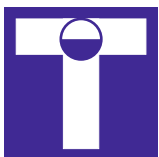
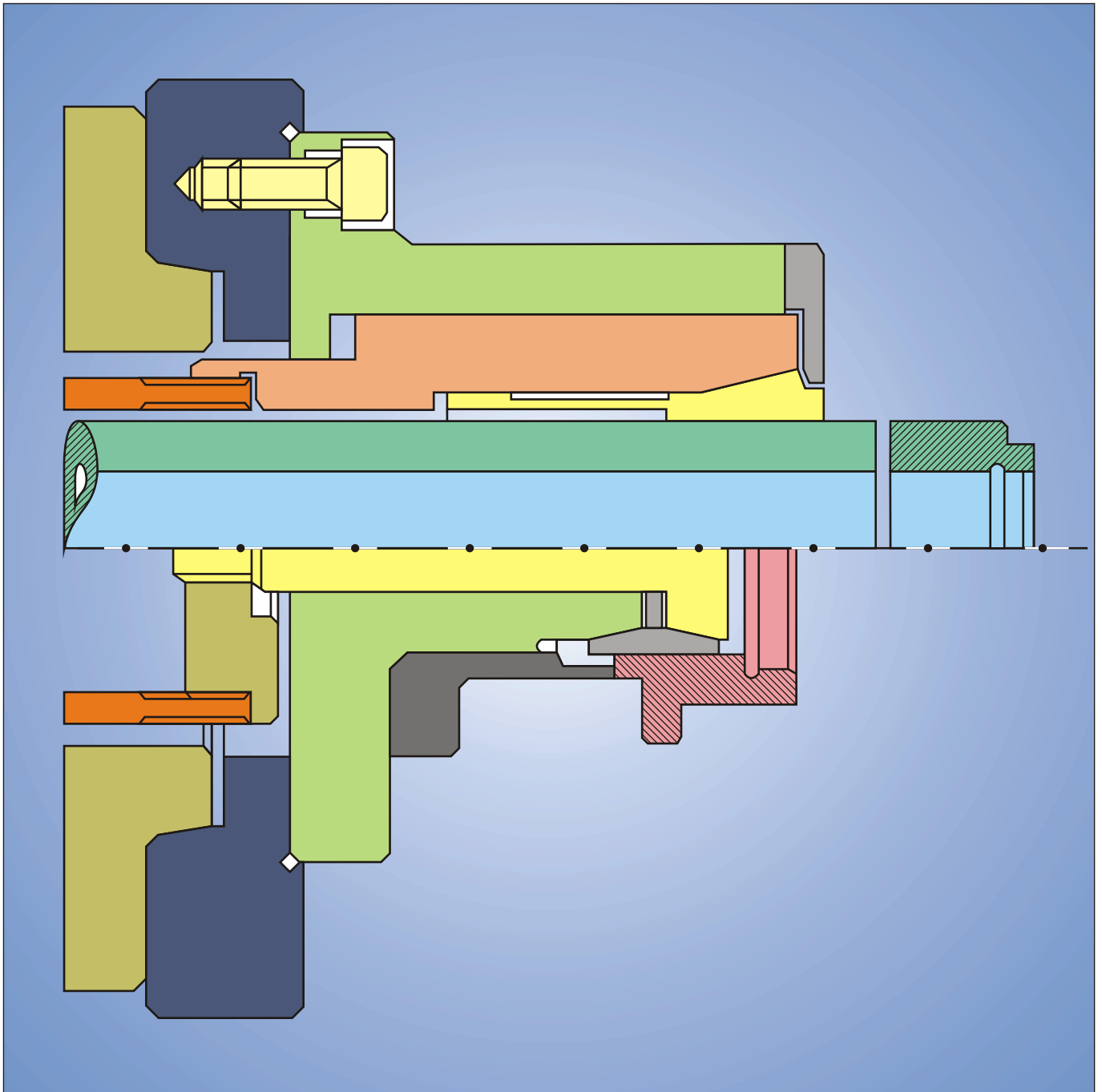


