With Brake with Lock

UFCD

Flat Cylinder with Free Position Fall Prevention

ø25, ø32, ø40, ø50, ø63

CONTENTS

With Brake / With Lock

ULK□

JSK2/
JSM2

JSG

JSC3,
JSC4

USSD

UFCD

USC

Cylinder
Switch

Ending

Free position locking Flat Cylinder

UFCD Series

Improved safety with free position fall prevention added to Flat Cylinder FCD series

Safety

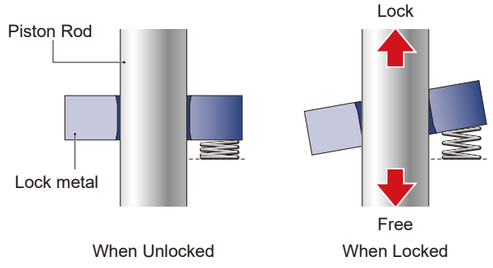
Ensures safety of workpieces etc. even during power outages or accidents.

Energy Saving

No power (electricity, air, etc.) is required while braking/locking.

Equipped with Free Position Fall Prevention Mechanism

- Can be locked at any position as long as the Piston Rod remains still.
- The direction of the lock can either be forward or backward.
- Easy to remove even with workpiece clamped as the cylinder moves freely in the reverse lock direction.



Space-saving / Simple Design

- Flat and can be installed in a tight space or arranged side-by-side.
- Even with its position locking mechanism, it has a simple design that can work with any device.

Anti-rotation not required

- Due to the oval piston structure, the Cylinder Body has a rotation-stop function. Therefore, a separate rotation-stop mechanism is not required.

UFCD Series Product System

Model Variations		Bore Size	Stroke (mm)	Lock Direction	Rod End
Flat Cylinder with Free Position Fall Prevention	UFCD	ø25 or equiv. to ø63 or equiv.	to 150	Forward Direction Lock Reverse Direction Lock	Female Thread Male thread

Variation Table

Flat Cylinder with Free Position Fall Prevention UFCD Series

●: Standard, ◎: Option

Variation	Model No.	Bore Size (mm)	Standard Stroke (mm) 5	10	15	20	25	30	40	50	Min Stroke (mm)	Intermediate Stroke (per mm)	Max Stroke (mm)	Option: Rod End male thread N	Switch	Page
Double Acting/ Single Rod Type	UFCD-KL	Equivalent to ø25, ø32 Equivalent to ø40, ø50, ø63	●	●	●	●	●	●	●	●	1	1	150	◎	◎	566

Flat Cylinder with Free Position Fall Prevention Double Acting / Single Rod Type

UFCD Series

● Bore Size: ø25, ø32, ø40, ø50, ø63 or equiv.

RoHS

Model No. Notation

Without switch
(Built-in magnet for switch)

UFCD-KL - 25 - [ ] - 10 - F ——— N

Model Number ❶ ❷ ❸ ❹ ❼

With switch
(Built-in magnet for switch)

UFCD-KL - 25 - [ ] - 10 - F - M2V - R - N

Model Number
❶Bore Size
❷Piping thread type
❸Stroke
❹Lock Direction
❺Switch Model
❻Number of Switches
❼Option

❶ Bore Size (mm)

Code	Content
25	Equivalent to ø25
32	Equivalent to ø32
40	Equivalent to ø40
50	Equivalent to ø50
63	Equivalent to ø63

❷Piping thread type

Code	Content
Blank	M5 (Equivalent to ø25, ø32)
	Rc thread (Equivalent to ø40 to ø63)
NN	NPT thread (Equivalent to ø40 or more) (Custom item)
GN	G thread (Equivalent to ø40 or more) (Custom item)

❸Stroke (mm)

Bore Size	Stroke	Intermediate Stroke
Equivalent to ø25 to ø63	1 to 150	in 1 mm increments

Note: For Standard Stroke and minimum stroke with switch, please refer to P. 568.

❹ Lock Direction

Code	Content	
F	Forward Direction Lock	
B	Reverse Direction Lock	

❺ Switch Model

For switch details, refer to P. 1457. Switches are pre-assembled on the product before shipment.

Contact	Indicator LED Special Function	Wiring (Output)	Load Voltage (V) AC	Load Voltage (V) DC	Load Current (mA) AC	Load Current (mA) DC	Lead wire *1 L-shape	
Solid State	1-Color	2-wire	—	10 to 30	-	5 to 30	M2V□	
		3-wire (NPN)	—	30 or less	—	100 or less	M3V□	
	1-color (Custom order)	3-wire (PNP)	—		-		M3PV□	
	2-color	2-wire	—	10 to 30	-	5 to 30	M2WV□	
		3-wire (NPN)	—	30 or less	—	100 or less	M3WV□	
Contact	1-Color	2-wire	110	12/24	7 to 20	5 to 50	M0V□	
	Without Indicator Lamp			5/12/24	20 or less	50 or less	M5V□	

*1: Insert the code selected in the "Lead wire length" table into "□" of the switch model number.

