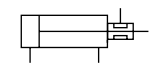
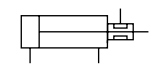



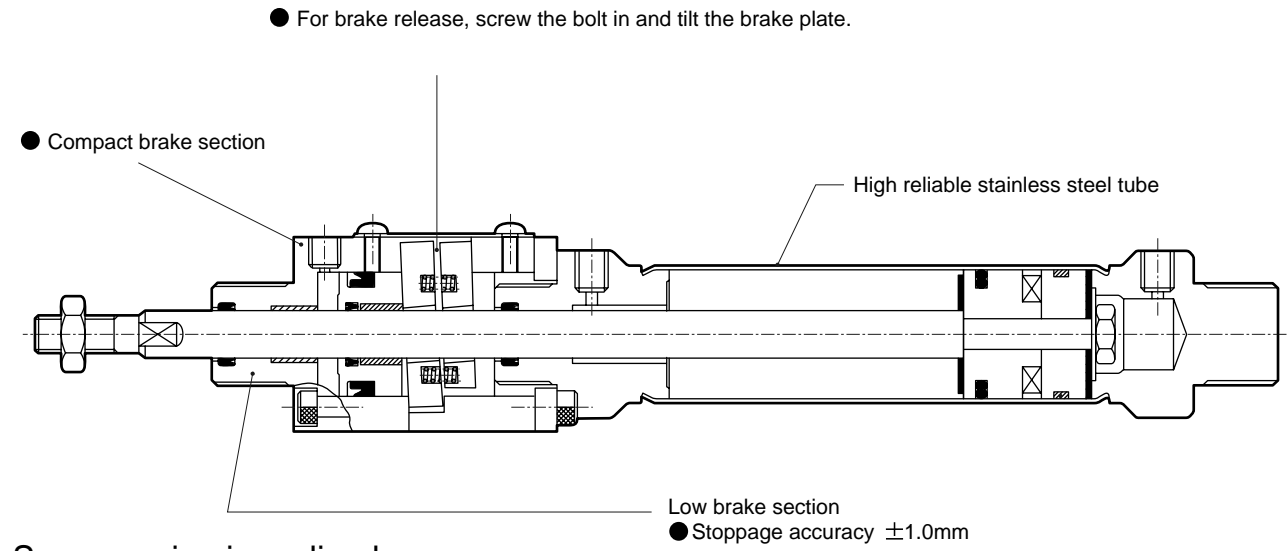
●: Standard ◎: Option ○: Custom order ■: Not available

SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
**ULK\***  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC  
Ending

SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
**ULK\***  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC  
Ending

Variation	Model no. JIS symbol	Bore size (mm)	Standard stroke length (mm)												Min. stroke length (mm)	Max. stroke length (mm)	Custom stroke length (per mm)		Mounting style										Option						Switch	Page
			15	25	30	45	50	60	75	100	150	200	250	300			Basic type	Axial foot type	Rod end axial foot type	Rod end flange type	Eye bracket type	Clevis bracket type	Fixed eye	Eye bush press fit type	Rod end trunnion type	Head end trunnion type	Bellows (100°C)	Bellows (250°C)	Piston rod material change	Boss cut off	Rod eye	Rod clevis	Eye bracket	Clevis bracket		
			00	LB	LS	FA	CA	CB	CC	CC1	TA	TB	J	L			M	V	I	Y	B1	B2														
Double acting	ULKP 	φ16	●		●	●		●																						◎	◎	◎	◎	◎		
Double acting	ULK 	φ20, φ25, φ32, φ40		●				●		●	●	●	●	●	●				●	●	●	●	◎	◎	◎	◎	◎	◎	◎	◎			◎	◎		
Double acting with valve	ULK-V 	φ20, φ25, φ32, φ40		●				●		●	●	●	●	●				●	●	●	●	◎	◎	◎	◎	◎	◎	◎					◎	◎		

### Product introduction



Space saving is realized.



## Pneumatic components

# Safety precautions

Always read this section before starting use.

Refer to Intro 71 for general precautions of the cylinder, and to Intro 78 for general precautions of the cylinder switch.

### Brake cylinder (medium bore size) ULKP/ULK Series

## Design & Selection

### WARNING

■ Structure so that nothing directly touches the driven object or movable sections of the cylinder with brakes. Provide a protective cover so that no human-body directly touches the unit. If parts contact is possible, provide safety measures by placing a sensor to stop the cylinder or sound a warning to report danger.

■ Use a balance circuit considering piston rod protrusion.

When activating brakes at any position in the stroke, if pneumatic pressure is applied to only one side of the cylinder, the piston protrudes at high speed when brakes are released. This involves risk to personnel and equipment. Use a balance circuit, such as the recommended pneumatic pressure circuit, to prevent protrusion.

This brake cylinder has oilless specifications. Do not lubricate this cylinder. Otherwise, braking faults may occur.

■ Holding force (max. static load) refers to performance to hold a static load without vibration or impact when brakes are activated in a no-load state.

Take care when constantly using near the upper limit of the holding force.

■ During braking, kinetic energy is large and the braking distance is long. Thus, avoid using when brakes may be applied at the stroke end.

Even if a cushion is provided, the back pressure is released and the cushions may not function.

If kinetic energy is large, overrun distance increases and stopping accuracy drops.

■ Do not apply loads with impact, strong vibration, or torque while brakes are activated.

If a load with impact, strong vibration, or torque is applied externally, holding force drops.

■ Consider the stoppage accuracy and the overrun distance when braking.

A mechanical lock is applied, so the cylinder does not stop instantly when the stop signal is issued, but stops with a time-wise delay. The stroke at which the cylinder slides due to this delay is the overrun distance. The maximum and minimum width of overrun distance is stopping accuracy.

● To achieve the required stop position, move the limit switch forward by the overrun distance.

● The limit switch must have a detection length (dog length) equivalent to the overrun distance +  $\alpha$ .

● With the CKD cylinder switch, the operation range is 7 to 16mm (differs according to the switch model). If the overrun exceeds this, provide the contact self-hold on the switch load side.

■ To improve stopping accuracy, minimize the time from stop signal output to brake stoppage.

Use a high response DC control electric circuit or solenoid valve, and set the solenoid valve as close to the cylinder as possible.

■ Stopping accuracy is affected by changes in piston speed.

If piston speed changes due to load fluctuation or disturbance during cylinder reciprocation, stop position dispersion increases. Take measures to keep piston speed constant just before the stop position. Speed changes are large during the acceleration range, compared to during the cushion stroke and when starting operation, so dispersion in the stop position increases.

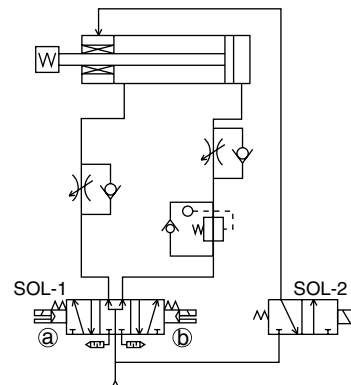
■ Basic circuit

When using this cylinder for position locking or emergency stop, use the circuits below. The 2-position valve cannot be used since cylinder thrust is also applied to brakes when stopped. Balance thrust and load with the circuit below. Brakes may not be released when load is applied to brakes.

● For horizontal load

If piping is as shown in Fig. 1, equalizing pressure is applied to both ends of the piston when stopped to prevent the rod from protruding when brakes are released. Place a regulator with a check valve on the head to balance thrust.

Fig. 1



① SOL-1	②	SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Return
OFF	ON	ON	Advance

SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
ULK\*  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC  
Ending

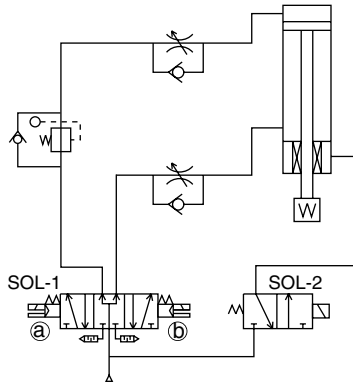
SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

● For downward vertical load

If load faces downward as shown in Fig. 2, the rod malfunctions in the load direction when brakes are released. Place a regulator with a check valve on the head to reduce thrust in the load direction and balance the load.

Fig. 2

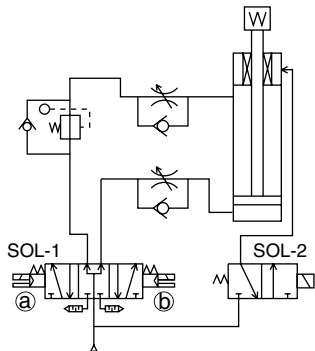


① SOL-1	②	SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Down
OFF	ON	ON	Up

● For upward vertical load

If the load faces upward as shown in Fig. 3, the rod malfunctions in the load direction when brakes are released. Place a regulator with a check valve on the rod to reduce thrust in the load direction and balance the load.

Fig. 3



① SOL-1	②	SOL-2	Operational status
OFF	OFF	OFF	Stop
ON	OFF	ON	Down
OFF	ON	ON	Up

- Release brakes faster than cylinder operation. If the cylinder operates first, brakes may not be released.
- If back pressure is applied to the locking mechanism, the lock may be released. Use the brake release valve as a single unit, or use an individual exhaust manifold.
- Use a 3-position P/A/B connection (pressurization on both sides) valve for the cylinder drive to prevent the piston from protruding when starting.

- Use a regulator with a check valve on the side with large thrust to balance thrust, including load.

## ⚠ CAUTION

### ■ Stoppage accuracy

- Stop pitch and load factor

Stopping accuracy differs with stop pitch and load factor.

The load factor below is recommended for achieving specified stopping accuracy.

Stop pitch	Load factor
50mm or less	20% of thrust
50mm to 100mm	40% of thrust
100mm and over	60% of thrust

- Valve selection for brake

Stopping accuracy and overrun distance change with the responsiveness of the valve for braking. Use the valve listed in the Device Selection Guide. Couple the valve directly to the brake port to improve stopping accuracy.

- Using a PLC

If a PLC is used as the electric control unit for the valve for brakes, stopping accuracy drops due to scan time (computing time). When using a PLC, do not assemble the valve for the brake into the PLC circuit.

- Do not make major changes in load weight when stopped with brakes, or the stopping position may change.

- The reed switch's contact life is generally several hundred thousand times, although this may differ with actual use. The contact life is reached sooner if the device is used continuously or operated at a high frequency. In this case, use a proximity switch with no contact.

## Installation & Adjustment

### ⚠ WARNING

■ Release brakes before coupling the load to the end of the rod.

If coupled while brakes are applied, torque or load exceeding holding force may be applied to the piston rod and damage the brake mechanism.

■ If brakes are released when air is pressurized on only one side of the cylinder, the piston may protrude at high speed, causing a hazard. Observe the points below when releasing brakes for adjustment, etc.

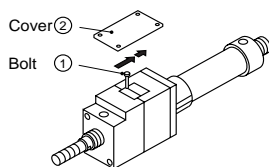
- Check that no one is in the movable range of the load and that no problem arises if the load moves when brakes are released.

- Take the following measures to prevent the load from dropping when brakes are released:

- Set the load at the lowering end
- Pressurize both sides
- Set a support column

- Confirm that air is not pressurized on only 1 side of the cylinder when releasing brakes.

- When using the ULK Series, brakes can be manually released by pressing the brake plate in the direction of the arrow with a bolt, etc. If the brake plate is not pressed over completely, only the PUSH side is released. Since there are 2 brake plates, brakes are not released unless both brake plates are pressed over. (During normal use, remove bolt (1) and place cover (2)).



■ Brakes can be released with manual releasing operations or by applying air pressure to the brake release port. With a load, the load may drop if brakes are left released with either of these operations. Before attaching the load, check that brakes can be applied from the initial state when using manual release or from when air is not applied to the brake release port.

■ Do not apply torque to the rod when brakes are applied because holding force may drop, presenting a hazard. Use a rod that does not rotate.

■ Do not apply brake holding force to the cylinder exceeding that indicated in the catalog.

■ If there is any play, such as looseness, in the brake signal dog, stopping accuracy is affected. Securely fix to eliminate play, etc.

■ If cylinder speed is fast, the detection dog must be long enough to match relay response time. If the dog is short, the stop signal is not output and operation does not stop.

### ⚠ CAUTION

■ Adjust the cylinder air balance.

With brakes released, place a load on the cylinder and balance the load by adjusting air pressure applied to the cylinder rod and head. Faults such as cylinder protrusion during brake release or improper brake release are prevented by accurately balancing the load.

■ Check the installation position of detectors such as the cylinder switch.

When using braking, consider overrun distance for the required stopping position, and adjust the position of detectors such as the cylinder switch.

■ Load fluctuation during the cylinder reciprocation stroke leads to changes in the piston speed, which in turn increases dispersion in the stop position. Place and adjust so the load does not change just before stopping in the cylinder reciprocation stroke.

■ Speed changes are large during the acceleration range, compared to during the cushion stroke and when starting operation, so dispersion in the stop position increases. Accuracy in specifications may therefore not be attained in step operation with a short stroke from the starting position to the next position.

■ Load onto piston rod

Compared to using a general-purpose air cylinder, check that load applied totally to the piston rod is applied in the axial direction. Limit load movement using guides so play or torsion does not occur.

■ Maintenance of rod sliding section

Check that scratches and dents are not made on the piston rod's sliding section. These can result in damage to packing, leaks, or brake faults.

## During Use & Maintenance

### 1. Common

#### ⚠ WARNING

- The brake section can be removed from the cylinder body. Do not disassemble or inspect brakes or hazards may result when brakes are used again.
- The required grease is applied to brakes. Avoid applying extra grease and do not wipe grease off.
- The required grease is applied when brakes are replaced, so there is no need to apply grease to rods.
- To prevent faults, use a dust cover during operation except when manually releasing brakes.

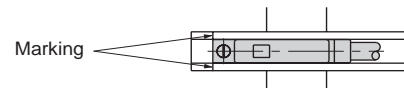
#### ⚠ CAUTION

- If the air supply pipe is thin or long, stoppage accuracy drops.
- Frictional resistance increases and causes the piston speed to change when the cylinder has been stopped for a long time, such as when using first thing in the morning or afternoon. This may impair stoppage accuracy. Conduct break-in operation to obtain stable stoppage accuracy.

