

Pedemax-S

Instruction Manual

Serial No.:

V/Hz:

Art.No. 14807000 Date: 21.01.1993

Pedemax-S

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. The machine must be placed in an adequate working position.
2. Be sure that the actual voltage corresponds to the voltage stated on the back of the machine. The machine must be earthed.
3. The specimens must be properly fixed in the specimen holder, e.g. using a Struers Uniforce levelling apparatus. The specimen holder must be mounted correctly in the quickcoupling.
4. Do not touch the rotating parts during operation.
5. If you observe malfunctions or hear unusual noises - stop the apparatus and call technical service.
6. Blue lubricant: follow the current safety rules for handling, mixing, filling, emptying and disposal of the alcohol-based lubricant.

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 take no responsibility for damage(s) to the user or the equipment.

Dismantling of any part of the apparatus/machine, in case of service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.).

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.

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Struers Tech A/S

Valhøjs Allé 176
DK-2610 Rødovre/Copenhagen
Denmark

☎ Telephone +45 36 70 80 90

☎ Fax +45 31 41 65 44

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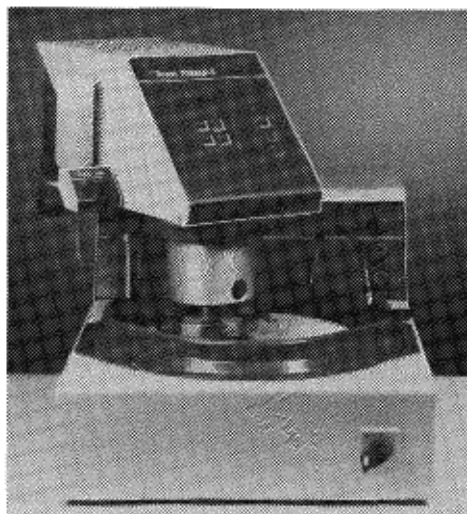
1. Introduction

Pedemax-S is a semi-automatic specimen mover with control panel, designed for use on the Rotopol or the Planopol grinding and polishing apparatus.

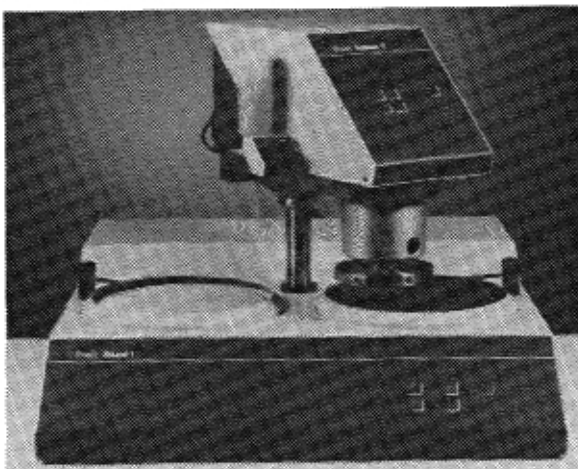
Lupo is an automatic drip lubricator delivered with Pedemax-S. Lupo supplies the necessary lubricant dosing for the preparation process.

On the Rotopol apparatus, Pedemax-S can be controlled from the grinding/polishing machine (start/stop).

Pedemax-S works with specimen holders containing 3-12 fixed specimens. The force on the specimens is applied centrally on the specimen holder.



Pedemax-S on Planopol



Pedemax-S on Rotopol

2. Operation

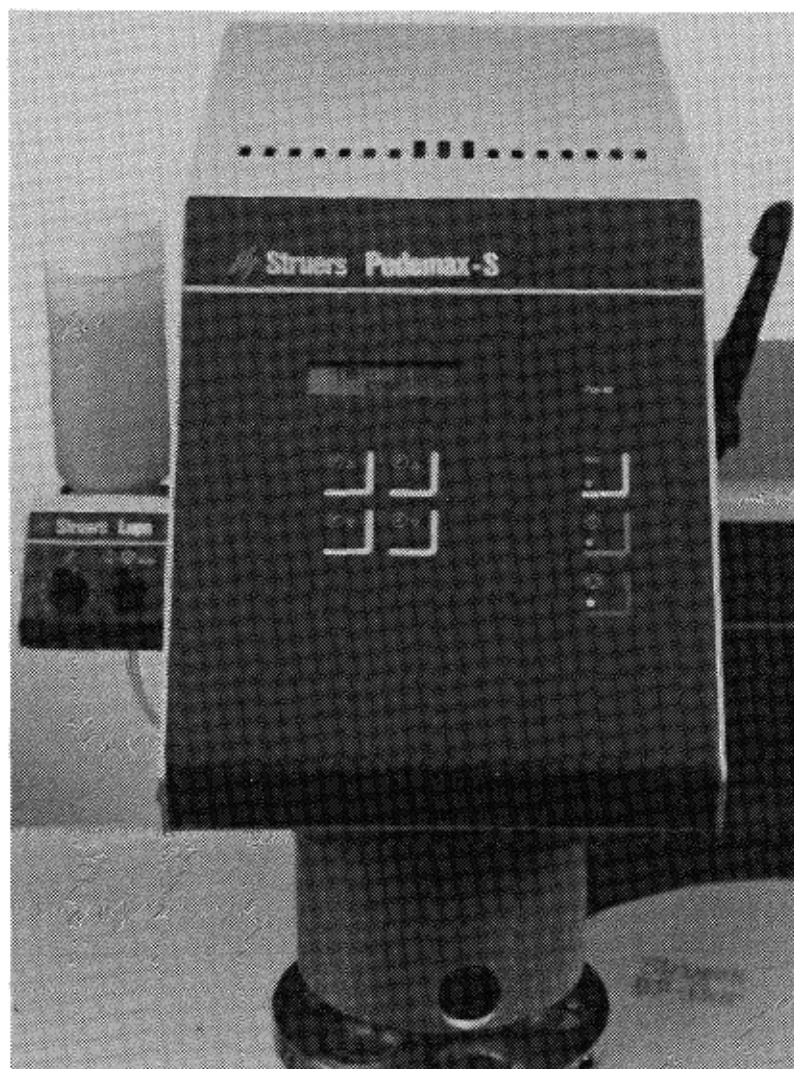
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Operation of Pedemax-S

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2.1 Operation of Pedemax-S

2.1.1 Controls on Pedemax-S



Force

Adjust force up or down according to the arrows. The force is shown in the display as Newton (N).



Time

Adjust preparation time up or down according to the arrows. The time is shown in the display as min:sec.

Auto

Auto

Rotopol only: when Auto Mode is active, start and stop of Pedemax-S can be controlled from Rotopol. When the Rotopol apparatus is stopped, Pedemax-S is automatically set to "Pause".



Start

On Rotopol: starts Pedemax-S when not in "Auto mode".

On Planopol: starts Pedemax-S manually.



Stop

On Rotopol: stops both Pedemax-S and Rotopol.

On Planopol: stops Pedemax-S manually

Main switch

Turn the main switch on the back of the apparatus to "On". All lights flash and a beep is heard. "Power" and the "Stop" button light up. The word "Pedemax-S" and the version number of the apparatus will appear on the display for a few seconds. The display shows the default parameters: force 120N and time 1 min:00 sec.

Locking handle

Horizontal positioning of Pedemax-S is accomplished by unlocking the handle, i.e. raising the handle to upright position.

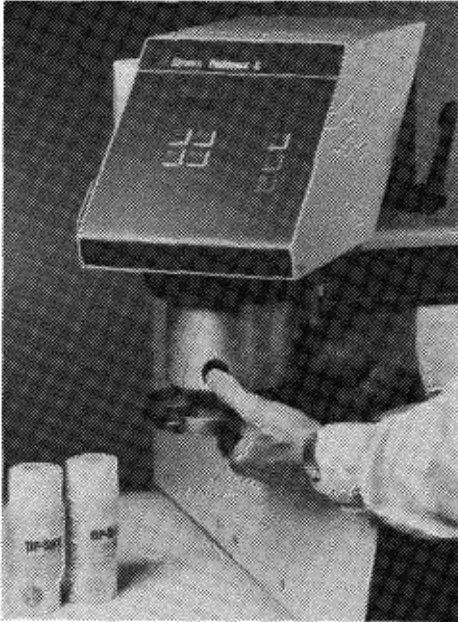
2.1.2 Pedemax-S on Rotopol

- Place the specimen holder under the quick-coupling.
- Keep pressing the black button while leading the force tap of the specimen holder into the coupling. Turn the specimen holder until a click is heard. Release the black button (see photo).
- Set the necessary parameters on the front panel (see Section 2.1.4, Pedemax-S modes and parameters and Section 3, Preparation of specimens),
- Set Lupo (if you need lubricant) and Pedemax-S to Auto mode.
- Press WATER ON  on Rotopol (for wet grinding).
- Unlock Pedemax-S by raising the locking handle.
- Place Pedemax-S in the appropriate eccentric position in relation to the grinding disc. Lock Pedemat by lowering the locking handle.
- Press START  on Rotopol. (If not in Auto mode, Pedemax-S will have to be started separately).
- When the preset time expires, Rotopol, Pedemax-S and Lupo stop automatically (in Auto mode).
- Unlock Pedemax-S by raising the locking handle.
- Keep your hand under the specimen holder and remove it from the quick-coupling by pressing the black button on the front of the cylinder head.

