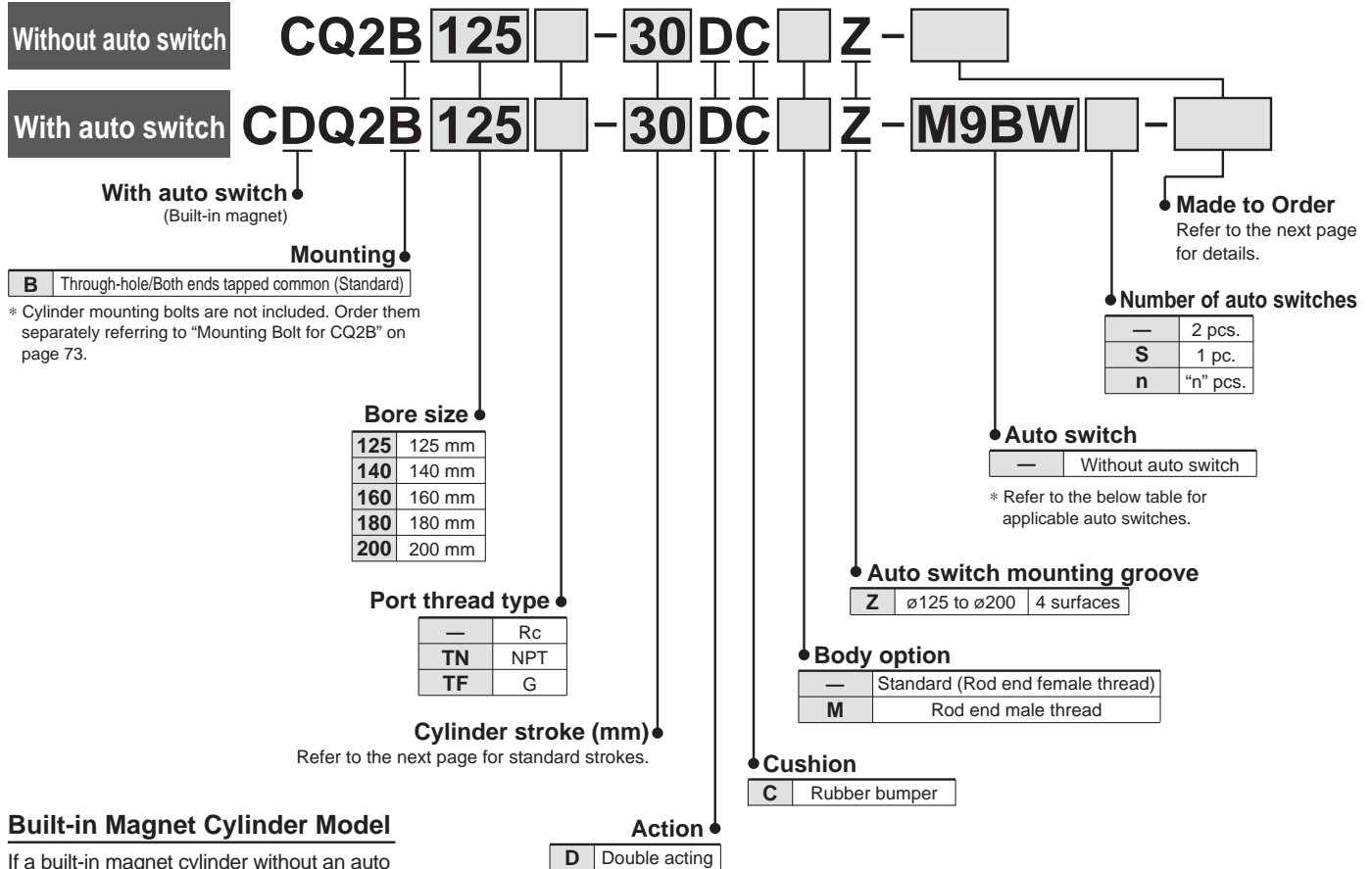


# Compact Cylinder: Large Bore Size Double Acting, Single Rod Series CQ2

ø125, ø140, ø160, ø180, ø200

## How to Order



### Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.  
(Example) CDQ2B140-30DCZ

