

# *High Precision Diaphragm Chucks*



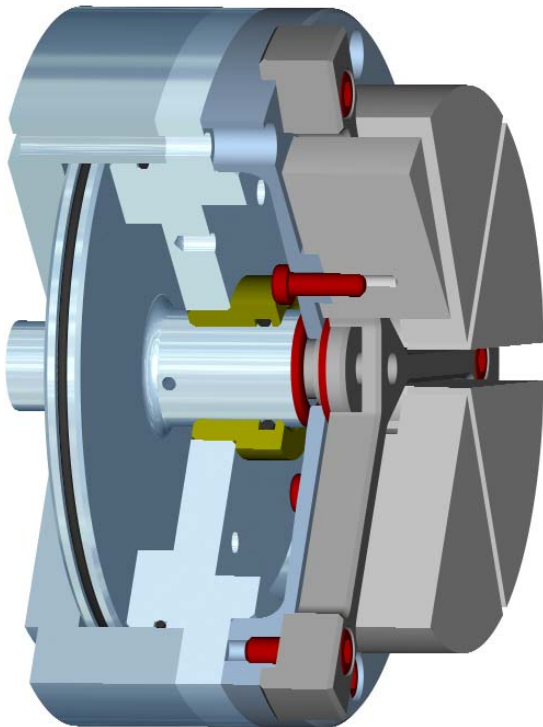
## Unique Diaphragm Chuck Design

### *Improving the quality and efficiency of secondary machining operations . . . .*

through high workpiece concentricity, and reliable chuck performance. For thirty years MicroCentric has supplied innovative chucking products to the metal-working industry according to this principle. The MBS high precision Diaphragm Chucks are the latest advance of MicroCentric's workholding technology. MBS chucks are available in both self-contained and draw tube operated designs. All models are double acting, meaning they are capable of both OD and ID clamping, and are available for rotating and stationary applications.

### *The MBS Concept . . . .*

The diaphragm of the MBS chuck, without an applied force, is in a neutral position. When a force is applied by either the internal piston, or the draw tube, the diaphragm is expanded or contracted. A force in the +Z axis opens the chuck. A force applied in the -Z axis closes the chuck, or clamps the workpiece in an OD chucking application. MBS Chucks do not rely solely on the spring force of the diaphragm to generate clamping force on the workpiece. Additionally, MBS chucks feature a greater jaw stroke than conventional diaphragm chucks due to the unique MBS diaphragm design that incorporates two pivot points. The MBS design provides load clearance up to .060" (1.5mm).



### *MBS Chuck Features . . . .*

- Accuracy to .0001" (0.005mm) TIR
- Pull back clamping against fixed part stop
- Low maintenance (MBS chucks do not require lubrication, and have no moving parts to wear out or become contaminated by chips and swarf)
- Large jaw opening for maximum load clearance
- High speed capability up to 10,000 rpm
- Variable clamping force makes MBS chucks ideal for both roughing and finishing operations
- 6 jaw design enables MBS chucks to clamp fragile workpieces with minimal distortion
- Clamping force can be varied during the machining cycle to maintain consistent grip on the workpiece
- Hi-Lo clamping capability
- Tooled Diaphragm Assembly (with top jaws and part locator) is designed to be removed and accurately remounted to chuck body to maintain .0004" (0.01mm) TIR runout

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MBS-L models are a self-contained design with built-in air cylinder for rotating applications. Air is supplied to MBS/L chucks by a rotating air tube assembly mounted inside the machine spindle. MBS/L chucks are available in sizes from 3 to 12 inch diameter.

### MBS-Z Draw Tube Actuated Chucks - *page 5*



MBS/Z models are actuated by either a hydraulic or pneumatic cylinder mounted to the rear of the machine spindle. MBS/Z chucks are a modular design that includes a spindle adapter and threaded draw tube connector. MBS/Z chucks are available in sizes from 4 to 12 inch diameter.

