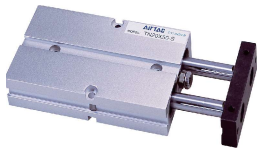
Compendium of TN/TR Series

TN series is enterprises standard, TR series is JIS standard

Multi-type cylinder

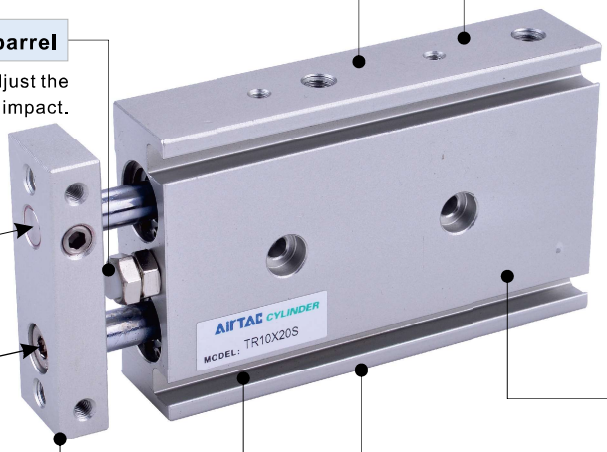
TN: Twin-rod cylinder (Double acting type)



TR: Twin-rod cylinder (Double acting type)

Bumper in front of the barrel

Bumper in front of the barrel can adjust the stroke of cylinder and relieve impact.



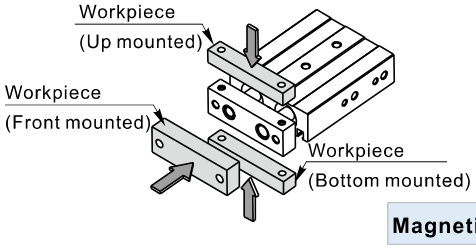
Twin-rod cylinder

It is good resistance to bending and twisting moments.

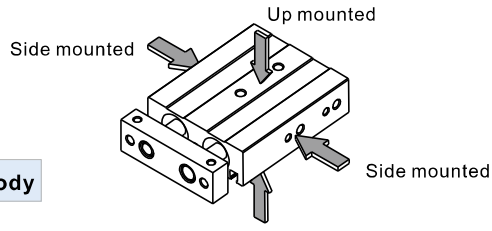
Five or six bore size are available

TN series bore size:10, 16, 20, 25, 32
TR series bore size:6, 10, 16, 20, 25, 32

Be mounted the workpiece from three directions



Mounted from four directions



Magnetic switch slots around the cylinder body

There are magnetic switch slots around the cylinder body convenient to install inducting switch.

Criteria for selection: Cylinder thrust

Unit : Newton(N)

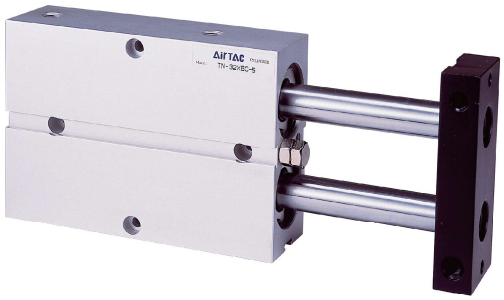
Bore size	Rod size	Acting type		Pressure area(mm^2)	Operating pressure(MPa)						
					0.1	0.2	0.3	0.4	0.5	0.6	0.7
6	4	Double acting	Push side	56.5	5.7	11.3	17.0	22.6	28.3	33.9	39.6
			Pull side	31.4	3.1	6.3	9.4	12.6	15.7	18.8	22.0
10	6	Double acting	Push side	157.1	15.7	31.4	47.1	62.8	78.6	94.3	110.0
			Pull side	100.5	10.1	20.1	30.2	40.2	50.3	60.3	70.4
16	8	Double acting	Push side	402.1	40.2	80.4	120.6	160.8	201.1	241.3	281.5
			Pull side	301.6	30.2	60.3	90.5	120.6	150.8	181.0	211.1
20	10	Double acting	Push side	628.3	62.8	125.7	188.5	251.3	314.2	377.0	439.8
			Pull side	471.2	47.1	94.2	141.4	188.5	235.6	282.7	329.8
25	12	Double acting	Push side	981.7	98.2	196.4	294.5	392.7	490.9	589.0	687.2
			Pull side	755.6	75.6	151.1	226.7	302.2	377.8	453.4	528.9
32	16	Double acting	Push side	1608.5	160.9	321.7	482.6	643.4	804.3	965.1	1126.0
			Pull side	1206.4	120.6	241.3	361.9	482.6	603.2	723.8	844.5

