

# **Pneumatic- Driving Machine**

## **Type 6 1016 0010**

Techn.Doc.-Nr 613

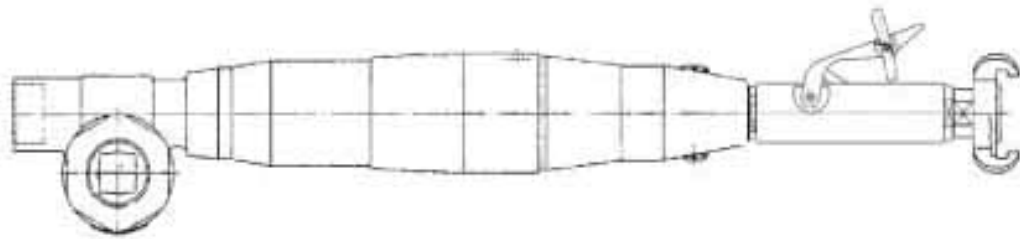


Illustration can differ from the original

# **Operation and Maintenance Instruction**

## TECHNICAL SPECIFICATION

Operating pressure (flow pressure)	p	6	bar
Performance	P	0.65	kW
Speed (load)	n	67	rpm
Speed (idle)	n	130	rpm
Torque	Mt	92,7	Nm
Tool Holder (inner diameter)	□	20	mm
Rotation (see figure)		CCW	
Air consumption	V	1.3	m <sup>3</sup> /min
Air connection		R 3/8"	
ID of Hose (minimum)		13	mm
Noise (average 1 m distance)		85	dB(A)

\* Claw coupling is an accessory

### OPERATING INSTRUCTIONS

Operation and procedure are described here.

### SAFETY INSTRUCTIONS

### USE

### DANGER ZONES

### MAINTENANCE AND ASSEMBLY INSTRUCTIONS

This section contains the fundamentals of pneumatic machines, technical data, maintenance instructions and wear, as well as disassembly and assembly procedures.

### PROBLEM / CAUSE / SOLUTION

### SPARE PARTS DOCUMENTATION

This section consists of parts list, sectional drawings or exploded views.

### SUPPLEMENT

Maintenance of Pneumatic Tools  
Instruction for oiler adjustment

## OPERATION INSTRUCTION

### General

The performance and pull-through force of this machine are designed for the drilling and milling steel and cast iron. Also, turning valves, cutting threads and tightening bolts and nuts. Freehand drilling and milling can only be performed for tools up to 100 mm in diameter. For tools with large diameters, always work with a dead stop and ensure against rotation of the machine (danger of injury).

### Drilling/Milling

- Check the oil level. If necessary, add oil to fill up the oiler.
- Attach desired tool to the machine.
- Centre the machine on a suitable support, if working with a tool having a diameter of more than 100 mm.
- Prevent the machine from rotating upwards (do not hold by hand), if working with a tool having a diameter of greater than 100 mm. See the section entitled „USE“.
- Connect the compressed air hose (blowing out of the hose before connecting is recommended in order to remove contaminants).
- Open the valve and begin the drilling or milling operation.  
(The rpm's can be regulated by the opening of the valve to different degrees).

### Other Application

- Tightening bolts and nuts (max torque 280 Nm).
- Cutting threads
- Closed and opening valves

### After Finishing the Operation

- Close the valve.
- Turn off the compressed air and disconnect the compressed air hose.
- Take the machine out of the square holding.
- Remove the tool.
- Clean the tool holder seat.
- Check the oiler.

## SAFETY INSTRUCTION

- Wear safety glasses (danger of injury through whirling up of dust particles).
- Wear safety gloves (injury by cutting oneself on sharp-edged work pieces).
- Wear protective clothing.
- Ensure that you maintain a good footing and proper balance at all times.
- Never work under the influence of alcohol, drugs or stronger medication.
- After use, disconnect the machine from the compressed air line (avoidance of unintentional machine start).
- Follow the general current and appropriate **Accident Prevention and Safety Procedures**.

### Use

#### Intended Use

The machine serves as a drive for drilling tools during the boring of pipes. The machine is guided by hand. When working with drilling or milling tools with diameters of more than 100 mm, the machine must continually contact a fixed dead stop in order for the torque to be transmitted to the machine.

