

Determining the Proper Spindle Type and Size

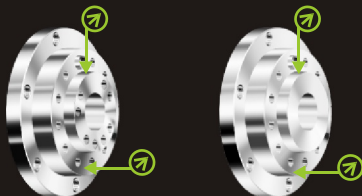
Gator Chucks meet all of the requirements of ASA Standard B5.9-1960.

For spindle nose accuracy (T.I.R) see page 7.

Selecting the chuck mounting:

- Choose from the types shown below.
- For short taper spindle noses Type A, D, & C (DIN), measure the pilot diameter and length (dimensions B & C), bolt circle diameter (dimensions F1 & F2) and diameter of the holes (dimensions E1 & E2).
- In the case of A type mount, check the number of bolt circles (one for A2 mount or two for A1 mount).
- All chucks with A1 mount can be installed on A1 spindle nose only.
- All chucks with A2 mount can be installed on either A1 or A2 spindle nose.
- For the long taper spindle noses Type L, check pilot diameter, length and thread size (dimensions A, C & B).
- For the threaded spindle noses, check the thread diameter, number of threads per inch and length (dimensions B & D), plus overall length (dimension F1).

→ Spindle Type A1&A2



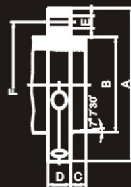
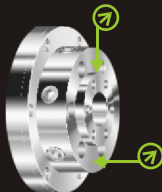
Type A1 has tapped holes on both inner and outer bolt circles.

Type A2 does not have holes in the inner bolt circles.



Spindle Nose	F1	F2	B	C max.	Thread E1=E2 UNC-3B
A-4	3.2500	-	2.5005+.0005	.4375	7/16-14
A-5	4.1250	2.4374	3.2505+.0005	.5625	7/16-14
A-6	5.2500	3.2500	4.1880+.0005	.6250	1/2-13
A-8	6.7500	4.3750	5.50075+.0005	.6875	5/8-11
A-11	9.2500	6.5000	7.75075+.0005	.7500	3/4-10
A-15	13.0000	9.7500	11.251+.001	.8125	7/8-9
A-20	18.2500	14.5000	16.251+.001	.8750	1-8
A-28	25.5000	20.8750	23.001+.001	1.000	1-1/4-7

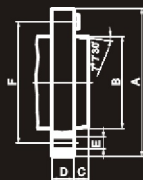
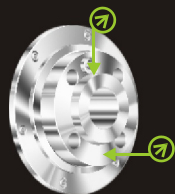
→ Camlock Spindle Type D1



Spindle Nose	A	F	B	C max.	E	No. of Holes	Camlock Stud Dia
D1-3	3.622	2.7820	2.1250+.00025	.4375	.5937	3	9/16
D1-4	4.606	3.2500	2.5005+.0005	.4375	.6562		5/8
D1-5	5.748	4.1250	3.2505+.0005	.5000	.8750		3/4
D1-6	7.126	5.2500	4.1880+.0005	.5625	1.000	6	7/8
D1-8	8.858	6.7500	5.50075+.0005	.6250	1.125		1
D1-11	11.732	9.2520	7.75075+.0005	.6875	1.250		1-3/16
D1-15	15.866	13.0000	11.251+.001	.7500	1.375		1-3/8

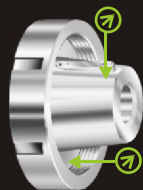
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→ German Standard DIN55027, Spindle Type C



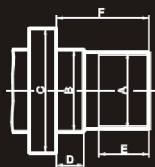
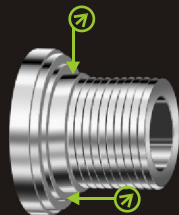
Spindle Nose	F	B	C max.	E	NO. of Holes
C-4	3.2500	2.5005	.4331	.83	3
C-5	4.1250	3.2505	.5118	.83	4
C-6	5.2500	4.1880	.5512	.91	4
C-8	6.7500	5.50075	.6299	1.14	4
C-11	9.2520	7.75075	.7087	1.42	6

→ Long Taper Key Drive, Spindle Type L



Spindle Nose	Thread B	C	A	Key
L00	3-3/4" - 6"	2	2.75	3/8 x 3/8 x 1-1/2
L0	4-1/2" - 6"	2-3/8	3.250	3/8 x 3/8 x 1-3/4
L1	6" - 6"	2-7/8	4.125	5/8 x 5/8 x 2-3/8
L2	7-3/4" - 5"	3-3/8	5.250	3/4 x 3/4 x 2-7/8
L3	10-3/8" - 4"	3-7/8	6.500	1 x 1 x 3-1/4

→ Threaded Spindle

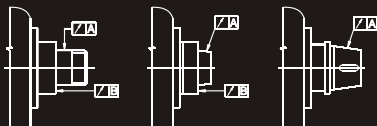


Spindle Nose A	B	F1	D	E
1"-10" UNS-2B	1.015	1.500	.4375	1.000
1-1/2"-8" UNS-2B	1.515	1.500	.4375	1.000
2-3/16"-10" UNS-2B	2.2025	1.750	.5625	1.125
2-1/4"-8" UNS-2B	2.260	1.750	.5625	1.125
2-3/16"-6" - UNS-2B	2.2025	1.750	.5625	1.125
2-3/4"-8" UNS-2B	2.760	2.0625	.6875	1.3125

Permissible Spindle Runout

To obtain the specified clamping accuracy of a chuck mounted on a machine tool, it is necessary to:

- 1. Reduce play in the spindle bearings to allowable minimum.
- 2. Ensure the machine spindle nose does not exceed the values specified.
- 3. Meet the basic requirements for correct mounting of the chuck on the spindle nose.
- 4. Follow the chuck manual.

