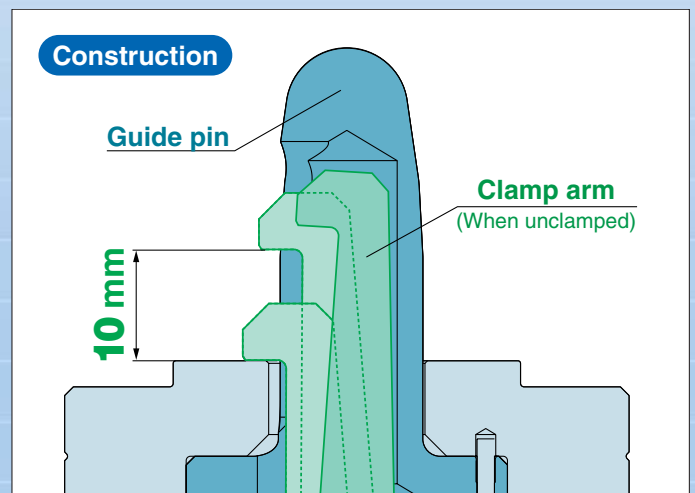


# Pin Clamp Cylinder



**Clamp!**

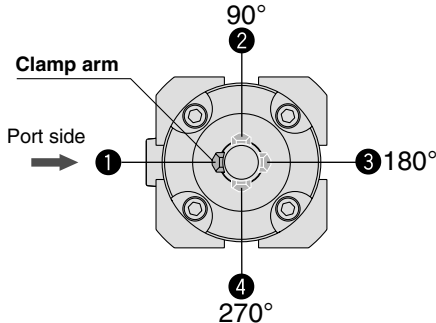
**Positioning and  
clamping at one time!**



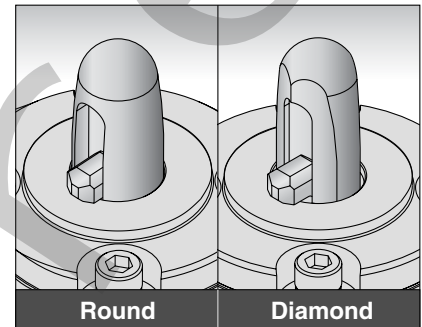
Series **CKQ/CLKQ**

# Multiple combinations are possible.

Clamp arm position can be selected from 4 different positions, depending on the installation condition.

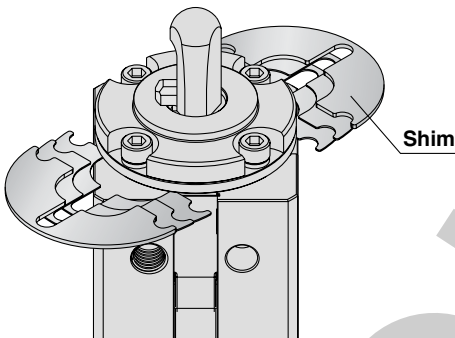


2 types of guide pins are available.



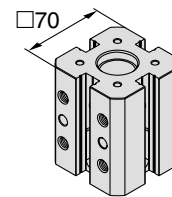
Clamp position height can be adjusted by selecting an appropriate shim.

Adjustable from **0.5 to 2 mm**

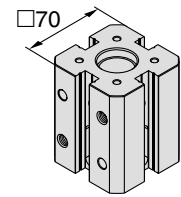


One 1 mm and two 0.5 mm shims are attached.  
(single side: 3 shims/both sides: 6 shims)

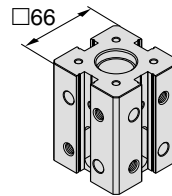
4 body shape options are available which offer extensive installation flexibility.



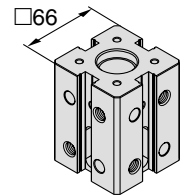
Mounting tap: M10 x 1.5  
Pin hole: ø8H7



Mounting tap: M10 x 1.5  
Pin hole: ø8H7



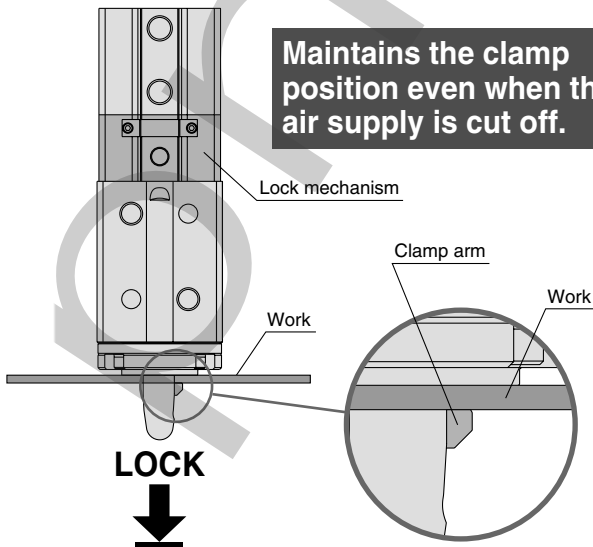
Mounting tap: M10 x 1.5  
Pin hole: ø10H7



Mounting tap: M12 x 1.75  
Pin hole: ø10H7

Possible to select the lock mechanism

Maintains the clamp position even when the air supply is cut off.



## Pin Clamp Cylinder Series CKQ/CLKQ ø50

# Pin Clamp Cylinder

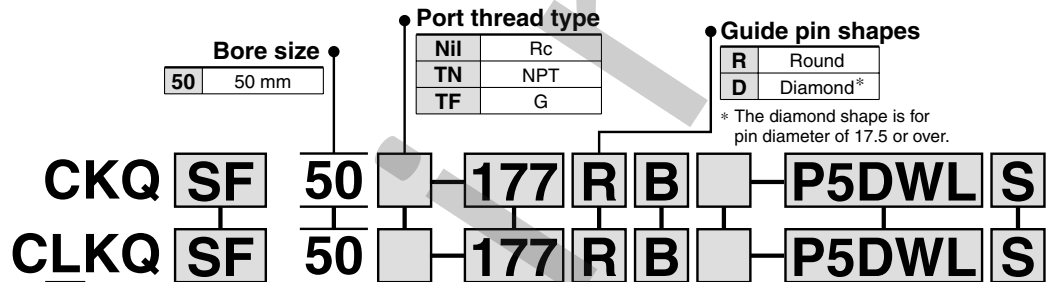
## Series CKQ/CLKQ

### ø50

### How to Order

Without lock

With lock



With a lock at the clamp side •

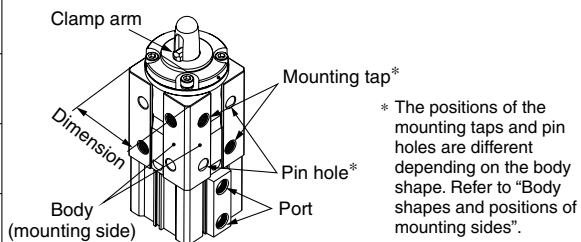
Body shapes and mounting positions (Note)

① Body shape		② Mounting side position (From top)	
Symbol	Dimension (mm)	Body shapes and mounting	Mounting positions
C	□70	Mounting tap: M10 x 1.5 Pin diameter: ø8H7	A Parallel side to port Port → Mounting side
		○: Mounting tap ●: Pin diameter Mounting hole: 6 points Mounting side: 2 sides	B Front side to port Mounting side → Port → Mounting side
T	□70	Mounting tap: M10 x 1.5 Pin diameter: ø8H7	A Parallel side to port Port → Mounting side
		○: Mounting tap ●: Pin diameter Mounting hole: 4 points Mounting side: 2 sides	B Front side to port Mounting side → Port → Mounting side
S	□66	Mounting tap: M10 x 1.5 Pin diameter: ø10H7	C a side → Port → b side
		○: Mounting tap ●: Pin diameter	D Port → a side
		○: Mounting tap ●: Pin diameter	E Port → b side
		Mounting hole: 4 points Mounting side: 2 sides	F Port → a side
		Mounting hole: 4 points Mounting side: 2 sides	F Port → b side
		○: Mounting tap ●: Pin diameter	F Port → a side
E	□66	Mounting tap: M12 x 1.75 Pin diameter: ø10H7	C a side → Port → b side
		○: Mounting tap ●: Pin diameter	D Port → a side
		○: Mounting tap ●: Pin diameter	E Port → b side
		Mounting hole: 4 points Mounting side: 2 sides	F Port → a side
		Mounting hole: 4 points Mounting side: 2 sides	F Port → b side
		○: Mounting tap ●: Pin diameter	F Port → a side

Guide pin diameter

Symbol	Guide pin diameter	Hole diameter of the work	Pin shape
125	12.5	For ø13	Round (R)
127	12.7		
145	14.5	For ø15	
147	14.7		
155	15.5	For ø16	Round (R) Diamond (D)
157	15.7		
175	17.5	For ø18	
177	17.7		
195	19.5	For ø20	Diamond (D)
197	19.7		
245	24.5	For ø25	
247	24.7		

\* Contact P/A for diamond shaped models with a guide pin of ø12.5 to ø15.7  
\* Contact P/A for models with guide pins that are different from those shown above.



Auto switch type

Nil	Without auto switch (Cylinder built-in magnet)
S	1 (Unclamp side)

\* Select an applicable auto switch model from the table below.  
\* Auto switch is not mounted and are supplied loose.

Number of auto switches

Nil	2
S	1 (Unclamp side)

\* D-P5DW□□ type is different side mounting. (Refer to page 15.)

Shim

Nil	No shim
S	With 2 mm shims

\* When a model includes shims, one 1mm shim and two 0.5 mm shims are attached.

Clamp arm position (clockwise from top)

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

\* Note) To compose a model number, combined the body shape number and mounting side position number. (Example) CKQSF50-177RB-P5DWLS

### Applicable Auto Switch

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage	Model	Lead wire length (m)		Prewired connector	Applicable load
					DC	Rail mounting	3 (L)	5 (Z)		
Solid state switch	Magnetic field resistant (2-color display)	Grommet (In-line)	Yes	2-wire	24 V	P5DW	●	●	○	Relay, PLC
						P5DWSC	—	—		

Note) P5DWSC is standard.

\* Lead wire length symbol 3 m ..... L (Example) P5DWL  
5 m ..... Z (Example) P5DWZ

\* Auto switch for CDQ2□50 except above auto switches can be mounted.

\* Besides the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 15.

\* Solid state switches marked with "○" are produced upon receipt of order.

# Series CKQ/CLKQ



## Basic Specifications

<b>Action</b>	Double acting	
<b>Bore size mm</b>	50	
<b>Fluid</b>	Air	
<b>Proof pressure</b>	1.5 MPa	
<b>Maximum operating pressure</b>	1.0 MPa	
<b>Minimum operating pressure</b>	CKQ: 0.1 MPa	CLKQ (With lock): 0.15 MPa*
<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 300 mm/sec	
<b>Port size</b>	1/4 (Rc, NPT, G)	

\* Minimum operating pressure when cylinder part and locking part use same piping is 0.2 MPa.

## 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 (unclamp direction)
<b>Maximum operating pressure</b>	1.0 MPa
<b>Unlocking port size</b>	1/8 (Rc, NPT, G)
<b>Holding force (N) (Maximum static load)</b>	982

## Clamp Specifications

<b>Clamp stroke</b>	Without shim	With shim
	10 <sup>0</sup> <sub>-0.5</sub> mm	10 mm to 12 mm
<b>Clamp arm</b>	1 pc.	
<b>Guide pin shape</b>	Round, Diamond	

Refer to "Selection" in page 22 regarding detailed specifications of the clamping force, etc.

