Oberflächentechnik
Surface Technology

Instruction Manual

Single-wheel surface lapping and polishing machine EL 600/700

Instruction manual

for the

single-wheel surface lapping and polishing machine

EL 600

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1 List of contents

2 Tips on using the manual

This manual has been written for the machine user to ensure a problem operation, care and maintenance.

Important instructions and information concerning safety and reliability have been highlighted.

The symbols used in the manual have the following meanings:

CAUTION! *Working and operating processes which must be observed to the exclude any risk to persons.*

Working and operating processes which must be observed to the avoid any damage to the machine.

Technical information to which the machine operator must give special attention.

The illustrations and diagrams are numbered in sequence within each chapter. Some of these illustrations have keys. References to illustrations within the text e. g. (5.1/2) have the following meaning:

5.1 = Figure 5.1

2 = Position 2 in the key to the figure.

Please feel free to call our customer service department at any time should you encounter technical problems which are not dealt with in this manual:

Telephone +49 (0)2204/839-38
Telefax +49 (0)2204/839-60.

3 Safety instructions

(1) This machine has been built according to the latest technical standards and generally accepted safety regulations. Nevertheless, it can constitue a risk to the operator or third parties and a hazard to the machine itself or other equipment during use.

(2) Only use the machine if in perfect working order and for its intended purpose. You must always pay attention to the instruction manual and safety instructions therein and be aware of the risks! Repair any faults which could affect the machine's safety immediately by yourself or have these repaired.

The machine should only be used for lapping, polishing or honing according to the disk type used. Any other use will be deemed to be contrary to its intended purpose. The manufacturer cannot be held liable for any resulting damages. The risk is borne solely by the user.

Correct use also includes compliance with the instruction manual and an observation of the care and maintenance conditions.

(3) Keep the instruction manual handy at the machine's place of use.

(4) Pay attention to and observe generally applicable statutory and otherwise binding regulations relating to accident prevention and environmental protection in addition to the information provided in the instruction manual!

(5) All personnel commissioned to work on or with the machine must have read this instruction manual, and particularly the safety instructions chapter, before starting work. This applies especially for personnel who only work with the machine ocassionally.

CAUTION!

(6) Observe safety notes on the machine and keep them legible.

(7) Stop the machine immediately should you notice changes to the machine or its operating behaviour that are relevant to its safety. Have these remedied before restarting work.

3 Safety instructions

(8) Do not carry out any modifications, additions or conversions to the machine! This also applies to the installation and adjustment of safety equipment.

(9) Spare parts must meet the technical requirements specified by the manufacturer. This can only be guaranteed with original JOKE spare parts.

(10) Any work on/with the machine may only be carried out by qualified, appropriately trained and authorised personnel. Pay attention to minimum statutory age limits!

(11) Personnel undergoing training or in a general apprenticeship should only be allowed to work with the machine under the constant supervision of an experienced operator!

(12) Restrain from any type of work that could jeopardise your safety.

(13) The machine may only be used if all protective and safety equipment is in place and in proper working order.

(14) Do not leave the machine unattended when switched on!

(15) Stop and secure the machine immediately in the event of malfunctions! Faults must remedied at once.

(16) Ensure sufficient ventilation of the working room when operating the polishing and lapping system!
If necessary, install a suction device in small rooms!

4 Warranty/Identification

joke Technology warrant the correct manufacture of every joke product which is delivered in accordance with the terms of contract and delivery.

This warranty does not cover damages caused by normal wear and tear, incorrect handling, negligent use, the fitting of non-original spare parts, inadequate care and/or a failure to comply with this technical manual.

The machine may only be used by appropriately trained personnel. If it is not, all warranty claims will be forefeited according to the terms of delivery.

Machine identification

The manufacturer's code, type code, and serial number can be found on the rear of the machine.

5 Machine overview

Intended use

The single-wheel surface lapping and polishing machines have been designed for lapping, polishing or flat honing.

The machines are fitted with lapping wheels, polishing wheels or fixed abrasive wheels depending on the field of use.

Wheels in connection with various lapping and polishing compounds are matched to the desired results of the finishing process.

The machines can be used to produce a smooth surface with low surface roughness values on workpieces of almost any material.

The main fields of use are in the production of mechanical components, components for electronics and optical systems.

5 Machine overview

Construction of a single-wheel surface lapping and polishing machine

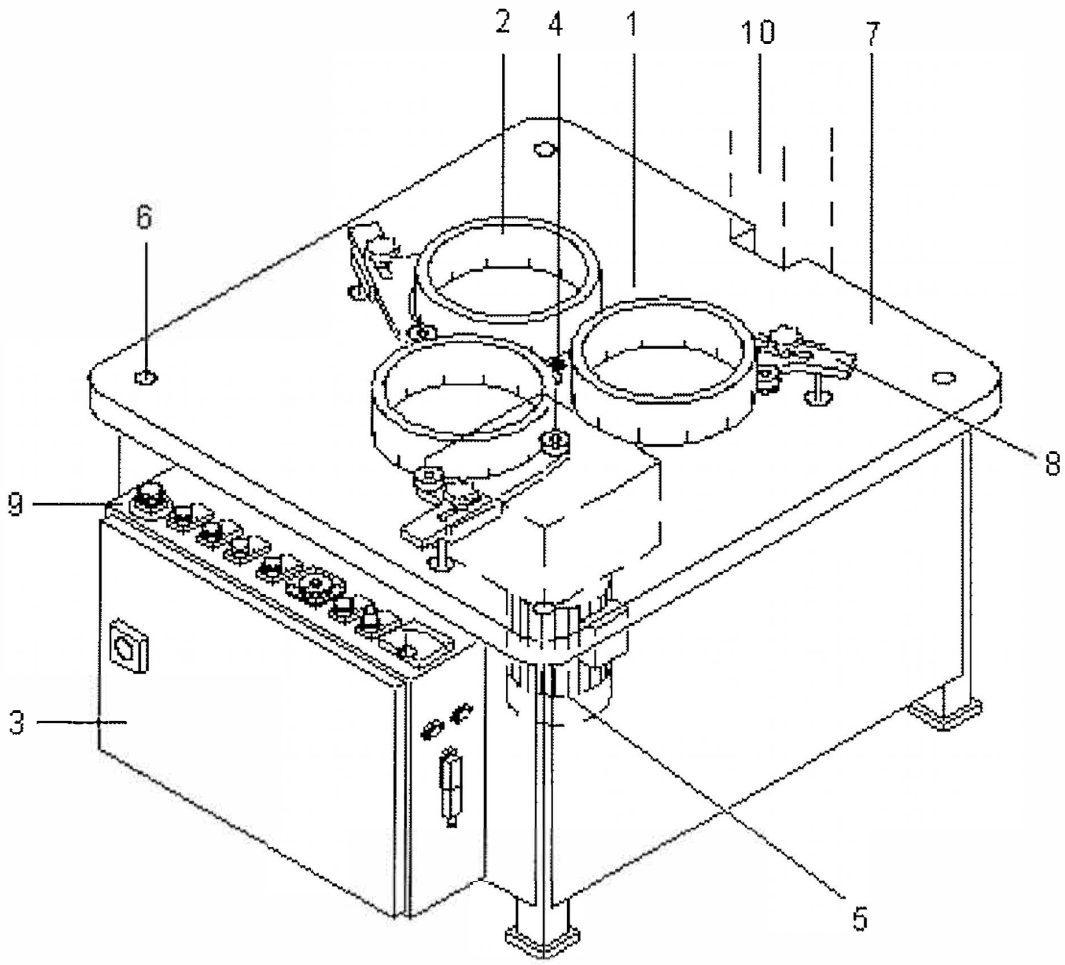


Figure 5.1 Machine overview

1 - Lapping or lapping and polishing wheel
2 - Dressing rings
3 - Switch and control box
4 - Screw to fasten the lapping wheel
5 - Motor and gear
6 - Screw to adjust the height of the table
7 - Machine table
8 - Roller yoke and guide rails
9 - Control desk
10 - Column for the pneumatic pressure device

6 Technical data

Technical data EL	600	700
Number of dressing rings	3 pieces	3 pieces
Dressing ring internal Ø	248 mm	275 mm
Lapping wheel Ø	610 mm	700 mm
Speed control	+	+
Lapping wheel speed/speed range	30-90 mm-1	30-90 mm-1
Machine length without pneumatics	1.300 mm	1.220 mm
Machine width	1.160 mm	1.240 mm
Machine height without pneumatics	1.375 mm	1.070 mm
Machine height with pneumatics	1.775 mm	1.775 mm
Mains voltage	400 Volt, 3~50	400 Volt, 3-50
Fuses	16 A, slo-blo	16 A, träge
Connected load	3,7 KVA	3,7 KVA
Drive motor	2,2 kW	3,7 kW
Pumpmotor	0.08 kW	0.08 kW
Lapping compound/tank capacity	12 l	12 Ltr.

Weight

Weight without pneumatics	approx. 720 kg	750 kg
Weight with pneumatics	approx. 820 kg	850 kg

7 Operation/Use

Unpacking the machine

(1) Remove all packaging materials.

Dressing rings, weights and lapping wheels are precision parts!

Handle carefully and protect against damage.

(2) Position the machine in its location using suitable lifting gear.

