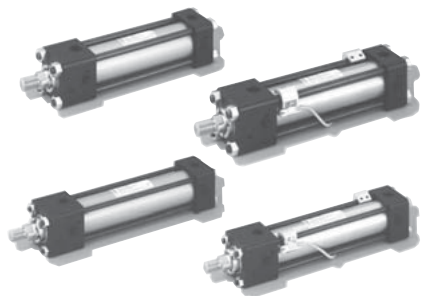


16 MPa double acting hydraulic cylinders with dimensions conforming to ISO standard

- Conforming to ISO 6020-2/JIS B8367-2 standard. (Note 1)
- The adoption of floating cushion realizes smooth startup. (Note 2)
- Switch Set Cylinders with bores from 32 mm to 160 mm are standardized.
- Lighter and more compact as compared to 140H-8 Series.
- High-performance cushion provided as a standard feature.
- Seals in sliding parts conform to ISO standards.



Standard Specifications

Type	Standard type, Switch Set
Nominal pressure	16 MPa
Maximum allowable pressure	20 MPa
Proof test pressure	24 MPa
Minimum operating pressure	Rod side: Rod A 0.6 MPa or less Cap side: 0.3 MPa or less Rod B 0.45 MPa or less
Working speed range (Note 3)	$\phi 32$ to $\phi 63$: 8 to 400mm/s $\phi 80$ to $\phi 125$: 8 to 300mm/s $\phi 140$ to $\phi 160$: 8 to 200mm/s
Working temperature range (ambient/fluid temperature)	Standard type : -10 to $+80^{\circ}\text{C}$ (Note 4) Switch Set AX type WR/WS type : -10 to $+70^{\circ}\text{C}$ (No freezing)
Structure of cushioning	Metal fitting system
Adaptable fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)
Tolerance for thread	JIS 6g/6H
Port thread	Rc(JIS B 0203)·G(ISO 1179-1) (Note 5)
Tolerance of stroke	0 to $100\text{mm}^{+0.8}$ 101 to $250\text{mm}^{+1.0}$ 251 to $630\text{mm}^{+1.25}$ 631 to $1000\text{mm}^{+1.4}$ 1001 to $1600\text{mm}^{+1.6}$ 1601 to $2000\text{mm}^{+1.8}$
Mounting style	SD·LA·EA·EB·FA·FE·FB·CA·CB·TA·TC
Accessories	<ul style="list-style-type: none"> ● Rod eye (T-end) ● Rod clevis (Y-end) with pin ● Lock nut ● Boots: Nylon tarpaulin (standard) Chloroprene (semi-standard) Conex (semi-standard) (Note 6)

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

Terminologies

Nominal pressure

Pressure given to a cylinder for convenience of naming. It is not always the same as the working 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 unreliable performance at the return to nominal pressure.

Minimum operating pressure

The minimum pressure that a 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, increase the thread length (dimension A).

Note 1) The cylinders with a bore of 140 mm and double rod cylinders are not specified in JIS nor ISO standards.

Rod series B and port Rc conform to JIS B 8367-2 (not included in ISO 6020-2).

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

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

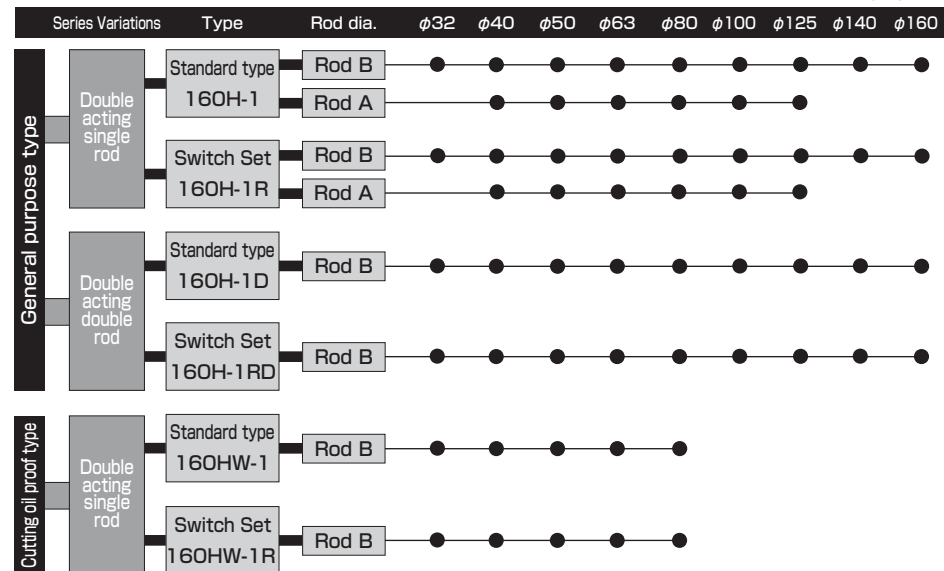
Note 4) The standard type cylinders can be used up to the working temperature range shown in the selection materials by using seal material [6], HNBR.

Note 5) The 32 mm bore cylinder of G thread type has a spacer.

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

Product Lineup

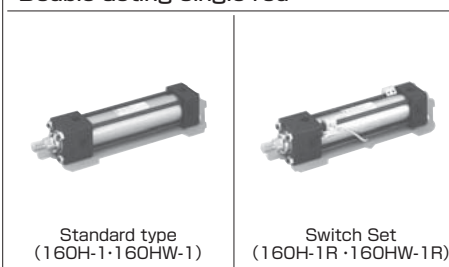
Unit: mm



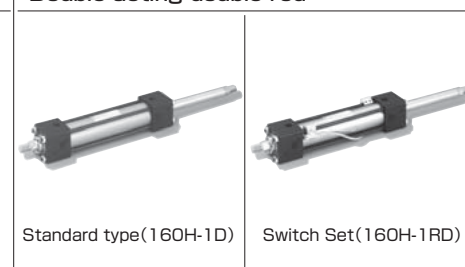
Notes) ● When using a sensor, use a Switch Set Cylinder.

● No sensor can be mounted onto the standard type cylinder.

Double acting single rod



Double acting double rod



Standard Stroke Range Unit: mm

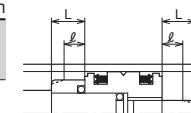
Bore	Stroke
$\phi 32$	1200
$\phi 40$ · $\phi 50$	1600
$\phi 63$	1800
$\phi 80$ to $\phi 160$	2000

- The above strokes indicate the maximum available strokes for the standard type. Contact us for longer strokes.
- For the rod buckling, check with the buckling chart in the selection materials.

Cushion Stroke Length Unit: mm

Bore	Cushion ring length L	Cushion ring parallel part length l
$\phi 32$	21	6
$\phi 40$ to $\phi 80$	25	
$\phi 100$ · $\phi 125$		30
$\phi 140$ · $\phi 160$		

- The cushion stroke lengths in case of cylinders used up to the stroke end.
- In the case that a cylinder is not used up to the stroke end, and it is stopped 5 mm or more before the stroke end, the cushioning effect will be weakened. In such a case, consult us.



How to order

General Purpose Type

The item enclosed by broken line needs not to be entered, if unnecessary. Semi-standard specification

● Standard type **160H-1** 2 LA 50 B B 100 - G A B - T K - J

● Switch Set **160H-1R** 2 LA 50 B B 100 - G A B AH 2 - T K - J

Double acting single rod
160H-1 : Standard type
160H-1R : Switch Set

Double acting double rod
160H-1D : Standard type
160H-1RD : Switch Set

1 Nitrile rubber
2 Urethane rubber
6 HNBR
8 Combined seal

● For seal structure, refer to the selection materials at the beginning of this catalog.

Mounting style
Cylinder bore (mm)
Rod B: $\phi 32$ to $\phi 160$
Rod A: $\phi 40$ to $\phi 125$

A Rod A
B Rod B

B With cushions on both ends
R With cushion on the rod side
H With cushion on the cap side
N No cushion

Cylinder stroke (mm)

None Rc thread
G G thread

Port position (A, B, C, D)

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

Sensor quantity (1, 2, to n)
Sensor symbol
Note) Select applicable sensors out of the Sensor List.

● Note on ordering Switch Set
● When no sensor is required, specify 0 for the sensor symbol ① and the sensor quantity ②.

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

K Long thread with lock nut
● For the thread length, refer to "Thread length of rod end with lock nut" in "Rod end Attachment."

J Nylon tarpaulin
JN Chloroprene
JK Conex

Cutting Oil Proof Type

● Standard type **160HW-1** 6 LA 50 B B 100 - G A B - T K

● Switch Set **160HW-1R** 6 LA 50 B B 100 - G A B RA 2 - T K

Double acting single rod
160HW-1 : Standard type
160HW-1R : Switch Set

HNBR

Cylinder bore (mm)
 $\phi 32 \cdot \phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80$

⑤ WR505(Rear wiring, w/ 5 m cord)
⑦ WR505F(Rear wiring, w/ 5 m cord/flexible tube attached)
⑥ WR515(Rear wiring, w/ 5 m cord)
RA AX205W(Rear wiring, w/ 5 m cord)
RB AZ205W(Upper wiring, w/ 5 m cord)
② WS215-1(Rear wiring, w/ 5 m cord)
④ WS215-1F(Rear wiring, w/ 5 m cord/flexible tube attached)
③ WS225-1(Rear wiring, w/ 5 m cord)

Sensor List

Type	Sensor symbol	Load voltage range	Load current range	Maximum switching capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load	
Reed sensor	AF AX101CE	DC:5 to 30V	DC:5 to 40mA	DC:1.5W	None	LED (Lights in red when sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	1.5m	Small relay, programmable controller	
	AG AX105CE									
	AH AX111CE									
	AJ AX115CE	AC:5 to 120V	AC:5 to 20mA	AC:2VA	Provided	None	5m			
	AE AX125CE									
	AK AX11ACE									
	AL AX11BCE	DC:5 to 30V	5 to 40mA	1.5W	Provided	LED (Lights in red when sensing)	4-pin connector type Rear wiring	0.5m		
	AP AZ101CE									
	AR AZ105CE									
	AS AZ111CE	DC:5 to 30V	DC:5 to 40mA	DC:1.5W	None	LED (Lights in red when sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Upper wiring	1.5m		
	AT AZ115CE									
	AN AZ125CE									
AU AZ11ACE	AC:5 to 120V	5 to 20mA	2VA	Provided	LED (Lights in red when sensing)	4-pin connector type Upper wiring	0.5m			
AW AZ11BCE										
AM AX135CE										
AY AZ135CE	AC/DC:90 to 240V	5 to 300mA	B contact output	Provided	LED (Lights in red when not sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Upper wiring	5m			
⑤ WR505										
⑦ WR505F										
⑥ WR515	DC:5 to 50V	DC:3 to 40mA	DC:1.5W	None	LED (Lights in red when sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	5m			
BE AX201CE-1										
BF AX205CE-1										
CE AX211CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	1.5m			
CF AX215CE-1										
CH AX21CCE-1										
CJ AX21DCE-1										
BM AZ201CE-1										
BN AZ205CE-1										
CM AZ211CE-1										
CN AZ215CE-1										
RA AX205WCE	DC:5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	5m			
RB AZ205WCE										
RE AX215WCE		5 to 20mA					Provided	LED (2-LED type in red/green)	0.3mm ² , 2-core, outer dia. ϕ 4mm Upper wiring	5m
RF AZ215WCE										
② WS215-1										
④ WS215-1F										
③ WS225-1	DC:10 to 30V	5 to 20mA	—	Provided	LED (2-LED type in red/green)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	5m			
CT AX211CE-1										
CU AX215CE-1										
CV AX21BCE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (2-LED type in red/green)	0.3mm ² , 2-core, outer dia. ϕ 4mm Rear wiring	1.5m			
CW AZ211CE-1										
CX AZ215CE-1										
CY AZ21BCE-1										

Notes ● For the sensors without a protective circuit, be sure to provide a protective circuit (SK-100) with the load when using any induction load (relay, etc.).
● The output logic of AX and AZ135CE is B contact. When the piston is detected, Reed sensor turns off (the lamp turns on).
● For the details of sensors, be sure to read the sensor specifications at the end of this catalog.
● We recommend AND Unit (AU series) for multiple sensors connected in series.
For details, refer to AND Unit at the end of this catalog.

● General purpose type AX type (rear wiring) AZ type (upper wiring)

● Cutting oil proof type WR/WS type sensor

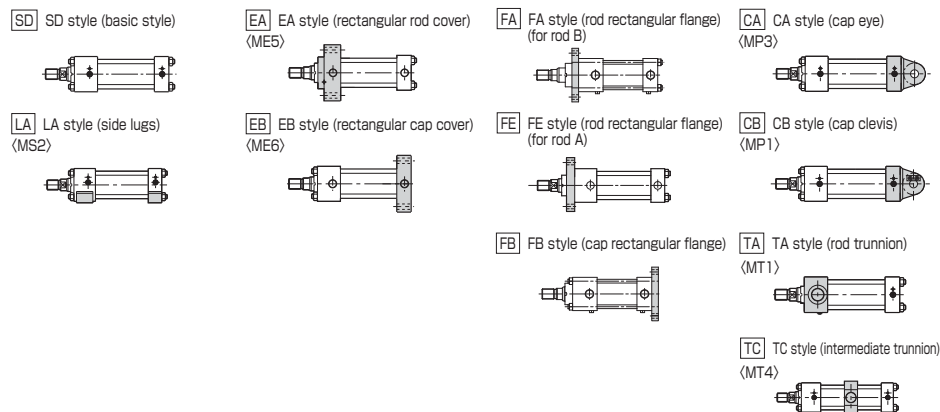


● When ordering the cutting oil proof type sensors, WR and WS types, please be carefully the following notification.