ITC

WORKHOLDING TECHNOLOGIES

Expanding Mandrels and Collet Chucks



INDUSTRIAL TOOLS CORPORATION

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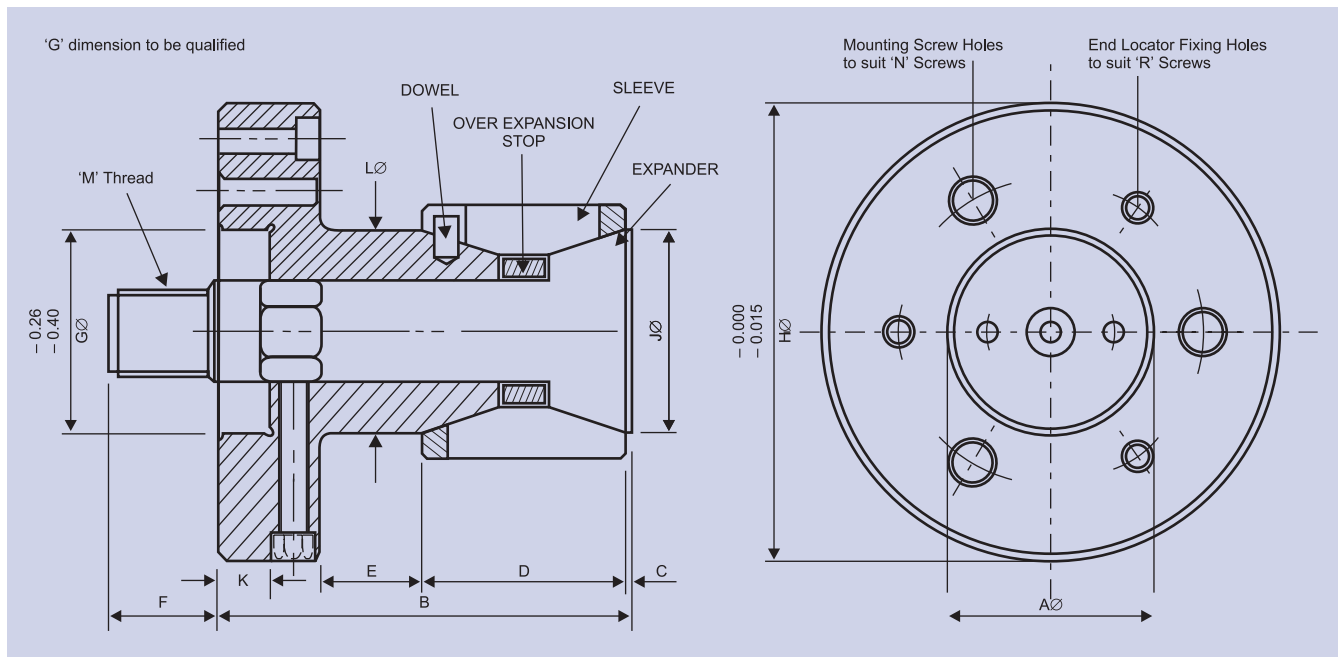
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PRECISION EXPANDING MANDREL

POWER-OPERATED, FLANGE TYPE DRAW BAR ACTUATED

- The power operated, flange type can be used on any machine with drawbar facility. Adaptor plates for mounting on the machine spindle and work piece end stoppers can be ordered from us. There is an over expansion ring to avoid over-expansion of sleeve. The natural pull back action of the sleeve ensures the component is resting against the locating face.
- High clamping force due to the clamping sleeve being in contact along its entire length through double angle
- Positioning accuracy of 0.015mm TIR.
- As sleeves in one type are interchangeable, one single expanding mandrel covers a very large clamping range.
- No pressure marks in the clamped bore. Easy loading and unloading of component.



The clamping angles of mandrel and sleeve must be in permanent contact with each other for maximum efficiency.