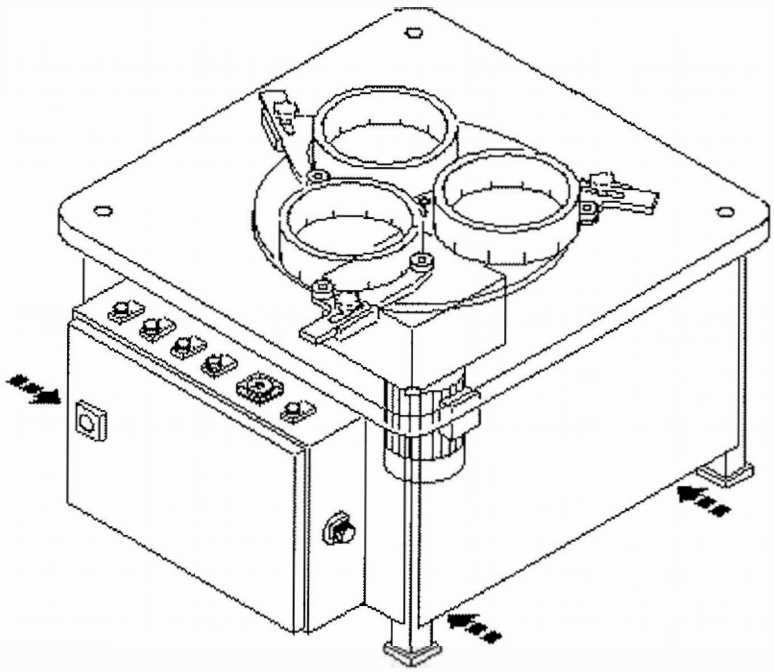
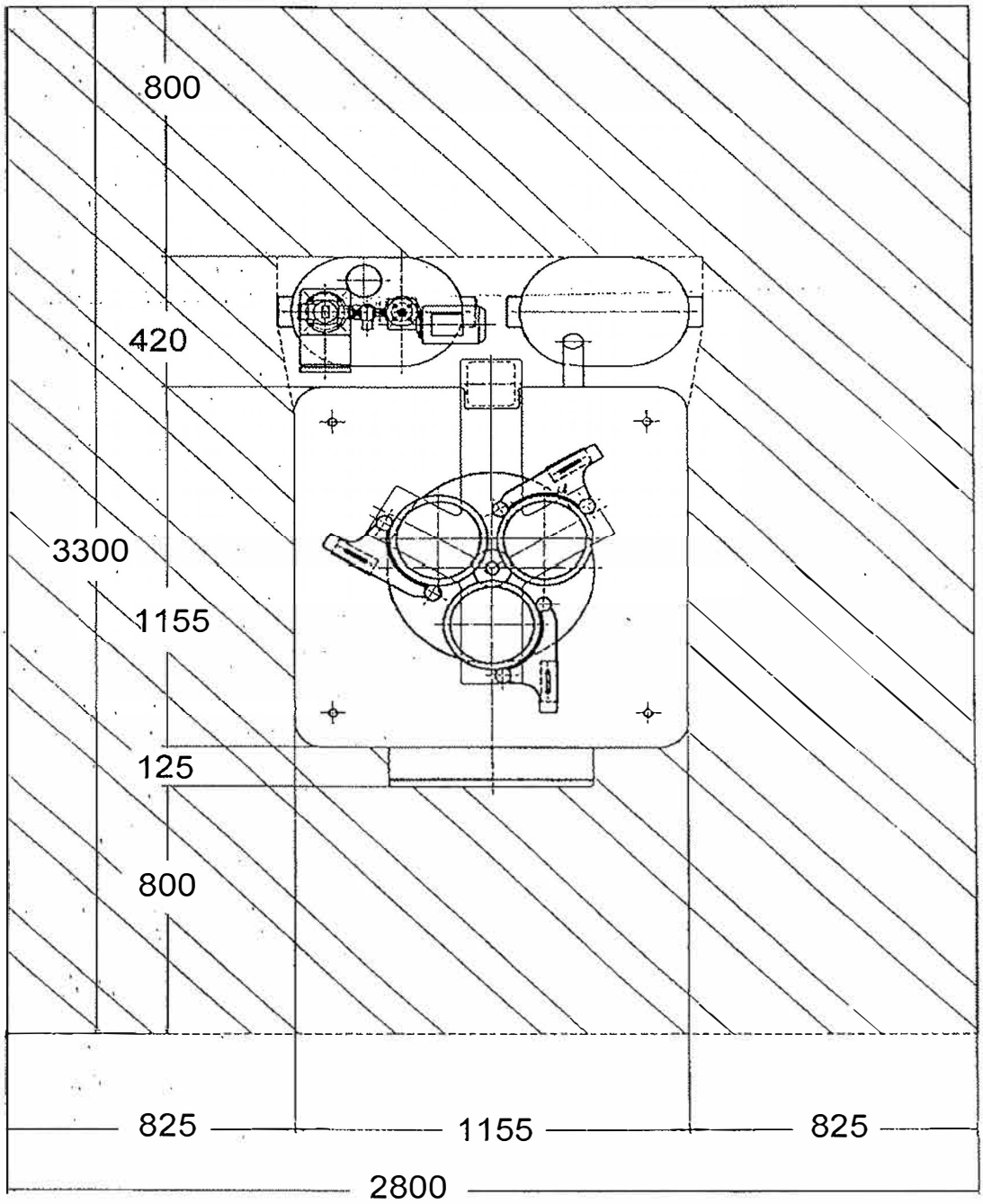


Figure 7.1

Space assignment plan EL 600



Dimensions in millimetres

Figure 7.2

7 Operation/Use

Machine location

(1) Space requirements see space assignment plan Figure 7.2.

The machine may not be positioned anywhere where it is exposed to emissions from other machines (dust, vibrations)!

(2) Align machine with a spirit level; reference surface is the lapping wheel.

Starting the machine

(1) Remove the dressing rings and hand weights from the lapping wheel.

(2) If a pneumatic pressure device has been supplied make the air connection via the service unit.

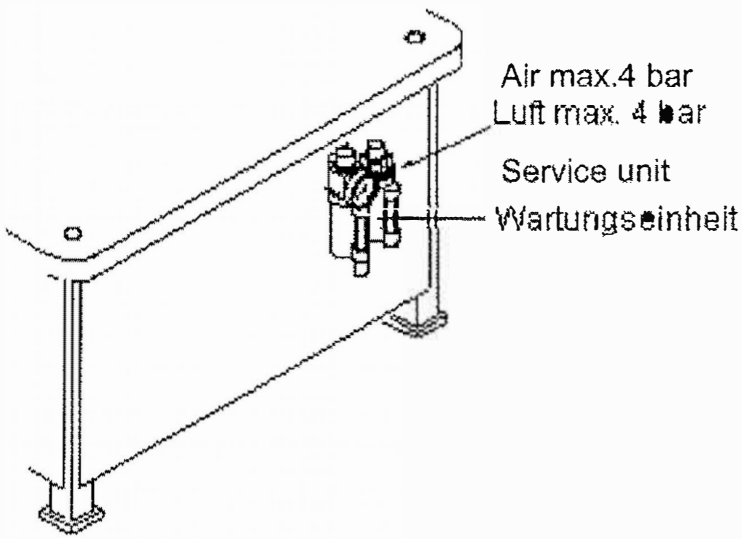


Figure 7.3

(3) Move pressure weights to the upper end position using the control valves (see Figure 7.7).

(4) Plug the machine's mains lead into a socket which provides the mains voltage specified in the technical data.

Make sure that this is earthed correctly!

7 Operation/Use

Check direction of rotation of the lapping wheel

(1) Switch on mains switch on the side of the control desk.

(2) Press the „START" (7.6/3) button.

CAUTION! ***Dressing rings must have been removed from the lapping wheel.***

If the direction of rotation is incorrect the rings slide off the machine! Risk of injuries!

The lapping wheels must rotate in a **counter**-clockwise direction.

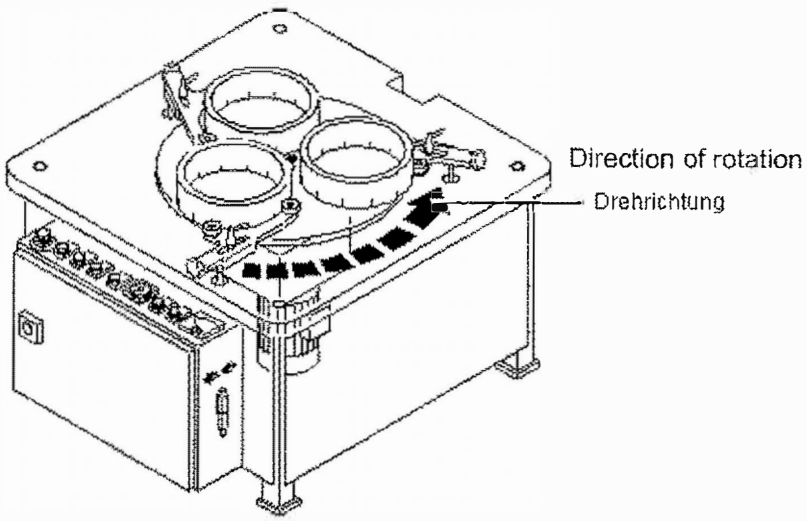


Figure 7.4

If the direction of rotation is wrong, correct by exchanging the phases of the electrical connection.

