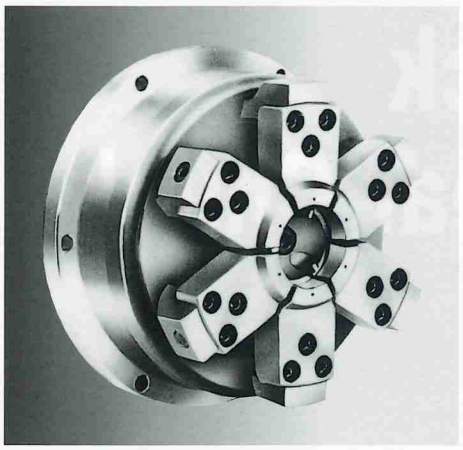
DIAPHRAGM CHUCK

MDC Diaphragm Chuck

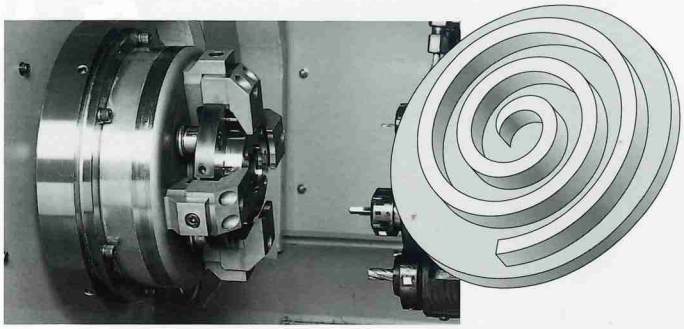
Master Jaw type

"For High Precision Operation" "Pull-Back" "Dust Free Type" "Design Specification"



For scroll machining .....

The machining of the scroll shaped work-pieces which are regarded as the important parts of scroll type compressor requires both high precision machining technique and holding technique. The MDC Diaphragm Chuck has been used in the machines for scroll machining which are supplied by many machine tool makers as to meet their high technical requests.



Structure and Function

Turning and grinding works for finishing, Precise boring, Honing and Inspection.

Accuracy

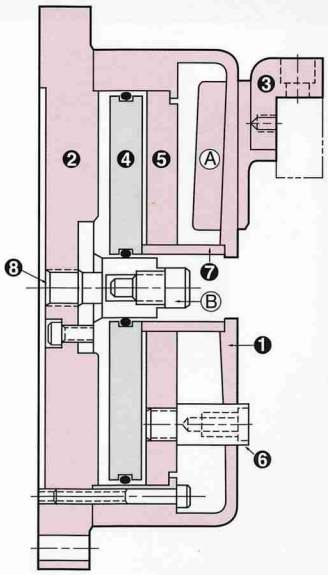
It is possible to attain high concentricity because of elastic restoring accuracy of the diaphragm. This chuck is suitable to the precise finishing machining because of the "Pull-Back" action by circular swing motion of jaws and the ability to improve the flatness / parallelism and roundness by flexible elastic action along with the unevenness of the clamping portion of the work-pieces.

Maintenance

The MDC is designed to use elastic restoring accuracy of the diaphragm for safe clamping purpose. There is no complicated mechanism causing the trouble and / or losing the power at the portion of friction movement. Additionally, it is not necessary to use grease since this chuck is well sealed and is not influenced by cutting chips and grinding scraps.

Design

The MDC Chuck is powered by Built-in Air Cylinder or Draw bar type. If more clamping force is needed, push and pull type is supplied. We can also design special types accoding to the customer's requirement.

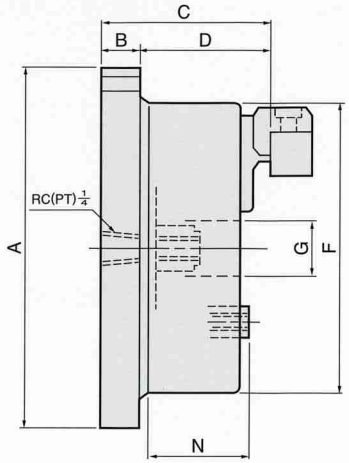


❶ Diaphragm
❷ Adapter plate
❸ Jaw supporting base
❹ Piston
❺ Back plate
❻ Work stopper fitting seat
❼ Bush sleeve
❽ Air supply

Ⓐ Counter weight
Prevent the jaws from opening by the centrifugal forces generated during rotation.

Ⓑ Center stopper fitting seat

Dimension diagram



Standard dimensions

Model No.	A	B	C	D	F	G	N
SC-5012	171.5	19.1	90.4	71.4	138.3	22.9	55.37
SC-7012	208.0	19.1	92.0	72.9	174.8	26.2	60.45
SC-8012	246.0	19.1	96.8	77.7	212.9	64.3	65.02
SC-10012	284.0	19.1	96.8	77.7	251.0	77.0	65.02
SC-13012	360.0	19.1	108.0	88.9	327.2	115.0	73.90
SC-17012	476.0	19.1	109.5	90.4	428.9	152.4	75.44

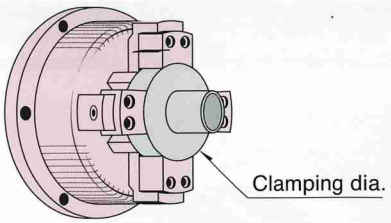
Standard specifications

Model No.	Max. Clamping force kN (kgf)		Jaw Q'ty	Jaw stroke mm	Clamping range mm	Weight kg
	Single	Double				
SC-5012	4.2 (427)	9.3 (945)	3	0.23	18~76	7.2
SC-7012	7.9 (810)	15.9 (1,620)	4	0.23	44~107	11.1
SC-8012	10.6 (1,080)	21.2 (2,160)	6	0.25	76~143	20.2
SC-10012	16.8 (1,710)	33.5 (3,420)	6	0.25	114~181	26.5
SC-13012	30.0 (3,060)	60.0 (6,120)	6	0.35	150~248	43.2
SC-17012	54.2 (5,535)	108.5 (11,070)	6	0.45	203~349	89.1