Pause

If Pedemax-S is stopped by pressing Rotopol STOP , Pedemax-S goes into "Pause". When you start Rotopol again, Pedemax-S and the countdown of the preset time will continue.

2.1.3 Pedemax-S on Planopol



- Place the specimen holder under the quick-coupling.
- Keep pressing the black button while leading the force tap of the specimen holder into the coupling. Turn the specimen holder until a click is heard. Release the black button (see photo).
- Set the necessary parameters on the front panel (see Section 2.1.4, Pedemax-S modes and parameters and Section 3, Preparation of specimens),
- Set Lupo (if you need lubricant) to Auto mode.
- Unlock Pedemax-S by raising the locking handle.
- Place Pedemax-S in the appropriate eccentric position in relation to the grinding disc. Lock Pedemat by lowering the locking handle.
- Activate the cooling water (wet grinding).
- Press START  on Planopol.
- Press START  on Pedemax-S.
- After the desired process time stop both Planopol and Pedemax-S simultaneously. Lupo may stay in Auto mode, ready for the next method step after adjustment of lubricant.
- Unlock Pedemax-S by raising the locking handle and swing Pedemax-S to the left.
- Keep your hand under the specimen holder and remove it from the quick-coupling by pressing the black button on the front of the cylinder head.

2.1.4 Pedemax-S modes and parameters

The following features are available from the Pedemax-S touch pad on the front plate:

Force on specimen holder

Adjust the force on the specimen holder. The force in N is indicated in the display. Default force setting is 120N, with a range between 30 to 400 N.

Preparation time

Adjust the preparation time (range: 0:05 to 99:30). The time is indicated in min:sec in the display. Default settings is 1 min:00 sec.

2.1.5 Change of grinding/polishing disc

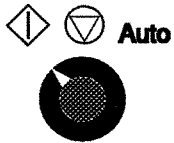
- Stop Pedemax-S, Lupo and the grinding/polishing machine.
- Unlock Pedemax-S by raising the locking handle, and turn Pedemax-S to the side.
- Place the disc, e.g. a Petrodisc-M or a grinding/polishing disc, onto the turntable.
- Lock Pedemax-S again.

IMPORTANT

The spring of Pedemax-S can carry a specimen holder (including the specimens) weighing up to 3 kg. If you need to lift heavier specimen holders you must support Pedemax-S manually

2.2 Operation of Lupo

2.2.1 Controls on Lupo



Control Modes

Switch between Auto, Start and Stop mode.



Dosing control

Switch for step dosing of lubricant between 1 to 10. The dosing level also depends on the lubricant level of the bottle. In order to maintain a reproducible dosing we recommend that you take the lubricant level into consideration when choosing a dosing step.

2.2.2 Lupo control modes

Auto

Auto mode

When Auto Mode is active, start and stop of Lupo can be controlled from Pedemax-S. When Pedemax-S is started/stopped, Lupo also starts/stops.

On Rotopol: in Auto Mode Lupo is controlled direct from a Rotopol.



Start mode

Manual start of Lupo, when not in "Auto mode", can also be used for manual predosing.



Stop mode

Manual and auto stop of Lupo. This mode does not stop either Pedemax-S or the grinding/polishing machine.

Dosing nozzle

2.2.3 Daily use of Lupo

Place the dosing nozzle manually over the grinding/polishing disc.

Auto mode

Having connected Lupo correctly to the connector plug and the nozzle hose, switch to Auto mode. Lupo will now act as a slave unit and start/stop together with Pedemax-S.

Manual mode (start/stop)

When not in Auto mode, you may start and stop the Lupo manually, independent of Pedemax-S or the grinding/polishing machine.

2.2.4 Changing to another Lupo unit (accessory)

- Switch Lupo to STOP  position.
- Dismount the current Lupo.
- Place the other Lupo (accessory) with an alternative lubricant in the connector on the supporting arm. Connect the nozzle hose to the lubricant outlet.

2.2.5 Changing lubricant type/refilling

- Switch Lupo to STOP  position.
- Remove Lupo from the supporting arm.
- Hold the Lupo lubricant bottle firmly and remove the top lid.
- Empty the bottle, still mounted on Lupo, of any remaining lubricant in the original Struers lubricant bottle.
- Dismount the Lupo lubricant bottle by holding the socket cap with one hand and unscrewing the bottle with the other hand in an anti-clockwise direction.

IMPORTANT

Avoid turning the socket cap while unscrewing the Lupo bottle, as the turning movement may cause damage to the socket cap gasket

- Clean the now empty Lupo bottle with mild soapy water and remount the bottle in the socket cap. Remember to hold back the socket cap!
- Put Lupo back on the supporting arm and be sure that the plugs and the hose are firmly connected.
- Refill with lubricant and remount the top lid.
- Set the dosing control to max. position (10) to empty the dosing nozzle of the previous type of lubricant.

3. Preparation of specimens

3.1 Preparation methods

PG Plane Grinding

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

SiC paper is used on a wet grinding disc, according to the Knuth-Rotor principle. PG-paper or Diadisc 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.

3.2 Struers Metalog Guide™

Pedemax-S 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.



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™.

4. Maintenance

4.1 Daily

Clean all accessible surfaces of the apparatus with a moist cloth.

4.2 Weekly

The coupling for the specimen holder may need cleaning:

- Unlock Pedemax-S.
- Press START  twice. The coupling descends without rotating.
- Clean the coupling with a damp cloth. Use no strong detergents.
- Press STOP  and the coupling returns to start position.

Lupo

To avoid clogging of the Lupo nozzle, you should clean the nozzle once a week:

- Empty the Lupo bottle and fill it with mild soapy water.
- Press start  on Lupo.
- Set the dosing control to max. dosing (step 10) and let the water run through the nozzle for 2-3 min.
- Refill with lubricant according to the description in Section 2, Operation of Lupo.

5. Accessories

	Code word
<i>Specimen Holders Ø 140 mm for Mounted or Unmounted Specimens</i> For 6 specimens, Ø 10-32 mm, aluminium For 6 specimens, Ø 10-32 mm, stainless steel For 4 specimens, Ø 10-40 mm, aluminium For 4 specimens, Ø 10-40 mm, stainless steel	PEDAL PEDST PEDFI PEDIS
<i>Specimen Holders Ø 160 mm for Mounted Cylindrical Specimens</i> for 6 each Ø 25 mm/1", aluminium. for 6 each Ø 30 mm, aluminium. for 6 each Ø 1.1/4", aluminium. for 4 each Ø 40 mm, aluminium. for 4 each Ø 1.1/2", aluminium.	MAXTO MAXUM MAXQU MAXLI MAXHA
<i>Specimen Holders Ø 160 mm for Mounted or Unmounted Specimens</i> for 6 specimens, Ø 12-40 mm, stainless steel for 6 specimens, Ø 12-40 mm, aluminium for 12 specimens, Ø 10-25.5 mm, stainless. for 6 flat specimens (max. 34x60 mm), stainless steel for 3 flat specimens (max. 41x72 mm), stainless. with 3 clamps for wire or plate (max. 24 x 52 mm) stainless steel	MAXCY MAXLU MAXDU MAXYK MAXDI MAXAB
<i>Specimen Holders Ø 160 mm without Holes</i> plane, solid specimen holder for adhesion of specimens or for custom-made shapes Stainless steel Aluminium	MAXSO MAXAS
<i>Uniforce, Basic Model</i> Device for levelling of specimens in specimen holders Ø 140, 160, and 200 mm <i>Uniforce, Advanced Model</i> with pressure foot for positioning the specimens <i>Uniforce Extension Kit</i> Pressure foot for positioning the specimens. <i>Levelling Disc for Clamping Specimens</i> In Ø 140 mm specimen holder discs. For the older model levelling device (MAXVA)	MAXWI MAXFU MAXMO MAXHU
<i>LUPO, optional extra drip lubricator</i>	PEDNY

Struers offers a comprehensive range of consumables for both plane and fine grinding/polishing. Ask for separate leaflets.

6. Installation

6.1 Contents of packing

- 1 Pedemax-S
- 1 Lupo automatic drip lubricator
- 1 Hose connection
- 1 Pressure hose, 3 m
- 2 Hose clamps
- 1 Hose clamp
- 1 Screw M5X10 with washer
- 1 Socket spanner
- 1 Hexagon key
- 1 Instruction Manual
- 1 Template sheet

6.2 Mounting of Pedemax-S on Rotopol

Remove Pedemax-S from the transport box. Save the nut and washer under the wooden plate to be re-used when mounting.