- ⑤ WR505 The sensor and straight box connector (F-SB) are
- ② WS215-1 combined (the flexible tube (F-0.5; 4.8m) is required).
- ⑦ WR505F The flexible tube (F-0.5; 4.8m) is attached to
- ④ WS215-1F the sensor and straight box connector (F-SB).

Mounting Style

The codes in the < > marks below are names called in ISO 6020-2.



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

Adaptability of Fluid to Seal Material

Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	Water in oil fluid	Oil in water fluid
① Nitrile rubber	○	○	×	○	○
② Urethane rubber	◎	×	×	△	△
⑥ HNBR	○	◎	×	◎	◎
⑧ Combined seal	○	○	×	○	○

- ◎○: Applicable ×: Inapplicable
- Consult us before using the △-marked items.
- The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.
- For the working temperature range, refer to the selection materials.

Cutting Oil Proof Type: Adaptability of cutting oil to seal material

Seal material	Nonaqueous cutting oil		Aqueous cutting oil
	Type 1	Type 2	
⑥ HNBR	○	×	○

○ : Applicable × : Inapplicable

For the working temperature range of seal materials, refer to the selection materials at the beginning of this catalog.

Seal Structure Table

Seal code	1	2	6	8
Type	Nitrile rubber	Urethane rubber	HNBR	Combined seal
Piston seal				
	HNBR	Urethane rubber	HNBR	HNBR
Rod seal and wiper ring				
Fixed part (O-ring, etc.)	Nitrile rubber	Nitrile rubber	HNBR	Nitrile rubber

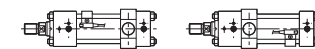
Sensor Mountable Minimum Stroke

Unit: mm

Bore mm	Sensor type	Styles other than TC				TC style			
		with one sensor		with two sensors		with one sensor		with two sensors	
		AXtype	WRtype WStyle	AXtype	WRtype WStyle	AXtype	WRtype WStyle	AXtype	WRtype WStyle
φ32	30	55(75)	30(40)	55(75)	60	85	115	165	170
φ40	25	50(75)	25	50(75)	60	80	115	165	170
φ50	25	50	25	50	65	90	125	175	180
φ63	25	50	25	50	65	95	125	180	180
φ80	20	50	25	50	75	100	135	190	190
φ100	20	-	25	-	90	-	150	-	-
φ125	20	-	25	-	90	-	160	-	-
φ140	20	-	25	-	95	-	170	-	-
φ160	20	-	25	-	110	-	185	-	-

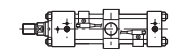
Notes)

- For the TC style with one sensor, the cylinder strokes when the TC accessory is positioned at the place other than the center (as shown below) are shown in the table.



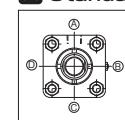
- For the minimum dimension PH of TC style for mounting sensor, refer to the dimensional drawings of TC type.

- For the TC style with two sensors, the cylinder strokes when the TC accessory is positioned in the center (as shown below) are shown in the table.



- The parenthesized values are the minimum strokes when the rod side detection sensor and the cap side detection sensor are mounted on the same surface.

★ Standard specifications



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

★ Port position and cushion valve position

- Standard: with cushions on both ends
- Standard port position and cushion valve position

Mounting style	Order symbol		Rod cover		Cap 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 standard positions of port and cushion valve for styles other than EA, EB and TA are (A) and (B), respectively. When modifying the positions, enter the symbol shown in the dimensional drawings.

- Specification of change in the positions of rod side port and cushion valve

(Example)
 160H-1R 2CA50BB100-**B** **A**AH2
 Port position (A, B, C, D)
 Cushion valve position (A, B, C, D, O)

- Specification of change in the positions of cap side port and cushion valve

(Example) 160H-1 2CA50BB100-AB-X
 Rod side port and cushion valve positions
 Position specification: PC-**BA**
 Cap side port and cushion valve positions

PPC
 Symbol for specification of change in cap side port and cushion positions

- Order symbols and port and cushion valve positions shown above are applicable to EA, EB and TA styles. When changing any position, specify the position on the rod and cap sides.

As for the TA style rod cover, neither port nor cushion valve can be provided on the (B) or (D) side.

As for the EA style rod cover, cushion valves cannot be provided on the (B) or (D) side.

As for the EB style rod cover, cushion valves cannot be provided on the (B) or (D) side.

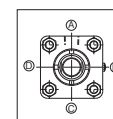
- In case that the cushion is not equipped, the cushion valve position is "O".

- If the ports are located on the (B) or (D) side of the LA style cylinder and general piping joints are used, they may interfere with the cylinder mounting bolts.

- Air vents are located on the same side as the cushion valves.

If the cylinder has no cushion, they are located on the (B) side (or (C) side in case of the EA or TA style rod cover).

- For the details of port, cushion valve and air vent positions, refer to **Positions of ports, cushion valves and air vents.**



★ Port G thread type

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

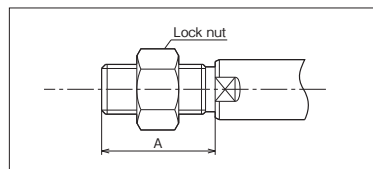
160H-1 2CA50BB100- G A B

- For 32 mm bore cylinders, the rod cover size is changed.
For details, contact us.

★ Notes on ordering cylinder with lock nut

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

160H-1 2LA50BB100-A B -[K]
Long thread with lock nut



Dimension A without lock nut
A=28

↓
Dimension A of long thread with lock nut
A=40

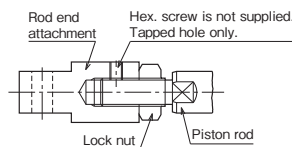
Note)

When a lock nut is attached to the rod end, dimension A must be equal to or longer than that of the long thread with lock nut. For details, refer to "Thread length of rod end with lock nut" in "Rod End Attachment."

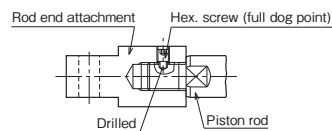
★ Delivery of rod end attachment (T-end or Y-end)

A delivery method for a cylinder provided with a lock nut and a rod end attachment differs from that for a cylinder provided with a rod end attachment only (without a lock nut). For details, refer to the dimensional drawings of rod end attachments.

- When the lock nut and rod end attachment are additionally ordered



- When only the rod end attachment is additionally ordered (without lock nut)



★ Semi-standard fabrication range

- With boots
- Change in TC accessory position (dimensional symbol: PH)
- Change in piston rod end (dimensional symbol: WF (W), A, KK)
- Plated cylinder tube (hard chrome plating thickness: 0.02 mm)

For details, contact us.

Weight Table

Unit: kg

Rod type	Bore (mm)	Basic weight (SD style)				Mounting accessory 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 eye (T-end)	Rod 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

Sensor Additional Weight

Unit: kg

Sensor	AX/AZ type			WR/WS type
	Cord length 1.5 m	Cord length 5 m	Connector type	
φ32 to φ63	0.05	0.13	0.04	0.5
φ80 to 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 mm of stroke)+(sensor additional weight×sensor quantity)+mounting accessory weight+rod end attachment weight

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

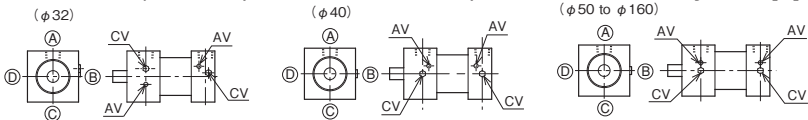
Positions of ports, cushion valves and air vents (Rod B)

Symbols: AV: Air vent
CV: Cushion valve

- For any mounting style, the cushion valve and air vent are positioned on the same surface. If the air vent position must be changed, consult us.
- For the detailed dimensions of the air vent position, contact us.
- Cylinders without cushion have no cushion valve. The air vent position depends on the mounting style.

Double acting single rod/SD, FA, FB, CA, CB and TC styles

- Basic form (Standard port and cushion valve positions: (A) (B), order symbols [A] [B])



- Other port and cushion valve positions (bore $\phi 50$ to $\phi 160$)

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

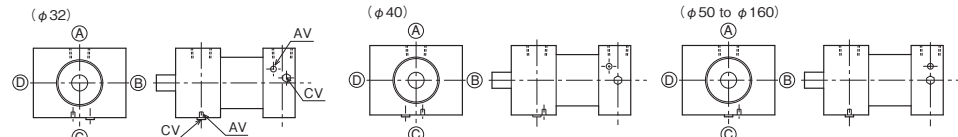
- (For cylinder with cushion)
- To change the cushion valve positions, turn them 90° from the basic form clockwise as viewed from the front of the rod.
- (For cylinder without cushion)
- The air vent is located at the position turned 90° from the port position clockwise as viewed from the front of the rod.
 - To change the port and cushion valve positions on the rod and cap sides, specify the positions on the rod and cap sides, respectively.

- Other port and cushion valve positions (bore $\phi 32$, $\phi 40$)

In the basic form, the cushion valve and air vent positions of cylinders with bores of 32 and 40 mm are different from those of cylinders with bores of 50 to 160 mm. To change the cushion valve position, turn it 90° clockwise as viewed from the front of the rod in the same manner as for cylinders with bores of 50 to 160 mm. The air vent positions are the same as the above, even when the cylinder has no cushion.

Double acting single rod/EA style

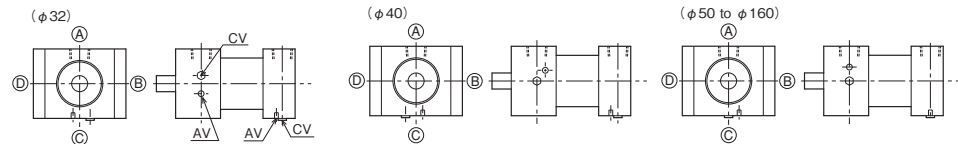
- Basic form (Port and cushion positions: Rod side (A) (C) Cap side (A) (B), order symbols [A] [C])



EA style cylinders with port and cushion valve positions different from the basic form are made to order. When ordering them, specify the positions. The air vents positions are the same as the above, even when the cylinder has no cushion.

Double acting single rod/EB style

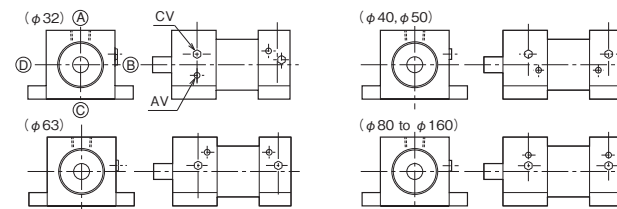
- Basic form (Port and cushion positions: Rod side (A) (B) Cap side (A) (C), order symbols [A] [B])



EA style cylinders with port and cushion valve positions different from the basic form are made to order. When ordering them, specify the positions. The air vents positions are the same as the above, even when the cylinder has no cushion.

Double acting single rod/LA style

- Basic form (Standard port and cushion valve positions: (A) (B), order symbols [A] [B])



- Other port and cushion valve positions (bore $\phi 80$ to $\phi 160$)

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

- (For cylinder with cushion)
- Port position A or C: Port position on axis line (without offset)
 - Port position B or D: Port position with upward offset of following distance from axis center
 - $\phi 32, \phi 40$ 5.5 mm
 - $\phi 50$ 6.5 mm
 - $\phi 63, \phi 80$ 12 mm
 - $\phi 100$ 15 mm
 - $\phi 125$ to $\phi 160$ 0
 - Change of cushion valve position (figures shown left)
 - Position A: Same as the cushion valve position A of the SD style
 - Position B: Basic form
 - Position C: Turn position B 90° clockwise as viewed from the front of the rod
 - Position D: Line-symmetric with respect to position B
 - The cushion valves on B or D are offset upward to prevent interference with the mounting bolts.

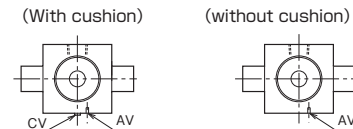
- (For cylinder without cushion)
- When the port is on A: The air vent is on B.
 - When the port is on B, C or D: The air vent is on A. (If you need to change the position, consult us.)

- Other port and cushion valve positions (bore $\phi 32$ to $\phi 63$)

In the basic form, the cushion valve and air vent positions of cylinders with bores of 32 and 63 mm are different from those of cylinders with bores of 80 to 160 mm. To change the cushion valve position, turn it 90° clockwise as viewed from the front of the rod in the same manner as for cylinders with bores of 80 to 160 mm. The air vent positions are the same as the above, even when the cylinder has no cushion.