***Lead Wire Length**

Code	Content
Blank	1 m (Standard)
3	3 m (Option)
5	5m (Option)

Example) Lead wire length
1 m M0V
3 m M0V3
5 m M0V5

❻ Number of Switches

Code	Content
R	With 1 pc on rod side
H	With 1 pc on head side
D	With 2 pcs

❼ Option

Code	Content	
Blank	Rod End female thread	
N	Rod End male thread	

Switch Single Unit Model No. Notation

● Switch body+Mounting bracket set

FCS - M2V

❺ Switch Model

● Switch body only

SW - M2V

❺ Switch Model

● Mounting bracket set

FCS - M

Mounting bracket

Specifications

Item		UFCD-KL				
Bore Size	mm	Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Operation type		Double Acting Type				
Operating Fluid		Compressed Air				
Max Operating Pressure	MPa	0.7				
Min Operating Pressure	MPa	0.25 (36 psi)				
Proof Pressure	MPa	1.05				
Ambient Temperature	°C	-10 to 60 (No freezing)				
Port Size		M5		Rc1/8		Rc1/4
Stroke Tolerance	mm	$^{+1.5}_{0}$ (up to 50) + $^{+2.0}_{0}$ (up to 150)				
Operating Piston Speed	mm/s	50 to 500				
Cushion		Rubber Cushion				
Lubrication		Not required (When lubricating, use turbine oil Class 1 ISO VG32)				
Locking Force	N	345	543	904	1350	2220
Allowable Absorbed Energy	J	0.34	0.54	0.67	1.02	1.56

Non-rotation accuracy / Allowable rotational torque

Item		Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Non-rotation accuracy	*2	±1°	±0.8°	±0.5°	±0.5°	±0.5°
Allowable rotational torque	N·m	1	1.6	2.5	3.9	5.9

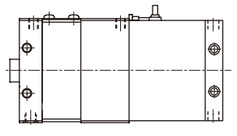
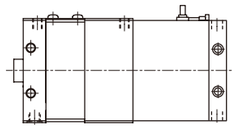
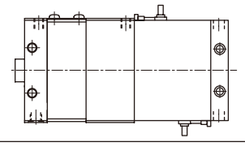
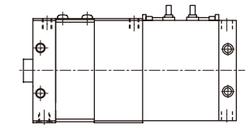
*1: Avoid use where rotational torque is applied impulsively or where the direction of torque load changes impulsively.
*2: The "non-rotation accuracy" value is the value when a torque load of 10% of the "allowable rotational torque" is applied to the tip of the Piston Rod.

Stroke

Model No.	Bore Size (mm)	Standard Stroke (mm)	Max Stroke (mm)	Min Stroke (mm)
UFCD-KL	ø25, ø32 ø40, ø50 Equivalent to ø63	5, 10, 15, 20, 25 30, 40, 50	150	1

*1: Intermediate strokes can be manufactured in 1 mm increments.
*2: The minimum stroke varies depending on the switch mounting method. Refer to the table below.

Minimum stroke with switch

With 1 pc		With 2 pcs	
Rod Side Mounting	Head Side Mounting	For different surface mounting	In case of same surface mounting
			
10 mm		15 mm	35 mm (Equivalent to ø25, 32, 40, 50) 30 mm (Equivalent to ø63)

Cylinder Weight

(Unit: g)

Bore Size (mm)	Product Weight when stroke (S) = 0 mm	Added Weight per S = 10 mm	Switch Weight	Mounting Bracket Weight
Equivalent to ø25	454	26	Please refer to the Weight listed in the switch specifications on P. 1457.	2
Equivalent to ø32	613	37		
Equivalent to ø40	1046	46		
Equivalent to ø50	1730	71		
Equivalent to ø63	3088	90		

(Example) Product Weight of UFCD-KL-32-20
- Product weight when S=0 mm ..... 613 g
- Additional weight when S=20 mm ..... $37g \times \frac{20}{10} = 74$ g
- Product weight ..... 613 g+74 g=687 g

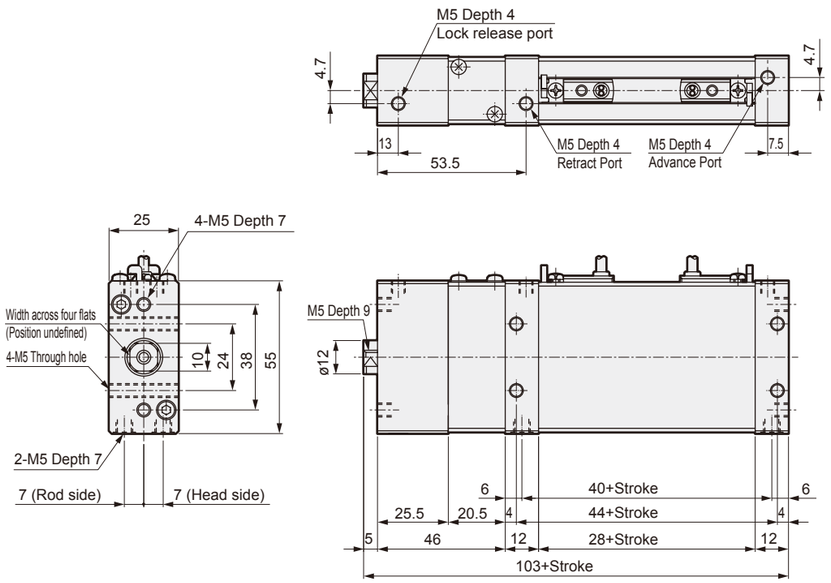
Theoretical Thrust Table

(Unit: N)

