

DEPRAG

Operating Instruction Booklet

Pneumatic Grinding Machine

21-042

312292 C

Dear Customer:

This tool is the result of more than 75 years of experience in the design and manufacturing of pneumatic tools for the industrial market.

We kindly ask that you read these operating instructions carefully so that you will be able to use this tool safely and for many years to come.

If you need additional information, please contact your DEPRAG Representative, one of our international support offices or us direct at DEPRAG. We will be happy to answer any questions.

Please visit our web site: www.deprag.com

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1 Safety Tips

1.1. General Safety Tips



Before operating tool make sure to carefully read and observe this operating instruction.

Generally, the operator of the equipment and/or machinery is responsible for the equipment's perfect condition and operation, while observing all necessary safety regulations. The equipment and/or machinery has been constructed in accordance with the newest level of technology while recognizing all necessary safety-related requirements. Nevertheless, while operating the equipment and/or machinery there is a risk of bodily harm to the operator as well as damage to equipment and/or machinery and other property.

Operate the equipment and/or machinery only if equipment/machinery

- Is used for the task it was designed for
- is in perfect working condition and safe to use.

It is important to observe the technical data of the equipment, especially in regards to the environmental temperatures. The designated area of use for this equipment is clearly described in chapter *Designated Equipment Use* and those requirements have to be observed as well. Prerequisite for the safe conduct and the uninterrupted operation of the equipment, is the knowledge of the basic safety tips and the safety regulations. Additionally, all current regulations for a safe operational area, for accident-prevention guidelines of electrical and mechanical installations, as well as noise suppression demands must be observed. During any maintenance or repair work, a clean work surface is recommended. Also, it is not recommended to either eat or smoke during repair or maintenance. Arbitrary changes made to the equipment, which alters its designated use, voids the warranty and cancels the manufacturers liability.

- The tool is not insulated to protect against an electrical power surge.
- It is not recommended to use this tool in explosive hazardous environments, unless it was specifically designed for such a use.

The operating instruction booklet, especially the safety symbols and safety tips attached to the equipment or included in the documentation, must be observed at all times by all persons getting into contact with the equipment.

1.2. Safety Tips for Grinders and their corresponding Grinding Inserts



- Use only approved grinding inserts with a correct shaft diameter.
- Make sure the rated speed of the insert is higher than the speed of the grinding resp. milling machine.
- Never use a grinding resp. milling machine that is not in good working order or one with defective parts.
- The grinding inserts (wheels/disks) must be handled and stored with care and in accordance with manufacturers instructions.
- Check the grinding inserts (wheels/disks) for damages prior to the use in grinding resp. milling machines. Never use damaged grinding inserts (wheels/disks). Only use the grinding inserts (wheels/disks) in accordance with the manufacturers' instructions.
- In case of a power interruption, the machine must be disconnected from the air supply.
- When connecting/disconnecting the grinding resp. milling machine to/from the air supply - please pay careful attention NOT to actuate the start lever while doing so.
- Disconnect machine from air supply prior to changing grinding inserts.
- Never remove protective devices from machines where fitted and ensure they are in good condition and properly adjusted before starting the machine.
- Guards where provided should be adjusted to deflect sparks and debris away from the operator.
- Strong vibrations may occur because of loose or damaged grinding inserts.
- Do not use cut-off wheels (when using machines with a collet).
- Do not exceed the maximum allowable operating speed. Check the maximum operating speed regularly.
- Check the grinding inserts (wheels/disks) for correct and tight clamping, prior to start-up of operation. Test the grinding resp. milling machine without load in a safe position and environment for a trial period of some 30 sec. When feeling considerable vibrations or in any other case of irregular behaviour or operation switch off the machine immediately. Analyze and eliminate all causes of irregular behaviour and vibration prior to new start-up.
- When working with specific materials, dust and abrasion as well as steam outs can be created which could result in an explosive endangered environment.
- Make sure to sufficiently fasten the work piece(s) prior to grinding/milling.
- Do not use the machine close to inflammable liquids or gas.

