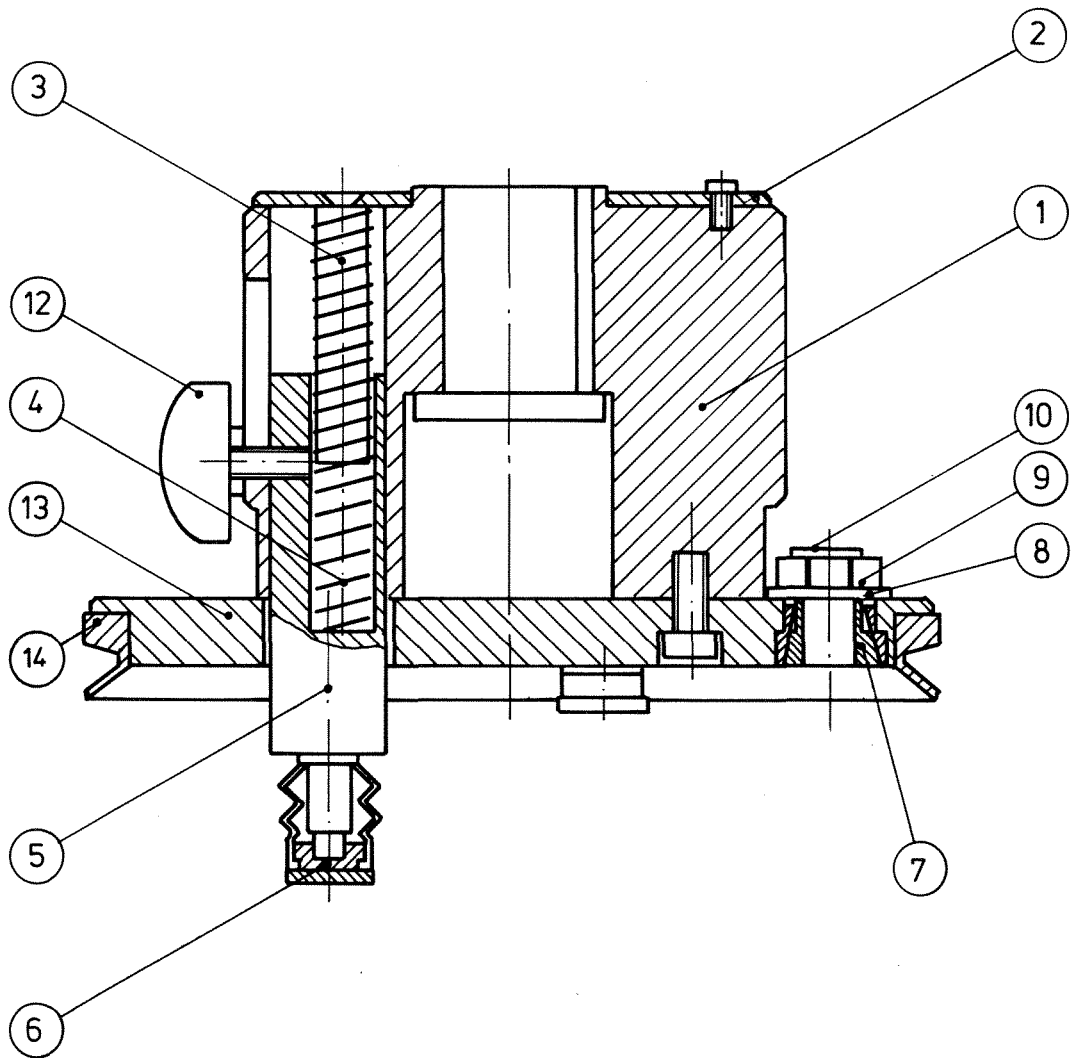


Fig. E3
Struers Prepamatic • 3751063 • 10.90

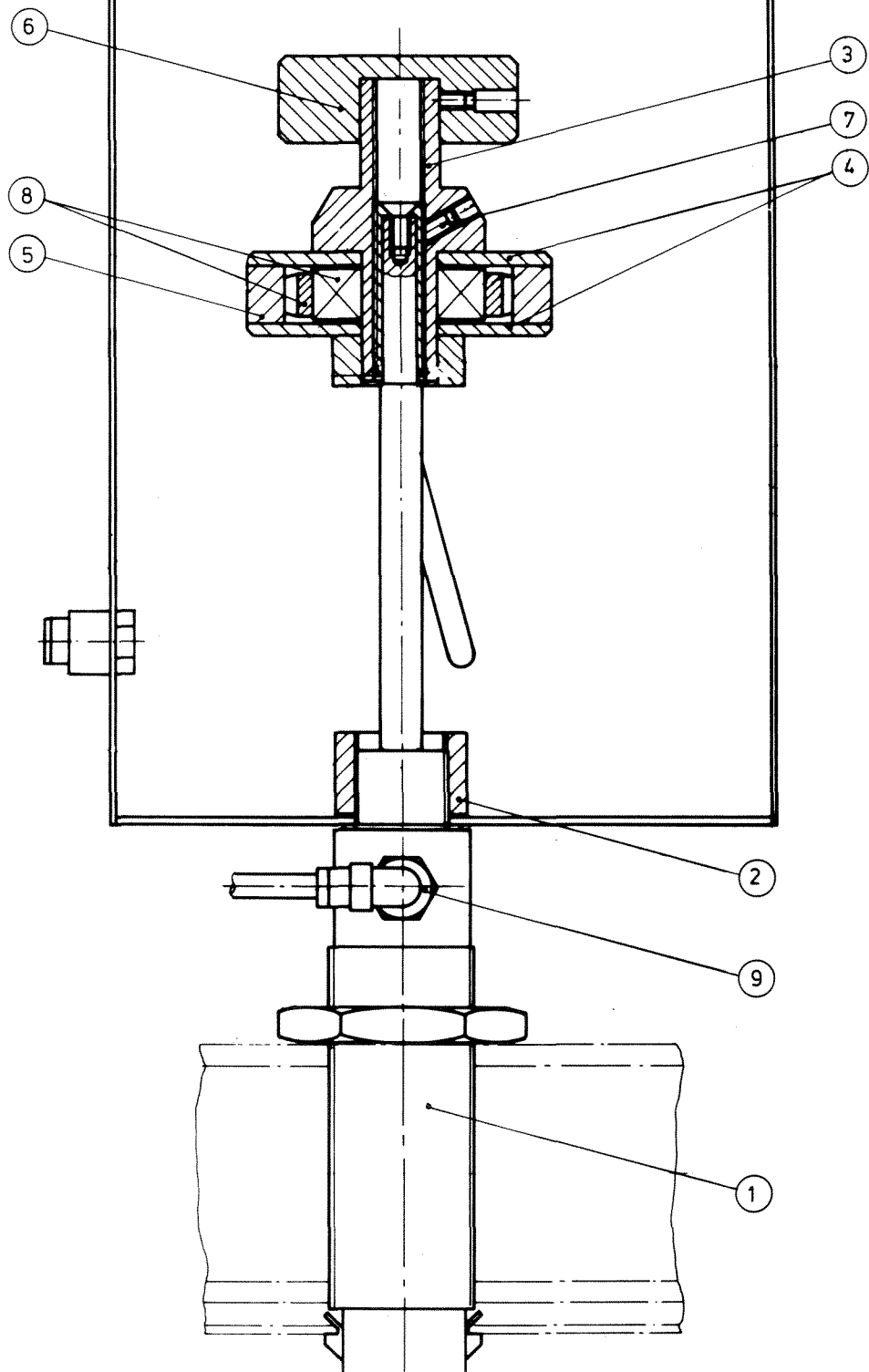


Fig. E4

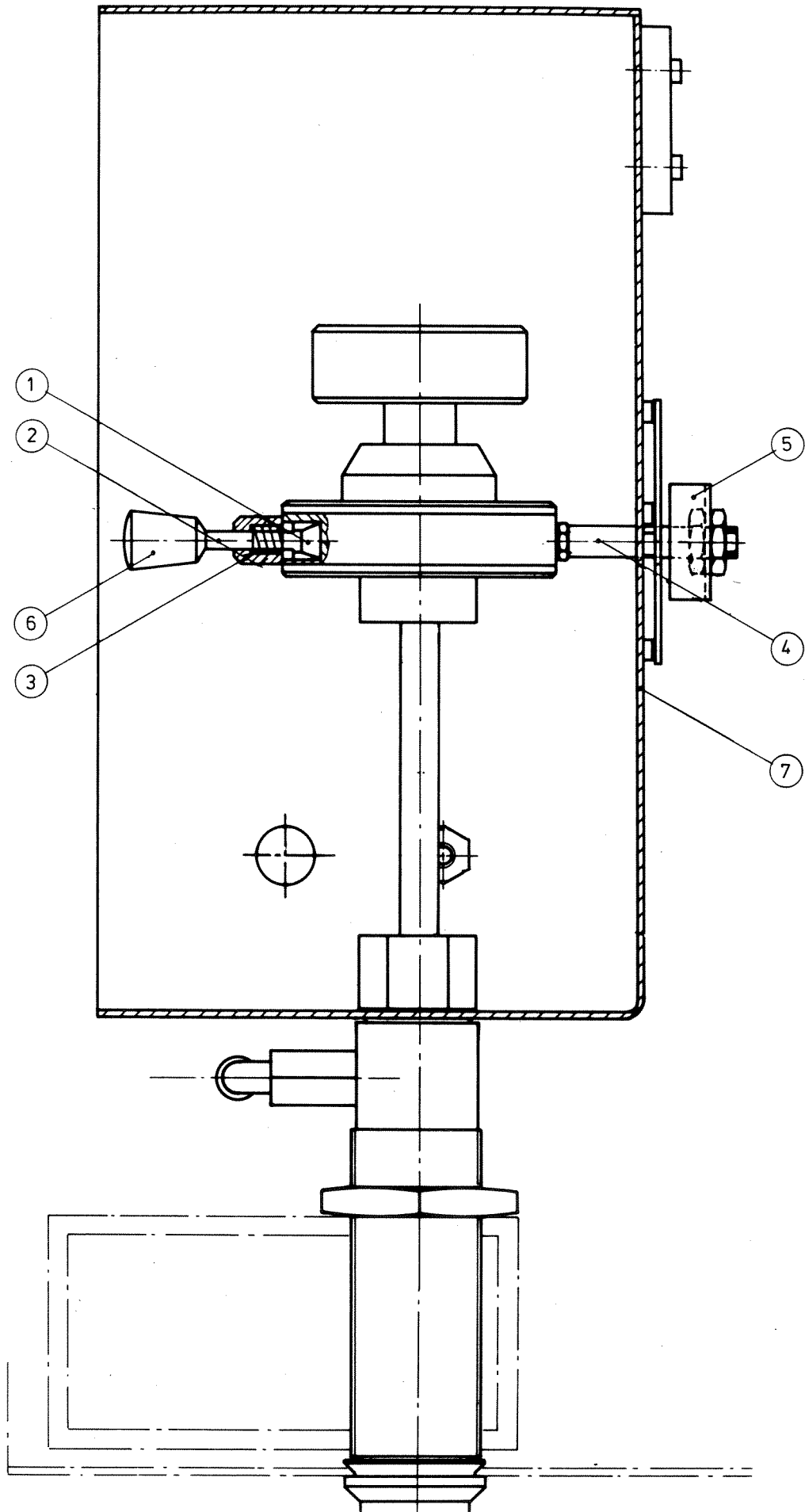


Fig. E5

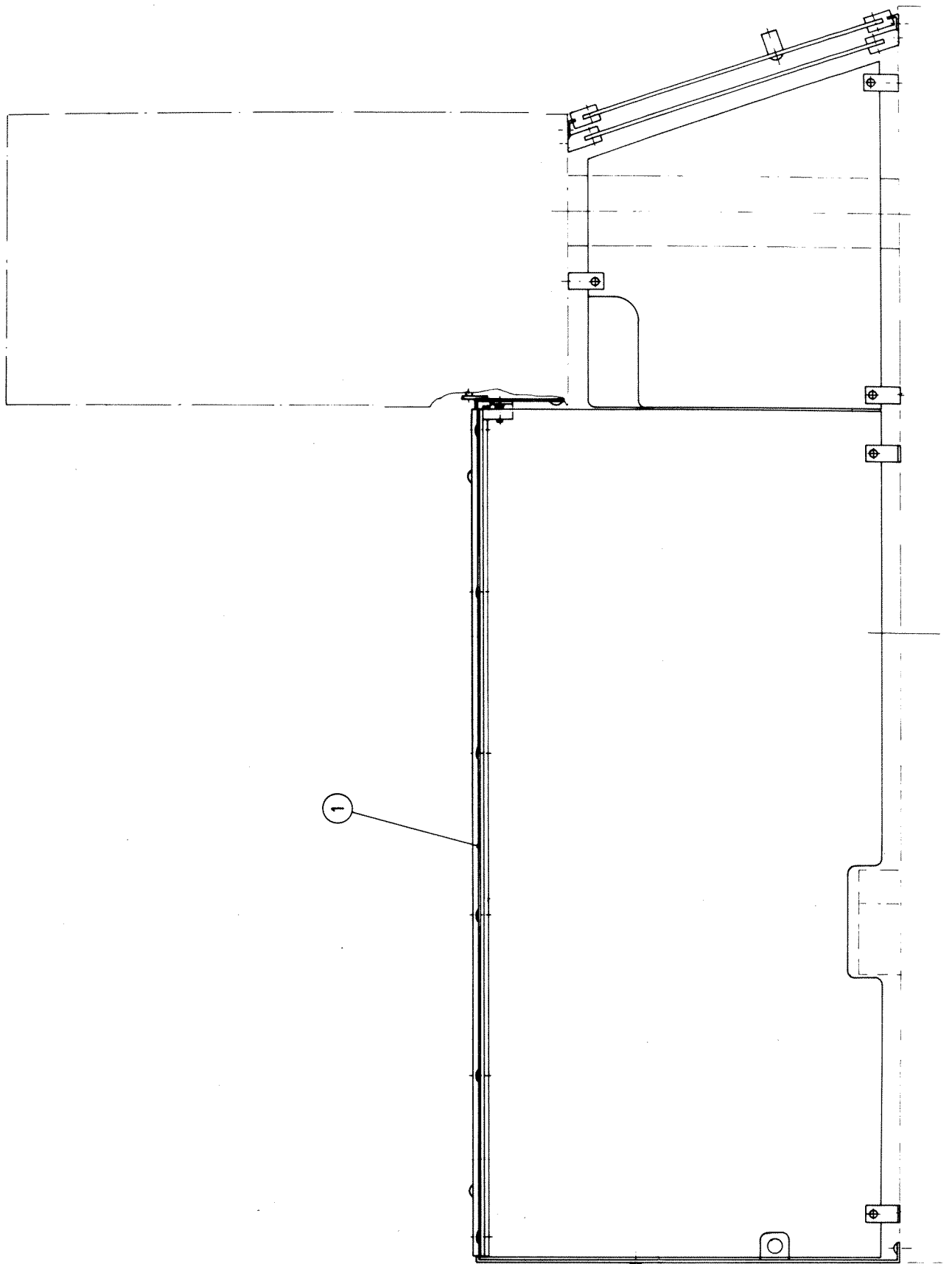


Fig. E6

Struers Prepamatic • 3751066 • 87.12

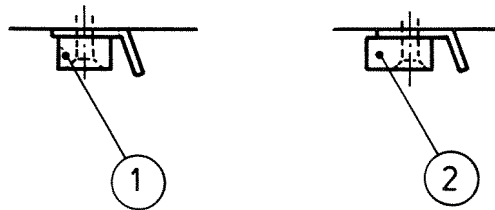


Fig. E7

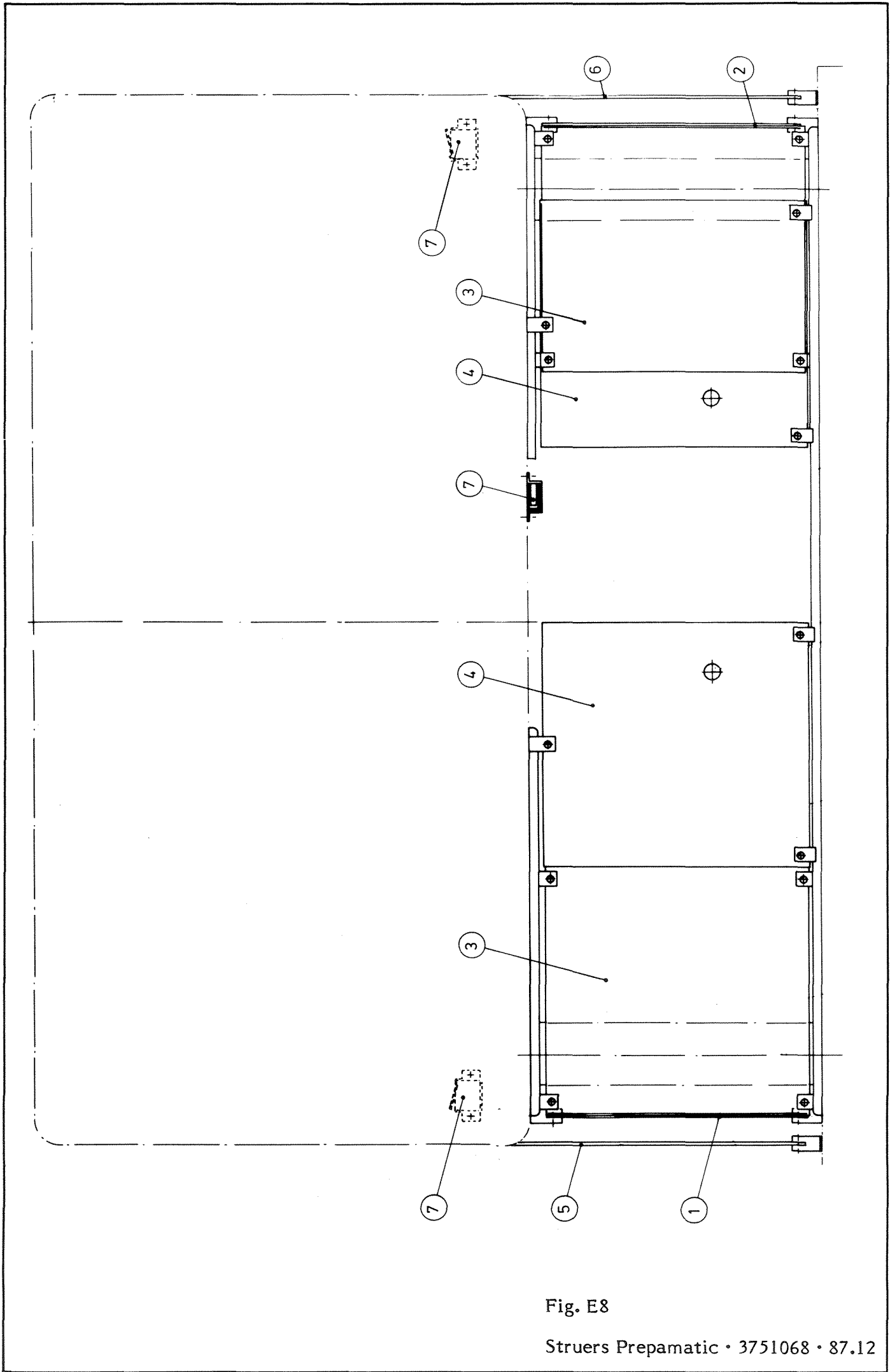
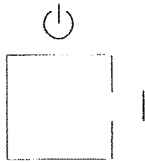


Fig. E8



Struers Prepamatic

+

Control panel featuring a staircase icon and six buttons arranged in two rows of three. The top row buttons have upward-pointing triangle symbols, and the bottom row buttons have downward-pointing triangle symbols.

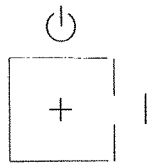
Control panel with three buttons. The first and third buttons are labeled "Pos." and feature a triangle symbol. The middle button is labeled "Dresser".

