Plate Cylinder with Lock

Series MLU

ø25, ø32, ø40, ø50

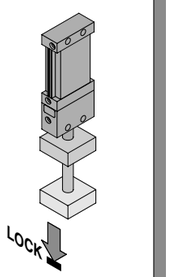
Drop prevention is possible at any point of stroke.

Cylinder can be locked at any desired position.

- Drop prevention for middle stroke emergency stops
- Lock positions can be changed to accommodate the position of the external stopper and the thickness of the clamped workpiece.

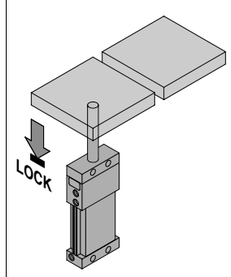
Drop prevention for press fitting jig

Extension lock



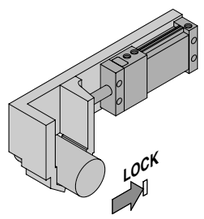
Drop prevention for litter

Retraction lock

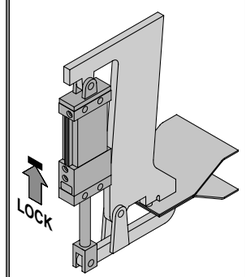


Holding clamped and unclamped positions

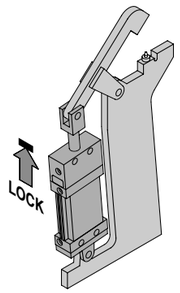
Retraction lock



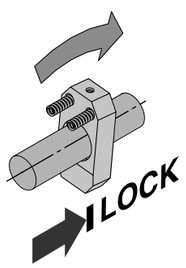
Retraction lock

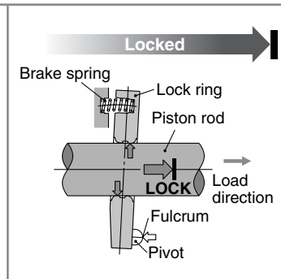


Extension lock

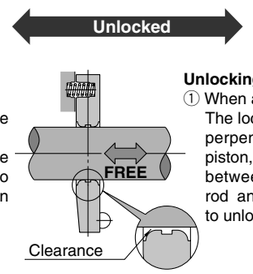


Simple construction: Simple and reliable locking system





Unlocking port:
① When air is exhausted: The brake spring force tilts the lock ring.
② The load increases the tilting of the lock ring to securely lock the piston rod.



Unlocking port:
① When air is supplied: The lock ring becomes perpendicular to the piston, creating a gap between the piston rod and the lock ring to unlock the piston.

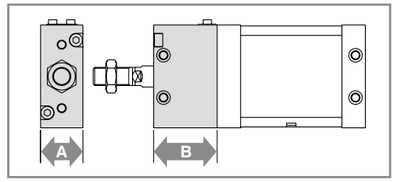
Slim and compact lock unit

- **Lock unit length**
  35mm to 50.5mm
- **Lock unit width**
  24mm to 39mm

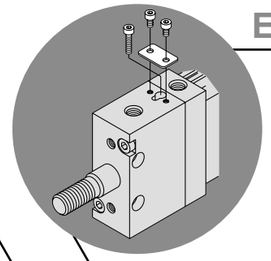
The compact lock unit does not protrude beyond the cylinder body surface.

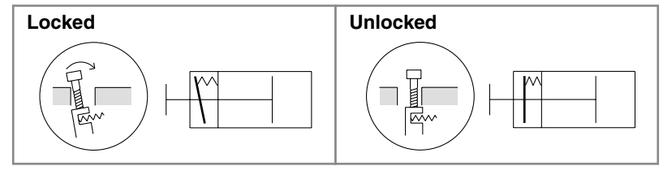
Lock unit thickness (mm)

Bore size (mm)	A	B
25	24	35
32	28	42
40	32	44
50	39	50.5

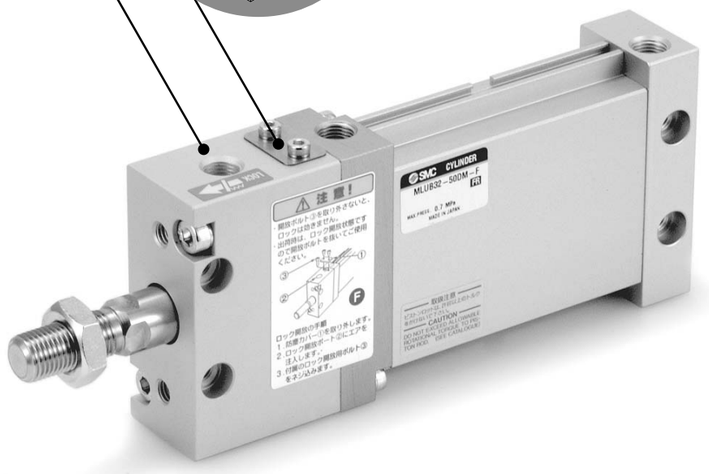


Easy manual unlocking

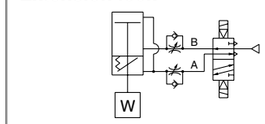




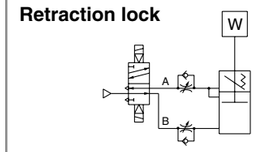
Locking direction can be selected.



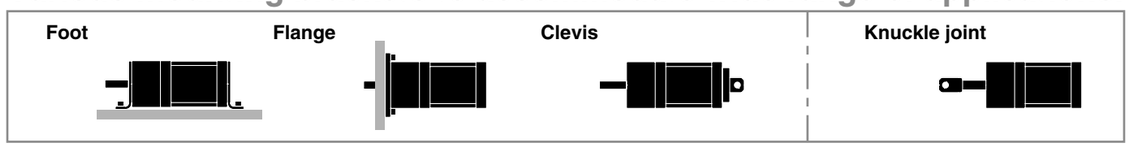
Extension lock



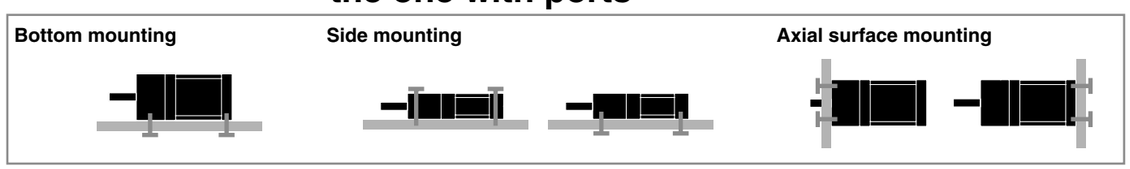
Retraction lock



Various mounting brackets to accommodate wide range of applications.



Flexible mounting: Possible to mount on all surfaces except for the one with ports



Series Variations

Series	Locking direction	Bore size (mm)	Standard stroke (mm)																
			5	10	15	20	25	30	35	40	45	50	75	100	125	150	175	200	250	300
MLU	Extension lock / Retraction lock	25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		40	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		50	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Series MLU
Specific Product Precautions 1
Be sure to read before handling.

Selection

⚠Warning

1. Do not use for intermediate cylinder stops.
This cylinder is designed for locking against inadvertent movement from a stationary condition. Do not perform intermediate stops while the cylinder is operating, as this will shorten its service life.

2. Select the correct locking direction, as this cylinder does not generate holding force opposite to the locking direction.
The extension locking direction does not generate holding force in the cylinder's retracting direction, and the retraction locking direction does not generate holding force in the cylinder's extending direction (free).

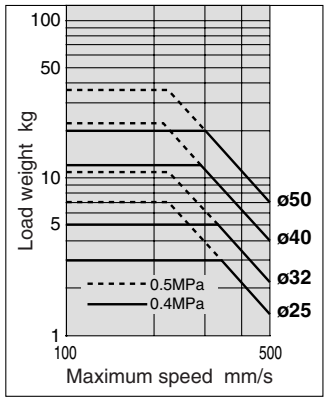
3. Even when locked, there may be stroke movement of about 1mm in the locking direction due to external forces such as the weight of the workpiece.
Even when locked, if air pressure drops, stroke movement of about 1mm may be generated in the locking direction of the lock mechanism due to external forces such as the workpiece weight.

4. When locked, do not apply impact loads, strong vibration or rotational force, etc.
This will lead to lock mechanism damage and reduced service life, etc.