## Weight

### CKQ (without lock) type

Unit: kg

Model Guide pin diameter (mm)	CKQC	CKQE	CKQS	CKQT
ø12.5	1.88	1.78	1.79	1.89
ø12.7	1.88	1.78	1.79	1.89
ø14.5	1.89	1.78	1.79	1.90
ø14.7	1.89	1.78	1.79	1.90
ø15.5	1.89	1.78	1.79	1.90
ø15.7	1.89	1.78	1.80	1.90
ø17.5	1.90	1.79	1.80	1.91
ø17.7	1.90	1.78	1.81	1.91
ø19.5	1.91	1.80	1.81	1.92
ø19.7	1.91	1.80	1.81	1.92
ø24.5	1.92	1.82	1.83	1.94
ø24.7	1.92	1.82	1.83	1.94

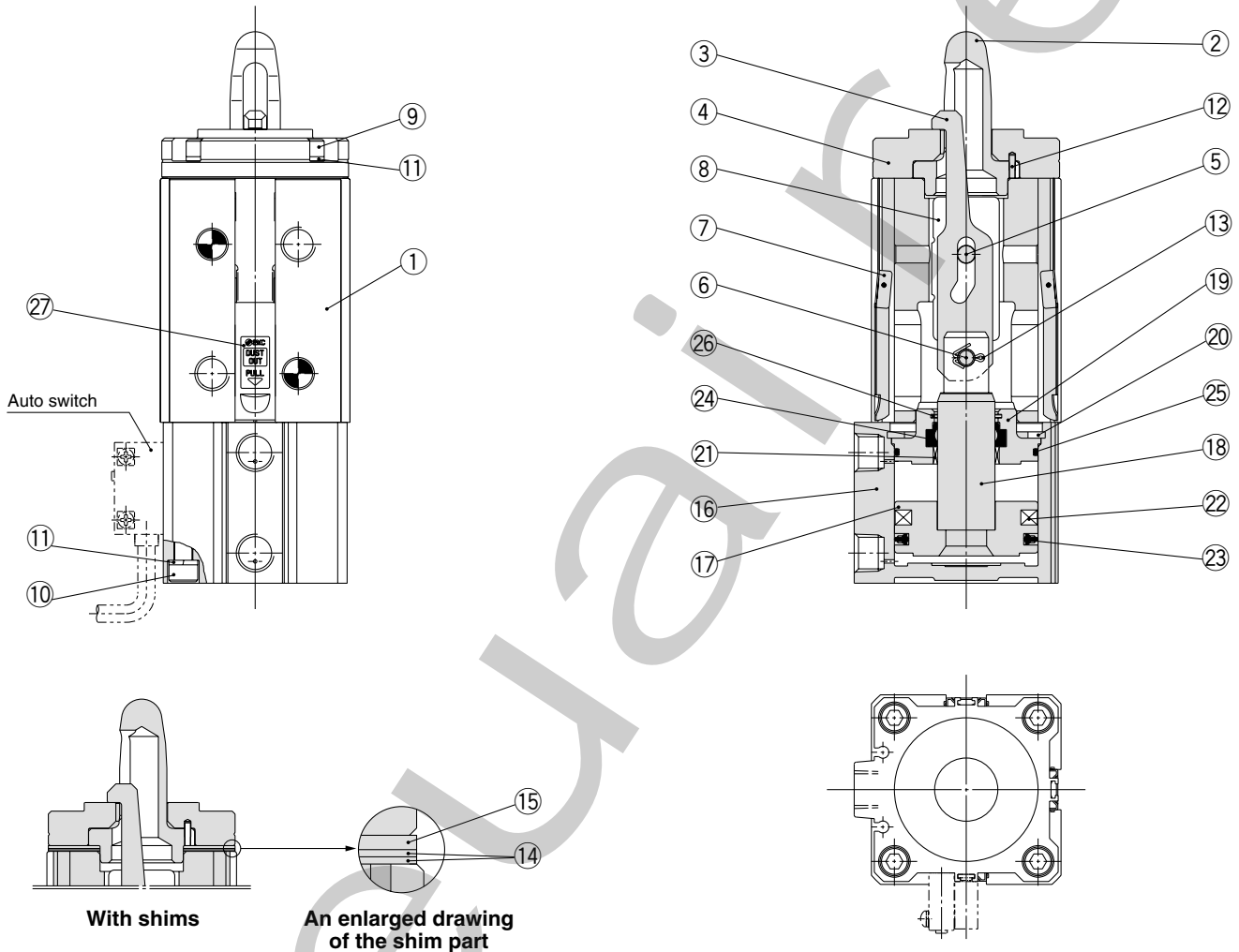
### CLKQ (with lock) type

Unit: kg

Model Guide pin diameter (mm)	CLKQC	CLKQE	CLKQS	CLKQT
ø12.5	2.40	2.29	2.31	2.41
ø12.7	2.40	2.29	2.31	2.41
ø14.5	2.40	2.30	2.31	2.42
ø14.7	2.40	2.30	2.31	2.42
ø15.5	2.40	2.30	2.31	2.42
ø15.7	2.41	2.30	2.31	2.42
ø17.5	2.41	2.31	2.32	2.43
ø17.7	2.41	2.31	2.32	2.43
ø19.5	2.42	2.32	2.33	2.44
ø19.7	2.42	2.32	2.33	2.44
ø24.5	2.44	2.34	2.35	2.45
ø24.7	2.44	2.34	2.35	2.46

**Construction**

**CKQ□□50**



**Parts List**

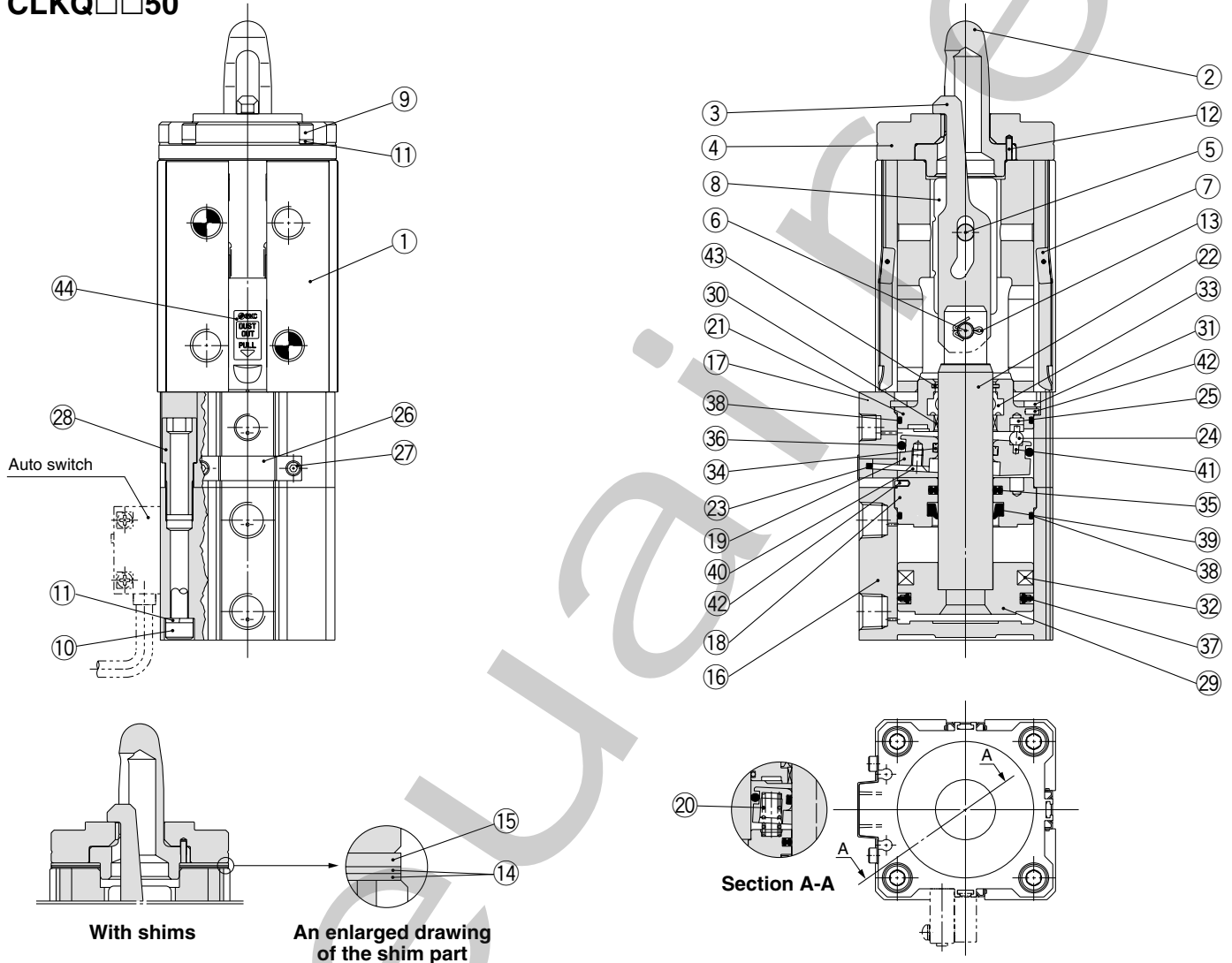
No.	Description	Material
1	<b>Body</b>	Aluminum alloy
2	<b>Guide pin</b>	Stainless steel
3	<b>Clamp arm</b>	Carbon steel
4	<b>Seat</b>	Structural steel
5	<b>Pin A</b>	Carbon steel
6	<b>Pin B</b>	Carbon steel
7	<b>Cover assembly</b>	Stainless steel
8	<b>Spatter cover</b>	Copper
9	<b>Hexagon socket head cap screw</b>	Structural steel
10	<b>Hexagon socket head cap screw</b>	Structural steel
11	<b>Spring washer</b>	Steel wire
12	<b>Spring pin</b>	Tool steel
13	<b>Cotter pin</b>	Stainless steel
14	<b>Shim A</b>	Stainless steel
15	<b>Shim B</b>	Stainless steel

No.	Description	Material
16	<b>Cylinder tube</b>	Aluminum alloy
17	<b>Piston</b>	Aluminum alloy
18	<b>Piston rod</b>	Stainless steel
19	<b>Collar</b>	Aluminum alloy
20	<b>Type C snap ring</b>	Tool steel
21	<b>Bushing</b>	Lead-bronze casted
22	<b>Plastic magnet</b>	Magnet
23	<b>Piston seal</b>	NBR
24	<b>Rod seal</b>	NBR
25	<b>Tube gasket</b>	NBR
26	<b>Coil scraper</b>	Bronze
27	<b>Seal</b>	PET

# Series CKQ/CLKQ

## Construction

CLKQ□□50



## Parts List

No.	Description	Material
1	Body	Aluminum alloy
2	Guide pin	Stainless steel
3	Clamp arm	Carbon steel
4	Seat	Structural steel
5	Pin A	Carbon steel
6	Pin B	Carbon steel
7	Cover assembly	Stainless steel
8	Spatter cover	Copper
9	Hexagon socket head cap screw	Structural steel
10	Hexagon socket head cap screw	Structural steel
11	Spring washer	Steel wire
12	Spring pin	Tool steel
13	Cotter pin	Stainless steel
14	Shim A	Stainless steel
15	Shim B	Stainless steel
16	Cylinder tube	Aluminum alloy
17	Lock body	Aluminum alloy
18	Intermediate collar	Aluminum alloy
19	Lock ring	Tool steel
20	Brake spring	Steel wire
21	Collar	Aluminum alloy
22	Piston rod	Stainless steel

