

Twist clamp cylinder

ACK Series



Specification

Bore size(mm)	25	32	40	50	63
Acting type	Double acting				
Fluid	Air(to be filtered by 40 μ m filter element)				
Operating pressure	0.15~1.0MPa(22~145psi)				
Proof pressure	1.5MPa(215psi)				
Temperature °C	-20~80				
Speed range mm/s	50~200				
Stroke tolerance	+1.0 0				
Rotary angle tolerance	± 1.5°				
Cushion type ①	No cushion				
Port size ②	M5 × 0.8		1/8"		

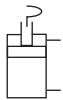
① If there is no buffering device, exhaust throttle shall be added to achieve buffering effect.

② PT thread, G thread and NPT thread are available.

Stroke

Bore size(mm)	Stroke type	90°	180°	Total stroke (90° /180°)
25	Rotation stroke	14	20	26
	Clamping stroke	12	6	26
32	Rotation stroke	15	21	27
	Clamping stroke	12	6	27
50	Rotation stroke	15	21	29
	Clamping stroke	14	8	29

Symbol



Product feature

1. The material of seals guarantees the reliable performance of the cylinder that is used under various conditions.
2. Three-slot guide structure leads to high guide precision.
3. There are single and double side clamping fingers can be selected (90°).
4. Levorotatory and dextrorotatory are available; 90° and 180°.
5. The material of piston rod is made from special alloy steel, which has longer life after heat treatment.

Ordering code

ACK L 25 × 90 □

Model

ACK: Twist clamp cylinder(Double acting type)
 ACKD: Twist clamp cylinder
 (Double push plate type, only for 90°)

Thread type ①

Blank: PT
 G: G
 T: NPT

Rotary direction

L: Push and turn left

When the piston of cylinder moves downward, the swivel arms moves anticlockwise, this is called levorotatory.

R: Push and turn right

When the piston of cylinder moves downward, the swivel arms moves clockwise, this is called dextrorotatory.

Rotary angle

90: 90°
 180: 180°

Bore size

25 32 40 50 63

① When the thread is standard, the code is blank.



Twist clamp cylinder

ACK Series

Inner structure and material of major parts

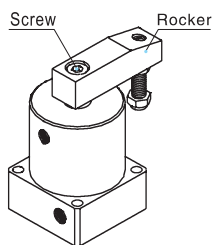
NO.	Item	Material	NO.	Item	Material
1	Screw	Carbon steel	12	Fixed pin	S45C
2	Rocker	Carbon steel	13	Back cover	Aluminum alloy
3	Rod packing	NBR	14	O-ring	NBR
4	O-ring	NBR	15	Push block	SCr440
5	Piston rod	S45C	16	Bushing	SCr440
6	Body	Aluminum alloy	17	Steel ball	Carbon steel
7	Piston seal	NBR	18	Rotary axis	SCr440
8	Wear ring	Wear resistant material	19	Bumper	PTFE
9	Screw	Carbon steel	20	Screw	Carbon steel
10	Screw	Carbon steel	21	Nut	Carbon steel
11	O-ring	NBR			

Installation and application

Rocking shaft initial point adjustment

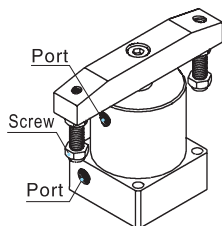
According to the actual need, loosening screw, may adjust the rocking shaft initial point.

Note: When assemble or disassemble the rocker by spanner and allen wrench; don't hold the body to assemble or disassemble rocker, it may damage the cylinder.



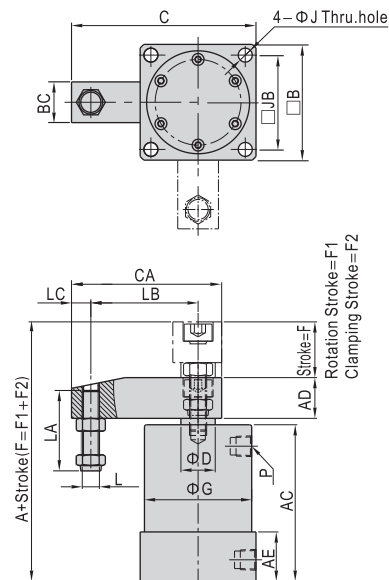
How to select the fitting for body's port

When ACK series with 180° rotation or ACKD is selected, miniature air fittings should be used to minimise obstruction.