Control panel with a staircase icon and several buttons. The top row includes "Display" (with a staircase icon), "Pos.1", "Pos.2", and "Pos.3". The second row includes "Pos.4" and "Pos.5". The third row includes "Time Removal", "Pressure Rotation", and "rpm Disc Type". The bottom row includes three buttons with spray icons and a "Predosing Cleaning" button with a bottle icon.

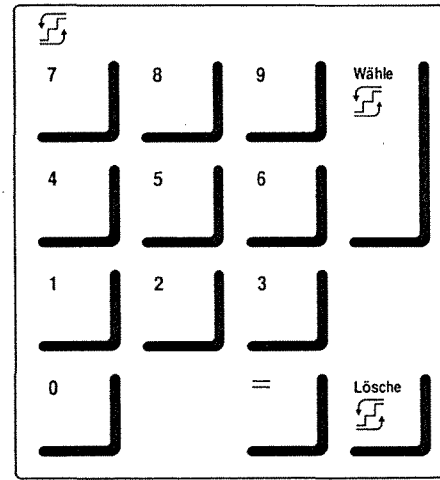
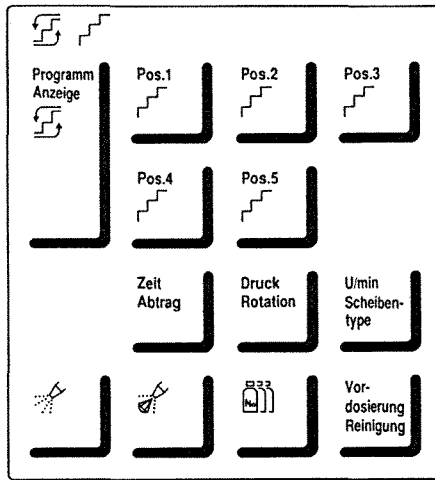
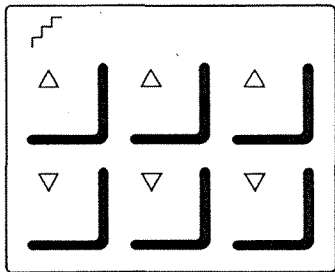
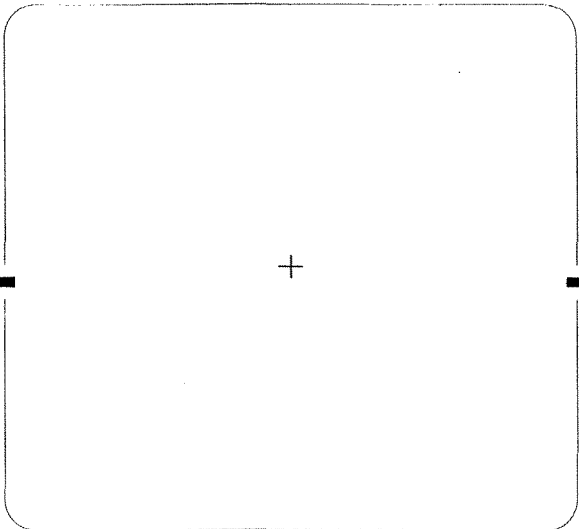
Control panel with four buttons. The first two buttons have staircase icons. The third button has a diamond symbol. The fourth button is labeled "Stop after Step".

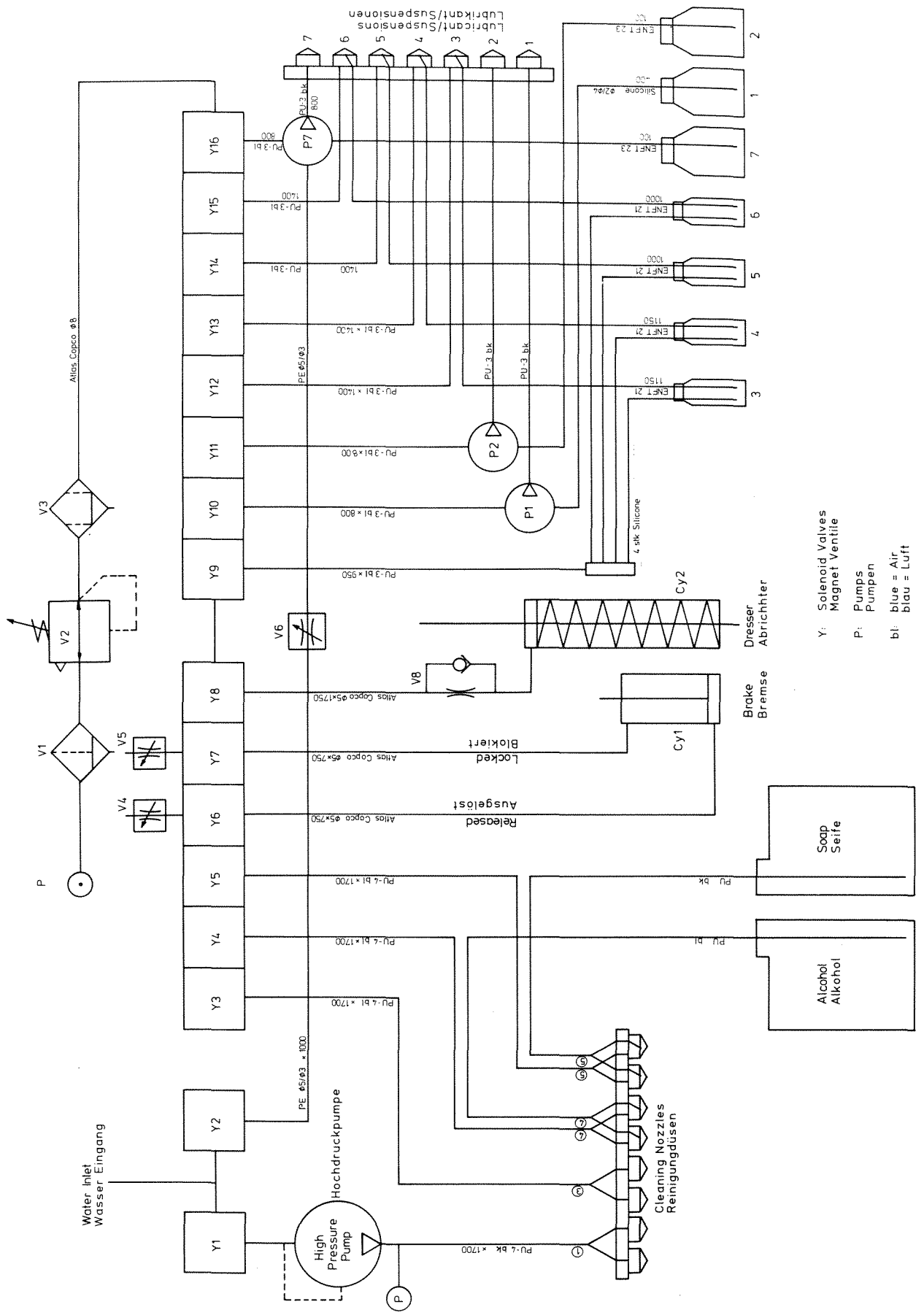
Control panel with a staircase icon and buttons for numbers 0 through 9. The "0" button has an equals sign symbol. The "Select" button has a staircase icon, and the "Delete" button has a staircase icon with a diagonal line through it.

Control panel with two buttons. The first button has a diamond symbol, and the second button has a circle symbol.