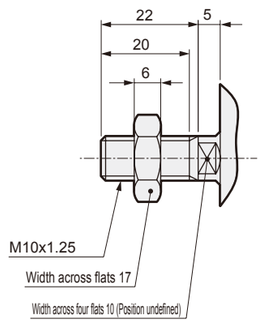
Bore Size (mm)	Operating Direction	Operating Pressure MPa 0.3	0.4	0.5	0.6	0.7
Equivalent to ø25	Push	1.48×10^2	1.97×10^2	2.46×10^2	2.96×10^2	3.45×10^2
	Pull	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
Equivalent to ø32	Push	2.33×10^2	3.10×10^2	3.88×10^2	4.66×10^2	5.43×10^2
	Pull	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
Equivalent to ø40	Push	3.87×10^2	5.16×10^2	6.45×10^2	7.75×10^2	9.04×10^2
	Pull	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
Equivalent to ø50	Push	5.80×10^2	7.73×10^2	9.66×10^2	1.16×10^3	1.35×10^3
	Pull	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
Equivalent to ø63	Push	9.53×10^2	1.27×10^3	1.59×10^3	1.91×10^3	2.22×10^3
	Pull	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

External dimensions diagram (Bore Size: Equivalent to ø25)

● UFCD-KL-25-F (Forward Locking)

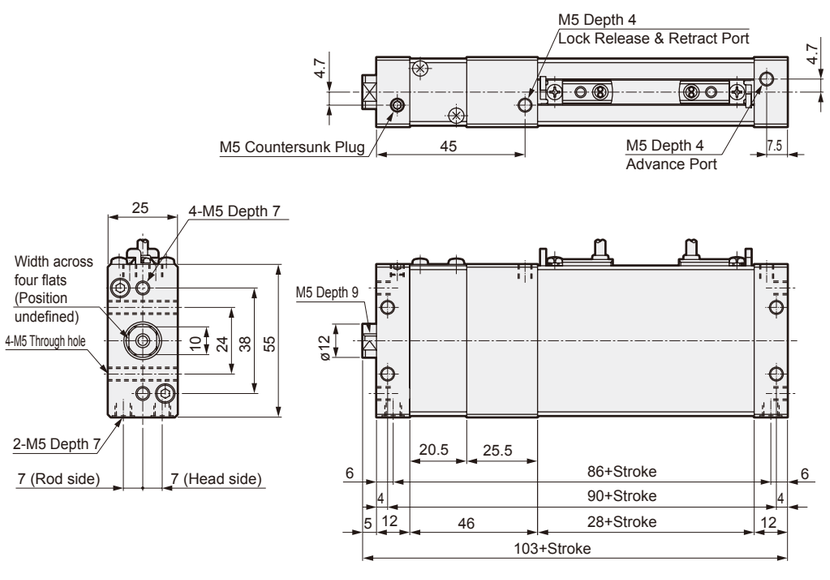


● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

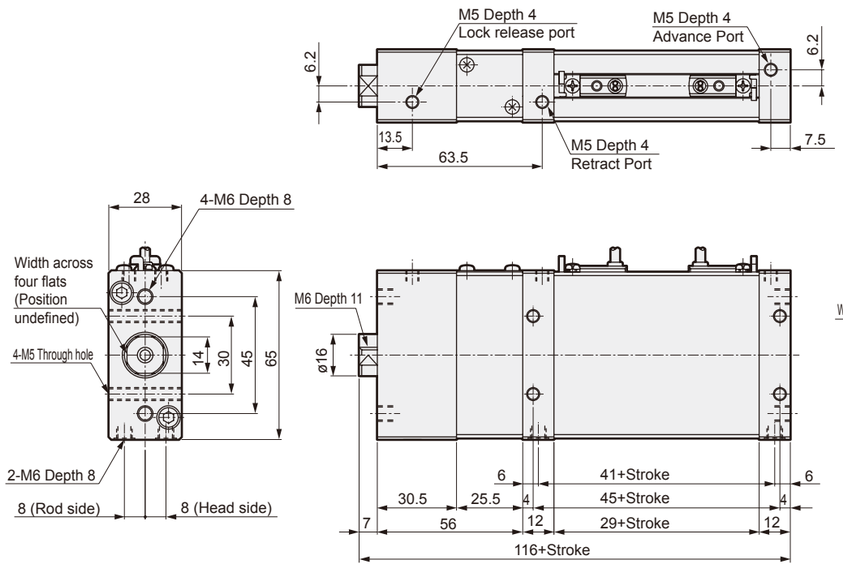
● UFCD-KL-25-B (Backward Locking)



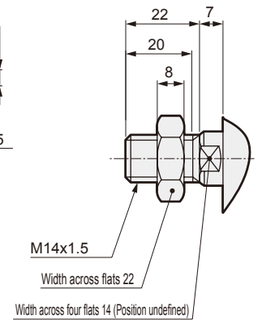
***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

Outline Dimension Drawing (Bore Size: Equivalent to ø32)