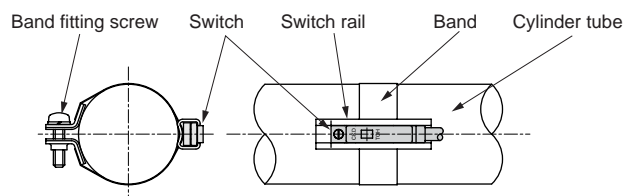
### 2. Common (T type with switch)

#### ⚠ CAUTION

- Shifting the switch position in the stroke direction
  - The 1 color indicator switch is line-tuned by  $\pm 3$  mm from the default. Move the band position if the adjustment exceeds  $\pm 3$  mm or when adjusting the 2-color indicator switch.
  - Loosen the switch fixing screw, shift the switch along the rail, then tighten at the specified position. When using T2, T3, T0, or T5, use a flat-tip screwdriver (screwdriver for clocks, precision screwdriver, etc.) with a 5 to 6 mm grip diameter, with a 2.4 mm or smaller tip, and 0.3 mm thick or less. Tighten with a tightening torque of 0.1 to 0.2 N·m. Tighten T1, T\**C*, T2J, T2Y, T3Y, T2YF, T3YF, T2YM, T3YM or T8 with a tightening torque of 0.5 to 0.7 N·m.
  - The switch rail has markings at 4 mm from the rail end. Use this as a guide for the mounting position when replacing the switch. Markings on the switch rail are set to the switch's maximum sensitivity position at the factory. The maximum sensitivity changes when the switch type is changed or when the band is changed, so adjust the position accordingly.



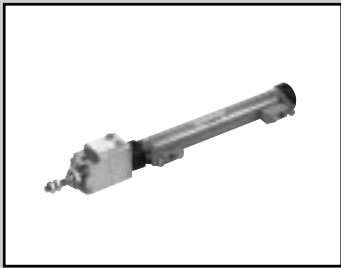
- Shifting the switch position circumferentially
  - Loosen the band fixing screw, shift the switch rail in the circumference direction, and tighten at the specified position. Tightening torque is 0.6 to 0.8 N·m.
- Shifting the band position
  - Loosen the band fixing screw, shift the switch rail and band along the cylinder tube, and tighten at the specified position. Tightening torque is 0.6 to 0.8 N·m.



SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

SCP\*2  
 CMK2  
 CMA2  
 SCM  
 SCG  
 SCA2  
 SCS  
 CKV2  
 CA/OV2  
 SSD  
 CAT  
 MDC2  
 MVC  
 SMD2  
 MSD\*  
 FC\*  
 STK  
 ULK\*  
 JSK/M2  
 JSG  
 JSC3  
 USSD  
 USC  
 JSB3  
 LMB  
 STG  
 STS/L  
 LCS  
 LCG  
 LCM  
 LCT  
 LCY  
 STR2  
 UCA2  
 HCM  
 HCA  
 SRL2  
 SRG  
 SRM  
 SRT  
 MRL2  
 MRG2  
 SM-25  
 CAC3  
 UCAC  
 RCC2  
 MFC  
 SHC  
 GLC  
 Ending

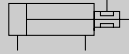


Brake cylinder Double acting single rod type

# ULKP Series

● Bore size:  $\phi 16$

JIS symbol ● Double acting cylinder with braking



## Specifications

Descriptions	ULKP/ULKP-L
Actuation	Double acting
Working fluid	Compressed air
Max. working pressure MPa	1.0
Min. working pressure MPa	Cylinder section: 0.15 Brake section: 0.3
Withstanding pressure MPa	1.6
Ambient temperature range °C	-10 to 60 (no freezing)
Bore size mm	$\phi 16$
Port size	M5
Stroke tolerance mm	$+1.0$ 0
Working piston speed mm/s	50 to 500
Cushion	Rubber cushion
Lubrication	Not available
Stoppage accuracy mm	$\pm 1.5$ (300mm/S loadless) Note 1
Holding force N	160

Note 1: Leaving pressurized brake section causes delay of response, and the stop position deviates.

## Stroke length

Model no.	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
ULKP/ULKP-L	15-30-45-60	260	5

\* Min. stroke length may differ depending on installation method of switch. Refer to the table below.  
 Custom stroke length is available per 1mm increment.

## Min. stroke length of type with switch

Rough sketch	With one switch		With two switches	
	Rod side installation	Head side installation	Different surface installation	Same surface installation
Min. stroke length	5mm		10mm	28mm

SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

### Switch specifications

Descriptions	Proximity 2 wire		Proximity 3 wire		
	M2V	M2WV (2 color indicator type)	M3V	M3PV (custom order)	M3WV
Applications	Programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-		NPN output	PNP output	NPN output
Power voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30mA		200mA or less	100mA or less	150mA or less
Light	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Yellow LED (ON lighting)	Red/green LED (ON lighting)
Leakage current	1mA or less		10 $\mu$ A or less	0.05mA or less	10 $\mu$ A or less

Descriptions	Reed 2 wire	
	M0V	M5V
Applications	Programmable controller, relay	Programmable controller, relay, IC circuit (without indicator light), serial connection
Power voltage	-	
Load voltage and current	5 to 50mA with 12/24 VDC 7 to 20mA with 110 VAC	50mA or less with 12/24 VDC 20mA or less with 110 VAC
Light	LED (ON lighting)	Without indicator light
Leakage current	0mA	

### Product weight

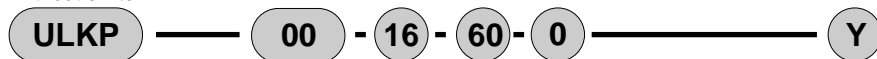
(Unit: g)

Descriptions	Stroke length (mm)	ULKP-16
Without switch	15	138
	30	143
	45	148
	60	153
With switch (With two switches)	15	186
	30	191
	45	196
	60	201
Switch weight (per switch)		24



## How to order

Without switch



With switch



H Accessory

A Model

B Mounting style

C Bore size

D Stroke length

E Head end port direction

F Switch model no.

G Switch quantity  
Note 3

Symbol	Descriptions		
<b>A Model</b>			
ULKP	Double acting		
ULKP-L	Double acting type with switch		
<b>B Mounting style</b>			
00	Basic type		
LS	Single axial foot type (rod end)		
FA	Rod end flange type		
CB	Clevis bracket type		
<b>C Bore size</b>			
16	φ16		
<b>D Stroke length</b>			
Bore size	Stroke length Note 1	Custom stroke length	
φ16	5 to 260	1 mm increment	
<b>E Head end port direction</b>			
Blank	Vertical		
0	Axial (Note 2)		
<b>F Switch model no.</b>			
Radial lead wire	Contact	Indicator	Lead wire
M0V*	Reed	1 color indicator type	2-wire
M5V*		Without indicator light	
M2V*	Proximity	1 color indicator type	
M2WV*		2 color indicator type	
M3V*	Proximity	1 color indicator type	3-wire
M3WV*		2 color indicator type	
M3PV*		1 color indicator type (custom order)	
<b>*Lead wire length</b>			
Blank	1m (standard)		
3	3m (option)		
5	5m (option)		
<b>G Switch quantity</b>			
R	One on rod end		
H	One on head end		
D	Two		
T	Three		
<b>H Accessory</b>			
I	Rod eye		
Y	Rod clevis (pin, washer and split pin attached)		
B1	Eye bracket		
B2	Clevis bracket (pin and snap ring attached)		

### ⚠ Note on model no. selection

Note 1: Refer to page 1198 for min. stroke length with switch.

Note 2: Mounting style CB is not available for port direction and axial direction.

Note 3: "I" and "Y" can not be selected at the same time.

<Example of model number>

**ULKP-L-00-16-60-0-M2V-R-Y**

A Model: Brake cylinder double acting type with switch

B Mounting style : Basic type

C Bore size : φ16

D Stroke length : 60mm

E Head end port direction : Axial

F Switch model no. : Proximity switch lead wire length: 1m

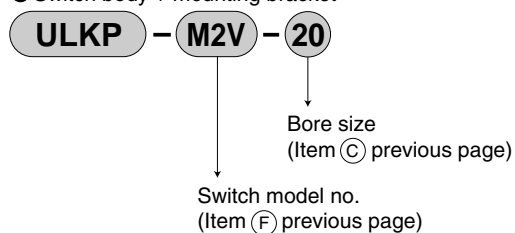
G Switch quantity : One on rod end

H Accessory : Rod clevis

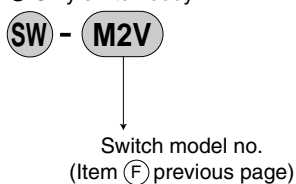


### How to order switch

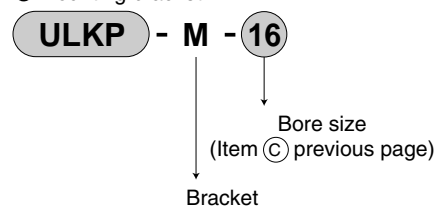
● Switch body + mounting bracket



● Only switch body



● Mounting bracket



### How to order mounting bracket

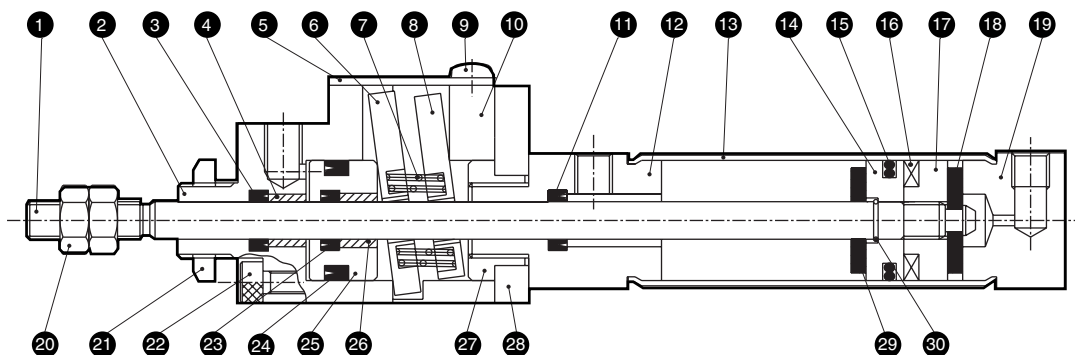
Bore size (mm)	φ 16
Mounting bracket	
Foot (LB/LS)	P2-LS-16
Flange (FA)	P2-FA-16

Note 1: 1 piece/set is applied for a foot type mounting bracket.

SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

## Internal structure and parts list

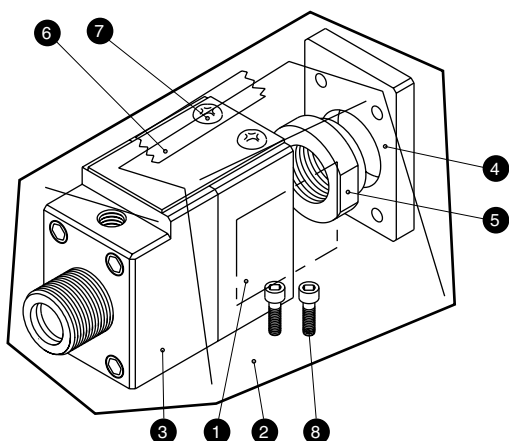


No.	Parts name	Material	No.	Parts name	Material
1	Piston rod	Stainless steel	16	Magnet	Plastic (only with switch)
2	Body A	Aluminum alloy	17	Spacer	Aluminum alloy
3	Brake rod packing seal	Nitrile rubber	18	Cushion rubber H	Urethane rubber
4	Bearing	Acetar resin	19	Head cover	Aluminum alloy
5	Cover	Aluminum alloy	20	Rod nut	Steel
6	Brake plate A	Special steel	21	Mounting nut	Steel
7	Brake spring	Piano wire	22	Hexagon socket head cap screw	Steel
8	Brake plate B	Special steel	23	Release rod packing seal	Nitrile rubber
9	Cross headed round machine screw	Steel	24	Release piston packing seal	Nitrile rubber
10	Body B	Aluminum alloy	25	Release piston	Aluminum alloy
11	Rod packing seal	Nitrile rubber	26	Release piston bearing	Acetar resin
12	Rod cover	Aluminum alloy	27	Lock nut	Steel
13	Cylinder tube	Stainless steel	28	Fixing flange	Steel
14	Piston	Aluminum alloy	29	Cushion rubber R	Urethane rubber
15	Piston packing seal	Nitrile rubber	30	Snap ring	Stainless steel

## Configurations table

● Brake unit

**ULK** - (16) - BRAKE-UNIT



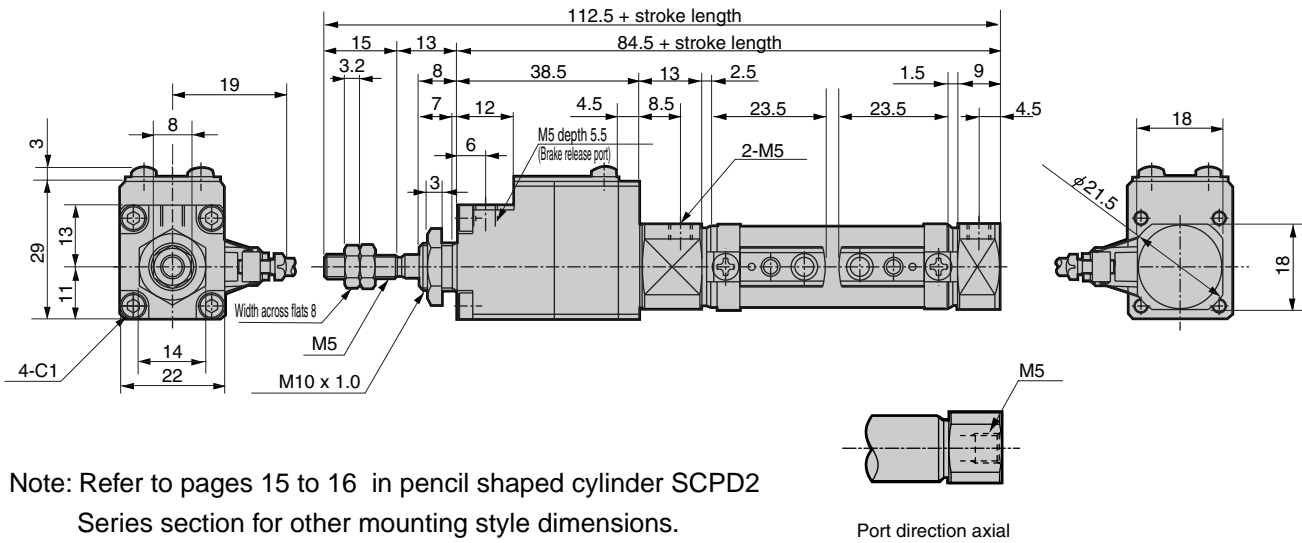
No.	Part name	Quantity
1	Label	1
2	Vinyl sheet or plastic bag	1
3	Brake assembly	1
4	Brake flange	1
5	Lock nut	1
6	Cover	1
7	Cross pan head machine screw	2
8	Hexagon socket head cap screw	2

SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
ULK\*  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC  
Ending

### Dimensions



● ULKP-\*-00-16



Note: Refer to pages 15 to 16 in pencil shaped cylinder SCPD2 Series section for other mounting style dimensions.