Double acting single rod/TA style

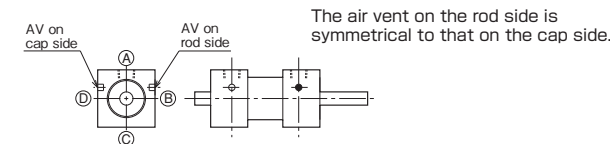
- Standard port and cushion valve positions: (A) (C), order symbols [A] [C]



- The port can be positioned only on A.
- The cushion valve and air vent are positioned on the side opposite to the port position.
- On the cap side, the port and cushion are positioned on (A) and (B).

Double acting double rod

(With cushion)
The port and valve positions are same as those of double acting single rod cylinder.

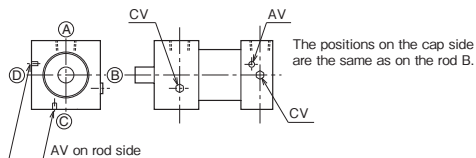


Positions of ports, cushion valves and air vents (Rod A)

Symbols AV: Air vent
CV: Cushion valve

Double acting single rod/SD, FE, FB, CA, CB and TC styles

- Basic form (Standard port and cushion valve positions: (A) (B), order symbols [A] [B])



- Other port and cushion valve positions (rod side)

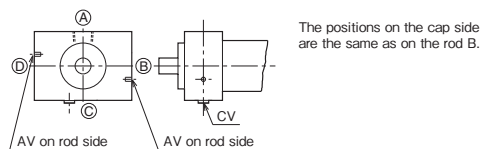
Turn the port and cushion valve positions 90° from the basic form clockwise as viewed from the front of the rod.

The positions on the cap side are the same as on the rod B (one air vent).

When the cylinder has no cushion, an air vent is provided at the cushion valve position (3 places).

Double acting single rod/EA style

- Basic form (Standard port and cushion valve positions: (A) (C), order symbols [A] [C])



- Other port and cushion valve positions (rod side)

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

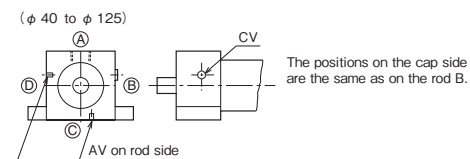
The positions on the cap side are the same as on the rod B (one air vent).

When the cylinder has no cushion, an air vent is provided at the cushion valve position (3 places).

- The positions for the EB style are the same as on the rod B.

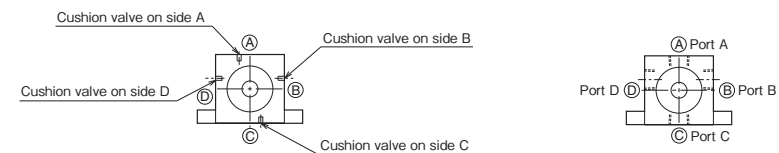
Double acting single rod/LA style

- Basic form (Standard port and cushion valve positions: (A) (B), order symbols [A] [B])

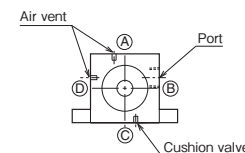


- Other port and cushion valve positions (rod side)

According to the following combination of the cushion valve and port positions. The air vents are positioned on two sides other than the port and cushion valve sides. However, the port and cushion valve cannot be positioned on the same side.



Example (Port and cushion valve positions: (B) (C))



Double acting single rod/TA style

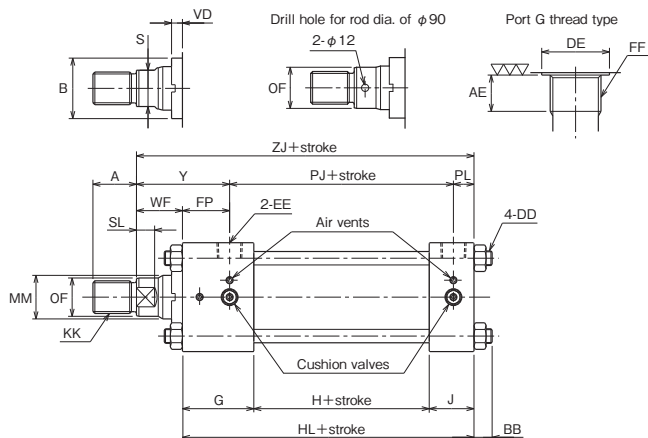
Standard port and cushion valve positions: (A) (C), order symbols [A] [C]

The cushion valve and air vent are positioned on the same side opposite to the port.

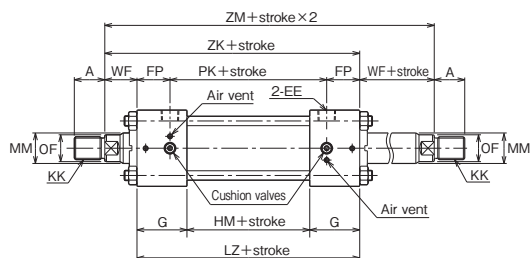
CAD/DATA 160H-1/TRH1 Bore A. B is available.

SD

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



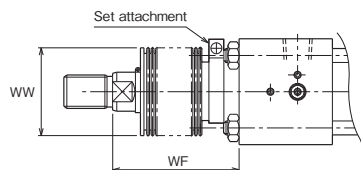
Double acting double rod (rod B)



● The distance between the covers of the double rod cylinder is longer than that of the single rod cylinder by 10 mm.

- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- When using the SD style, be sure to see "4. Mounting" in "Precautions for use" at the beginning of this catalog.
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

With Boots



	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

Notes)

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Dimension WF

Rod B

Nylon tarpaulin Chloroprene

$\phi 32 \cdot \phi 40$	1/3 stroke+X
$\phi 50$	1/3.5 stroke+X
$\phi 63$ to $\phi 100$	1/4 stroke+X
$\phi 125$ to $\phi 160$	1/5 stroke+X

Conex

$\phi 32$	1/2 stroke+X
$\phi 40 \cdot \phi 50$	1/2.5 stroke+X
$\phi 63$ to $\phi 100$	1/3 stroke+X
$\phi 125$ to $\phi 160$	1/3.5 stroke+X

Rod A

Nylon tarpaulin Chloroprene

$\phi 40$	1/3.5 stroke+X
$\phi 50$ to $\phi 80$	1/4 stroke+X
$\phi 100 \cdot \phi 125$	1/5 stroke+X

Conex

$\phi 40$	1/2.5 stroke+X
$\phi 50$ to $\phi 80$	1/3 stroke+X
$\phi 100 \cdot \phi 125$	1/3.5 stroke+X

● If the calculated WF has a fractional part, round it up.

Dimensional Table

Symbol Bore	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
$\phi 32$	18	$\phi 30$ f9	$\phi 34$ f9	M14×1.5	$\phi 18$	$\phi 17$	14	10	10	—	—	—	—	—	—	—	—
$\phi 40$	22	$\phi 34$ f9	$\phi 40$ f9	M16×1.5	$\phi 22$	$\phi 21$	17	9	10	28	$\phi 42$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9
$\phi 50$	28	$\phi 42$ f9	$\phi 46$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9	36	$\phi 50$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9
$\phi 63$	36	$\phi 50$ f9	$\phi 55$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9	45	$\phi 60$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8
$\phi 80$	45	$\phi 60$ f9	$\phi 65$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8	56	$\phi 72$ f9	M42×2	$\phi 56$	$\phi 54$	50	21	8
$\phi 100$	56	$\phi 72$ f9	—	M42×2	$\phi 56$	$\phi 54$	50	21	8	63	$\phi 88$ f9	M48×2	$\phi 70$	$\phi 68$	60	24	6
$\phi 125$	63	$\phi 88$ f9	—	M48×2	$\phi 70$	$\phi 68$	60	24	6	85	$\phi 108$ f9	M64×3	$\phi 90$	$\phi 88$	—	—	5
$\phi 140$	75	$\phi 98$ f9	—	M56×2	$\phi 80$	$\phi 78$	70	27	5	—	—	—	—	—	—	—	—
$\phi 160$	85	$\phi 108$ f9	—	M64×3	$\phi 90$	$\phi 88$	—	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AA	AE	BB	DD	DE	E	EE	FF	FP	G	H
$\phi 32$	47	12	7	M6×1	$\phi 21.5$	$\square 45$	Rc1/4	G1/4	35	49	28
$\phi 40$	59	12	9	M8×1	$\phi 25.5$	$\square 62$	Rc3/8	G3/8	37	54	39
$\phi 50$	74	14	13	M12×1.25	$\phi 30$	$\square 75$	Rc1/2	G1/2	42	60	38
$\phi 63$	91	14	13	M12×1.25	$\phi 30$	$\square 90$	Rc1/2	G1/2	39	59	40
$\phi 80$	117	16	16	M16×1.5	$\phi 36.9$	$\square 114$	Rc3/4	G3/4	46	70	45
$\phi 100$	137	16	16	M16×1.5	$\phi 36.9$	$\square 130$	Rc3/4	G3/4	47	74	47
$\phi 125$	178	18	21	M22×1.5	$\phi 46.1$	$\square 165$	Rc1	G1	51	82	55
$\phi 140$	200	18	22	M24×1.5	$\phi 46.1$	$\square 185$	Rc1	G1	51	82	62
$\phi 160$	219	18	25	M27×2	$\phi 46.1$	$\square 205$	Rc1	G1	54	87	64

Symbol Bore	HL	HM	J	LZ	PJ	PK	PL	TG	WF	Y	ZJ	ZK	ZM
$\phi 32$	103	38	26	136	56	66	12	$\square 33.2$	25	60	128	161	186
$\phi 40$	128	49	35	157	73	83	18	$\square 41.7$	25	62	153	182	207
$\phi 50$	134	48	36	168	74	84	18	$\square 52.3$	25	67	159	193	218
$\phi 63$	136	50	37	168	80	90	17	$\square 64.3$	32	71	168	200	232
$\phi 80$	159	55	44	195	93	103	20	$\square 82.7$	31	77	190	226	257
$\phi 100$	168	57	47	205	101	111	20	$\square 96.9$	35	82	203	240	275
$\phi 125$	197	65	60	229	117	127	29	$\square 125.9$	35	86	232	264	299
$\phi 140$	203	72	59	236	124	134	28	$\square 141.4$	35	86	238	271	306
$\phi 160$	213	74	62	248	130	140	29	$\square 154.9$	32	86	245	280	312

● The tolerance of MM is f8.

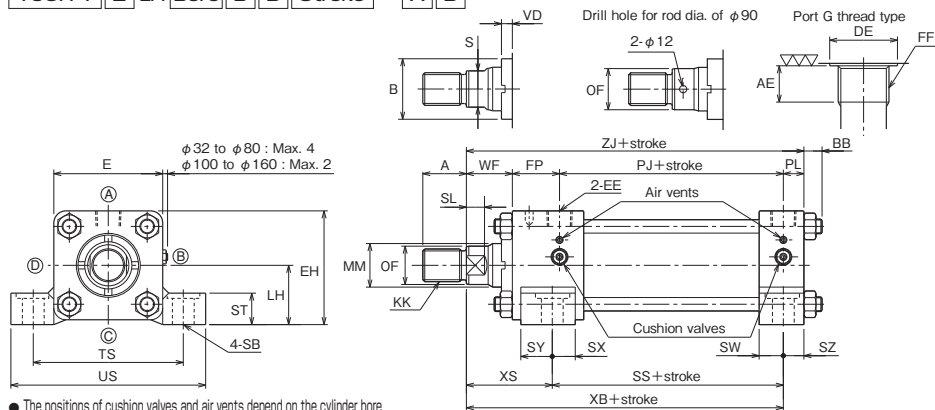
With Boots

Bore		$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$
Symbol	WW	$\phi 40$	$\phi 50$	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 125$	$\phi 140$
	X	—	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 140$	—	—
Symbol	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—

160H-1/TRH1 Bore A. B is available.