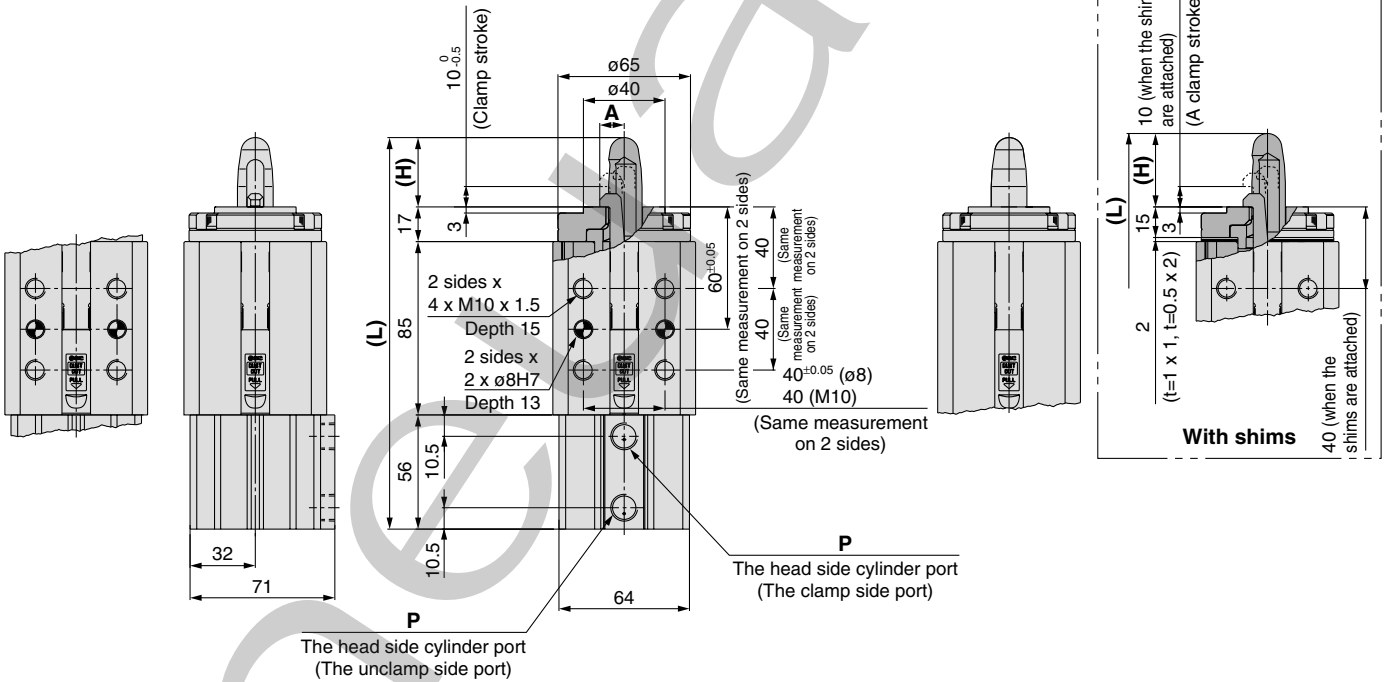
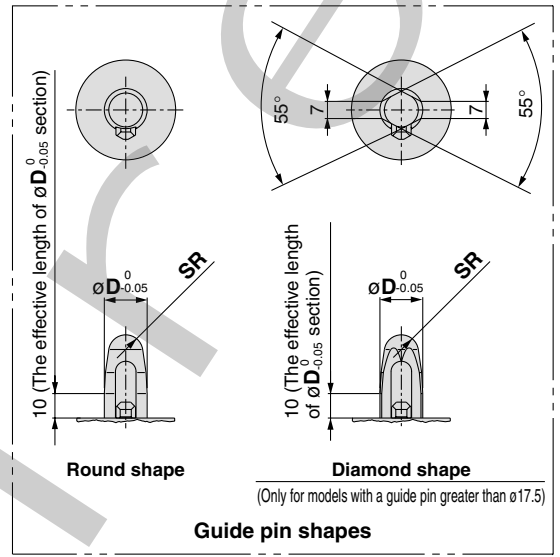
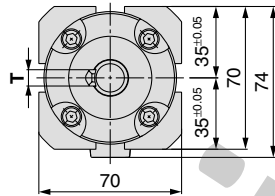
No.	Description	Material
23	Lever	Stainless steel
24	Pivot pin	Carbon steel
25	Pivot key	Carbon steel
26	Dust cover	Steel wire
27	Dust cover holding bolt	Structural steel
28	Unit holding bolt	Carbon steel
29	Piston	Aluminum alloy
30	Bushing	Lead-bronze casted
31	Type C snap ring	Tool steel
32	Plastic magnet	Magnet
33	Rod seal A	NBR
34	Rod seal B	NBR
35	Rod seal C	NBR
36	Piston seal A	NBR
37	Piston seal B	NBR
38	Tube gasket	NBR
39	Scraper	NBR
40	Hexagon socket countersunk head screw	Structural steel
41	Spring pin	Tool steel
42	Parallel pin	Stainless steel
43	Coil scraper	Bronze
44	Seal	PET

**Dimensions**

**CKQCB50**

**CKQCA50** (The angle of the cylinder port position against the mounting side is 90°)

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.



Applicable hole diameter	øD (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
ø13	ø12.5	4.5	29	31	9	6	187	189
	ø12.7	4.6						
ø15	ø14.5	5.5	29	31	11	7	187	189
	ø14.7	5.6						
ø16	ø15.5	6	29	31	11	7	187	189
	ø15.7	6.1						
ø18	ø17.5	7	34	36	12	8	192	194
	ø17.7	7.1						
ø20	ø19.5	8.5	34	36	13	8	192	194
	ø19.7	8.6						
ø25	ø24.5	10.5	34	36	15.5	8	192	194
	ø24.7	10.6						

P (Port thread size)		
Nil	TF	TN
Rc1/4	G1/4	NPT1/4

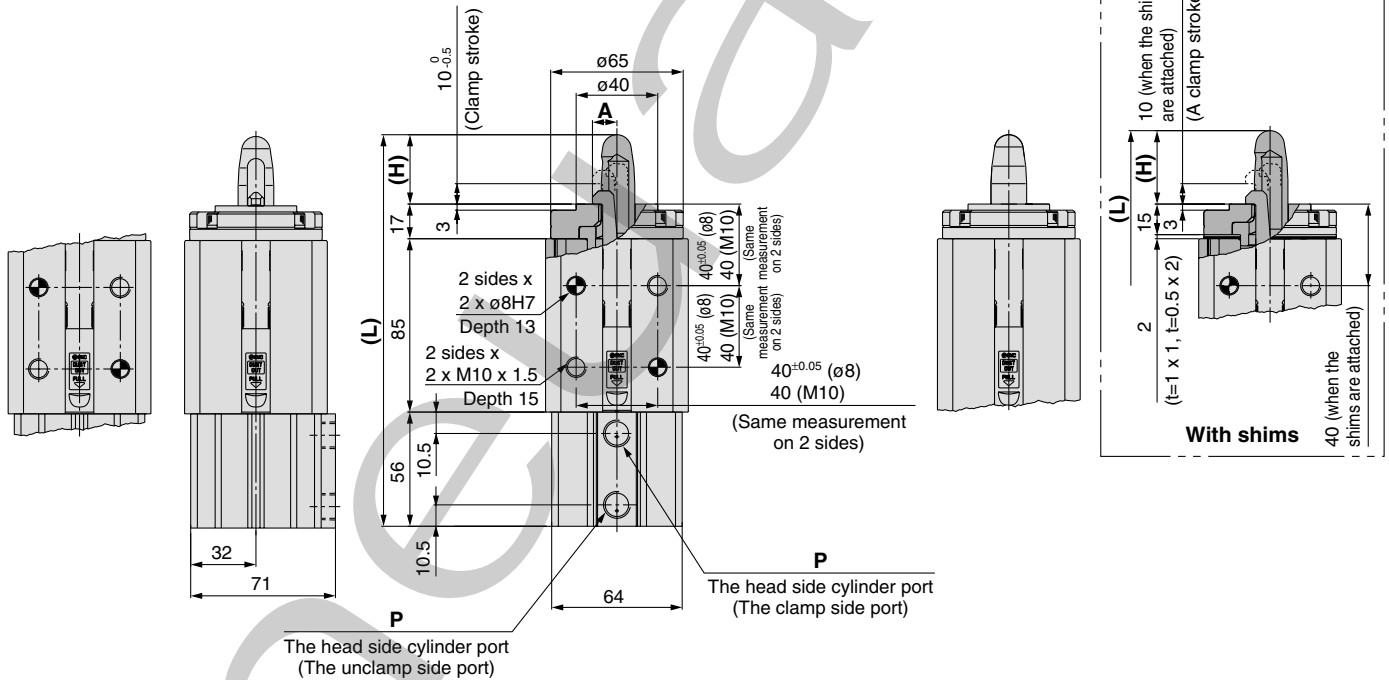
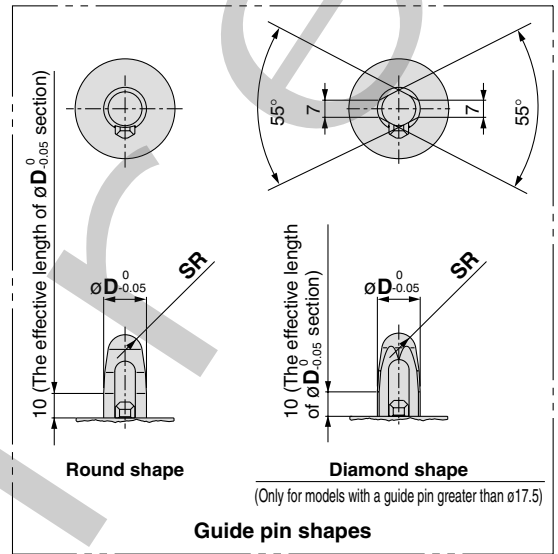
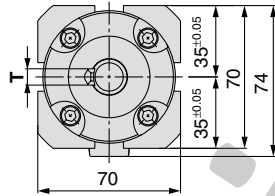
# Series CKQ/CLKQ

## Dimensions

### CKQTB50

CKQTA50 (The angle of the cylinder port position against the mounting side is 90°)

\* Refer to "How to Order" on page 1 for the mounting side and a port position relationship.




Applicable hole diameter	$\varnothing D$ (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
$\varnothing 13$	$\varnothing 12.5$	4.5	29	31	9	6	187	189
	$\varnothing 12.7$	4.6						
$\varnothing 15$	$\varnothing 14.5$	5.5	29	31	11	7	187	189
	$\varnothing 14.7$	5.6						
$\varnothing 16$	$\varnothing 15.5$	6	29	31	11	7	187	189
	$\varnothing 15.7$	6.1						
$\varnothing 18$	$\varnothing 17.5$	7	34	36	12	8	192	194
	$\varnothing 17.7$	7.1						
$\varnothing 20$	$\varnothing 19.5$	8.5	34	36	13	8	192	194
	$\varnothing 19.7$	8.6						
$\varnothing 25$	$\varnothing 24.5$	10.5	34	36	15.5	8	192	194
	$\varnothing 24.7$	10.6						