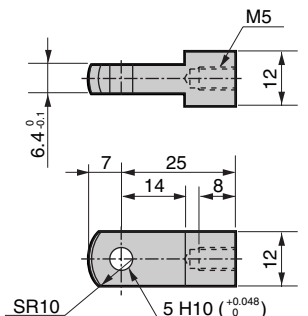
Port direction axial

### Accessory dimensions



● Rod eye (I)

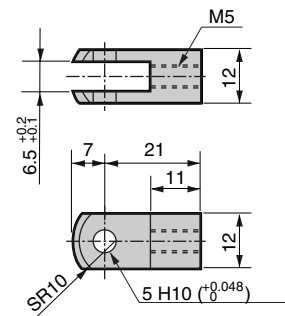
Model no.: P2-I-16



Material: Steel  
Weight: 21g

● Rod clevis (Y)

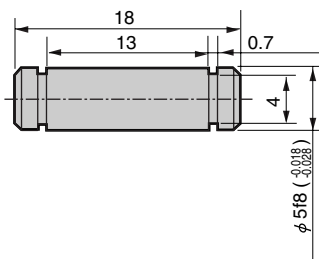
Model no.: P2-Y-16



Material: Steel  
Weight: 20g

● Pin for rod eye/clevis

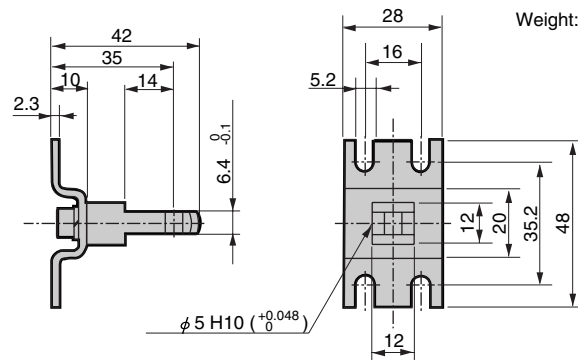
Model no.: P2-P-16



Material: Stainless steel  
Weight: 3.0g

● Eye bracket (B1)

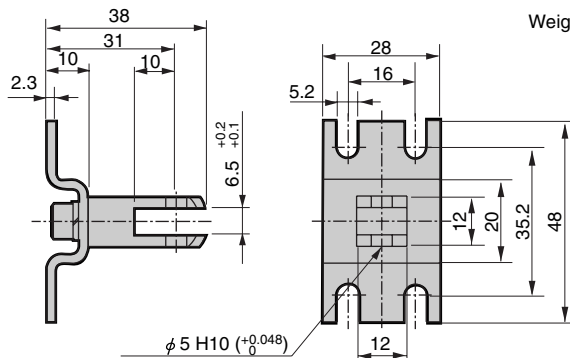
Model no.: P2-B1-16



Material: Steel  
Weight: 48g

● Clevis bracket (B2)

Model no.: P2-B2-16

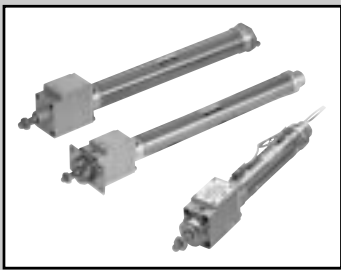


Material: Steel  
Weight: 44g

SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

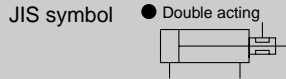
SCP\*2  
 CMK2  
 CMA2  
 SCM  
 SCG  
 SCA2  
 SCS  
 CKV2  
 CA/OV2  
 SSD  
 CAT  
 MDC2  
 MVC  
 SMD2  
 MSD\*  
 FC\*  
 STK  
 ULK\*  
 JSK/M2  
 JSG  
 JSC3  
 USSD  
 USC  
 JSB3  
 LMB  
 STG  
 STS/L  
 LCS  
 LCG  
 LCM  
 LCT  
 LCY  
 STR2  
 UCA2  
 HCM  
 HCA  
 SRL2  
 SRG  
 SRM  
 SRT  
 MRL2  
 MRG2  
 SM-25  
 CAC3  
 UCAC  
 RCC2  
 MFC  
 SHC  
 GLC  
 Ending



Brake cylinder (medium bore size) Double acting, double acting with valve

# ULK/ULK-V Series

● Bore size:  $\phi$  20,  $\phi$  25,  $\phi$  32,  $\phi$  40



## Specifications

Descriptions		ULK				ULK-V			
Bore size	mm	$\phi$ 20	$\phi$ 25	$\phi$ 32	$\phi$ 40	$\phi$ 20	$\phi$ 25	$\phi$ 32	$\phi$ 40
Actuation		Double acting				Double acting with valve			
Working fluid		Compressed air							
Max. working pressure		1.0				Cylinder section: 1.0 Brake section: 0.6			
Min. working pressure	Brake section	0.3							
	Cylinder section	0.15							
Withstanding pressure		1.6							
Ambient temperature		-10 to 60 (no freezing)				-10 to 50 (no freezing)			
Port size	Brake section	Rc1/8							
	Cylinder section	Rc1/8							
Stroke tolerance	mm	$^{+2.0}_0$ (to 200)				$^{+2.4}_0$ (201 to)			
Working piston speed	mm/s	50 to 500							
Cushion		Rubber cushion							
Lubrication		Not available							
Stoppage accuracy	mm	$\pm 1.0$ (300mm/s loadless)							
Holding force	N	251	393	643	1005	251	393	643	1005
Allowable energy absorption	J	0.166	0.308	0.424	0.639	0.166	0.308	0.424	0.639

Note: Refer to "Pneumatic Valves (No. CB-23SA)" about details of valves (P5136 series).

## Stroke length

Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
$\phi$ 20	25, 50, 75, 100, 150, 200, 250, 300	700	5
$\phi$ 25			
$\phi$ 32			
$\phi$ 40			

Note 1: Custom stroke length is available per 1mm increment.

Note 2: Min. stroke length may differ depending on installation method of switch. Refer to the table below.

## Min. stroke length of type with switch

(Unit: mm)

Switch quantity	1				2				3			
	Proximity		Reed		Proximity		Reed		Proximity		Reed	
	T2, T3	T1, T*Y*	T0, T5	T8	T2, T3	T1, T*Y*	T0, T5	T8	T2, T3	T1, T*Y*	T0, T5	T8
$\phi$ 20	10				25	35	25	35	50	55	50	55
$\phi$ 25	10				25	35	25	35	50	55	50	55
$\phi$ 32	10				25	35	25	35	50	55	50	55
$\phi$ 40	10				25	35	25	35	50	55	50	55

Note 1: Switches can be installed up to three.

### Switch specifications

\*The T0/T5 switch can be used with 220 VAC.  
Consult CKD for working conditions.

● 1 color/2 color indicator

Descriptions	Proximity 2 wire			Proximity 3 wire			Reed 2 wire						
	T1H/T1 V	T2H/T2V/ T2JH/T2JV	T2YH/T2YV	T3H/T3V	T3PH/T3PV (Custom order)	T3YH/T3YV	TOH/TOV		T5H/T5V		T8H/T8V		
Applications	Programmable controller relay, small solenoid valve	Programmable controller		Programmable controller, relay			Programmable controller, relay		Programmable controller, relay, IC circuit (w/o indicator light), serial connection		Programmable controller, relay		
Output method	-			NPN output	PNP output	NPN output	-						
Power voltage	-			10 to 28 VDC			-						
Load voltage	85 to 265 VAC	10 to 30 VDC		30 VDC or less			12/24 VDC	110 VAC	5/12/24 VDC	110 VAC	12/24 VDC	110 VAC	220 VAC
Load current	5 to 100mA	5 to 20mA (Note 1)		100mA or less	50mA or less		5 to 50mA	7 to 20mA	50mA or less	20mA or less	5 to 50mA	7 to 20mA	7 to 10mA
Light	LED (ON lighting)	LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)	Green LED (ON lighting)	Red/green LED (ON lighting)	LED (ON lighting)		Without indicator light		LED (ON lighting)		
Leakage current	1mA or less with 100 VAC 2mA or less with 200 VAC	1mA or less		10 μA or less			0mA						

● With preventive maintenance output

Descriptions	Proximity 3 wire		Proximity 4 wire		Proximity 3 wire		Proximity 4 wire		
	T2YFH/V		T3YFH/V		T2YMH/V		T3YMH/V		
Applications	Programmable controller		Programmable controller, relay		Programmable controller		Programmable controller, relay		
Output method	NPN output								
Light	Red/green LED (ON lighting)								
	Installation position adjustment section		-						Yellow LED (ON lighting)
Regular Output	Power voltage	-		10 to 28 VDC		-		10 to 28 VDC	
	Load voltage	10 to 30 VDC		30 VDC or less		10 to 30 VDC		30 VDC or less	
	Load current	5 to 20mA		50mA or less		5 to 20mA		50mA or less	
	Leakage current	1mA or less		10 μA or less		1.2mA or less		10 μA or less	
Preventive maintenance Output	Load voltage	30 VDC or less							
	Load current	20mA or less		50mA or less		5 to 20mA or less		50mA or less	
	Leakage current	10 μA or less							

Note 1: Refer to Ending 1 other switch specifications.

Note 2: Max. load current above: 20mA at 25°C. The current will be lower than 20mA if ambient temperature around switch is higher than 20mA. (5 to 10mA at 60°C)

### Valve electric specifications for brake

Descriptions	ULK-V-[bore size]-VALVE-KIT-[Voltage]		
Rated voltage (V)	100 VAC (50/60Hz)	200 VAC (50/60Hz)	24 VDC
Starting current (A)	0.056/0.044	0.034/0.026	0.075
Holding current (A)	0.028/0.022	0.017/0.013	
Power consumption (W)	1.8/1.4	2.1/1.6	1.8
Voltage fluctuation range	±10%		
Insulation class	Class B molded coil		

Note 1: 100/200 VAC coil is available for 110/220 VAC (60Hz).

### Cylinder weight

● ULK

Unit: kg

Descriptions/mounting style	Product weight when stroke length (S) = 0mm						Switch weight	Switch rail	Additional weight
	Basic type (00)	Axial foot type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion type (TA/TB)	Grommet	+ band weight	per S=10mm
φ20	0.47	0.62	0.53	0.62	0.48	0.52	0.018	0.005	0.01
φ25	0.84	1.10	0.99	1.08	0.84	0.94	0.018	0.005	0.01
φ32	0.88	1.14	1.03	1.12	0.88	0.98	0.018	0.009	0.02
φ40	1.47	1.73	1.62	1.71	1.49	1.63	0.018	0.009	0.02

● ULK V (with valve)

Unit: kg

Descriptions/mounting style	Product weight when stroke length (S) = 0mm						Switch weight	Switch rail	Additional weight
	Basic type (00)	Axial foot type (LB)	Flange type (FA)	Clevis type (CA)	Clevis type (CC)	Trunnion type (TA/TB)	Grommet	+ band weight	per S=10mm
φ20	0.53	0.68	0.59	0.68	0.54	0.58	0.018	0.005	0.01
φ25	0.90	1.16	1.05	1.14	0.90	1.00	0.018	0.005	0.01
φ32	0.94	1.20	1.09	1.18	0.94	1.04	0.018	0.009	0.02
φ40	1.53	1.79	1.68	1.77	1.55	1.69	0.018	0.009	0.02

SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
ULK\*  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC

Ending  
Brake cylinder  
With brake

# ULK/ULK-V Series

## How to order

Without solenoid valve

**ULK** - **00** - **20** - **100** - **T0H** - **R** - **V** **I**

With solenoid valve

**ULK-V** - **00** - **20** - **100** - **1** - **T0H** - **R** - **V** **I**

**A** Model no.

**B** Mounting style

**C** Bore size

**D** Stroke length

**E** Solenoid valve voltage

**F** Switch model no.

### Note on model no. selection

Note 1: Refer to page 1204 for min. stroke length with switch.

Note 2: Not less than stroke length 25mm for bellows "J". Consult with CKD when stroke length is shorter than 25 mm.

Note 3: Instantaneous max. temperature is the temperature when spark and spatter etc., instantaneously contacts to bellows.

Note 4: "I" and "Y" can not be selected at the same time.

Note 5: Up to three switches can be mounted. If more than four switches are required, the switch mounting brackets for the extra switches must be prepared separately.

Note 6: Refer to Ending 89 for custom specifications of rod end form.