In the packing box a so-called "template" is enclosed. The template sheet indicates where to punch the necessary hole for the Pedemax-S supporting column:

- Place the template on Rotopol.
- Punch out the pre-cast hole in Rotopol with a round-headed hammer, as follows: strike the circle on the template stating "Pedemax-S" with one or two firm blows. When the hole opens, remove the template.
- Place two working tables of equal height at a distance about half the length of Rotopol. Balance Rotopol between the tables.
- Lead the supporting column of Pedemax-S down the support hole in the cover plate of Rotopol. Adjust the column until the cross pin in the bottom of the column gets caught by the guiding slots inside Rotopol.
- Fasten the nut and washer from the transportation box tightly under the column of Pedemax-S below Rotopol. Use the enclosed socket spanner 24 mm.

WARNING!

Be careful, while adjusting the apparatus, as Pedemax-S weighs about 25 kg!

6.3 Mounting of Pedemax-S on Planopol¹

- Remove Pedemax-S from the transport box.
- Remove the left cover (about 50 mm Ø) on the upper side of the Planopol cabinet.

IMPORTANT

Pedemax-S must not be mounted in the right column hole of Planopol.

- Place two working tables of equal height at a distance about half the length of Planopol. Balance Planopol between the tables.
- Insert the column in the left column hole in Planopol.
- Unlock Pedemax-S.
- Swing Pedemax-S over the center of the Planopol rotating disc. Keep the position and twist the column clock-wise as far as possible. This enables free movement of Pedemax-S to the left of Planopol.
- Tighten the nut and washer firmly.

WARNING!

Be careful, while adjusting the apparatus, as Pedemax-S weighs about 25 kg!

¹ Pedemax-S only fits Planopol-3, from serial no. 4141096 or Planopol-V, from serial no. 4010477.

6.4 Connection of Pedemax-S (version for Rotopol)

Pedemax-S is factory mounted with electric cable, connecting wire and air pressure hose.

Power supply

- Remove the protection bag covering the cables. Mount a plug on the cable:

Black and brown: phase

Yellow/green: earth

IMPORTANT

Check that the mains voltage corresponds to the voltage stated on the type plate on the back of the apparatus.

- Check that the specimen holder rotates counter-clockwise when Pedemax-S is started. If not, switch two phases.
- Connect the plug of the connecting wire to the socket on Rotopol. Use the screw cap.

Air pressure

- If you have your own air supply hose, you may mount the enclosed hose connection on your hose. Use the enclosed hose clamp.
- Place the hose clamp around the quick-coupling and mount the clamp in the upper hole on the back of Rotopol. Tighten the screw.
- Ensure that the air pressure is between 5 and 6.5 bars. If the air pressure exceeds 6.5 bars mount a reduction valve.

6.5 Connection of Pedemax-S (version for Planopol)

Pedemax-S is factory mounted with electric cable, connecting wire and air pressure hose.

Power supply

- Remove the protection bag covering the cables. Mount a plug on the cable:

Black and brown: phase
Yellow/green: earth

IMPORTANT

Check that the mains voltage corresponds to the voltage stated on the type plate on the back of the apparatus.

- Check that the specimen holder rotates counter-clockwise when Pedemax-S is started. If not, switch two phases. Hide the communications cable of Pedemax-S behind the apparatus.

Air pressure

If you have your own air supply hose, you may mount the enclosed hose connection on your hose. Use the enclosed hose clamp.

- Ensure that the air pressure is between 5 and 6.5 bars. If the air pressure exceeds 6.5 bars mount a reduction valve.

6.6 Mounting of Lupo

- Remove Lupo from its box.
- Plug Lupo into the supporting arm connector on Pedemax-S and connect the hose. Pedemax-S now supplies Lupo with 24 V.
- Hold the lubricant bottle with one hand and remove the top lid.
- Fill the Lupo bottle with lubricant to the upper edge below the rim.
- Remount the top lid and Lupo is ready for use.

7. Trouble-shooting

Display/Error	Cause	Action
Pedemax-S		
OVERLOAD	Pedemax-S has stopped due to overload of the motor.	Wait for the motor to cool down and for the PAUSE/OVERLOAD message to appear in the display.
PAUSE/ OVERLOAD	The motor has cooled down after overloading. Pedemax-S is now ready for use again.	Restart Pedemax-S.
PAUSE/ NO AIR	Air pressure too low, motor stopped.	Supply correct air pressure and restart
LOCK HANDLE	The handle has not been pulled and Pedemax-S is not locked.	Lower handle
Lupo		
Bad or missing dosing	Dosing nozzle clogged	Clean the nozzle with alcohol
Lubricant leaking below the bottle	The bottle has not been fastened correctly	Fasten tightly. Remember to hold back the socket cap itself to avoid damage to the bottom gasket

8. Spare parts and illustrations/ Ersatzteile und Abbildungen/ Pièces de rechange et illustrations

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Drawing

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8.3	Pneumatic connections	14800125
8.4	Lupo	14820010

Diagrams

8.5	Pneumatic diagram	14800130
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Some of the drawings may contain position numbers not used in connection with this manual.

Drawing

14800105 (1 of 2)

Pos. Description Spare Part No.

8.1 Chassis (drawing 1 of 2)

	Pressure hose 1/4", blue	2NU12403
	Hose nipple Ø8	2NF40200
140	O-Ring 15.60-2.40 (2 pcs)	2I024035
230	Disc, nylon M8	2ZI20804
240	Cover Ø 21	2GD54025
310	Poly-V belt (L=508 mm)	2JD30508

