

LINEAR SLIDE CYLINDER LCG SERIES

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New

Rust proof type
($\phi 20, 25$)



Highly accurate, rigid, and easy to use

Installation holes on two surfaces

Wide linear guide

Sliding table

Symmetric stopper

Standard port for back piping provided for all bore sizes

Cylinder switch installation groove

Improved accuracy

The linear guide's table is used for the sliding table. Accuracy is improved over conventional products.

Parallelism 0.03 mm ($\phi 12-30$ mm stroke)

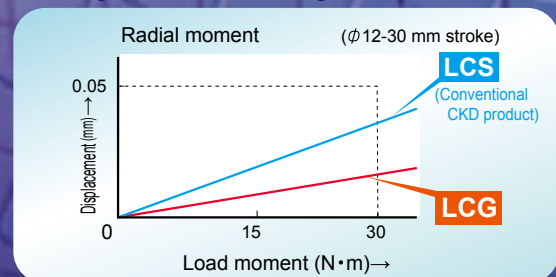
End plate perpendicularity 0.05 mm

Easier to use

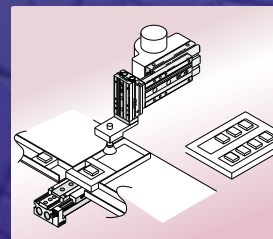
The cylinder and linear slide are now designed together, reducing design work hours. Design for symmetrical stopper installation and multiside piping improve the degree of freedom and ease of use.

Higher rigidity

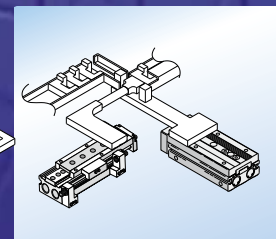
The slide table material has been changed from conventional aluminum to stainless steel or steel. Rigidity is further increased by using this slide table together with the wide guide.



Applications



Storage of small parts in tray or removal of parts from tray



Feeding of small parts

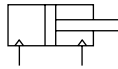
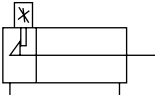

LCG Series

Linear slide cylinder

Series variation



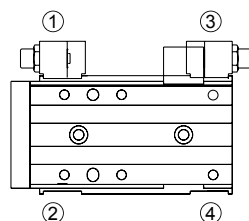
Linear slide cylinder LCG Series

Variation	Model no. JIS symbol	Bore size (mm)	Stroke length (mm)									
			10	20	30	40	50	75	100	125		150
Double acting single rod type	LCG 	ø6	●	●	●	●	●					
		ø8	●	●	●	●	●	●				
		ø12	●	●	●	●	●	●	●			
		ø16	●	●	●	●	●	●	●	●		
		ø20, ø25	●	●	●	●	●	●	●	●	●	
Double acting position locking type	LCG-Q 	ø8	●	●	●	●	●	●				
		ø12	●	●	●	●	●	●	●			
		ø16	●	●	●	●	●	●	●	●		
		ø20, ø25	●	●	●	●	●	●	●	●	●	
Double acting single rod type Clean room specifications	LCG-P7* 	ø6	●	●	●	●	●					
		ø8	●	●	●	●	●	●				
		ø12	●	●	●	●	●	●	●			
		ø16	●	●	●	●	●	●	●	●		
		ø20, ø25	●	●	●	●	●	●	●	●	●	

●: Standard ○: Option ◯: Available ■: Not available

Option																Switch	Page
Stopper for adjustable stroke						Shock absorber type stopper						With buffer		Rust proof			
Stopper position ①	Stopper position ②	Stopper position ③	Stopper position ④	Stopper position ① and ③	Stopper position ② and ④	Stopper position ①	Stopper position ②	Stopper position ③	Stopper position ④	Stopper position ① and ③	Stopper position ② and ④	Without switch groove	With switch groove	Rust proof treatment			
S1	S2	S3	S4	S5	S6	A1	A2	A3	A4	A5	A6	B	BL	U			
○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	■	○	1
○	○	■	■	■	■	○	○	■	■	■	■	○	○	○	■	○	25
○	○	○	○	○	○	■	■	■	■	■	■	■	■	■	■	○	33

● Stopper position





Safety precautions

Always read this section before starting use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanical mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.

It is important to select, use, handle, and maintain the product appropriately to ensure that the CKD product is used safely.

Observe warnings and precautions to ensure device safety.

Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part. It must be handled by an operator having sufficient knowledge and experience in handling.

2 Use this product in accordance of specifications.

This product must be used within its stated specifications. It must not be modified or machined.

This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.

Note that this product can be used when CKD is consulted prior to use and the customer consents to CKD product specifications. The customer must provide safety measures to avoid risks in the event of problems.

- ① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment, or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
- ② Use for applications where life or assets could be adversely affected, and special safety measures are required.

3 Observe corporate standards and regulations, etc., related to the safety of device design and control, etc. ISO 4414, JIS B 8370 (pneumatic system rules)

JFPS 2008 (principles for pneumatic cylinder selection and use)


Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.


4 Do not handle, pipe, or remove devices before confirming safety.


- ① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
- ② Note that there may be hot or charged sections even after operation is stopped.
- ③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
- ④ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions on the pages below to prevent accidents.

■ The safety cautions are ranked as “DANGER”, “WARNING” and “CAUTION” in this section.

 **DANGER:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, or when there is a high degree of emergency to a warning.

 **WARNING:** When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries.

 **CAUTION:** When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as “CAUTION” may lead to serious results depending on the situation. In any case, important information that must be observed is explained.

Disclaimer

1. CKD cannot be held liable for any business interruption, loss of profit, personal injury, delay cost, or any other ancillary or indirect loss, cost, or damage resulting from the use of or faults in the use of CKD products.

2. CKD cannot be held responsible for the following damage:

- ① Damage resulting from failure of CKD parts due to fire from reasons not attributable to CKD, or by intentional or negligence of a third party or customer.
- ② When a CKD product is assembled into customer equipment, damage that could have been avoided if customer equipment were provided with functions and structure, etc., generally accepted in the industry.
- ③ Damage resulting from use exceeding the scope of specifications provided in CKD catalogs or instruction manuals, etc., or from actions not following precautions for installation, adjustment, or maintenance, etc.
- ④ Damage resulting from production modifications not approved by CKD, or from faults due to combination with other software or other connected devices.



Pneumatic components

Safety precautions

Always read this section before starting use.

Refer to Pneumatic cylinders (CB-029SA) for the general details on cylinders and cylinder switch.

Design & Selection

1. Common

⚠ CAUTION

- Refer to the LCG Selection Guide on pages 47 to 50 when selecting the cylinder.
- When using the cylinder where it could be subject to water or oil exposure, where it could corrode, or where high levels of dust are present, the cylinder could be damaged or malfunction. Protect the product with a cover.
- Precautions for using type with switch
 - When using the T*V switch with the cylinder with a stopper for adjustable stroke (S3**, S4**, S5**, S6**) or shock absorber stopper (A3**, A4**, A5**, A6**), the head side switch could interfere with the stopper. Install the switch on the side opposite the stopper.

- When using a switch with a stroke of less than 30, one switch is installed in each of the two grooves on the body. Check the direction of leads in design.

- A powerful magnet placed near this product could magnetize the table and cause the switch to malfunction.

2. Position locking type LCG-Q

⚠ CAUTION

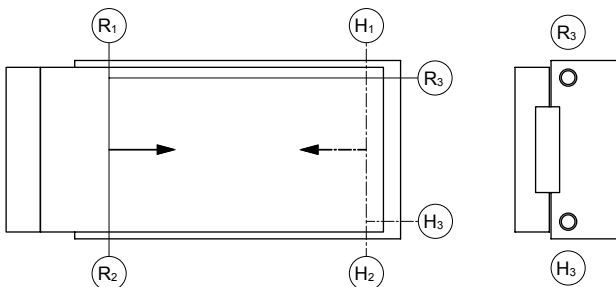
- Do not use a 3-position valve.
 - Do not use this cylinder with a 3-position valve, especially with a closed center metal seal. The lock is not applied if pressure is sealed on the port having the lock. Even if the lock is applied, air leaking from the valve may enter the cylinder or the lock may be released over time.

Installation & Adjustment

1. Common; Piping

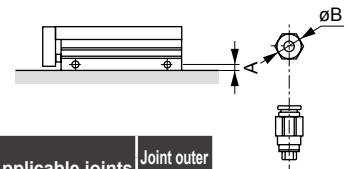
⚠ CAUTION

- When changing a piping port position, apply adhesive to M3 and M5 plug (hexagon socket head set screw). (Low intensity adhesive such as LOCTITE 222, 221, THREE BOND 1344 recommended)
- Port direction and operating direction



Ⓡ Indicates the rod side pressurized port and Ⓜ indicates head side pressurized port. All ports except for Ⓡ₁ Ⓜ₁ (or Ⓡ₂ Ⓜ₂) depending on the position of the stopper if it is ordered) will be sealed by a plug upon shipping.

- Precautions for piping joint
 - Install a flow control valve when piping. The applicable joints are shown as below.



Descriptions	Bore size (mm)	Port size	Port dimension A	Applicable joints	Joint outer diameter B
	ø6	M3	4	SC3W-M3-4 SC3WU-M3-4 SC3W-M3-3.2 SC3WU-M3-3.2 GWS3-M3-S GWS4-M3-S	ø8 or less
	ø8	M5	5.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5	ø11 or less
	ø12		5.5		
	ø16	M5	6.5	SC3W-M5-4 SC3W-M5-6 GWS4-M5-S GWS4-M5 GWL4-M5 GWL6-M5 GWS6-M5	ø13 or less
	ø20	Rc1/8	8	SC3W-6-4, 6, 8 GWS4-6 GWS8-6 GWL6-6 GWS6-6 GWL4-6	ø15 or less
	ø25		9		

Installation & Adjustment

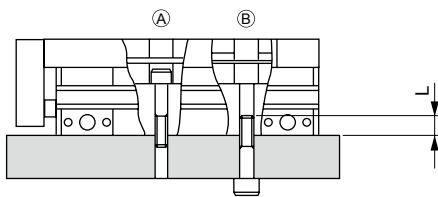
2. Common; installation

CAUTION

Do not dent or scratch or otherwise compromise flatness of the installation or table surface. Maintain flatness of the corresponding installed component on the body or table at 0.02 mm or less.

Observe the following values for the bolt insertion length and tightening torque when installing this product.

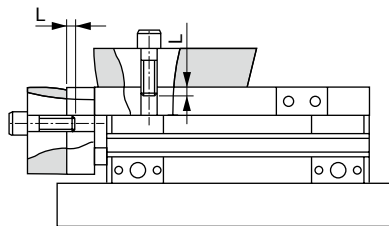
<Fig. 1>



Descriptions	A		B		Max. screw depth L (mm)
	Applicable bolts	Tightening torque (N•m)	Applicable bolts	Tightening torque (N•m)	
LCG-6	M3 x 0.5	0.6 to 1.1	M4 x 0.7	1.4 to 2.4	6
LCG-8	M3 x 0.5	0.6 to 1.1	M4 x 0.7	1.4 to 2.4	6
LCG-12	M4 x 0.7	1.4 to 2.4	M5 x 0.8	2.9 to 5.1	8
LCG-16	M5 x 0.8	2.9 to 5.1	M6 x 1.0	4.8 to 8.6	9
LCG-20	M5 x 0.8	2.9 to 5.1	M6 x 1.0	4.8 to 8.6	9
LCG-25	M6 x 1.0	4.8 to 8.6	M8 x 1.25	12.0 to 21.6	12

Observe the following bolt insertion lengths and tightening torque when installing the jig on the slide table or end plate.

<Fig. 2>

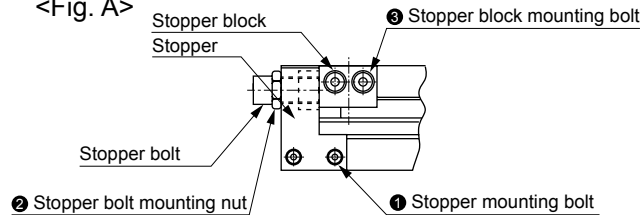


Descriptions	Table		
	Applicable bolts	Tightening torque (N•m)	Max. screw-in length L (mm)
LCG-6	M3 x 0.5	0.6	3
LCG-8	M3 x 0.5	0.6	3
LCG-12	M4 x 0.7	1.4	4
LCG-16	M5 x 0.8	2.9	5
LCG-20	M5 x 0.8	2.9	5
LCG-25	M6 x 1.0	4.8	6

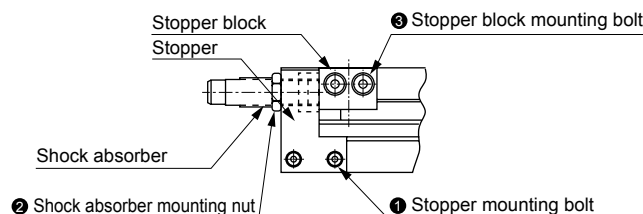
Descriptions	End plate		
	Applicable bolts	Tightening torque (N•m)	Screw-in length L (mm)
LCG-6	M3 x 0.5	0.6	4.5 to 6
LCG-8	M3 x 0.5	0.6	4.5 to 7
LCG-12	M4 x 0.7	1.4	6 to 9
LCG-16	M5 x 0.8	2.9	7.5 to 9
LCG-20	M5 x 0.8	2.9	7.5 to 11
LCG-25	M6 x 1.0	4.8	9 to 11

Observe the following values for bolts at the stopper and in nut tightening torque.

<Fig. A>



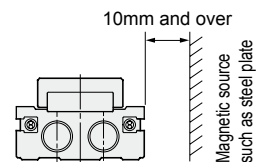
Hexagon socket set screw stopper with rubber cushion



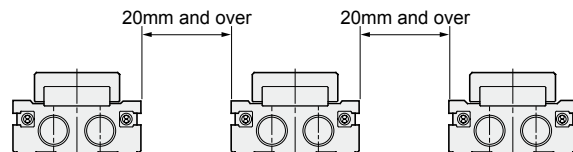
Shock absorber

Model	1 Stopper mounting bolt	2 Stopper bolt mounting nut	3 Stopper block mounting bolt
	(N•m)	(N•m)	(N•m)
LCG-6	0.4 to 0.5	1.2 to 2.0	0.6 to 0.8
LCG-8	0.4 to 0.5	1.2 to 2.0	0.6 to 0.8
LCG-12	0.6 to 0.8	1.2 to 2.0	0.6 to 0.8
LCG-16	0.6 to 0.8	3.0 to 4.0	1.4 to 1.8
LCG-20	2.9 to 3.5	4.5 to 6.0	1.4 to 1.8
LCG-25	2.9 to 3.5	4.5 to 6.0	2.9 to 3.5

Sources of magnetism such as steel plates near the cylinder switch could cause the cylinder to malfunction. Keep at least 10 mm from the cylinder. (Same for all bore size)



If cylinders are adjacent, the cylinder switch could malfunction. Check that the following distance is maintained between cylinder surfaces. (Same for all bore size)



The CKD shock absorber is treated as a consumable. Replace the shock absorber if energy absorption performance drops or if movement is no longer smooth.

When using the positioning hole, use a pin that will not pressfit. Using a pin with dimensions for pressfit may damage or lower the accuracy of the linear guide due to the pressfit load applied.

Recommended JIS tolerance is m6 or less.

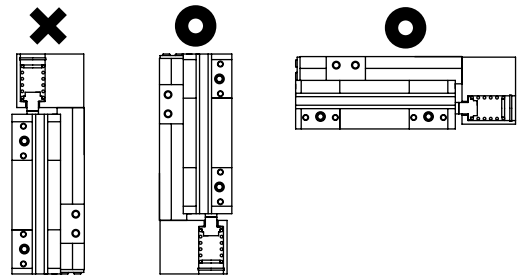
3. Position locking type LCG-Q

⚠ CAUTION

- The locking mechanism functions at the stroke end, so applying the stopper with the external stopper at mid-stroke prevents the locking mechanism from functioning and the load may drop. Before setting the load, check that the locking mechanism functions correctly.
- Supply a pressure higher than the minimum working pressure to the port having the locking mechanism.
- If piping on the side with the lock is thin and long, or if the speed controller is separated from the cylinder port, exhaust may slow, taking time for the lock to function. This may also occur if the silencer on the solenoid valve's EXH. port is clogged.

4. With buffer LCG-B

- Depending on the speed and load, the buffer may activate upon extracting and the switch may malfunction. Adjust the speed according to the speed.
- LCG-B can not be used facing vertically upwards.



- Use the buffer below the buffer stroke. It may result in damage or malfunctioning.

During Use & Maintenance

1. Common

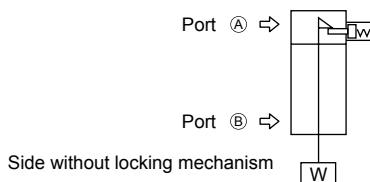
⚠ CAUTION

- Apply AFJ grease (THK) to guide rails once a month or every 1,000,000 operations, whichever is sooner.
- Check for table corrosion.
The table is made of martensitic stainless steel 6 to 16 in diameter or alloy steel 20 or 25 in diameter. Use in a hot, humid environment or contact with water due to condensation, etc., could cause rust.

2. Position locking type LCG-Q

⚠ WARNING

- If pressure is supplied to port (A) in the locked state with neither port pressurized, locks may not be releasable or may be released suddenly, causing the piston rod to pop out, which is extremely dangerous. When releasing the locking mechanism, supply pressure to port (B) and check that no load is applied to the locking mechanism.

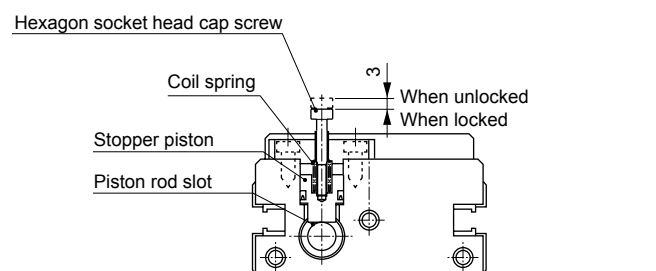


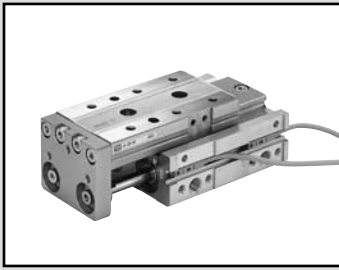
- If slower speed is to be increased with the quick exhaust valve, the cylinder may move out faster than the lock pin and prevent the lock pin from being released correctly. Do not use a quick exhaust valve with the position locking cylinder.

⚠ CAUTION

- If negative pressure is applied to the locking mechanism, the lock may be released. Use a discrete solenoid valve or use an individual exhaust manifold.

- After manually operating the locking mechanism, return the locking mechanism to the original position. Do not use a manual override except during adjustment, because this may be dangerous.
- Release the lock when installing or adjusting the cylinder.
The lock could be damaged if the cylinder is installed while the lock is applied.
- Do not use multiple cylinders synchronized.
Do not move one workpiece using more than two position locking cylinders synchronized. One of the cylinder's locks may not be released.
- Use the flow control valve with meter-out control.
Locks may not be released during meter-in control.
- Use the side with the lock with the cylinder stroke end.
If the cylinder's piston does not reach the stroke end, the lock may not be applied or may not be released.
- How to release
Screw a hexagon socket head cap screw (M3 × 20) into the stopper piston, and pull the bolt up 3 mm with a force of 20N and over. The stopper piston moves and the lock is released during horizontal no-load installation or with the rod port pressurized. When the hand is released, the stopper piston is returned by the internal spring and enters the piston rod slot, locking the cylinder.



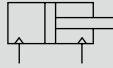


Linear slide cylinder double acting single rod type

LCG Series

● Bore size: $\varnothing 6$, $\varnothing 8$, $\varnothing 12$, $\varnothing 16$, $\varnothing 20$, $\varnothing 25$

JIS symbol



Specifications

Descriptions		LCG					
Bore size	mm	$\varnothing 6$	$\varnothing 8$	$\varnothing 12$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.15 (Note 1)					
Withstanding pressure	MPa	1					
Ambient temperature	°C	-10 to 60 (to be unfrozen) (Note 2)					
Port size	Body side surface	M3	M5			Rc1/8	
	Rear body	M3			M5	Rc1/8	
Stroke tolerance	mm	+ 2.0 0 (Note 3)					
Working piston speed	mm/s	50 to 500 (Note 4)					
Cushion		Rubber cushioned					
Lubrication		Not required (when lubricating, use turbine oil Class one ISOVG 32.)					
Allowable energy absorption	J	Refer to the table 3 on Page 47.					

Note 1: 0.2 MPa when using the shock absorber stopper 6 in diameter.

Note 2: The maximum temperature is 50°C when the switch 6 in diameter is used -- 45°C when installing on a steel plate.

Note 3: When not using a stopper, a slight gap may exist between the end plate and floating bushing.

Note 4: Use the stopper for adjusting the stroke between 50 and 200 mm/s.

Stroke length

Bore size (mm)	Standard stroke length (mm)
$\varnothing 6$	10, 20, 30, 40, 50
$\varnothing 8$	10, 20, 30, 40, 50, 75
$\varnothing 12$	10, 20, 30, 40, 50, 75, 100
$\varnothing 16$	10, 20, 30, 40, 50, 75, 100, 125
$\varnothing 20$	10, 20, 30, 40, 50, 75, 100, 125, 150
$\varnothing 25$	10, 20, 30, 40, 50, 75, 100, 125, 150

Note: Stroke length other than above is not available.

Specification with buffer

Specifications other than the ones shown below are the same as the specifications shown on the table above.

Descriptions		LCG with buffer					
Bore size	mm	$\varnothing 6$	$\varnothing 8$	$\varnothing 12$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$
Buffer stroke	mm	4		9		10	
Buffer spring load	Setting N	3	5	10	13	17	21
	Operating N	7	8	14	20	25	29

Note 1: Rod side stroke adjustment by a type with buffer shortens buffer stroke length as much as adjusted stroke length. This also results in higher spring load at setting.

Note 2: Use buffer stroke below the above stroke length. There is a risk of malfunction and damage.

Switch specifications

● 1/2 color indicator *T0/T5 switch can be used with AC220V. Contact CKD for working conditions.

Descriptions	Reed 2 wire				Proximity 2 wire		Proximity 3 wire	
	T0H/T0V		T5H/T5V		T2H/T2V	T2WH/T2WV	T3H/T3V	T3WH/T3WV
Applications	PLC, relay		PLC, relay, IC circuit (without indicator light, serial connection)		Programmable Controller dedicated		Programmable Controller and relay	
Output type	-		-		-		NPN output	
Power voltage	-		-		-		10 to 28V DC	
Load voltage	12/24VDC	110VAC	5/12/24VDC	110VAC	10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 20mA		100mA or less	50mA or less
Light	LED (ON lighting)		Without indicator light		LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	0mA				1mA or less		10µA or less	

Descriptions	Proximity 2 wire		Proximity 3 wire		Proximity 2 wire		Proximity 3 wire	
	F2S		F3S		F2H/F2V	F2YH/F2YV	F3H/F3V	F3YH/F3YV
Applications	PLC only		PLC, relay		PLC only		PLC only	
Output type	-		NPN output		-		NPN output	
Power voltage	-		DC10 to 28V		-		10 to 28V DC	
Load voltage	DC10 to 30V		DC30V or less		10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 20mA		50mA or less		5 to 20mA		100mA or less	50mA or less
Light	Red LED (ON lighting)				LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	1mA or less		10µ or less		1mA or less		10µA or less	

Cylinder weight

● Basic type

(Unit: g)

Bore size (mm)	Basic type stroke (mm)								
	10	20	30	40	50	75	100	125	150
ø6	150	150	170	230	250	-	-	-	-
ø8	220	220	250	330	360	450	-	-	-
ø12	480	480	480	530	580	770	910	-	-
ø16	750	740	730	810	890	1,240	1,430	1,630	-
ø20	1,270	1,260	1,250	1,370	1,490	1,930	2,220	2,510	2,800
ø25	2,120	2,100	2,080	2,260	2,440	3,240	3,660	4,080	4,500

● Additional weight for options

(Unit: g)

Bore size (mm)	Option, stopper symbol				W/ buffer
	S1 to S4	S5/S6	A1 to A4	A5 to A6	B to BL
ø6	30	40	40	50	40
ø8	40	60	50	70	40
ø12	70	100	80	110	70
ø16	110	150	120	160	80
ø20	170	250	180	270	150
ø25	290	380	300	400	320

How to order

Without switch



With switch



Model no.

A Bore size

B Stroke length

D Switch quantity

C Switch model no.

⚠ Note on model no. selection

Note 1: Use stopper parts for the adjustable stroke on page 6 when changing the adjustable stroke range.

Note 2: When using a shock absorber, refer to the stopper dimensions table on page 23 for the adjustable stroke range.

Note 3: Refer to stopper dimensions on page 23 for port locations.

Note 4: If no stopper is provided, the standard port locations are (1) and (3) below.

Note 5: The stopper for adjustable stroke and shock absorber stopper combination is available as a customized part.

Note 6: Selectable only when using a stopper.

Note 7: Refer to page 5 to find out how to order a switch for the buffer section.