### MBS-N Air Operated Stationary Chucks - *page 7*



MBS/N models are a self-contained design with built-in air cylinder for stationary applications. Air is supplied directly to the side of the chuck body. MBS/N chucks are available in sizes from 3 to 12 inch diameter.

### Diaphragms & Stop Spiders - *page 9*



MMR Diaphragms are a 6 jaw design. 2, 3, and 4 jaw configurations are available on request. ASS Stop Spiders are mounted to the face of the diaphragm and are used to mount part stop to locate the workpiece being clamped.

### Blank Top Jaws - *page 10*



Blank top jaws are available from stock in 6 jaw configurations. Other configurations are available on request.

### MBS Chuck Accessories - *page 11*



Rotating air tube assemblies and air controls are available to operate MBS/L and MBS/N chuck models.

# MBS/L Air Operated Diaphragm Chucks



## Design

Self-contained design with built-in air cylinder. Air is supplied to the chuck by a multi passage air tube assembly with a rotary coupling. Coolant through the spindle capability is standard.

## Application

OD and ID chucking for cylindrical grinding, turning, and hard turning. Ideal for workpieces requiring high concentricity, and/or close roundness. Ideal for fragile parts which are easily distorted, and applications requiring high spindle speeds.

## Chuck Specifications

Chuck Model	Chuck Size	Repeating Accuracy	No. of Jaws	Jaw Stroke*	Max. Jaw Force	Max. Air Pressure	Max. rpm**	Weight***
MBS/L-80	3.19"	.0001"	6	.060"	510 lbf	100 psi	8,000	3.3 lb
	80 mm	.0025 mm						
MBS/L-100	4.02"	.0001"	6	.060"	1,560 lbf	100 psi	7,000	6.5 lb
	102 mm	.0025 mm						
MBS/L-125	5.00"	.0001"	6	.060"	3,640 lbf	100 psi	6,500	10.4 lb
	127 mm	.0025 mm						
MBS/L-150	5.98"	.0001"	6	.060"	6,090 lbf	100 psi	6,000	14.3 lb
	152 mm	.0025 mm						
MBS/L-200	8.03"	.0001"	6	.060"	10,950 lbf	100 psi	4,500	29.1 lb
	204 mm	.0025 mm						
MBS/L-250	10.00"	.0001"	6	.080"	17,090 lbf	100 psi	3,500	64.5 lb
	254 mm	.0025 mm						
MBS/L-300	11.57"	.0001"	6	.080"	27,470 lbf	100 psi	3,000	96.1 lb
	294 mm	.0025 mm						

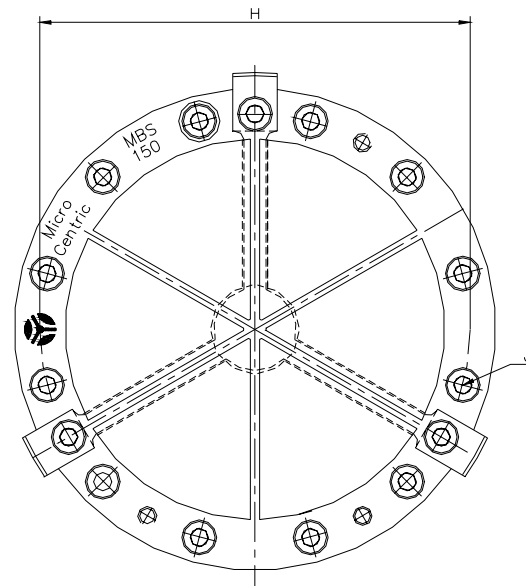
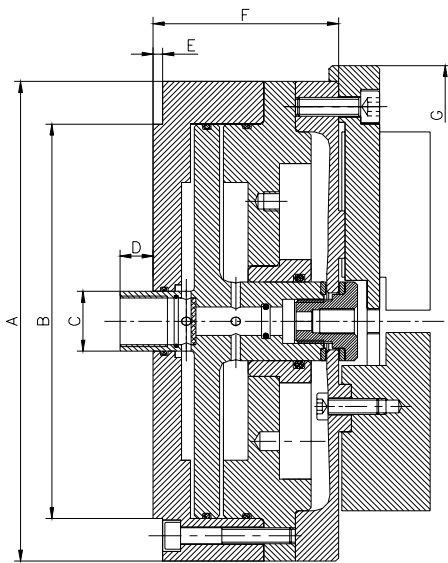
\* Jaw stroke on diameter with 1.50" high top jaws