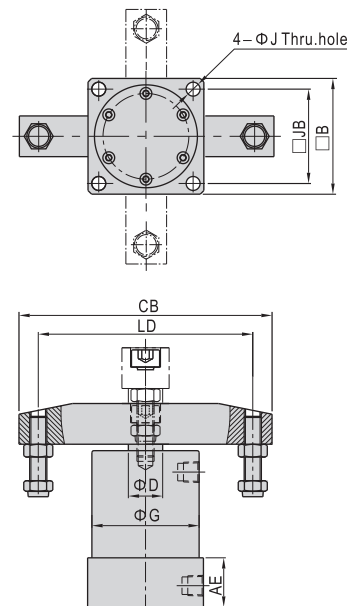


Dimensions

ACK



ACKD



Bore size\Item	A	AC	AD	AE	B	BC	C	CA	CB	D	F(90° /180°)	F1(90°)
25	85	65	16	23	40	16	58	48	76	14	26	14
32	95	73	19	23	54	19	86	70	118	16	26	14
40	97	74	19	26	58	19	88	70	118	16	27	15
50	109.5	80	25.5	26	68	25.5	114	93	160	20	29	15
63	115.5	86	25.5	30	82	25.5	121	93	160	20	29	15

Bore size\Item	F1(180°)	F2(90°)	F2(180°)	G	J	JB	L	LA	LB	LC	LD	P
25	20	12	6	35	4.5	30	M6×1.0	29.5	30	8	60	M5×0.8
32	20	12	6	50	6.5	44	M8×1.25	37.5	50	9	100	1/8"
40	21	12	6	55	6.5	48	M8×1.25	37.5	50	9	100	1/8"
50	21	14	8	60	8.5	55	M10×1.5	45	70	10	140	1/8"
63	21	14	8	70	8.5	64	M10×1.5	45	70	10	140	1/8"



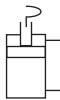
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Rotary clamp cylinder

QCK Series



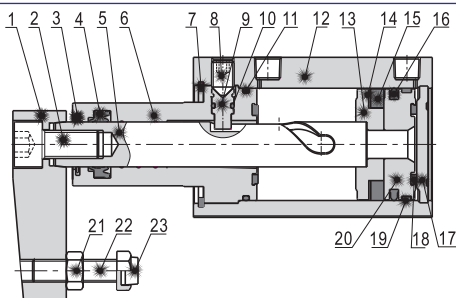
Symbol



Product feature

1. It can be used on welding fixture, the QPQ surface treatment prevent piston rod damage by welding slag; better than chrome plated piston rod.
2. The front cover with stainless steel dust scraping ring, can keep the dust and welding slag out, and protect cylinder internal parts.
3. Strong magnet is optioned for $\Phi 32 \sim \Phi 63$ bore size, which can be used in high magnetic fields.
4. The mounting dimension of body is the same as ACQ series, can use ACQ series' accessories.

Inner structure and material of major parts



NO.	Item	Material
1	Rocker	Carbon steel
2	Screw	Carbon steel
3	Dust scraping ring	No ($\Phi 12, \Phi 16$)\Stainless steel(Others)
4	Front cover packing	NBR
5	Piston rod	SCr440
6	Front cover	Aluminum alloy
7	C Clip	Spring steel
8	Screw	Carbon steel
9	Operating screw	SCr440
10	O-ring	NBR
11	O-ring	NBR
12	Body	Aluminum alloy
13	Magnet holder	Brass ($\Phi 12, \Phi 16$)\Aluminum alloy(Others)
14	Magnet washer	NBR
15	Magnet	Sintered metal(Neodymium-iron-boron ($\Phi 12 \sim \Phi 25$))\Plastic(Others)
16	Piston seal	NBR
17	Back cover	Aluminum alloy
18	Bumper	TPU ($\Phi 12 \sim \Phi 25$)\NBR(Others)
19	Wear ring	No ($\Phi 12 \sim \Phi 32$)\Wear resistant material(Others)
20	Piston	Brass ($\Phi 12, \Phi 16$)\Aluminum alloy(Others)
21	Screw	Carbon steel
22	Fixing screw	Carbon steel
23	Bumper	PTFE ($\Phi 12 \sim \Phi 40$)\POM(Others)