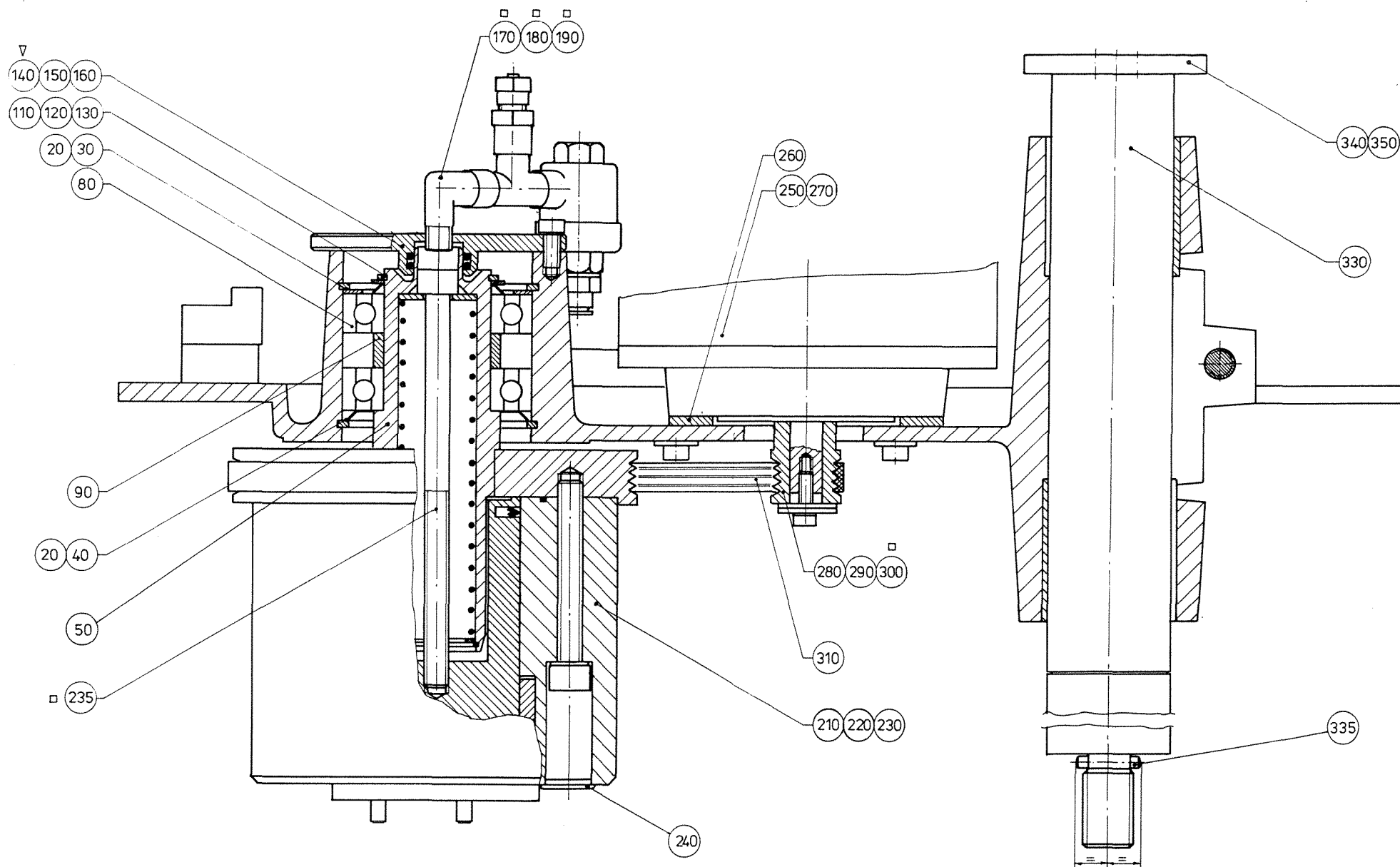
Drawing

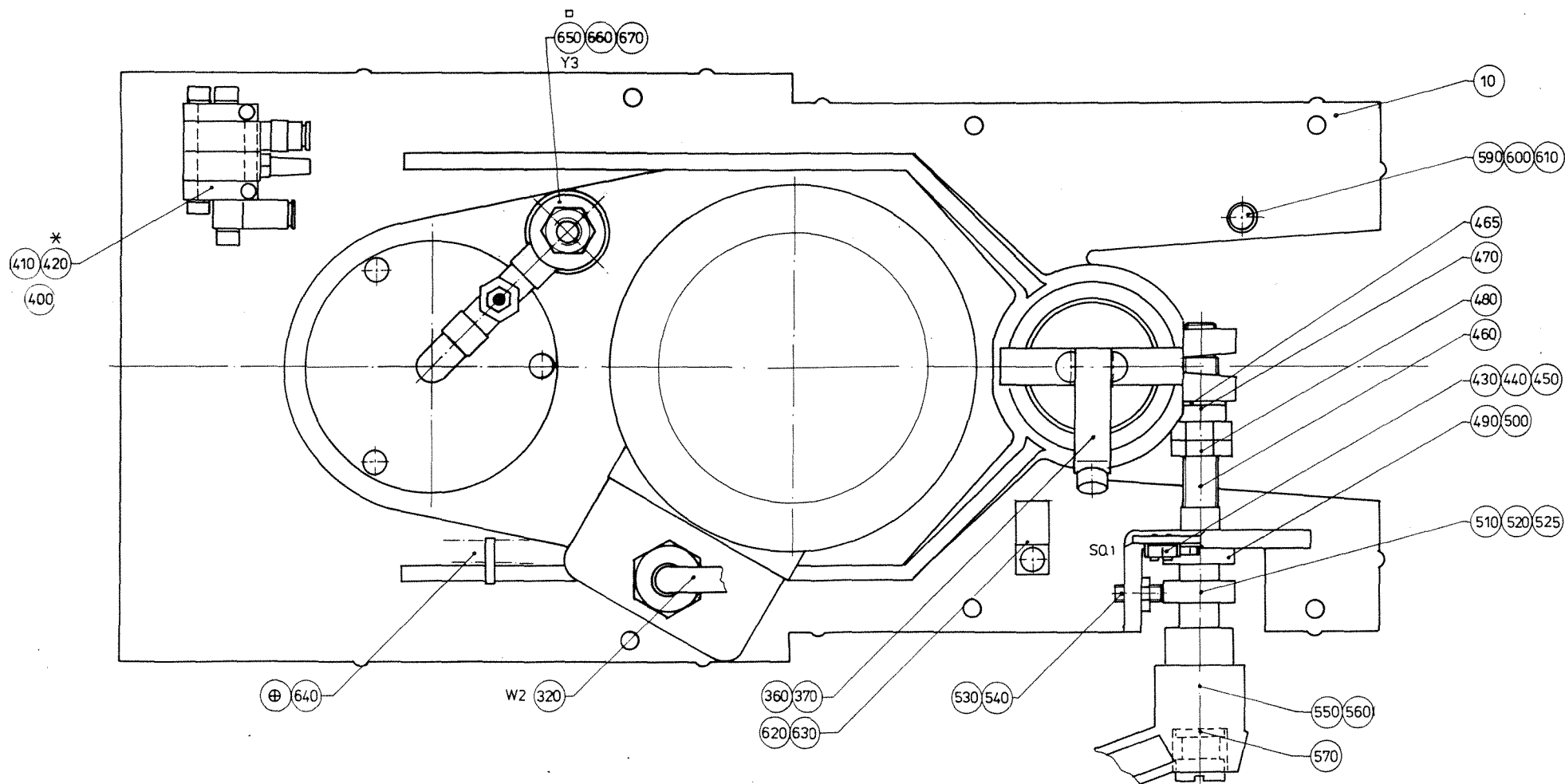
14800105 (2 of 2)

Pos. Description Spare Part No.

Chassis (drawing 2 of 2)

400	Valve block, complete	14800109
400	Gasket, fiber	2IF00010
400	3/2 solenoid valve 12VDC	2YM10114
430	Micro switch	14790217
550	Kipp-handle	2GH30012
560	Cylinder pin, stainless 3m6x15	2ZS01315
650	Quick release valve	2YH00040
660	Quick coupling	2NF10012
670	Gasket, fiber	2IF00011





Drawing

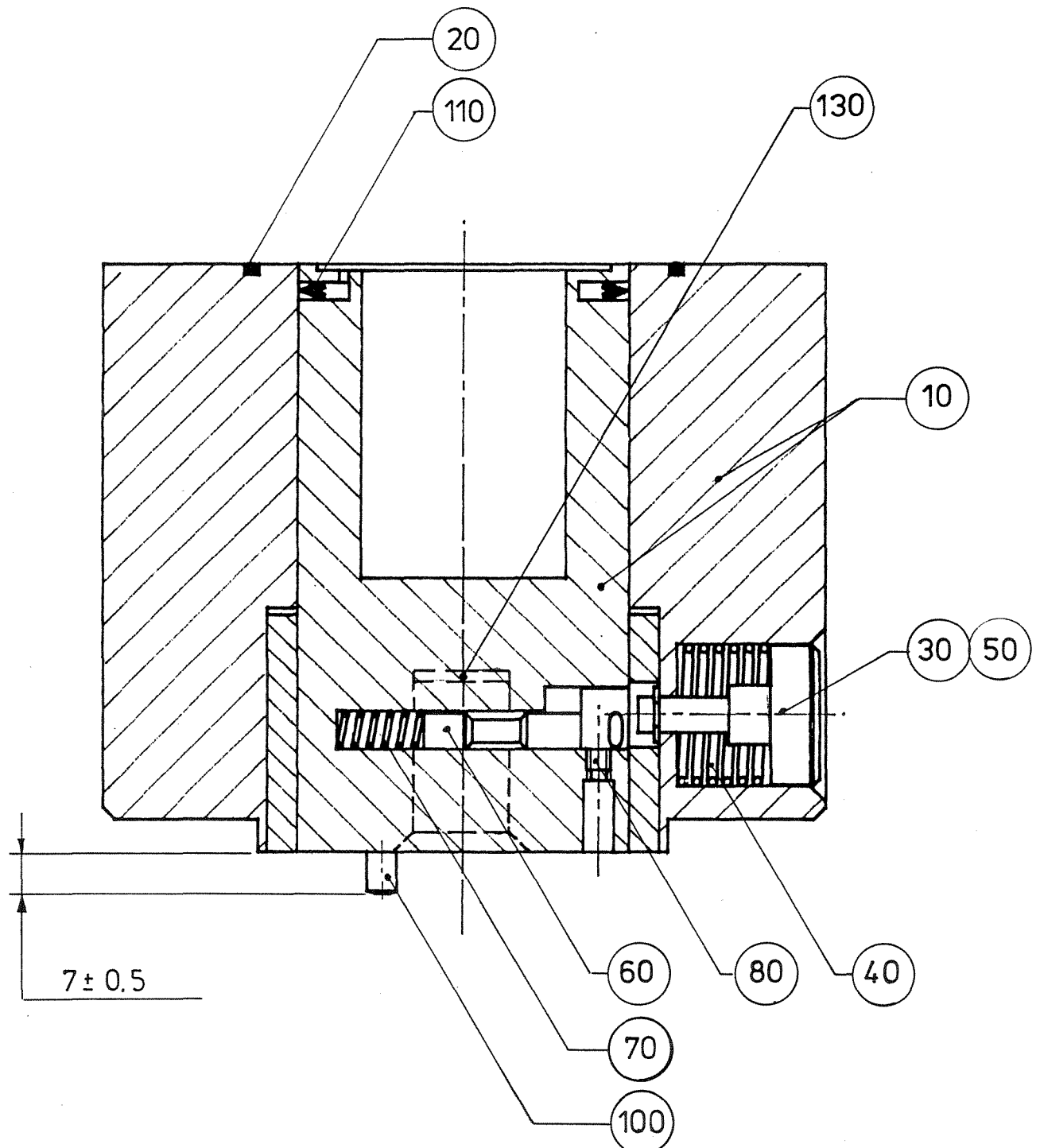
14800107

Pos. Description

Spare Part No.