\*\* Max. rpm is influenced by air pressure applied and weight of top jaws

\*\*\* Without top jaws

## Chuck Dimensions

Model No.	A	B	C	D	E	F	G	H	J
MBS/L-80	3.19"	2.000"	.750"	.51"	.060"	1.77"	3.50"	2.750"	M5
	81 mm	50.8 mm	19 mm	13 mm	1.5 mm	45 mm	88.9 mm	69.9 mm	M5
MBS/L-100	4.02"	3.249"	.750"	.50"	.060"	2.21"	4.33"	3.500"	M5
	102.1 mm	82.5 mm	19 mm	12.7 mm	1.5 mm	56.1 mm	110 mm	88.9 mm	M5
MBS/L-125	5.00"	3.937"	.750"	.34"	.120"	2.28"	5.35"	4.409"	M6
	127 mm	100 mm	19 mm	8.6 mm	3 mm	57.9 mm	135.9 mm	112 mm	M6
MBS/L-150	5.98"	4.920"	.750"	.46"	.120"	2.19"	6.38"	5.350"	M6
	152 mm	125 mm	19 mm	11.7 mm	3 mm	55.6 mm	162.1 mm	135.9 mm	M6
MBS/L-200	8.03"	6.600"	1.187"	.43"	.125"	2.48"	8.43"	7.200"	M10
	204 mm	167.6 mm	30 mm	10.9 mm	3.2 mm	63 mm	214.1 mm	182.9 mm	M10
MBS/L-250	10.00"	8.500"	1.187"	.28"	.185"	3.54"	9.21"	9.200"	M10
	254 mm	215.9 mm	30 mm	7.1 mm	4.7 mm	90 mm	234 mm	233.7 mm	M10
MBS/L-300	11.57"	9.758"	1.187"	-	.185"	3.66"	12.05"	10.500"	M10
	293.9 mm	247.8 mm	30 mm	-	4.7 mm	93 mm	306 mm	266.7 mm	M10



## MBS/Z Draw Bar Operated Diaphragm Chucks



### Design

Draw tube operated design. Can be actuated with either a hydraulic or pneumatic cylinder mounted at the rear of the machine spindle.

### Application

OD and ID chucking for cylindrical grinding, turning, and hard turning. Ideal for workpieces requiring high concentricity, and applications requiring high chucking force and/or high spindle speeds.

### Chuck Specifications

Chuck Model	Chuck Size	Repeating Accuracy	No. of Jaws	Jaw Stroke*	Max. Jaw Force	Max. Draw Tube Force	Max. rpm**	Weight***
MBS/Z-100	4"	.0001"	6	.060"	8,665 lbf	3,950 lbf	7,000	6.9 lb
	102mm	.0025mm	6	1.5mm	2,940 kgf	1,795 kgf		3.1 kg
MBS/Z-125	5"	.0001"	6	.060"	11,420 lbf	3,950 lbf	6,500	10.6 lb
	127mm	.0025mm	6	1.5mm	5,190 kgf	1,795 kgf		4.8 kg
MBS/Z-150	6"	.0001"	6	.060"	12,210 lbf	3,950 lbf	6,000	14.5 lb
	152mm	.0025mm	6	1.5mm	5,550 kgf	1,795 kgf		6.6 kg
MBS/Z-200	8"	.0001"	6	.060"	15,595 lbf	4,550 lbf	4,500	28.7 lb
	204mm	.0025mm	6	1.5mm	7,090 kgf	2,070 kgf		13.0 kg
MBS/Z-250	10"	.0001"	6	.080"	38,075 lbf	11,200 lbf	4,000	60.9 lb
	254mm	.0025mm	6	2.0mm	17,300 kfg	5,090 kgf		27.7 kg
MBS/Z-300	10"	.0001"	6	.080"	43,110 lbf	11,200 lbf	3,500	109.4 lb
	294mm	.0025mm	6	2.0mm	19,600 kgf	5,090 kgf		49.7 kg