Specification

Bore size(mm)	12	16	20	25	32	40	50	63
Acting type	Double acting							
Fluid	Air(to be filtered by $40 \mu\text{m}$ filter element)							
Operating pressure	0.15~1.0MPa(23~145psi)(1.5~10bar)							
Proof pressure	1.5MPa(215psi)(15bar)							
Temperature $^{\circ}\text{C}$	-20~80							
Speed range mm/s	50~200							
Rotation angle	$90^{\circ} \pm 10^{\circ}$							
Rotation direction	Turn left or turn right							
Rotation stroke mm	7.5		9.5		15		19	
Clamping stroke mm	10 20	10 20 30		10 20 30 50				
Stroke tolerance	$+1.0$ 0							
Cushion type	Bumper							
Port size ①	M5 \times 0.8				1/8"		1/4"	

① PT thread, G thread and NPT thread are available.

Add) QCK series are all attached with magnet, please refer to Page 457~480 for the specific content of sensor switch.

Ordering code

QCK L 32 \times 20 S FB

- Model**: QCK: Rotary clamp cylinder
- Rotation direction**: L: Push and turn left, R: Push and turn right
- Bore size**: 12 16 20 25 32 40 50 63
- Clamping stroke**:

Bore size	Clamping stroke
$\Phi 12$	10, 20
$\Phi 16 \sim \Phi 25$	10, 20, 30
$\Phi 32 \sim \Phi 63$	10, 20, 30, 50
- Thread type**: Blank: PT, G: G, T: NPT
- Mounting type**: Blank: No bracket, FB: FB type ①
- Magnet**: S: With magnet

① Back flange is same as ACQ series (please refer below table), if need front flange, please contact us.

Bore size\Accessories	FB	Material	Bore size\Accessories	FB	Material
12	F-ACQ12FA	Aluminum alloy	32	F-ACQ32FA	Aluminum alloy
16	F-ACQ16FA		40	F-ACQ40FA	
20	F-ACQ20FA		50	F-ACQ50FA	
25	F-ACQ25FA		63	F-ACQ63FA	

② When the thread is standard, the code is blank.

The definition of rotation direction and angle

QCKL Clamping turn left 90°

QCKR Clamping turn right 90°

Retracted stroke end(Clamp)

Levorotatory(QCKL): When the piston of cylinder moves downward, the swivel arms moves anticlockwise, this is called levorotatory.

Dextrorotatory(QCKR): When the piston of cylinder moves downward, the swivel arms moves clockwise, this is called dextrorotatory.