8.2 Rotating head, details

20	O-ring 68.00-2.00	21O20080
30	Key	14790418
40	Pressure spring Ø22.1 x 0.9	14790421
50	Ring	2ZJ20040
60	Release	14790429
70	Pressure spring Ø5.2 x 0.6	14790430
110	K-ring	2IK00055
130	Rubber piece	14790442



Drawing

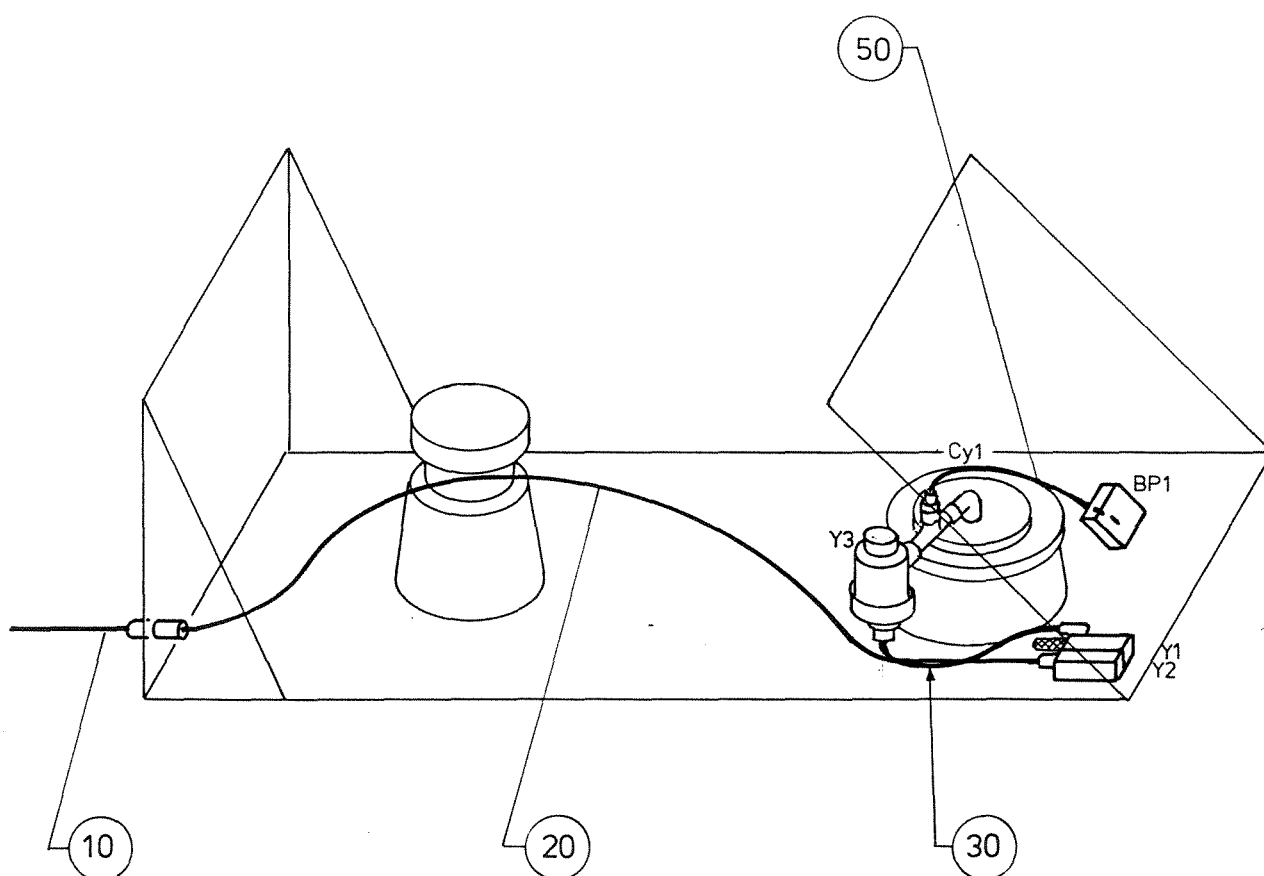
14800125

Pos. Description

Spare Part No.

8.3 Pneumatic connections

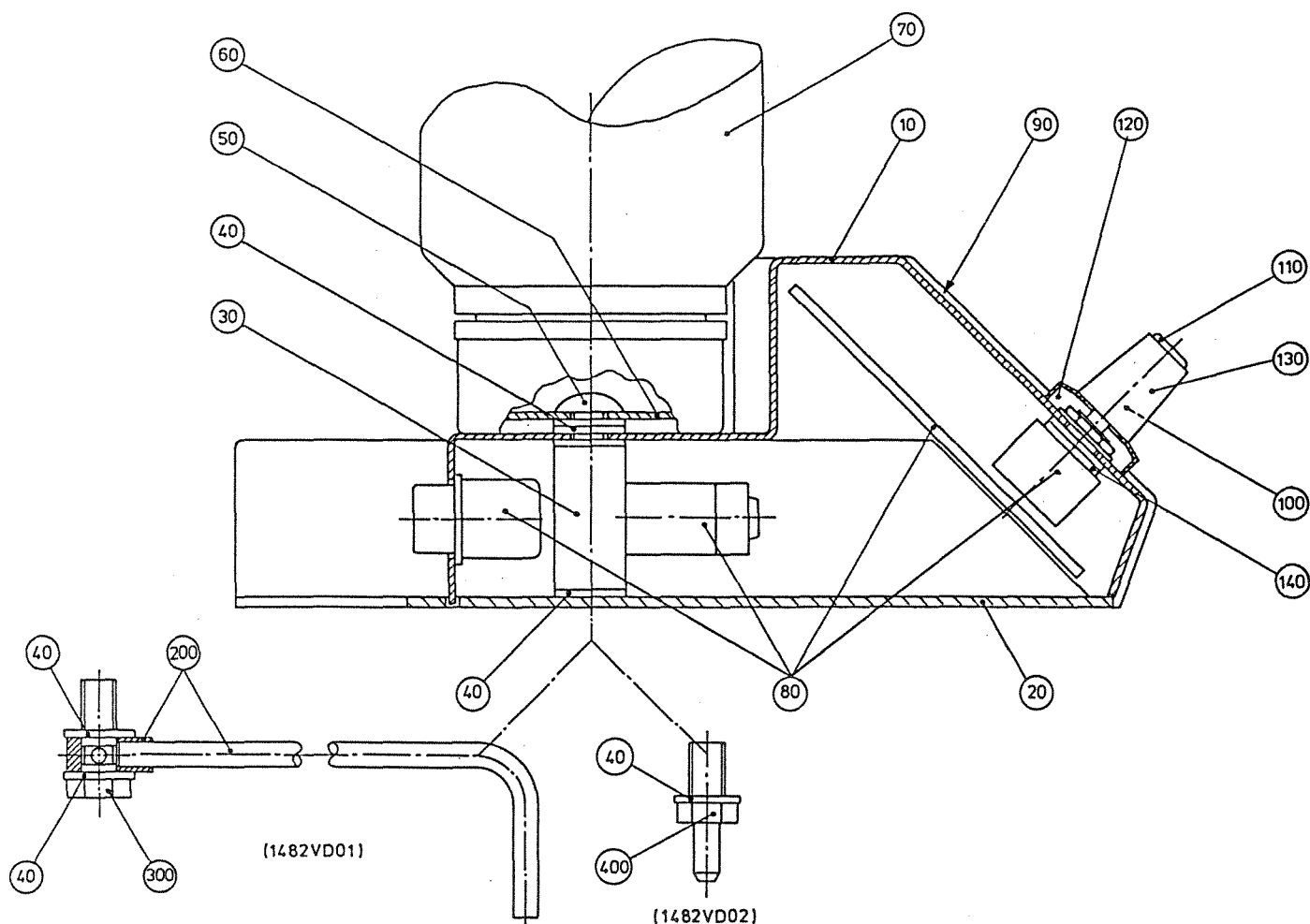
10	Nylon hose, superflex Ø8/Ø6, 550 mm	2NU12508
10	Quick-coupling double	2NF10055
10	Spiral hose type SPF 15, 333 mm	2WK90015



Drawing

14820010

Pos.	Description	Spare Part No.
8.4	Lupo	
40	Nylon washer	2ZE00510
50	Bottle screw	14820026
60	Washer Ø 31x1	14820027
70	Lupo lubricant bottle	14820028
80	PCB	14823000
100	Mode switch button	2GD12125
110	Cover	2GD51025
120	Cover with line	2GD02125
130	Dosing switch button	2GD12225
400	Hose nipple	14828001

