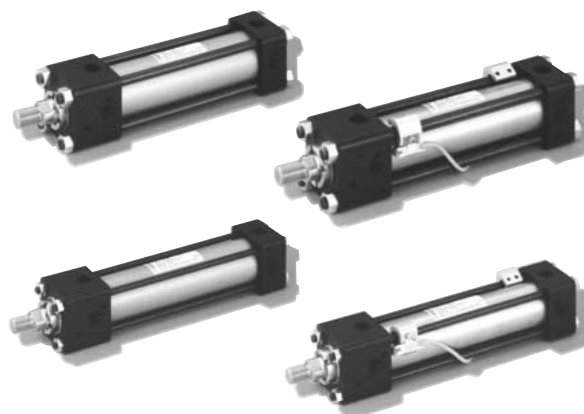


## 16 MPa double-acting hydraulic cylinder with size conforming to JIS standards

- Designed to ISO 6020-2/JIS B8367-2 cylinder.
- Compact design and lightweight (Compared to previous JIS standard.)
- New floating cushion provides effective cushioning and quick start of each stroke.
- Switches can be used to all bore sizes in standard, 32 mm to 160 mm.
- Seals in sliding sections were designed to ISO standard.
- Light weight and compact. (Comparison to 140H-8 series)



### Standard specifications

Types	Specifications of general purpose and cutting fluid proof types
Nominal pressure	16 MPa
Maximum allowable pressure	20 MPa
Proof test pressure	24 MPa
Minimum working pressure	Rod side: Rod A 0.6 MPa or less Head side: 0.3 MPa or less Rod B 0.45 MPa or less
Operating speed range (Note 3)	$\phi 32 - \phi 63$ : 8 - 400 mm/s $\phi 80 - \phi 125$ : 8 - 300 mm/s $\phi 140 \cdot \phi 160$ : 8 - 200 mm/s
Temperature range (Ambient temperature and oil temperature)	Standard type : -10 - + 80°C Note 4) Switch set : -10 - + 70°C
Structure of cushioning	Metal fitting system
Adaptable working oil	Petroleum-based fluid (When using other fluids, refer to the table showing applicability of fluids.)
Tolerance of thread	JIS6g/6H
Port thread	Rc (JIS B 0203) • G (ISO 1179-1) Note 5)
Tolerance of stroke	100 mm or less $^{+0.8}_0$ 101-250 mm $^{+1.0}_0$ 251-630 mm $^{+1.25}_0$ 631-1000 mm $^{+1.4}_0$ 1001-1600 mm $^{+1.6}_0$ 1601-2000 mm $^{+1.8}_0$
Mounting type	SD • LA • EA • EB • FA • FE • FB • CA • CB • TA • TC
Accessories	<ul style="list-style-type: none"> <li>● Rod end eye (T-end)</li> <li>● Rod end clevis (Y-end) with pin</li> <li>● Lock nut</li> <li>● Boots : Nylon tarpaulin (Standard) : Chloroprene (Semi-standard) : Conex (Semi-standard) Note 6)</li> </ul>

- Mounting styles SD, FA, FE, and FB are not specified in JIS nor ISO standards.

### Terminologies

#### Nominal pressure

Pressure given for a cylinder for convenience of naming. It is not always the same as the operating pressure (rated pressure) that guarantees performance under the specified conditions.

#### Maximum allowable pressure

The maximum allowable pressure generated in a cylinder (surge pressure, etc.)

#### Proof test pressure

Test pressure against which a cylinder can withstand without unreliability performance at the return to nominal pressure.

#### Minimum working pressure

The minimum pressure that the cylinder placed horizontally without a load can work.

- The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
- In case that the lock nut is attached to the piston rod end thread part, lengthen the thread length (dimension A).

Note 1) Cylinder with a bore of 140 mm and double rod type cylinder are not specified in JIS nor ISO standards. Rod series B and port Rc are included in JIS B8367-2 (not included in ISO6020-2).

Note 2) Floating cushion is not provided for the rod side of the rod A.

Note 3) The minimum working speed range of the combined seal type cylinder (packing code: 8) is 1 mm/s.

Note 4) The standard type cylinder can be used up to the operating temperature range shown in the selection materials by using packing material (6), hydrogenated nitrile rubber.

Note 5) The piping spacer and gasket are attached to the G thread of 32mm bore.

Note 6) Conex, material of the boots, is the trademark of Teijin, Ltd.

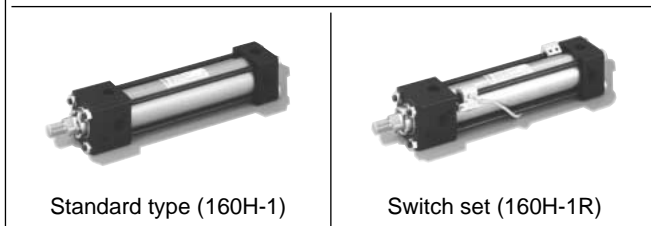
Lines

Unit : mm

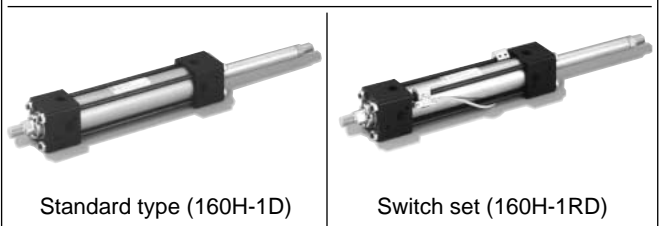
Structure	Type	Rod dia.	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
General purpose type	Double Acting Single Rod	Standard type 160H-1	Rod B	●	●	●	●	●	●	●	●
		Rod A		●	●	●	●	●	●		
	Switch set 160H-1R	Rod B	●	●	●	●	●	●	●	●	●
		Rod A		●	●	●	●	●	●		
Double Acting Double Rod	Standard type 160H-1D	Rod B	●	●	●	●	●	●	●	●	●
	Switch set 160H-1RD	Rod B	●	●	●	●	●	●	●	●	●

- Notes) • When using a switch, use a switch set cylinder.  
 • No switch can be mounted onto the standard type cylinder.

Double Acting Single Rod



Double Acting Double Rod

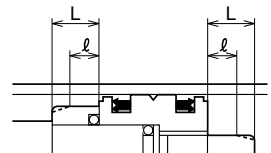


Standard stroke fabrication range Unit : mm

Bore	Stroke
φ32	- 1200
φ40 · φ50	- 1600
φ63	- 1800
φ80 - φ160	- 2000

Cushion stroke length Unit : mm

Bore	Cushion ring length L	Cushion ring parallel part length ℓ
φ32	21	6
φ40 - φ80	25	
φ100 · φ125	30	8
φ140 · φ160		



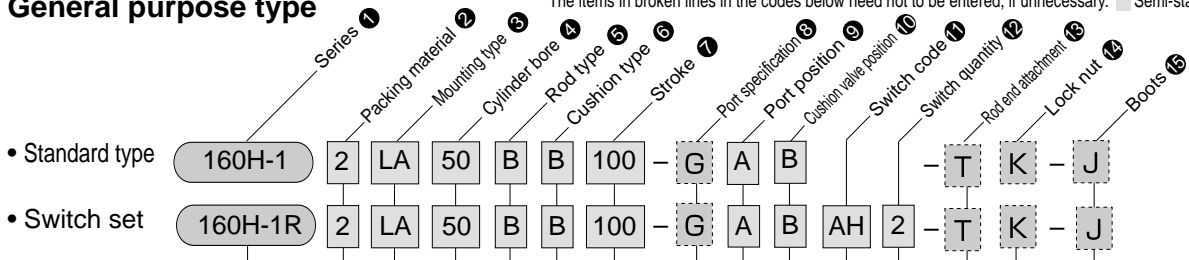
- The strokes above indicate the maximum available strokes for the standard type. If you request larger strokes than those in the table above, contact us.
- For the rod buckling, check with the buckling chart in the selection materials.
- Figures shown in the table above indicate the cushion stroke lengths in the case of cylinders used up to the stroke end.
- In the case that a cylinder is not used up to the stroke end, and if it is stopped 5 mm or more before the stroke end, the cushioning effect will be weakened. In such a case, contact us.

Packing structure table

Packing code	1	2	6	8
Name of type	Nitrile rubber type	Urethane rubber type	Hydrogenated nitrile rubber type	Combined seal type
Packing structure	Piston packing	<p>Wearing Nitrile rubber Urethane rubber</p>	<p>Nitrile rubber</p>	<p>Wearing Nitrile rubber Fluoric resin</p>
	Rod packing and wiper ring	<p>Urethane rubber</p>	<p>Hydrogenated nitrile rubber</p>	<p>Hydrogenated nitrile rubber</p>
Fixed section (including O-ring)	Nitrile rubber	Nitrile rubber	Hydrogenated nitrile rubber	Nitrile rubber

### General purpose type

The items in broken lines in the codes below need not to be entered, if unnecessary.   Semi-standard specification



#### Double-Acting Single Rod

160H-1 : Standard type  
160H-1R : Switch set

#### Double-Acting Double Rod

160H-1D : Standard type  
160H-1D : Switch set

- 1 Nitrile rubber
- 2 Urethane rubber
- 6 Hydrogenated nitrile rubber
- 8 Combined seal

● For packing configuration, refer to the selection materials at the beginning of this catalogue.

#### Cylinder bore (mm)

##### Rod B

φ32 • φ40 • φ50 • φ63 • φ80 • φ100 • φ125 • φ140 • φ160

##### Rod A

φ40 • φ50 • φ63 • φ80 • φ100 • φ125

- A Rod A
- B Rod B

- B with cushions on both ends
- R with cushion on the rod side
- H with cushion on the head side
- N without cushion

- None Rc thread
- G G thread

- J Nylon tarpaulin
- JN Chloroprene
- JK Conex

- K Long thread with lock nut

● For thread length, refer to the "Rod end attachment/Thread length with lock nut".

- T T-end (rod end eye)
- Y Y-end (rod end clevis)

Switch quantity (1, 2, to n)

#### Switch symbol

Note) Select applicable switches out of the Switch List

#### Notes on order for switch sets

● If a switch is unnecessary, enter the switch code **1** and the switch quantity **12** of 0.

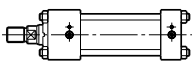
Cushion valve position (A, B, C, D, 0)

Port position (A, B, C, D)

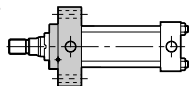
Cylinder stroke (mm)

### Mounting type Codes in the < > marks below are names called in ISO 6020-2.

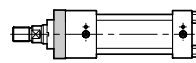
SD SD type (Basic type)



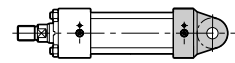
EA EA type (Rectangular rod cover attached)  
<ME5>



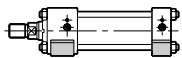
FA FA type (head rectangular flange mounting)  
(for Rod B)



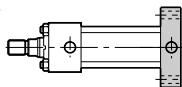
CA CA type (Eye mounting)  
<MP3>



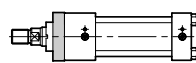
LA LA type (Side lugs mounting)  
<MS2>



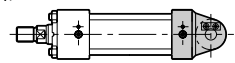
EB EB type (Rectangular head cover attached)  
<ME6>



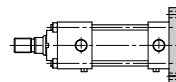
FE FE type (head rectangular flange mounting)  
(for Rod A)



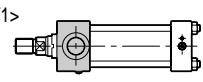
CB CB type (Clevis mounting)  
<MP1>



FB FB type (cap rectangular flange mounting)

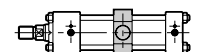


TA TA type (head trunnion mounting)  
<MT1>



Note) SD, FA, FE, and FB types are not included in ISO standards.

TC TC type (intermediate trunnion mounting)  
<MT4>



Switch List

Kind	Switch code	Load voltage range	Load current range	Maximum open/close capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load device		
Contact	AF AX101	DC:5 - 30V AC:5 - 120V	DC:5 - 40mA AC:5 - 20mA	DC:1.5W AC:2VA	None	LED (Lights up in red during ON)	0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, rear wiring	1.5m	Small relay programmable controller		
	AG AX105							5m			
	AH AX111				1.5m						
	AJ AX115				5m						
	AE AX125	DC: 30 V or less AC: 120 V or less	DC:40mA or less AC:20mA or less	2VA	None	No	4-pin connector type, rear wiring	5m			
	AK AX11A	AC:5 - 120V	5 - 20mA					0.5m			
	AL AX11B	DC:5 - 30V	5 - 40mA	1.5W	Present	LED (Lights up in red during ON)	4-pin connector type, rear wiring	0.5m			
	AP AZ101	DC:5 - 30V AC:5 - 120V	DC:5 - 40mA AC:5 - 20mA	DC:1.5W AC:2VA				None		LED (Lights up in red during ON)	0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, upper wiring
	AR AZ105				1.5m						
	AS AZ111				5m						
	AT AZ115				5m						
	AN AZ125	DC:30Vor less AC:120Vor less	DC:40mAor less AC:20mAor less	2VA	None	No	4-pin connector type, upper wiring	0.5m			
	AU AZ11A	AC:5 - 120V	5 - 20mA					0.5m			
	AW AZ11B	DC:5 - 30V	5 - 40mA	1.5W	Present	LED (Lights up in red during ON)	4-pin connector type, upper wiring	0.5m			
No contact	BE AX201	DC:5 - 30V	5- 40mA	-				Present	LED (Lights up in red during ON)	0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, rear wiring	1.5m
	BF AX205				5m						
	CE AX211				1.5m						
	CF AX215					5m					
	CH AX21C				4-pin connector type, rear wiring	0.5m					
	CJ AX21D					1m					
	BM AZ201				LED (Lights up in red during ON)	0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, upper wiring	1.5m				
	BN AZ205						5m				
	CM AZ211				(2-lamp type, red/green)	4mm, upper wiring	1.5m				
	CN AZ215						5m				
No contact (CE coformed)	CT AX211CE	DC:5 - 30V	5 - 40mA	-	Present	LED (2-lamp type, red/green)	0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, rear wiring	1.5m	Small relay programmable controller		
	CU AX215CE							5m			
	CV AX21BCE							4-pin connector type, rear wiring		0.5m	
	CW AZ211CE							0.3mm <sup>2</sup> , 2-core, outer dia. 4mm, upper wiring		1.5m	
	CX AZ215CE									5m	
	CY AZ21BCE							4-pin connector type, upper wiring		0.5m	

- Notes) ● For the switches without a protective circuit, be sure to provide the protective circuit (SK-100) with load devices when using induction load devices (relay, etc.).  
 ● For the handling of switches, be sure to refer to the switch specifications in the end of this catalogue.  
 ● For the 200 V AC type, contact us.  
 ● We recommend AND UNIT (AU series) for multiple switches connected in series.

AX type (Rear wiring)

Cord type



Connector type



AZ type (Upper wiring)

Cord type



Connector type



Standard stroke fabrication range

Unit : mm

Bore	Stroke
φ32	- 1200
φ40 · φ50	- 1600
φ63	- 1800
φ80 - φ160	- 2000

- The strokes above indicate the maximum available strokes for the standard type. If you request larger strokes than those in the table above, contact us.  
 ● For the rod buckling, check with the buckling chart in the selection materials.

Adaptability of working oil to packing material

Packing material	Adaptable working oil				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	W/O Water in oil fluid	O/W Oil in water fluid
1 Nitrile rubber	○	○	×	○	○
2 Urethane rubber	◎	×	×	△	△
6 Hydrogenated nitrile rubber	○	◎	×	◎	◎

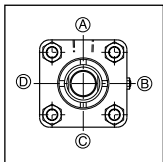
- Notes) 1. The ◎ and ○-marked items are applicable, while the ×-marked items are inapplicable. For the use of the △-marked items, contact us.  
 2. The ◎-marked items are the recommended packing materials in case of giving the first priority to abrasion resistance.  
 3. When using [8] combined seals, refer to the notes on nitrile rubber seals.

## Switch mounting allowable min. stroke

Unit: mm

Bore mm	Mounting style	Types other than TC type		TC type	
	Switch quantity	with a switch	with two switches	with a switch	with two switches
	Switch type	AX type	AX type	AX type	AX type
φ32		30	30 (40)	60	115
φ40		25	25	60	115
φ50		25	25	65	125
φ63		25	25	65	125
φ80		20	25	75	135
φ100		20	25	90	150
φ125		20	25	90	160
φ140		20	25	95	170
φ160		20	25	110	185

## ★ Standard specifications



- With both ends cushions
- Port position (A), cushion valve position (B)

## ★ Port position and cushion valve position

- Standard type: With both end cushions  
Standard port position, cushion valve position

Mounting style	Order symbol		Rod cover		Head cover	
	Port position	Valve position	Port position	Valve position	Port position	Valve position
SD · LA · CA · CB · FA · FB · TC	A (B · C · D)	B (C · D · A)	A (B · C · D)	B (C · D · A)	A (B · C · D)	B (C · D · A)
EB	A	B	A	B	A	C
EA · TA	A	C	A	C	A	B

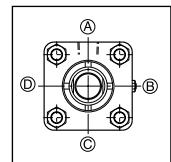
- The symbols (A) shown in the table above indicate the standard port positions of types other than EA, EB, and TA, and symbols (B) indicate the standard cushion valve positions. When changing any position, write down symbols shown in dimensional drawings.
- Specification of change in positions of rod side port and cushion valve (Example)
- Specification of change in positions of head side port and cushion valve (Example)

160H-1R 2CA50BB100- **B** **A** AH2  
 Port position  
 Cushion valve position

160H-1 2CA50BB100-**AB-X** **PPC**  
 Rod side port and cushion valve position  
 Head side port and cushion position change specification symbol

Position specification: **PC-BA**  
 Head side port and cushion valve position

- Order symbols and port and cushion valve positions shown above are applicable to the EA, EB, and TA types.  
When changing any position, specify the position on the rod side or the head side.  
As for the TA type rod cover, neither port nor cushion valve can be provided on the (B) or (D) side.  
As for the EA type rod cover, cushion valves cannot be provided on the (B) or (D) side.  
As for the EB type rod cover, cushion valves cannot be provided on the (B) or (D) side.
- If the cylinder has no cushion, cushion valve position is indicated as "0".
- If the ports are located on the (B) or (D) side of the LA type cylinder and general piping joints are used, they may interfere with the cylinder mounting bolts.
- Air vents are located on the same side as that the cushion valves are installed.  
If the cylinder has no cushion, they are located on the (B) side ((C) side, in the case of the EA or TA type rod cover).
- For details of positions of the ports, cushion valves, and air vents, refer to 31 page.