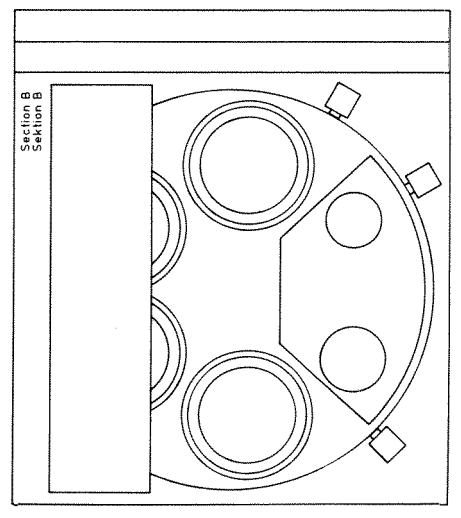
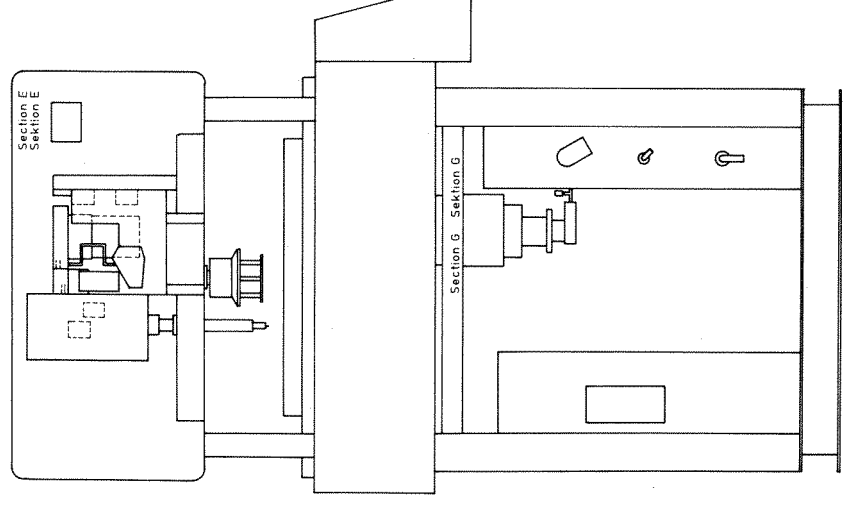
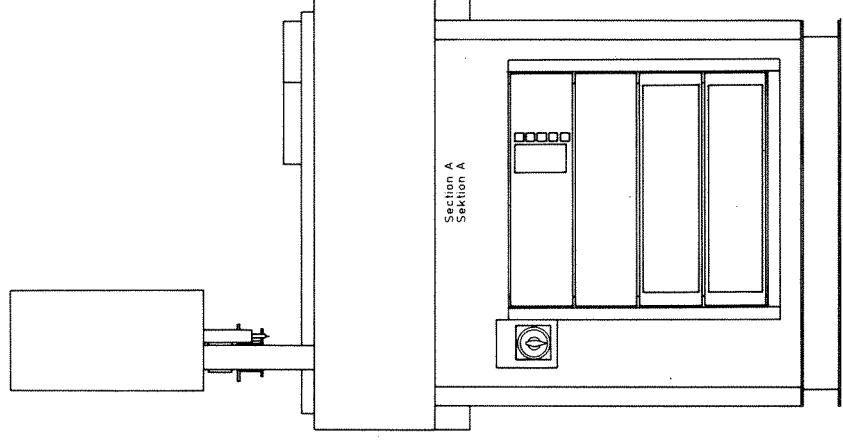
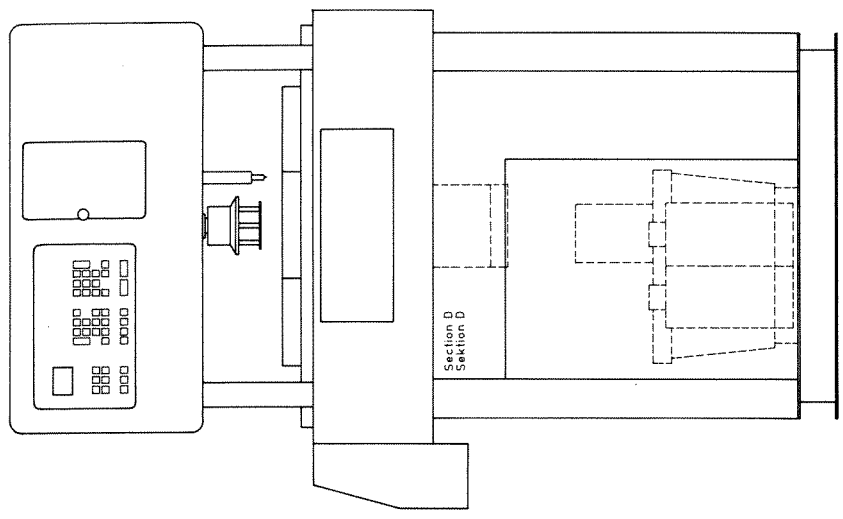
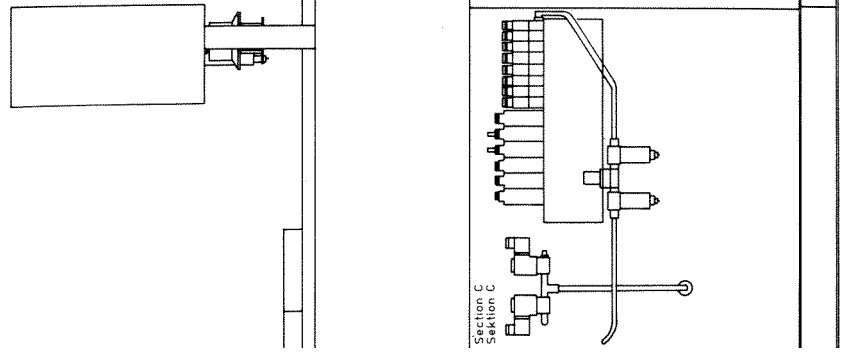


Struers Prepamatic





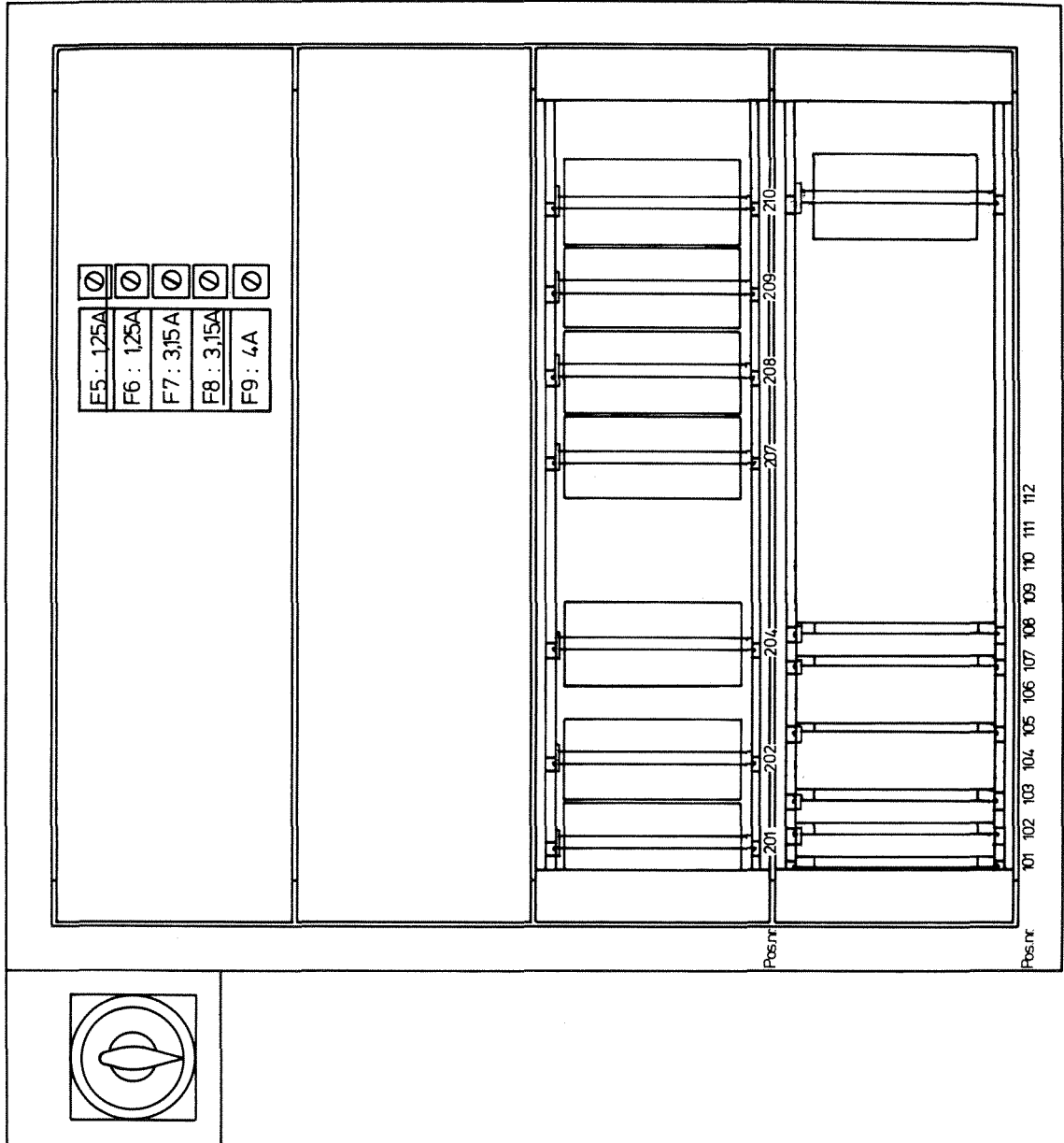
- Y: Solenoid Valves
Magnet Ventile
- P: Pumps
Pumpen
- bl: blue = Air
blau = Luft
- bk: black = Liquid
schwarz = Flüssigkeit

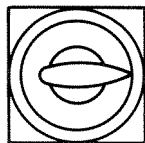


Pos. no	Description.
101	CPU- module.
102	Parallel output with optocoupler.
103	Parallel output with optocoupler.
105	Parallel input with optocoupler.
107	I/O for pressure control unit and A/D converter.
108	I/O for display and keyboard.
116	Power supply 5V/3Amp.
201	Output board with triac (control of contactors).
202	Output board with triac (control of magnet valves).
204	Input board for inductive sensors and (optical) switches.
207	Driver for carousel.
208	Pressure control unit.
209	Relay board for stand-by, emergency stop and overload.
210	Power supply, 5V, ±15V.

Connection boards for pos. 101 - 210:

Pos. no.	Mother-board, type:
101-110	SMP-S401-A10, C8451-A1-A160
or	
101-112	Mother board, type:
	SMP-S401-A12, C8451-A1-A162
116-210	Connection boards.



