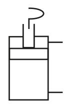
Symbol



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 dextrorotary are available; 90° and 180°.
5. The material of piston rod is made from special alloy steel, which has longer life after heat treatment.

Specifications

Bore size(mm)	25	32	40	50	63
Acting type	Double acting				
Fluid	Air (to be filtered by 40μm filter element)				
Operating pressure	0.15~1.0MPa(22~145psi)				
Proof pressure	1.5MPa(215psi)				
Temperature (℃)	-20~70				
Speed range (mm/s)	50~200				
Stroke tolerance	$^{+1.0}_{0}$				
Rotary angle tolerance	±1.5°				
Cushion type Note1)	No cushion				
Port size Note 2)	M5×0.8	1/8"			

Note: 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
32	Clamping stroke	12	6	26
40	Rotation stroke	15	21	27
	Clamping stroke	12	6	27
50	Rotation stroke	15	21	29
63	Clamping stroke	14	8	29

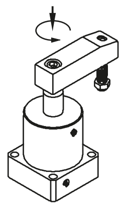
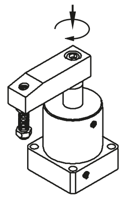
Ordering code

ACK **L** **25** × **90** □

Model

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

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 dextrorotary.	

Bore size

25	25mm
32	32mm
40	40mm
50	50mm
63	63mm

Rotary angle

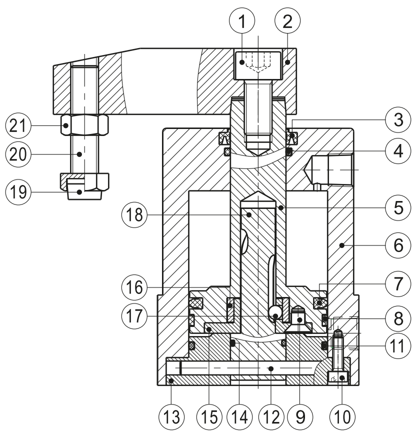
90	90°
180	180°

Thread type Note)

Blank	PT
G	G
T	NPT

Note: When the thread is standard, the code is blank.

Inner structure and material of major parts

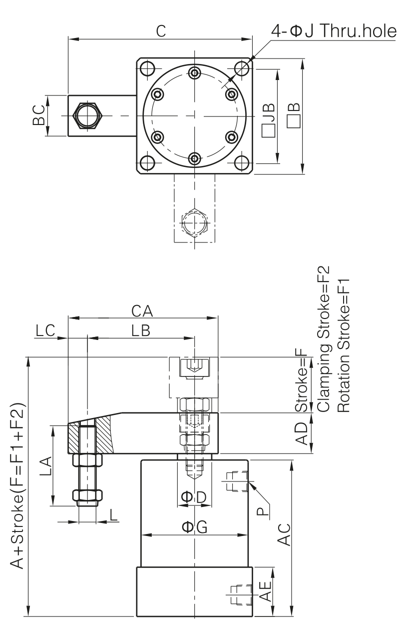


NO.	Item	Material	NO.	Item	Material
1	Screw	Carbon steel	12	Fixed pin	S45C
2	Rocker	Carbon steel	13	Back cover	Aluminum alloy
3	Rod packing	NBR	14	O-ring	NBR
4	O-ring	NBR	15	Push block	SCr440
5	Piston rod	S45C	16	Bushing	SCr440
6	Body	Aluminum alloy	17	Steel ball	Carbon steel
7	Piston seal	NBR	18	Rotary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