CAUTION! ***This work may only be performed by a qualified electrician !***

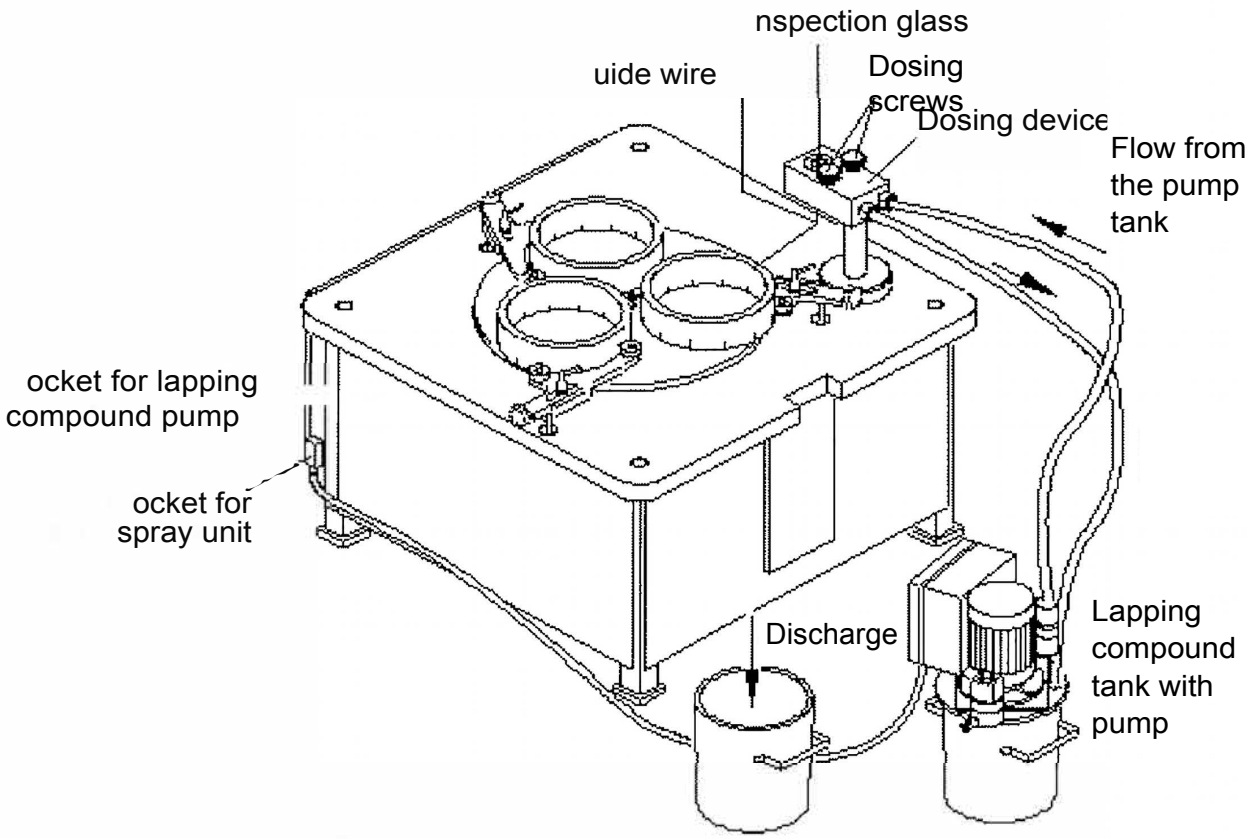
Further work before starting

(1) Degrease dressing rings and lapping wheels with a suitable compound.

(2) Place dressing rings on the lapping wheel in the „neutral" position.

(3) Fit lapping compound tank with pump and waste tank (see Figure 7.5).

7 Operation/Use



7 Operation/Use

Controls on the lapping machine

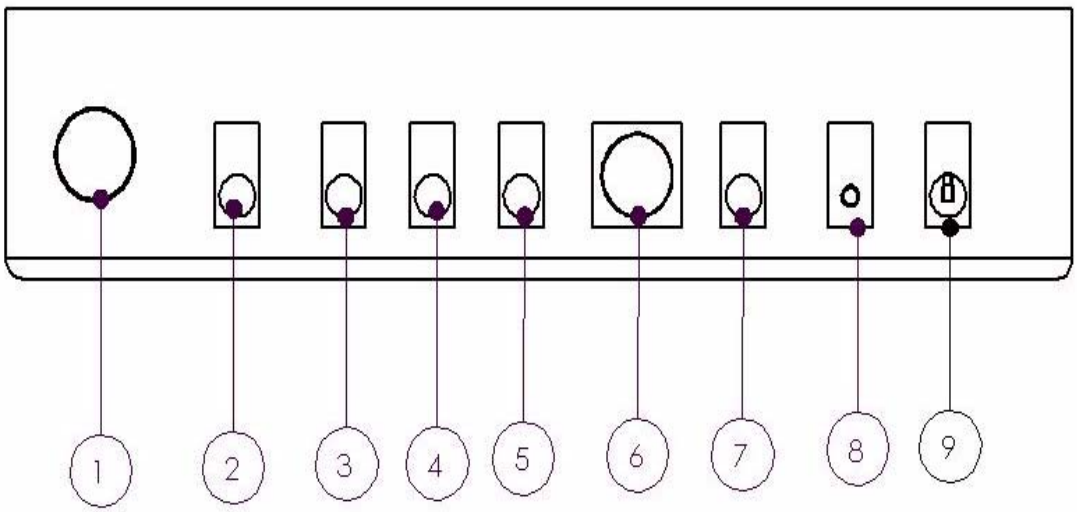


Figure 7.6

1 - EMERGENCY OFF
2 - control light MAINS ON
3 - machine START
4 - machine STOP
5 - PUMP START
6 - TIME CONTROL
7 - Control light LAPPING TIME END
8 - potentiometer SPEED
9 - control SPEED

Pneumatic pressure device

The pneumatic pressure device is available for JOKE® lapping machines in the „EL" series, also as a retrofit set.

Diagrammatic view

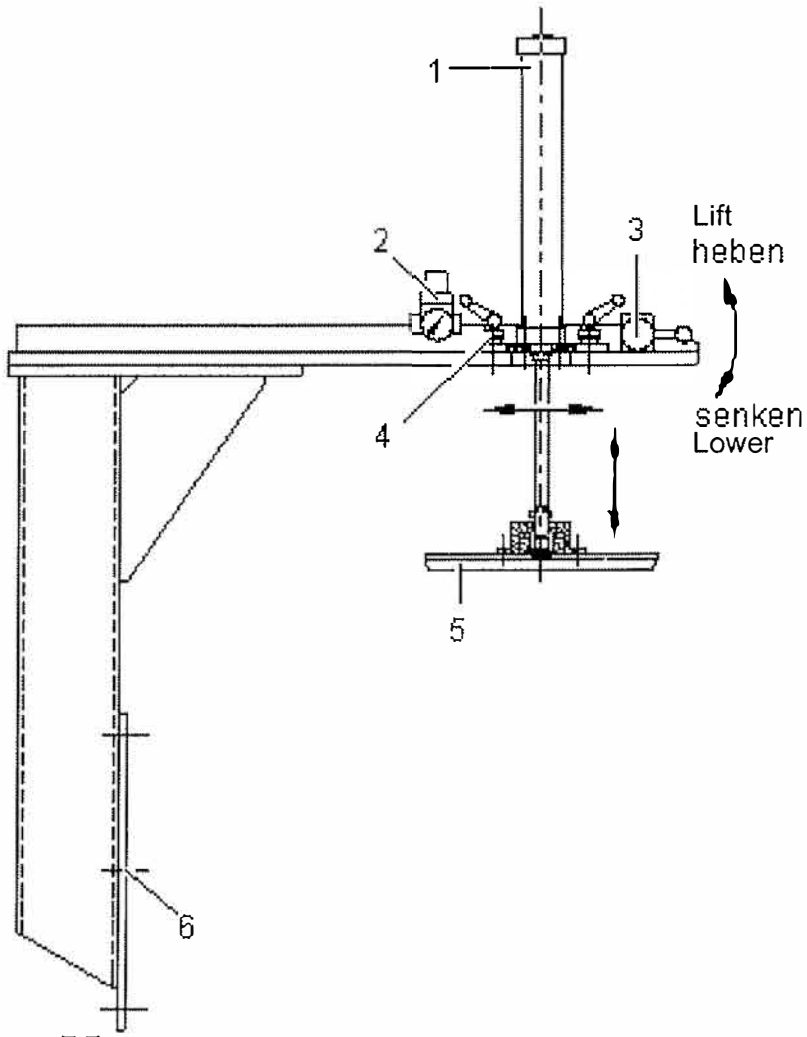


Figure 7.7

1 - Pneumatic cylinder
2 - Pressure control valve
3 - Control valve
4 - Locking screw for cylinder holding plate
5 - Pressure plate
6 - Mounting flange for pneumatic pressure device

7 Operation/Use

The three pressure cylinders (7.7/1) of the pneumatic pressure device can be individually moved to their working or end-of-travel positions by means of the control valves (7.7/3).

The necessary working pressure can be controlled via separately set pressure reducing valves (7.7/2). One exception here is the machine type „EL 380-P/N“ which has a pressure reducing valve for all three pressure cylinders.

The position of the pneumatic pressure cylinders can be adjusted relative to the lapping machine dressing rings via a guide after loosening two locking screws (7.7/4).

The compressive force exerted is shown in the corresponding diagram.

The necessary compressive force depends on the size of the area to be processed and the processing method selected. This is normally determined empirically.

Run at a lower travelling speed for safety reasons!