● UFCD-KL-32-F (Forward Locking)

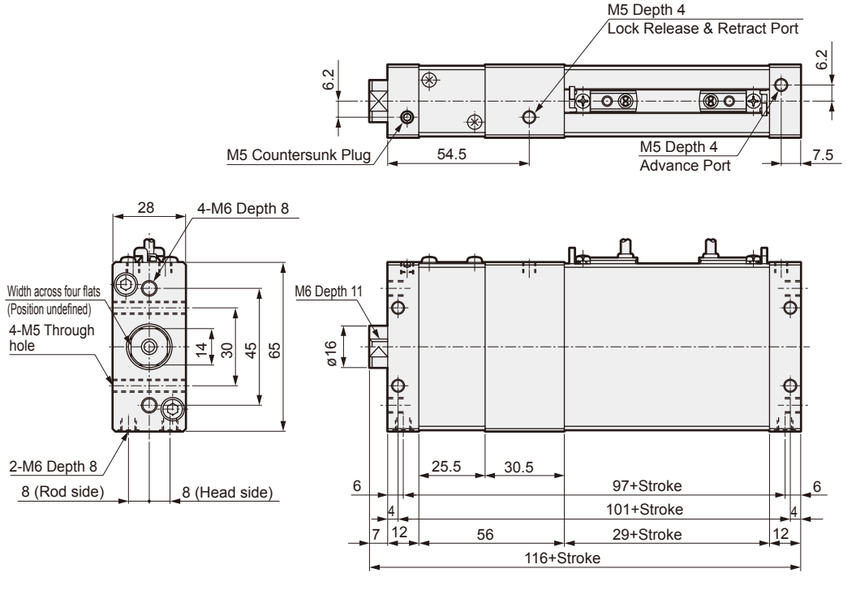


● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

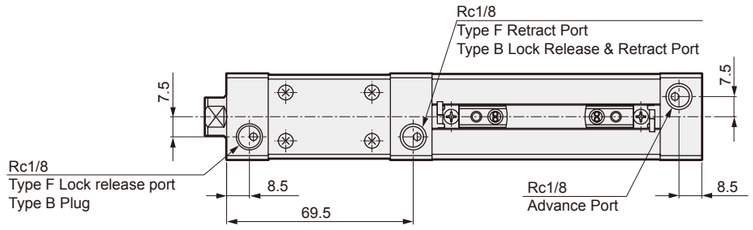
● UFCD-KL-32-B (Backward Locking)

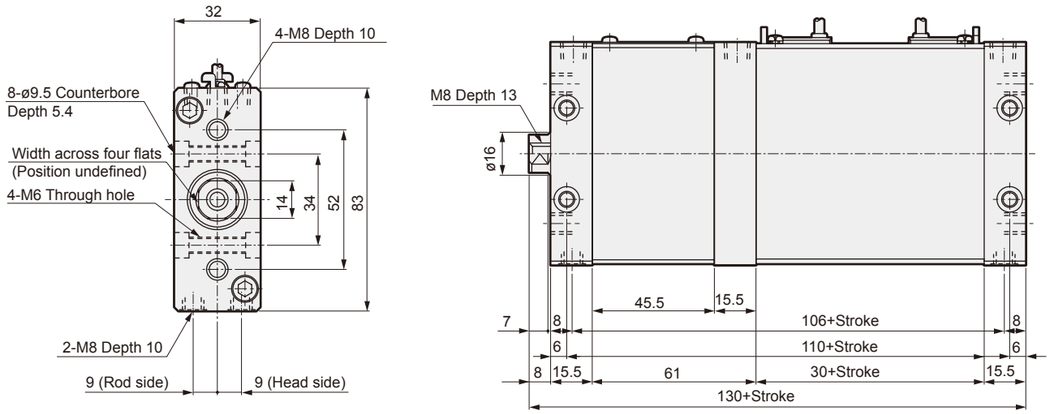


***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

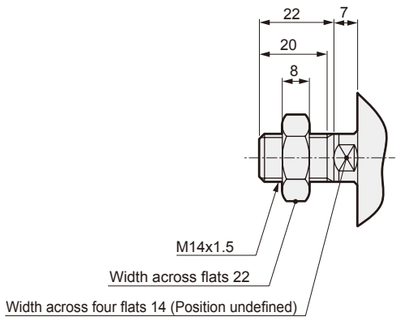
Outline Dimension Drawing (Bore Size: Equivalent to ø40)

● UFCD-KL-40-F/B (forward/Backward Locking)





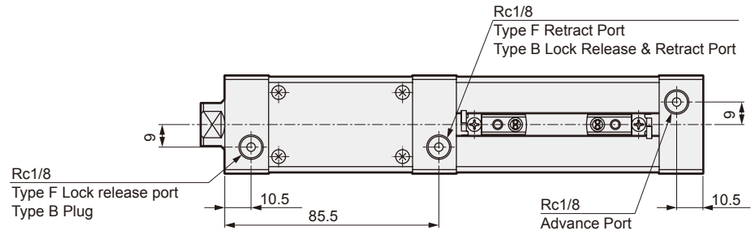
● Rod End male thread
(Option Code N)

