

## Specification - *Model 380* Series Drill & Tool Grinders

## **Rush Machinery, Inc.**

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6. Spin and Index grinding
  - a) Spin Grind- straight (i.e. drill shanks and pilots), chamfer (adjustable angle) & square end.
  - b) Index grind flats - with integral 12 position indexing plate.
7. Grind most tool materials (i.e. high speed steel, cobalt high speed steel and tungsten carbide) with the use of the properly selected grinding wheels.

#### **II. Construction Features**

##### **A. Grinding Spindle Assembly**

1. Wheel Spindle shaft- hardened and ground steel with a standard tapered end for wheel hub mounting (taper- 3" per foot).
2. Sealed ball bearings- (1) single row and (1) double row, angular contact bearing
3. Spindle Housing
  - a) Material - cast iron
  - b) Adjustable tilt from horizontal: +/- 30 degrees
4. Spindle Mounting Column
  - a) Material- cast iron
  - b) Spindle vertical position adjustment is by Acme screw, bronze nut & hand wheel.
  - c) Vertical dovetail ways are provided with adjustable tapered gibs.
  - d) Linear vertical positioning scales are mounted on each side of the column.
  - e) Accordion type dust cover is used over the ways and lead screw.
5. Spindle motor-1 H.P., Totally Enclosed Fan Cooled (TEFC), 3450 rpm, 3 phase system, 230/400/460V, 50/60 Hz  
*Note: Machines equipped with the Automatic In-feed System, a 1-1/2 H.P., 3 phase motor is provided, as standard.*
6. Magnetic starter system is used for a 3 phase motor control and has overload protection; 115V. output control transformer and a push button on/off station.
7. Coupling, motor/spindle shaft- keyed, self-aligning splined elastomer type.
8. Protective grinding wheel shroud with hinged cover for easy access
  - a) Steel construction
  - b) Has provision for using the *optional* - Overhead Rush "Easy Dress" Wheel Dresser (P/N WD01- See *optional* list in para. III)
9. Grinding Wheels
  - a) Standard - Main wheel: 7" diameter by 1-1/2" wide aluminum oxide & ceramic blend with 1-1/4" bore. *Note: A CBN main grinding wheel is provided, as standard, with the optional Automatic Infeed System.*
  - b) *Optional*- Ceramic/aluminum oxide, CBN and diamond wheels of various types - See Rush Price List or contact Rush Machinery for details.

##### **B. Cross Slides (X & Y directions)**

1. Cast iron
2. Spindle mounting vertical column mounts on the cross-slides.

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3. Dovetail ways with adjustable tapered gibs on each slide
  4. Both slides are equipped with Acme screws and bronze nuts
  5. An adjustable stop is mounted on the traverse ways, to ensure a repeatable centering position during point splitting and other operations. Stop can be quickly disengaged, when not in use.
  6. The traverse slide has a calibrated dial with crank. Dial calibrations are to 0.002"
  7. In-feed slide has a calibrated dial with crank. Dial calibrations are to 0.001"  
*Note: Optional- Millimeter dial calibrations (6. & 7. above).*
  8. Metal and accordion type dust covers protect the ways.
- C. Machine base
1. Cast iron
  2. Tool point angles set with easy to read, point angle scale
  3. Provides mounting for the cross-slides and the workhead.
  4. Two manual pin holes, in the base, provide positive workhead angular "lock" locations, at perpendicular to and parallel to the grinding wheel axis.
- D. Work head
1. Machines cast aluminum- main body and gear cover with cast iron work head base.
  2. Work holding Chuck 7-9/16" (192 mm) O.D.- self centering, with 6 precision and hardened steel jaws with a holding length of 3.25" (82.5 mm), Meehanite body and hardened steel scroll plate. Chuck work holding diameter range- 3/16" (4.5 mm) to 3-1/8" (80 mm).
  3. Chuck spindle- hollow, hardened and ground with 3-1/8"+ (80+mm) diameter bore.
  4. Chuck spindle and cam rotation drive uses machined gears in a covered housing. Drive source is a hand crank, or a geared-head air motor.

#### **Model configurations:**

Model 380 as above.

Model 380S- Semiautomatic Model or Automatic In-feed models (below) have a pneumatic system to provide chuck rotation with an adjustable speed controlled air motor, through a timing belt, as the drive source plus a hand knob for small quick chuck position adjustments. The system also includes an air lubricator, pressure regulator and filter, speed control valve, 4-way valve (for forward, reverse and stop control) and a gear-head air motor (mentioned above).

Model 380S with Automatic In-feed System: The In-feed system functions through electronic and pneumatic elements, in addition to the above mentioned chuck rotation pneumatic system. In-feed control elements: a programmable controller, proximity switch (to count chuck revolutions), electric counter with count limit control, in-feed "on" & "off" push buttons, toggle switch with "full" & "1/2" feed rate positions, and an

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adjustable in-feed screw ratchet mechanism (adjusts for 0.0005", 0.001" or 0.0015" in-feed for each chuck revolution control signal). *Note:* With automatic in-feed "off", the machine can be manually operated.

*Note:* Information sheet is available for the Automatic Infeed System.