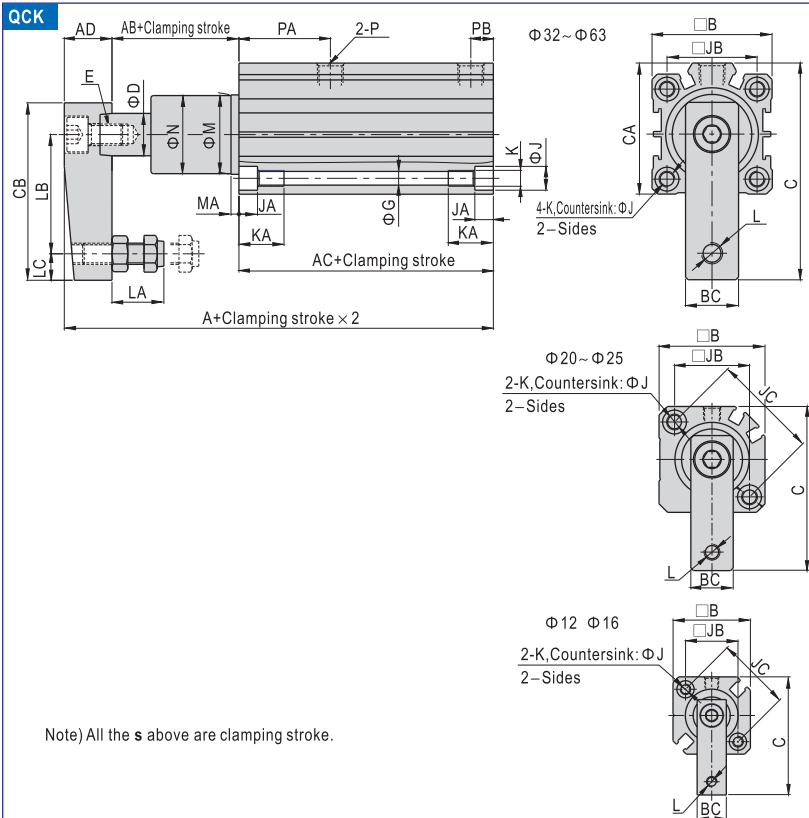
The order code is **L**

The order code is **R**

Rotary clamp cylinder

QCK Series

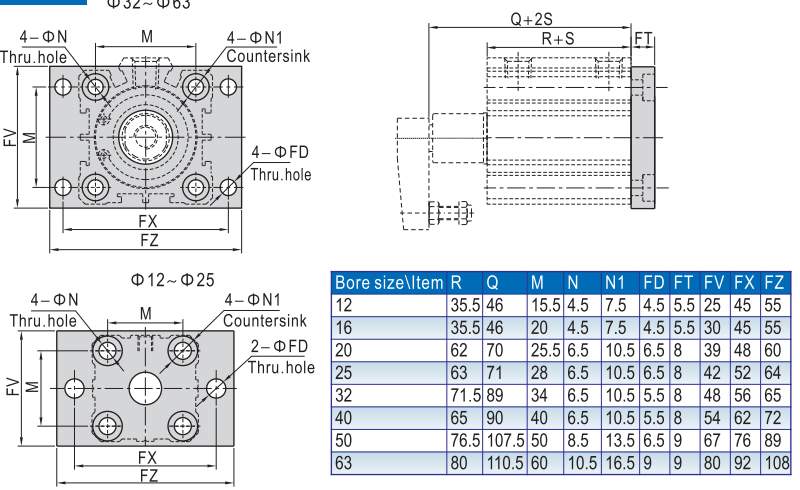
■ Dimensions



Bore size\Item	A	AB	AC	AD	B	BC	C	CA	CB	D	E	G	J	JA	JB
12	55	10.5	35.5	9	25	9	36.5	-	29	6	M3 × 0.5	3.3	6.5	3.5	15.5
16	59	10.5	35.5	13	29	11	44.5	-	36	8	M5 × 0.8	3.3	6.5	3.5	20
20	86	8	62	16	36	16	60	-	51	12	M8 × 1.25	5	9	7	25.5
25	87	8	63	16	40	16	62	-	51	12	M8 × 1.25	5	9	7	28
32	108	17.5	71.5	19	45	19	82	49.5	67	16	M10 × 1.5	5	9	7	34
40	109	25	65	19	53	19	85.5	57	67	16	M10 × 1.5	5	9	7	40
50	133	31	76.5	25.5	64	25.5	114	71	88	20	M12 × 1.75	6.5	11	8	50
63	136	30.5	80	25.5	77	25.5	120.5	84	88	20	M12 × 1.75	8.5	14	10.5	60

