

# Series ASL

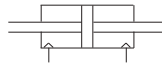
## Slide Cylinder

Bore Size(mm) : Ø12, Ø16, Ø20, Ø25, Ø32

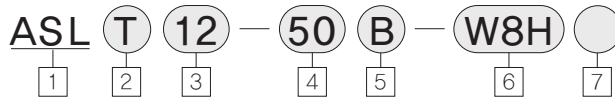


- ENSURE HIGH POSITIONAL ACCURACY
- AUTO SWITCH CAN BE INSTALLED
- COMPACT TYPE
- SMOOTH OPERATION AND HIGH THRUST
- MOUNTABLE BY THE HOUSING OR THE PLATE

### Symbol



### How to order



#### 1 Slide Cylinder (Built in Magnet)

#### 2 Mounting

T : TUBE mounting  
P : PLATE mounting

#### 3 Bore Size

12 : 12mm  
16 : 16mm  
20 : 20mm  
25 : 25mm  
32 : 32mm

#### 4 Stroke

Ø12 : 25, 50, 75  
Ø16 : 25, 50, 75, 100  
Ø20 : 25, 50, 75, 100  
Ø25 : 25, 50, 75, 100, 125  
Ø32 : 25, 50, 75, 100, 125, 150

#### 5 Cushion

Blank : Stopper 2EA  
B : Shock Absorber 2EA  
BS : Shock Absorber 1EA(Built in magnet)

#### 6 Auto Switch

Blank : None  
W8H : Reed Auto Switch(Horizontal)  
W9H : Solid State Auto Switch(Horizontal)  
W8V : Reed Auto Switch(Vertical)  
W9V : Solid State Auto Switch(Vertical)

#### 7 Number of Auto Switches

Blank : 2 pcs  
S : 1 pc  
N : N pcs

### Specifications

Model	ASL12	ASL16	ASL20	ASL25	ASL32	
Cylinder (mm)	2×12	2×16	2×20	2×25	2×32	
Rod (mm)	6	10	12	14	16	
Standard Stroke (mm)	25, 50, 75	25, 50, 75, 100	25, 50, 75, 100	25, 50, 75, 100, 125	25, 50, 75, 100, 125, 150	
Theoretical Force (kgf)	1.69×P	3.02×P	4.71×P	7.56×P	18.84×P	
Port Size	M5	M5	M5	PT 1/8	PT 1/8	
Weight (kgf)	0.14 + 0.002×S,T	0.23 + 0.0035×S,T	0.5 + 0.0045×S,T	0.7 + 0.007×S,T	1.24 + 0.01×S,T	
Max. Holing Force(kgf)	TUBE	0.2 ~ 0.9	0.3 ~ 2.5	0.4 ~ 4.5	0.4 ~ 6.6	0.8 ~ 11.2
	PLATE	0.1 ~ 0.5	0.1 ~ 0.8	0.2 ~ 1.4	0.2 ~ 1.8	0.3 ~ 4.1
Fluid	Air					
Operating Pressure	0.15 ~ 1.0MPa(21~145psi)					
Lubrication	None(Non-Lube)					
Temperature : °C(°F)	5 ~ 60(41~140)					
Speed (mm/sec)	50 ~ 300					
Action	Double Acting					
Switch	W8H, W9H					
AUTO Switch	W8V, W9V					

### Max. Movable Weight / Non-rotating Accuracy

Model	ASL12	ASL16	ASL20	ASL25	ASL32
Max. Movable Weight	1kg	4kg	5kg	6kg	10kg
Non-rotating accuracy	±0.1°	±0.04°	±0.04°	±0.02°	±0.01°

※ Place the center of gravity of the load and center of the slide unit close during operation.

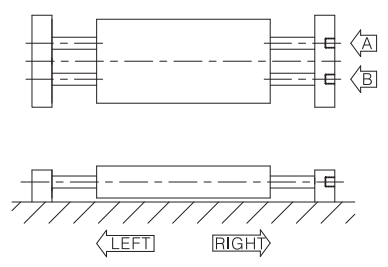
# Series ASL

Weight (kg)								
Model	Stroke (mm)							
	25	50	75	100	125	150	175	200
ASL12	0.19	0.24	0.29		-	-	-	-
ASL16	0.32	0.41	0.49	0.58				
ASL20	0.61	0.73	0.85	0.95				
ASL25	0.89	1.10	1.23	1.41	1.58			
ASL32	1.49	1.75	1.99	2.24	2.49	2.74		

- SB
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- NR
- ASL**
- LOW SPEED CYLINDER
- CHANGE OF ROD END SHAPE
- TPC-1000  
TPC-1200
- SAH
- NBU
- ACU
- SE
- ARM

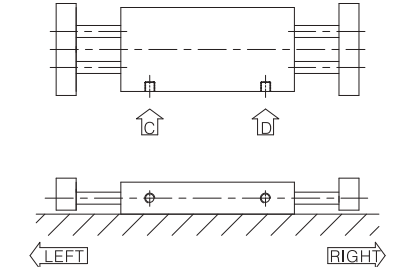
## Operating direction per pressurized port

When the plate is fixed, operating direction of the housing.



Pressurized Port	A	B
Operating direction	Left	Right

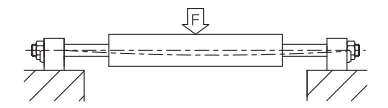
When the housing is fixed, operating direction of the plate.



Pressurized Port	C	D
Operating direction	Left	Right

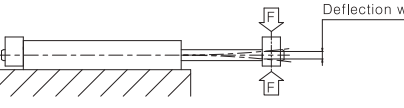
## Deflection of the piston rod by center loading

In event that the middle of the housing is provided with center loading.



Model	Stroke Load(N)	(mm)	
		100	150
ASL12	9.8	0.07	-
ASL16	39.1	0.05	0.20
ASL20	49	0.03	0.14
ASL25	58	0.02	0.08
ASL32	98	0.02	0.07

In event that the middle of the plate is provided with center loading.



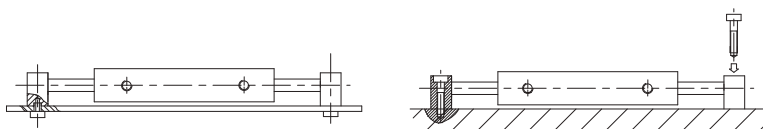
Model	Stroke Load(N)	(mm)			
		50	100	125	150
ASL12	2.9	0.06	0.30	-	-
ASL16	4.9	0.03	0.10	-	-
ASL20	7.8	0.03	0.09	-	-
ASL25	9.8	0.03	0.09	0.16	-
ASL32	29.3	0.02	0.05	0.10	0.15

Note) Here, the factors represent the total deflection widths in the vertical direction.

# Series ASL

## Mounting Method

### Plate Mounting

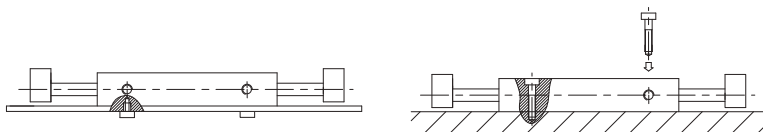


Bottom side is fixed

Topside is fixed

Model	Mounting Method	Thread	Max. mounting Torque N*m(kgf*cm)
ASLP12	Bottom side is fixed	M4×0.7	2.1 ( 21 )
	Topside is fixed	M3×0.5	0.88 ( 9 )
ASLP16	Bottom side is fixed	M5×0.8	4.3 ( 44 )
	Topside is fixed	M4×0.7	2.1 ( 21 )
ASLP20	Bottom side is fixed	M6×1.0	5.9 ( 60 )
	Topside is fixed	M5×0.8	4.3 ( 44 )
ASLP25	Bottom side is fixed	M8×1.25	18 ( 183 )
	Topside is fixed	M6×1.0	5.9 ( 60 )
ASLP32	Bottom side is fixed	M8×1.25	18 ( 183 )
	Topside is fixed	M6×1.0	5.9 ( 60 )

