

## Pneumatic Die Grinders

### GENERAL DIE-GRINDER APPLICATIONS

Pneumatic grinders with collets, having a model number GDS, are best suited for the manual radial- and lateral grinding using grinding-wheels. The grinders can also be equipped with carbide grinding inserts.

These grinders are generally used for the treatment of forms, dies, and punches; and to finish different type of cast iron, welding seams-, or work surfaces.

They may also be used for the treatment of metals, alloys, plastics, and hard rubber.



### LARGE PRODUCT LINE

All our tools excel through their high quality, ergonomic design, simple and safe operation, low maintenance requirement and an outstanding power-to-weight ratio. Our product specialists will be glad to assist you with the selection of the right tool. We offer

pneumatic die-grinders in different designs, such as grinders in standard execution, in long execution, in short execution, with a reduced body OD, inline design or with an angle-head. Special designs include models that may be mounted into an automatic ma-

chine; models with feature an extended shaft (to access difficult to reach surfaces). All our standard grinders are available with either trigger- or lever-start. We also offer die-grinders with either a turbine motor or the proven and powerful vane-motor.



*Die Grinder  
Model GDS 015-470 SY*

### TOP-SPEED GRINDER

**90 W**

- **Optimum surface removal and surface quality by use of a speed consistent gear-drive**
- **High repeatability due to gear-motor without vanes**
- **Oilfree operation without loss of power**
- **Best Ergonomic Shape**

High-speed midget grinders are used for grinding, for deburring and also for the treatment of non-metallic materials, especially when used with high-grade steel inserts at a very high speed. The technical difficulty in obtaining such speeds are hampered by the common air-motor that

needs to output sufficient power, the loss of speed under load and the general insufficient durability of an air-motor with vanes. The other option is to use a turbine motor with additional gearing, which is expensive and does not offer the best solution. The DEPRAG INDUSTRIAL Top-

Speed-Grinder with a modernized gear-motor, incorporates all of these advantages, such as high power output, consistent high speed, robustness and oil-free use, without any of the previous mentioned disadvantages.

The best results when removing surfaces or when trying to obtain top surface quality, depends primarily on the speed under load and the use of the best-suited tooling. Compared to a vane-motor, the advantage of this new high-speed gear-motor is in limiting the speed loss under power.



*Top-Speed Grinder  
Model GDS 009-1000 BY*

The speed-loss of an already low-speed vane-motor amounts to about 50% under load, whereby the new gear-motor only loses about 30%. Because of the no-friction operation of the motor-parts, the wear and tear is greatly reduced and the frequent replacement of vanes is a thing of the past!

The integrated materials of the power-drive allow an oilfree operation, without any loss of power or speed.

The extreme high precision (<0.03 mm) of the integrated collet is superior to any collets offered by our competitors.

They offer an increased longevity, they increase the quality of the material surface while simultaneously reducing the tools' vibration.

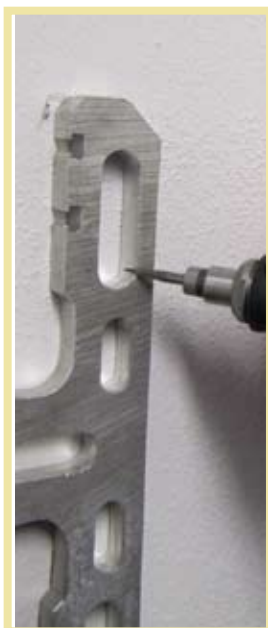
Independent from the technical data, the state-of-the-art ERGONOMIC design contributes heavily to a positive production result. The asymmetric form allows an individual comfortable grip and a non-slip orientation in the hand.

The rear exhaust removes unpleasant exhaust-air from the operator and the workstation. The integrated silencer reduces the noise level to a comfortable 72 dB(A).