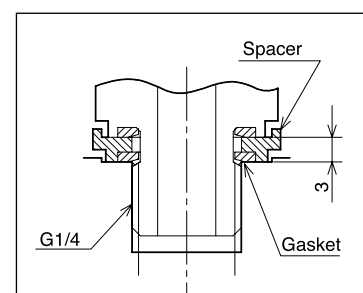


## ★ Port G thread type

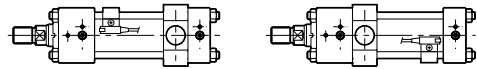
- As for the port G thread type, add "G" ahead of the port position symbol.  
(Example)

160H-1R 2CA50BB100 - **G** **A** **B**  
 Port G thread type  
 Port position  
 Cushion valve position

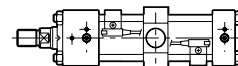
- Use the attached spacers and gaskets for the port G thread type cylinder with 32 mm bore.  
(If no spacer is attached to it, the joint may interfere with the parts in the cylinder.)



- Notes ● For the TC type (with a switch), cylinder strokes in case that the TC type attachment shown in the figures below is positioned closest to the cover are shown in the table on the left.



- Notes ● For the minimum PH at switch mounting, refer to the dimensional drawings of the TC type.
- For the TC type (with two switches), cylinder strokes in case that the TC type attachment shown in the figure below is positioned in the center are shown in the table on the left.

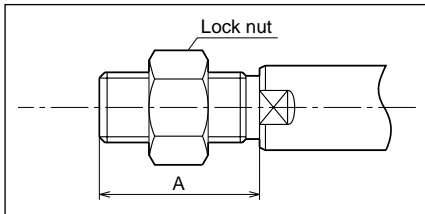


- Notes ● Figure in the parentheses in the line of bore 32 mm shown in the table on the left indicates the minimum stroke when the rod side detection switch and the head side detection switch are mounted on the same side.

★ Notes on order of cylinder with lock nut

The rod end thread length (A) must be longer when a lock nut is attached to the rod end.

(Example) **160H-1 2LA50BB100-AB -K**  
 Long thread with lock nut



A without lock nut  
 A=28  
 ↓  
 A of long thread with lock nut  
 A=40

Note) When a lock nut is attached to the rod end, length "A" shown in the figure above must be the same as that of the long thread with lock nut type or longer. For details, refer to "Rod end attachment/Thread length with lock nut".

★ Delivery of rod end attachment (T-end and Y-end)

Delivery specifications of the cylinder with lock nut and rod end attachment differ from those of the cylinder with rod end attachment only (without lock nut). For details, refer to the dimensional drawing of rod end attachment.

★ Semi-standard fabrication range

- With boots
- Change in position of TC attachment (Size symbol: PH)
- Change in piston rod end (Size symbol: WF (W), A, KK)
- Plated cylinder tube (Hard chrome plated 2/100 mm)

For details, contact us.

Weight table

Unit: kg

Rod type	Bore mm	Basic weight (SD type)		Additional weight per 1 mm stroke		Mounting accessories weight										Rod end attachment weight		
		Single rod type	Double rod type	Single rod type	Double rod type	LA	EA	EB	FA	FE	FB	CA	CB	TA	TC	Rod end eye (T-end)	Rod end clevis (Y-end)	Lock nut
B	φ32	1.31	1.73	0.0062	0.0082	0.26	0.34	0.23	0.32	—	0.28	0.15	0.19	0.04	0.16	0.31	0.38	0.03
	φ40	2.94	3.59	0.0098	0.0127	0.32	1.02	0.81	0.93	—	0.88	0.26	0.32	0.08	0.45	0.38	0.54	0.03
	φ50	4.55	5.69	0.0146	0.0194	0.65	1.42	1.16	1.60	—	1.48	0.80	0.99	0.15	0.84	1.17	1.68	0.05
	φ63	6.63	8.18	0.0193	0.0272	1.18	1.66	1.43	2.47	—	2.29	0.96	1.15	0.31	1.54	1.25	1.86	0.09
	φ80	12.55	15.40	0.0316	0.0440	1.37	2.93	2.58	4.40	—	4.07	1.97	2.45	0.63	3.05	1.95	3.64	0.13
	φ100	17.93	21.88	0.0458	0.0650	1.98	3.76	3.41	6.05	—	5.56	3.99	4.99	1.23	4.31	5.30	7.97	0.23
	φ125	33.67	39.03	0.0738	0.1038	2.49	6.67	6.67	10.24	—	9.44	6.60	8.46	2.43	9.01	7.31	11.79	0.31
	φ140	43.36	50.39	0.0988	0.1380	2.87	8.23	8.23	14.15	—	13.07	8.44	10.89	3.48	12.25	9.98	15.64	0.38
A	φ40	3.03	—	0.0116	—	0.32	1.02	0.81	—	1.43	0.88	0.26	0.32	0.08	0.45	0.50	0.62	0.05
	φ50	4.72	—	0.0177	—	0.65	1.42	1.16	—	2.28	1.48	0.80	0.99	0.15	0.84	1.25	1.86	0.09
	φ63	6.94	—	0.0238	—	1.18	1.66	1.43	—	3.50	2.29	0.96	1.15	0.31	1.54	1.66	2.08	0.13
	φ80	13.08	—	0.0384	—	1.37	2.93	2.58	—	5.43	4.07	1.97	2.45	0.63	3.05	2.98	3.98	0.23
	φ100	18.88	—	0.0566	—	1.98	3.76	3.41	—	7.90	5.56	3.99	4.99	1.23	4.31	6.78	9.25	0.31
	φ125	35.78	—	0.0934	—	2.49	6.67	6.67	—	14.95	9.44	6.60	8.46	2.43	9.01	10.28	13.77	0.46

Switch additional weight

Unit: kg

Bore (mm)	Switch	AX • AZ type		
		Cord length 1.5 m	Cord length 5 m	Connector type
φ32 - φ63		0.05	0.13	0.04
φ80 - φ140		0.07	0.15	0.06
φ160		0.09	0.17	0.08

Calculation formula cylinder weight (kg) = basic weight + (cylinder stroke mm × additional weight per 1 mm stroke) + (switch additional weight × switch quantity) + mounting accessories weight + rod end attachment weight

Calculation example 160H-1R, bore φ80, rod B, cylinder stroke 200 mm, LA type, 2 pcs. of AX215  
 12.55 + (0.0316 × 200) + 1.37 + (0.15 × 2) = 20.54 kg

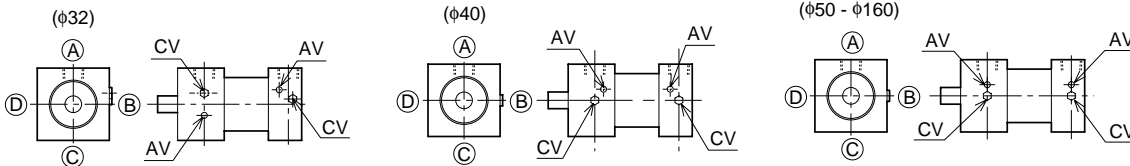
### Positions of ports, cushion valves, and air vents (Rod B)

Symbols AV : Air vent  
CV : Cushion valve

- In all the mounting styles, cushion valves and air vents are located on the same side. When any change in the position of air vent is required, contact us.
- If you need detailed dimensions of air vent positions, contact us.
- Cylinders without cushion have no cushion valve. Positions of air vents depend on mounting style.

### Double-acting type single rod/SD, FA, FB, CA, CB, TC types

- Basic type (Port and cushion position: (A) • (B) Order symbol [A] [B] )



- Other positions of port and cushion valve (bore from 50 mm to 160 mm)

		Cushion valve position				
		B	C	D	A	0 (without cushion)
Port position	A					
	B					
	C					
	D					

(With cushion)

- When changing the positions of cushion valves, turn them in the standard type clockwise by 90° viewed from the front of the rod.

(Without cushion)

- Air vents are at the positions turned clockwise from the port positions by 90° viewed from the front of the rod.

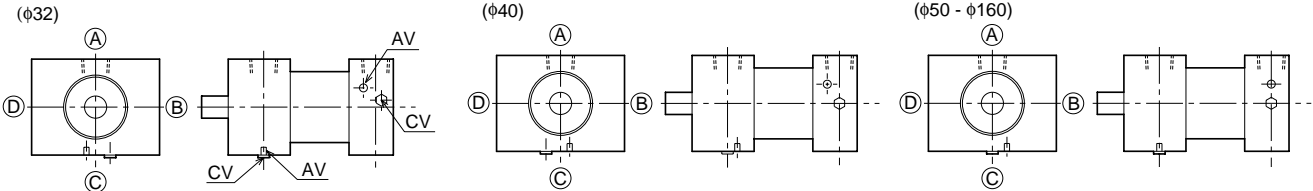
- When changing positions of the ports and cushion valves on the rod side and head side, specify the positions on the rod side and head side, respectively.

- Other positions of port and cushion valve (with 32 mm or 40 mm bore)

In the basic type cylinders with 32 mm or 40 mm bore, positions of the cushion valves and air vents differ from those of the cylinder with a bore from 50 mm to 160 mm. When changing the positions of the cushion valves, turn them clockwise by 90° viewed from the front of the rod, in a similar manner to the cylinder with a bore from 50 mm to 160 mm. Positions of air vents are the same as the above, even when the cylinder has no cushion.

### Double-acting type single rod/EA type

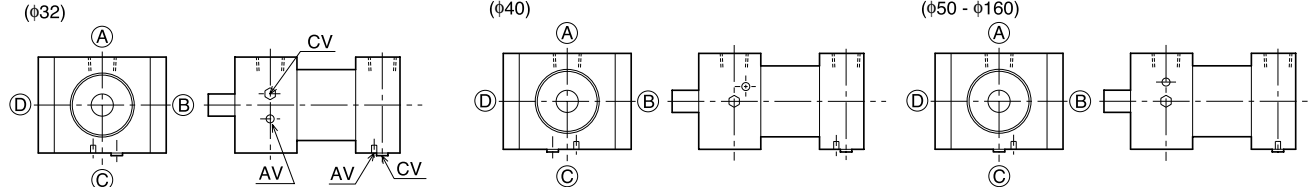
- Basic type (port, cushion position: Rod side: (A) • (C) Head side (A) • (B) Order symbol [A] [C] )



EA type cylinders with ports and cushion valves at positions other than basic ones are manufactured on demand. When ordering them, give us directions separately. Positions of air vents are the same as the above, even when the cylinders have no cushion.

### Double-acting type single rod/EB type

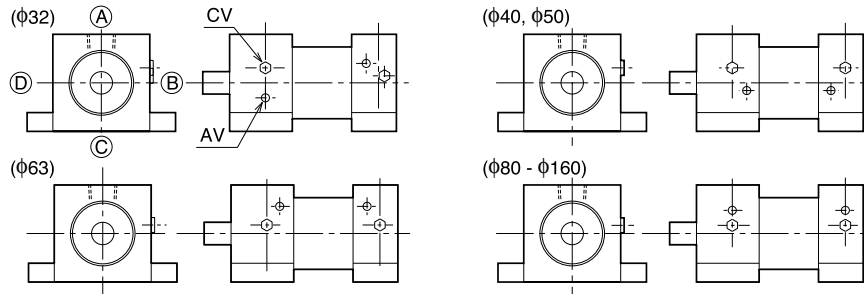
- Basic type (port, cushion position: Rod side (A) • (B) Head side (A) • (B) Order symbol [A] [B] )



EA type cylinders with ports and cushion valves at positions other than basic ones are manufactured on demand. When ordering them, give us directions separately. Positions of air vents are the same as the above, even when the cylinders have no cushion.

Double-acting type single rod/LA type

- Basic type (Standard port and cushion position: (A) • (B) Order symbol [A] [B] )



- Other positions of port and cushion valve (with 80 mm or 160 mm bore)

		Cushion valve position				
		B	C	D	A	0 (without cushion)
Port position	A					
	B					
	C					
	D					

(With cushion)

- Port position A, C: The port is positioned on the axis line (without offset)
- Port position B, D: The port is offset from the axis center upward by the distances shown below.

φ32, φ40	5.5mm
φ50	6.5mm
φ63, φ80	12mm
φ100	15mm
φ125 - φ160	0

- Change in cushion valve position (shown in drawings on the left side)

- Position A: Same as the cushion valve position A of the SD type
- Position B: Basic position
- Position C: Turn the position B clockwise by 90° viewed from the front of the position B.
- Position D: Line symmetric with respect to the position B

- Cushion valves on the B or D side are offset upward to prevent interference with the mounting bolts.

(Without cushion)

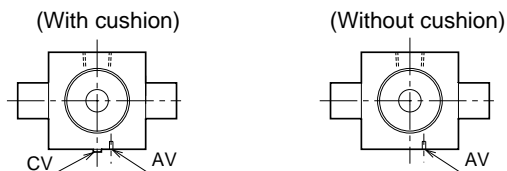
- When ports are located on the A side: The air vent is on the B side.
- When a port is located on the B, C, or D side: The air vent is on the A side. (If you need to change the location, contact us.)

- Other positions of port and cushion valve (with 32 mm or 63 mm bore)

In the basic type cylinders with 32 mm or 63 mm bore, positions of the cushion valves and air vents differ from those of the cylinder with a bore from 80 mm to 160 mm. When changing the positions of the cushion valves, turn them clockwise by 90° viewed from the front of the rod, in a similar manner to the cylinder with a bore from 80 mm to 160 mm. Positions of air vents are the same as the above, even when the cylinder has no cushion.

Double-acting type single rod/TA type

- Standard port and cushion position: (A) • (C) Order symbol [A] [C]

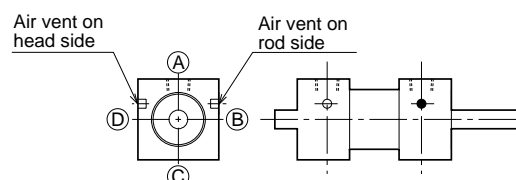


- The ports can be located on the A side only.
- The cushion valve and air vent are located on the side opposite to the ports.
- On the head side, the port cushions can be located on the (A) or (B) side.

Double-acting double rod type

(With cushion)  
Locations of the ports and valves are the same as those of the double-acting single rod type.

(Without cushion)



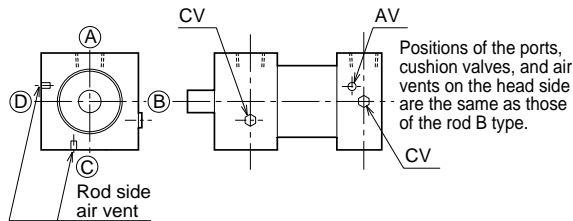
The air vent on the rod side is located on the side symmetric with the head side.

## Locations of ports, cushion valves, and air vents (Rod A)

Symbols AV : Air vent  
CV : Cushion valve

## Double-acting single rod type/SD, FE, FB, CA, CB, TC types

- Basic type (Standard port and cushion valve positions: (A) • (B) Order symbol (A) (B) )



- Other positions of port and cushion valve (on the rod side)

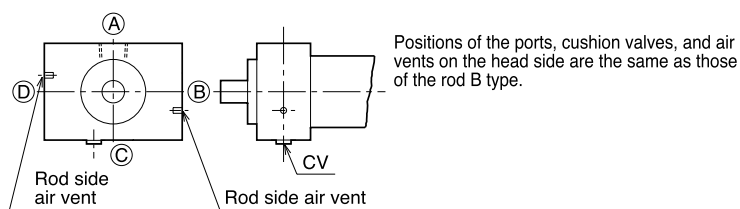
Turn the positions of the port and cushion valve of the basic type clockwise by 90° viewed from the front of the rod.

On the head side, the air vent is at the same position as that of the rod B type.

If the cylinder has no cushion, the air vents are installed to the cushion valve positions of the type with cushions. (Three positions)

## Double-acting single rod type/EA types

- Basic type (Standard port and cushion valve positions: (A) • (C) Order symbol (A) (C) )



- Other positions of port and cushion valve (on the rod side)

Turn the positions of the port and cushion valve of the basic type clockwise by 90° viewed from the front of the rod.

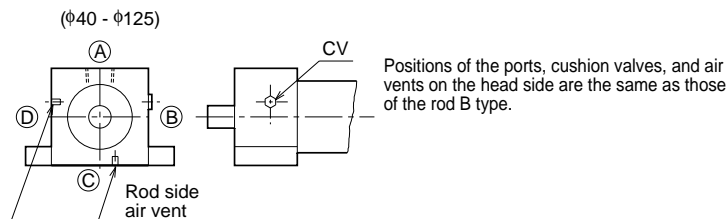
On the head side, the air vent is at the same position as that of the rod B type.