P (Port thread size)		
Nil	TF	TN
Rc1/4	G1/4	NPT1/4




**Dimensions**

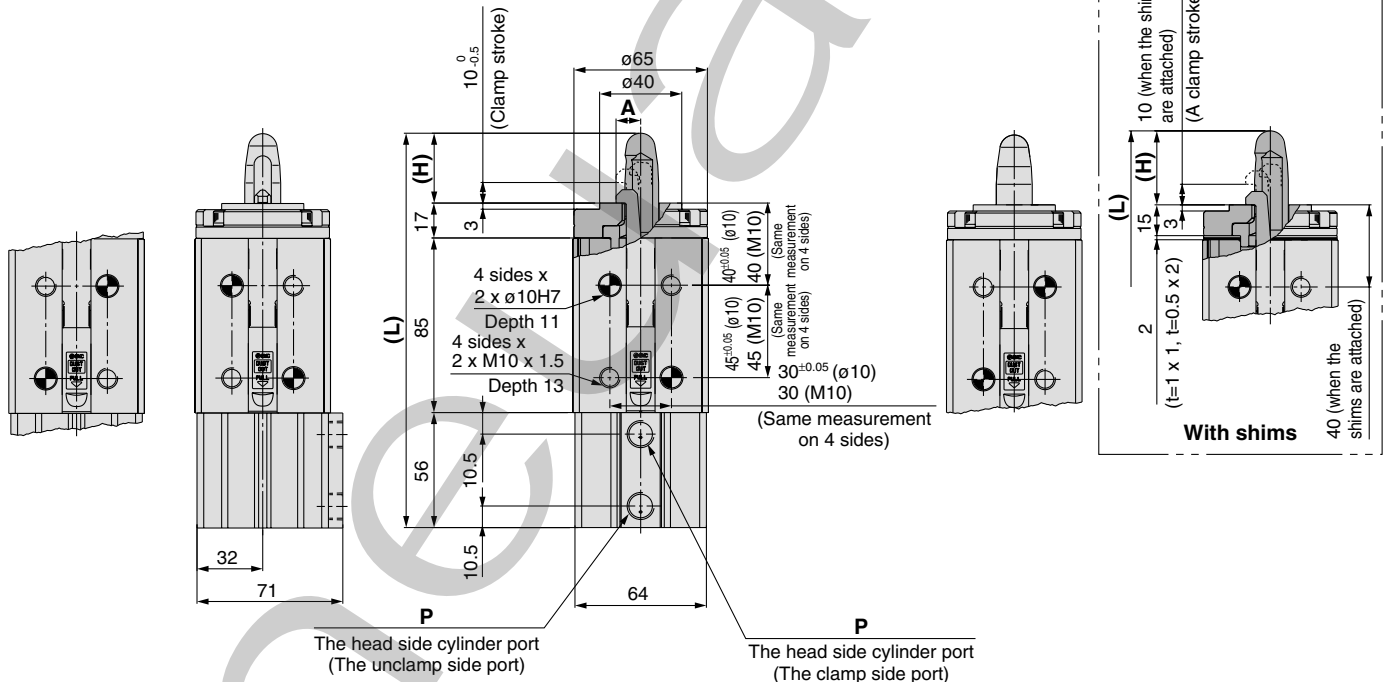
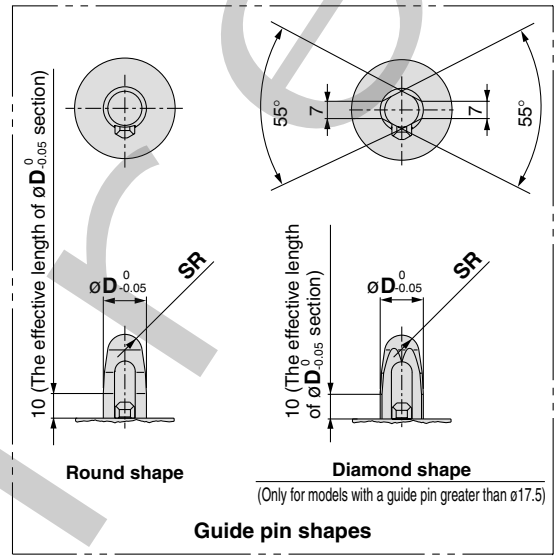
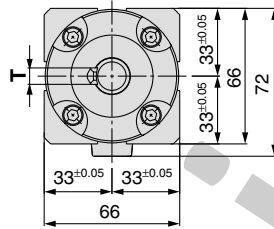
**CKQSC50**

(The mounting side and the port position of **CKQSD50** is )

(The mounting side and the port position of **CKQSE50** is )

(The mounting side and the port position of **CKQSF50** is )

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.




Applicable hole diameter	$\varnothing D$ (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
$\varnothing 13$	$\varnothing 12.5$	4.5	29	31	9	6	187	189
	$\varnothing 12.7$	4.6						
$\varnothing 15$	$\varnothing 14.5$	5.5	29	31	11	7	187	189
	$\varnothing 14.7$	5.6						
$\varnothing 16$	$\varnothing 15.5$	6	29	31	11	7	187	189
	$\varnothing 15.7$	6.1						
$\varnothing 18$	$\varnothing 17.5$	7	34	36	12	8	192	194
	$\varnothing 17.7$	7.1						
$\varnothing 20$	$\varnothing 19.5$	8.5	34	36	13	8	192	194
	$\varnothing 19.7$	8.6						
$\varnothing 25$	$\varnothing 24.5$	10.5	34	36	15.5	8	192	194
	$\varnothing 24.7$	10.6						


P (Port thread size)		
Nil	TF	TN
Rc1/4	G1/4	NPT1/4


# Series CKQ/CLKQ

## Dimensions

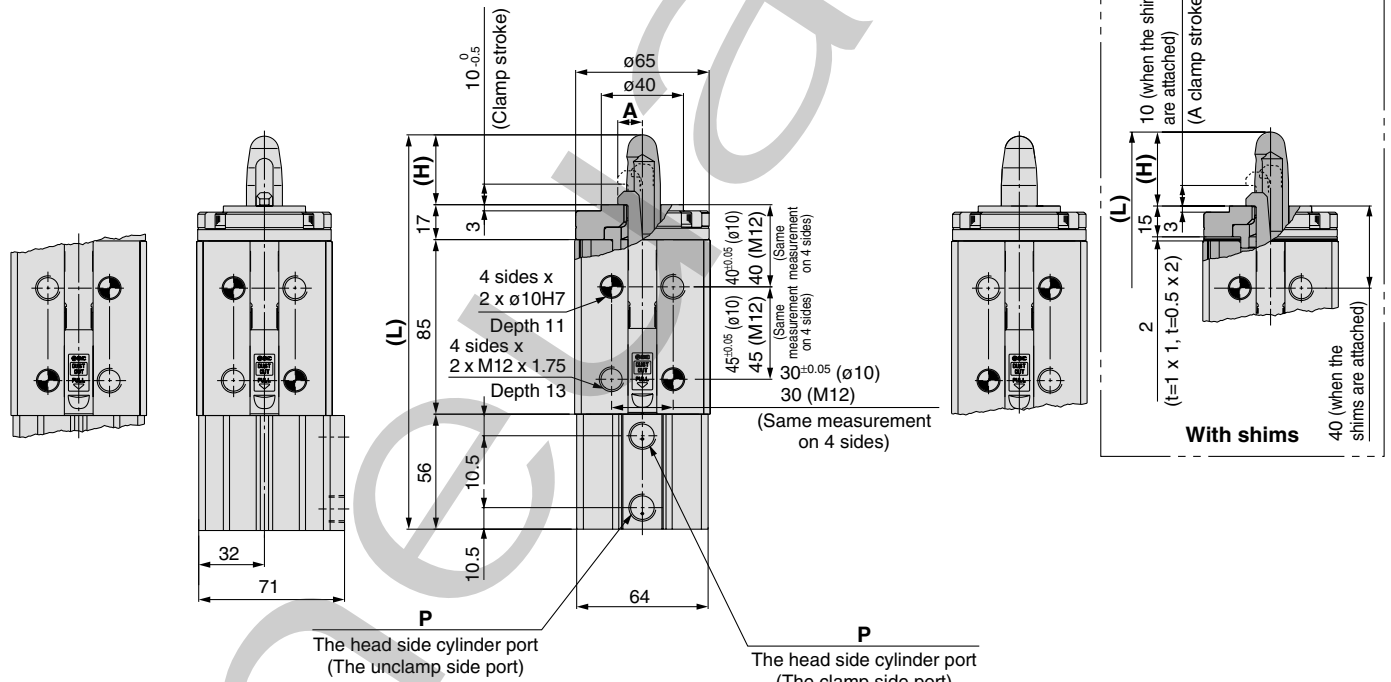
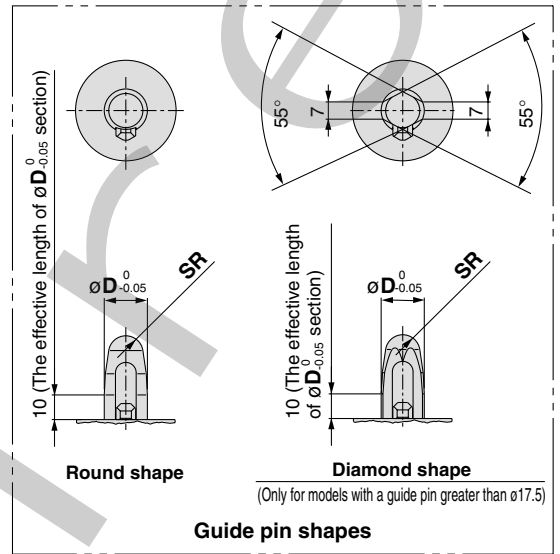
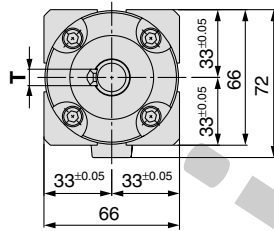
### CKQEC50

(The mounting side and the port position of **CKQED50** is .)

(The mounting side and the port position of **CKQEE50** is .)

(The mounting side and the port position of **CKQEF50** is .)

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.



Applicable hole diameter	$\varnothing D$ (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
$\varnothing 13$	$\varnothing 12.5$	4.5	29	31	9	6	187	189
	$\varnothing 12.7$	4.6						
$\varnothing 15$	$\varnothing 14.5$	5.5	29	31	11	7	187	189
	$\varnothing 14.7$	5.6						
$\varnothing 16$	$\varnothing 15.5$	6	29	31	11	7	187	189
	$\varnothing 15.7$	6.1						
$\varnothing 18$	$\varnothing 17.5$	7	34	36	12	8	192	194
	$\varnothing 17.7$	7.1						
$\varnothing 20$	$\varnothing 19.5$	8.5	34	36	13	8	192	194
	$\varnothing 19.7$	8.6						
$\varnothing 25$	$\varnothing 24.5$	10.5	34	36	15.5	8	192	194
	$\varnothing 24.7$	10.6						

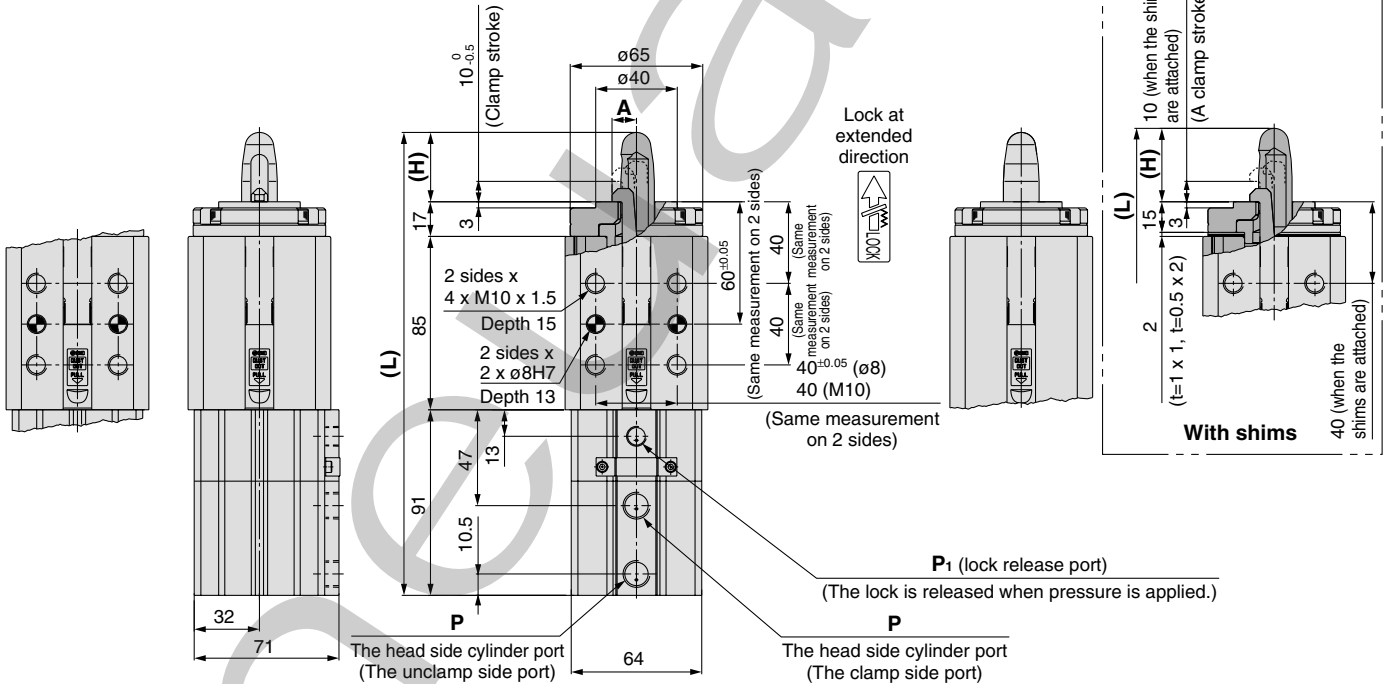
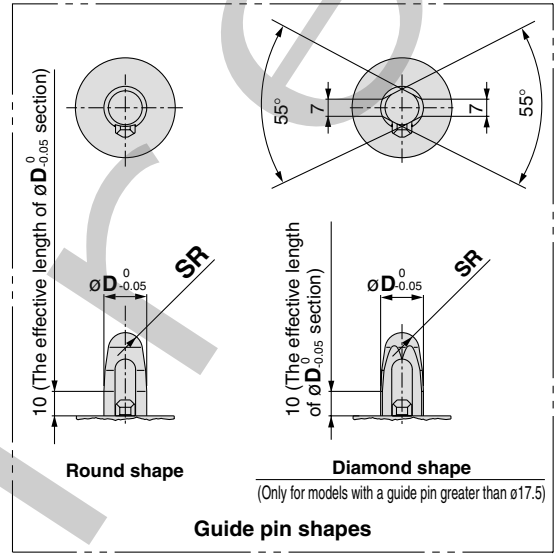
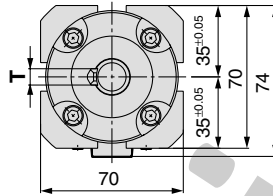
P (Port thread size)		
Nil	TF	TN
Rc1/4	G1/4	NPT1/4