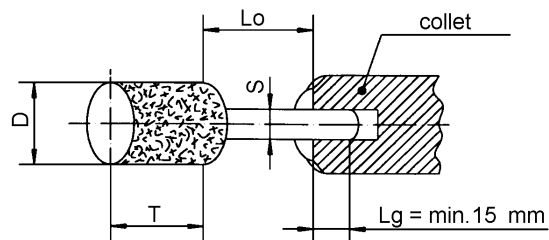
- Do provide devices for cleaning the air at the working place, in case explosive dust, steam or aerosols dangerous to your health may occur.
 - After turning-off the grinding resp. milling machine, the tool will continue to rotate (inertia). Lay aside the grinding resp. milling machine in a safe way and position. Do not apply pressure to its surface.
- i**
- Always wear eye protection (EN 166 Grade B) and hearing protection (EN 352). It is also recommended to wear gloves (EN 388 Category 2) and safety clothing.
 - Dependent on the materials to be processed, personal safety equipment must be used and a dust removal system should be installed.
 - Do not wear wide clothing or jewelry, for they can be seized by movable parts. Wear a hairnet if operator has long hair.
 - Do take due note of special markings, limitations or any other explicit instructions of use at the grinding insert or the grinding resp. milling machine.
 - Ensure that the correct abrasive product is selected. An unsuitable product can produce excessive debris, dust, vibration and noise.
 - Use only abrasive products conforming to the highest standards of safety. These products will bear the relevant EN standard number and/or the inscription „oSa“.
 - Do not exceed the maximum allowable air pressure. A pressure regulator has to be installed, which regulated the air pressure before reaching the tool.
 - Store abrasives in dry, frost-free conditions avoiding wide variations in temperature. Ensure they are properly protected and supported to prevent damage and distortion.
 - Coated abrasives should be stored at 18-22°C, 45-65% relative humidity.
 - Abrasive belts should be hung on a rod or peg not less than 50 mm diameter.
 - Never use an abrasive product beyond its expiry date where marked.
 - Do not modify neither grinding resp. milling machine nor inserting tool after receipt! Never force the abrasive product onto the mounting fixture.
 - Check that the correct mounting devices are used and that they are undistorted, clean and free from burrs.
 - Do not grind on the part of the product that is not designed for the operation. Avoid grinding with the edge of abrasive belts, use the centre of the belt if possible.
 - Do not leave abrasive belts under tension when not in use.

- Avoid clogging and uneven wear to ensure that the abrasive product is working efficiently. Dress frequently where appropriate.
- Before start-up of tool make sure to visually check both the grinding resp. milling machine and the grinding inserts, whether they are okay and not damaged in any way and whether they are appropriate for the work ahead.
- Use grinding resp. milling machine only with a maintenance unit, consisting of Filter with condensation reservoir, regulator and oiler (appx. 1-2 drops pro m³). When operating with oilfree air, a performance reduction of up to 20% occurs and maintenance requirements increases! The pressure must not drop below 6.3 bar/90 PSI.
- Expert users trained by authorized, responsible technical personnel only must be allowed to work with the grinding resp. milling machine.
- Do wear a respirator (EN 149), if using the grinding resp. milling machine for dust-producing jobs. Exposure to dust generated from workpiece and/or abrasive materials can result in lung damage and/or other physical injury.
- Disassembly resp. assembly of this DEPRAG grinding resp. milling machine must be done either by DEPRAG or other authorized trained personnel only.
- There is a risk of getting hurt by a whip-lashing air hose - please pay careful attention.
- Use the DEPRAG recommended lubrication oil only.
- Action needs to be taken if tingling, pins and needles or numbness is experienced after 10 minutes continuous use of the abrasive product. Avoid continuous use of the abrasive product.
- The effects of vibration are more pronounced in cold conditions so keep the hands warm and exercise hands and fingers regularly.
- Maintain mounting flanges and back-up pads in good condition and replace if worn or distorted.
- Do not grip the workpiece or machine too tightly and do not exert excessive pressure on the abrasive product.
- Used or defective abrasives should be disposed in accordance with local or national regulations.
- Be aware that the abrasive product may be contaminated with material from the workpiece or process after use.