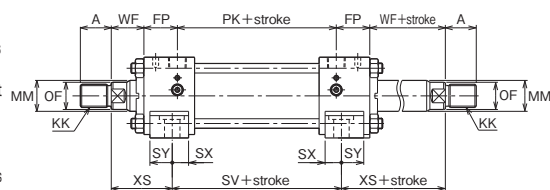
LA

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



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- Notes on mounting bolts of cylinders with bores of 100 mm or more. Use bolts with hex. hole as the mounting bolts. If hexagonal bolts are used, bolt heads may interfere with the cover and spot facing, causing mounting failure. When using washers, it is recommended to use disc springs for bolts with hex. hole. Flat washers or spring washers may interfere with the cover and spot facing, causing mounting failure.
- When the cylinder bore is between 32 to 80 mm, hexagonal bolts, bolts with hex. hole and flat washers can be used.
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

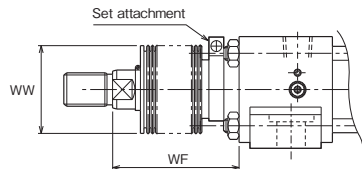
Double acting double rod (rod B)



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

With Boots

160H-1/TRH1 Bore K



Dimension WF

Material	Standard	Semi-standard
Nylon tarpaulin	φ32 · φ40 1/3 stroke+X	φ40 1/3.5 stroke+X
Chloroprene	φ50 1/3.5 stroke+X	φ50 to φ80 1/4 stroke+X
	φ63 to φ100 1/4 stroke+X	φ100 · φ125 1/5 stroke+X
Conex	φ32 1/2 stroke+X	φ40 1/2.5 stroke+X
	φ40 · φ50 1/2.5 stroke+X	φ50 to φ80 1/3 stroke+X
	φ63 to φ100 1/3 stroke+X	φ100 · φ125 1/3.5 stroke+X
	φ125 to φ160 1/3.5 stroke+X	

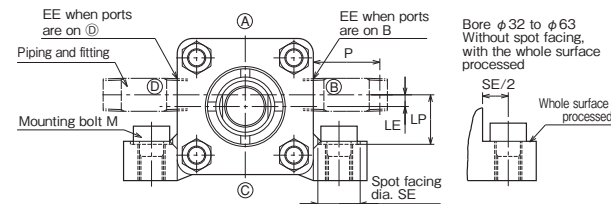
Rod A

Material	Standard	Semi-standard
Nylon tarpaulin	φ40 1/3.5 stroke+X	φ50 to φ80 1/4 stroke+X
Chloroprene	φ50 to φ80 1/4 stroke+X	φ100 · φ125 1/5 stroke+X
Conex	φ40 1/2.5 stroke+X	φ50 to φ80 1/3 stroke+X
	φ50 to φ80 1/3 stroke+X	φ100 · φ125 1/3.5 stroke+X

- If the calculated WF has a fractional part, round it up.

Notes on LA style with ports on lateral side (ⓑ or Ⓒ)

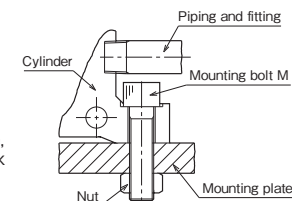
- The port G thread type is not the standard type. (When the cylinder bore is not less than 40 mm, the position on the Ⓐ or Ⓒ side is the same as that of the standard type.)
- The port position deviates from the cylinder center by dimension LE.
- Take into consideration the interference of the piping and fitting 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 Note 1
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

Note 1) Dimension P must be determined in consideration of interference of the fitting with the mounting bolts.

- When the cylinder bore is between 32 to 80 mm, mounting with hexagonal bolts is recommended. If bolts with hex. hole are used, they may not be mounted because the bolt heads and a tightening tool (allen wrench, etc.) may be in contact with the piping or fittings.
- When the cylinder bore is 100 mm or more, hexagonal bolts cannot be used (because their heads interfere with the cover and spot facing). In such a case, use bolts with hex. hole, and mount the cylinder by tightening nuts on the back of the mounting plate (refer to the drawing on the right).



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	φ34 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—				
φ40	22	φ34 f9	φ40 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9			
φ50	28	φ42 f9	φ46 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9			
φ63	36	φ50 f9	φ55 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8			
φ80	45	φ60 f9	φ65 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	—	—	5			
φ140	75	φ98 f9	—	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—			
φ160	85	φ108 f9	—	M64×3	φ90	φ88	—	Drill hole	5	—	—	—	—	—	—	—	—			

Symbol Bore	AE	BB	DE	E	EE	EH	FF	FP	LH	PJ	PK	PL	SB	SS	ST	SV	SW	SX	SZ	TS	US	WF	XB	XS	ZJ	
φ32	12	7	φ21.5	45	Rc1/4	44.5	G1/4	35	22 ^{0-0.084}	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 ^{0-0.100}	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 ^{0-0.100}	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 ^{0-0.100}	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 ^{0-0.120}	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 ^{0-0.120}	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 ^{0-0.140}	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 ^{0-0.140}	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 ^{0-0.140}	130	140	29	φ33	130	38	140	33	28	49	29	260	318	32	216	86	245

- The tolerance of MM is f8.

With Boots

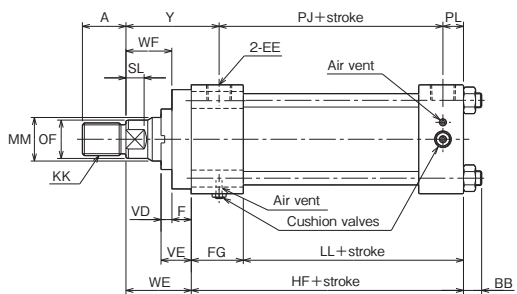
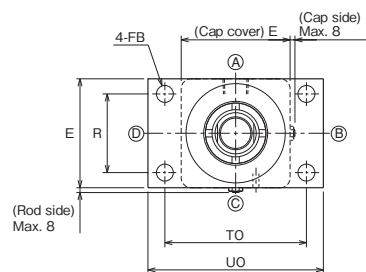
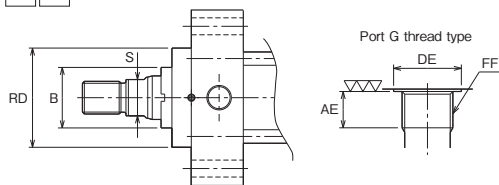
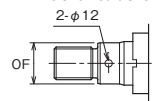
Bore	Symbol	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ40	φ50	φ50	φ71	φ80	φ100	φ100	φ125
	Rod A	—	φ50	φ71	φ80	φ100	φ100	φ140	—	—
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—

160H-1/TRH1 A B is available.

EA

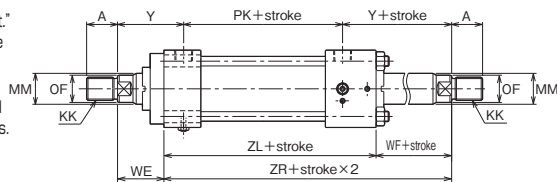
160H-1 2 EA Bore B B Stroke - A C

Drill hole for rod dia. of $\phi 90$



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- If the mounting plate is located on the cylinder tube side of the Switch Set Cylinder, take into consideration the interference of the sensor with the mounting plate.
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

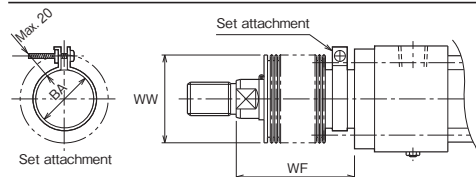
Double acting double rod (rod B)



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

With Boots

160H-1/TRH1 Bore K



	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

(Notes)

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Rod A

Nylon tarpaulin	$\phi 40$	$1/3.5 \text{ stroke} + X$
Chloroprene	$\phi 50$ to $\phi 80$	$1/4 \text{ stroke} + X$
	$\phi 100 \cdot \phi 125$	$1/5 \text{ stroke} + X$
Conex	$\phi 40$	$1/2.5 \text{ stroke} + X$
	$\phi 50$ to $\phi 80$	$1/3 \text{ stroke} + X$
	$\phi 100 \cdot \phi 125$	$1/3.5 \text{ stroke} + X$

- If the calculated WF has a fractional part, round it up.

Dimension WF Rod B

Nylon tarpaulin
Chloroprene

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

$\phi 32 \cdot \phi 40$	$1/3 \text{ stroke} + X$
$\phi 50$	$1/3.5 \text{ stroke} + X$
$\phi 63$ to $\phi 100$	$1/4 \text{ stroke} + X$
$\phi 125$ to $\phi 160$	$1/5 \text{ stroke} + X$

Conex

$\phi 32$	$1/2 \text{ stroke} + X$
$\phi 40 \cdot \phi 50$	$1/2.5 \text{ stroke} + X$
$\phi 63$ to $\phi 100$	$1/3 \text{ stroke} + X$
$\phi 125$ to $\phi 160$	$1/3.5 \text{ stroke} + X$

Dimensional Table

Symbol	Rod B											Rod A										
	A	B		KK	MM	OF	RD	S	SL	VD	VE	A	B	KK	MM	OF	RD	S	SL	VD	VE	
		Standard type	Cutting oil proof type																			
$\phi 32$	18	$\phi 30$	$\phi 34$	M14×1.5	$\phi 18$	$\phi 17$	$\phi 42$	14	10	10	20	—	—	—	—	—	—	—	—	—	—	—
$\phi 40$	22	$\phi 34$	$\phi 40$	M16×1.5	$\phi 22$	$\phi 21$	$\phi 62$	17	9	10	20	28	$\phi 42$	M20×1.5	$\phi 28$	$\phi 26$	$\phi 62$	22	11	9	19	—
$\phi 50$	28	$\phi 42$	$\phi 46$	M20×1.5	$\phi 28$	$\phi 26$	$\phi 74$	22	11	9	25	36	$\phi 50$	M27×2	$\phi 36$	$\phi 34$	$\phi 74$	30	14	9	25	—
$\phi 63$	36	$\phi 50$	$\phi 55$	M27×2	$\phi 36$	$\phi 34$	$\phi 82$	30	14	9	25	45	$\phi 60$	M33×2	$\phi 45$	$\phi 43$	$\phi 88$	38	17	8	24	—
$\phi 80$	45	$\phi 60$	$\phi 65$	M33×2	$\phi 45$	$\phi 43$	$\phi 92$	38	17	8	28	56	$\phi 72$	M42×2	$\phi 56$	$\phi 54$	$\phi 105$	50	21	8	28	—
$\phi 100$	56	$\phi 72$	—	M42×2	$\phi 56$	$\phi 54$	$\phi 105$	50	21	8	30	63	$\phi 88$	M48×2	$\phi 70$	$\phi 68$	$\phi 125$	60	24	6	28	—
$\phi 125$	63	$\phi 88$	—	M48×2	$\phi 70$	$\phi 68$	$\phi 125$	60	24	6	28	85	$\phi 108$	M64×3	$\phi 90$	$\phi 88$	$\phi 150$	—	—	—	—	—
$\phi 140$	75	$\phi 98$	—	M56×2	$\phi 80$	$\phi 78$	$\phi 140$	70	27	5	28	—	—	—	—	—	—	—	—	—	—	—
$\phi 160$	85	$\phi 108$	—	M64×3	$\phi 90$	$\phi 88$	$\phi 150$	—	—	—	Drill hole	5	30	—	—	—	—	—	—	—	—	—

Symbol	AE	BB	DE	E	EE	F	FB	FF	FG	HF	LL
$\phi 32$	12	7	$\phi 21.5$	45	Rc1/4	10	$\phi 6.6$	G1/4	39	93	54
$\phi 40$	12	9	$\phi 25.5$	62	Rc3/8	10	$\phi 11$	G3/8	44	118	74
$\phi 50$	14	13	$\phi 30$	75	Rc1/2	16	$\phi 14$	G1/2	44	118	74
$\phi 63$	14	13	$\phi 30$	90	Rc1/2	16	$\phi 14$	G1/2	43	120	77
$\phi 80$	16	16	$\phi 36.9$	114	Rc3/4	20	$\phi 18$	G3/4	50	139	89
$\phi 100$	16	16	$\phi 36.9$	130	Rc3/4	22	$\phi 18$	G3/4	52	146	94
$\phi 125$	18	21	$\phi 46.1$	165	Rc1	22	$\phi 22$	G1	60	175	115
$\phi 140$	18	22	$\phi 46.1$	185	Rc1	23	$\phi 26$	G1	59	180	121
$\phi 160$	18	25	$\phi 46.1$	205	Rc1	25	$\phi 26$	G1	62	188	126

Symbol	PJ	PK	PL	R	TO	UO	WE	WF	Y	ZL	ZR
$\phi 32$	56	66	12	33	58	70	35	25	60	126	151
$\phi 40$	73	83	18	41	87	110	35	25	62	147	172
$\phi 50$	74	84	18	52	105	130	41	25	67	152	177
$\phi 63$	80	90	17	65	117	145	48	32	71	152	184
$\phi 80$	93	103	20	83	149	180	51	31	77	175	206
$\phi 100$	101	111	20	97	162	200	57	35	82	183	218
$\phi 125$	117	127	29	126	208	250	57	35	86	207	242
$\phi 140$	124	134	28	142	230	280	58	35	86	213	248
$\phi 160$	130	140	29	155	253	300	57	32	86	223	255

- The tolerance of MM is f8.

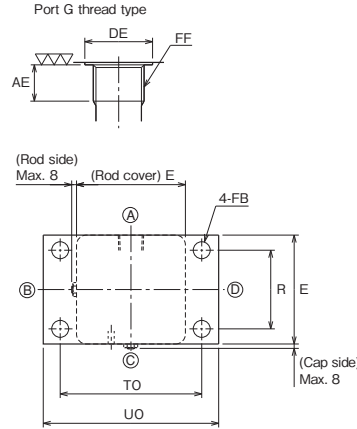
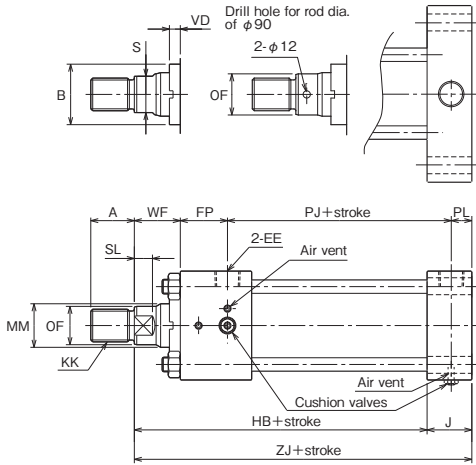
With Boots

Symbol	Bore									
	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$	
WW	Rod B	$\phi 40$	$\phi 50$	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 125$	$\phi 140$
	Rod A	—	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 140$	—	—
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—
BA	Rod B	$\phi 34$	$\phi 40$	$\phi 46$	$\phi 55$	$\phi 65$	$\phi 77$	$\phi 92$	$\phi 103$	$\phi 112$
	Rod A	—	$\phi 46$	$\phi 55$	$\phi 65$	$\phi 77$	$\phi 92$	$\phi 112$	—	—

160H-1/TRH1 Bore A. B is available.