**TOP-SPEED-GRINDER**

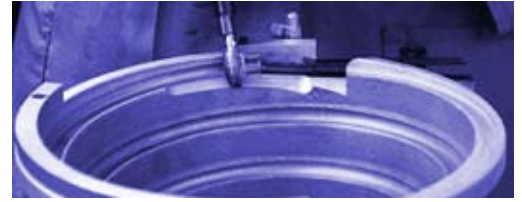
**100.000 RPM**



## PNEUMATIC DIE GRINDERS

# 110 - 350 W

- **Start options: twist valve / lever start**
- **Basic, short, long or slender design**
- **Inline (i.e. GDS 011, GDS 013, GDS 025, GDS 030)**  
**Angle-design (i.e. GDA 013, GDA 030, GDB 030)**



Special tools:

- Model GDS 030 - design „G“ - The housing of this stationary grinder allows it to be clamped into a fixed stand, machine, gripper or holder
- Model GDS 030 - design „Q“ - These grinders are generally used for the treatment of forms, dies, and punches and to finish different type of cast iron, welding-seams, or other work surfaces.



**We can use these grinders for less exactiva adjustment in heavily open place**



The die-grinders of the series GDS with a power of 110 to 350W are best suited for the manual surface- or edge-grinding using abrasives.

They are capable for working on hardened steel and especially adaptive when used to grind castings, forgings and welding-seams.

In short, they can be used on a variety of materials, no matter

whether the material is made of metals, alloys, plastics or even rubber.

Because of the particularly slim spindle-bearing, the tools of the execution "V" may also be used to access hard-to-reach areas.

All grinders are equipped with a speed-regulator (similar to the series GDS 030-300/450 BX, BY, VX, VY), which simplifies handling, increases efficiency and reduces air

consumption.

These grinders are also available with an angle-head with a 90°-angle (Models GDA 030) or a 120°-degree angle. (Models GDB 030).



## TURBINE GRINDER

250 W

Our turbine grinders are available in two inline designs: GDST 025-700 BY (with brake), GDST 025-700 BYO (without brake). The design execution without brake is for applications where the tool has longer resting intervals. The design with integrated brake assures a faster spindle-stop.

### RECOMMENDATION

Grinding tip - max.  $\varnothing$  13mm

Grinding insert - max.  $\varnothing$  6mm,  
Largest collet size =  $\frac{1}{4}$ ".



## PNEUMATIC DIE GRINDERS

- **Start Options:** twist valve / lever start
- **Basic, short, long, slender or extension design**
- **Inline (i.e. GDST 050, GDS 070, GDS 100)**  
**Angle-Design (i.e. GDA 070, GDB 070)**

# 500 W - 1,13 kW

Air-operated grinders with collets, having a model number GDS (power 500 W - 1 kW), are suited for the manual radial- and lateral grinding with grinding-wheels. The grinders can also be used with carbide grinding inserts. The maximum allowable speed of the grinding wheels and grinding inserts is shown in the technical data of each individual grinder.

These grinders are generally used for the treatment of forms, dies, and punches; and to finish different types of cast iron, welding-, or work surfaces. They can also be used for the treatment of metals, alloys, plastics, and hard rubber.

### Advantages of range GDS 050:

- Collets are equipped with special nut for superior clamping force
- Safety pin protects against the release of lever while in operation
- Dual insulated housing
- Twist valve / lever start



*Die Grinders*  
Model GDS 050-200 SXI  
Model GDS 050-300 BYI  
Model GDS 050-300 VXI  
Model GDS 050-200 WXI

## TURBINE GRINDERS

# 500 W



*Turbine Grinders*  
Model GDST 050-550 SYO  
Model GDST 050-550 VXO

### Advantages of range GDST 050:

- No lubrication required
- Increased motor longevity – no wear parts to replace in motor (such as vanes)
- Due to the high speed, this grinder series is especially well-suited for the use with high-tech grinding inserts
- Low air consumption at speed without load. Instantaneous regulator response to increased load

Collets are equipped with a retainer nut for a superior clamping force. The turbine grinders do not replace the standard grinder series GDS 050; however, they do offer additional choices in this speed range (from 50,000 to 60,000 rpm). The turbine technology equipped grinders are especially well suited for metal- and plastic fabrications. This grinder series does not incorporate an automatic brake. To quickly stop operation, simply press the abrasive onto the fabricated material.