- Disposed abrasive products should be damaged to prevent them from being taken from waste skips and re-used.
- Use mounting blotters where supplied.
- Do not tighten the mounting device excessively.
- Never remove guards from machines where fitted and ensure they are in good condition and properly adjusted.
- Never start the machine with the workpiece in contact with the abrasive product.
- Never apply excessive force or shock to the abrasive product or let it overheat.

- It is especially important to keep in mind, that the allowable speed of the installed grinding insert is reduced, if the distance between the end of the collet and the bottom of the insert (overhang “Lo”) is increased. Observe the instructions given by the manufacturer of the grinding inserts resp. carbide burrs as well as the Industrial Standard DIN EN 12413. A minimum shaft insertion length “Lg” has to be guaranteed.

Lo = overhang
S = shaft diameter
D = insert diameter
T = insert length
Lg = shaft insertion length



- The shaft diameter of the insert and collet capacity has to be the same.

1.3. Owner Obligation

The owner is obliged to only let persons operate the equipment, who

- are familiar with basic work environment safety rules and accident-preventing regulations. Also, those persons must have been instructed in the correct use of the equipment.
- have read and understood all safety and warning notifications in the Operating Instruction Booklet, as well as all other documentation pertaining to this equipment.
- check and confirm at regular intervals, that a safety oriented operation is guaranteed.

Only qualified and authorized personnel is allowed to operate, maintain and repair this equipment. A malfunction, which impairs operator safety, must be immediately removed.

1.4. Operator Obligation

Personnel, who is engaged in the operation of the equipment, must always be committed to

- observe the basic safety and accident preventing regulations,
- read and observe the safety and warning notifications of this operating instruction booklet.

1.5. Warranty and Liability

Unless otherwise specified, our “General Sales and Delivery Conditions” apply. Warranty and liability claims in regards to persons or equipment damages are invalid, if one or several of the following causes apply:

- Use of the equipment in a non-designated application.
- Improper installation, operation, service or maintenance of the machine.
- Operation of the machine with either defective or removed safety and protection devices.
- Non-observance of the requirements stated in the operating instruction booklet, in regards to transportation, storage, mounting, installation, operation, maintenance and service of the equipment.
- Structural change or adjustment on the equipment to a non-designated use.
- Inadequate supervision of wear parts.
- Improper repair, inspection or maintenance.
- Catastrophic cases because of a war, acts of god or other reasons which are beyond our control.

1.6. Symbol Description



Read and observe the Operating Instruction Booklet, prior to and during operation of tool.



DANGER

Reference to an immediate danger to a person. May lead to serious injuries or even death, if unobserved!



Properly recycle environmentally damaging grease, cooling agents or detergents.



RECOMMENDATIONS

Important or additional information on the equipment or in the documentation.



Use eye protection or wear safety goggles.

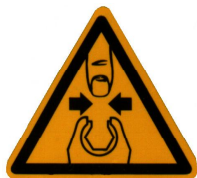


Wear hearing protection.



Warning against hand-injuries.

Attention: Keep away your hands from areas, which are marked with this symbol!



Hands may be crushed, seized or otherwise injured.



ESD-protected area

Equipment may be damaged or destroyed by an electrostatic discharge.



Maintenance and repair on hydraulic and pneumatic equipment may only be performed by specially trained personnel!
Disconnect equipment from air supply, prior to repair of pneumatic or hydraulic equipment.