\* Jaw stroke on diameter with 1.50" high top jaws

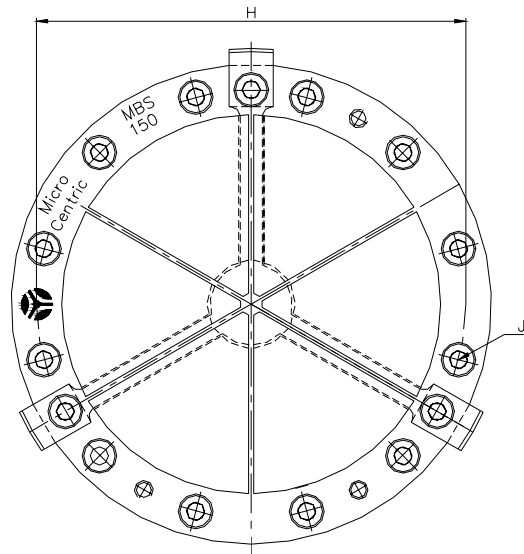
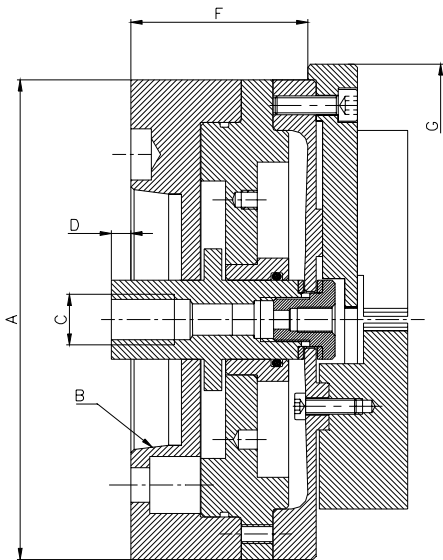
\*\* Max. rpm is influenced by draw tube force and weight of top jaws

\*\*\*Weight without top jaws

\*\*\*Other mounting configurations available upon request

## Chuck Dimensions

Model No.	A	B****	C	D	F	G	H	J
MBS/Z-100	4.02" 102.1mm	A2-4	M16	.314" 8.0mm	2.36" 60mm	4.33" 110mm	3.500" 88.9mm	M5
MBS/Z-125	5.00" 127mm	A2-4	M16	-.126" -3.2mm	2.32" 58.9mm	5.35" 135.9mm	4.409" 112mm	M6
MBS/Z-150	5.98" 152mm	A2-5	M16	-.244" -6.19mm	2.21" 56.1mm	6.38" 162.1mm	5.350" 135.9mm	M6
MBS/Z-200	8.03" 204mm	A2-6	M16	.284" 7.2mm	2.46" 62.4mm	8.43" 214.1mm	7.200" 182.9mm	M10
MBS/Z-250	10.00" 254mm	A2-8	M20	.354" 9.0mm	3.34" 84.8mm	10.39" 263.9mm	9.200" 233.7mm	M10
MBS/Z-300	11.57" 293.9mm	A2-11	M20	.829" 21.0mm	4.17" 105.9mm	12.05" 306mm	10.050" 266.7mm	M10



## MBS/N Stationary Diaphragm Chucks



### Design

Self-contained design with built-in air cylinder. Air ports are located on the side of the chuck body for stationary use.

### Application

OD and ID chucking for milling, drilling, inspection, or any other non-rotating application requiring high concentricity and/or close workpiece roundness. The inherent spring characteristic of the diaphragm allows workpieces to be clamped without continuous air supply for pallet and tombstone applications.