Installation and application

1. When load changes in the work, the cylinder with abundant output capacity shall be selected.
2. Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion;
3. Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding dregs.
4. Dirty substances in the pipe must be eliminated before cylinder is connected with pipeline to prevent the entrance of particles into the cylinder;
5. The medium used by cylinder shall be filtered to 40μm or below.
6. As both the front cover and piston are short, too large stroke can not be selected.
7. Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
8. The cylinder shall avoid redial load in operation to maintain the normal and extend service life.
9. If the cylinder is dismantled and stored for a long time, please conduct anti-rust treatment to the surface. Anti-dust cap shall be inserted into the inlet and outlet ports. As the precision of the manufacture and guide is high, Please do not dismantle the fixed block or cylinder cover .

Twin-rod cylinder

TN Series



Specification

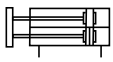
Bore size(mm)	10	16	20	25	32
Acting type	Double acting				
Fluid	Air(to be filtered by 40μm filter element)				
Operating pressure	0.2~1.0MPa(29~145psi)	0.15~1.0MPa(22~145psi)			
Proof pressure	1.5MPa(215psi)				
Temperature ℃	-20~70				
Speed range mm/s	30~500				
Adjustable stroke mm	-5~0				
Stroke tolerance	$\leq 100^{+1.0}_{0}$	$>100^{+1.5}_{0}$			
Cushion type	Bumper				
Non-rotating tolerance [Note1]	±0.4°	±0.3°			
Port size [Note2]	M5×0.8				1/8"

[Note1] Retract position.

[Note2]PT thread is available.

Add) Refer to P362 for detail of sensor switch.

Symbol



Product feature

1. Enterprises standard is implemented.
2. Embedded installation and fixation mode saves the installation space.
3. It is good resistance to bending and twisting moments.
4. Mounting holes on three sides facilitates multi-position mounting.
5. Bumper in front of the barrel can adjust the stroke of cylinder and relieve impact.
6. Standard configuration of this series has magnet and the type without magnet is not available.

Stroke

Bore size (mm)	Standard stroke (mm)	Max.std stroke
10	10 20 30 40 50 60 70 80 90 100	100
16	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
20	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
25	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
32	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200

[Note] When the stroke less then or equal to 100mm, The dimensions of non-std stroke cylinder has the same dimensions as the next longer stroke std. stroke cylinder. e.g. 35mm stroke cylinder has the same dimensions of 40 std. stroke cylinder.

Ordering code

TN 20 ×50 S □

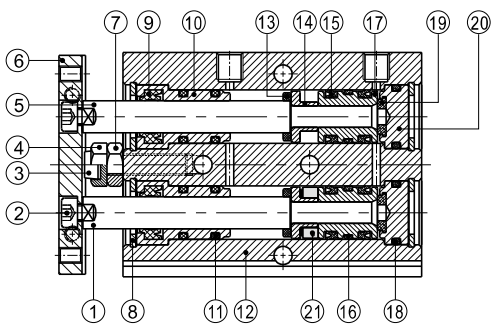
① ② ③ ④ ⑤

①Model	②Bore size	③Stroke	④Magnet [Note1]	⑤Thread type [Note 2]
TN: Twin-rod cylinder (Double acting type)	10 16 20 25 32	Refer to stroke table for details	S: With magnet	Blank: PT

[Note1] TN Series are all with magnet. [Note2] When the thread is standard, the code is blank.