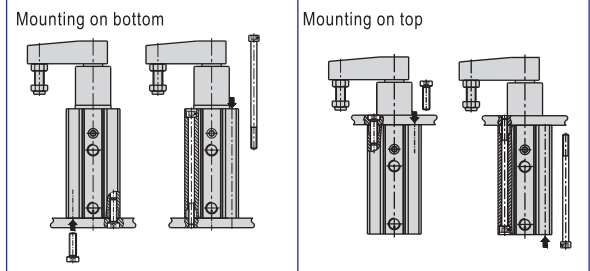
Bore size\Item	JC	K	KA	L	LA	LB	LC	M	MA	N	P	PA	PB
12	22	M4 × 0.7	11	M4 × 0.7	7~13	20	4	11	3	10.8	M5 × 0.8	13.5	5.5
16	28	M4 × 0.7	11	M4 × 0.7	7~13	25	5	14	3	13.8	M5 × 0.8	15	5.5
20	36	M6 × 1.0	17	M6 × 1.0	9.5~20.5	35	7	18	3	17.8	M5 × 0.8	30	6
25	40	M6 × 1.0	17	M6 × 1.0	9.5~20.5	35	7	23	6	22.5	M5 × 0.8	30	7
32	-	M6 × 1.0	17	M8 × 1.25	13.5~25.5	45	10	30	7	29.5	1/8"	34.5	8.5
40	-	M6 × 1.0	17	M8 × 1.25	13.5~25.5	45	10	30	3	29.5	1/8"	26.5	9
50	-	M8 × 1.25	22	M10 × 1.5	14.5~30	65	10	37	3.5	36.5	1/4"	34	11.5
63	-	M10 × 1.5	28.5	M10 × 1.5	14.5~30	65	10	48	3.5	47.5	1/4"	34.5	11.5

QCK-FB

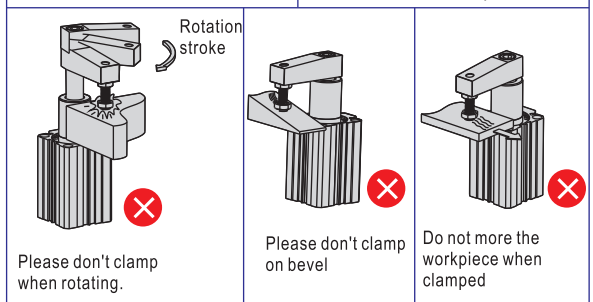
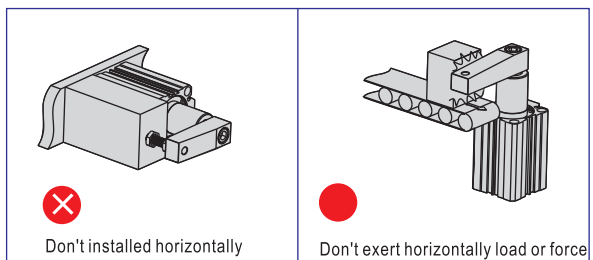
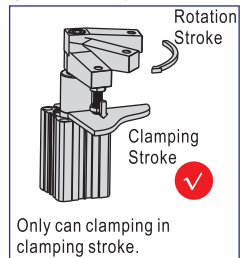


■ Installation and operation

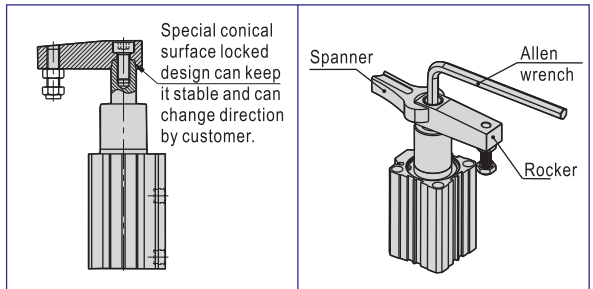
- To insure the life-span of cylinder and jig, please use flow control valve to control the speed of cylinder.
- The method of installation are mounted by flange on top or bottom.



- Before the cylinder is connected to pipeline sundries in the pipe must be eliminated, or may cause leakage.
- Please clean the piston-rod and dust scraping ring to protect the cylinder.
- The cylinder using normal magnet ring can use the same sensor as ACQ series. For the cylinder using strong magnet ring we suggest using AirTAC's CS1-69AM sensor.
- Because the rotary force is strong when the cylinder's acting, we suggest using flow control valve to control the speed to protect cylinder.
- Please install the cylinder following the right diagram.
- The installation method as the diagram below is wrong, and will injure the cylinder and shorten the cylinder life.