### Recommended max. $\varnothing$ of grinding tip (50m/s)

DEPENDENT ON IDLE SPEED OF THE GRINDER

Table of conversion rpm and working speed depending on diameter grinding tips

$\varnothing$ of grinding tip [mm]	Maximal working speed [m/s]																	
	5	6	8	10	12	16	20	25	32	35	40	50	63	80	100	125	140	160
6	16 000	19100	25 500	31 900	38 200	51 000	64 000	80 000	102 000	112 000	128 000	160 000	201 000					
8	12 000	14 000	19 100	24 000	29 000	38 200	48 000	60 000	76 500	84 000	95 500	120 000	150 500	191 000				
10	9 600	11 500	15 300	19 100	23 000	30 600	38 200	48 000	61 200	67 000	76 500	95 500	120 500	153 000	191 000			
13	7 400	8 850	11 800	14 700	17 700	23 550	29 500	35 600	47 100	51 500	58 800	73 500	92 600	118 000	147 000	184 000	206 000	
16	6 000	7 200	9 550	11 950	14 350	19 100	23 900	29 850	38 200	41 800	47 800	59 700	75 200	95 500	120 000	150 000	168 000	191 000
20	4 800	5 750	7 650	9 550	11 500	15 300	19 100	23 900	30 600	33 500	38 200	47 800	60 200	76 500	95 500	120 000	134 000	153 000
25	3 850	4 600	6 150	7 650	9 200	12 300	15 300	19 100	24 500	26 800	30 600	38 200	48 200	61 200	76 500	95 500	107 000	123 000
32	3 000	3 600	4 800	6 000	7 200	9 550	11 950	14 950	19 100	20 900	23 900	30 000	37 600	48 000	60 000	75 000	84 000	95 500
40	2 400	2 900	3 850	4 800	5 750	7 650	9 550	11 950	15 300	16 750	19 100	23 900	30 100	38 200	47 200	59 700	67 000	76 500
50	1 950	2 300	3 100	3 8/50	4 600	6 150	7 650	9 550	12 250	13 400	15 300	19 100	24 100	30 600	38 200	47 750	53 500	61 200
63	1 550	1 850	2 450	3 050	3 650	4 850	6 100	7 600	9 750	10 650	12 150	15 200	19 100	24 300	30 250	37 900	42 500	48 500
80	1 200	1 450	1 950	2 400	2 900	3 850	4 800	6 000	7 650	8 400	9 550	12 000	15 100	19 100	23 900	29 850	33 500	38 200
100	960	1 150	1 550	1 950	2 300	3 100	3 850	4 800	6 150	6 700	7 650	9 550	12 100	15 300	19 100	23 900	26 800	30 600
115	830	1 000	1 350	1 700	2 000	2 700	3 350	4 200	5 350	5 850	6 650	8 350	10 500	13 300	16 650	20 800	23 250	26 600
125	770	920	1 250	1 550	1 850	2 450	3 100	3 850	4 900	5 350	6 150	7 650	9 650	12 250	15 300	19 100	21 400	24 500
150	640	770	1 050	1 300	1 550	2 050	2 550	3 200	4 100	4 500	5 100	6 400	8 050	10 200	12 700	16 000	17 850	20 400
180	530	640	850	1 100	1 300	1 700	2 150	2 700	3 400	3 750	4 250	5 350	6 700	8 500	10 650	13 300	14 900	17 000
200	480	580	765	955	1 150	1 550	1 950	2 400	3 100	3 350	3 850	4 800	6 050	7 650	9 550	11 950	13 400	15 300
230	420	500	665	830	1 000	1 650	1 700	2 100	2 700	2 950	3 350	4 200	5 250	6 650	8 350	10 400	11 650	13 300
250	380	460	615	765	920	1 250	1 550	1 950	2 450	2 700	3 100	3 850	4 850	6 150	7 650	9 550	10 700	12 250
300	320	380	510	640	765	1 050	1 300	1 600	2 050	2 250	2 550	3 200	4 050	5 100	6 400	8 000	8 950	10 200
350/356	280	330	440	550	655	875	1 100	1 400	1 750	1 950	2 200	2 750	3 450	4 400	5 500	6 850	7 650	8 750

GDS 050-300 ...

GDST 050-550 ...