### <Example of model number>

**ULK-V-LB-20-100-1-T0H-R-JI**

Model: Brake cylinder

**A** Model no. : Double acting with valve

**B** Mounting style : Axial foot type

**C** Bore size :  $\phi$  20mm

**D** Stroke length : 100mm

**E** Solenoid valve voltage : 100 VAC (50/60Hz)

**F** Switch model no. : Reed T0H switch

**G** Switch quantity : One on rod end

**H** Option : Bellows material, max. ambient temperature 100°C, instantaneous max. temperature 200°C

**I** Accessory : Rod eye

**G** Switch quantity  
Note 4

**H** Option

**I** Accessory  
Note 3

**A** Model no.

Double acting

Double acting with solenoid valve - V

Symbol	Descriptions	Double acting	Double acting with solenoid valve - V
<b>B Mounting style</b>			
<b>00</b>	Basic type	●	●
<b>LB</b>	Axial foot type	●	●
<b>FA</b>	Rod end flange type	●	●
<b>CA</b>	Eye bracket type	●	●
<b>CC</b>	Fixed eye	●	●
<b>CC1</b>	Eye bush press fit type	●	●
<b>TA</b>	Rod end trunnion type	●	●
<b>TB</b>	Head end trunnion type	●	●

<b>C Bore size (mm)</b>			
<b>20</b>	$\phi$ 20	●	●
<b>25</b>	$\phi$ 25	●	●
<b>32</b>	$\phi$ 32	●	●
<b>40</b>	$\phi$ 40	●	●

<b>D Stroke length (mm)</b>			
Bore size	Stroke length Note 1	Custom stroke length	
$\phi$ 20	5 to 700	1 mm increment	
$\phi$ 25	5 to 700		
$\phi$ 32	5 to 700		
$\phi$ 40	5 to 700		

<b>E Solenoid valve voltage</b>			
<b>1</b>	100 VAC (50/60Hz)	●	●
<b>2</b>	200 VAC (50/60Hz)	●	●
<b>3</b>	24 VDC	●	●

<b>F Switch model no.</b>				
Axial lead wire	Radial lead wire	Contact	Indicator	Lead wire
<b>T0H*</b>	<b>T0V*</b>	Reed	1 color indicator type	2-wire
<b>T5H*</b>	<b>T5V*</b>		Without indicator light	
<b>T8H*</b>	<b>T8V*</b>		1 color indicator type	
<b>T1H*</b>	<b>T1V*</b>	Proximity	1 color indicator type	2-wire
<b>T2H*</b>	<b>T2V*</b>		1 color indicator type	2-wire
<b>T3H*</b>	<b>T3V*</b>		1 color indicator type	3-wire
<b>T2YH*</b>	<b>T2YV*</b>		2 color indicator type	2-wire
<b>T3YH*</b>	<b>T3YV*</b>	Proximity	2 color indicator type	3-wire
<b>T3PH*</b>	<b>T3PV*</b>		1 color indicator type (custom order)	3-wire
<b>T2YFH*</b>	<b>T2YFV*</b>		2 color indicator type (without indicator light for preventive maintenance output)	3-wire
<b>T3YFH*</b>	<b>T3YFV*</b>		2 color indicator type (with indicator light for preventive maintenance output)	4-wire
<b>T2YMH*</b>	<b>T2YMV*</b>		2 color indicator type (with indicator light for preventive maintenance output (1 color))	3-wire
<b>T3YMH*</b>	<b>T3YMV*</b>	Proximity	Off-delay type	4-wire
<b>T2JH*</b>	<b>T2JV*</b>		Off-delay type	2-wire

<b>*Lead wire length</b>			
<b>Blank</b>	1m (standard)	●	●
<b>3</b>	3m (option)	●	●
<b>5</b>	5m (option)	●	●

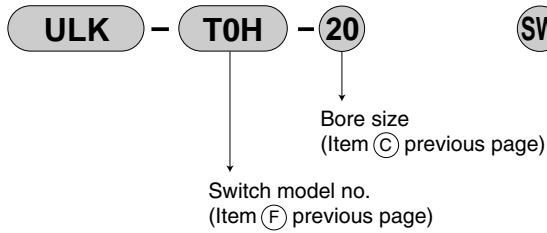
<b>G Switch quantity</b>			
<b>R</b>	One on rod end	●	●
<b>H</b>	One on head end	●	●
<b>D</b>	Two	●	●
<b>T</b>	Three	●	●

<b>H Option</b>					
		Max. ambient temperature	Instantaneous max. temperature		
<b>J</b>	Bellows	100°C	200°C	●	●
<b>L</b>	Bellows	250°C	400°C	●	●
<b>M</b>	Piston rod material (stainless steel)			●	●
<b>V</b>	Boss cut off			●	●

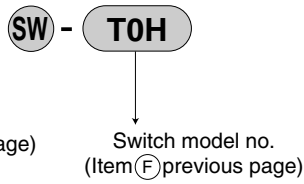
<b>I Accessory</b>			
<b>I</b>	Rod eye	●	●
<b>Y</b>	Rod clevis (pin, washer and split pin attached)	●	●
<b>B2</b>	Clevis bracket (pin and snap ring attached)	●	●

### How to order switch

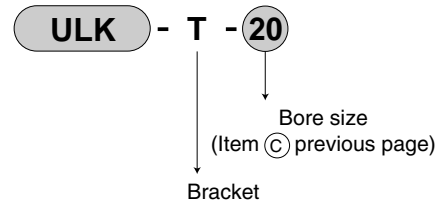
● Switch body + mounting bracket



● Only switch body



● Mounting bracket



### How to order discrete solenoid valve for brake



### How to order discrete brake unit



### How to order mounting bracket

Bore size (mm)	φ20	φ25	φ32	φ40
Axial foot type (LB)	M1-LB-20	M1-LB-30	M1-LB-30	M1-LB-30
Flange (FA)	M1-FA-20	M1-FA-30	M1-FA-30	M1-FA-30
Eye (CA)	M1-CA-20	M1-CA-30	M1-CA-30	M1-CA-30
Trunnion (TA/TB)	M1-TA-20	M1-TA-30	M1-TA-30	M1-TA-40

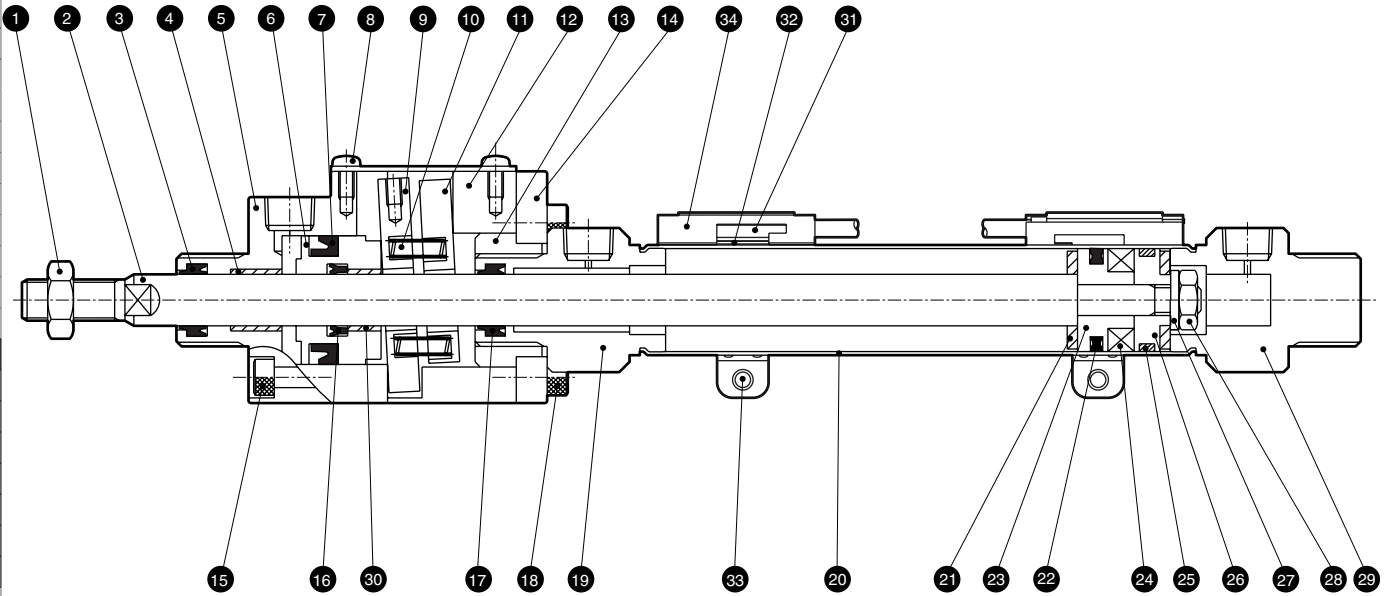
Note 1: 1 piece/set is applied for a foot type mounting bracket.

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending

Brake cylinder  
With brake



## Internal structure and parts list



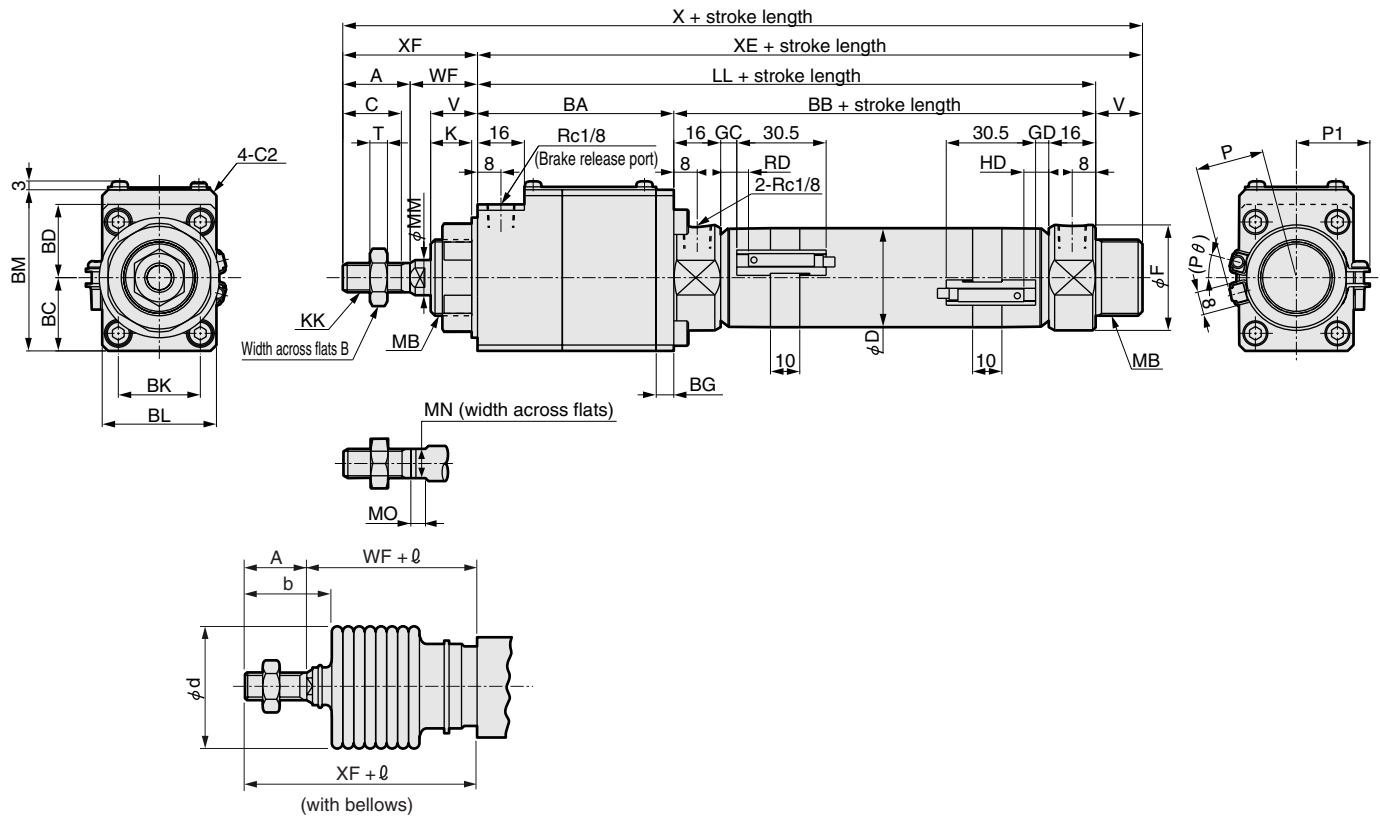
### Part list

No.	Parts name	Material	Remarks	No.	Parts name	Material	Remarks
1	Rod nut	Steel	JIS B1181 hexagon nut	18	Hexagon socket head cap screw	Steel	Blackening
2	Piston rod	$\phi 20, \phi 25$ stainless steel $\phi 32, \phi 40$ steel	Industrial chrome plating	19	Rod cover	Aluminum alloy	
3	Brake rod packing seal	Nitrile rubber		20	Cylinder tube	Stainless steel	
4	Bearing	Acetar resin	DBB bush	21	Cushion rubber	Urethane rubber	
5	Body A	Aluminum alloy	Alumite	22	Piston packing seal	Nitrile rubber	
6	Release piston	Aluminum alloy	Alumite	23	Piston A	Aluminum alloy	
7	Release piston packing seal	Nitrile rubber		24	Magnet	Plastic	
8	Round machine screw	Steel		25	Wear ring	Acetar resin	
9	Brake plate A	Special steel	Phosphoric acid manganese treatment	26	Piston B	Aluminum alloy	
10	Brake spring	Piano wire	Blackening	27	Spacer	Steel	
11	Brake plate B	Special steel	Phosphoric acid manganese treatment	28	Hexagon nut	Steel	JIS B1181 hexagon nut
12	Body B	Aluminum alloy	Alumite	29	Head cover	Aluminum alloy	
13	Lock nut	Steel	Galvanizing	30	Release rod bushing	Acetar resin	DBB bush
14	Flange	Steel	Galvanizing	31	Switch body		
15	Hexagon socket head cap screw	Steel	Blackening	32	Band	Stainless steel	
16	Release rod packing seal	Nitrile rubber		33	Pan head machine screw	Stainless steel	
17	Rod packing seal	Nitrile rubber		34	Switch rail	Stainless steel	

### Dimensions



● Basic type (00)



RD: Rod end max. sensitive position

HD: Head end max. sensitive position

Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

Note 2: For ℓ dimensions, round up below decimal point.

Note 3: Refer to page 1218 for dimensions of accessories.