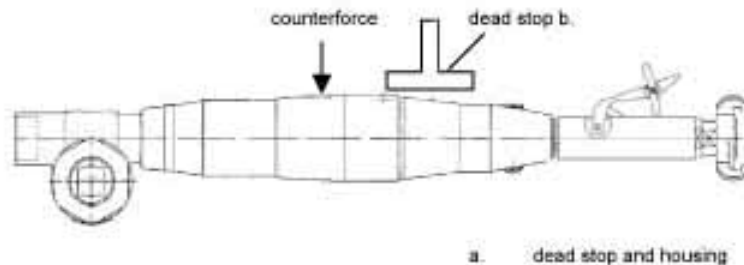
Any use which deviates from the instructions mentioned in this guide qualifies as unintended use.

#### Unintended use

Working without a dead stop when using tools with diameters greater than 100 mm.

Use the machine as a drive for lifting goods or people.

Working without using personal safety protective measures.



## **Danger Zones**

<b>Operating Conditions</b>	<b>Normal Function</b>	<b>Malfunction</b>	<b>Misuse</b>	<b>Expected Use</b>
<b>Life Phase</b>				
Transport	Transport of the machine in an inoperable condition	Machine is dropped	Transport of the machine in an operable condition	Unknown
Start-up	Inserting the machine into the drill stand provided	Unknown	Drilling without using the drill stand	Unknown
Operation	Machine runs only when valve is open	Machine runs unintentionally	Valve is blocked while open	Unknown
	Machine moves the tool	Tools is blocked	Unknown	Unknown
Maintenance	Regular changing of vanes			
	Operation on a service unit	Breakdown of machine	Unknown	Unknown

## **MAINTENANCE AND ASSEMBLY INSTRUCTIONS**

Service life and performance of this machine are decisively determined by

- a) the air purity
- b) the lubrication conditions and maintenance

at a):

Before connecting the compressed air supply to the machine, blow out the air hose. If rust is able to build up and water is able to condense in the compressed air supply line, the place dirt and water precipitation filters at the air inlet.



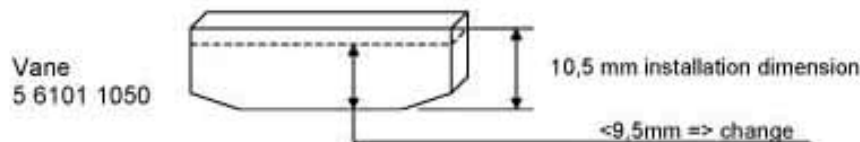
at b);

The distance between the machine and the oiler should not be more than 5 m. The oiler, which is found in the latch valve, should therefore always be checked to determine the oil level.

The oiler should be adjusted so that 2-5 drops are dispersed per m<sup>3</sup>/min of air consumption. Resin- and acid-free lubricating oils SAE 5 W – SAE 10 should always be used. Viscous oils cause sticking of the vanes and thereby impair the start-up and performance of the motor. Through optimal lubrication, the service life will be multiplied. Please take note of the supplement

## MAINTENANCE OF PNEUMATIC TOOLS

Sealed and greased ball bearings must not be washed out and the machine must generally never be rinsed with petroleum or similar cleaning fluids. After ending the drilling or milling operation, rinse the machine with a thin oil or use other measures to ensure against corrosion. Clean the filters at the air inlet regularly. In winter and in case of very humid compressed air, antifreeze lubricants, such as **BP-Energol AX 10**, **Killfrost** or **Komranol N 74**, should be used. Parts exposed to wear - especially the vanes - should be regularly changed. They are considered to be worn when the width is less than 9.5 mm.



We recommend reapplication of the grease in the planetary gear and in the worm gear after 300 hours of operation. Use only special gear grease. The rolling bearings must be thoroughly cleaned and filled with new bearing grease after approximately 900 hours of operation. In order to avoid excessive heating of the bearing, the space between the inner and outer rings should only be filled with grease until it is about 1/3 full.

The correct amount of grease is very important with respect to achieving good lubrication and minimal heating.