Provide regular preventive maintenance on hoses and airlines. Exchange hose lines, even if there is no visible damage! (Observe corresponding requirements of the manufacturer!)

After repair and maintenance, check the following items:

- make sure all detached and re-attached connections are solid.
- confirm that removed covers, screens or filters were re-installed
- During disconnecting or reconnecting of an air-operated equipment, injury may occur due to a whipping air-hose

After conclusion of maintenance or repair and prior to start of operation, make sure to

- remove all materials, tools and other supplies needed for the maintenance or repair from work area of the equipment
- remove leaking liquid or oils
- make sure all safety devices on the equipment work perfectly!

1.7. Observe Environmental Regulations



When working on or with the equipment, it is imperative to observe all requirements in regards to waste-disposal and proper recycling.

Especially during installation, repair or maintenance, water damaging agents such as

- lubricating grease and oil
- hydraulic fluid
- cooling agents
- solvent-containing cleaning agents

must not leak into the ground or into the sewage system!

Such materials must be stored, transported, contained and recycled in suitable containers.

2 Designated Equipment Use

This midget grinder is used preferably with grinding pins or milling inserts, mainly for the treatment of plastic and metals in foundries, in the entire mechanical engineering industry, the tool- and die industry, the appliance-industry to level, de-burr or treat cast-iron parts.

3 Installation

- Blow out air line and pressure hose, prior to connection it to the equipment.
- The hoses must be free of bends and kinks.
- Make sure, that all air lines have a sufficient cross-section and remove possible throttle areas.
- This DEPRAG Grinder or Polisher should be operated with lubricated air only (see paragraph: Maintenance and Upkeep). Best results are achieved, when machine is lubricated with 1 – 2 drops of oil per 1m³. When operating with oilfree air, a performance reduction of up to 20% occurs and maintenance requirements increases!
- Connect Grinders or Polishers as follows:
 - a) for standard operation connect equipment to a maintenance unit, consisting of Filter with condensation reservoir, Regulator and Oiler. When choosing a maintenance unit, observe air consumption of the machine (see Technical Data).

Air Consumption	Thread Size	Part No.
0,05 - 0,5 m ³ /min	1/4 "	820454 A
0,15 – 1,5 m ³ /min	1/2 "	820455 A
0,8 – 6,0 m ³ /min	3/4 "	821608 A

- b) for the use with minimal lubrication connect to a filter-regulator consisting of Filter with condensation reservoir and pressure regulator

Air Consumption	Thread Size	Part No.
0,05 - 0,5 m ³ /min	1/4 "	822408 A
0,15 – 0,9 m ³ /min	3/8 "	826981 A
0,5 – 1,5 m ³ /min	1/2 "	822409 A
0,8 – 6,0 m ³ /min	3/4 "	826982 A

in connection with a Point-of-Use Oiler (Part No. 378077 A)

- Check air pressure at F/R/L outlet. The Regulator needs to be adjusted to an airflow of max. 6,3 bar (90 PSI). A higher pressure than 6,3 bar leads to increased wear and tear. Pressure below 6,3 bar leads to performance loss.

In regards to air-quality according to ISO8573-1, we recommend:

CLASS	RESIDUE OF OIL		RESIDUE OF DUST		RESIDUE OF WATER	
	Content mg/m ³	Particle Size µm	Concentration max. mg/m ³	Dew Point °C	Pressure Concentration max. g/m ³	
Lubricated Air	4	5	15	8	+3	6
Dry Air	3	1	5	5	-20	0,88

4 Operation

Prior to commissioning, be sure to insert the tool as deeply as possible into the collet and fasten it using the single-ended open-jawed wrench included in the delivery (see *Safety Tips*).

Attention:



Before operating the tool, check that grinding insert is securely fastened. A loose grinding insert may cause an injury.

Use only acceptable grinding inserts. Check and make sure that the allowable speed of the grinding insert is higher than the speed of the grinder.