Advantages

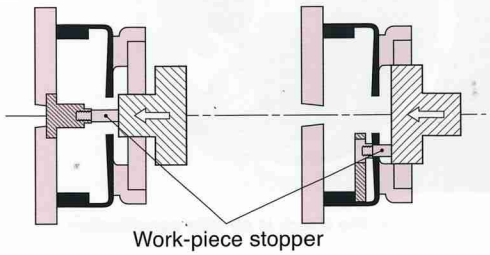
1 Concentricity : 0.002 mm T.I.R. of elastic repeating accuracy

The Diaphragm Chuck has accuracy of elastic repeating accuracy, and concentricity accuracy is designed to be 1/3 of the tolerance of the work-piece's clamping diameter. In case of thin-walled work-pieces, the collet chuck which clamps a periphery, then the roundness accuracy of the pre-process is left just as it is in the processed portion. But when using the Diaphragm Chuck, the roundness accuracy of the pre-process is substantialy improved because the 6 jaws of the Diaphragm Chuck (from #8) elastically deform according to the uneveness of clamping portion flexibly.



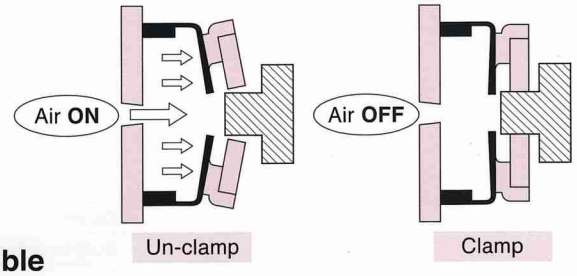
2 Flatness & Parallelism : Work-piece adheres closely to stops

Since the jaws of the Diaphragm Chuck clamps the work-pieces with circular swing motion, it works as the force to draw the normal work-pieces which have smaller clamping diameter than the supporting point of the diaphragm (when I.D. Clamping, bigger clamping diameter than the supporting point) to the stopper. Therefore, there is no dispersion of thickness accuracy because of the work-piece floating. (We are available to design Air Sensor type detecting the influence of cutting dust.)



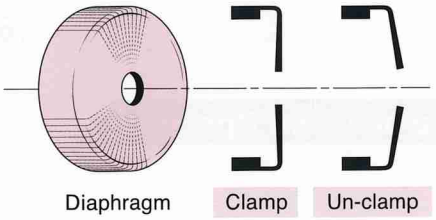
3 Built-in cylinder can be used for air line system

The Diaphragm Chuck (Built-in Cylinder Type) has the thin chuck body and light weight compared with the general chucks. Therefore, the influence to the machine spindle is much smaller. This chuck can be used in factory air line as power source and also is designed so the jaw unclamping range does not reach over the endurance limit.



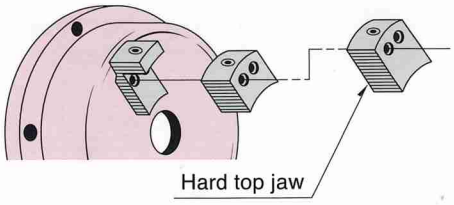
4 The structure without any motion loss or trouble

The Diaphragm Chuck is designed with considering stress distribution and shaped like a bowl in order to have enough opening space. The materials using high grade alloy steel are strengthened by specified heat treatment. The Diaphragm Chuck has no constructive problems and also no abrasion or scraping portion losing power. It is easy to maintain high clamping accuracy for long time.

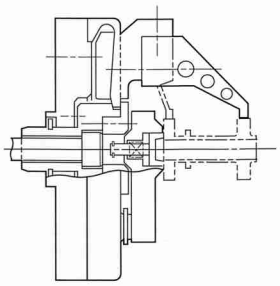


5 High hardness and high accuracy top jaws

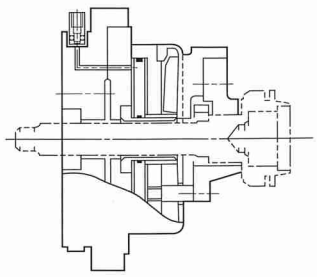
The top jaws of the Diaphragm Chuck are made to be high hardness by giving heat treatment in order to be used for long term keeping high accuracy. Also, those are designed according to each work-piece with ensuring high-accuracy and have interchangeability to all of the Diaphragm Chucks of the same size, which means there is no need to do accuracy adjustment when attaching the top jaws every time. (If you require higher accuracy, adjust accuracy by a master ring first after the exchanging the top jaws.)



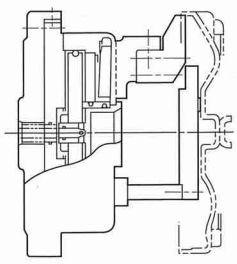
Practical examples



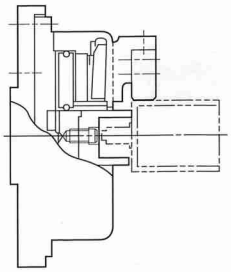
For : Gear
Clamping : ϕ49



For :Gear main drive shaft
Clamping : ϕ45



For : Converter front
Clamping : ϕ258



For : Roter air pump
Clamping : ϕ64