Symbol	Basic type (00) basic dimensions													
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	K
φ20	20	13	58	66	20	20	6	20	29	45	18	21.4	28	12
φ25	23	17	67	69	25	25	6	28	39	55	20	26.4	32	14
φ32	23	17	67	69	25	25	6	28	39	55	20	33.6	36	14
φ40	25	19	74	73	29	30	9	39	50	69	22	41.6	45	14

Symbol													With switch			
Bore size (mm)	KK	LL	MB	MM	MN	MO	T	V	WF	X	XE	XF	GC	GD	RD	HD
φ20	M8 x 1.0	124	M18 x 1.5	10	8	5	5	14	24	182	138	44	4.0	3.0	8.0	7.0
φ25	M10 x 1.25	136	M26 x 1.5	12	10	5	6	16	23	198	152	46	5.5	4.5	9.5	8.5
φ32	M10 x 1.25	136	M26 x 1.5	12	10	5	6	16	23	198	152	46	5.5	4.5	9.5	8.5
φ40	M12 x 1.5	147	M26 x 1.5	14	12	6	7	16	23	211	163	48	7.0	6.5	11.5	10.5

Symbol	With bellows						
Bore size (mm)	P	P1	(Pθ)°	XF	b	d	ℓ
φ20	17.3	19.5	22	44	30	30	(Stroke length/3) + 6
φ25	19.8	22.0	18	46	32	46	(Stroke length/3.25) + 7
φ32	24.3	25.5	15	46	32	46	(Stroke length/3.25) + 7
φ40	28.3	29.5	12	48	34	46	(Stroke length/3.25) + 7

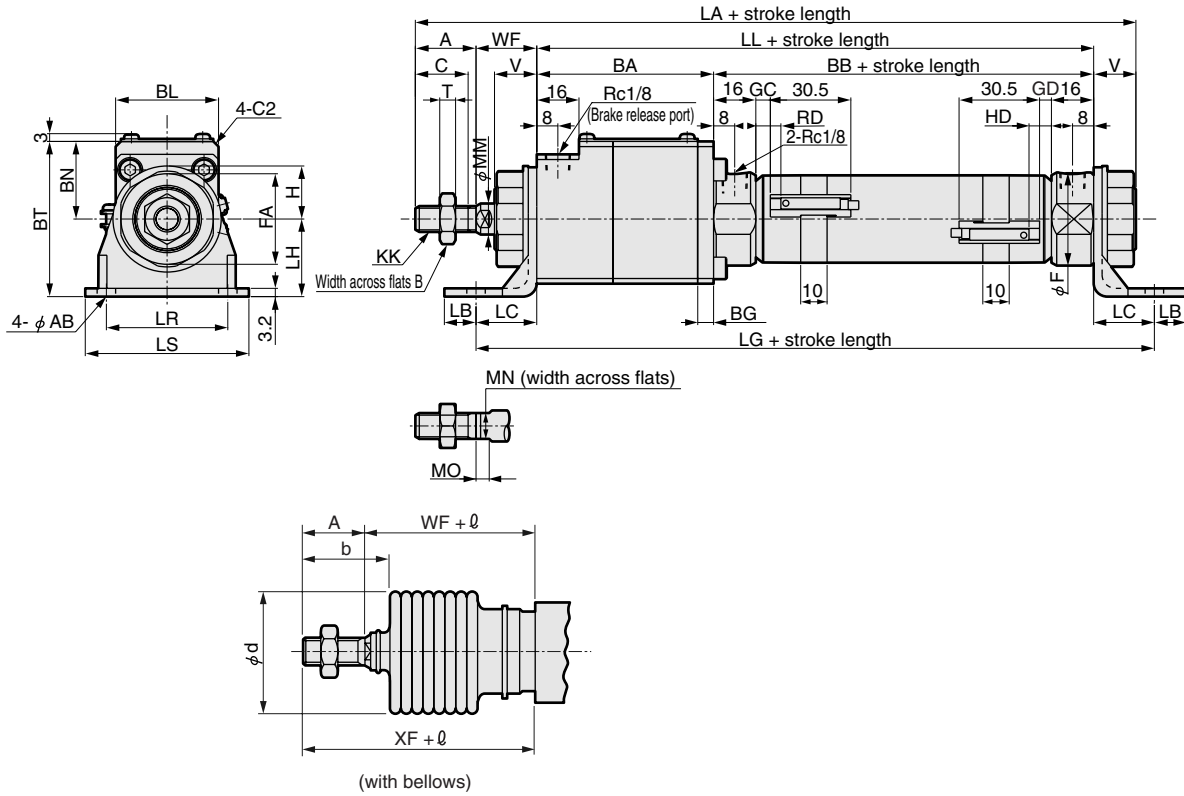
SCP\*2  
CMK2  
CMA2  
SCM  
SCG  
SCA2  
SCS  
CKV2  
CA/OV2  
SSD  
CAT  
MDC2  
MVC  
SMD2  
MSD\*  
FC\*  
STK  
**ULK\***  
JSK/M2  
JSG  
JSC3  
USSD  
USC  
JSB3  
LMB  
STG  
STS/L  
LCS  
LCG  
LCM  
LCT  
LCY  
STR2  
UCA2  
HCM  
HCA  
SRL2  
SRG  
SRM  
SRT  
MRL2  
MRG2  
SM-25  
CAC3  
UCAC  
RCC2  
MFC  
SHC  
GLC  
Ending

Brake cylinder  
With brake

## Dimensions



### ● Axial foot type (LB)



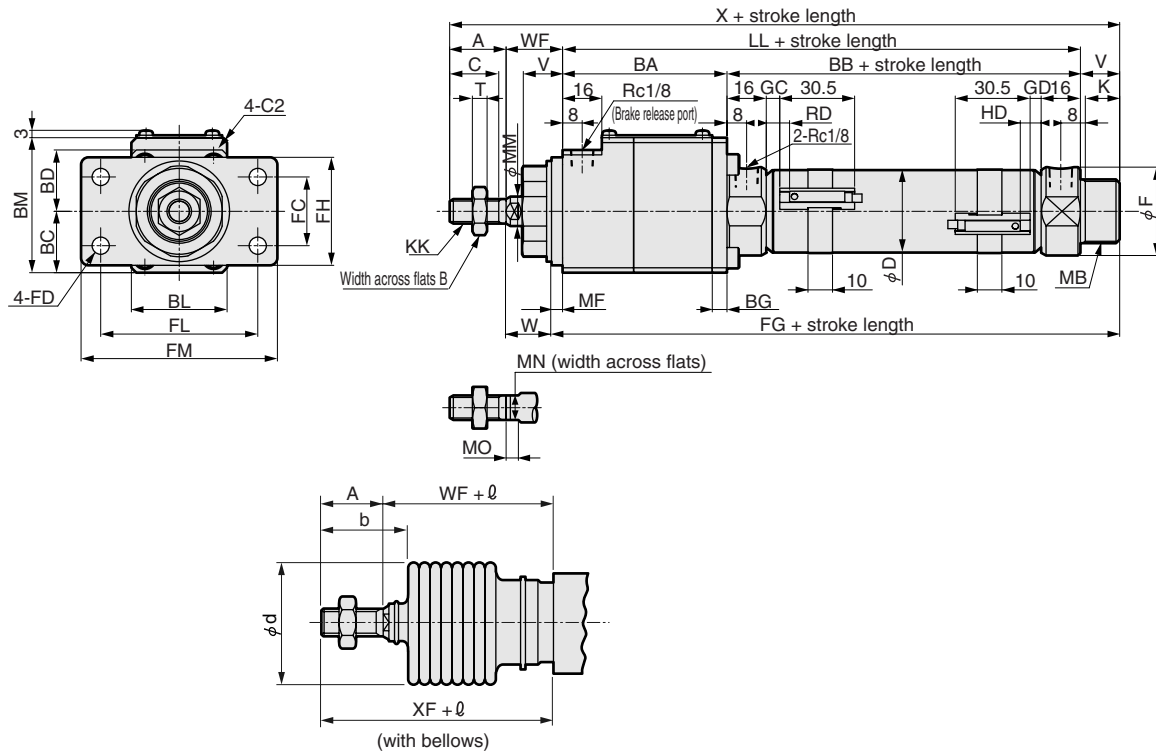
Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.  
 Note 2: For  $\ell$  dimensions, round up below decimal point.  
 Note 3: Refer to page 1218 for dimensions of accessories.

Symbol	Axial foot type (LB) basic dimensions																	
Bore size	A	AB	B	BA	BB	BC	BD	BG	BL	BN	BT	C	D	F	FA	H	KK	
$\phi 20$	20	6	13	58	66	20	20	6	29	25	50	18	21.4	28	26	15	M8 x 1.0	
$\phi 25$	23	7	17	67	69	25	25	6	39	30	60	20	26.4	32	35	20	M10 x 1.25	
$\phi 32$	23	7	17	67	69	25	25	6	39	30	60	20	33.6	36	35	20	M10 x 1.25	
$\phi 40$	25	7	19	74	73	29	30	9	50	40	70	22	41.6	45	35	20	M12 x 1.5	
Symbol	Installation dimensions											With switch						
Bore size	LL	MM	MN	MO	T	V	WF	LA	LB	LC	LG	LH	LR	LS	GC	GD	RD	HD
$\phi 20$	124	10	8	5	5	14	24	196	10	18	160	25	30	44	4.0	3.0	8.0	7.0
$\phi 25$	136	12	10	5	6	16	23	217	12	23	182	30	46	62	5.5	4.5	9.5	8.5
$\phi 32$	136	12	10	5	6	16	23	217	12	23	182	30	46	62	5.5	4.5	9.5	8.5
$\phi 40$	147	14	12	6	7	16	23	230	12	23	193	30	46	62	7.0	6.5	11.5	10.5
Symbol	With bellows																	
Bore size (mm)	XF	b	d	$\ell$														
$\phi 20$	44	30	30	(Stroke length/3) + 6														
$\phi 25$	46	32	46	(Stroke length/3.25) + 7														
$\phi 32$	46	32	46	(Stroke length/3.25) + 7														
$\phi 40$	48	34	46	(Stroke length/3.25) + 7														

### Dimensions



● Rod end flange type (FA)



Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

Note 2: For  $\phi$  dimensions, round up below decimal point.

Note 3: Refer to page 1218 for dimensions of accessories.

Symbol	Rod end flange type (FA) basic dimensions															
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BL	BM	C	D	F	K	KK	LL	MB
φ 20	20	13	58	66	20	20	6	29	45	18	21.4	28	12	M8 x 1.0	124	M18 x 1.5
φ 25	23	17	67	69	25	25	6	39	55	20	26.4	32	14	M10 x 1.25	136	M26 x 1.5
φ 32	23	17	67	69	25	25	6	39	55	20	33.6	36	14	M10 x 1.25	136	M26 x 1.5
φ 40	25	19	74	73	29	30	9	50	69	22	41.6	45	14	M12 x 1.5	147	M26 x 1.5

Symbol	Installation dimensions									With switch									
Bore size (mm)	MF	MM	MN	MO	T	V	W	WF	X	FC	FD	FG	FH	FL	FM	GC	GD	RD	HD
φ 20	3.2	10	8	5	5	14	20.8	24	182	20	6	141.2	34	40	54	4.0	3.0	8.0	7.0
φ 25	4.5	12	10	5	6	16	18.5	23	198	28	7	156.5	44	64	80	5.5	4.5	9.5	8.5
φ 32	4.5	12	10	5	6	16	18.5	23	198	28	7	156.5	44	64	80	5.5	4.5	9.5	8.5
φ 40	4.5	14	12	6	7	16	18.5	23	211	28	7	167.5	44	64	80	7.0	6.5	11.5	10.5

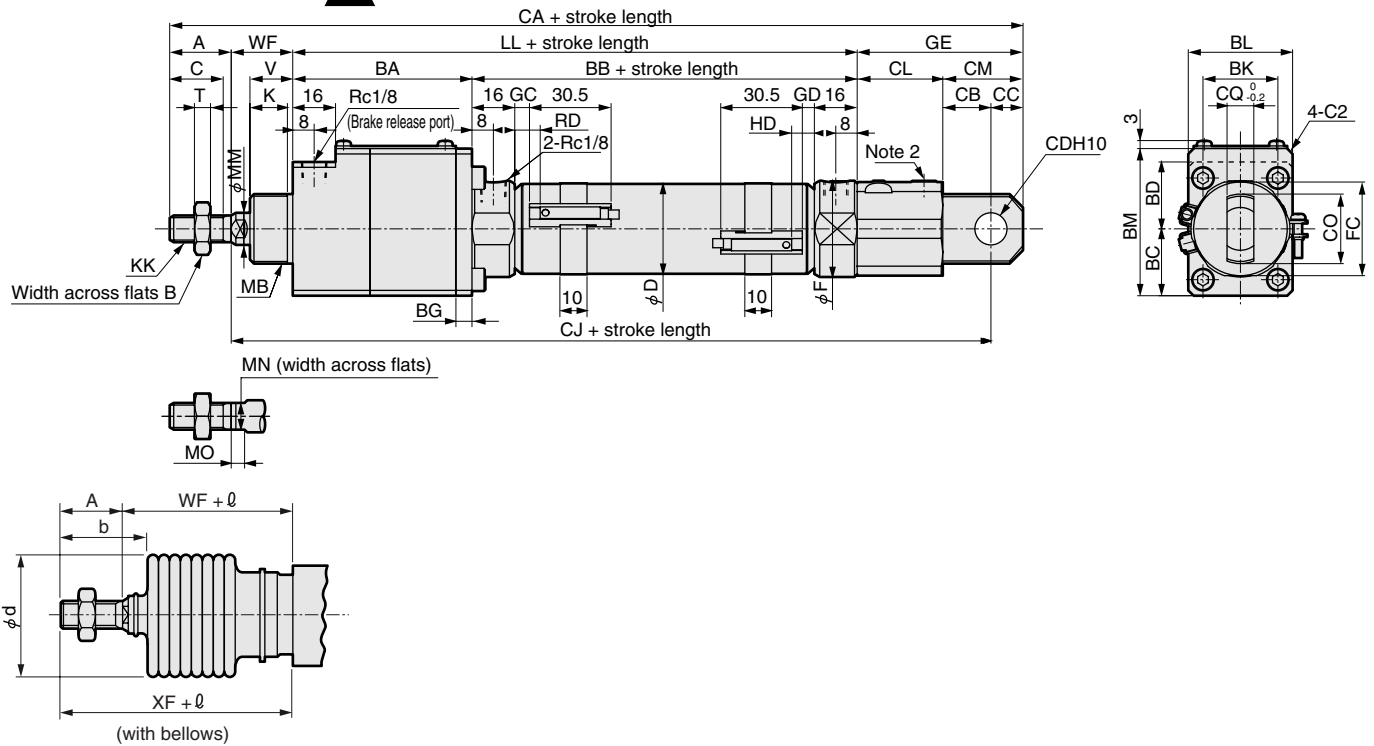
Symbol	With bellows			
Bore size (mm)	XF	b	d	$\phi$
φ 20	44	30	30	(Stroke length/3) + 6
φ 25	46	32	46	(Stroke length/3.25) + 7
φ 32	46	32	46	(Stroke length/3.25) + 7
φ 40	48	34	46	(Stroke length/3.25) + 7