### Chuck Specifications

Chuck Model	Chuck Size	Repeating Accuracy	No. of Jaws	Jaw Stroke*	Max. Jaw Force	Max. Air Pressure	Weight**
MBS/N-80	3.19"	.0001"	6	.060"	510 lbf	100 psi	3.3 lb
	80mm	.0025mm	6	1.5mm	232 kgf	7.1 kg/cm <sup>2</sup>	1.5 kg
MBS/N-100	4.02"	.0001"	6	.060"	1,560 lbf	100 psi	6.5 lb
	102mm	.0025mm	6	1.5mm	709 kgf	7.1 kg/cm <sup>2</sup>	3.0 kg
MBS/N-125	5"	.0001"	6	.060"	3,640 lbf	100 psi	10.4 lb
	127mm	.0025mm	6	1.5mm	1,655 kgf	7.1 kg/cm <sup>2</sup>	4.7 kg
MBS/N-150	5.98"	.0001"	6	.060"	6,090 lbf	100 psi	14.3 lb
	152mm	.0025mm	6	1.5mm	2,768 kgf	7.1 kg/cm <sup>2</sup>	6.5 kg
MBS/N-200	8.03"	.0001"	6	.060"	10,950 lbf	100 psi	29.1 lb
	204mm	.0025mm	6	1.5mm	4,977 kgf	7.1 kg/cm <sup>2</sup>	13.2 kg
MBS/N-250	10"	.0001"	6	.080"	17,090 lbf	100 psi	64.5 lb
	254mm	.0025mm	6	2.0mm	7,768 kgf	7.1 kg/cm <sup>2</sup>	29.3 kg
MBS/N-300	12"	.0001"	6	.080"	27,470 lbf	100 psi	96.1 lb
	294mm	.0025mm	6	2.0mm	12,486 kgf	7.1 kg/cm <sup>2</sup>	43.7 kg

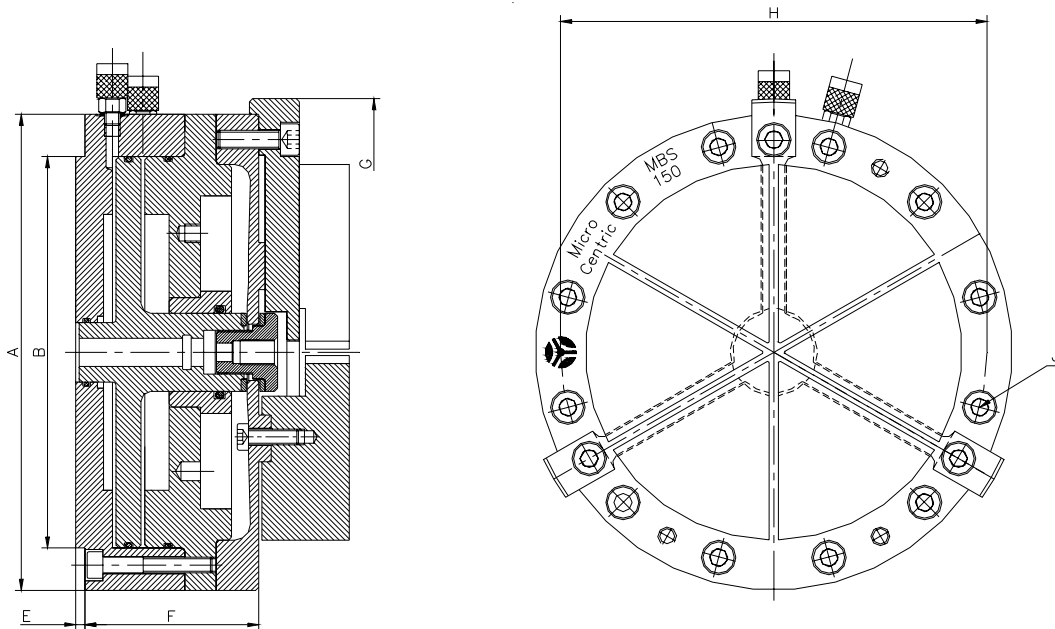
\* Jaw stroke on diameter with 1.50" high top jaws

