

Technical Information – Powergrip Milling Chuck



Technical Data and Operating Instructions

CV Shank

The Powergrip milling chuck's sleeve is ground in line with its shank and is an integral part of the tool. This is the main reason there is little problem with runout. The Powergrip shank is hardened while its sleeve is soft so it can flex. This allows the sleeve to act as a master collet and compress around the tool to provide a very strong grip. The sleeve bore is compressed by the pressure of roller bearings that are tracked up a taper.

BT Shank

Roller bearings are held in a retainer at an angle that matches the taper on the outside of the sleeve, at a slight skew. A guide surrounds the bearing retainer, and its wall thickness is greater than that of the sleeve. As the guide ring is rotated, the roller bearings track in a helical movement and gradually climb up the shallow taper. There are no threads on the guide ring.

DV Shank

As the two tapers are forced together, a tremendously high, uniform force is created, squeezing the sleeve inward and conforming it to the cutting tool shank. This force continues until an internal stop is reached. The shallow contact angles produce a self-locking effect, so the chuck will not release during operation.

HSK Shank

The extremely high grip force of the Powergrip chuck enhances the chuck's ability to transmit energy created during the machining process to the machine tool. Vibration, deflection, and runout are minimized.

Straight Shank

There is no axial drawback of the cutting tool shank as the guide ring is tightened. This is an advantage over collet chucks during presetting because they do draw back the cutting tool shank when tightened.

Collets/Sleeves

The OD of the cutting tool shank and the ID of the Powergrip chuck must be wiped with a clean dry cloth before assembly. Any contamination will increase runout and reduce gripping force.

Accessories

Carefully monitor the cutting tools used in these chucks so they do not exceed the nominal to $-.0005$ (h6 metric) on the cutting tool shank diameter. Use tools as close to nominal as possible. Cutting tool shank roundness should be within $.0001$ (0,003 mm). Undersize tools cause excessive stress on the sleeve portion of the chuck and may cause chuck failure.

Toolholding Technical Data

Best performance from the Powergrip chuck is attained when the cutting tool shank is round, without flats. Cutting tools with small flats may be held, but runout will increase. Whistle and flatted cutting tool shanks are recommended to be used in conjunction with reducing sleeves. For best performance, keep cutting tool shank flats to a minimum.

The Powergrip chuck should **never** be tightened without a cutting tool inside the bore. High gripping forces will cause permanent ID deformation.

Minimum length of engagement is 2x the diameter of the cutting tool shanks. Short holding length may result in breakage of the cutting tool and chuck. It could also result in bodily harm to the machine operator if the cutting tool should dislodge from the chuck during use.


Toolholding Systems

By using the wrench provided, clamp the cutting tool into the chuck with hand pressure only. **Do not** use a hammer, pipe, or any other device to exert added torque on the wrench. Tighten to the torque value specified on the guide ring or as shown in the above right torque chart. Do not exceed these values as the milling chuck could be damaged.

Index



Torque Chart

chuck size	replacement wrench	tightening torque 		gripping strength	
		ft.-lbs.	Nm	ft.-lbs.	Nm
3/4" (20 mm)	APSW125300	30-35	40-45	1,800	2,440
1" (25 mm)	PSW58M	30-35	40-45	2,300	3,120
1 1/4" (32 mm)	PSW68M	35-40	45-50	2,900	3,930
1 1/2" (40 mm)	PSW80M	40-45	55-60	4,000	5,420
2" (50 mm)		50-55	70-75	5,100	6,915

If the preceding recommendations are adhered to, the maximum runout guarantee is $.0002$ (0,005 mm) at face of chuck to $.0006$ (0.015 mm) TIR at 4" (100 mm) from the face of the chuck without reducing sleeves, when using a cutting tool shank close to nominal size. The use of reducing sleeves and excessive tightening force will increase runout.

Coolant may be directed through the chuck. Although the roller bearings are protected by seals, coolants and contaminants can cause these seals to break down over a period of time. If this occurs, a "roughness" when tightening the guide ring will be noticed. The chuck must be "regreased" at this time per the maintenance instructions on the next page or Kennametal can rebuild or regrease your chucks, if requested. Please contact your Kennametal representative for price and procedure.

Stop screws, for length adjustment, or coolant feed are available for all chucks. For 3/4", 1", and 1 1/4" diameters, use stop screw #PCSS050100. For 1 1/2" and 2" sizes, use stop screw #PSS075100.

Maximum operating speed for all standard or heavy-duty chucks is 12,000 rpm. For speeds higher than 12,000 rpm, balanced and balanceable milling chucks are available. Contact your Kennametal representative.



Accessories:

Milling chuck stop screws – please see page S307.

Milling chuck sleeves – please see page S257.

Maintenance Operations:

1. Remove the retaining ring from the front of the nosepiece (1).
2. Lift and rotate the guide ring assembly and remove (5).
3. Remove back-up ring, seal, and collar from the front of the guide ring (2, 3 & 4).
4. Remove retaining ring (10) from guide ring (5).
5. Remove seal (9), thrust washer (8), and retainer (6) from guide ring (5).
6. Remove roller bearings (7) from retainer and clean with solvent. Inspect rollers for flat spots and cracks. **CAUTION:** Rollers are provided as a matched set. **DO NOT** mix with rollers from other chucks.
7. Wipe off old grease from the milling chuck sleeve and all other components. Liberally re-coat with a good quality, water-resistant grease.
8. Coat retainer (6) and roller bearings (7) with grease and reinstall bearings.
9. Thoroughly re-grease ID of the guide ring (5) with a good quality, water-resistant grease.
10. Install retainer, thrust washer, seal, and retaining ring (6, 8, 9, & 10) in guide ring.
11. Slide the guide ring (5) over the sleeve and wipe off all excess grease that comes out of the guide ring.
12. Replace the collar, seal, back-up ring, and retaining ring (4, 3, 2, & 1).
13. Tighten and loosen the guide ring several times. Recheck the snap ring for correct fitting.

Please contact Kennametal's Service and Repair Department to have your Kennametal products serviced or repaired by qualified Kennametal Service Technicians.

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