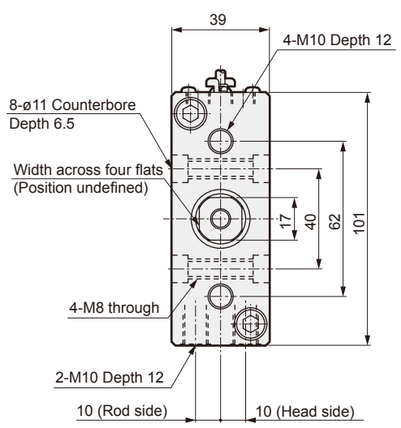


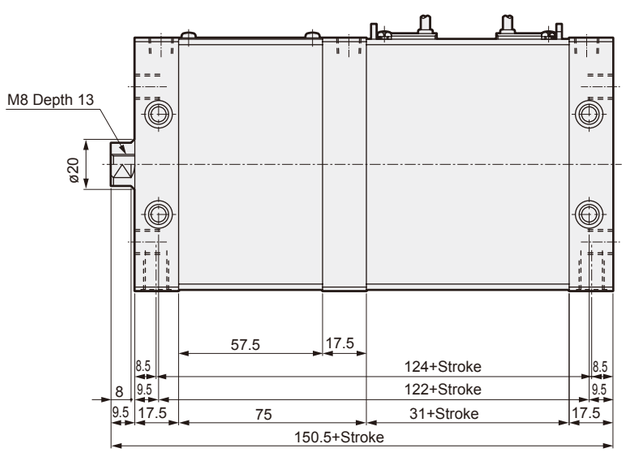
***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

Outline Dimension Drawing (Bore Size: Equivalent to ø50)

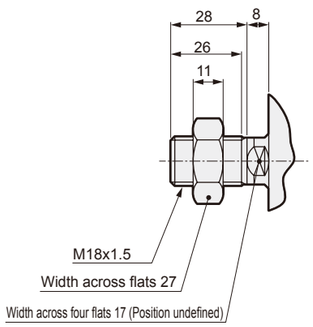
● UFCD-KL-50-F/B (forward/Backward Locking)







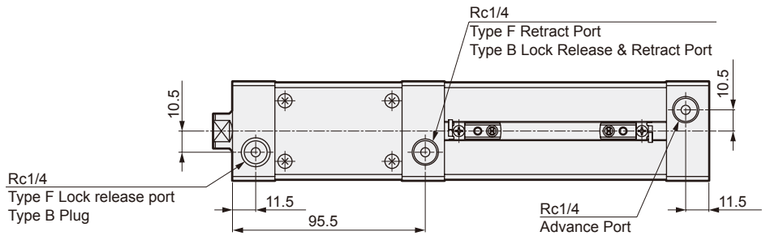
● Rod End male thread
(Option Code N)

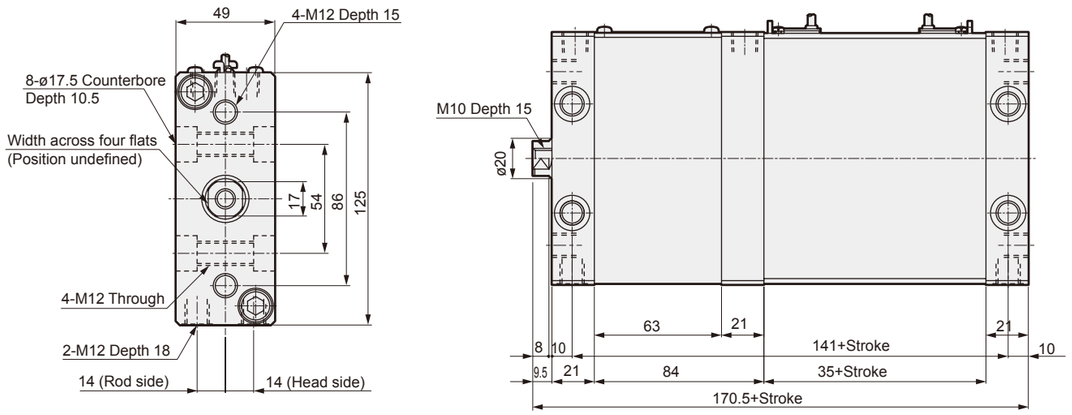


***1: For same-surface installation with 2 switches, the stroke of 35 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

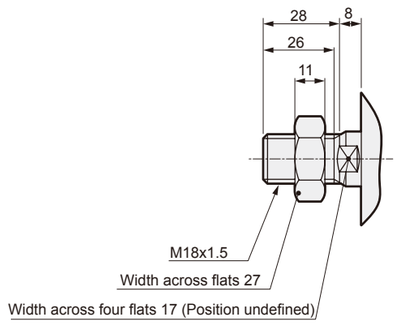
Outline Dimension Drawing (Bore Size: Equivalent to ø63)

● UFCD-KL-63-F/B (forward/Backward Locking)





● Rod End male thread
(Option Code N)



***1: For same-surface installation with 2 switches, the stroke of 30 mm and over is required. If less than that, it will be different-surface mounting.**
***2: For dimensions of models with switches, see P. 578.**