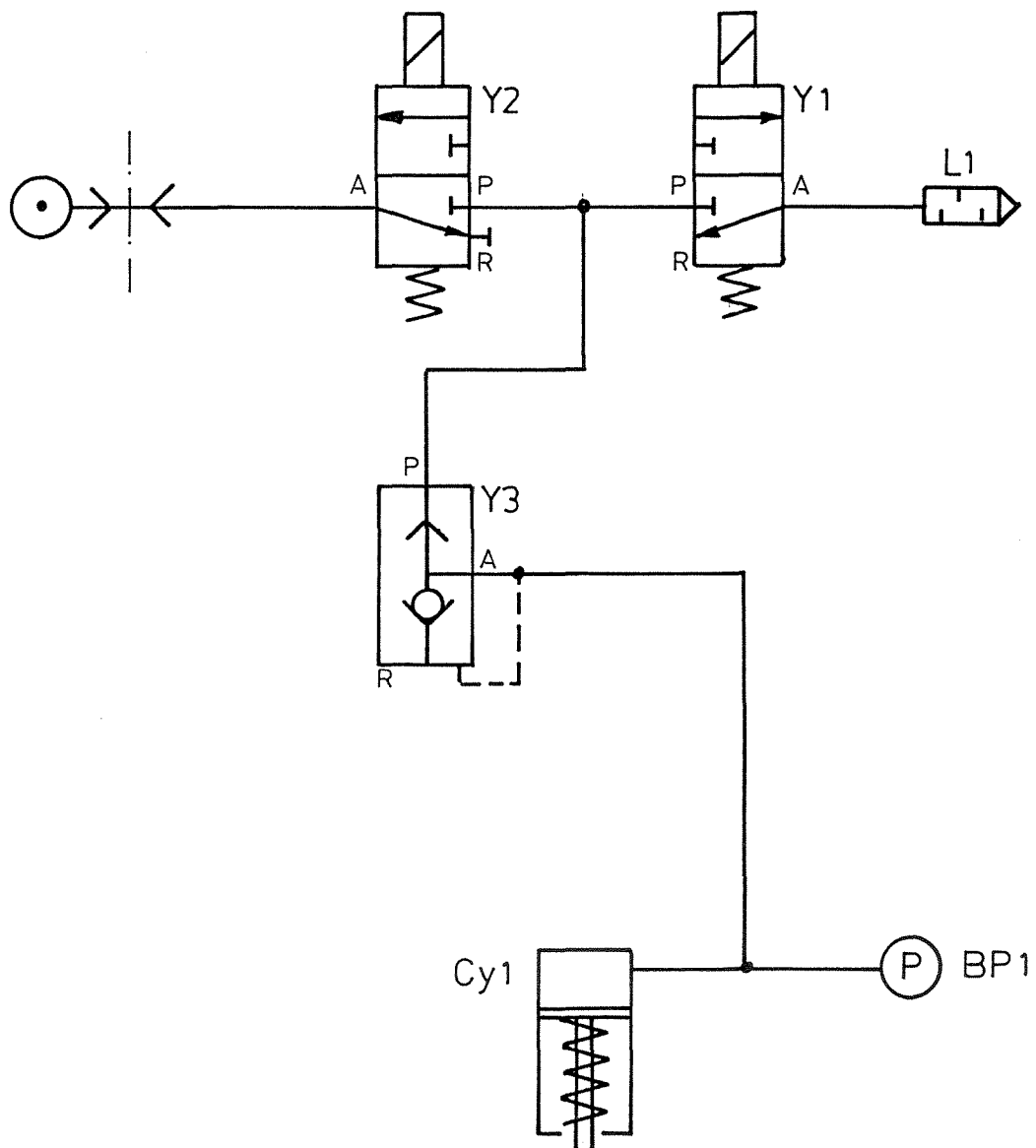


Diagram

14800130

Description

8.5 Pneumatic diagram



Drawing

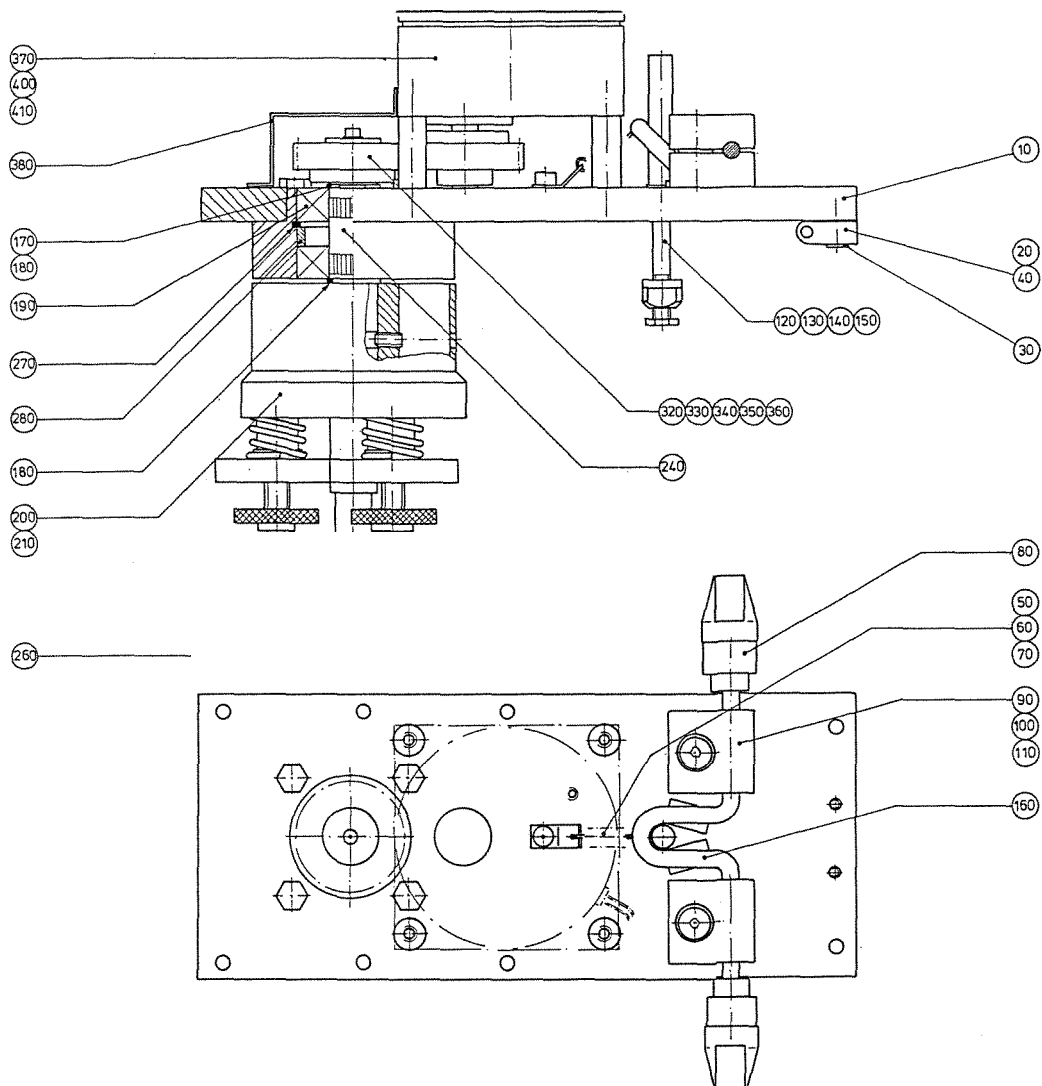
14810023

Pos. Description

Spare parts no.