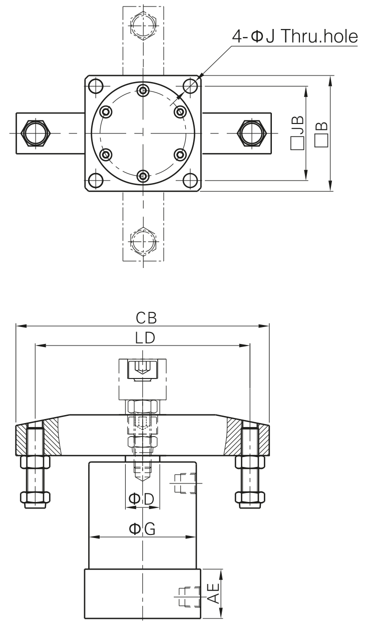
Cylinder
SC
SC(Big)
SCT
SCF
SU
SUF
SI
SIF
DNC
QGB
QGBZ
NCQ2
NCQ2(Big)
NCQ2(Long)
NCQS
NCQM
NRQ
SDA
ADVU
ACE(AND)
MAL
MA
MI
NCM2
NCJ2
NCG1
NCJP
TD
TN(TDA)
NCXS
NCXSW
NMGP
NMGG
NCU
NCUJ
NCY3B
NCY3R
NCY1S
NCY1L
STM
NMXH
NMXS
NMXQ
NMHZ2
NMHC2
NMHL2
NMHY2
NMHT2
NMHW2
NMHF2
NMHS2
NMHS3
NMHS4
NMRHQ
NMSQ
NCRA1
NCRQ2
NCRB2
ACK
SRC
QCK
NCK1

Dimensions

ACK



ACKD

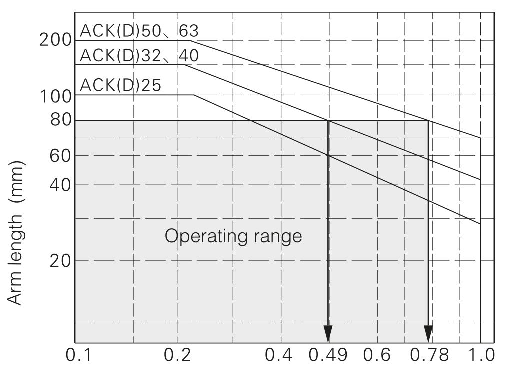


Bore size\Item	A	AC	AD	AE	B	BC	C	CA	CB	D	F(90°/180°)	F1(90°)	F1(180°)	F2(90°)	F2(180°)	G	J	JB	L	LA	LB	LC	LD	P
25	85	65	16	23	40	16	58	48	76	14	26	14	20	12	6	35	4.5	30	M6×1.0	29.5	30	8	60	M5×0.8
32	95	73	19	23	54	19	86	70	118	16	26	14	20	12	6	50	6.5	44	M8×1.25	37.5	50	9	100	1/8"
40	97	74	19	26	58	19	88	70	118	16	27	15	21	12	6	55	6.5	48	M8×1.25	37.5	50	9	100	1/8"
50	109.5	80	25.5	26	68	25.5	114	93	160	20	29	15	21	14	8	60	8.5	55	M10×1.5	45	70	10	140	1/8"
63	115.5	86	25.5	30	82	25.5	121	93	160	20	29	15	21	14	8	70	8.5	64	M10×1.5	45	70	10	140	1/8"

How to select product

1. When arms are to be made separately, their length and weight should be within the following range.

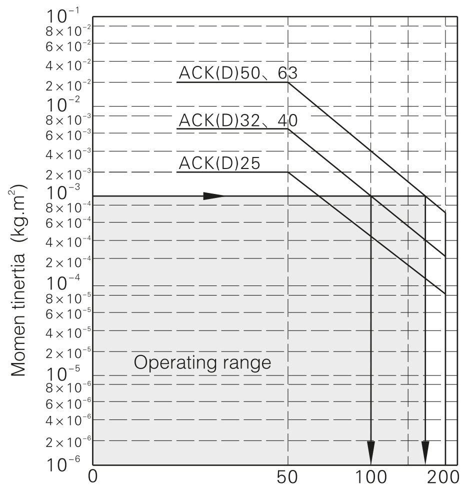
2. Allowable bending moment:
   Use the arm length and operating pressure within graph(1) for allowable bending moment loaded piston rod.



Example: When arm length is 80mm, pressure should be less than

ACK32/40: 0.59MPa   ACK50/63: 0.78MPa

3. Moment of inertia:
   When the arm is long and heavy, damage of internal parts may be caused due to inertia.Use the inertia moment and cylinder speed within graph(2) based on arm requirement.