Inner structure and material of major parts

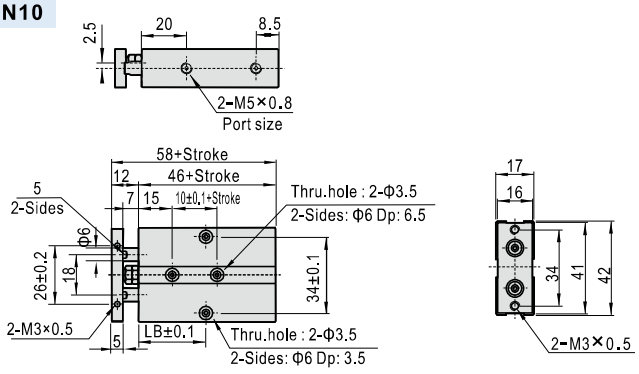
TN



NO.	Item		Material	NO.	Item		Material
1	Piston rod B	Φ32	S45C	12	Body		Aluminum alloy
		Other	SUS304	13	Bumper		TPU
2	Screw		Carbon steel	14	Magnet holder	Φ10	SUS303
3	Bumper		POM			Other	Aluminum alloy
4	Adjustable nut		Carbon steel	15	Piston seal		NBR
5	Piston rod A		S45C	16	Wear ring		Wear resistant material
6	Fixing plate		Free cutting steel	17	Piston	Φ10	SUS303
7	Screw		Carbon steel			Other	Aluminum alloy
8	C clip		Spring steel	18	Seal ring		NBR
9	Wiper seal		NBR	19	Bumper		TPU
10	Front cover		Aluminum alloy	20	Back cover		Aluminum alloy
11	O-ring		NBR	21	Magnet		Sintered metal(Neodymium-iron-boron)

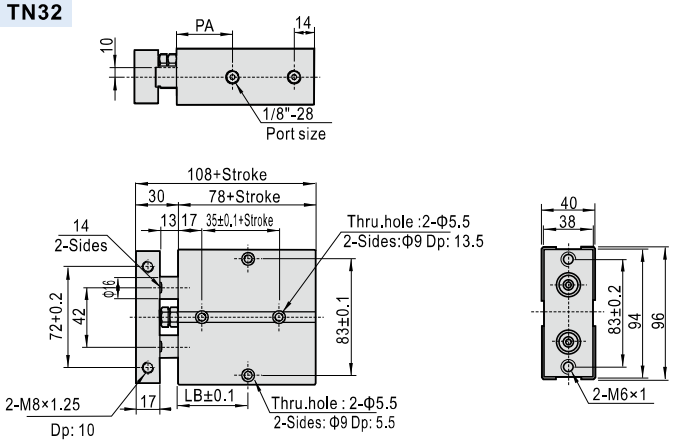
Dimensions

TN10



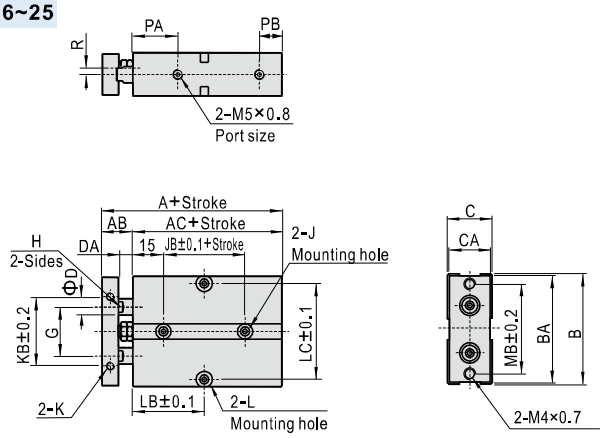
Item\Stroke	10	20	30	40	50	60	70	80	90	100
LB	30	30	35	40	45	50	55	60	65	70

TN32



Item\Stroke	10	20	30	40	50	60	70	80	90	100	125	150	175	200
LB	45	50	55	60	65	70	75	80	85	90	102.5	115	127.5	140
PA	35	40												

TN16~25



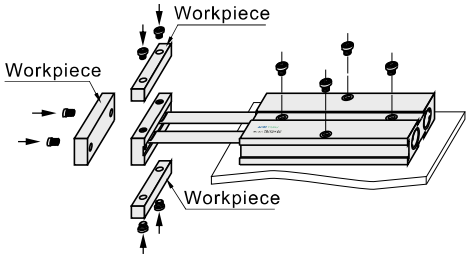
Bore size\Item	A	AB	AC	B	BA	C	CA	D	DA	G	H	J
16	68	15	53	54	53	21	20	8	8.2	24	6	Both sides:Φ7.5Dp:7.5Thru.hole:Φ4.5
20	78	20	58	62	61	25	24	10	10.2	28	8	Both sides:Φ7.5Dp:7.5Thru.hole:Φ4.5
25	81	19	62	73	72	30	29	12	10.2	34	10	Both sides:Φ7.5Dp:7.5Thru.hole:Φ4.5

