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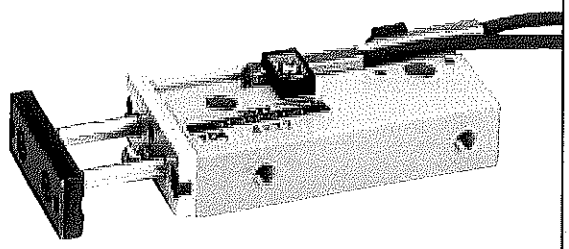


KOGANEI

ACTUATORS GENERAL CATALOG

TWIN ROD CYLINDERS φ6

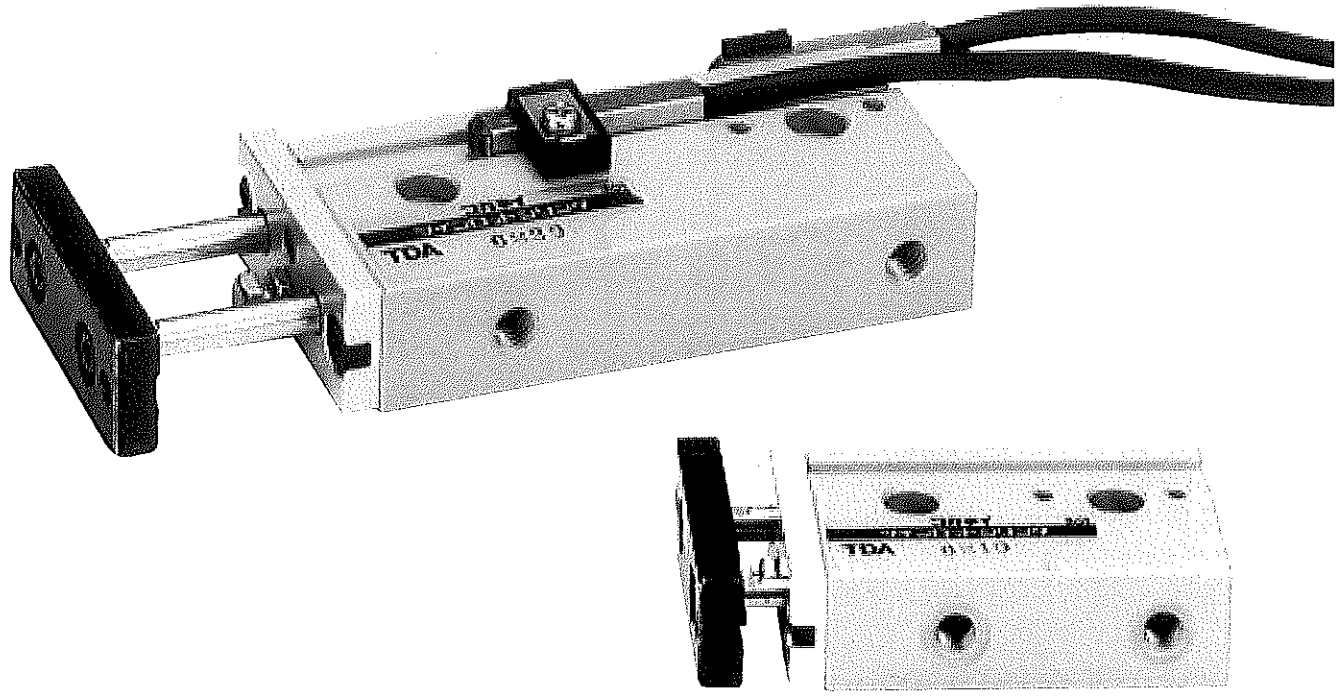
CONTENTS

TWIN ROD CYLINDERS ϕ 6

A square style, a compact design that needs no guides, and direct mounting makes the mechanical devices more compact!

Non-rotating accuracy is ±0.45°.

Moreover, cylinder thrust is twice that of conventional cylinders.



Selection Chart

Item / Operation type	Bore size mm	Strokes mm	Sensor switches		Non-lon specification
			Solid state type	Reed switch type	
Double acting type	6	10, 20, 30, 40, 50	ZC130 ZC153	CS5T CS11T	None

Cylinder Thrust

Select a suitable cylinder bore size considering the load and air pressure to obtain the required thrust.
Since the figures in the table are calculated values, select a bore size that results in a load ratio (load ratio = $\frac{\text{Load}}{\text{Calculated value}}$) of 70% or less (50% or less for high speed application).