**Dimensions**

**CLKQCB50**

**CLKQCA50** (The angle of the cylinder port position against the mounting side is 90°)

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.



Applicable hole diameter	øD (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
ø13	ø12.5	4.5	29	31	9	6	222	224
	ø12.7	4.6						
ø15	ø14.5	5.5	29	31	11	7	222	224
	ø14.7	5.6						
ø16	ø15.5	6	29	31	11	7	222	224
	ø15.7	6.1						
ø18	ø17.5	7	34	36	12	8	227	229
	ø17.7	7.1						
ø20	ø19.5	8.5	34	36	13	8	227	229
	ø19.7	8.6						
ø25	ø24.5	10.5	34	36	15.5	8	227	229
	ø24.7	10.6						

P (Port thread size)			P1 (Lock release port thread size)		
Nil	TF	TN	Nil	TF	TN
Rc1/4	G1/4	NPT1/4	Rc1/8	G1/8	NPT1/8

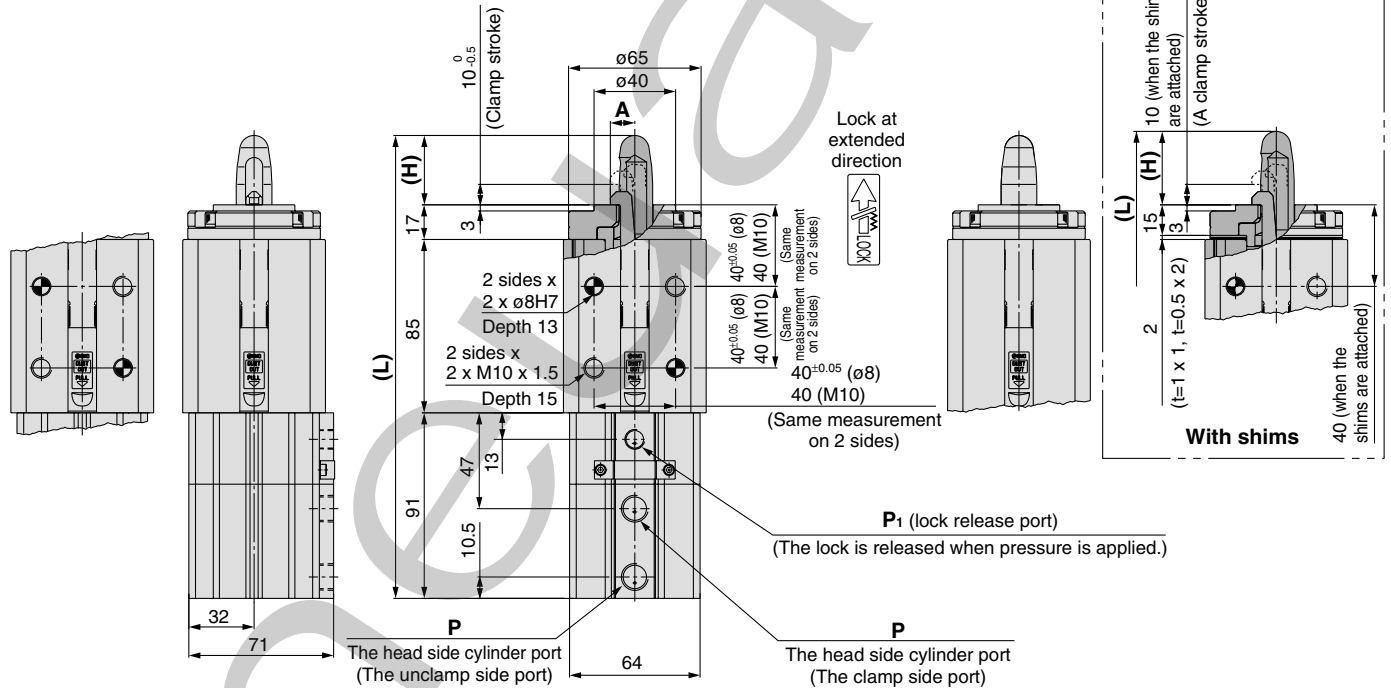
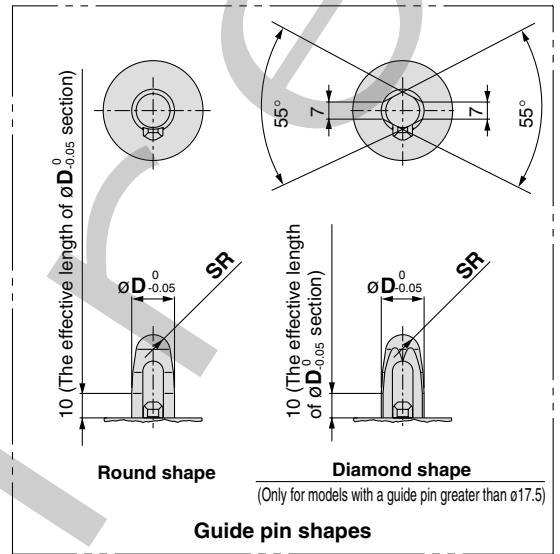
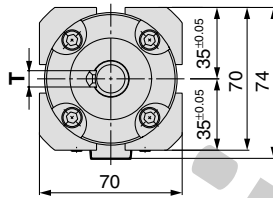
# Series CKQ/CLKQ

## Dimensions

### CLKQTB50

**CLKQTA50** (The angle of the cylinder port position against the mounting side is 90°)

\* Refer to "How to Order" on page 1 for the mounting side and a port position relationship.





Applicable hole diameter	$\varnothing D$ (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
$\varnothing 13$	$\varnothing 12.5$	4.5	29	31	9	6	222	224
	$\varnothing 12.7$	4.6						
$\varnothing 15$	$\varnothing 14.5$	5.5	29	31	11	7	222	224
	$\varnothing 14.7$	5.6						
$\varnothing 16$	$\varnothing 15.5$	6	29	31	11	7	222	224
	$\varnothing 15.7$	6.1						
$\varnothing 18$	$\varnothing 17.5$	7	34	36	12	8	227	229
	$\varnothing 17.7$	7.1						
$\varnothing 20$	$\varnothing 19.5$	8.5	34	36	13	8	227	229
	$\varnothing 19.7$	8.6						
$\varnothing 25$	$\varnothing 24.5$	10.5	34	36	15.5	8	227	229
	$\varnothing 24.7$	10.6						


P (Port thread size)			P <sub>1</sub> (Lock release port thread size)		
Nil	TF	TN	Nil	TF	TN
Rc1/4	G1/4	NPT1/4	Rc1/8	G1/8	NPT1/8

**Dimensions**

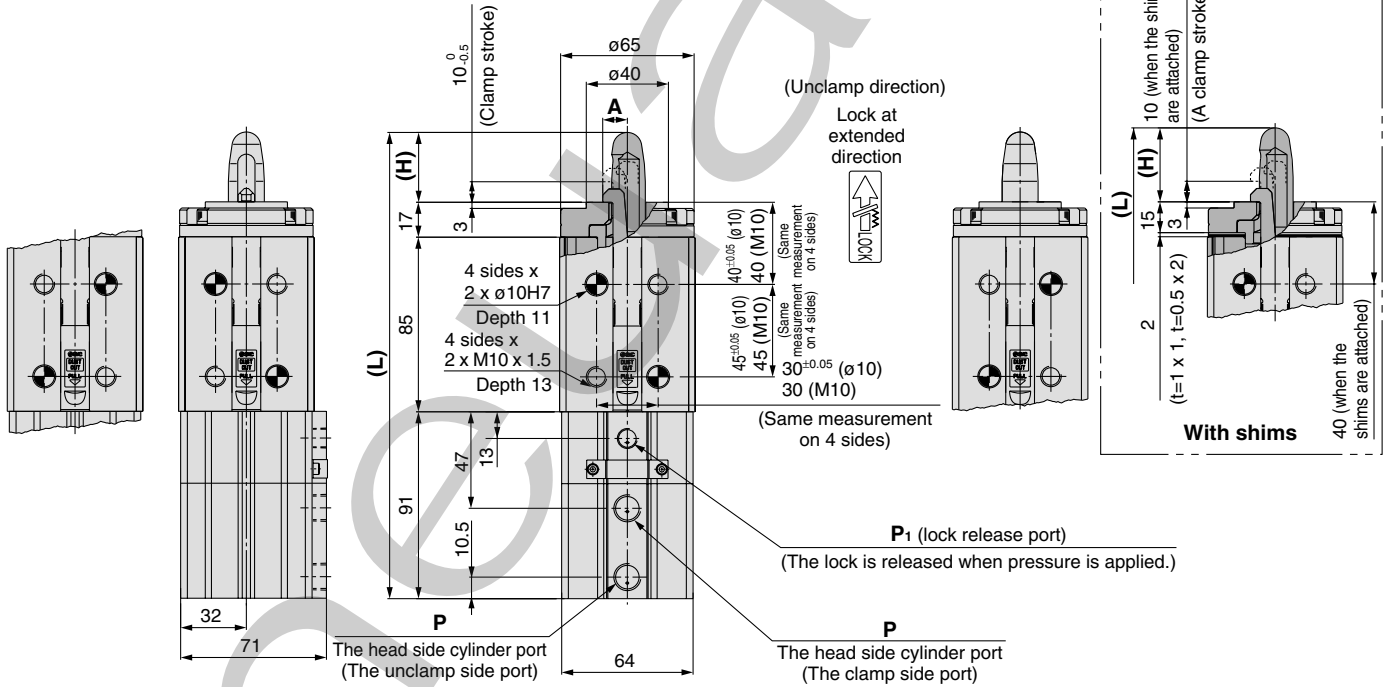
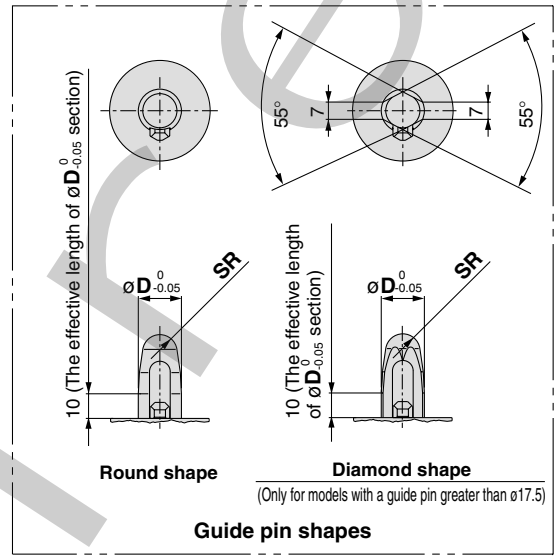
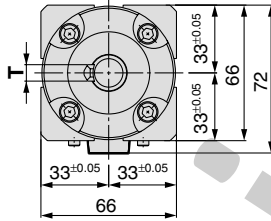
**CLKQSC50**

(The mounting side and the port position of **CLKQSD50** is )

(The mounting side and the port position of **CLKQSE50** is )

(The mounting side and the port position of **CLKQSF50** is )

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.