Bore size\Item	JB	K	KB	PA	PB	L	LC	MB	R
16	20	M4×0.7Dp:5	34	22	11	Both sides:Φ8Dp:4.5Thru.hole:Φ4.5	47	47	3
20	20	M4×0.7Dp:5	44	25	12	Both sides:Φ8Dp:4.5Thru.hole:Φ4.5	55	55	3.5
25	30	M4×0.7Dp:6	56	27	12	Both sides:Φ8Dp:4.5Thru.hole:Φ4.5	66	66	6

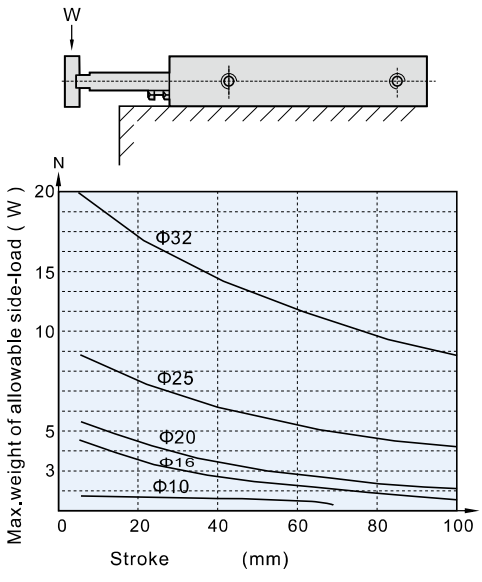
Bore size\Item	LB													
Stroke≤	10	20	30	40	50	60	70	80	90	100	125	150	175	200
16	30	35	40	45	50	55	60	65	70	75	87.5	100	112.5	125
20	35	35	40	45	50	55	60	65	70	75	87.5	100	112.5	125
25	40	40	45	50	55	60	65	70	75	80	92.5	105	117.5	130

Installation and application

1、How to mount workpiece :



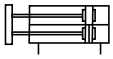
2、Max. weight of allowable side-load



Twin-rod cylinder

TR Series

Symbol



Product feature

1. JIS standard is implemented.
2. The non-rotating precision is high and deflection of the end of piston rod is low, which is suitable for precise guide.
3. It adopts lengthening type sliding supporting guide. No additional lubricant is needed and it has good performance of guide.
4. Mounting holes on three sides facilitates multi-position mounting.
5. It is good resistance to bending and twisting moments.
6. Except for the axial, each side of the cylinder has installation orifices to provide several installation and fixation ways for the customers.
7. There are two groups of air intake and outlet at two sides of the cylinder for the actual selection.
8. Bumper in front of the barrel can adjust the stroke of cylinder and relieve impact.
9. Standard configuration of this series has magnet and the type without magnet is not available.

Specification

Bore size(mm)	6	10	16	20	25	32
Acting type	Double acting					
Fluid	Air(to be filtered by 40μm filter element)					
Operating pressure	0.2~1.0MPa(29~145psi)		0.15~1.0MPa(22~145psi)			
Proof pressure	1.5MPa(215psi)					
Temperature ℃	-20~70					
Speed range mm/s	30~500					
Adjustable stroke mm	-5~0					
Stroke tolerance	$\leq 100\ ^{+1.0}_{0}$		$>100\ ^{+1.5}_{0}$			
Cushion type	Bumper					
Non-rotating tolerance [Note1]	±0.2°	±0.15°			±0.1°	
Port size [Note2]	M5×0.8				1/8"	

[Note1] Retract position.

[Note2]PT thread, G thread and NPT thread are available.

Add) Refer to P362 for detail of sensor switch.

Stroke

Bore size (mm)	Standard stroke (mm)	Max.std stroke
6	10 20 30 40 50	50
10	10 20 30 40 50 60 70 80 90 100	100
16	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
20	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
25	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
32	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200

[Note] When the stroke less then or equal to 100mm, The dimensions of non-std stroke cylinder has the same dimensions as the next longer stroke std. stroke cylinder. e.g. 35mm stroke cylinder has the same dimensions of 40 std. stroke cylinder.