Note 8: Refer to the selection table on page 4 for option combinations.

Note 9: A1**, A2**, A5**, and A6** at $\phi 6$ to $\phi 8$ -10st or $\phi 12$ to $\phi 25$ -20st or less cannot be adjusted with the standard stopper, and are available only as customized parts.

Note 10: When installing two switches with $\phi 6$ -10st S*** or A***, select the F*H switch.

Note 11: Rust proof type with a bore size of $\phi 6$ to $\phi 16$ are custom orders.

Note 12: F2S, F3S switches will be enclosed with the cylinder. Please contact our sales if you need to have the switches assembled to the cylinder.

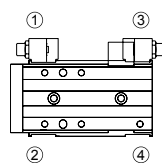
<Example of model number>

LCG-12-40-F2H-R-A1DT

Model: Linear slide cylinder double acting single rod type LCG

- A** Bore size : $\phi 12$
- B** Stroke length : 40mm
- C** Switch model no. : Proximity and 2 wire Axial lead wire
- D** Switch quantity : With one on rod end
- E** Other options : shock absorber type
Stopper position ①
With side or base port
Material, alloy steel (nitriding)

● Stopper position



Symbol	Descriptions
A Bore size	
6	$\phi 6$
8	$\phi 8$
12	$\phi 12$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$

		Bore size (ϕ)					
		6	8	12	16	20	25
10	10	●	●	●	●	●	●
20	20	●	●	●	●	●	●
30	30	●	●	●	●	●	●
40	40	●	●	●	●	●	●
50	50	●	●	●	●	●	●
75	75		●	●	●	●	●
100	100			●	●	●	●
125	125				●	●	●
150	150					●	●

C Switch model no.							Bore size					
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$		
F2S		Proximity	One color indicator	2-wire								
F3S				3-wire	●	●	●					
F2H*	F2V*			2-wire								
F3H*	F3V*			3-wire	●	●	●					
F2YH*	F2YV*			2-wire								
F3YH*	F3YV*	3-wire	2 color indicator									
T0H*	T0V*	Reed	No indicator	2-wire								
T5H*	T5V*											
T2H*	T2V*	Proximity	One color indicator	2-wire				●	●	●		
T3H*	T3V*			3-wire								
T2WH*	T2WV*			2-wire								
T3WH*	T3WV*	3-wire	2 color indicator									

*Lead wire length		$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Blank	1m (standard)			●			
3	3m (option)			●			
5	5m (option)						●

D Switch quantity	
R	One on rod end
H	One on head end
D	Two

E Option	
Blank	No option

S Stopper for adjustable stroke		Stopper installation position
Adjustable stroke single side 5mm		
Note 1, Note 5, Note 7		
S1**	Stopper position ① (Changeable to ④)	
S2**	Stopper position ② (Changeable to ③)	
S3**	Stopper position ③ (Changeable to ②)	
S4**	Stopper position ④ (Changeable to ①)	
S5**	Stopper position ① and ③	
S6**	Stopper position ② and ④	

A Shock absorber type stopper		Stopper installation position
Note 2, Note 5, Note 7		
A1**	Stopper position ① (Changeable to ④)	
A2**	Stopper position ② (Changeable to ③)	
A3**	Stopper position ③ (Changeable to ②)	
A4**	Stopper position ④ (Changeable to ①)	
A5**	Stopper position ① and ③	
A6**	Stopper position ② and ④	

** section	
Blank	Port at stopper section: no port
D	Port at stopper section: with side or base port Note 3, Note 6
Blank	Stopper block material: Rolled steel
T	Stopper block material: Alloy steel (nitriding) Note 6

B With buffer		Note 7, Note 8
B	Without switch groove	
BL	With switch groove	

U Rust proof treatment	
Blank	None
U	Rust proof treated (Guide section only) Note 11

LCG Double acting, single rod selection table

(Combination with stopper for adjustable stroke and shock absorber stopper)

○: Available -: Not available

Model no. symbol	Option symbol		Stopper for adjustable stroke						Shock absorber type stopper					
	Bore size	Stroke length	S1	S2	S3	S4	S5	S6	A1	A2	A3	A4	A5	A6
LCG	ø6, ø8	10	○	○	○	○	○	○	-	-	○	○	-	-
		20 and over	○	○	○	○	○	○	○	○	○	○	○	○
	ø12 to ø25	10 to 20	○	○	○	○	○	○	-	-	○	○	-	-
		30 and over	○	○	○	○	○	○	○	○	○	○	○	○

Option symbol D: with stopper section port and T: stopper block alloy steel (nitriding) combined as shown in the selection table above.

How to order switch

If $\varnothing 6$ to $\varnothing 12$

SW - F2H

Switch model no.
(Page 27 item ©)

If $\varnothing 16$ to $\varnothing 25$

SW - T2H3

Switch model no.
(Page 27 item ©)

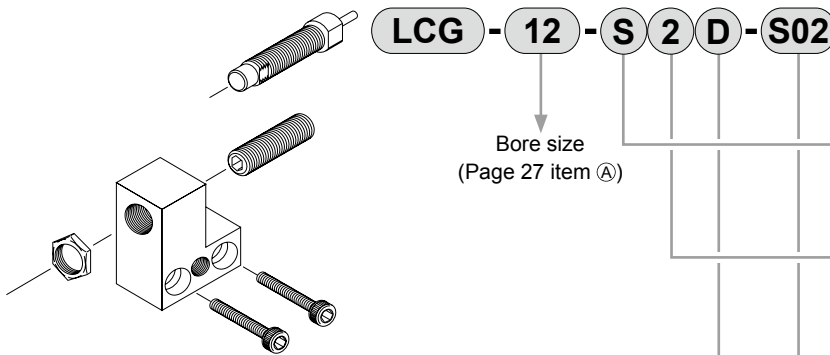
● For buffer

F 2 V 3

Output	
2	DC proximity 2 wire
3	DC proximity 3 wire
Lead wire L type	
Lead wire length	
Blank	1m (Standard)
3	3m (Option)

How to order stopper set

- Stopper section and stopper for adjustable stroke or shock absorber stopper set
- Use when changing from standard to stopper for adjustable stroke or with shock absorber stopper



Bore size
(Page 27 item A)

A Stopper type	
S	Stopper for adjustable stroke
A	Shock absorber type stopper
B Stopper installation position Note 1	
1	For stopper position ① or ④
2	For stopper position ② or ③
C Port at stopper section	
Blank	No port
D	With side and bottom ports
D Stroke adjustment Note 3 ,Note3	
Blank	Stroke adjustment range 5mm
S02	Stroke adjustment range 15mm
S03	Stroke adjustment range 25mm

Note 1: Refer to the table below when attaching to stopper mounting position ① or ② since extra parts may be required.

Note 2: "S03" is not available for $\varnothing 6$ and $\varnothing 8$.

Note 3: Not available for shock absorber type stopper "A".

-: not available

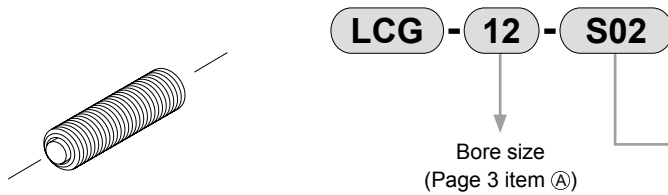
Precautions for ordering stopper set

S01 is included in the stopper for adjustable stroke parts for the stopper for adjustable stroke set.
When installing at position ① or ② (refer to page 3), add parts shown on the right based on the stroke or adjustable stroke length.

Model no. symbol	Option symbol		Discrete stopper for adjustable stroke		
	Bore size	Stroke length	Adjustable stroke length (mm)		
			-5	-15	-25
LCG Series	$\varnothing 6, \varnothing 8$	10	S02	-	-
		20 and over	Addition not required	S02	-
	$\varnothing 12$ to $\varnothing 25$	10	S03	-	-
		20	S02	S03	-
		30 and over	Addition not required	S02	S03

How to order the discrete stopper for adjustable stroke

- Hexagon socket head set screw with urethane
- Use for changing the adjustable stroke range or setting to the middle stroke



A Adjustable stroke range	
S01	Single 5mm (standard)
S02	Single 15mm
S03	Single 25mm

Designate S01, S02, or S03 for (A).

Note: S03 is not used for $\phi 6$ or $\phi 8$.

Depending on the type, the incompatible models or adjustable stroke ranges may differ from the above values.

Precautions for ordering discrete stopper

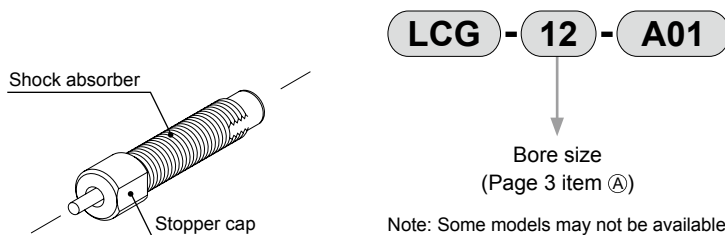
Only when installing the discrete stopper for an adjustable stroke or discrete shock absorber stopper at installation position ① or ② (refer to page 3), the combination will be as shown on the right depending on the stroke or adjustable stroke length.

-: combination not available

Model no. symbol	Option symbol		Discrete stopper for adjustable stroke			Discrete shock absorber type stopper
			Adjustable stroke length (mm)			
	Bore size	Stroke length	-5	-15	-25	
LCG Series	$\phi 6, \phi 8$	10	S02	-	-	-
		20 and over	S01	S02	-	A01
-S1, S2, S5, S6	$\phi 12$ to $\phi 25$	10	S03	-	-	-
-A1, A2, A5, A6		20	S02	S03	-	-
		30 and over	S01	S02	S03	A01

How to order the discrete shock absorber stopper

- Sets of shock absorber and stopper cap
- Use for changing from the stopper for an adjustable stroke to the shock absorber stopper.



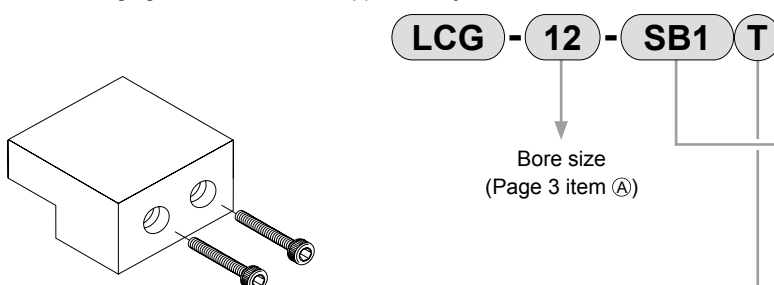
Note: Some models may not be available depending on the type. Refer to Page 3. Refer to Page 21 for adjustable stroke range of a shock absorber type stopper.

Applicable shock absorber model No.

Model	Shock absorber model no.
LCG-6	NCK-00-0.1
LCG-8	NCK-00-0.3
LCG-12	NCK-00-0.3
LCG-16	NCK-00-0.7
LCG-20	NCK-00-1.2
LCG-25	NCK-00-1.2

Discrete stopper block model no. display

- Use when changing from standard to stopper for adjustable stroke or with shock absorber stopper

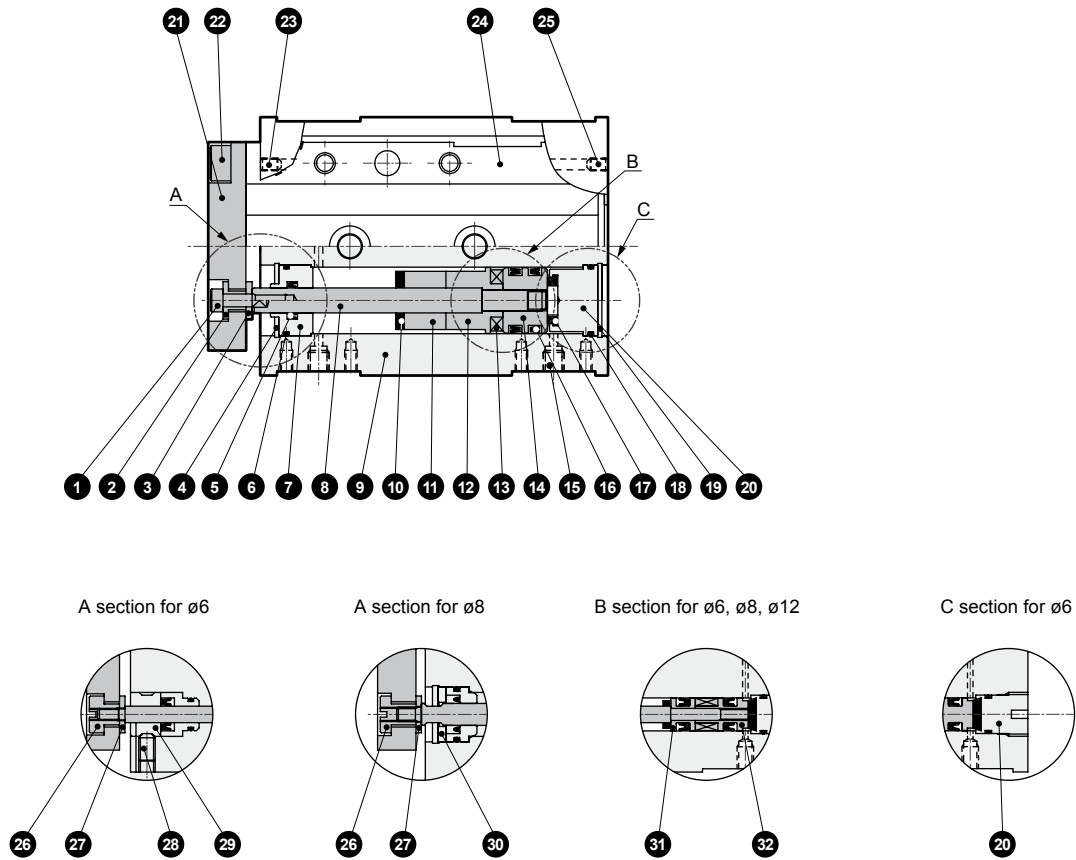


A Stopper block	
SB1	$\phi 6, \phi 8$: 30 mm stroke or less
	$\phi 12$ to $\phi 25$: 50 mm stroke or less
SB2	$\phi 6, \phi 8$: 40 mm stroke and over
	$\phi 12$ to $\phi 25$: 75 mm stroke and over

B Material	
Blank	Stopper block material: Rolled steel
T	Stopper block material: Alloy steel (nitriding)

Internal structure and parts list

● LCG



Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Hexagon socket head cap screw	Alloy steel	Zinc chromate	17	Cushion rubber (H)	Urethane rubber	
2	Floating bush A	Alloy steel	Zinc chromate	18	Guard gasket	Nitrile rubber	
3	Floating bush B	Stainless steel		19	C type snap ring	ø8: steel ø12 to 25: Stainless steel	Only ø8 to 25
4	C type snap ring	ø8: Steel ø12 to 25: Stainless steel	Only ø8 to 25	20	Guard	Aluminum alloy	Chromate
5	Rod packing seal	Nitrile rubber		21	End plate	Aluminum alloy	Alumite
6	Metal gasket	Nitrile rubber		22	Hexagon socket head cap screw	Alloy steel	Zinc chromate
7	Rod bushing	Aluminum alloy	Alumite	23	Plug	Stainless steel	
8	Piston rod	Stainless steel		24	Table	ø6 to 16: Stainless steel ø20, 25: Steel	
9	Cylinder body	Aluminum alloy	Hard alumite	25	Hexagon socket head set screw	Stainless steel	
10	Cushion rubber (R)	Urethane rubber		26	Floating bush A	Stainless steel	
11	Spacer	Aluminum alloy	ø6: Only 10, 40, 50st ø8: Only 10st ø12, 16, 20, 25: Only 10, 20st	27	Floating bush B	Stainless steel	
12	Magnet spacer	Aluminum alloy	Chromate	28	Hexagon socket head set screw	Stainless steel	Only ø6
13	Magnet	Plastic		29	Rod bushing A	Stainless steel	
14	Piston	Aluminum alloy	Chromate	30	Cap	Aluminum alloy	Chromate
15	Plug	Stainless steel		31	Piston A	Aluminum alloy	Chromate
16	Piston packing seal	Nitrile rubber		32	Piston B	Aluminum alloy	Chromate

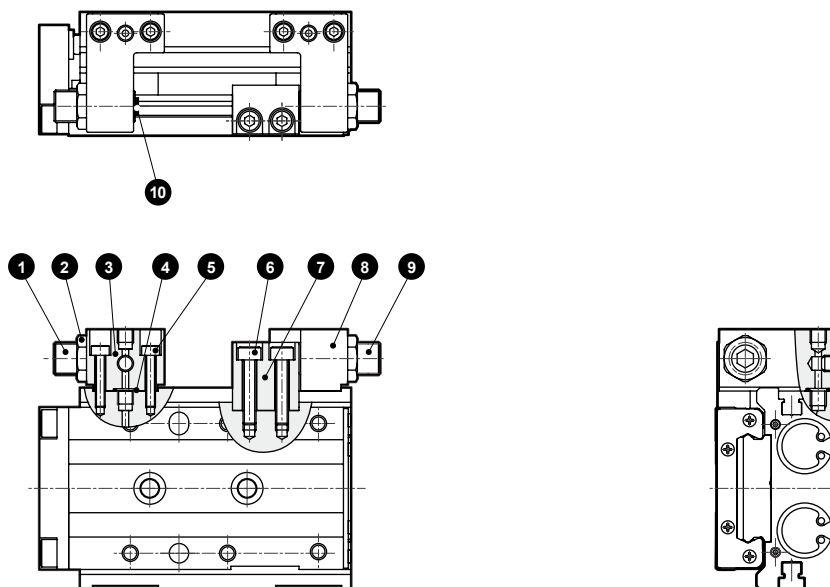
Repair parts list

Bore size (mm)	Kit No.	Repair parts number
ø6	LCG-6K	
ø8	LCG-8K	
ø12	LCG-12K	
ø16	LCG-16K	
ø20	LCG-20K	
ø25	LCG-25K	

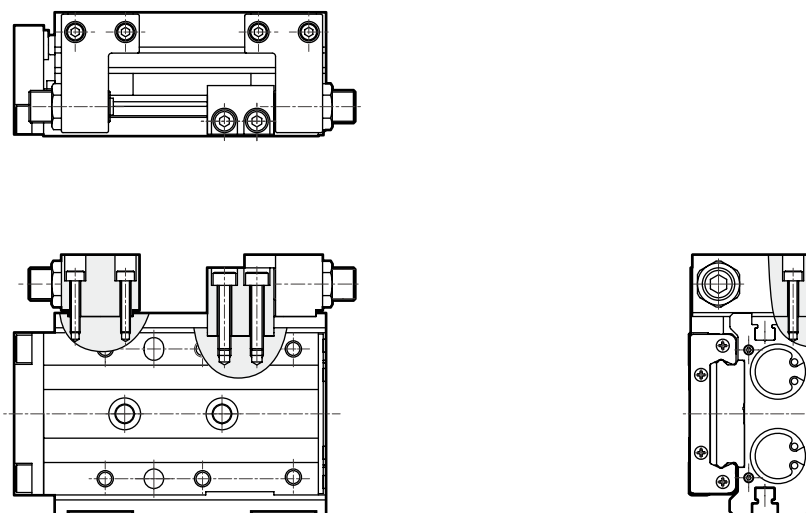
Internal structure and parts list

Configuration with stopper

● Type with stopper section port on side or base (Symbol D)



● Type without stopper section port



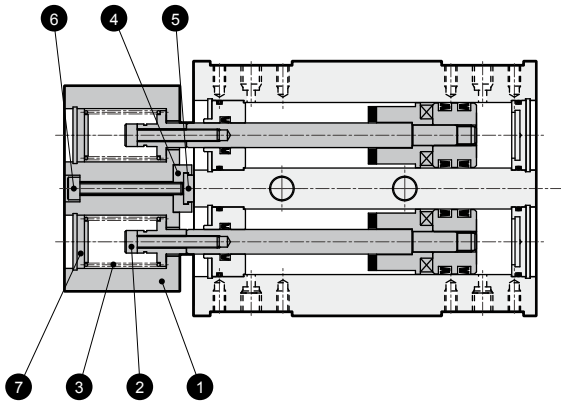
Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Stopper bolt	Alloy steel	Nickeling	7	Stopper block (stopper block symbol: blank)	Steel	Nickeling
2	Hexagon nut	Alloy steel	Nickeling		Stopper block (stopper block symbol: T)	Alloy steel	Nitriding
3	Stopper A	Aluminum alloy	Alumite	8	Stopper B	Aluminum alloy	Alumite
4	Gasket	Urethane rubber		9	Stopper bolt	Alloy steel	Nickeling
5	Hexagon socket head cap screw	Alloy steel	Zinc chromate	10	Cushion rubber	Urethane rubber	
6	Hexagon socket head cap screw	Alloy steel	Zinc chromate				

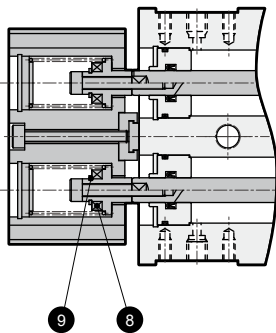
Internal structure and parts list

LCG-*-*-B*

- With buffer, without switch groove



- With buffer and switch groove



Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	End plate	Aluminum alloy	Alumite	6	C type snap ring	ø6, 8: Steel ø12 to 25: Stainless steel	
2	Hexagon socket head cap bolt	Alloy steel	Zinc chromate				
3	Coil spring	Steel		7	Cover	Aluminum alloy	Chromate
4	Stopper	6:Stainless steel ø8 to 25:Aluminum alloy		8	Magnet	Plastic	
5	Cushion rubber	Urethane rubber		9	E ring	ø6 to 12: Stainless steel ø16 to 25: Steel	

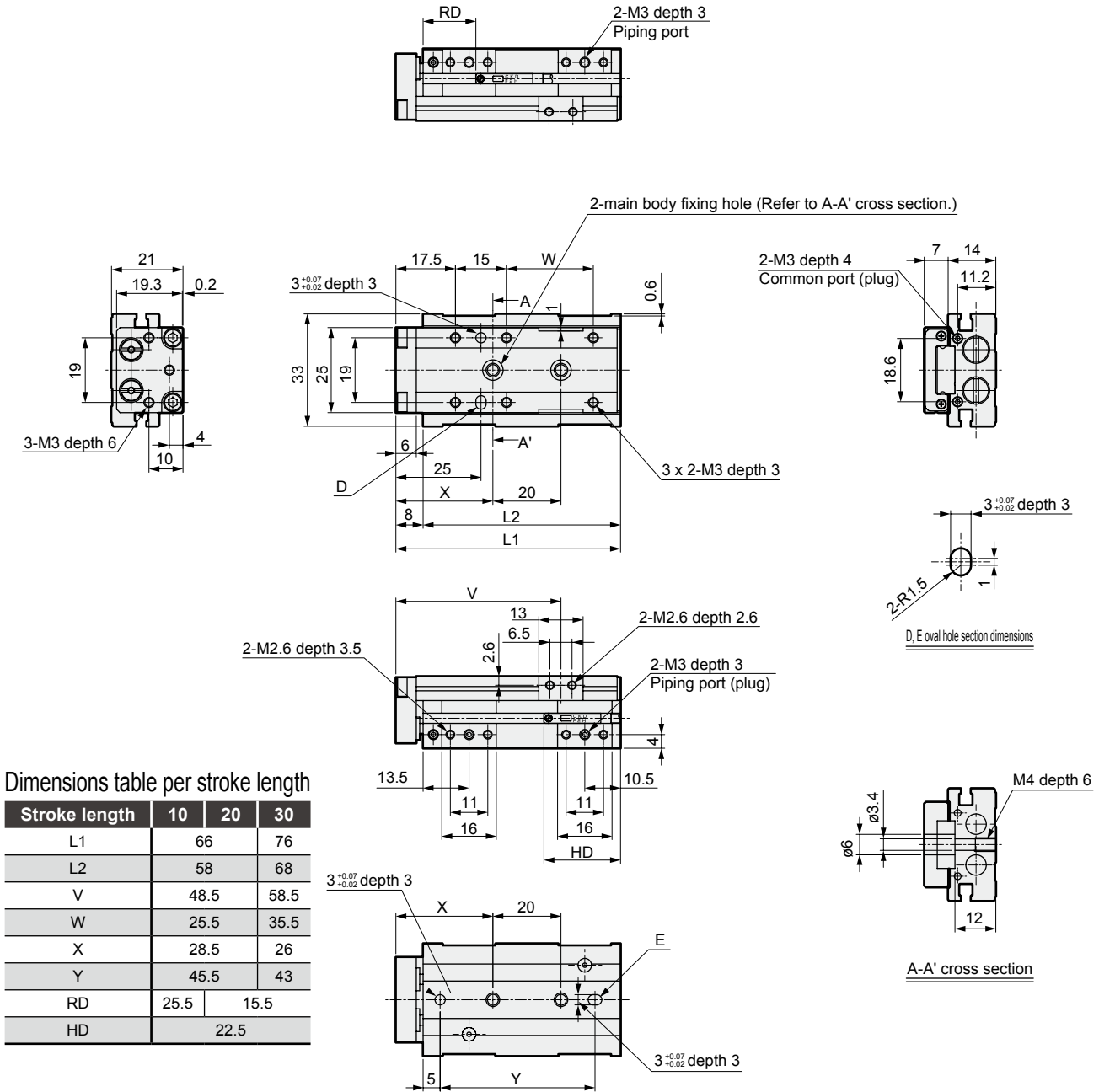
MEMO

Dimensions (bore size: $\phi 6$)

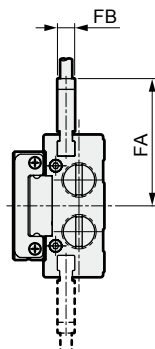
● LCG-6

Stroke length: 10, 20, 30

(Main fixing holes in this drawing are for the 20 mm stroke.)