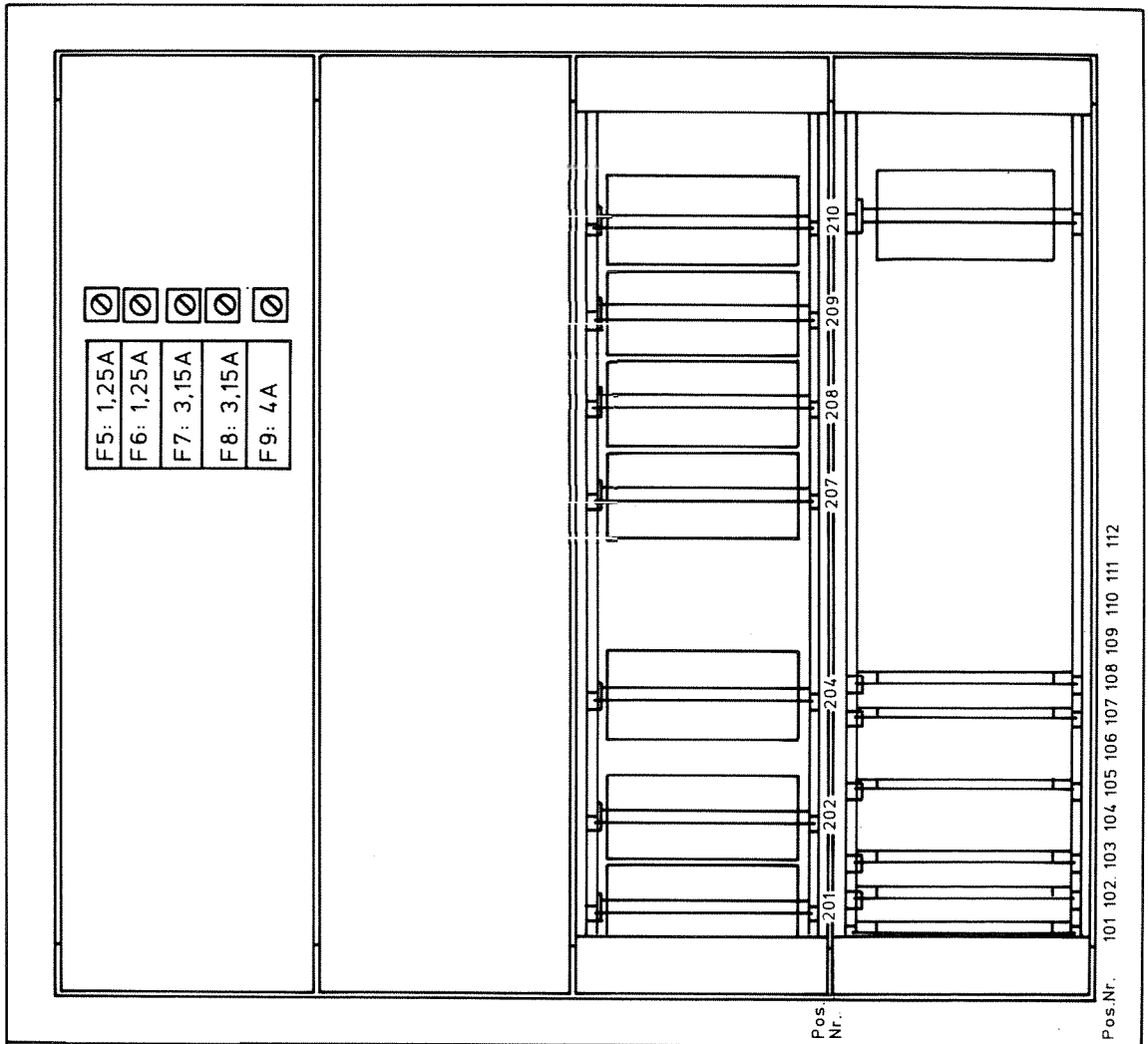


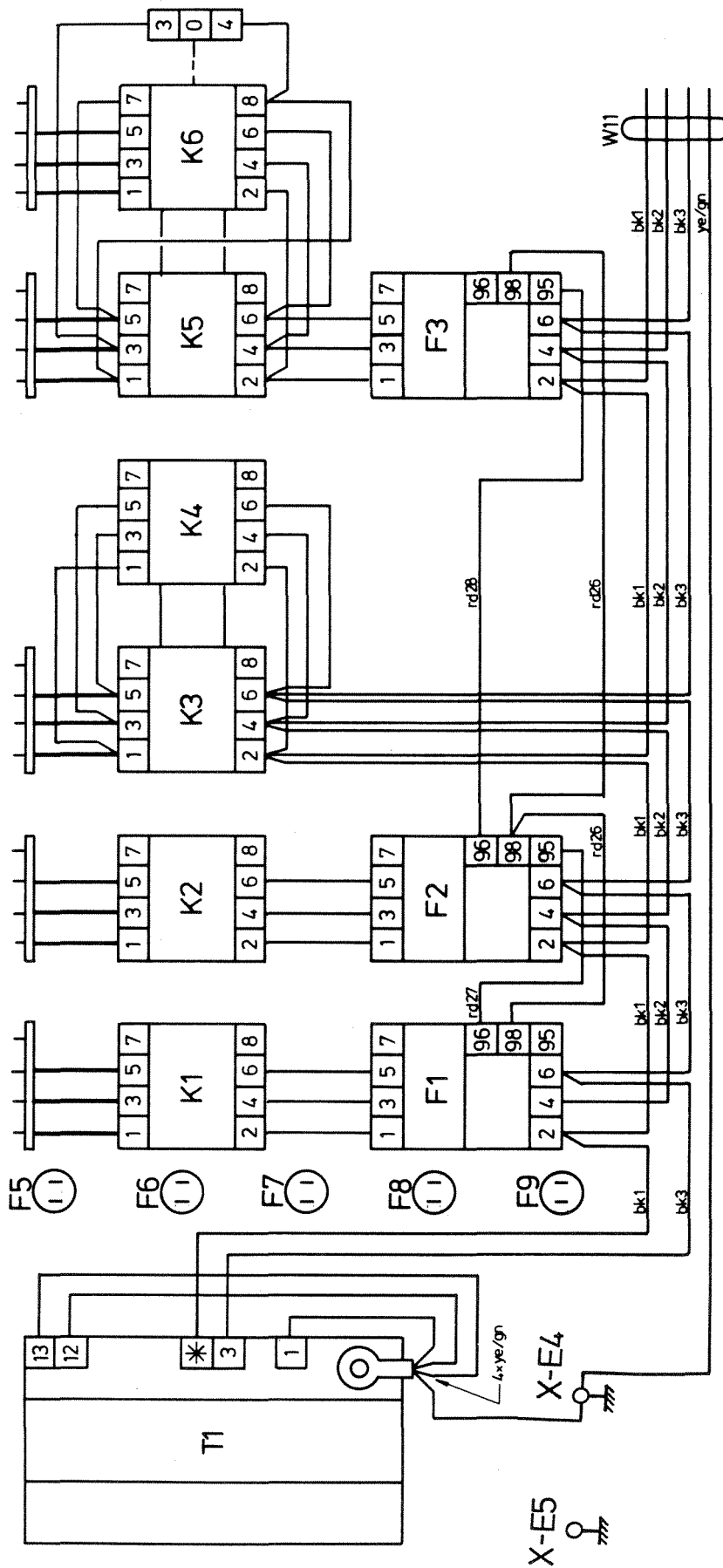
Pos.Nr. Beschreibung.

- 101 CPU-Modul.
- 102 Parallel Ausgang mit Optokoppler.
- 103 Parallel Ausgang mit Optokoppler.
- 105 Parallel Eingang mit Optokoppler.
- 107 Ein/Aus für Druckkontrolleinheit und A/D Converter.
- 108 Ein/Auf für Display und Tastatur.
- 116 Zuleitungskreis 5V/3A.
- 201 Ausgang Platine mit Triacs (Kontrolle von Schützen).
- 202 Ausgang Platine mit Triacs. (Kontrolle von Ventilen).
- 204 Eingang Platine für inductive und optische Tasten.
- 207 Karussell Kontrolle.
- 208 Druckkontrolleinheit..
- 209 Relais Platine für Stand-by, Notstop und Überlast.
- 210 Zuleitungskreis 5V ± 15V.

Anschluss Platinen für Pos. 101 - 210:

- Pos.Nr. Mutter-Platine, Type:
- 101 - 210 SMP-S401-A10, C8451-A1-A160
- oder
- 101 - 112 Mutter-Platine, Type: SMP-S401-A12, C8451-A1-A162
- 116 - 210 Anschluss Platine.



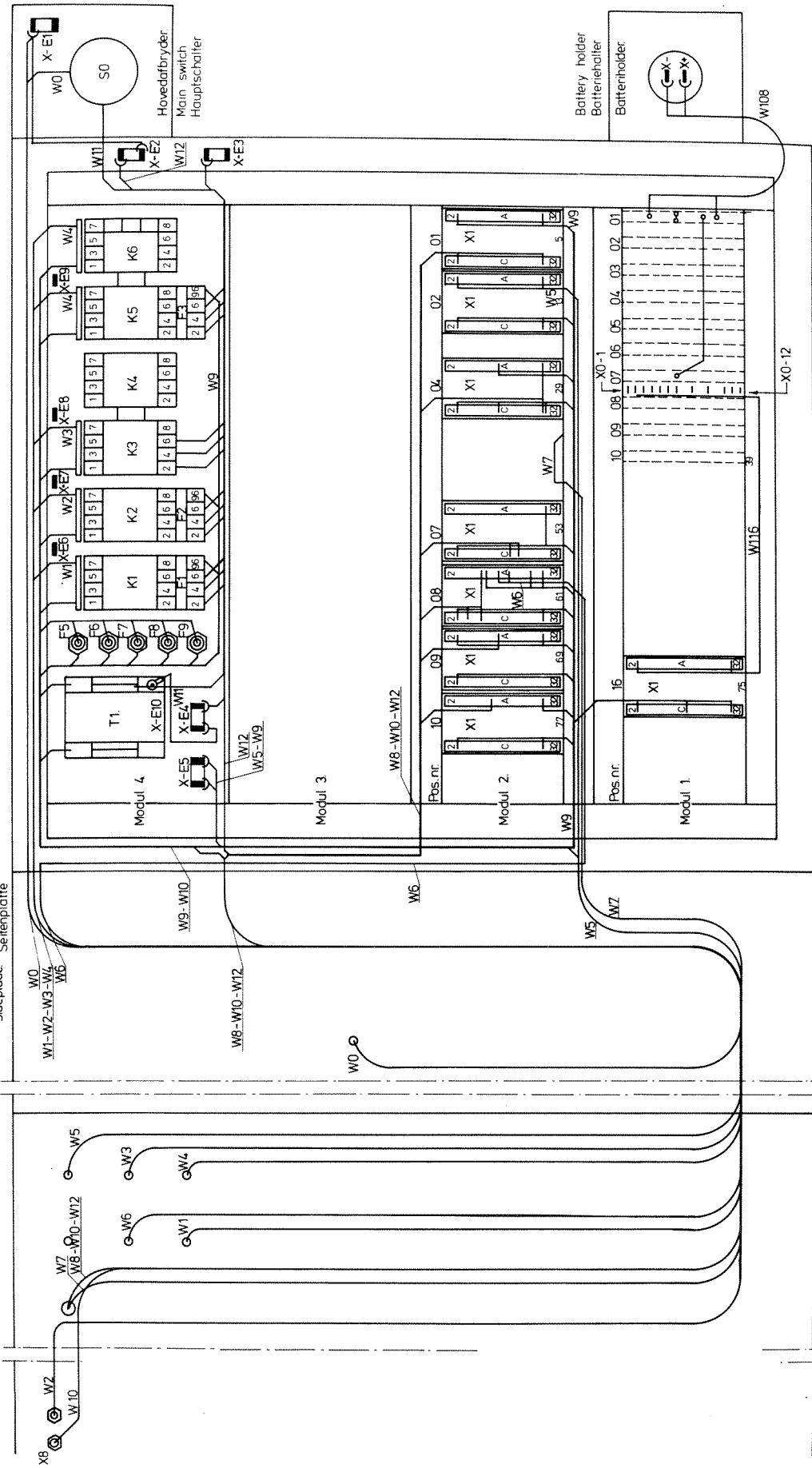


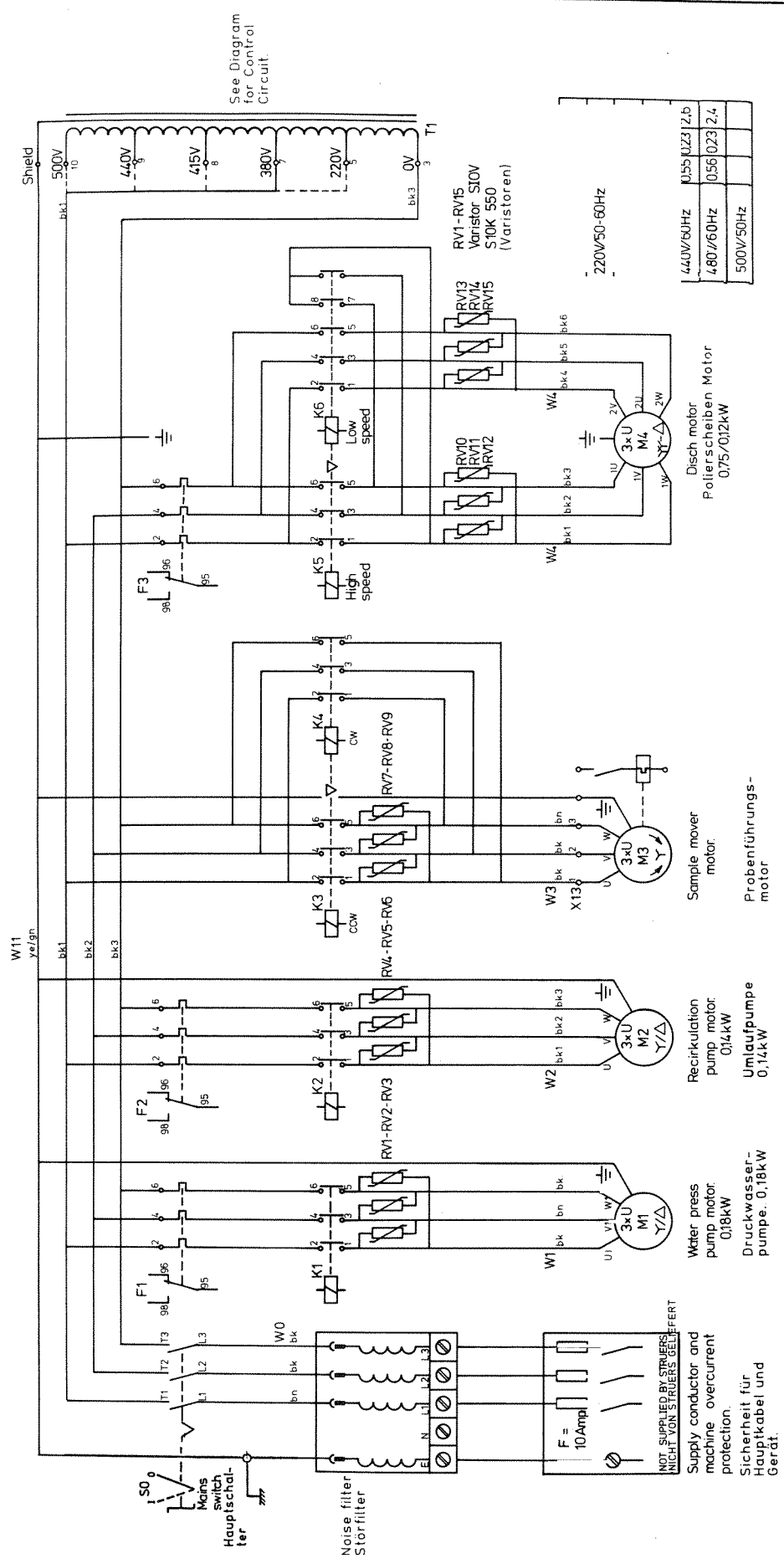
rd = red = rot
 bk = sort = schwarz
 ye = gul = gelb
 gn = gran = grün