### Applicable Auto Switches/Refer to pages 1263 to 1371 in Best Pneumatics No. 2 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	—	○				
				2-wire				M9BV	M9B	●	●	●	○	—	○				
	Diagnostic indication (2-colour indication)			3-wire (NPN)				M9NWV	M9NW	●	●	●	○	—	○			IC circuit	
				3-wire (PNP)				M9P WV	M9PW	●	●	●	○	—	○				
				2-wire				M9B WV	M9BW	●	●	●	○	—	○				
	Water resistant (2-colour indication)			3-wire (NPN)				M9NAV**	M9NA**	○	○	●	○	—	○			IC circuit	
				3-wire (PNP)				M9PAV**	M9PA**	○	○	●	○	—	○				
				2-wire				M9BAV**	M9BA**	○	○	●	○	—	○				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—		
				2-wire				12 V	100 V	A93V	A93	●	—	●	—	—	—	—	Relay, PLC
								5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—	—	IC circuit

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
 1 m ..... M (Example) M9NWM  
 3 m ..... L (Example) M9NWL  
 5 m ..... Z (Example) M9NWZ

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

\* There are other applicable auto switches other than the listed above. For details, refer to page 199.

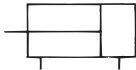
\* For details about auto switches with pre-wired connector, refer to pages 1328 and 1329 in Best Pneumatics No. 2.

# Compact Cylinder: Large Bore Size Double Acting, Single Rod **Series CQ2**

## Specifications



**Symbol**  
Double acting,  
Single rod



**Made to Order**  
(For details, refer to pages 201 to 235.)

Symbol	Specifications
-XA□	Change of rod end shape
-XB10	Intermediate stroke (Exclusive body type)
-XC85	Grease for food processing equipment
-X271	Fluororubber seals, ø125 to ø160 only

Bore size (mm)	125	140	160	180	200
<b>Action</b>	Double acting, Single rod				
<b>Fluid</b>	Air				
<b>Proof pressure</b>	1.5 MPa			1.05 MPa	
<b>Maximum operating pressure</b>	1.0 MPa			0.7 MPa	
<b>Minimum operating pressure</b>	0.05 MPa				
<b>Ambient and fluid temperature</b>	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)				
<b>Lubrication</b>	Not required (Non-lube)				
<b>Piston speed</b>	50 to 500 mm/s			20 to 400 mm/s	
<b>Allowable kinetic energy (J)</b>	7.4	9.8	12.4		
<b>Stroke length tolerance</b>	+1.4 mm (Note) 0				

Note) Stroke length tolerance does not include the amount of bumper change.

## Standard Strokes

Bore size (mm)	Standard stroke (mm)
<b>125, 140, 160 180, 200</b>	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200, 250, 300

## Manufacture of Intermediate Strokes

Type	A spacer is installed in the standard stroke body.	Exclusive body (-XB10)								
<b>Part no.</b>	Refer to "How to Order" for the standard model number. (P. 71)	Suffix "-XB10" to the end of standard model number. (P. 71)								
<b>Description</b>	Strokes in 5 mm intervals are available by installing a spacer in the standard stroke cylinder.	Strokes in 1 mm intervals are available by using an exclusive body with the specified stroke.								
<b>Stroke range</b>	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>125 to 200</td> <td>5 to 295</td> </tr> </tbody> </table>	Bore size	Stroke range	125 to 200	5 to 295	<table border="1"> <thead> <tr> <th>Bore size</th> <th>Stroke range</th> </tr> </thead> <tbody> <tr> <td>125 to 200</td> <td>11 to 299</td> </tr> </tbody> </table>	Bore size	Stroke range	125 to 200	11 to 299
Bore size	Stroke range									
125 to 200	5 to 295									
Bore size	Stroke range									
125 to 200	11 to 299									
<b>Example</b>	Part no.: CQ2B160-165DCZ CQ2B160-175DCZ with 10 mm width spacer inside The B dimension is 266 mm.	Part no.: CQ2B160-165DCZ-XB10 Makes 165 mm stroke tube. The B dimension is 256 mm.								

Refer to pages 193 to 199 for the specifications of cylinders with autoswitches.