● Projection when F2S, F3S switch is mounted.



Stroke	10	20	30
FA	29.6		
FB	4		
RD	24.5	14.5	
HD	23.5		

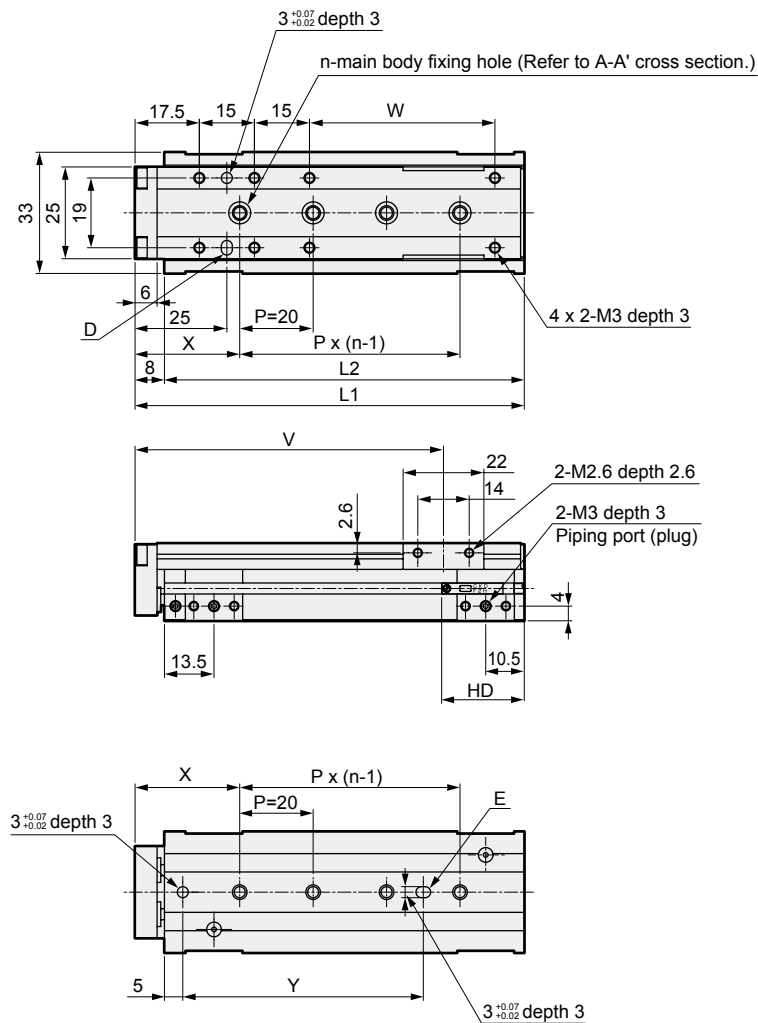
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\phi 6$)

● LCG-6

Stroke length: 40, 50

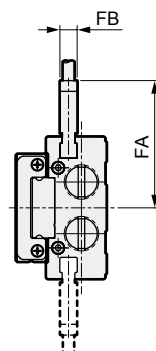
(Main fixing holes in this drawing are for the 50 mm stroke.)



Dimensions table per stroke length

Stroke length	40	50
L1	96	106
L2	88	98
n	3	4
V	74	84
W	40.5	50.5
X	27	28.5
Y	44	65.5
RD	25.5	
HD	22.5	

● Projection when F2S, F3S switch is mounted.



Stroke	40	50
FA	29.6	
FB	4	
RD	24.5	
HD	23.5	

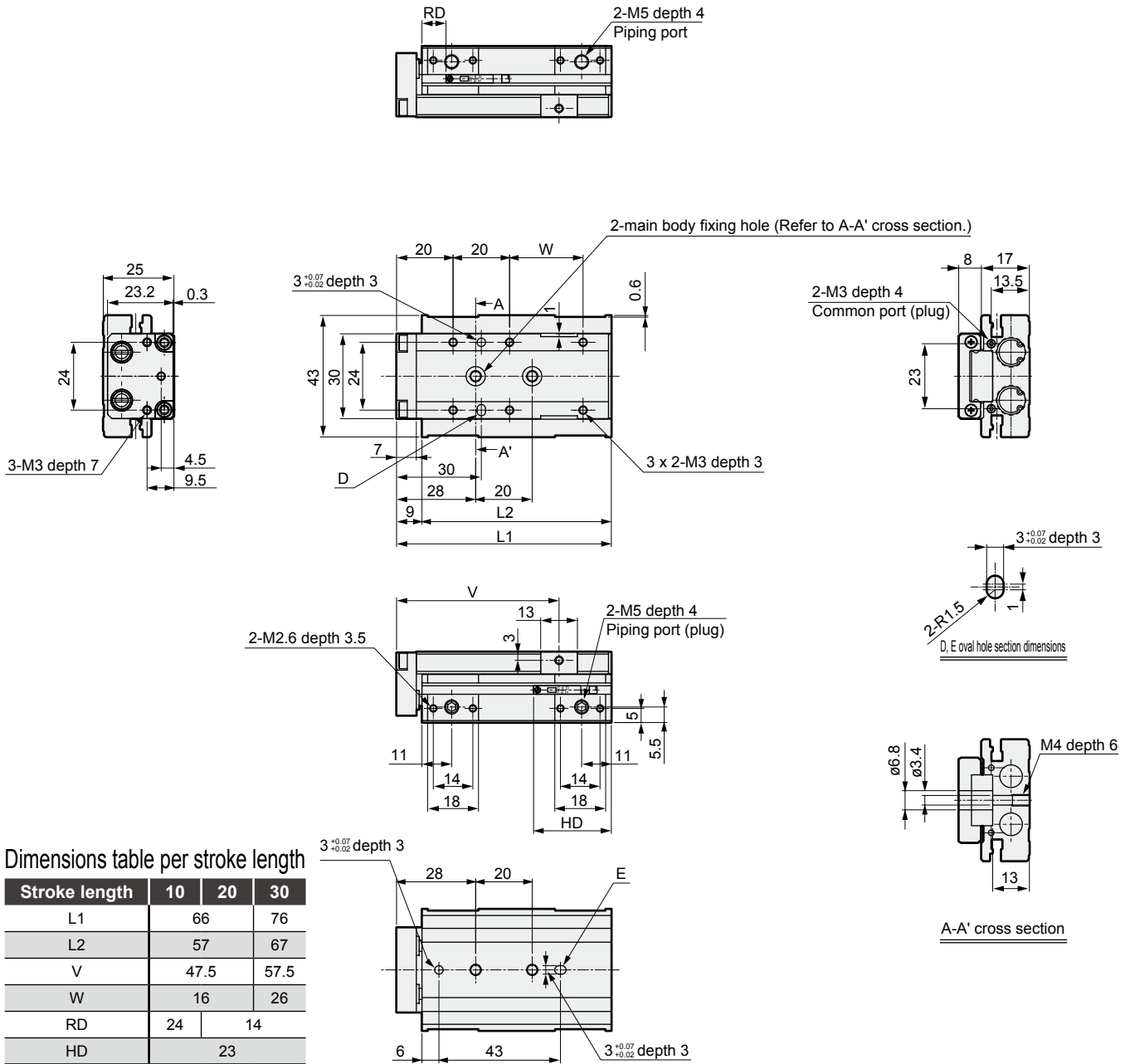
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 8$)

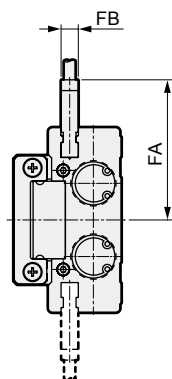
● LCG-8

Stroke length: 10, 20, 30

(Main fixing holes in this drawing are for the 30 mm stroke.)



● Projection when F2S, F3S switch is mounted.



Stroke	10	20	30
FA	32.6		
FB	4		
RD	23	13	
HD	24		

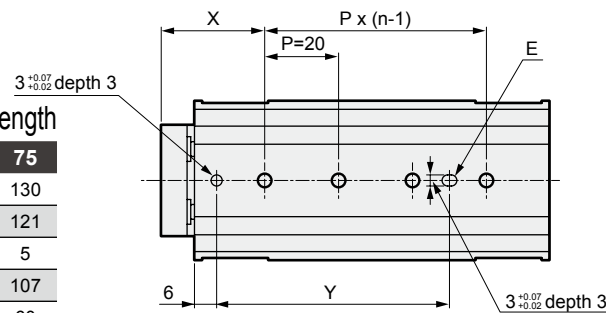
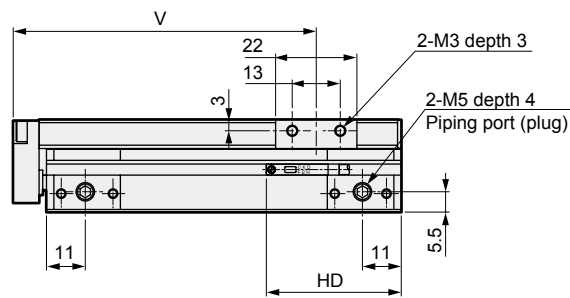
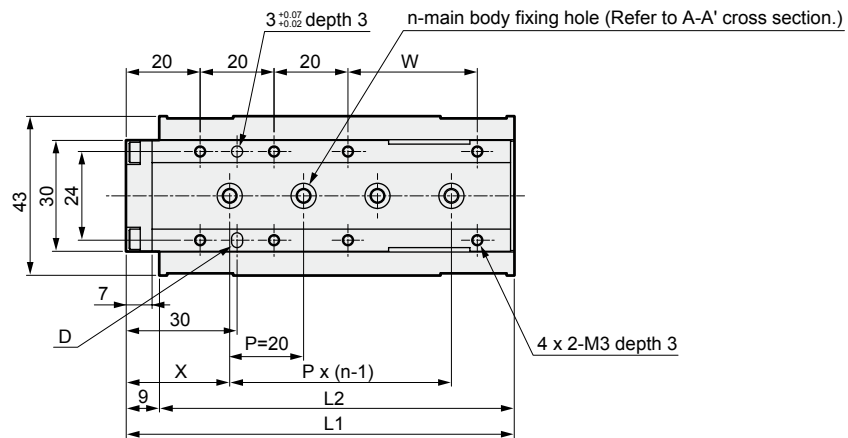
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 8$)

● LCG-8

Stroke length: 40, 50, 75

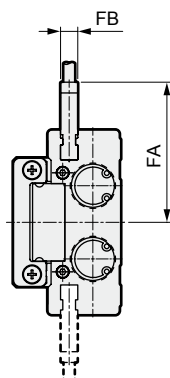
(Main fixing holes in this drawing are for the 50 mm stroke.)



Dimensions table per stroke length

Stroke length	40	50	75
L1	95	105	130
L2	86	96	121
n	3	4	5
V	72	82	107
W	25	35	60
X	26.5	28	25
Y	41.5	63	80
RD	14		
HD	32		

● Projection when F2S, F3S switch is mounted.



Stroke	40	50	75
FA	32.6		
FB	4		
RD	13		
HD	33		

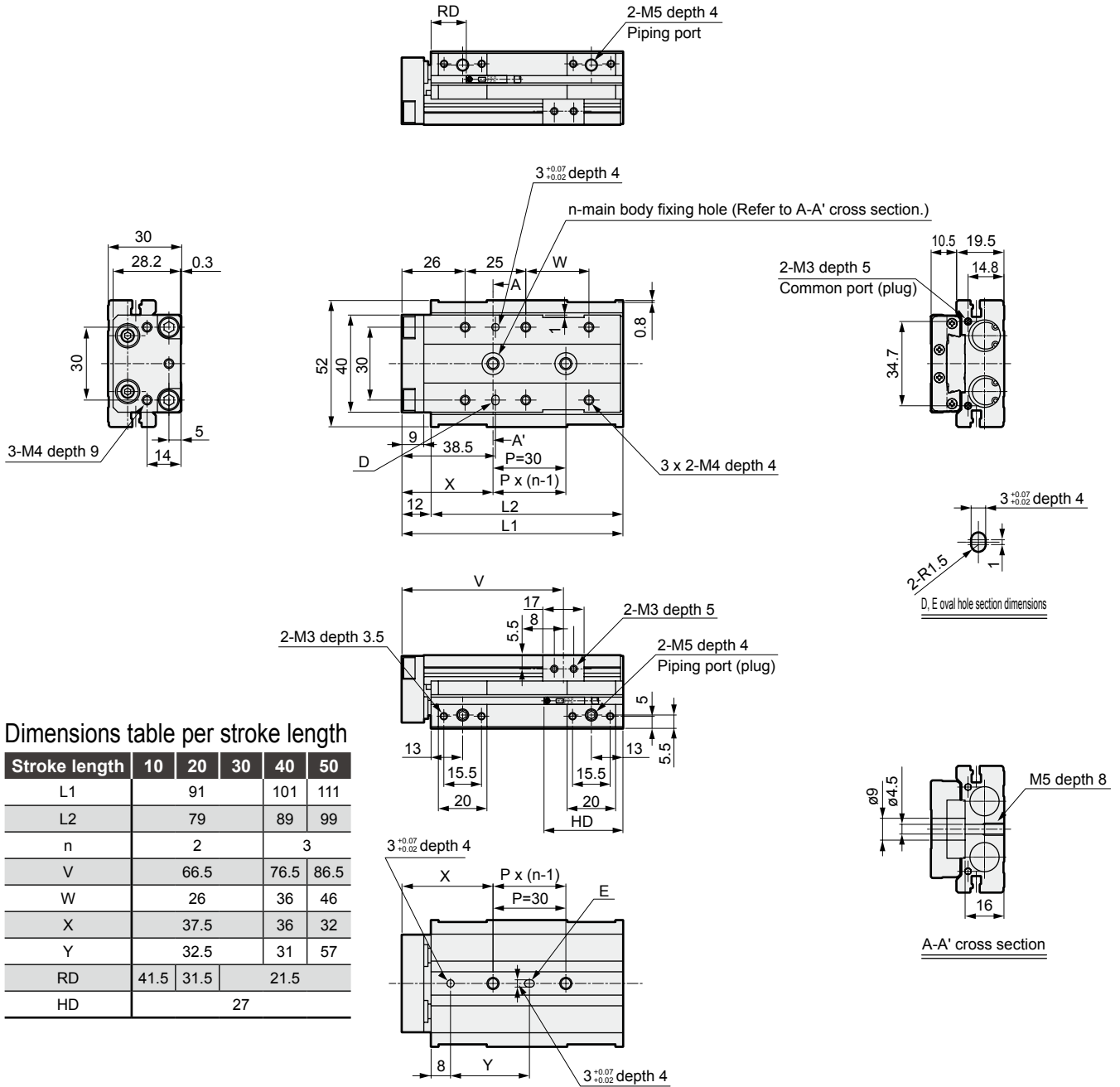
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\phi 12$)

● LCG-12

Stroke length: 10, 20, 30, 40, 50

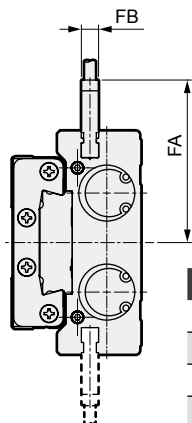
(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1	91	101	111		
L2	79	89	99		
n	2	3			
V	66.5	76.5	86.5		
W	26	36	46		
X	37.5	36	32		
Y	32.5	31	57		
RD	41.5	31.5	21.5		
HD	27				

● Projection when F2S, F3S switch is mounted.



Stroke	10	20	30	40	50
FA	37.8				
FB	4				
RD	40.5	30.5	20.5		
HD	28				

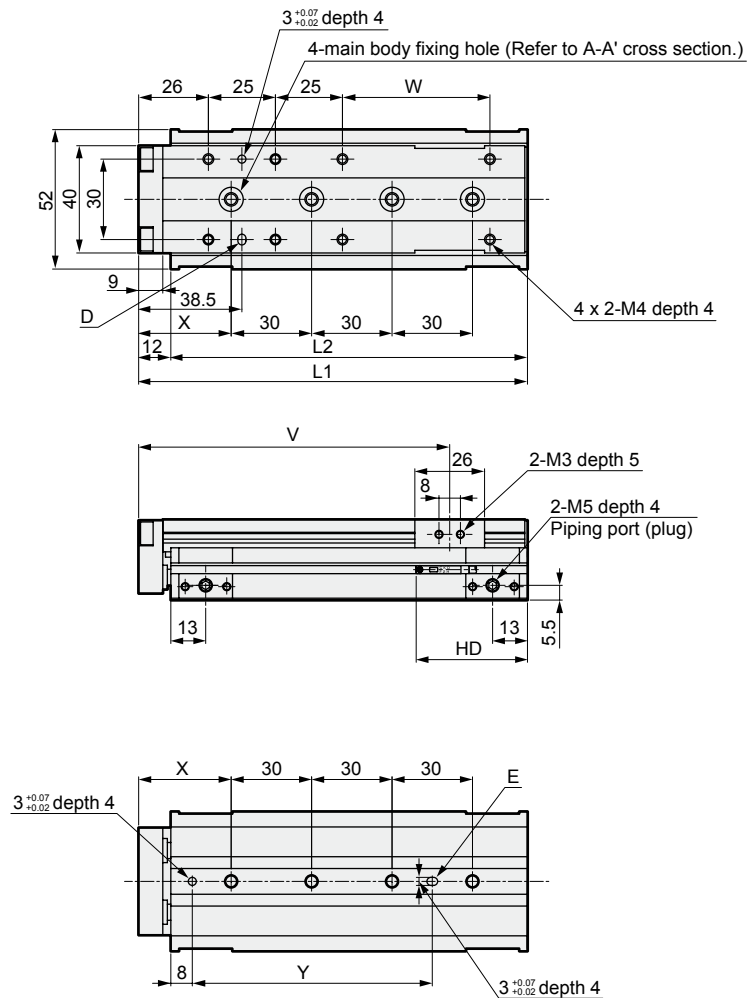
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\phi 12$)

● LCG-12

Stroke length: 75, 100

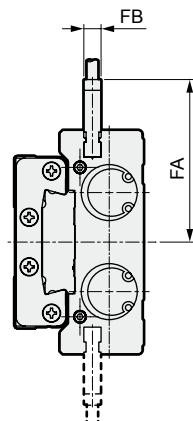
(Main fixing holes in this drawing are for the 100 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100
L1	145	170
L2	133	158
V	116	141
W	55	80
X	34.5	47
Y	89.5	102
RD	21.5	
HD	36	

● Projection when F2S, F3S switch is mounted.



Stroke	75	100
FA	37.8	
FB	4	
RD	20.5	
HD	37	

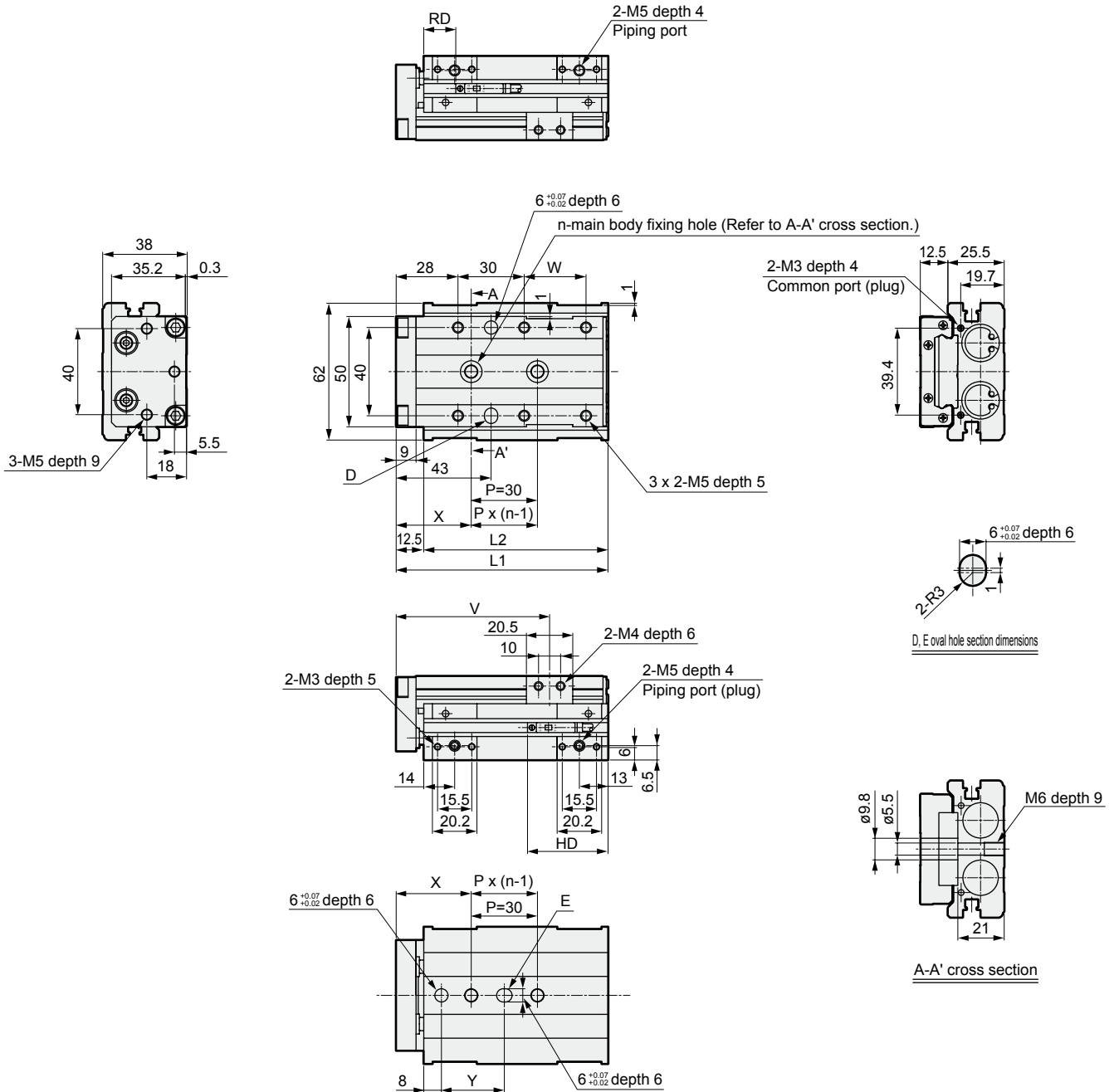
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\phi 16$)

● LCG-16

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		96	106	116	
L2		83.5	93.5	103.5	
n		2		3	
V		69.8	79.8	89.8	
W		28	38	48	
X		34	45.5	35.5	
Y		28.5	40	60	
T0/5*	RD	37	27	17	
T2/3*	HD	36.5			
T2/3W*	RD	39.5	29.5	19.5	
	HD	34			

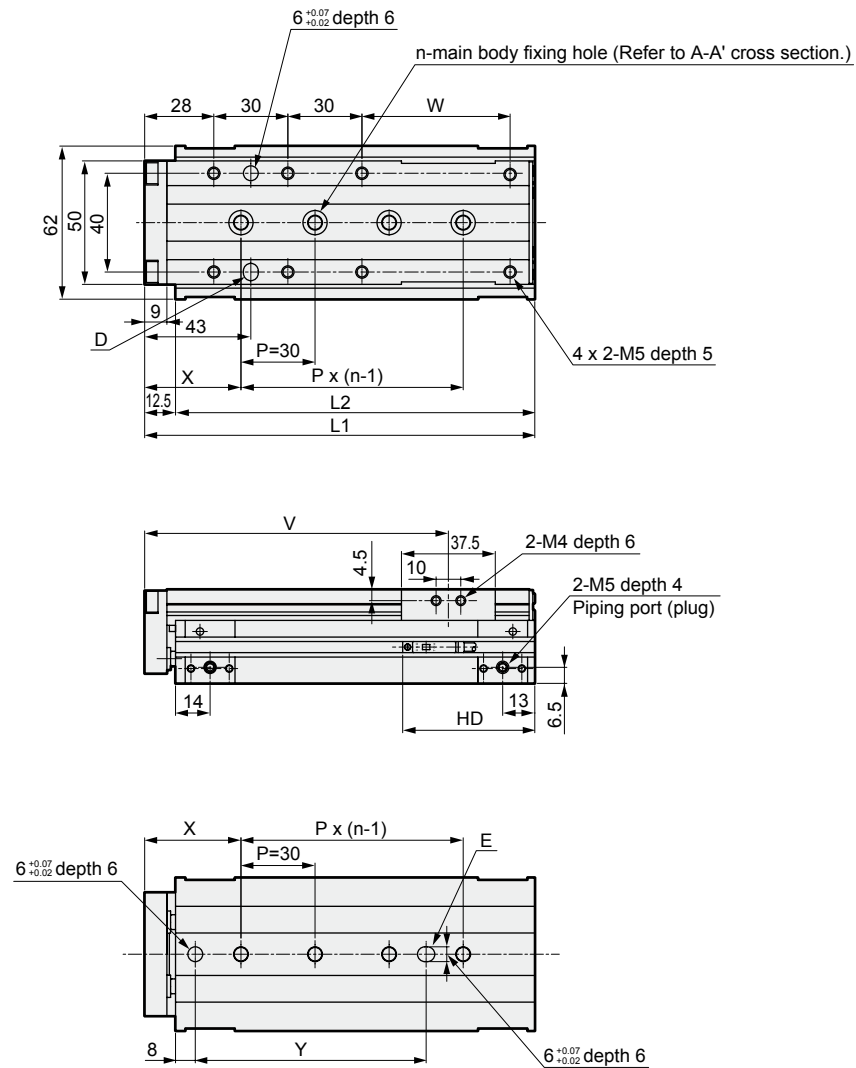
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 16$)