8.6 Supporting plate

20	Hinge, center, mounted	14810030
30	Buffer	13820158
70	Release spring	14810024
320	Gear	14810007
	Gear motor 100-120 V	14810054
	Main cable with US plug	2WC07503
	Gear motor 200-240 V	14810055
	Main cable with SCUKO	2WC01234



Drawing

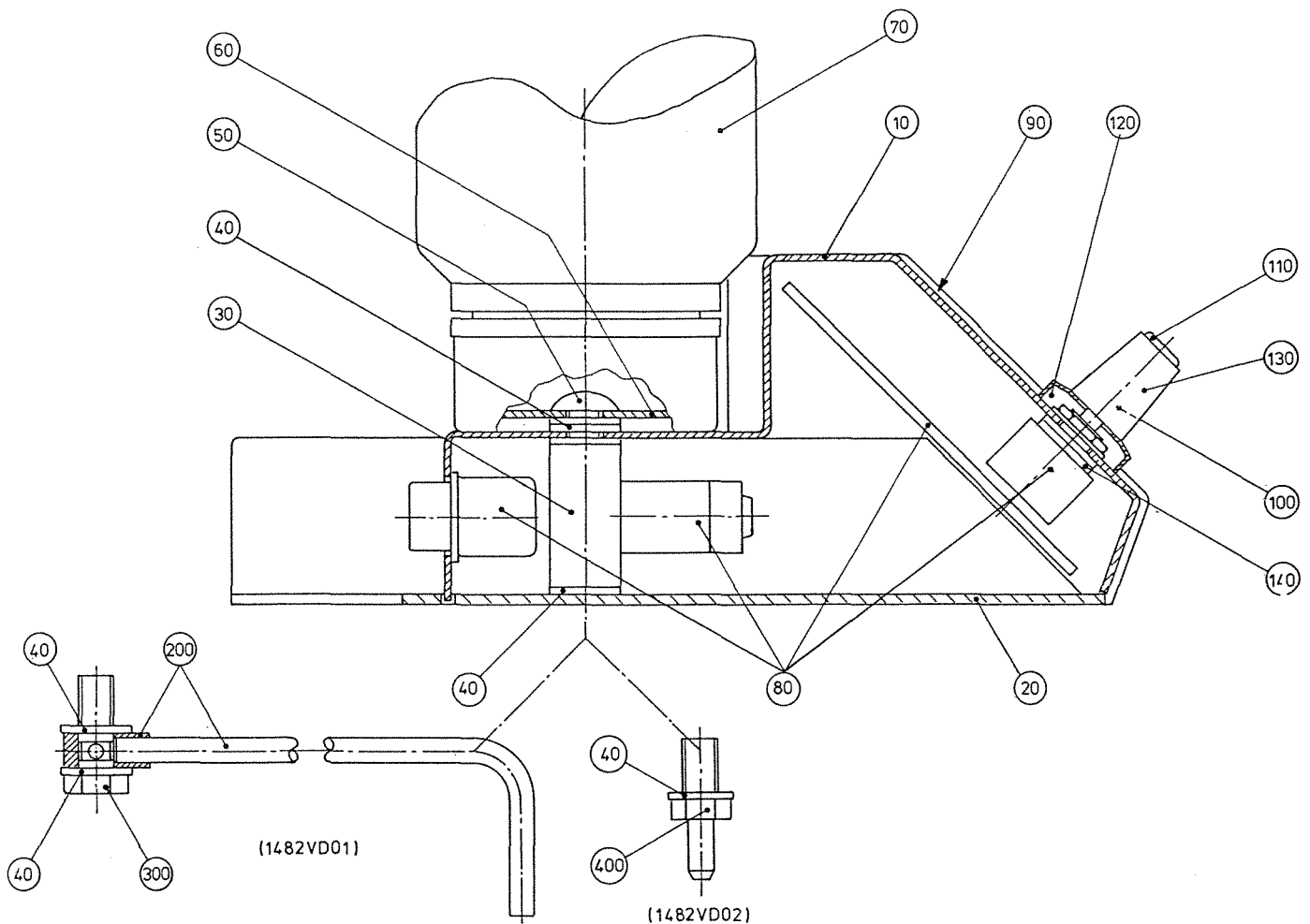
14820010

Pos. Description

Spare parts no.

8.7 Lupo

50	Bottle screw	14820026
55	Nylon washer	2ZE00510
70	Lupo lubricant bottle	14820028
80	PCB logical card	14823000
300	Screw	14820023
200	Dosing nozzle, complete	14820040
400	Hose nipple	14828001
100	Mode switch button	2GD12125
110	Cover	2GD51025
130	Dosing switch button	2GD12225
120	Cover with line	2GD02125



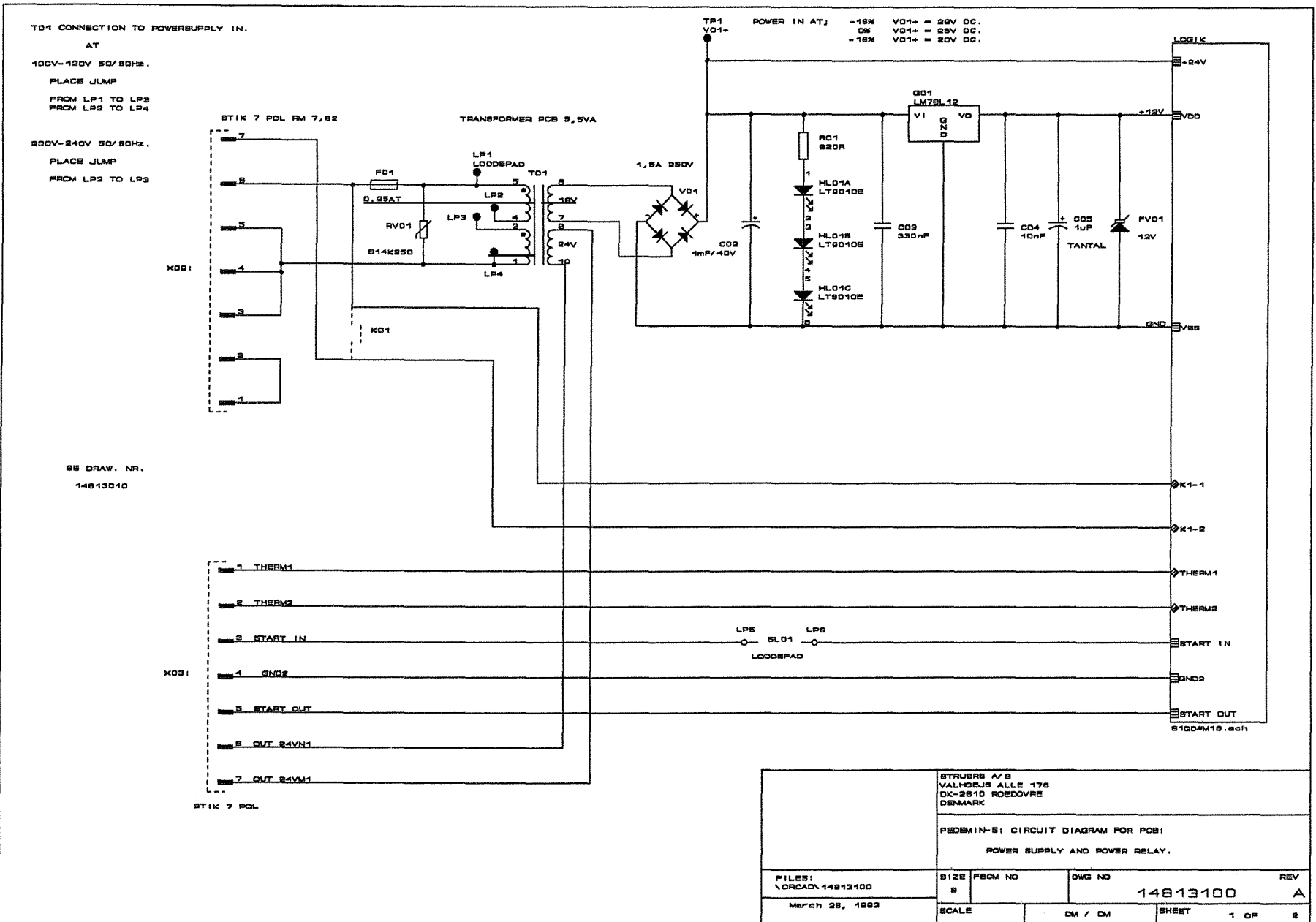
Diagram

Description

14813100 (1 of 2)

8.8 Circuit diagram for PCB

STRUERSE A/S VALHØJES ALLE 175 DK-2810 ROEDØVRE DENMARK			
PEDEMIN-S: CIRCUIT DIAGRAM FOR PCB: POWER SUPPLY AND POWER RELAY.			
FILES: \\CROCAD\14813100	SIZE B	PSCM NO	DWG NO 14813100
MARCH 28, 1993	SCALE	CM / CM	REV A
		SHEET	1 OF 2