EB

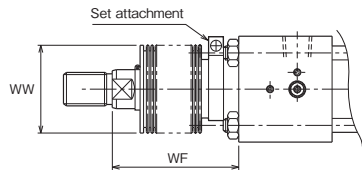
160H-1 2 EB Bore B B Stroke - A B



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- If the mounting plate is located on the cylinder tube side of the Switch Set Cylinder, take into consideration the interference of the sensor with the mounting plate.
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

With Boots

160H-1/TRH1 Bore K



	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

Notes

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Dimension W

Material	Bore	Stroke	W
Nylon tarpaulin	φ32 · φ40	1/3 stroke+X	100
	φ50	1/3.5 stroke+X	110
	φ63 to φ100	1/4 stroke+X	120
Chloroprene	φ125 to φ160	1/5 stroke+X	140
	φ32	1/2 stroke+X	100
	φ40 · φ50	1/2.5 stroke+X	110
Conex	φ63 to φ100	1/3 stroke+X	120
	φ125 to φ160	1/3.5 stroke+X	140

Material	Bore	Stroke	W
Nylon tarpaulin	φ40	1/3.5 stroke+X	110
	φ50 to φ80	1/4 stroke+X	120
	φ100 · φ125	1/5 stroke+X	140
Chloroprene	φ40	1/2.5 stroke+X	110
	φ50 to φ80	1/3 stroke+X	120
	φ100 · φ125	1/3.5 stroke+X	140

- If the calculated WF has a fractional part, round it up.

Dimensional Table

Symbol	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
		Standard type	Cutting oil proof type														
φ32	18	φ30 f9	φ34 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	φ40 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	φ46 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	φ55 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	φ65 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	—	—	—
φ140	75	φ98 f9	—	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	—	M64×3	φ90	φ88	—	Drill hole	5	—	—	—	—	—	—	—	—

Symbol	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	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

- The tolerance 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	φ140
	Rod A	—	φ50	φ71	φ80	φ100	φ100	φ140	—
X	Rod B	56	61	64	77	80	82	94	102
	Rod A	—	64	77	80	82	94	102	—

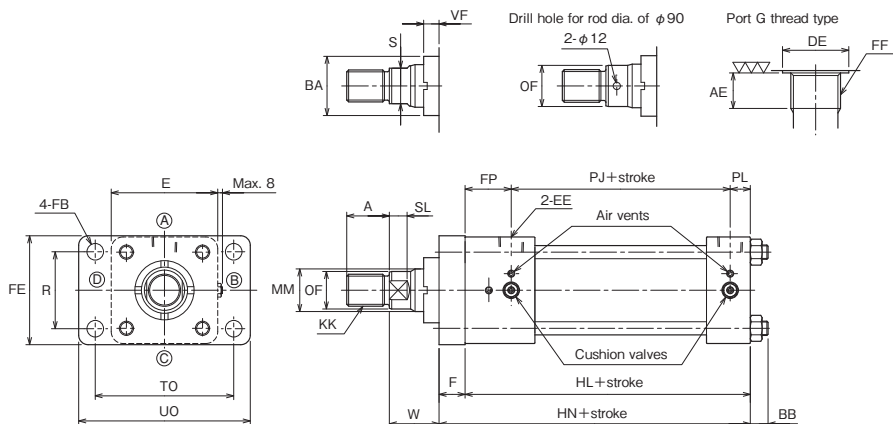
CAD/DATA 160H-1/TRH1 Bore B is available.

FA

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

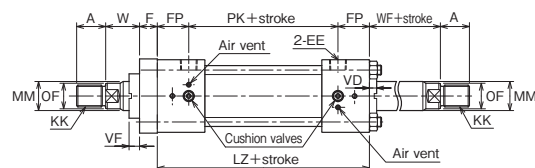
General Hydraulic Cylinders

160H-1



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- If you want to change the rod protrusion length, specify dimension W.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

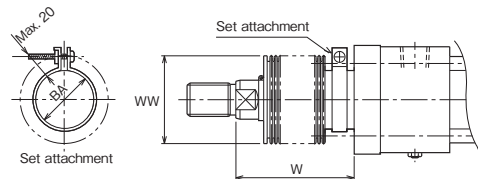
Double acting double rod (rod B)



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

With Boots

160H-1/TRH1 Bore K



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

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

Notes)

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Dimension WF Rod B

Nylon tarpaulin	$\begin{pmatrix} \phi 32 \cdot \phi 40 & 1/3 \text{ stroke} + X \\ \phi 50 & 1/3.5 \text{ stroke} + X \\ \phi 63 \text{ to } \phi 100 & 1/4 \text{ stroke} + X \\ \phi 125 \text{ to } \phi 160 & 1/5 \text{ stroke} + X \end{pmatrix}$
Chloroprene	
Conex	

- If the calculated W has a fractional part, round it up.

General Hydraulic Cylinders

160H-1

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	—	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	35
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	25
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	229	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

- The tolerance 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
X	Rod B	45	45	45	55	55	55	65	65	65
BA	Rod B	φ34	φ40	φ46	φ55	φ65	φ77	φ92	φ103	φ112

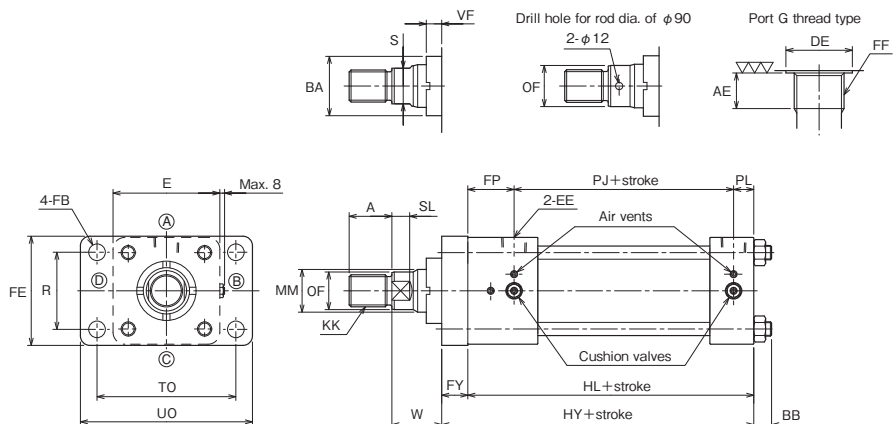
160H-1/TRH1 [Bore] A is available.

FE

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

General Hydraulic Cylinders

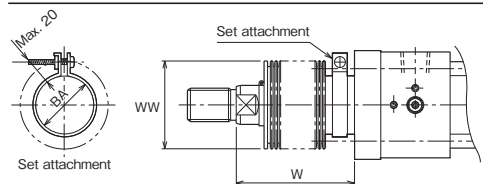
160H-1



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension W.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

With Boots

160H-1/TRH1 [Bore] K



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

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

Notes)

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Dimension W

Rod A

Nylon tarpaulin
Chloroprene

$$\begin{pmatrix} \phi 40 & 1/3.5 \text{ stroke} + X \\ \phi 50 \text{ to } \phi 80 & 1/4 \text{ stroke} + X \\ \phi 100 \cdot \phi 125 & 1/5 \text{ stroke} + X \end{pmatrix}$$

Conex

$$\begin{pmatrix} \phi 40 & 1/2.5 \text{ stroke} + X \\ \phi 50 \text{ to } \phi 80 & 1/3 \text{ stroke} + X \\ \phi 100 \cdot \phi 125 & 1/3.5 \text{ stroke} + X \end{pmatrix}$$

- If the calculated W has a fractional part, round it up.

General Hydraulic Cylinders

160H-1

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	—	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	G3/8
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	35
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

- The tolerance of MM is f8.

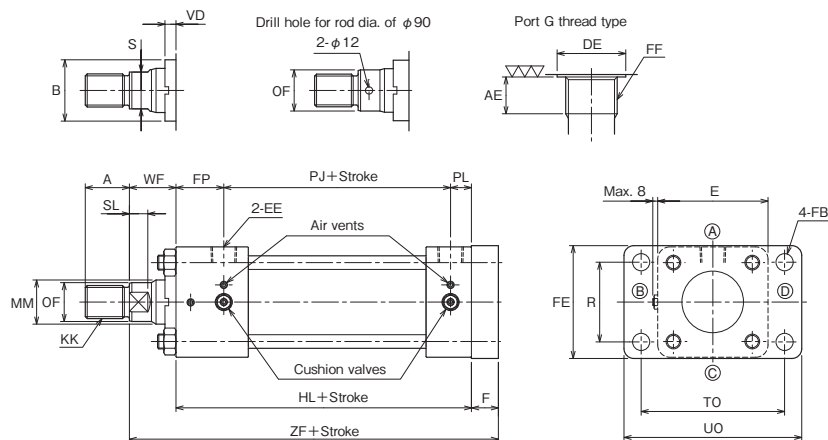
With Boots

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

CAD/DATA 160H-1/TRH1 Bore A. B is available.

FB

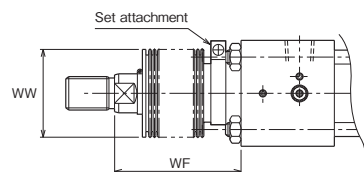
160H-1 2 FB Bore B B Stroke - A B



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

With Boots

160H-1/TRH1 Bore K



	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

- Notes)
- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
 - Conex is the registered trademark of Teijin Limited.
 - The boots have been mounted at our factory prior to delivery.

Rod A	Nylon tarpaulin	Chloroprene
	$\phi 40$	$\phi 40$
	$\phi 50$ to $\phi 80$	$\phi 50$ to $\phi 80$
	$\phi 100$ to $\phi 125$	$\phi 100$ to $\phi 125$
Conex	$\phi 40$	$\phi 40$
	$\phi 50$ to $\phi 80$	$\phi 50$ to $\phi 80$
	$\phi 100$ to $\phi 125$	$\phi 100$ to $\phi 125$

- If the calculated WF has a fractional part, round it up.

Dimension WF

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

Dimensional Table

Symbol Bore	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
		Standard type	Cutting oil proof type														
$\phi 32$	18	$\phi 30$ f9	$\phi 34$ f9	M14×1.5	$\phi 18$	$\phi 17$	14	10	10	—	—	—	—	—	—	—	—
$\phi 40$	22	$\phi 34$ f9	$\phi 40$ f9	M16×1.5	$\phi 22$	$\phi 21$	17	9	10	28	$\phi 42$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9
$\phi 50$	28	$\phi 42$ f9	$\phi 46$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9	36	$\phi 50$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9
$\phi 63$	36	$\phi 50$ f9	$\phi 55$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9	45	$\phi 60$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8
$\phi 80$	45	$\phi 60$ f9	$\phi 65$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8	56	$\phi 72$ f9	M42×2	$\phi 56$	$\phi 54$	50	21	8
$\phi 100$	56	$\phi 72$ f9	—	M42×2	$\phi 56$	$\phi 54$	50	21	8	63	$\phi 88$ f9	M48×2	$\phi 70$	$\phi 68$	60	24	6
$\phi 125$	63	$\phi 88$ f9	—	M48×2	$\phi 70$	$\phi 68$	60	24	6	85	$\phi 108$ f9	M64×3	$\phi 90$	$\phi 88$	—	—	5
$\phi 140$	75	$\phi 98$ f9	—	M56×2	$\phi 80$	$\phi 78$	70	27	5	—	—	—	—	—	—	—	—
$\phi 160$	85	$\phi 108$ f9	—	M64×3	$\phi 90$	$\phi 88$	—	Drill hole	5	—	—	—	—	—	—	—	—

Symbol Bore	AE	DE	E	EE	F	FB	FE	FF
$\phi 32$	12	$\phi 21.5$	$\square 45$	Rc1/4	11	$\phi 6.6$	47	G1/4
$\phi 40$	12	$\phi 25.5$	$\square 62$	Rc3/8	16	$\phi 11$	64	G3/8
$\phi 50$	14	$\phi 30$	$\square 75$	Rc1/2	19	$\phi 14$	77	G1/2
$\phi 63$	14	$\phi 30$	$\square 90$	Rc1/2	22	$\phi 14$	92	G1/2
$\phi 80$	16	$\phi 36.9$	$\square 114$	Rc3/4	25	$\phi 18$	116	G3/4
$\phi 100$	16	$\phi 36.9$	$\square 130$	Rc3/4	27	$\phi 18$	132	G3/4
$\phi 125$	18	$\phi 46.1$	$\square 165$	Rc1	29	$\phi 22$	167	G1
$\phi 140$	18	$\phi 46.1$	$\square 185$	Rc1	32	$\phi 26$	187	G1
$\phi 160$	18	$\phi 46.1$	$\square 205$	Rc1	37	$\phi 26$	207	G1

Symbol Bore	FP	HL	PJ	PL	R	TO	UO	WF	ZF
$\phi 32$	35	103	56	12	33	58	70	25	139
$\phi 40$	37	128	73	18	41	87	110	25	169
$\phi 50$	42	134	74	18	52	105	130	25	178
$\phi 63$	39	136	80	17	65	117	145	32	190
$\phi 80$	46	159	93	20	83	149	180	31	215
$\phi 100$	47	168	101	20	97	162	200	35	230
$\phi 125$	51	197	117	29	126	208	250	35	261
$\phi 140$	51	203	124	28	142	230	280	35	270
$\phi 160$	54	213	130	29	155	253	300	32	282

- The tolerance of MM is f8.