● LCG-16

Stroke length: 75, 100, 125

(Main fixing holes in this drawing are for the 75 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100	125
L1	158	183	208
L2	145.5	170.5	195.5
n	4	5	
V	123.3	148.3	173.3
W	60	85	110
X	39	37	49
Y	93.5	121.5	133.5
T0/5*	RD	17	
T2/3*	HD	53.5	
T2/3W*	RD	19.5	
	HD	51	

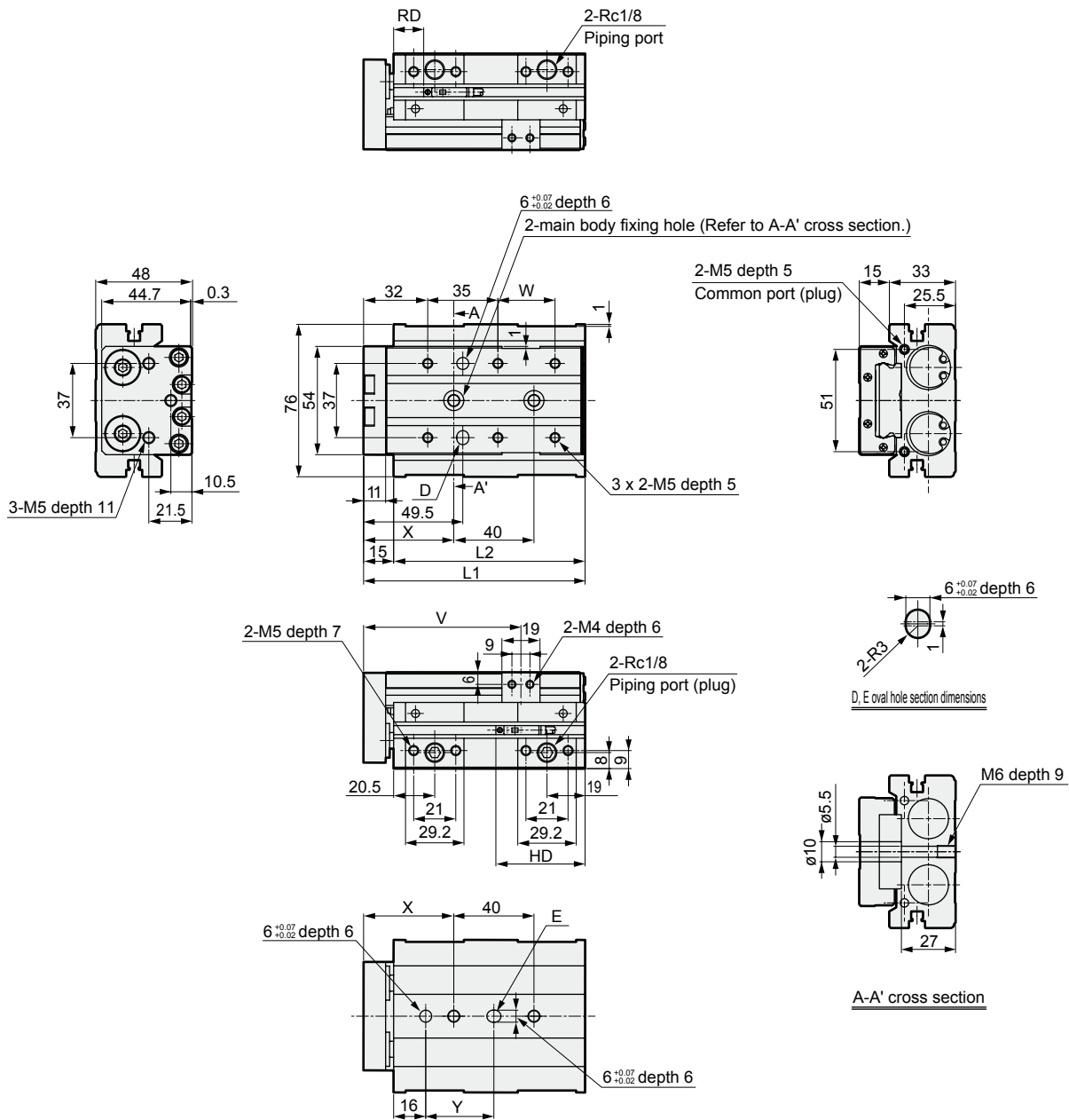
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 20$)

● LCG-20

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		110.5		120.5	130.5
L2		95.5		105.5	115.5
V		78.5		88.5	98.5
W		28.5		38.5	48.5
X		45		51	49
Y		34		40	38
T0/5*	RD	36	26		16
T2/3*	HD			49.5	
T2/3W*	RD	38.5	28.5		18.5
	HD			47	

*The dimensions for rust proof type U is the same.

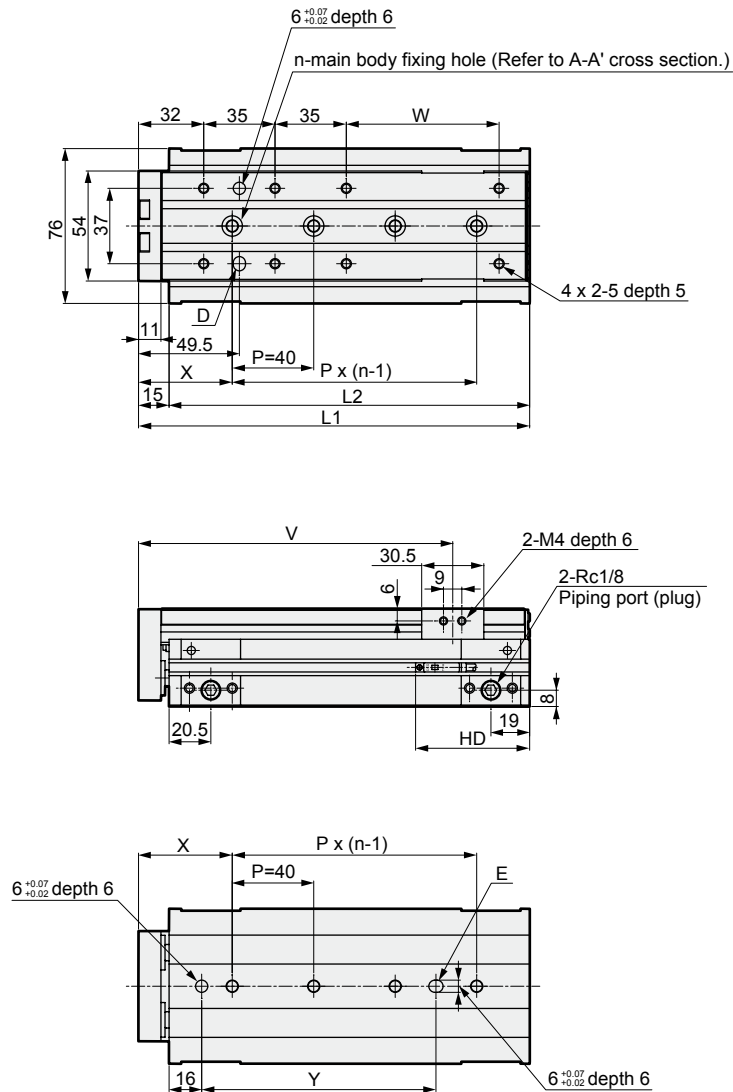
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 20$)

● LCG-20

Stroke length: 75, 100, 125, 150

(Main fixing holes in this drawing are for the 100 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100	125	150
L1	167	192	217	242
L2	152	177	202	227
n	3	4	5	
V	129.3	154.3	179.3	204.3
W	50	75	100	125
X	46	53	51	
Y	75	115	122	160
T0/5*	RD	16		
	HD	61		
T2/3*	RD	18.5		
	HD	58.5		

*The dimensions for rust proof type U is the same.

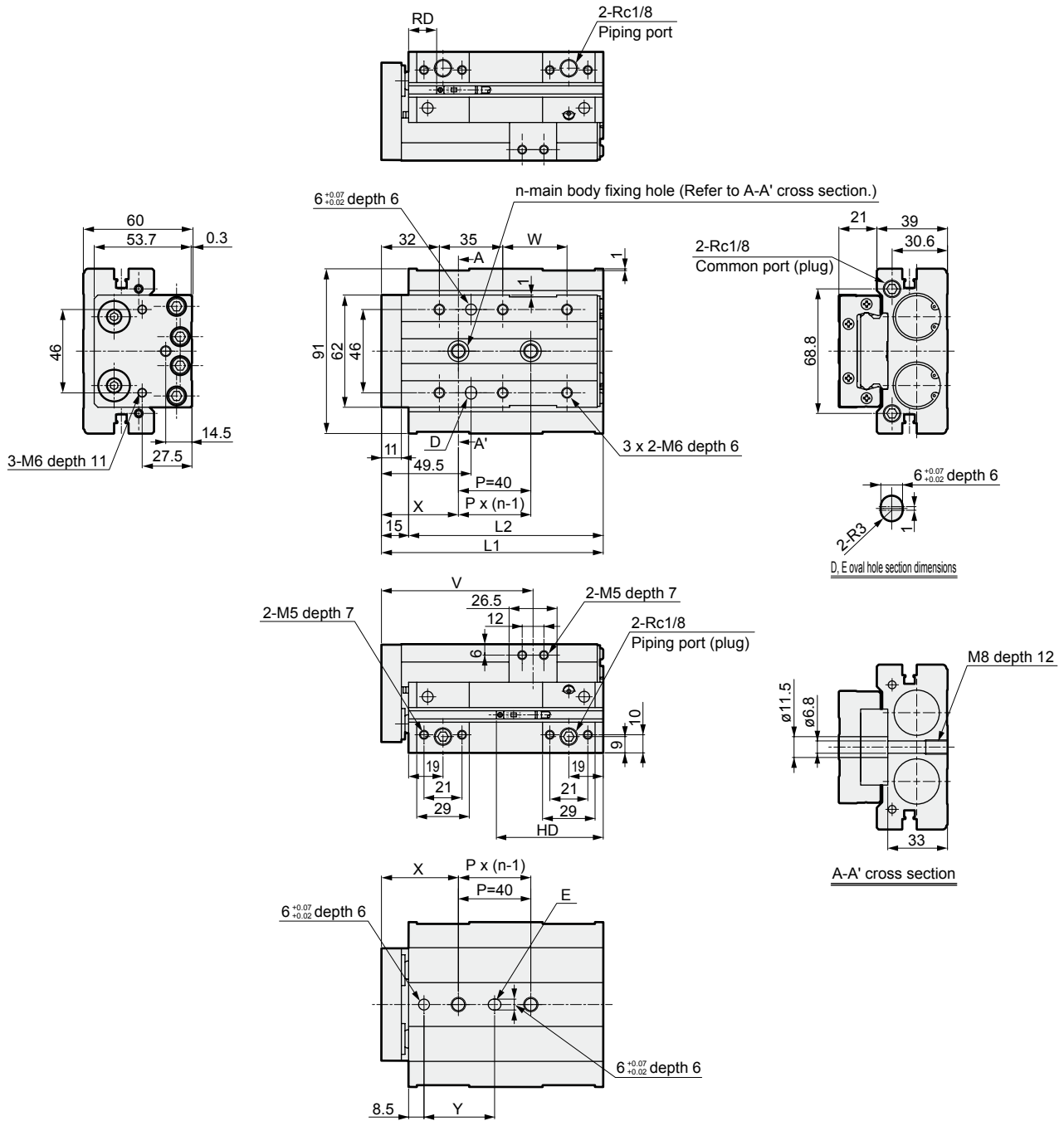
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 25$)

● LCG-25

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		122.5	132.5	142.5	
L2		107.5	117.5	127.5	
n		2	3	2	
V		83.8	93.8	103.8	
W		35.5	45.5	55.5	
X		42.5	45.5	60.5	
Y		39	42	57	
T0/5*	RD	38.5	28.5	18.5	
T2/3*	HD	59			
T2/3W*	RD	41	31	21	
	HD	56.5			

*The dimensions for rust proof type U is the same.

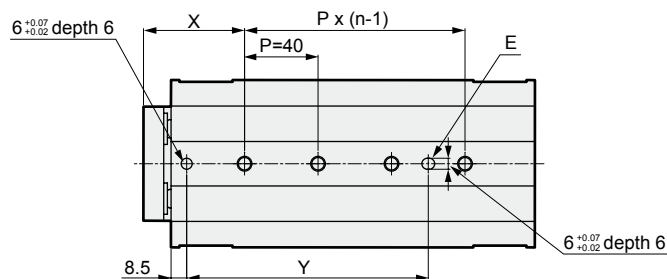
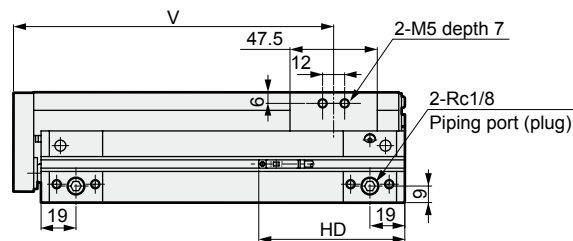
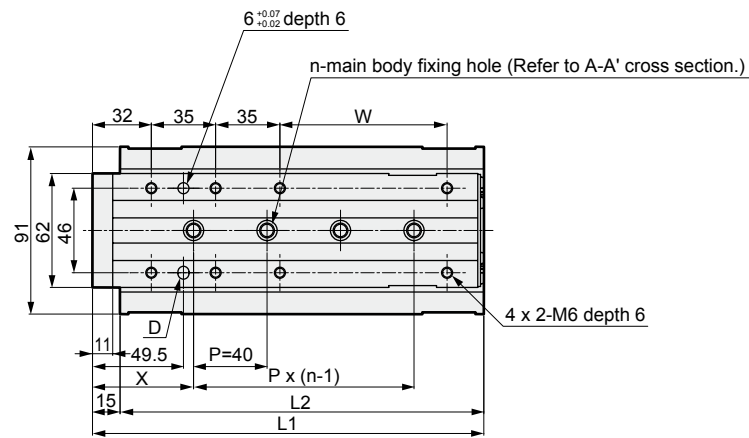
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 25$)

● LCG-25

Stroke length: 75, 100, 125, 150

(Main fixing holes in this drawing are for the 100 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100	125	150
L1	188	213	238	263
L2	173	198	223	248
n	3	4	5	
V	138.8	163.8	188.8	213.8
W	66	91	116	141
X	60	55	45	60
Y	96.5	131.5	161.5	176.5
T0/5*	RD	18.5		
	HD	79.5		
T2/3W*	RD	21		
	HD	77		

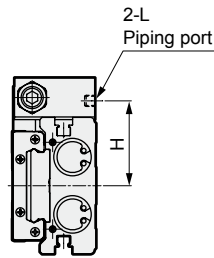
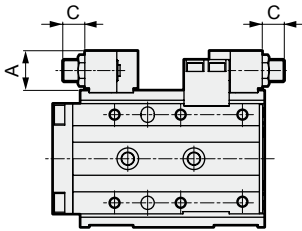
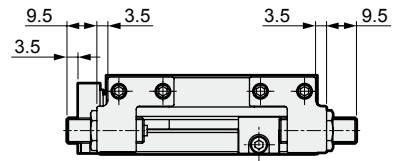
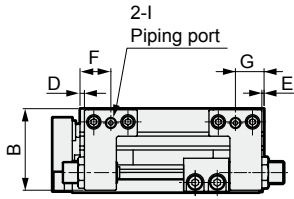
*The dimensions for rust proof type U is the same.

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions: Option

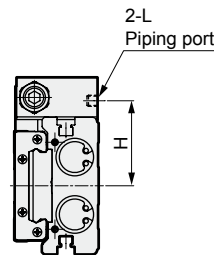
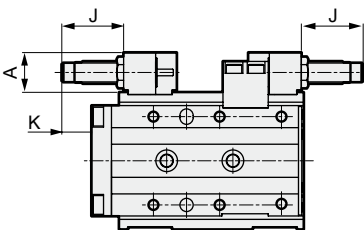
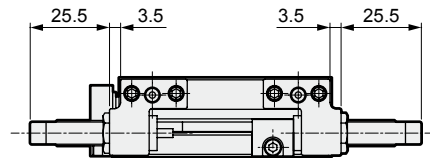
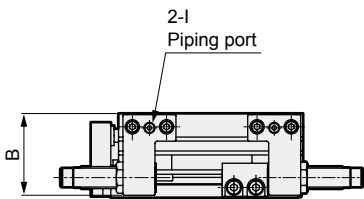
● Stopper for adjustable stroke (S1 to S6)

· For $\phi 8$



● Shock absorber stopper (A1 to A6)

· For $\phi 8$



Note 1: F, H, and L dimensions apply only to that with a stopper section port (S*D*, A*D*).

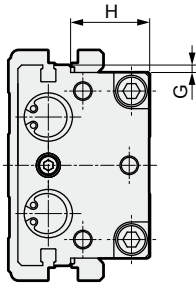
Note 2: The adjustable stroke range for the stopper is 5 mm on a side.

Note 3: S3** to S6** and A3** to A6** are not available for that with position locking.

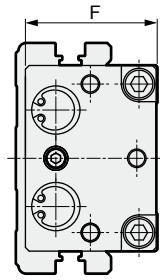
Symbol	A	B	C	D	E	F	G	H	I	J	K	L	Shock absorber type stopper Stroke adjustment range (single side)
$\phi 6$	14	19.5	11	4	1	13.5	10.5	24	M3 depth 3	21	9	M3 depth 3	9
$\phi 8$	15.6	24.5	9.5	0.5	0.5	10.5	10.5	27.3	M5 depth 4	25.5	16	M5 depth 4	17
$\phi 12$	15.5	29	12	1	1	13	13	31	M5 depth 4	25.5	12.5	M5 depth 4	14.5
$\phi 16$	18	37	10	2	1	14	13	39	M5 depth 4	28.5	14	M5 depth 4	15
$\phi 20$	20.5	45	14.5	4	2.5	20.5	19	46	Rc1/8	29.5	10.5	M5 depth 4	13
$\phi 25$	20.5	57	11.5	2.5	2.5	19	19	54.5	Rc1/8	26.5	9	M5 depth 4	10

Dimensions: Options

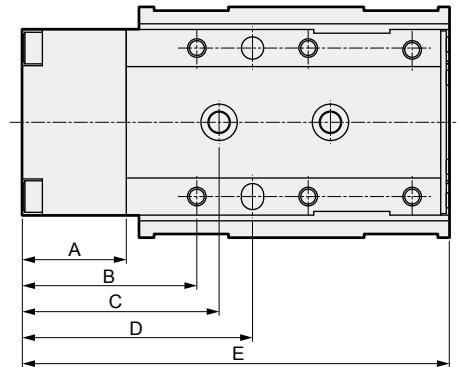
•With buffer (B, BL)



Option: B



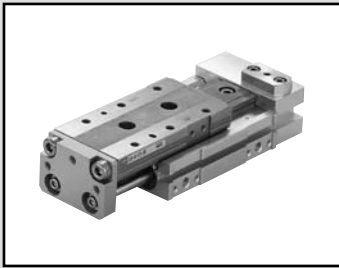
Option: B



Symbol	A	B	C									D
			Stroke (mm)									
Bore size (mm)			10	20	30	40	50	75	100	125	150	
ø6	22.5	34	45	45	42.5	43.5	45	-	-	-	-	41.5
ø8	21.5	34.5	42.5	42.5	42.5	41	42.5	39.5	-	-	-	44.5
ø12	27	44	55.5	55.5	55.5	54	50	52.5	65	-	-	56.5
ø16	28	47	53	53	53	64.5	54.5	58	56	68	-	62
ø20	31	52	65	65	65	71	69	66	66	73	71	69.5
ø25	34	55	65.5	65.5	65.5	68.5	83.5	83	78	68	83	72.5

Symbol	E									F	G	H
	Stroke (mm)											
Bore size (mm)	10	20	30	40	50	75	100	125	150			
ø6	82.5	82.5	92.5	112.5	122.5	-	-	-	-	20	3	11
ø8	80.5	80.5	90.5	109.5	119.5	144.5	-	-	-	23.5	3	13.5
ø12	109	109	109	119	129	163	188	-	-	29	3	16
ø16	115	115	115	125	135	177	202	227	-	35.5	1	21.5
ø20	130.5	130.5	130.5	140.5	150.5	187	212	237	262	45.5	4	24.5
ø25	145.5	145.5	145.5	155.5	165.5	211	236	261	286	56	4.5	31

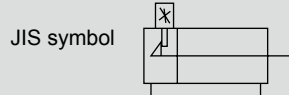
Note: Dimensions not listed will be identical to standard models.



Linear slide cylinder double acting position locking type

LCG-Q Series

● Bore size: $\varnothing 8$, $\varnothing 12$, $\varnothing 16$, $\varnothing 20$, $\varnothing 25$



Specifications

Descriptions		LCG-Q				
Bore size	mm	$\varnothing 8$	$\varnothing 12$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$
Actuation		Double acting				
Working fluid		Compressed air				
Max. working pressure	MPa	0.7				
Min. working pressure	MPa	0.15				
Withstanding pressure	MPa	1				
Ambient temperature	°C	-10 to 60 (to be unfrozen)				
Port size	Body side surface	M5			Rc1/8	
	Rear body	None				
Stroke tolerance	mm	+ 2.0 0 (Note 1)				
Working piston speed	mm/s	50 to 500				
Cushion		Rubber cushioned				
Position locking mechanism		Head end				
Holding force	N	At PULL, theoretical thrust $\times 0.7$ (at 0.7 MPa)				
Lubrication		Not required (when lubricating, use turbine oil Class one ISOVG 32.)				
Allowable energy absorption	J	Refer to the table 3 on Page 49.				

Note 1: When not using a stopper, a slight gap may exist between the end plate and floating bushing.

Stroke length

Bore size (mm)	Standard stroke length (mm)
$\varnothing 8$	10, 20, 30, 40, 50, 75
$\varnothing 12$	10, 20, 30, 40, 50, 75, 100
$\varnothing 16$	10, 20, 30, 40, 50, 75, 100, 125
$\varnothing 20$	10, 20, 30, 40, 50, 75, 100, 125, 150
$\varnothing 25$	10, 20, 30, 40, 50, 75, 100, 125, 150

Note: Stroke length other than above is not available.

Specification with buffer Specifications other than the ones shown below are the same as the specifications shown on the table above.

Descriptions		LCG-Q				
Bore size	mm	$\varnothing 8$	$\varnothing 12$	$\varnothing 16$	$\varnothing 20$	$\varnothing 25$
Buffer stroke	mm	4	9		10	
Buffer spring load	Setting N	5	10	13	17	21
	Operating N	8	14	20	25	29

Note 1: Rod side stroke adjustment by a type with buffer shortens buffer stroke length as much as adjusted stroke length. This also results in higher spring load at setting.

Note 2: Use buffer stroke below the above stroke length. There is a risk of malfunction and damage.

Switch specifications

● 1/2 color indicator *T0/T5 switch can be used with AC220V. Contact CKD for working conditions.