Ordering code

TR 20 ×50 S □

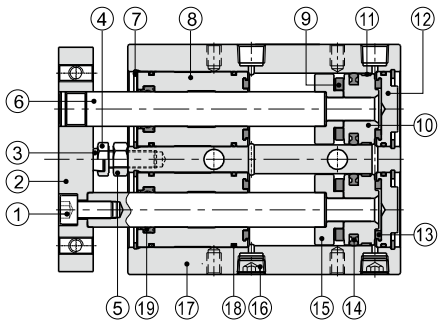
① ② ③ ④ ⑤

①Model	②Bore size	③Stroke	④Magnet [Note1]	⑤Thread type [Note 2]
TR: Twin-rod cylinder (Double acting type)	6 10 16 20 25 32	Refer to stroke table for details	S: With magnet	Blank: PT G : G T : NPT

[Note1] TR Series are all with magnet. [Note2] When the thread is standard, the code is blank.

Inner structure and material of major parts

TR



NO.	Item		Material	NO.	Item		Material
1	Screw		Carbon steel	10	Piston	Φ6,10	SUS304
2	Fixing plate		Aluminum alloy			Other	Aluminum alloy
3	Bumper		POM	11	Wear ring		Nylon 6
4	Screw		Free cutting steel	12	Back cover		Aluminum alloy
5	Nut		Carbon steel	13	Bumper		TPU
6	Piston rod	Φ20~32	Carbon steel	14	Piston seal		NBR
		Other	SUS304	15	Magnet holder	Φ6,10	SUS304
7	C clip		Spring steel			Other	Aluminum alloy
8	Front cover		Aluminum alloy	16	Screw		Carbon steel
9	Magnet	Φ32	Plastic	17	Body		Aluminum alloy
		Other	Sintered metal (Neodymium-iron-boron)	18	Back cover O-ring		NBR
				19	Spool O-ring		NBR

Dimensions

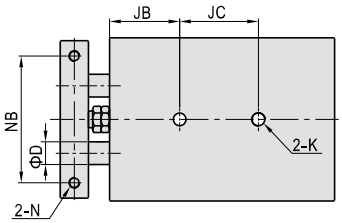
TR6~16

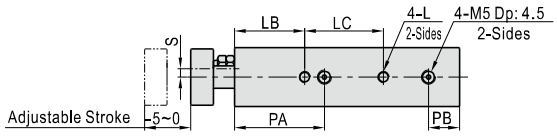
Bore size\Item	A	AB	AC	B	BA	C	CA	D	DA	G	T	NB	PA	PB	R	S
6	58.5	13.5	45	37	35	16	14	4	8	16	23	28	24.5	6.5	M3×0.5	4.5
10	72	17	55	46	44	17	15	6	9	20	36.5	35	30	8	M4×0.7	3.5
16	79	19	60	58	56	20	18	8	9	25	46.5	45	38	8	M5×0.8	5

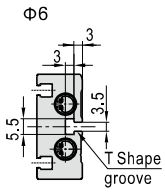
Bore size\Item	JC LC							
Stroke	10~25	30~50	60~80	90~100	125	150	175	200
6	JC=10+Stroke/2 LC=13+Stroke		-	-	-	-	-	-
10	30	40	50	60	-	-	-	-
16	25	35	45	55	65	75	145	145

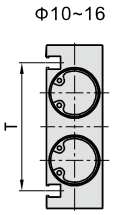
Bore size\Item	J	JB	K
6	One side:Φ6.5Dp:3.5Thru.hole:Φ3.5	13	-
10	One side:Φ6.5Dp:3.5Thru.hole:Φ3.5	20	M4×0.7Thru.thread
16	One side:Φ8.0Dp:4.5Thru.hole:Φ4.5	30	M5×0.8Thru.thread

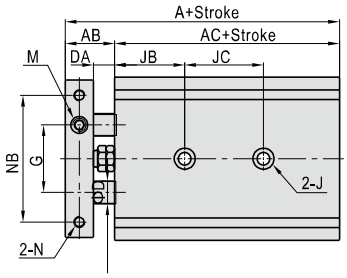
Bore size\Item	L	LB	M
6	M3×0.5Dp:4.5	10	M3×0.5
10	M3×0.5Dp:5	20	M5×0.8
16	M4×0.7Dp:5	30	M6×1.0