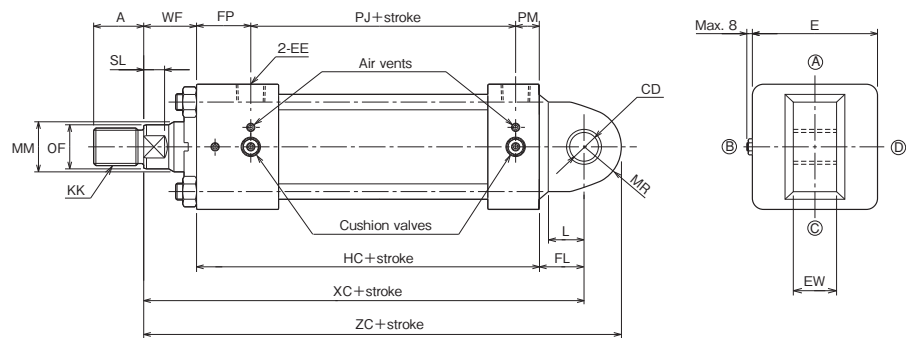
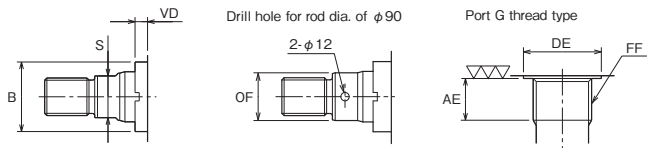
With Boots

Symbol	Bore									
	Rod B	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$
WW	Rod B	$\phi 40$	$\phi 50$	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 125$	$\phi 140$
	Rod A	—	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 140$	—	—
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—

160H-1/TRH1 Bore A. B is available.

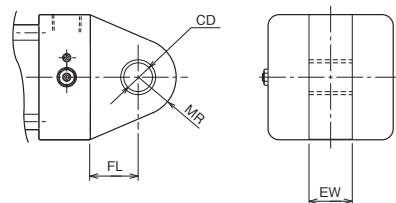
CA

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

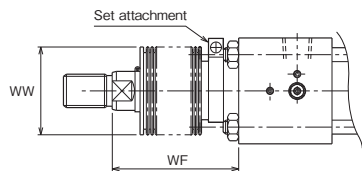


- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- A bush (gray cast iron) has been press-fitted into the mounting hole (dimensional symbol: CD).
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

● Bore φ 32 · φ 40



With Boots



Dimension WF Rod B

Nylon tarpaulin	(φ32 · φ40 1/3 stroke+X)
Chloroprene	(φ50 1/3.5 stroke+X)
	(φ63 to φ100 1/4 stroke+X)
	(φ125 to φ160 1/5 stroke+X)
Conex	(φ32 1/2 stroke+X)
	(φ40 · φ50 1/2.5 stroke+X)
	(φ63 to φ100 1/3 stroke+X)
	(φ125 to φ160 1/3.5 stroke+X)

Rod A

Nylon tarpaulin	(φ40 1/3.5 stroke+X)
Chloroprene	(φ50 to φ80 1/4 stroke+X)
	(φ100 · φ125 1/5 stroke+X)
Conex	(φ40 1/2.5 stroke+X)
	(φ50 to φ80 1/3 stroke+X)
	(φ100 · φ125 1/3.5 stroke+X)

- If the calculated WF has a fractional part, round it up.

160H-1/TRH1 Bore K

	Standard	Semi-standard	
Material	Nylon tarpaulin	Chloroprene	Conex
Heat proof	80°C	130°C	200°C

(Notes)

- Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.
- Conex is the registered trademark of Teijin Limited.
- The boots have been mounted at our factory prior to delivery.

Dimensional Table

Symbol	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
		Standard type	Cutting oil proof type														
φ32	18	φ30 f9	φ34 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	φ40 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	φ46 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	φ55 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	φ65 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	—	—	—
φ140	75	φ98 f9	—	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	—	M64×3	φ90	φ88	—	Drill hole	5	—	—	—	—	—	—	—	—

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

Symbol	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

- The tolerance of MM is f8.

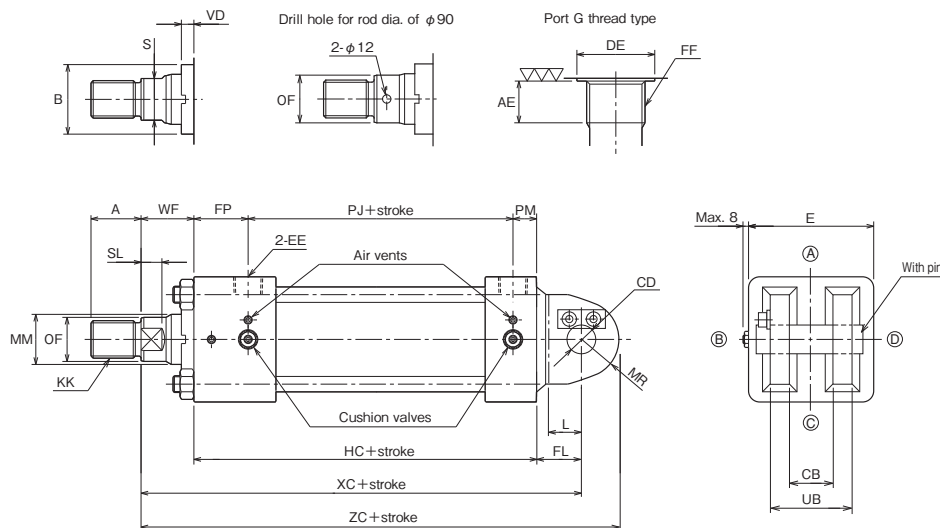
With Boots

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	—	—

CAD/DATA 160H-1/TRH1 [Bore] A. B is available.

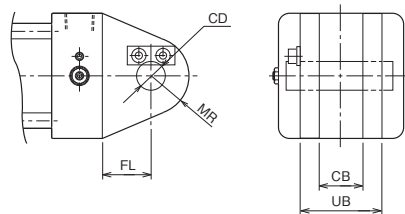
CB

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



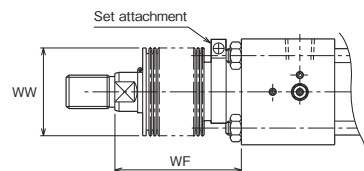
- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

• Bore φ 32 · φ 40



With Boots

160H-1/TRH1 [Bore] K



Dimension WF Rod B

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

Rod A

Nylon tarpaulin	φ40	1/3.5 stroke+X
Chloroprene	φ50 to φ80	1/4 stroke+X
Conex	φ100 · φ125	1/5 stroke+X
	φ40	1/2.5 stroke+X
Conex	φ50 to φ80	1/3 stroke+X
	φ100 · φ125	1/3.5 stroke+X

- If the calculated WF has a fractional part, round it up.

Dimensional Table

Symbol Bore	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
		Standard type	Cutting oil proof type														
φ32	18	φ30 f9	φ34 f9	M14×1.5	φ18	φ17	14	10	10	-	-	-	-	-	-	-	-
φ40	22	φ34 f9	φ40 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	φ46 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	φ55 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	φ65 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	-	-	5
φ140	75	φ98 f9	-	M56×2	φ80	φ78	70	27	5	-	-	-	-	-	-	-	-
φ160	85	φ108 f9	-	M64×3	φ90	φ88	-	Drill hole	5	-	-	-	-	-	-	-	-

Symbol Bore	AE	CB	CD	DE	E	EE	FF	FL
φ32	12	16 ^{+0.69} / _{+0.25}	φ12 H9/f8	φ21.5	□45	Rc1/4	G1/4	19
φ40	12	20 ^{+0.70} / _{+0.30}	φ14 H9/f8	φ25.5	□62	Rc3/8	G3/8	19
φ50	14	30 ^{+0.70} / _{+0.30}	φ20 H9/f8	φ30	□75	Rc1/2	G1/2	33
φ63	14	30 ^{+0.70} / _{+0.30}	φ20 H9/f8	φ30	□90	Rc1/2	G1/2	33
φ80	16	40 ^{+0.91} / _{+0.31}	φ28 H9/f8	φ36.9	□114	Rc3/4	G3/4	41
φ100	16	50 ^{+0.92} / _{+0.32}	φ36 H9/f8	φ36.9	□130	Rc3/4	G3/4	56
φ125	18	60 ^{+0.94} / _{+0.34}	φ45 H9/f8	φ46.1	□165	Rc1	G1	62
φ140	18	65 ^{+0.94} / _{+0.34}	φ50 H9/f8	φ46.1	□185	Rc1	G1	65
φ160	18	70 ^{+0.96} / _{+0.36}	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

- The tolerance 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
	X	-	φ50	φ71	φ80	φ100	φ100	φ140	-	-
Symbol	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	-	64	77	80	82	94	102	-	-

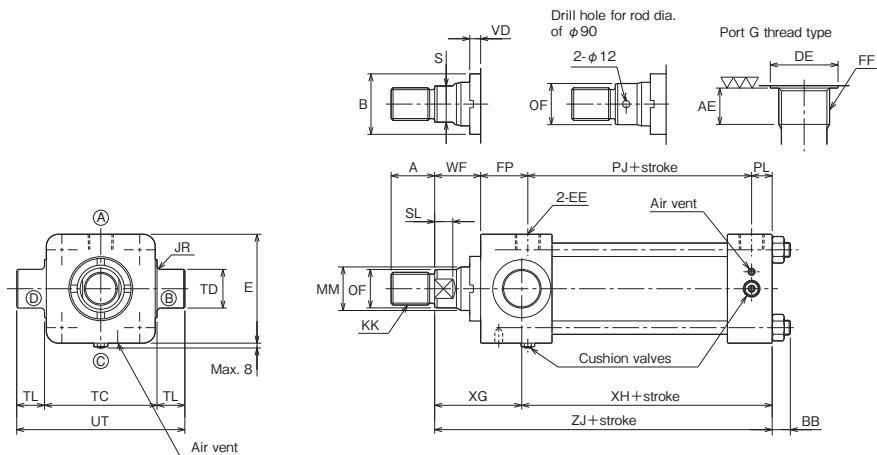
CAD/DATA
160H-1/TRH1 [Bore] A. B is available.

TA

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

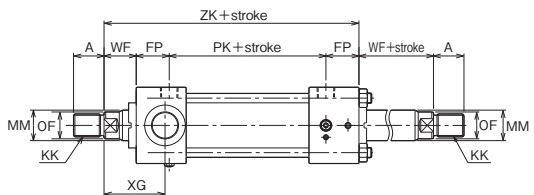
General Hydraulic Cylinders

160H-1



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- If the stroke is short, take care that the cushion valve does not get into contact with the mounting bracket.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

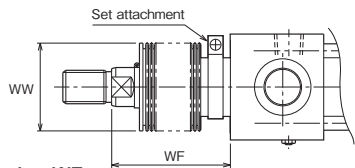
Double acting double rod (rod B)



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

With Boots

160H-1/TRH1 [Bore] K



Dimension WF Rod B

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

Rod A

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

- If the calculated WF has a fractional part, round it up.