- Auto switch proper mounting position (detection at stroke end) and its mounting height
- Minimum stroke for auto switch mounting
- Operating range
- Auto switch mounting brackets/Part no.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

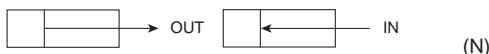
With Auto Switch

Auto Switch

Made to Order

# Series CQ2

## Theoretical Output



Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
125	IN	3376	5627	7878
	OUT	3682	6136	8590
140	IN	4313	7188	10063
	OUT	4618	7697	10776
160	IN	5655	9425	13195
	OUT	6032	10053	14074
180	IN	7257	12095	16933
	OUT	7634	12724	17813
200	IN	9048	15080	21112
	OUT	9425	15708	21991

## Weight

### Without Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.24	5.48	5.71	5.94	6.18	6.76	7.35	7.93	8.52	9.10	9.69	10.86	12.03
140	6.19	6.44	6.71	6.98	7.25	7.90	8.57	9.23	9.90	10.56	11.23	12.55	13.88
160	8.57	8.88	9.20	9.52	9.84	10.64	11.44	12.25	13.05	13.85	14.65	16.26	17.85
180	11.54	11.92	12.31	12.70	13.09	14.05	15.03	16.00	16.97	17.93	18.90	20.84	22.78
200	14.56	15.07	15.49	15.92	16.34	17.41	18.47	19.54	20.60	21.67	22.82	24.85	26.99

### With Auto Switch

Bore size (mm)	Cylinder stroke (mm)												
	10	20	30	40	50	75	100	125	150	175	200	250	300
125	5.30	5.54	5.77	6.01	6.24	6.83	7.40	7.99	8.58	9.16	9.75	10.92	12.09
140	6.26	6.51	6.78	7.05	7.32	7.97	8.64	9.30	9.97	10.63	11.30	12.62	13.95
160	8.65	8.96	9.28	9.60	9.92	10.72	11.52	12.33	13.13	13.93	14.73	16.34	17.93
180	11.62	12.00	12.39	12.78	13.17	14.13	15.11	16.08	17.05	18.01	18.98	20.92	22.86
200	14.64	15.15	15.57	16.00	16.42	17.49	18.55	19.62	20.68	21.75	22.90	24.93	27.07

## Mounting Bolt for CQ2B

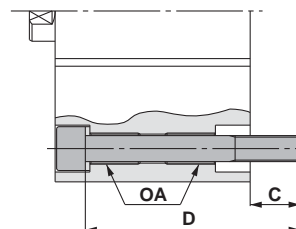
Mounting method: Mounting bolt for through-hole mounting of the C(D)Q2B is available as an option. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

**Example) CQ-M12 x 100L 4 pcs.**

Note 1) To install a through-hole type mounting bolt, make sure to use the flat washer that is provided.

Note 2) For mounting bolts for the stroke length exceeding 100 mm, use the OA screw provided on the cylinder tube to secure the cylinder.

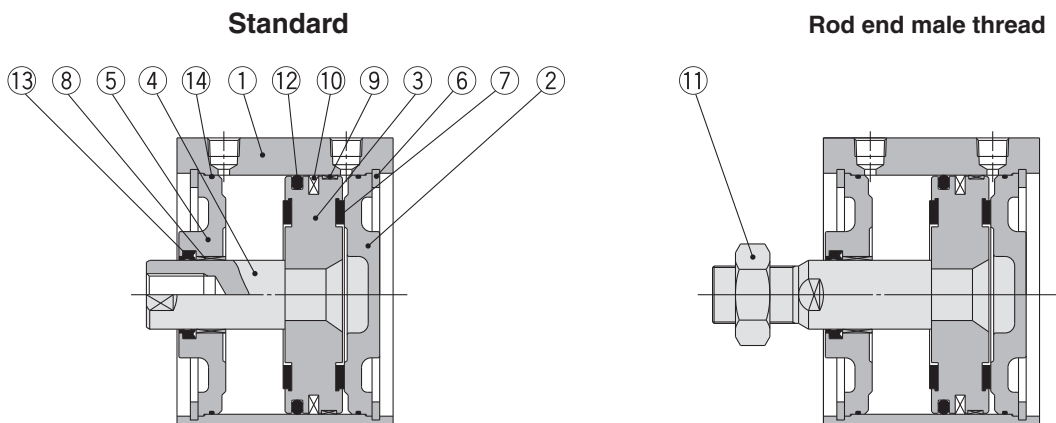
Material: Chromium molybdenum steel  
Surface treatment: Zinc chromated