Type	A range		B	C	D	E	F	G	H	J	K	L	M	N		R		Tool No.
	Min.	Max.												PCD	Size	PCD	Size	
01	12.5	16.0	60	2.0	22.0	14.6	20	40	75	11.0	6	12.6	M4	58	M8	28	M4	560.70.01
02	16.0	22.0	66	2.0	27.0	15.0	22	40	75	15.0	6	14.1	M8	58	M8	28	M4	560.70.02
03	22.0	28.5	72	2.0	32.0	15.5	30	40	75'	20.0	6	20.7	M8	58	M8	58	M6	560.70.03
04	28.5	41.0	79	2.0	38.0	15.3	31	40	75	26.5	6	26.3	M10	58	M8	58	M6	560.70.04
05	41.0	63.5	84	2.0	43.0	14.8	36	40	75	37.5	6	37.0	M12	58	M8	58	M6	560.70.05
06	63.5	76.2	109	2.5	51.0	25.3	36	60	120	55.0	6	57.3	M20	94	M10	94	M8	560.70.06
07	76.2	89.0	118	2.5	57.0	24.7	37	60	120	74.5	6	71.1	M20	94	M10	94	M8	560.70.07
08	89.0	130.0	133	3.0	63.5	25.2	47	100	180	86.5	6	84.1	M24	150	M12	150	M10	560.70.08
09	130.0	178.0	153	3.0	79.5	24.6	22	100	180	124.0	6	123.0	M36	150	M12	150	M10	560.70.09

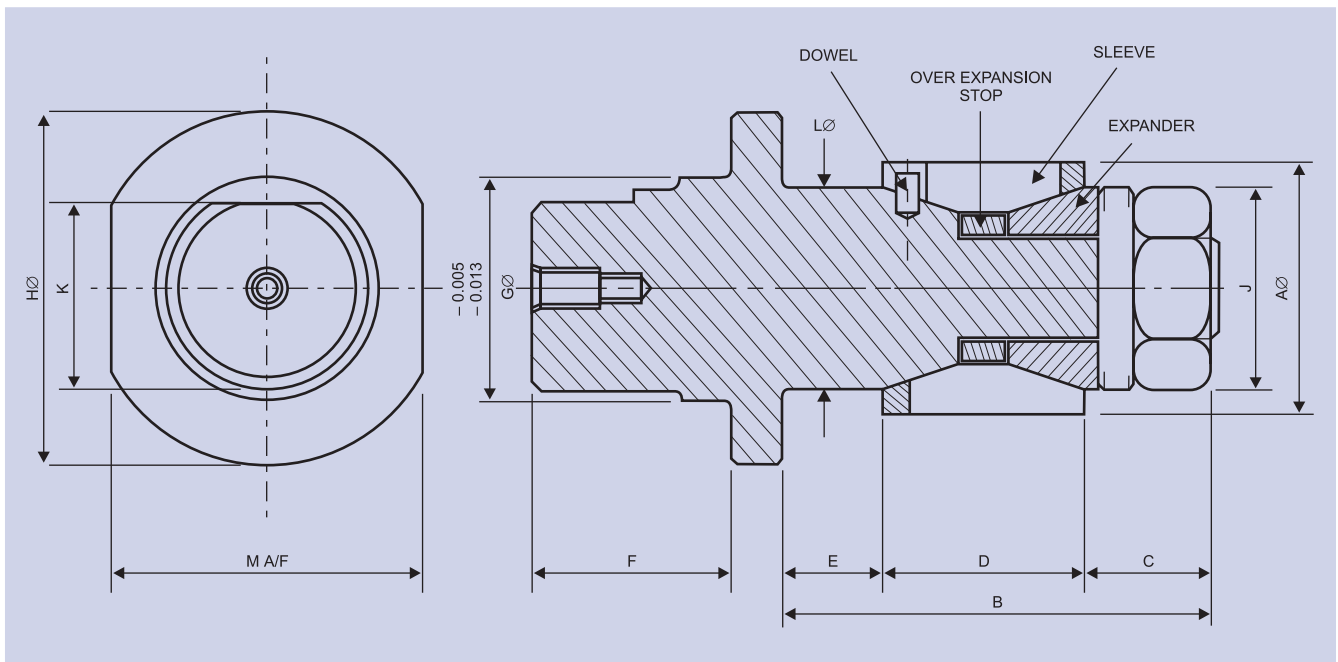
Example of order:

- 1 Power-operated Precision Expanding Mandrel, type 04 Flange type. Tool No.560.70.04
- 1 Precision clamping sleeve, type 04.Standard type. Tool No.560.70.04.abc.de where abc.de is sleeve dia in 5digits. i.e.34.55 dia will be designated as 034.55

PRECISION EXPANDING MANDREL

NUT-OPERATED, BETWEEN CENTRES

- The nut-operated, between centres type expanding mandrel is normally mounted Between two 60°centres. The drive is effected with the aid of a flat on the mandrel. On diameter L, single end stopper can be mounted. Ground diameter G is provided to adapt for face plate mounting. These mandrels can be used for grinding / turning as well as for inspection.
- High clamping force due to the clamping sleeve being in contact along its entire length through double angle
- Positioning accuracy of 0.015mm TIR.
- As sleeves in one type are interchangeable, one single expanding mandrel covers a very large clamping range.
- No pressure marks in the clamped bore. Easy loading and unloading of component.



The clamping angles of mandrel and sleeve must be in permanent contact with each other for maximum efficiency.

Type	A range		B	C	D	E	F	G	H	J A/F	K	L	M	Tool No.
	Min.	Max.												
01	12.5	16.0	77	16.0	22.0	10.0	20	20	26.0	10	18	9.5	22	660.80.01
02	16.0	22.0	83	17.0	27.0	9.0	20	20	26.0	13	18	14.1	22	660.80.02
03	22.0	28.5	99	18.5	32.0	10.5	27	30	40.0	19	27	20.7	36	660.80.03
04	28.5	41.0	107	20.8	38.0	10.2	27	30	40.0	24	27	26.3	36	660.80.04
05	41.0	63.5	120	27.0	43.0	10.0	27	30	50.0	36	27	37.0	46	660.80.05
06	63.5	76.2	145	33.0	51.0	26.0	35	40	57.3	55	35	57.3	50	660.80.06
07	76.2	89.0	155	37.0	57.0	26.0	35	50	71.1	65	45	71.1	60	660.80.07
08	89.0	130.0	205	47.5	63.5	34.0	50	60	84.1	85Ø	55	84.1	70	660.80.08
09	130.0	178.0	235	50.5	79.5	55.0	50	80	123.0	124Ø	73	123.1	105	660.80.09