Descriptions	Reed 2 wire				Proximity 2 wire		Proximity 3 wire	
	T0H/T0V		T5H/T5V		T2H/T2V	T2WH/T2WV	T3H/T3V	T3WH/T3WV
Applications	PLC, relay		PLC, relay, IC circuit (without indicator light, serial connection)		Programmable Controller dedicated		Programmable Controller and relay	
Output type	-		-		-		NPN output	
Power voltage	-		-		-		10 to 28V DC	
Load voltage	12/24VDC	110VAC	5/12/24VDC	110VAC	10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 20mA		100mA or less	50mA or less
Light	LED (ON lighting)		Without indicator light		LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	0mA				1mA or less		10µA or less	

Descriptions	Proximity 2 wire		Proximity 3 wire		Proximity 2 wire		Proximity 3 wire	
	F2S		F3S		F2H/F2V	F2YH/F2YV	F3H/F3V	F3YH/F3YV
Applications	PLC only		PLC, relay		PLC only		PLC only	
Output type	-		NPN output		-		NPN output	
Power voltage	-		DC10 to 28V		-		10 to 28V DC	
Load voltage	DC10 to 30V		DC30V or less		10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 20mA		50mA or less		5 to 20mA		100mA or less	50mA or less
Light	Red LED (ON lighting)				LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	1mA or less		10µ or less		1mA or less		10µA or less	

Cylinder weight

● Position locking type

(Unit: g)

Bore size (mm)	Basic type								
	10	20	30	40	50	75	100	125	150
ø8	280	280	310	390	420	510	-	-	-
ø12	570	570	570	620	670	860	1,000	-	-
ø16	880	870	860	940	1,020	1,370	1,560	1,760	-
ø20	1,450	1,440	1,430	1,550	1,670	2,110	2,400	2,690	2,980
ø25	2,360	2,340	2,320	2,500	2,680	3,480	3,900	4,320	4,740

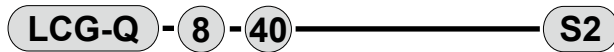
● Additional weight for options

(Unit: g)

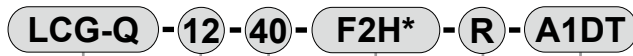
Bore size (mm)	Option, stopper symbol		With buffer
	S1/S2	A1/A2	B/BL
ø8	40	50	40
ø12	70	80	70
ø16	110	120	80
ø20	170	180	150
ø25	290	300	320

How to order

Without switch



With switch



Model no.

A Bore size

B Stroke length

D Switch quantity

C Switch model no.

E Option

⚠ Note on model no. selection

- Note 1: Use stopper parts for the adjustable stroke on page 6 when changing the adjustable stroke range.
- Note 2: When using a shock absorber, refer to the stopper dimensions table on page 23 for the adjustable stroke range.
- Note 3: Refer to stopper dimensions on page 23 for port locations.
- Note 4: If no stopper is provided, the standard port locations are (1) and (3) below.
- Note 5: The stopper for adjustable stroke and shock absorber stopper combination is available as a customized part.
- Note 6: Selectable only when using a stopper.
- Note 7: Refer to page 28 to find out how to order a switch for the buffer section.
- Note 8: Refer to the selection table on page 28 for option combinations.
- Note 9: A1** and A2** at $\phi 8$ -10st or $\phi 12$ to $\phi 25$ -20st or less cannot be adjusted with the standard stopper, and are available only as customized parts.
- Note 10: Rust proof type with a bore size of $\phi 6$ to $\phi 16$ are custom orders.
- Note 11: F2S, F3S switches will be enclosed with the cylinder. Please contact our sales if you need to have the switches assembled to the cylinder.

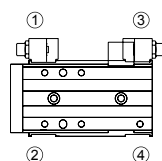
<Example of model number>

LCG-Q-12-40-F2H-R-A1DT

Model: Linear slide cylinder double acting position locking type LCG-Q

- A Bore size : $\phi 12$
- B Stroke length : 40mm
- C Switch model no. : Proximity and 2 wire
Axial lead wire
- D Switch quantity : With one pc. on rod end
- E Other options : shock absorber type
Stopper position ①
With side or base port
Material, alloy steel (nitriding)

● Stopper position



Symbol	Descriptions
A Bore size	
8	$\phi 8$
12	$\phi 12$
16	$\phi 16$
20	$\phi 20$
25	$\phi 25$

		Bore size (ϕ)				
		8	12	16	20	25
10	10	●	●	●	●	●
20	20	●	●	●	●	●
30	30	●	●	●	●	●
40	40	●	●	●	●	●
50	50	●	●	●	●	●
75	75	●	●	●	●	●
100	100		●	●	●	●
125	125			●	●	●
150	150				●	●

Axial lead wire		Radial lead wire		Contact	Indicator	Lead wire	Bore size																	
F2S	F3S	F2H*	F2V*				F3H*	F3V*	F2YH*	F2YV*	F3YH*	F3YV*	T0H*	T0V*	T5H*	T5V*	T2H*	T2V*	T3H*	T3V*	T2WH*	T2WV*	T3WH*	T3WV*
				Proximity	One color indicator	2-wire																		
						3-wire																		
						2-wire	●	●																
						3-wire																		
						2-wire																		
						3-wire																		
				Reed	One color indicator	2-wire																		
						No indicator																		
				Proximity	One color indicator	2-wire																		
						3-wire																		
					2-wire																			
					3-wire																			

*Lead wire length		Bore size				
Blank	1m (standard)					●
3	3m (option)					●
5	5m (option)					●

D Switch quantity	
R	One on rod end
H	One on head end
D	Two

E Option	
Blank	No option

S Stopper for adjustable stroke

Adjustable stroke single side 5mm Note 1, Note 5, Note 7

S1**	Stopper position ①	Stopper installation position
S2**	Stopper position ②	Stopper installation position

A Shock absorber type stopper Note 2, Note 5, Note 7

A1**	Stopper position ①	Stopper installation position
A2**	Stopper position ②	Stopper installation position

** section

Blank	Port at stopper section: no port
D	Port at stopper section: with side or base port Note 3, Note 6
Blank	Stopper block material: Rolled steel
T	Stopper block material: Alloy steel (nitriding) Note 6
B With buffer Note 7, Note 8	
B	Without switch groove
BL	With switch groove
U Rust proof treatment	
Blank	None
U	Rust proof (guide section only) Note 10

LCG-Q position locking type selection table

(Combination with stopper for adjustable stroke and shock absorber stopper)

○: Available -: Not available

Model no. symbol	Option symbol		Stopper for adjustable stroke						Shock absorber type stopper					
	Bore size	Stroke length	S1	S2	S3	S4	S5	S6	A1	A2	A3	A4	A5	A6
LCG-Q base	ø8	10	○	○	-	-	-	-	-	-	-	-	-	-
		20 and over	○	○	-	-	-	-	○	○	-	-	-	-
	ø12 to ø25	10 to 20	○	○	-	-	-	-	-	-	-	-	-	-
		30 and over	○	○	-	-	-	-	○	○	-	-	-	-

Option symbol D: with stopper section port and T: stopper block alloy steel (nitriding) combined as shown in the selection table above.

How to order switch

If $\varnothing 8$ to $\varnothing 12$

SW - F2H

Switch model no.
(Page 27 item ©)

If $\varnothing 16$ to $\varnothing 25$

SW - T2H3

Switch model no.
(Page 27 item ©)

● For buffer

SW - F 2 V 3

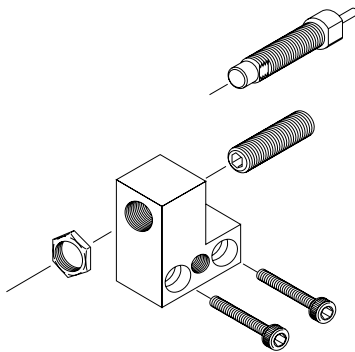
Output	
2	DC proximity 2 wire
3	DC proximity 3 wire
Lead wire L type	
Lead wire length	
Blank	1m (Standard)
3	3m (Option)

How to order stopper set

- Stopper section and stopper for adjustable stroke or shock absorber stopper set
- Use when changing from standard to stopper for adjustable stroke or with shock absorber stopper

LCG - 12 - S 2 D

Bore size
(Page 27 item A)



A Stopper type	
S	Stopper for adjustable stroke
A	Shock absorber type stopper
B Stopper installation position Note 1	
1	For stopper position ① or ④
2	For stopper position ② or ③
C Port at stopper section	
Blank	No port
D	With side and bottom ports
D Stroke adjustment Note 3, Note3	
Blank	Stroke adjustment range 5mm
S02	Stroke adjustment range 15mm
S03	Stroke adjustment range 25mm

Note 1: Refer to the table below when attaching to stopper mounting position ① or ② since extra parts may be required.

Note 2: "S03" is not available for $\varnothing 6$ and $\varnothing 8$.

Note 3: Not available for shock absorber type stopper "A".

Precautions for ordering stopper set

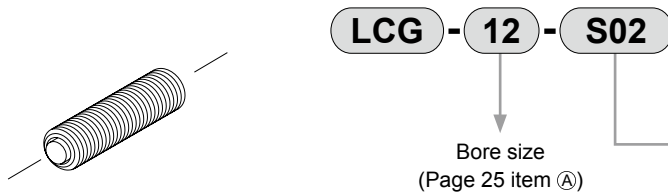
-: not available

S01 is included in the stopper for adjustable stroke parts for the stopper for adjustable stroke set.
When installing at position ① or ② (refer to page 25), add parts shown on the right based on the stroke or adjustable stroke length.

Model no. symbol	Option symbol		Discrete stopper for adjustable stroke		
	Bore size	Stroke length	Adjustable stroke length (mm)		
			-5	-15	-25
LCG-Q Series	$\varnothing 8$	10	S02	-	-
		20 and over	Addition not required	S02	-
	$\varnothing 12$ to $\varnothing 25$	10	S03	-	-
		20	S02	S03	-
		30 and over	Addition not required	S02	S03

How to order the discrete stopper for adjustable stroke

- Hexagon socket head set screw with urethane
- Use for changing the adjustable stroke range or setting to the middle stroke



A Adjustable stroke range	
S01	Single 5mm (standard)
S02	Single 15mm
S03	Single 25mm

Indicate S01, S02 or S03 in A section.

Note: S03 is not used for ø8.

Depending on the type, the incompatible models or adjustable stroke ranges may differ from the above values.

Precautions for ordering discrete stopper

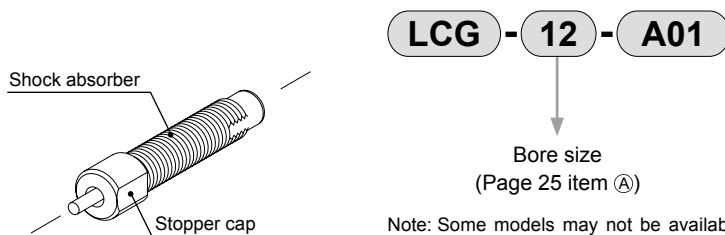
Only when installing the discrete stopper for an adjustable stroke or discrete shock absorber stopper at installation position ① or ② (refer to page 25), the combination will be as shown on the right depending on the stroke or adjustable stroke length.

-: combination not available

Model no. symbol	Option symbol		Discrete stopper for adjustable stroke			Discrete shock absorber type stopper
			Adjustable stroke length (mm)			
	Bore size	Stroke length	-5	-15	-25	
LCG Series -S1, S2 -A1, A2	ø8	10	S02	-	-	-
		20 and over	S01	S02	-	A01
	ø12 to ø25	10	S03	-	-	-
		20	S02	S03	-	-
		30 and over	S01	S02	S03	A01

How to order the discrete shock absorber stopper

- Sets of shock absorber and stopper cap
- Use for changing from the stopper for an adjustable stroke to the shock absorber stopper.



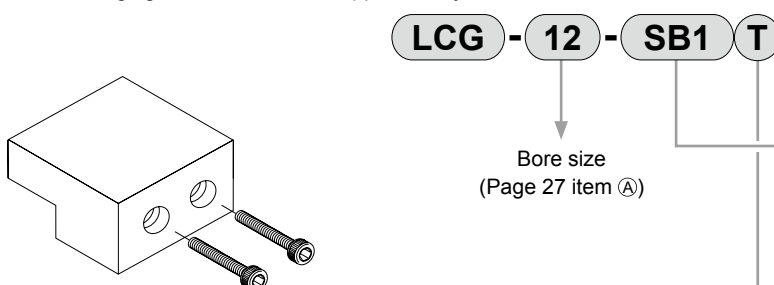
Note: Some models may not be available depending on the type. Refer to page 25.
Refer to page 21 for adjustable stroke range of a shock absorber type stopper.

Applicable shock absorber model No.

Model	Shock absorber model no.
LCG-8	NCK-00-0.3
LCG-12	NCK-00-0.3
LCG-16	NCK-00-0.7
LCG-20	NCK-00-1.2
LCG-25	NCK-00-1.2

Discrete stopper block model no. display

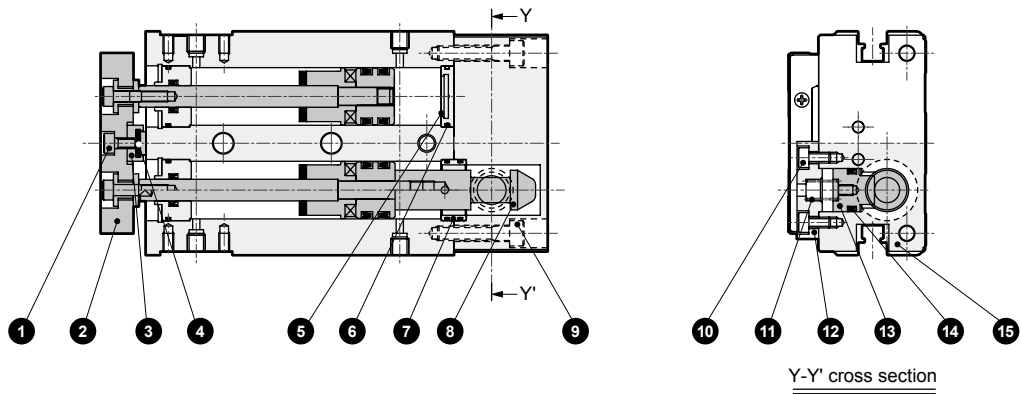
- Use when changing from standard to stopper for adjustable stroke or with shock absorber stopper



A Stopper block	
SB1	ø8: 30 mm stroke or less
	ø12 to ø25: 50 mm stroke or less
SB2	ø8: 40 mm stroke and over
	ø12 to ø25: 75 mm stroke and over
B Material	
Blank	Stopper block material: Rolled steel
T	Stopper block material: Alloy steel (nitriding)

Internal structure and parts list

● LCG-Q



Parts list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Hexagon socket head cap screw	Alloy steel	Zinc chromate	8	Sleeve	Carbon steel	Nitriding
2	End plate	Aluminum alloy	Alumite	9	Hexagon socket head cap screw	Alloy steel	Zinc chromate
3	Stopper	Aluminum alloy	Alumite	10	Hexagon socket head cap screw	Alloy steel	Zinc chromate
4	Cushion rubber (H)	Urethane rubber		11	Coil spring	Steel	
5	Guard	Aluminum alloy		12	Stopper guard	Aluminum alloy	Alumite
6	Gasket	Nitrile rubber		13	Stopper piston	Carbon steel	Nitriding
7	Joint ring	ø8: stainless steel	ø12 to 25: chromate	14	Stopper packing seal	Nitrile rubber	
		ø12 to 25: aluminum alloy		15	Head cover	Aluminum alloy	Alumite

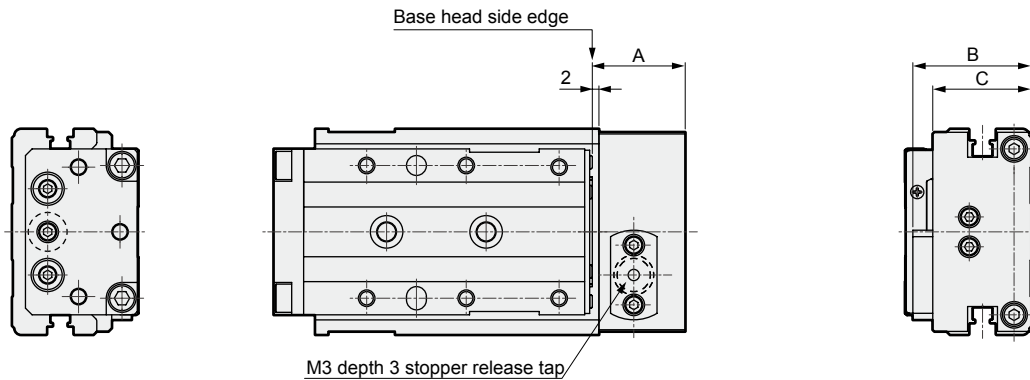
Repair parts list

Bore size (mm)	Kit No.	Repair parts number	
		Position locking unit repair parts	Basic unit repair parts
ø8	LCG-Q-8K		
ø12	LCG-Q-12K		
ø16	LCG-Q-16K	4 14	5 6 10 16 18
ø20	LCG-Q-20K		
ø25	LCG-Q-25K		

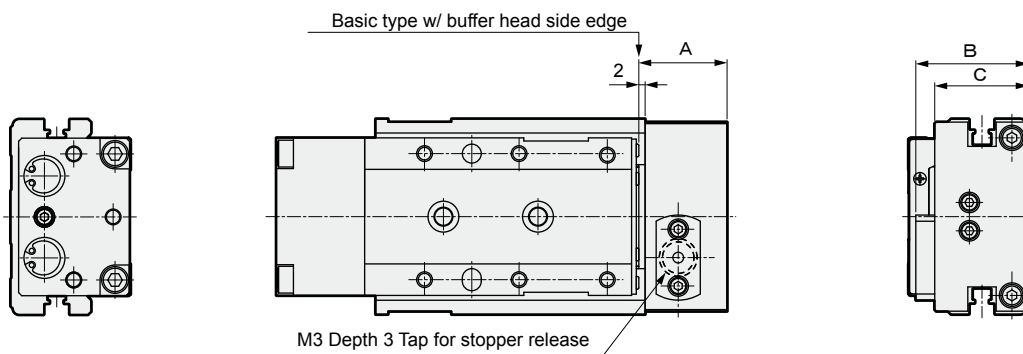
Note: Basic unit repair part numbers correspond to the double acting single rod parts list on page 7.

Dimensions

● LCG-Q

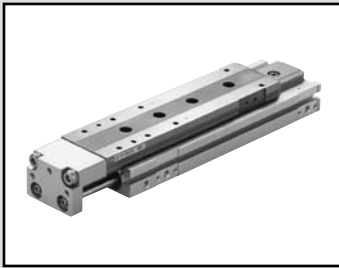


● LCG-Q-*-B (with buffer)



Symbol	A	B	C
∅8	23	29.5	22
∅12	24.5	30.5	24.5
∅16	28	35.7	29.7
∅20	30	39	33
∅25	30	48	42

Note: Dimensions other than the above are the same as for the double acting single rod model.

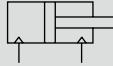


Linear slide cylinder double acting single rod type clean room specifications

LCG-P7* Series

● Bore size: $\phi 6$, $\phi 8$, $\phi 12$, $\phi 16$, $\phi 20$, $\phi 25$

JIS symbol



Specifications

Descriptions		LCG-P73					
Bore size	mm	$\phi 6$	$\phi 8$	$\phi 12$	$\phi 16$	$\phi 20$	$\phi 25$
Actuation		Double acting					
Working fluid		Compressed air					
Max. working pressure	MPa	0.7					
Min. working pressure	MPa	0.15					
Withstanding pressure	MPa	1					
Ambient temperature	°C	-10 to 60 (to be unfrozen) (Note 1)					
Port size	Body side surface	M3	M5			Rc1/8	
	Rear body	M3			M5	Rc1/8	
Relief port size		M3	M5			Rc1/8	
Stroke tolerance	mm	+2.0 0 (Note 2)					
Working piston speed	mm/s	50 to 500					
Cushion		Rubber cushioned					
Lubrication		Not available					
Allowable energy absorption	J	Refer to the table 3 on Page 49.					

Note 1: The maximum temperature is 50°C when the switch 6 in diameter is used -- 45°C when installing on a steel plate.

Note 2: When not using a stopper, a slight gap may exist between the end plate and floating bushing.

Stroke length

Bore size (mm)	Standard stroke length (mm)
$\phi 6$	10, 20, 30, 40, 50
$\phi 8$	10, 20, 30, 40, 50, 75
$\phi 12$	10, 20, 30, 40, 50, 75, 100
$\phi 16$	10, 20, 30, 40, 50, 75, 100, 125
$\phi 20$	10, 20, 30, 40, 50, 75, 100, 125, 150
$\phi 25$	10, 20, 30, 40, 50, 75, 100, 125, 150

Note: Stroke length other than above is not available.

Switch specifications

● 1/2 color indicator *T0/T5 switch can be used with AC220V. Contact CKD for working conditions.

Descriptions	Reed 2 wire				Proximity 2 wire		Proximity 3 wire	
	T0H/T0V		T5H/T5V		T2H/T2V	T2WH/T2WV	T3H/T3V	T3WH/T3WV
Applications	PLC, relay		PLC, relay, IC circuit (without indicator light, serial connection)		Programmable Controller dedicated		Programmable Controller and relay	
Output type	-		-		-		NPN output	
Power voltage	-		-		-		10 to 28V DC	
Load voltage	12/24VDC	110VAC	5/12/24VDC	110VAC	10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 20mA		100mA or less	50mA or less
Light	LED (ON lighting)		Without indicator light		LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	0mA				1mA or less		10µA or less	

Descriptions	Proximity 2 wire		Proximity 3 wire		Proximity 2 wire		Proximity 3 wire	
	F2S		F3S		F2H/F2V	F2YH/F2YV	F3H/F3V	F3YH/F3YV
Applications	PLC only		PLC, relay		PLC only		PLC only	
Output type	-		NPN output		-		NPN output	
Power voltage	-		DC10 to 28V		-		10 to 28V DC	
Load voltage	DC10 to 30V		DC30V or less		10 to 30V DC	24V DC±10%	30V DC or less	
Load current	5 to 20mA		50mA or less		5 to 20mA		100mA or less	50mA or less
Light	Red LED (ON lighting)				LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	1mA or less		10µ or less		1mA or less		10µA or less	

Cylinder weight

● Clean specifications

(Unit: g)

Bore size (mm)	Basic type								
	10	20	30	40	50	75	100	125	150
ø6	170	170	190	250	270	□	□	□	□
ø8	270	270	300	380	410	500	□	□	□
ø12	550	550	550	600	650	840	980	□	□
ø16	890	880	870	950	1,030	1,380	1,570	1,770	□
ø20	1,470	1,460	1,450	1,570	1,690	2,130	2,420	2,710	3,000
ø25	2,410	2,390	2,370	2,550	2,730	3,530	3,950	4,370	4,790

● Additional weight for options (stopper)

(Unit: g)

Bore size (mm)	Option. stopper symbol	
	S1 to S4	S5/S6
ø6	30	40
ø8	40	60
ø12	70	100
ø16	110	150
ø20	170	250
ø25	290	380

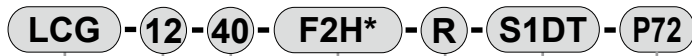
LCG-P7* Series

How to order

Without switch



With switch



Model no.

A Bore size

B Stroke length

F Clean room specifications

C Switch model no.

D Switch quantity

E Option

⚠ Note on model no. selection

Note 1: Refer to stopper dimensions on page 21 for port locations.

Note 2: If no stopper is provided, the standard port locations are (1) and (3) below.

Note 3: Selectable only when using a stopper.

Note 4: When installing two switches with $\phi 6$ -10st S***, select the F*H switch.

Note 5: Rust proof type with a bore size of $\phi 6$ to $\phi 16$ are custom orders.

Note 6: F2S, F3S switches will be enclosed with the cylinder. Please contact our sales if you need to have the switches assembled to the cylinder.