N [lbf.]

Bore size mm [in.]	Rod size mm [in.]	Operation		Pressure area mm² [in²]	Air pressure MPa [psi.]						
					0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]
6 [0.236]	4 [0.157]	Double acting type	Push side	56 [0.087]	—	11.2 [2.52]	16.8 [3.78]	22.4 [5.04]	28 [6.29]	33.6 [7.55]	39.2 [8.81]
			Pull side	31 [0.048]	—	6.2 [1.39]	9.3 [2.09]	12.4 [2.79]	15.5 [3.48]	18.6 [4.18]	21.7 [4.88]

Note: Minimum operating pressure is 0.2MPa.

Air Flow Rate and Air Consumption

While the twin rod cylinder's air flow rate and air consumption can be found through the following calculations, the quick reference chart below provides the answers more conveniently.

Air flow rate $Q_1=\frac{\pi D^2}{4}\times L\times\frac{60}{t}\times\frac{P+0.1013}{0.1013}\times10^{-6}\times2$

Air consumption $Q_2=\frac{\pi D^2}{4}\times L\times2\times n\times\frac{P+0.1013}{0.1013}\times10^{-6}\times2$

Q_1: Required air flow rate for cylinder	ℓ/min (ANR)
Q_2: Air consumption of cylinder	ℓ/min (ANR)
D: Cylinder bore diameter	mm
L: Cylinder stroke	mm
t: Time required for cylinder to travel one stroke	s
n: Number of cylinder reciprocations per minute	times/min
P: Air pressure	MPa

Air flow rate $Q_1'=\frac{\pi D'^2}{4}\times L'\times\frac{60}{t}\times\frac{P'+14.696}{14.696}\times\frac{1}{1728}\times2$

Air consumption $Q_2'=\frac{\pi D'^2}{4}\times L'\times2\times n\times\frac{P'+14.696}{14.696}\times\frac{1}{1728}\times2$

Q_1': Required air flow rate for cylinder	ft³/min. (ANR)※
Q_2': Air consumption of cylinder	ft³/min. (ANR)※
D': Cylinder bore diameter	in.
L': Cylinder stroke	in.
t: Time required for cylinder to travel one stroke	sec.
n: Number of cylinder reciprocations per minute	times/min.
P': Air pressure	psi.

※Refer to p.54 for an explanation of ANR.

Air consumption for each 1mm [0.0394in.] stroke

cm³ [in³]/Reciprocation (ANR)

Bore size mm [in.]	Air pressure MPa [psi.]						
	0.1 [15]	0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]
6 [0.236]	(0.22 [0.0134])	0.34 [0.0207]	0.45 [0.0275]	0.56 [0.0342]	0.67 [0.0409]	0.78 [0.0476]	0.89 [0.0543]

The figures in the table show the air flow rate and air consumption when a Twin Rod cylinder makes 1 reciprocation with stroke of 1mm [0.0394in.].

The air flow rate and air consumption actually required is found by the following calculations.

● Finding the air flow rate (for selecting F.R.L., valves, etc.)

Example 1. When operating a Twin Rod cylinder with bore size of 6mm [0.236in.] at speed of 300mm/s [11.8in./sec.], under air pressure of 0.5MPa [73psi.]

$0.67\times\frac{1}{2}\times300\times10^{-3}=0.1$ ℓ/s [0.00353ft³/sec.] (ANR)※

(At this time, the flow rate per minute is $0.67\times\frac{1}{2}\times300\times60\times10^{-3}=6.03$ ℓ/min [0.213ft³/sec.] (ANR))

● Finding the air consumption

Example 1. When operating a Twin Rod cylinder with bore size of 6mm [0.236in.] and stroke of 50mm [1.97in.], under air pressure of 0.5MPa [73psi.], for 1 reciprocation

$0.67\times50\times10^{-3}=0.0335$ ℓ [0.00118ft³]/Reciprocation (ANR)

Example 2. When operating a twin rod cylinder with bore size of 6mm [0.236in.] and stroke of 50mm [1.97in.], under air pressure of 0.5MPa [73psi.], for 10 reciprocations per minute

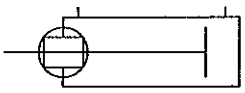
$0.67\times50\times10\times10^{-3}=0.335$ ℓ/min [0.0118ft³/min.] (ANR)

※Refer to p.54 for an explanation of ANR.