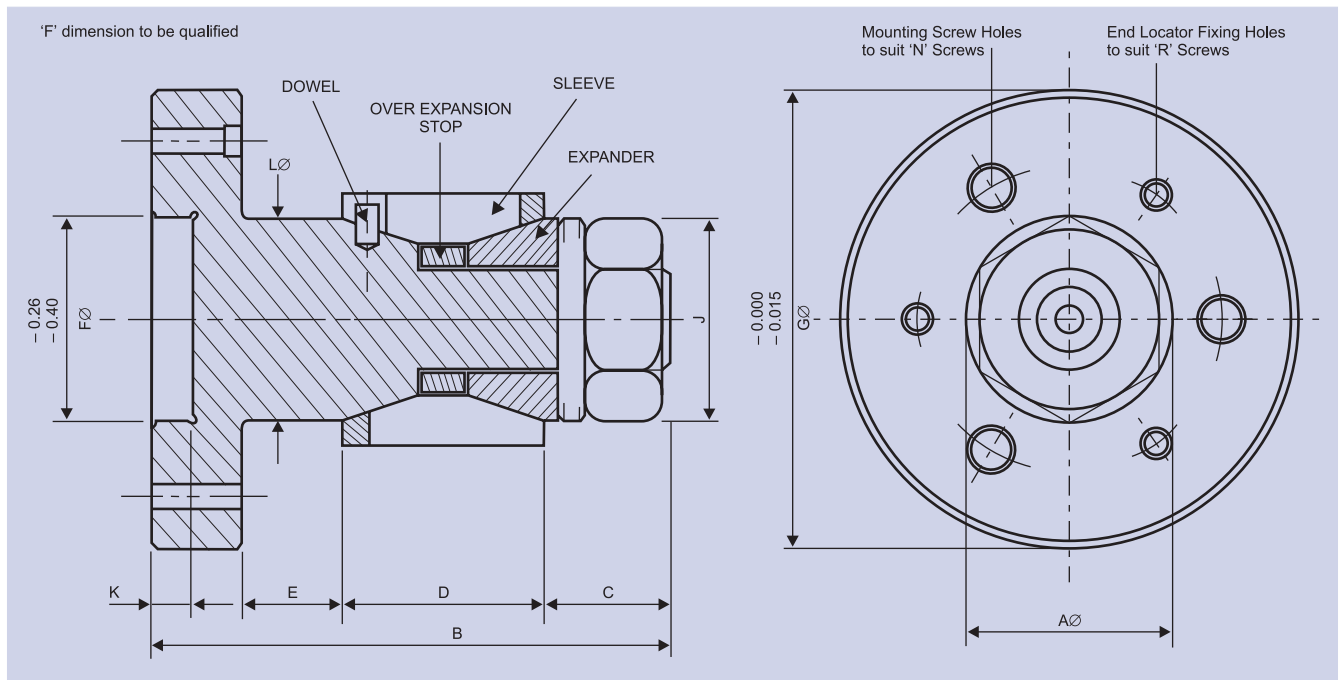
Example of order:

- 1 Nut-operated Precision Expanding Mandrel, type 04 between centre. Tool No.660.80.04
- 1 Precision clamping sleeve, type 04. Standard type. Tool No.660.80.04.abc.de where abc.de is sleeve dia in 5digits. i.e.34.55 dia will be designated as 034.55

PRECISION EXPANDING MANDREL

NUT-OPERATED, FLANGE TYPE

- The nut-operated, flange type can be used on any machine with no drawbar facility. Adaptor plates for mounting on the machine spindle and work piece end stoppers can be ordered from us. There is an over expansion ring to avoid over-expansion of sleeve. The natural pull back action of the sleeve ensures the component is resting against the locating face.
- High clamping force due to the clamping sleeve being in contact along its entire length through double angle taper.
- Positioning accuracy of 0.015mm TIR.
- As sleeves in one type are interchangeable, one single expanding mandrel covers a very large clamping range.
- No pressure marks in the clamped bore Easy loading and unloading of component.



The clamping angles of mandrel and sleeve must be in permanent contact with each other for maximum efficiency.

Type	A range		B	C	D	E	F	G	J A/F	K	L	N		R		Tool No.
	Min.	Max.										PCD	Size	PCD	Size	
01	12.5	16.0	73	16	22	15.0	40	75	10	6	12.6	58	M8	28	M4	760.90.01
02	16.0	22.0	79	17.0	27.0	15.0	40	75	13	6	14.1	58	M8	28	M4	760.90.02
03	22.0	28.5	86	18.5	32.0	15.5	40	75	19	6	20.7	58	M8	58	M6	760.90.03
04	28.5	41.0	94	20.8	38.0	15.2	40	75	24	6	26.3	58	M8	58	M6	760.90.04
05	41.0	63.5	105	27.0	43.0	15.0	40	75	36	6	37.0	58	M8	58	M6	760.90.05
06	63.5	76.2	134	33.0	51.0	25.0	60	120	55.0	6	57.3	94	M10	94	M8	760.90.06
07	76.2	89.0	144	37.0	57.0	25.0	60	120	65	6	71.1	94	M10	94	M8	760.90.07
08	89.0	130.0	166	47.5	63.5	25.0	100	180	85Ø	6	84.1	150	M12	150	M10	760.90.08
09	130.0	178	185	50.5	79.5	25.0	100	180	124Ø	6	123.1	150	M12	150	M10	760.90.09