\*\* Without top jaws



## Chuck Dimensions

Model No.	A	B	E	F	G	H	J
MBS/N-80	3.19" 81mm	2.000" 50.8	.060" 1.5mm	1.77" 44.9mm	3.50" 88.9mm	2.750" 69.8mm	M5
MBS/N-100	4.02" 102.1mm	3.249" 82.5	.060" 1.5mm	2.21" 56.1mm	4.33" 110mm	3.500" 88.9mm	M5
MBS/N-125	5.00" 127mm	3.937" 100mm	.120" 3.0mm	2.28" 57.9mm	5.35" 135.9mm	4.409" 112mm	M6
MBS/N-150	5.98" 152mm	4.920" 125mm	.120" 3.0mm	2.19" 55.6mm	6.38" 162.1mm	5.350" 135.9mm	M6
MBS/N-200	8.03" 204mm	6.600" 167.6mm	.125" 3.1mm	2.48" 63mm	8.43" 214.1mm	7.200" 182.9mm	M10
MBS/N-250	10.00" 254mm	8.500" 215.9mm	.185" 4.7mm	3.54" 90mm	9.21" 234mm	9.200" 233.7mm	M10
MBS/N-300	11.57" 293.9mm	9.758" 247.8mm	.185" 4.7mm	3.66" 93mm	12.05" 306mm	10.500" 266.7	M10



## MMR Diaphragms



Chuck Size	Model No.	No. Jaws	Diameter	Height
3"	MMR-80-6	6	3.19"	.63"
81mm			81mm	16mm
4"	MMR-100-6	6	4.02"	.71"
102mm			102.1mm	18mm
5"	MMR-125-6	6	5.00"	.71"
127mm			127mm	18mm
6"	MMR-150-6	6	5.98"	.70"
152mm			152mm	17.7mm
8"	MMR-200-6	6	8.03"	.69"
204mm			204mm	17.5mm
10"	MMR-250-6	6	10.00"	.87"
254mm			254mm	22mm
12"	MMR-300-6	6	11.57"	1.02"
294mm			293.9mm	25.9mm

MMR diaphragms are used with SMR series top jaws which are bolted on from the rear of the diaphragm. This eliminates the possibility of having an interrupted clamping diameter since there are no counter-bored mounting holes in the top jaws. MMR diaphragms are also available in 2, 3, and 8 jaw configurations.

## ASS Part Stop Spider



Chuck Size	Model No.
3" (81mm)	ASS-80
4" (102mm)	ASS-100
5" (127mm)	ASS-125
6" (152mm)	ASS-150
8" (204mm)	ASS-200
10" (254mm)	ASS-250
12" (294mm)	ASS-300

ASS part stop spiders are mounted to the face of the diaphragm, underneath the top jaws. They are machined for locating pins or other part stops to be mounted to the stop spider for end location of the workpiece.