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending

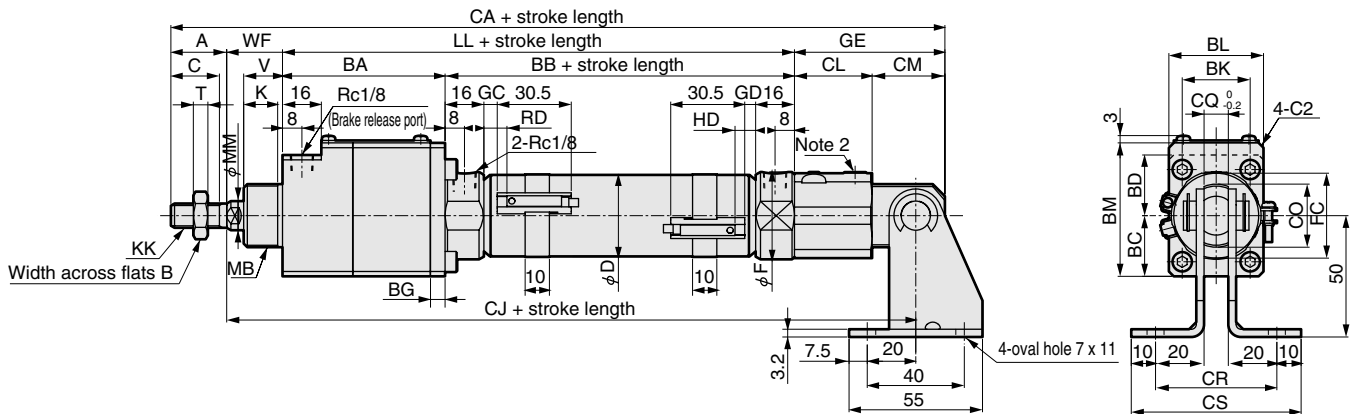
Brake cylinder  
With brake

## Dimensions

### ● Eye bracket type (CA)



### ● With bracket (option B2)



Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

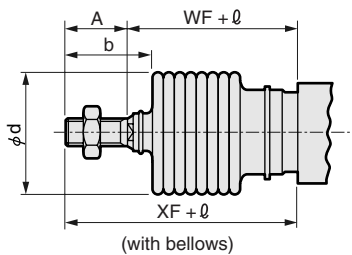
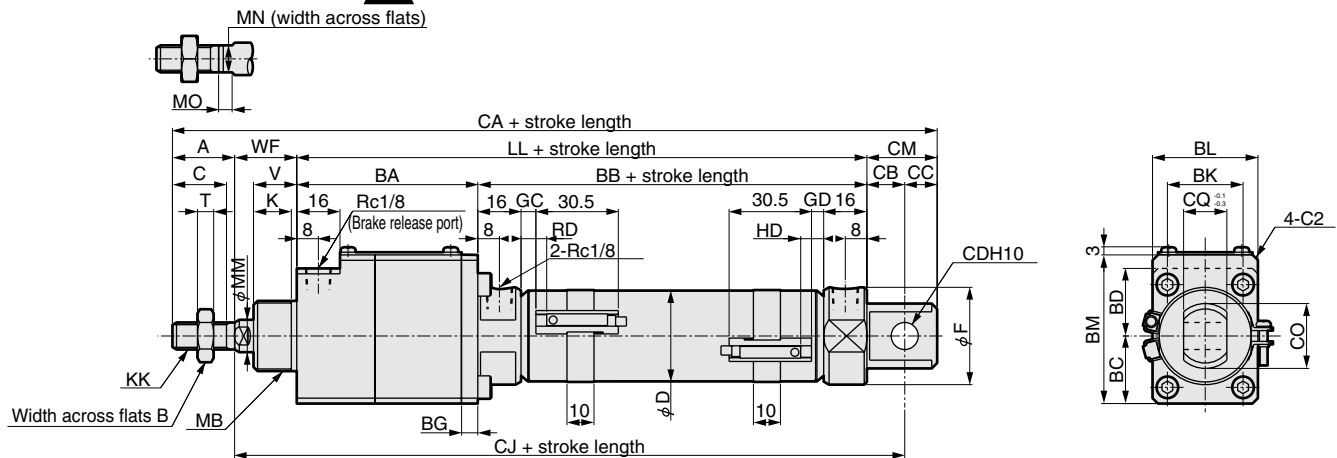
Note 2: This is not a piping port. Note 3: For  $\phi$  dimensions, round up below decimal point.

Note 4: Refer to page 1218 for dimensions of accessories.

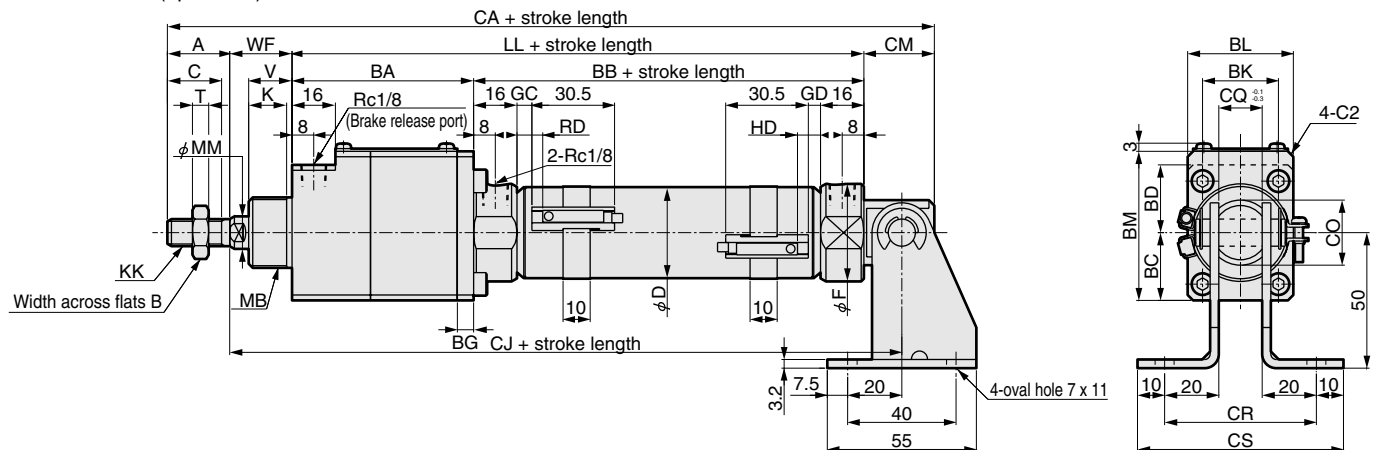
Symbol	Eye bracket type (CA) basic dimensions																				
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	FC	GE	K	KK	LL	MB		
$\phi 20$	20	13	58	66	20	20	6	20	29	45	18	21.4	28	26	55	12	M8 x 1.0	124	M18 x 1.5		
$\phi 25$	23	17	67	69	25	25	6	28	39	55	20	26.4	32	35	62	14	M10 x 1.25	136	M26 x 1.5		
$\phi 32$	23	17	67	69	25	25	6	28	39	55	20	33.6	36	35	62	14	M10 x 1.25	136	M26 x 1.5		
$\phi 40$	25	19	74	73	29	30	9	39	50	69	22	41.6	45	35	62	14	M12 x 1.5	147	M26 x 1.5		
Symbol	Installation dimensions														With switch						
Bore size (mm)	MM	MN	MO	T	V	WF	CA	CB	CC	CD	CJ	CL	CM	CO	CQ	CR	CS	GC	GD	RD	HD
$\phi 20$	10	8	5	5	14	24	223	14	10	10	193	31	24	22	8	48	68	4.0	3.0	8.0	7.0
$\phi 25$	12	10	5	6	16	23	244	18	12	12	209	32	30	26	10	50	70	5.5	4.5	9.5	8.5
$\phi 32$	12	10	5	6	16	23	244	18	12	12	209	32	30	26	10	50	70	5.5	4.5	9.5	8.5
$\phi 40$	14	12	6	7	16	23	257	18	12	12	220	32	30	26	10	50	70	7.0	6.5	11.5	10.5
Symbol	With bellows																				
Bore size (mm)	XF	b	d	$\ell$																	
$\phi 20$	44	30	30	(Stroke length/3) + 6																	
$\phi 25$	46	32	46	(Stroke length/3.25) + 7																	
$\phi 32$	46	32	46	(Stroke length/3.25) + 7																	
$\phi 40$	48	34	46	(Stroke length/3.25) + 7																	

### Dimensions

● Fixed eye (CC)



● With bracket (option B2)



Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

Note 2: For  $l$  dimensions, round up below decimal point.

Note 3: Refer to page 1218 for dimensions of accessories.

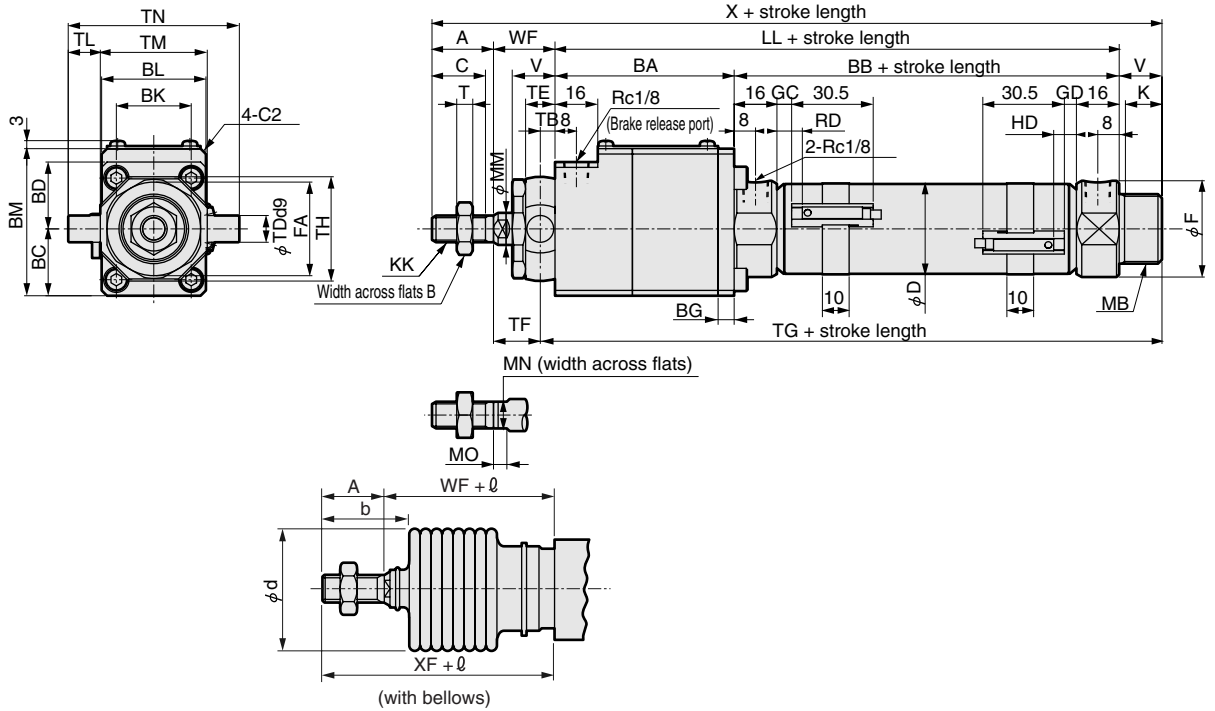
Symbol	Fixed eye (CC) basic dimensions																				
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	K	KK	LL					
φ20	20	13	58	66	20	20	6	20	29	45	18	21.4	28	12	M8 x 1.0	124					
φ25	23	17	67	69	25	25	6	28	39	55	20	26.4	32	14	M10 x 1.25	136					
φ32	23	17	67	69	25	25	6	28	39	55	20	33.6	36	14	M10 x 1.25	136					
φ40	25	19	74	73	29	30	9	39	50	69	22	41.6	45	14	M12 x 1.5	147					
Symbol	Installation dimensions											With switch									
Bore size (mm)	MB	MM	MN	MO	T	V	WF	CA	CB	CC	CD	CJ	CM	CO	CQ	CR	CS	GC	GD	RD	HD
φ20	M18 x 1.5	10	8	5	5	14	24	189	12	9	8	160	21	22	16	56	76	4.0	3.0	8.0	7.0
φ25	M26 x 1.5	12	10	5	6	16	23	203	12	9	8	171	21	24	16	56	76	5.5	4.5	9.5	8.5
φ32	M26 x 1.5	12	10	5	6	16	23	208	14	12	10	173	26	24	16	56	76	5.5	4.5	9.5	8.5
φ40	M26 x 1.5	14	12	6	7	16	23	225	16	14	12	186	30	30	20	60	80	7.0	6.5	11.5	10.5
Symbol	With bellows																				
Bore size (mm)	XF	b	d	l																	
φ20	44	30	30	(Stroke length/3) + 6																	
φ25	46	32	46	(Stroke length/3.25) + 7																	
φ32	46	32	46	(Stroke length/3.25) + 7																	
φ40	48	34	46	(Stroke length/3.25) + 7																	

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending

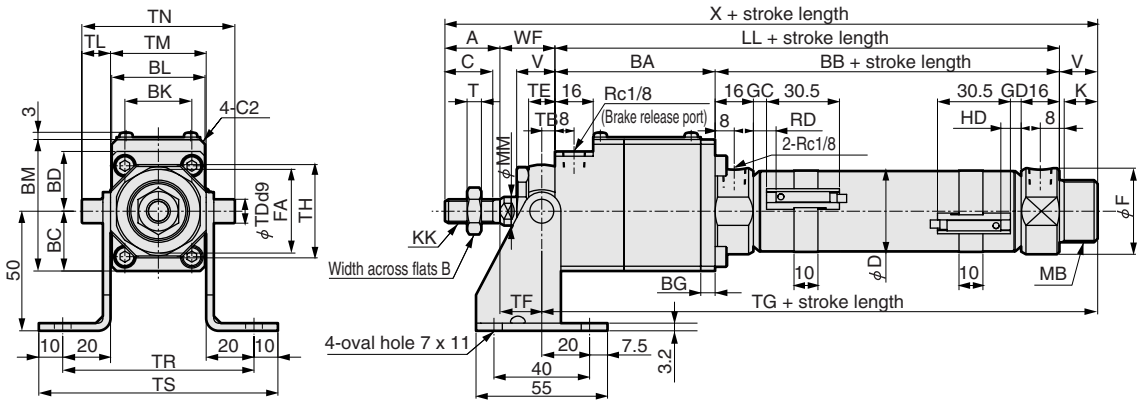
Brake cylinder  
With brake

## Dimensions

### ● Rod end trunnion type (TA)



### ● With bracket (option B2)



Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

Note 2: For  $\ell$  dimensions, round up below decimal point.

Note 3: Refer to page 1218 for dimensions of accessories.