Example of order:

- 1 Nut-operated Precision Expanding Mandrel, type 04 Flange type. Tool No.760.90.04
- 1 Precision clamping sleeve, type 04. Standard type. Tool No.760.90.04.abc.de where abc.de is sleeve dia in 5digits.i.e.34.55 dia will be designated as 034.55

EXPANDING SLEEVES

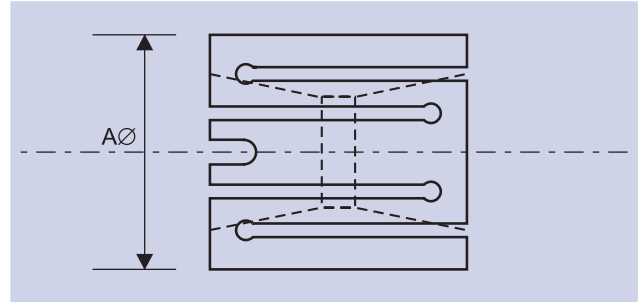
STANDARD LENGTH SLEEVE SPECIFICATIONS

Type	A range		Length
	Min.	Max.	
01	12.5	16.0	22.0
02	16.0	22.0	27.0
03	22.0	28.5	32.0
04	28.5	41.0	38.0
05	41.0	63.5	43.0
06	63.5	76.0	51.0
07	76.0	89.0	57.0
08	89.0	130.0	63.5
09	130.0	178.0	80.0

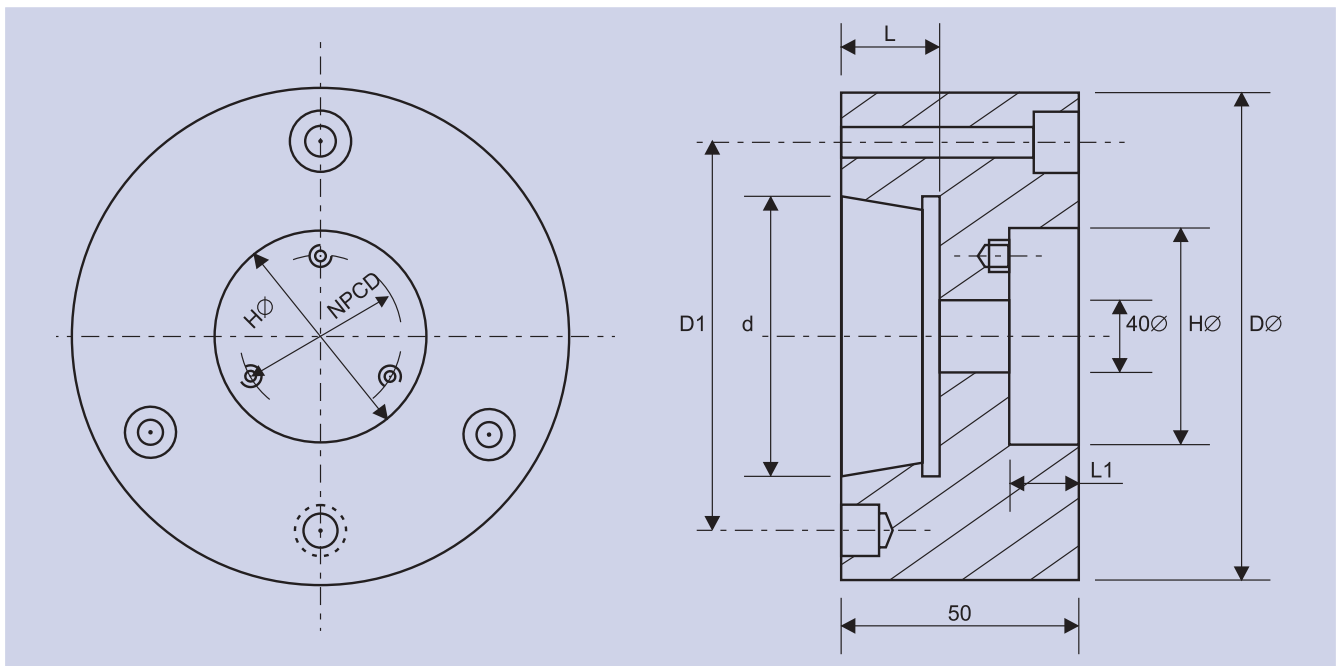
ORDERING PROCEDURE

All sleeve orders should specify the type, model number, the component bore and tolerance.