Keep the pressure light during working. High speeds at low pressure are preferable over low speeds with high pressure. When selecting a milling cutter mould, make sure that the work piece radius of boreholes or angles is always larger than the milling cutter radius, as the milling cutter otherwise get stuck and jag. When milling in recesses and slits, the milling cutter should be moved marginally back and forth during the process.

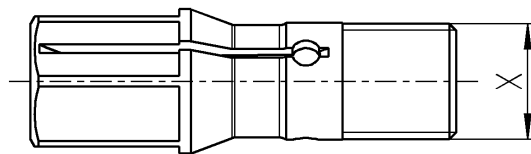
Be sure to guide the machine in a manner ensuring that neither spring chuck nor spindle touch the workpiece to avoid unnecessary wear and tear of these parts and the ball bearings.

Connection:

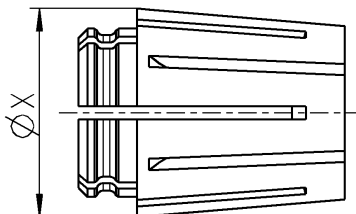
- Connect hose 806095 (I.D. 6 mm) with quick release coupling 804251 to quick release nipple 323214.
- Open shut-off valve (operating pressure 6.3 bar/90 PSI).

Start:

- Push lever 302860 A and machine will start.



COLLET WITH THREAD	RECOMMENDED TIGHTENING TORQUE
X = M6 x 0,75 (LH)	Appx. 3,5 Nm
X = M8 x 0,75 (LH)	Appx. 8 Nm
X = M9 x 1 (LH)	Appx. 9 Nm
X = M12 x 1 (LH)	Appx. 11 Nm



COLLET WITH SCREW CAP	RECOMMENDED TIGHTENING TORQUE
ØX = 16,1 mm	Appx. 11 Nm

5 Handling

The tool should only be used while observing all safety- and danger recommendations.

Machine starts by lever valve.

6 Disassembly - Assembly

Disassembly: (see Spare Parts Drawing)



Prior to disassembly, disconnect equipment from air supply ! Only experienced maintenance personnel may assemble or disassemble this equipment.

After repair or maintenance, verify that equipment runs to specification!

Principally, use only DEPRAG original spare parts. Otherwise, a reduction in equipment power-output and an increased maintenance-requirement occurs. If NON-DEPRAG parts are installed, DEPRAG is justified to void any existing warranty and liability obligations.

1. Disconnect machine from air supply.
2. Unscrew spindle bearing 312655 A (left-hand thread).
3. Unscrew lever valve 340313 A complete (right-hand thread).
4. Slide motor 312654 A complete out of the motor housing 311860.
5. Take off bearing cover 311921 resp. 311910.
6. Take out the 3 vanes 312130/3 and check them thoroughly.



IMPORTANT

Minimum vanes width should be 6 mm.
Exchange too small or worn vanes.

Assembly:



IMPORTANT

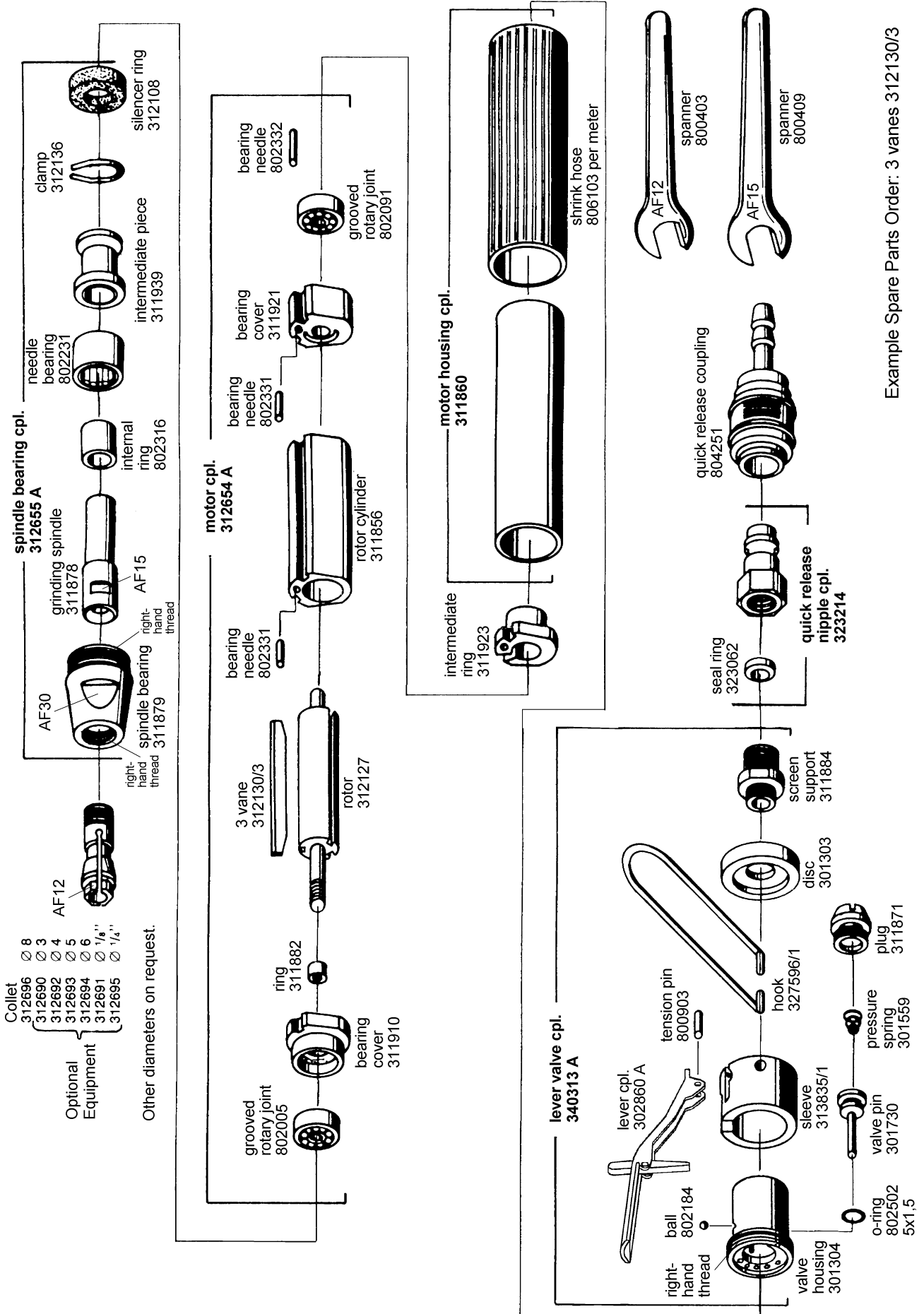
Clean all parts and slightly grease them.
Replace worn or damaged parts.

For assembly proceed logically in reverse order with reference to disassembly!

6.1. Special Repair Tools (Optional Equipment)

NAME	PART No.
Pressure pin (for motor housing 311860)	460417
Chucking jaws (for motor housing 311860)	460334
Fixing device (for rotor cylinder 311856)	460475
Arbor (for lever 302860 A)	462138
Speedometer (to verify speed)	830390

6.2. Spare Parts Drawing



Example Spare Parts Order: 3 vanes 312130/3

7 Maintenance and Upkeep

Operator can perform inspection and maintenance. Only specialized personnel may perform assembly or disassembly of this equipment. Faulty assembly may lead to danger for the operator and to permanent damage of the equipment.

This grinder requires little maintenance. If the following rules are observed, the tool reaches its promised high life span and remains in a safe condition to use.