- 4 : 200V
- 5 : 220V
- 7 : 380V
- 8 : 415V
- 9 : 460V
- 10 : 500V

*

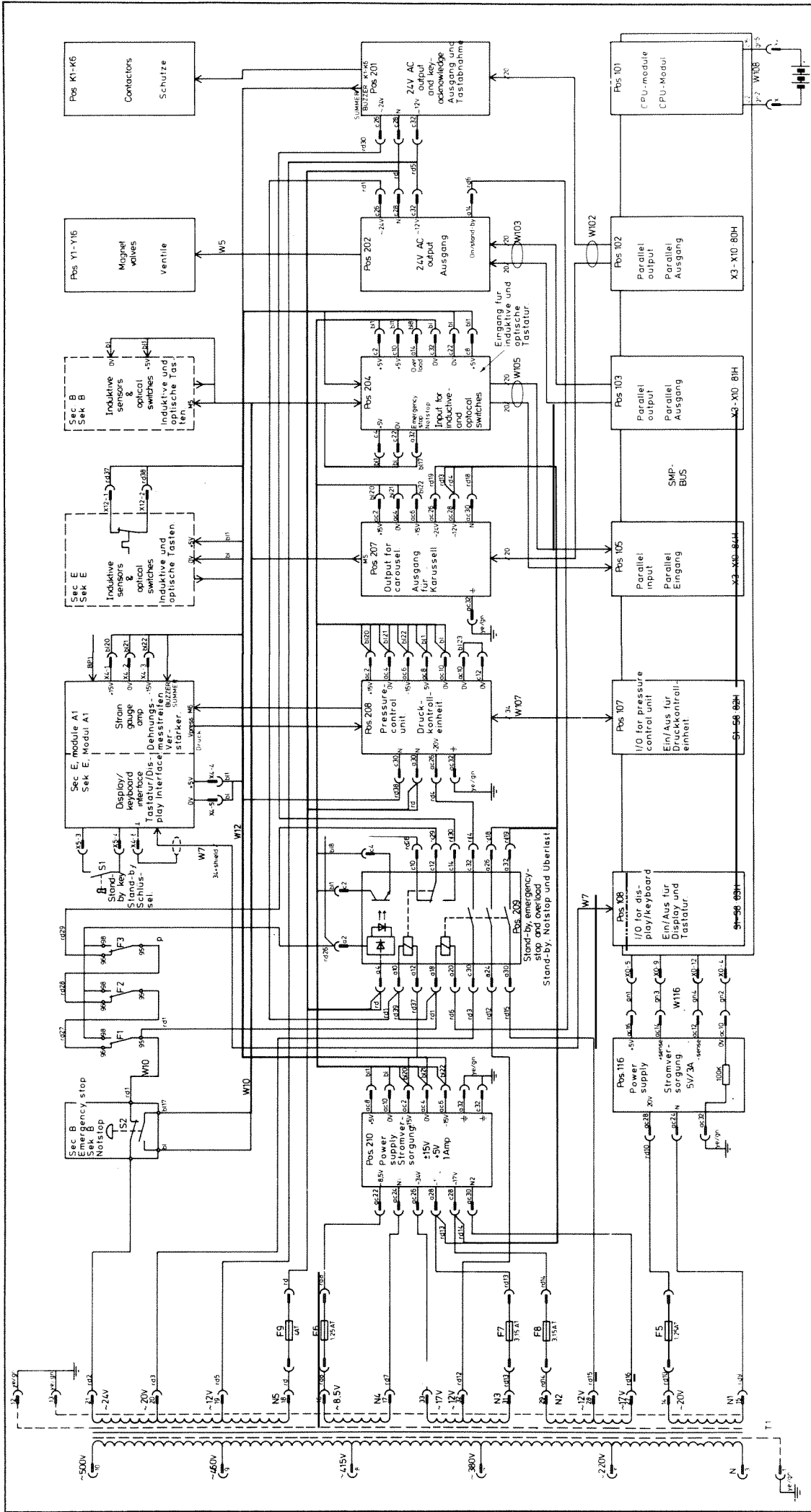
Bagplade: Rear plate
 Hintere Platte
 Højre sideplade: Cover, right
 Seitenplatte





440V/50HZ	0,55	0,23	2,4
480V/60HZ	0,56	0,23	2,4
500V/50Hz			

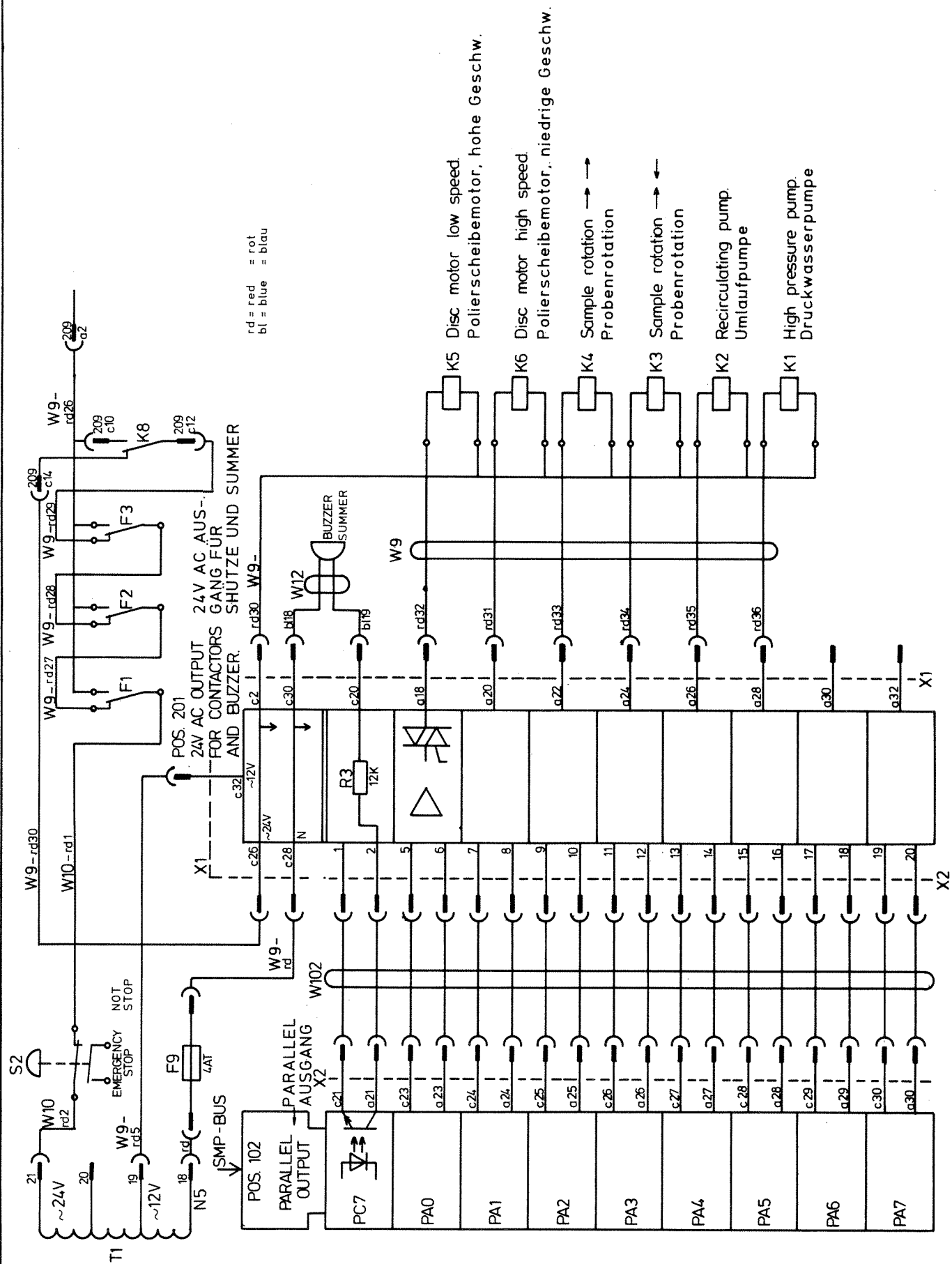
Struers Prepamatic · 3753064B · 04.92
 Circuit diagram, mains voltage
 Netzspannung-Schaltplan
 3 x (220-500 V), 50-60 Hz



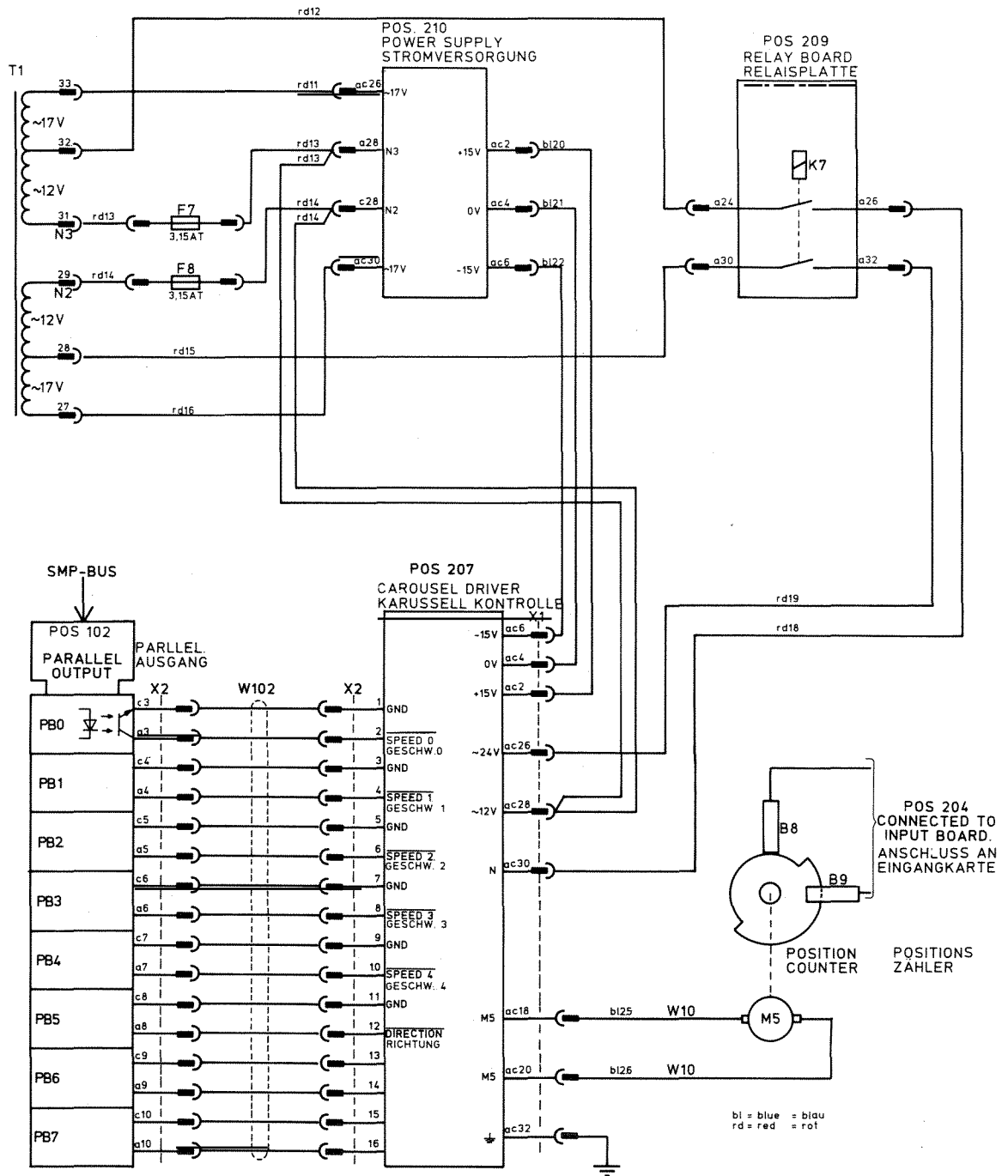
blue - blue
 black - black
 red - red
 green - green

All wires with no cable number marked has the number W9
 Alle Leitungen ohne Kabelnummer haben Nummer W9

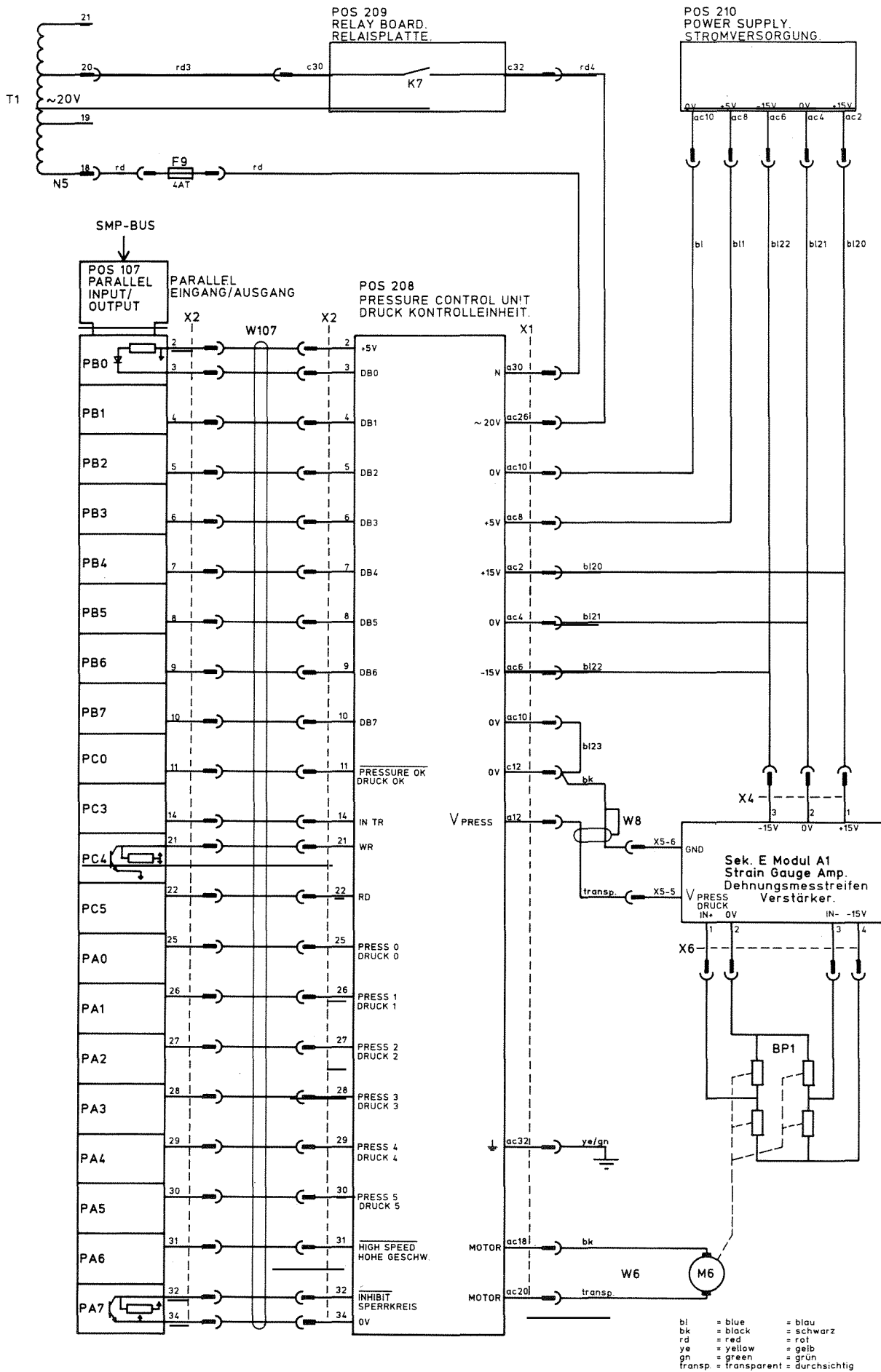
Struers Prepamatic • 3753012 • 88.02
 Block diagram
 Blockdiagramm