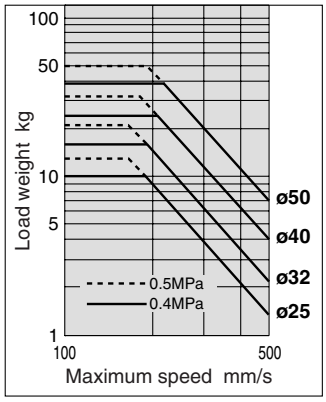
5. Operate so that load weight, maximum speed and eccentric distance are within the limiting ranges in the graphs below.
Operation beyond the limiting range will lead to cylinder damage and reduced service life, etc.

Allowable Kinetic Energy

Extension locking direction



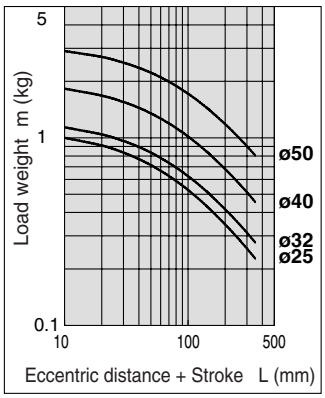
Retraction locking direction

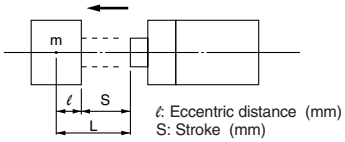


Selection

Allowable Load Weight

Horizontal (without switch and with switch)





Pneumatic Circuit

⚠Warning

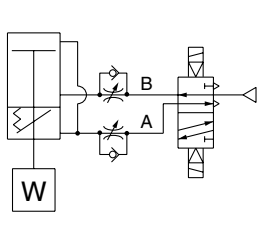
1. Do not use 3 position valves.
The lock may be released due to inflow of the unlocking pressure.

2. Install speed controllers for meter-out control.
Malfunction may occur if meter-in control is used.

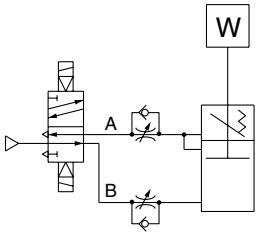
3. Be careful of reverse exhaust pressure flow from a common exhaust type valve manifold.
Since the lock may be released due to reverse exhaust pressure flow, use an individual exhaust type manifold or single type valve.

4. Branch off the compressed air piping for the lock unit between the cylinder and the speed controller.
Use of an external branch may cause a reduction in service life.

5. Perform piping so that the side going from the piping junction to the lock unit is short.
If it is long, this may cause unlocking malfunction and reduce the lock's service life, etc.



F: Extension locking direction



B: Retraction locking direction

Series MLU
Specific Product Precautions 2

Be sure to read before handling.

Mounting

⚠ Caution

1. Be sure to connect the load to the rod end with the cylinder in an unlocked condition.
If this is done when in a locked condition, it may cause damage to the lock mechanism.

2. When fixing a work piece at the end of the piston rod, first retract the piston rod to the back end. Use the spanner hook at the end of the rod to keep the torque below the allowable tightening torque.

3. Always apply the piston rod load in the axial direction. Avoid operation where rotational torque is applied. If it is the only possible way, be sure to use it within the allowable range shown in the table below.

Allowable Rotational Torque (N·m)

Size	25	32	40	50
Allowable rotational torque	0.25	0.25	0.55	1.25
Allowable torque for workpiece mounting	1.7	1.9	2.0	4.9

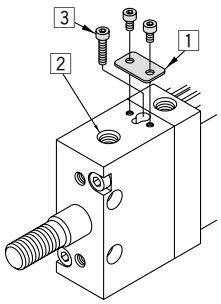
4. The piston speed may exceed the maximum operating speed of 500mm/s if the piping is directly connected to the cylinder. Please use speed controllers by SMC to adjust the piston speed so that it will not exceed 500mm/s.

Preparing for Operation

⚠ Warning

1. When starting operation from the locked position, be sure to restore air pressure to the B line in the pneumatic circuit.
It is very dangerous to apply pressure to the A line with the B line in an unpressurized state, because the cylinder will move suddenly when unlocked.

2. Shipped in the unlocked condition maintained by the unlocking bolt. Be sure to remove the unlocking bolt following the procedures below before operation.
The locking mechanism will not be effective without the removal of the unlocking bolt.



1) Confirm that there is no air pressure inside the cylinder, and remove dust cover 1.
2) Supply air pressure of 0.2MPa or more to unlocking port 2 shown in the drawing on the left.
3) Use a hexagon wrench (ø25, ø32: Width across flats 2.5, ø40, ø50: Width across flats 3) to remove unlocking bolt 3.

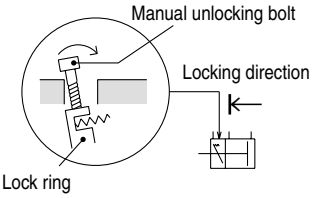
Manually Unlocking

⚠ Warning

1. Do not perform unlocking when an external force such as a load or spring force is being applied.
This is very dangerous because the cylinder will move suddenly. Take the following steps.
1) The lock after restoring the air pressure in the B line of the pneumatic circuit to operating pressure, and then reduce the pressure gradually.
2) In case air pressure cannot be used, release the lock after preventing cylinder movement with a lifting device such as a jack.

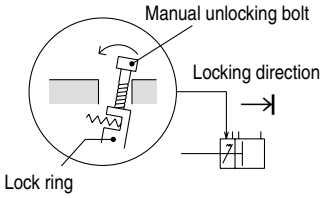
2. After confirming safety, operate the manual release following the steps shown below.
Carefully confirm that no one is inside the load movement range, etc., and that there is no danger even if the load moves suddenly.

Manually unlocking



Extension locking direction

1) Remove the dust cover.
2) Screw a manual unlocking bolt (a conventional bolt of ø25, ø32: M3 x 0.5 x 25ℓ or more, ø40, ø50: M4 x 0.7 x 35ℓ or more) into the lock ring threads as shown above, and lightly push the bolt in the direction of the arrow (head side) to unlock.



Retraction locking direction

1) Remove the dust cover.
2) Screw a manual unlocking bolt (a conventional bolt of ø25, ø32: M3 x 0.5 x 25ℓ or more, ø40, ø50: M4 x 0.7 x 35ℓ or more) into the lock ring threads as shown above, and lightly push the bolt in the direction of the arrow (rod side) to unlock.

Maintenance

⚠ Caution

1. In order to maintain good performance, operate with clean unlubricated air.
If lubricated air, compressor oil or drainage, etc., enter the cylinder, there is a danger of sharply reducing the locking performance.

2. Do not apply grease to the piston rod.
There is a danger of sharply reducing the locking performance.

3. Never disassemble the lock unit.
It contains a heavy duty spring which is dangerous. There is also a danger of reducing the locking performance.

Series MLU
Specific Product Precautions 3
Be sure to read before handling.

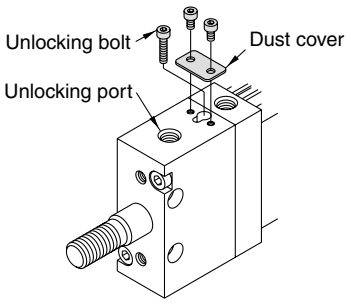
Holding the Unlocked State

⚠ Warning

1. Sizes MLU can hold the unlocked condition.

<Holding the unlocked condition>

1) Remove the dust cover.
2) Supply air pressure of 0.2MPa or more to the unlocking port, and set the lock ring to the perpendicular position.
3) Screw the unlocking bolt which is included (hexagon socket head screw ø25, ø32: M3 x 12ℓ, ø40, ø50: M4 x 16ℓ) into the lock ring to hold the unlocked condition.



2. To use the locking mechanism again, be sure to remove the unlocking bolt.

The locking mechanism will not function with the unlocking bolt screwed-in. Remove the unlocking bolt according to the procedures described in the section "Preparing for Operation".

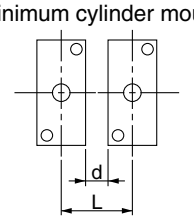
Auto Switch Handling Precautions

⚠ Warning

1. If two or more cylinders are used in close proximity, the auto switches may malfunction affected by the magnets built in the nearby cylinder.

Please keep the cylinder mounting pitch larger than the values in the table below.