## SMR Blank Top Jaws



Chuck Size	Model No.	Diameter	Height	Material	Weight
3" 81mm	SMR-80-25S	2.36" 59.9mm	1.00" 25.4mm	4140	1.10 lb .50 kg
	SMR-80-38S	2.36" 59.9mm	1.50" 38.1mm	4140	1.60 lb .72 kg
4" 102mm	SMR-100-25S	3.15" 80mm	1.00" 25.4mm	4140	1.90 lb .86 kg
	SMR-100-38S	3.15" 80mm	1.50" 38.1mm	4140	2.90 lb 1.31 kg
	SMR-100-50S	3.15" 80mm	2.00" 50.8mm	4140	3.80 lb 1.72 kg
5" 127mm	SMR-125-25S	3.46" 87.8mm	1.00" 26.4mm	4140	2.20 lb 1.00 kg
	SMR-125-38S	3.46" 87.8mm	1.50" 38.1mm	4140	3.40 lb 1.54 kg
	SMR-125-50S	3.46" 87.8mm	2.00" 50.8mm	4140	4.60 lb 2.09 kg
	SMR-150-25S	4.72" 119.9mm	1.00" 15.4mm	4140	4.10 lb 1.86 kg
6" 152mm	SMR-150-38S	4.72" 119.8mm	1.50" 38.1mm	4140	6.20 lb 2.81 kg
	SMR-150-50S	4.72" 119.9mm	2.00" 50.8mm	4140	8.10 lb 3.68 kg
	SMR-150-75S	4.72" 119.9mm	3.00" 76.2	4140	12.20 lb 5.54 kg
	SMR-200-38S	6.30" 160mm	1.50" 38.1mm	4140	10.20 lb 4.63 kg
	SMR-200-50S	6.30" 160mm	2.00" 50.8mm	4140	13.60 lb 6.18 kg
8" 204mm	SMR-200-75S	6.30" 160mm	3.00" 76.2	4140	20.40 lb 9.27 kg
	SMR-250-38S	7.48" 190mm	1.50" 50.8mm	4140	14.40 lb 6.54 kg
	SMR-250-50S	7.48" 190mm	2.00" 50.8mm	4140	19.10 lb 8.68 kg
	SMR-250-75S	7.48" 190mm	3.00" 76.2mm	4140	28.70 lb 13.04 kg
10" 254mm	SMR-300-38S	9.13" 232mm	1.50" 38.1mm	4140	21.40 lb 9.27 kg
	SMR-300-50S	9.13" 232mm	2.00" 50.8mm	4140	28.50 lb 12.95 kg
	SMR-300-75S	9.13" 232mm	3.00" 76.2mm	4140	42.70 lb 19.40 kg

SMR blank top jaws are used with MMR diaphragms. They are machined on the chuck to suit the workpiece. Refer to MicroCentric's operating manual for detailed instructions on the design and preparation of finished top jaws. Blanks jaws can be hardened after rough machining, and then finish ground on the chuck. Blank jaws are available in other configurations and materials. Contact our sales department for information on custom hardened and ground top jaws.

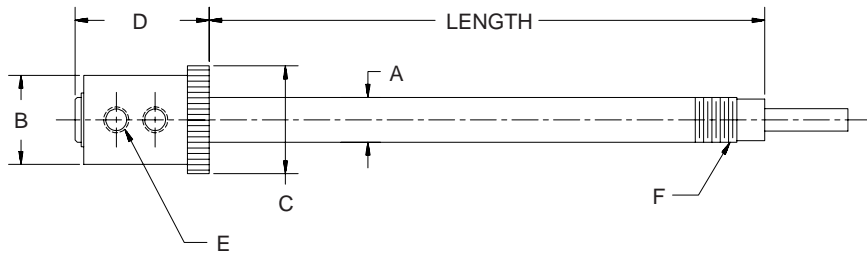
# MBS Chuck Accessories

## Rotating Air Tubes



Air tube assemblies are used with MBS/L chuck models. The rotary air coupling features a hardened steel journal and a maintenance free oil-lite bearing.

Rotary air tubes include a blank support bushing, air hoses and fittings. Length to be specified when ordering. Contact our sales department for assistance in determining the correct length for your application.



Air Tube	Chucks used with:
Model 50	80, 100, 125 & 150 models
Model 82	250 and 300 models

Air Tube	A	B	C	D	E	F	Max Speed
Model 50	.625" 15.9mm	1.24" 31.5mm	1.50" 38.1mm	2.21" 56.1mm	1/16"-27 NPT	5/8"-32 UNF	6,000 rpm
Model 82	1.00" 25.4mm	2.50" 63.5mm	2.75" 69.9mm	4.85" 123.2mm	1/4"-18 NPT	1.0"-24 UNF	4,000 rpm

## Operating Valves



HV operating valves are three position manually operated pneumatic valves that direct air flow to open and close MicroCentric air chucks.