⚠ ***The travelling speed of the cylinders is throttled to < 10 mm / sec. for safety reasons.***

General advice on lapping

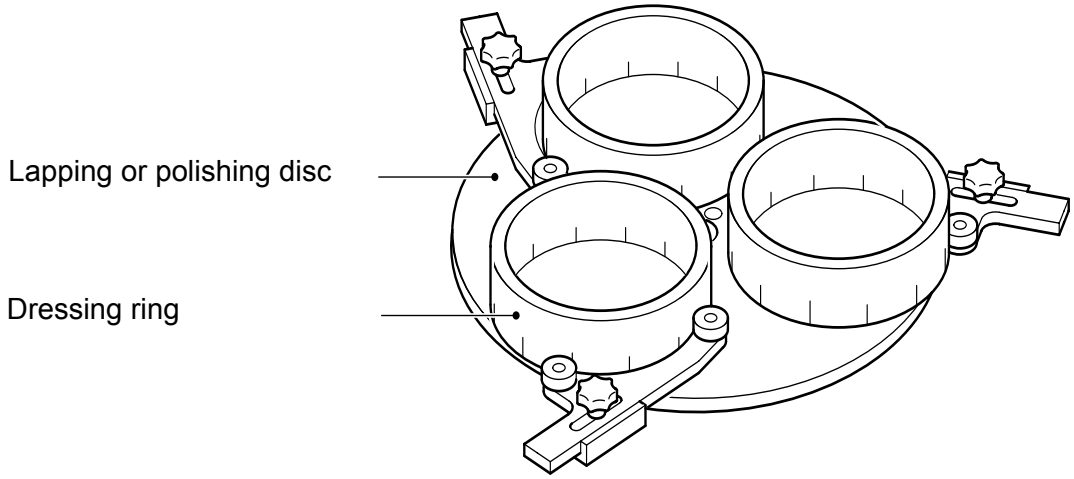


Bild 7.8

The dressing rings serve for holding the lapping disc flat and guiding and receiving the workpieces in addition to distributing the lapping or polishing medium.
The dressing rings run at three positions against machine yokes which are capable of transferring shearing force.
The means of transmitting force to the workpiece is either the dressing ring itself (with the ring fully loaded) or a mask corresponding to the workpiece(s).
The mask is generally a hard paper disc with the internal dimension of the sealing ring and recesses for receiving the workpieces.

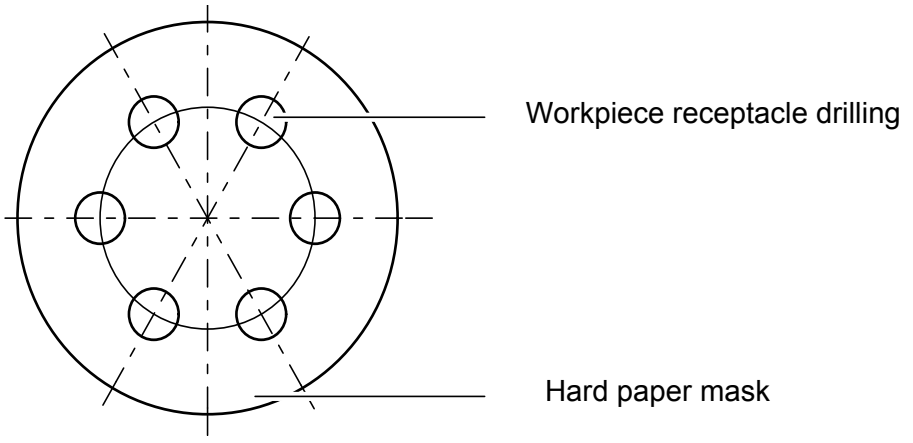


Bild 7.9

This mask should have approx. 1 - 2 mm of play in relation to the dressing ring; the workpieces should have approximately the same play in the mask in order to ensure flat contact between the workpiece surface and the lapping disc.
The hard paper masks are to be provided with suitable spacers (e.g. commercially available U washers) in order to limit the lapping process to the workpieces and the dressing rings.

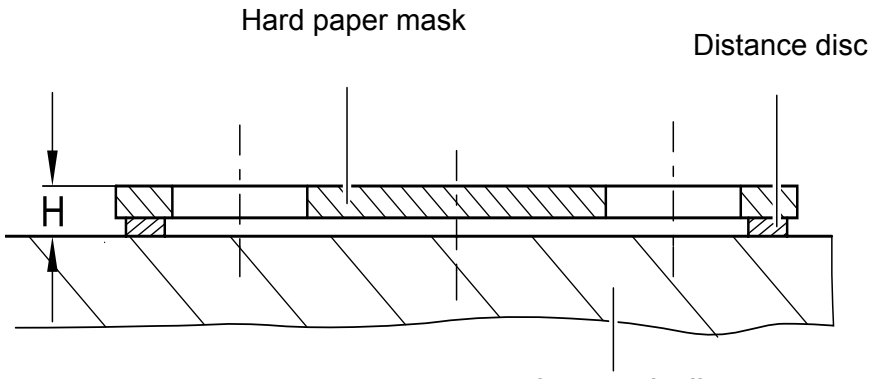


Bild 7.10

The height "H" must be less than the height of the workpieces to be processed.
The dressing rings are fitted with workpieces after the lapping disc displays an adequate film of lapping medium.
This is achieved by a brief period of machining with the lapping machine running idle but with the lapping medium supply system activated.
When the dressing rings are equipped with workpieces, the contact pressure required for machining is created by applying the hand weights or, if the machine is equipped with a pneumatic system, by charging the contact pressure cylinder.
Compensation washers (soft rubber material) should be placed between the workpieces and the contact pressure weights to compensate for any differences in dimensions of the individual.

Lapping

The following components are needed for the processing method „Lapping".

(1) Lapping wheels of fine grit chill casting .

(2) Lapping compound pump with tank and waste tank (optional with clock device).

(3) Lapping compound (abrasive), e. g. AL_2O_3, Sic or B_4C.

(4) Lapping fluid.

Setting up the lapping machine

(1) Mix abrasive and lapping fluid (oil or H_2O with anticorrosive) in the lapping compound tank at a ratio of approx. 1:7 (standard).

The mixing ratio has to be varied depending on the processing parameter.

Pay attention to the max. lapping compound level.

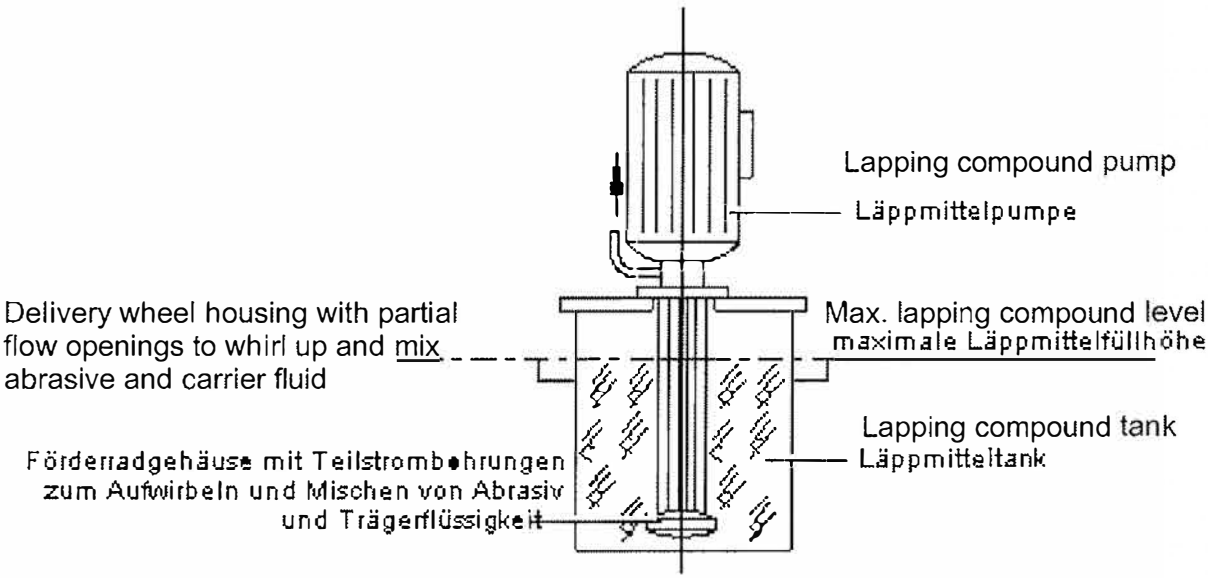


Figure 7.12

(2) Läppmittel- und Abfalltank an der Maschine positionieren.

Läppmittelpumpe montieren (Bild 7.5).

Pumpe an Steckdose (7.6/8) anschließen.

Takteinrichtung an Steckdose (7.6/9) anschließen.

(3) Taste (7.6/3) „PUMPE“ Start drücken. Läppscheibe rotiert noch nicht, wird jedoch mit Läppmittel benetzt.

(4) Mit der Taste (7.6/2) Maschine „STOP“ kann sowohl die Maschine als auch der Förderstrom des Läppmittels gestoppt werden.

(5) Außerdem startet die Pumpe automatisch durch Betätigen der Taste (7.6/1) „START“.

(6) Läppmaschine mit Werkstücken beladen (siehe „Allgemeine Hinweise“).

(7) Einstellen der Läppzeit:

Die Schaltuhr ist auf eine Läppzeit von 10 Min. voreingestellt.

Wird die Läppzeit von 10 Min. durch Stoppen der Maschine unterbrochen, zählt die Uhr nach Wiederstart der Maschine weiter. Wenn die Läppzeit von 10 Min. abgelaufen ist, stoppt die Maschine von selbst!

Bei Wiederstart fängt die Uhr neu an zu zählen. Um die voreingestellte Läppzeit zu verändern müssen die Wippschalter 1 – 4 betätigt werden.