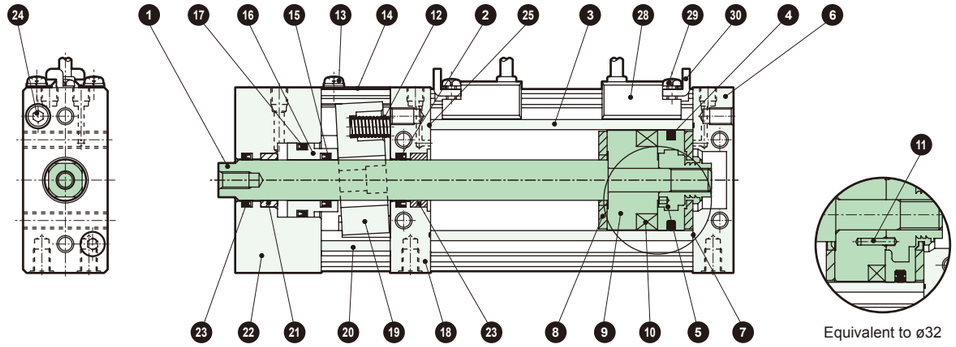
MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

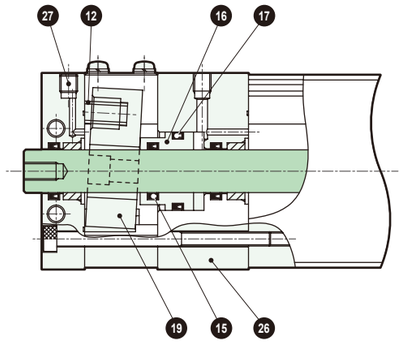
Internal Structure Drawing / Material (Bore Size: Equivalent to ø25, ø32)

● UFCD-KL-25, 32

• Lock Direction: F (Forward Locking)



• Lock Direction: B (Backward Locking)



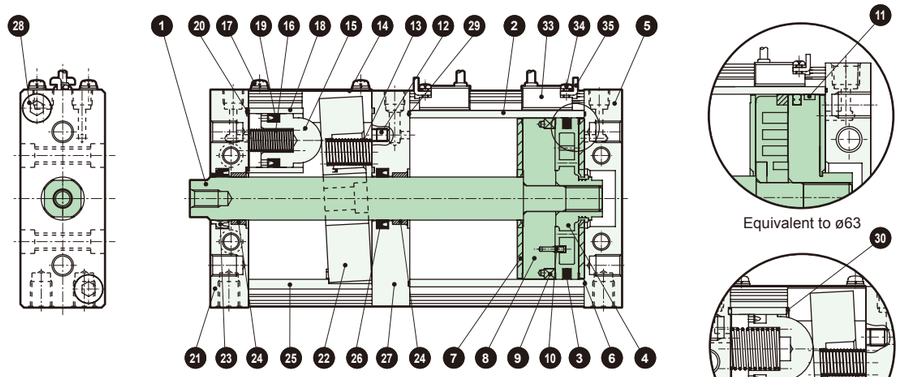
Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	17	Piston Packing	Nitrile Rubber	
2	Rod Packing	Nitrile Rubber		18	Rod Cover	Aluminum Alloy	Black alumite
3	Cylinder Body	Aluminum Alloy	Hard Anodized	19	Lock plate	Cast Iron	Zinc Chromate
4	Piston Packing	Nitrile Rubber		20	Lock Tube	Aluminum Alloy	Alumite
5	Piston	Aluminum Alloy, Polyacetal		21	Metal Bushing	Bearing Alloy	
6	Head cover	Aluminum Alloy	Black alumite	22	Lock Body F	Aluminum Alloy	Black alumite
7	Cover gasket	Nitrile Rubber		23	Rod Packing	Nitrile Rubber	
8	Cushion Rubber	Urethane Rubber		24	Hexagon Socket Head Cap Screw	Steel	Black Oxide
9	Spacer	Aluminum Alloy		25	Cover gasket	Nitrile Rubber	
10	Magnet	Plastic		Reverse Direction Lock			
11	Spring pin	Steel		26	Lock Body B	Aluminum Alloy	Black alumite
12	Brake Spring	Piano Wire	Black Oxide	27	Hexagon Socket Set Screw	Steel	Black Oxide
13	Pan Head Screw	Steel	Zinc Chromate	With switch			
14	Dust cover	Stainless Steel		28	Switch		
15	Rod Packing	Nitrile Rubber		29	Pan Head Screw	Steel	Zinc Chromate
16	Release Piston	Copper Alloy		30	Switch Mounting Bracket	Stainless Steel	

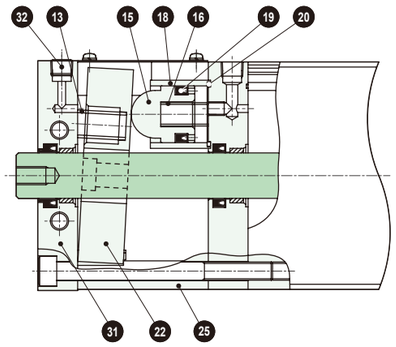
Internal Structure Drawing / Material (Bore Size: Equivalent to ø40 to ø63)

● UFCD-KL-40 to 63

• Lock Direction: F (Forward Locking)



• Lock Direction: B (Backward Locking)