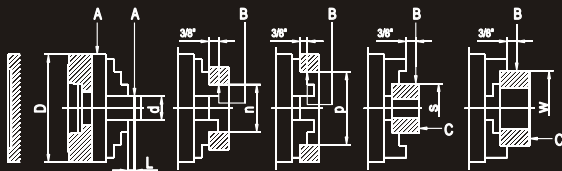


Chuck Dia.	Spindle Runout
PO Series Steel Body Chucks	
3" - 16"	.00012"max.
20" - 25"	.0002"max.
PS Series Semi-Steel Body	
3" - 6"	.00012"max.
8" - 32"	.0002"max.

Self-Centering Scroll Chuck Accuracy

- All allowable runouts which are specified concern measurements at three different jaw openings d(1, 2 & 3).

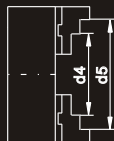
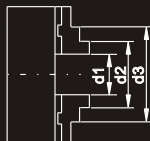
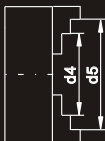
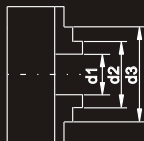
Chuck Dia. D	Universal and Precision Chuck Types: PA Series ,PO Series ,PS Series											
	d			L	n	p	s	w solid jaws	w 2 pc.jaws	Radial Runout		Axial Runout C
	1	2	3							A	B	
3-1/4"	0.39	-	0.55	1.57	1.57	2.36	1.38	2.48	-	0.0008	0.001	0.0006
4"	0.39	0.55	0.71	1.57	1.57	2.95	1.97	3.15	-	0.0008	0.001	0.0006
5"	0.71	0.98	1.18	2.36	1.97	3.94	2.44	3.94	4.72	0.0012	0.0014	0.0008
6-1/4"	0.71	1.18	1.57	2.36	1.97	5.31	3.46	3.94	5.9	0.0012	0.0014	0.0008
8"	1.18	1.57	2.08	3.15	3.15	6.38	3.78	6.3	7.28	0.0016	0.0018	0.001
10"	1.18	2.08	2.95	3.15	3.15	7.87	5.9	6.3	8.86	0.0016	0.0018	0.001
12-1/2"	2.08	2.95	3.94	4.72	4.92	9.92	8.27	9.84	11.81	0.002	0.0022	0.0012
15-3/4"	2.08	3.94	4.92	4.72	4.92	11.1	9.84	9.84	13.78	0.0024	0.0025	0.0012
20"	2.95	3.94	4.92	6.3	7.87	11.1	11.81	15.75	15.75	0.004	0.004	0.002
25"	2.95	4.92	6.3	6.3	7.87	12.79	15.75	15.75	15.75	0.004	0.004	0.002
31-1/2"	6.3	7.87	9.84	6.3	12.8	19.7	15.75	19.7	19.7	0.0059	0.0059	0.0024