<Example of model number>

LCG-12-40-F2H*-R-S1DT-P72

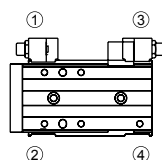
Model: Linear slide cylinder double acting single rod type (clean room specifications) LCG-P7*

- A** Bore size : $\phi 12$
- B** Stroke length : 40mm
- C** Switch model no. : Proximity and 2 wire Axial lead wire
- D** Switch quantity : With one pc. on rod end
- E** Other options : Stopper for stroke adjustment
Stopper position ①
With side or base port
Material, alloy steel

(nitriding)

- F** Clean room specifications: Exhaust treatment

● Stopper position



Symbol	Descriptions						
A Bore size							
6	$\phi 6$						
8	$\phi 8$						
12	$\phi 12$						
16	$\phi 16$						
20	$\phi 20$						
25	$\phi 25$						
B Stroke length (mm)							
		Bore size (ϕ)					
		6	8	12	16	20	25
10	10	●	●	●	●	●	●
20	20	●	●	●	●	●	●
30	30	●	●	●	●	●	●
40	40	●	●	●	●	●	●
50	50	●	●	●	●	●	●
75	75		●	●	●	●	●
100	100			●	●	●	●
125	125				●	●	●
150	150					●	●
C Switch model no.							
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire	Bore size		
F2S	F2V*	Proximity	One color indicator	2-wire	●	●	●
F3S	F3V*			3-wire			
F2H*	F2YH*			2-wire			
F3H*	F3YH*			3-wire			
F2YH*	F2YV*			2-wire			
F3YH*	F3YV*			3-wire			
T0H*	T0V*	Reed	One color indicator	2-wire			
T5H*	T5V*			No indicator			
T2H*	T2V*			Proximity			
T3H*	T3V*	3-wire					
T2WH*	T2WV*	2-wire					
T3WH*	T3WV*	3-wire					
Lead wire length							
Blank	1m (standard)						●
3	3m (option)						●
5	5m (option)						●
D Switch quantity							
R	One on rod end						●
H	One on head end						●
D	Two						●
E Option							
Blank	No option						●
S Stopper for adjustable stroke							
Adjustable stroke single side 5mm					Note 4		
S1**	Stopper position ① (Changeable to ④)		Stopper installation position	●			
S2**	Stopper position ② (Changeable to ③)			●			
S3**	Stopper position ③ (Changeable to ②)			●			
S4**	Stopper position ④ (Changeable to ①)			●			
S5**	Stopper position ① and ③			●			
S6**	Stopper position ② and ④			●			
** section							
Blank	Port at stopper section: no port						●
D	Port at stopper section: with side or base port		● Note 1, Note 3				
Blank	Stopper block material: Rolled steel		●				
T	Stopper block material: Alloy steel (nitriding)		● Note 3				
U Rust proof treatment							
Blank	None						
U	Rust proof treated (Guide section only)		Note 5				
F Clean room specifications							
Structure							
P72	Exhaust treatment						
P73	Vacuum treatment						

MEMO

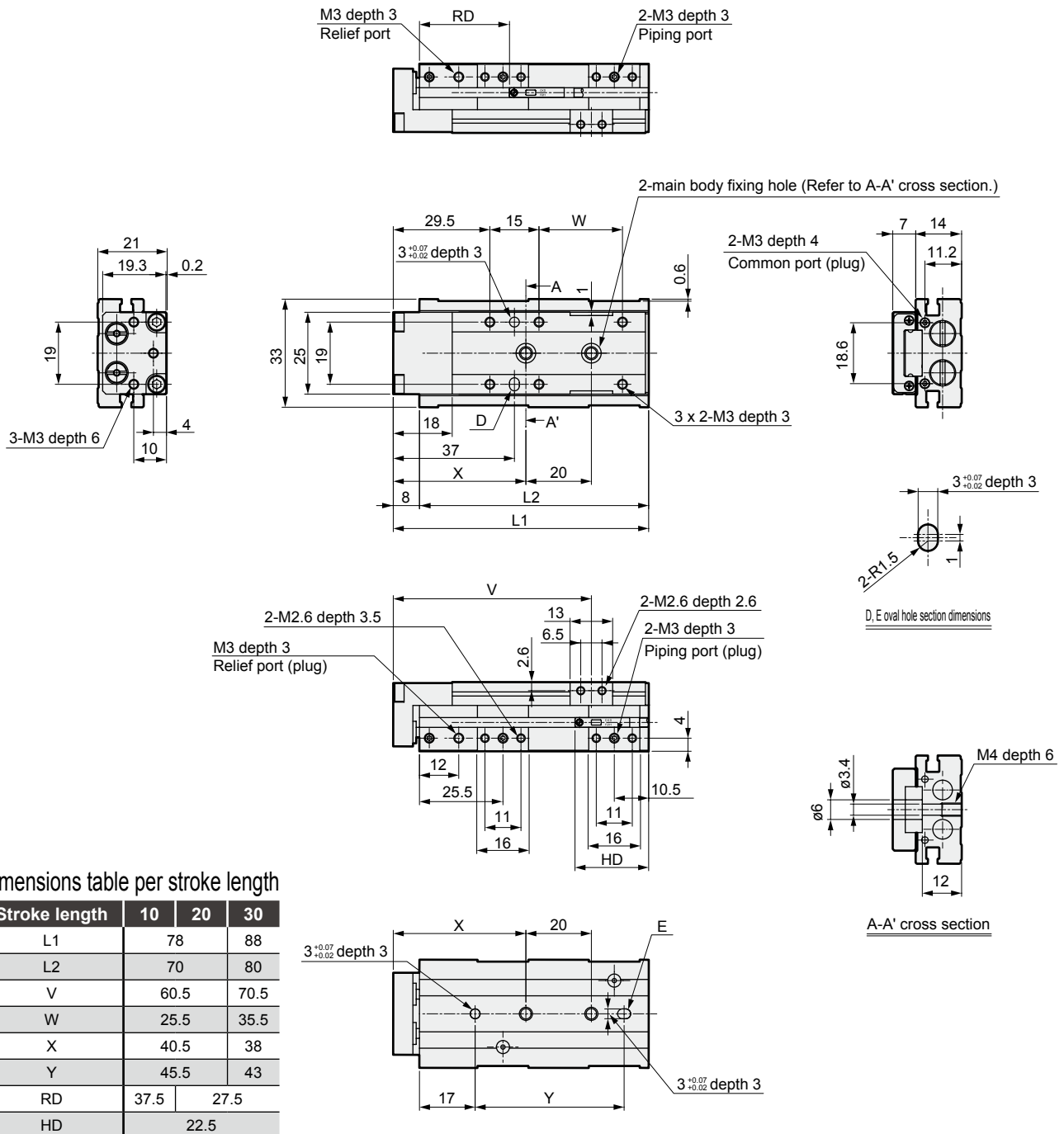
LCG-P7* Series

Dimensions (bore size: $\varnothing 6$)

● LCG-6-P7*

Stroke length: 10, 20, 30

(Main fixing holes in this drawing are for the 20 mm stroke.)

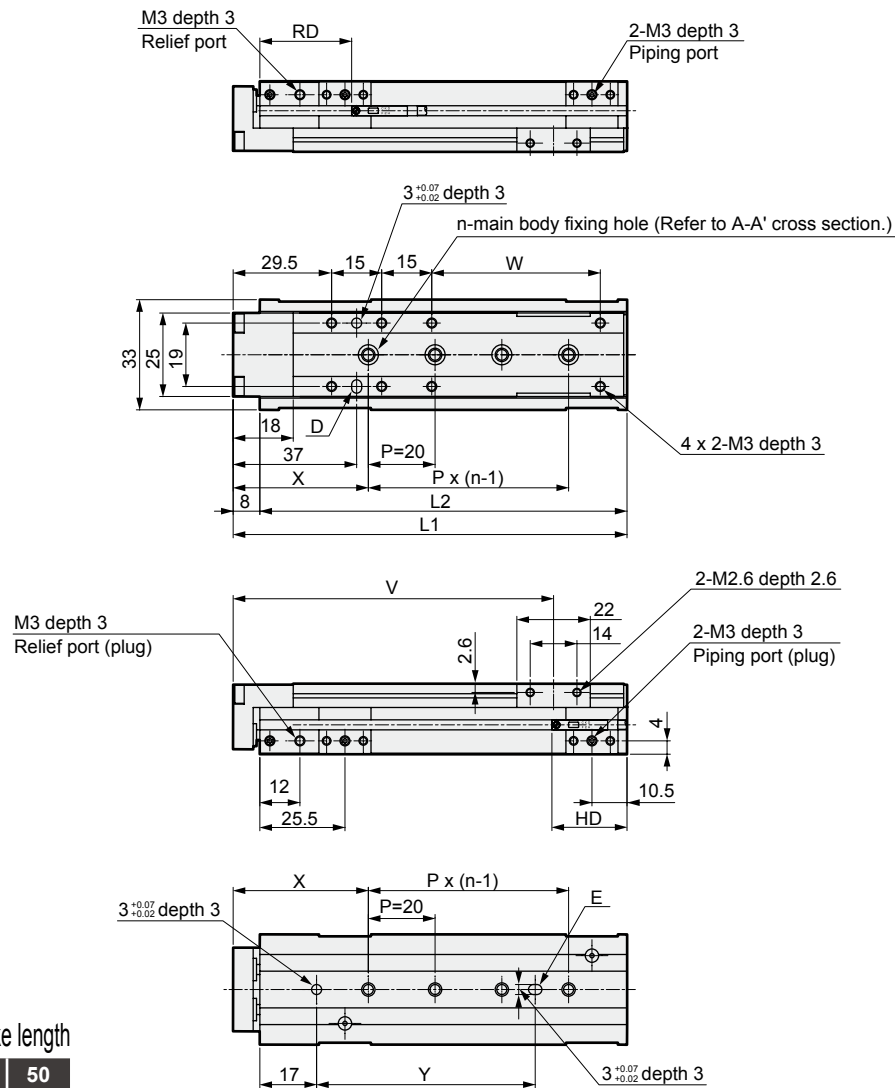


Dimensions (bore size: $\varnothing 6$)

● LCG-6-P7*

Stroke length: 40, 50

(Main fixing holes in this drawing are for the 50 mm stroke.)



Dimensions table per stroke length

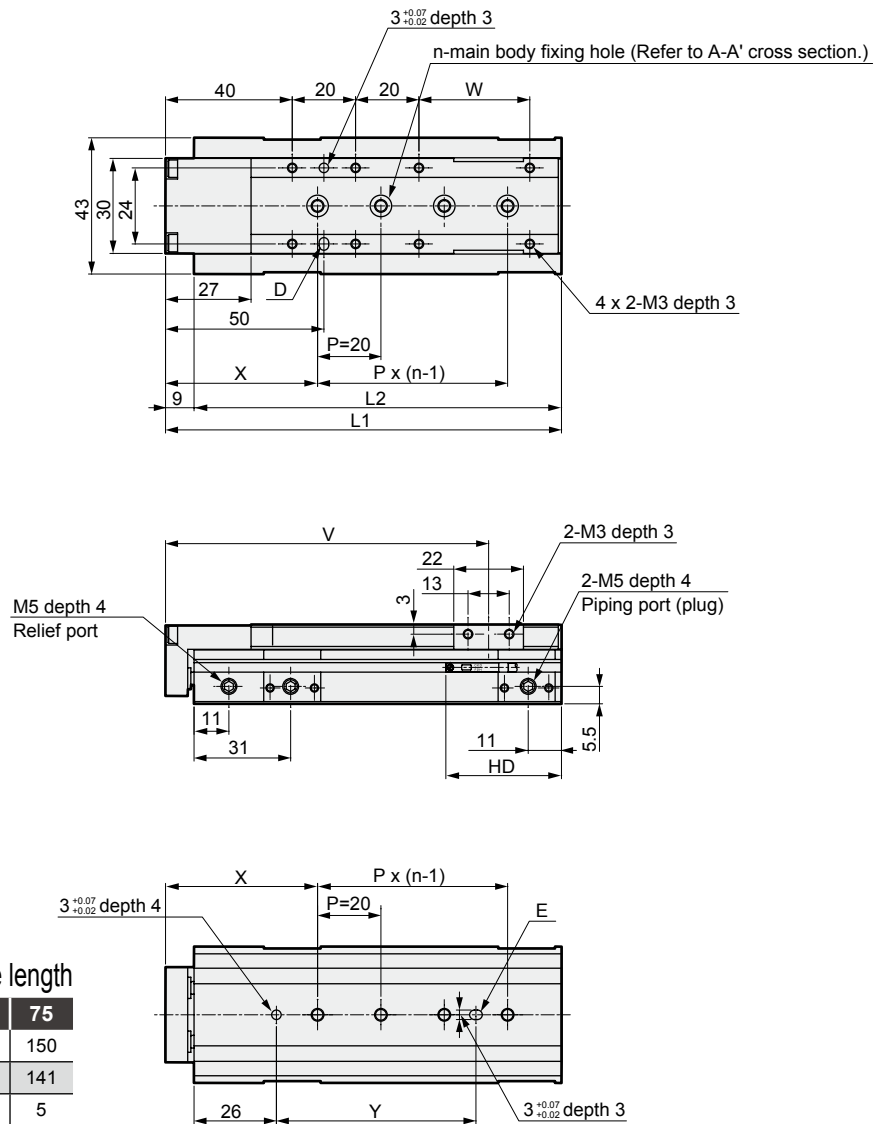
Stroke length	40	50
L1	108	118
L2	100	110
n	3	4
V	86	96
W	40.5	50.5
X	39	40.5
Y	44	65.5
RD	37.5	
HD	22.5	

Dimensions (bore size: $\varnothing 8$)

● LCG-8-P7*

Stroke length: 40, 50, 75

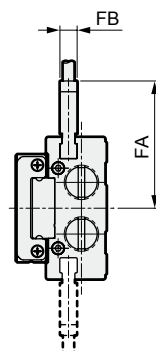
(Main fixing holes in this drawing are for the 50 mm stroke.)



Dimensions table per stroke length

Stroke length	40	50	75
L1	115	125	150
L2	106	116	141
n	3	4	5
V	92	102	127
W	25	35	60
X	46.5	48	45
Y	41.5	63	80
RD	34		
HD	32		

● Projection when F2S, F3S switch is mounted.



Stroke	40	50
FA	29.6	
FB	4	
RD	36.5	
HD	23.5	

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

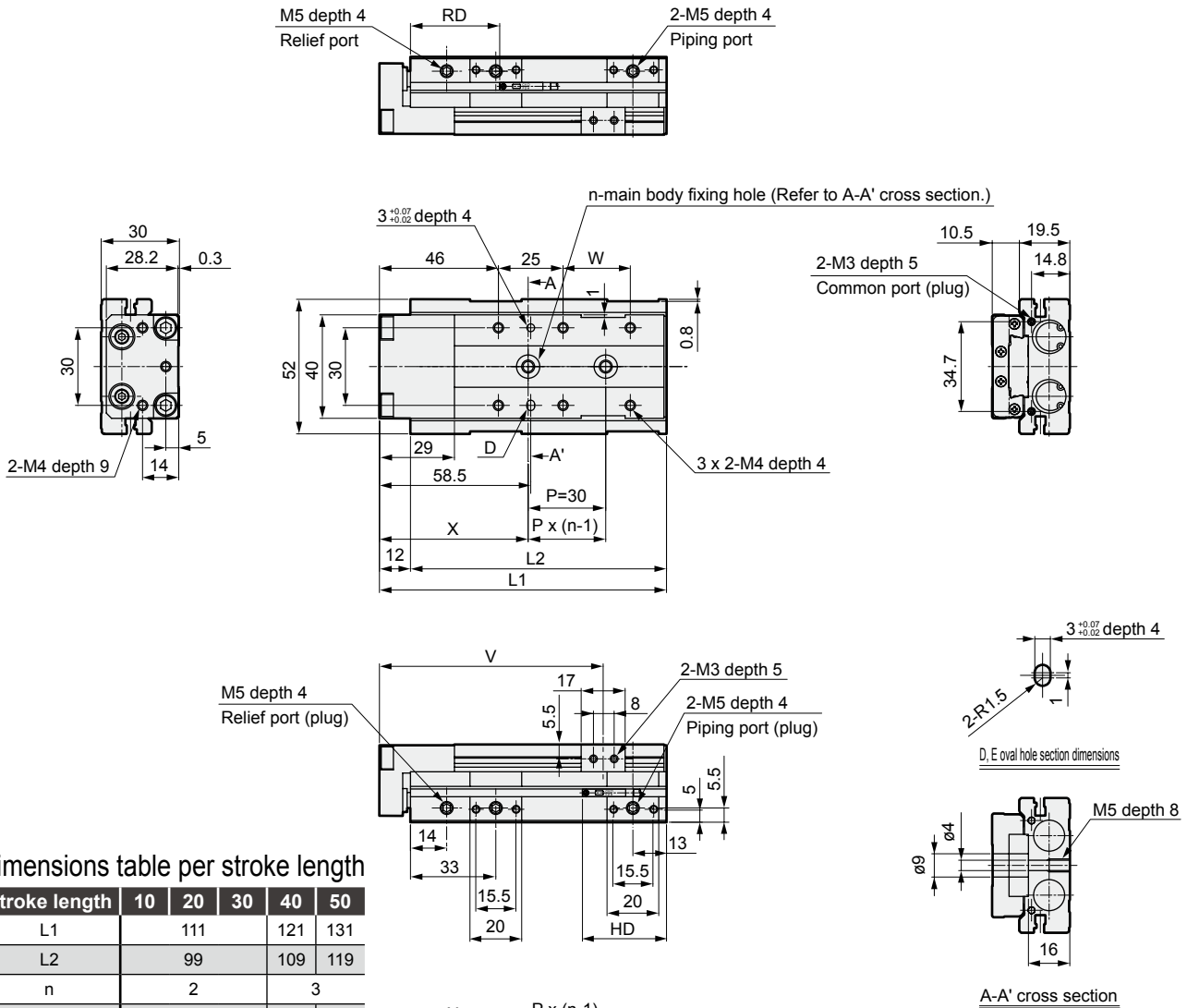
LCG-P7* Series

Dimensions (bore size: $\phi 12$)

● LCG-12-P7*

Stroke length: 10, 20, 30, 40, 50

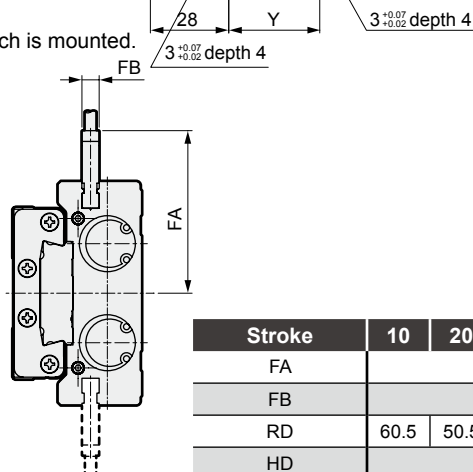
(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1	111	121	131		
L2	99	109	119		
n	2	3			
V	86.5	96.5	106.5		
W	26	36	46		
X	57.5	56	52		
Y	32.5	31	57		
RD	61.5	51.5	41.5		
HD	27				

● Projection when F2S, F3S switch is mounted.



Stroke	10	20	30	40	50
FA	37.8				
FB	4				
RD	60.5	50.5	40.5		
HD	28				

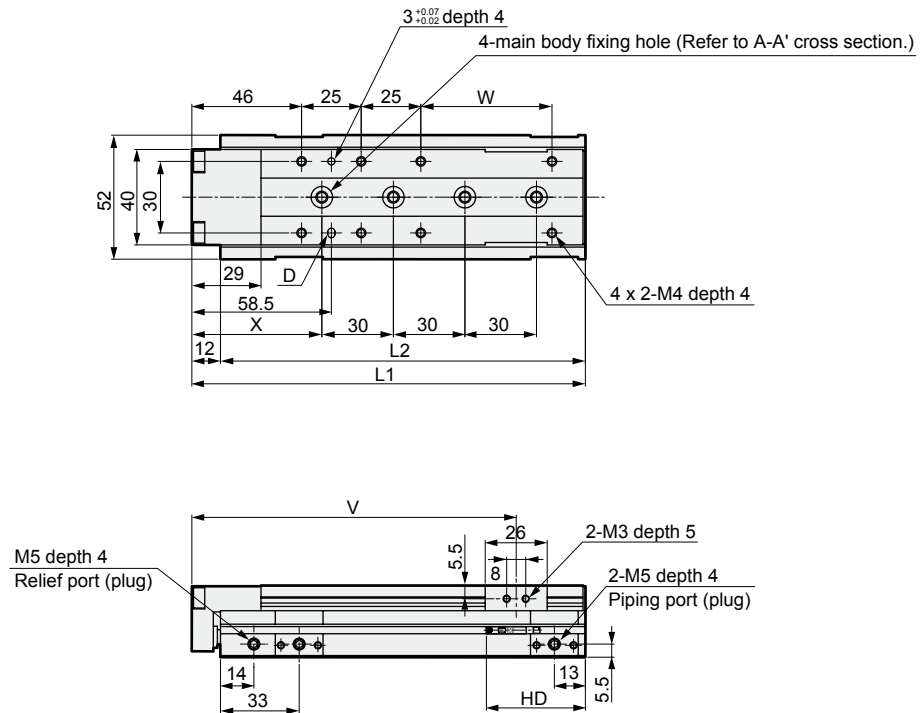
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\phi 12$)

● LCG-12-P7*

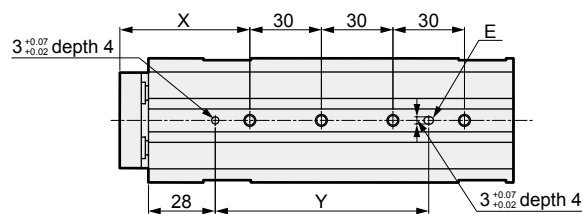
Stroke length: 75, 100

(Main fixing holes in this drawing are for the 100 mm stroke.)

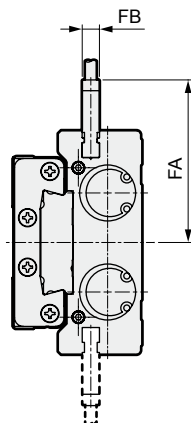


Dimensions table per stroke length

Stroke length	75	100
L1	165	190
L2	153	178
V	136	161
W	55	80
X	54.5	67
Y	89.5	102
RD	41.5	
HD	36	



● Projection when F2S, F3S switch is mounted.



Stroke	75	100
FA	37.8	
FB	4	
RD	40.5	
HD	37	

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

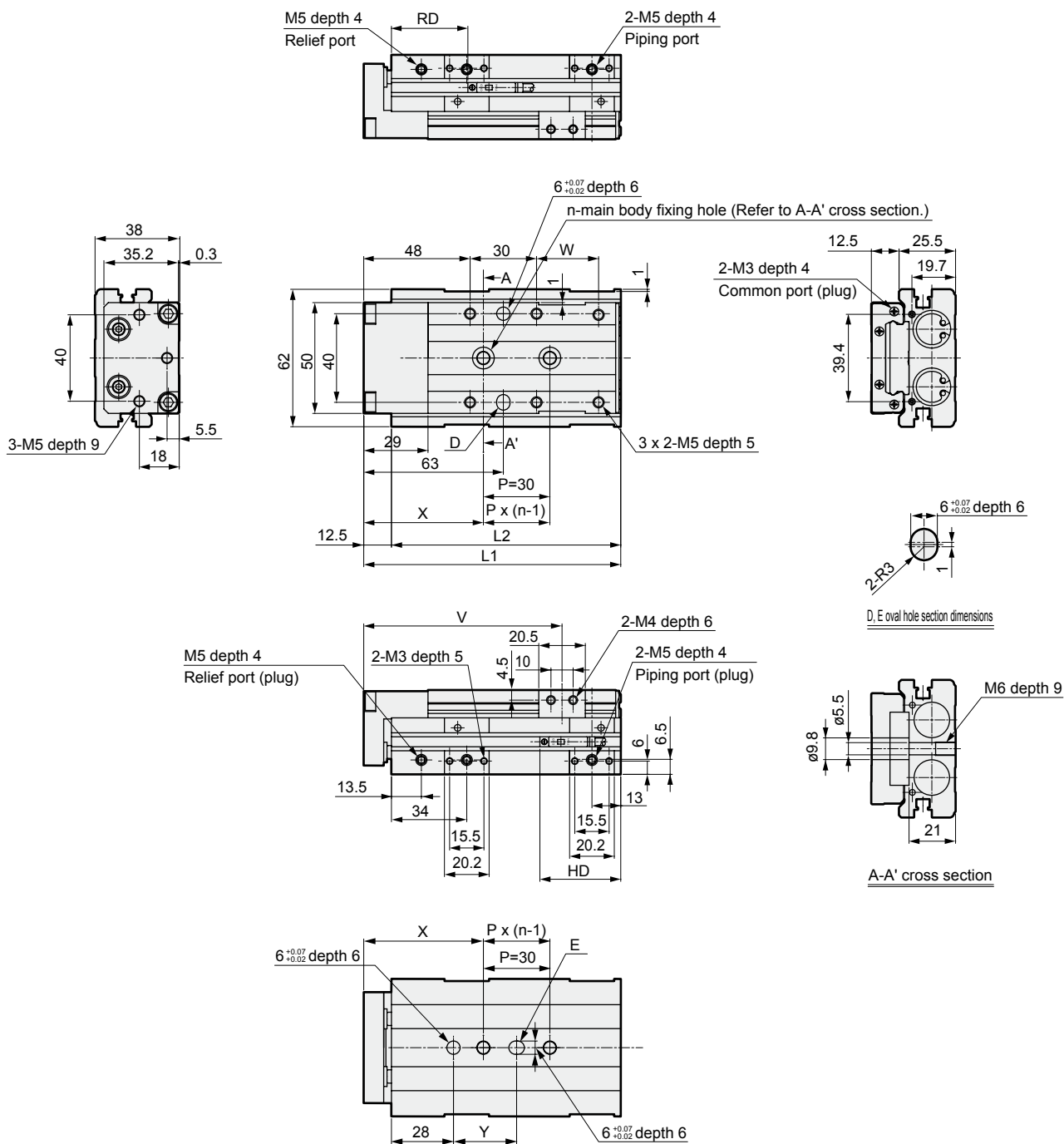
LCG-P7* Series

Dimensions (bore size: $\varnothing 16$)

● LCG-16-P7*

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		116	126	136	
L2		103.5	113.5	123.5	
n		2		3	
V		89.8	99.8	109.8	
W		28	38	48	
X		54	65.5	55.5	
Y		28.5	40	60	
T0*/T5*	RD	57	47	37	
	HD	36.5			
T2*/T3*	RD	59.5	49.5	39.5	
	HD	34			