Applicable hole diameter	$\varnothing D$ (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
$\varnothing 13$	$\varnothing 12.5$	4.5	29	31	9	6	222	224
	$\varnothing 12.7$	4.6						
$\varnothing 15$	$\varnothing 14.5$	5.5	29	31	11	7	222	224
	$\varnothing 14.7$	5.6						
$\varnothing 16$	$\varnothing 15.5$	6	29	31	11	7	222	224
	$\varnothing 15.7$	6.1						
$\varnothing 18$	$\varnothing 17.5$	7	34	36	12	8	227	229
	$\varnothing 17.7$	7.1						
$\varnothing 20$	$\varnothing 19.5$	8.5	34	36	13	8	227	229
	$\varnothing 19.7$	8.6						
$\varnothing 25$	$\varnothing 24.5$	10.5	34	36	15.5	8	227	229
	$\varnothing 24.7$	10.6						


P (Port thread size)			P1 (Lock release port thread size)		
Nil	TF	TN	Nil	TF	TN
Rc1/4	G1/4	NPT1/4	Rc1/8	G1/8	NPT1/8


# Series CKQ/CLKQ

## Dimensions

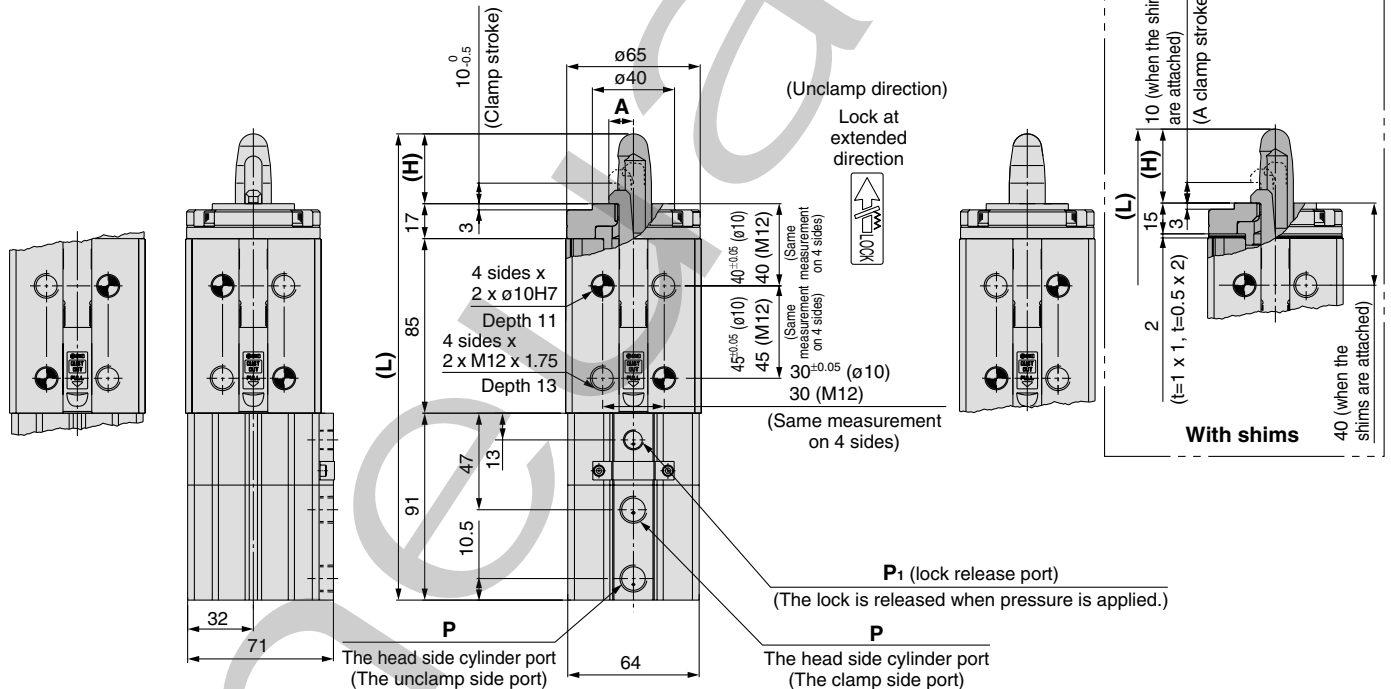
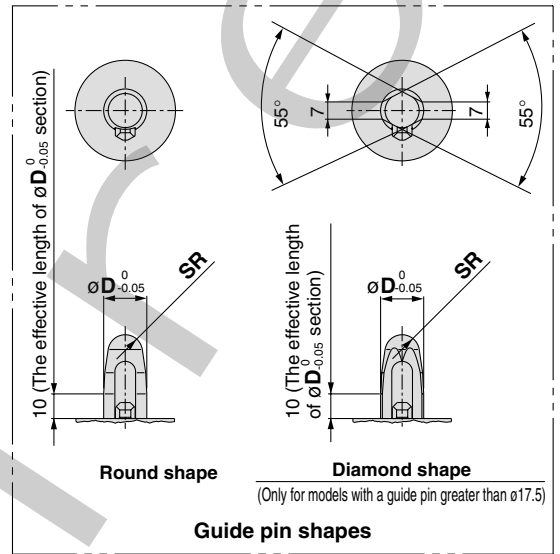
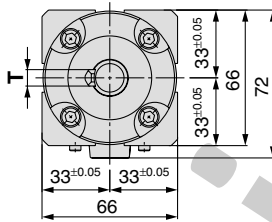
### CLKQEC50

(The mounting side and the port position of **CLKQED50** is .)

(The mounting side and the port position of **CLKQEE50** is .)

(The mounting side and the port position of **CLKQEF50** is .)

\* Refer to "How to Order" on page1 for the mounting side and a port position relationship.



Applicable hole diameter	øD (Guide pin diameter)	SR (The radius of the tip of the guide pin)	H (Pin height)		A (Arm length)	T (Arm thickness)	L (Total length)	
			Without shims	With shims			Without shims	With shims
ø13	ø12.5	4.5	29	31	9	6	222	224
	ø12.7	4.6						
ø15	ø14.5	5.5	29	31	11	7	222	224
	ø14.7	5.6						
ø16	ø15.5	6	29	31	11	7	222	224
	ø15.7	6.1						
ø18	ø17.5	7	34	36	12	8	227	229
	ø17.7	7.1						
ø20	ø19.5	8.5	34	36	13	8	227	229
	ø19.7	8.6						
ø25	ø24.5	10.5	34	36	15.5	8	227	229
	ø24.7	10.6						

P (Port thread size)			P1 (Lock release port thread size)		
Nil	TF	TN	Nil	TF	TN
Rc1/4	G1/4	NPT1/4	Rc1/8	G1/8	NPT1/8

## How to Mount the Auto Switches

### (1) For D-A7□, D-A80, D-F7□ and D-J79 models

Slide a mounting nut into the auto switch groove and align it to where the auto switch will be mounted. Insert a spacer into the auto switch groove directly on top of the mounting nut. Align the auto switch's mounting bracket with the depressed part of the spacer until both parts interlock. Insert a mounting screw into the auto switch's mounting bracket and loosely tighten the screw. Slide the auto switch to the desired detection position and securely tighten the auto switch with the screw. When tightening the mounting screw, use a watchmaker's screwdriver with a 5 to 6 mm handle diameter and tighten with a torque of 0.5 to 0.7 N·m. (Refer to Figure 1.)

Mounting bracket kit number	Items and number of each item
BQ-2	<ul style="list-style-type: none"> <li>• Switch mounting screw x 1</li> <li>• Switch spacer x 1</li> <li>• Switch mounting nut x 1</li> </ul>

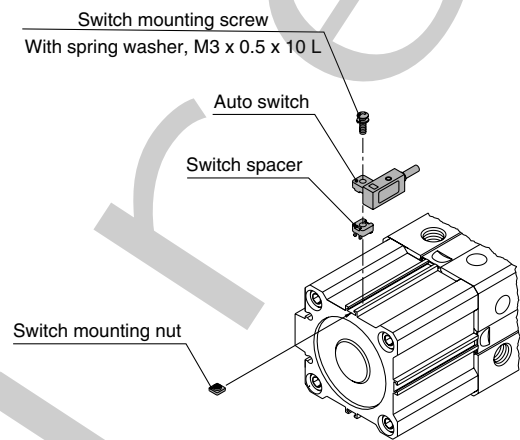


Figure 1

### (2) For D-A9□, D-F9□W and D-M9□ models

Insert the front of the auto switch into the auto switch groove and slide the switch to the desired detection position. Securely tighten the mounting screw on the auto switch. When tightening the mounting screw, use a watchmaker's screwdriver with a 5 to 6 mm handle diameter and tighten with a torque of 0.10 to 0.20 N·m. As a guide, an acceptable tightening level is reached by tightening the screw an additional 90 degrees (1/4 turn) from the point at which the screw is snug. (Refer to Figure 2.)

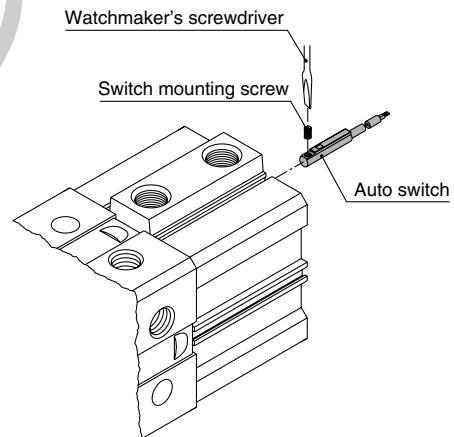


Figure 2

### (3) For D-P5DW□□ models

Insert the front side of the auto switch into the auto switch groove and slide the switch to the desired detection position. Securely tighten the mounting screw on the auto switch. When tightening the mounting screw, use a watchmaker's screw driver with a 5 to 6 mm handle diameter and tighten with a torque of 0.10 to 0.20 N·m. As a guide, an acceptable tightening level is reached by tightening the screw an additional 90 degrees (1/4 turn) from the point at which the screw is snug. (Refer to Figure 3.)