Durch Bestätigen der RST-Taste wird die gewünschte Zeit übernommen.

Die Zeit kann beliebig von 0-99,55 Min. eingestellt werden.

Bild 7.12

(8) Läppmaschine durch Drücken des Tasters (7.6/1) Maschine „START“ starten.

Die Maschine verfügt über einen Sanftanlauf und erreicht erst nach einigen Sekunden die eingestellte Drehzahl.

Dies ist erforderlich, um die Werkstücke nicht beim Anlauf der Maschine zu beschädigen!

Nach Ablauf der voreingestellten Läppzeit (7.6/5) schaltet die Maschine automatisch ab.

(9) Mit der Taste (7.6/2) Maschine „STOP“ kann sowohl die Maschine als auch der Förderstrom des Läppmittels gestoppt werden.

Die Anlaufzeit ist werksseitig an der Drehzahlsteuerung eingestellt. (Siehe Anhang Steuerung).

Die erforderlichen Bearbeitungsparameter für den Prozeß können in der joke Anwendungstechnik unter der Tel.-Nr. 002204/839-77 erfragt bzw. ermittelt werden.

Polierläppen

Für das Polierläppen sind folgende Komponenten erforderlich:

(1) Polierläppscheibe

(2) Dosiergerät und Sprüharm.

Die Wahl der geeigneten Polierläppscheibe in Verbindung mit der Diamantsuspension (Körnung) wird aufgrund der gewünschten Prozeßresultate getroffen.

Für Bearbeitungsempfehlungen steht unsere Anwendungstechnik
Tel. 02204/839-77 zur Verfügung.

Setting up the machine for the polishing-lapping process

(1) Screw glass container with Hyprez® Fluid and Hyprez® diamond emulsion beneath the dosing device.

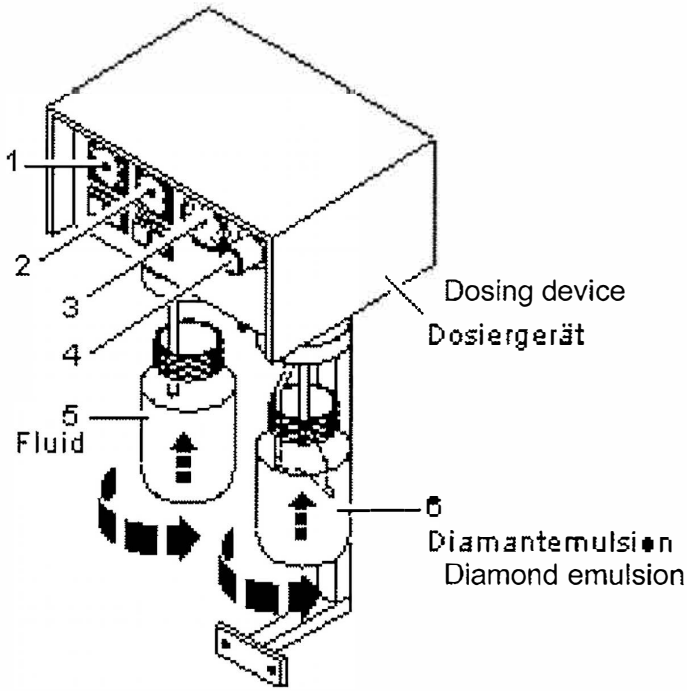


Figure 7.14

(2) Connect dosing device to air and electricity.

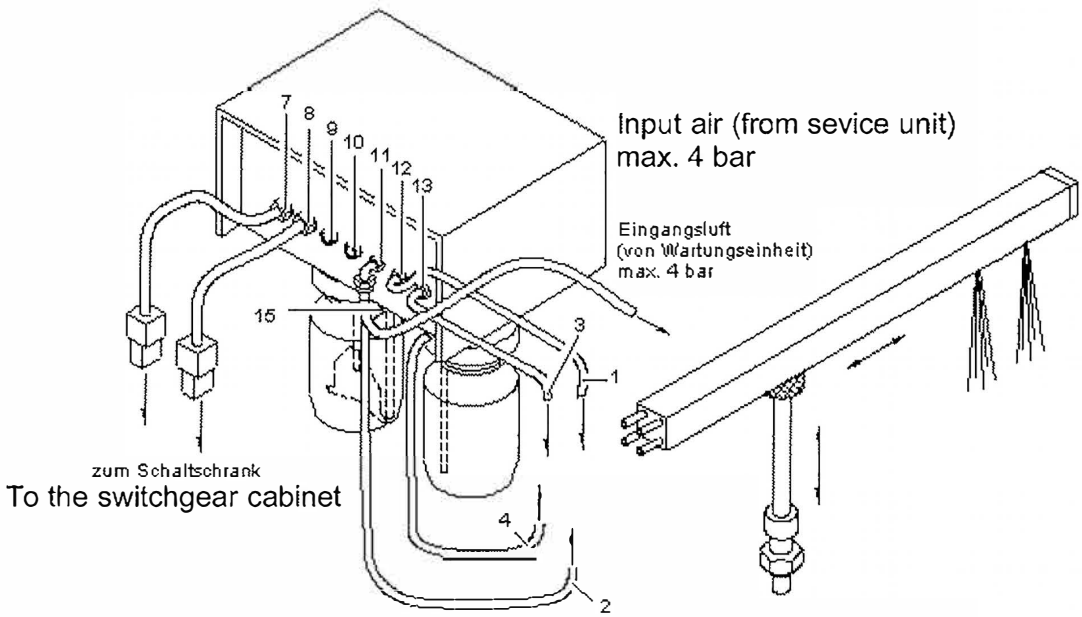


Figure 7.15

Connecting the dosing device to the spray arm

Dosing device output (7.15/12) to spray arm input (7.15/1).

Dosing device output (7.15/13) to spray arm input (7.15/3).

Diamond emulsion output (7.15/14) to spray arm input (7.15/2).

Fluid output (7.15/15) to spray arm input (7.15/4).

Dosing device input (7.15/11) to service unit output (max. 4 bar).

Connecting the switch cabinet (lapping machine) to the dosing device

Connect plug (7.17/7) of dosing device to the socket (7.6/11) of the switch cabinet.

Connect plug (7.15/8) of dosing device to the socket (7.6/10) of the switch cabinet.

The dosing device has two separate switching circuits so that the diamond emulsion and the fluid can be sprayed onto the polishing-lapping wheel at different spray times and intervals.

Solenoid valves are actuated via timers and the compressed air starts the spray process via the spray arm, which is fitted with 2 nozzles.

Setting the timers

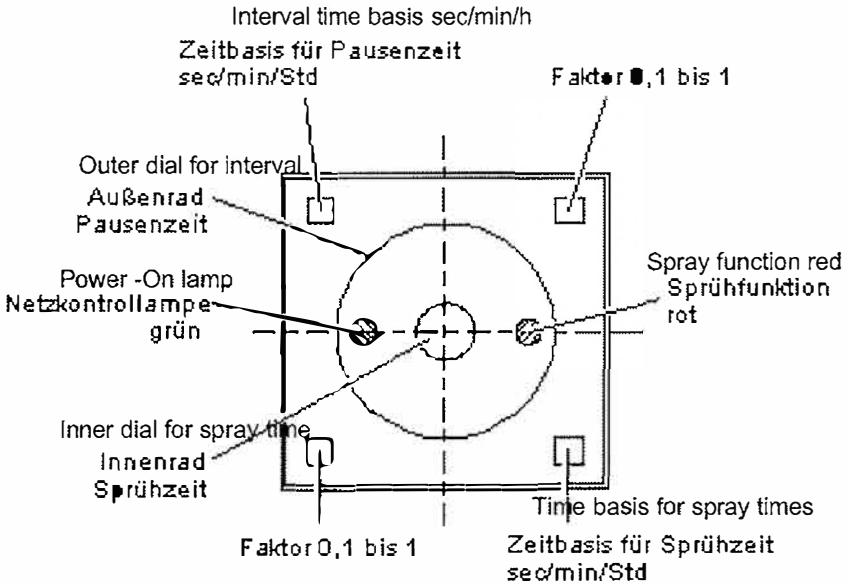


Figure 7.16

The spray times and intervals have to be selected for the respective process parameters.

During polishing-lapping the polishing-lapping wheel should not be too moist since it will then only slide over the workpiece without removing any material!

The spray process is started with the times set in the spray unit by pressing the „PUMP“ (7.6/5) or „START“ (7.6/3) buttons on the lapping machine switch cabinet.

The spray process stops automatically when the machine is switched off.

Switch off with the „STOP“ (7.6/4) button or on expiry of the pre-set time in the lapping machine's timer (7.6/6).

MM® polishing-lapping wheels consist of metal powders and an artifical resin bonding agent. Since the geometry of the polishing-lapping wheel has a decisive influence over the workpiece accuracy, the polishing-lapping wheels have to be treated very carefully.

Protruding burs on the workpiece cause grooves in the MM®-coating.

Make sure workpieces have no burs!

7 Operation/Use

Preparing the Multi-Metal wheels for use on the surface lapping machines

If you wish to fit an MM®-System on an existing lapping machine this machine first has to be carefully cleaned.

Special attention should hereby be paid to the conventional abrasive tank and feed pipes. After cleaning you should fill the tank with Al_2O_3 (13 µm) mixed with lapping oil.

The ratio:
1/2 kg abrasive to 5 litres of oil or water.

Once the dressing rings have been cleaned and checked for damage they are placed on the MM®-wheel and rotated by hand to ensure that there are no damages.

