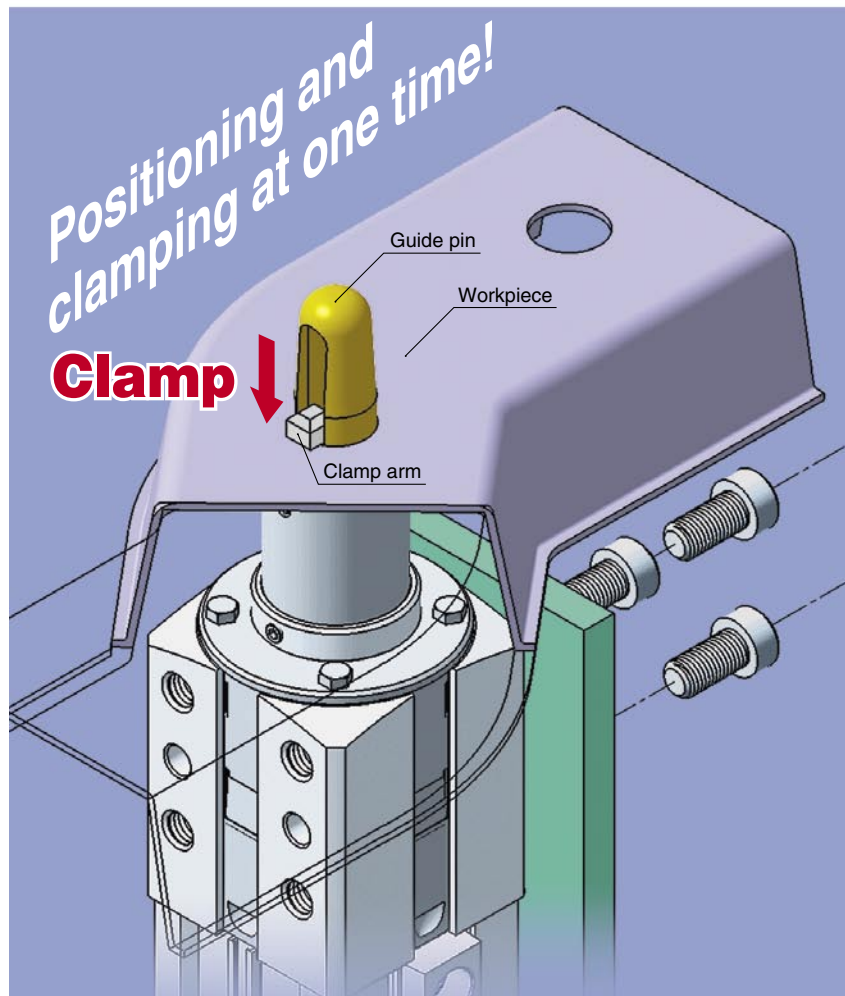
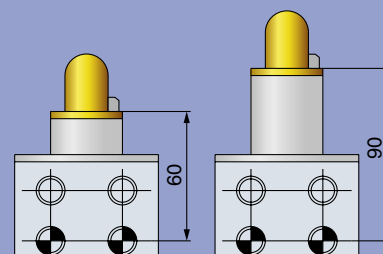


# Pin Clamp Cylinder

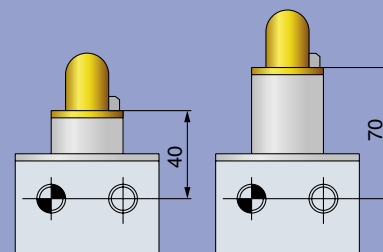
Interference with the body reduced by adjusting height for clamping a workpiece!



## Clamping Height



Body shape: D type



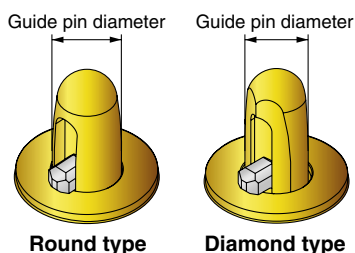
Body shape: U, K, M type <sup>Note)</sup>

Note) See Features 1 for further details.

## 55 types of guide pins

Compatible with a broad range of workpiece configurations

### Applicable Guide Pin Diameter



Round type	Guide pin diameter (mm)														
	Applicable hole diameter of workpiece	125	127	128	129	130	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9
Guide pin shape	For ø13					For ø15					For ø16				
	Round type														

Round type Diamond type	Guide pin diameter (mm)																			
	Applicable hole diameter of workpiece	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9
Guide pin shape	For ø18				For ø20					For ø25					For ø30					
	Round type, Diamond type																			

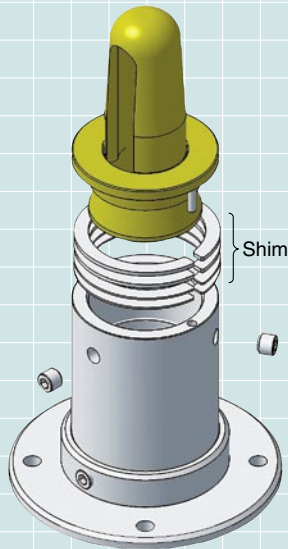
Series **C(L)KQG**□/**C(L)KQP**□



CAT.EUS20-199A-UK

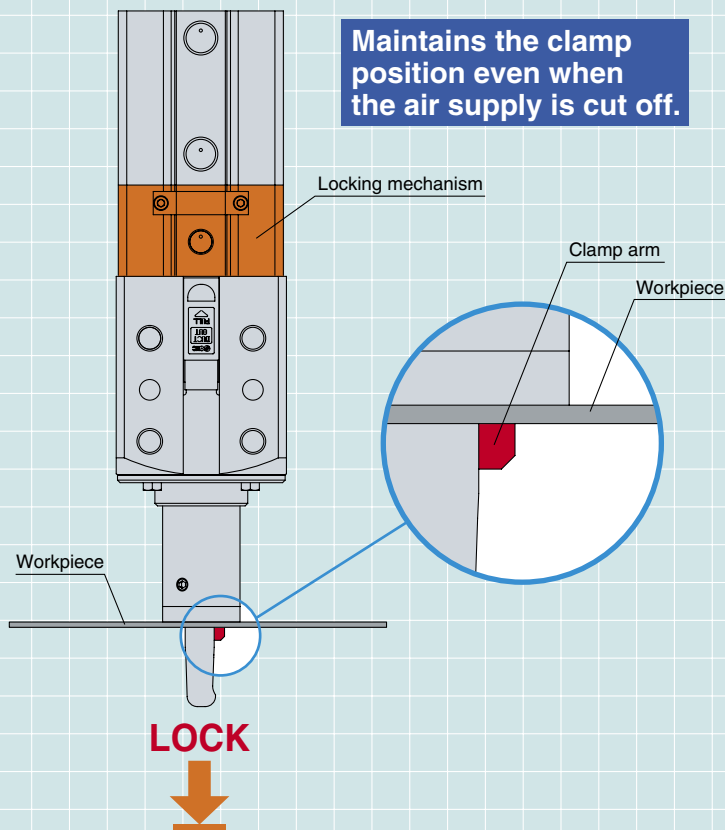
## Precise clamp position height adjustment by selecting an appropriate shim.

[Adjustment range: 0.5 to 3 mm]



A total shim height of 3 mm consists of 2 shims with a thickness of 1 mm each and 2 shims with a thickness of 0.5 mm each (assembled before shipping).

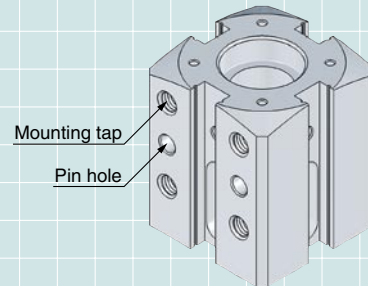
## Possibility of lock mechanism selection.



## 4 body shape options, offering extensive installation flexibility

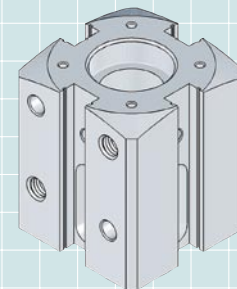
### D series

Mounting tap: 4 x M10 x 1.5  
Pin hole: 2 x ø8H7



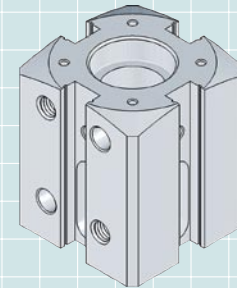
### U series

Mounting tap: 2 x M10 x 1.5  
Pin hole: 2 x ø8H7



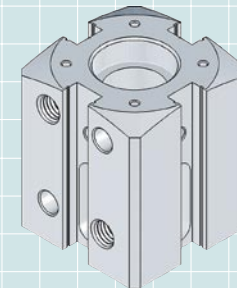
### K series

Mounting tap: 2 x M10 x 1.5  
Pin hole: 2 x ø10H7



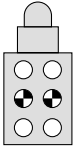
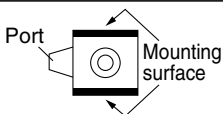
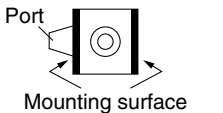
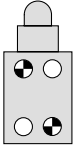
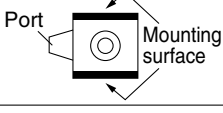
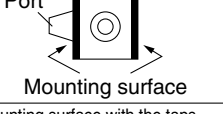
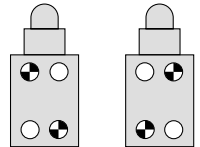
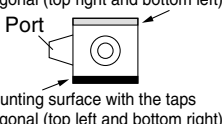
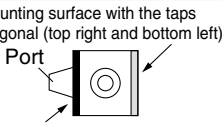
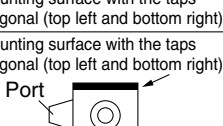
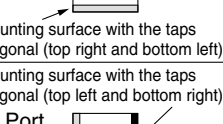
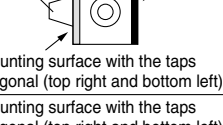
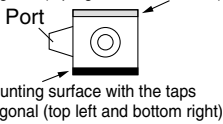
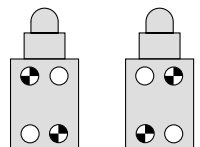
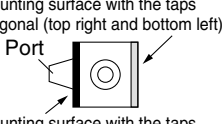
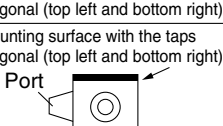
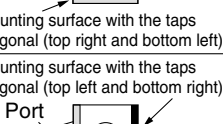
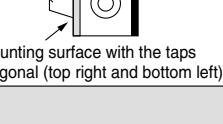
### M series

Mounting tap: 2 x M12 x 1.75  
Pin hole: 2 x ø10H7



# Pin Clamp Cylinder Mounting Variations

## Series C(L)KQG□/C(L)KQP□

Series	Body shape symbol	Dimension	Mounting	Mounting hole (tap, pin hole) arrangement	Mounting surface (viewed from top)		
					Symbol	Port location	
<b>C(L)KQG</b> (Built-in standard magnet)  <b>C(L)KQP</b> (Built-in strong magnet)	<b>D</b>	□66	Mounting tap: 4 x M10 x 1.5 Pin hole: 2 x ø8H7	Taps are parallel.  ○: Mounting tap ●: Pin hole	<b>A</b>		<b>P.2</b>
					<b>B</b>		
	<b>U</b>		Mounting tap: 2 x M10 x 1.5 Pin hole: 2 x ø8H7	Taps diagonal (top right and bottom left)  ○: Mounting tap ●: Pin hole	<b>A</b>		<b>P.12</b>
					<b>B</b>		
	<b>K</b>		Mounting tap: 2 x M10 x 1.5 Pin hole: 2 x ø10H7	Taps diagonal (top right and bottom left)    Taps diagonal (top left and bottom right)  ○: Mounting tap ●: Pin hole	<b>C</b>	Mounting surface with the taps diagonal (top right and bottom left) 	<b>P.22</b>
					<b>D</b>	Mounting surface with the taps diagonal (top left and bottom right) 	
					<b>E</b>	Mounting surface with the taps diagonal (top left and bottom right) 	
					<b>F</b>	Mounting surface with the taps diagonal (top right and bottom left) 	
					<b>C</b>	Mounting surface with the taps diagonal (top right and bottom left) 	
					<b>D</b>	Mounting surface with the taps diagonal (top left and bottom right) 	
	<b>M</b>		Mounting tap: 2 x M12 x 1.75 Pin hole: 2 x ø10H7	Taps diagonal (top right and bottom left)    Taps diagonal (top left and bottom right)  ○: Mounting tap ●: Pin hole	<b>C</b>	Mounting surface with the taps diagonal (top right and bottom left) 	<b>P.32</b>
					<b>D</b>	Mounting surface with the taps diagonal (top left and bottom right) 	
<b>E</b>		Mounting surface with the taps diagonal (top left and bottom right) 					
<b>F</b>		Mounting surface with the taps diagonal (top right and bottom left) 					

# Pin Clamp Cylinder

D series



# Series CKQ<sup>G</sup><sub>P</sub>D/CLKQ<sup>G</sup><sub>P</sub>D

## How to Order

**Built-in standard magnet**  
With magnetic field resistant auto switch

C  KQGD A 50  - 177 R A L  - P4DWSC

**Built-in strong magnet**  
With magnetic field resistant auto switch

C  KQP D A 50  - 198 R A L  - P79WSE

Lock on the clamp side

—	Without lock
L	With lock

Mounting surface (viewed from top)

Symbol	Port location
A	
B	

Bore size

50	50 mm
----	-------

Port thread type

—	Rc
TN	NPT
TF	G

Guide pin diameter

Note) For guide pin diameter, refer to Table 1 below.

Body shape

Symbol	Dimension	Mounting hole (tap, pin hole) arrangement	Mounting	Mounting surface (viewed from top)
D	□66		Mounting tap: 4 x M10 x 1.5 Pin hole: 2 x ø8H7	

Guide pin shape

R	Round type
D	Diamond type Note)

Note) Diamond type guide pin diameter is ø17.5 or more.

Number of auto switches

—	2 pcs.
S	1 pc. (Unclamp side)

Note) The D-P4/P7 type is different-surface mounting. (Refer to page 42.)

Auto switch type

—	Without auto switch (Built-in magnet)
---	---------------------------------------

Note 1) For applicable auto switch models, refer to page 3.  
Note 2) Auto switches are included, (but not assembled).

Shim

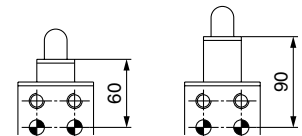
—	Without shims
S	With 3 mm shims Note)

Note) When a model includes shims, two 1 mm shims and two 0.5 mm shims are attached.

Clamping height (Refer to the below figure.)

L	LOW type (60 mm)
H	HIGH type (90 mm)

LOW type HIGH type



Clamping height

Clamp arm position (clockwise viewed from top)

A	Same direction as port 	C	180° from port 
B	90° from port 	D	270° from port 

Table 1. Guide Pin Diameter

Symbol	125	127	128	129	130	145	147	148	149	150	155	157	158	159	160
Guide pin diameter	12.5	12.7	12.8	12.9	13.0	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9	16.0
Applicable hole diameter of workpiece	For ø13					For ø15					For ø16				
Guide pin shape	Round type														



Round type Diamond type

Symbol	175	177	178	179	180	195	197	198	199	200	245	247	248	249	250	295	297	298	299	300
Guide pin diameter	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9	30.0
Applicable hole diameter of workpiece	For ø18					For ø20					For ø25					For ø30				
Guide pin shape	Round type, Diamond type																			

# Pin Clamp Cylinder *Series CKQ<sup>G</sup>D/CLKQ<sup>G</sup>D*

**Table 2. Applicable Auto Switches /** For detailed auto switch specifications, refer to page 43 through to 47.

Applicable cylinder series	Type	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no in use)	Load voltage	Lead wire length	Applicable load
<b>C(L)KQG series</b>	<b>Solid state switch</b>	<b>D-P4DWSC</b>	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-colour display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P4DWSE</b>				2-wire (1-4)		3 m	
		<b>D-P4DWL</b>		Grommet		2-wire		5 m	
		<b>D-P4DWZ</b>							
<b>C(L)KQP series</b>	<b>Reed switch</b>	<b>D-P79WSE</b>	DC/AC magnetic field	Pre-wired connector	2-colour display	2-wire (1-4)	24 VDC	0.3 m	
		<b>D-P74L</b>		Grommet (Pre-wired connector) <small>Note 2)</small>	1-colour display	2-wire	24 VDC 100 VAC	3 m	
		<b>D-P74Z</b>						5 m	

Note 1) PLC: Programmable Logic Controller

Note 2) Refer to page 47 for pre-wired connector products.

# Series CKQ<sup>G</sup><sub>P</sub>D/CLKQ<sup>G</sup><sub>P</sub>D



## Basic Specifications

<b>Action</b>	Double acting	
<b>Bore size (mm)</b>	50	
<b>Fluid</b>	Air	
<b>Minimum operating pressure</b>	CKQ□: 0.1 MPa	CLKQ□ (With lock): 0.15 MPa <sup>Note)</sup>
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)	
<b>Cushion</b>	None	
<b>Lubrication</b>	Non-lube	
<b>Piston speed (Clamp speed)</b>	50 to 150 mm/sec	
<b>Port size (Cylinder port)</b>	1/4 (Rc, NPT, G)	

Note) Minimum operating pressure when cylinder part and locking part use the same piping is 0.2 MPa.

## Proof Pressure/Maximum Operating Pressure

Guide pin diameter	Proof pressure	Max. operating pressure
ø12.5 to ø13.0	1.0 MPa	0.7 MPa
ø14.5 to ø30.0	1.5 MPa	1.0 MPa

## Clamp Specifications

Clamp stroke	Without shims	With shims
	10 mm	10 to 13 mm
<b>Clamp arm</b>	1 pc.	
<b>Guide pin shape</b>	Round type, Diamond type	

Note 1) Refer to table below "Clamp Specifications" and Selection regarding detailed specifications of the clamping force, etc.

Note 2) Diamond type guide pin diameter is ø17.5 or more.

## Lock Specifications

<b>Locking action</b>	Spring locking (Exhaust locking)
<b>Unlocking pressure</b>	0.2 MPa or more
<b>Lock starting pressure</b>	0.05 MPa or less
<b>Locking direction</b>	Lock at extended direction (Clamp holding)
<b>Unlocking port size</b>	1/8 (Rc, NPT, G)
<b>Holding force (N) (Maximum static load)</b>	982

## Weight

Unit: kg

Model	C(L)KQ <sup>G</sup> <sub>P</sub> D			
	Without lock		With lock	
	L	H	L	H
ø12.5 to 13.0	1.66	1.83	2.18	2.34
ø14.5 to 15.0	1.66	1.83	2.18	2.34
ø15.5 to 16.0	1.67	1.83	2.18	2.35
ø17.5 to 18.0	1.71	1.88	2.22	2.4
ø19.5 to 20.0	1.72	1.89	2.23	2.41
ø24.5 to 25.0	1.78	1.98	2.29	2.5
ø29.5 to 30.0	1.82	2.02	2.33	2.54

## Clamp Specifications

(N)

Model	Guide pin diameter	Operating pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	164.9	329.8	494.7	659.6	824.5	989.4	—	—	—
	ø14.5 to ø30.0	164.9	329.8	494.7	659.6	824.5	989.4	1154.3	1319.2	1484.1
CLKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	82.4	247.3	412.2	577.1	742.0	906.9	—	—	—
	ø14.5 to ø30.0	82.4	247.3	412.2	577.1	742.0	906.9	Note 1) 1071.8	Note 1) 1236.7	Note 1) 1401.6

Note 1) Lock holding force of the CLKQ□ is 982 N. Design the circuit such that the lock holding force is taken into consideration when the operating pressure exceeds 0.75 MPa.

The operating pressure should not be greater than the lock holding force as it may cause wearing out and/or damage of the locking part, shorten lock life, and lead to possible failure if applied with a load larger than the lock holding force.

Note 2) It takes approximately 0.3 seconds for the cylinder to operate and generate clamping force from an unclamping state (when no speed controller is installed). Design the circuit taking into consideration the time before the clamping force is generated.

Note 3) Determine the clamping force according to the workpiece strength. It can be damaged if the clamping force is too large.

## Maintenance Parts

### Replacement Parts: Seal Kit

Kit No.	Content
CQ2B50-PS	Piston seal Rod seal Tube gasket

Note) Consult SMC for maintenance service. Seal kit for the CLKQ<sup>G</sup><sub>P</sub> series maintenance is not available.

### Replacement Parts: Grease Pack

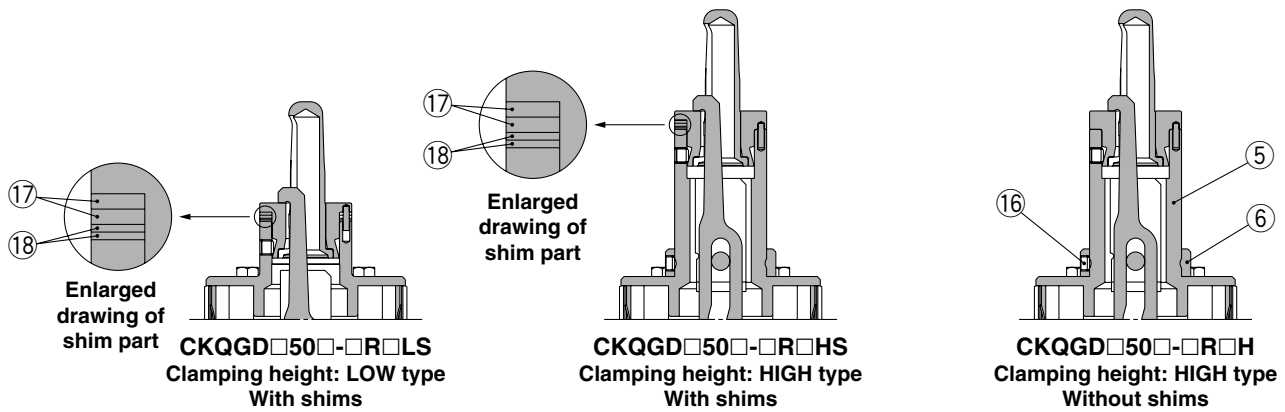
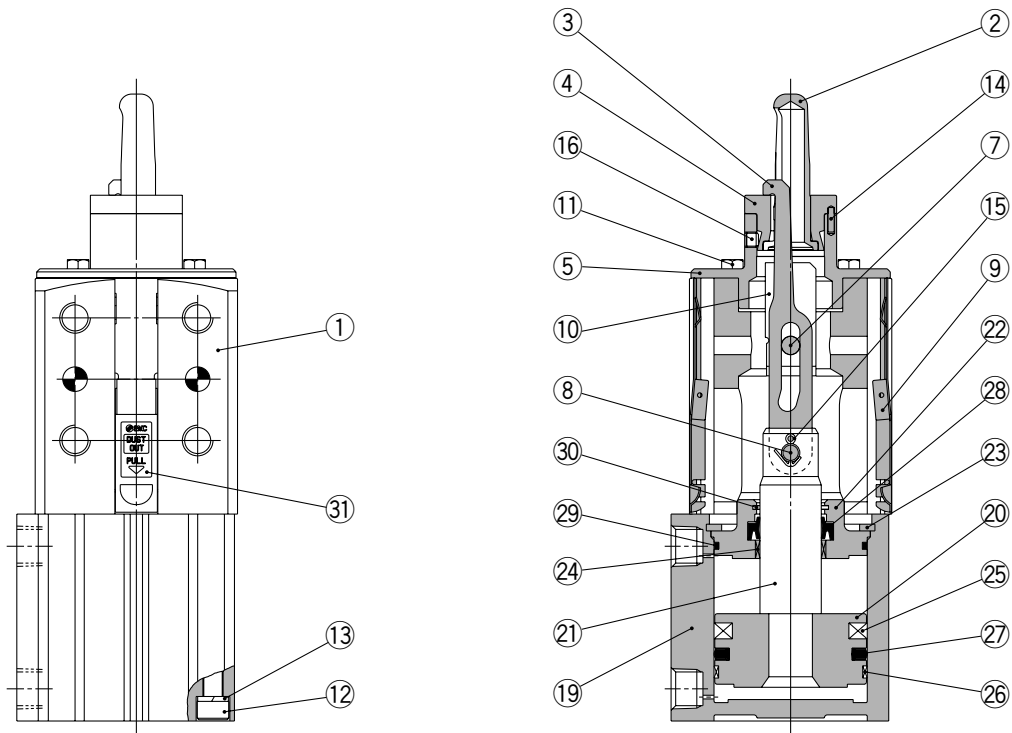
Kit No.	Content
GR-S-010	Grease 10 g

Note) Consult SMC when replacing the actuating cylinders.