These sleeves are interchangeable within the range of each type and can be used with all models. For example the 04 drawbar operated mandrel will accept sleeve of type 04 originally used on a nut operated or between centres mandrel.



FLANGE ADAPTORS FOR SPINDLE NOSE MOUNTING

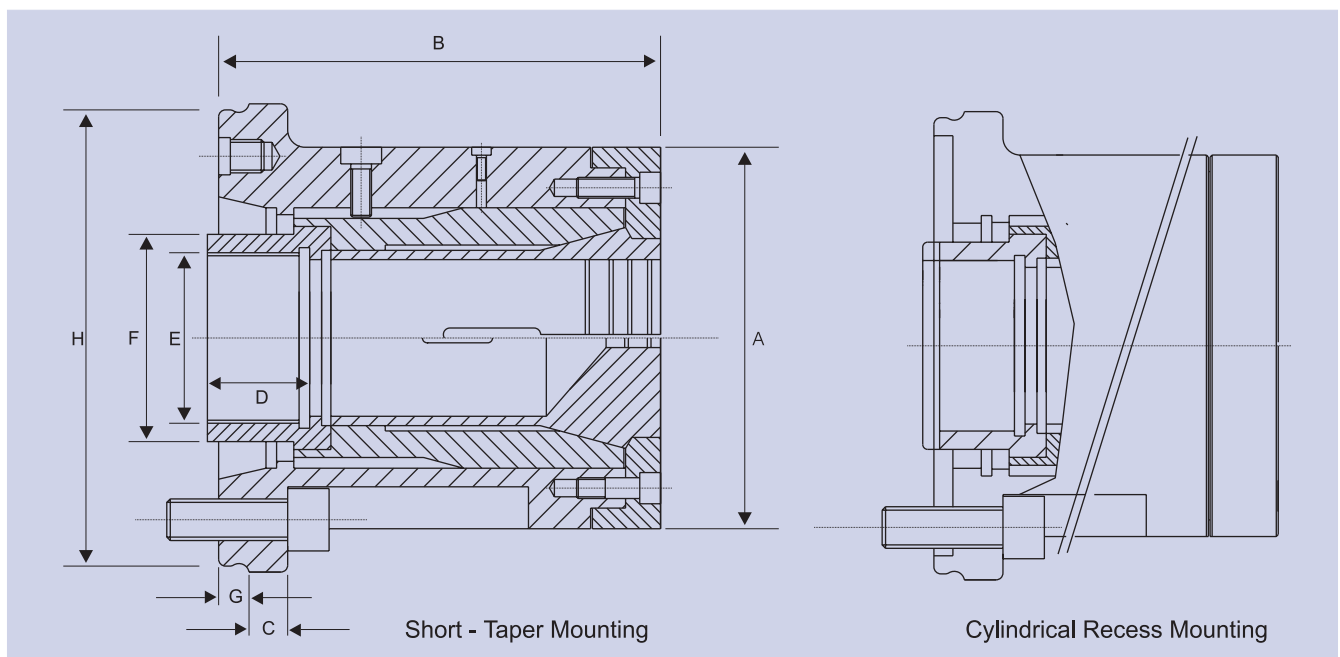


Tool Code	Dimensions, mm/ Spindle Nose Type	Dimensions, inch			
		D	D1	d	L
PA1-5	5	135 5.31	104.8 4.13	82.58 3.25	16 0.63
PA1-6	6	165 6.50	133.4 5.25	106.39 4.19	18 0.71
PA1-8	8	220 8.66	171.4 6.75	139.735 5.50	20 0.79