### Housing Mounting



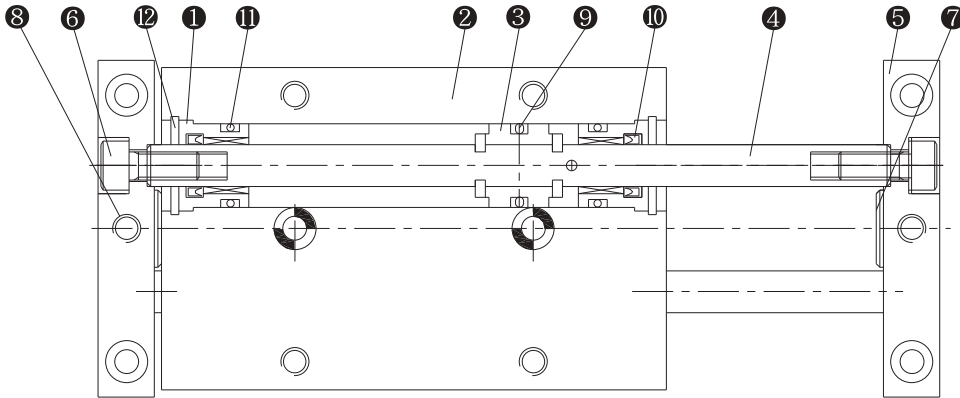
Bottom side is fixed

Upside is fixed

Model	Mounting Method	Thread	Max. mounting Torque N*m(kgf*cm)
ASLT12	Bottom side is fixed	M4×0.7	2.1 ( 21 )
	Upside is fixed	M3×0.5	0.88 ( 9 )
ASLT16	Bottom side is fixed	M5×0.8	4.3 ( 44 )
	Upside is fixed	M4×0.7	2.1 ( 21 )
ASLT20	Bottom side is fixed	M6×1.0	5.9 ( 60 )
	Upside is fixed	M5×0.8	4.3 ( 44 )
ASLT25	Bottom side is fixed	M8×1.25	18 ( 183 )
	Upside is fixed	M6×1.0	5.9 ( 60 )
ASLT32	Bottom side is fixed	M8×1.25	18 ( 183 )
	Upside is fixed	M6×1.0	5.9 ( 60 )

# Series ASL

## Construction / Parts List



- SB
- NF
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- ASL**
- LOW SPEED CYLINDER
- CHANGE OF ROD END SHAPE
- TPC-1000  
TPC-1200
- SAH
- NBU
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- ARM

## Parts List

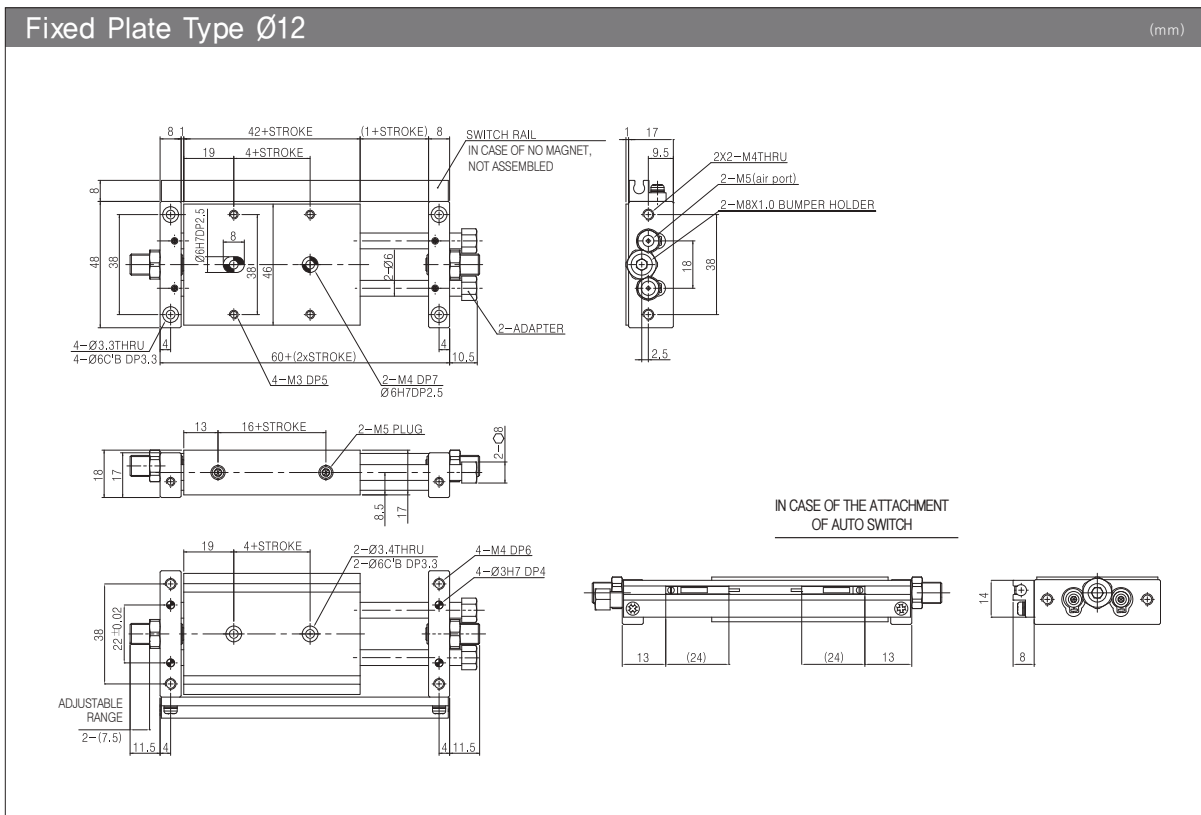
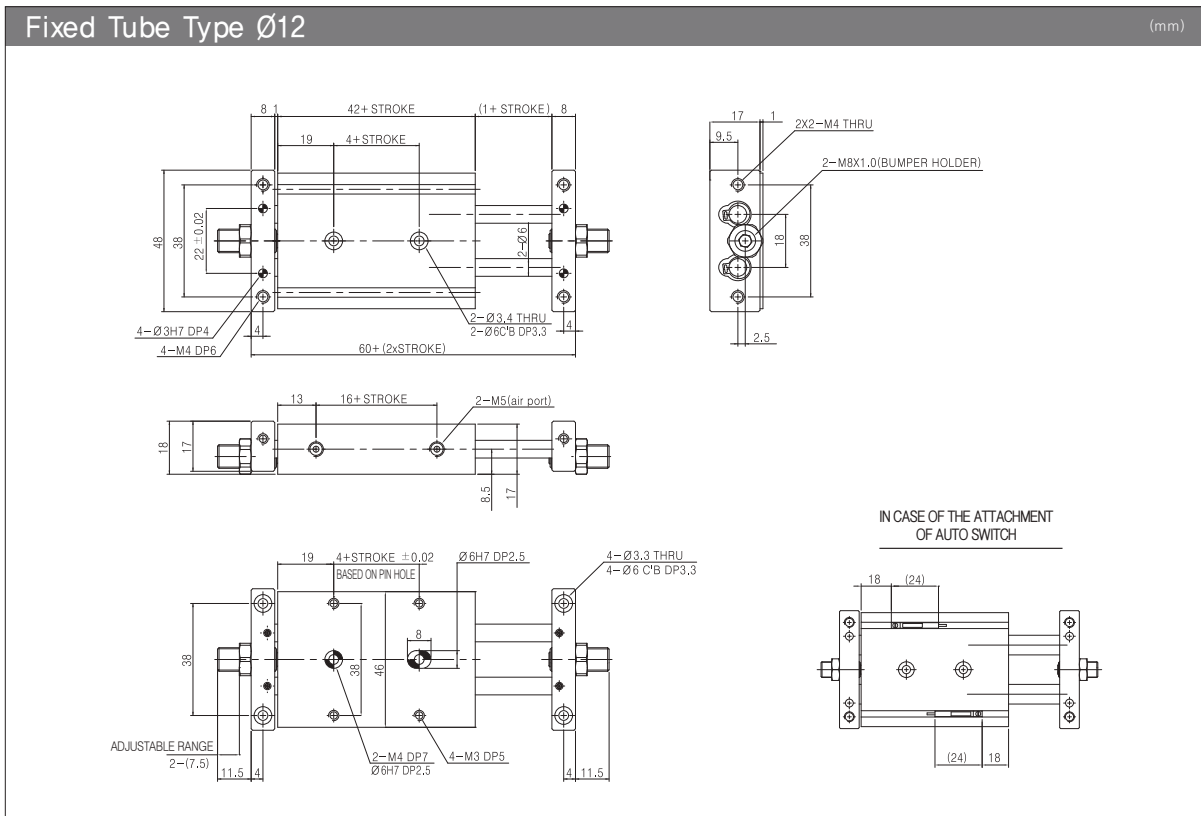
No	Description	Material	Note
1	Rod Cover	Aluminum alloy	Alumate
2	Cyl. Tube	Aluminum alloy	Alumate
3	Piston	Aluminum alloy	
4	Piston Rod	Carbon Steel piping for machine constructions	Hard Chrome
5	Plate	Aluminum alloy	Hard Alumate
6	Bolt	Steel	