## Construction

### CKQGDA50

Figures below correspond to CKQGDA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

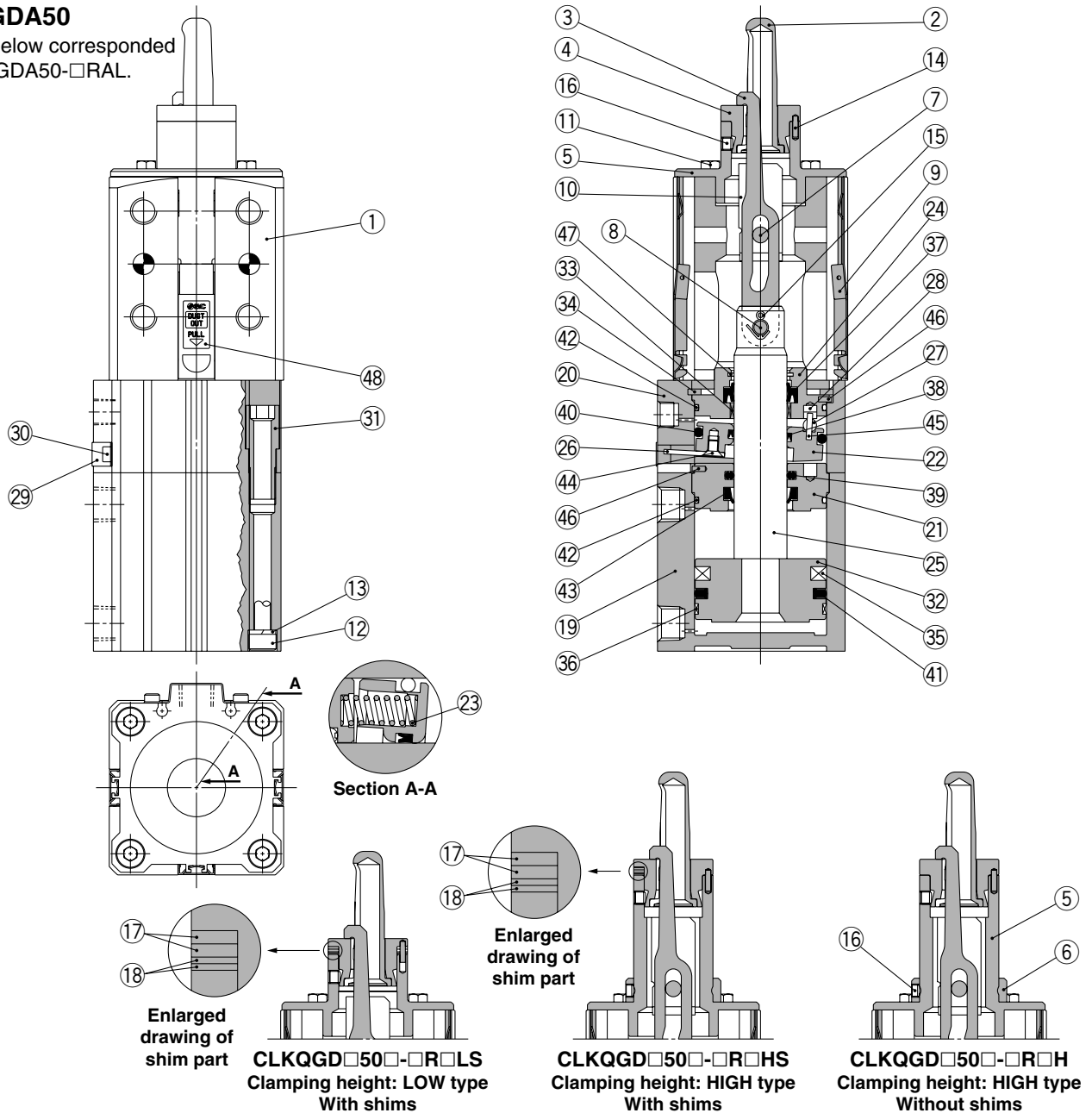
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Structural steel	
22	Collar	Aluminum alloy	
23	Retaining ring	Tool steel	
24	Bushing	Lead-bronze casted	
25	Magnet	Magnetic material	
26	Wear ring	Resin	
27	Piston seal	NBR	
28	Rod seal	NBR	
29	Tube gasket	NBR	
30	Coil scraper	Bronze	
31	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>D/CLKQ<sub>P</sub><sup>G</sup>D

## Construction

### CLKQGDA50

Figures below corresponded to CLKQGDA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Structural steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	

### Component Parts

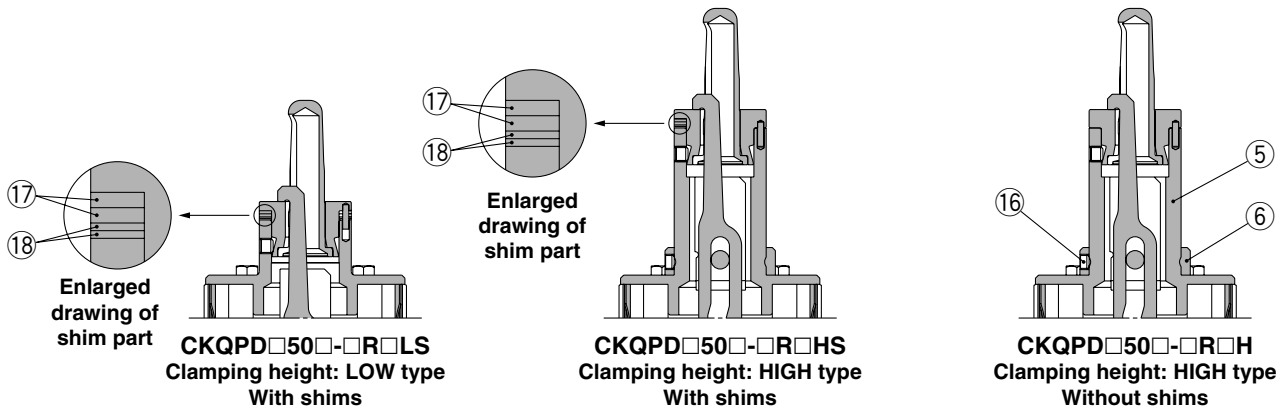
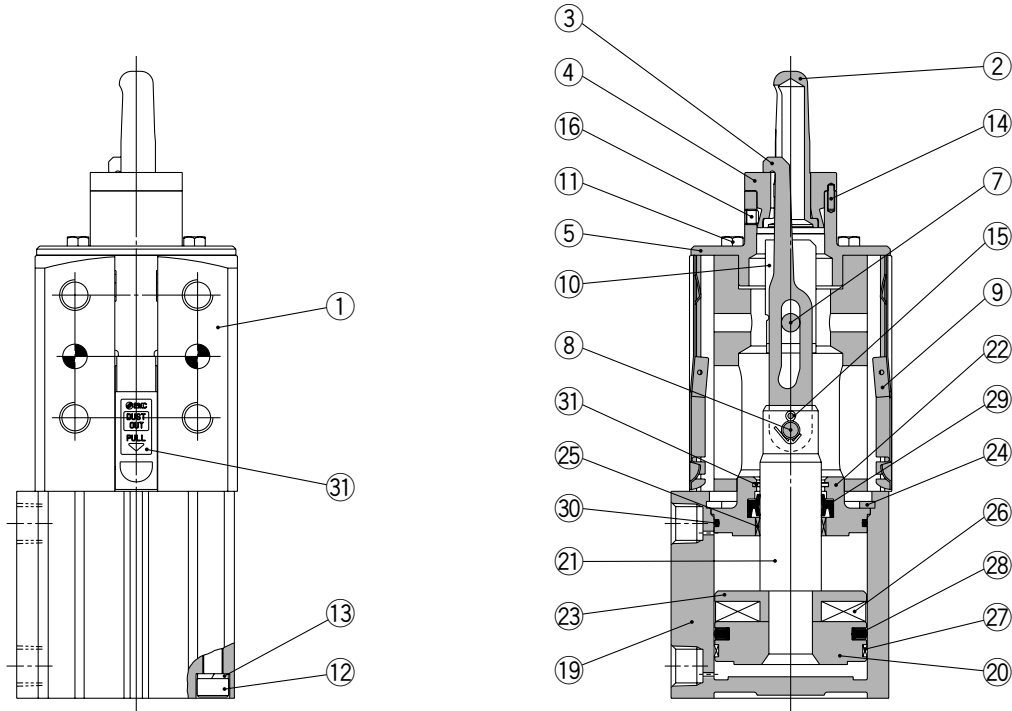
No.	Description	Material	Note
33	Bushing	Lead-bronze casted	
34	Retaining ring	Tool steel	
35	Magnet	Magnetic material	
36	Wear ring	Resin	
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Rod seal C	NBR	
40	Piston seal A	NBR	
41	Piston seal B	NBR	
42	Tube gasket	NBR	
43	Scraper	NBR	
44	Hex. socket counter-sunk head screw	Structural steel	
45	Spring pin	Tool steel	
46	Parallel pin	Stainless steel	
47	Coil scraper	Bronze	
48	Seal	PET	



## Construction

### CKQPDA50

Figures below correspond to CKQPDA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

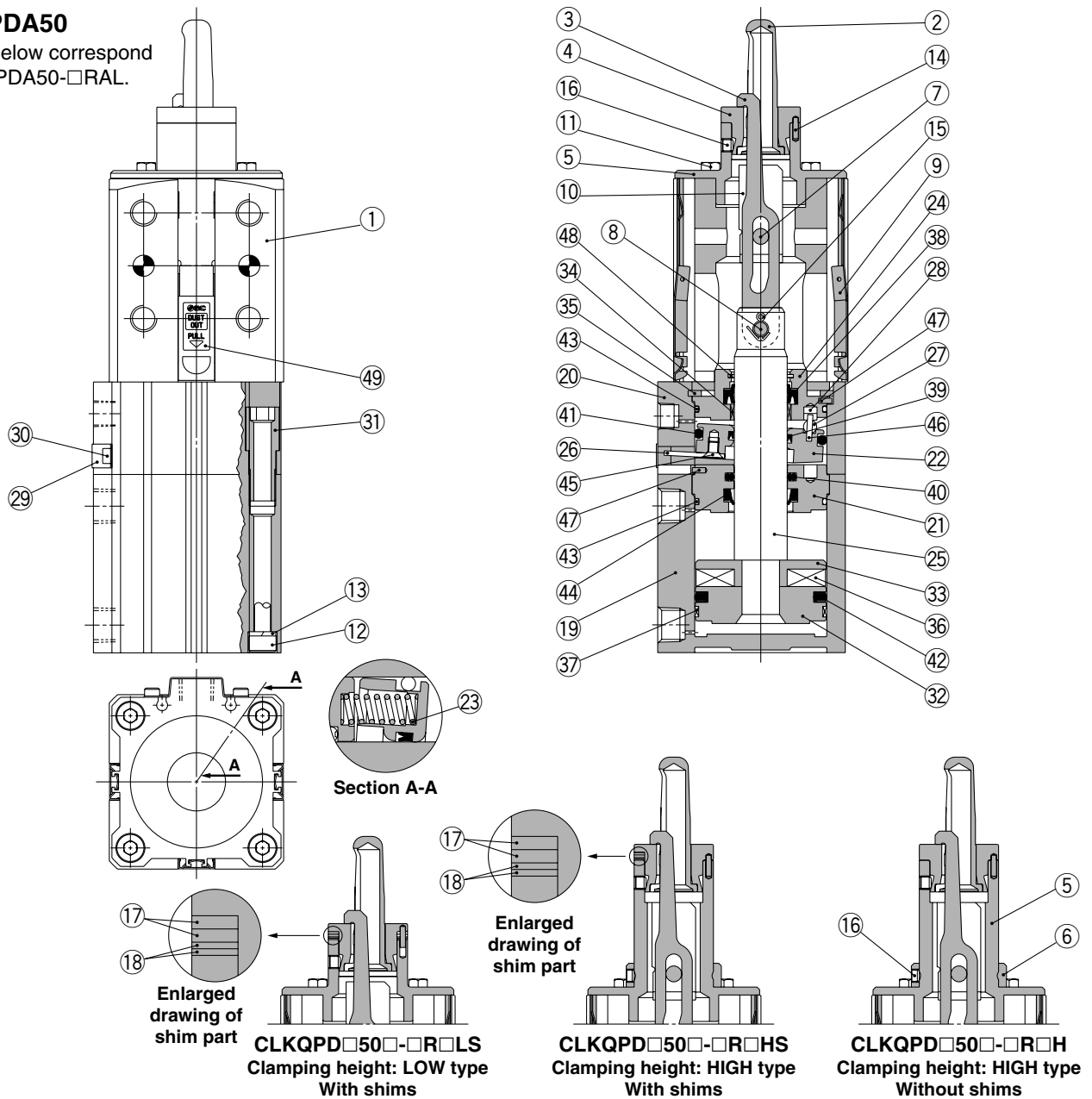
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Stainless steel	
22	Collar	Aluminum alloy	
23	Magnet holder	Aluminum alloy	
24	Retaining ring	Tool steel	
25	Bushing	Lead-bronze casted	
26	Magnet	Magnetic material	
27	Wear ring	Resin	
28	Piston seal	NBR	
29	Rod seal	NBR	
30	Tube gasket	NBR	
31	Coil scraper	Bronze	
32	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>D/CLKQ<sub>P</sub><sup>G</sup>D

## Construction

### CLKQPDA50

Figures below correspond to CLKQPDA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	
17	Shim A	Stainless steel	t = 1 mm

### Component Parts

No.	Description	Material	Note
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Stainless steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	
33	Magnet holder	Aluminum alloy	
34	Bushing	Lead-bronze casted	

### Component Parts

No.	Description	Material	Note
35	Retaining ring	Tool steel	
36	Magnet	Magnetic material	
37	Wear ring	Resin	
38	Rod seal A	NBR	
39	Rod seal B	NBR	
40	Rod seal C	NBR	
41	Piston seal A	NBR	
42	Piston seal B	NBR	
43	Tube gasket	NBR	
44	Scraper	NBR	
45	Hex. socket counter-sunk head screw	Structural steel	
46	Spring pin	Tool steel	
47	Parallel pin	Stainless steel	
48	Coil scraper	Bronze	
49	Seal	PET	

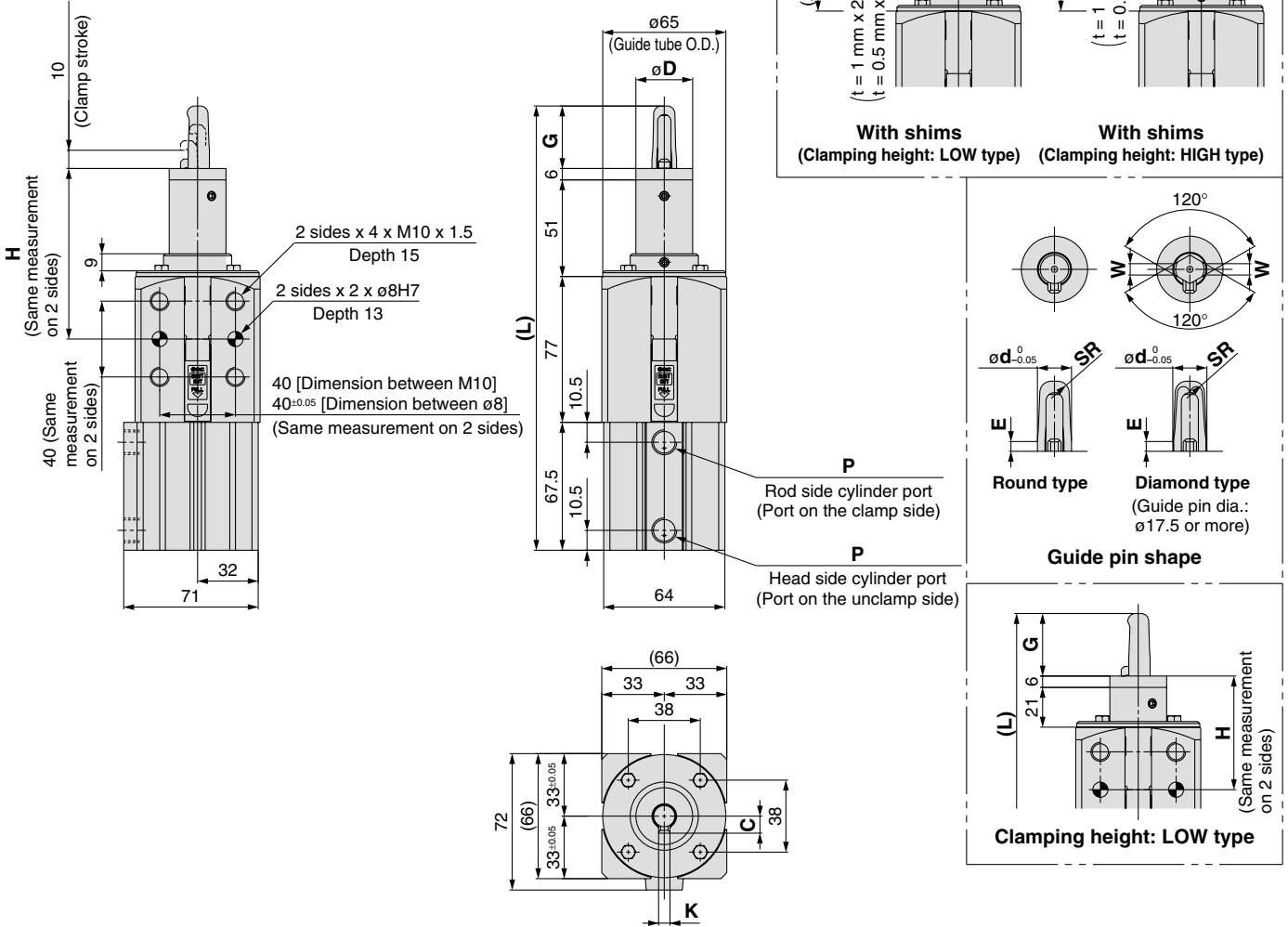
## Dimensions

### CKQ<sub>P</sub><sup>G</sup>DA50

**CKQ<sub>P</sub><sup>G</sup>DB50** (The angle of the cylinder port location against the mounting side is 90°.)

Note 1) Refer to "How to Order" on page 2 for mounting side and a port position relationship.

Note 2) Figures below correspond to CKQ<sub>P</sub><sup>G</sup>DA50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	204.5	234.5	4	—	ø36
			ø12.7	≈9		60±0.05	90±0.05						
			ø12.8	≈8		With shims 60	With shims 90						
			ø12.9	≈8									
			ø13.0	≈7									
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	205.5	235.5	5	—	ø36
			ø14.7	≈8		60±0.05	90±0.05						
			ø14.8	≈8		With shims 60	With shims 90						
			ø14.9	≈7									
			ø15.0	≈7									
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	205.5	235.5	5.5	—	ø36
			ø15.7	≈9		60±0.05	90±0.05						
			ø15.8	≈8		With shims 60	With shims 90						
			ø15.9	≈8									
			ø16.0	≈7									

P		
Nil	TN	TF
Rc1/4	NPT1/4	G1/4

Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	208.5	238.5	6	6	ø40
			ø17.7	≈9		60±0.05	90±0.05						
			ø17.8	≈8		With shims 60	With shims 90						
			ø17.9	≈8									
			ø18.0	≈7									
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	210.5	240.5	7	7	ø40
			ø19.7	≈9		60±0.05	90±0.05						
			ø19.8	≈8		With shims 60	With shims 90						
			ø19.9	≈8									
			ø20.0	≈7									
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	210.5	240.5	9.5	7	ø47
			ø24.7	≈9		60±0.05	90±0.05						
			ø24.8	≈8		With shims 60	With shims 90						
			ø24.9	≈8									
			ø25.0	≈7									
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	210.5	240.5	11	9	ø47
			ø29.7	≈9		60±0.05	90±0.05						
			ø29.8	≈8		With shims 60	With shims 90						
			ø29.9	≈8									
			ø30.0	≈7									

# Series CKQ<sub>P</sub><sup>G</sup>D/CLKQ<sub>P</sub><sup>G</sup>D

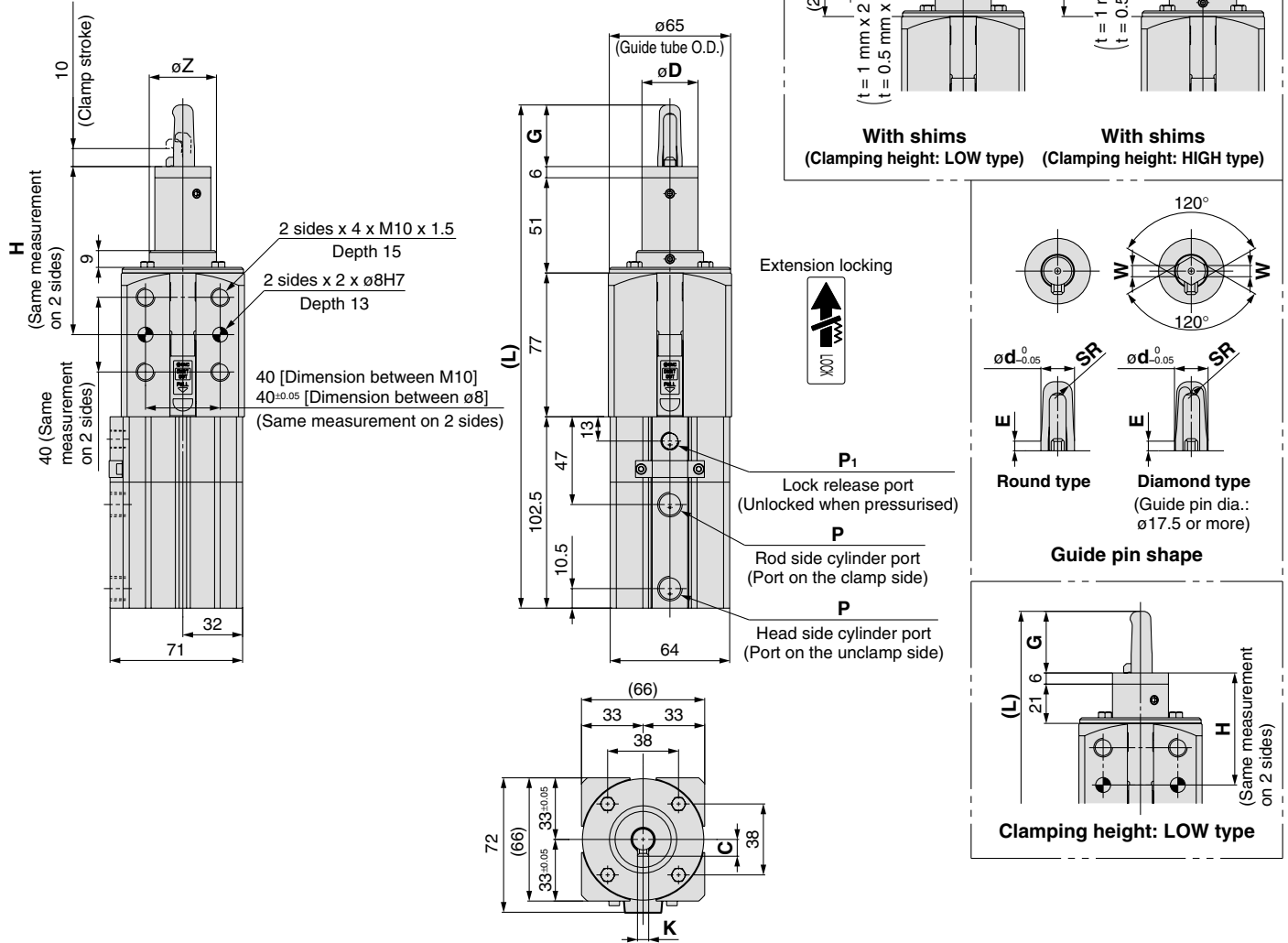
## Dimensions

### CLKQ<sub>P</sub><sup>G</sup>DA50

CLKQ<sub>P</sub><sup>G</sup>DB50 (The angle of the cylinder port location against the mounting surface is 90°.)

Note 1) Refer to "How to Order" on page 2 for the mounting surface and a port position relationship.

Note 2) Figures below correspond to CLKQ<sub>P</sub><sup>G</sup>DA50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	239.5	269.5	4	—	ø36
			ø12.7	≈9		60±0.05	90±0.05						
			ø12.8	≈8		With shims	With shims						
			ø13.0	≈7		60	90						
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	240.5	270.5	5	—	ø36
			ø14.7	≈8		60±0.05	90±0.05						
			ø14.8	≈8		With shims	With shims						
			ø14.9	≈7		60	90						
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	240.5	270.5	5.5	—	ø36
			ø15.7	≈9		60±0.05	90±0.05						
			ø15.8	≈8		With shims	With shims						
			ø15.9	≈8		60	90						

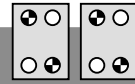
Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	243.5	273.5	6	6	ø40
			ø17.7	≈9		60±0.05	90±0.05						
			ø17.8	≈8		With shims	With shims						
			ø17.9	≈8		60	90						
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	245.5	275.5	7	7	ø40
			ø19.7	≈9		60±0.05	90±0.05						
			ø19.8	≈8		With shims	With shims						
			ø19.9	≈8		60	90						
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	245.5	275.5	9.5	7	ø47
			ø24.7	≈9		60±0.05	90±0.05						
			ø24.8	≈8		With shims	With shims						
			ø24.9	≈8		60	90						
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	245.5	275.5	11	9	ø47
			ø29.7	≈9		60±0.05	90±0.05						
			ø29.8	≈8		With shims	With shims						
			ø29.9	≈8		60	90						

P			P <sub>1</sub>		
Nil	TN	TF	Nil	TN	TF
Rc1/4	NPT1/4	G1/4	Rc1/8	NPT1/8	G1/8



# Pin Clamp Cylinder

U series



# Series CKQ<sup>G</sup><sub>P</sub>U/CLKQ<sup>G</sup><sub>P</sub>U

## How to Order

**Built-in standard magnet**  
With magnetic field resistant auto switch

C **KQGU** A 50 - 177 R A L - P4DWSC

**Built-in strong magnet**  
With magnetic field resistant auto switch

C **KQP** U A 50 - 198 R A L - P79WSE

**Lock on the clamp side**

—	Without lock
L	With lock

**Mounting surface (viewed from top)**

Symbol	Port location
A	
B	

**Bore size**

50	50 mm
----	-------

**Port thread type**

—	Rc
TN	NPT
TF	G

**Guide pin diameter**

Note) For guide pin diameter, refer to Table 1 below.

**Body shape**

Symbol	Dimension	Mounting hole (tap, pin hole) arrangement	Mounting	Mounting surface (viewed from top)
U	□66		Mounting tap: 2 x M10 x 1.5 Pin hole: 2 x ø8H7	

**Guide pin shape**

R	Round type
D	Diamond type <small>Note)</small>

Note) Diamond type guide pin diameter is ø17.5 or more.

**Number of auto switches**

—	2 pcs.
S	1 pc. (Unclamp side)

Note) The D-P4/P7 type is different-surface mounting. (Refer to page 42.)

**Auto switch type**

—	Without auto switch (Built-in magnet)
---	---------------------------------------

Note 1) For applicable auto switch models, refer to page 13.

Note 2) Auto switches are included, (but not assembled).

**Shim**

—	Without shims
S	With 3 mm shims <small>Note)</small>

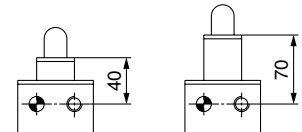
Note) When a model includes shims, two 1 mm shims and two 0.5 mm shims are attached.

**Clamping height (Refer to the below figure.)**

L	LOW type (40 mm)
H	HIGH type (70 mm)

LOW type

HIGH type



**Clamping height**

**Clamp arm position (clockwise viewed from top)**

A	Same direction as port 	C	180° from port 
B	90° from port 	D	270° from port 

**Table 1. Guide Pin Diameter**

Symbol	125	127	128	129	130	145	147	148	149	150	155	157	158	159	160	
Guide pin diameter	12.5	12.7	12.8	12.9	13.0	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9	16.0	
Applicable hole diameter of workpiece	For ø13					For ø15					For ø16					
Guide pin shape	Round type															

Symbol	175	177	178	179	180	195	197	198	199	200	245	247	248	249	250	295	297	298	299	300
Guide pin diameter	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9	30.0
Applicable hole diameter of workpiece	For ø18					For ø20					For ø25					For ø30				
Guide pin shape	Round type, Diamond type																			



Round type Diamond type

# Pin Clamp Cylinder *Series CKQ<sup>G</sup>U/CLKQ<sup>G</sup>U*

**Table 2. Applicable Auto Switches /** For detailed auto switch specifications, refer to page 43 through to 47.

Applicable cylinder series	Type	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no in use)	Load voltage	Lead wire length	Applicable load
<b>C(L)KQG series</b>	<b>Solid state switch</b>	<b>D-P4DWSC</b>	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-colour display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P4DWSE</b>				2-wire (1-4)			
		<b>D-P4DWL</b>		Grommet		2-wire		3 m	
		<b>D-P4DWZ</b>						5 m	
<b>C(L)KQP series</b>	<b>Reed switch</b>	<b>D-P79WSE</b>	DC/AC magnetic field	Pre-wired connector	2-colour display	2-wire (1-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P74L</b>		Grommet (Pre-wired connector) <small>Note 2)</small>	1-colour display	2-wire	24 VDC 100 VAC	3 m	
		<b>D-P74Z</b>						5 m	

Note 1) PLC: Programmable Logic Controller

Note 2) Refer to page 47 for pre-wired connector products.

# Series CKQ<sup>G</sup><sub>P</sub>U/CLKQ<sup>G</sup><sub>P</sub>U



## Basic Specifications

<b>Action</b>	Double acting	
<b>Bore size (mm)</b>	50	
<b>Fluid</b>	Air	
<b>Minimum operating pressure</b>	CKQ□: 0.1 MPa	CLKQ□ (With lock): 0.15 MPa <sup>Note)</sup>
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)	
<b>Cushion</b>	None	
<b>Lubrication</b>	Non-lube	
<b>Piston speed (Clamp speed)</b>	50 to 150 mm/sec	
<b>Port size (Cylinder port)</b>	1/4 (Rc, NPT, G)	

Note) Minimum operating pressure when cylinder part and locking part use the same piping is 0.2 MPa.