General Hydraulic Cylinders

160H-1

Dimensional Table

Symbol	Rod B								Rod A								
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
Bore	Standard type	Cutting oil proof type															
$\phi 32$	18	$\phi 30$ f9	$\phi 34$ f9	M14×1.5	$\phi 18$	$\phi 17$	14	10	10	—	—	—	—	—	—	—	—
$\phi 40$	22	$\phi 34$ f9	$\phi 40$ f9	M16×1.5	$\phi 22$	$\phi 21$	17	9	10	28	$\phi 42$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9
$\phi 50$	28	$\phi 42$ f9	$\phi 46$ f9	M20×1.5	$\phi 28$	$\phi 26$	22	11	9	36	$\phi 50$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9
$\phi 63$	36	$\phi 50$ f9	$\phi 55$ f9	M27×2	$\phi 36$	$\phi 34$	30	14	9	45	$\phi 60$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8
$\phi 80$	45	$\phi 60$ f9	$\phi 65$ f9	M33×2	$\phi 45$	$\phi 43$	38	17	8	56	$\phi 72$ f9	M42×2	$\phi 56$	$\phi 54$	50	21	8
$\phi 100$	56	$\phi 72$ f9	—	M42×2	$\phi 56$	$\phi 54$	50	21	8	63	$\phi 88$ f9	M48×2	$\phi 70$	$\phi 68$	60	24	6
$\phi 125$	63	$\phi 88$ f9	—	M48×2	$\phi 70$	$\phi 68$	60	24	6	85	$\phi 108$ f9	M64×3	$\phi 90$	$\phi 88$	—	—	5
$\phi 140$	75	$\phi 98$ f9	—	M56×2	$\phi 80$	$\phi 78$	70	27	5	—	—	—	—	—	—	—	—
$\phi 160$	85	$\phi 108$ f9	—	M64×3	$\phi 90$	$\phi 88$	—	Drill hole	5	—	—	—	—	—	—	—	—

Symbol	AE	BB	DE	E	EE	FF	FP	JR	PJ	PK
$\phi 32$	12	7	$\phi 21.5$	$\square 45$	Rc1/4	G1/4	35	R2	56	66
$\phi 40$	12	9	$\phi 25.5$	$\square 62$	Rc3/8	G3/8	37	R2	73	83
$\phi 50$	14	13	$\phi 30$	$\square 75$	Rc1/2	G1/2	42	R2.5	74	84
$\phi 63$	14	13	$\phi 30$	$\square 90$	Rc1/2	G1/2	39	R2.5	80	90
$\phi 80$	16	16	$\phi 36.9$	$\square 114$	Rc3/4	G3/4	46	R3	93	103
$\phi 100$	16	16	$\phi 36.9$	$\square 130$	Rc3/4	G3/4	47	R3	101	111
$\phi 125$	18	21	$\phi 46.1$	$\square 165$	Rc1	G1	51	R4	117	127
$\phi 140$	18	22	$\phi 46.1$	$\square 185$	Rc1	G1	51	R4	124	134
$\phi 160$	18	25	$\phi 46.1$	$\square 205$	Rc1	G1	54	R4	130	140

Symbol	PL	TC	TD	TL	UT	WF	XG	XH	ZJ	ZK
$\phi 32$	12	44 ⁰ _{-0.62}	$\phi 16$ f8	12	68	25	54	74	128	161
$\phi 40$	18	63 ⁰ _{-0.74}	$\phi 20$ f8	16	95	25	57	96	153	182
$\phi 50$	18	76 ⁰ _{-0.74}	$\phi 25$ f8	20	116	25	64	95	159	193
$\phi 63$	17	89 ⁰ _{-0.87}	$\phi 32$ f8	25	139	32	70	98	168	200
$\phi 80$	20	114 ⁰ _{-0.87}	$\phi 40$ f8	32	178	31	76	114	190	226
$\phi 100$	20	127 ⁰ _{-1.00}	$\phi 50$ f8	40	207	35	71	132	203	240
$\phi 125$	29	165 ⁰ _{-1.00}	$\phi 63$ f8	50	265	35	75	157	232	264
$\phi 140$	28	184 ⁰ _{-1.15}	$\phi 70$ f8	58	300	35	75	163	238	271
$\phi 160$	29	203 ⁰ _{-1.15}	$\phi 80$ f8	63	329	32	75	170	245	280

- The tolerance of MM is f8.

With Boots

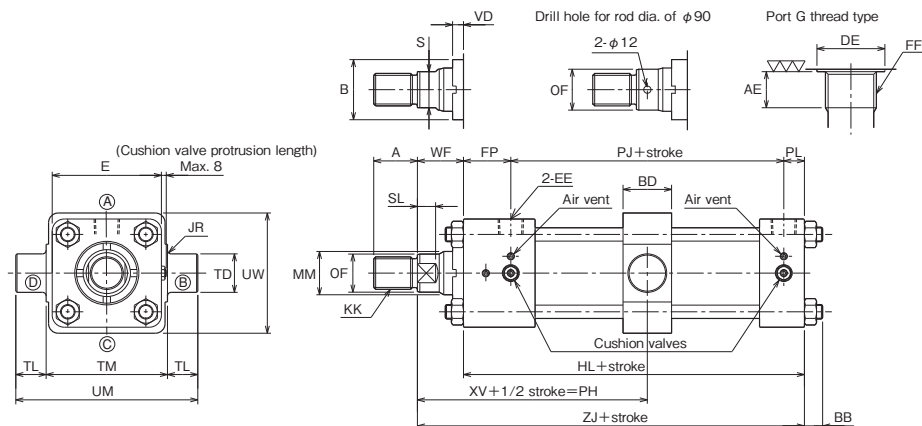
Symbol	Bore	$\phi 32$	$\phi 40$	$\phi 50$	$\phi 63$	$\phi 80$	$\phi 100$	$\phi 125$	$\phi 140$	$\phi 160$
	WW	Rod B	$\phi 40$	$\phi 50$	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 125$
	Rod A	—	$\phi 50$	$\phi 71$	$\phi 80$	$\phi 100$	$\phi 100$	$\phi 140$	—	—
X	Rod B	56	61	64	77	80	82	94	97	102
	Rod A	—	64	77	80	82	94	102	—	—

CAD/DATA
160H-1/TRH1 [Bore] A. B is available.

TC

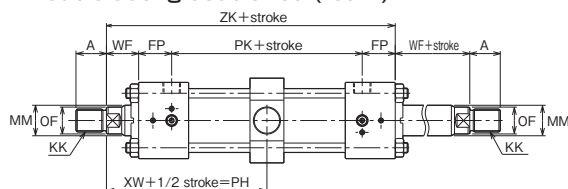
160H-1 [2] TC [Bore] [B] [B] Stroke - [A] [B]

General Hydraulic Cylinders



- The positions of cushion valves and air vents depend on the cylinder bore.
- The rod end thread length (dimension A) is longer when a lock nut is attached to the rod end. Refer to "Thread length of rod end with lock nut" in "Rod End Attachment."
- If the stroke is short, take care that the cushion valve does not get into contact with the mounting bracket.
- On the rod side of the rod A, the air vents are positioned on two sides other than the port and cushion valve sides.
- If you want to change the rod protrusion length, specify dimension WF.
- For dimensions not shown in these figures, refer to the SD style (basic style).
- For the mounting of sensors, refer to the dimensional drawings of "Switch Set." All the contents other than "Sensor mounting dimensions" are the same.

Double acting double rod (rod B)



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

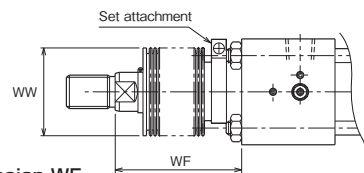
Minimum Stroke of TC Style

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

- For the min. strokes of Switch Set Cylinders, refer to the model codes.

With Boots

160H-1/TRH1 [Bore] K



Dimension WF Rod B

Material	Stroke	WF
Nylon tarpaulin Chloroprene	φ32 · φ40 1/3 stroke+X	10
	φ50 1/3.5 stroke+X	15
	φ63 to φ100 1/4 stroke+X φ125 to φ160 1/5 stroke+X	20
Conex	φ32 1/2 stroke+X	15
	φ40 · φ50 1/2.5 stroke+X	20
	φ63 to φ100 1/3 stroke+X φ125 to φ160 1/3.5 stroke+X	25

Rod A

Material	Stroke	WF
Nylon tarpaulin Chloroprene	φ40 1/3.5 stroke+X	15
	φ50 to φ80 1/4 stroke+X φ100 · φ125 1/5 stroke+X	20
	Conex	φ40 1/2.5 stroke+X
φ50 to φ80 1/3 stroke+X		25
φ100 · φ125 1/3.5 stroke+X		30

- If the calculated WF has a fractional part, round it up.

General Hydraulic Cylinders

160H-1

Dimensional Table

Symbol	Rod B									Rod A							
	A	B		KK	MM	OF	S	SL	VD	A	B	KK	MM	OF	S	SL	VD
φ32	18	φ30 f9	φ34 f9	M14×1.5	φ18	φ17	14	10	10	—	—	—	—	—	—	—	—
φ40	22	φ34 f9	φ40 f9	M16×1.5	φ22	φ21	17	9	10	28	φ42 f9	M20×1.5	φ28	φ26	22	11	9
φ50	28	φ42 f9	φ46 f9	M20×1.5	φ28	φ26	22	11	9	36	φ50 f9	M27×2	φ36	φ34	30	14	9
φ63	36	φ50 f9	φ55 f9	M27×2	φ36	φ34	30	14	9	45	φ60 f9	M33×2	φ45	φ43	38	17	8
φ80	45	φ60 f9	φ65 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	—	—	5
φ140	75	φ98 f9	—	M56×2	φ80	φ78	70	27	5	—	—	—	—	—	—	—	—
φ160	85	φ108 f9	—	M64×3	φ90	φ88	—	Drill hole	5	—	—	—	—	—	—	—	—

Symbol	AE	BB	BD	DE	E	EE	FF	FP	HL	JR	Min. PH	PJ
φ32	12	7	30	φ21.5	□45	Rc1/4	G1/4	35	103	R2	89	56
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	PK	PL	TD	TL	TM	UM	UW	WF	XV	XW	ZJ	ZK
φ32	66	12	φ16 f8	12	55 ⁰ _{-0.62}	79	55	25	88	93	128	161
φ40	83	18	φ20 f8	16	76 ⁰ _{-0.74}	108	76	25	98.5	103.5	153	182
φ50	84	18	φ25 f8	20	89 ⁰ _{-0.87}	129	89	25	104	109	159	193
φ63	90	17	φ32 f8	25	100 ⁰ _{-0.87}	150	100	32	111	116	168	200
φ80	103	20	φ40 f8	32	127 ⁰ _{-1.00}	191	127	31	123.5	128.5	190	226
φ100	111	20	φ50 f8	40	140 ⁰ _{-1.00}	220	140	35	132.5	137.5	203	240
φ125	127	29	φ63 f8	50	178 ⁰ _{-1.00}	278	178	35	144.5	149.5	232	264
φ140	134	28	φ70 f8	58	200 ⁰ _{-1.00}	316	200	35	148	153	238	271
φ160	140	29	φ80 f8	63	215 ⁰ _{-1.15}	341	215	32	151	156	245	280

- The tolerance of MM is f8.

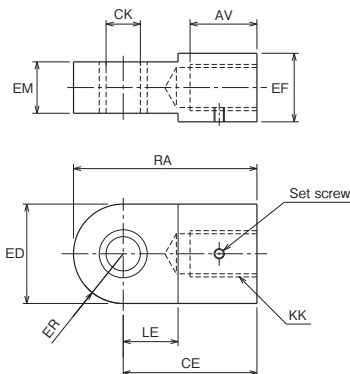
With Boots

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	—	—

160H-1/TRH1 [Bore]K CAD/DATA is available.

Rod End Attachment

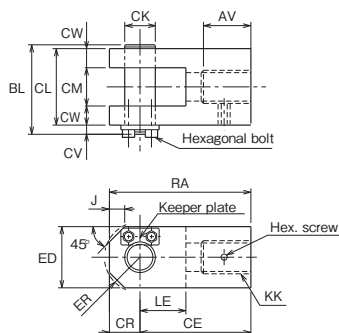
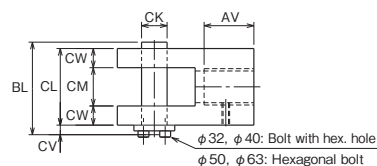
• Rod eye (T-end)



• Rod clevis (Y-end)

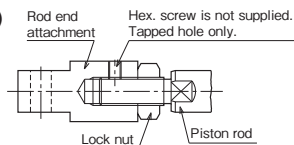
Bore $\phi 32$ to $\phi 63$

Bore $\phi 80$ to $\phi 160$

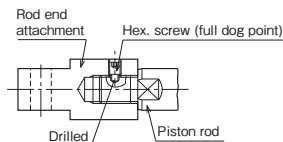


• Delivery of rod end attachment (T-end or Y-end)

① When 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 adjusting the position of the rod end attachment.
No hex. screw is supplied.



② When 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 the drill hole is unnecessary, give us such instructions.