No	Description	Material	Note
7	Stopper	Urethane	
8	Adjusting Bolt	Chrome Steel	
9	Piston Packing	NBR	DYP Series
10	Rod Packing	NBR	DYP Series
11	Tube Gasket	NBR	
12	C Type Ring for Stopping	Spring Steel	

## Replacement Parts : Seal kits & Shock Absorber

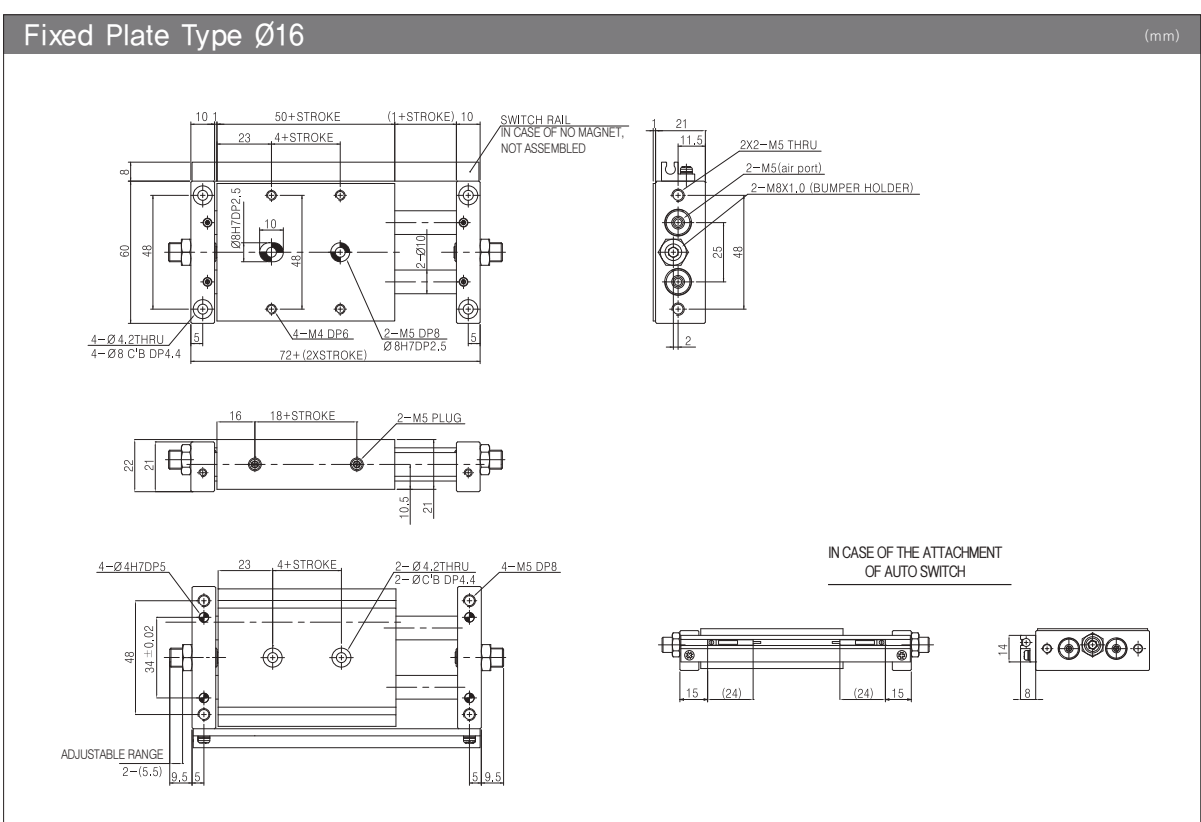
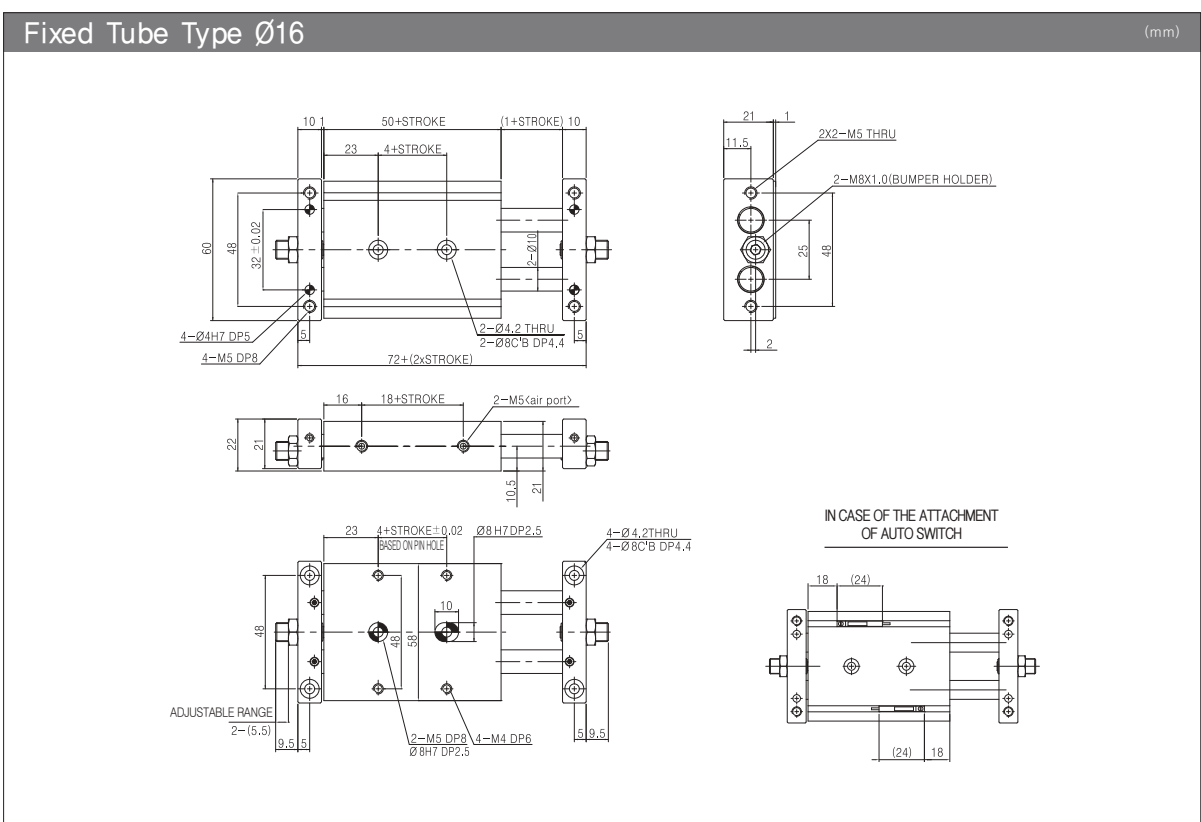
Model	Seal kit Model No.	Contents
ASLT / ASLP12	ASL12-SK	9, 10, 11 are included in one set.
ASLT / ASLP16	ASL16-SK	
ASLT / ASLP20	ASL20-SK	
ASLT / ASLP25	ASL25-SK	
ASLT / ASLP32	ASL32-SK	