- Rocker
 - The design of rocker can keep it stable and can change direction by customer.
 - Please follow the diagram below on right side to assemble/disassemble the rocker by spanner and allen wrench; don't hold the body to assemble/disassemble rocker, or will damage the cylinder.
 - If need customize rocker, please contact us.



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 (mm ²)	Instroke Side	377	603	1055	1649
	Outstroke Side	490	804	1256	1963
Service Life	1 Million Times				

Stroke

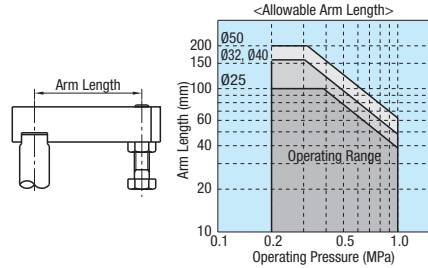
Tube I.D. (mm)	Stroke	Stroke on Rotating (mm)	Stroke on Clamping (mm)	Rotating Direction
Ø25	31	11	20	Counterclockwise Clockwise
Ø32	35	15	20	
Ø40	35	15	20	
Ø50	70	20	50	

Design / Selection

- NOTE**
In operation, the piston rod of this cylinder strokes while rotates at 90°. Be sure that the arm mounted on 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 on 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.

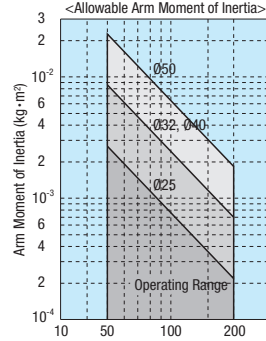


Clamping Position

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: 2.0x10⁻³kg·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 2.0x10⁻³kg·m - Piston Speed 100mm/s: Within the Operating Range

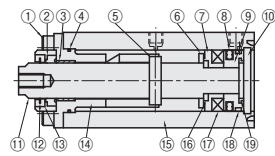
[IMPORTANT] Precautions for Handling Rotary Clamp Cylinders *Be sure to read the precautions [IMPORTANT!] in the "Compact Air Cylinder Overview" on P1484.

(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.

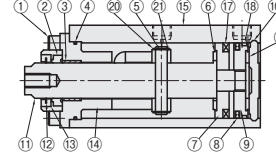
(Rotary Clamp Cylinder) NOTE

- 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.

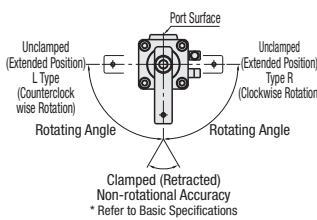
MKRC A25



MKRC A32, 40, 50



Number	Product Name	Material	Number	Product Name	Material
1	Hex Socket Head Cap Screw	Stainless Steel	11	Piston Rod	Steel
2	Rod Gasket	Nitrile Rubber	12	Coil Scraper	Copper Alloy
3	Bushing	Coppers	13	Holder	Aluminum Alloy
4	Cylinder Gasket	Nitrile Rubber	14	Rod Cover	Steel
5	Pin	Steel	15	Cylinder Body	Aluminum Alloy
6	Cushion Rubber	Urethane Rubber	16	Spacer Washer	Stainless Steel
7	Spacer	Ø25: Special Resin	17	Magnet	Plastic
8	Piston Gasket	Ø32 - Ø50: Aluminum Alloy	18	Wear Contact	Acetal Resin
9	Piston	Aluminum Alloy	19	Cushion Rubber	Urethane Rubber
10	Cover	Ø25: Stainless Steel Ø32 - Ø50: Aluminum Alloy	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.