Minimum cylinder mounting pitch



(mm)

Size	25	32	40	50
L (d)	33 (10)	32 (5)	36 (5)	38 (0)

When the mounting pitch is equal to or smaller than the value shown above, it has to be shielded by an iron plate or a magnetic shielding plate (Part No. MU-S025) purchased separately. Please contact SMC for more information.

Plate Cylinder with Lock

Series MLU

ø25, ø32, ø40, ø50

How to Order

Without auto switch MLU B 25 ☐ 30 D ☐ F

With auto switch MDLU B 25 ☐ 30 D ☐ F J79W S

Built-in magnet

Mounting style

B	Basic style
L	Axial foot style
F	Front flange style
G	Rear flange style
C	Single clevis style
D	Double clevis style

Size

25	Pressure receiving area equivalent to that of ø25 type
32	Pressure receiving area equivalent to that of ø32 type
40	Pressure receiving area equivalent to that of ø40 type
50	Pressure receiving area equivalent to that of ø50 type

Thread type

Nil	M thread	ø25
	Rc	ø32, ø40, ø50
TN	NPT	

Stroke (mm)

For "Standard Stroke" and "Manufacture of Intermediate of Stroke", refer to page 9-13-9.

Action

D	Double acting

Rod end shape

Nil	Rod end female thread
M	Rod end male thread

Locking direction

F	Extension locking
B	Retraction locking

Auto switch

Nil	Without auto switch (Built-in magnet)

∗For the applicable auto switch model, refer to the table below.
∗Auto switches are shipped together, (but not assembled).

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Applicable Auto Switch/Refer to page 9-15-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Rail mounting Perpendicular	Rail mounting In-line	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equiv.)	—	5V	—	—	**A76H**	●	●	—	—	IC circuit	—
				2-wire		—	200V	**A72**	**A72H**	●	●	—	—	—	Relay, PLC
			No		24V	12V	100V	**A73**	**A73H**	●	●	●	—		
						5V, 12V	100V or less	**A80**	**A80H**	●	●	—	—		
		Connector	Yes			—	—	**A73C**	—	●	●	●	●		
			No			5V, 12V	24V or less	**A80C**	—	●	●	●	●		
	Diagnostic indication (2-color display)	Grommet	Yes			—	—	**A79W**	—	●	●	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	**F7NV**	**F79**	●	●	○	—	IC circuit	Relay, PLC
				3-wire (PNP)				**F7PV**	**F7P**	●	●	○	—		
				2-wire		12V		**F7BV**	**J79**	●	●	○	—	—	
		Connector						**J79C**	—	●	●	●	●		
	Diagnostic indication (2-color display)	Grommet		3-wire (NPN)		5V, 12V		**F7NWV**	**F79W**	●	●	○	—	IC circuit	
				3-wire (PNP)				—	**F7PW**	●	●	○	—		
				2-wire		12V	—	**F7BWV**	**J79W**	●	●	○	—	—	
	Water resistant (2-color display)							—	**F7BA**	—	●	○	—		
								F7BAV	—	—	●	○	—		
	With timer			3-wire (NPN)		5V, 12V		—	**F7NT**	—	●	○	—	IC circuit	
	With diagnostic output (2-color display)			4-wire (NPN)		5V,1 2V		—	**F79F**	●	●	○	—		
	Magnetic field resistant (2-color display)			2-wire		—		—	**P5DW**	—	●	●	—	—	

∗Lead wire length symbols 0.5m·····Nil (Example) A73C
3m·····L (Example) A73CL
5m·····Z (Example) A73CZ
None·····N (Example) A73CN

∗Solid state switches marked with a "○" symbol are produced upon receipt of order.

∗D-P5DWL type can only be mounted on the types for tubing of ø40 and ø50. Only D-P5DWL is mounted when shipped.

Cylinder Specifications

Size	25	32	40	50
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.05 MPa			
Maximum operating pressure	0.7 MPa			
Minimum operating pressure	0.2 MPa Note)			
Ambient and fluid temperature	−10 to 60°C (with no freezing)			
Lubrication	Non-lube			
Cushion	Rubber bumper (Standard)			
Rod end thread tolerance	JIS class 2			
Stroke length tolerance	$^{+1.4}_{0}$			
Piston speed	50 to 500 mm/s			
Cylinder port size	M5 x 0.8	Rc, NPT, 1/8		Rc, NPT, 1/4

Note) The minimum operating pressure of the cylinder is 0.1MPa when the cylinder and lock are connected to separate ports.

Lock Specifications

Size	25	32	40	50
Locking action	Spring locking (Exhaust locking)			
Unlocking pressure	0.2 MPa or more			
Locking pressure	0.05 MPa or less			
Locking direction	One direction (Either extension locking or retraction locking)			
Maximum operating pressure	0.7 MPa			
Unlocking port connection size	M5 x 0.8	Rc, NPT, 1/8		
Holding force N (maximum static load)	245	403	629	982

Non-rotating Rod Accuracy

Size	25	32	40	50
Non-rotating rod accuracy	±1°	±0.8°	±0.5°	±0.5°

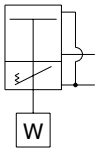
Standard Stroke

Size	Standard stroke (mm)	Max. manufacturable stroke
25, 32, 40, 50	5, 10, 15, 20, 25, 30, 35, 40, 45, 50 75, 100, 125, 150, 175, 200, 250, 300	300

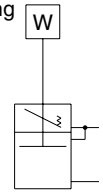
∗ Strokes other than the above are produced upon receipt of order.

JIS Symbol

Extension locking



Retraction locking



Theoretical Output

Unit: N

Size	Rod size (mm)	Actuation direction	Piston area (mm^2)
25	12	IN·OUT	378
32	14	IN·OUT	650
40	16	IN·OUT	1056
50	20	IN·OUT	1649

Size	Operating pressure (MPa)					
	0.2	0.3	0.4	0.5	0.6	0.7
25	76	113	151	189	227	265
32	130	195	260	325	390	455
40	211	317	422	528	634	739
50	330	495	660	824	989	1154

∗ Theoretical output (N) = Pressure (MPa) x Piston area (mm^2)

Weight

Unit: kg

	Size	25	32	40	50
Basic weight	Basic style	0.34	0.58	0.87	1.52
	Axial foot style	0.41	0.72	1.08	1.86
	Flange style: Front/Rear	0.44	0.72	1.10	1.98
	Single clevis style	0.40	0.70	1.09	1.92
	Double clevis style (with pin)	0.41	0.74	1.13	1.99
Additional weight per each 50mm of stroke		0.12	0.16	0.22	0.34
Attached metal weight	Single clevis style (Double clevis bracket)	0.06	0.12	0.22	0.40
	Double clevis style (Single clevis bracket)	0.07	0.16	0.26	0.47
	Single knuckle joint	0.03	0.04	0.07	0.16
	Double knuckle joint (with pin)	0.05	0.09	0.14	0.29

Note) The weights of the attached metal single clevis and double clevis include the weight of two pieces of mounting bolts.

Calculation method–Example: **MDLUL32-100**

- Basic weight····0.72 (axial foot type·size32)
- Additional weight····0.16/50 stroke
- Stroke····100 stroke

0.72 +100/50 x 0.16 = 1.04kg

Mounting Bracket Part No.