If the cylinder has no cushion, the air vents are installed to the cushion valve positions of the type with cushions. (Three positions)

- Locations of the ports, cushion valves, and air vents of the EB type cylinder are the same as those of the rod B type.

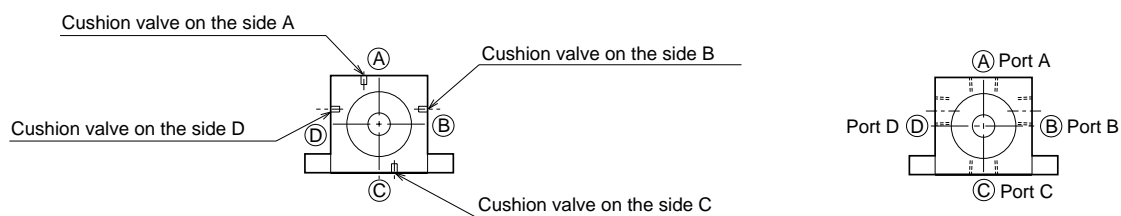
**Double-acting single rod/LA type**

- Basic type (Standard port and cushion valve positions: (A) · (B) Order symbol: [A] [B] )

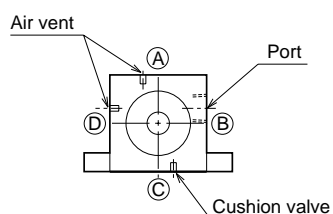


- Other positions of ports and cushion valve (on the rod side)

The combinations of cushion valve position and port position shown in the figures below are applicable. The air vents can be located on the two sides neither the port nor the cushion valve is located. Note that the ports and the cushion valve cannot be located on the same side.



Example (Positions of ports and cushion valve: (B), (C) )



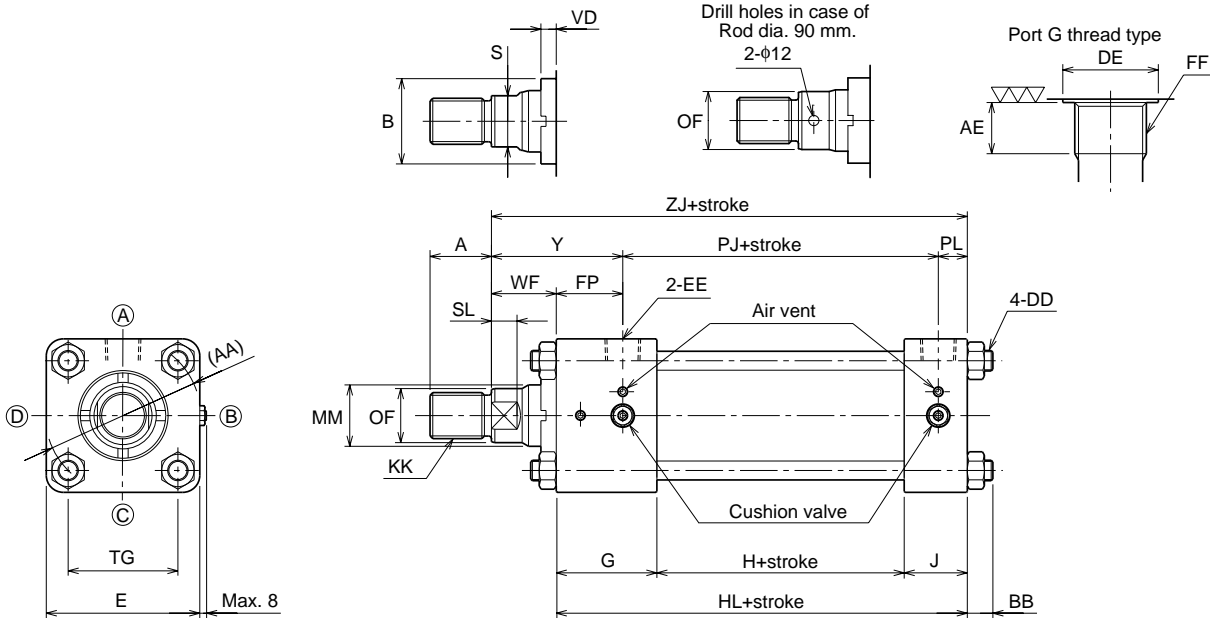
**Double-acting single rod/ TA type**

Standard port and cushion valve positions: (A) · (C) Order symbol: [A] [C] )

The cushion valve and air vents are located on the side opposite to that the ports are located.

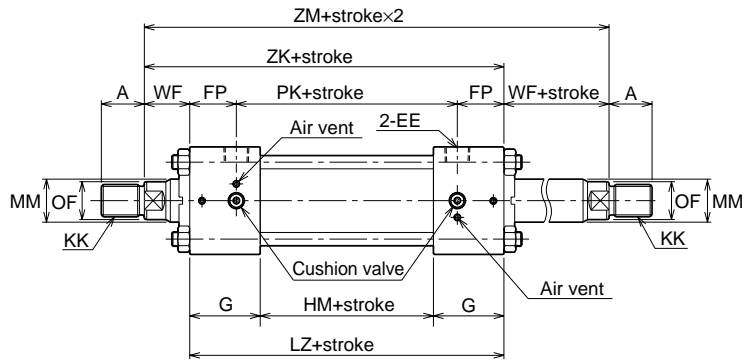
### SD

160H-1 [ 2 ] SD Bore [ B ] [ B ] Stroke - [ A ] [ B ]



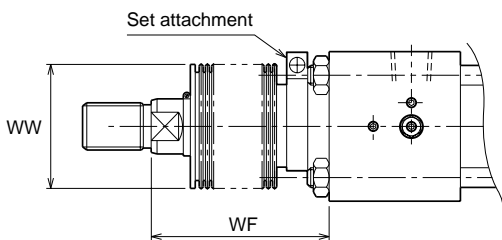
- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- For the use of the SD type, be sure to refer to the "Precautions for use, 4. Mounting" in the beginning of this catalogue.
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### Double-acting double rod (Rod B)



- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

### With boots



### WF

#### Rod B

Nylon tarpaulin	φ32-φ40	1/3	Stroke+X
	φ50	1/3.5	Stroke+X
Chloroprene	φ63 - φ100	1/4	Stroke+X
	φ125 - φ160	1/5	Stroke+X
Conex	φ32	1/2	Stroke+X
	φ40-φ50	1/2.5	Stroke+X
	φ63 - φ100	1/3	Stroke+X
	φ125 - φ160	1/3.5	Stroke+X

#### Rod A

Nylon tarpaulin	φ40	1/3.5	Stroke+X
	φ50 - φ80	1/4	Stroke+X
	φ100-φ125	1/5	Stroke+X
Chloroprene	φ40	1/2.5	Stroke+X
	φ50 - φ80	1/3	Stroke+X
	φ100-φ125	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- (Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	-	-	-	-	-	-	-	-
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	-	-	-	-	-	-	-	-
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	-	-	-	-	-	-	-	-

Symbol Bore	AA	AE	BB	DD	DE	E	EE	FF	FP	G	H
	φ32	47	12	7	M6×1	φ21.5	□45	Rc1/4	G1/4	35	49
φ40	59	12	9	M8×1	φ25.5	□62	Rc3/8	G3/8	37	54	39
φ50	74	14	13	M12×1.25	φ30	□75	Rc1/2	G1/2	42	60	38
φ63	91	14	13	M12×1.25	φ30	□90	Rc1/2	G1/2	39	59	40
φ80	117	16	16	M16×1.5	φ36.9	□114	Rc3/4	G3/4	46	70	45
φ100	137	16	16	M16×1.5	φ36.9	□130	Rc3/4	G3/4	47	74	47
φ125	178	18	21	M22×1.5	φ46.1	□165	Rc1	G1	51	82	55
φ140	200	18	22	M24×1.5	φ46.1	□185	Rc1	G1	51	82	62
φ160	219	18	25	M27×2	φ46.1	□205	Rc1	G1	54	87	64

Symbol Bore	HL	HM	J	LZ	PJ	PK	PL	TG	WF	Y	ZJ	ZK	ZM
	φ32	103	38	26	136	56	66	12	33.2	25	60	128	161
φ40	128	49	35	157	73	83	18	41.7	25	62	153	182	207
φ50	134	48	36	168	74	84	18	52.3	25	67	159	193	218
φ63	136	50	37	168	80	90	17	64.3	32	71	168	200	232
φ80	159	55	44	195	93	103	20	82.7	31	77	190	226	257
φ100	168	57	47	205	101	111	20	96.9	35	82	203	240	275
φ125	197	65	60	229	117	127	29	125.9	35	86	232	264	299
φ140	203	72	59	236	124	134	28	141.4	35	86	238	271	306
φ160	213	74	62	248	130	140	29	154.9	32	86	245	280	312

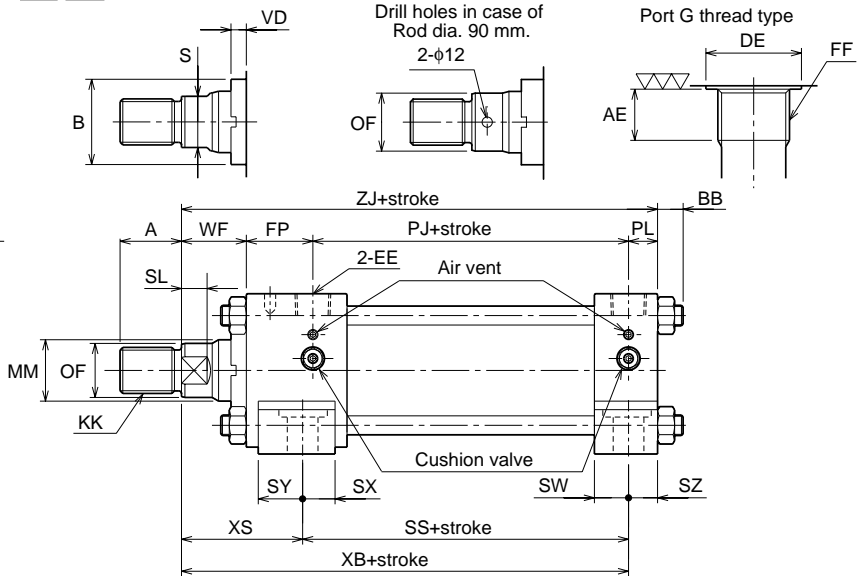
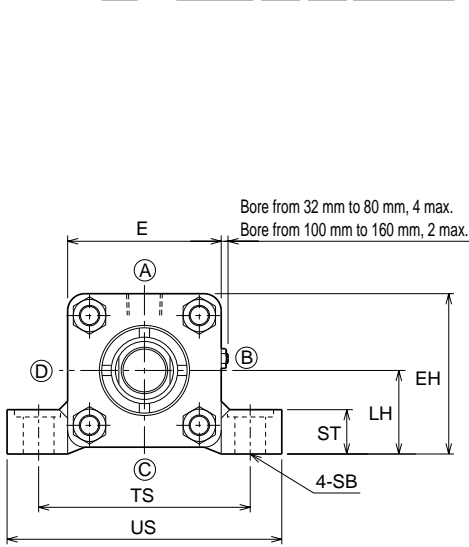
● Allowance of MM is f8.

## With boots

Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
		WW	Rod B	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125
Rod A	-		φ50	φ71	φ80	φ100	φ100	φ140	-	-	
X	Rod B	56	61	64	77	80	82	94	97	102	
	Rod A	-	64	77	80	82	94	102	-	-	

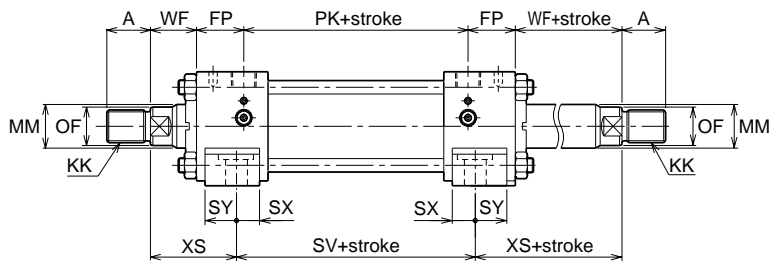
### LA

160H-1 [2] LA [Bore] [B] [B] Stroke - [A] [B]



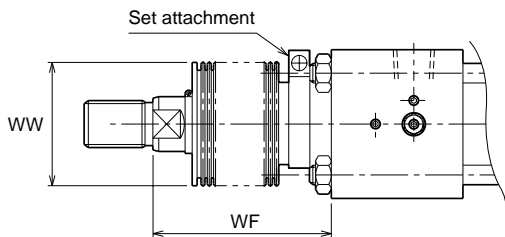
- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment".
- Notes on mounting bolts of cylinder with a bore of 100 mm or longer  
Use bolts with hexagonal hole as the mounting bolts.  
If hexagonal bolts are used, bolt heads may interfere with the cover or spot facing, causing failure in mounting.  
When using a washer, use of a disc spring for bolt with hexagonal hole is recommended.  
If a flat washer or spring washer is used, it may interfere with the cover or spot facing, causing failure in mounting.
- When the cylinder bore ranges 32 mm to 80 mm, hexagonal bolts, bolts with hexagonal hole, and flat washers can be used.
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions other than those shown in the drawings, refer to the pages related to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### Double-acting double rod (Rod B)



- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

### With boots



### WF Rod B

Nylon tarpaulin Chloroprene	φ32-φ40	1/3	Stroke+X
	φ50	1/3.5	Stroke+X
	φ63 - φ100	1/4	Stroke+X
	φ125 - φ160	1/5	Stroke+X
Conex	φ32	1/2	Stroke+X
	φ40-φ50	1/2.5	Stroke+X
	φ63 - φ100	1/3	Stroke+X
	φ125 - φ160	1/3.5	Stroke+X

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- Notes) • Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.  
• Conex is the registered trademark of Teijin Ltd.  
• The boots have been mounted at our factory prior to delivery.

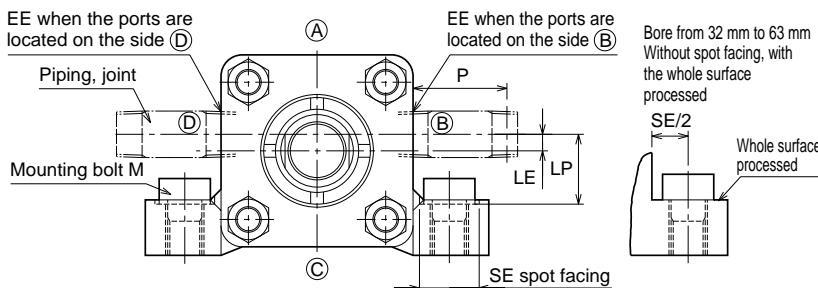
### Rod A

Nylon tarpaulin Chloroprene	φ40	1/3.5	Stroke+X
	φ50 - φ80	1/4	Stroke+X
	φ100-φ125	1/5	Stroke+X
Conex	φ40	1/2.5	Stroke+X
	φ50 - φ80	1/3	Stroke+X
	φ100-φ125	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

### ● Notes on LA type with ports on lateral side (B or D side)

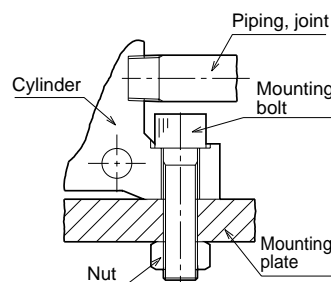
- The port G thread type is not the standard type. (When the bore is not less than 40 mm, position on the (A) or (C) side is the same as that of the standard type.)
- Positions of the ports are deviated from the cylinder center by the distance LE.
- Take into consideration the interference of the piping and joint with the mounting bolts (including handling of tightening tools), referring to the table on the right.



Symbol Bore	Port EE	LE	LP	Mounting bolt M	Spot facing dia. SE	P Note1
φ32	Rc 1/4	5.5	15	M8	18	20
φ40	Rc 3/8	5.5	24	M10	21	21
φ50	Rc 1/2	6.5	24.5	M12	27	26
φ63	Rc 1/2	12	30	M16	34	36
φ80	Rc 3/4	12	44	M16	31	36
φ100	Rc 3/4	15	47	M24	39	43
φ125	Rc 1	0	51	M24	39	45
φ140	Rc 1	0	55	M30	50	51
φ160	Rc 1	0	64	M30	50	57

Note1. When determining the length P, interference of joints with mounting bolts must be taken into consideration.

- When the cylinder bore is between 32 mm and 80 mm, mounting with hexagonal bolts is recommended. If bolts with hexagonal hole are used, bolt heads or tightening tool (Allen key wrench) may interfere with the piping or joint, causing failure in mounting or tightening.
- When the cylinder bore is 100 mm or longer, hexagonal bolts cannot be used (because the head of a hexagonal bolt may interfere with the cover or spot facing). Thus, in such a case, use bolts with hexagonal hole, and mount the cylinder by tightening nuts on the back of the mounting plate (refer to the drawing on the right side).



### Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	BB	DE	E	EE	EH	FF	FP	LH	PJ	PK	PL	SB	SS	ST	SV	SW	SX	SY	SZ	TS	US	WF	XB	XS	ZJ
φ32	12	7	φ21.5	□45	Rc1/4	44.5	G1/4	35	22 <sup>0</sup> <sub>-0.084</sub>	56	66	12	φ9	73	12.5	96	16	29	20	10	63	84	25	118	45	128
φ40	12	9	φ25.5	□62	Rc3/8	62	G3/8	37	31 <sup>0</sup> <sub>-0.100</sub>	73	83	18	φ11	98	12.5	117	25	34	20	10	83	103	25	143	45	153
φ50	14	13	φ30	□75	Rc1/2	74.5	G1/2	42	37 <sup>0</sup> <sub>-0.100</sub>	74	84	18	φ14	92	19	110	23	31	29	13	102	127	25	146	54	159
φ63	14	13	φ30	□90	Rc1/2	89	G1/2	39	44 <sup>0</sup> <sub>-0.100</sub>	80	90	17	φ18	86	26	102	20	26	33	17	124	161	32	151	65	168
φ80	16	16	φ36.9	□114	Rc3/4	114	G3/4	46	57 <sup>0</sup> <sub>-0.120</sub>	93	103	20	φ18	105	26	121	27	30	34	17	149	186	31	173	68	190
φ100	16	16	φ36.9	□130	Rc3/4	128	G3/4	47	63 <sup>0</sup> <sub>-0.120</sub>	101	111	20	φ26	102	32	117	25	28	41	22	172	216	35	181	79	203
φ125	18	21	φ46.1	□165	Rc1	164.5	G1	51	82 <sup>0</sup> <sub>-0.140</sub>	117	127	29	φ26	131	32	141	38	35	40	22	210	254	35	210	79	232
φ140	18	22	φ46.1	□185	Rc1	184.5	G1	51	92 <sup>0</sup> <sub>-0.140</sub>	124	134	28	φ33	130	38	146	31	35	42	28	240	298	35	210	80	238
φ160	18	25	φ46.1	□205	Rc1	203.5	G1	54	101 <sup>0</sup> <sub>-0.140</sub>	130	140	29	φ33	130	38	140	33	28	49	29	260	318	32	216	86	245

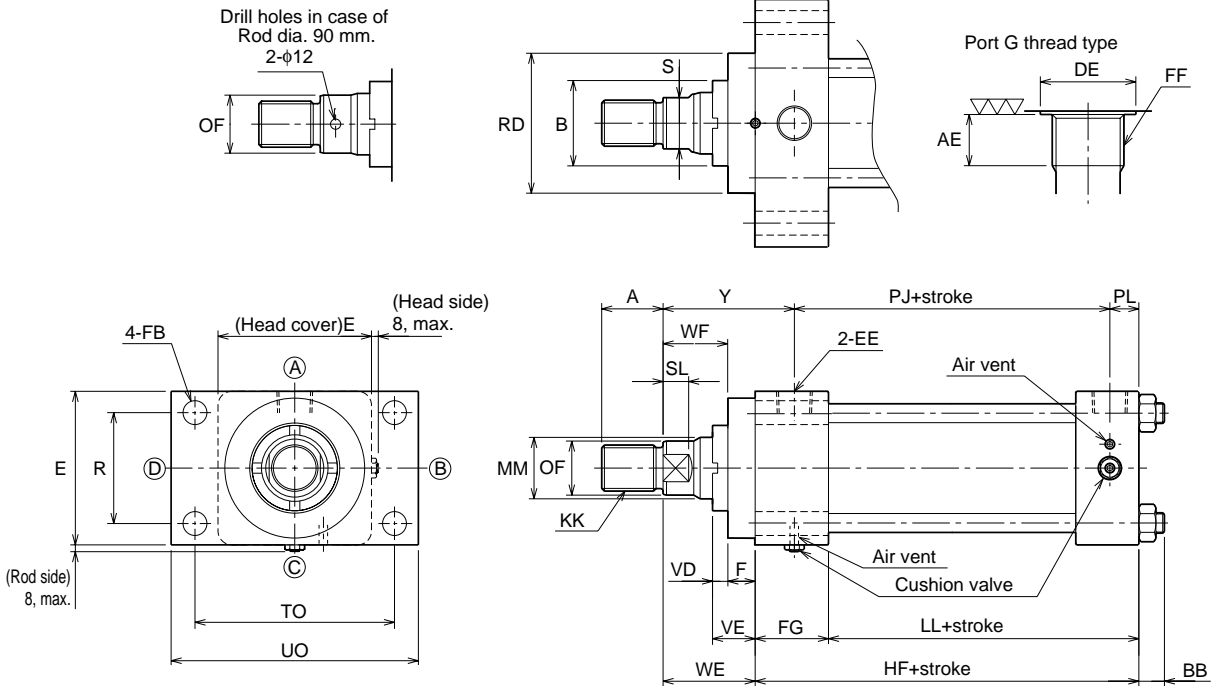
● Allowance of MM is f8.

### With boots

Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
WW	Rod B		φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
	Rod A		—	φ50	φ71	φ80	φ100	φ100	φ140	—	—
X	Rod B		56	61	64	77	80	82	94	97	102
	Rod A		—	64	77	80	82	94	102	—	—

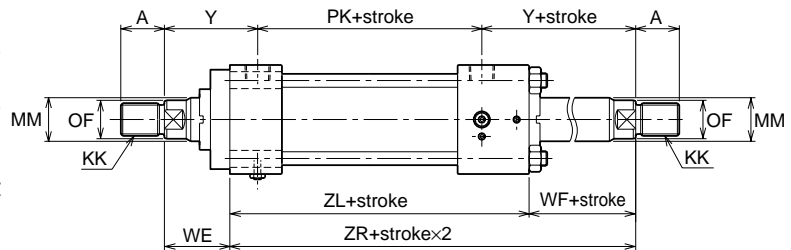
### EA

160H-1 [2] EA [Bore] [B] [B] [Stroke] - [A] [B]



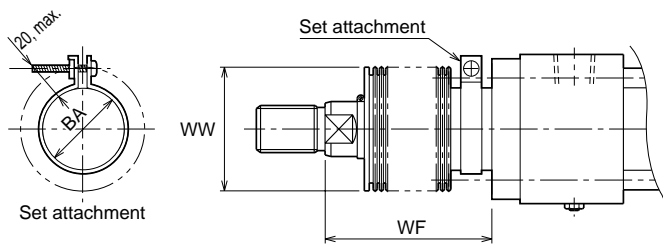
- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- If the mounting plate is located on the cylinder tube side of the switch set cylinder, take into consideration the interference of the switch with the mounting plate.
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### Double-acting double rod (Rod B)



- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

### With boots



Note) Take into consideration the interference of the set attachment with the mounting plate.

### WF

#### Rod B

Nylon tarpaulin Chloroprene	$\phi 32 - \phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40 - \phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

#### Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100 - \phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100 - \phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

Dimensional table

Symbol Bore	Rod B										Rod A									
	A	B	KK	MM	OF	RD	S	SL	VD	VE	A	B	KK	MM	OF	RD	S	SL	VD	VE
φ32	18	φ30 f9	M14×1.5	φ18	φ17	φ42 f8	14	10	10	20	-	-	-	-	-	-	-	-	-	-
φ40	22	φ34 f9	M16×1.5	φ22	φ21	φ62 f8	17	9	10	20	28	φ42 f9	M20×1.5	φ28	φ26	φ62 f8	22	11	9	19
φ50	28	φ42 f9	M20×1.5	φ28	φ26	φ74 f8	22	11	9	25	36	φ50 f9	M27×2	φ36	φ34	φ74 f8	30	14	9	25
φ63	36	φ50 f9	M27×2	φ36	φ34	φ82 f8	30	14	9	25	45	φ60 f9	M33×2	φ45	φ43	φ88 f8	38	17	8	24
φ80	45	φ60 f9	M33×2	φ45	φ43	φ92 f8	38	17	8	28	56	φ72 f9	M42×2	φ56	φ54	φ105 f8	50	21	8	28
φ100	56	φ72 f9	M42×2	φ56	φ54	φ105 f8	50	21	8	30	63	φ88 f9	M48×2	φ70	φ68	φ125 f8	60	24	6	28
φ125	63	φ88 f9	M48×2	φ70	φ68	φ125 f8	60	24	6	28	85	φ108 f9	M64×3	φ90	φ88	φ150 f8	80	Drill hole	5	27
φ140	75	φ98 f9	M56×2	φ80	φ78	φ140 f8	70	27	5	28	-	-	-	-	-	-	-	-	-	-
φ160	85	φ108 f9	M64×3	φ90	φ88	φ150 f8	80	Drill hole	5	30	-	-	-	-	-	-	-	-	-	-

Symbol Bore	AE	BB	DE	E	EE	F	FB	FF	FG	HF	LL
φ32	12	7	φ21.5	45	Rc1/4	10	φ6.6	G1/4	39	93	54
φ40	12	9	φ25.5	62	Rc3/8	10	φ11	G3/8	44	118	74
φ50	14	13	φ30	75	Rc1/2	16	φ14	G1/2	44	118	74
φ63	14	13	φ30	90	Rc1/2	16	φ14	G1/2	43	120	77
φ80	16	16	φ36.9	114	Rc3/4	20	φ18	G3/4	50	139	89
φ100	16	16	φ36.9	130	Rc3/4	22	φ18	G3/4	52	146	94
φ125	18	21	φ46.1	165	Rc1	22	φ22	G1	60	175	115
φ140	18	22	φ46.1	185	Rc1	23	φ26	G1	59	180	121
φ160	18	25	φ46.1	205	Rc1	25	φ26	G1	62	188	126

Symbol Bore	PJ	PK	PL	R	TO	UO	WE	WF	Y	ZL	ZR
φ32	56	66	12	33	58	70	35	25	60	126	151
φ40	73	83	18	41	87	110	35	25	62	147	172
φ50	74	84	18	52	105	130	41	25	67	152	177
φ63	80	90	17	65	117	145	48	32	71	152	184
φ80	93	103	20	83	149	180	51	31	77	175	206
φ100	101	111	20	97	162	200	57	35	82	183	218
φ125	117	127	29	126	208	250	57	35	86	207	242
φ140	124	134	28	142	230	280	58	35	86	213	248
φ160	130	140	29	155	253	300	57	32	86	223	255

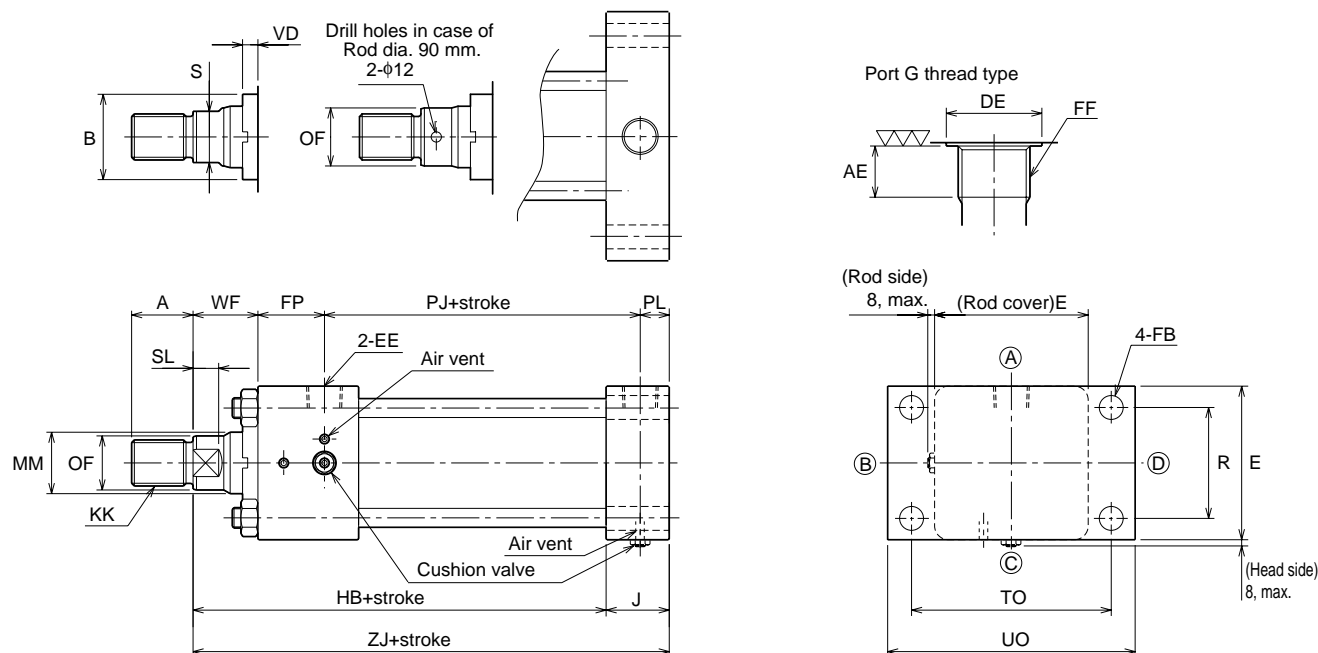
• Allowance of MM is f8.

## With boots

Bore		φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160	
Symbol	WW	Rod B	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
	Rod A	-	φ50	φ71	φ80	φ100	φ100	φ140	-	-	
X	Rod B	56	61	64	77	80	82	94	97	102	
	Rod A	-	64	77	80	82	94	102	-	-	
BA	Rod B	φ34	φ40	φ46	φ55	φ65	φ77	φ92	φ103	φ112	
	Rod A	-	φ46	φ55	φ65	φ77	φ92	φ112	-	-	

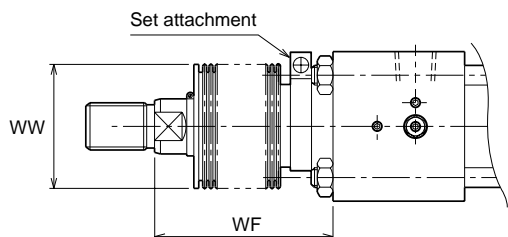
## EB

160H-1 [2] EB Bore [B] [B] Stroke - [A] [B]



- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- If the mounting plate is located on the cylinder tube side of the switch set cylinder, take into consideration the interference of the switch with the mounting plate.
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

## With boots



## WF

## Rod B

Nylon tarpaulin Chloroprene	$\phi 32-\phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40-\phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- (Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

## Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100-\phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100-\phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	-	-	-	-	-	-	-	-
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	-	-	-	-	-	-	-	-
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	-	-	-	-	-	-	-	-

Symbol Bore	AE	DE	E	EE	FB	FF	FP	HB
φ32	12	φ21.5	45	Rc1/4	φ6.6	G1/4	35	102
φ40	12	φ25.5	62	Rc3/8	φ11	G3/8	37	118
φ50	14	φ30	75	Rc1/2	φ14	G1/2	42	123
φ63	14	φ30	90	Rc1/2	φ14	G1/2	39	131
φ80	16	φ36.9	114	Rc3/4	φ18	G3/4	46	146
φ100	16	φ36.9	130	Rc3/4	φ18	G3/4	47	156
φ125	18	φ46.1	165	Rc1	φ22	G1	51	172
φ140	18	φ46.1	185	Rc1	φ26	G1	51	179
φ160	18	φ46.1	205	Rc1	φ26	G1	54	183

Symbol Bore	J	PJ	PL	R	TO	UO	WF	ZJ
φ32	26	56	12	33	58	70	25	128
φ40	35	73	18	41	87	110	25	153
φ50	36	74	18	52	105	130	25	159
φ63	37	80	17	65	117	145	32	168
φ80	44	93	20	83	149	180	31	190
φ100	47	101	20	97	162	200	35	203
φ125	60	117	29	126	208	250	35	232
φ140	59	124	28	142	230	280	35	238
φ160	62	130	29	155	253	300	32	245

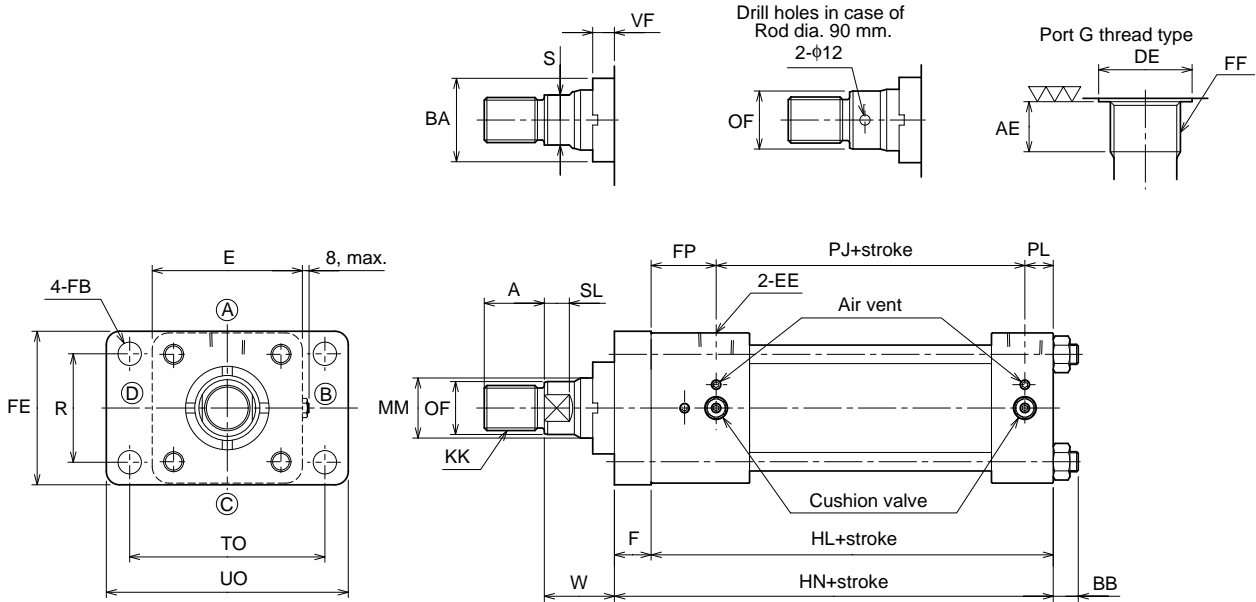
• Allowance of MM is f8.