Tightening Torque

Tube Dia.	Tightening Torque
25~40	4.3~5.3N·m
50	10.8~13.2N·m

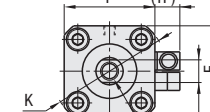
Rotary Clamp Cylinders

Rotary Clamp Cylinders

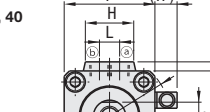


MKRC A

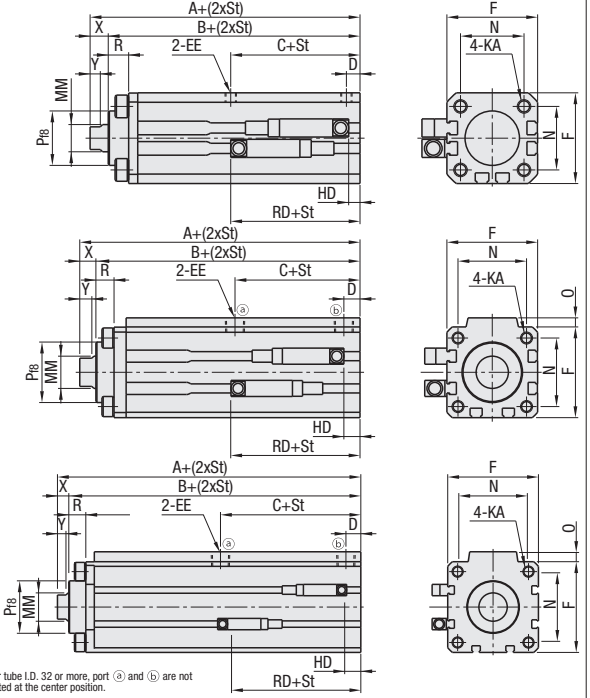
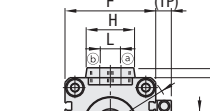
Ø25



Ø32, 40



Ø50



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.

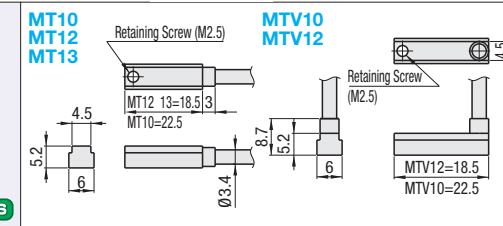
Part Number	Type	Tube I.D. (mm)	St Stroke	Rotating Direction	Stroke on Rotating (mm)	Stroke on Clamping (mm)	Unit Price
MKRCA		25	31	L	11	20	
		32	35	Counterclockwise Rotation	15	20	
		40	35	R	15	20	
		50	70	Clockwise Rotation	20	50	

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
MKRCA25 - 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)
MT10	L1 (1m)	L3 (3m)	12/24VDC	5~50mA(DC)	Contact	2	Rear		
			110VAC	7~20mA(AC)	No Contact	2			
			10~30VDC	*5~20mA	No Contact	2			
MT12	L1 (1m)	L3 (3m)	30VDC or Less	100Am or Less	No Contact	3	Top		
			12/24VDC	5~50mA(DC)	Contact	2			
MT13	L1 (1m)	L3 (3m)	110VAC	7~20mA(AC)	No Contact	3	Top		
			10~30VDC	*5~20mA	No Contact	2			
MTV10	L1 (1m)	L3 (3m)	12/24VDC	5~50mA(DC)	Contact	2	Rear		
			110VAC	7~20mA(AC)	No Contact	2			
MTV12	L1 (1m)	L3 (3m)	10~30VDC	*5~20mA	No Contact	2	Top		
			12/24VDC	5~50mA(DC)	Contact	2			

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
MT10L1

Rotary Clamp Cylinder Sensors Specifications

Item	Contact Point 2 Wire Type		No Contact Point 2 Wire Type		No Contact Point 3 Wire Type	
	MT10, MTV10	MT12, MTV12	MT13		MT13	
Application	For PLC and Relays	For Controller (Dedicated)	For PLC and Relays		For PLC and Relays	
Output Method	NPN Output				NPN Output	
Power Supply Voltage	10~28VDC				10~28VDC	
Load Voltage	12/24VDC	110VAC	10~30VDC		30VDC or Less	
Load Current	5~50mA	7~20mA	*5~20mA		100mA or Less	
Consumption Current	24VDC, 10mA or lower				24VDC, 10mA or lower	
Internal Voltage Drop	3V or Less	4V or Less	0.5V or Less		0.5V or Less	
Lamp	LED (Lights when ON)					
Leakage Current	0mA	1mA or Less	10µA 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						

Ordering Example: Part Number
MT10L1