You should then run the machine for approx. 10 minutes using the grinding compound named above. (Do not use a different type of abrasive or grit for this purpose).

The MM®-wheel should be checked for surface evenness (flatness) and the machine should continue to run with the dressing rings in position until the desired surface evenness is reached.

You should then clean the MM®-wheel, dressing rings and surrounding areas carefully to remove all traces of the abrasive used.

After selecting a suitable diamond emulsion the dressing rings should be run for approx. 10 minutes in a neutral position whilst using abrasive and diamond emulsion in the recommended quantities.

The MM®-wheel and machine are now ready for use.

During operation the MM®-wheel should be only moist, not as wet as is common during normal lapping.

When changing the MM®-wheels or MM®-diamond emulsion you must remove all traces of the earlier abrasive.

MULTI-Metal lapping wheels must be stored flat (even).

Changing the diamond emulsion grit

When changing the diamond emulsion grit the wheels first have to be dressed with Al_2O_3 (13 µm).

This removes all residues of the former grit.

Then clean the wheel, machine and dressing rings carefully.

The new grit can then be used on the wheel in the recommended quantities for approx. 10 minutes.

Fitting the LAM PLAN® spray device on existing lapping machines

The screw-on position for the spray unit depends on the position of the MM®-wheel, i. e. the top edge of the MM®-wheel must be level with the tank as shown in Figure 12.1. The connecting hoses between the spray device and spray arm should be kept as short as possible to prevent any settling of the diamond emulsion in the hoses.

The working pressure for the spray device is 0.5 - 1.0 bar.

Checking and correcting the surface evenness of lapping wheels

The grinding, lapping and polishing-lapping wheel is just as exposed to the abrasive during processing as the workpiece being processed.

Material is thus also removed from the lapping wheel, and may alter its shape. In order to detect this unwanted change in shape at an early date, and to combat this, the surface evenness of the wheel should be checked at regular intervals.

Three possibilities exist:

- **Flatness check with flatness gauge:**

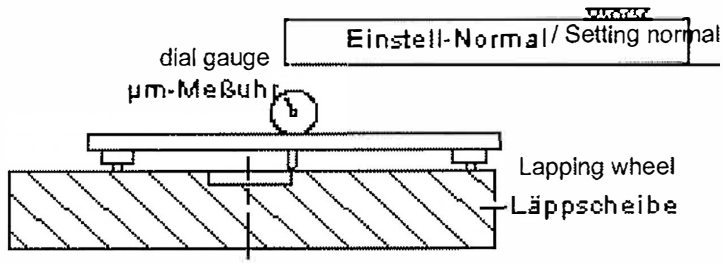


Figure 7.17

After setting the diameter to be checked and zeroing the dial gauge to the setting normal (granite block), the flatness deviation can be measured and recorded as a numerical value.

- **Flatness check using engineer's flat rule and thin paper (e. g. cigarette paper):**

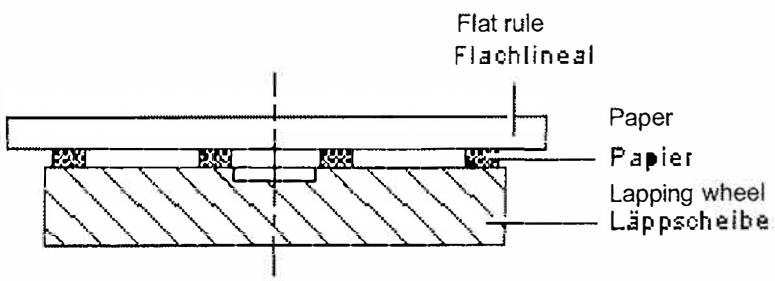


Figure 7.18

In this method the lapping wheel is checked for flatness through a tension test on the paper strips.

- **Test block and interference measurement**

  A flat workpiece (test block) is hereby processed during a processing interval. After processing, the flatness of the test block is checked by interference measurement.

The first method is the most practical since it is both quick and easy to perform and the flatness error can be read off directly on the dial gauge.

Intererence test

To check the flatness of the lapping wheel, the test block must be lapped with this and then polished with paper.

The plane face glass is then laid on the block and loaded slightly on one edge with a finger.

Light bands bent around the finger mean:	Light bands bent away from the finger mean:
convex test block concave lapping wheel	concave test block convex lapping wheel

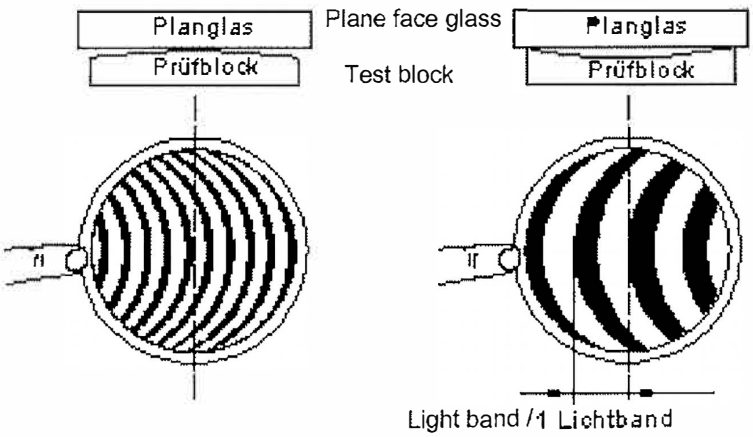


Figure 7.19

This test block is 3 light band convex.	This test block is 1 light band concave.
Concave lapping wheel correct by adjusting the rings to the outside.	Convex lapping wheel correct by adjusting the rings to the inside.

Konkave Läppscheibe
korrigiere durch Verstellen
der Ringe nach außen.

Konvexe Läppscheibe
korrigiere durch Verstellen
der Ringe nach innen.

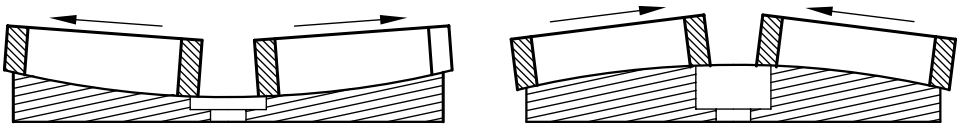


Bild 7.19

Ausführliche Informationen über das Prüfen ebener Flächen mit Interferenzprüfgeräten und Plangläsern siehe Sonderinformation „Interferenzprüfgeräte“.

Abrichten der Polierläppscheibe mit dem Diamant-Abrichtblock

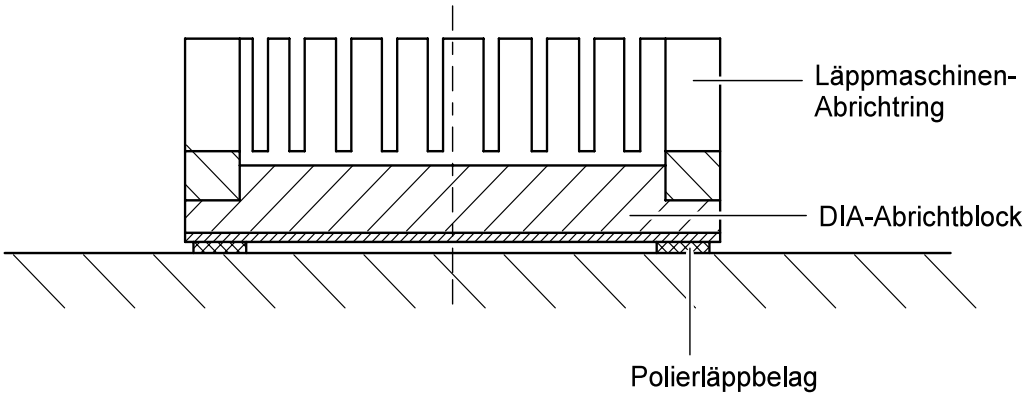


Bild 7.20

7 Bedienung/Betrieb

Die Korrektur von Polierläppbelägen läßt sich am komfortabelsten und wirtschaftlichsten mit dem Diamant-Abrichtblock durchführen.

Aufbau des Diablocks (Art.-Nr.3645715 für EL 600, 3645718 für EL 700):

- Aluminiumträgerscheibe mit Ösenschraube
- selbstklebende Diamantpellets
- Pellets haben unterschiedliche Körnungen für die jeweilige Scheibentype (Fein und Grob).

Zum Abrichten wird der DIA-Block an einer der drei Abrichtring-Positionen auf die Polierläppscheibe aufgelegt.

Die Führung des DIA-Blockes im Läppmaschinenjoch wird durch den umgekehrt aufgelegten Abrichtring gewährleistet.

Die Gewichtsbelastung durch den Abrichtring ist für den Abrichtvorgang ausreichend.

Beim Abrichten der Scheibe wird als Kühlschmiermittel für den Abrichtprozess wasserlösliches Fluid verwendet.

Folgende Punkte müssen beim Abrichten beachtet werden:

- Gewichtsbelastung: Abricht- und Diablock.

  Es besteht die Möglichkeit nach einiger Abrichtzeit das Gewicht noch zu erhöhen.

max. 50%

- Es muß sichergestellt sein, daß die Pellets beim Abrichten nicht mit ihrer kompletten Fläche über den Läppscheibenrand hinaustreten.

Sollte dies nicht beachtet werden, können sich die Pellets lösen oder auf der Polierläppscheibe entsteht ein Absatz!

7 Bedienung/Betrieb

Vorteile beim Abrichtvorgang gegenüber Abrichtmethode mit Al_2O_3:

- Geringere Abrichtzeit.
- Säubern der Maschine von Läppmittel (Al_2O_3) entfällt (Scheibe und Abrichtringe).
- Beim Abrichtvorgang wird nur wasserlösliches Fluid (Artikel-Nr.: 3645645) hinzugegeben.