# Series ASL

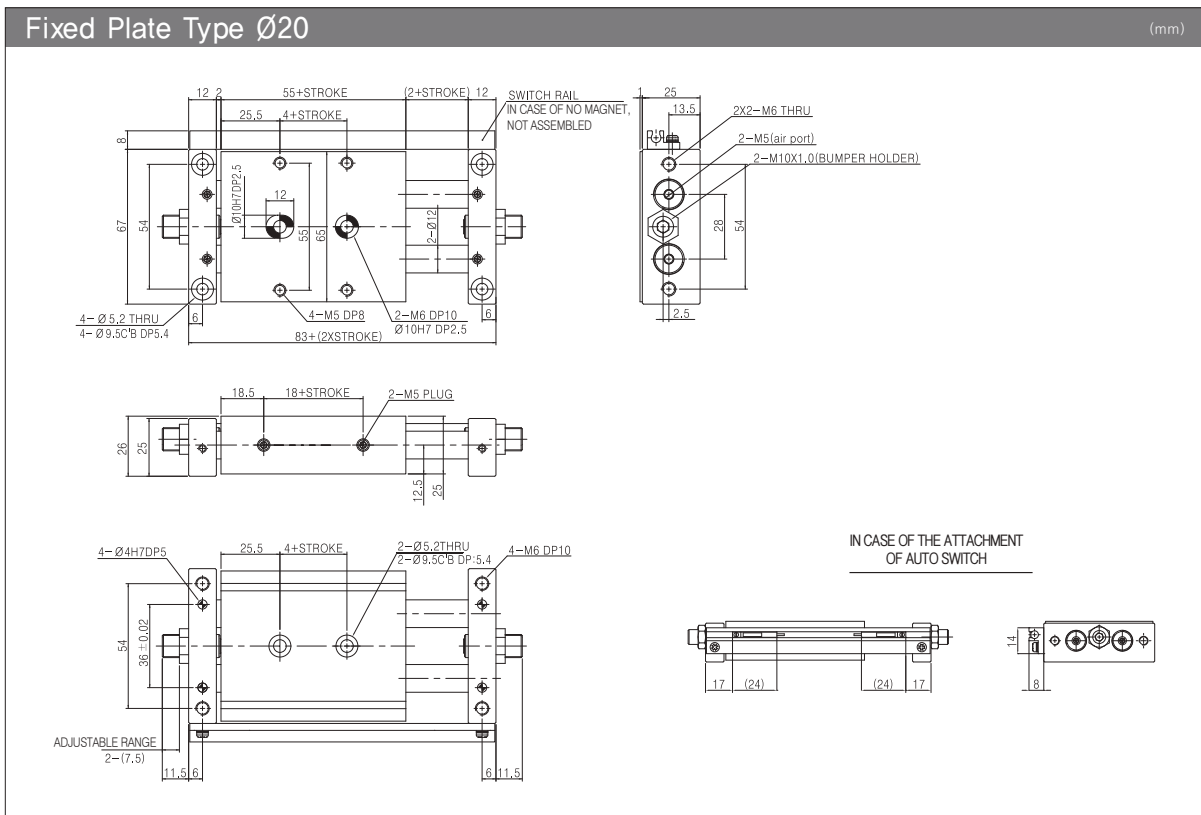
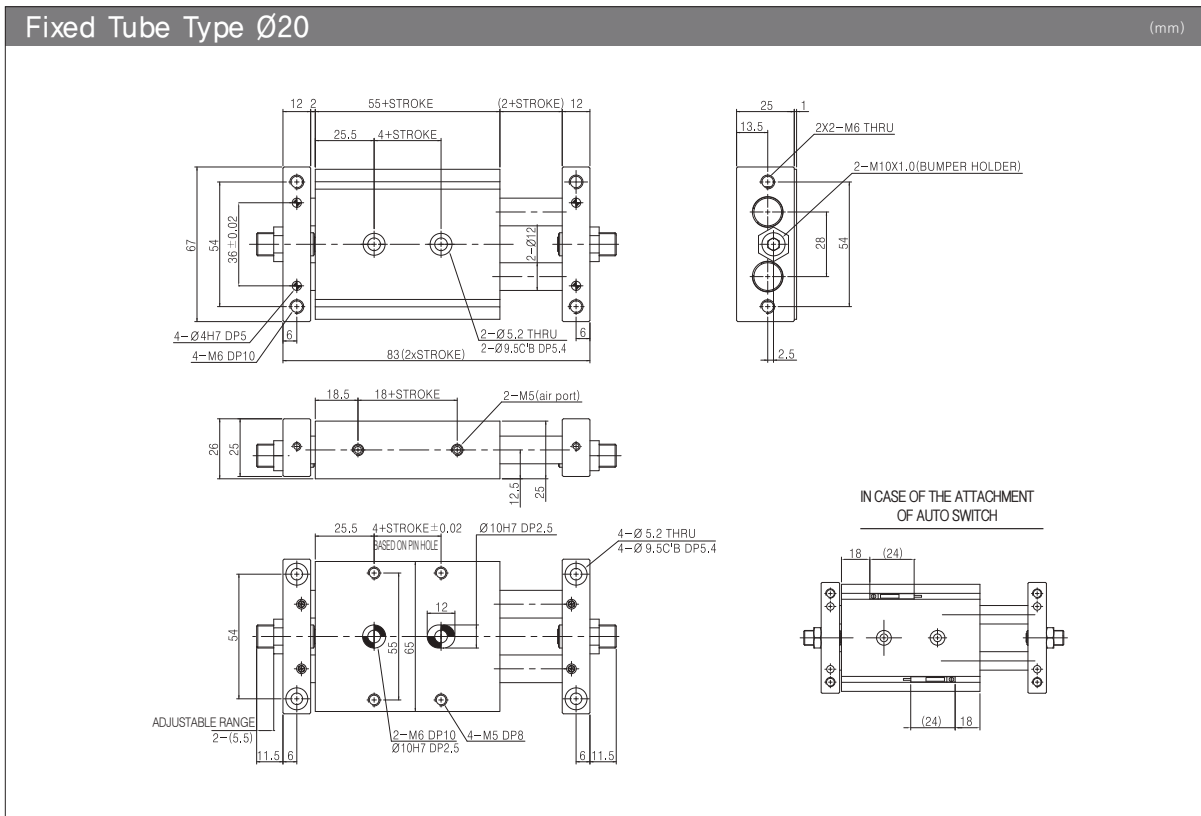