HØ	N		L1
	PCD	SIZE	
75Ø	58Ø	M8	15
120Ø	94Ø	M10	15
180Ø	150Ø	M12	15

CR SERIES COLLET CHUCKS

- CR series power operated Collet Chucks are used frequently for the bar work instead of standard power operated three Jaw chucks.
- They are low cost exchange chucks and are used to machine work pieces that cannot be chucked optimally in power operated Jaw chucks. In particular for the parts susceptible to deformation or surface damage and workpieces that needs to be machined at high speeds.
- Spare Collets can be procured from ITC at a short notice.
- CR Collet chucks operate within a defined axial travel in both directions. Therefore changing from 3 Jaw chuck to Collet Chuck requires no change of stroke control.

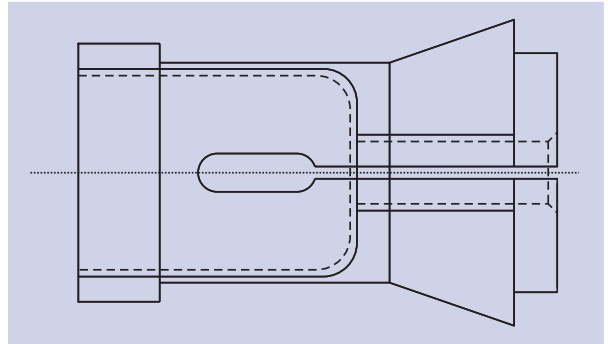


Mode	Unit	CR35	CR42	CR42A05	CR42A06	CR60	CR60A06	SPECIAL FEATURES
Mount		110.005X 5.00	140.005X 5.00	A2-5	A2-6	170.005X 6.00	A2-6	<ul style="list-style-type: none"> • Hardened and Ground Alloy Steel Design • Near Zero Part Movement • Ideal for Second Operations • Excellent Gripping Characteristics • Special Collets Available • High Concentric Accuracy and Compact Design
A	mm.	102.00	110.00	110.00	110.00	138.00	138.00	
B	mm.	127.00	133.00	143.00	145.00	148.00	160.00	
C	mm.	20.00	20.00	20.00	30.00	24.00	27.00	
D	mm.	30.00	30.00	30.00	30.00	30.00	30.00	
E max	mm.	M55 x 1.5	M55 x 1.5	M55 x 1.5	M55 x 1.5	M70 x 1.5	M70 x 1.5	
F	mm.	62.00	62.00	62.00	62.00	80.00	80.00	
G max	mm.	11.00	11.00	1.00	1.00	10.00	2.00	
G min	mm.	4.00	4.00	6.00	8.00	3.00	9.00	
H	mm.	148.00	160.00	135.00	165.00	190.00	165.00	

ACCESSORIES AND SPARES

- CR series collet chucks can be used to the chucking capacity of the next smallest chuck type by replacing the thrust - sleeve and cover

Suitable for CR Chuck Type	Order No. Type*Size*Shape	Chucking Capacity		Collapse Of Collet
		O	□	
CR35	163E*abcd*0/•	3-30	5-20	+0.15 -0.2
CR42 CR42A05 CR42A06	173E*abcd*0/•	3-42	6-29	+0.2 -0.3
CR60 CR60A06	185E*abcd*0/•	4-60	7-42	+0.2 -0.3



Ordering Example:

Collet Suitable for CR42 for Bore dia.20 in round Shape.
Order No. will be 173E* 2000*O

For difficult clamping problems refer to us for specials. Please note following important points.

For the solution of difficult clamping problems, we require as much information as possible. This avoids time consuming check backs. Please give following data.

- 1) Work-piece details drawing.
- 2) Jobs as fed to machine.
- 3) Previous machine information.
- 4) Machining operation required.
- 5) Stock removal.
- 6) Cutting speeds and feeds.
- 7) Desired production rate.
- 8) Face and concentric accuracy.
- 9) Position of end stop & positive drive.
- 10) Clamping position.
- 11) Necessary free space for tools.
- 12) Kind of activation.
- 13) Actual machining.