

Rotary Clamp Cylinders - Overview

Overview

The square and space-saving cylinders have built-in rotary (swing) clamping mechanisms. Suitable for clamping small workpieces such as electronic parts in limited spaces.

Features

- Space Saving / Square**
Sensors of all diameters (Contact / No Contact) are mountable to the cylinders.
- High Rigidity**
For enhanced wear resistance, the cylinders are equipped with two guide grooves compatible with all diameters. In addition, each of the guide pins is outfitted with a roller (Ø32 ~ Ø50).

Basic Specifications of Clamp Cylinders

Tube I.D. (mm)	25	32	40	50
Operating Type	Double Acting			
Applicable Fluid	Compressed Air			
Max. Operating Pressure (MPa)	1.0			
Min. Operating Pressure (MPa)	0.2			
Guaranteed Withstand Pressure (MPa)	1.6			
Operating Temp. Range (°C)	-10 ~ 60 (Non-Freezing)			
Connection Dia.	M5	Rc1/8	Rc1/4	
Piston Speed (mm/s)	50~200			
Cushion Mechanism	With Cushion Rubber			
Lubrication	N/A			
Rotating Angle	90°±10°			
Rotating Direction	Right / Left			
Rod Non-rotating Accuracy (when Clamped): Initial Value	±1°	±0.9°		±0.7°
Pressure Area (mm²)	Instroke Side	377	603	1055
	Outstroke Side	490	804	1256
Service Life	1 Million Times			

Stroke

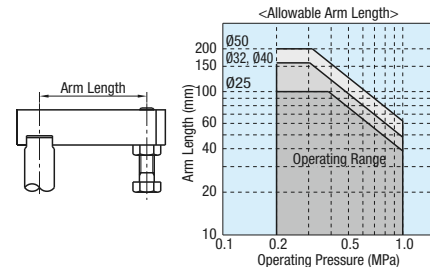
Tube I.D. (mm)	Stroke	Stroke on Rotating (mm)	Stroke on Clamping (mm)	Rotating Direction
Ø25	31	11	20	Counterclockwise Clockwise
Ø32	35	15	20	
Ø40	35	15	20	
Ø50	70	20	50	

Design / Selection

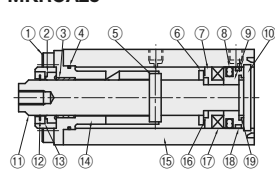
- NOTE**
- In operation, the piston rod of this cylinder strokes while rotates (at 90°). Be sure that the arm mounted onto the tip of the piston rod does not interfere with any external objects while rotating. Take precautions such as installing a protective cover if the pivoting arm mounted onto the tip of the piston rod poses a hazard to human body.

Arm Length & Operating Pressure

Set the arm length and the operating pressure to be within the ranges below.

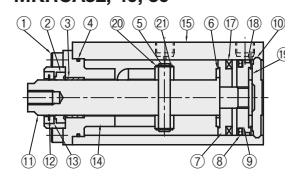


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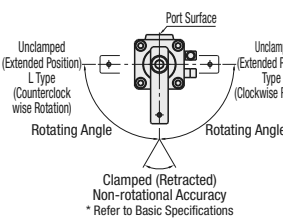


Number	Product Name	Material
1	Hex Socket Head Cap Screw	Stainless Steel
2	Rod Gasket	Nitrile Rubber
3	Bushing	Coppers
4	Cylinder Gasket	Nitrile Rubber
5	Pin	Steel
6	Cushion Rubber	Urethane Rubber
7	Spacer	Ø25: Special Resin
8	Piston Gasket	Ø32 ~ Ø50: Aluminum Alloy
9	Piston	Nitrile Rubber
10	Cover	Aluminum Alloy

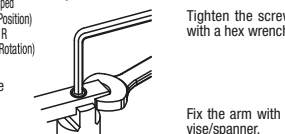
MKRC A32, 40, 50



Number	Product Name	Material
11	Piston Rod	Steel
12	Coil Scraper	Copper Alloy
13	Holder	Aluminum Alloy
14	Rod Cover	Steel
15	Cylinder Body	Aluminum Alloy
16	Spacer Washer	Stainless Steel
17	Magnet	Plastic
18	Wear Contact	Acetal Resin
19	Cushion Rubber	Urethane Rubber
20	E Type Retaining Ring	Steel
21	Roller	Steel



- How to Mount an Arm**
Mount an arm according to the following steps as shown below.