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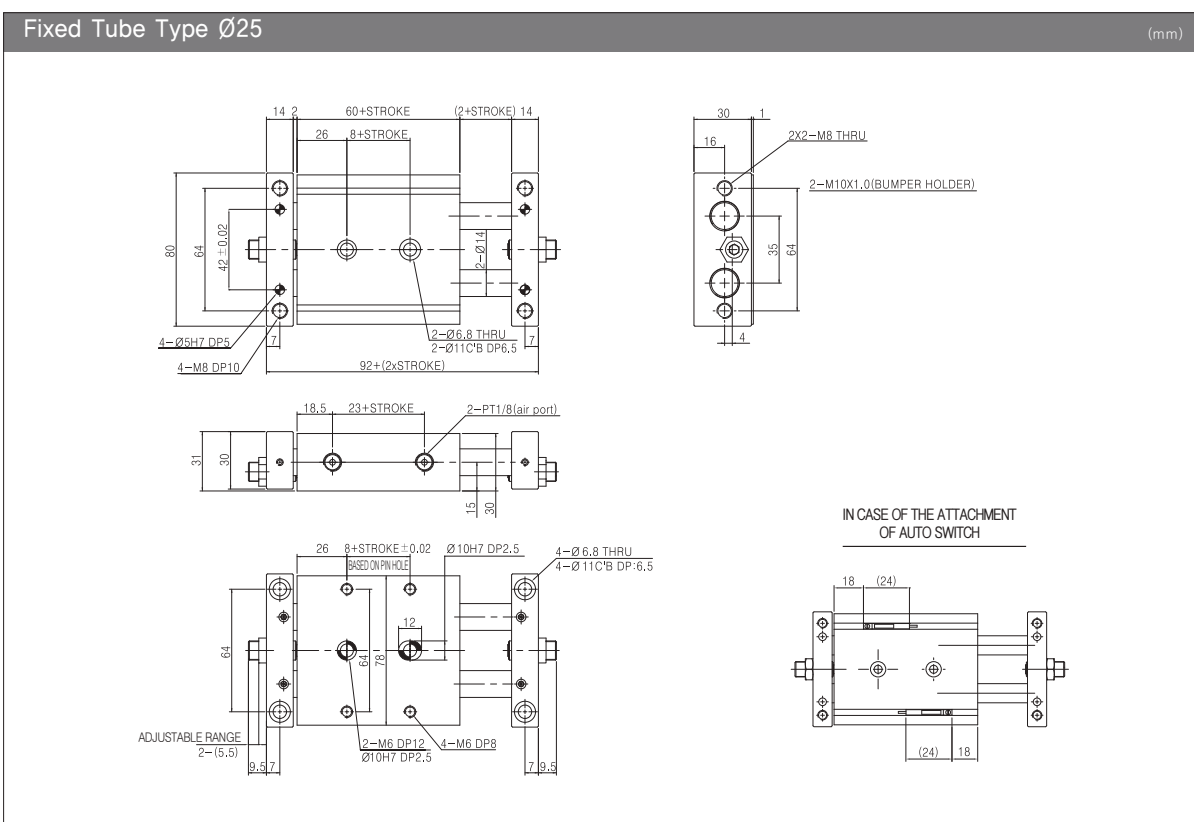
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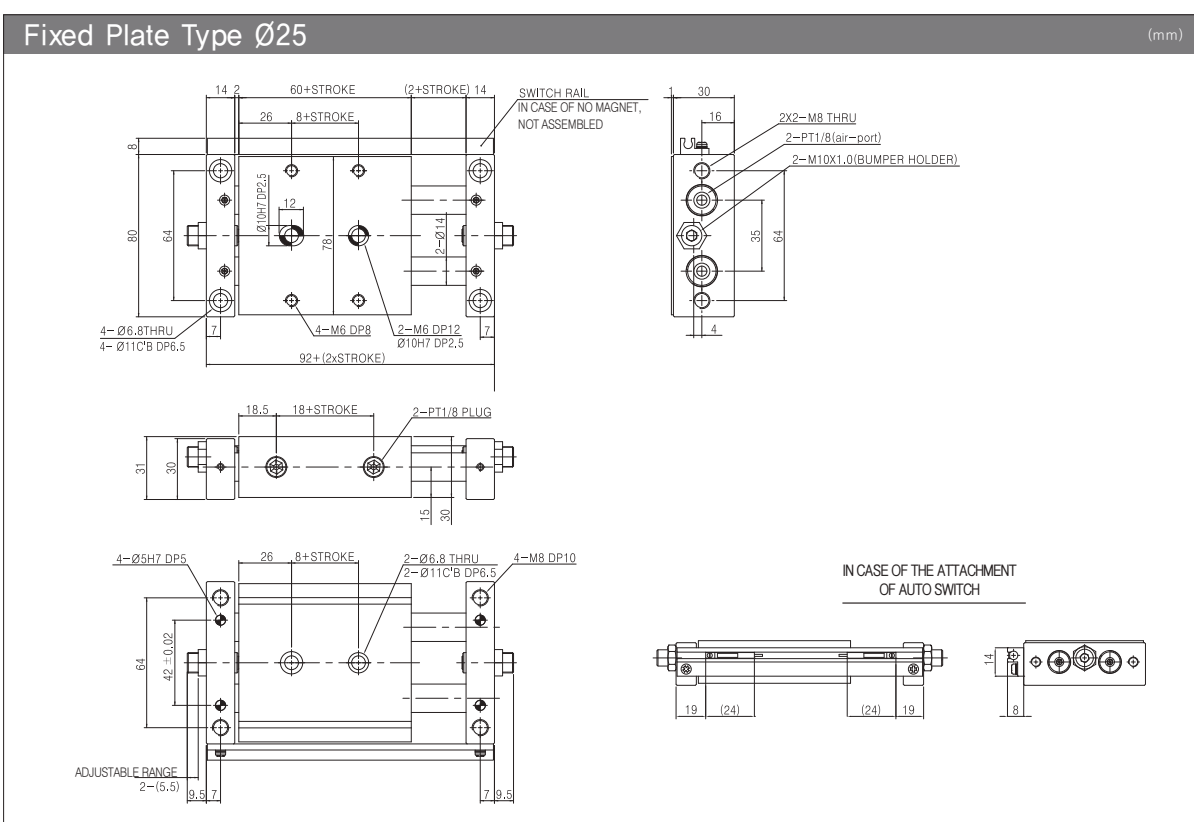
# Series ASL