- Regularly check equipment for external damage.
- Check the air filter (bleed water condensation on a regular basis) and the oil reservoir, as well as the oiler adjustment. We recommend DEPRAG-Oil, Part No. 790081 E (250 cm³).
- We recommend a maintenance interval of every 1000 operating hours. Vanes have to be checked and if needed, replaced.
- After re-assembly, drip 2 – 3 drops of oil into the air inlet.
- If grinder malfunctions, we recommend to send the machine to DEPRAG.

7.1. Wear Parts

QUANTITY	NAME	PART No.
3	Vane	312130/3
1	O-Ring	802502

8 Trouble Shooting

In the case of a malfunction, check and observe all instructions contained in this technical documentation. If necessary, adjust equipment as needed.

Possible faults and their causes are shown below:

FAULT	CAUSE	SOLUTION
Insufficient Power	Air pressure too low	Air pressure should be 90 PSI for maximum performance
	Restriction in air hose	Remove bends or other restrictions
	Hose I.D. is too small	Use required hose I.D.
	Worn vanes	Exchange vanes
	Screen Support clogged	Clean screen support or exchange with new one
	Insufficient lubrication	Provide the required air-quality
Machine does not start	No air, shut-off valve is closed.	Open shut-off valve
	Worn vanes or vanes are jammed	Exchange vanes
Machine does not want to stop	Worn O-Ring	Replace O-Ring

If necessary, send the equipment to DEPRAG.

9 Delivery Capacity

Please check the delivery capacity in regards to its completeness.

QUANTITY	NAME	PART No.
1	Operating Instruction Booklet	010046EN
1	Grinding machine	312292 C
1	Spanner AF 12	800403
1	Spanner AF 15	800409

10 Storage

Unused machines should be stored in a dry, locked area.

11 Technical Data

Manufacturer DEPRAG SCHULZ GMBH u. CO.
Address Kurfürstenring 12 - 18 Postfach 1352
D-92224 Amberg D-92203 Amberg
Phone 09621/371-0
Fax 09621/371-120

Technical Data:

TYPE	21-042
Part No.	312292 C
Exhaust	spindle side
Air Intake	lever valve
Grinding Wheel Dimensions max.	
Ceramic (30m/s) Head-Ø (mm)	25
Bakelite (45m/s) Head-Ø (mm)	40
Reinforced (80m/s) Head-Ø (mm)	70
Speed, unloaded (rpm)	19 000
Air Consumption, under load (m³/min)	0.5
Power (kW)	0.40
Machine Diameter (mm)	38
Machine Length (mm)	188
Weight, without Hoses (kg/lbs)	0.9 / 1.98
Noise level (dB(A))	82
Hose I.D. for air supply (mm/in.)	6 / ¼"
Thread size	¼" m
Air pressure (bar/PSI)	6.3 / 90
Vibration (m/s²)	< 2.5

12 Disposal

Unused machines should be stored in a dry, locked area. Disassemble the machine for the required disposal complete. Observe local and environmental regulations for the separation and recycling of materials.



Recycle waste oil to avoid environmental contamination!

13 Conformity Declaration

EC-Conformity Declaration according to the EC-Machine-Guidelines 98/37/EC, Amendment IIA

We,

DEPRAG SCHULZ GMBH & CO.
PO Box 1352
D-92203 Amberg

hereby confirm, that the design of the
grinding machine

21-042

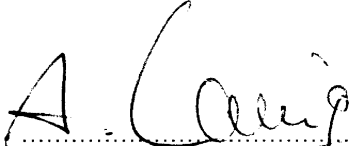
conforms to the following, relevant regulation:

- EC-Machine-Guidelines, Version 98/37/EC, Amendment No. 1 and No. 2.2.

Applicable Standard:

- EN ISO 12100-1 and 12100-2

Amberg, 18.06. 2008


Dipl. Ing. (FH) A. Langig
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14 Service Locations and Authorized Partners

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