5. The spindle bearing is a large diameter precision rotary-linear ball bearing which provides anti-frictional motion in both rotational and linear directions.
6. The spindle and cam rotational drive system uses hardened and ground gear shafts with radial and thrust anti-friction needle bearings. Gear ratio between the cam and workhead rotation is 2:1 for even number of flutes grinding. The cams provide controlled axial motion to the workhead spindle, for various grinding requirements.
7. Cam action- provides controlled spindle forward/back axial motion for a variety of grinding requirements including grinding *left hand* (LH) & *right hand* (RH) tools.
  - a) All cams are surface hardened.
  - b) Cam followers are ball bearing roller type
  - c) Cams can be changed in 5 to 10 seconds without tools.
  - d) Cams available:

P/N	Standard Cams	P/N	Optional Cams
C04	#4- RH 2-flute drills & taps	C09	#9- LH 6-flute straight taps & reamers
C06	#6- RH 2-flute step & subland drills	C10	#10- RH 6-flute straight taps & reamers
C08	#8- RH 4-flute drills & taps	C10A	#10A- RH 6-flute for larger taps
		C12	#12- RH 2-flute self-centering spiral pt.
		C14	#14- RH 2-flute sheet metal, fishtail and
	<b>Optional Cams</b>		brad point
C01	#1- LH 2-flute drills & taps	C14S	#14S- RH 2-flute structural steel point
C05	#5- LH 2-flute step & subland drills	C15	#15- LH 8-flute reamers & taps
C07	#7- LH 4-flute drills & taps	C16	#16- RH 8-flute reamers & taps
C08A	#8A- RH 4-flute high relief for taps	C17	#17- LH 10-flute reamers
	1" diameter and up	C18	#18- RH 10-flute reamers

#### 8. Rear Steady Rests

- a) Provides centering support for drills with Morse tapers and larger diameter straight shank drills in the spindle bore.
- b) Rear Steady Rests
  - (1) Morse Taper- Standard: MT #2, #3, #4, #5 & #6
  - (2) Straight shank- *Optional:* Recommended for drills over 1" (25 mm) diameter (P/N RS80)

#### E. Flood Coolant System

1. Consists of: tank, motor-pump, shutoff valve, check valve, flexible feed line with nozzle, associated pipe, fittings and flexible supply and return hoses.

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2. Tank- rectangular, 10 gallon capacity, has a removable strainer and a two part tank to allow settling of grinding residue.
3. Motor-pump
  - a) Motor 1/8 HP
  - b) Delivers up to 6 gallons per minute.
  - c) Pump runs only when the grinding spindle motor is activated via separate auxiliary contacts in the spindle control.
- F. Cabinet- Machine Stand with enclosed storage
  1. Material - 12 Ga. sheet steel
  2. Dimensions- 30" (762 mm) high, 30" (762 mm) deep and 28" - 23" (710 mm - 584 mm) (tapered) width.
  3. Continuous hinged door with latch knob for storage area.
  4. Cabinet top with 2" (50 mm) high sides serves as coolant tray with a drain tube connection at the rear.
  5. Four floor mount feet each with a 13/32" (10.3 mm) hole.
  6. Included are the following supplementary items
    - a) Padded tool/work tray (6"[152 mm] x 12" [305 mm]), which clip mounts anywhere along the coolant collector top lip.
    - b) Flat vertical mount splash shield (7"[178 mm] high" x 16"[406 mm] long), which clip mounts along the coolant collector top lip.
    - c) Curved splash shield with a magnetic mount.
- G. Standard Work Light
  1. Maximum 100 watts incandescent lamp @ 115 V.  
*Note:* Power @ 115 V. is provided from an oversized control transformer.
  2. Goose neck- 24" long for adequate maneuverability.
  3. Cool lamp shade construction
  4. *Optional*- Attached inspection magnifier (2X mag.) for standard work light. (P/N MG02)
  5. *Optional*- High Intensity Halogen work light (P/N HL02) plus an *optional* attached 2.5X inspection magnifier (P/N MG01).
- H. Machine Weights & Dimensions
  1. Crated Dimensions:     37" (94cm) wide  
                                  49" (124cm) deep  
                                  64" (163cm) high
  2. Weights:                 Manual:                         720lbs (327kg) net  
   890lbs (405kg) crated  
                                     Semi-automatic:             745lbs (339kg) net  
   915lbs (416kg) crated  
                                     Automatic infeed:           835lbs (380kg) net  
   1010lbs (459kg) crated
  3. Maximum Dimensions (full extension of travels):  
          Manual (380 only), Semi-automatic:     48" wide x 44" deep x 55" high  
          Automatic infeed:                           50" wide x 47" deep x 57" high

III. ***Optional*** Equipment- Items available to mount on or compliment these machines.

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- A. Air Bearing End Mill Grinding Attachment (P/N AB80) *Note:* Air Bearing Grinding Fixture Specification is available.
- B. Mounted Overhead Wheel Dresser "Easy Dress" (P/N WD01) - designed for simple one hand operation. *Note:* Wheel Dresser Information sheet is available
- C. Halogen Hi Intensity Work Light- 20 watts (P/N HL02) has an *optional* mounted Inspection Magnifier with 2.5 X magnification (P/N MG01).
- D. Radial Relief Attachment (P/N RR80) - for pilot relief of step drills
- E. Precision Wheel Balancer (P/N WB01) with tapered wheel hub, supporting mandrel.
- F. Spindle Extension (P/N SE80) - support assistance for extra long drills, from 20" to 28" over all length.
- G. Rear Steady for Straight Shank Drills (P/N RS80) - for drills over 1" dia.
- H. Single Flute Grinding Attachment (P/N SF80)
- I. Radius Grinding Fixture (See Radius Grinding Fixture Specifications)