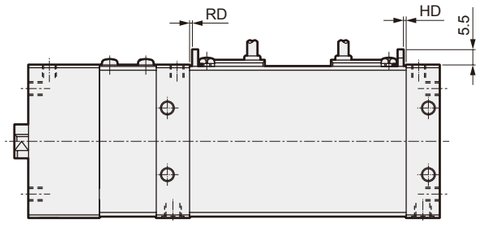


Do not disassemble

Part No.	Part Name	Material	Remarks	Part No.	Part Name	Material	Remarks
1	Piston Rod	Steel	Industrial Hard Chrome Plating	18	Release Piston Tube	Stainless Steel	
2	Cylinder Body	Aluminum Alloy	Hard Anodized	19	Piston Packing	Nitrile Rubber	
3	Piston Packing	Nitrile Rubber		20	O-ring	Nitrile Rubber	
4	Piston	Equivalent to ø40, ø50: Aluminum Alloy, Polyacetal		21	Rod Cover F	Aluminum Alloy	Black alumite
				22	Lock plate	Cast Iron	Zinc Chromate
		Equivalent to ø63 Aluminum Alloy	Equivalent to ø63 Chromate	23	Rod Packing	Nitrile Rubber	
5	Head cover	Aluminum Alloy	Black alumite	24	Metal Bushing	Bearing Alloy	
6	Cover gasket	Nitrile Rubber		25	Lock Tube	Aluminum Alloy	Alumite
7	Cushion Rubber	Urethane Rubber		26	Rod Packing	Nitrile Rubber	
8	Spacer	Equivalent to ø40, ø50: Aluminum Alloy		27	Lock body	Aluminum Alloy	Black alumite
		Equivalent to ø63 Polyamide		28	Hexagon Socket Head Cap Screw	Steel	Black Oxide
9	Magnet	Plastic		29	Cover gasket	Nitrile Rubber	
10	Spring pin	Steel		30	Metal Washer	Stainless Steel	Equivalent to ø63 only
11	Wear Ring	Polyacetal	Equivalent to ø63 only	Reverse Direction Lock			
12	Hexagon Socket Set Screw	Steel	Black Oxide	31	Rod Cover B	Aluminum Alloy	Black alumite
13	Brake Spring	Piano Wire	Black Oxide	32	Hexagon Socket tapered screw plug	Steel	Black Oxide
14	Dust cover	Stainless Steel		With switch			
15	Release Piston	Copper Alloy		33	Switch		
16	Piston Spring	Piano Wire	Black Oxide	34	Switch Mounting Bracket	Stainless Steel	
17	Pan Head Screw	Steel	Zinc Chromate	35	Pan Head Screw	Steel	Zinc Chromate

UFCD Series Switch Equipped Outline Dimension Drawing

● UFCD-KL
M2V, M3V, M2WV, M3WV, M3PV, M0V, M5V



Bore Size (mm)	RD	HD
Equivalent to ø25	1	1
Equivalent to ø32	2	1
Equivalent to ø40	2	2
Equivalent to ø50	2	3
Equivalent to ø63	2	7

Note: For same-surface installation with 2 switches, ø25 to ø50 or equivalent: 35 mm or more, ø63 or equivalent: The stroke must be at least 30 mm. If less than that, it will be different-surface mounting.

MEMO

With Brake / With Lock
ULK□
JSK2/ JSM2
JSG
JSC3, JSC4
USSD
UFCD
USC
Cylinder Switch
Ending

Pneumatic Equipment

To Use This Product Safely

Be sure to read this before use. For general cylinder information, see Intro 41, and for cylinder switches, see P. 1512.

Individual Precautions: Free position locking flat cylinder UFCD Series

Design / Selection

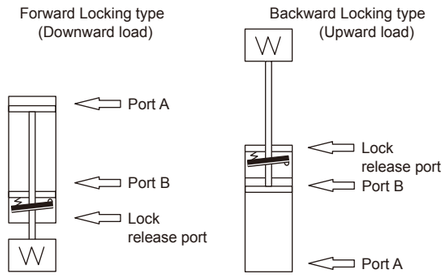
⚠Warning

■ Cylinder with position locking mechanism (for holding cylinder stationary). If used for emergency stop or urgent stop (stopping from cylinder operating state), the service life will be significantly reduced.

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

■ Do not apply torque to the rod when locked because the holding force may decrease, creating a dangerous condition. Also, use with a mechanism that prevents rod rotation.

■ To release the lock, when using Forward Locking, supply pressure to port B, and when using Backward Locking, supply pressure to port A. Check that load is not applied to the locking mechanism. If pressure is supplied to port A for Forward Locking type or port B for Backward Locking type while both ports A and B are exhausted and the piston is locked, the lock may not release, or even if released, the Piston rod may extend suddenly, which is very dangerous.



■ Do not use multiple synchronized cylinders with position locking. If a synchronization error occurs, excessive moment load or load concentration may occur on the cylinder that locked first, potentially causing lock release failure, reduced lifespan, or damage.