### With boots

Bore		φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
Symbol	WW	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
		-	φ50	φ71	φ80	φ100	φ100	φ140	-	-
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	-	64	77	80	82	94	102	-	-

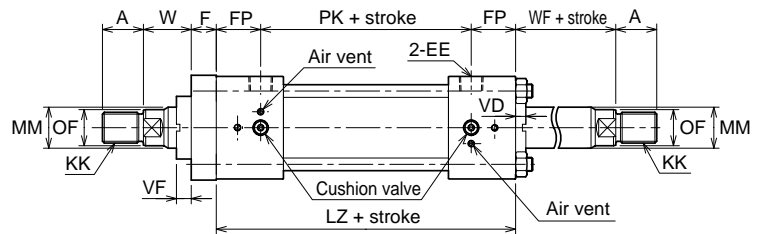
### FA

160H-1 [2] FA [Bore] B [B] Stroke - B [B]



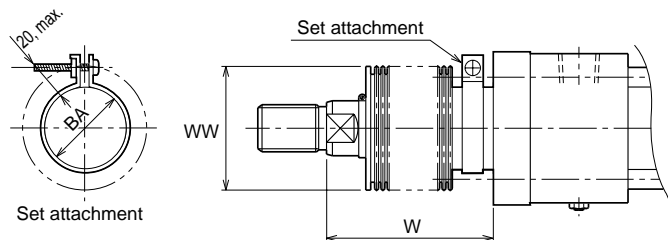
- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- When you want to change the length of the projected rod, specify the "W".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### Double-acting double rod (Rod B)



- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

### With boots



Note) Take into consideration the interference of the set attachment with the mounting plate.

### W Rod B

Nylon tarpaulin Chloroprene	$\phi 32 - \phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40 - \phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

- When the calculated W has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

Dimensional table

Symbol Bore	Rod B								
	A	BA	KK	MM	OF	S	SL	VD	VF
φ32	18	φ34 f9	M14×1.5	φ18	φ17	14	10	10	13
φ40	22	φ40 f9	M16×1.5	φ22	φ21	17	9	10	13
φ50	28	φ46 f9	M20×1.5	φ28	φ26	22	11	9	13
φ63	36	φ55 f9	M27×2	φ36	φ34	30	14	9	13
φ80	45	φ65 f9	M33×2	φ45	φ43	38	17	8	13
φ100	56	φ77 f9	M42×2	φ56	φ54	50	21	8	13
φ125	63	φ92 f9	M48×2	φ70	φ68	60	24	6	13
φ140	75	φ103 f9	M56×2	φ80	φ78	70	27	5	13
φ160	85	φ112 f9	M64×3	φ90	φ88	80	Drill hole	5	13

Symbol Bore	AE	BB	DE	E	EE	F	FB	FE	FF	FP
	φ32	12	7	φ21.5	□45	Rc1/4	11	φ6.6	47	G1/4
φ40	12	9	φ25.5	□62	Rc3/8	16	φ11	64	G3/8	37
φ50	14	13	φ30	□75	Rc1/2	19	φ14	77	G1/2	42
φ63	14	13	φ30	□90	Rc1/2	22	φ14	92	G1/2	39
φ80	16	16	φ36.9	□114	Rc3/4	25	φ18	116	G3/4	46
φ100	16	16	φ36.9	□130	Rc3/4	27	φ18	132	G3/4	47
φ125	18	21	φ46.1	□165	Rc1	29	φ22	167	G1	51
φ140	18	22	φ46.1	□185	Rc1	32	φ26	187	G1	51
φ160	18	25	φ46.1	□205	Rc1	37	φ26	207	G1	54

Symbol Bore	HL	HN	LZ	PJ	PK	PL	R	TO	UO	W	WF
	φ32	103	114	136	56	66	12	33	58	70	35
φ40	128	144	157	73	83	18	41	87	110	35	25
φ50	134	153	168	74	84	18	52	105	130	41	25
φ63	136	158	168	80	90	17	65	117	145	48	32
φ80	159	184	195	93	103	20	83	149	180	51	31
φ100	168	195	205	101	111	20	97	162	200	57	35
φ125	197	226	209	117	127	29	126	208	250	57	35
φ140	203	235	236	124	134	28	142	230	280	58	35
φ160	213	250	248	130	140	29	155	253	300	57	32

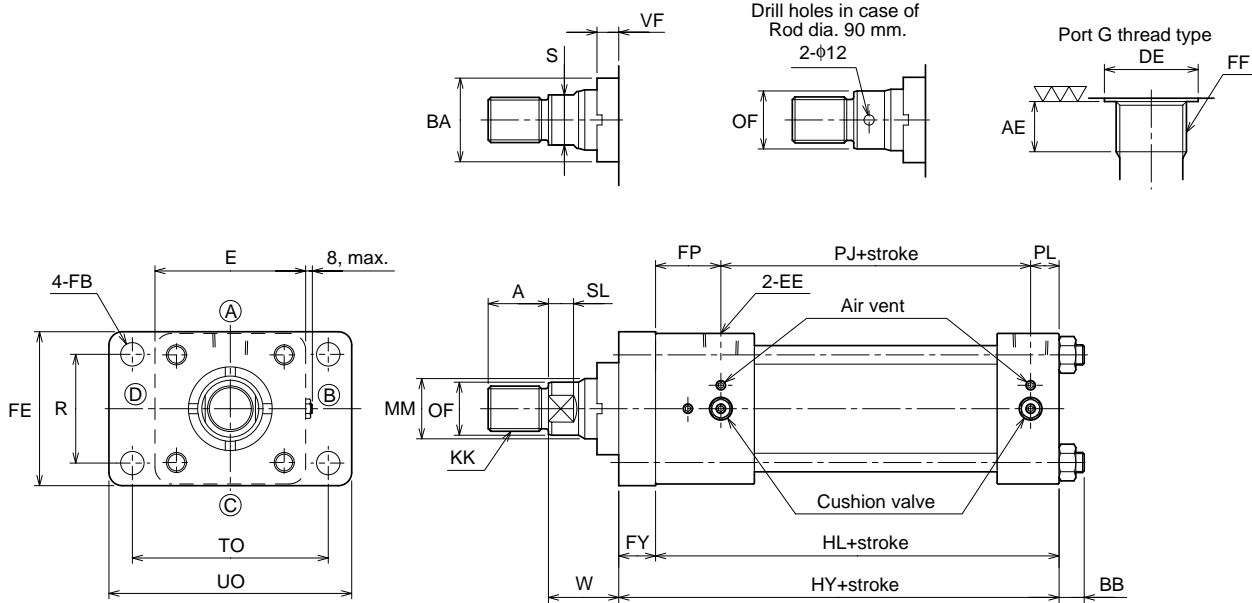
• Allowance of MM is f8.

## With boots

Symbol	Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125
X	Rod B	45	45	45	55	55	55	65	65	65
BA	Rod B	φ34	φ40	φ46	φ55	φ65	φ77	φ92	φ103	φ112

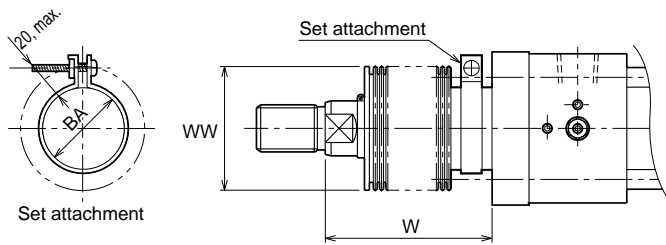
### FE

160H-1 [2] FE [Bore] [A] [B] [Stroke] - [A] [B]



- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "W".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### With boots



	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- Notes) ● Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.  
 ● Conex is the registered trademark of Teijin Ltd.  
 ● The boots have been mounted at our factory prior to delivery.

### W

#### Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100 - \phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100 - \phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

## Dimensional table

Symbol Bore	Rod A							
	A	BA	KK	MM	OF	S	SL	VF
φ40	28	φ46 f9	M20×1.5	φ28	φ26	22	11	13
φ50	36	φ55 f9	M27×2	φ36	φ34	30	14	13
φ63	45	φ65 f9	M33×2	φ45	φ43	38	17	13
φ80	56	φ77 f9	M42×2	φ56	φ54	50	21	13
φ100	63	φ92 f9	M48×2	φ70	φ68	60	24	13
φ125	85	φ112 f9	M64×3	φ90	φ88	80	Drill hole	13

Symbol Bore	AE	BB	DE	E	EE	FY	FB	FE	FF
	φ40	12	9	φ25.5	□ 62	Rc3/8	19	φ11	64
φ50	14	13	φ30	□ 75	Rc1/2	22	φ14	77	G1/2
φ63	14	13	φ30	□ 90	Rc1/2	25	φ14	92	G1/2
φ80	16	16	φ36.9	□ 114	Rc3/4	27	φ18	116	G3/4
φ100	16	16	φ36.9	□ 130	Rc3/4	29	φ18	132	G3/4
φ125	18	21	φ46.1	□ 165	Rc1	37	φ22	167	G1

Symbol Bore	FP	HL	HY	PJ	PL	R	TO	UO	W
	φ40	37	128	147	73	18	41	87	110
φ50	42	134	156	74	18	52	105	130	41
φ63	39	136	161	80	17	65	117	145	48
φ80	46	159	186	93	20	83	149	180	51
φ100	47	168	197	101	20	97	162	200	57
φ125	51	197	234	117	29	126	208	250	57

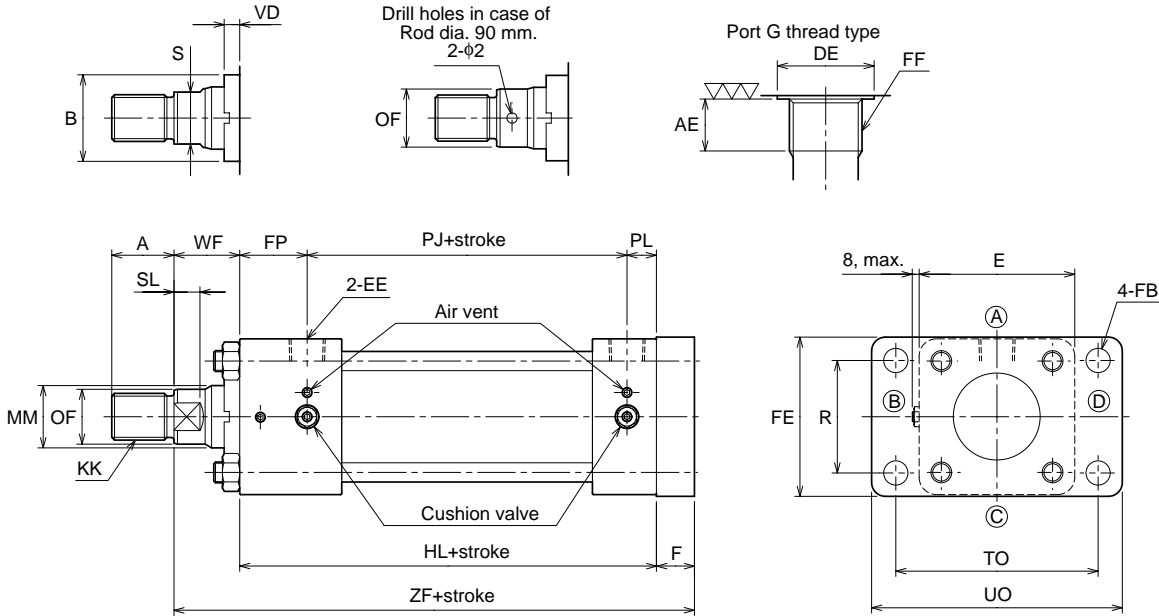
● Allowance of MM is f8.

## With boots

Symbol		Bore					
		φ40	φ50	φ63	φ80	φ100	φ125
WW	Rod A	φ50	φ71	φ80	φ100	φ100	φ140
X	Rod A	45	55	55	55	65	65
BA	Rod A	φ46	φ55	φ65	φ77	φ92	φ112

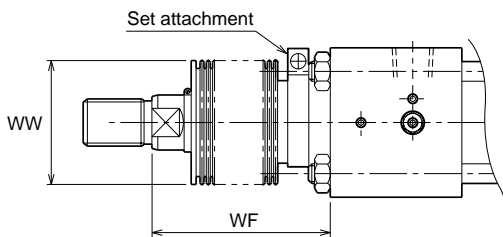
### FB

160H-1 [2] FB Bore B B Stroke - A B



- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### With boots



### WF

#### Rod B

Nylon tarpaulin Chloroprene	$\phi 32-\phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40-\phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

#### Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100-\phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100-\phi 125$	1/3.5	Stroke+X

- Notes) • Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.  
 • Conex is the registered trademark of Teijin Ltd.  
 • The boots have been mounted at our factory prior to delivery.

• When the calculated WF has decimals, raise them to the next whole number.

**Dimensional table**

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	-	-	-	-	-	-	-	-
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	-	-	-	-	-	-	-	-
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	-	-	-	-	-	-	-	-

Symbol Bore	AE	DE	E	EE	F	FB	FE	FF
φ32	12	φ21.5	□45	Rc1/4	11	φ6.6	47	G1/4
φ40	12	φ25.5	□62	Rc3/8	16	φ11	64	G3/8
φ50	14	φ30	□75	Rc1/2	19	φ14	77	G1/2
φ63	14	φ30	□90	Rc1/2	22	φ14	92	G1/2
φ80	16	φ36.9	□114	Rc3/4	25	φ18	116	G3/4
φ100	16	φ36.9	□130	Rc3/4	27	φ18	132	G3/4
φ125	18	φ46.1	□165	Rc1	29	φ22	167	G1
φ140	18	φ46.1	□185	Rc1	32	φ26	187	G1
φ160	18	φ46.1	□205	Rc1	37	φ26	207	G1

Symbol Bore	FP	HL	PJ	PL	R	TO	UO	WF	ZF
φ32	35	103	56	12	33	58	70	25	139
φ40	37	128	73	18	41	87	110	25	169
φ50	42	134	74	18	52	105	130	25	178
φ63	39	136	80	17	65	117	145	32	190
φ80	46	159	93	20	83	149	180	31	215
φ100	47	168	101	20	97	162	200	35	230
φ125	51	197	117	29	126	208	250	35	261
φ140	51	203	124	28	142	230	280	35	270
φ160	54	213	130	29	155	253	300	32	282

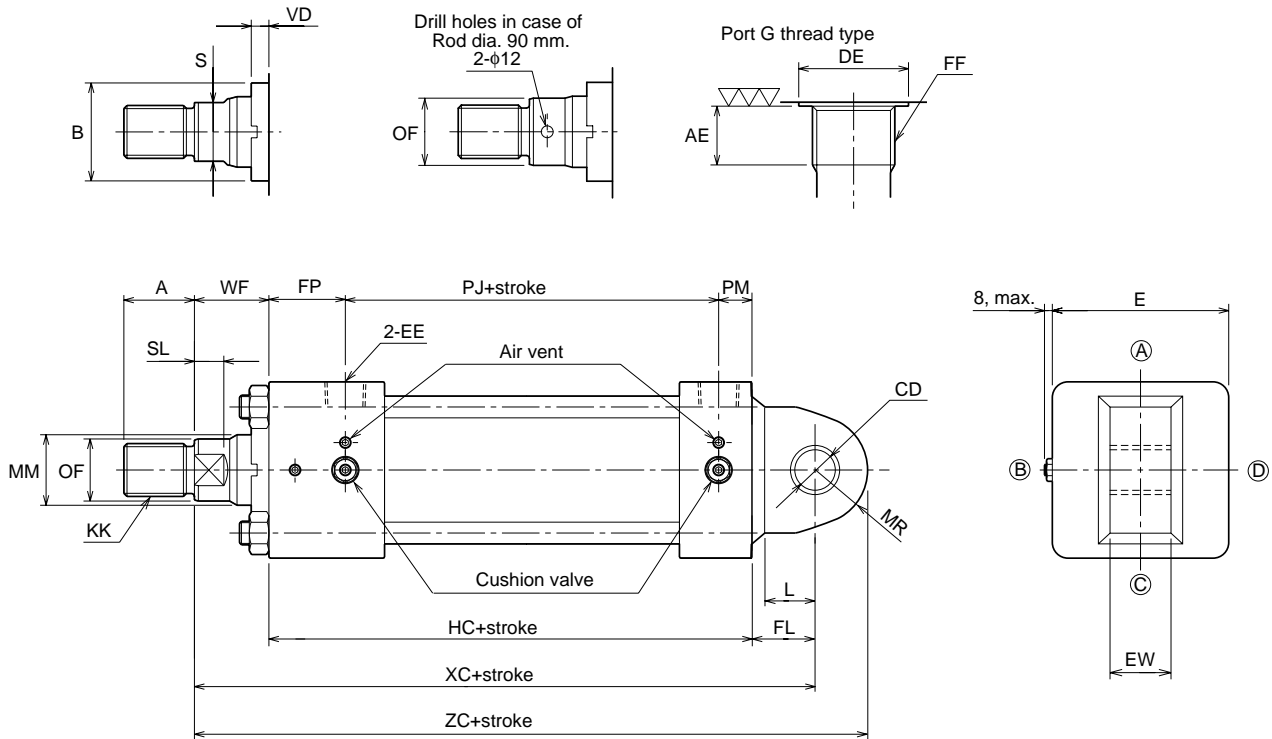
• Allowance of MM is f8.