Clamping Ranges for Self-Centering Scroll Chucks

Solid Jaws

Two-piece Reversible Jaws

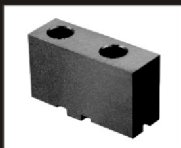


Chuck Diameter	d1		d2		d3 max.		d4 max.		d5 max.		
	mm	inch	solid	reversible	solid	reversible	solid	reversible	solid	reversible	
60	2-1/3	.02-.95	-	.79-1.65	-	1.46-2.36	-	.79-1.65	-	1.50-2.36	-
80	3-1/4	.08-1.06	-	.87-1.81	-	1.77-2.72	-	.98-1.97	-	1.89-2.80	-
100	4	.12-1.30	-	.98-2.20	-	2.20-3.43	-	1.26-2.44	-	2.44-3.27	-
125	5	.12-1.97	.12-1.97	1.37-2.91	1.34-2.99	2.83-4.53	2.95-4.65	1.54-3.27	2.05-3.78	3.15-4.92	3.74-4.92
160	6-1/4	.12-2.52	.12-2.52	1.65-3.94	1.65-3.82	3.70-6.06	3.46-5.75	1.97-4.21	2.44-4.76	3.86-6.30	4.53-6.30
200	8	.16-3.54	.16-3.54	2.05-5.31	1.97-5.12	4.72-7.95	4.13-7.48	2.36-5.71	2.83-6.14	5.12-7.87	5.24-7.87
250	10	.20-4.65	.20-4.65	2.44-6.85	2.28-6.50	5.70-10.43	4.92-9.25	3.03-7.40	3.38-7.75	6.30-9.84	6.30-9.84
315	12-1/2	.39-5.16	.20-5.16	3.07-7.87	2.56-7.16	6.77-11.77	5.70-10.43	3.54-8.46	4.06-8.90	7.48-12.40	7.48-12.40
400	15-3/4	.39-7.09	.39-7.09	3.35-9.92	2.83-8.98	8.27-14.96	6.50-12.95	4.05-10.71	5.00-11.57	9.05-15.75	9.05-15.75
500	20	.79-9.25	.79-9.25	4.72-13.19	4.72-16.14	9.65-18.74	7.87-19.10	5.51-14.06	4.33-15.75	10.87-19.69	7.48-19.69
630	25	1.18-13.19	1.18-13.19	6.30-18.31	5.51-23.23	12.80-24.80	8.27-26.18	7.09-19.17	4.72-22.44	13.58-24.80	7.88-24.80
800	31-1/2	5.9-18.98	5.9-18.98	11.10-24.17	9.92-28.99	17.64-30.71	12.91-31.97	11.89-24.96	9.45-28.5	18.43-31.50	12.44-31.50

To Avoid a Chuck Gripping Problem,
Select the proper Hard Top Jaws or Soft Top Jaws



Jaw for Heavy Machining



Jaw for Special Applications

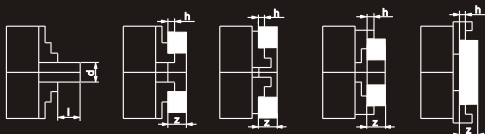


Jaw for Finishing

Safe Operating Parameters

Conditions:

- $l \& z$ = maximum length of workpiece
- d = workpiece diameter
- h = height of the clamping jaw step
- workpiece is clamped into the chuck jaws with out additional support.



Chuck Diameter	3-1/4"	4"	5"	6-1/4"	8"	10"	12-1/2"	15-3/4"	20"	25"	31-1/2"
l				1.2 x d			1.5 x d			1 x d	
z							4 x h				

Total Gripping Force of all Self-Centering Chucks (lbs.)

Chuck Diameter	3-1/4"	4"	5"	6-1/4"	8"	10"	12-1/2"	15-3/4"	20"	25"	31-1/2"
Steel & Semi-Steel Chucks	2,200	3,750	5,300	6,800	8,200	10,000	12,000	14,300	16,000	17,700	19,800

Recommended Maximum Speeds for Self-Centering Chucks(RPM)

Chuck Diameter	3-1/4"	4"	5"	6-1/4"	8"	10"	12-1/2"	15-3/4"	20"	25"	31-1/2"
Universal Chucks (Semi-steel body)	4000	3500	3200	3000	2500	2000	1500	1000	700	500	300
Precision Chucks (Steel body)	6000	5200	4800	4500	4000	3500	2800	2000	1200	1000	450

Value of Balancing for Precision Self-Centering Chucks Only.

Chuck Diameter	3-1/4"	4"	5"	6-1/4"	8"	10"	12-1/2"	15-3/4"	20"	25"
Balancing (ounce-inch)	0.15	0.22	0.32	0.44	0.62	0.87	1.25	1.94	4.16	8.88

Lathe Chuck Safety Conditions

- ➔ Due to chuck rotating speeds and cutting forces during machining, care should be taken to insure the proper after safe use of your chuck.
- ➔ Cleaning should be done often for safety purposes as well as to provide a long work life for your chuck.
- ➔ Proper maintenance will insure your satisfaction.

PRIOR TO OPERATING YOUR LATHE CHUCK, PLEASE:

- ➔ Read the chuck manual.
- ➔ Do not start the lathe until all is clear. A collision between the chuck and lathe will cause damage to both.
- ➔ Do not use the chuck on heavy work where the chuck jaws project appreciably from the chuck body. Refer to the tables on page 8 to select the correct size chuck for the application.
- ➔ Do not clamp long work pieces in the chuck without additional support, this can cause heavy damage to the lathe and work environment. Refer to the table on this page for safety parameters.
- ➔ Always remove the chuck wrench before starting the machine.
 - ➔ Do not remove the safety spring from the chuck wrench.
 - ➔ Never operate the chuck if any parts are damaged, missing or cracked.
 - ➔ Do not temper with the chuck. If an inaccuracy is found, check the spindle nose or adapter plate for true-running and make sure there is no dirt or foreign matter between the mounting faces.
 - ➔ Never exceed maximum speed (RPM) of the chuck. The MAX RPM is stamped on the chuck face. Refer to the table on this page for recommended maximum speeds for self-centering chucks.
 - ➔ Periodically inspect and service chucks for wear to avoid inadequate workholding conditions.

- ➔ Be sure top jaws are securely bolted to the master jaws.
- ➔ Never do any unauthorized chuck modifications.
- ➔ Always keep your chuck clean and lubricated.