Grease (resin- and acid-free)	Multipurpose Grease for Rolling and Sliding Bearings and for Gears	Special Grease for Worm Gears
Designation according to DIN 51502	KL 2k	G 00 h
Consistency class DIN 51818	2	00
Saponification additive	lithium	sodium
Drop point	185° C	145° C
Werk penetration	265 – 295	400 – 410
Temperature range	-25° C to +125° C	-25° C to +100° C

## Disassembly and Assembly

The disassembly and the assembly should only be performed with assistance of the exploded views and sectional drawings.

### Disassembly

#### Motor

Detach the motor housing (1) and the gear connection (16). The exhaust ring (19) can be pulled off the motor housing. Unscrew the valve (60) and push motor parts, such as the end plates (3 and 10), the cylinder bushing (6) and the rotor (8), out from behind. Check all parts especially the vanes (9), for signs of wear and damage.

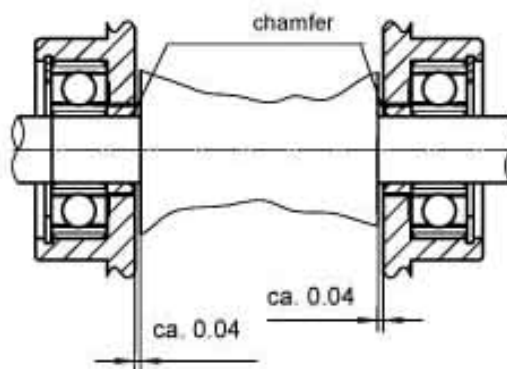
#### Planetary Gear

Detach the gear housing (25) and the gear connection (16). By gentle knocking against a wooden block, the two planetary gear stages complete with the bearings can be removed from the gear housing. After the lock washer (49) and the bearing cover (50) have been screwed off, the worm gear wheel (46) and the worm (47), as well as the axial bearing (41), the radial bearings (43 and 48) and the needle bearing (44), can be removed.

### Assembly

The assembly is performed in basically the opposite order as the disassembly. Ensure that the motor is precisely aligned. The clearance between the rotor (8) and the end plates (3 and 10) should be 0.04 mm in the front and in the back (see figure 2). The chamfers in the spacer rings (13 and 21) must point to the middle of the rotor. The cylinder bushing has to be correctly oriented before being inserted.

Figure 2:



The position of the lever valve can be determined with the help of the compensating coils.

**For all repairs, use the ORIGINAL SPARE PARTS only.**

Check after Assembly			
Operating Pressure (Flow Pressure)	p	6	bar
Speed (idle)	n	130	rpm
Air consumption (idle)	V	1.3-1.4	m <sup>3</sup> /min
Noise (1 m distance)	ca.	85-87	dB(A)

### Problem / Cause / Solution

	PROBLEM	CAUSE	SOLUTION
<b>a</b>	Machine doesn't start up	<ul style="list-style-type: none"> <li>&gt; Not connected to compressed air</li> <li>&gt; Rotor has been rusted by humidity</li> <li>&gt; Vanes are jammed (worn)</li> <li>&gt; Gearing is blocked</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Connect and open the compressed air line</li> <li>&gt; Dismantle and clean the motor; check the servie unit to see if it is functioning</li> <li>&gt; Dismantle and clean the motor; replace worn parts.</li> <li>&gt; Dismantle and clean the gearing; change worn parts</li> </ul>
<b>b</b>	Valve lever / shaft is jammed	<ul style="list-style-type: none"> <li>&gt; Contamination in valve</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Screw off the connection fitting; clean the spring, ball, seal and shaft</li> </ul>
<b>c</b>	Machine is rotating too slowly	<ul style="list-style-type: none"> <li>&gt; Operating pressure is too low</li> <li>&gt; Rotor is rubbing against the end plate / cylinder bushing</li> <li>&gt; Gear parts are worn down</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Increase the operating pressure on the machine to 6 bar</li> <li>&gt; Dismantle and clean the motor; replace worn parts and align the motor again</li> <li>&gt; Dismantle and clean the gearing; replace worn or damaged parts</li> </ul>
<b>d</b>	Motor seizes up / jammed	<ul style="list-style-type: none"> <li>&gt; Vanes are worn or broken; broken parts are jammed between the rotor and the cylinder bushing</li> <li>&gt; No lubrication – ball bearings were running dry; rotor was rubbing against the end plates</li> <li>&gt; Coarse dirt particles in the motor compartment between the rotor and the cylinder bushing</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Dismantle and clean the motor; replace worn parts and align the motor again</li> <li>&gt; Dismantle and clean the motor; replace worn parts</li> <li>&gt; Dismantle and clean the motor; replace worn parts and align the motor again</li> </ul>
<b>e</b>	Gear makes loud noises	<ul style="list-style-type: none"> <li>&gt; Needle cages are defective</li> <li>&gt; Gear teeth are chattering</li> <li>&gt; Ball Bearings are defective</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Dismantle and clean the gearing; replace worn or damaged parts</li> </ul>