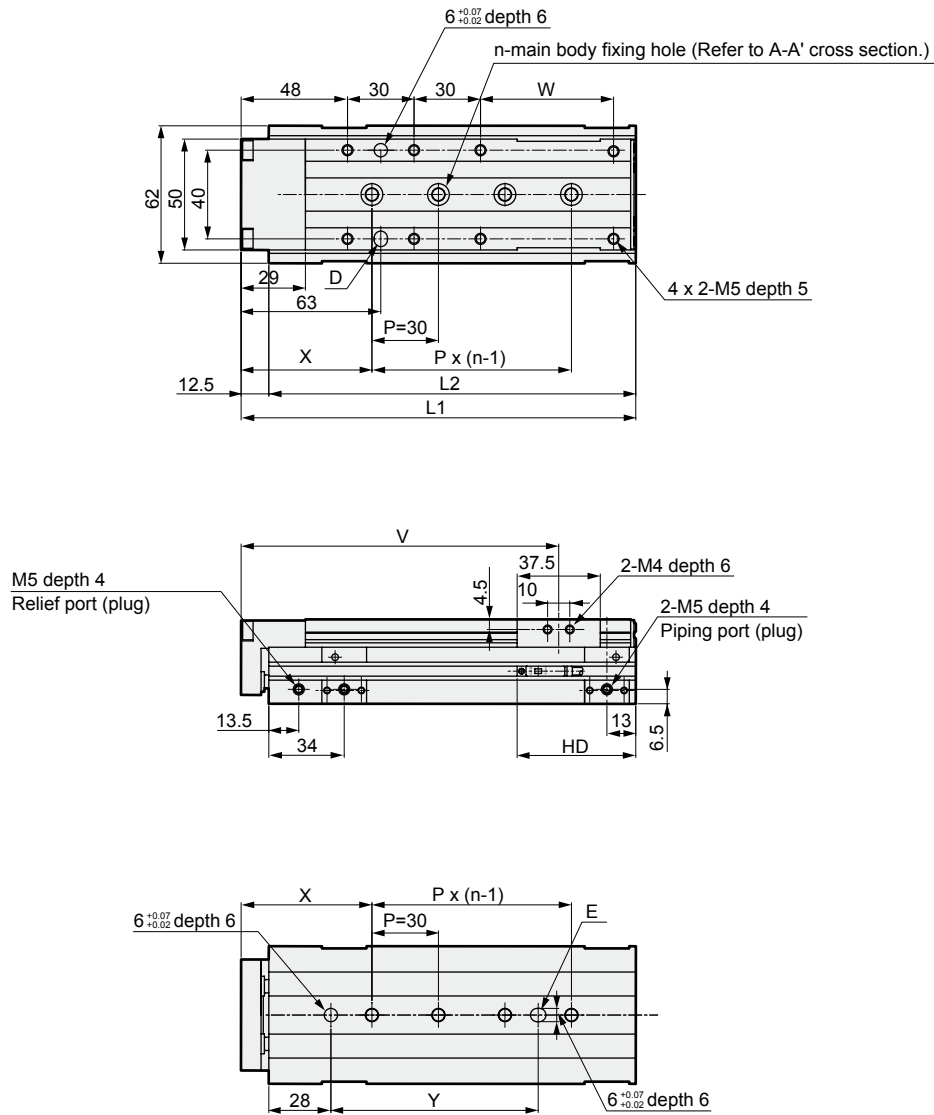
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 16$)

● LCG-16-P7*

Stroke length: 75, 100, 125

(Main fixing holes in this drawing are for the 75 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100	125
L1	178	203	228
L2	165.5	190.5	215.5
n	4	5	
V	143.3	168.3	193.3
W	60	85	110
X	59	57	69
Y	93.5	121.5	133.5
T0*/T5*	RD	37	
	HD	53.5	
T2*/T3*	RD	39.5	
	HD	51	

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

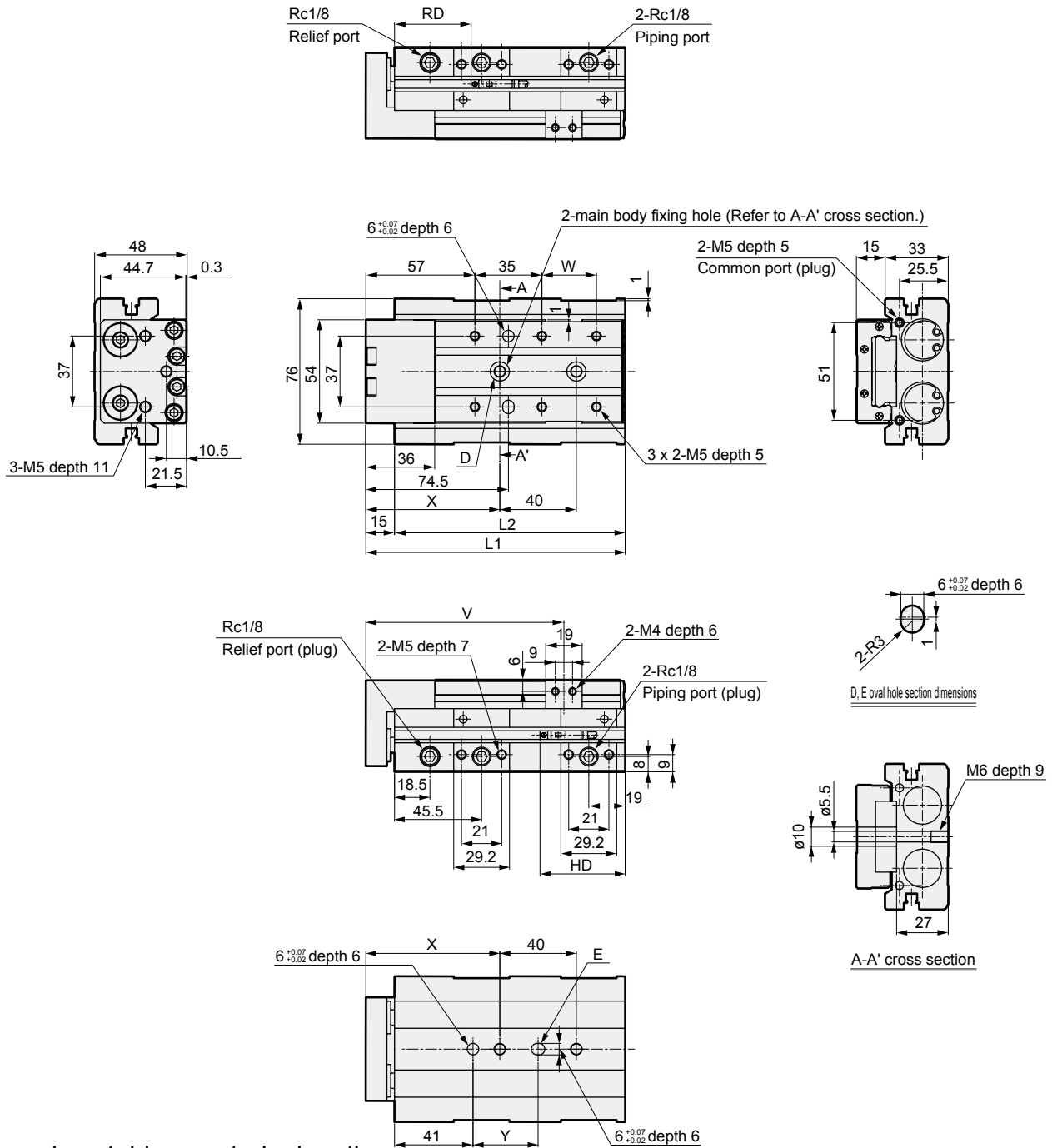
LCG-P7* Series

Dimensions (bore size: $\varnothing 20$)

● LCG-20-P7*

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		135.5		145.5	155.5
L2		120.5		130.5	140.5
V		103.5		113.5	123.5
W		28.5		38.5	48.5
X		70		76	74
Y		34		40	38
T0*/T5*	RD	61	51	41	
T2*/T3*	HD	49.5			
T2W*/T3W*	RD	63.5	53.5	43.5	
	HD	47			

*The dimensions for rust proof type U is the same.

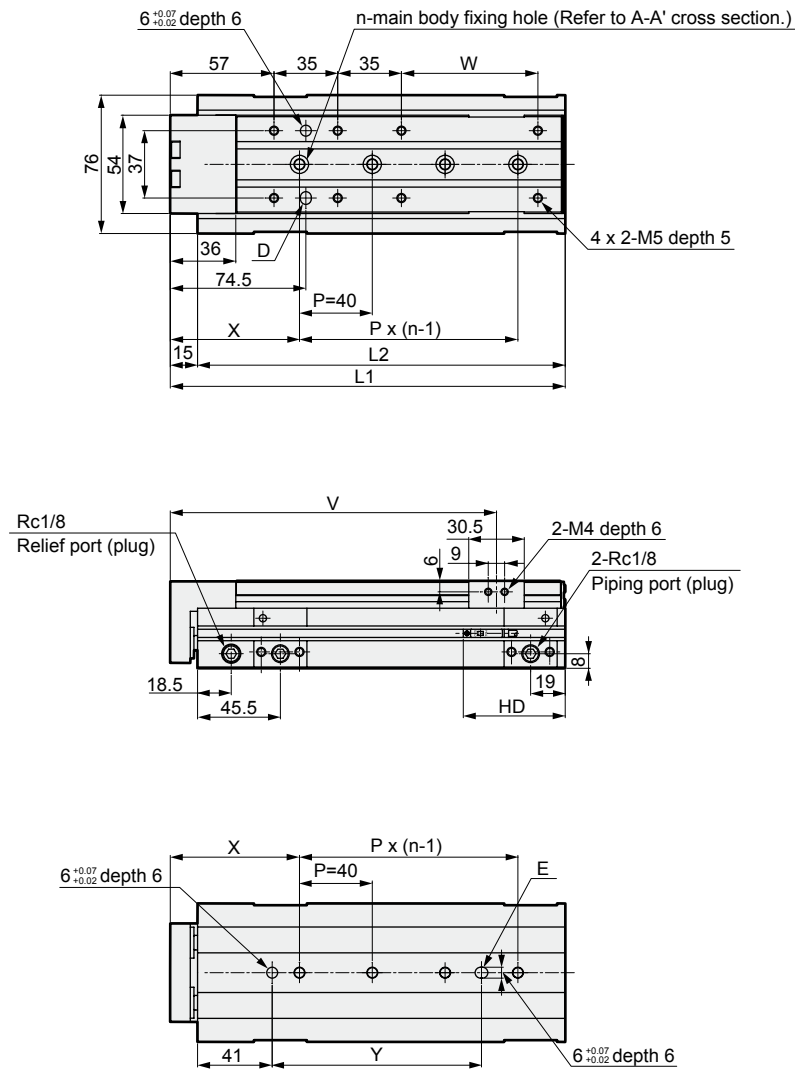
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 20$)

● LCG-20-P7*

Stroke length: 75, 100, 125, 150

(Main fixing holes in this drawing are for the 100 mm stroke.)



Dimensions table per stroke length

Stroke length	75	100	125	150
L1	192	217	242	267
L2	177	202	227	252
n	3	4	5	
V	154.3	179.3	204.3	229.3
W	50	75	100	125
X	71		78	76
Y	75	115	122	160
T0*/T5*	RD	41		
T2*/T3*	HD	61		
T2W*/T3W*	RD	43.5		
	HD	58.5		

*The dimensions for rust proof type U is the same.

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

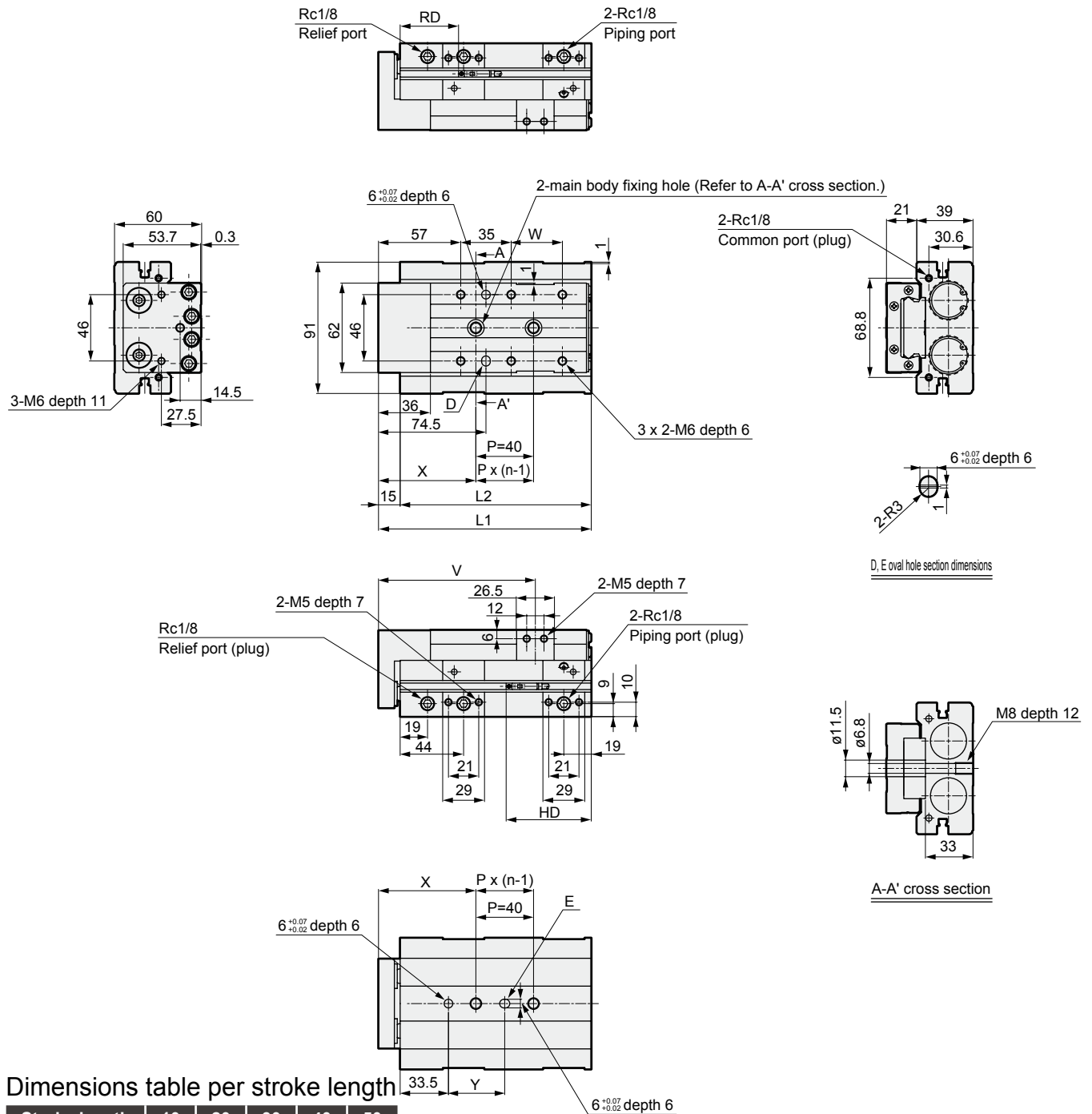
LCG-P7* Series

Dimensions (bore size: $\varnothing 25$)

● LCG-25-P7*

Stroke length: 10, 20, 30, 40, 50

(Main fixing holes in this drawing are for the 30 mm stroke.)



Dimensions table per stroke length

Stroke length	10	20	30	40	50
L1		147.5	157.5	167.5	
L2		132.5	142.5	152.5	
n		2	3	2	
V		108.8	118.8	128.8	
W		35.5	45.5	55.5	
X		67.5	70.5	85.5	
Y		39	42	57	
T0*/T5*	RD	63.5	53.5	43.5	
T2*/T3*	HD	59			
T2W*/T3W*	RD	66	56	46	
	HD	56.5			

*The dimensions for rust proof type U is the same.

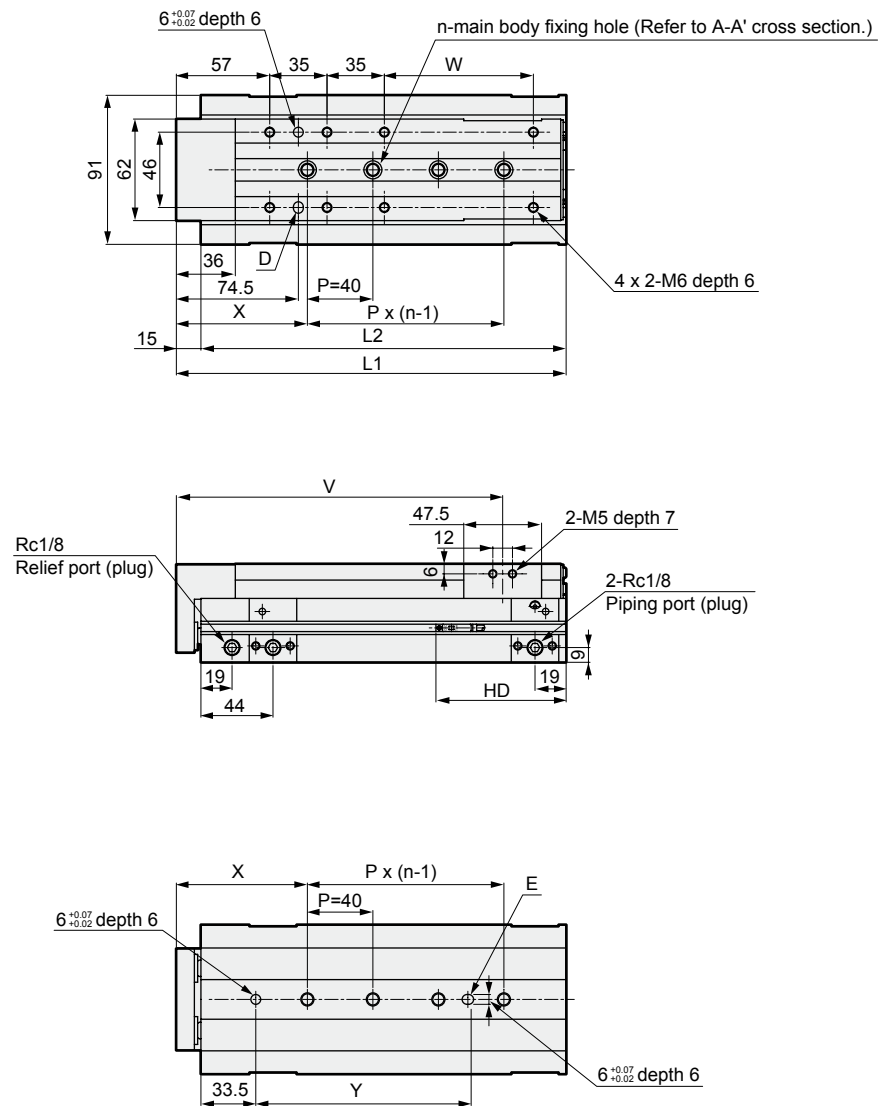
Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

Dimensions (bore size: $\varnothing 25$)

● LCG-25-P7*

Stroke length: 75, 100, 125, 150

(Main fixing holes in this drawing are for the 100 mm stroke.)



Dimensions table per stroke length

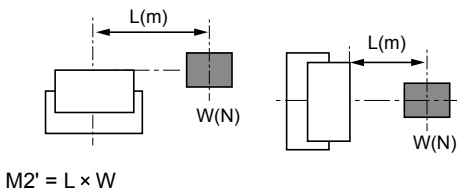
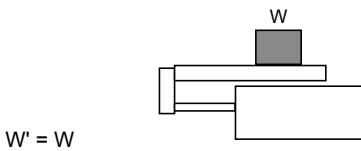
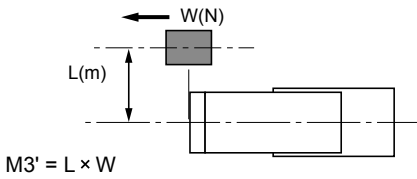
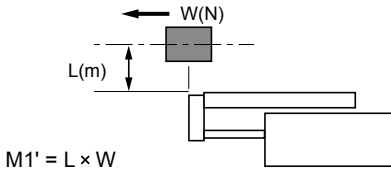
Stroke length	75	100	125	150
L1	213	238	263	288
L2	198	223	248	273
n	3	4	5	
V	163.8	188.8	213.8	238.8
W	66	91	116	141
X	85	80	70	85
Y	96.5	131.5	161.5	176.5
T0*/T5*	RD	43.5		
T2*/T3*	HD	79.5		
T2W*/T3W*	RD	46		
	HD	77		

*The dimensions for rust proof type U is the same.

Note 1: When using the dowel hole, a pin with the dimension for pressfit must not be used. Recommended tolerance for the pin is JIS tolerance m6 or less.

STEP-1

① Obtain the load and impact moment generated in each direction at the stroke end.



Obtain the approximate G coefficient from [Table 1].

[Table 1] V_a (average speed) = $\frac{\text{Moving distance}}{\text{Moving time}}$ (m/s)

V_a average speed (m/s)	V_m Stroke end speed (m/s)	G coefficient
to 0.07	to 0.1	5
to 0.2	to 0.3	14
to 0.27	to 0.4	19
to 0.35	to 0.5	24

G coefficient =

$M1' \times G = \text{[] (N}\cdot\text{m)}$

$M2' = \text{[] (N}\cdot\text{m)}$

$M3' \times G = \text{[] (N}\cdot\text{m)}$

$W' = \text{[] (N)}$

$E' = \frac{1}{2} \times (m + m_a) \times V_m^2$

$= \text{[] (J)}$

$(m \approx \frac{W}{9.8})$

② Temporarily select a bore size that satisfies the following conditional expression:

$$M' T = \frac{M1' \times G}{M1' \text{ max}} + \frac{M2'}{M2' \text{ max}} + \frac{M3' \times G}{M3' \text{ max}} + \frac{W'}{W' \text{ max}} < 1$$

$E' < E \text{ max}$

$M' T$: Moment composite (As condition, must be smaller than 1)

G : G coefficient

$W' \text{ max}$: W' maximum tolerance (From Table 2)

$M1' \text{ max}$: $M1'$ maximum tolerance (From Table 2)

$M2' \text{ max}$: $M2'$ maximum tolerance (From Table 2)

$M3' \text{ max}$: $M3'$ maximum tolerance (From Table 2)

$E \text{ max}$: E_0 maximum tolerance (From Table 3)

m_a : Table weight (From Table 4)

[Table 2] Static load tolerance

Bore size	Stroke length (mm)	Vertical load $W' \text{ max(N)}$	Bending moment $M1' \text{ max(N}\cdot\text{m)}$	Radial moment $M2' \text{ max(N}\cdot\text{m)}$	Twist moment $M3' \text{ max(N}\cdot\text{m)}$
ø6	10 to 30	140	1.7	4.0	1.7
	40 to 50	186	10.7	6.0	10.7
ø8	10 to 30	152	3.4	6.8	3.4
	40 to 75	230	13.8	10.3	13.8
ø12	10 to 50	220.8	5.7	15.2	5.7
	75 to 100		22.2	21.0	22.2
ø16	10 to 50	380.8	17.8	36.0	17.8
	75 to 125		37.3	40.0	37.3
ø20	10 to 50	548.8	31.1	60.3	31.1
	75 to 150		56.2	61.6	56.2
ø25	10 to 50	961.5	65.1	131.8	65.1
	75 to 150		127.5	132.0	127.5

Note: When load is applied to the end plate, even if long stroke length is selected; 40 mm stroke or longer for ø6.8, or 75 mm stroke or longer for ø12 and over, calculate the allowable valve with the value of short stroke length; 30 mm stroke or less for ø6.8, or 50 mm stroke or less for ø12 and over.

[Table 3] LCG allowable energy absorption (E_0)

Bore size	Standard (J)	With stopper for adjustable stroke (J)	With shock absorber stopper (J)
ø6	0.025	0.0032	0.6
ø8	0.058	0.0032	2.1
ø12	0.112	0.014	2.1
ø16	0.176	0.043	5.4
ø20	0.314	0.055	9.7
ø25	0.314	0.14	9.7

[Table 4] Table weight

(Unit: kg)

Bore size	Stroke (mm)										Add for P72 P73	Add for B BL
	10	20	30	40	50	75	100	125	150			
ø6	0.060	0.060	0.070	0.085	0.095	-	-	-	-	0.005	0.030	
ø8	0.080	0.080	0.090	0.110	0.125	0.150	-	-	-	0.015	0.030	
ø12	0.210	0.210	0.210	0.235	0.260	0.335	0.400	-	-	0.025	0.060	
ø16	0.315	0.315	0.315	0.350	0.380	0.515	0.595	0.680	-	0.035	0.070	
ø20	0.475	0.475	0.475	0.520	0.565	0.715	0.820	0.930	1.035	0.045	0.140	
ø25	0.785	0.785	0.785	0.845	0.915	1.200	1.360	1.515	1.680	0.075	0.310	

STEP-2

Next, increase the accuracy of the load factor, effective thrust, speed at stroke end, and moment composite value.