Symbol	Rod end trunnion type (TA) basic dimensions																	
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	FA	K	KK	LL	MB
$\phi 20$	20	13	58	66	20	20	6	20	29	45	18	21.4	28	26	12	M8 x 1.0	124	M18 x 1.5
$\phi 25$	23	17	67	69	25	25	6	28	39	55	20	26.4	32	35	14	M10 x 1.25	136	M26 x 1.5
$\phi 32$	23	17	67	69	25	25	6	28	39	55	20	33.6	36	35	14	M10 x 1.25	136	M26 x 1.5
$\phi 40$	25	19	74	73	29	30	9	39	50	69	22	41.6	45	35	14	M12 x 1.5	147	M26 x 1.5

Symbol	Installation dimensions																	With switch				
Bore size (mm)	MM	MN	MO	T	V	WF	X	TB	TD	TE	TF	TG	TH	TL	TM	TN	TR	TS	GC	GD	RD	HD
$\phi 20$	10	8	5	5	14	24	182	4.5	8	9	19.5	142.5	29	8	30	46	70	90	4.0	3.0	8.0	7.0
$\phi 25$	12	10	5	6	16	23	198	5.5	10	11	17.5	157.5	39	12	40	64	80	100	5.5	4.5	9.5	8.5
$\phi 32$	12	10	5	6	16	23	198	5.5	10	11	17.5	157.5	39	12	40	64	80	100	5.5	4.5	9.5	8.5
$\phi 40$	14	12	6	7	16	23	211	5.5	10	11	17.5	168.5	44	9.5	53	72	93	113	7.0	6.5	11.5	10.5

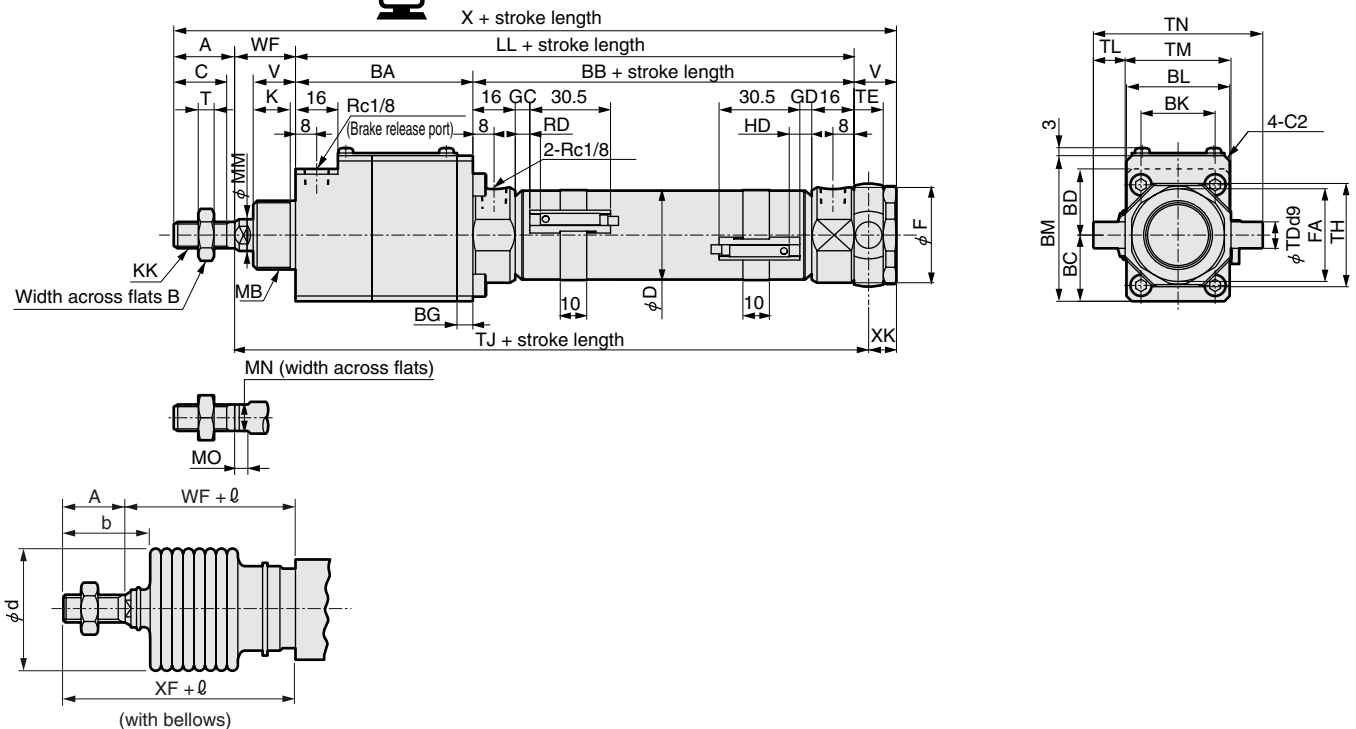
  

Symbol	With bellows			
Bore size (mm)	XF	b	d	$\ell$
$\phi 20$	44	30	30	(Stroke length/3) + 6
$\phi 25$	46	32	46	(Stroke length/3.25) + 7
$\phi 32$	46	32	46	(Stroke length/3.25) + 7
$\phi 40$	48	34	46	(Stroke length/3.25) + 7

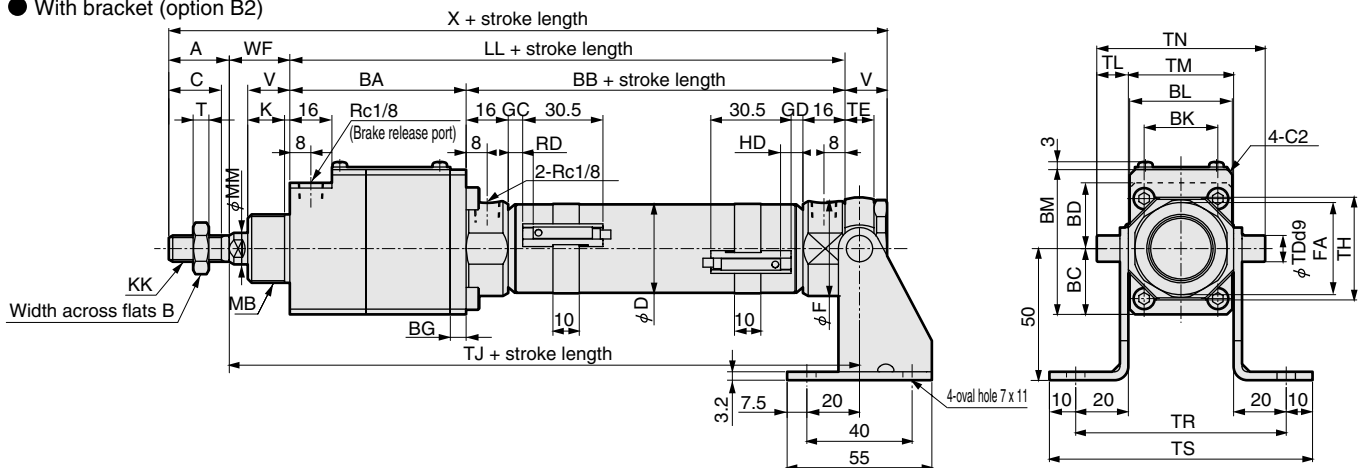


## Dimensions

### ● Head end trunnion type (TB)



### ● With bracket (option B2)



Note 1: Refer to page 1217 for the HD, RD, and projecting dimensions of T1\*, T8\* switch, 2 color indication type, preventive maintenance output type.

Note 2: For  $\ell$  dimensions, round up below decimal point.

Note 3: Refer to page 1218 for dimensions of accessories.

Symbol	Rod end flange type (TB) basic dimensions																				
Bore size (mm)	A	B	BA	BB	BC	BD	BG	BK	BL	BM	C	D	F	FA	K	KK	LL	MB			
$\phi 20$	20	13	58	66	20	20	6	20	29	45	18	21.4	28	26	12	M8 x 1.0	124	M18 x 1.5			
$\phi 25$	23	17	67	69	25	25	6	28	39	55	20	26.4	32	35	14	M10 x 1.25	136	M26 x 1.5			
$\phi 32$	23	17	67	69	25	25	6	28	39	55	20	33.6	36	35	14	M10 x 1.25	136	M26 x 1.5			
$\phi 40$	25	19	74	73	29	30	9	39	50	69	22	41.6	45	35	14	M12 x 1.5	147	M26 x 1.5			
Symbol	Installation dimensions										With switch										
Bore size (mm)	MM	MN	MO	T	V	WF	X	XK	TD	TE	TH	TJ	TL	TM	TN	TR	TS	GC	GD	RD	HD
$\phi 20$	10	8	5	5	14	24	182	9.5	8	9	29	152.5	8	30	46	70	90	4.0	3.0	8.0	7.0
$\phi 25$	12	10	5	6	16	23	198	10.5	10	11	39	164.5	12	40	64	80	100	5.5	4.5	9.5	8.5
$\phi 32$	12	10	5	6	16	23	198	10.5	10	11	39	164.5	12	40	64	80	100	5.5	4.5	9.5	8.5
$\phi 40$	14	12	6	7	16	23	211	10.5	10	11	44	175.5	9.5	53	72	93	113	7.0	6.5	11.5	10.5
Symbol	With bellows																				
Bore size (mm)	XF	b	d	$\ell$																	
$\phi 20$	44	30	30	(Stroke length/3) + 6																	
$\phi 25$	46	32	46	(Stroke length/3.25) + 7																	
$\phi 32$	46	32	46	(Stroke length/3.25) + 7																	
$\phi 40$	48	34	46	(Stroke length/3.25) + 7																	

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending

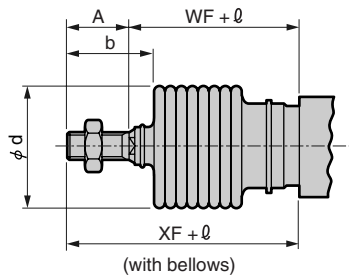
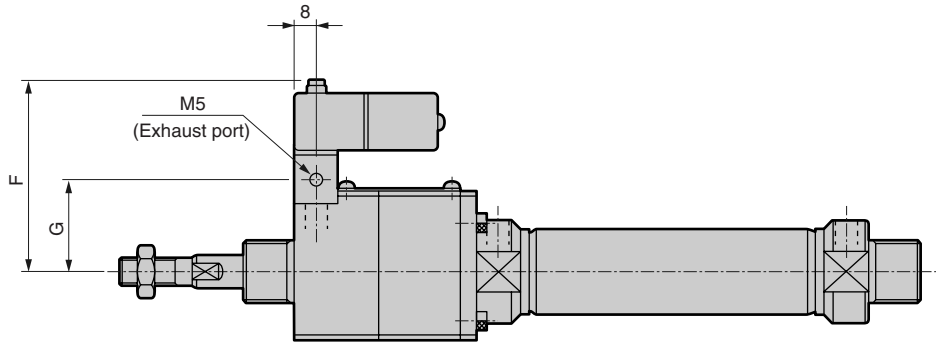
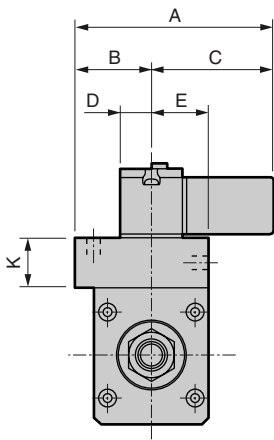
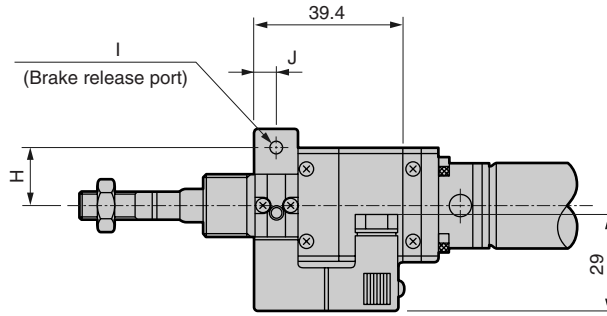
Brake cylinder  
With brake

## Dimensions



● With valve

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending



Note 1: For  $l$  dimensions, round up below decimal point.  
 Note 2: Refer to page 1218 for dimensions of accessories.

Symbol	A	B	C	D	E	F	G	H	I	J	K
Bore size (mm)											
$\phi 20$	56.5	25	31.5	8	15	52	26.5	17	M5	8	12
$\phi 25$	57	24	33	6.5	18	58	31	16	Rc1/8	9	13
$\phi 32$	57	24	33	6.5	18	58	31	16	Rc1/8	9	13
$\phi 40$	57	24	33	6.5	18	63	36	16	Rc1/8	9	13

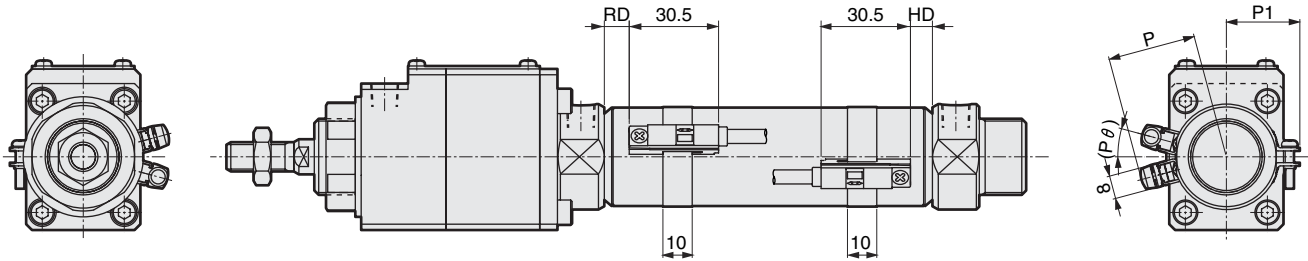
Symbol	With bellows			
	XF	b	d	$l$
Bore size (mm)				
$\phi 20$	44	30	30	(Stroke length/3) + 6
$\phi 25$	46	32	46	(Stroke length/3.25) + 7
$\phi 32$	46	32	46	(Stroke length/3.25) + 7
$\phi 40$	48	34	46	(Stroke length/3.25) + 7

# ULK/ULK-V Series

## Dimensions

ULK series common (2 color indicator type, with preventive maintenance output, with switch) dimensions

● ULK-\*\*-\*\*-T<sub>3</sub><sup>2</sup>YH/V, T<sub>3</sub><sup>2</sup>YFH/V, T<sub>3</sub><sup>2</sup>YMH/V



2 color indicator type, preventive maintenance output switch installation dimensions