Example: When arm's moment of inertia is 10^{-3}Kg · m² cylinder speed should be less than

ACK32/40: 100mm/s
ACK50/63: 170mm/s

Note: The average speed of piston=the highest speed of piston/1.6

4. Moment of inertia of cylinder's arm when rotating based on its rotary axis,shown in graph(3).

Model	Moment of inertia (Kg·m²)
ACK25 with single arm	2.006×10^{-5}
ACK25with double arms	7.651×10^{-4}
ACK32\40 with single arm	1.271×10^{-4}
ACK32\40 with double arms	4.148×10^{-4}
ACK50\63 with single arm	9.614×10^{-3}
ACK50\63with double arms	1.888×10^{-3}

5. Calculation reference:

5.1) Moment of inertia of arm(I_1): Refer to the graph(3) after the cylinder bore diameter is determined.

5.2) Moment of inertia of jig (I_2): According to shape of the jig and the next item 6 "Calculation for moment of inertia", pick out a proper formula for calculation. The jig shown on the right graph is a cylinder, its formula of moment of inertia is:

$I_2=(m_2*D*D)/8+m_2*L*L$

When ACK32 is selected: L=0.05m(arm length);

If D=0.04m $m_2=0.4$kg

From graph(3): $I_1=1.271\times10^{-4}(kg\cdot m^2)$

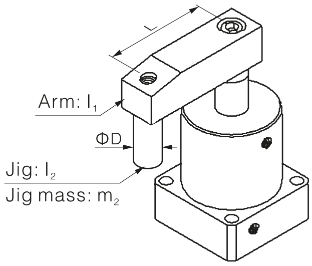
By Calculation: $I_2=(m_2*D*D)/8+m_2*L*L=(0.4*0.04*0.04)/8+0.4*0.05*0.05$

$=10.8\times10^{-4}(kg\cdot m^2)$

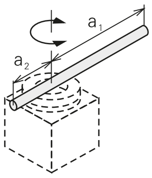
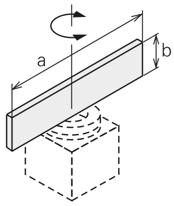
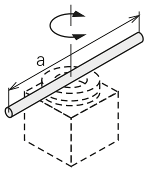
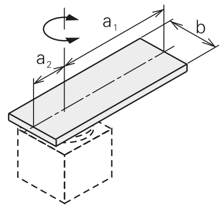
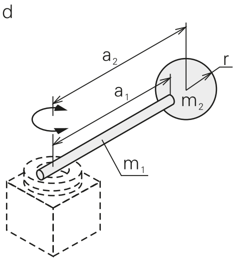
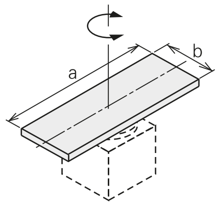
Total value: $I=I_1+I_2=12.071\times10^{-4}=1.2071\times10^{-3}(kg\cdot m^2)$

According to graph(2), the highest speed of the cylinder should be less than 95 mm/s;

According to graph(1), it can be used under a pressure of 0.9Mpa. The average speed of piston=the highest speed of piston/1.6=59 mm/s.



6. Calculation for moment of inertia

Diagram	Calculation formula of moment of inertia	Diagram	Calculation formula of moment of inertia
1. Thin bar Position of rotary axis: Vertical to the bar and through the end 	$I=\frac{m_1a_1^2+m_2a_2^2}{3}$	4. Thin rectangular plate (Cube) Position of rotary axis: Parallel to side b and through the center of gravity 	$I=\frac{ma^2}{12}$
2. Thin bar Position of rotary axis: Vertical to the bar and through the center of gravity 	$I=\frac{ma^2}{12}$	5. Thin rectangular plate (Cube) Position of rotary axis: Vertica to the plate and through the end 	$I=m_1\times\frac{4a_1^2+b^2}{12}+m_2\times\frac{4a_2^2+b^2}{12}$
3. Load at the end of lever arm 	$I=m_1\times\frac{a_1^2}{3}+m_2\times a_2^2+k$ $k=m_2\times\frac{2r^2}{5}$	6. Thin rectangular plate (Cube) Position of rotary axis: Through the center of gravity and vertical to the plate(Same as also thick rectanglaur plate) 	$I=\frac{ma^2+mb^2}{12}$