**With boots**

Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
WW	Rod B		φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
	Rod A		-	φ50	φ71	φ80	φ100	φ100	φ140	-	-
X	Rod B		56	61	64	77	80	82	94	97	102
	Rod A		-	64	77	80	82	94	102	-	-

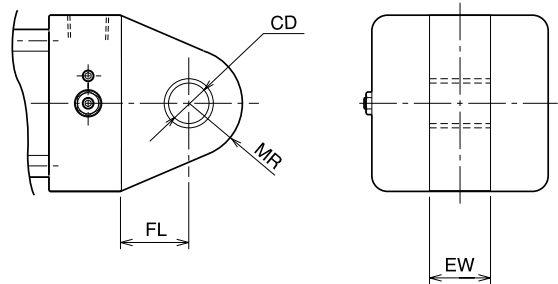
### CA

160H-1 [2] CA Bore B B Stroke - A B

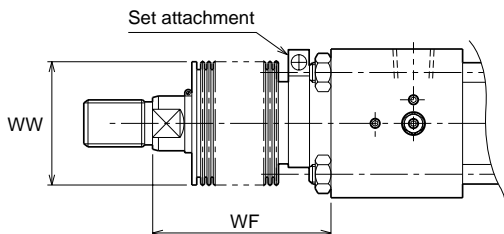


- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- Bush (made of gray iron cast) is press-fit to the mounting hole (dimensional symbol: CD).
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### ● Bore 32 mm, 40 mm



### With boots



### WF

#### Rod B

Nylon tarpaulin Chloroprene	$\phi 32-\phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40-\phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

#### Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100-\phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100-\phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- (Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

**Dimensional table**

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	CD	DE	E	EE	EW	FF	FL
φ32	12	φ12 H9	φ21.5	□45	Rc1/4	16 <sup>0</sup> <sub>-0.43</sub>	G1/4	19
φ40	12	φ14 H9	φ25.5	□62	Rc3/8	20 <sup>0</sup> <sub>-0.52</sub>	G3/8	19
φ50	14	φ20 H9	φ30	□75	Rc1/2	30 <sup>0</sup> <sub>-0.52</sub>	G1/2	33
φ63	14	φ20 H9	φ30	□90	Rc1/2	30 <sup>0</sup> <sub>-0.52</sub>	G1/2	33
φ80	16	φ28 H9	φ36.9	□114	Rc3/4	40 <sup>0</sup> <sub>-0.62</sub>	G3/4	41
φ100	16	φ36 H9	φ36.9	□130	Rc3/4	50 <sup>0</sup> <sub>-0.62</sub>	G3/4	56
φ125	18	φ45 H9	φ46.1	□165	Rc1	60 <sup>0</sup> <sub>-0.74</sub>	G1	62
φ140	18	φ50 H9	φ46.1	□185	Rc1	65 <sup>0</sup> <sub>-0.74</sub>	G1	65
φ160	18	φ56 H9	φ46.1	□205	Rc1	70 <sup>0</sup> <sub>-0.74</sub>	G1	68

Symbol Bore	FP	HC	L	MR	PJ	PM	WF	XC	ZC
φ32	35	103	—	R17	56	12	25	147	164
φ40	37	128	—	R17	73	18	25	172	189
φ50	42	133	30	R28	74	17	25	191	219
φ63	39	135	30	R28	80	16	32	200	228
φ80	46	157	35	R33	93	18	31	229	262
φ100	47	166	51	R49	101	18	35	257	306
φ125	51	192	54	R52	117	24	35	289	341
φ140	51	200	57	R55	124	25	35	300	355
φ160	54	208	60	R58	130	24	32	308	366

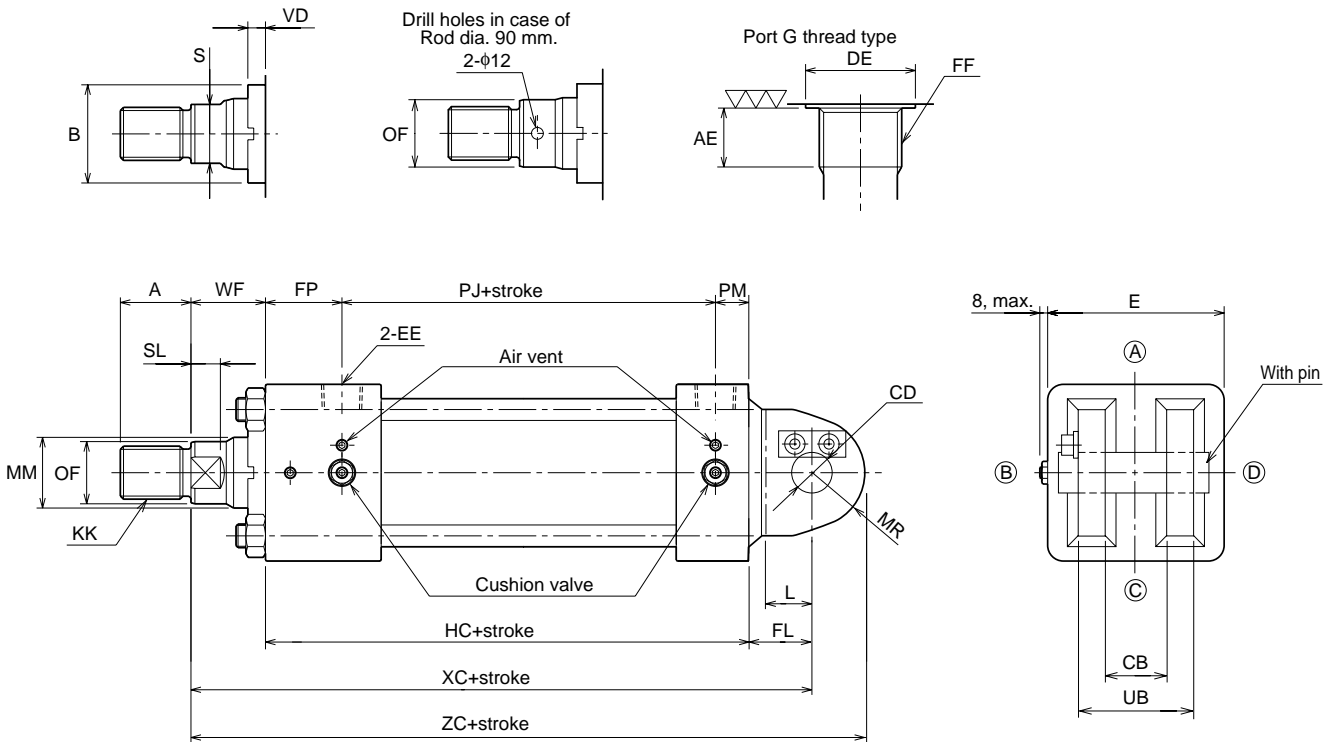
● Allowance of MM is f8.

**With boots**

Bore		φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
Symbol	WW	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
		—	φ50	φ71	φ80	φ100	φ100	φ140	—	—
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—

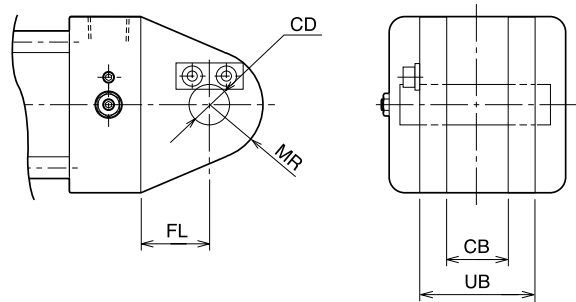
### CB

160H-1 [ 2 CB Bore B B Stroke - A B ]

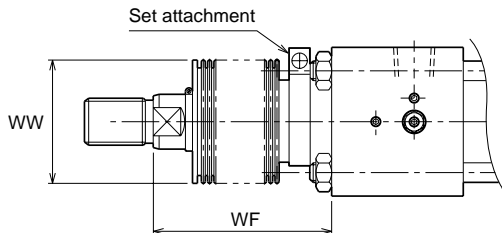


- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- On the rod side of the rod A type cylinder, the air vents are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

### ● Bore 32 mm, 40 mm



### With boots



### WF Rod B

Nylon tarpaulin Chloroprene	$\phi 32 \sim \phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40 - \phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- Notes) ● Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.  
 ● Conex is the registered trademark of Teijin Ltd.  
 ● The boots have been mounted at our factory prior to delivery.

### Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100 - \phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100 - \phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

**Dimensional table**

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	CB	CD	DE	E	EE	FF	FL
φ32	12	16 <sup>+0.69</sup> <sub>+0.29</sub>	φ12 H9/f8	φ21.5	□ 45	Rc1/4	G1/4	19
φ40	12	20 <sup>+0.70</sup> <sub>+0.30</sub>	φ14 H9/f8	φ25.5	□ 62	Rc3/8	G3/8	19
φ50	14	30 <sup>+0.70</sup> <sub>+0.30</sub>	φ20 H9/f8	φ30	□ 75	Rc1/2	G1/2	33
φ63	14	30 <sup>+0.70</sup> <sub>+0.30</sub>	φ20 H9/f8	φ30	□ 90	Rc1/2	G1/2	33
φ80	16	40 <sup>+0.91</sup> <sub>+0.31</sub>	φ28 H9/f8	φ36.9	□ 114	Rc3/4	G3/4	41
φ100	16	50 <sup>+0.92</sup> <sub>+0.32</sub>	φ36 H9/f8	φ36.9	□ 130	Rc3/4	G3/4	56
φ125	18	60 <sup>+0.94</sup> <sub>+0.34</sub>	φ45 H9/f8	φ46.1	□ 165	Rc1	G1	62
φ140	18	65 <sup>+0.94</sup> <sub>+0.34</sub>	φ50 H9/f8	φ46.1	□ 185	Rc1	G1	65
φ160	18	70 <sup>+0.96</sup> <sub>+0.36</sub>	φ56 H9/f8	φ46.1	□ 205	Rc1	G1	68

Symbol Bore	FP	HC	L	MR	PJ	PM	UB	WF	XC	ZC
φ32	35	103	—	R17	56	12	32	25	147	164
φ40	37	128	—	R17	73	18	40	25	172	189
φ50	42	133	30	R28	74	17	60	25	191	219
φ63	39	135	30	R28	80	16	60	32	200	228
φ80	46	157	35	R33	93	18	80	31	229	262
φ100	47	166	50	R49	101	18	100	35	257	306
φ125	51	192	53	R52	117	24	120	35	289	341
φ140	51	200	56	R55	124	25	130	35	300	355
φ160	54	208	59	R58	130	24	140	32	308	366

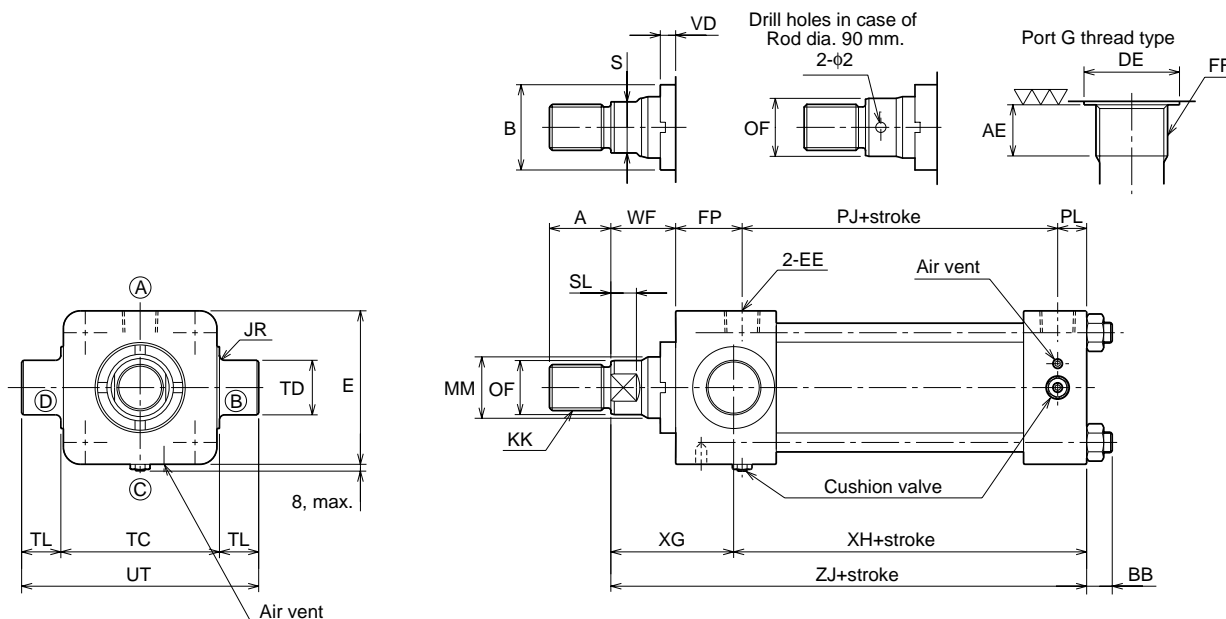
• Allowance of MM is f8.

**With boots**

Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
WW	Rod B		φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
	Rod A		—	φ50	φ71	φ80	φ100	φ100	φ140	—	—
X	Rod B		56	61	64	77	80	82	94	97	102
	Rod A		—	64	77	80	82	94	102	—	—

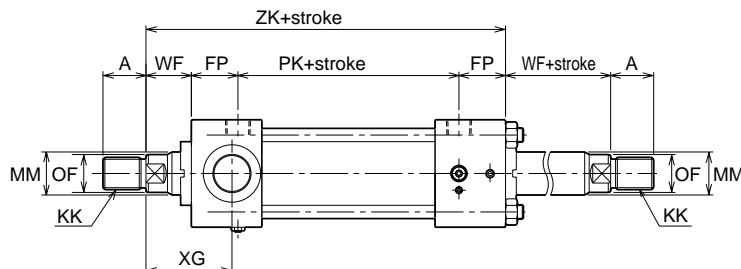
## TA

160H-1 2 TA Bore B B Stroke - A B



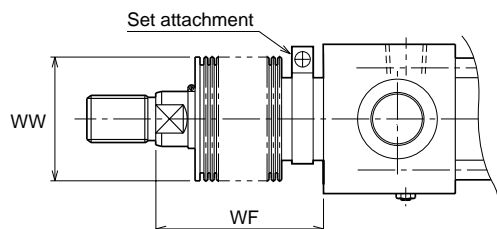
- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- If the stroke is short, pay attention to prevent the cushion valve from interfering with the mounting bracket.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

## Double-acting double rod (Rod B)



- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

## With boots

WF  
Rod B

Nylon tarpaulin Chloroprene	$\phi 32-\phi 40$	1/3	Stroke+X
	$\phi 50$	1/3.5	Stroke+X
	$\phi 63 - \phi 100$	1/4	Stroke+X
	$\phi 125 - \phi 160$	1/5	Stroke+X
Conex	$\phi 32$	1/2	Stroke+X
	$\phi 40-\phi 50$	1/2.5	Stroke+X
	$\phi 63 - \phi 100$	1/3	Stroke+X
	$\phi 125 - \phi 160$	1/3.5	Stroke+X

## Rod A

Nylon tarpaulin Chloroprene	$\phi 40$	1/3.5	Stroke+X
	$\phi 50 - \phi 80$	1/4	Stroke+X
	$\phi 100-\phi 125$	1/5	Stroke+X
Conex	$\phi 40$	1/2.5	Stroke+X
	$\phi 50 - \phi 80$	1/3	Stroke+X
	$\phi 100-\phi 125$	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- (Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

**Dimensional table**

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	BB	DE	E	EE	FF	FP	JR	PJ	PK
φ32	12	7	φ21.5	□45	Rc1/4	G1/4	35	R2	56	66
φ40	12	9	φ25.5	□62	Rc3/8	G3/8	37	R2	73	83
φ50	14	13	φ30	□75	Rc1/2	G1/2	42	R2.5	74	84
φ63	14	13	φ30	□90	Rc1/2	G1/2	39	R2.5	80	90
φ80	16	16	φ36.9	□114	Rc3/4	G3/4	46	R3	93	103
φ100	16	16	φ36.9	□130	Rc3/4	G3/4	47	R3	101	111
φ125	18	21	φ46.1	□165	Rc1	G1	51	R4	117	127
φ140	18	22	φ46.1	□185	Rc1	G1	51	R4	124	134
φ160	18	25	φ46.1	□205	Rc1	G1	54	R4	130	140

Symbol Bore	PL	TC	TD	TL	UT	WF	XG	XH	ZJ	ZK
φ32	12	44 <sup>0</sup> <sub>-0.62</sub>	φ16 f8	12	68	25	54	74	128	161
φ40	18	63 <sup>0</sup> <sub>-0.74</sub>	φ20 f8	16	95	25	57	96	153	182
φ50	18	76 <sup>0</sup> <sub>-0.74</sub>	φ25 f8	20	116	25	64	95	159	193
φ63	17	89 <sup>0</sup> <sub>-0.87</sub>	φ32 f8	25	139	32	70	98	168	200
φ80	20	114 <sup>0</sup> <sub>-0.87</sub>	φ40 f8	32	178	31	76	114	190	226
φ100	20	127 <sup>0</sup> <sub>-1.00</sub>	φ50 f8	40	207	35	71	132	203	240
φ125	29	165 <sup>0</sup> <sub>-1.00</sub>	φ63 f8	50	265	35	75	157	232	264
φ140	28	184 <sup>0</sup> <sub>-1.15</sub>	φ70 f8	58	300	35	75	163	238	271
φ160	29	203 <sup>0</sup> <sub>-1.15</sub>	φ80 f8	63	329	32	75	170	245	280