Symbol	1 color indicator (T1,T8), 2 color indicator (T <sub>3</sub> <sup>2</sup> Y, T <sub>3</sub> <sup>2</sup> Y <sub>M</sub> <sup>F</sup> )								
	RD Note 1		HD Note 2		P			P1	(Pθ)°
	T1, T <sub>3</sub> <sup>2</sup> Y, T <sub>3</sub> <sup>2</sup> Y <sub>M</sub> <sup>F</sup>	T8	T1, T <sub>3</sub> <sup>2</sup> Y, T <sub>3</sub> <sup>2</sup> Y <sub>M</sub> <sup>F</sup>	T8	T1	T <sub>3</sub> <sup>2</sup> Y, T8	T <sub>3</sub> <sup>2</sup> Y <sub>M</sub> <sup>F</sup>		
φ20	7.0	2.0	6.0	1	28.5	23.1	28.1	19.5	22
φ25	8.5	3.5	7.5	2.5	31.0	25.6	30.6	22.0	18
φ32	8.5	3.5	7.5	2.5	35.5	30.1	35.1	25.5	15
φ40	10.5	5.5	9.5	4.5	39.5	34.1	39.1	29.5	12

SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSKM2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC
Ending

Brake cylinder  
With brake

# ULK/ULK-V Series

## Accessory

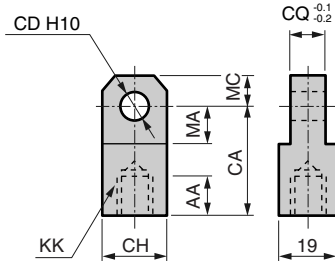
### Accessory dimensions (rod eye/clevis, bracket, pin) with bellows

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
- JSG
- JSC3
- USSD
- USC
- JSB3
- LMB
- STG
- STS/L
- LCS
- LCG
- LCM
- LCT
- LCY
- STR2
- UCA2
- HCM
- HCA
- SRL2
- SRG
- SRM
- SRT
- MRL2
- MRG2
- SM-25
- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending

#### ● Rod eye (I)



Material: Steel

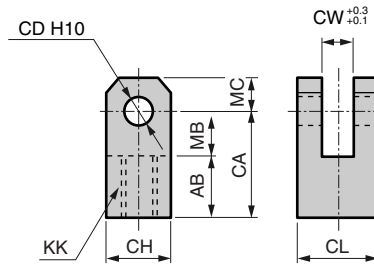


Model no.	Applicable bore size (mm)	AA	CA	CD	CH	CQ	KK	MA	MC	Weight (g)
M1-I-20	20	14	30	10	19	8	M8 x 1.0	13	10	60
M1-I-30	25, 32	16	36	12	25	10	M10 x 1.25	16	12	106
M1-I-40	40	16	36	12	25	10	M12 x 1.5	16	12	100

#### ● Rod clevis (Y)



Material: Steel



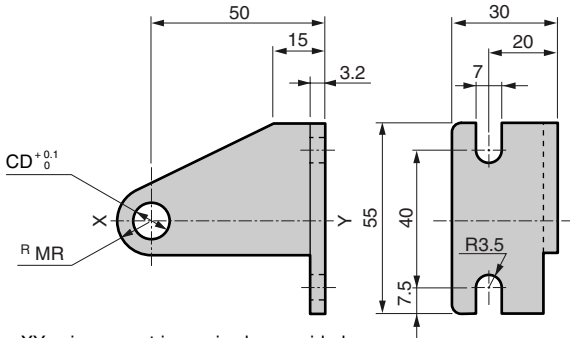
Pin, washer and split pin are attached.

Model no.	Applicable bore size (mm)	AB	CA	CD	CH	CL	CW	KK	MB	MC	Weight (g)
M1-Y-20	20	17	30	10	19	19	8	M8 x 1.0	13	10	99
M1-Y-30	25, 32	20	36	12	25	25	10	M10 x 1.25	16	12	197
M1-Y-40	40	20	36	12	25	25	10	M12 x 1.5	16	12	193

#### ● Clevis bracket (B2)



Material: Steel



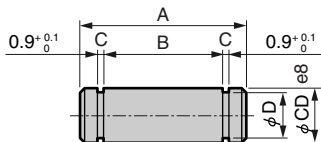
Note: XY axis symmetric one is also provided.

Model no.	Applicable model	Applicable bore size (mm)	CD	MR	Weight (g)
M1-B2-20-CC	ULK-CC	20, 25	8	8	145
M1-B2-30-CC		32	10	11	163
M1-B2-40-CC	ULK-CA	40	12	11	170
M1-B2-30-CA		20	10	11	158
M1-B2-40-CA	ULK-TA/TB	25, 32, 40	12	11	162
M1-B2-20-TA		20	8	8	132
M1-B2-30-TA		25, 32, 40	10	11	142

Note: The model No. above include snap ring and pin.  
(Not attached for trunnion type)

#### ● Pin for clevis bracket (P1) (P2)

Material: Carbon steel

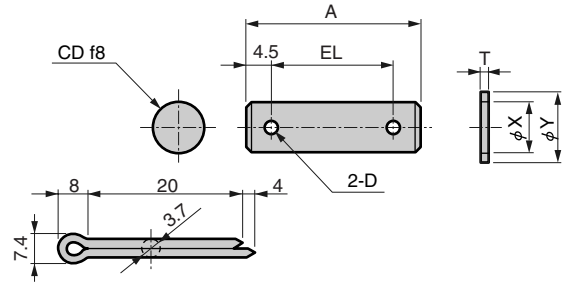


Model no.	Applicable model and applicable bore size (mm)	A	B	C	D	Applicable snap ring	Weight (g)
M1-P1-20	ULK-CC-20/25	33	28	8	7	E type 7	13
M1-P1-30	ULK-CC-32	33	28	10	9	E type 9	21
M1-P1-40	ULK-CC-40	37	32	12	9	E type 9	32
M1-P2-20	ULK-CA-20	25	20	10	9	E type 9	16
M1-P2-30	ULK-CA-25/32/40	27	22	10	9	E type 9	24

Note: For bracket type, pin and snap ring are attached to the product.  
(Not attached for trunnion type)

#### ● Pin for rod clevis (P)

Material: Carbon steel



Model no.	Applicable bore size (mm)	A	D	CD	EL	T	X	Y	Weight (g)
M1-P-20	20	37	4	10	28	2	10.5	18	29
M1-P-30	25, 32, 40	46	4	12	37	2.5	13	21	50

Note: For rod clevis type, pin, washer and split pin are attached to the product.

## Applications This product can be used with devices and equipment requiring the following functions.

### 1 When multipoint positioning is required (transfer/positioning)

Equipment can be accurately stopped at several positions.

### 2 When position locking is required

Brakes can be applied and held instantly when the air pressure source or power is turned OFF during power failure or accident, preventing damage to equipment and ensuring safety.

### 3 When emergency stop is required

The cylinder can be stopped with electric signals, etc. when personnel, etc., enter hazardous areas.

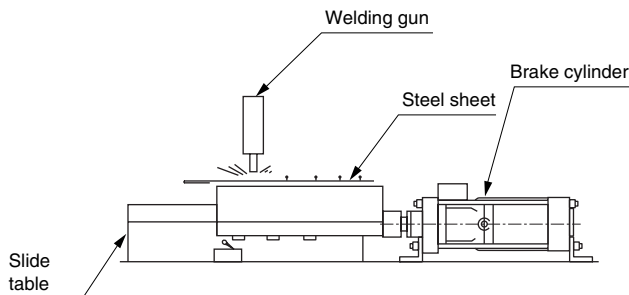
### 4 Workpiece lock

When locking a work piece to a jig or a bracket etc., even if pneumatic sources is not supplied, locked position is held. The work piece can be transferred with locking onto the jig.

## Applications

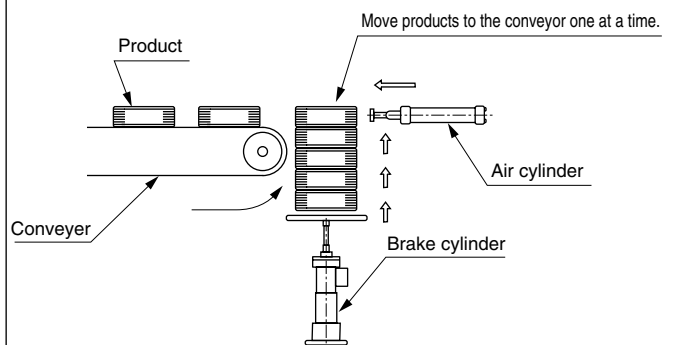
### 1 Linear multipoint welding

When welding steel plates, etc., linearly at several points, this cylinder can be used to move and position the slide table or welding gun.



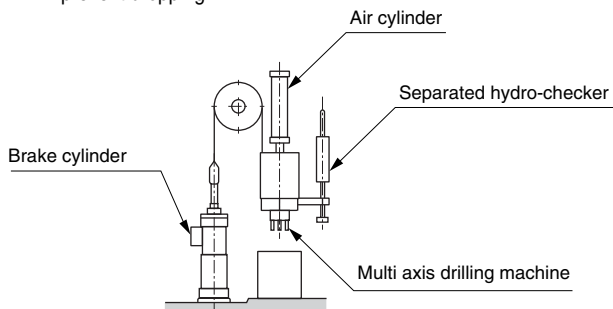
### 4 Moving to conveyer

Move products to the conveyer one at a time.



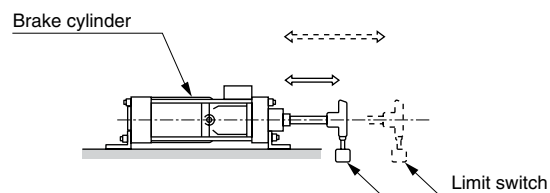
### 2 Position locking

For a load in the vertical direction that could drop of its own weight when pressure is cut, this brake cylinder brakes are applied to prevent dropping.



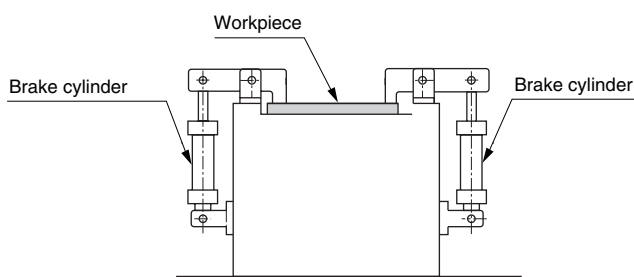
### 5 When several cylinders with different strokes are required

When different-sized products flow to the conveyer, etc., and many cylinders are set, the stroke must be changed. Using the middle bore size brake cylinder, a cylinder compatible with different strokes is created electrically.



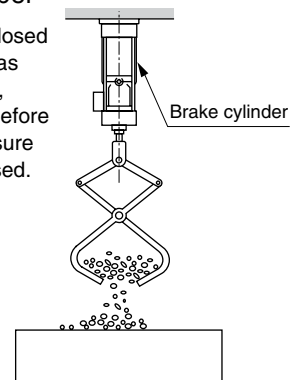
### 3 Workpiece lock

When the workpiece is locked to a jig, etc., it can be locked even when air pressure source or power is OFF by using the middle size brake cylinder.



### 6 Opening/closing hopper

When a hopper must be closed at a specific weight, such as when dispensing powders, the hopper is closed just before it is full to accurately measure powder, then it is fully closed.



SCP*2
CMK2
CMA2
SCM
SCG
SCA2
SCS
CKV2
CA/OV2
SSD
CAT
MDC2
MVC
SMD2
MSD*
FC*
STK
<b>ULK*</b>
JSK/M2
JSG
JSC3
USSD
USC
JSB3
LMB
STG
STS/L
LCS
LCG
LCM
LCT
LCY
STR2
UCA2
HCM
HCA
SRL2
SRG
SRM
SRT
MRL2
MRG2
SM-25
CAC3
UCAC
RCC2
MFC
SHC
GLC

Ending

Brake cylinder  
With brake

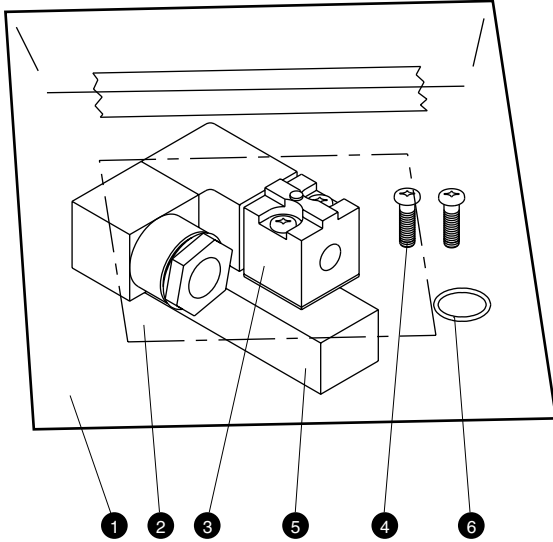
# ULK/ULK-V Series

## Configurations table

### Configurations table

● Valve kit for brake

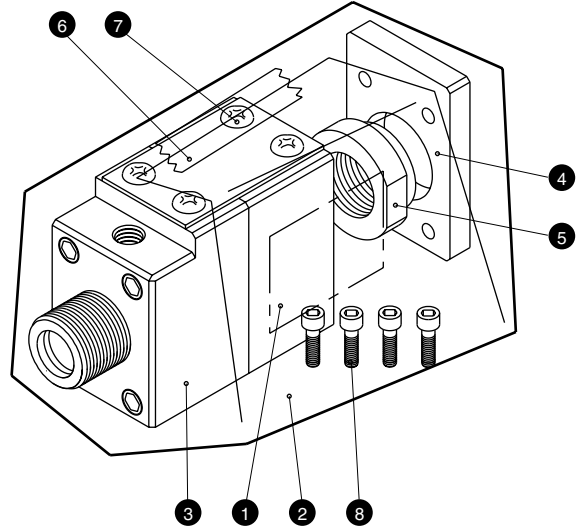
**ULK-V** – **Bore size** – **VALVE-KIT** – **Voltage**



No.	Part name	Quantity
1	Label	1
2	Plastic bag or vinyl sheet	1
3	Brake release valve	1
4	Cross headed pan	2
5	Sub base	1
6	Gasket	1

● Brake unit

**ULK** – **Bore size** – **BRAKE-UNIT**



No.	Part name	Quantity
1	Label	1
2	Plastic bag or vinyl sheet	1
3	Brake assembly	1
4	Brake flange	1
5	Lock nut	1
6	Cover	1
7	Cross headed pan	4
8	Hexagon socket head cap screw	4

- SCP\*2
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS
- CKV2
- CA/OV2
- SSD
- CAT
- MDC2
- MVC
- SMD2
- MSD\*
- FC\*
- STK
- ULK\***
- JSK/M2
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- HCM
- HCA
- SRL2
- SRG
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- SRT
- MRL2
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- CAC3
- UCAC
- RCC2
- MFC
- SHC
- GLC
- Ending