## Proof Pressure/Maximum Operating Pressure

Guide pin diameter	Proof pressure	Max. operating pressure
ø12.5 to ø13.0	1.0 MPa	0.7 MPa
ø14.5 to ø30.0	1.5 MPa	1.0 MPa

## Clamp Specifications

Clamp stroke	Without shims	With shims
	10 mm	10 to 13 mm
<b>Clamp arm</b>	1 pc.	
<b>Guide pin shape</b>	Round type, Diamond type	

Note 1) Refer to table below "Clamp Specifications" and Selection regarding detailed specifications of the clamping force, etc.

Note 2) Diamond type guide pin diameter is ø17.5 or more.

## Lock Specifications

<b>Locking action</b>	Spring locking (Exhaust locking)
<b>Unlocking pressure</b>	0.2 MPa or more
<b>Lock starting pressure</b>	0.05 MPa or less
<b>Locking direction</b>	Lock at extended direction (Clamp holding)
<b>Unlocking port size</b>	1/8 (Rc, NPT, G)
<b>Holding force (N) (Maximum static load)</b>	982

## Weight

Unit: kg

Model	C(L)KQ <sup>G</sup> <sub>P</sub> U			
	Without lock		With lock	
	L	H	L	H
ø12.5 to 13.0	1.67	1.84	2.19	2.36
ø14.5 to 15.0	1.67	1.84	2.19	2.36
ø15.5 to 16.0	1.68	1.85	2.19	2.36
ø17.5 to 18.0	1.72	1.9	2.24	2.41
ø19.5 to 20.0	1.73	1.91	2.24	2.42
ø24.5 to 25.0	1.79	2	2.3	2.51
ø29.5 to 30.0	1.83	2.04	2.35	2.55

## Clamp Specifications

Model	Guide pin diameter	Operating pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
		CKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	164.9	329.8	494.7	659.6	824.5	989.4	—
ø14.5 to ø30.0	164.9		329.8	494.7	659.6	824.5	989.4	1154.3	1319.2	1484.1
CLKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	82.4	247.3	412.2	577.1	742.0	906.9	—	—	—
	ø14.5 to ø30.0	82.4	247.3	412.2	577.1	742.0	906.9	Note 1) 1071.8	Note 1) 1236.7	Note 1) 1401.6

Note 1) Lock holding force of the CLKQ□ is 982 N. Design the circuit such that the lock holding force is taken into consideration when the operating pressure exceeds 0.75 MPa.

The operating pressure should not be greater than the lock holding force as it may cause wearing out and/or damage of the locking part, shorten lock life, and lead to possible failure if applied with a load larger than the lock holding force.

Note 2) It takes approximately 0.3 seconds for the cylinder to operate and generate clamping force from an unclamping state (when no speed controller is installed). Design the circuit taking into consideration the time before the clamping force is generated.

Note 3) Determine the clamping force according to the workpiece strength. It can be damaged if the clamping force is too large.

## Maintenance Parts

### Replacement Parts: Seal Kit

Kit No.	Content
CQ2B50-PS	Piston seal Rod seal Tube gasket

Note) Consult SMC for maintenance service. Seal kit for the CLKQ<sup>G</sup><sub>P</sub> series maintenance is not available.

### Replacement Parts: Grease Pack

Kit No.	Content
GR-S-010	Grease 10 g

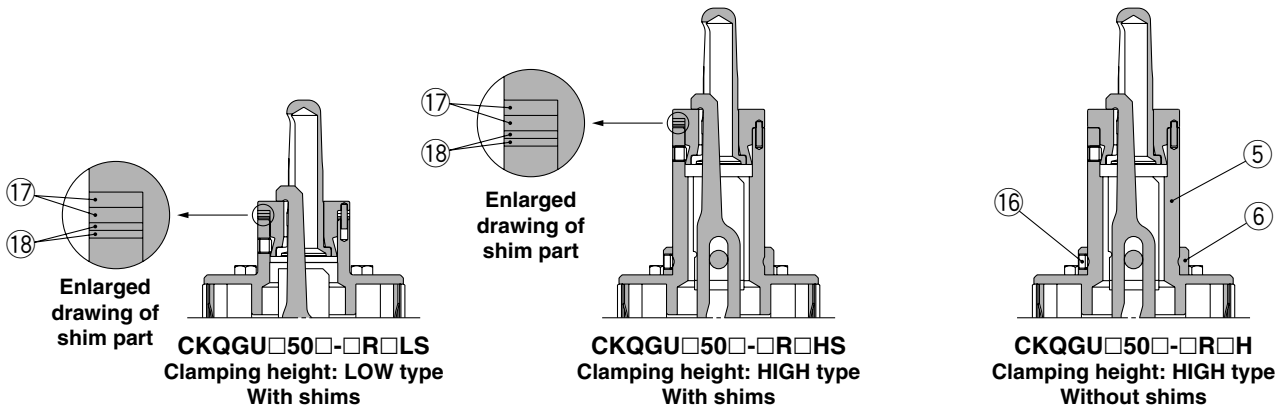
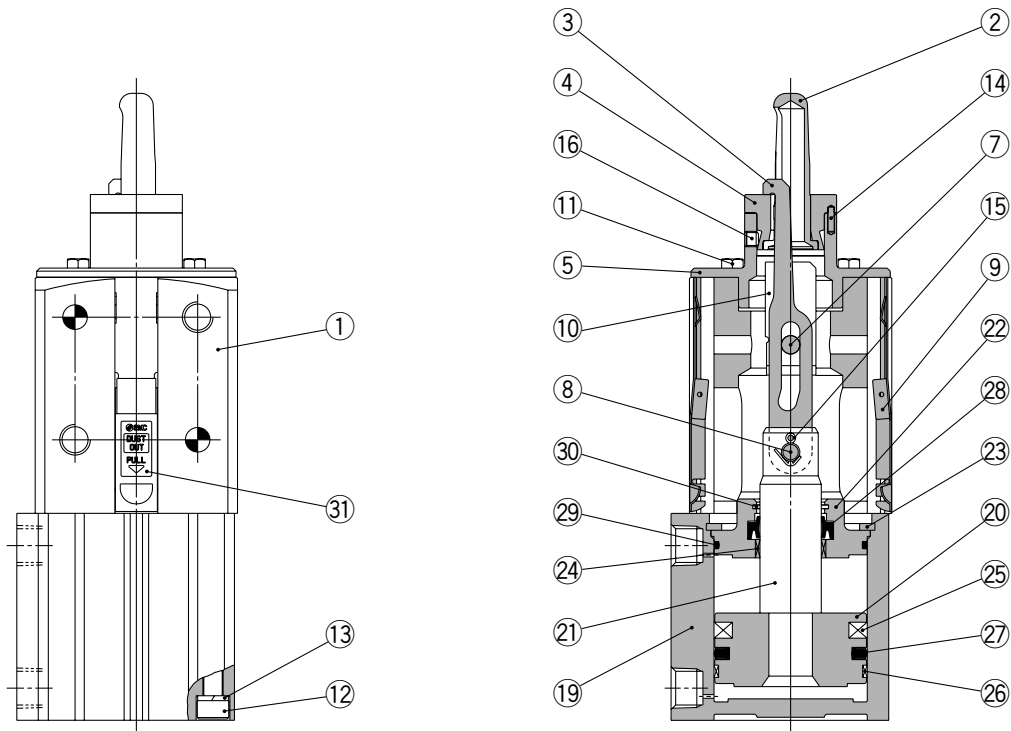
Note) Consult SMC when replacing the actuating cylinders.



## Construction

### CKQGUA50

Figures below correspond to CKQGUA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

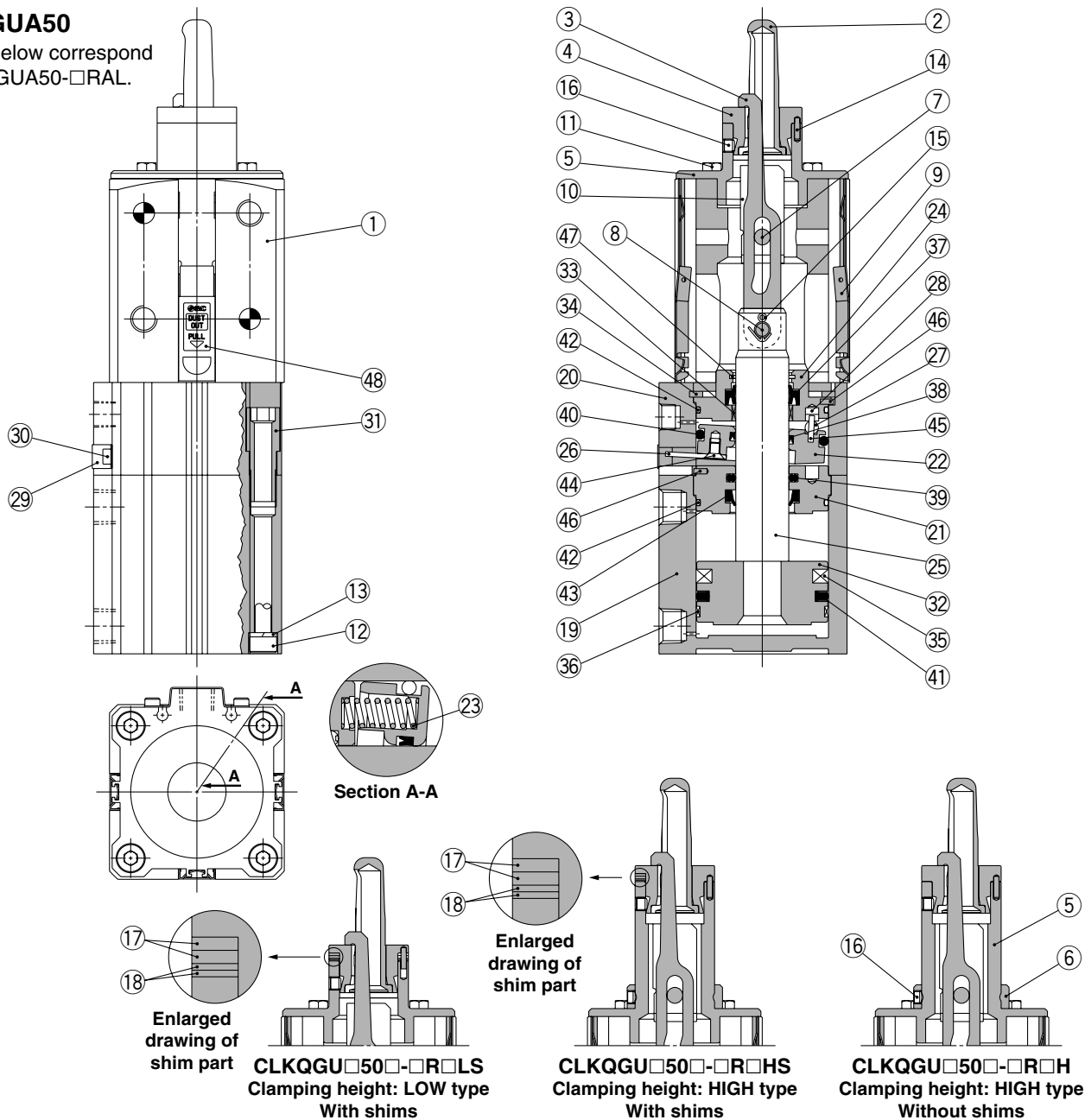
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Structural steel	
22	Collar	Aluminum alloy	
23	Retaining ring	Tool steel	
24	Bushing	Lead-bronze casted	
25	Magnet	Magnetic material	
26	Wear ring	Resin	
27	Piston seal	NBR	
28	Rod seal	NBR	
29	Tube gasket	NBR	
30	Coil scraper	Bronze	
31	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>U/CLKQ<sub>P</sub><sup>G</sup>U

## Construction

### CLKQGUA50

Figures below correspond to CLKQGUA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Structural steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	

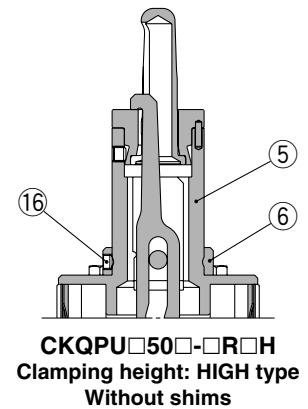
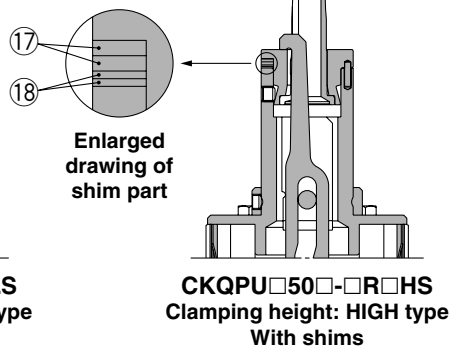
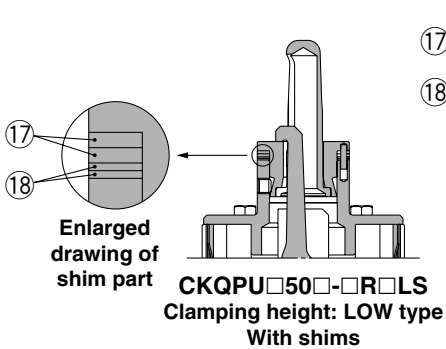
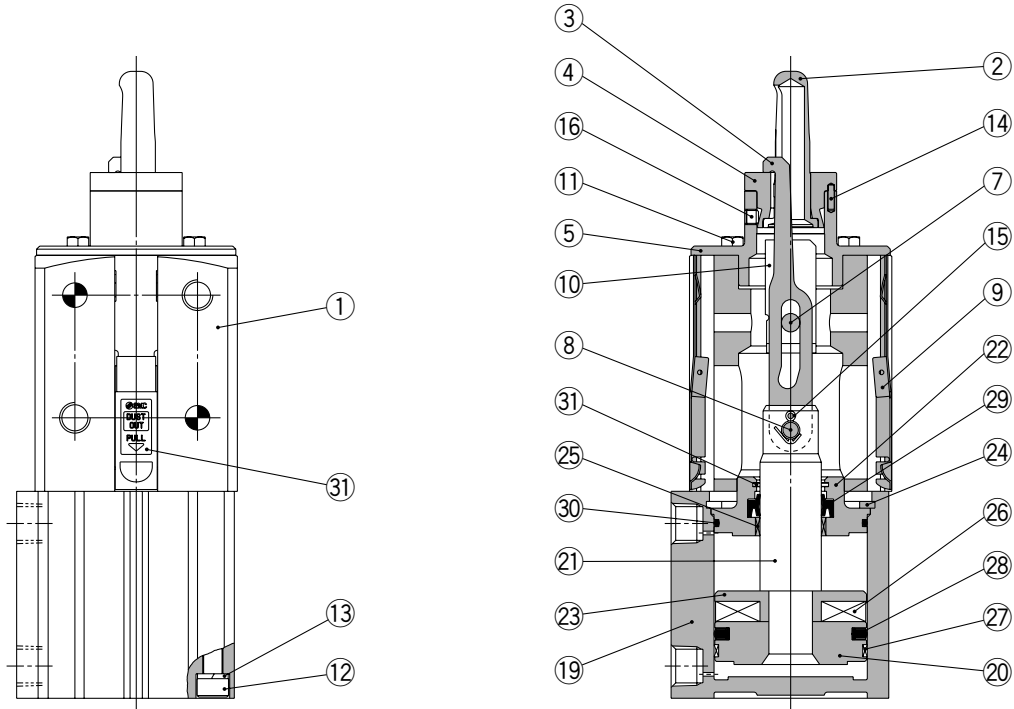
### Component Parts

No.	Description	Material	Note
33	Bushing	Lead-bronze casted	
34	Retaining ring	Tool steel	
35	Magnet	Magnetic material	
36	Wear ring	Resin	
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Rod seal C	NBR	
40	Piston seal A	NBR	
41	Piston seal B	NBR	
42	Tube gasket	NBR	
43	Scraper	NBR	
44	Hex. socket counter-sunk head screw	Structural steel	
45	Spring pin	Tool steel	
46	Parallel pin	Stainless steel	
47	Coil scraper	Bronze	
48	Seal	PET	

## Construction

### CKQPUA50

Figures below correspond to CKQPUA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

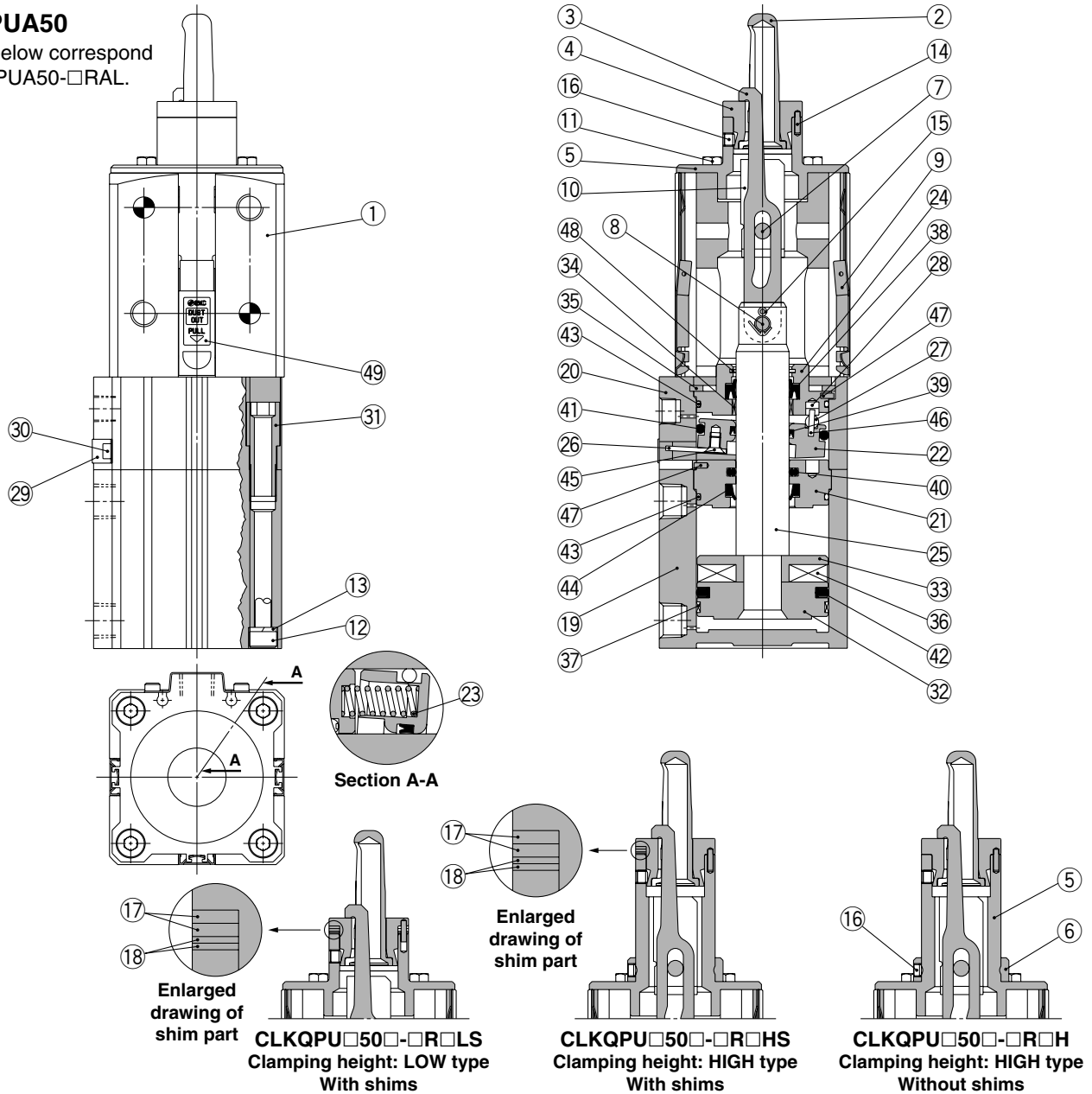
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Stainless steel	
22	Collar	Aluminum alloy	
23	Magnet holder	Aluminum alloy	
24	Retaining ring	Tool steel	
25	Bushing	Lead-bronze casted	
26	Magnet	Magnetic material	
27	Wear ring	Resin	
28	Piston seal	NBR	
29	Rod seal	NBR	
30	Tube gasket	NBR	
31	Coil scraper	Bronze	
32	Seal	PET	

# Series CKQ<sub>P</sub>U/CLKQ<sub>P</sub>U

## Construction

### CLKQPUA50

Figures below correspond to CLKQPUA50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	
17	Shim A	Stainless steel	t = 1 mm

### Component Parts

No.	Description	Material	Note
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Stainless steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	
33	Magnet holder	Aluminum alloy	
34	Bushing	Lead-bronze casted	

### Component Parts

No.	Description	Material	Note
35	Retaining ring	Tool steel	
36	Magnet	Magnetic material	
37	Wear ring	Resin	
38	Rod seal A	NBR	
39	Rod seal B	NBR	
40	Rod seal C	NBR	
41	Piston seal A	NBR	
42	Piston seal B	NBR	
43	Tube gasket	NBR	
44	Scraper	NBR	
45	Hex. socket counter-sunk head screw	Structural steel	
46	Spring pin	Tool steel	
47	Parallel pin	Stainless steel	
48	Coil scraper	Bronze	
49	Seal	PET	

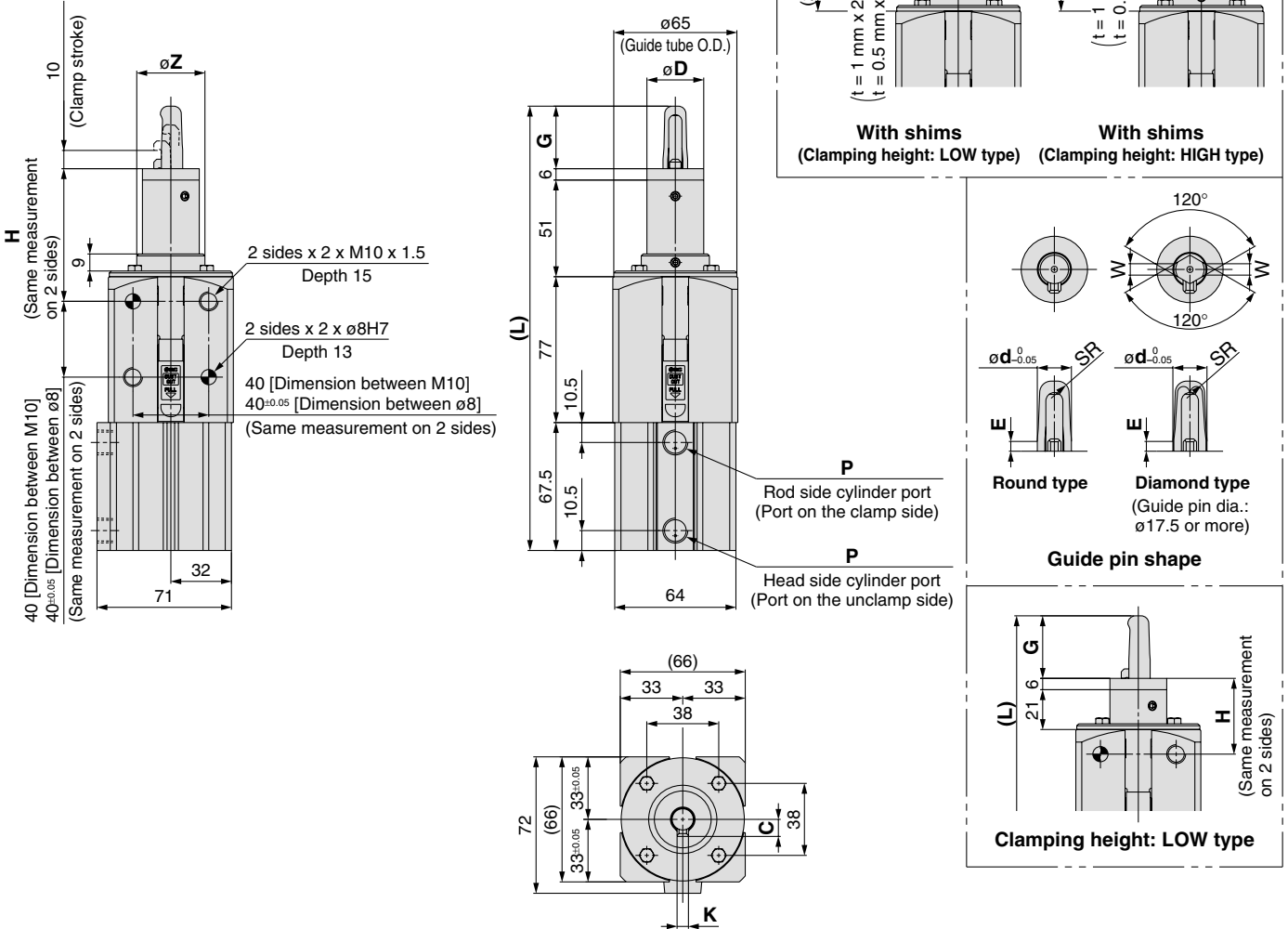
## Dimensions

### CKQ<sub>P</sub><sup>G</sup>UA50

**CKQ<sub>P</sub><sup>G</sup>UB50** (The angle of the cylinder port location against the mounting surface is 90°.)

Note 1) Refer to "How to Order" on page 12 for the mounting surface and a port position relationship.