TWIN ROD CYLINDERS ϕ6

ϕ6 Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]	6 [0.236]
Operation type	Double acting type
Media	Air
Mounting type	Side mount
Operating pressure range MPa [psi.]	0.2~0.7 [29~102]
Proof pressure MPa [psi.]	1.03 [149]
Operating temperature range °C [°F]	0~60 [32~140]
Operating speed range mm/s [in./sec.]	100~500 [3.9~19.7]
Cushion	None
Lubrication	Not required
Non-rotating accuracy	±0.45°
Stroke adjusting range mm [in.]	−5~0 [−0.197~0] (To the specification stroke)
Port size	M5×0.8

Bore Size and Stroke

mm

Bore size	Standard strokes	Maximum available stroke	Pull side stroke adjusting range
6	10, 20, 30, 40, 50	70	−5~0

Note: Consult us for delivery of strokes that exceed the standard strokes.

Order Codes

TDA 6× 10 — □ □ □

Twin rod cylinder double acting type Note

Bore size
6 —— ϕ6

Stroke

Sensor switch
Blank —— No sensor switch

ZC130	2-lead wire Solid state type	with indicator lamp	DC10~28V
ZC153	3-lead wire Solid state type	with indicator lamp	DC4.5~28V
CS5T	2-lead wire Reed switch type	without indicator lamp	DC5~28V AC85~115V
CS11T	2-lead wire Reed switch type	with indicator lamp	DC10~28V

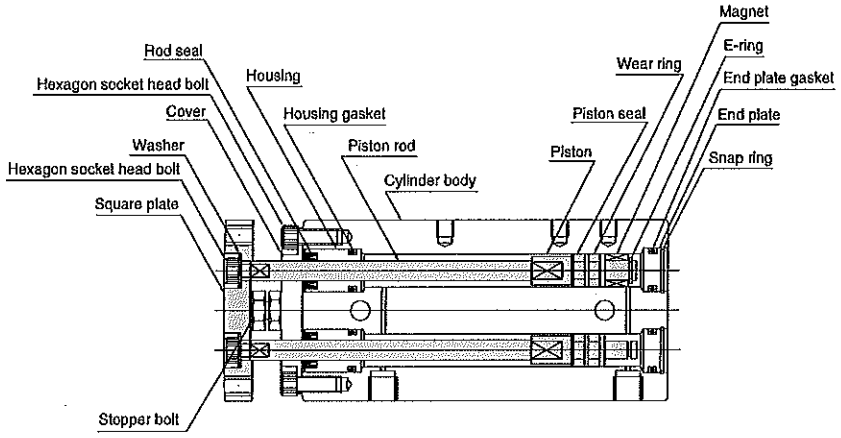
● For details of sensor switches, see p.1544.

Lead wire length
A : 1000mm [39in.]
B : 3000mm [118in.]

Number of sensor switches
1 —— With 1 sensor switch
2 —— With 2 sensor switches

Note: In the standard cylinder, a magnet for sensor switch is built-in.

Inner Construction and Major Parts



Major Parts and Materials

Parts	Materials
Cylinder body	Aluminum alloy (anodized)
Piston	Aluminum alloy (anodized)
Cover	Steel (nickel plated)
Wear ring	Plastic
Piston rod	Stainless steel
Gasket	Synthetic rubber (NBR)
Housing	Aluminum alloy (special wear-resistant treatment)
End plate	Plastic
Seal	Synthetic rubber (NBR)
Snap ring	Steel (nickel plated)
Magnet	Sintered alloy magnet
E-ring	Stainless steel
Washer	Steel (nickel plated)
Square plate	Mild steel (special surface treatment)
Stopper bolt	Mild steel (zinc plated)

Remark: Non-Ion specification is not available.

Seals

Parts / Quantity / Bore	Rod seal	Piston seal	End plate gasket	Housing gasket
	2	2	2	2
6	MYR-4	COP-6L	1×6	1×6

Mass

g [oz.]