● Obtain the load factor.

$$\alpha = \frac{F_0}{F} \times 100[\%]$$

α : Load factor

F_0 : Force required to move the workpiece (N)

F : Cylinder theoretical thrust (N)

[Table 5]

At horizontal operation	At vertical operation
$F_0 = Fw$	$F_0 = W + Fw$
FW: $W \times 0.2$ Note (N)	
W: Load (N)	

Note: Friction coefficient

[Table 5] Theoretical thrust table

(Unit: N)

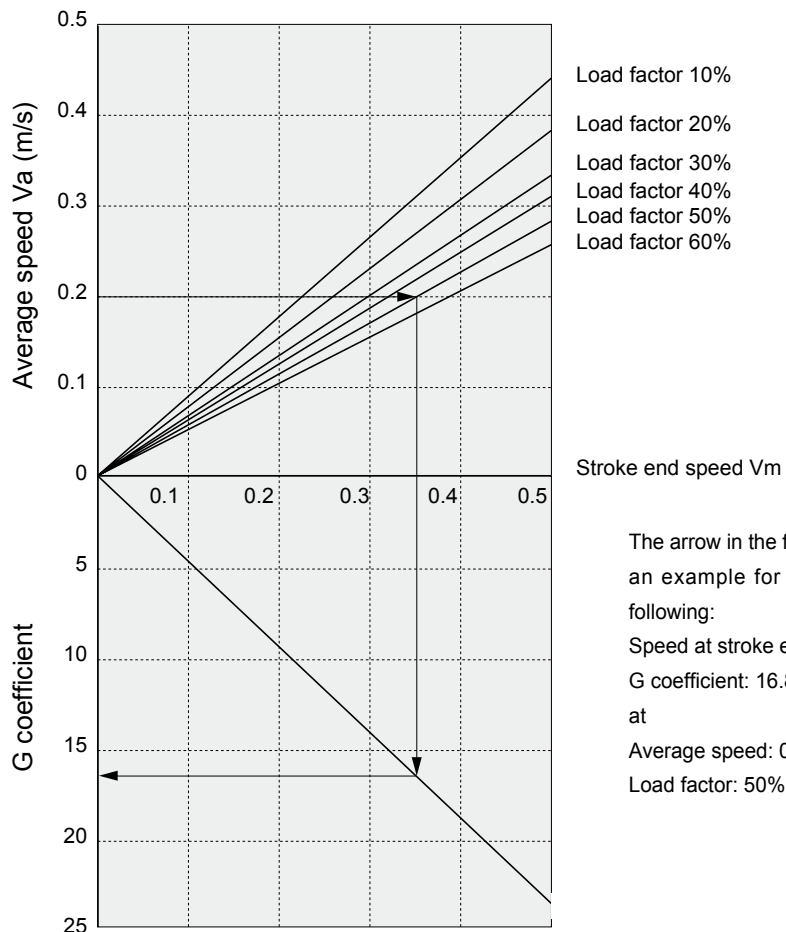
Bore size (mm)	Operation direction	Working pressure MPa						
		0.15	0.2	0.3	0.4	0.5	0.6	0.7
ø6	PUSH	8	11	17	23	28	34	40
	PULL	6	8	13	17	21	25	30
ø8	PUSH	15	20	30	40	50	60	70
	PULL	11	15	23	30	38	45	53
ø12	PUSH	34	45	68	90	113	136	158
	PULL	25	34	51	68	85	102	119
ø16	PUSH	60	80	121	161	201	241	281
	PULL	52	69	104	138	173	207	242
ø20	PUSH	94	126	188	251	314	377	440
	PULL	79	106	158	211	264	317	369
ø25	PUSH	147	196	295	393	491	589	687
	PULL	124	165	247	330	412	495	577

[Table 6] Guide to load factor

Working pressure MPa	Load factor (%)
0.2 to 0.3	$\alpha \leq 40$
0.3 to 0.6	$\alpha \leq 50$
0.6 to 0.7	$\alpha \leq 60$

STEP-3

Obtain the speed at stroke end (V_m) and G coefficient from the average speed (V_a) and load factor obtained in STEP-2.



The arrow in the figure indicates an example for obtaining the following:

Speed at stroke end: 0.35 m/s
G coefficient: 16.8
at
Average speed: 0.20 m/s
Load factor: 50%

Speed-G coefficient graph
G coefficient =

STEP-4

Confirm composite moment (M_T) with the G coefficient speed at stroke end (V_m) obtained in STEP-3.

$$M1' \times G = \text{[] (N}\cdot\text{m)}$$

$$M2' = \text{[] (N}\cdot\text{m)}$$

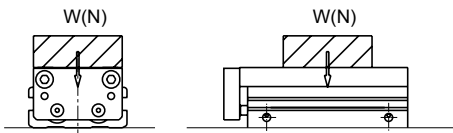
$$M3' \times G = \text{[] (N}\cdot\text{m)}$$

$$W' = \text{[] (N)}$$

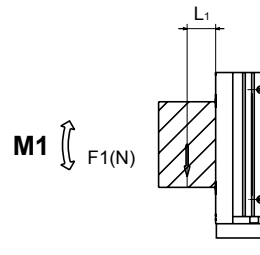
$$M_T = \frac{M1' \times G}{M1' \text{ max}} + \frac{M2'}{M2' \text{ max}} + \frac{M3' \times G}{M3' \text{ max}} + \frac{W'}{W' \text{ max}} = \text{[]}$$

Confirm composite moment M_T during travel. (Note that this differs from the value obtained in STEP-1.)

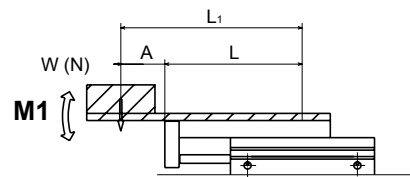
● Vertical load: W (N)



● Bending moment: $M1$ (N·m)



$$M1 = F1 \times L1$$

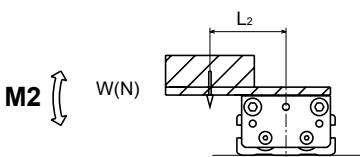


$$M1 = W \times L1$$

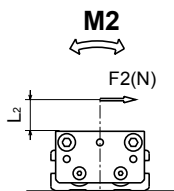
$$L1 = A + L$$

L is taken from the following table

● Radial moment: $M2$ (N·m)

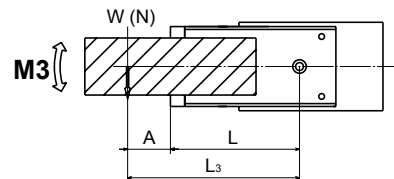


$$M2 = W \times L2$$



$$M2 = F2 \times L2$$

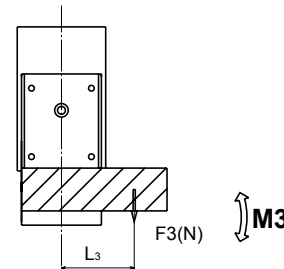
● Twist moment: $M3$ (N·m)



$$M3 = W \times L3$$

$$L3 = A + L$$

L is taken from the following table



$$M3 = F3 \times L3$$

Value L

Unit (m)

Bore size	Stroke									Add for P72 P73	Add for B BL
	10	20	30	40	50	75	100	125	150		
ø6	0.039	0.0415	0.049	0.0615	0.069	-	-	-	-	0.012	0.0165
ø8	0.0395	0.042	0.0495	0.0615	0.069	0.088	-	-	-	0.020	0.0145
ø12	0.053	0.0555	0.058	0.0655	0.073	0.096	0.115	-	-	0.020	0.018
ø16	0.0555	0.058	0.0605	0.068	0.0755	0.1025	0.1215	0.140	-	0.020	0.019
ø20	0.0635	0.066	0.0685	0.076	0.0835	0.108	0.127	0.1455	0.1645	0.025	0.020
ø25	0.0695	0.072	0.0745	0.082	0.0895	0.1185	0.1375	0.156	0.175	0.025	0.023

$$M1=M1 = \text{[]} \text{ (N}\cdot\text{m)}$$

$$M2=M2 = \text{[]} \text{ (N}\cdot\text{m)}$$

$$M3=M3 = \text{[]} \text{ (N}\cdot\text{m)}$$

$$W=W = \text{[]} \text{ (N)}$$

$$M_T = \frac{M1 \times G}{M1_{max}} + \frac{M2}{M2_{max}} + \frac{M3 \times G}{M3_{max}} + \frac{W}{W_{max}} = \text{[]}$$

M_T : Moment composite

W_{max} : W maximum tolerance (From Table 7)

$M1_{max}$: M1 maximum tolerance (From Table 7)

$M2_{max}$: M2 maximum tolerance (From Table 7)

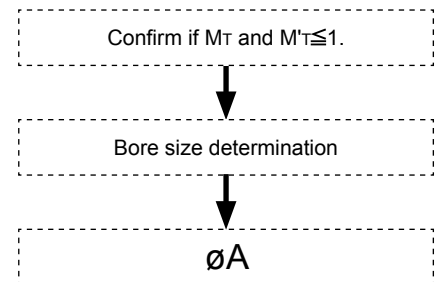
$M3_{max}$: M3 maximum tolerance (From Table 7)

E_{max} : E_0 maximum tolerance (From Table 3)

[Table 7] Travel load tolerance

Bore size	Stroke length (mm)	Vertical load W_{max} (N)	Bending moment $M1_{max}$ (N·m)	Radial moment $M2_{max}$ (N·m)	Twist moment $M3_{max}$ (N·m)
ø6	10 to 30	14	0.17	0.40	0.17
	40 to 50	15.5	0.89	0.50	0.89
ø8	10 to 30	15.2	0.34	0.68	0.34
	40 to 75	19.2	1.1	0.86	1.1
ø12	10 to 50	27.6	0.71	1.9	0.71
	75 to 100		2.2	2.1	2.2
ø16	10 to 50	47.6	1.9	4.0	1.9
	75 to 125		4.6	5.0	4.6
ø20	10 to 50	68.6	3.4	6.7	3.4
	75 to 150		7.0	7.7	7.0
ø25	10 to 50	128.2	7.6	15.5	7.6
	75 to 150		17.0	17.6	17.0

Note: When load is applied to the end plate, even if long stroke length is selected; 40 mm stroke or longer for ø6.8, or 75 mm stroke or longer for ø12 and over, calculate the allowable valve with the value of short stroke length; 30 mm stroke or less for ø6.8, or 50 mm stroke or less for ø12 and over.



STEP-5

Confirm allowable energy absorption

$$E = \frac{1}{2} \times (m+m_a) \times V_m^2$$

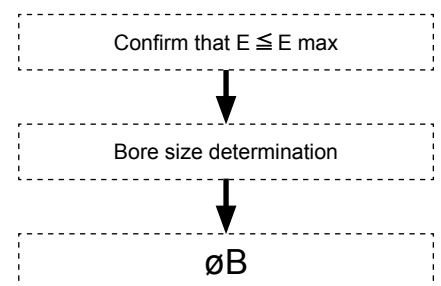
E : Kinetic energy at workpiece end (J)

m : Mass of load (kg) ($m \doteq \frac{W(N)}{9.8}$)

m_a : Table weight (From Table 4)

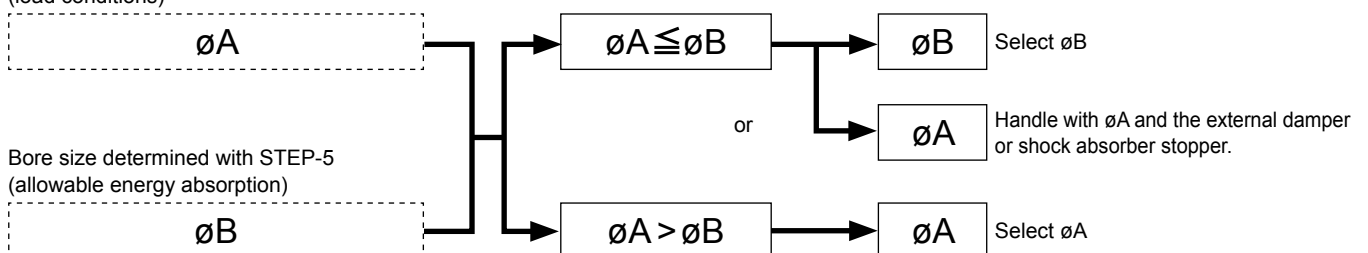
V_m : Stroke end speed (m/s)

E_{max} : E_0 maximum tolerance (From Table 3)



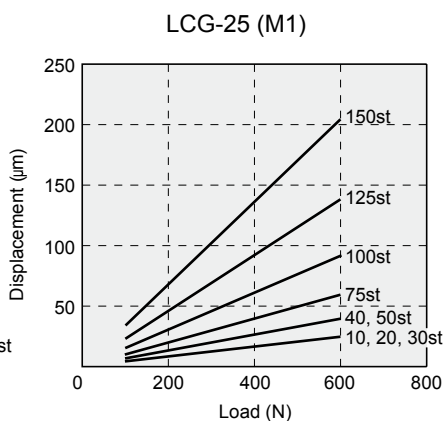
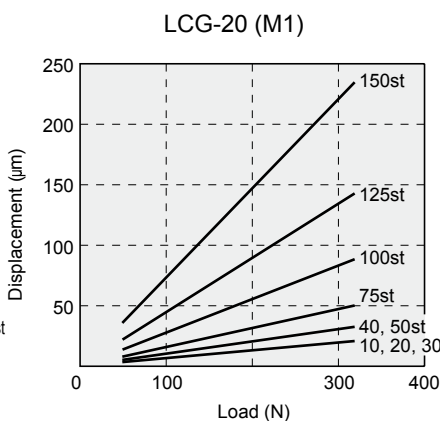
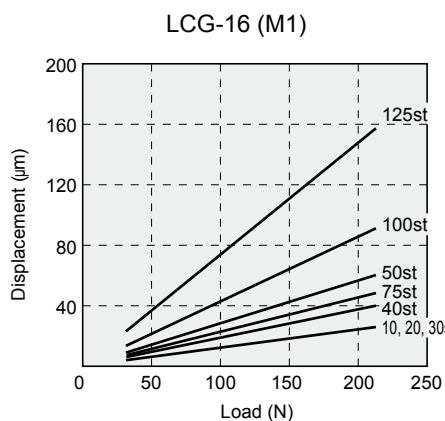
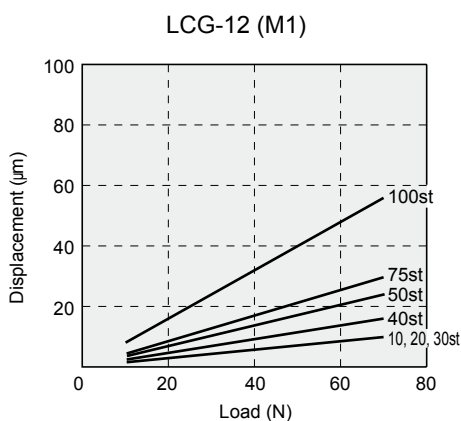
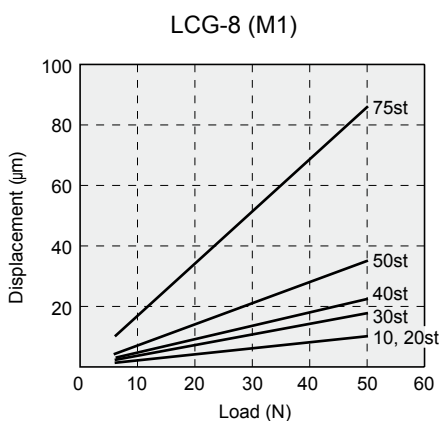
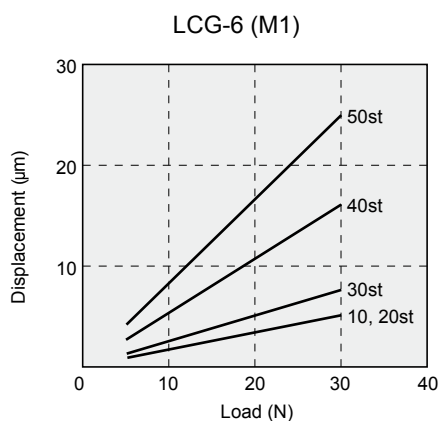
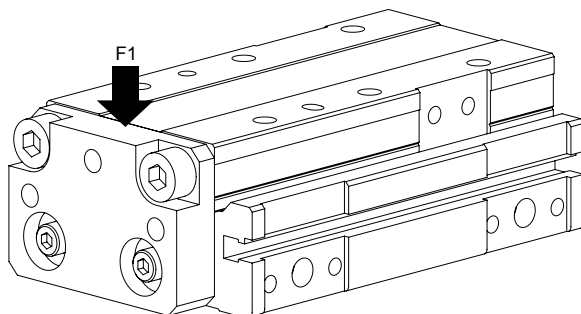
STEP-6

Bore size determined with STEP-4
(load conditions)



[Amount of table displacement caused by M1 moment]

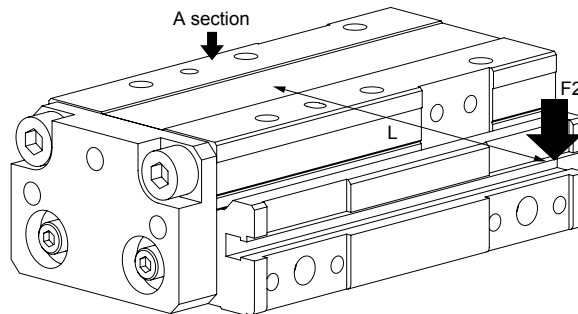
Displacement at table end when load (F1) is applied to table end



Displacement at point A

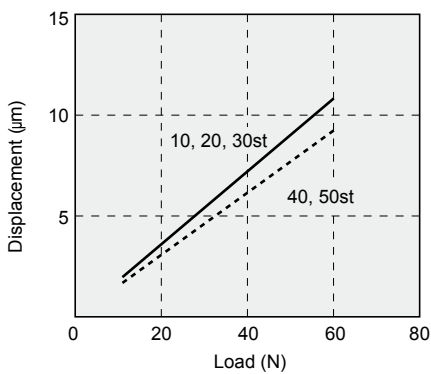
[Amount of table displacement caused by M2 moment]

Displacement at table end (A section) when load (F2) is applied at a location separated L mm from the center of the cylinder

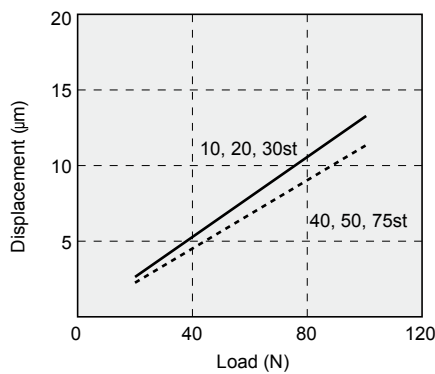


Value L
 ø 6: L = 70, ø 8: L = 70
 ø12: L = 90, ø16: L = 100
 ø20: L = 100, ø25: L = 200

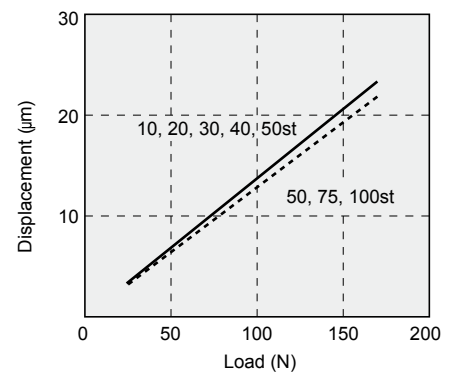
LCG-6 (M2)



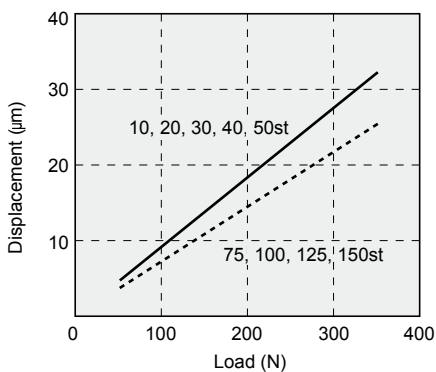
LCG-8 (M2)



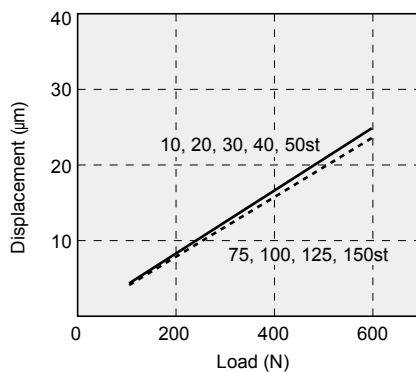
LCG-12 (M2)



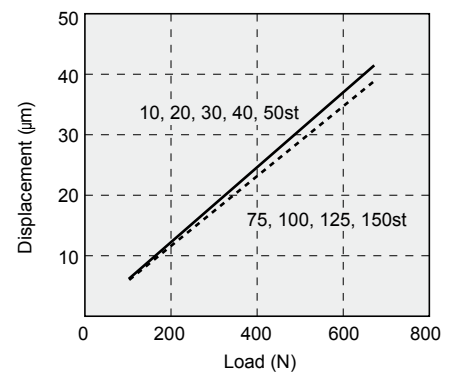
LCG-16 (M2)



LCG-20 (M2)



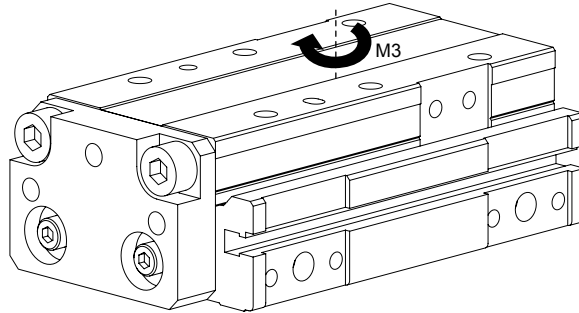
LCG-25 (M2)



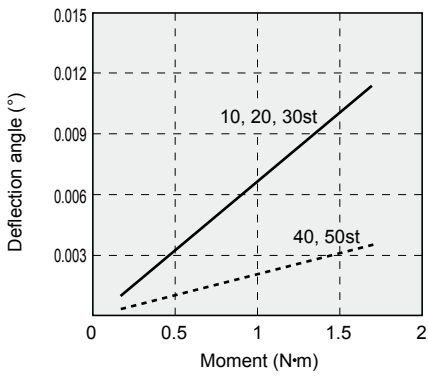
Displacement at point A

[Table displacement angle caused by M3 moment]

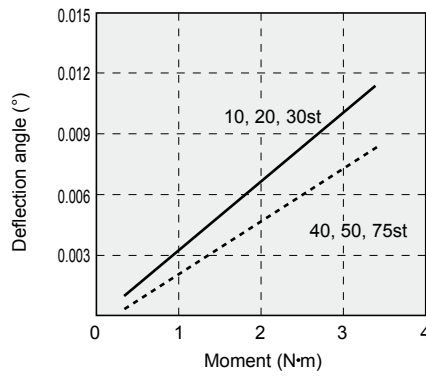
Table displacement angle when rotary moment (M3) is applied to cylinder



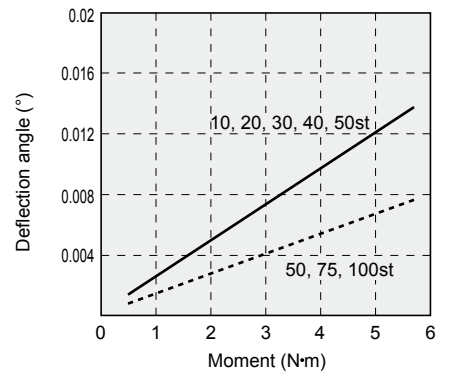
LCG-6 (M3)



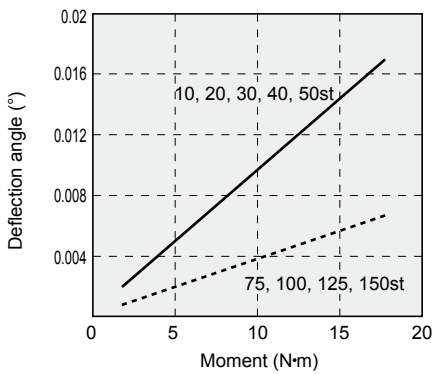
LCG-8 (M3)



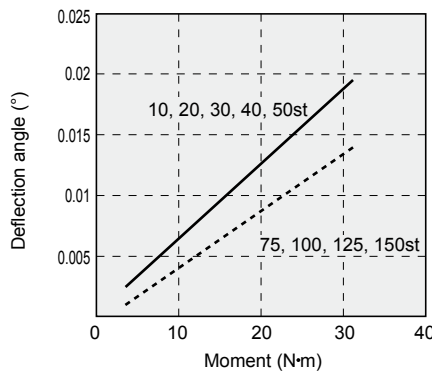
LCG-12 (M3)



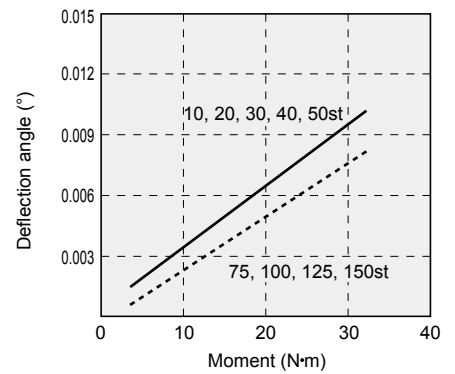
LCG-16 (M3)



LCG-20 (M3)



LCG-25 (M3)



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- Constant pressure
CKD's original magnetic spring structure.
- Low profile, light weight
Its low profile, light weight design using only a few parts makes it the best match for LCG Series.
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MEMO

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