Mounting bracket kit number	Items and number of each item
BQP1-050	<ul style="list-style-type: none"> <li>• Switch mounting bracket x 1</li> <li>• Switch mounting nut x 1</li> <li>• Round head Phillips screw x 1</li> <li>• Hexagon socket head cap screw x 2</li> <li>• Spring washer x 4</li> </ul>

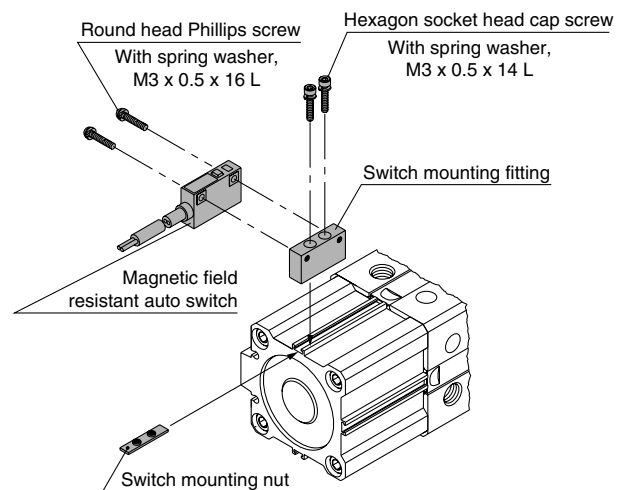


Figure 3

# Series CKQ/CLKQ

## Proper Auto Switch Mounting Position and Its Mounting Height

### Proper Auto Switch Mounting Position

Atmosphere	General use																		Welding			
Mounting	Rail mounting										Direct mounting								Rail mounting			
Model	D-A79W		D-A72		D-A73 D-A80		D-A7□H-D-A80H D-A73C-D-A80C D-F7□WV D-F7BAL D-F7BAVL D-F7□W-D-J79W D-F7NTL,D-F79F		D-F7□V D-J79C D-F7□ D-J79		D-A9□ D-A9□V		D-F9□W D-F9□WV		D-F9BAL		D-M9□V		D-M9□		D-P5DWL D-P5DWSC	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
CKQ	8.5		11		11		11.5		11.5		10		14		13		14		14		7	
CLKQ	43.5	33 or more	46	27 or more	46	28 or more	46.5	27 or more	46.5	22 or more	45	30 or more	49	22 or more	48	—	49	17 or more	49	54 or more	42	52 or more

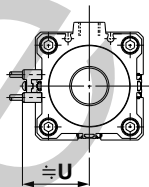
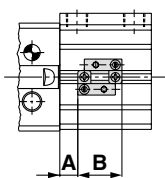
### Auto Switch Mounting Height

Atmosphere	General use										Welding					
Mounting	Rail mounting					Direct mounting					Rail mounting					
Model	D-A79W	D-A7□ D-A80	D-A7□H D-A80H D-F7BAL D-F7□W D-J79W D-F7NTL D-F79F D-F7□D-J79		D-A73C D-A80C	D-F7□WV D-F7BAVL D-F7□V		D-J79C	D-A9□V		D-F9□WV D-F9□V D-M9□V		D-F9BAL		D-P5DWL D-P5DWSC	
	≡U															
C(L)KQ	43.5	41	42	48	44.5	47.5	36.5	38.5	36	50						

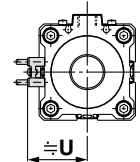
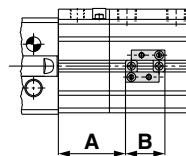
### Rail mounting type

· Applicable auto switch: D-A79W · D-A7□ · D-A80 · D-A7□H · D-A80H · D-A73C · D-A80C · D-F7□WV · D-F7BAL · D-F7BAVL · D-F7□W · D-J79W · D-F7NTL · D-F79F · D-F7□V · D-J79C · D-F7□ · D-J79

[For CKQ]



[For CLKQ]



### Direct mounting type

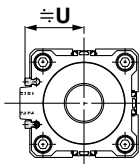
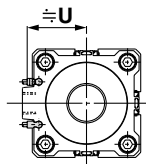
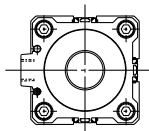
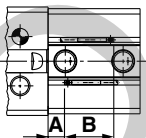
· Applicable auto switch: D-A9□ · D-A9□V · D-F9□WV · D-F9BAL · D-M9□V · D-F9□W

[For CKQ]

D-A9□, D-F9□W

D-A9□V, D-M9□V  
D-F9□WV

D-F9BA

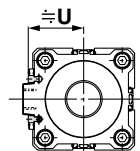
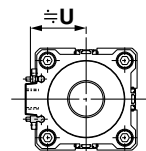
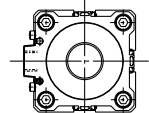
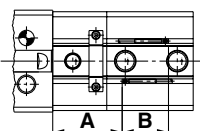


[For CLKQ]

D-A9□, D-F9□W

D-A9□V, D-M9□V  
D-F9□WV

D-F9BA



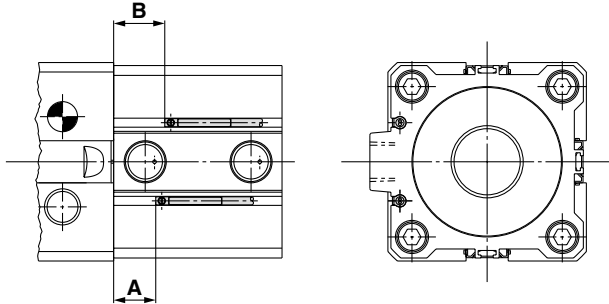


## Proper Auto Switch Mounting Position and Its Mounting Height

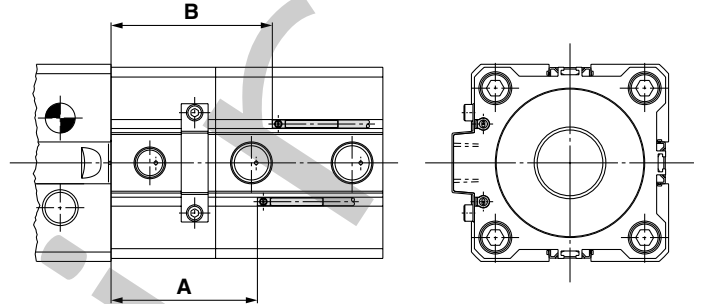
### Direct mounting type

· Applicable auto switch: **D-M9**□

[For CKQ]



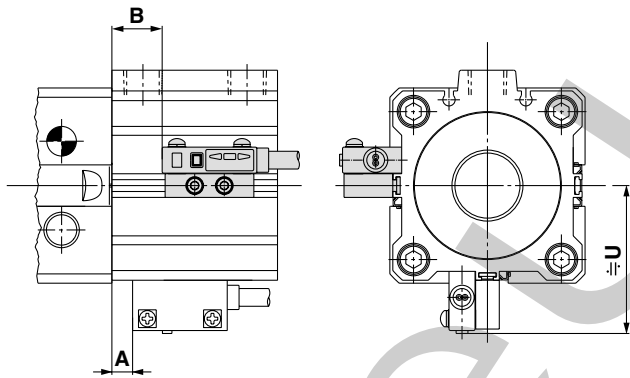
[For CLKQ]



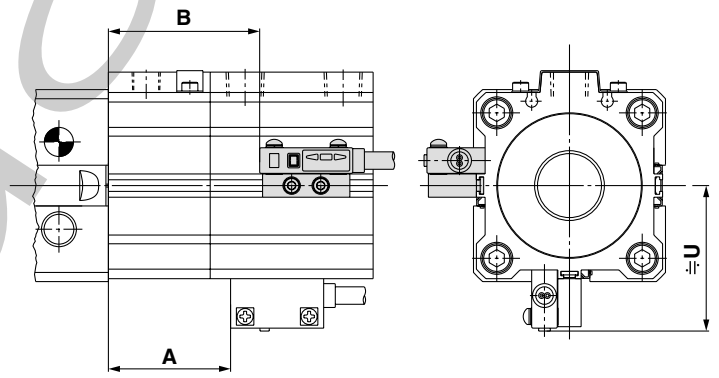
### Rail mounting type

· Applicable auto switch: **D-P5DWL** · **D-P5DWSC** (Different side)

[For CKQ]



[For CLKQ]



Besides the models listed in "How to Order," the following auto switches are applicable.

Auto switch type	Model	Electrical entry	Features
Reed switch	<b>D-A7</b> □	Grommet (Perpendicular)	With indicator light
	<b>D-A7</b> □ <b>H</b>	Grommet (In-line)	With indicator light
	<b>D-A73C</b>	Connector (Perpendicular)	With indicator light
	<b>D-A80</b>	Grommet (Perpendicular)	Without indicator light
	<b>D-A80H</b>	Grommet (In-line)	Without indicator light
	<b>D-A80C</b>	Connector (Perpendicular)	With indicator light
	<b>D-A90</b>	Grommet (In-line)	Without indicator light
	<b>D-A93</b>	Grommet (In-line)	With indicator light
	<b>D-A96</b>	Grommet (In-line)	With indicator light
	<b>D-A90V</b>	Grommet (Perpendicular)	Without indicator light
	<b>D-A93V</b>	Grommet (Perpendicular)	With indicator light
	<b>D-A96V</b>	Grommet (Perpendicular)	With indicator light
	<b>D-A79W</b>	Grommet (Perpendicular)	2-color display

Auto switch type	Model	Electrical entry	Features
Solid state switch	<b>D-F7</b> □	Grommet (In-line)	With indicator light
	<b>D-F7</b> □ <b>V</b>	Grommet (Perpendicular)	With indicator light
	<b>D-F7</b> □ <b>W</b>	Grommet (In-line)	2-color display
	<b>D-F79F</b>	Grommet (In-line)	2-color display
	<b>D-J79</b>	Grommet (In-line)	With indicator light
	<b>D-J79C</b>	Grommet (Perpendicular)	With indicator light
	<b>D-J79W</b>	Grommet (In-line)	2-color display
	<b>D-F7</b> □ <b>WV</b>	Grommet (Perpendicular)	2-color display
	<b>D-F7BAL</b>	Grommet (In-line)	With indicator light
	<b>D-F7BALV</b>	Grommet (Perpendicular)	With indicator light
	<b>D-F7NTL</b>	Grommet (In-line)	With timer
	<b>D-F9</b> □ <b>W</b>	Grommet (In-line)	With indicator light
	<b>D-F9</b> □ <b>WV</b>	Grommet (Perpendicular)	With indicator light
	<b>D-F9BAL</b>	Grommet (In-line)	2-color display
	<b>D-M9</b> □	Grommet (In-line)	With indicator light
<b>D-M9</b> □ <b>V</b>	Grommet (Perpendicular)	With indicator light	

# Series CKQ/CLKQ Auto Switch Specifications

## Auto Switches Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 $\mu$ A or less, 2-wire: 0.8 mA or less
Operating time	1.2 ms	1 ms or less <sup>2)</sup>
Impact resistance	300 m/s <sup>2</sup>	1000 m/s <sup>2</sup>
Insulation resistance	50 M $\Omega$ or more at 500 M VDC (Between lead wire and case)	
Withstand voltage	1500 VAC for 1 minute <sup>1)</sup> (Between lead wire and case)	1000 VAC for 1 minute (Between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC529 Standard IP67, Immersible construction (JIS C 0920)	

Note 1) Electrical entry: Connector type (A73C/A80C) and A9/A9□V type: 1000 VAC/min. (Between lead wire and the case)

Note 2) Except magnetic resistant 2-color indication type solid state switch (D-P5DWL/P5DWSC).

## Lead Wire Length

### Lead wire length indication

(Example) **D-M9P** **L**

#### Lead wire length

Nil	0.5 m
L	3 m
Z	5 m
N*	None

\* Applicable for the connector type (D-□□C) only.

Note 1) Applicable auto switch with 5 m lead wire ("Z")  
Reed switch: D-A73(C)(H)/A80C  
Solid state switch: Manufactured upon receipt of order as standard.

Note 2) Lead wire lengths of 3 m and 5 m are standard for magnetic field resistant 2-color indication type solid state switches. (0.5 m is not available.)

Note 3) For solid state switches with flexible wire specification, add "-61" at the end of the lead wire length.

(Example)

**D-F9PWL-61**

Flexible lead wire specifications

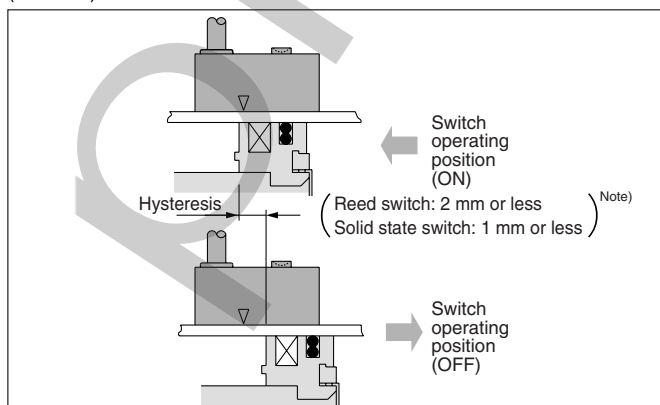
#### Part No. of Lead Wires with Connectors

(Applicable only for connector type)

Model	Lead wire length
D-LC05	0.5 m
D-LC30	3 m
D-LC50	5 m

## Auto Switch Hysteresis

Hysteresis is the distance between the position at which piston movement operates an auto switch to the position at which reverse movement turns the switch off. This hysteresis is included in part of the operating range (one side).