Note 2) Figures below correspond to CKQ<sub>P</sub><sup>G</sup>UA50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	204.5	234.5	4	—	ø36
			ø12.7	≈9		40±0.05	70±0.05						
			ø12.8	≈8		With shims	With shims						
			ø12.9	≈8		40	70						
			ø13.0	≈7		40	70						
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	205.5	235.5	5	—	ø36
			ø14.7	≈8		40±0.05	70±0.05						
			ø14.8	≈8		With shims	With shims						
			ø14.9	≈7		40	70						
			ø15.0	≈7		40	70						
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	205.5	235.5	5.5	—	ø36
			ø15.7	≈9		40±0.05	70±0.05						
			ø15.8	≈8		With shims	With shims						
			ø15.9	≈8		40	70						
			ø16.0	≈7		40	70						

P		
Nil	TN	TF
Rc1/4	NPT1/4	G1/4

Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	208.5	238.5	6	6	ø40
			ø17.7	≈9		40±0.05	70±0.05						
			ø17.8	≈8		With shims	With shims						
			ø17.9	≈8		40	70						
			ø18.0	≈7		40	70						
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	210.5	240.5	7	7	ø40
			ø19.7	≈9		40±0.05	70±0.05						
			ø19.8	≈8		With shims	With shims						
			ø19.9	≈8		40	70						
			ø20.0	≈7		40	70						
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	210.5	240.5	9.5	7	ø47
			ø24.7	≈9		40±0.05	70±0.05						
			ø24.8	≈8		With shims	With shims						
			ø24.9	≈8		40	70						
			ø25.0	≈7		40	70						
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	210.5	240.5	11	9	ø47
			ø29.7	≈9		40±0.05	70±0.05						
			ø29.8	≈8		With shims	With shims						
			ø29.9	≈8		40	70						
			ø30.0	≈7		40	70						

# Series CKQ<sub>P</sub>U/CLKQ<sub>P</sub>U

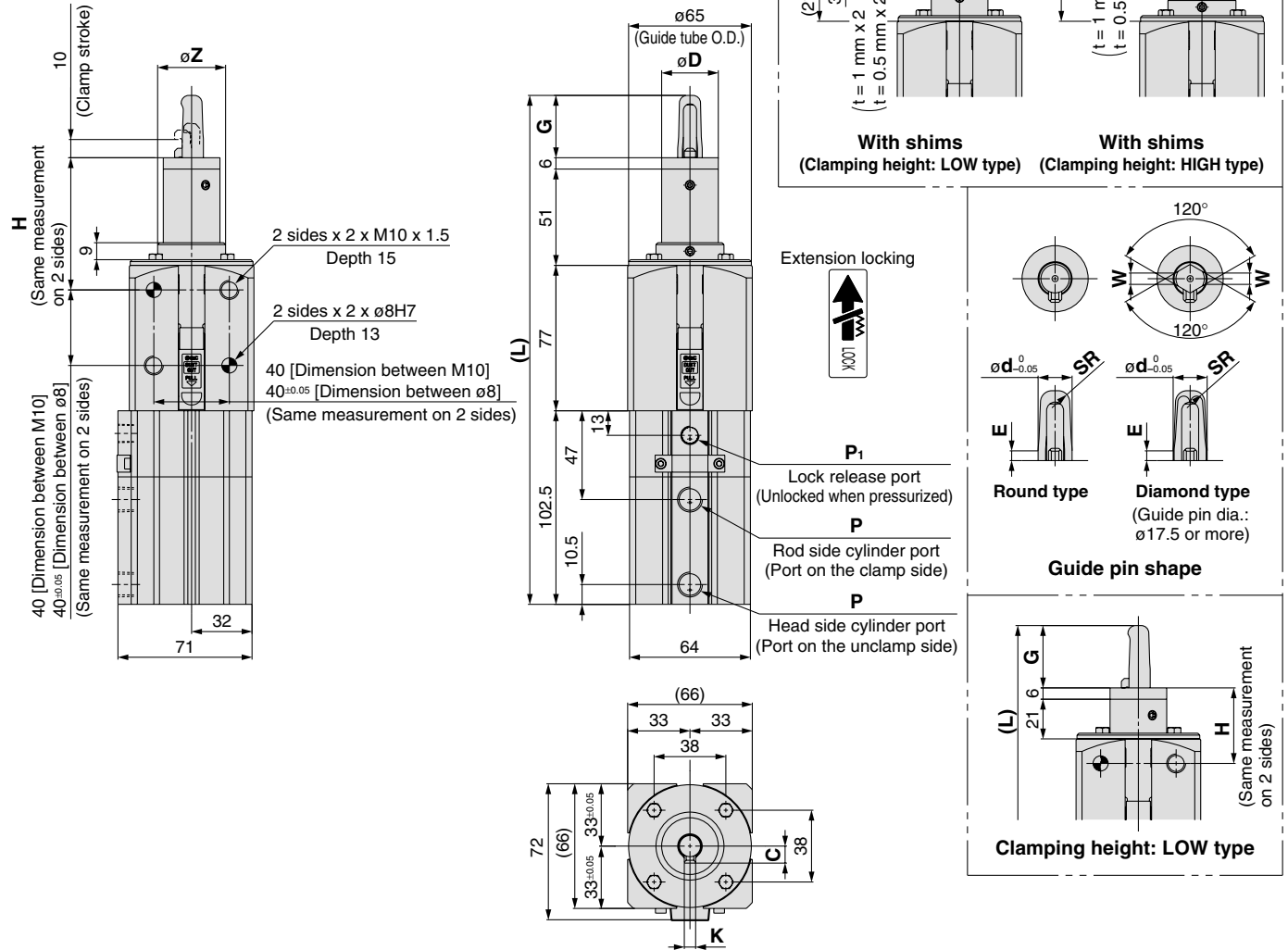
## Dimensions

### CLKQ<sub>P</sub>UA50

CLKQ<sub>P</sub>UB50 (The angle of the cylinder port location against the mounting surface is 90°.)

Note 1) Refer to "How to Order" on page 12 for the mounting surface and a port position relationship.

Note 2) Figures below correspond to CLKQ<sub>P</sub>UA50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	239.5	269.5	4	—	ø36
			ø12.7	≈9		40±0.05	70±0.05						
			ø12.8	≈8		With shims	With shims						
			ø12.9	≈8		40	70						
			ø13.0	≈7		40	70						
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	240.5	270.5	5	—	ø36
			ø14.7	≈8		40±0.05	70±0.05						
			ø14.8	≈8		With shims	With shims						
			ø14.9	≈7		40	70						
			ø15.0	≈7		40	70						
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	240.5	270.5	5.5	—	ø36
			ø15.7	≈9		40±0.05	70±0.05						
			ø15.8	≈8		With shims	With shims						
			ø15.9	≈8		40	70						
			ø16.0	≈7		40	70						

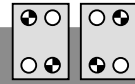
Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	243.5	273.5	6	6	ø40
			ø17.7	≈9		40±0.05	70±0.05						
			ø17.8	≈8		With shims	With shims						
			ø17.9	≈8		40	70						
			ø18.0	≈7		40	70						
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	245.5	275.5	7	7	ø40
			ø19.7	≈9		40±0.05	70±0.05						
			ø19.8	≈8		With shims	With shims						
			ø19.9	≈8		40	70						
			ø20.0	≈7		40	70						
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	245.5	275.5	9.5	7	ø47
			ø24.7	≈9		40±0.05	70±0.05						
			ø24.8	≈8		With shims	With shims						
			ø24.9	≈8		40	70						
			ø25.0	≈7		40	70						
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	245.5	275.5	11	9	ø47
			ø29.7	≈9		40±0.05	70±0.05						
			ø29.8	≈8		With shims	With shims						
			ø29.9	≈8		40	70						
			ø30.0	≈7		40	70						

P			P <sub>1</sub>		
Nil	TN	TF	Nil	TN	TF
Rc1/4	NPT1/4	G1/4	Rc1/8	NPT1/8	G1/8



# Pin Clamp Cylinder

K series



# Series CKQ<sup>G</sup><sub>P</sub>K/CLKQ<sup>G</sup><sub>P</sub>K

## How to Order

Built-in standard magnet  
With magnetic field resistant auto switch

C KQGK C 50 - 177 R A L - P4DWSC

Built-in strong magnet  
With magnetic field resistant auto switch

C KQP K C 50 - 198 R A L - P79WSE

### Lock on the clamp side

—	Without lock
L	With lock

### Number of auto switches

—	2 pcs.
S	1 pc. (Unclamp side)

Note) The D-P4/P7 type is different-surface mounting. (Refer to page 42.)

### Auto switch type

—	Without auto switch (Built-in magnet)
---	---------------------------------------

Note 1) For applicable auto switch models, refer to page 23.  
Note 2) Auto switches are included, (but not assembled).

### Shim

—	Without shims
S	With 3 mm shims <sup>Note)</sup>

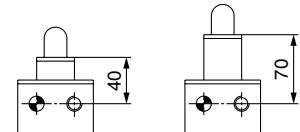
Note) When a model includes shims, two 1 mm shims and two 0.5 mm shims are attached.

### Clamping height (Refer to the below figure.)

L	LOW type (40 mm)
H	HIGH type (70 mm)

LOW type

HIGH type



### Clamping height

### Clamp arm position (clockwise viewed from top)

A	Same direction as port Port Clamp arm Guide pin	C	180° from port Port Clamp arm Guide pin
B	90° from port Port Clamp arm Guide pin	D	270° from port Port Clamp arm Guide pin

### Mounting surface (viewed from top)

Symbol	Port location	Symbol	Port location
C	Mounting surface with the taps diagonal (top right and bottom left) Port	E	Mounting surface with the taps diagonal (top left and bottom right) Port
	Mounting surface with the taps diagonal (top left and bottom right)		Mounting surface with the taps diagonal (top right and bottom left)
D	Mounting surface with the taps diagonal (top right and bottom left) Port	F	Mounting surface with the taps diagonal (top left and bottom right) Port
	Mounting surface with the taps diagonal (top left and bottom right)		Mounting surface with the taps diagonal (top right and bottom left)

Bore size  
50 50 mm

### Port thread type

—	Rc
TN	NPT
TF	G

### Guide pin diameter

Note) For guide pin diameter, refer to Table 1 below.

### Guide pin shape

R	Round type
D	Diamond type <sup>Note)</sup>

Note) Diamond type guide pin diameter is  $\phi 17.5$  or more.

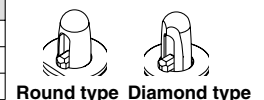
### Body shape

Symbol	Dimension	Mounting hole (tap, pin hole) arrangement	Mounting	Mounting surface (viewed from top)
K	□66	: Mounting tap : Pin hole	Mounting tap: 2 x M10 x 1.5 Pin hole: 2 x $\phi 10H7$	 Mounting surface (Two facing sides)

Table 1. Guide Pin Diameter

Symbol	125	127	128	129	130	145	147	148	149	150	155	157	158	159	160	
Guide pin diameter	12.5	12.7	12.8	12.9	13.0	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9	16.0	
Applicable hole diameter of workpiece	For $\phi 13$					For $\phi 15$					For $\phi 16$					
Guide pin shape	Round type															

Symbol	175	177	178	179	180	195	197	198	199	200	245	247	248	249	250	295	297	298	299	300
Guide pin diameter	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9	30.0
Applicable hole diameter of workpiece	For $\phi 18$					For $\phi 20$					For $\phi 25$					For $\phi 30$				
Guide pin shape	Round type, Diamond type																			



Round type Diamond type



# Pin Clamp Cylinder *Series CKQ<sup>G</sup>P<sub>K</sub>/CLKQ<sup>G</sup>P<sub>K</sub>*

**Table 2. Applicable Auto Switches /** For detailed auto switch specifications, refer to page 43 through to 47.

Applicable cylinder series	Type	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no in use)	Load voltage	Lead wire length	Applicable load
<b>C(L)KQG series</b>	<b>Solid state switch</b>	<b>D-P4DWSC</b>	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-colour display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P4DWSE</b>				2-wire (1-4)			
		<b>D-P4DWL</b>		Grommet		2-wire		3 m	
		<b>D-P4DWZ</b>						5 m	
<b>C(L)KQP series</b>	<b>Reed switch</b>	<b>D-P79WSE</b>	DC/AC magnetic field	Pre-wired connector	2-colour display	2-wire (1-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P74L</b>		Grommet (Pre-wired connector) <small>Note 2)</small>	1-colour display	2-wire	24 VDC 100 VAC	3 m	
		<b>D-P74Z</b>						5 m	

Note 1) PLC: Programmable Logic Controller

Note 2) Refer to page 47 for pre-wired connector products.

# Series CKQ<sup>G</sup><sub>P</sub>K/CLKQ<sup>G</sup><sub>P</sub>K



## Basic Specifications

<b>Action</b>	Double acting	
<b>Bore size (mm)</b>	50	
<b>Fluid</b>	Air	
<b>Minimum operating pressure</b>	CKQ□: 0.1 MPa	CLKQ□ (With lock): 0.15 MPa <sup>Note)</sup>
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)	
<b>Cushion</b>	None	
<b>Lubrication</b>	Non-lube	
<b>Piston speed (Clamp speed)</b>	50 to 150 mm/sec	
<b>Port size (Cylinder port)</b>	1/4 (Rc, NPT, G)	

Note) Minimum operating pressure when cylinder part and locking part use the same piping is 0.2 MPa.

## Proof Pressure/Maximum Operating Pressure

Guide pin diameter	Proof pressure	Max. operating pressure
ø12.5 to ø13.0	1.0 MPa	0.7 MPa
ø14.5 to ø30.0	1.5 MPa	1.0 MPa

## Clamp Specifications

Clamp stroke	Without shims	With shims
	10 mm	10 to 13 mm
<b>Clamp arm</b>	1 pc.	
<b>Guide pin shape</b>	Round type, Diamond type	

Note 1) Refer to table below "Clamp Specifications" and Selection regarding detailed specifications of the clamping force, etc.

Note 2) Diamond type guide pin diameter is ø17.5 or more.

## Lock Specifications

<b>Locking action</b>	Spring locking (Exhaust locking)
<b>Unlocking pressure</b>	0.2 MPa or more
<b>Lock starting pressure</b>	0.05 MPa or less
<b>Locking direction</b>	Lock at extended direction (Clamp holding)
<b>Port size (Lock release port)</b>	1/8 (Rc, NPT, G)
<b>Holding force (N) (Maximum static load)</b>	982

## Weight

Unit: kg

Model	C(L)KQ <sup>G</sup> <sub>P</sub> K			
	Without lock		With lock	
	L	H	L	H
ø12.5 to 13.0	1.67	1.84	2.19	2.35
ø14.5 to 15.0	1.67	1.84	2.19	2.35
ø15.5 to 16.0	1.68	1.84	2.19	2.36
ø17.5 to 18.0	1.72	1.89	2.23	2.41
ø19.5 to 20.0	1.73	1.9	2.24	2.42
ø24.5 to 25.0	1.79	1.99	2.3	2.51
ø29.5 to 30.0	1.83	2.03	2.34	2.55

## Clamp Specifications

(N)

Model	Guide pin diameter	Operating pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	164.9	329.8	494.7	659.6	824.5	989.4	—	—	—
	ø14.5 to ø30.0	164.9	329.8	494.7	659.6	824.5	989.4	1154.3	1319.2	1484.1
CLKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	82.4	247.3	412.2	577.1	742.0	906.9	—	—	—
	ø14.5 to ø30.0	82.4	247.3	412.2	577.1	742.0	906.9	Note 1) 1071.8	Note 1) 1236.7	Note 1) 1401.6

Note 1) Lock holding force of the CLKQ□ is 982 N. Design the circuit such that the lock holding force is taken into consideration when the operating pressure exceeds 0.75 MPa.

The operating pressure should be not greater than the lock holding force as it may cause wearing out and/or damage of the locking part and shorten lock life and may lead to possible failure if applied with a load larger than the lock holding force.

Note 2) It takes approximately 0.3 seconds for the cylinder to operate to generate clamping force from an unclamping state (when no speed controller is installed). Design circuit taking into consideration the time before the clamping force is generated.

Note 3) Determine the clamping force according to the strength of the workpiece. It can be damaged if the clamping force is too large.

## Maintenance Parts

### Replacement Parts: Seal Kit

Kit No.	Content
CQ2B50-PS	Piston seal Rod seal Tube gasket

Note) Consult SMC for maintenance service. Seal kit for CLKQ<sup>G</sup> series maintenance of the is not available.

### Replacement Parts: Grease Pack

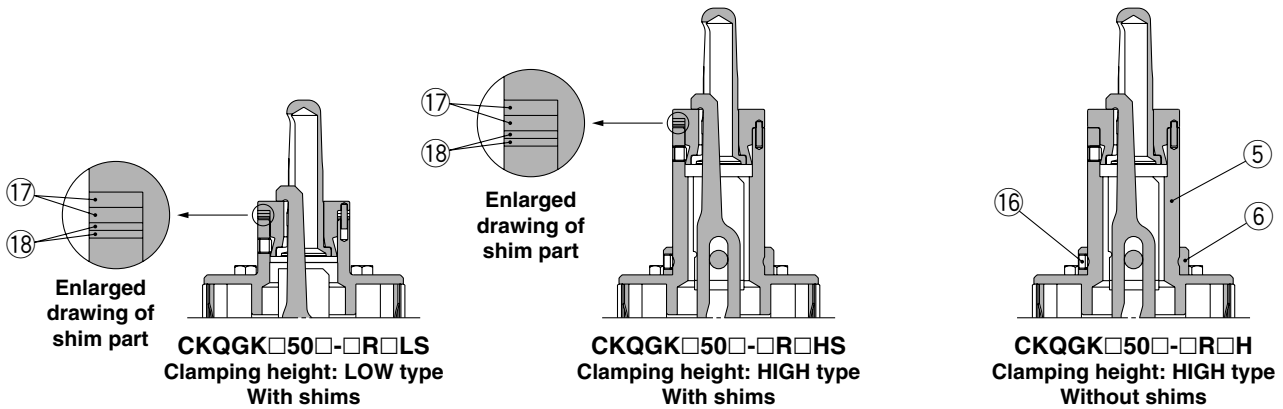
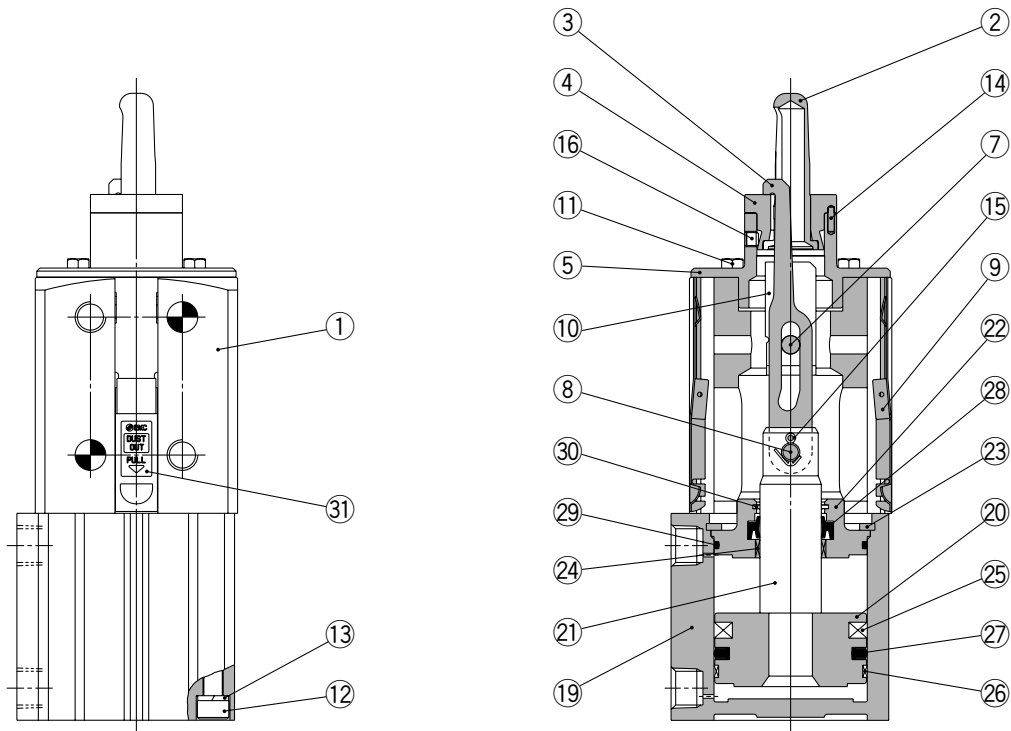
Kit No.	Content
GR-S-010	Grease 10 g

Note) Consult SMC when replacing the actuating cylinders.

## Construction

### CKQGKC50

Figures below correspond to CKQGKC50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

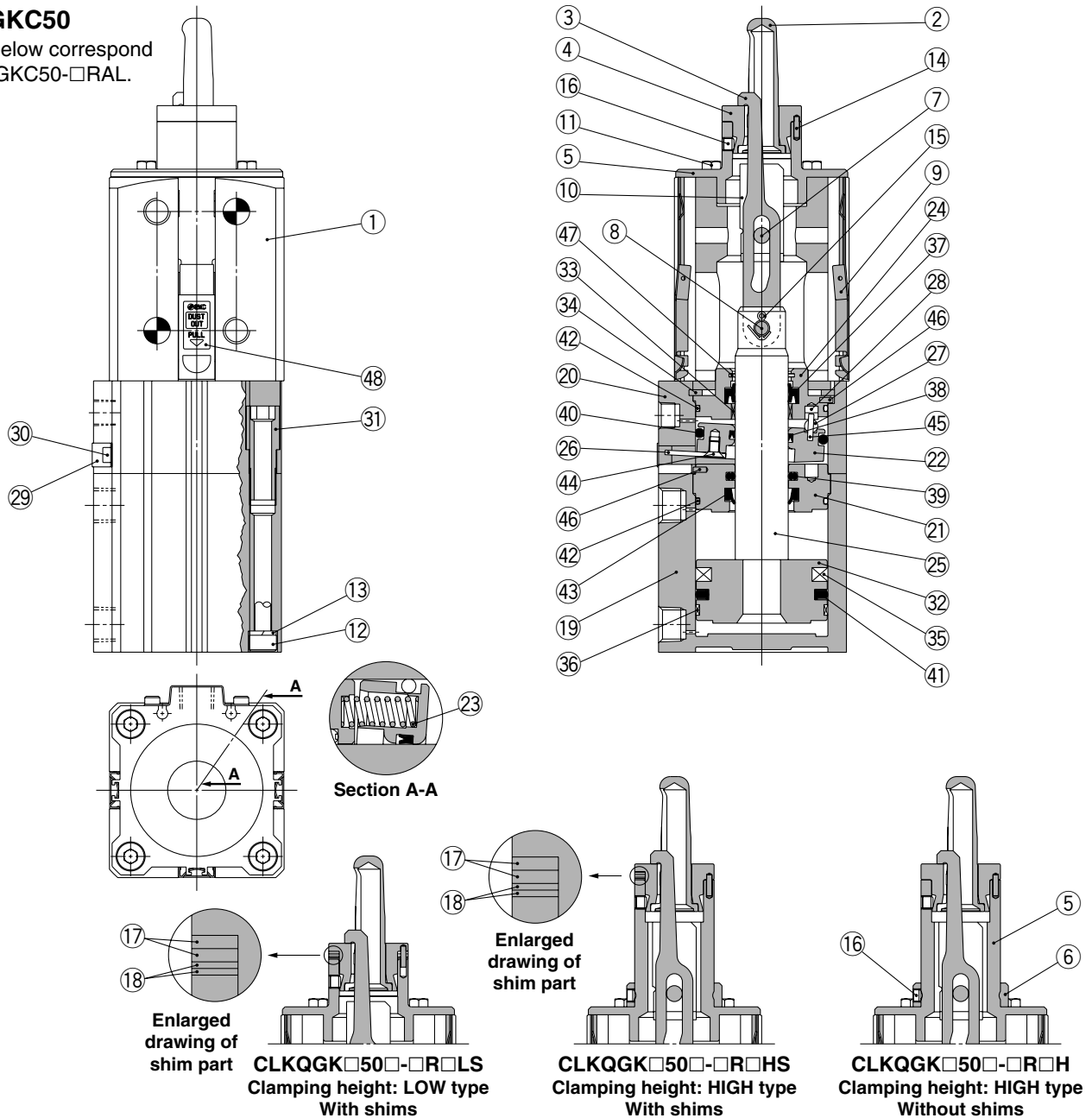
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Structural steel	
22	Collar	Aluminum alloy	
23	Retaining ring	Tool steel	
24	Bushing	Lead-bronze casted	
25	Magnet	Magnetic material	
26	Wear ring	Resin	
27	Piston seal	NBR	
28	Rod seal	NBR	
29	Tube gasket	NBR	
30	Coil scraper	Bronze	
31	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>K/CLKQ<sub>P</sub><sup>G</sup>K

## Construction

### CLKQGKC50

Figures below correspond to CLKQGKC50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Structural steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	

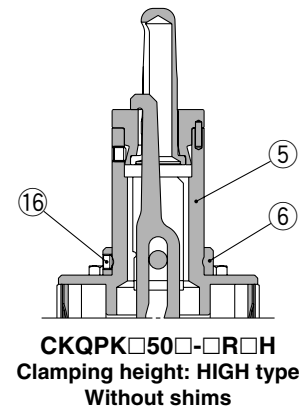
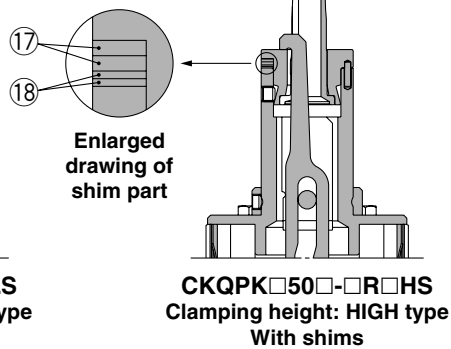
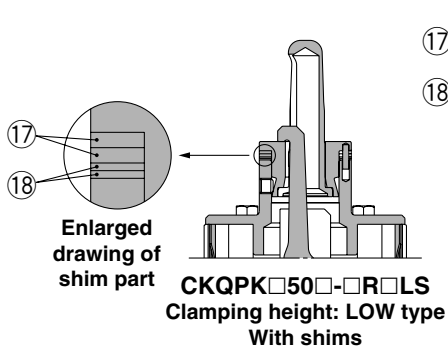
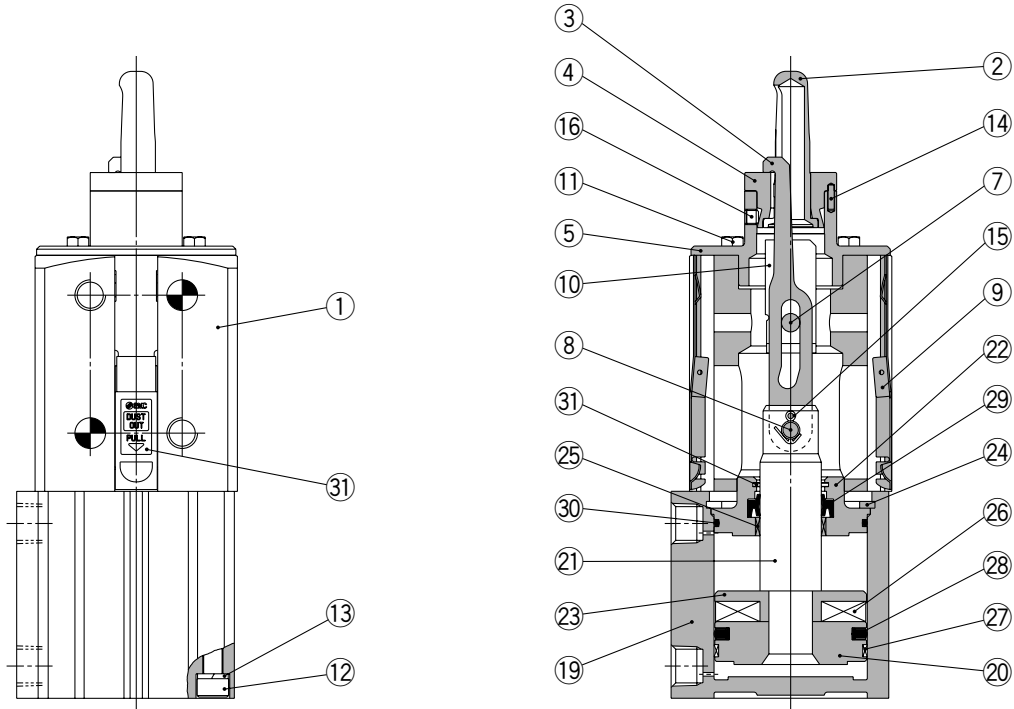
### Component Parts

No.	Description	Material	Note
33	Bushing	Lead-bronze casted	
34	Retaining ring	Tool steel	
35	Magnet	Magnetic material	
36	Wear ring	Resin	
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Rod seal C	NBR	
40	Piston seal A	NBR	
41	Piston seal B	NBR	
42	Tube gasket	NBR	
43	Scraper	NBR	
44	Hex. socket counter-sunk head screw	Structural steel	
45	Spring pin	Tool steel	
46	Parallel pin	Stainless steel	
47	Coil scraper	Bronze	
48	Seal	PET	

## Construction

### CKQPK50

Figures below correspond to CKQPK50-□RAL.



#### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

#### Component Parts

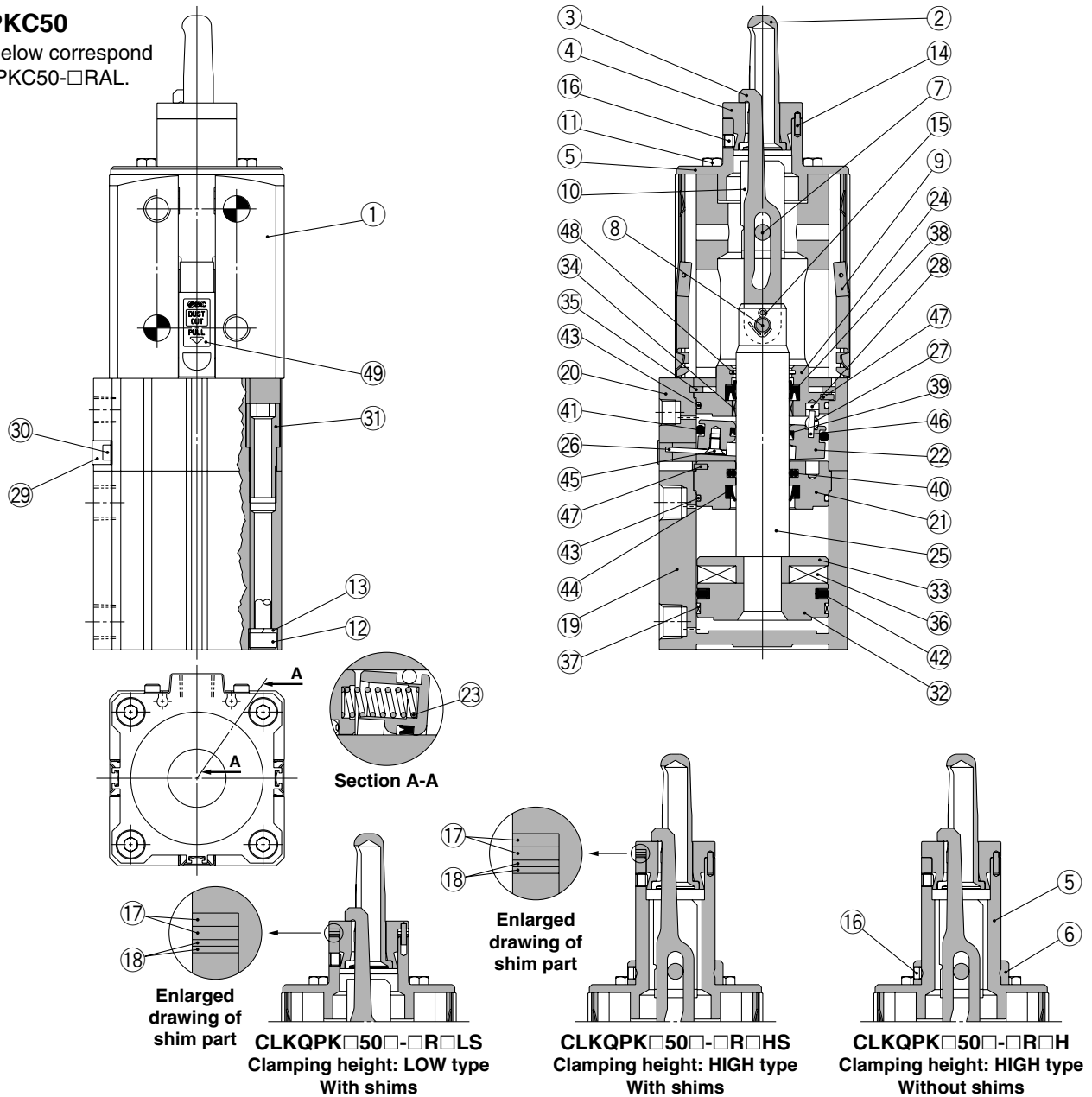
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Stainless steel	
22	Collar	Aluminum alloy	
23	Magnet holder	Aluminum alloy	
24	Retaining ring	Tool steel	
25	Bushing	Lead-bronze casted	
26	Magnet	Magnetic material	
27	Wear ring	Resin	
28	Piston seal	NBR	
29	Rod seal	NBR	
30	Tube gasket	NBR	
31	Coil scraper	Bronze	
32	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>K/CLKQ<sub>P</sub><sup>G</sup>K

## Construction

### CLKQPK50

Figures below correspond to CLKQPK50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	
17	Shim A	Stainless steel	t = 1 mm

### Component Parts

No.	Description	Material	Note
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Stainless steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	
33	Magnet holder	Aluminum alloy	
34	Bushing	Lead-bronze casted	

### Component Parts


No.	Description	Material	Note
35	Retaining ring	Tool steel	
36	Magnet	Magnetic material	
37	Wear ring	Resin	
38	Rod seal A	NBR	
39	Rod seal B	NBR	
40	Rod seal C	NBR	
41	Piston seal A	NBR	
42	Piston seal B	NBR	
43	Tube gasket	NBR	
44	Scraper	NBR	
45	Hex. socket counter-sunk head screw	Structural steel	
46	Spring pin	Tool steel	
47	Parallel pin	Stainless steel	
48	Coil scraper	Bronze	
49	Seal	PET	





# Series CKQ<sub>P</sub><sup>G</sup>K/CLKQ<sub>P</sub><sup>G</sup>K

## Dimensions

### CLKQ<sub>P</sub><sup>G</sup>KC50

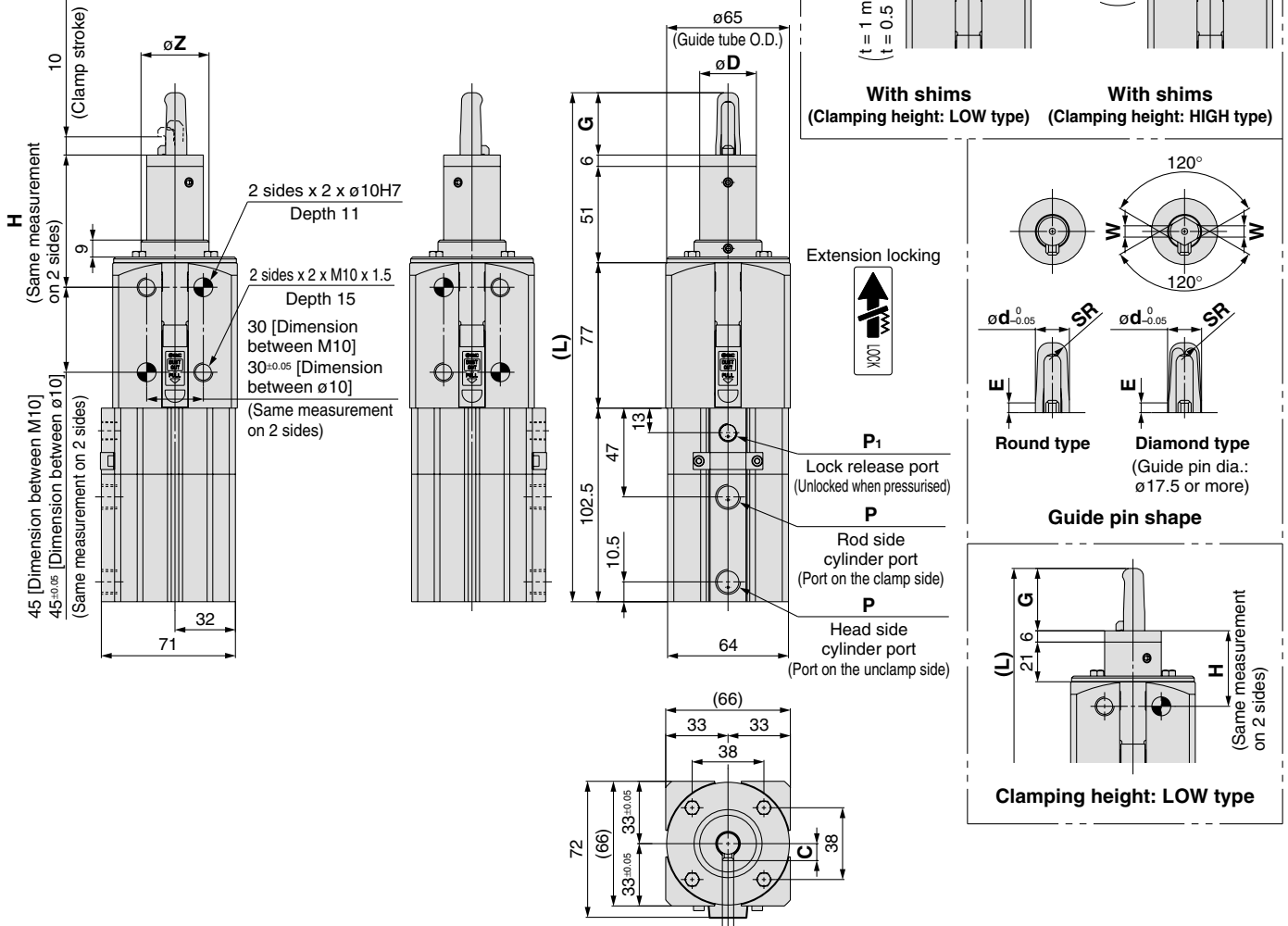
CLKQ<sub>P</sub><sup>G</sup>KD50 (Relationship between the mounting surface and a port location is )

CLKQ<sub>P</sub><sup>G</sup>KE50 (Relationship between the mounting surface and a port location is )

CLKQ<sub>P</sub><sup>G</sup>KF50 (Relationship between the mounting surface and a port location is )

Note 1) refer to "How to Order" on page 22 for the mounting surface and a port position relationship.

Note 2) Figures below correspond to CLKQ<sub>P</sub><sup>G</sup>KC50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	239.5	269.5	4	—	ø36
			ø12.7	≈9		40±0.05	70±0.05						
			ø12.8	≈8		With shims	With shims						
			ø13.0	≈7		40	70						
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	240.5	270.5	5	—	ø36
			ø14.7	≈8		40±0.05	70±0.05						
			ø14.8	≈8		With shims	With shims						
			ø14.9	≈7		40	70						
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	240.5	270.5	5.5	—	ø36
			ø15.7	≈9		40±0.05	70±0.05						
			ø15.8	≈8		With shims	With shims						
			ø15.9	≈8		40	70						

Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	243.5	273.5	6	6	ø40
			ø17.7	≈9		40±0.05	70±0.05						
			ø17.8	≈8		With shims	With shims						
			ø17.9	≈8		40	70						
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	245.5	275.5	7	7	ø40
			ø19.7	≈9		40±0.05	70±0.05						
			ø19.8	≈8		With shims	With shims						
			ø19.9	≈8		40	70						
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	245.5	275.5	9.5	7	ø47
			ø24.7	≈9		40±0.05	70±0.05						
			ø24.8	≈8		With shims	With shims						
			ø24.9	≈8		40	70						
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	245.5	275.5	11	9	ø47
			ø29.7	≈9		40±0.05	70±0.05						
			ø29.8	≈8		With shims	With shims						
			ø29.9	≈8		40	70						

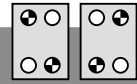
P			P <sub>1</sub>		
Nil	TN	TF	Nil	TN	TF
Rc1/4	NPT1/4	G1/4	Rc1/8	NPT1/8	G1/8





# Pin Clamp Cylinder

M series



# Series CKQ<sup>G</sup><sub>P</sub>M/CLKQ<sup>G</sup><sub>P</sub>M

## How to Order

Built-in standard magnet  
With magnetic field resistant auto switch

C KQGM C 50 - 177 R A L - P4DWSC

Built-in strong magnet  
With magnetic field resistant auto switch

C KQP M C 50 - 198 R A L - P79WSE

Lock on the clamp side

—	Without lock
L	With lock

Number of auto switches

—	2 pcs.
S	1 pc. (Unclamp side)

Note) The D-P4/P7 type is different-surface mounting. (Refer to page 42.)

Auto switch type

—	Without auto switch (Built-in magnet)
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Note 1) For applicable auto switch models, refer to page 33.  
Note 2) Auto switches are included, (but not assembled).

Shim

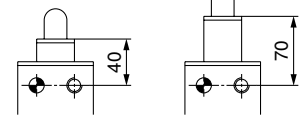
—	Without shims
S	With 3 mm shims <sup>Note)</sup>

Note) When a model includes shims, two 1 mm shims and two 0.5 mm shims are attached.

Clamping height (Refer to the below figure.)

L	LOW type (40 mm)
H	HIGH type (70 mm)

LOW type HIGH type



Clamping height

Clamp arm position (clockwise viewed from top)

A	Same direction as port Port Clamp arm Guide pin	C	180° from port Port Clamp arm Guide pin
B	90° from port Port Clamp arm Guide pin	D	270° from port Port Clamp arm Guide pin

Mounting surface (viewed from top)

Symbol	Port location	Symbol	Port location
C	Mounting surface with the taps diagonal (top right and bottom left) Port	E	Mounting surface with the taps diagonal (top left and bottom right) Port
	Mounting surface with the taps diagonal (top left and bottom right)		Mounting surface with the taps diagonal (top right and bottom left)
D	Mounting surface with the taps diagonal (top right and bottom left) Port	F	Mounting surface with the taps diagonal (top left and bottom right) Port
	Mounting surface with the taps diagonal (top left and bottom right)		Mounting surface with the taps diagonal (top right and bottom left)

Bore size

50	50 mm
----	-------

Port thread type

—	Rc
TN	NPT
TF	G

Guide pin diameter

Note) For guide pin diameter, refer to Table 1 below.

Guide pin shape

R	Round type
D	Diamond type <sup>Note)</sup>

Note) Diamond type guide pin diameter is  $\phi 17.5$  or more.

Body shape

Symbol	Dimension	Mounting hole (tap, pin hole) arrangement	Mounting	Mounting surface (viewed from top)
M	□66	 ○: Mounting tap ●: Pin hole	Mounting tap: 2 x M12 x 1.75 Pin hole: 2 x $\phi 10H7$	 Mounting surface (Two facing sides)

Table 1. Guide Pin Diameter

Symbol	125	127	128	129	130	145	147	148	149	150	155	157	158	159	160
Guide pin diameter	12.5	12.7	12.8	12.9	13.0	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9	16.0
Applicable hole diameter of workpiece	For $\phi 13$					For $\phi 15$					For $\phi 16$				
Guide pin shape	Round type														



Round type Diamond type

Symbol	175	177	178	179	180	195	197	198	199	200	245	247	248	249	250	295	297	298	299	300
Guide pin diameter	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9	30.0
Applicable hole diameter of workpiece	For $\phi 18$					For $\phi 20$					For $\phi 25$					For $\phi 30$				
Guide pin shape	Round type, Diamond type																			

**Table 2. Applicable Auto Switches /** For detailed auto switch specifications, refer to page 43 through to 47.

Applicable cylinder series	Type	Auto switch model	Applicable magnetic field	Electrical entry	Indicator light	Wiring (Pin no in use)	Load voltage	Lead wire length	Applicable load
<b>C(L)KQG series</b>	<b>Solid state switch</b>	<b>D-P4DWSC</b>	AC magnetic field (Single-phase AC welding magnetic field)	Pre-wired connector	2-colour display	2-wire (3-4)	24 VDC	0.3 m	Relay, PLC
		<b>D-P4DWSE</b>				2-wire (1-4)		3 m	
		<b>D-P4DWL</b>		Grommet		2-wire		5 m	
		<b>D-P4DWZ</b>							
<b>C(L)KQP series</b>	<b>Reed switch</b>	<b>D-P79WSE</b>	DC/AC magnetic field	Pre-wired connector	2-colour display	2-wire (1-4)	24 VDC	0.3 m	
		<b>D-P74L</b>		Grommet (Pre-wired connector) <small>Note 2)</small>	1-colour display	2-wire	24 VDC 100 VAC	3 m	
		<b>D-P74Z</b>						5 m	

Note 1) PLC: Programmable Logic Controller

Note 2) Refer to page 47 for pre-wired connector products.

# Series CKQ<sup>G</sup><sub>P</sub>M/CLKQ<sup>G</sup><sub>P</sub>M



## Basic Specifications

<b>Action</b>	Double acting	
<b>Bore size (mm)</b>	50	
<b>Fluid</b>	Air	
<b>Minimum operating pressure</b>	CKQ□: 0.1 MPa	CLKQ□ (With lock): 0.15 MPa <sup>Note)</sup>
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)	
<b>Cushion</b>	None	
<b>Lubrication</b>	Non-lube	
<b>Piston speed (Clamp speed)</b>	50 to 150 mm/sec	
<b>Port size (Cylinder port)</b>	1/4 (Rc, NPT, G)	

Note) Minimum operating pressure when cylinder part and locking part use the same piping is 0.2 MPa.

## Proof Pressure/Maximum Operating Pressure

Guide pin diameter	Proof pressure	Max. operating pressure
ø12.5 to ø13.0	1.0 MPa	0.7 MPa
ø14.5 to ø30.0	1.5 MPa	1.0 MPa

## Clamp Specifications

Clamp stroke	Without shims	With shims
	10 mm	10 to 13 mm
<b>Clamp arm</b>	1 pc.	
<b>Guide pin shape</b>	Round type, Diamond type	

Note 1) Refer to table below "Clamp Specifications" and Selection regarding detailed specifications of the clamping force, etc.

Note 2) Diamond type guide pin diameter is ø17.5 or more.

## Lock Specifications

<b>Locking action</b>	Spring locking (Exhaust locking)
<b>Unlocking pressure</b>	0.2 MPa or more
<b>Lock starting pressure</b>	0.05 MPa or less
<b>Locking direction</b>	Lock at extended direction (Clamp holding)
<b>Port size (Lock release port)</b>	1/8 (Rc, NPT, G)
<b>Holding force (N) (Maximum static load)</b>	982

## Weight

Unit: kg

Model	C(L)KQ <sup>G</sup> <sub>P</sub> M			
	Without lock		With lock	
	L	H	L	H
ø12.5 to 13.0	1.67	1.84	2.18	2.35
ø14.5 to 15.0	1.67	1.84	2.18	2.35
ø15.5 to 16.0	1.67	1.84	2.19	2.36
ø17.5 to 18.0	1.72	1.89	2.23	2.41
ø19.5 to 20.0	1.72	1.9	2.24	2.42
ø24.5 to 25.0	1.78	1.99	2.3	2.51
ø29.5 to 30.0	1.83	2.03	2.34	2.55

## Clamp Specifications

Model	Guide pin diameter	Operating pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
		CKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	164.9	329.8	494.7	659.6	824.5	989.4	—
ø14.5 to ø30.0	164.9		329.8	494.7	659.6	824.5	989.4	1154.3	1319.2	1484.1
CLKQ <sup>G</sup> <sub>P</sub>	ø12.5 to ø13.0	82.4	247.3	412.2	577.1	742.0	906.9	—	—	—
	ø14.5 to ø30.0	82.4	247.3	412.2	577.1	742.0	906.9	Note 1) 1071.8	Note 1) 1236.7	Note 1) 1401.6

Note 1) Lock holding force of the CLKQ□ is 982 N. Design the circuit such that the lock holding force is taken into consideration when the operating pressure exceeds 0.75 MPa.

The operating pressure should not be greater than the lock holding force as it may cause wearing out and/or damage of the locking, and shorten lock life, and lead to possible failure if applied with a load larger than the lock holding force.

Note 2) It takes approximately 0.3 seconds for the cylinder to operate and generate clamping force from an unclamping state (when no speed controller is installed). Design circuit taking into consideration the time before the clamping force is generated.

Note 3) Determine the clamping force according to the workpiece strength. It can be damaged if the clamping force is too large.

## Maintenance Parts

### Replacement Parts: Seal Kit

Kit No.	Content
CQ2B50-PS	Piston seal Rod seal Tube gasket

Note) Consult SMC for maintenance service. Seal kit for CLKQ<sup>G</sup><sub>P</sub> series maintenance is not available.

### Replacement Parts: Grease Pack

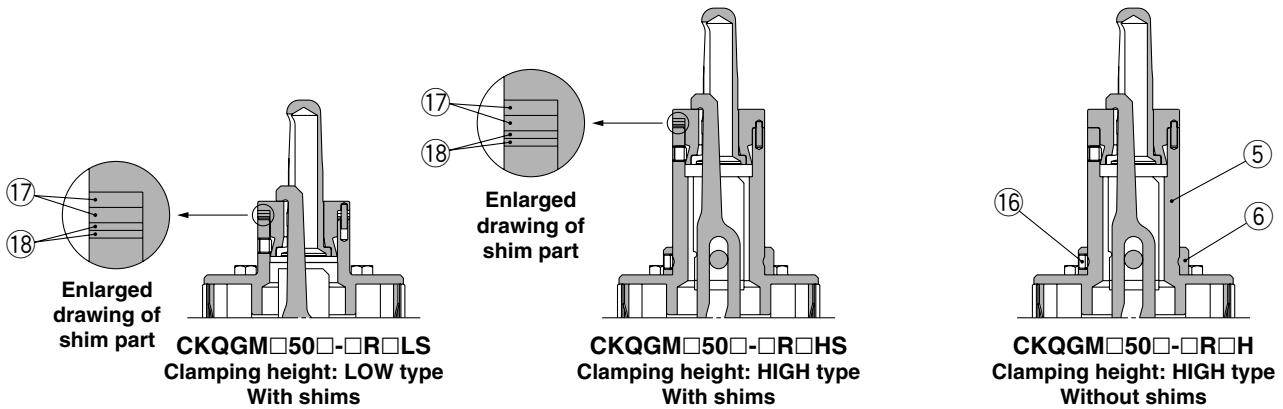
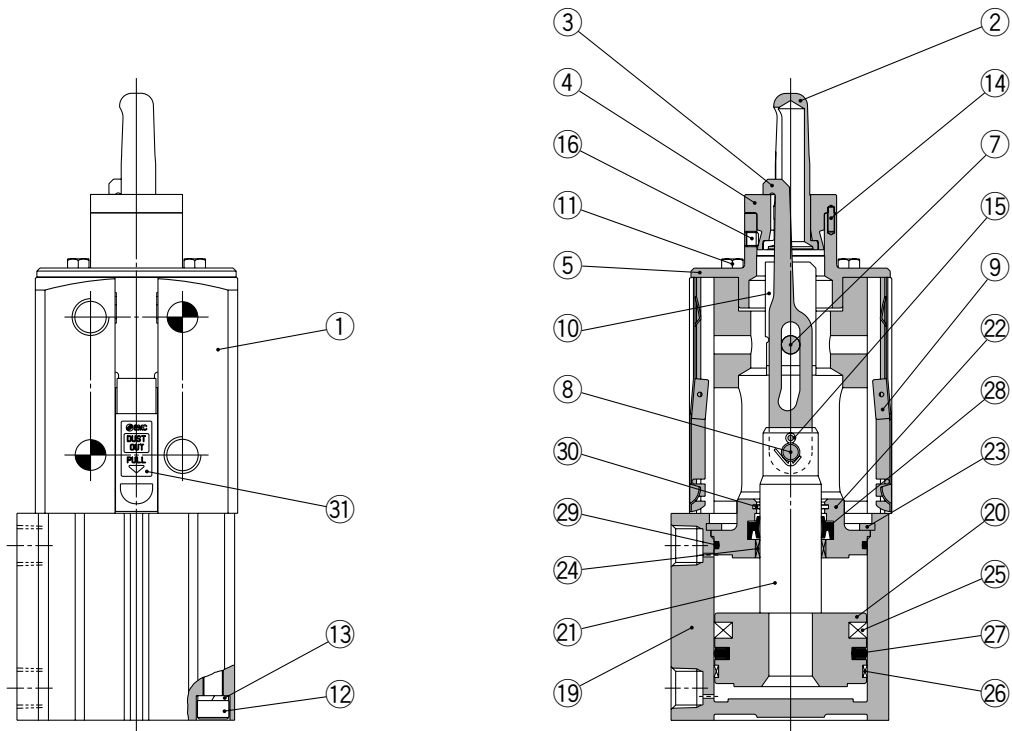
Kit No.	Content
GR-S-010	Grease 10 g

Note) Consult SMC when replacing the actuating cylinders.