Pneumatic-Driving Machine  
6 1016 0010

**SPITZNAS**  
Maschinenfabrik GmbH

## MAINTENANCE OF PNEUMATIC TOOLS

Only proper maintenance can ensure constant performance, reduction in wear and thus, a decrease in operating costs and an increase in service life.

Our pneumatic tools are equipped for an operating pressure of 6 bar. A regulator setting for an operating pressure of 4 bar is possible as well as expedient for grinding machines with a built-in regulator, so as to take full advantage of the speed prescribed for the corresponding grinding wheels.

Pneumatic tools should not run empty, because this results in heat and higher wear. The compressed air should be clean and dry. This is guaranteed by a proper pneumatic system. Blow through the pneumatic hose before connecting it. For the economical use of pneumatic tools, the prescribed air quantities are necessary, i.e., the line, armatures and hoses must have the required cross sections so that the flow pressure remains constant. Proper lubrication is a must; for this reason, our pneumatic tools usually have built-in oilers, which are located between the inlet valve and the motor, and which function in any position. In smaller and lighter hand tools, these oilers must often be left out, because the machines would then be too heavy and not easy to manage. In such cases, lubrication must be carried out by service units or by manual hose oilers. We recommend service units for permanently installed workplaces

(see accessories list). However, where longer hose lines are necessary, line oilers built into the hose lines are more effective. The distance between the tool and oiler should not be more than 5 m.

Most of pneumatic tools have located at the connection a lined-up screen, which is to be regularly checked and cleaned.

After ending a working task, the machines are to be flushed with a thin oil, or protected some other way against corrosion.

Visible grease nipples are provided for regular lubrication of the gears with a grease gun. Note the following for grease lubrication: Every 60 hours of operation check striking mechanism, friction bearings and antifriction bearings; if necessary, grease them. Every 300 hours of operation grease the gears and antifriction bearings anew. In the case of impact wrenches, use a grease gun to grease the anvil guide before beginning daily work or every 6 to 8 hours. All inner parts must be lubricated before storing for longer periods of time in order to prevent rusting. It is recommended to check the valves and bearings at regular intervals. Store pneumatic tools in dry rooms only.

**Lubricating oils** to be used:  
Generally SAE 5 W to SAE 10

For gearless impact wrenches and small grinders, only SAE 5 W

For damp compressed air, oils are to be used that take up water (without losing the lubricating effect) and that contain anticorrosive additives. At lower temperatures (especially for work outside) it may be necessary to use an antifreeze lubricant (e.g., Kithof, EP Energol AX 10, Kompranol N 74).

**For saw-chain lubrication on chain saws:**  
Machine oil **with adhesive additive**, viscosity c ST 49-55° (6.5-7.5 E) / 50° C

Greases (free of resins and acids)	Multi-purpose greases for antifriction and friction bearings and gears	Special greases for high-speed roller gears
Designation in accordance with DIN 51502 Consistency class (DIN 51818) Saponification type Dropping point Worked penetration Temperature range	KL 2 K 2 lithium 185° C 265 to 295 -25° C to 125° C	G 00 h 00 sodium 145° C 400 to 410 -25° C to + 100° C



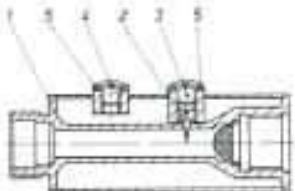
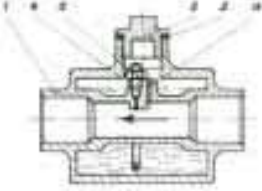
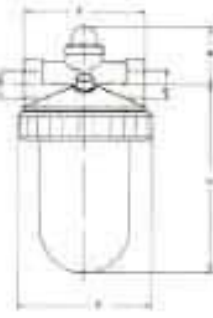
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## OILER TYPES USED ON OR WITH OUR TOOLS