Cylinder model	C	D	Mounting bolt part no.
<b>C□Q2B125/140-10DCZ</b>	22.9	100	CQ-M12 x 100L
<b>-20DCZ</b>		110	x 110L
<b>-30DCZ</b>		120	x 120L
<b>-40DCZ</b>		130	x 130L
<b>-50DCZ</b>		140	x 140L
<b>-75DCZ</b>		165	x 165L
<b>-100DCZ</b>		190	x 190L
<b>C□Q2B160-10DCZ</b>	27.7	110	CQ-M14 x 110L
<b>-20DCZ</b>		120	x 120L
<b>-30DCZ</b>		130	x 130L
<b>-40DCZ</b>		140	x 140L
<b>-50DCZ</b>		150	x 150L
<b>-75DCZ</b>		175	x 175L
<b>-100DCZ</b>		200	x 200L

Cylinder model	C	D	Mounting bolt part no.
<b>C□Q2B180-10DCZ</b>	36	125	CQ-M18 x 125L
<b>-20DCZ</b>		135	x 135L
<b>-30DCZ</b>		145	x 145L
<b>-40DCZ</b>		155	x 155L
<b>-50DCZ</b>		165	x 165L
<b>-75DCZ</b>		190	x 190L
<b>-100DCZ</b>		215	x 215L
<b>C□Q2B200-10DCZ</b>	39	135	CQ-M18 x 135L
<b>-20DCZ</b>		145	x 145L
<b>-30DCZ</b>		155	x 155L
<b>-40DCZ</b>		165	x 165L
<b>-50DCZ</b>		175	x 175L
<b>-75DCZ</b>		200	x 200L
<b>-100DCZ</b>		225	x 225L

## Construction



### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodised
2	Head cover	Carbon steel	Nickel plated
3	Piston	Aluminum alloy	Chromated
4	Piston rod	Carbon steel	Hard chrome plated
5	Rod cover	Carbon steel	Nickel plated
6	Retaining ring	Carbon tool steel	Phosphate coated
7	Bumper	Urethane	
8	Bushing	Bearing alloy	
9	Wear ring	Resin	
10	Magnet	—	For CDQ2B□ only
11	Rod end nut	Carbon steel	Nickel plated
12	Piston seal	NBR	
13	Rod seal	NBR	
14	Tube gasket	NBR	

### Replacement Parts/Seal Kit

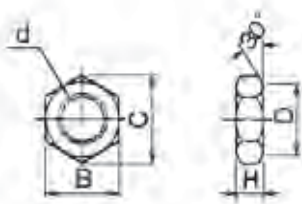
Bore size (mm)	Kit no.	Contents
125	CQ2B125-PS	Kits include items ⑫, ⑬, ⑭ from the table.
140	CQ2B140-PS	
160	CQ2B160-PS	
180	CQ2B180-PS	
200	CQ2B200-PS	

\* Seal kit includes ⑫, ⑬, ⑭. Order the seal kit, based on each bore size.

\* Since the seal kit does not include a grease pack, order it separately.

**Grease pack part no.:** GR-S-010 (10 g)

### Rod End Nut



Material: Carbon steel  
Surface treatment: Nickel plated

Part no.	Applicable bore size (mm)	d	H	B	C	D
NT-12	125, 140	M30 x 1.5	18	46	53.1	44
NT-16	160, 180, 200	M36 x 1.5	21	55	63.5	53

### Retaining Ring Installation/Removal

#### ⚠ Caution

- For installation and removal, use an appropriate pair of pliers (tool for installing a type C retaining ring).
- Even if a proper plier (tool for installing a type C retaining ring) is used, it is likely to inflict damage to a human body or peripheral equipment, as a retaining ring may be flown out of the tip of a plier (tool for installing a type C retaining ring). Be much careful with the popping of a retaining ring. Besides, be certain that a retaining ring is placed firmly into the groove of rod cover before supplying air at the time of installment.

Standard  
Large Bore Size  
Long Stroke  
Non-rotating Rod  
Axial Piping  
Anti-lateral Load  
With End Lock  
Water Resistant  
With Auto Switch  
Auto Switch  
Made to Order