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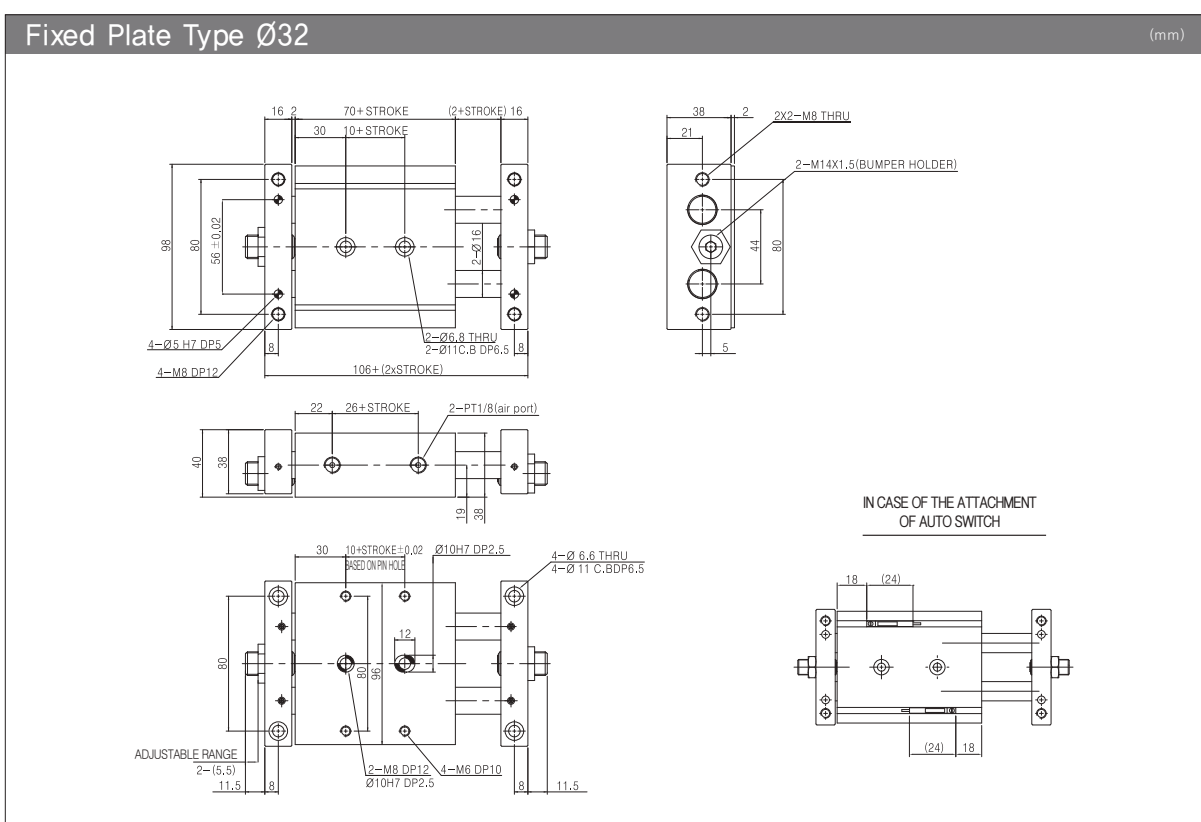
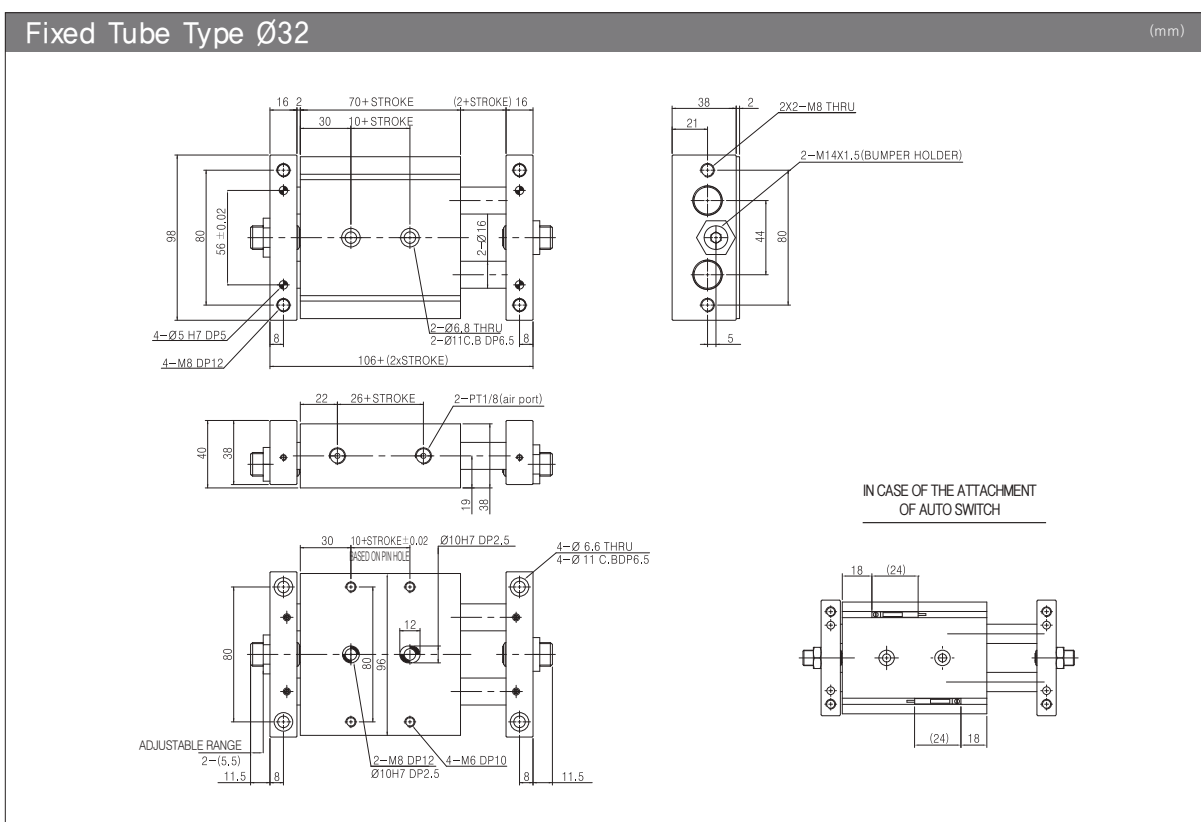


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# Series ASL



## Series ASL

### ! General Suggestions for Slide Cylinder Series

Please read all instructions before selecting and using our products. Refer to the directions for each model for details. Relating to each products characteristics.

#### Installation Suggestions

### ! Warning

#### 1) Tightly fasten each joint and connection of the Slide Cylinders.

When operating the Slide Cylinder frequently or under heavy vibration, fasten the connections\*, according to manufacturers specifications. Leak test before applying full pressure.

#### Selection Suggestions

### ! Warning

#### 1) Carefully read the Properties.

The products introduced in this catalog are designed for industrial compressed-air systems only. Overloaded energy, pressure or temperature cause damage or mal-operation and, therefore, do not exceed the range of the properties.

#### 2) Vibration and Impact

Do not use the Slide Cylinder to absorb vibration and impact of machineries.

### ! Warning

#### 1) Establishing space for storage and maintenance

When installing the product, establish adequate operation space around it. When not established, it may cause difficulty with daily inspections and maintenance and repair works and eventually cause operational defects and damages.

#### 2) Avoid cuts on the wire cords such as the Auto Switch lead wires.

Cutting, excessive bending, putting, rolling, loading with heaving object and putting between two objects may cause fire, electrical shocks or abnormal operations due to electricity leakage or connection defects.

#### 3) During the the operation of the Slide Cylinder, do not place the auto switch on an outer magnetic field.

It may move unexpectedly and cause damages.

#### 4) Install a safety valve.

Install a device such as a safety valve to keep the pressure below the regular pressure when the pressure increases due to outer forces applied onto the Slide Cylinder.

It may break due to excessive pressure.

#### 5) Do not deform the product.

It may cause physical injury, electrical shocks or fire due to abnormal operations.

#### 6) Test the unit before operations.

If the unit was not used over 48 hours or stored as stock for a long time, the connections may have adhered to each other and delay the operation.

In this case, test the unit before normal operations.

#### 7) Strictly observe the connecting screws for torque.

Upon installation, fasten the screws with the recommended torque.

#### 8) Before operations

Always inspect safety details of the operational space in prior to operating the device by supplying electricity and air.

#### 9) After operations

Do not touch where electricity is exposed, such as terminals, during the electricity supply.

It may cause electrical shocks or abnormal operations.

#### 10) Be cautious when handling objects with mass.

When transporting or adjoining heavy objects, establish safe surroundings for the operators and handle with caution by completely supporting them with lifts or supports.

#### 11) High-pressure Gas Safety Supervision Regulations and its Enforcement Ordinances apply.

Follow all published regulations by all pertinent regulation agencies.

### ! Warning

#### 1) Do not overload the shaft of the Slide Cylinder which may cause distortion or bending.

It may cause a decrease in life span and abrasion and damage of shaft or inner parts.

#### 2) Avoid denting or cutting the operating part of the shaft of the Slide Cylinder.

The inner tube is manufactured by precise tolerance and may cause operational defects even with a little distortion.

Also, dents or cuts on the operating part of the shaft may cause air leakage due to damages on the packings.

#### 3) When installing

When installing the wires and pipes of the products, always refer to the catalog and other references.

SB

NF

NR

ASL

LOW SPEED  
CYLINDERCHANGE OF  
ROD END SHAPETPC-1000  
TPC-1200

SAH

NBU

ACU

SE

ARM

## Series ASL

### 4) Safety

Always wear protecting gloves, glasses and boots for safety purposes.

### 5) Reference to handling manual

Carefully read and understand the handling manual before adjoining and using the products.

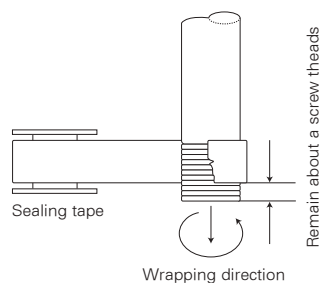
#### Caution

#### 1) Management before piping

Before piping, remove chips, oil residue or dust.

#### 2) Method of adhering seal tape

When connecting pipes or fitting parts, keep the chips of piping screws or other wastes, away from the inside of the pipes. Also, when using the seal tape, leave 1.5~2 threader uncovered.



#### Fueling Suggestions

### ⚠ Caution

#### 1) Non lube type Slide Cylinder

This product is a non-fueling type.  
Do not use machine-oil or spindle-oil.

#### Air Source Related Suggestions

### ⚠ Warning

#### 1) Use clean air.

When the compressed air contains chemicals, compound oil with organic liquid, salt content or corrosive gas, it may cause damage or operational defects.

### ⚠ Caution

#### 1) Use an air filter.

#### 2) Install After-Cooler, Air Dryer, Drain Catch and etc as counterplans.

#### 3) Maintain the oil temperature and surrounding temperature within the allowance range.

When the temperature drops below 5°C, the moisture content of the circuit may freeze and cause damages or mal-operations of the packing. Therefore, prevent freezing.