Bracket \ Size	25	32	40	50
Foot Note 1)	MU-L02	MU-L03	MU-L04	MU-L05
Flange	MU-F02	MU-F03	MU-F04	MU-F05
Single clevis	MU-C02	MU-C03	MU-C04	MU-C05
Double clevis Note 3)	MU-D02	MU-D03	MU-D04	MU-D05

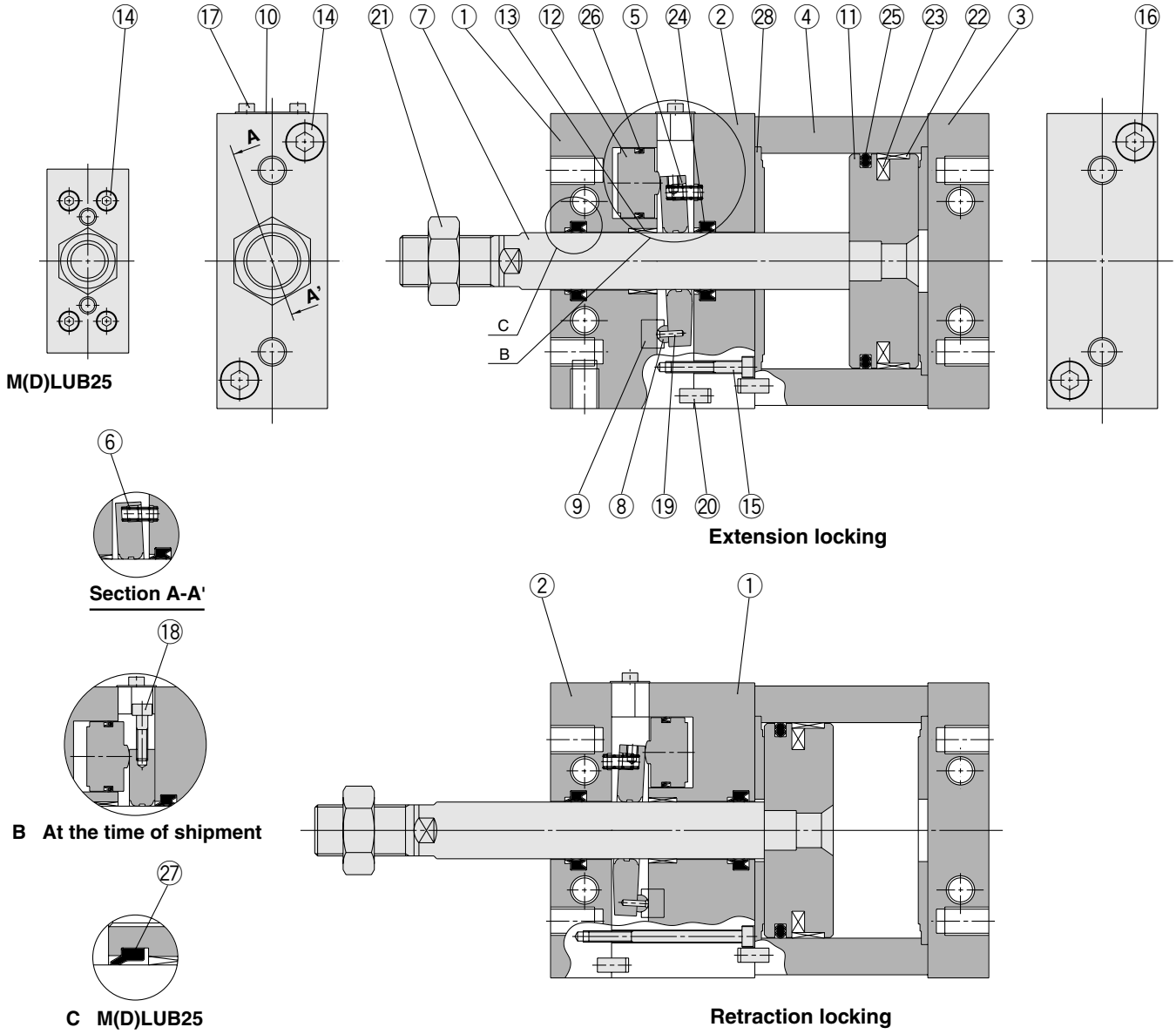
Note 1) When ordering foot brackets, order 2 pieces for each cylinder.
Note 2) The parts included with each bracket are shown below.
Foot, Flange, Single clevis/Body mounting bolt
Double clevis/Pins for clevis, C set ring for axis, Body mounting
Note 3) Clevis pin and snap ring are included with the double clevis type.

Auto Switch Mounting Bracket Part No.

Size	Bracket no.	Note	Applicable aute switch	
			Reed switch	Solid state switch
25, 32, 40, 50	BMU1-025	Auto switch mounting screw (M3 x 0.5 x 6.5ℓ) Auto switch mounting nut	D-A7□, D-A80 D-A7□H, D-A80H D-A73C, D-A80C D-A79W	D-F7□, D-J79 D-F7□V, D-J79C D-F7□W, D-J79W D-F7□WV, D-F7□F D-F7NTL D-F7BAL, F7BAVL
40, 50	BMU2-040	Auto switch mounting bracket Round head Philips screw (M3 x 0.5 x 14ℓ) Hexagon socket head cap bolt (M3 x 0.5 x 5ℓ) Flat washer, Auto switch mounting nut	—	D-P5DWL

∗ Stainless steel mounting screw kit
Use the following stainless steel mounting screw kit (includes nut) depending on the operating environment.
BBA2: D-A7/A8/F7/J7
The above stainless steel screw kit is used for auto switch D-F7BAL and D-F7BAVL when it is shipped mounted on a cylinder.
Also, BBA2 is included when a auto switch alone is shipped.

Construction



Component Parts

No.	Description	Material	Note
①	Lock body	Aluminium alloy	Hard anodized
②	Cover	Aluminium alloy	Hard anodized
③	Head cover	Aluminium alloy	Hard anodized
④	Cylinder tube	Aluminium alloy	Hard anodized
⑤	Lock ring	Carbon steel	Heat treatment
⑥	Brake spring	Steel wire	Zinc chromated
⑦	Piston rod	Carbon steel	Hard chromium electro plating
⑧	Pivot	Carbon steel	Heat treatment, zinc chromated
⑨	Pivot key	Carbon steel	Heat treatment, zinc chromated
⑩	Dust proof cover	Stainless steel	
⑪	Piston	Aluminium alloy	Chromate
⑫	Release piston	Special steel	Heat treatment
⑬	Bushing	Sinteringoil impregnated alloy	M(D)LUB25, 32
		Lead-bronze casting	M(D)LUB40, 50
⑭	Hexagon socket head cap bolt A	Stainless steel	

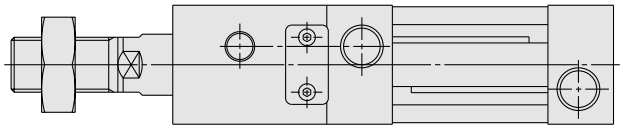
No.	Description	Material	Note
⑮	Hexagon socket head cap bolt B	Stainless steel	
⑯	Hexagon socket head cap bolt C	Stainless steel	
⑰	Hexagon socket head cap bolt D	Chrome molybdenum steel	Nickel plated
⑱	Hexagon socket head cap bolt E	Chrome molybdenum steel	Nickel plated
⑲	Spring pin	Carbon steel	JIS B2808
⑳	Parallel pin	Stainless steel	JIS B1354
㉑	Rod end nut	Rolling steel	Only for use with nickel plated rod end male thread
㉒	Wear ring	Resin	
㉓	Magnet	Magnet	Only for use with built-in magnet type
㉔	Rod seal	NBR	Use one piece with M(D)LUB25
			Use 2 pieces with M(D)LUB32~50
㉕	Piston seal	NBR	
㉖	Release piston seal	NBR	Only for use with M(D)LUB25
㉗	Scraper	NBR	
㉘	Bumper	Urethane rubber	