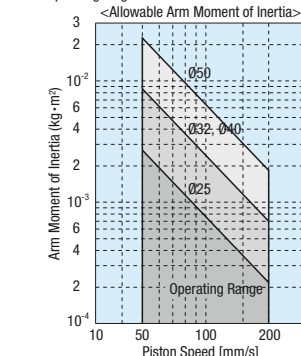
Draw the rotating portion out of the piston rod. Make sure that the piston rod rotates before fixing the arm. If the arm is fixed at any other location, overload might damage the internal components.

Clamping Position

Do not clamp while the arm is rotating. For clamping, allow 3 mm or more before the stroke end.

Arm Inertia Moment & Piston Speed

Set the arm inertia moment and the piston speed to be within the operating range as shown below.



Note)The Arm Allowable Inertia Moment Chart applies only to vertical actuation installations.

Selection Example A

- <Requirements>
- Required Clamping Force : 500N
 - Operating Pressure: 0.5MPa
 - Piston Speed: 100mm/s
 - Arm Length: 80mm
 - Arm Inertia Moment: 2.0x10⁻⁴kg·m
- Calculate a required pressure area.
Required Pressure Area (mm²)= Required Clamping Force (N) / Operating Pressure (MPa)=500/0.5=1000 (mm²).
 - Select a cylinder size based on the list and the pressure area (instroke side).
Ø40 Pressure Area: 1055 (mm²) > Required Pressure Area 1000 (mm²)
 - Make sure that the arm length and the operating pressure are within the operating ranges as shown in the applicable chart.
Operating Pressure 0.5MPa - Arm Length 80mm: Within the Operating Range
 - Confirm that the arm inertia moment and the piston speed are within the operating ranges as shown in the chart.
Lever Inertia Moment 2.0x10⁻⁴kg·m-Piston Speed 100mm/s: Within the Operating Range

IMPORTANT! Precautions for Handling Rotary Clamp Cylinders

*Be sure to read the precautions [IMPORTANT!] in the "Compact Air Cylinder Overview" on P1484.

Rotary Clamp Cylinders) CAUTION

Never touch any moving part while the cylinder is in operation. It is extremely dangerous because fingers may be caught between moving parts.

Rotary Clamp Cylinder) NOTE

- Protect the sliding sections of the piston rods and piston guide rods from being scratched and dented.
- Installing the Speed Controller
Install the speed controller (meter out: throttle on the exhaust side) to the air pressure outlet side. The performance of the speed controller affects the operation of the cylinder. Use a speed controller with low cracking pressure.
- Installing Conditioning Equipment
Cylinder failures are mostly caused by foreign materials in the atmosphere or drains. Protect the cylinder from trouble by installing an air dryer or air filter upstream.
- Space
Provide sufficient space around the equipment to ensure easy handling.

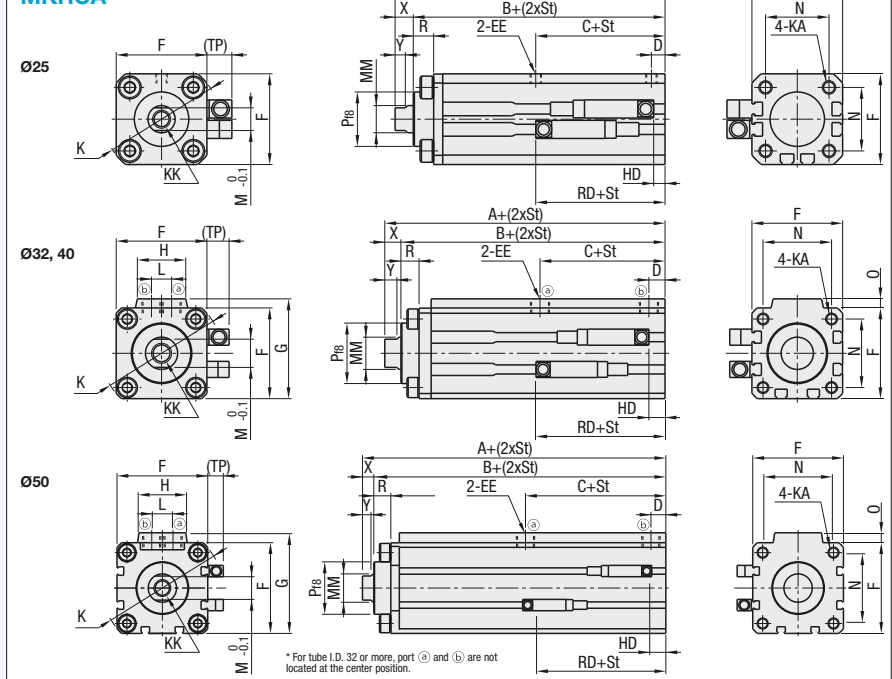
- Flushing
Before plumbing, flush the pipe thoroughly to protect it from solids or seal tape fragments.
- Ambient Environment
Do not use the cylinder in the following environments:
An area filled with oil or grease. (It may cause dust to adhere to the sliding section.)
An area where intense vibrations may occur.
An area where the equipment may be affected by chemicals.