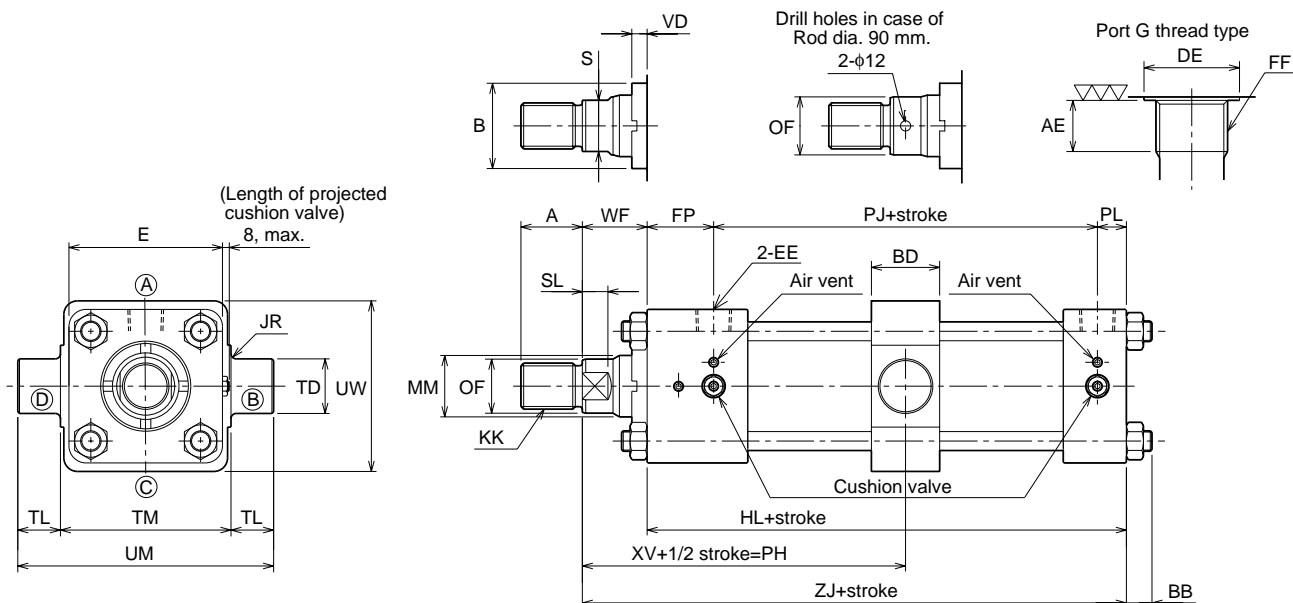
• Allowance of MM is f8.

**With boots**

Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
WW	Rod B		φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125	φ140
	Rod A		—	φ50	φ71	φ80	φ100	φ100	φ140	—	—
X	Rod B		56	61	64	77	80	82	94	97	102
	Rod A		—	64	77	80	82	94	102	—	—

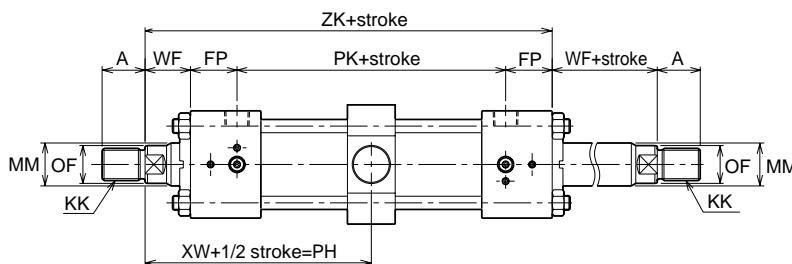
## TC

160H-1 [ 2 TC Bore B B Stroke - A B ]



- Positions of the cushion valves and air vents depend on the cylinder bore.
- Rod end thread length (A) must be longer when a lock nut is attached to the rod end. Refer to "Rod end attachment/Rod end thread length with lock nut".
- If the stroke is short, pay attention to prevent the cushion valve from interfering with the mounting bracket.
- The air vents on the rod side of the rod A type cylinder are located on the two sides neither the port nor the cushion valve is located.
- When you want to change the length of the projected rod, specify the "WF".
- As for the dimensions not shown in these drawings, refer to the SD type (basic type).
- For the mounting of switches, refer to the dimensional drawings of "Switch set". All the contents other than "switch mounting dimensions" are identical.

## Double-acting double rod (Rod B)



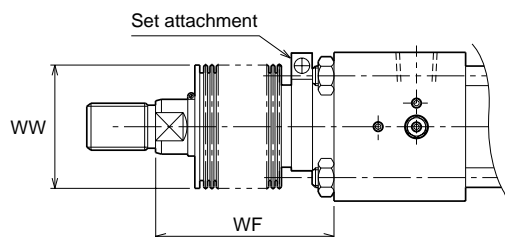
- Distance between the covers of the double rod type cylinder is longer than that of the single rod type cylinder by 10 mm.

## Minimum stroke of TC type

Bore	Stroke	Bore	Stroke	Bore	Stroke
φ32	10	φ63	10	φ125	25
φ40	10	φ80	10	φ140	25
φ50	10	φ100	25	φ160	35

- As for the minimum stroke of the switch set cylinder, refer to the model code.

## With boots



## WF

## Rod B

Nylon tarpaulin Chloroprene	φ32-φ40	1/3	Stroke+X
	φ50	1/3.5	Stroke+X
	φ63 - φ100 φ125 - φ160	1/4 1/5	Stroke+X Stroke+X
Conex	φ32	1/2	Stroke+X
	φ40-φ50	1/2.5	Stroke+X
	φ63 - φ100	1/3	Stroke+X
	φ125 - φ160	1/3.5	Stroke+X

## Rod A

Nylon tarpaulin Chloroprene	φ40	1/3.5	Stroke+X
	φ50 - φ80 φ100A-φ125	1/4 1/5	Stroke+X Stroke+X
	φ40	1/2.5	Stroke+X
Conex	φ50 - φ80	1/3	Stroke+X
	φ100-φ125	1/3.5	Stroke+X

- When the calculated WF has decimals, raise them to the next whole number.

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Resistible temperature	80°C	130°C	200°C

- (Notes)
- Remember that the resistible temperatures shown in the table above are for the boots, not for the cylinder.
  - Conex is the registered trademark of Teijin Ltd.
  - The boots have been mounted at our factory prior to delivery.

**Dimensional table**

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	M33×2	φ45	φ43	38	17	8	56	φ72 f9	M42×2	φ56	φ54	50	21	8
φ100	56	φ72 f9	M42×2	φ56	φ54	50	21	8	63	φ88 f9	M48×2	φ70	φ68	60	24	6
φ125	63	φ88 f9	M48×2	φ70	φ68	60	24	6	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5
φ140	75	φ98 f9	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	M64×3	φ90	φ88	80	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	BB	BD	DE	E	EE	FF	FP	HL	JR	Minimum PH	PJ
	φ32	12	7	30	φ21.5	□45	Rc1/4	G1/4	35	103	R2	89
φ40	12	9	30	φ25.5	□62	Rc3/8	G3/8	37	128	R2	94	73
φ50	14	13	40	φ30	□75	Rc1/2	G1/2	42	134	R2.5	105	74
φ63	14	13	43	φ30	□90	Rc1/2	G1/2	39	136	R2.5	112.5	80
φ80	16	16	53	φ36.9	□114	Rc3/4	G3/4	46	159	R3	127.5	93
φ100	16	16	68	φ36.9	□130	Rc3/4	G3/4	47	168	R3	144	101
φ125	18	21	73	φ46.1	□165	Rc1	G1	51	197	R4	154.5	117
φ140	18	22	83	φ46.1	□185	Rc1	G1	51	203	R4	159.5	124
φ160	18	25	98	φ46.1	□205	Rc1	G1	54	213	R4	168	130

Symbol Bore	PK	PL	TD	TL	TM	UM	UW	WF	XV	XW	ZJ	ZK
	φ32	66	12	φ16 f8	12	55 <sup>0</sup> <sub>-0.62</sub>	79	55	25	88	93	128
φ40	83	18	φ20 f8	16	76 <sup>0</sup> <sub>-0.74</sub>	108	76	25	98.5	103.5	153	182
φ50	84	18	φ25 f8	20	89 <sup>0</sup> <sub>-0.87</sub>	129	89	25	104	109	159	193
φ63	90	17	φ32 f8	25	100 <sup>0</sup> <sub>-0.87</sub>	150	100	32	111	116	168	200
φ80	103	20	φ40 f8	32	127 <sup>0</sup> <sub>-1.00</sub>	191	127	31	123.5	128.5	190	226
φ100	111	20	φ50 f8	40	140 <sup>0</sup> <sub>-1.00</sub>	220	140	35	132.5	137.5	203	240
φ125	127	29	φ63 f8	50	178 <sup>0</sup> <sub>-1.00</sub>	278	178	35	144.5	149.5	232	264
φ140	134	28	φ70 f8	58	200 <sup>0</sup> <sub>-1.00</sub>	316	200	35	148	153	238	271
φ160	140	29	φ80 f8	63	215 <sup>0</sup> <sub>-1.15</sub>	341	215	32	151	156	245	280

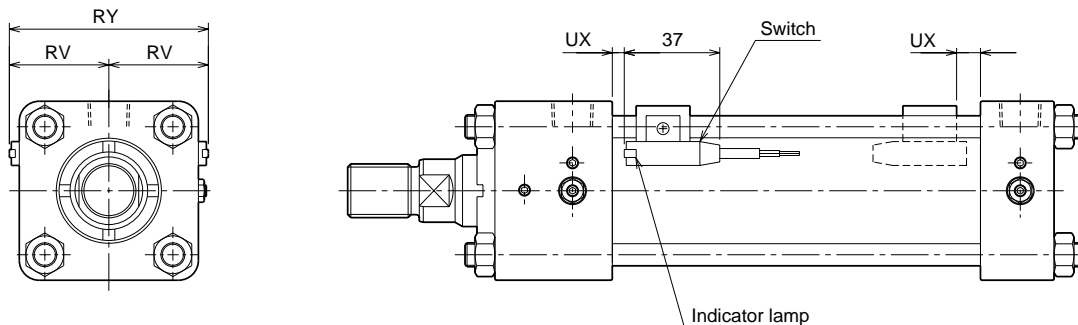
• Allowance of MM is f8.

**With boots**

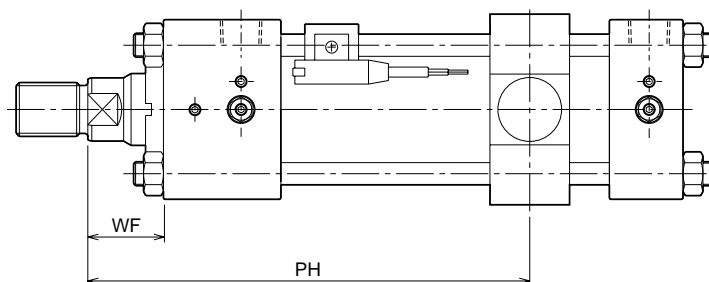
Symbol		Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
		WW	Rod B	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125
Rod A	—		φ50	φ71	φ80	φ100	φ100	φ140	—	—	—
X	Rod B	56	61	64	77	80	82	94	97	102	—
	Rod A	—	64	77	80	82	94	102	—	—	—

## Switch set

160H-1R	2	SD	Bore	B	B	Stroke	–	A	B	Switch code	Switch quantity
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## Minimum dimension PH of switch set cylinder 160H-1R



- The minimum dimension PH of the switch set cylinder is the dimension when the trunnion is moved toward the rod side in case that the switch is mounted to the rod side.

If the boots are equipped, the dimension WF is modified. In such a case, specify the dimension PH.

**Dimensional table**

Symbol Bore	RV	RY	UX	The minimum dimension PH
φ32	33	66	4 (9)	150 (155)
φ40	38	76	11 (16)	160 (165)
φ50	45	90	10 (15)	170 (175)
φ63	50	100	11 (16)	178.5 (183.5)
φ80	60	120	13 (18)	195.5 (200.5)
φ100	68	136	14 (19)	212 (217)
φ125	83	166	19 (24)	227.5 (232.5)
φ140	92	182	21 (26)	234.5 (239.5)
φ160	99	200	22 (27)	245 (250)

Note) ● Figures on the previous page show the AX type switch (rear wiring). As for the AZ type switch (upper wiring), take into consideration the bending radius of cord.

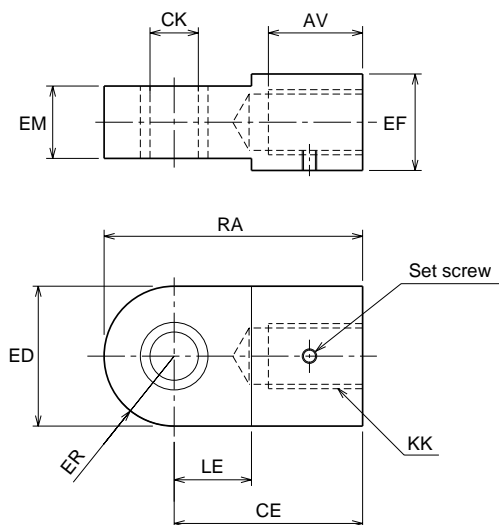
- The dimension UX indicates the optimum switch mounting position at the detection of the stroke end.
- Figures in the parentheses shown in the table above are applicable to the double rod type cylinder.

**Working range and difference**

Bore mm	Contact		No contact	
	AX1**		AX2**	
	Working range	Difference	Working range	Difference
φ32	4 - 14	2 or smaller	3 - 8	1 or smaller
φ40				
φ50				
φ63				
φ80				
φ100	11 - 18	4 - 10	6 - 13	
φ125	5 - 15			
φ140	11 - 20			
φ160				

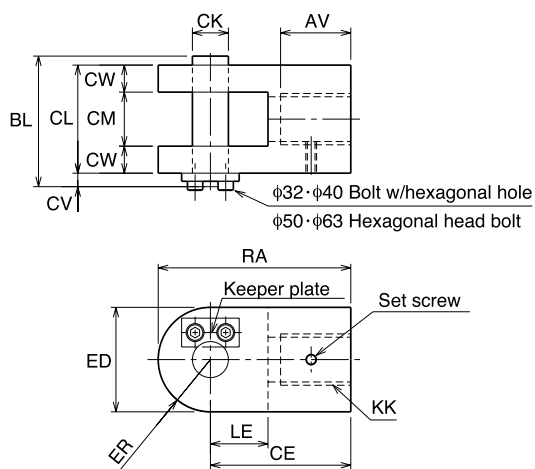
## Rod end attachment

### ● Rod end eye (T-end)

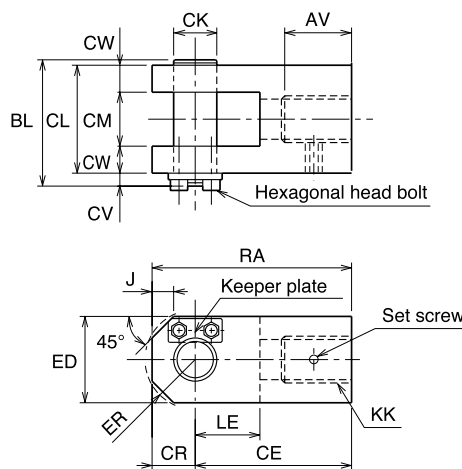


### ● Rod end clevis (Y-end)

Bore from 32 mm to 63 mm



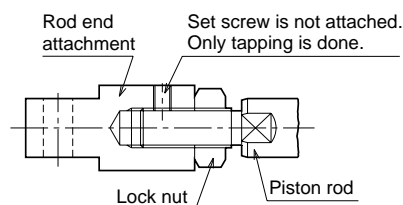
Bore from 80 mm to 160 mm



### ● Delivery of rod end attachment (T-end, Y-end)

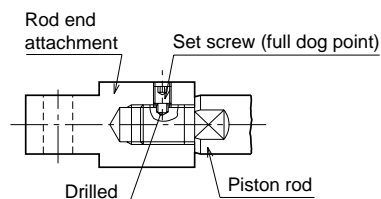
(1) In the case that the lock nut and rod end attachment are additionally ordered

The rod end attachment and lock nut are temporarily assembled to the piston rod for delivery. Since the lock nut is not tightened, tighten it after the position of the rod end attachment is adjusted. No set screw is included.



(2) In the case that only the rod end attachment is additionally ordered (without lock nut)

The rod end attachment is tightened to the piston rod, and a drill hole is made on the piston rod for delivery.



If a drill hole is unnecessary, advise us.