Series MLU

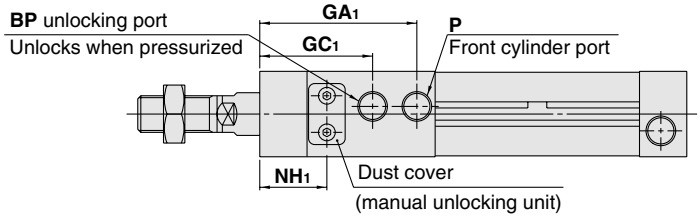
Dimensions

Basic style

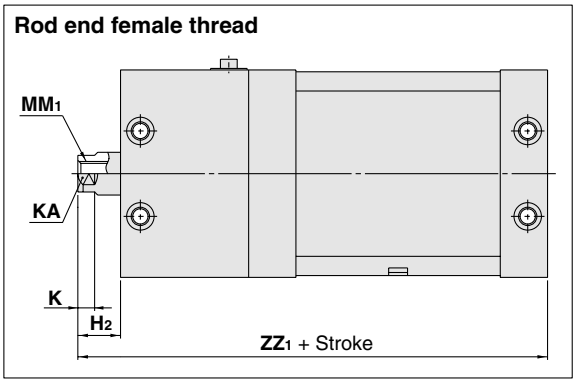
M(D)LUB40, 50



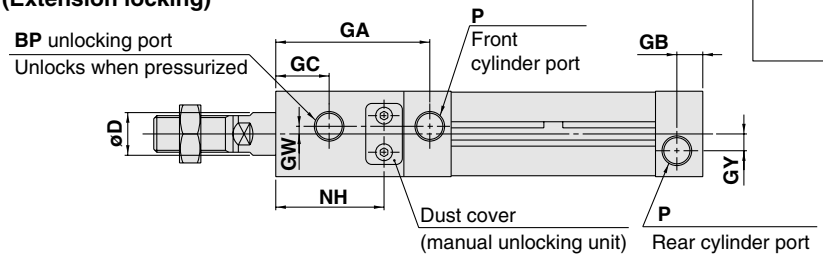
Retraction locking

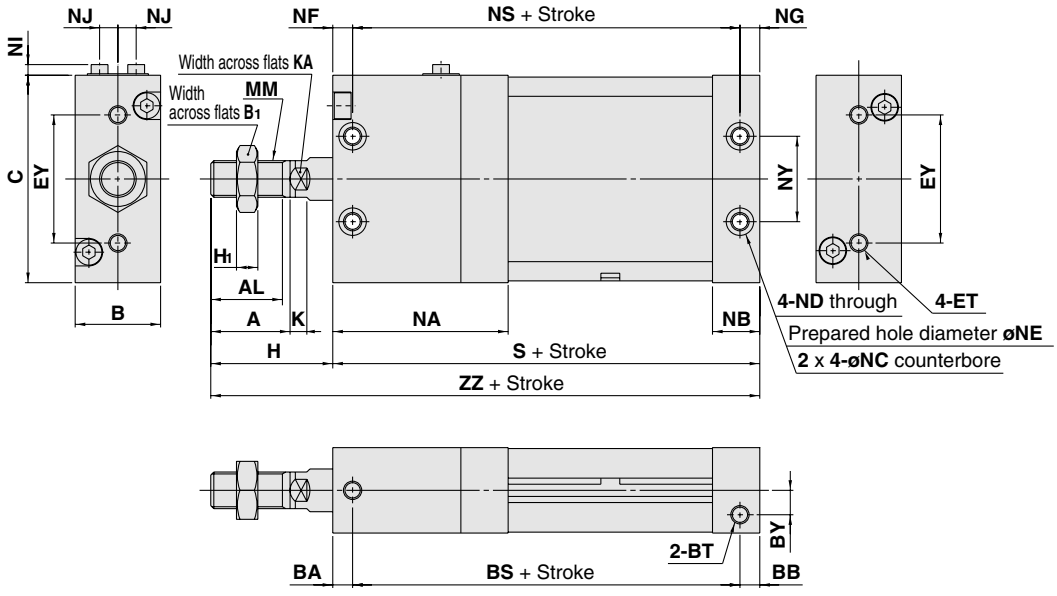


Rod end female thread



M(D)LUB25,32
(Extension locking)





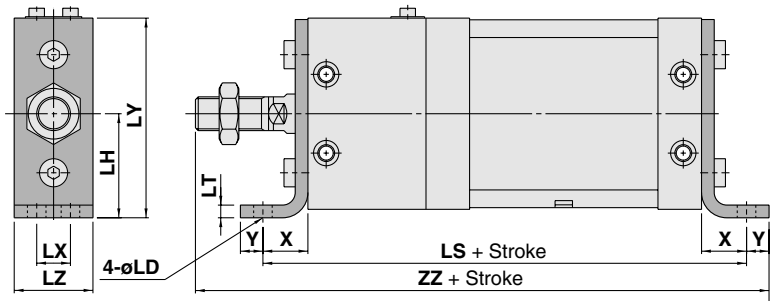
(mm)

Model	Stroke range	A	AL	B	B1	BA	BB	BP	BS	BT	BY	C	D	ET	EY	GA	GA1	GB	GC	GC1	GW	GY	H	H1
MLUB25	5 to 300	22	19.5	24	17	8	9	M5 x 0.8	73	M5 x 0.8 depth 7.5	7	54	12	M5 x 0.8 depth 11	26	45	45	10	15.5	32.5	2.5	5	36	6
MLUB32	5 to 300	26	23.5	28	19	6.5	6.5	Rc, NPT, 1/8	87	M6 x 1 depth 12	8	68	14	M6 x 1 depth 11	42	50.5	51.5	8.5	17.5	37	0	5.5	40	7
MLUB40	5 to 300	30	27	32	22	9	8	Rc, NPT, 1/8	87	M8 x 1.25 depth 13	9	86	16	M8 x 1.25 depth 11	54	53	53	9	18.5	38.5	0	7	45	8
MLUB50	5 to 300	35	32	39	27	12	10	Rc, NPT, 1/8	102.5	M10 x 1.5 depth 14.5	9	104	20	M10 x 1.5 depth 15	64	62	62	11.5	23	43	6	8	53	11

Model	H2	K	KA	MM	MM1	NA	NB	NC	ND	NE	NF	NG	NH	NH1	NI	NJ	NS	NY	P	S	ZZ	ZZ1
MLUB25	14	5.5	10	M10 x 1.25	M6 x 1 depth 12	49	14	7.5 depth 4.5	M5 x 0.8	4.3	8	6	30	19	3.5	6	76	26	M5 x 0.8	90	126	104
MLUB32	14	5.5	12	M12 x 1.25	M8 x 1.25 depth 13	57.5	15.5	9 depth 5.5	M6 x 1	5.1	6.5	6.5	35.5	22	3.5	6	87	28	Rc, NPT, 1/8	100	140	114
MLUB40	15	6	14	M14 x 1.5	M8 x 1.25 depth 13	60	16	10.5 depth 6.5	M8 x 1.25	6.9	9	8	37.5	22.5	3.5	9	87	36	Rc, NPT, 1/8	104	149	119
MLUB50	18	7	18	M18 x 1.5	M10 x 1.5 depth 15	72	21.5	13.5 depth 8.5	M10 x 1.5	8.7	12	10	44	28	3.5	9	102.5	42	Rc, NPT, 1/4	124.5	177.5	142.5

Dimensions

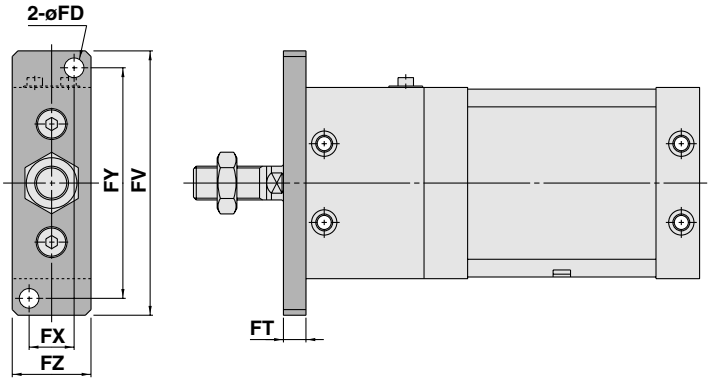
Axial foot style



(mm)

Model	LD	LH	LS	LT	LX	LY	LZ	X	Y	ZZ
MLUL25	5.5	29	114	3.2	11	56	23	12	6	144
MLUL32	6.6	37	132	4.5	12	71	27	16	8	164
MLUL40	9	46	140	4.5	15	89	31	18	10	177
MLUL50	11	57	166.5	5	18	109	37	21	11	209.5