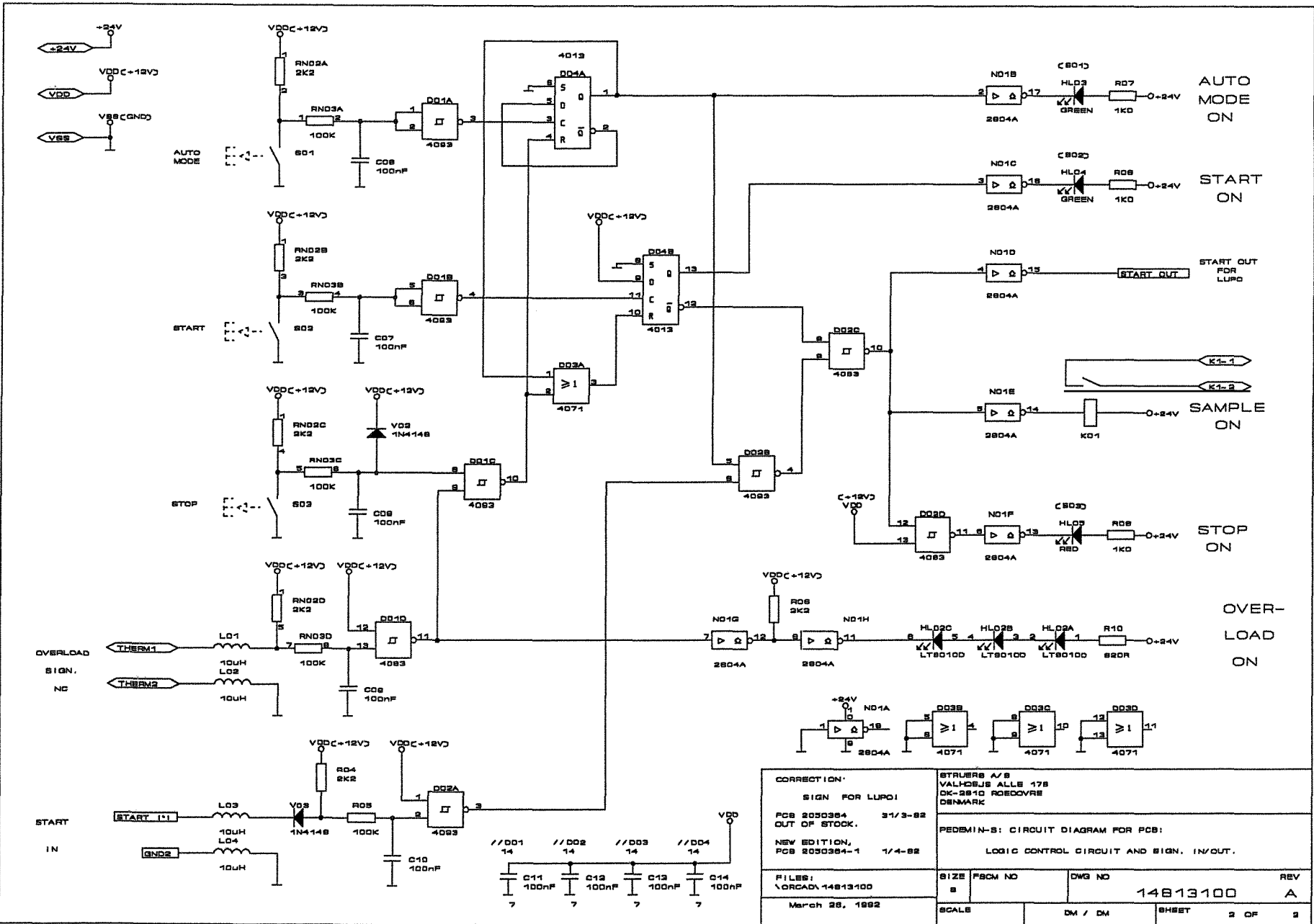


Diagram

14813100 (2 of 2)

Description

Circuit diagram for PCB

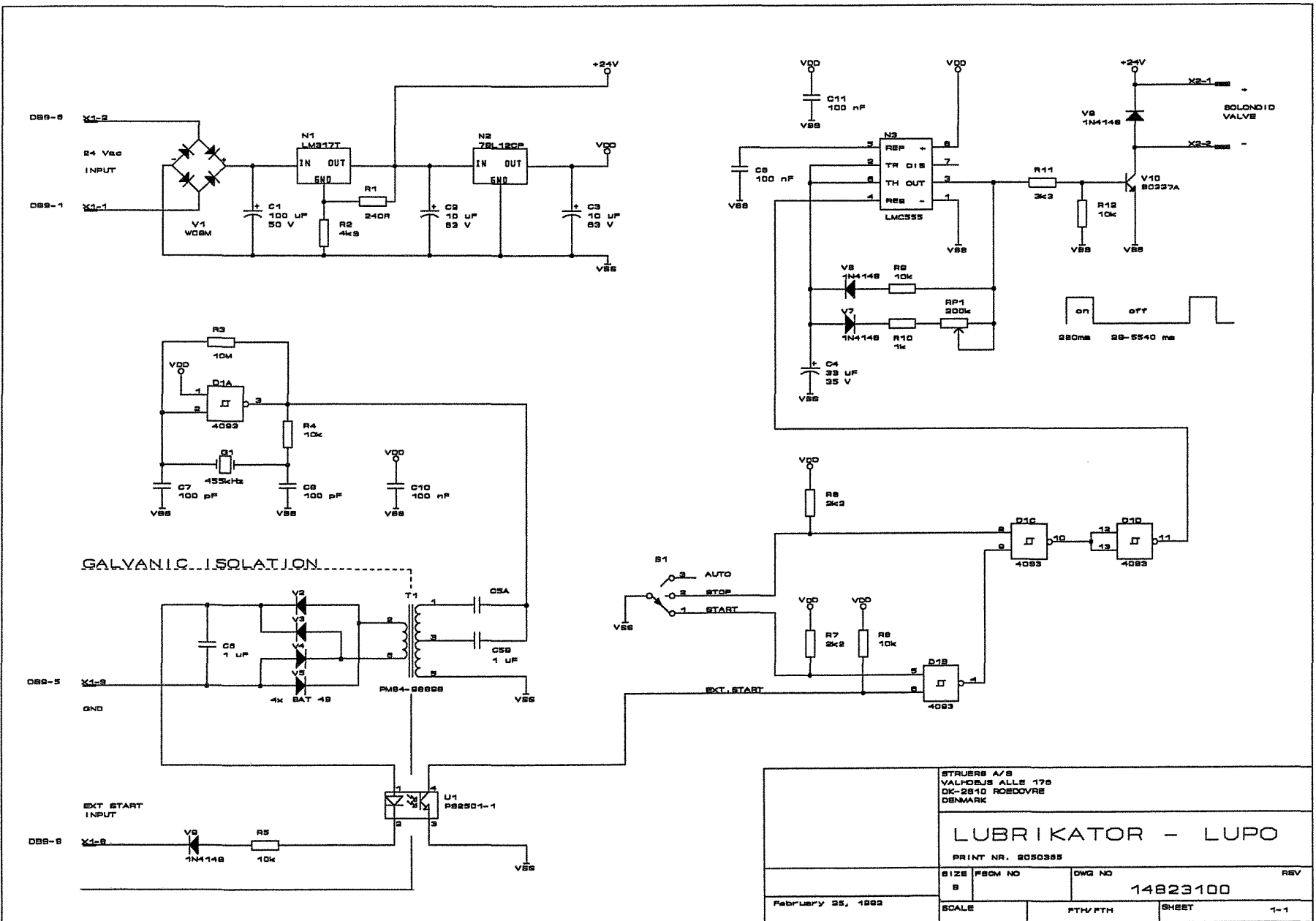


Diagram

14823010

Description

8.9 Circuit diagram for Lupo



9. Technical data

<i>Voltage/frequency</i>	3 x 200 V, 50 Hz 3 x 220 V, 50 Hz 3 x 380 V, 50 Hz 3 x 415 V, 50 Hz 3 x 200 V, 60 Hz 3 x 220 V, 60 Hz 3 x 440 V, 60 Hz 3 x 480 V, 60 Hz
<i>Fuse</i>	Max. 16 A, external
<i>Motor output</i>	90W
<i>Air pressure</i>	Min. 5 bar, max. 6.5 bar
<i>Rotational speed</i>	150 rpm
<i>Direction of rotation</i>	Co-rotation
<i>Force on specimens</i>	30-400 N in 10 N steps
<i>Specimens in specimen holder</i>	Ø 10-40 mm
<i>Specimen height</i>	8-35 mm
<i>Safety standard</i>	IEC 204 / EN 60204-1 (VDE 0113)
<i>Dimensions</i>	Height: 320 mm Width: 205 mm Depth: 450 mm
<i>Weight</i>	25 kg

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11. Quick Reference Card

Inserting a specimen holder

- Place the specimen holder stud in the quick-coupling.
- Press the black button and adjust the coupling stud in the quick-coupling until a click is heard.
- Adjust the force with the  touch button on the front panel. Set the timer with the .

Starting Pedemax-S on Rotopol

- Set Lupo (if you need lubricant) and Pedemax-S to Auto mode.
- Press START  on Rotopol. After the preset time Pedemax-S and Rotopol will stop.

Starting Pedemax-S on Planopol

- Set Lupo to Auto mode (if you need lubricant).
- Press START  on Planopol.
- Press START  on Pedemax-S.
- After expiration of the preset preparation time, Pedemax-S stops and return to starting position. Planopol is stopped by manually pressing stop . Lupo may stay in Auto mode, ready for the next method step after adjustment of lubricant.