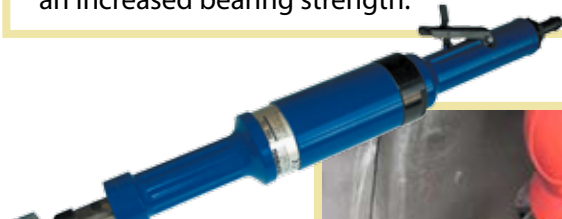
## 700 W, 1 kW

*Die Grinders  
Models GDS 070; GDS 100*



### Advantages of range GDS 070 und GDS 100:

- Large assortment
- Basic design, short, slender or extension design for heavy industrial use partial exhaust to the front
- Dual insulated housing (temperature of the tool surface is a minimum of +4°C)
- Ergonomic design
- The extended version "W" is for the interior cleaning of pipes and the grinding of areas that are difficult to access
- Accepts steel brushes up to max. 50-mm diameter
- Totally modular design – the spindle is exchangeable by individual extensions from 400-mm (Model .... WXI) to 1200-mm (model ... W4XI). The numerical digit in the model number pertains to the number of integrated extensions (in the case of W2XI = 200-mm)
- Version "H" is for heavy industrial usage
- Version "H" is for heavy industrial usage; compared to the standard execution grinders GDS070-190SXI, BXI and VXI, the "H" models have mainly an increased bearing strength.



*Die Grinder  
Model PBK 75X*



## 1,13 kW



## 700 W

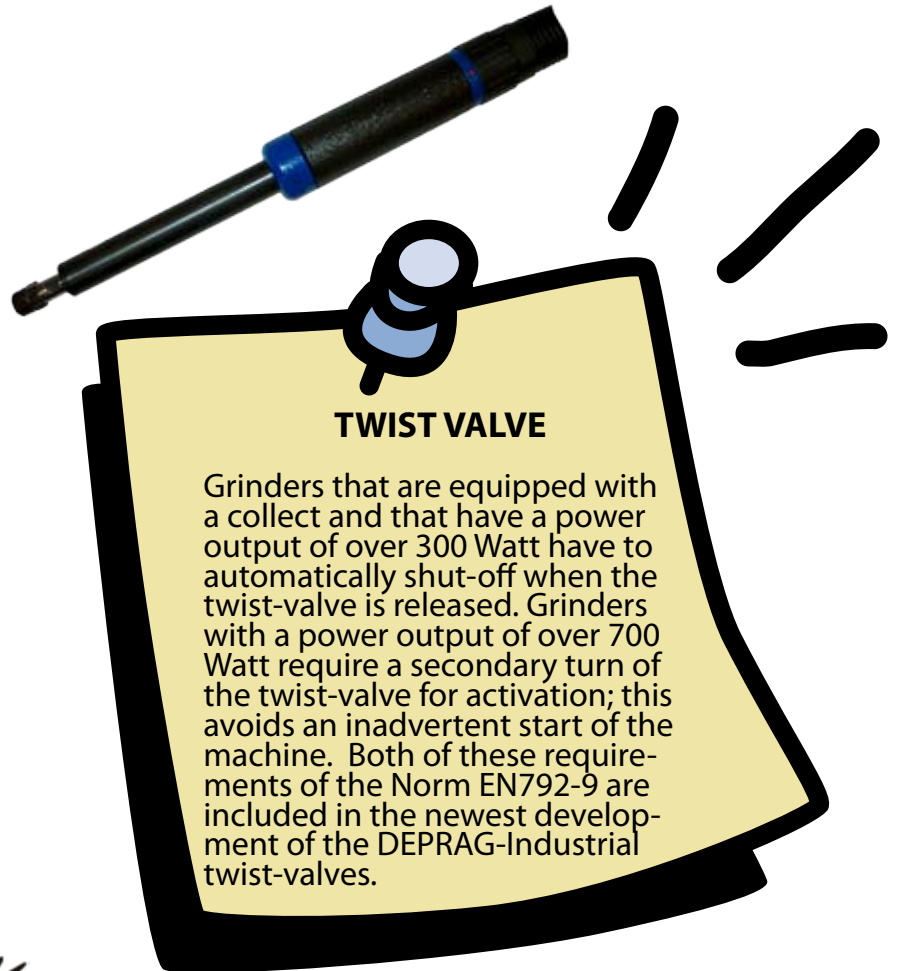


*Die Grinder  
Model GDB 070-153 BX*



### Advantages of range GDA 070, GDB 070:

- Design selection - angle-head 90° (version A) or angle-head 120° (version B)
- Ergonomic design
- Simple assembly and disassembly minimizes maintenance