## Construction

### CKQGMC50

Figures below correspond to CKQGMC50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

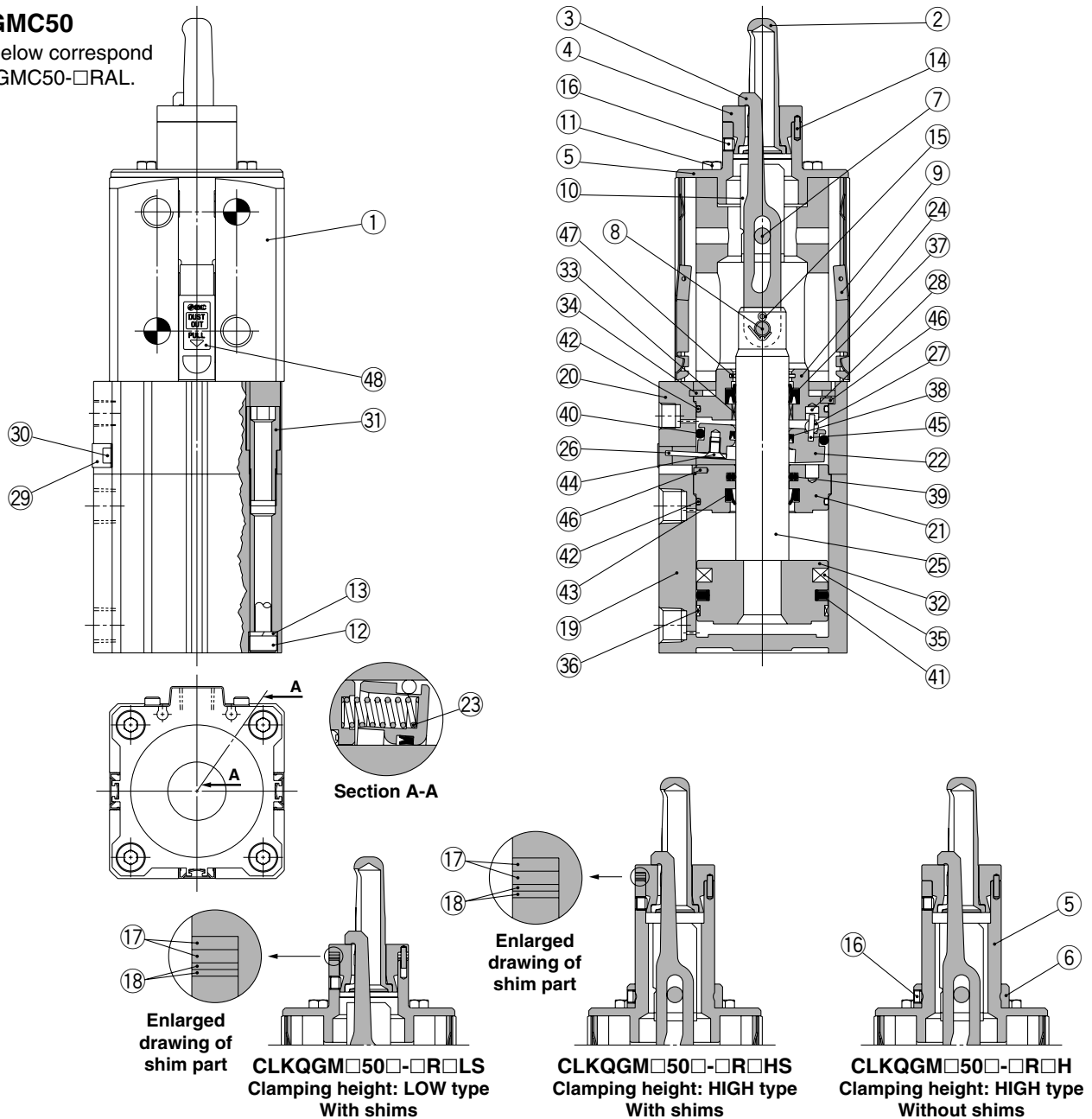
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Structural steel	
22	Collar	Aluminum alloy	
23	Retaining ring	Tool steel	
24	Bushing	Lead-bronze casted	
25	Magnet	Magnetic material	
26	Wear ring	Resin	
27	Piston seal	NBR	
28	Rod seal	NBR	
29	Tube gasket	NBR	
30	Coil scraper	Bronze	
31	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>M/CLKQ<sub>P</sub><sup>G</sup>M

## Construction

### CLKQGM50

Figures below correspond to CLKQGM50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Structural steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	

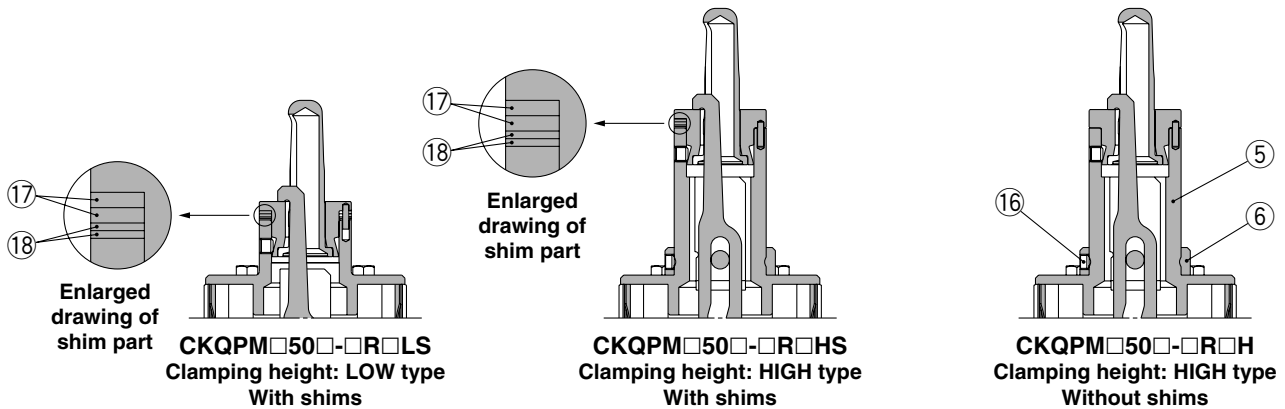
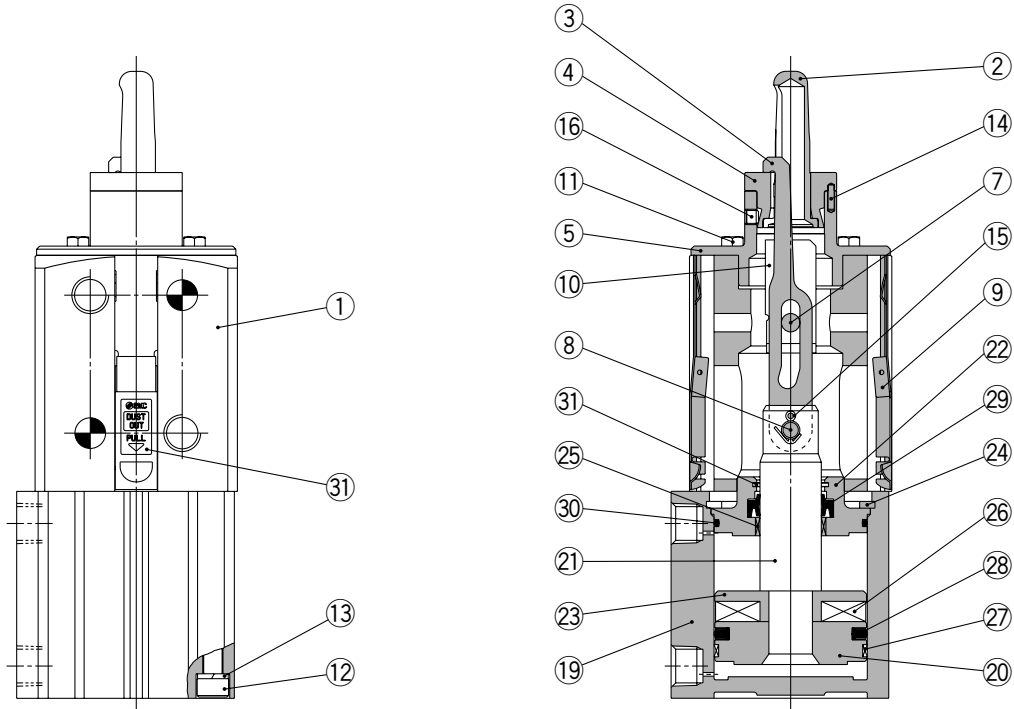
### Component Parts

No.	Description	Material	Note
33	Bushing	Lead-bronze casted	
34	Retaining ring	Tool steel	
35	Magnet	Magnetic material	
36	Wear ring	Resin	
37	Rod seal A	NBR	
38	Rod seal B	NBR	
39	Rod seal C	NBR	
40	Piston seal A	NBR	
41	Piston seal B	NBR	
42	Tube gasket	NBR	
43	Scraper	NBR	
44	Hex. socket counter-sunk head screw	Structural steel	
45	Spring pin	Tool steel	
46	Parallel pin	Stainless steel	
47	Coil scraper	Bronze	
48	Seal	PET	

## Construction

### CKQPMC50

Figures below correspond to CKQPMC50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	

### Component Parts

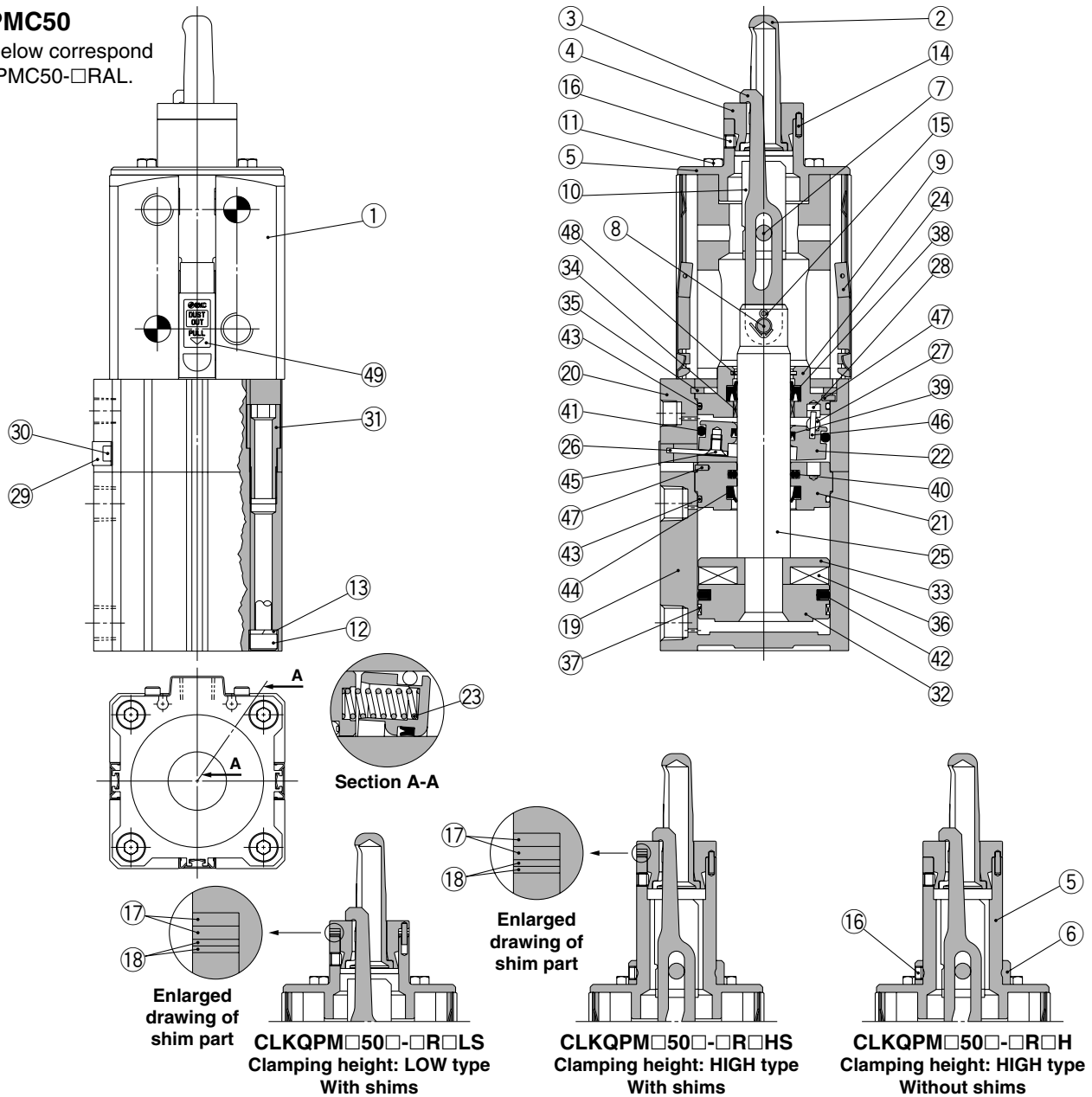
No.	Description	Material	Note
17	Shim A	Stainless steel	t = 1 mm
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Piston	Aluminum alloy	
21	Piston rod	Stainless steel	
22	Collar	Aluminum alloy	
23	Magnet holder	Aluminum alloy	
24	Retaining ring	Tool steel	
25	Bushing	Lead-bronze casted	
26	Magnet	Magnetic material	
27	Wear ring	Resin	
28	Piston seal	NBR	
29	Rod seal	NBR	
30	Tube gasket	NBR	
31	Coil scraper	Bronze	
32	Seal	PET	

# Series CKQ<sub>P</sub><sup>G</sup>M/CLKQ<sub>P</sub><sup>G</sup>M

## Construction

### CLKQPMC50

Figures below correspond to CLKQPMC50-□RAL.



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	
2	Guide pin	Stainless steel	
3	Clamp arm	Structural steel	
4	Seat	Stainless steel	
5	Guide tube	Structural steel	
6	Ring	Aluminum alloy	
7	Pin A	Structural steel	
8	Pin B	Structural steel	
9	Cover assembly	Stainless steel	
10	Spatter cover	Tough pitch copper	
11	Hexagon bolt	Structural steel	
12	Hexagon socket head cap screw	Stainless steel	
13	Spring washer	Stainless steel	
14	Parallel pin	Tool steel	
15	Cotter pin	Stainless steel	
16	Hexagon socket head set screw	Structural steel	
17	Shim A	Stainless steel	t = 1 mm

### Component Parts

No.	Description	Material	Note
18	Shim B	Stainless steel	t = 0.5 mm
19	Cylinder tube	Aluminum alloy	
20	Lock body	Aluminum alloy	
21	Intermediate collar	Aluminum alloy	
22	Lock ring	Tool steel	
23	Brake spring	Steel wire	
24	Collar	Aluminum alloy	
25	Piston rod	Stainless steel	
26	Lever	Stainless steel	
27	Pivot pin	Structural steel	
28	Pivot key	Structural steel	
29	Dust cover	Steel strip	
30	Dust cover holding bolt	Structural steel	
31	Unit holding bolt	Structural steel	
32	Piston	Aluminum alloy	
33	Magnet holder	Aluminum alloy	
34	Bushing	Lead-bronze casted	


### Component Parts


No.	Description	Material	Note
35	Retaining ring	Tool steel	
36	Magnet	Magnetic material	
37	Wear ring	Resin	
38	Rod seal A	NBR	
39	Rod seal B	NBR	
40	Rod seal C	NBR	
41	Piston seal A	NBR	
42	Piston seal B	NBR	
43	Tube gasket	NBR	
44	Scraper	NBR	
45	Hex. socket counter-sunk head screw	Structural steel	
46	Spring pin	Tool steel	
47	Parallel pin	Stainless steel	
48	Coil scraper	Bronze	
49	Seal	PET	




### Dimensions

**CKQ<sup>G</sup>MC50**

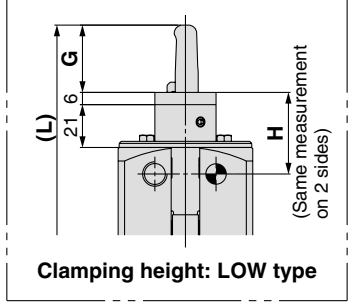
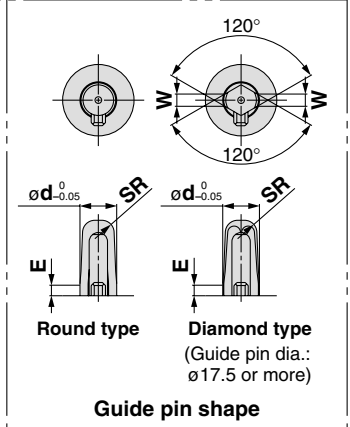
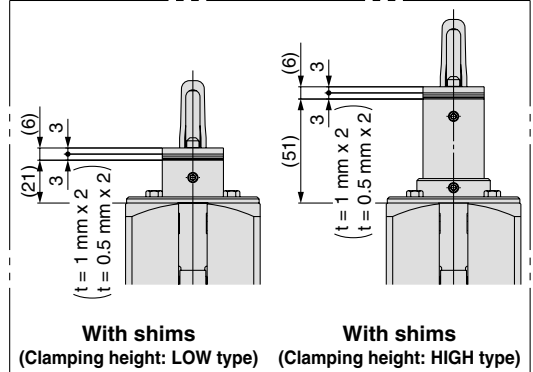
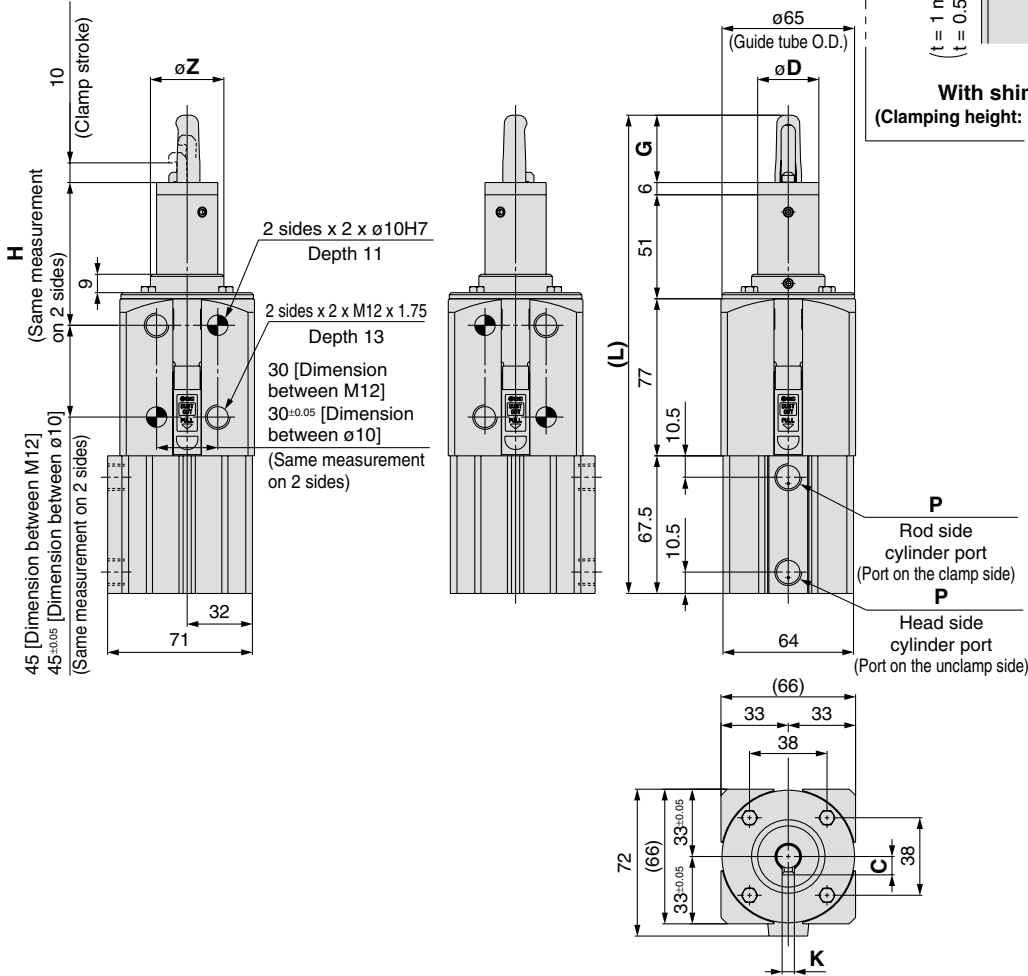
**CKQ<sup>G</sup>MD50** (Relationship between the mounting surface and a port location is )

**CKQ<sup>G</sup>ME50** (Relationship between the mounting surface and a port location is )

**CKQ<sup>G</sup>MF50** (Relationship between the mounting surface and a port location is )

Note 1) Refer to “How to Order” on page 32 for the mounting surface and a port position relationship.

Note 2) Figures below correspond to CKQ<sup>G</sup>MC50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
						ø13	9		ø30	ø12.5 ≈10 ø12.7 ≈9 ø12.8 ≈8 ø12.9 ≈8 ø13.0 ≈7			
ø15	11	ø30	ø14.5 ≈9 ø14.7 ≈8 ø14.8 ≈8 ø14.9 ≈7 ø15.0 ≈7	34	Without shims 40±0.05 With shims 40	Without shims 70±0.05 With shims 70	7	205.5	235.5	5	—	ø36	
ø16	11	ø30	ø15.5 ≈10 ø15.7 ≈9 ø15.8 ≈8 ø15.9 ≈8 ø16.0 ≈7	34	Without shims 40±0.05 With shims 40	Without shims 70±0.05 With shims 70	7	205.5	235.5	5.5	—	ø36	


P		
Nil	TN	TF
Rc1/4	NPT1/4	G1/4


Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
						ø18	12		ø35	ø17.5 ≈10 ø17.7 ≈9 ø17.8 ≈8 ø17.9 ≈8 ø18.0 ≈7			
ø20	13	ø35	ø19.5 ≈10 ø19.7 ≈9 ø19.8 ≈8 ø19.9 ≈8 ø20.0 ≈7	39	Without shims 40±0.05 With shims 40	Without shims 70±0.05 With shims 70	8	210.5	240.5	7	7	ø40	
ø25	16	ø40	ø24.5 ≈10 ø24.7 ≈9 ø24.8 ≈8 ø24.9 ≈8 ø25.0 ≈7	39	Without shims 40±0.05 With shims 40	Without shims 70±0.05 With shims 70	8	210.5	240.5	9.5	7	ø47	
ø30	18	ø40	ø29.5 ≈10 ø29.7 ≈9 ø29.8 ≈8 ø29.9 ≈8 ø30.0 ≈7	39	Without shims 40±0.05 With shims 40	Without shims 70±0.05 With shims 70	8	210.5	240.5	11	9	ø47	


# Series CKQ<sup>G</sup><sub>P</sub>M/CLKQ<sup>G</sup><sub>P</sub>M

## Dimensions

### CLKQ<sup>G</sup><sub>P</sub>MC50

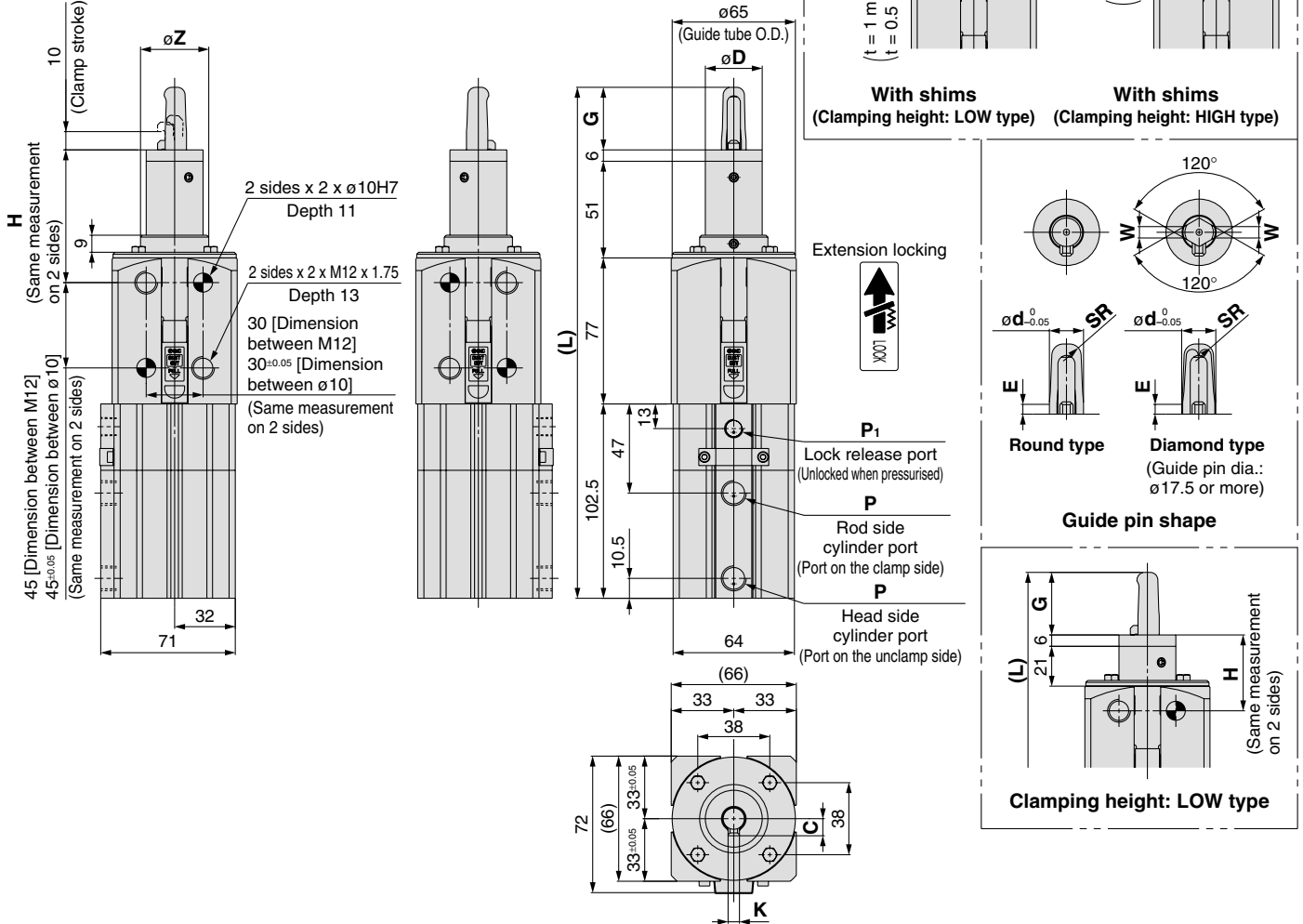
CLKQ<sup>G</sup><sub>P</sub>MD50 (Relationship between the mounting surface and a port location is )

CLKQ<sup>G</sup><sub>P</sub>ME50 (Relationship between the mounting surface and a port location is )

CLKQ<sup>G</sup><sub>P</sub>MF50 (Relationship between the mounting surface and a port location is )

Note 1) Refer to "How to Order" on page 32 for the mounting surface and a port position relationship.

Note 2) The below figures indicate the CLKQ<sup>G</sup><sub>P</sub>MC50-□RAH.



Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø13	9	ø30	ø12.5	≈10	33	Without shims	Without shims	6	239.5	269.5	4	—	ø36
			ø12.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø12.8	≈8		With shims	With shims						
			ø13.0	≈7		40	70						
ø15	11	ø30	ø14.5	≈9	34	Without shims	Without shims	7	240.5	270.5	5	—	ø36
			ø14.7	≈8		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø14.8	≈8		With shims	With shims						
			ø14.9	≈7		40	70						
ø16	11	ø30	ø15.5	≈10	34	Without shims	Without shims	7	240.5	270.5	5.5	—	ø36
			ø15.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø15.8	≈8		With shims	With shims						
			ø15.9	≈8		40	70						
			ø16.0	≈7									

Applicable hole diameter	C	øD	ød	E	G	H		K	L		SR	W	øZ
						LOW type	HIGH type		LOW type	HIGH type			
ø18	12	ø35	ø17.5	≈10	37	Without shims	Without shims	7	243.5	273.5	6	6	ø40
			ø17.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø17.8	≈8		With shims	With shims						
			ø17.9	≈8		40	70						
ø20	13	ø35	ø19.5	≈10	39	Without shims	Without shims	8	245.5	275.5	7	7	ø40
			ø19.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø19.8	≈8		With shims	With shims						
			ø19.9	≈8		40	70						
ø25	16	ø40	ø24.5	≈10	39	Without shims	Without shims	8	245.5	275.5	9.5	7	ø47
			ø24.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø24.8	≈8		With shims	With shims						
			ø24.9	≈8		40	70						
ø30	18	ø40	ø29.5	≈10	39	Without shims	Without shims	8	245.5	275.5	11	9	ø47
			ø29.7	≈9		40 <sub>±0.05</sub>	70 <sub>±0.05</sub>						
			ø29.8	≈8		With shims	With shims						
			ø29.9	≈8		40	70						
			ø30.0	≈7									

P			P <sub>1</sub>		
Nil	TN	TF	Nil	TN	TF
Rc1/4	NPT1/4	G1/4	Rc1/8	NPT1/8	G1/8

## Auto Switch Mounting

For D-P4DW□□, D-P7□ and P79WSE models:

1. Mount the mounting bracket onto the mounting nut by tightening bracket fixing screw lightly through the mounting hole on the top of bracket.
2. Insert the mounting bracket assembly (bracket + nut) into the mounting groove and set it at the auto switch mounting position.
3. Push the auto switch mounting screw lightly into the auto switch through the mounting hole to secure.
4. After reconfirming the detecting position, tighten the mounting screw to secure the mounting bracket and the auto switch. (Tightening torque should be 0.5 to 0.7 N·m.) (See Fig. 1 and Fig. 2.)

Note) Be aware that the D-P79WSE should be installed in the specified direction when installed in the auto switch mounting bracket. Therefore the soft resin mold surface must be in contact with the auto switch mounting bracket. (See Fig. 2.)