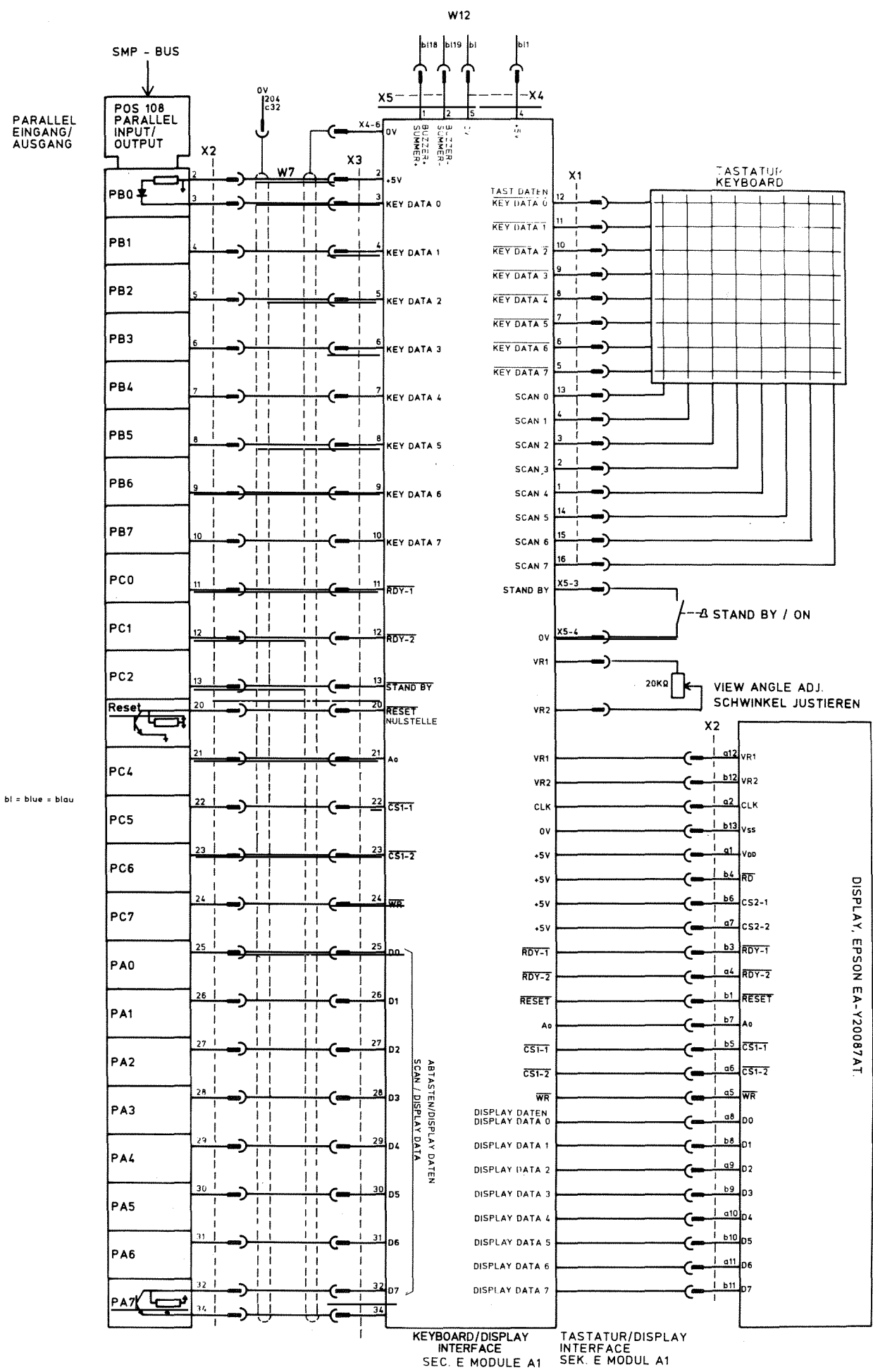
Struers Prepamatic • 3753065 • 09.87
Circuit diagram for control contactors and buzzer
Kontrolldiagramm für Schütze und Summer

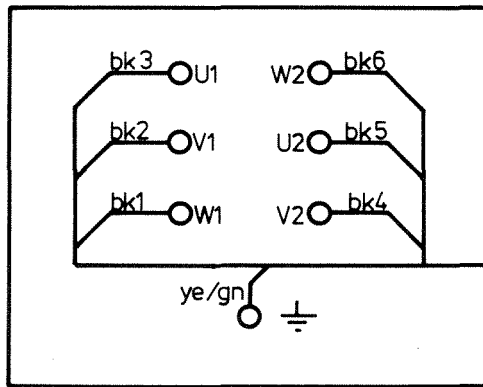


Struers Prepamatic • 3753068 • 09.87
 Circuit diagram for control of carousel
 Kontrolldiagramm für Karussell

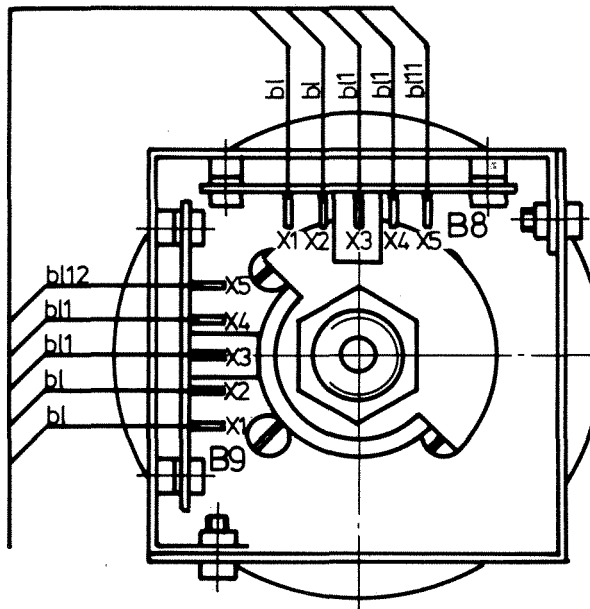


Struers Prepamatic • 3753069 • 09.87
 Circuit diagram for pressure control
 Diagramm für Druckkontrolle

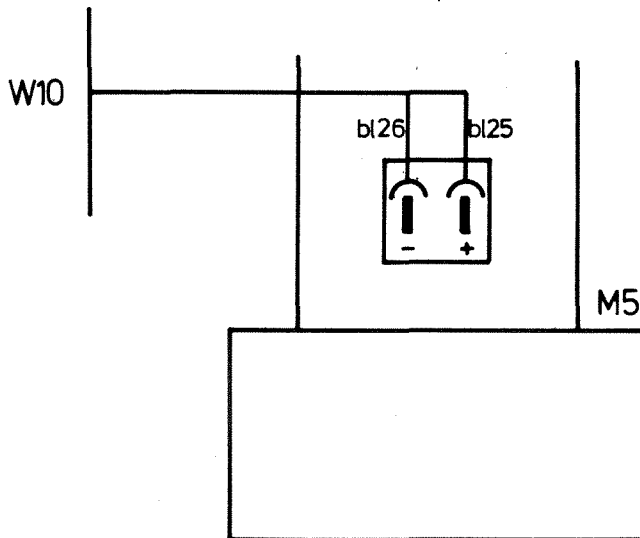




Klemkasse på M4
 Disc Motor Terminal
 Box.
 Polierscheibenmotor
 (M4)Klemmenschutz-
 kasten.

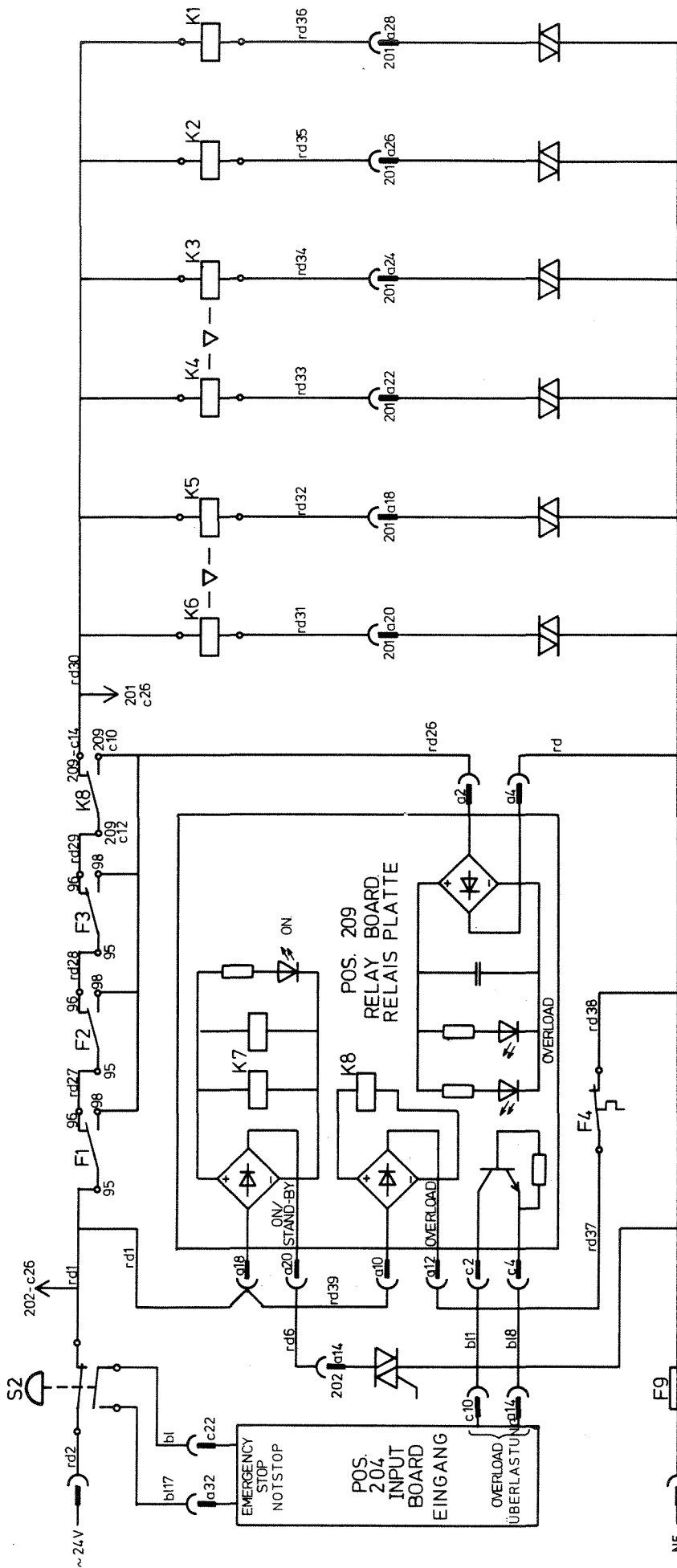


Tilslutning til karrusel-
 motor og positionstæller.
 Carousel Motor
 positioning Counter
 Connections.
 Karussell Motor
 Position Zähler
 Anschluss.



Carousel Motor (M5)
 Connection.
 Karussell Motor (M5)
 Anschluss.

bl = blå = blue = blau
 bk = sort = black = schwarz



Disc motor high speed,
Polierscheibemotor,
hohe Geschw.

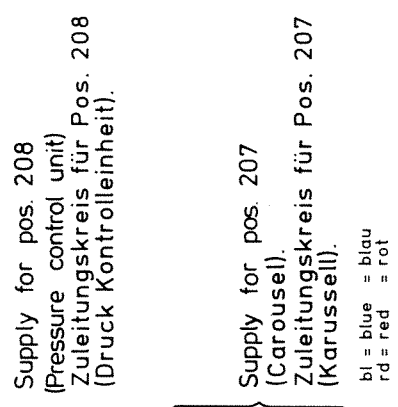
Disc motor low speed,
Polierscheibemotor,
niedrige Geschw.