### **TWIST VALVE**

Grinders that are equipped with a collect and that have a power output of over 300 Watt have to automatically shut-off when the twist-valve is released. Grinders with a power output of over 700 Watt require a secondary turn of the twist-valve for activation; this avoids an inadvertent start of the machine. Both of these requirements of the Norm EN792-9 are included in the newest development of the DEPRAG-Industrial twist-valves.

### **SAFETY SPECIFICATIONS**

Observe all safety regulations, which is an inseparable component of the delivery of each tool DEPRAG INDUSTRIAL. A safe operation of the tool and its correct function is only possible, if the instruction booklet has been read in detail and if the required instructions are observed.

### **Turbine versus Vane motor**

#### **Advantages of the turbine motor:**

- Oil free – no need for lubrication results into improved environmental conditions
- The motor does not include wear parts (vanes)
- The motor rotates without creating surface friction
- High speed – well suited for grinding inserts and special grinding tips
- Extreme low air consumption at idle speed – 130 l/min
- Minimized weight – about 13% lower than GDS 050
- Instant load achievement due to the fast reaction of the speed regulator
- Low noise level – below 70 dB(A)

#### **Advantages of the vane motor:**

- High start torque
- Smaller diameter of the motor (low-power motors)
- Continued regulation of the rotational speed without a gearbox

# Air-Turbine Motors for Power Tools

**The main advantage of the air-motor is its high performance density, which is only about 1/5th of the mass or 1/3rd of the size of an electric motor with comparable performance. Due to this advantage, an air-motor is better suited as a drive for power tools.**

## Power characteristics

The power output performance of the air-motor is virtually constant over broad speed ranges. It can also be operated in a wide field of alternating loads. The power output can be easily adjusted by changing the operating-pressure, and the speed is perpetually variable by the reduction of the air-volume.

## Load capacity

The air-motor can easily be loaded to a full standstill; it even tolerates a negative turn direction if the load is increased. The motor always reaches its full power output and there will be no damage to the motor!

## Temperature behavior

Expanding air cools the motor when the load is increased. Only

when idling, a rise in temperature may occur. The motor is therefore temperature insensitive and overheating through over-load is practically impossible.

## Exhaust

The noise generated by the exhaust air is reduced by a specialized silencer. Additionally, the exhaust air is directed away from the operator through a coaxial pressure/exhaust-hose.

## Vane motor

All vane motors essentially consist of the rotor, which circulates in an eccentrically offset perforation of the rotor cylinder. Because of this eccentrically offset perforation, the vanes form working chambers, the volume of which increase in the turn direction. Because of the expansion of the compressed supply air, the pressure energy is converted into kinetic energy and therefore results into the rotation of the rotor.

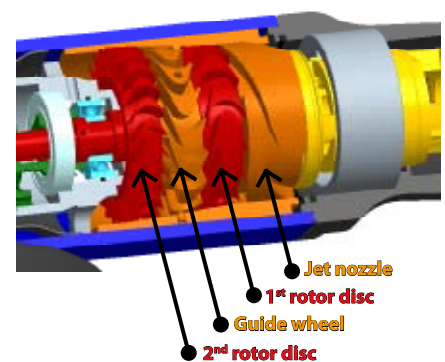
## Turbine motor

Our turbine motors offer the ideal drive solution for high speed ranges. From turbine design and prototype production up to a se-

ries manufacturing, a tailor-made motor solution is available for your individual application.

## Structure and function of the DEPRAG turbine

Conversion of pressure energy to kinetic energy in the jet nozzle. Most of the kinetic energy is transformed within the first rotor disc. The fixed guide wheel alters the air flow. The residual energy is transformed in the second rotor disc. The turbine is a turbo machine which does not need tangential sealing. Turbine operation with oil-free air therefore causes absolutely no wear. Turbo machines use pneumatic energy optimally. Therefore, the air requirements sink to a third in comparison with a standard vane motor. The performance to weight ratio (kg/kW) is only half as large.