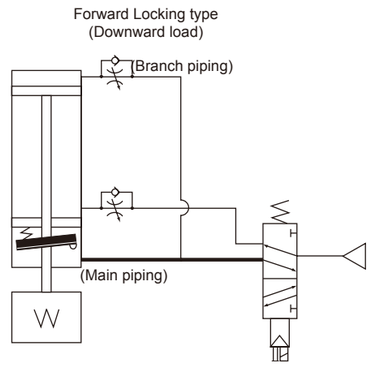
⚠CAUTION

■ Basic Circuit Diagram

Configure the air piping for this cylinder as shown below. Piping to the fall prevention unit alone or piping different from the figure below may cause problems such as response delay.

1. Be sure to branch the piping after the valve as shown below, and pipe to the fall prevention unit (lock release port as main piping) and cylinder unit (cylinder port as branch piping).

2. If cylinder operation is faster than lock release, the lock may not release or the Piston rod may extend suddenly, so design the piping so that lock release is faster than cylinder operation.



If emergency stop or urgent stop is performed with the air piping shown above, the Forward Locking type will continue to retract and the Backward Locking type will continue to extend, returning to the origin position. (If residual pressure is gone, it will stop at that position.)

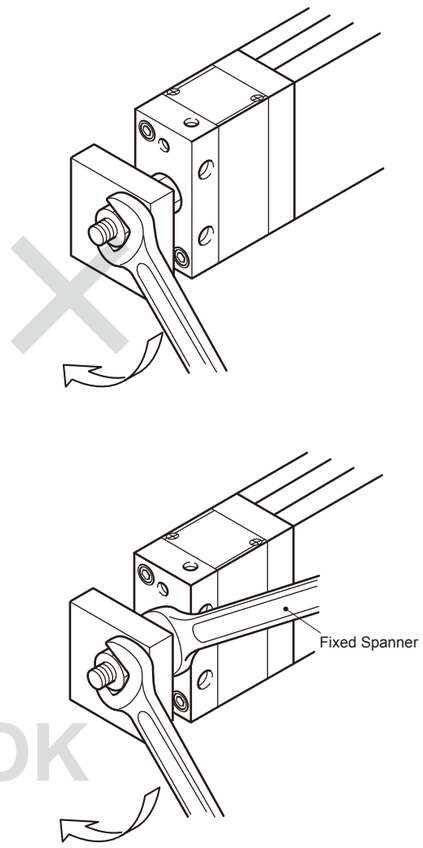
⚠Warning

■ Do not apply grease to the Piston Rod because holding force drops and creates a hazard.

⚠CAUTION

■ Main piping in the basic circuit diagram on the previous page should be thicker and shorter than branch piping.

■ For male threads with load mounted on ends, fix the wrench hook at the end of the rod with a wrench and tighten.



■ For female threads, fix the wrench hook at the end of the rod with a wrench using a standard tool (Allen wrench), and tighten.

■ Avoid using the product so as to apply rotation torque to the Piston Rod. If unavoidable, use within the allowable rotational torque range.

Item \ Model No.	Equivalent to ø25	Equivalent to ø32	Equivalent to ø40	Equivalent to ø50	Equivalent to ø63
Allowable rotational torque (N·m)	1	1.6	2.5	3.9	5.9

○ Even when the value is within the allowable torque range, do not apply rotation torque with impact, or with instantaneous changes in torque Load Direction.

■ When locking the first time after leaving the lock released for long periods, a delayed response may occur in the lock. Do not leave the lock part pressurized; operate the lock part with each cylinder operation. (Please use the basic circuit diagram on P. 580)

■ If the cylinder is held with pressure applied on the locking mechanism, the lock could be released. Do not use 3-position closed-center and 3-position P·A·B connection solenoid valves.

■ Due to the structure, the Piston Rod drops by about 1 mm when the lock is applied.

■ The Cylinder Body may be damaged or may malfunction if a unit with excessive inertia, etc., is actuated. Use within the allowable absorbed energy range.

During Use

⚠Warning

■ Do not apply additional grease to the Piston Rod or wipe off the grease that is already applied.

■ Do not disassemble the unit, as doing so may be dangerous.

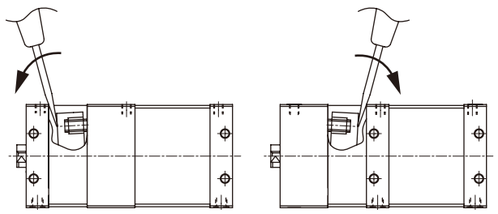
■ Always use the product with the dust cover on, except for when performing manual release, in order to prevent failure or malfunction.

■ If no air pressure is supplied in vertical mounting, etc., holding force may not be sufficient when the lock is manually released. This may cause the rod to move (drop) with the load's weight. In that case, for safety, perform the following preparations before manual release.

- Move the load to the bottom end.
- Provide a stopper to the load
- Apply air pressure to the cylinder to balance the load.

⚠CAUTION

■ How to unlock manually



Forward direction lock
(Lock direction ←)

Reverse direction lock
(Lock direction →)

- Remove the cover, insert a flathead screwdriver or the like and lightly push it down in the direction of arrow A to lift the lock plate, unlock and free the Piston Rod.

For precautions during mounting, installation, adjustment, use, and maintenance, please see "Precautions for Use" in this catalog and the CKD Components product site (https://www.ckd.co.jp/kiki/en/) → "Model No." → Instruction Manual.

MEMO