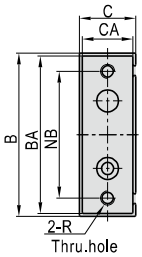












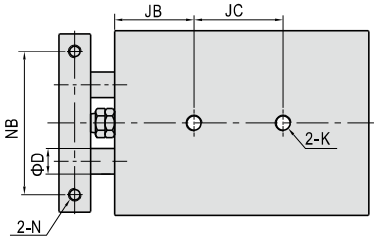
TR20~32

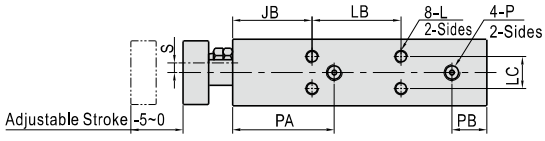
Bore size\Item	A	AB	AC	B	BA	C	CA	D	DA	G	JB	P	PA	PB
20	94	24	70	64	62	25	23	10	12	28	30	M5×0.8	46	9
25	96	24	72	80	78	30	28	12	12	35	30	1/8"	43	9
32	112	30	82	98	96	38	36	16	14	44	30	1/8"	53	10

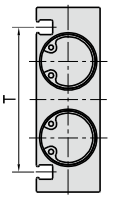
Bore size\Item	JC LB						
Stroke	10~25	30~50	60~100	125	150	175	200
20	30	40	60	80	80	100	100
25	30	40	60	80	80	100	100
32	40	50	70	90	90	110	110

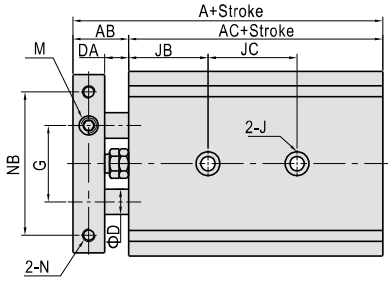
Bore size\Item	K	J	L
20	M6×1.0	One side:Φ9.5Dp:5.5Thru.hole:Φ5.5	M4×0.7Dp:5.5
25	M8×1.25	One side:Φ11Dp:6.5Thru.hole:Φ7	M5×0.8Dp:7
32	M8×1.25	One side:Φ11Dp:6.5Thru.hole:Φ7	M5×0.8Dp:7

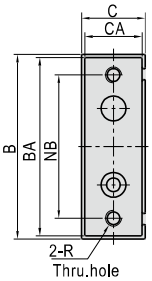
Bore size\Item	LC	M	N	NB	R	S	T
20	9.5	M8×1.25	M4×0.7Dp:6	50	M5×0.8	6.5	52
25	13	M8×1.25	M5×0.8Dp:7.5	60	M6×1.0	9	61
32	20	M10×1.5	M5×0.8Dp:8	75	M6×1.0	11.5	73





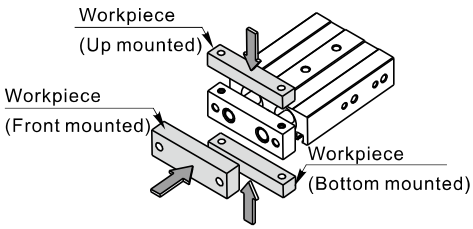




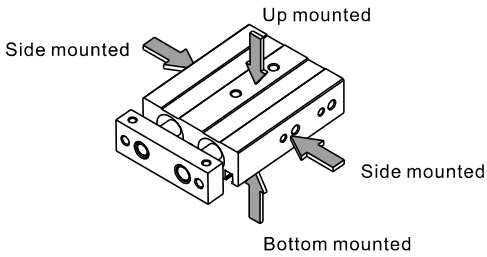


Installation and application

1、How to mount workpiece：



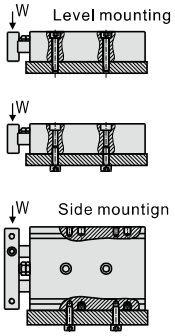
How to mount the workpiece

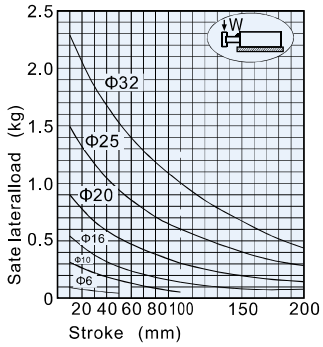


How to mount the cylinder

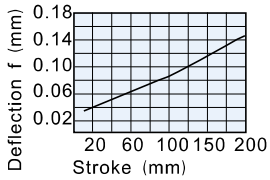
2、Max. weight of allowable side-load

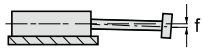
Mounting type





3、Safe deflection





The average value of deflection of rod end of the whole series basically stays in the line showed in the chart on the right.