## Grinding Tips, Grinding Inserts

### GRINDING TIPS



Area of Usage		Structural Steel	Stainless Steel			Cast Iron		Steel for forms			Non-ferrous metals
Name	Material	Untreated structural steel	Weld on alloyed steel and on plain steel	Fireproof and acid-proof steel	High alloyed steel	Malleable and spherical iron	Grey cast iron	Heat-treated steel	Hardened steel	Steel - hard chromium plated	Aluminium
	Recommended working speed (m/s)										
Noble corundum (pink)	30-50										
Noble corundum (white in brown design)	25-40										
Compound of noble corundums (dark red + pink)	30-50										
Standard corundum (resin bond, without sulphur and iron)	40-50										
Standard corundum with resin bond	40-50										
Compound of noble corundum (white + normal)	40-50										
Compound of noble corundum (pink + normal)	30-50										
Combination of corundum	10-30										
Noble corundum - white	20-35										
Noble corundum (pink in brown design)	40-50										
Siliciumcarbide - green	25-40										

**Abrasives are tools that are used for the finishing of a surface - from simple roughing up to fine-honing.. The selection of the correct quality of the abrasive is crucial for the optimal application in regards to performance, longevity and quality of the surface.**

The quality is categorized as follows:

- Raw material selection (standard corundum, noble corundum pink, white, red, corundum compounds, silicon carbide)
- Grains accord. PEPA (6, 8, 10, 12, 14, 16, 20, 26, 30, 36, 46, 54, 60, 70, 80, 90, 100, 120, 150, 180, 220, 240, 280, 320, 400, 500)
- Hardness (identified by the letters A through Z ( Z = the hardest)
- Structure (0 - 14; 14 = the highest porosity)
- Bonding (V = ceramic, Ba - resin)

Abrasives with a ceramic bonding are generally produced for maximum speeds of 50-m/s and abrasives with resin bonding for an allowable maximum speed 50- or 63- m/s . Maximum allowable speeds depend on the weight and form of the abrasive, shaft diameters and shaft material, as well the run-out deviation. The concrete value of the allowable operating speeds is stated on the safety tag of each abrasive.

**Tip**

The recommended speed should not be exceeded! It is necessary to observe the supplied safety regulations, when using an abrasive. The maximum operating speed has to be coordinated with the push-out of the abrasive from the collet.

### RECOMMENDED MAX. Ø OF GRINDING INSERTS



DEPENDING ON OPERATING SPEED OF THE GRINDER AND GRINDING MATERIAL

Recommended working speed						
Material	Diameter	0,125"	0,250"	0,375"	0,500"	0,625"
		3 mm	6 mm	10 mm	13 mm	16 mm
Aluminium and aluminium alloy, plastics, zinc alloy, laminate		30 000 - 90 000	15 000 - 70 000	10 000 - 50 000	7 000 - 38 000	6 000 - 30 000
Brass, cast iron, copper, bronzes		45 000 - 90 000	22 500 - 60 000	15 000 - 40 000	11 000 - 30 000	9 000 - 24 000
Soft steel		60 000 - 90 000	45 000 - 60 000	30 000 - 40 000	22 500 - 30 000	18 000 - 24 000
Ceramic materials, hard steel alloy, manganese forging, titanium alloy		60 000 - 90 000	30 000 - 45 000	19 000 - 30 000	15 000 - 22 500	12 000 - 18 000

**General recommendations for the use of grinders**

To achieve the best results, it is very important to preset the working conditions to coordinate with the above mentioned graphs. For harder materials we recommend a lower cutting speed. Higher speeds generally result in a better surface quality. Keep the tool constantly moving and apply low pressure during the grinding operation. Using the grinder at too low a speed may cause the abrasive to shatter. Using a damaged or worn abrasive may cause the abrasive to shatter as well. Do not use an abrasive with a smaller diameter than 1/3rd of its perimeter. Increasing the cutting speed to be above the recommended speed, does not lead to increased efficiency but will prematurely wear the abrasive.