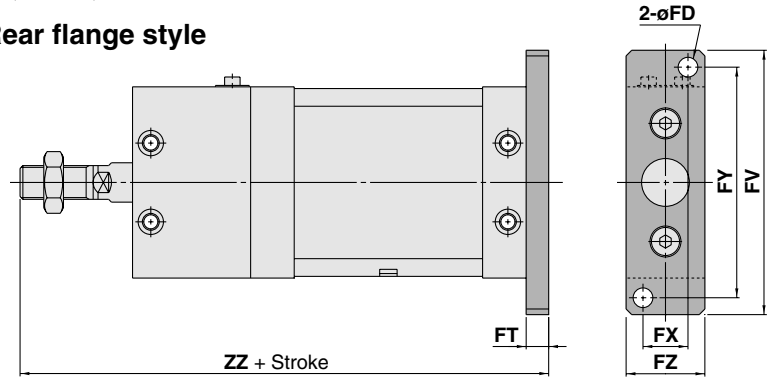
Front flange style



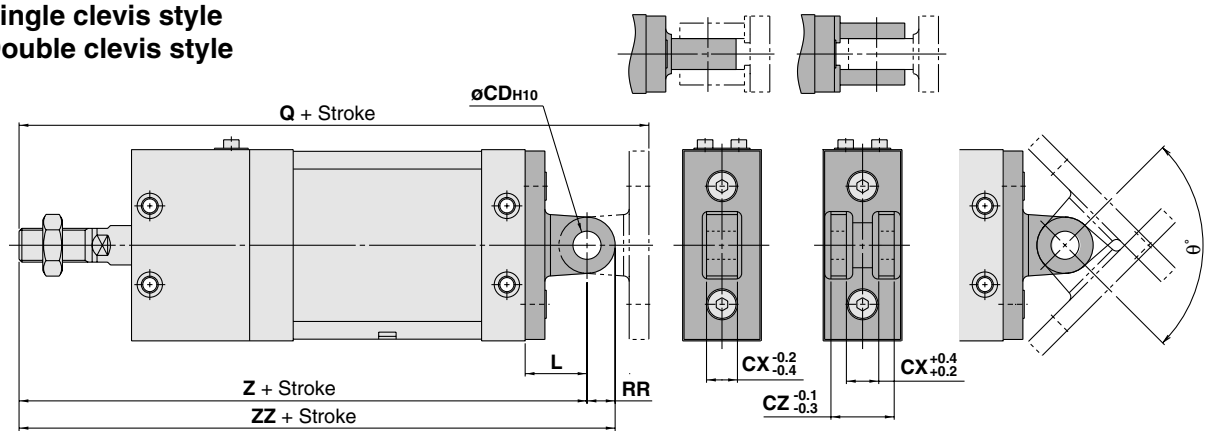
(mm)

Model	FD	FT	FV	FX	FY	FZ	ZZ
MLUF25, MLUG25	5.5	8	76	14	66	24	134
MLUF32, MLUG32	7	8	94	16	82	28	148
MLUF40, MLUG40	9	9	118	18	102	32	158
MLUF50, MLUG50	11	12	144	22	126	39	189.5

Rear flange style



Single clevis style
Double clevis style

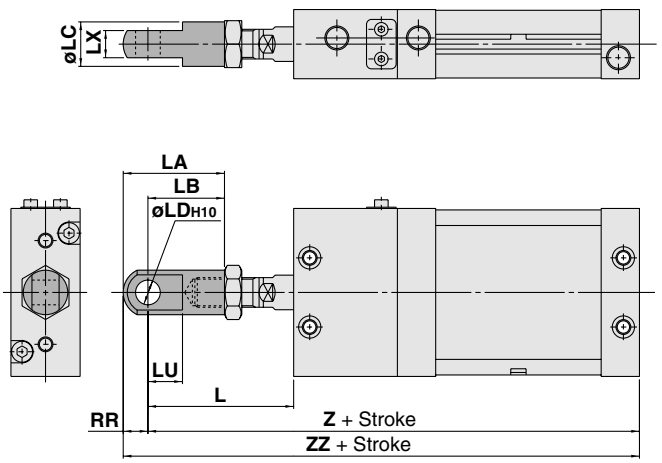


(mm)

Model	CDH10	CX	CZ	L	Q	RR	Z	ZZ	Rotation angle
MLUC25, MLUD25	$8^{+0.058}_{0}$	9	18	17	160	8	143	151	100
MLUC32, MLUD32	$10^{+0.058}_{0}$	11	22	22	184	10	162	172	90
MLUC40, MLUD40	$10^{+0.058}_{0}$	13	26	27	203	10	176	186	80
MLUC50, MLUD50	$14^{+0.070}_{0}$	16	32	32	241.5	14	209.5	223.5	80

Accessory Bracket Dimensions

Single knuckle joint

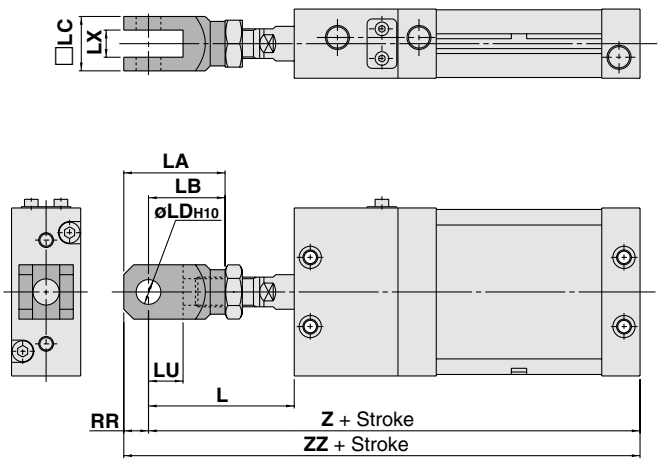


(mm)

Model	L	LA	LB	LC	LD	LU	LX	RR	Z	ZZ
MLU□25	52.5	35.5	27	16	$8^{+0.058}_{0}$	11	$9^{-0.2}_{-0.4}$	8.5	142.5	151
MLU□32	59	41	31	18	$10^{+0.058}_{0}$	14	$11^{-0.2}_{-0.4}$	10	159	169
MLU□40	67	47	36	20	$10^{+0.058}_{0}$	15	$13^{-0.2}_{-0.4}$	11	171	182
MLU□50	81	62	46	28	$14^{+0.070}_{0}$	20	$16^{-0.2}_{-0.4}$	16	205.5	221.5

The "L", "Z" and "ZZ" dimensions are reference dimensions when mounting a single knuckle joint. Please use them as guidelines.

Double knuckle joint

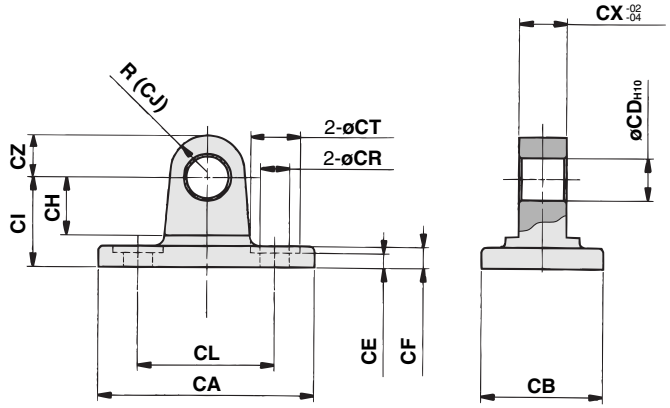


(mm)

Model	L	LA	LB	□LC	LD	LU	LX	RR	Z	ZZ	Applicable pin no.
MLU□25	52.5	35	27	18	$8^{+0.058}_{0}$	13	$9^{+0.4}_{+0.2}$	8	142.5	150.5	CD-MU02
MLU□32	59	41	31	22	$10^{+0.058}_{0}$	14	$11^{+0.4}_{+0.2}$	10	159	169	CD-MU03
MLU□40	67	46	36	26	$10^{+0.058}_{0}$	17	$13^{+0.4}_{+0.2}$	10	171	181	CD-MU04
MLU□50	81	62	46	32	$14^{+0.070}_{0}$	23	$16^{+0.4}_{+0.2}$	16	205.5	221.5	CD-MU05

The "L", "Z" and "ZZ" dimensions are reference dimensions when mounting a double knuckle joint. Please use them as guidelines.