Ersatzpellets:

Artikel-Nr.: 3645755 - Fein (benötigt werden 24 x)

Artikel-Nr.: 3645756 - Grob (benötigt werden 24 x)

Prüfung der Planheit (Werkstücke)

Die geläppten Teile haben eine stumpfe, matte Oberfläche. Um die geläppten Teile mit monochromatischem Licht hinsichtlich der Planheit zu prüfen, ist es erforderlich, die Oberfläche der Teile zu polieren, so dass sie reflektieren.

- Nach Reinigung das geläppte Teil auf feinem Polierpapier abziehen bis die Oberfläche reflektiert.
  (Bei Bearbeitung mit dem Polierläpp-System nicht erforderlich.)
- Geläpptes und poliertes Teil unter monochromatische Lichtquelle legen. Dabei muss die zu prüfenden Fläche nach oben zeigen. Dann wird das Planglas auf die geläppte und polierte Fläche gelegt.

Äußerste Sauberkeit ist notwendig.

- Das monochromatische Licht wird von der Oberfläche der zu prüfenden Fläche mittels Planglas reflektiert, wobei eine Reihe dunkler Bänder entstehen.

Wenn die Fläche des zu prüfenden Teiles absolut plan ist, sind die Bänder gerade und parallel. Sind die Bänder gebogen, so ist die Oberfläche unplan - Einzelheiten: siehe Prospekt.

Ausführliche Information siehe Sonderinformation „Interferenzprüfgeräte“.

8 Troubleshooting

See enclosure:

Pay attention to the manufacturer' instructions for the gear motor and control.

9 Care and maintenance

Care

- The lapping machine is correctly lubricated before leaving the works.
- The roller yoke bearings have a lifetime lubrication.
- Gear oil should be changed every 16,000 working hours or after 3 years at the latest.
- For more detailed information see the enclosure on the gear.
- Check the oil in the service unit of machines with a pneumatic pressure device every month.
- Recommended lubricant X73012 (see JOKE® Main Catalogue).

Handle dressing rings carefully and avoid damages!

- Then rub rings dry and grease lightly.
- Lapping wheels and dressing rings: remove dressing rings from the machine at the end of work and clean. Use water or oil-soluble cleaning agent depending on the lapping compound used.
- Clean lapping wheels too.
- Cover the lapping disk area during machine downtimes (e. g. with a film) to avoid soiling.

Impurities on the lapping wheel lead to scratches on the lapped surface.

10 Incidentals

For more detailed information on

- lapping and polishing compounds,
- lapping and polishing wheels,
- polishing cones, etc.

please refer to the JOKE® machine and order documentation „POLISHING-LAPPING TECHNOLOGY".

11 Ersatzteile

Die Lage der Verschleiß- und Ersatzteile sind in dem folgenden Bild angesprochen!

Ersatzteile für EL 600/700

Pos. Nr.	Sach-Nr.	Bezeichnung	Menge
1	3637004 3637005 3637104 3637105	Läppscheibe, genutet, 600 mm EL600 Läppscheibe, genutet, 700 mm EL700 Läppscheibe, ungenutet, 600 mm EL600 Läppscheibe, ungenutet, 700 mm EL700	1 1
2	3637304 3637305 3637404 3637405	Abrichtring, genutet 248/286x70 EL600 Abrichtring, genutet 275/314x70 EL700 Abrichtring, ungenutet 248/x286x70 EL600 Abrichtring, ungenutet 275/314x70 EL700	1 1
3	3635508	Handgewicht 520-017-2	1
4	3635502	Ausgleichfilz	1
5	3635509	Werkstückhalter	1
6	3635310	Abstreifer 519-020-3	1
8	32004809	Drehstrom-Getriebemotor 2,2 KW, 1.400 l/min.	1
10	32004224	Tauchpumpe KTA 25/270	1
11	3635311	Pumpenaufnahme 519-114-3	1
12	3635312	Läppmitteltank 519-113-2	1
13	3635313	Abfalltank 519-113-2	1
15	3635314	Laufrolle, kompl. 519-205-5	1
16	31730960	O-Ring OR38.00-4.00	1
17	32005005	Pneum. Andruckvorrichtung	1

11 Ersatzteile

Ersatzteile für EL 600/700

Pos. Nr.	Sach-Nr.	Bezeichnung	Menge
18	31730204	Flanschlager FLCTE 25	1
19	3635321	Druckplatte 519-305-3	1
24	3635331	Dosierblock 519-308-3	1
25	3635332	Dosierschraube, kompl. 519-311-4	1
26	31730950	O-Ring, Dosierschraube QR 5.00-1,20	1
27	32002825 31722531	Schlauch, klar PVC-NW8x2 Schlauch, schwarz PU-6	1 1
28	31722201	Dichtscheibe G-1/8	1
29	32004651	Tropfgeber 527-064-4	1
30	3635734	Führungsdraht 527-064-4	1
31	31730560	Laufrolle LR 201 NPP	1
33	3635330	Dosierblock, kompl. 519-350-2	1
34	31733369	Klemmhebel 63-M8-30	1
35	31720254	Pneum. Zylinder DW-50-H 300	1
36	32004882	Kreuzgriffschraube 50-M10-25	1
37	32002411	O-Ring, Zentrierscheibe QR 52.07-2.62	1
38	31720903	Drossel-Rückschlagventil GRLA-1/4	1
39	31720434	Schalldämpfer U-1/4	1
40	32004969	Joch 519-063-3	1
41	32004967 32006436	Jochhalter, Standard 519-062-4 Jochhalter, Pneumatik	1 1

11 Spare parts

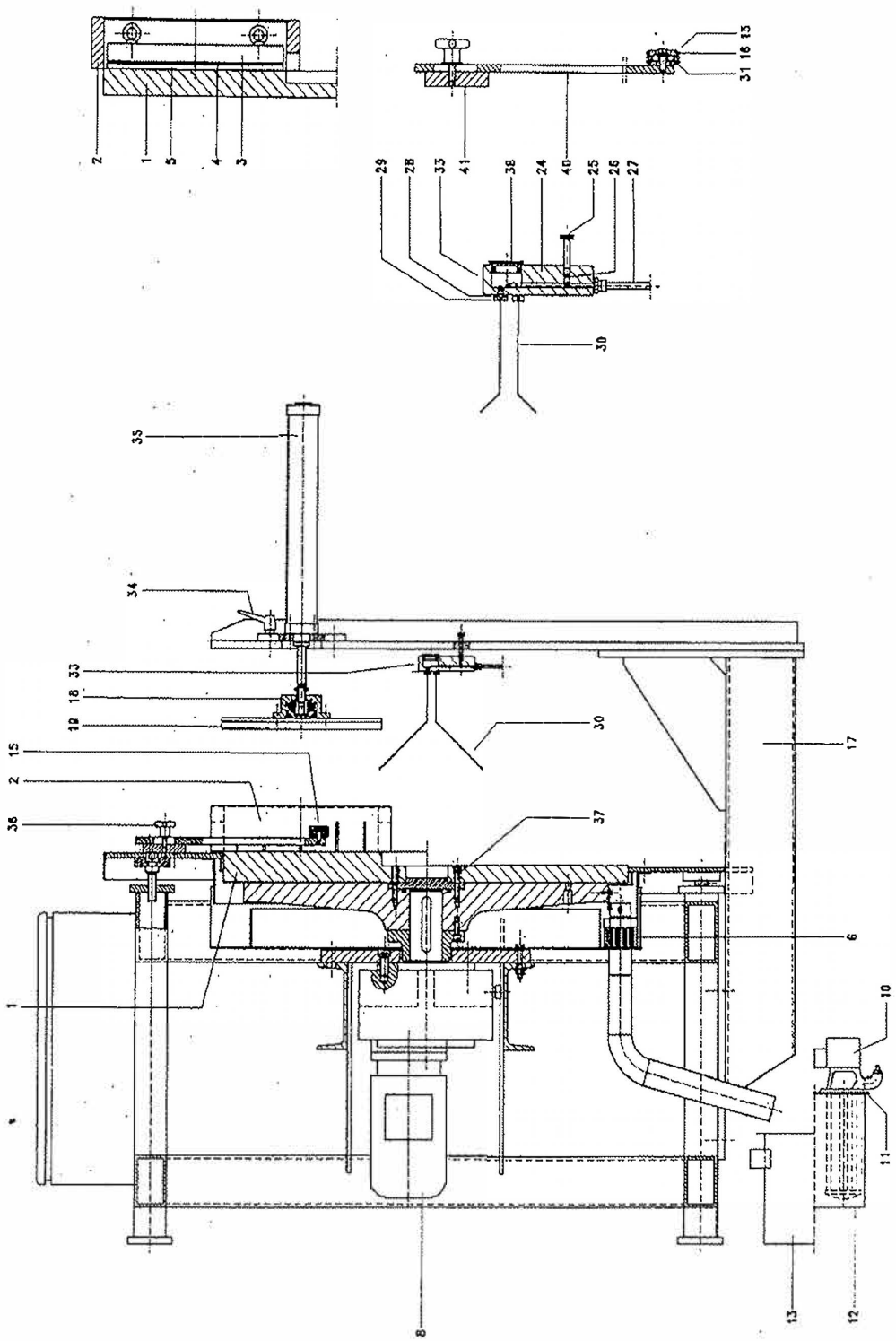
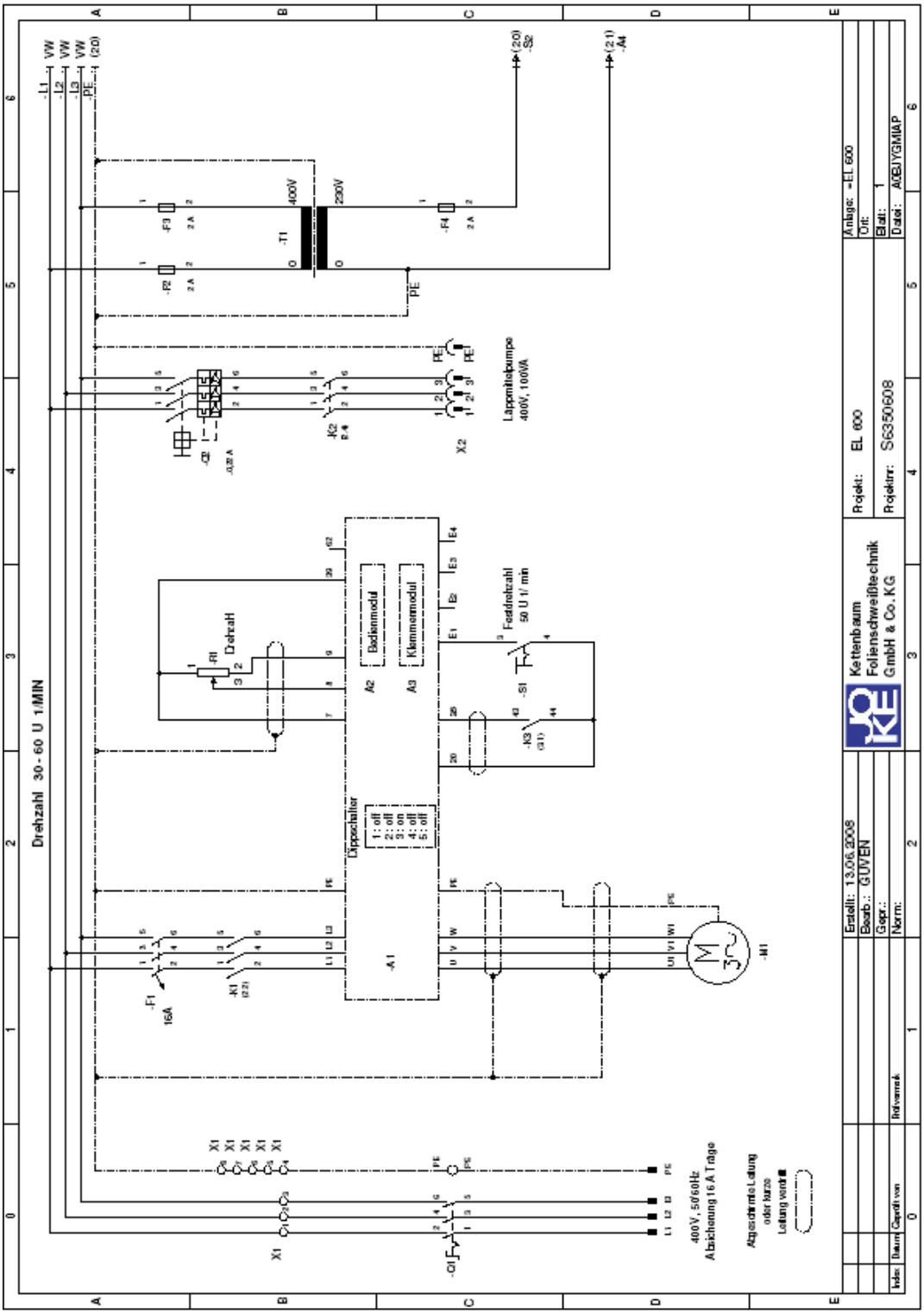