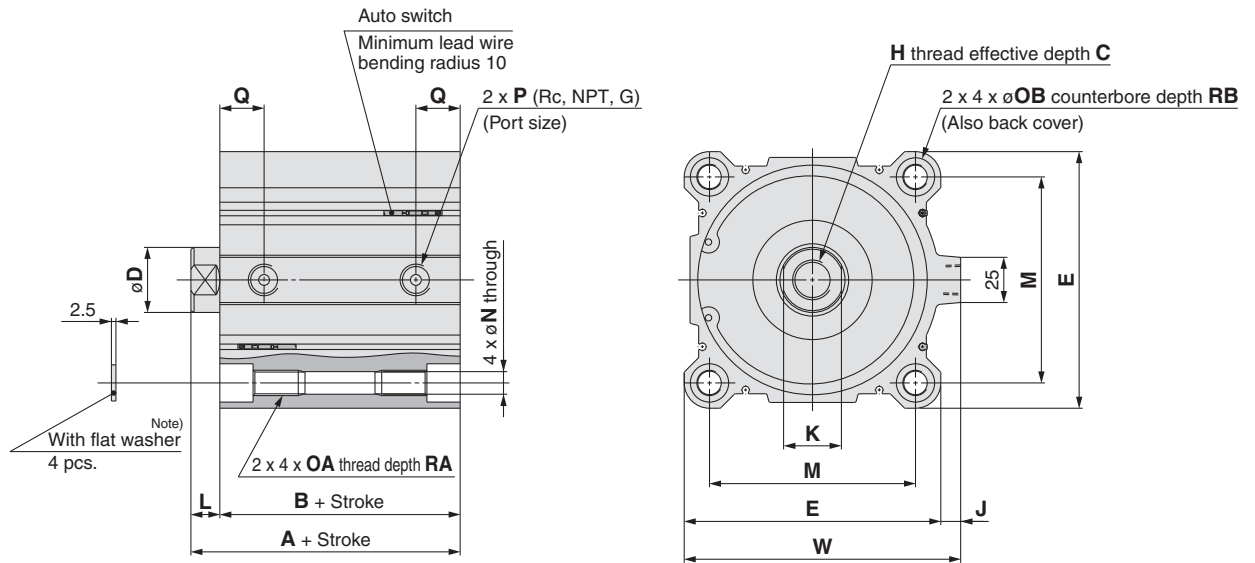
# Series CQ2

## Dimensions

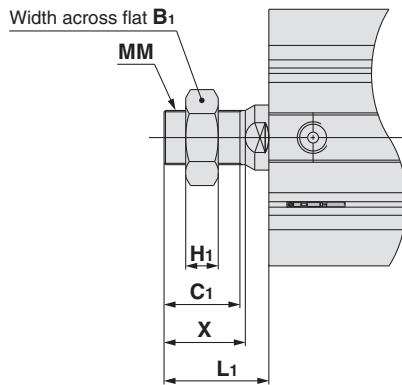
### ∅125 to ∅160

The dimensions are the same with or without an auto switch.

Standard (Through-hole): C□Q2B



#### Rod end male thread



#### Rod End Male Thread (mm)

Bore size (mm)	B <sub>1</sub>	C <sub>1</sub>	H <sub>1</sub>	L <sub>1</sub>	MM	X
125	46	42	18	58	M30 x 1.5	45
140	46	42	18	58	M30 x 1.5	45
160	55	47	21	64	M36 x 1.5	50

Bore size (mm)	Standard stroke	A	B	C	D	E	H	J	K	L	M	N	OA	OB	P	Q	RA	RB	W
125	10, 20, 30, 40, 50	99	83	30	36	142	M22 x 2.5	11	32	16	114	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	153
140	75, 100, 125, 150	99	83	30	36	158	M22 x 2.5	10	32	16	128	12.5	M14 x 2	21.2	3/8	24.5	25	18.4	168
160	175, 200, 250, 300	108	91	33	40	178	M24 x 3	10	36	17	144	14.5	M16 x 2	24.2	3/8	27.5	28	21.2	188