#### Operation Environment Related Suggestions

### ⚠ Danger

#### 1) Do not use around hazardous materials such as flammables.

### ⚠ Warning

#### 1) Do not use where there is an exceeding amount of dust, salt content, steel powder or moisture content and where the surrounding atmosphere with organic solvent also contains phosphoric-acid ester-class activating oil, sulfurous acid gas, chlorine gas and other acidic materials. These conditions may cause operation interruption, sudden capacity declination or shortened life span. .

#### 2) When using the auto switch, do not use around ferromagnetism.

Do not use the auto switch around high electric current or a strong magnetic field.

### ⚠ Warning

#### 1) Do not use the auto switches of other companies.

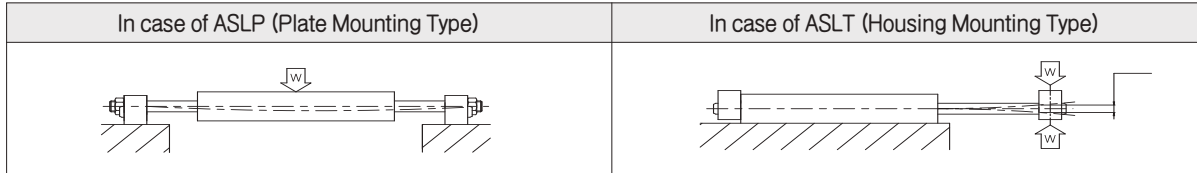
Only use TPC switches.

# Series ASL

## How to Select

Maximum deflection (&) should be less than 0.3mm

How to calculate defelction



**A(mm)** : Distance between plate and center of support point

**Wt(Kgf)** : Weight of the slide table (including Bush)

**L(mm)** : Distance between center of load and center of shaft

**D(mm)** : Distance between center of the load and plate

**E(mm)** : Stroke + Length of piston rod

**M(gf/mm<sup>3</sup>)**: Weight of shaft

**C(mm)** : Distance between center of the shafts

**Fs(Kgf)** : Static Movement

**T** : Constant Factor

**P(mm)** : Center between support point of bush

**Wp(Kgf)** : Plate Weight

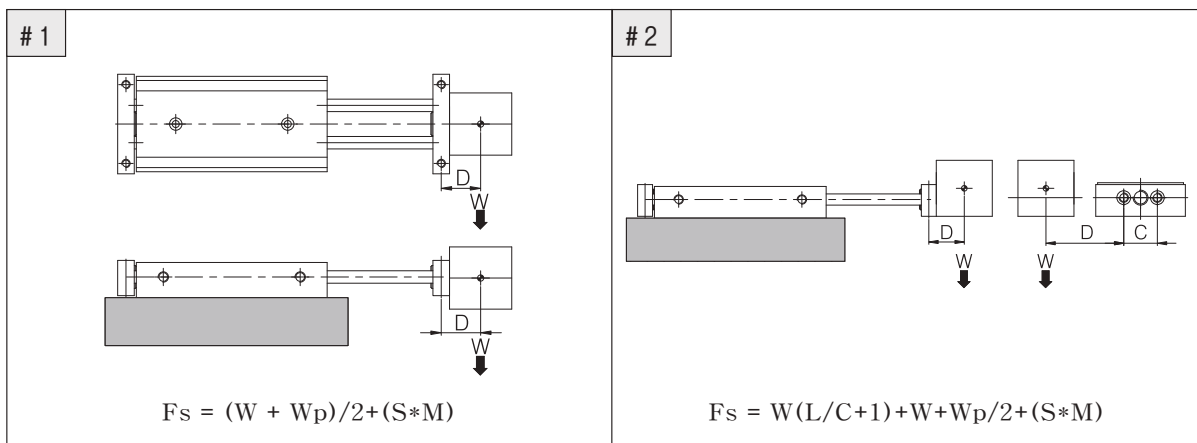
**W(Kgf)** : Load weight

**S(mm)** : Stroke

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- LOW SPEED CYLINDER
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Model	A	C	E	Wp(gf)	Wt(gf)	T	P	M
ASL12	15	18	S+44	17	99+1,62ST	4,01×10 <sup>-6</sup>	ST+22	0,44
ASL16	16	25	S+52	31	190+2,36ST	1,27×10 <sup>-7</sup>	ST+30	0,78
ASL20	17	28	S+59	50	295+3,07ST	3,04×10 <sup>-7</sup>	ST+37	1,22
ASL25	23	35	S+64	79	459+4,09ST	6,41×10 <sup>-7</sup>	ST+32	1,76
ASL32	23	44	S+74	125	724+5,71ST	2,03×10 <sup>-7</sup>	ST+44	3,14

### 5. The static load transferred to the shaft depending on position and direction of the lead.



# Series ASL

<p># 3</p> $F_s = \sqrt{[(W+W_p)/2+S*M]^2+(W+L)^2/C}$	<p># 4</p> $F_s = (W*L)/[2(A+D+S)]$
<p># 5</p>	<p># 6</p>
<p># 7</p> $F_s = (W+W_t)/2$ $F_s = \sqrt{[(W+W_t)/2]^2+[(W+L)/C]^2}$	<p># 8</p> $F_s = W+W(L/C+1)+W_t/2$ $F_s = (W*L)/P$
<p># 9</p> $F_s = (W\sqrt{D^2+L^2})/P$	

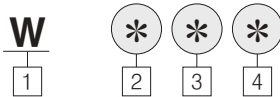
# Mini Auto Switch



- ENLARGEMENT OF STANDARD LEAD WIRE
- OIL PROOF AND INTERNAL COMBUSTION IS EXCELLENT
- COMPACT DESIGN
- EASY TO CHECK EXISTING / NON PLUG

- SB
- NF
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- ASL
- LOW SPEED CYLINDER
- CHANGE OF ROD END SHAPE
- TPC-1000  
TPC-1200
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## How to Order



- 1** TPC Auto Switch Model
- 2** 7 : Mini existing plug point AUTO SWITCH  
 8 : Mini existing plug point AUTO SWITCH  
 9 : Mini non plug point round AUTO SWITCH  
 10 : Mini non plug point round AUTO SWITCH(10mm)
- 3** H : LEAD WIRE HORIZONTAL TYPE  
 (W7 : Horizontal only)  
 V : LEAD WIRE VERTICAL TYPE  
 (W10 : Vertical only)
- 4** Blank : Wiring Method(2 wires), LEAD WIRE Length(1m)  
 L : LEAD WIRE(3m)  
 N : Wiring Method(3 wires, NPN), LEAD WIRE Length(1m)  
 P : Wiring Method(3 wires, PNP), LEAD WIRE Length(1m)  
 NL : Wiring Method(3 wires, NPN), LEAD WIRE (3m)  
 PL : Wiring Method(3 wires, PNP), LEAD WIRE (3m)
- (Note1) "N", "P", "NL" and "PL" are only for solid state switch W9\* type.  
 (Note2) W10 : Lead wire 0.5mm, 2wires, "N" type only.