Figure 11.1

12 Anhang

Schaltplan für EL 600/ 700 S 6350608



12 Anhang

Elektroteilliste EL 600/700

Pos	Bestell-Nr.	Bezeichnung
A1	32013762	Frequenzumrichter Typ E 82EV222K4C, 2,2 KW
A2	32012423	Keypad E82ZBC
A3	32011494	Standard I/O-Modul, E82ZAFS
A4	32016826	Sicherheitsrelais XPSAC3721, 230VAC
C1	32014624	RC-Glied-LAD4RCU
C2	32013505	RC-Glied-LA4KA1U
C3	32013505	RC-Glied-LA4KA1U
F1	32007328 32004794	Sicherung FAZB 16A-3 Hilfssch. XHT001
F2	31711491 32013748	Sicherung 2A Sicherungshalter AMBUS
F3	31711491 32013748	Sicherung 2A Sicherungshalter AMBUS
F4	31711491 32013748	Sicherung 2A Sicherungshalter AMBUS
H1	32016045	Schaltansatz mit LED, grün
H2	32018445	Leuchtmelder, gelb mit LED, 230V
K1	32014568	Schütz LC1D25P7, 230 V, 50/60 Hz
K2	32013503	Schütz LC1K0910P7, 230 V, 50/60 Hz
K3	32013503	Schütz LC1K0910P7, 230 V, 50/60 Hz
K4	32001890	Zeitrelais H2C-S/30H, 230 VAC
L1	.	
L2	.	
L3	.	
M1	32012537	Drehstromgetriebemotor 3,0 kW
P1	32010174	Betriebsstundenzähler UWZ 48KED, 230 V
PE	.	

12 Anhang

Elektroteilliste EL 600/700

Pos	Bestell-Nr.	Bezeichnung
Q1	31710626	Hauptschalter, Not/AUS 25 A, 400 V, 5,5kW
Q2	32004814 32008386	Motorschutzschalter PKZM0-0,25 NHI 11
R1	32004805 32012654	Potentiometer 1kOhm Antrieb
S1	32012649 32012643	Kippschalter Schaltansatz
S2	32012640 32012643	NOT/AUS-Schalter Schaltansatz
S3	32016043 32016045	Leuchtdrucktaster, grün Ansatz
S4	32012647 32012643	Drucktaster, grün Schaltansatz
S5	32012647 32012643	Drucktaster, grün Schaltansatz
S6	32012648 32012643	Drucktaster, rot Schaltansatz
T1	32004792	Transformator STV 0,5 400/230 V, 500 VA
X0	31710885	Stecker CEE 16 A, 400 V
X1	32007060 32007058	Reihenklemmen Schutzleiterklemmen
X2	31710811	Steckdose-STAKAP + STASI
X3	32004862	Steckdose IEC, geschaltet, 250 V/10A
X4	32004862	Steckdose IEC, geschaltet, 250 V/10A

joke Technology GmbH
Asselborner Weg 14-16
D-51429 Bergisch Gladbach

Konformitäts-Erklärung / *Declaration of Conformity*

gilt, wenn diese Anlage als eigenständige Maschine betrieben wird

applies if this equipment is operated as independent machine.

Wir / *We*

joke Technology GmbH

Anschrift / *Adress*

D-51429 Bergisch Gladbach
Asselborner Weg 14-16

erklären in alleiniger Verantwortung, daß das Produkt

hereby declare, at our sole responsibility, that the product:

Bezeichnung / *Designation*

Beschreibung Maschine
Description machine

Einscheiben-Planläpp- und Poliermaschine
Single plate lapping and polishing machine

Typenbezeichnung / *Model*

EL 600

gültig ab Gerätenummer
valid from device number

140 …

den Bestimmungen der EG-Richtlinien und deren mitgeltenden Normen:

meets the regulations of the European guideline and the standards referred to therein:

EG-Maschinenrichtlinie **EC Machinery Directive**	**RL 2006 / 42 / EG**
EG-Elektromagnetische Verträglichkeit **EC Electromagnetic Compatibility Directive**	**RL 2004 / 108 / EG**
CE-Kennzeichnungsrichtlinie **CE Marking Directive**	**RL 93 / 68 / EWG**

in der zum Zeitpunkt der Ausstellung gültigen Fassung entspricht.

in accordance with the version in force on the date of issue.

Konformitätsvermutung gilt durch die Anwendung der nachfolgend aufgeführten harmonisierten Normen, nationalen technischen Normen und Spezifikationen.

Presumption of conformity is given by the application of the harmonized standards, national technical standards and specifications listed below.

DIN 547-1, DIN 547-2, DIN 547-3, DIN 614-1, DIN EN 842, DIN EN 953, DIN EN 981, DIN EN 1005-1, DIN EN 1005-2, DIN EN 1005-3, EN ISO 12100-1, EN ISO 12100-2, EN ISO 13849-1, EN ISO 13850, EN ISO 13857, EN ISO 14121-1, EN ISO 14738, DIN EN 60204-1, DIN EN 61000-6-3, VDE 0100, VDE 0701,

Bevollmächtigter für technische Dokumentation:
Authorised for technical documentation:

Kerstin Otto
Leiter Konstruktion / Head of construction

Eine Technische Dokumentation ist vollständig vorhanden. Die zugehörigen Betriebsanleitungen liegen in der Landessprache des Herstellers und des Anwenders vor.

Technical documentation is completely available.The operating instructions belonging to it are in the language of the land of fabricants and user.

Der Inhalt dieser Erklärung entspricht
DIN EN ISO 17050-1 und 17050-2

This declaration is in accordance with
DIN EN ISO 17050-1 and 17050-2

Bergisch Gladbach,

Datum / *Date* 10.06.14

Udo Fielenbach

Geschäftsführer
Managing Director

Unterschrift des Befugten
Signature of authorized person