Single clevis (Double clevis bracket)

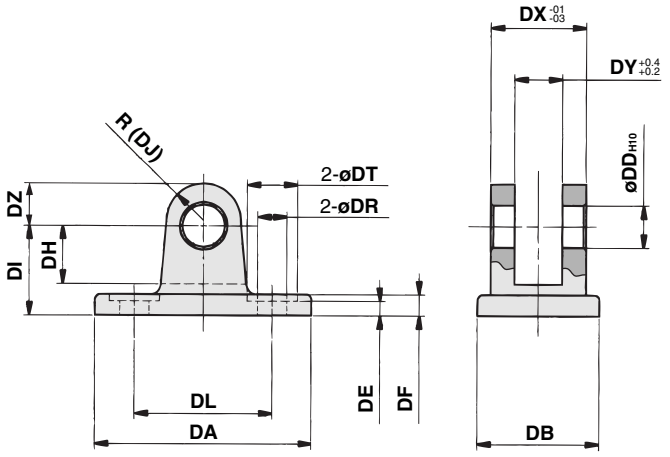


(mm)

Part no.	Size	CA	CB	CD_{H10}	CE	CF	CH	CI	CJ
MU-C02	25	53	23	$8^{+0.058}_{0}$	3.5	4	11	17	7
MU-C03	32	67	27	$10^{+0.058}_{0}$	3.5	7	13	22	10
MU-C04	40	85	31	$10^{+0.058}_{0}$	3.5	10	13	27	10
MU-C05	50	103	37	$14^{+0.058}_{0}$	5.5	12	17	32	14

Part no.	CL	CR	CT	CX	CZ
MU-C02	26	5.3	9.5	9	8
MU-C03	42	6.4	11	11	10
MU-C04	54	8.4	14	13	10
MU-C05	64	10.5	17	16	14

Double clevis (Single clevis bracket)



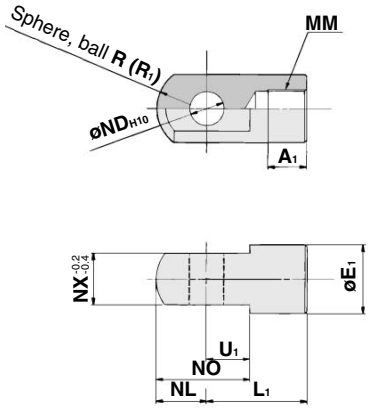
(mm)

Part no.	Size	DA	DB	DD_{H10}	DE	DF	DH	DI	DJ
MU-D02	25	53	23	$8^{+0.058}_{0}$	3.5	4	11	17	7
MU-D03	32	67	27	$10^{+0.058}_{0}$	3.5	7	13	22	10
MU-D04	40	85	31	$10^{+0.058}_{0}$	3.5	10	13	27	10
MU-D05	50	103	37	$14^{+0.070}_{0}$	5.5	12	17	32	14

Part no.	DL	DR	DT	DX	DY	DZ	Applicable pin no.
MU-D02	26	5.3	9.5	18	9	8	CD-MU02
MU-D03	42	6.4	11	22	11	10	CD-MU03
MU-D04	54	8.4	14	26	13	10	CD-MU04
MU-D05	64	10.5	17	32	16	14	CD-MU05

Clevis pins and snap rings are included with the double clevis type.

Single knuckle joint

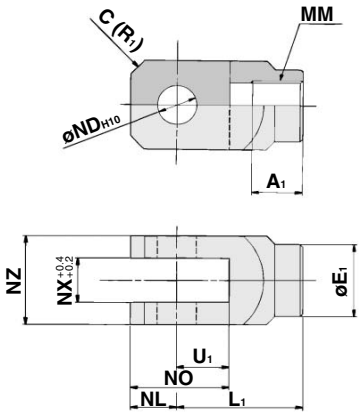


(mm)

Part no.	Size	A_1	E_1	L_1	MM
I-MU02	25	10.5	16	27	M10 x 1.25
I-MU03	32	12	18	31	M12 x 1.25
I-MU04	40	14	20	36	M14 x 1.5
I-MU05	50	18	28	46	M18 x 1.5

Part no.	ND_{H10}	NL	NO	NX	R_1	U_1
I-MU02	$8^{+0.058}_{0}$	8.5	19.5	9	8.5	11
I-MU03	$10^{+0.058}_{0}$	10	24	11	10	14
I-MU04	$10^{+0.058}_{0}$	11	26	13	11	15
I-MU05	$14^{+0.070}_{0}$	16	36	16	16	20

Double knuckle joint



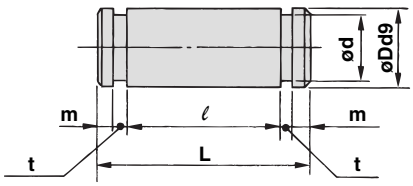
(mm)

Part no.	Size	A_1	E_1	L_1	MM	ND_{H10}
Y-MU02	25	10.5	14	27	M10 x 1.25	$8^{+0.058}_{0}$
Y-MU03	32	12	18	31	M12 x 1.25	$10^{+0.058}_{0}$
Y-MU04	40	14	20	36	M14 x 1.5	$10^{+0.058}_{0}$
Y-MU05	50	18	28	46	M18 x 1.5	$14^{+0.070}_{0}$

Part no.	NL	NO	NX	NZ	R_1	U_1	Applicable pin no.
Y-MU02	8	21	9	18	3	13	CD-MU02
Y-MU03	10	24	11	22	4	14	CD-MU03
Y-MU04	10	27	13	26	5	17	CD-MU04
Y-MU05	16	39	16	32	6	23	CD-MU05

∗ Knuckle pin and snap ring are included.

Clevis pin and knuckle pin



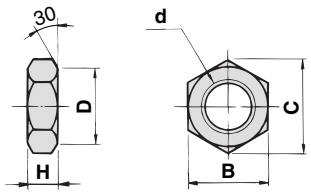
(mm)

Part no.	Size	Dd9	L	d	ℓ
CD-MU02	25	$8^{-0.040}_{-0.076}$	23	7.6	18.2
CD-MU03	32	$10^{-0.040}_{-0.076}$	27	9.6	22.2
CD-MU04	40	$10^{-0.040}_{-0.076}$	31	9.6	26.2
CD-MU05	50	$14^{-0.050}_{-0.093}$	38	13.4	32.2

Part no.	m	t	Snap ring
CD-MU02	1.5	0.9	C8 type for pivot
CD-MU03	1.25	1.15	C10 type for pivot
CD-MU04	1.25	1.15	C10 type for pivot
CD-MU05	1.75	1.15	C14 type for pivot

∗ Included with the double clevis and double knuckle joint as standard.

Rod end nut



(mm)

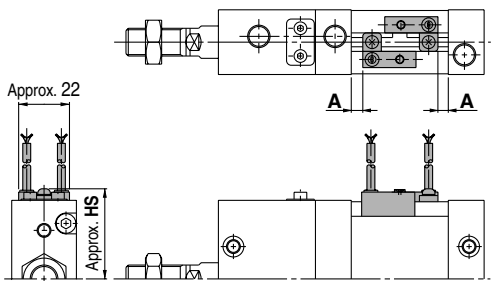
Part no.	Size	d	H	B	C	D
NT-03	25	M10 x 1.25	6	17	19.6	16.5
NT-MU03	32	M12 x 1.25	7	19	21.9	18
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50	M18 x 1.5	11	27	31.2	26

∗ One piece is included with the rod end male thread as standard.

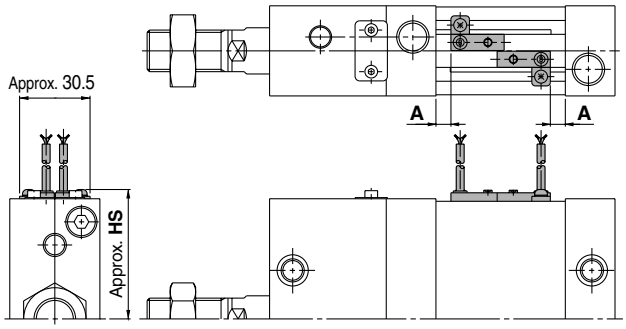
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-A7□
D-A80