Each HV valve includes air hoses and fittings required for installation.

<i>Model</i>	<i>Fitting Size</i>	<i>Max Pressure</i>	<i>Air Tube Model</i>
<b>HV-10</b>	1/8"-27 NPT	150 psi 10 kg/cm <sup>2</sup>	Model 50
<b>HV-20</b>	1/4"-18 NPT	150 psi 10 kg/cm <sup>2</sup>	Model 82

## Air Filter/Regulator/Lubricator Units



The FRL-15 is a combination air filter/regulator/lubricator unit that controls the air pressure to the chuck's built-in cylinder, and provides lubrication to the rotary air bearing assembly. This unit also filters contaminants from the air supply. Water that accumulates in the filter unit can be purged by a manual drain.

Each unit includes a pressure gage, as well as air hoses and fittings.

<i>Model</i>	<i>Fitting Size</i>	<i>Max Pressure</i>
<b>FRL-15</b>	1/4"-18 NPT	150 psi 10kg/cm <sup>2</sup>

## Rotary Union



A rotary union is required to supply coolant through the air tube assembly, or for the AL-Automatic Lubrication option.

The rotary union threads into the rear of the air tube and includes a hose and fittings.

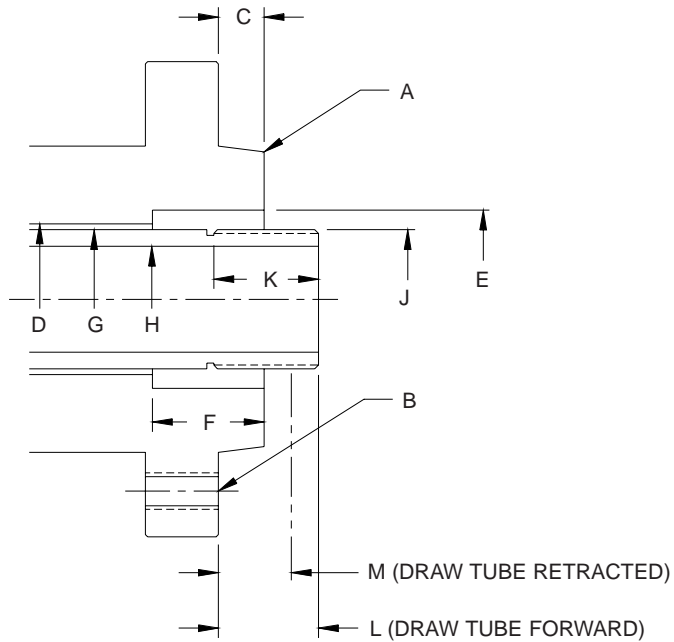
<i>Model</i>	<i>Fitting Size</i>	<i>Max Pressure</i>	<i>Max Speed</i>	<i>Air Tube Model</i>
<b>RU-10</b>	1/8"-27 NPT	150 psi 10 kg/cm <sup>2</sup>	6,000 rpm	Model 50
<b>RU-20</b>	1/4"-18 NPT	150 psi 10 kg/cm <sup>2</sup>	4,000 rpm	Model 82

# Spindle & Draw Tube Data Sheet

Company		Date	
Chuck Model		Ref. No.	

Please complete this spindle data sheet and submit it with your order for MBS/Z chuck models.

This information will enable us to furnish a spindle mounting plate and threaded draw tube connector with the chuck that is designed for your machine.



Machine Make	
Machine Model	
Machine Serial No.	
A* taper size	
B mounting thread	
C length of pilot	
D through hole diameter	
E ID counterbore or taper (if any)	
F depth of counterbore (if any)	
G OD of draw tube	
H ID of draw tube	
J thread (RH or LH / ID or OD)	
K length of thread	
L** forward position	
M retracted position	

\* For machines with a straight spindle pilot a detail drawing of the spindle must be submitted

\*\* Positive (+) indicates draw tube is in front of the spindle face (as shown)

Negative (-) indicates draw tube is behind the spindle face



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