Note) Hysteresis may fluctuate due to the operating environment. Please contact P/A if hysteresis causes an operational problem.

## Contact Protection Box: CD-P11, CD-P12

### <Applicable switch types>

D-A9/A9□V, and D-A7□(H) type, D-A80□(H):(C)

The above auto switches do not have internal contact protection circuits.

1. Operating load is an inductive load.
2. The length of wiring to the load is 5 m or more.
3. The load voltage is 100 or 200 VAC.

A contact protection box should be used in any of the above conditions. Unless using a contact protection box, the contact life may be shortened. (Due to permanent energizing conditions.)

**D-A72(H) must be used with the contact protection box regardless of load styles and lead wire length.**

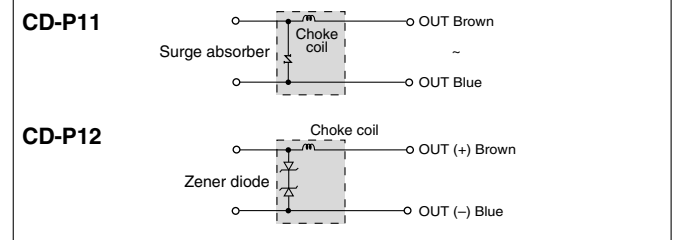
### Contact Protection Box Specifications

Part no.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Max. load current	25 mA	12.5 mA	50 mA

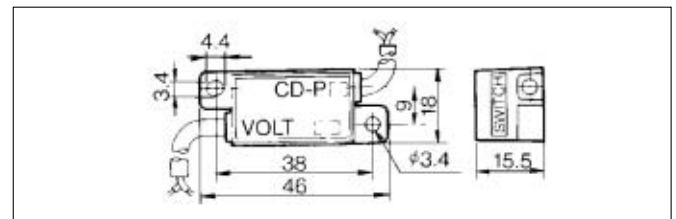
\* Lead wire length — Switch connection side 0.5 m  
Load connection side 0.5 m



### Contact Protection Box Internal Circuit



### Contact Protection Box/Dimensions



### Contact Protection Box Connection

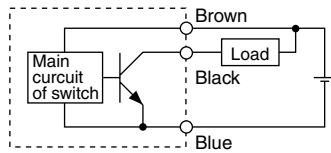
To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box, with a lead wire length of no more than 1 meter.

# Series CKQ/CLKQ

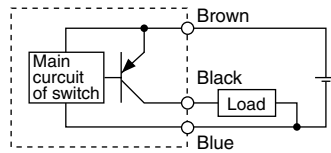
# Auto Switches Connection and Example

## Basic Wiring

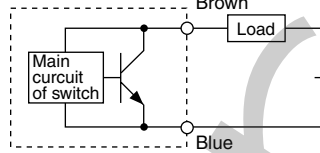
### Solid state 3-wire, NPN



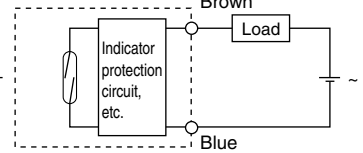
### Solid state 3-wire, PNP



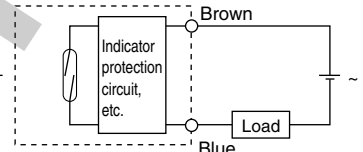
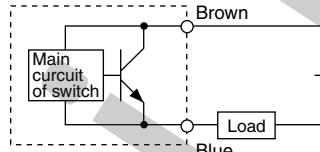
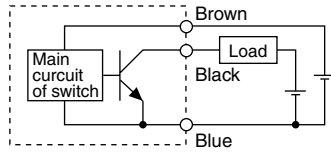
### Solid state 2-wire



### Reed switch 2-wire

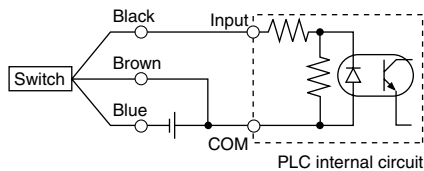


(Power supply for switch and load are separate)

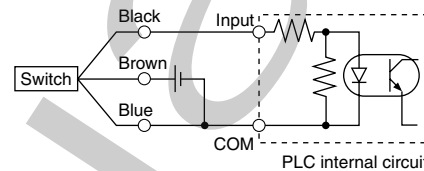


## Example of Connection with PLC (Programmable Logic Controller)

### • Sink input specifications 3-wire, NPN

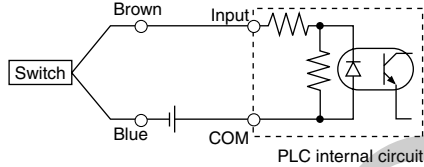


### • Source input specifications 3-wire, PNP

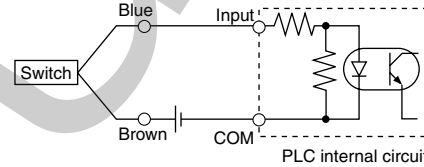


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

### 2-wire



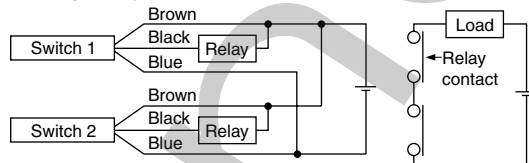
### 2-wire



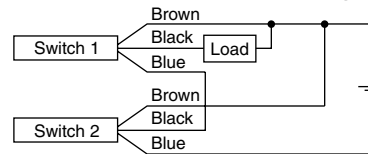
## Example of AND (Series) and OR (Parallel) Connection

### • 3-wire

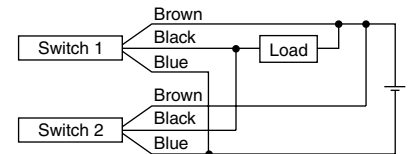
#### AND connection for NPN output (Using relays)



#### AND connection for NPN output (Performed with switches only)

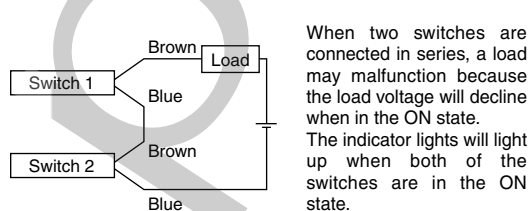


#### OR connection for NPN output



The indicator lights will light up when both switches are turned ON.

#### 2-wire with 2-switch AND connection

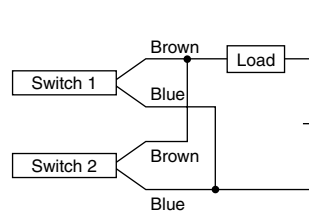


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the switches are in the ON state.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Internal voltage drop} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

Example: Power supply is 24 VDC  
Internal voltage drop in switch is 4 V.

#### 2-wire with 2-switch OR connection



(Solid state switch)  
When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed switch)  
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the switches.

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Load impedance is 3 kΩ.  
Leakage current from switch is 1 mA.

# Magnetic Field Resistant 2-color Indication Type Solid State Switch: Rail Mounting Style D-P5DWL



## Grommet

It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).



## Caution

### Precautions

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

## Auto Switch Specifications

PLC: Abbreviation of Programmable Logic Controller

D-P5DW (With indicator light)	
Auto switch model	D-P5DWL
Wiring type	2-wire (non-polar)
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 lights when ON. Optimum operating position.....Green LED lights when ON.

- Lead wire — Oil resistant vinyl heavy-duty cord,  $\phi 6$ , 0.5 mm<sup>2</sup>, 2 cores (Brown, Blue), 3 m
- Note 1) Regarding the common specifications of the solid state switches, refer to page 16.
- Note 2) Regarding the lead wire length, refer to page 16.

## Weight

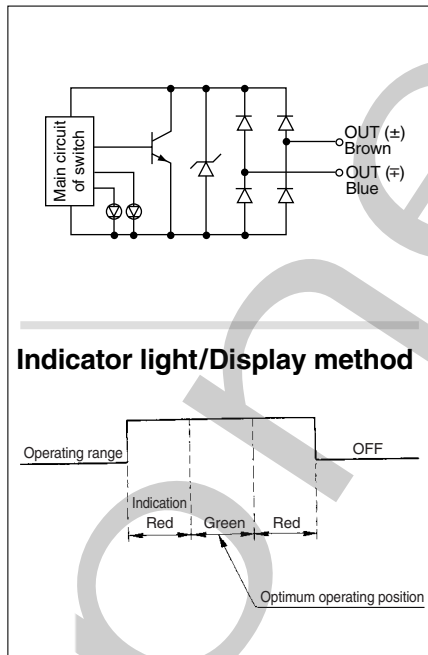
Unit: g

Auto switch model		D-P5DW
Lead wire length (m)	0.5	—
	3	150
	5	244

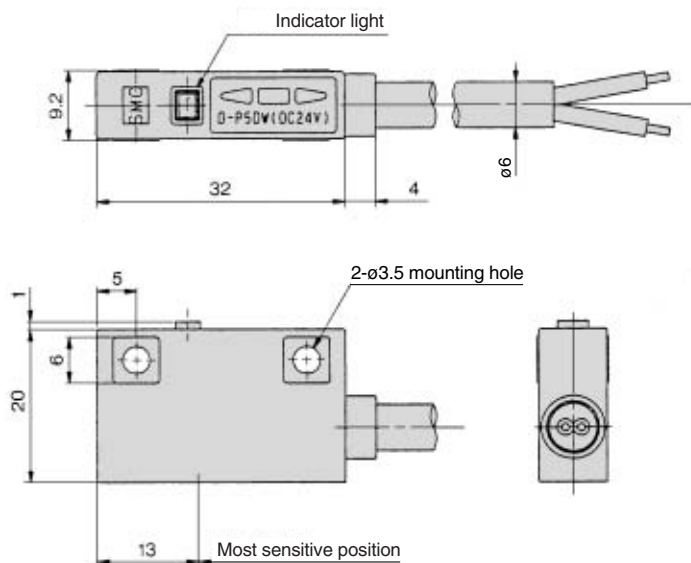
## Magnetic Field Resistance

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.  
Contact P/A when the AC welding current exceeds 16,000 A.

## Auto Switch Internal Circuit



## Dimensions



# Magnetic Field Resistant 2-color Indication Type Solid State Switch: Rail Mounting Style D-P5DWSC



## Grommet

It is possible to use in an environment which generates a magnetic field disturbance (AC magnetic field).



## Caution

### Precautions

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

## Auto Switch Specifications

PLC: Abbreviation of Programmable Logic Controller

D-P5DW (With indicator light)	
Auto switch model	D-P5DWL
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 lights when ON. Optimum operating position.....Green LED lights when ON.

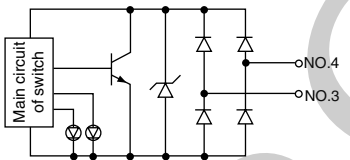
- Lead wire — Flexible fluorine resin heavy-duty cable,  $\phi 6$ ,  $0.5\text{mm}^2$ , 2 cores, 300 mm
- Impact resistance — Switch part :  $1000\text{ m/s}^2$ , Connector part :  $300\text{ m/s}^2$
- Insulation resistance —  $50\text{ M}\Omega$  or more at 500 VDC (between lead wire and case)
- Withstand voltage —  $1000\text{ VAC}$  for 1 minute (between lead wire and case)
- Ambient temperature —  $-10$  to  $60^\circ\text{C}$
- Enclosure IEC529 standard IP67, JIS 0920 Watertight structure

## 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. Contact P/A when the AC welding current exceeds 16,000 A.

## Dimensions

### Auto Switch Internal Circuit



### Indicator light/Display method