ø25, ø32

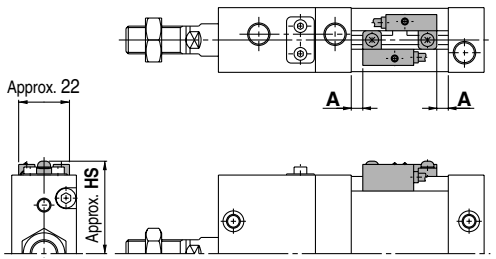


ø40, ø50

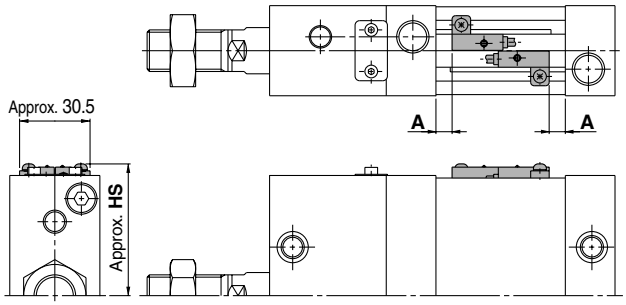


D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F
D-F7NT
D-F7BAL

ø25, ø32

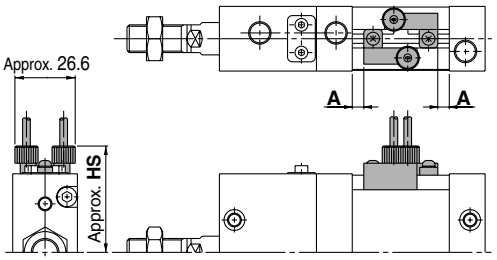


ø40, ø50

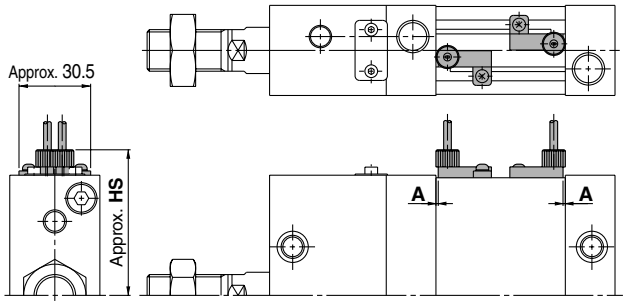


D-A73C
D-A80C
D-J79C

ø25, ø32

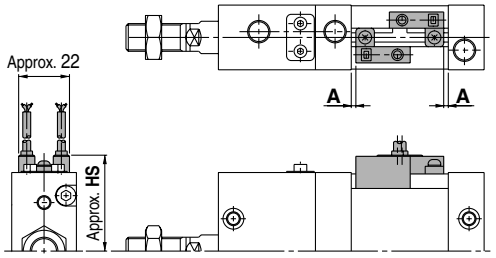


ø40, ø50

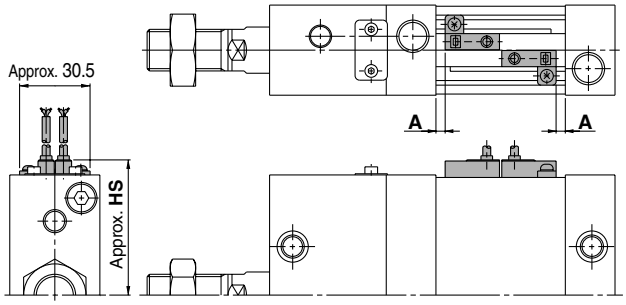


D-A79W
D-F7□WV
D-F7□V
D-F7BAVL

ø25, ø32

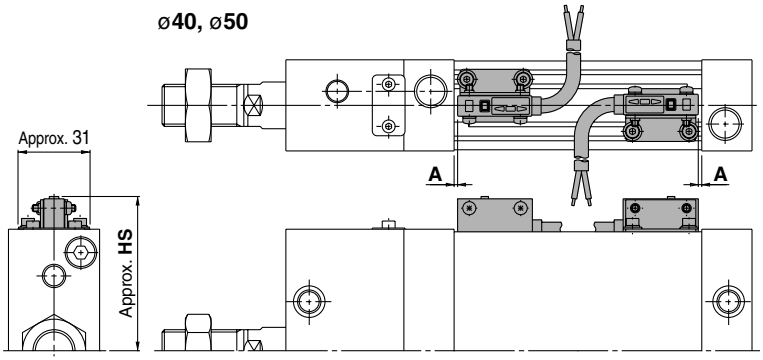


ø40, ø50



D-P5DW

ø40, ø50



Proper Auto Switch Mounting Position

(mm)

Auto switch model / Size	D-A7□ D-A80	D-A7□H D-A80H D-F7□ D-F7□V D-J79 D-F7□W D-F7□WV D-J79W D-F7BAL D-F7BAVL D-F79F	D-A73C D-A80C D-J79C	D-A79W	D-F7LF	D-F7NTL	D-P5DWL
	A	A	A	A	A	A	A
25	4.5	5	5	2	9	10	—
32	4.5	5	5	2	9	10	—
40	5	5.5	0	2.5	9.5	10.5	0.5
50	6.5	7	1	4	11	12	2

Auto Switch Mounting Height

(mm)

D-A7□ D-A80	D-A7□H D-80H D-F7□ D-J79 D-F7□W D-79W D-F7NTL D-F79F D-F7BAL	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A79W	D-P5DWL
Hs	Hs	Hs	Hs	Hs	Hs	Hs
32	33	39	35.5	37.5	34.5	—
39	40	46	42.5	44.5	41.5	—
47	48	54	50.5	52.5	49.5	56.5
56	57	63	59.5	61.5	58.5	66

Operating Range

(mm)

Auto switch model	Bore size			
	25	32	40	50
D-A7□, A80 D-A7□H, A80H D-A73C, A80C	13	13	13	13
D-A79W	13	13	14	14
D-F7□, J79 D-F7□V, J79C D-F7□W, F7□WV D-J79W, F7NTL D-F7BAL, F7BAVL D-F79F	6.5	7	6.5	6.5
D-P5DWL	—	—	5	5

∗ Hysteresis specifications are given as a guide, it is not a guaranteed range. (Tolerance ±30%)
Hysteresis may fluctuate due to the operating environment.

Minimum Stroke for Auto Switch Mounting

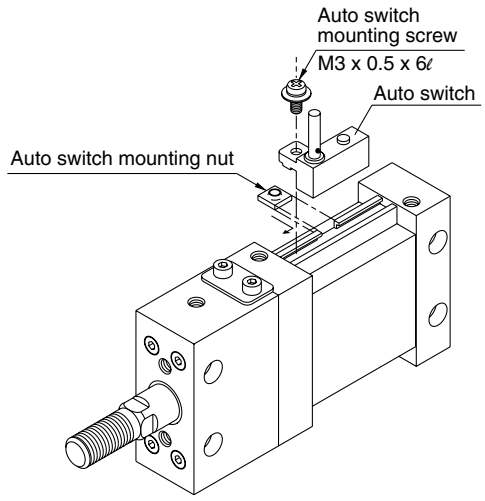
(mm)

Number of auto switches	D-F7□V D-J79C	D-A7□ D-A80 D-A73C D-A80C	D-F7□WV D-F7BAVL	D-A7□H, D-A80H D-A79W D-F7□, D-J79 D-F7□W, D-J79W D-F7BAL, D-F7NTL D-F79F	D-P5DWL∗	
					Different side(s)	Same side
2 pcs.	5	10	15	15	20	75
1 pc.	5	5	10	15	20	

∗ Only size 40 and 50 can be mounted.

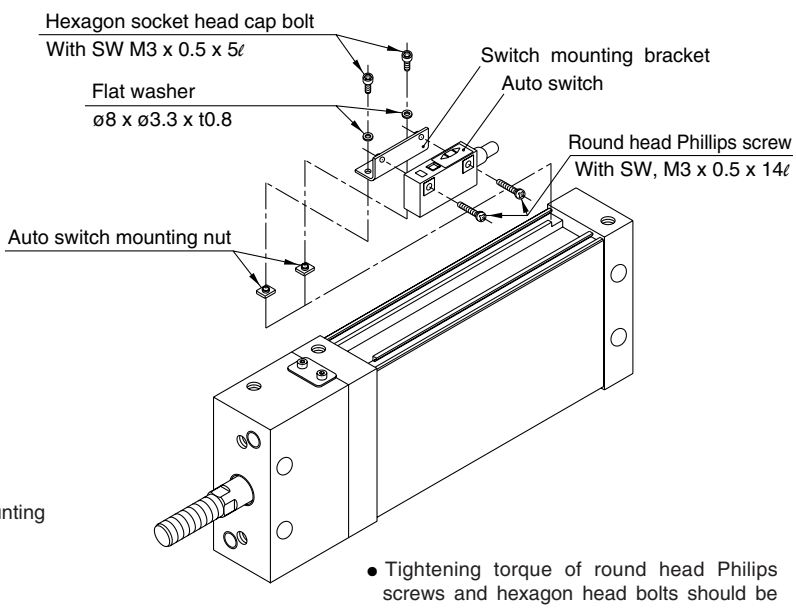
Mounting of Auto Switch

Except D-P5DWL



● Tightening torque of auto switch mounting screws should be 0.5 to 0.7N·m.

D-P5DWL



● Tightening torque of round head Philips screws and hexagon head bolts should be 0.5 to 0.7N·m.