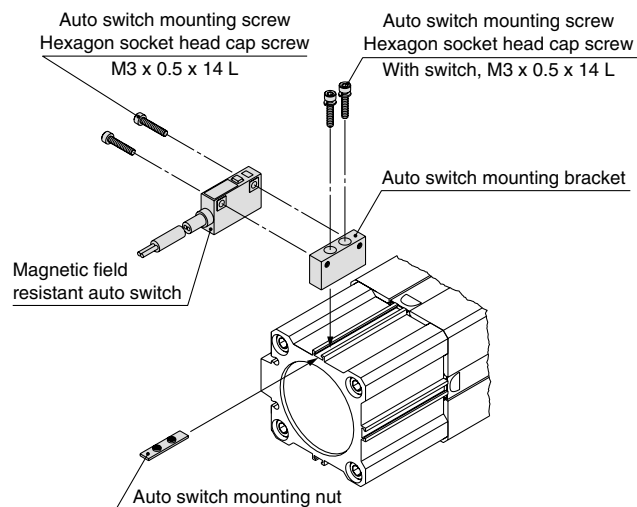


Figure 1

Mounting bracket part number	Items and number of each item
BQP1T-050	<ul style="list-style-type: none"> <li>• Switch mounting bracket x 1</li> <li>• Switch mounting nut x 1</li> <li>• Hexagon socket head cap screw x 2</li> <li>• Hexagon socket head cap screw x 2 (with switch)</li> </ul>

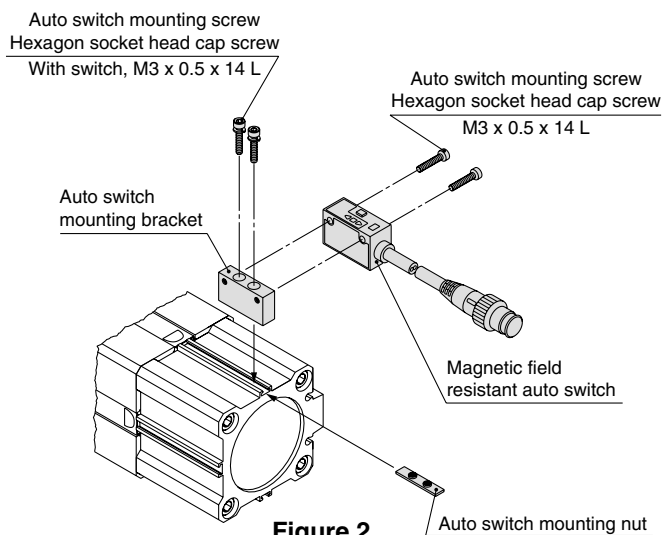


Figure 2

# Series CKQG<sup>G</sup>□/CLKQG<sup>G</sup>□

## Proper Auto Switch Mounting Position and Its Mounting Height

### Proper Auto Switch Mounting Position

Environment	Welding			
Mounting	Rail mounting			
Model	D-P4DWSE D-P4DWSC D-P4DWL D-P4DWZ		D-P74L D-P74Z D-P79WSE	
	A	B	A	B
CKQG	7	17 or more	—	—
CLKQG	42	52 or more	—	—
CKQP	—	—	5.5	20.5 or more
CLKQP	—	—	40.5	55.5 or more

Note) Adjust the auto switch once the operation to set is confirmed.

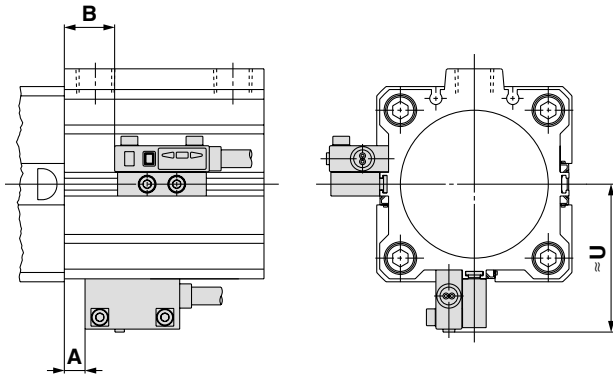
### Proper Auto Switch Mounting Height

Environment	Welding	
Mounting	Rail mounting	
Model	D-P4DWSE D-P4DWSC D-P4DWL D-P4DWZ	D-P74L D-P74Z D-P79WSE
	≈U	
C(L)KQG	50	—
C(L)KQP	—	50

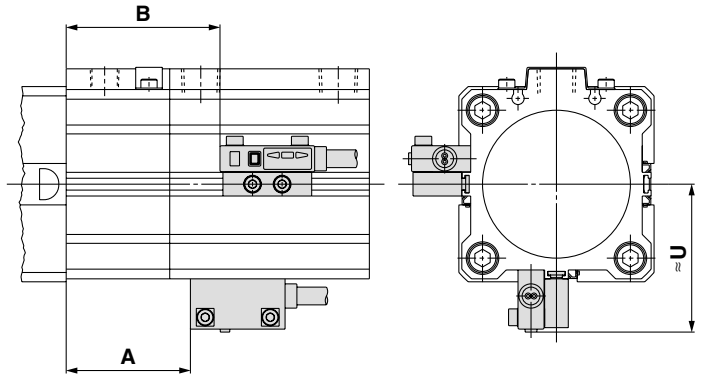
### Rail mounting type (Different-surface mounting)

• Applicable auto switch: D-P4DW□□

#### [CKQG]

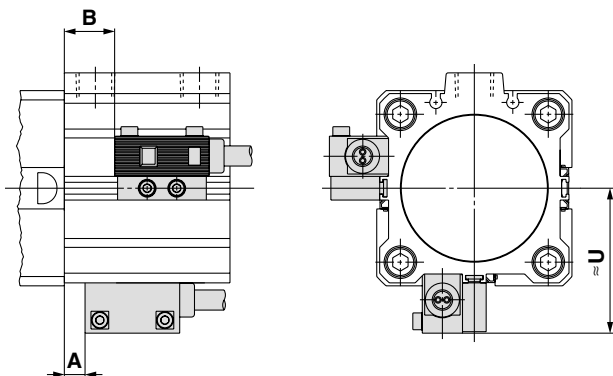


#### [CLKQG]

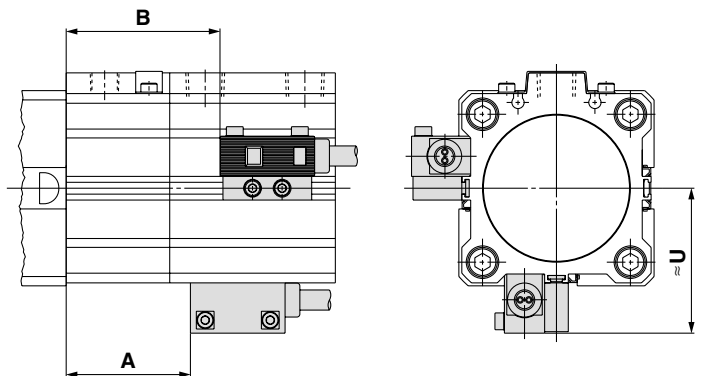


• Applicable auto switch: D-P74□/D-P79WSE

#### [CKQP]



#### [CLKQP]



## Operating Range

Cylinder model	Auto switch model	Operating range
C(L)KQG	D-P4DWS□ D-P4DW□	6.5
C(L)KQP	D-P74□ D-P79WSE	10

Note) Since this is a guideline including hysteresis, it does not mean its is guaranteed.  
(Assuming approximately ±30% dispersion.)  
It may vary substantially depending on the environment.

# Magnetic Field Resistant 2-Colour Indication Solid State Switch

## D-P4DWSC/D-P4DWSE

(Electrical entry: Pre-wired connector)



- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- The optimum operating position can be determined by the colour of the light. (Red → Green ← Red)

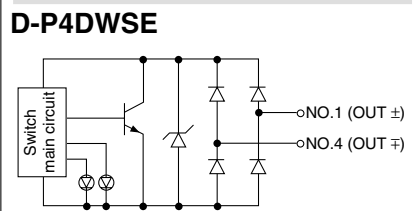
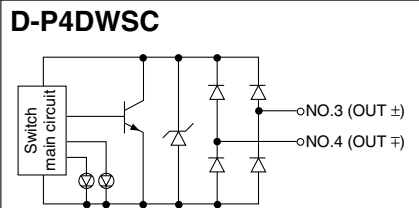


### ⚠ Caution

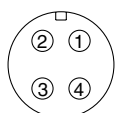
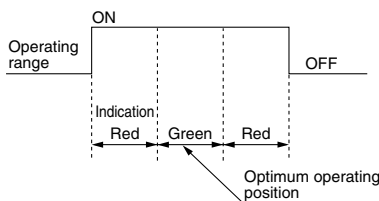
#### Precautions

For single-phase AC welding machines  
Not applicable for DC inverter welding machines (including rectifying type) and or condenser type welding.

### Auto Switch Internal Circuit



### Indicator light/Display method



Connector pin

### Auto Switch Specifications

PLC: Programmable Logic Controller

D-P4DWS□ (With indicator light)		
Auto switch model	D-P4DWSC	D-P4DWSE
Applicable load	24 VDC relay, PLC	
Load voltage	24 VDC (20 to 28 VDC)	
Load current	6 to 40 mA or less	
Internal voltage drop	5 V or less	
Leakage current	1 mA or less at 24 VDC	
Operating time	40 ms or less	
Indicator light	Operating position → Red LED illuminates when turned ON. Optimum operating position → Green LED illuminates when turned ON.	
Standards	Conforming to CE standards	

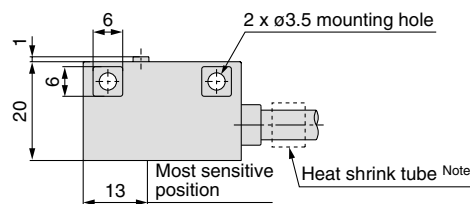
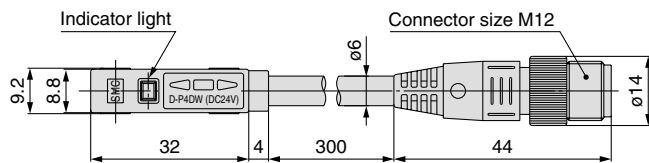
- Lead wire → Oilproof heavy-duty vinyl cable,  $\phi 6$ , 0.5 mm<sup>2</sup>, 2 cores, 300 mm.
- Impact resistance → Switch: 1000 m/s<sup>2</sup>, Connector: 300 m/s<sup>2</sup>.
- Insulation resistance → 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case).
- Withstand voltage → 1000 VAC for 1 minute (between lead wire and case).
- Ambient temperature → -10 to 60°C.
- Enclosure → IEC60529 standard IP67, JIS 0920 waterproof construction.

### Magnetic Field Resistance

If the current of the AC welding machine is 16,000 A or lower, the switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder or switch is 0 mm. Please contact SMC when the AC welding current exceeds 16,000 A.

### Dimensions

Unit: mm



Note) D-P4DWSC = "SC 3-4", D-P4DWSE = "SE 1-4"

# Magnetic Field Resistant 2-Colour Indication Solid State Switch

## D-P4DWL/D-P4DWZ

(Electrical entry: Grommet)



- It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).
- The optimum operating position can be determined by the colour of the light. (Red → Green ← Red)



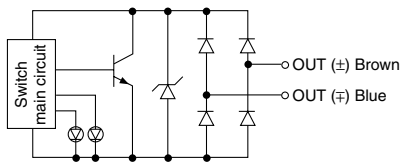
### ⚠ Caution

#### Precautions

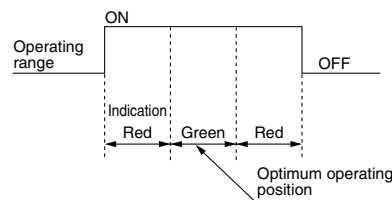
For single-phase AC welding machines  
Not applicable for DC inverter welding machines (including rectifying type) and or condenser type welding.

### Auto Switch Internal Circuit

#### D-P4DWL/Z



#### Indicator light/Display method



### Auto Switch Specifications

PLC: Programmable Logic Controller

D-P4DW□ (With indicator light)		
Auto switch model	D-P4DWL	D-P4DWZ
Applicable load	24 VDC relay, PLC	
Load voltage	24 VDC (20 to 28 VDC)	
Load current	6 to 40 mA or less	
Internal voltage drop	5 V or less	
Leakage current	1 mA or less at 24 VDC	
Operating time	40 ms or less	
Indicator light	Operating position → Red LED illuminates when turned ON. Optimum operating position → Green LED illuminates when turned ON.	
Standards	Conforming to CE standards	

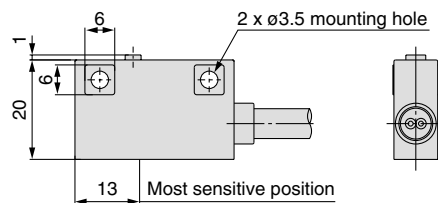
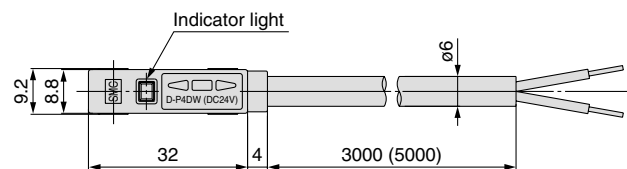
- Lead wire → Oilproof heavy-duty vinyl cable,  $\phi 6$ , 0.5 mm<sup>2</sup>, 2 cores,  
D-P4DWL: 3 m, D-P4DWZ: 5 m.
- Impact resistance → 1000 m/s<sup>2</sup>.
- Insulation resistance → 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case).
- Withstand voltage → 1000 VAC for 1 minute (between lead wire and case).
- Ambient temperature → -10 to 60°C.
- Enclosure → IEC60529 standard IP67, JIS 0920 waterproof construction.

### Magnetic Field Resistance

If the current of the AC welding machine is 16000 A or lower, the switch can be used, even if the distance between the welding conductor (gun cable) and the cylinder or switch is 0 mm.  
Please contact SMC when the AC welding current exceeds 16000 A.

### Dimensions

Unit: mm



# Magnetic Field Resistant 2-Colour Indication Reed Switch

## D-P79WSE

(Electrical entry: Pre-wired connector)



- The optimum operating position can be determined by the colour of the light. (Red → Green ← Red)



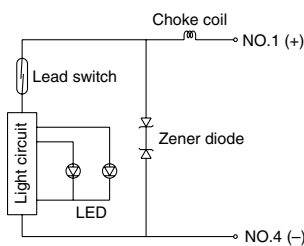
### Caution

#### Precautions

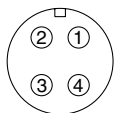
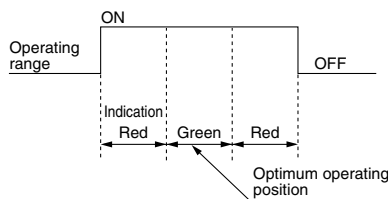
Cylinder with a strong integrated magnet must be used.

### Auto Switch Internal Circuit

#### D-P79WSE



### Indicator light/Display method



Connector pin

### Auto Switch Specifications

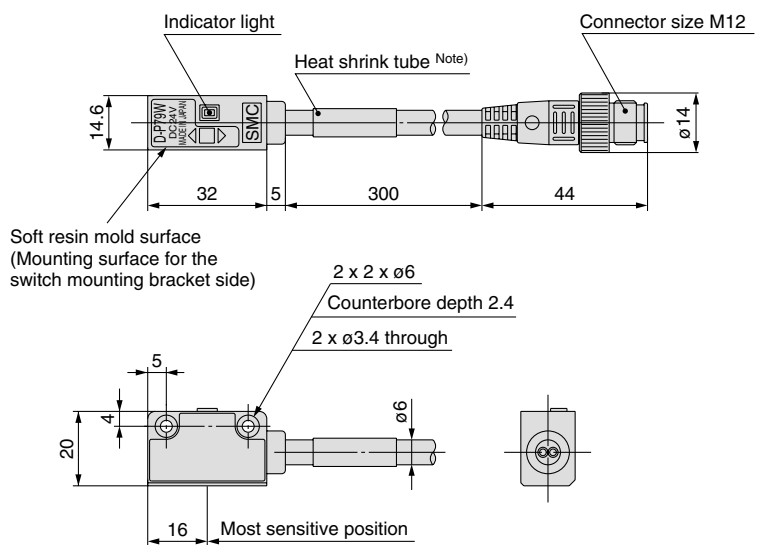
Auto switch model	D-P79WSE
Load voltage	24 VDC
Load current range	8 to 20 mA
Contact protection circuit	Yes
Internal voltage drop	6 V or less
Operating time	1.2 ms
Indicator light	Operating position → Red LED illuminates when turned ON. Optimum operating position → Green LED illuminates when turned ON.
Standards	Conforming to CE standards

- Lead wire → Oilproof, fire resistant heavy-duty vinyl cable,  $\phi 6$ , 0.75 mm<sup>2</sup>, 2 cores (300 mm).
- Impact resistance → 300 m/s<sup>2</sup>.
- Insulation resistance → 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case).
- Withstand voltage → 1000 VAC for 1 minute (between lead wire and case).
- Ambient temperature → -10 to 60°C.
- Enclosure → IEC60529 standard IP67, waterproof (JIS C0920), oilproof construction.

### Dimensions

Unit: mm

#### D-P79WSE



Note) D-P79WSE = "SE 1 4-"

### Caution

Please be careful with the mounting direction. The soft resin mold surface must be directed to the switch mounting bracket side.

# Magnetic Field Resistant Reed Switch

## D-P74L/D-P74Z

(Electrical entry: Grommet)



### Auto Switch Specifications



D-P74□ (With indicator light)		
Auto switch model	D-P74L	D-P74Z
Electrical entry	Grommet	
Application	Relay, Sequence controller	
Load voltage	24 VDC	100 VDC
Max. load voltage/Load current range	5 to 40 mA	5 to 20 mA
Contact protection circuit	Yes	
Internal voltage drop (internal resistance)	2.4 V or less	
Leakage current	0	
Operating time	1.2 ms	
Indicator light	Red LED illuminates when turned ON.	
Standards	Conforming to CE standards	

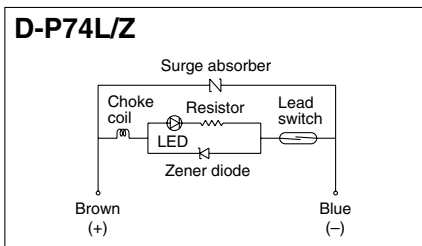
### Caution

#### Precautions

Cylinder with a strong integrated magnet must be used.

### Auto Switch Internal Circuit

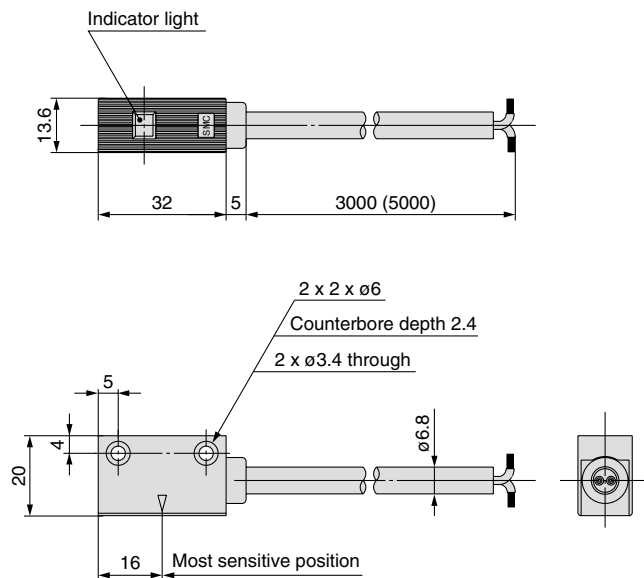
#### D-P74L/Z



- Lead wire → Oilproof, fire resistant heavy-duty vinyl cable,  $\phi 6.8$ , 0.75 mm<sup>2</sup>, 2 cores (Brown, Blue), D-P74L: 3 m, D-P74Z: 5 m.
  - Impact resistance → 300 m/s<sup>2</sup>.
  - Insulation resistance → 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case).
  - Withstand voltage → 1000 VAC for 1 minute (between lead wire and case).
  - Ambient temperature → -10 to 60°C.
  - Enclosure → IEC60529 standard IP67, waterproof (JIS C0920), oilproof construction.
- Note) Indicate "L" for 3 m lead wire and "Z" for 5 m lead wire at the end of an auto switch part number.

### Dimensions

Unit: mm



Note: ( ): D-P74Z



# Magnetic Field Resistant Reed Switch D-P74-376

(Electrical entry: Pre-wired connector)



## Auto Switch Specifications



D-P74-376 (With indicator light)	
Auto switch model	D-P74-376
Electrical entry	Grommet
Application	Relay, Sequence controller
Load voltage	24 VDC
Max. load voltage/Load current range	5 to 20 mA
Contact protection circuit	Yes
Internal voltage drop (internal resistance)	2 V or less
Leakage current	0
Operating time	1.2 ms
Indicator light	Red LED illuminates when turned ON.
Standards	Conforming to CE standards

### Caution

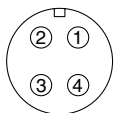
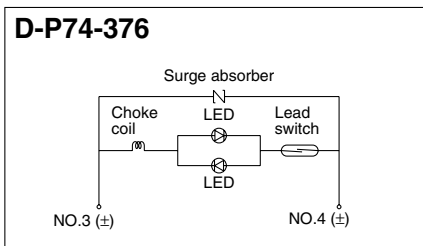
#### Precautions

Cylinder with a strong integrated magnet must be used.

- Lead wire → Oilproof, fire resistant heavy-duty vinyl cable,  $\phi 6$ , 0.5 mm<sup>2</sup>, 2 cores, 0.5 m.
- Impact resistance → 300 m/s<sup>2</sup>.
- Insulation resistance → 50 M $\Omega$  or more at 500 VDC Mega (between lead wire and case).
- Lead wire → 1000 VAC for 1 minute (between lead wire and case).
- Ambient temperature → -10 to 60°C.
- Enclosure → IEC60529 standard IP67, waterproof (JIS C0920), oilproof construction.

### Auto Switch Internal Circuit

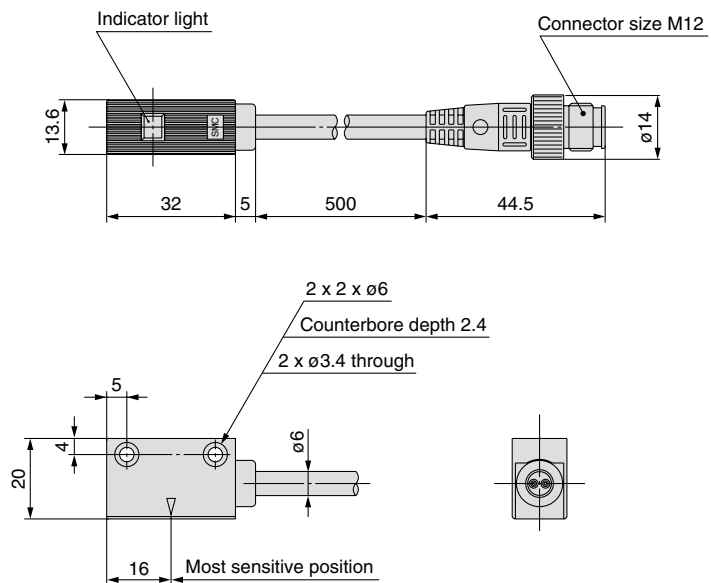
#### D-P74-376



Connector pin

### Dimensions

Unit: mm








Series **CKQ<sup>G</sup>□/CLKQ<sup>G</sup>□**

# Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 <sup>Note 1)</sup>, JIS B 8370 <sup>Note 2)</sup> and other safety practices.

## ■ Explanation of the Labels

Labels	Explanation of the labels
 <b>Danger</b>	In extreme conditions, there is a possible result of serious injury or loss of life.
 <b>Warning</b>	Operator error could result in serious injury or loss of life.
 <b>Caution</b>	Operator error could result in injury <sup>Note 3)</sup> or equipment damage. <sup>Note 4)</sup>

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

Note 3) Injury indicates light wounds, burns and electrical shocks that do not require hospitalization or hospital visits for long-term medical treatment.

Note 4) Equipment damage refers to extensive damage to the equipment and surrounding devices.

## ■ Selection/Handling/Applications

### 1. The compatibility of pneumatic equipment is responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet the specific requirements. The expected performance and safety assurance are responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

### 2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators. (Understanding JIS B 8370 General Rules for Pneumatic Equipment, and other safety rules are included.)

### 3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven objects have been confirmed.
2. When equipment is removed, confirm that safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent quick extension of a cylinder piston rod, etc.

### 4. Contact SMC if the product is to be used many of the following conditions.

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
4. If the products are used in an interlock circuit, prepare a double interlock style circuit with a mechanical protection function for the prevention of a breakdown. Examine the devices periodically either if they function normally or not.

## ■ Exemption from Liability

1. SMC, its officers and employees shall be exempted from liability for any loss or damage arising out of earthquakes or fire, action by a third person, accidents, customer error with or without intention, product misuse, and any other damages caused by abnormal operating conditions.

2. SMC, its officers and employees shall be exempted from liability for any direct or indirect loss or damage, including consequential loss or damage, loss of profits, or loss of chance, claims, demands, proceedings, costs, expenses, awards, judgments and any other liability whatsoever including legal costs and expenses, which may be suffered or incurred, whether in tort (including negligence), contract, breach of statutory duty, equity or otherwise.

3. SMC is exempted from liability for any damages caused by operations not contained in the catalogues and/or instruction manuals, and operations outside of the specification range.

4. SMC is exempted from liability for any loss or damage whatsoever caused by malfunctions of its products when combined with other devices or software.



# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

## Auto Switches Precautions 1

Be sure to read this before handling.

### Design and Selection

#### ⚠ Warning

##### 1. Check the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

##### 2. Use caution when multiple cylinders are used close to each other.

When two or more auto switch cylinders are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40 mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

The auto switches may malfunction due to the interference from magnetic fields. Using a magnetic shield plate (MU-S025) or magnetic shield tape available on the market may decrease magnetic interference.

##### 3. Use caution to the on time of a switch at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate. However, if the speed is too great, the operating time will be shortened and the load may not operate properly.

The maximum detectable piston speed is:

$$V \text{ (mm/s)} = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

In cases of high piston speed, the use of an auto switch (D-F7NTL) with a built-in OFF delay timer ( $\approx 200$  ms) makes it possible to extend the load operating time.

##### 4. Keep wiring as short as possible.

###### <Reed switch>

1) The rush current at switching on increases when the length of the wiring increases. This may shorten the product's life as the switch stays on all the time

To prevent this effect, use a contact protection box when the wire length is 5 m or longer.

2) Even if an auto switch has a built-in contact protection circuit, if wiring is higher than 30 m long, rush current will not be adequately absorbed. Again, in order to prevent a product life's reduction, connect a protection box.

###### <Solid state switch>

Although wire length should not affect switch function, use a wire 100 m or shorter to prevent a noise.

When the wire length is long, it's recommend to attach a ferrite core is attached to both ends of the cable to prevent excess noise.

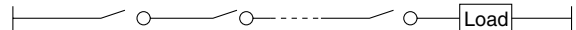
Since the solid state switch is a semiconductor switch which has no contacts, no contact protection box is needed.