Sample rotation, ↓
Sample rotation, ↑

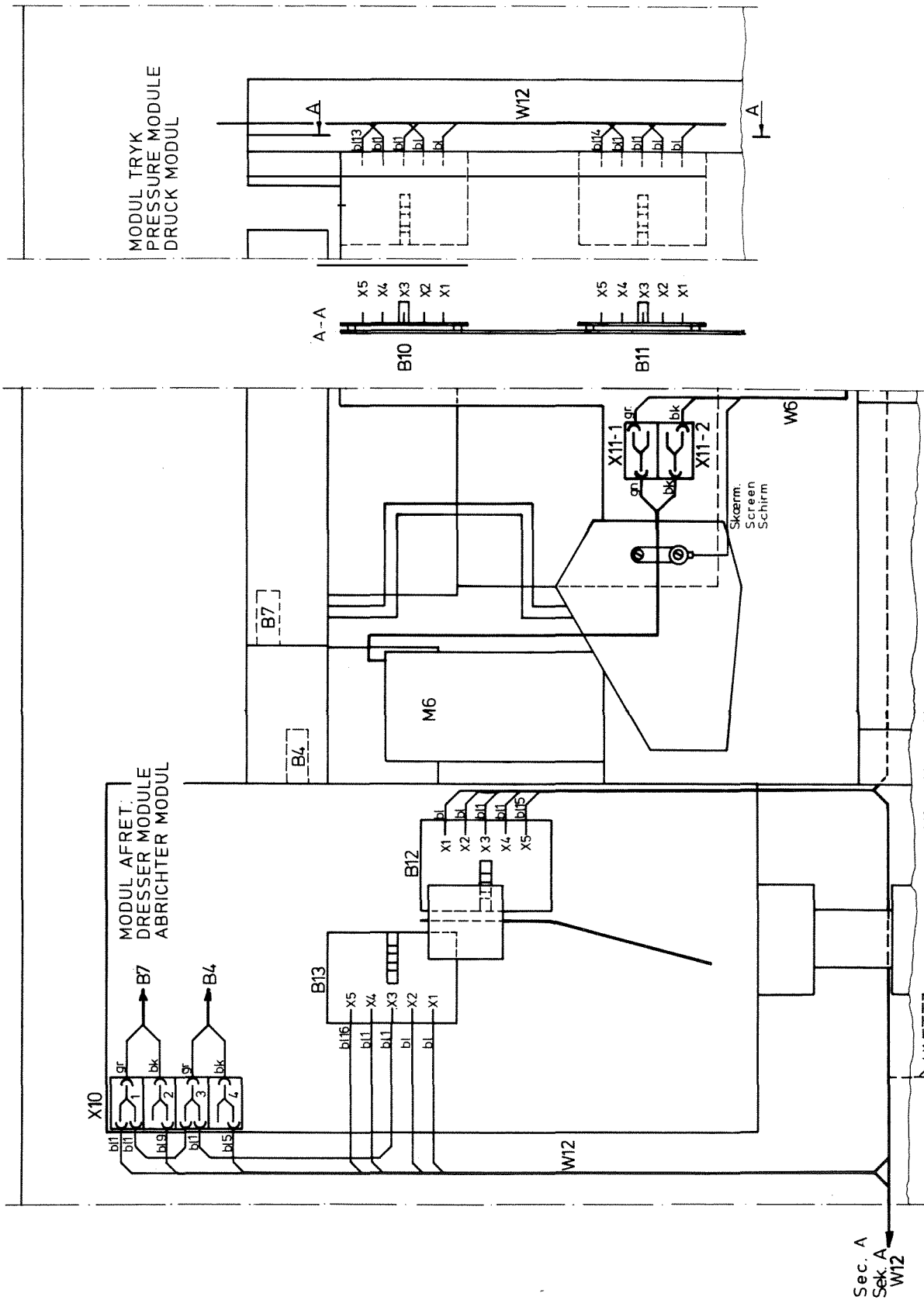
Sample rotation, ↓
Sample rotation, ↑

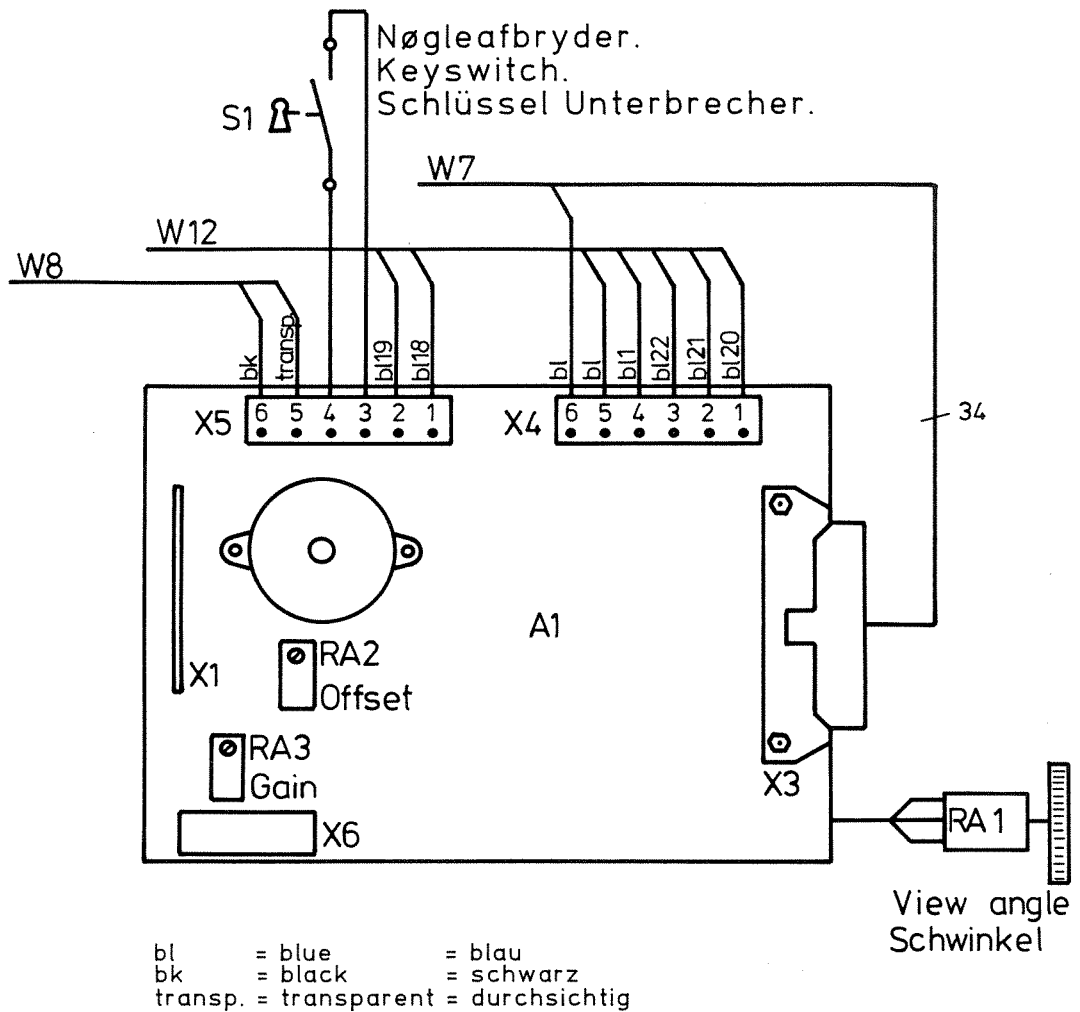
Umlaufpumpe,
Recirculating pump.

High pressure pump,
Druckwasserpumpe.



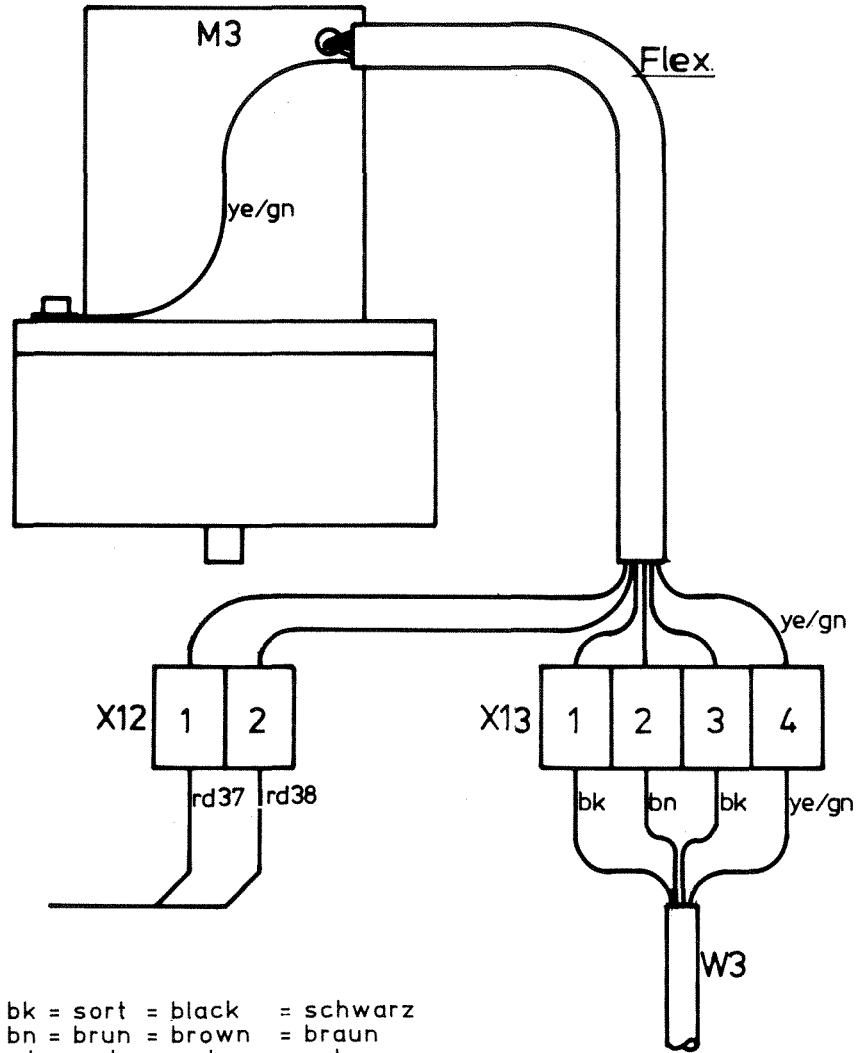
Struers Prepamatic • 3753071 • 09.87
Control circuit diagram. Emergency-overload and contactor
Kontrolldiagramm für Notstop und Überlastung Schütze



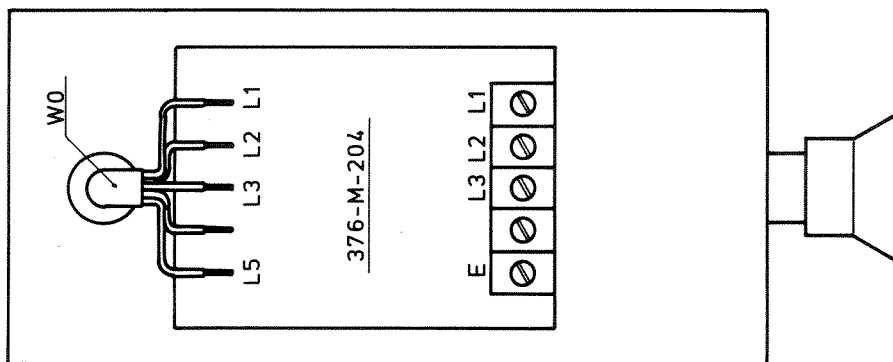
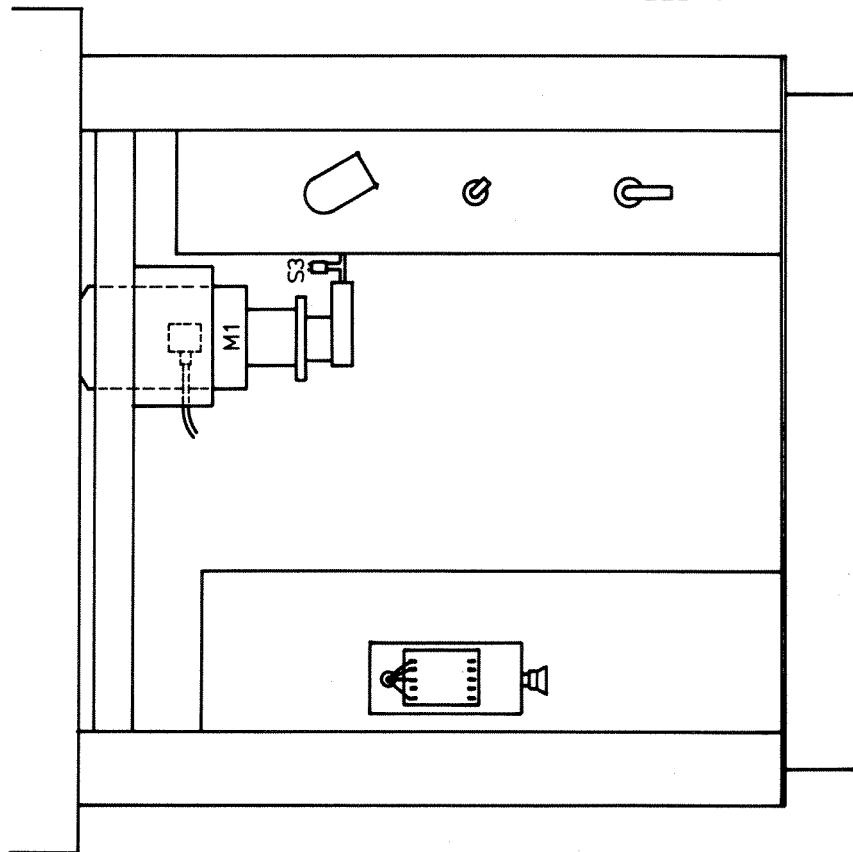


Struers Prepamatic • 3753163A • 10.88
 Sec. E: Display/keyboard connections on module A1.
 Strain gauge amp.
 Sek. E: Display/Tastatur Anschlüsse an Modul A1.
 Dehnungsmesstreifen Verstärker.