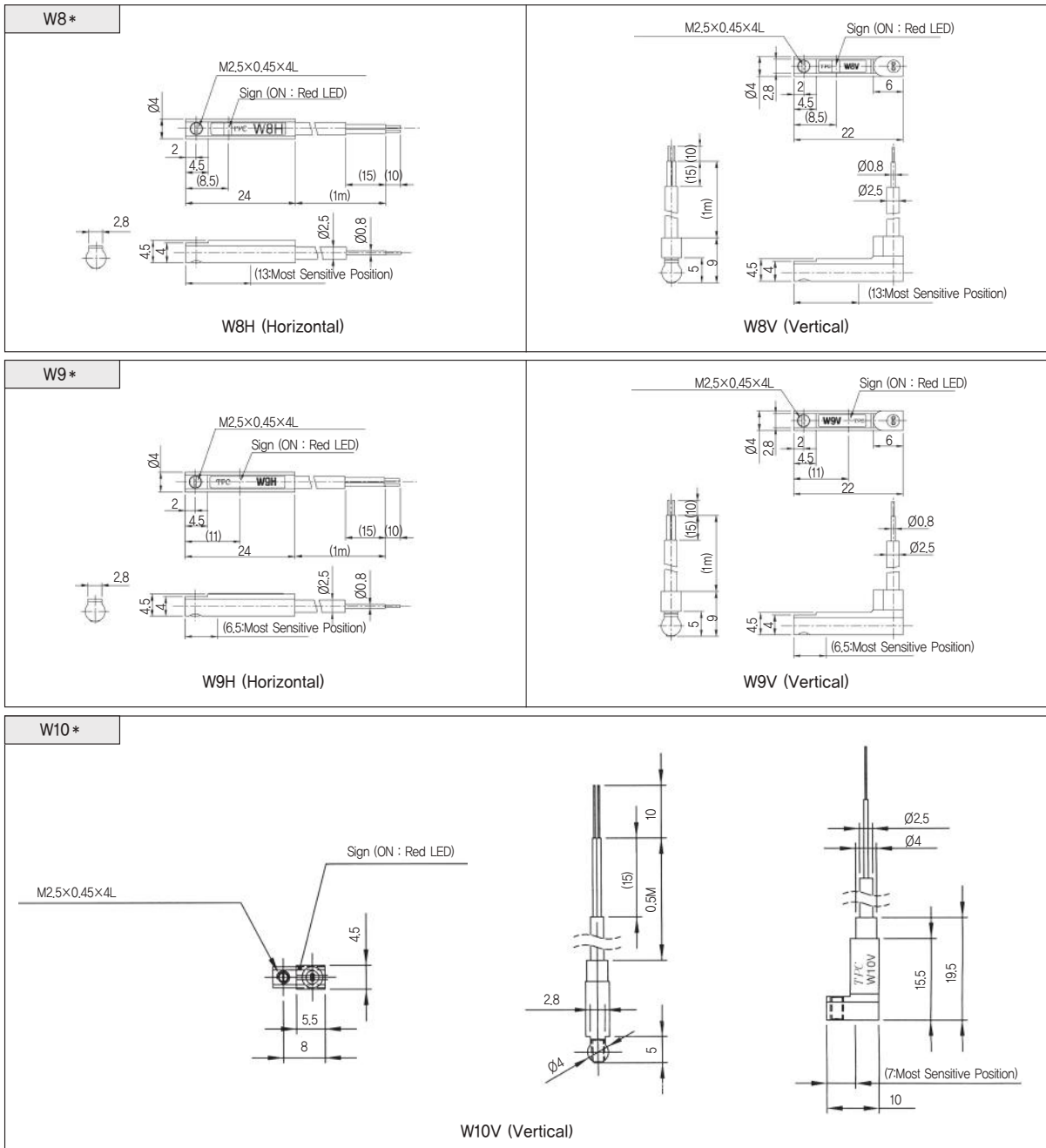
Specification					
Item	W7	Contact (W8)	Non-Contact (W9)	W10 * *	
Size	Outer Diameter of 4mm		Outer Diameter of 4mm	Solid State Switch 2 wire	Solid State Switch 3 wire(NPN)
Loaded Voltage	AC220V	DC24V, AC100V	DC24V	DC24V	
Working electric Current	5~15mA	5~40mA (DC24V) 5~20mA(AC110V)	5~30mA	5~40mA	Less than 100mA
Direction of Lead Wire	Vertical, Horizontal		Vertical, Horizontal	Vertical(V)	
Lamp	Red LED lights when ON		Green LED lights when ON	Green LED lights when ON	
Wiring	Double wiring		Double wiring (Triple wiring)		
Output	-		NPN, PNP		
Attachment	Screw-attachment on		Screw-attachment on Rail		
Operation Time	Less than 1.2ms		Less than 1.2ms	Less than 4.5V	Less than 1.5V
Inner Voltage Epression	Less than 2.4V		Less than 4.5V	Less than 0.9mA	Less than 100μA
Minimum Gauss Required	Higher than 65G		Higher Than 35G	-	Less than 12mA
Maximum Gauss Limited	Lower than 450G				
Lifespan of Switch	1×10 <sup>7</sup> when loaded 5V, 5mV 1×10 <sup>7</sup> when loaded 12V, 5mV 1×10 <sup>7</sup> when loaded 24V, 5mV		-		
Electric Current Leakage	-		Less than 15mA under DC24V		

Remote Range of the Switch			
Classification	W7 * *, W8 * *	W9 * *	W10 * *
L(Maximum Remote Range)	13	6.5	7
Remote Range of the Switch	7~12	4.3~4.7	4~7

\* Warning : When the amount of motion electric current loaded on the controllers such as PLC, is lower than that of current leakage, it is called non-operative state (ON) and results in miss-operation.  
 When the number of parallel connection is n, the amount of current leakage multiplies n times.

# Mini Auto Switch

## Measurement Illustration



## Low Speed Cylinder

# Low Speed Cylinder

- A cylinder with special specification which smoothly operates without stick slip under the condition lower than minimum operating speed of standard product

SB

NF

NR

ASL

LOW SPEED  
CYLINDERCHANGE OF  
ROD END SHAPETPC-1000  
TPC-1200

SAH

NBU

ACU

SE

ARM

## How to Order

### Standard Product Order Specification — XLS

1

**1] Type**

: Applied cylinder number  
Ex) AQ2B32-50D-XLS

2

**2] XLS**

: Low speed cylinder

Applied piston speed : 5~50mm/sec

※ Other dimensions and specification are identical to standard product

#### Applied Cylinder Series

Index	Applied Tube Diameter
ACP	Ø6~Ø16
NLCD(S)	Ø6~Ø32
ADR	Ø10~Ø25
NDM	Ø10~Ø25
AS	Ø20~Ø40
AM	Ø20~Ø40
AGX	Ø20~Ø40
ARD	Ø20~Ø63
AQ2	Ø12~Ø125
AQ	Ø12~Ø25
TGQ, NGQ	Ø12~Ø100
AM2	Ø40~Ø100
AM	Ø40~Ø100
AL/ALX	Ø125~Ø200

Note1) Contact a manufacturer for application of cylinder beside the lists above.

Note2) Air cushion is not necessary for low speed operation, so that make an order without cushion for AM, AM2, AL/ALX (2) and ARD cylinders.

Ex) AM50-150N-XLS  
ARDB40-150-XLS

#### Notices

- Operation beyond specified operation piston speed degrades cylinder durability.
- Since special lubricant is used, refueling may consume lubricant, which possibly causes degradation of performance.



# Change of Rod End Shape

## Change of Rod End Shape

Symbol : R0 The shape of rod end is same to that of standard type.  
Be sure to indicate H size if it is different from standard size.

<p>Symbol : R1</p>	<p>Symbol : R2</p>	<p>Symbol : R3</p>	<p>Symbol : R4</p>
<p>Symbol : R5</p>	<p>Symbol : R6</p>	<p>Symbol : R7</p>	<p>Symbol : R8</p>
<p>Symbol : R9</p>	<p>Symbol : R10</p>	<p>Symbol : R11</p>	<p>Symbol : R12</p>
<p>Symbol : R13</p>	<p>Symbol : R14</p>	<p>Symbol : R15</p>	<p>Symbol : R16</p>
<p>Symbol : R17</p>	<p>Symbol : R18</p>	<p>Symbol : R19</p>	<p>Symbol : R20</p>
<p>Symbol : R21</p>	<p>Symbol : R22</p>	<p>Symbol : R23</p>	<p>Symbol : R26</p>
<p>Symbol : R27</p>	<p>Symbol : R28</p>	<p>Symbol : R29</p>	<p>Symbol : R30</p>
<p>Symbol : R31</p>	<p>Symbol : R32</p>	<p>Symbol : R33</p>	<p>Symbol : R34</p>
<p>Symbol : R35</p>	<p>Symbol : R36</p>	<p>Symbol : R37</p>	<p>Symbol : R38</p>