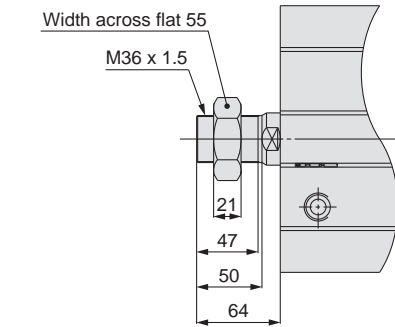
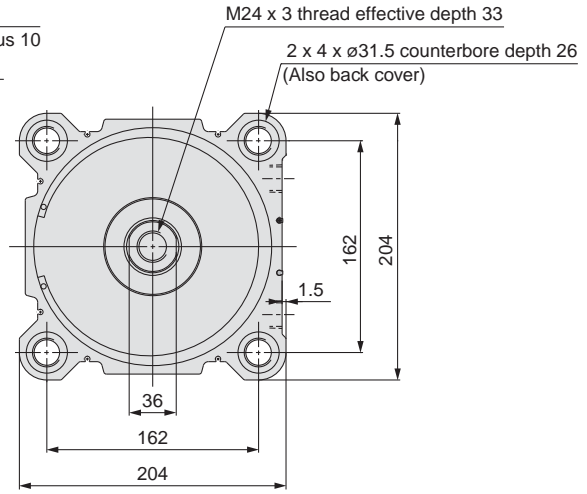
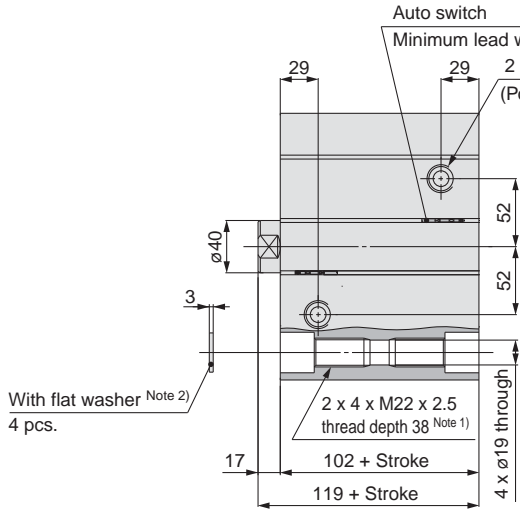
Note) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Dimensions

**∅180, ∅200**

**∅180**

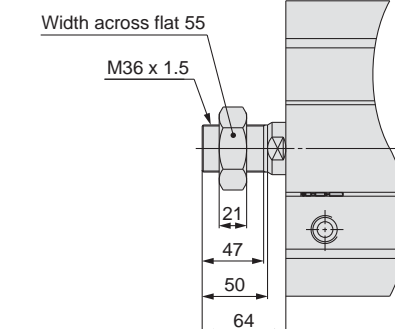
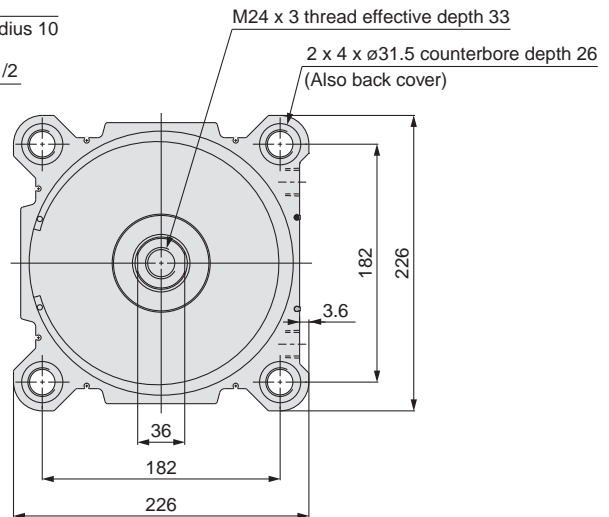
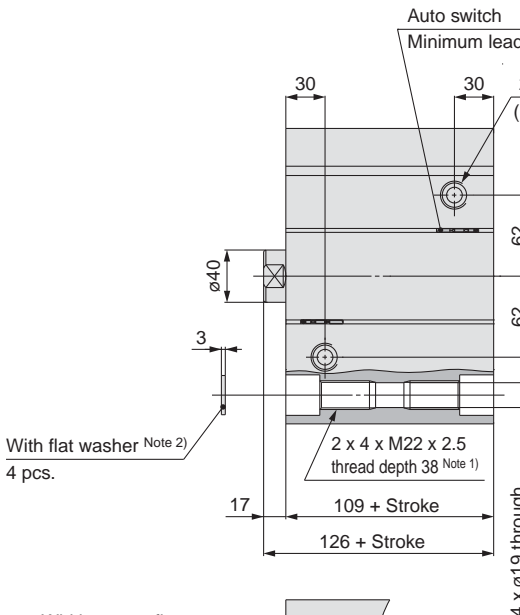
The dimensions are the same with or without an auto switch.



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

**∅200**



Note 1) In the case of 20 mm stroke or less, it would come with 2 x 4 x M22 x 2.5 through thread.

Note 2) Be sure to use the attached flat washer for mounting cylinder with through-holes.

Standard

Large Bore Size

Long Stroke

Non-rotating Rod

Axial Piping

Anti-lateral Load

With End Lock

Water Resistant

With Auto Switch

Auto Switch

Made to Order