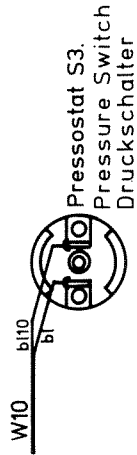
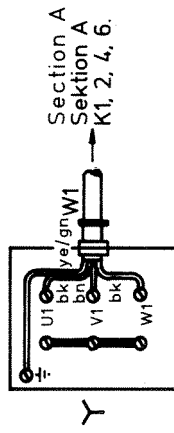
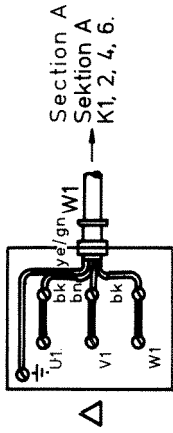
Prøveholdermotor
 Samplemove Motor
 Probeführungsmotor



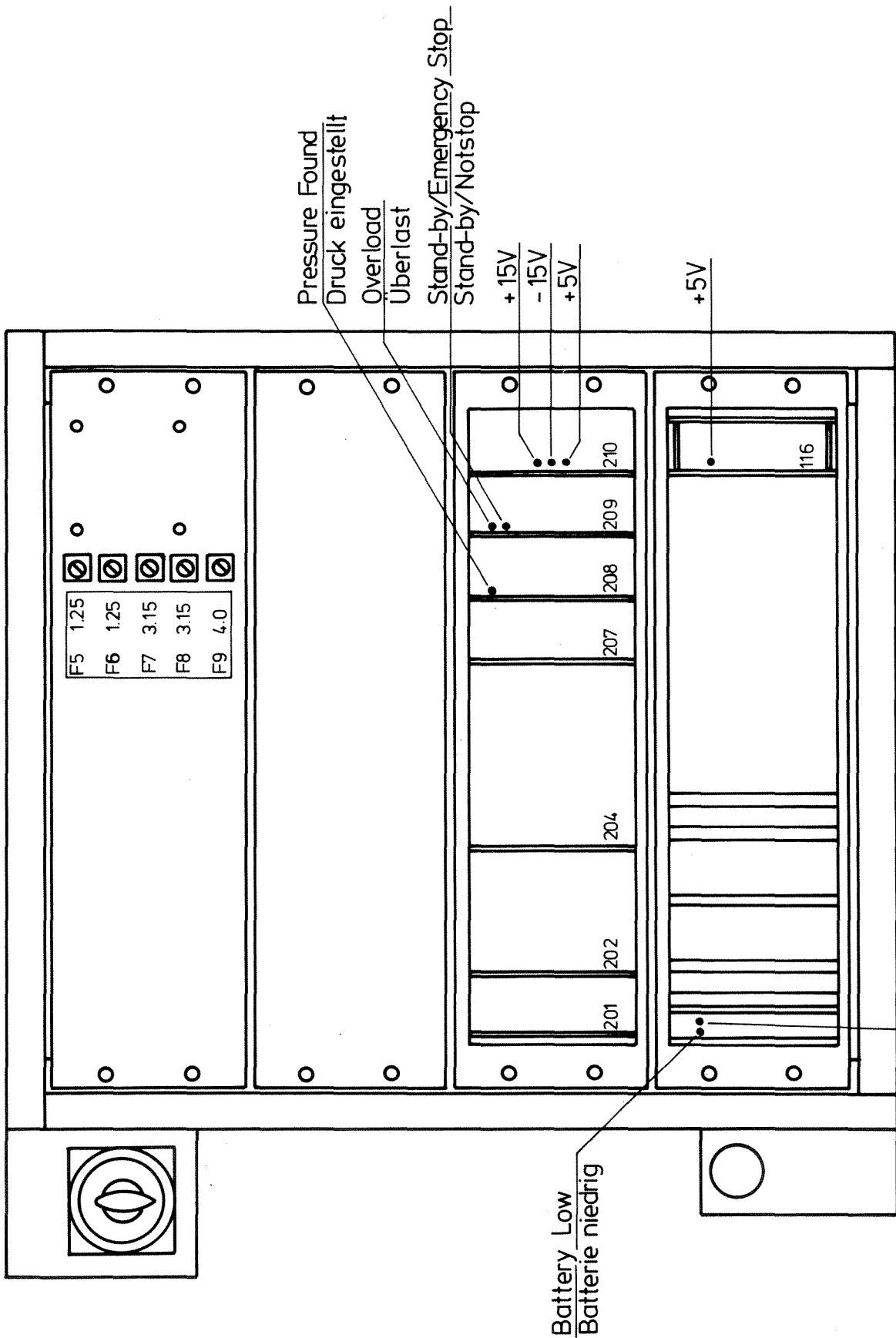
bk = sort = black = schwarz
 bn = brun = brown = braun
 rd = rød = red = rot
 ye = gul = yellow = gelb
 gn = grøn = green = grün

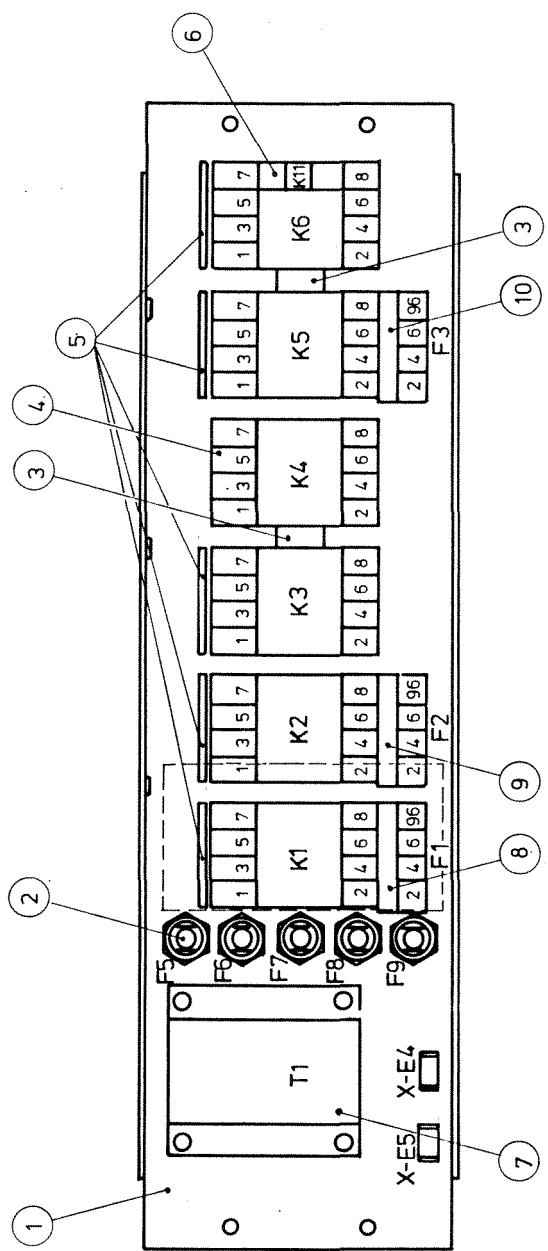


Klemkase, på M1
 M1 Terminal Box
 M1 Klemmschutzkasten



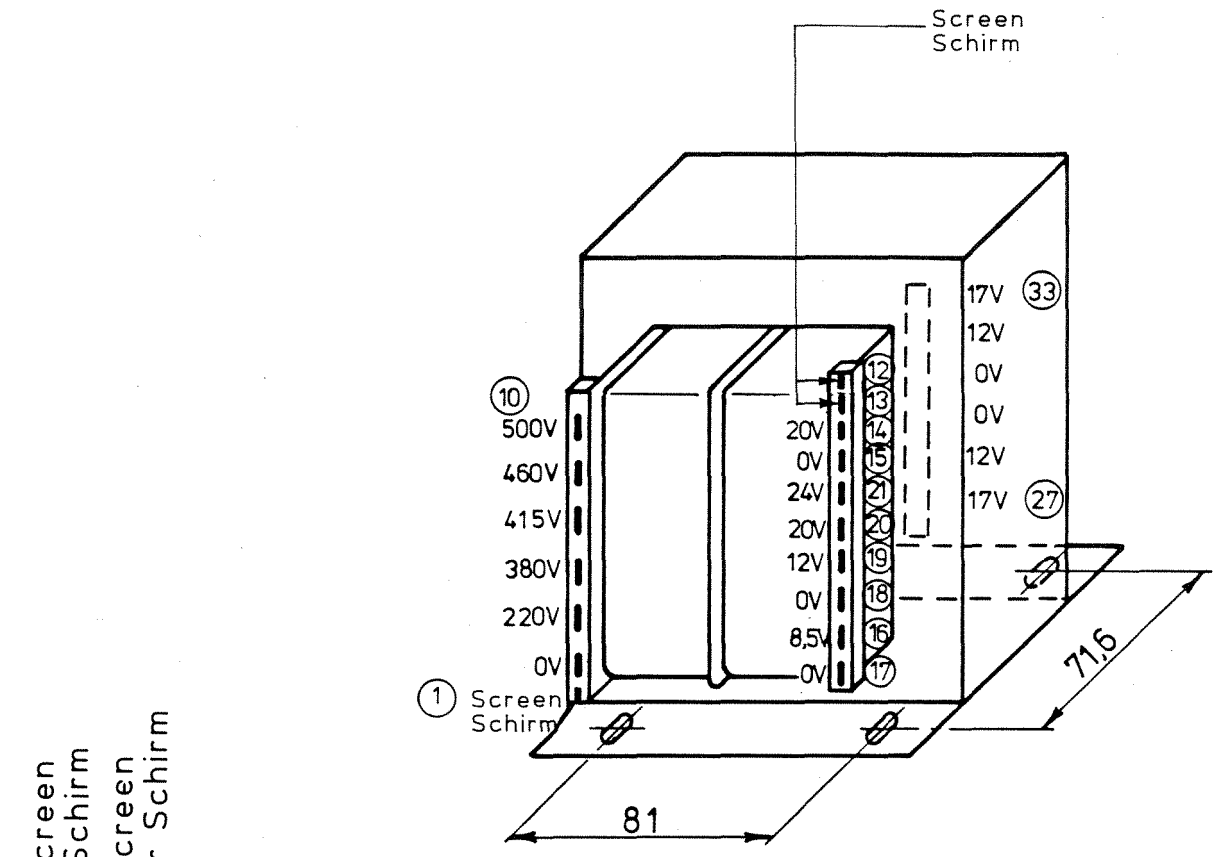
- Pressostat S3.
 Pressure Switch
 Druckschalter
- bl = blå = blue
 - bk = sort = black
 - bn = brun = brown
 - ye = gul = yellow
 - gn = grøn = green
 - blau = blau = blue
 - schwarz = schwarz = black
 - braun = braun = brown
 - gelb = gelb = yellow
 - grün = grün = green



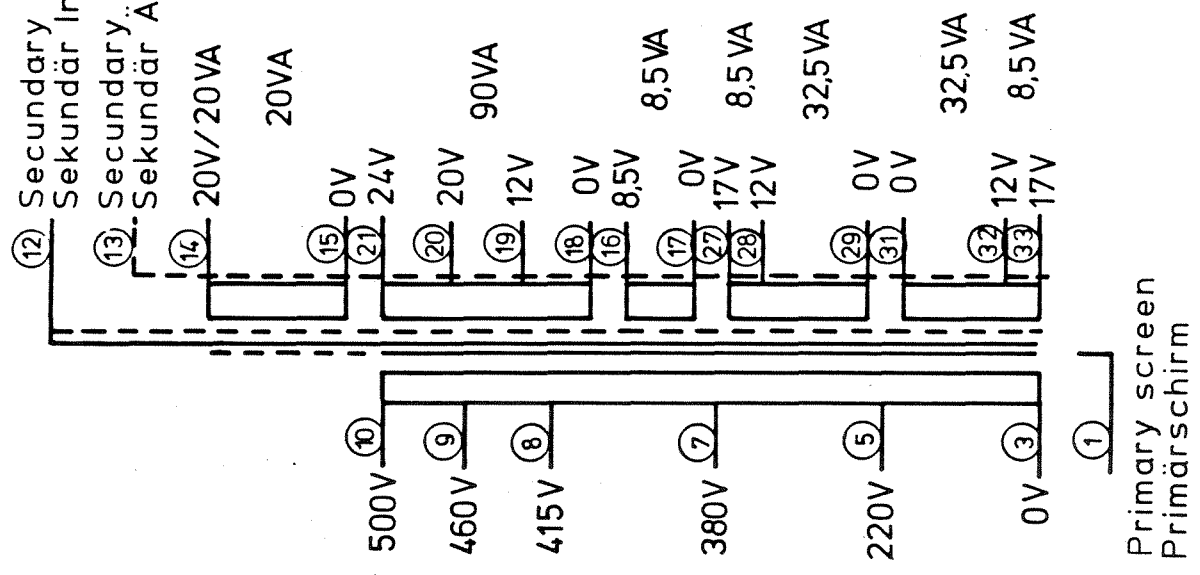


F5	125 AT
F6	125 AT
F7	3,15 AT
F8	3,15 AT
F9	4 AT

Struers Prepamatic • 3753239 • 09.87
 Contactorplate
 Schützplatte



⑫ Secondary inner screen
 Sekundär Innerer Schirm
 ⑬ Secondary outer screen
 Sekundär Ausserer Schirm



Struers Prepamatic • 3753240 • 09.87
 Safetytransformer with primary and secondary screen
 Sicherheitstransformator mit Primär- und Sekundärschirm