Rotary Clamp Cylinders

Rotary Clamp Cylinders



MKRC A



Rotary Clamp Cylinder External Dimensions

Tube I.D. (mm)	A	B	C	D	EE	F	G	H	K	KA	KK	L	M	MM	N	O	P	R	X	Y
25	57	49	26	6	M5x0.8	40	-	-	51	M6 Depth 11	M8 Depth 15	-	10	12	28	-	24	9	8	4.5
32	69	61	27	8	Rc1/8	45	49.5	24	60	M6 Depth 11	M10 Depth 15	10	14	16	34	4.5	30	9	8	6
40	70	62	29	8.5	Rc1/8	52	57	24	69	M6 Depth 11	M10 Depth 15	10	14	16	40	5	35	9	8	6
50	74	66	29	10.5	Rc1/4	64	71	33	86	M8 Depth 13	M12 Depth 15	15	17	20	50	7	37	12	8	6

For selections, be sure to check the "Specifications" and "Precautions" on P1497.

Part Number	Type	Tube I.D. (mm)	St Stroke	Rotating Direction	Stroke on Rotating (mm)	Stroke on Clamping (mm)	Unit Price 1 ~ 4 pc(s).
MKRC A		25	31	L	11	20	
		32	35	(Counterclockwise Rotation)	15	20	
		40	35	R	15	20	
		50	70	(Clockwise Rotation)	20	50	

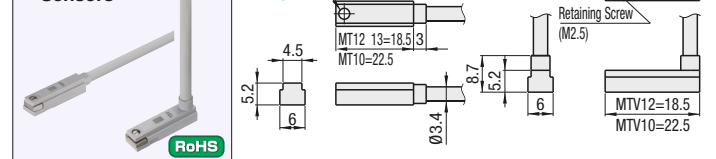
Rotary Clamp Cylinder External Dimensions

Tube I.D. (mm)	MT12, 13/MTV12				MT10/MTV10			
	HD	RD	(TP)		HD	RD	(TP)	
25	6	25	0	5	26	0		
32	9	28	0	8	29	0		
40	10	29	0	9	30	0		
50	11	30	0	10	31	0		



Ordering Example
Part Number - St Stroke - Rotating Direction
MKRC A25 - 31 - L

Rotary Clamp Cylinder Sensors



Part Number	Type	L Selection	Load Voltage	Load Current	Sensor Type	Line	Wire Exit	Unit Price	
								L1 (1m)	L3 (3m)
MT12	L1 (1m)	L3 (3m)	12/24VDC 110VAC	5~50mA(DC) 7~20mA(AC)	Contact	2	Rear		
			10~30VDC 30VDC or Less	*5~20mA 100mA or Less	No Contact	2			
			12/24VDC 110VAC	5~50mA(DC) 7~20mA(AC)	Contact	2			
MTV12			10~30VDC	*5~20mA	No Contact	2	Top		

The values of the maximum load current 20mA is for 25°C. When used in ambient temperature 25°C or higher, load current is lower than 20mA. (5 ~ 10mA when 60 °C)

The sensor used for this rotary clamp cylinder is applicable only for rotary clamp cylinders. It cannot be used for compact type, pen type or guide type cylinders.



Ordering Example
Part Number

Rotary Clamp Cylinder Sensors Specifications

Item	Contact Point 2 Wire Type	No Contact Point 2 Wire Type MT12, MTV12	No Contact Point 3 Wire Type MT13
Application	For PLC and Relays		For PLC and Relays
Output Method			NPN Output
Power Supply Voltage			10~28VDC
Load Voltage	12/24VDC	110VAC	30VDC or Less
Load Current	5~50mA	7~20mA	100mA or Less
Consumption Current			24VDC, 10mA or lower
Internal Voltage Drop	3V or Less	4V or Less	0.5V or Less
Lamp	LED (Lights when ON)		
Leakage Current	0mA	1mA or Less	10µA or Less
Lead Wire Length	1m (Oil Resistant Vinyl Cab Tire Cord 0.2mm ²)		
Max. impact	294m/s ²	980m/s ²	
Insulation Resistance	20MΩ or more with 500VDC high resistance meter		
Dielectric Strength Voltage	No anomaly to be recognized after application of 1000VAC for 1 minute.		
Ambient Temperature	-10 ~ +60°C		
Protection Structure	IEC Standards IP67 JIS C0920 (Water-resistant) Oil-proof		
Mass	1m:20g 3m:50g		
Circuit			