##### 5. Use caution to the internal voltage drop of the auto switch.

###### <Reed switch>

Switches with an indicator light:

- If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to the internal voltage drop in the auto switch specifications.) [The voltage drop will be "n" times larger when "n" auto switches are connected.] Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

###### <Solid state switch>

Generally, the internal voltage drop will be greater with a 2-wire solid state switch than with a reed switch. Take the same precautions as in reed switch above.

Also, note that a 12 VDC relay is not applicable.

##### 6. Pay attention to leakage current.

###### <Solid state switch>

With a 2-wire solid state switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

$$\text{Operating current of load (OFF condition)} > \text{Leakage current}$$

If the condition given in the above formula is not met, it will not reset correctly (stays ON). Use a 3-wire switch if this specification can not be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

##### 7. Do not use a load that generates surge voltage.

###### <Reed switch>

If driving a load such as a relay that generates a surge voltage, use a contact protection box.

###### <Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state switch, damage may still occur if the surge is applied repeatedly. When a load, such as a relay or solenoid, which generates surge is directly driven, use a type of switch with a built-in surge absorbing element.



# Series CKQ<sup>G</sup>□/CLKQ<sup>G</sup>□ Auto Switches Precautions 2

Be sure to read this before handling.

## Design and Selection

### Warning

#### 8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also, perform periodic maintenance and confirm proper operation.

#### 9. Ensure sufficient space for maintenance activities.

When designing an application, be sure to allow sufficient space for maintenance and inspections.

## Mounting and Adjustment

### Warning

#### 1. Operating manual

Install and operate the products only after reading the operating manual carefully. Keep the manual where it can be referred to when necessary.

#### 2. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300 m/s<sup>2</sup> or more for reed switches and 1000 m/s<sup>2</sup> or more for solid state switches) while handling. Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

#### 3. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder (actuator) by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

#### 4. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of fastening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below the range of fastening torque may allow the switch to slip out of position.

#### 5. Mount a switch at the center of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting position shown in the catalogue indicates the optimum position at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable.

- Applications where the stop position at stroke end may vary and exceed the operating range of the auto switch (for example, pushing, pressing, clamping operation, etc).
- Applications where the auto switch is used for detecting an intermediate stroke stop position. (In this case the detecting time will be reduced.)

In these applications, set the auto switch to the center of the required detecting range.

## Wiring

### Warning

#### 1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

If bending or tensile force are not avoidable, fix the lead wire close to the switch and allow a bend radius of R40 to 80 mm or larger. Due to stress and tensile force applied to the connection between the cable and switch increases the possibility of disconnection.

#### 2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

#### 3. Confirm proper insulation of wiring.

Be sure that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

#### 4. Do not wire with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits, including auto switches, may malfunction due to noise from these other lines.

#### 5. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

#### 6. Avoid incorrect wiring.

<Reed switch>

A 24 VDC switch with indicator light has polarity. The brown lead wire is (+) and the blue lead wire is (-).

<Solid state switch>

If connections are reversed on a 2-wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will always stay in an ON state. However, it is still necessary to avoid reversed connections, since the switch could be damaged by a load short circuit in this condition.



Series **CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□**

# Auto Switches Precautions 3

Be sure to read this before handling.

## Operating Environment

### Warning

- 1. Never use in an atmosphere of explosive gases.**  
The construction of SMC auto switches does not make them explosion-proof. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.
- 2. Do not use in an area where a magnetic field is generated.**  
Please use magnetic field resistant auto switched.
- 3. Do not use in an environment where the auto switch will be in water or continually exposed to water.**  
Although switches satisfy IEC standard IP67 structure (JIS C 0920: waterproof construction), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.
- 4. Do not use in an environment with oil or chemicals.**  
Please consult SMC if auto switches will be used in an environment with coolant, cleaning solvents, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.
- 5. Do not use in an environment with temperature cycles.**  
Please consult SMC if switches are to be used under temperature cycles other than normal temperature changes, as they may be adversely affected internally.
- 6. Do not use in environment where there is excessive impact shock.**  
<Reed switches>  
When excessive impact (300 m/s<sup>2</sup> or more) is applied to a reed switch during operation, the contact point may malfunction and generate or cut off a signal momentarily (1 ms or less). Please consult SMC regarding the need to use a solid state switch depending on the environment.
- 7. Do not use in an area where surges are generated.**  
<Solid state switches>  
When there are units (solenoid type lifter, high frequency induction furnace, motor, etc.) which generate large surges in the area around cylinders with solid state auto switches, this may cause deterioration or damage to the switches. Avoid sources of surge generation and crossed lines.

### Caution

- 1. Avoid accumulation of iron debris or close contact with magnetic substances.**  
When a large amount of ferrous debris such as machining chips or spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch cylinder, it may cause the auto switches to malfunction due to a loss of the magnetic force inside the cylinder.
- 2. Consult SMC concerning water resistance and elasticity of lead wires.**
- 3. Do not use with direct sunlight.**
- 4. Do not mount the product in environments exposed to radiant heat.**

## Maintenance

### Warning

- 1. Periodically perform the following maintenance to prevent possible danger resulting from unexpected auto switch malfunction.**
  - 1) Securely tighten auto switch mounting screws.  
If screws become loose or the mounting position shifts, re-tighten them after readjusting the mounting position.
  - 2) Confirm that the lead wires are not damaged.  
If a damaged lead wire is discovered, either replace the switch or repair the lead wire to prevent faulty wire insulation.
  - 3) Confirm that the green LED on the 2-colour indicator type auto switch is on.  
When the switch is on the set position, confirm that the green LED is on. If the red LED is on, the mounting position is not appropriate. Therefore, readjust the mounting position until the green LED turns on.
- 2. Maintenance procedures are outlined in the operating manual.**  
Please follow the procedures in order to prevent the product to malfunction damage.
- 3. Removal of equipment, and supply/exhaust of compressed air**  
Before any machinery or equipment is removed, ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.  
When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent actuators from moving suddenly.



Be sure to read this before handling.

## Design

### Warning

**1. There is a possibility of dangerous sudden action by cylinders if sliding parts of machinery are twisted due to external forces, etc.**

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be adjusted to operate smoothly and designed to avoid such dangers.

**2. A protective cover is recommended to minimize the risk of personal injury.**

If a stationary object and moving parts of a cylinder are in close proximity, personal injury may occur. Design the structure to avoid contact with the human body.

**3. Securely tighten all stationary parts and connected parts so that they will not become loose.**

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

**4. Design the equipment so that the maximum theoretical force is not applied to the cylinder.**

If the cylinder becomes damaged there is a danger of human injury and or equipment damage.

**5. Select the mounting base by taking into consideration its rigidity because the cylinder applies a large amount of force.**

Otherwise there is a danger of human injury and/or equipment damage.

**6. Consider the possibility of a decrease in circuit pressure when power is turned off.**

If the cylinder is used for a clamping application there is a danger of the workpiece being released since the circuit pressure decreases when the power is turned off. Install safety equipment to prevent human injury and damage to machine and or equipment. The same consideration should be given for hanging or lift applications to prevent dropping of a workpiece.

**7. Consider a possible loss of power source.**

Measures should be taken to protect against bodily injury and equipment damage in the event that there is a loss of power to equipment controlled by pneumatics, electricity, or hydraulics.

**8. Consider emergency stops.**

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

**9. Consider the action when operation is restarted after an emergency stop or abnormal stop.**

Design the machinery so that human injury or equipment damage will not occur upon restart of operation.

When the cylinder has to be reset at the starting position, install manual safety equipment.

**10. Intermediate stop**

In the case of 3-position closed center of a valve, it is difficult to make a piston stop at the required position as accurately and precisely as with hydraulic pressure due to compressibility of air. Furthermore, since valves and cylinders, etc. are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in the case it is necessary to hold a stopped position for an extended period. Do not intermediately stop the CLKQ cylinder during a locking operation because it will shorten the life of the cylinder.

## Selection

### Warning

**1. Confirm the specifications.**

The products featured in this catalogue are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are outside the range of specifications, damage and/or malfunctions may occur. Do not use in these conditions. (Refer to the specifications.)

Please consult SMC if you use a fluid other than compressed air.

**2. Do not use for applications other than clamping.**

Since the cylinder performs both positioning and clamping simultaneously, any other application may cause an accident or damage to the cylinder.

**3. Do not modify the cylinder.**

Do not modify the cylinder because it may cause damage to it, shorten the protect life, and or cause an accident.

**4. Maximum thickness of workpieces to be clamped.**

Model	Without shims	With shims
<b>CKQG</b>	10 mm	10 to 13 mm
<b>CLKQG</b>	10 mm	10 to 13 mm
<b>CKQP</b>	10 mm	10 to 13 mm
<b>CLKQP</b>	10 mm	10 to 13 mm

Workpieces to be clamped should not be thicker than those shown in the table above.

**5. Clamp only the flat side of a workpiece.**

**6. If a workpiece is transferred three dimensionally and at high speed by a robot after it is clamped, the work weight must be 1/10 or less of the theoretical thrust (clamping force), or stoppers should be installed as a preventive measure for the movement of the workpiece.**

**7. Do not clamp without setting the workpiece on a work surface.**

If the clamp arm makes contact with the seat surface without clamping a workpiece, the surface flatness condition of the seat surface and the clamp arm (the clamping surface) will be adversely effected.

**8. Do not apply an impact load, strong vibrations or rotating force to the product.**

Since the cylinder is composed of precisely manufactured parts, they may be damaged and the life may be shortened if a strong impact load, strong vibration or rotating force are applied.



# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

## Specific Product Precautions 2

Be sure to read this before handling.

### Selection

### Warning

[For only CLKQG/P series]

#### 9. Do not use for intermediate cylinder stops.

This cylinder is designed to lock in a clamped condition to prevent unwanted movement. Do not perform any intermediate stops while the cylinder is operating, since it will shorten the product life.

#### 10. Select the correct locking position since this cylinder does not generate a holding force opposite to the locking direction.

The forwarded lock type (F type) clamp does not generate a holding force in the opposite direction (clamping direction). In addition the locking direction can not be changed.

#### 11. Even when locked, there may be a stroke movement of approximately 1 mm in the locking direction due to external forces, such as the weight of the workpiece.

Even when locked, if air pressure drops, a stroke movement of approximately 1 mm may occur in the locking direction. This is caused by external forces, such as, the workpiece weight due to the general characteristics of the locking mechanism.

#### Applicable Guide Pin Diameter

Model	Guide pin diameter (mm)													
	12.5	12.7	12.8	12.9	13.0	14.5	14.7	14.8	14.9	15.0	15.5	15.7	15.8	15.9
Hole diameter of workpiece	For ø13				For ø15					For ø16				
Guide pin shape	Round type													

Model	Guide pin diameter (mm)																		
	17.5	17.7	17.8	17.9	18.0	19.5	19.7	19.8	19.9	20.0	24.5	24.7	24.8	24.9	25.0	29.5	29.7	29.8	29.9
Hole diameter of workpiece	For ø18				For ø20					For ø25				For ø30					
Guide pin shape	Round type, Diamond type																		

#### Clamping Force

(N)

Model	Guide pin diameter (mm)	Operating pressure (MPa)								
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CKQG	ø12.5 to ø13.0	164.9	329.8	494.7	659.6	824.5	989.4	1154	1319	1484
CKQP	ø14.5 to ø30.0	164.9	329.8	494.7	659.6	824.5	989.4	—	—	—
CLKQG	ø12.5 to ø13.0	82.4	247.3	412.2	577.1	742.0	906.9	1071.8 <sup>Note 1)</sup>	1236.7 <sup>Note 1)</sup>	1401.6 <sup>Note 1)</sup>
CLKQP	ø14.5 to ø30.0	82.4	247.3	412.2	577.1	742.0	906.9	—	—	—

Note 1) When designing a circuit with an operating pressure that exceeds 0.75 MPa, consider the holding force of the lock since the holding force for the CLKQG/P lock is 982 N. The cylinder should be used below the maximum theoretical holding force because damage, shortening of life, and or an accident may occur due to friction in the lock section or damage from a load which exceeds the lock holding force.

Note 2) Design a circuit taking into consideration that it takes approximately 0.3 seconds from the time an unclamped cylinder starts to operate to the time that the clamping force is generated.

Note 3) Take into consideration the durability of a workpiece because it may be damaged if the clamping force is too great.

### Caution

#### 1. To adjust the cylinder speed, attach a speed controller and begin to adjust the speed by setting it to a low speed first. Gradually increase the set speed till the required speed is reached.



# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

## Specific Product Precautions 3

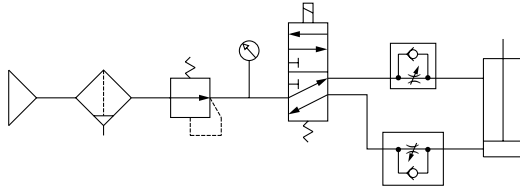
Be sure to read this before handling.

### Pneumatic Circuit

#### Warning

##### 1. Recommended pneumatic pressure circuit for the CKQG/P series

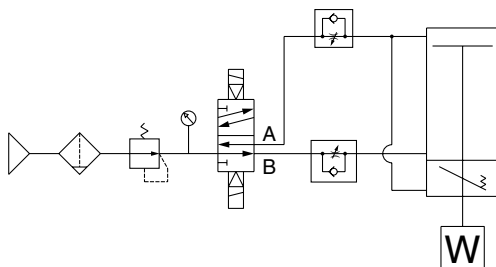
The following is an example of a basic meter-out control circuit for operating a cylinder using an air filter, a regulator, a solenoid valve and a speed controller.



Recommended pneumatic pressure circuit

##### 2. Recommended pneumatic pressure circuit for the CLKQG/P series

- 1) Do not use a 3-positioning valve (double check valve, exhaust center or pressure center types) for any application because the lock may fail due to unlocking pressure.
- 2) Install speed controllers for meter-out control. If it used in meter-in control, it may result in malfunction.
- 3) Be careful of reverse exhaust pressure flow from a common exhaust type manifold. Since the lock may be released due to reverse exhaust pressure flow, use an individual exhaust type manifold or single type valve.
- 4) Branch off of the compressed air piping for the lock unit between the cylinder and the speed controller. Branching off of another part may shorten the product life.
- 5) Construct piping so that the piping length from the branched point to the lock unit is short. If it is long, unlocking may not function well, and it may shorten product life of the lock.
- 6) SMC recommends using a 2-position double solenoid valve.



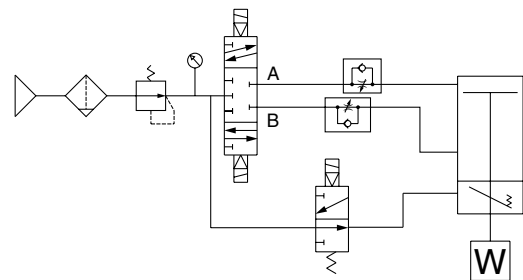
Recommended pneumatic pressure circuit

- 7) It is possible to use the pneumatic circuit shown below, however, unlock the cylinder before operating. Also, unlock the cylinder first before operating the cylinder in any direction.

In the event that unlocking is initially delayed, it will cause product damage and drastic shortening of product life. It is also highly dangerous because there is possibility of the cylinder lurching at high speed. The cylinder must be unlocked before operating it in free direction, as well.

- 8) When the pneumatic circuit indicated below is used, please remember that the work displacement at the locked position of the cylinder to the direction that the stroke advances may be a large degree.

Depending on the piping length and the exhaust time, the activation of the locking function may be delayed, resulting in a large degree of work displacement in the direction of the advancing stroke.



### Mounting

#### Caution

1. Do not use the cylinder until it is confirmed that the equipment is operating correctly.

After installation, maintenance or replacement, connect the compressed air or electricity and verify that the installation is correct by performing appropriate function and/or leakage tests.

2. Do not dent the cylinder tube or the guide pin parts.

Slight deformation will cause a malfunction since the tube I.D. is manufactured with a tight tolerance. Excessive impact will cause damage to the guide pin because it is heat treated.

3. Prevent any foreign materials, such as machining chips, from entering into internal cylinder from the air supply port.

When the mounting holes for the cylinder are made, machined chips may enter the cylinder from the air supply port if the cylinder is left near the installation site. Please prevent the machining chips from entering into the cylinder.

4. The opening part of a guide pin should not face in the same direction as oncoming spatter.

If the spatter enters the cylinder from the opening part of the guide pin, it will shorten the product life and cause a malfunction.





# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

## Specific Product Precautions 4

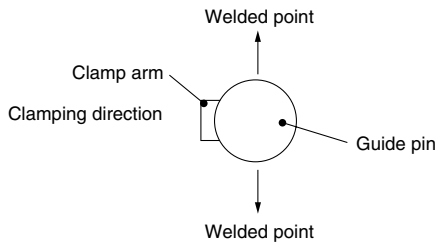
Be sure to read this before handling.

### Mounting

#### ⚠ Caution

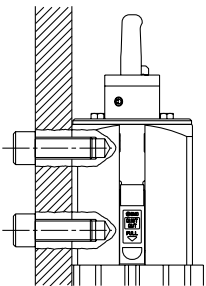
##### 5. Consider the welding point of the guide pin when determining the direction of the clamp arm setting.

The clamp arm will be damaged if clamping is performed at the welded point of the guide pin. Therefore, set the clamping direction as illustrated below, so that the welded point is not effected by clamping.



##### 6. When assembling and adjusting the product, begin the task by applying pressure only to the unlocking port (for CLKQG/P series).

##### 7. When attaching a cylinder to the equipment, use the tightening torque specified in the below table.



Thread size	Tightening torque (N·m)
M10	20 to 25
M12	35 to 42

##### 8. Check the auto switch operation when the product is used where welding is performed.

##### 9. When installing a cylinder with an auto switch, secure enough space at the bottom side of the cylinder providing the minimum bending radius for the lead wire to allow proper maintenance (such as replacement of groove mounting auto switches).

##### 10. Operating manual

Install the products and operate them only after reading the operating manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

### Piping

#### ⚠ Caution

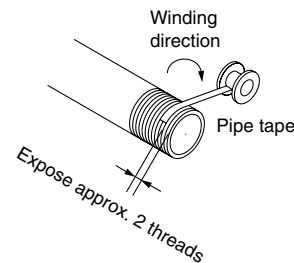
##### 1. Before piping

Before piping, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

##### 2. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping.

Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



##### 3. Piping length should be short.

If the piping to the cylinder is too long, the volume of water vapor in the internal tubing increases beyond that of the internal cylinder due to the generation of water vapor by adiabatic expansion. Since the water vapor stays inside of the tubing without being released into the air, repeated operation results in the generation of water. Grease in the cylinder is drained out as it flows away with the water. This action lowers the smoothness in the cylinder, resulting in air leakage due to worn out seals, and or malfunction due to increased friction resistance. Please do the following to prevent this problem:

- 1) Tubing from a solenoid valve to a cylinder should be as short as possible to assure the evacuation of the generated water vapor into the air.  
As a guide, the air capacity in the cylinder, which when converted to atmospheric pressure, should be  $\geq 70\%$  of the piped tubing capacity.
- 2) Pipe a speed exhaust controller ASV and a quick exhaust valve to a cylinder to exhaust the exhaust pressure directly to the air.
- 3) Piping port should face downward so that the generated moisture inside tubing does not easily return to the cylinder.



# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

## Specific Product Precautions 5

Be sure to read this before handling.

Refer to the back of page 1 for Safety Instructions and “Precautions for Handling Pneumatic Devices” (M-03-E3A).

### Lubrication

#### ⚠ Caution

##### 1. Lubrication for the CKQG/P cylinder

The cylinder is lubricated at the factory, and can be used without further lubrication.

In the event that lubricant is used, install a lubricator in the circuit and use Class 1 turbine oil (without additives) ISO VG32. A malfunction can occur due to loss of the original lubricant if lubrication is stopped in the future. Therefore, once lubrication is applied, it must be used continuously.

##### 2. Lubrication for the CLKQG/P cylinder

Do not lubricate because it may considerably lower the locking performance.

### Maintenance

#### ⚠ Caution

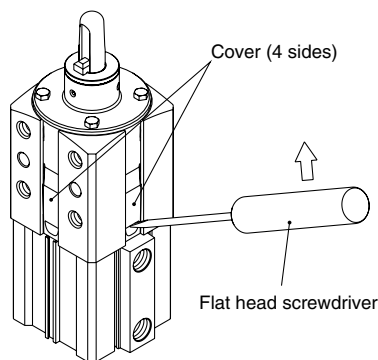
##### 1. If spatter enters the cylinder body, remove it by first detaching the covers. Do not scratch or make dents on the sliding parts of the piston rod by striking it with other objects or grasping them with other objects.

Since the outside diameter of a piston rod is manufactured with a tight tolerance, even a slight deformation can cause an operation malfunction.

Any scratches and dents on the sliding parts of the piston rod can cause damage to the seals, resulting in air leakage.

##### 2. To release the cover, insert a flat head screwdriver in the notch on the cover and apply force.

If a finger is used to remove the cover, the edge of the cover's notch may injure the finger.



##### 3. Drain flushing

Remove drainage from air filters regularly.

### Handling

Magnetic field resistant auto switches D-P79WSE/D-P74□ type are specifically for use with magnetic field resistant cylinders and are not compatible with general auto switches or cylinders. Magnetic field resistant cylinders are labeled as follows.

Magnetic field resistant cylinder with built-in magnet  
(For use with auto switch D-P7 type)

### Mounting

##### 1. In order to fully use the capacity of magnetic field resistant auto switches, consider the following precautions:

- 1) Do not allow the magnetic field to occur when the cylinder piston is moving.
- 2) When a welding cable or welding gun electrodes are near the cylinder, change the auto switch position to fall within the operational ranges shown in the graphs on the back of page 10, or move the welding cable away from the cylinder.
- 3) Cannot be used in an environment where welding cables surround the cylinder.
- 4) Consult SMC when a welding cable and welding gun electrodes (something energised with secondary current) are near multiple switches.

##### 2. In an environment where spatter directly hits the lead wire, cover the lead wire with protective tubing. Use protective tubing I.D. ø8 or more that has excellent heat resistance and flexibility.

### Contact Capacity

Never operate a load that exceeds the maximum contact capacity of the auto switch.



# Series CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□

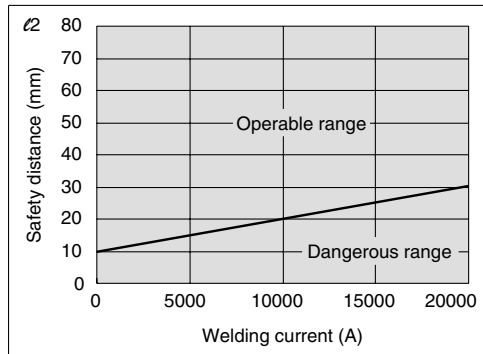
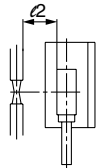
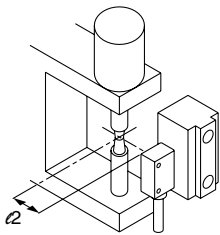
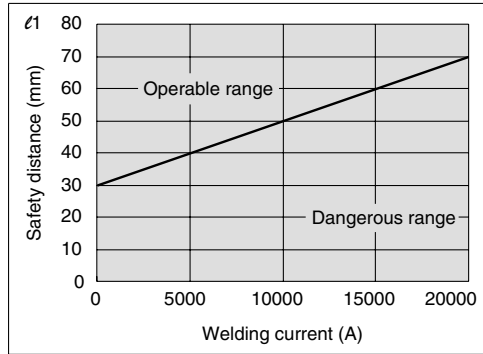
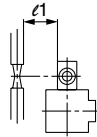
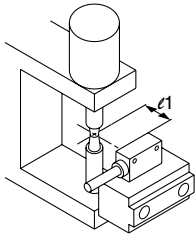
## Specific Product Precautions 6

Be sure to read this before handling.

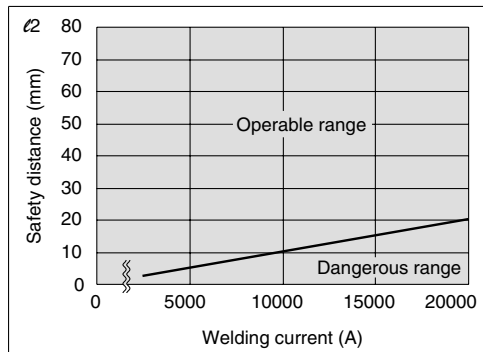
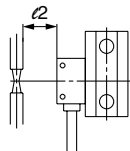
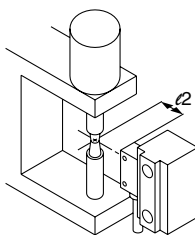
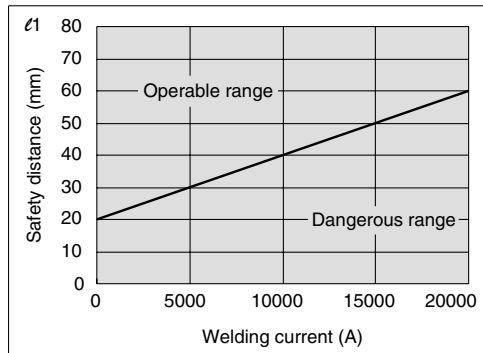
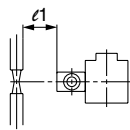
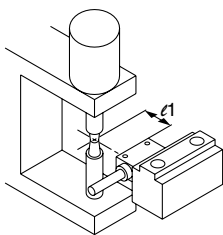
Refer to the back of page 1 for Safety Instructions and “Precautions for Handling Pneumatic Devices” (M-03-E3A).

### Data: Magnetic Field Resistant Reed Switch (D-P79WSE type, D-P74□ type) Safety Distance

#### Safety Distance from Side of Auto Switch



#### Safety Distance from Top of Auto Switch





Series **CKQ<sub>P</sub><sup>G</sup>□/CLKQ<sub>P</sub><sup>G</sup>□**

## Specific Product Precautions 7

Be sure to read this before handling.

### Operation

#### Warning

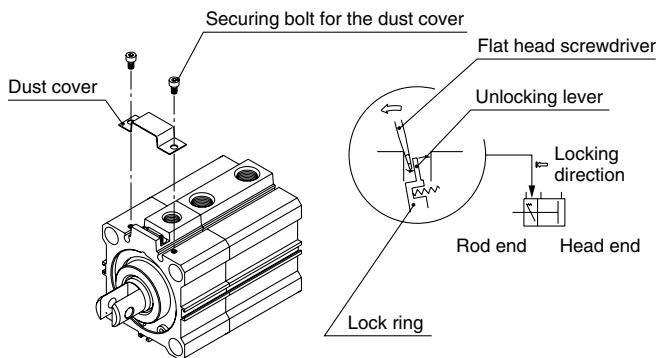
**1. Do not unlock when an external force, such as a load or spring force is being applied.**

This is very dangerous because the cylinder will move suddenly. Take the following steps.

- 1) Restore the air pressure in the B line of the pneumatic circuit to operating pressure. Once restored, gradually let the air pressure drop.
- 2) If air pressure cannot be used, prevent cylinder movement with a lifting device such as a jack, then release the lock.

**2. After all safety precautions have been confirmed, perform the manual release by following the steps shown below.**

Carefully confirm that no one is inside the load movement range, that there is no danger even if the load moves suddenly, etc.



#### How to unlock manually

- 1) Remove the dust cover.
- 2) Insert a flat head screwdriver on the rod end of the manual unlocking lever as shown in the figure above, and lightly push the screwdriver in the direction of the arrow (rod side) to unlock.







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