Bore size mm [in.]		Zero stroke mass Note1	Additional mass	
			Additional mass of each 10mm [0.394in.] stroke	Mass of 1 sensor switch Note2 CS5T□,CS11T□,ZC130□,ZC153□
6 [0.236]	Standard specification	55 [1.94]	12 [0.42]	20 [0.71]

Notes: 1. The above table is for the standard strokes.
2. There are 2 types of sensor switch lead wire lengths.
A: 1000mm [39in.], B: 3000mm [118in.]
The sensor switch mass in the table above is for Type A.

Calculation example: The mass for bore size of 6mm and stroke of 40mm with 2 sensor switches (CS5TA),

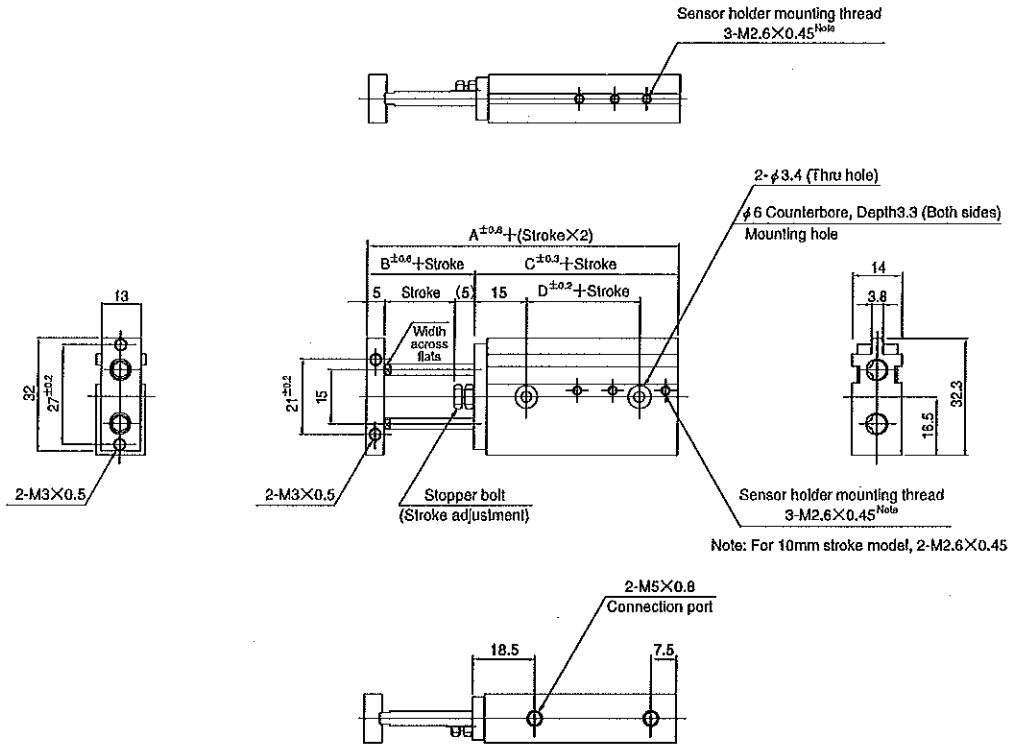
55+(12×4)+(20×2)=143g [5.04oz.]

Stroke / 10

Dimensions of Double Acting Type (mm)

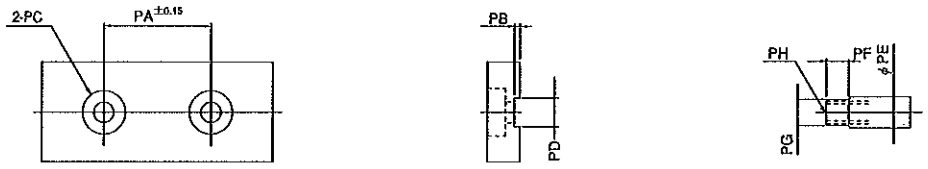
TDA 6× Stroke

CAD TDA06



Bore mm [in] \ Code	A	B	C	D
6 [0.236]	49	10	39	13

Dimensions of Rod End Portion (mm)



Bore mm [in] \ Code	PA	PB	PC	PD	PE	PF	PG	PH
6 [0.236]	15	0.5	φ3 Counterbore φ5 Depth 3.2	3.5 +0.15 +0.03	4	3	3.5 0 -0.15	M2.6×0.45 Depth5