**Dimensional table/rod end eye (T-end)**

Symbol Bore	Rod B							Rod A						
	Part code	AV	CE	EF	KK	RA	Set screw	Part code	AV	CE	EF	KK	RA	Set screw
φ32	RTH-14-H	21	50	25	M14×1.5	67	M6	—	—	—	—	—	—	—
φ40	RTH-16-3-H	25	55	30	M16×1.5	72	M6	RTH-20-4-H	31	67	35	M20×1.5	84	M6
φ50	RTH-20-3-H	31	67	40	M20×1.5	96	M6	RTH-27-H	39	78	40	M27×2	107	M6
φ63	RTH-27-H	39	78	40	M27×2	107	M6	RTH-33-1-H	48	94	50	M33×2	123	M6
φ80	RTH-33-H	48	94	50	M33×2	128	M6	RTH-42-1-H	59	112	65	M42×2	146	M8
φ100	RTH-42-H	59	112	65	M42×2	162	M8	RTH-48-4-H	66	135	75	M48×2	185	M10
φ125	RTH-48-3-H	66	125	75	M48×2	178	M10	RTH-64-5-H	88	158	100	M64×3	211	M12
φ140	RTH-56-1-H	78	148	85	M56×2	204	M12	—	—	—	—	—	—	
φ160	RTH-64-4-H	88	158	100	M64×3	217	M12	—	—	—	—	—	—	

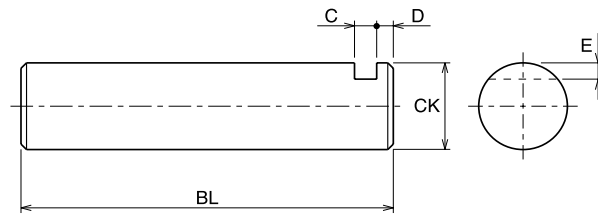
Symbol Bore	CK	ED	EM	ER	LE
φ32	φ12 H9	34	16 <sub>0</sub> <sup>0.27</sup>	R17	19
φ40	φ14 H9	34	20 <sub>0</sub> <sup>0.33</sup>	R17	19
φ50	φ20 H9	58	30 <sub>0</sub> <sup>0.33</sup>	R29	32
φ63	φ20 H9	58	30 <sub>0</sub> <sup>0.33</sup>	R29	32
φ80	φ28 H9	68	40 <sub>0</sub> <sup>0.39</sup>	R34	39
φ100	φ36 H9	100	50 <sub>0</sub> <sup>0.39</sup>	R50	54
φ125	φ45 H9	106	60 <sub>0</sub> <sup>0.46</sup>	R53	57
φ140	φ50 H9	112	65 <sub>0</sub> <sup>0.46</sup>	R56	63
φ160	φ56 H9	118	70 <sub>0</sub> <sup>0.46</sup>	R59	63

**Dimensional table/rod end clevis (Y-end)**

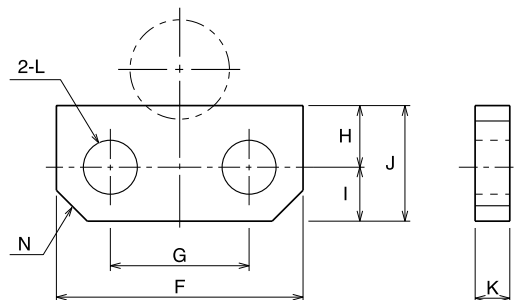
Symbol Bore	Rod B						Rod A					
	Part code	AV	CE	KK	RA	Set screw	Part code	AV	CE	KK	RA	Set screw
φ32	RYH-14-H	21	50	M14×1.5	67	M6	—	—	—	—	—	—
φ40	RYH-16-3-H	25	55	M16×1.5	72	M6	RYH-20-4-H	31	67	M20×1.5	84	M6
φ50	RYH-20-3-H	31	67	M20×1.5	96	M6	RYH-27-H	39	78	M27×2	107	M6
φ63	RYH-27-H	39	78	M27×2	107	M6	RYH-33-1-H	48	94	M33×2	123	M6
φ80	RYH-33-H	48	94	M33×2	125	M6	RYH-42-1-H	59	112	M42×2	143	M8
φ100	RYH-42-H	58	112	M42×2	155	M8	RYH-48-4-H	66	135	M48×2	178	M10
φ125	RYH-48-3-H	68	125	M48×2	170	M10	RYH-64-5-H	90	158	M64×3	203	M12
φ140	RYH-56-1-H	85	148	M56×2	198	M12	—	—	—	—	—	—
φ160	RYH-64-4-H	95	158	M64×3	212	M12	—	—	—	—	—	—

Symbol Bore	BL	CK	CL	CM	CR	CV	CW	ED	ER	J	LE
φ32	42	φ12 H9/f8	32	16 <sub>+0.29</sub> <sup>+0.69</sup>	—	8	8	34	R17	—	19
φ40	50	φ14 H9/f8	40	20 <sub>+0.30</sub> <sup>+0.70</sup>	—	8	10	34	R17	—	19
φ50	72	φ20 H9/f8	60	30 <sub>+0.30</sub> <sup>+0.70</sup>	—	10	15	58	R29	—	32
φ63	72	φ20 H9/f8	60	30 <sub>+0.30</sub> <sup>+0.70</sup>	—	10	15	58	R29	—	32
φ80	92	φ28 H9/f8	80	40 <sub>+0.31</sub> <sup>+0.91</sup>	31	10	20	65	R33	22	39
φ100	115	φ36 H9/f8	100	50 <sub>+0.32</sub> <sup>+0.92</sup>	43	13	25	90	R48	24	54
φ125	138	φ45 H9/f8	120	60 <sub>+0.34</sub> <sup>+0.94</sup>	45	14	30	100	R51	28	57
φ140	152	φ50 H9/f8	130	65 <sub>+0.34</sub> <sup>+0.94</sup>	50	18	32.5	100	R55	28	63
φ160	162	φ56 H9/f8	140	70 <sub>+0.36</sub> <sup>+0.96</sup>	54	18	35	110	R59	33	63

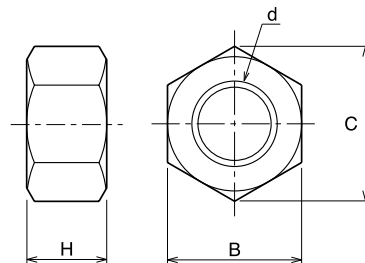
● Parallel pin



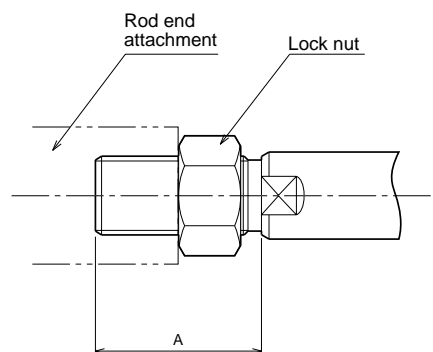
● Keeper plate



● Lock nut



● Thread length with lock nut



The standard fitting length of the rod end attachment and piston rod is approximately 80% of the thread diameter. When using a lock nut, it is required to lengthen the thread length (A) as shown in the figure above. If you order a cylinder with lock nut attached (symbol: K), the thread length (A) is as shown in the table on the next page.

### Dimensional table/Parallel pin

Symbol Bore	Rod A, B				
	BL	C	CK	D	E
φ32	42	4	φ12f8	4	2
φ40	50	4	φ14f8	4	2
φ50	72	5.5	φ20f8	4.5	3
φ63	72	5.5	φ20f8	4.5	3
φ80	92	5.5	φ28f8	4.5	4
φ100	115	7	φ36f8	6	5
φ125	138	7	φ45f8	7	5.5
φ140	152	10	φ50f8	8	7
φ160	162	10	φ56f8	8	7

Note) ● For the rod A type, the bore is within the range from 40 mm to 125 mm.

### Dimensional table/Keeper plate

Symbol Bore	Rod A, B								Mounting bolt
	F	G	H	I	J	K	L	N	
φ32	19	10	5.5	4.5	10	3	φ5.5	C2.5	M5
φ40	19	10	5.5	4.5	10	3	φ5.5	C2.5	M5
φ50	32	17	8	8	16	4.5	φ6.6	C4	M6
φ63	32	17	8	8	16	4.5	φ6.6	C4	M6
φ80	38	23	7	8	15	4.5	φ6.6	C4	M6
φ100	44	24	11	11	22	6	φ9	C3	M8
φ125	60	32	15	13	28	6	φ11	C10	M10
φ140	65	41	15	15	30	9	φ13	C10	M12
φ160	65	41	15	15	30	9	φ13	C10	M12

Note) ● For the rod A type, the bore is within the range from 40 mm to 125 mm.

### Dimensional table/Lock nut

Symbol Bore	Rod B					Rod A				
	Parts model	B	C	d	H	Parts model	B	C	d	H
φ32	LNH-14F-H	22	25.4	M14×1.5	11	—	—	—	—	—
φ40	LNH-16F-1-H	24	27.7	M16×1.5	13	LNH-20F-2-H	30	34.6	M20×1.5	16
φ50	LNH-20F-2-H	30	34.6	M20×1.5	16	LNH-27F-H	41	47.3	M27×2	22
φ63	LNH-27F-H	41	47.3	M27×2	22	LNH-33F-H	50	57.7	M33×2	26
φ80	LNH-33F-H	50	57.7	M33×2	26	LNH-42F-1-H	65	75	M42×2	34
φ100	LNH-42F-1-H	65	75	M42×2	34	LNH-48F-2-H	75	86.5	M48×2	38
φ125	LNH-48F-2-H	75	86.5	M48×2	38	LNH-64F-2-H	95	110	M64×3	51
φ140	LNH-56F-1-H	85	98.1	M56×2	45	—	—	—	—	—
φ160	LNH-64F-2-H	95	110	M64×3	51	—	—	—	—	—

### Dimensional table/A when lock nut is used (long thread)

Symbol Bore	Rod B		Rod A	
	A	KK	A	KK
φ32	28	M14×1.5	—	—
φ40	32	M16×1.5	40	M20×1.5
φ50	40	M20×1.5	54	M27×2
φ63	54	M27×2	66	M33×2
φ80	66	M33×2	84	M42×2
φ100	84	M42×2	96	M48×2
φ125	96	M48×2	128	M64×3
φ140	112	M56×2	—	—
φ160	128	M64×3	—	—

### Special specification at the rod end **For rod size B**

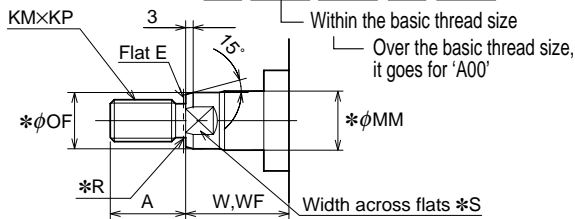
(Please consult us in case of 'A rod' or the case that doesn't go for 'A01' or 'A00' below.)

- You can easily order following categorized items using the Semi-standard symbols and dimensional parameters.  
(No need to specify dimensional parameters if you would apply the basic dimensions.)

**How to order** Series Model number – X Semi-standard symbols Dimensional parameters

Semi-standard symbols: **A01** Parameter KM and KP need to be specified as a pair.

Optional parameters: **A KM KP W WF**



**The basic dimension table (=160H-1 Standard dimension)**

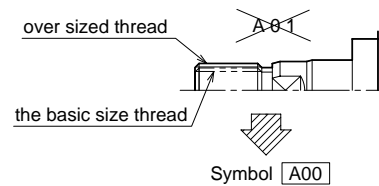
Bore	A	KM	KP	*MM	*OF	*R	*S	W (FA type)	WF (Others)
φ32	18	14	1.5	φ18	φ17	1	14	35	25
φ40	22	16	1.5	φ22	φ21	1.6	17	35	25
φ50	28	20	1.5	φ28	φ26	1.6	22	41	25
φ63	36	27	2	φ36	φ34	2	30	48	32
φ80	45	33	2	φ45	φ43	2	38	51	31
φ100	56	42	2	φ56	φ54	2	50	57	35
φ125	63	48	2	φ70	φ68	2	60	57	35
φ140	75	56	2	φ80	φ78	2	70	58	35
φ160	85	64	3	φ90	φ88	3	Drill hole	57	32

Occasion ■ Slight dimension change on the basis of 160H-1 series standard thread size.

Note

■ A01's basic dimension shows the original 160H-1's standard itself. Don't use semi-standard symbols to avoid confusion in such a case.

■ In case of over sized thread, the symbol should be 'A00', not 'A01'.

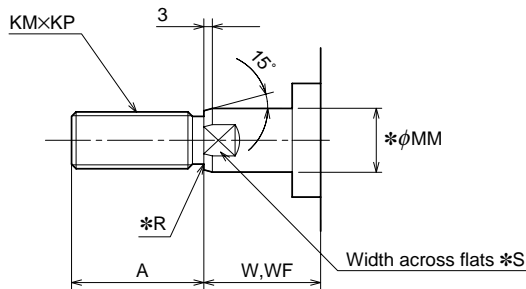


ex.

- bore:40mm, rod:B, thread size:M16×2, WF:80mm  
(order)160H-1 1CA40BB250-AB-X A01  
KM-16, KP-2, WF-80  
(manufacturing) rod end style A=22, KM=16, KP=2, WF=80, φMM=φ22, φOF=φ21, R=1.6, S=17
- bore:100mm, rod:B, thread size:M45×1.5  
'A01' can't be used. Refer to the symbol 'A00'.

Semi-standard symbols: **A00** Parameter KM and KP need to be specified as a pair.

Optional parameters: **A KM KP W WF**



**The basic dimension table**

Bore	A	KM	KP	*MM	*R	*S	W (FA type)	WF (Others)
φ32	25	16	1.5	φ18	1	14	35	25
φ40	30	20	1.5	φ22	1	19	35	25
φ50	35	24	1.5	φ28	1	24	41	25
φ63	45	30	1.5	φ36	1.6	30	48	32
φ80	60	39	1.5	φ45	1.6	41	51	31
φ100	75	48	1.5	φ56	1.6	50	57	35
φ125	95	64	2	φ70	2	65	57	35
φ140	110	72	2	φ80	2	75	58	35
φ160	120	80	2	φ90	2	85	57	32

Occasion ■ In case of ordering over sized thread  
■ In case of applying the standard thread size of 70/140H-8 series

Note

■ On this symbol 'A00' the basic dimension is completely different from that of 'A01'. 'A00's basic is originally based on the standard of 70/140H-8.

ex.

- bore:63mm, rod:B, 'A00' basic dimensions  
(order)160H-1R 2FA63BB300-BC-X A00  
(manufacturing) rod end style A=45, KM=30, KP=1.5, W=48, φMM=φ36, R=1.6, S=30
- bore:100mm, rod=B, thread size M45×1.5 other dimensions from 'A01' basic  
(order)160H-1 2CB100BR500-AB-X A00  
KM-45, KP-1.5, A-56  
(manufacturing) rod end style A=56, KM=45, KP=1.5, WF=35, φMM=φ56, R=1.6, S=50
- bore:50mm, rod:B, thread size:M22×1.5, WF:100mm, other dimensions from the basic  
(order)160H-1 2CA50BB500-AB-X A00  
KM-22, KP-1.5, WF-100  
(manufacturing) rod end style A=35, KM=22, KP=1.5, WF=100, φMM=φ28, R=1, S=24

- Dimensions indicated by \*Mark are fixed as our semi-standard.
- You are requested to consult us if you would like to change fixed dimensions.

## Installation of cylinder

Take into consideration the points shown below.

We cannot be responsible for faults due to inappropriate installation of the cylinder.

(1) Fixed type

SD type

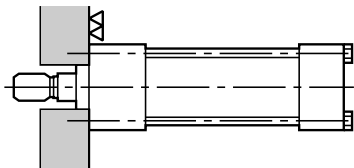
- Thread precision of tie rod: JIS 6g
- Tightening torque: Specified tie rod tightening torque

## Specified tie rod tightening torque table.

(Note: Molybdenous Grease should be used.)

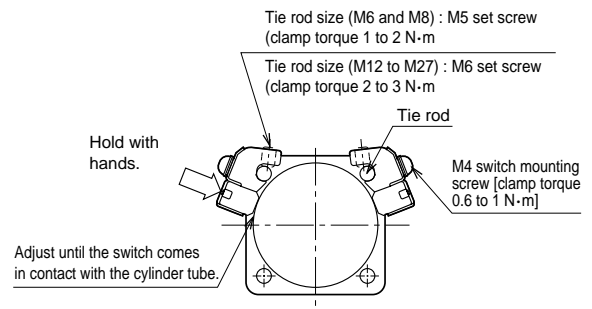
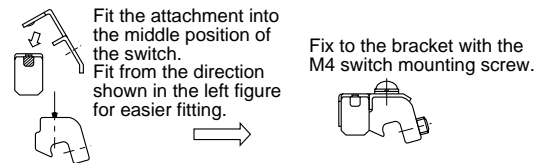
Bore (mm)	φ32	φ40	φ50·63	φ80·100
Tie rod thread	M6×1	M8×1	M12×1.25	M16×1.5
Tightening torque N·m	8	22	70	170

Bore (mm)	φ125	φ140	φ160
Tie rod thread	M22×1.5	M24×1.5	M27×2
Tightening torque N·m	460	610	850



## Setting method of switch detecting position

### AX Type



1. Loosen the two set screws with an Allen wrench, and move them along with the tie rod.
2. Adjust the detecting position (for the 2-lamp type, the position that the green lamp lights up) 2 to 5 mm (about half of the working range is appropriate) before the required position that the switch indicator lamp starts to light up (ON). Then, gently hold the top of the switch so that the cylinder tube contacts the detecting face of the switch, and clamp the set screw with the appropriate clamp torque.  
Note) Inappropriate clamp torque may cause the off-center of the switch position.
3. The indicator lamp lights up when the switch is set to the ON position.
4. Switches can be mounted to any of four tie rods and on the most suitable position depending on the mounting space of the cylinder and wiring method.
5. Mount a switch to the most suitable position to detect the stroke end with the "Switch mounting dimension" (dimension UX).