	<p><b>Oiler to mount on the machine or connect in the hose line</b></p> <p>Setting the oiler: The adjustment screw (item 2) is visible after removing the screw plug (item 3). The oil supply is decreased by tightening the screw, and by loosening the screw, more oil gets into the machine. In most cases it is sufficient to tighten or loosen the screw by 1/4 or 1/2 of a turn. When plugged, clean borehole (dia. 2 mm) with wire.</p> <p>Correct setting: When under pressure and with the filter screw (item 4) open, the oil must bubble slightly. The filling lasts for approx. 6 operating hours.</p>
	<p><b>Line oiler</b></p> <p>For stationary pneumatic machines and motors, the lubrication is carried out by lined-up oilers for horizontal or vertical installation.</p> <p>Setting of oilers: Shut off air supply. Open plug (item 3). Loosen visible lock nut (item 5) with a socket wrench. Using a screw driver turn back the tightened screw plug (item 4) by 1/4 to 1/2 of a turn and then lock again. No oil is to get into the borehole "a" when filling. Close plug (item 3) and open the air supply.</p> <p>Correct setting: A piece of paper held for a short time in front of the outlet must be coated with oil without drops forming.</p>
	<p><b>Transparent oiler</b></p> <p>For installing in permanently equipped workplaces, especially for type using service units – see accessories list.</p> <p>The transparent supply containers allow for good checking as well as for good setting possibility by means of a screw driver via a set screw with visible dripping. (The set screw is above the lateral thread connection – turning to the right for less oil; turning to the left for more oil). The setting (2 to 5 drops per m³/min air consumption) is to be carried out when air is flowing through, i.e., when the machine is running.</p>



Spare Parts List					
Description:  <b>Pneumatic- Driving Machine</b>			Part and drawing number: <b>6 1016 0010</b>		
			Page no.: 1/3	Date: 09/03	
Item	Qty.	Description	Part and drawing no.		Remarks
1	1	Motor housing, Assy.	3 6339 1910		with item 2
2	1	Adjusting screw	9 1151 9010		
3	1	End plate	3 6341 1110	*	
4	1	Spacer	3 6341 1080	*	
5	1	Grooved ball bearing	9 1001 0090	*	
6	1	Snap ring	9 1703 0050		
7	1	Cylinder bushing	1 1430 1020	*	
8	2	Spiral dowel pin	9 1642 0080		
9	1	Rotor	3 6348 1030		
10	4	Vane	1 1430 1050	*	
11	1	End plate	5 1202 1100		
12	1	Grooved ball bearing	9 1003 0020	*	
13	1	Snap ring	9 1703 0070		
14	1	Spacer	5 1202 1080		
15	1	O-Ring	9 1901 2070		
16	1	O-Ring	9 1901 2430		
17	1	Gear connection	3 6339 1190		
18	1	Exhaust ring	3 6339 1180		
19	1	Damping material	3 6339 1770		
20	1	O-Ring	9 1901 3270		
21	1	Nipple	9 2205 0035		
22	1	Lever throttle with pawl	9 2002 0120		
23	1	Screw plug	9 1150 9070		
24	1	Seal	9 1913 0260		
25	1	Screw plug	9 1150 9030		
26	2	Seal	9 1903 0340		
27	1	Shim ring	9 3331 2020		
27	1	Shim ring	9 3331 0050		
27	1	Shim ring	9 3331 0240		
30	1	Gearbox casing I	6 1016 4010		
31	1	Bearing washer	6 1016 4060		
32	1	Radial shaft seal	9 1905 0030		
33	1	Grooved ball bearing	9 1002 0030		
34	1	Planet carrier	6 1016 4030		
35	2	Needle roller	9 1016 0310		
36	6	Needle cage	9 1015 0190		
37	2	Planetary wheel	6 2001 4040		
38	1	Grooved ball bearing	9 1004 0030		

[illegible]