Dimensional Table/Rod 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	Part code
$\phi 32$	RTH-14-H	21	50	25	M14×1.5	67	M6	—	—	—	—	—	—	—
$\phi 40$	RTH-16-3-H	25	55	30	M16×1.5	72	M6	RTH-20-4-H	31	67	35	M20×1.5	84	M6
$\phi 50$	RTH-20-3-H	31	67	40	M20×1.5	96	M6	RTH-27-H	39	78	40	M27×2	107	M6
$\phi 63$	RTH-27-H	39	78	40	M27×2	107	M6	RTH-33-1-H	48	94	50	M33×2	123	M6
$\phi 80$	RTH-33-H	48	94	50	M33×2	128	M6	RTH-42-1-H	59	112	65	M42×2	146	M8
$\phi 100$	RTH-42-H	59	112	65	M42×2	162	M8	RTH-48-4-H	66	135	75	M48×2	185	M10
$\phi 125$	RTH-48-3-H	66	125	75	M48×2	178	M10	RTH-64-5-H	88	158	100	M64×3	211	M12
$\phi 140$	RTH-56-1-H	78	148	85	M56×2	204	M12	—	—	—	—	—	—	—
$\phi 160$	RTH-64-4-H	88	158	100	M64×3	217	M12	—	—	—	—	—	—	—

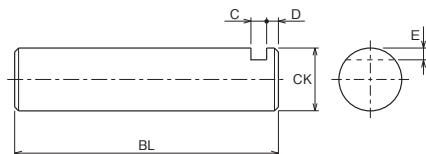
Symbol Bore	CK	ED	EM	ER	LE
$\phi 32$	$\phi 12$ H9	34	16 $_{-0.27}$	R17	19
$\phi 40$	$\phi 14$ H9	34	20 $_{-0.33}$	R17	19
$\phi 50$	$\phi 20$ H9	58	30 $_{-0.33}$	R29	32
$\phi 63$	$\phi 20$ H9	58	30 $_{-0.33}$	R29	32
$\phi 80$	$\phi 28$ H9	68	40 $_{-0.39}$	R34	39
$\phi 100$	$\phi 36$ H9	100	50 $_{-0.39}$	R50	54
$\phi 125$	$\phi 45$ H9	106	60 $_{-0.46}$	R53	57
$\phi 140$	$\phi 50$ H9	112	65 $_{-0.46}$	R56	63
$\phi 160$	$\phi 56$ H9	118	70 $_{-0.46}$	R59	63

Dimensional Table/Rod clevis (Y-end)

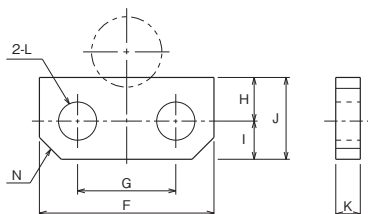
Symbol Bore	Rod B						Rod A					
	Part code	AV	CE	KK	RA	Set screw	Part code	AV	CE	KK	RA	Part code
$\phi 32$	RYH-14-H	21	50	M14×1.5	67	M6	—	—	—	—	—	—
$\phi 40$	RYH-16-3-H	25	55	M16×1.5	72	M6	RYH-20-4-H	31	67	M20×1.5	84	M6
$\phi 50$	RYH-20-3-H	31	67	M20×1.5	96	M6	RYH-27-H	39	78	M27×2	107	M6
$\phi 63$	RYH-27-H	39	78	M27×2	107	M6	RYH-33-1-H	48	94	M33×2	123	M6
$\phi 80$	RYH-33-H	48	94	M33×2	125	M6	RYH-42-1-H	59	112	M42×2	143	M8
$\phi 100$	RYH-42-H	58	112	M42×2	155	M8	RYH-48-4-H	66	135	M48×2	178	M10
$\phi 125$	RYH-48-3-H	68	125	M48×2	170	M10	RYH-64-5-H	101	158	M64×3	203	M12
$\phi 140$	RYH-56-1-H	85	148	M56×2	198	M12	—	—	—	—	—	—
$\phi 160$	RYH-64-4-H	95	158	M64×3	212	M12	—	—	—	—	—	—

Symbol Bore	BL	CK	CL	CM	CR	CV	CW	ED	ER	J	LE
$\phi 32$	42	$\phi 12$ H9/f8	32	16 $_{+0.66}$	—	8	8	34	R17	—	19
$\phi 40$	50	$\phi 14$ H9/f8	40	20 $_{+0.70}$	—	8	10	34	R17	—	19
$\phi 50$	72	$\phi 20$ H9/f8	60	30 $_{+0.70}$	—	10	15	58	R29	—	32
$\phi 63$	72	$\phi 20$ H9/f8	60	30 $_{+0.70}$	—	10	15	58	R29	—	32
$\phi 80$	92	$\phi 28$ H9/f8	80	40 $_{+0.91}$	31	10	20	65	R33	22	39
$\phi 100$	115	$\phi 36$ H9/f8	100	50 $_{+0.92}$	43	13	25	90	R48	24	54
$\phi 125$	138	$\phi 45$ H9/f8	120	60 $_{+0.94}$	45	14	30	100	R51	28	57
$\phi 140$	152	$\phi 50$ H9/f8	130	65 $_{+0.94}$	50	18	32.5	100	R55	28	63
$\phi 160$	162	$\phi 56$ H9/f8	140	70 $_{+0.96}$	54	18	35	110	R59	33	63

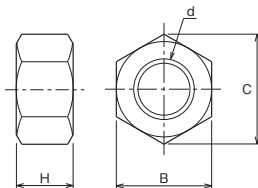
• Parallel pin



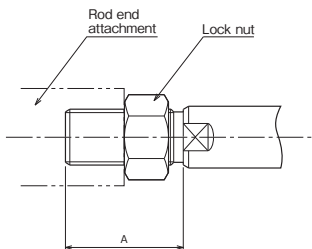
• Retainer



• Lock nut



• Thread length of rod end with lock nut



The standard fitting length of the rod end attachment and piston rod is about 80% of the thread diameter. When using a lock nut, it is necessary to increase the thread length (dimension A) as shown above. If you order a cylinder with a lock nut (symbol: K), the thread length (dimension A) is as shown on the next page.

Dimensional Table/Parallel pin

Symbol	Rod A or 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) • The rod A is used for cylinders with bores of 40 to 125 mm.

Dimensional Table/Retainer

Symbol	Rod A or B								Mounting bolt
	F	G	H	I	J	K	L	N	
φ32	19	10	5.5	5.5	11	3	φ5.5	C2.5	M5
φ40	19	10	5.5	5.5	11	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) • The rod A is used for cylinders with bores of 40 to 125 mm.

Dimensional Table/Lock nut

Symbol	Rod B					Rod A				
	Part code	B	C	d	H	Part code	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/Dimension A when lock nut is used (long thread)

Symbol	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	—	—

Change of Rod End Shape **Rod B** (Consult us in case of rod A or the case that doesn't go for 'A01' or 'A00' below.)

■ You can specify the shape and dimension of the rod end as shown below using the semi-standard symbols and dimension symbols.
(No need to specify the dimension symbol if you order a cylinder with the basic dimension. Specify only the semi-standard symbol.)

How to order **Series** **Model number** — × **Semi-standard symbol** **Dimension symbol** (Specify only when the dimension differs from the basic dimension.)

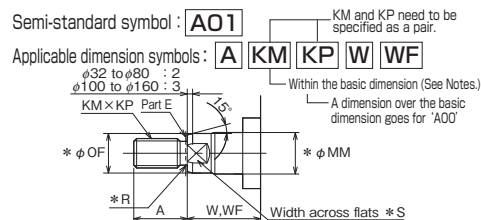


Table of Basic Dimensions (=Standard dimensions of 160H-1)

Bore	A	KM	KP	*MM	*OF	*R	*S	W (FA)	WF (other than FA)
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

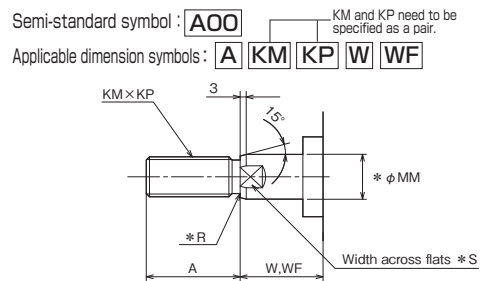


Table of Basic Dimensions

Bore	A	KM	KP	*MM	*R	*S	W (FA)	WF (other than FA)
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	Drill hole	57	32

Usage

- To change the dimensions of the rod end shape of 160H-1

Notes

- When the dimensions are identical to the basic dimensions, the semi-standard symbol is unnecessary because the basic dimensions are the same as the standard dimensions.
- When a thread size larger than the basic dimension is specified, the part E will not have a contact area. Therefore, the rod end will have the shape of 'A00'. In this case, the semi-standard symbol must be 'A00'. ('A01' cannot be used.)

Use symbol **A00** and specify the dimensions.

Examples

- Bore: 40 mm, rod B, rod end thread: M16×2, WF=80 mm
(Order) 160H-1 1CA40BB250-AB-X A01
KM-16, KP-2, WF-80
(Fabrication) Rod end shape A=22, KM=16, KP=2, WF=80, φMM=φ22, φOF=φ21, R=1.6, S=17
- Bore: 100 mm, rod B, rod end thread: M45×1.5 'A01' cannot be used. Refer to 'A00'.

Usage

- To specify a thread size larger than the basic dimension of 'A01'
- To conform to the rod end thread pitch of the rod B of TAIYO 70/140H-8

Notes

- The basic dimensions A, KM and KP of 'A00' differ from those of 'A01'. When using symbol 'A00' to specify a thread size larger than the basic dimension of 'A01', specify dimension A at the same time.

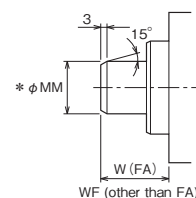
Examples

- Bore : 63 mm, rod B, with basic dimensions of 'A00'
(Order) 160H-1R 2FA63BB300-BC-X A00
(Fabrication) Rod end shape A=45, KM=30, KP=1.5, W=48, φMM=φ36, R=1.6, S=30
- Bore: 100 mm, rod B, rod end thread: M45×1.5, with other standard dimensions of 160H-1 (=basic dimensions of 'A01')
Since the thread is larger than the basic dimension of 'A01', the shape must be 'A00'.
(Order) 160H-1 2CB100BR500-AB-X A00
KM-45, KP-1.5, A-56
(Fabrication) Rod end shape A=56, KM=45, KP=1.5, WF=35, φMM=φ56, R=1.6, S=50
- Bore: 50 mm, rod B, shape: A00, rod end thread: M22×1.5, WF=100, with other basic dimensions of 'A01'
(Order) 160H-1 2CA50BB500-AB-X A00
KM-22, KP-1.5, WF-100
(Fabrication) Rod end shape A=35, KM=22, KP=1.5, WF=100, φMM=φ28, R=1, S=24

● The *-marked dimensions are fixed.
● If it is necessary to change the fixed dimensions, consult us.

Rod B Special Rod End Shapes

A51



A81

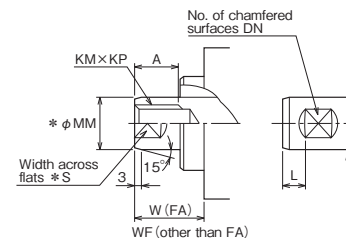


Table of Basic Dimensions

Bore	A	DN	KM	KP	L	*MM	*S	W (FA)	WF (other than FA)
φ32	15	2	M12	1.75	0	φ18	14	35	25
φ40	20	2	M16	2	0	φ22	19	35	25
φ50	24	2	M20	2.5	0	φ28	24	41	25
φ63	33	2	M27	3	0	φ36	30	48	32
φ80	36	2	M30	3.5	0	φ45	41	51	31
φ100	45	2	M39	4	0	φ56	50	57	35
φ125	58	2	M48	2	0	φ70	65	57	35
φ140		2			0	φ80	75	58	35

For the cylinders with a bore of 140 mm, basic dimensions have not been determined. When ordering them, specify the dimensions in the blank fields.

● The *-marked dimensions are fixed.
● If it is necessary to change the fixed dimensions, consult us.

A82

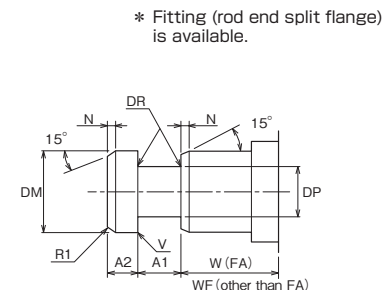


Table of Basic Dimensions

Bore	* A1 ^{+0.5} / _{-0.3}	* A2 ^{-0.2} / _{-0.3}	* DM	* DP ^{-0.2} / _{-0.3}	* DR	* MM	* N	* V	W (FA)	WF (other than FA)
φ32	12.5	12.5	φ18	φ13	1.0	φ18	3	C0.2	35	25
φ40	12.5	12.5	φ22	φ16	1.5	φ22	3	C0.2	35	25
φ50	12.5	12.5	φ28	φ21	1.5	φ28	3	C0.2	41	25
φ63	15	15	φ30	φ26	2.0	φ36	3	C0.2	48	32
φ80	15	15	φ45	φ31	2.0	φ45	3	C0.2	51	31
φ100	20	20	φ56	φ38	3.0	φ56	3	C0.2	57	35
φ125	25	25	φ70	φ49	3.5	φ70	3	R1	57	35
φ140	25	25	φ80	φ56	4.0	φ80	3	R1	58	35
φ160	30	30	φ90	φ60	5.0	φ90	6	R1	57	32

MM is the rod diameter.

Rod A Special Rod End Shapes

A00

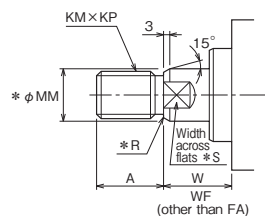


Table of Basic Dimensions (Standard dimensions)

Bore	A	KM	KP	*MM	*R	*S	W (FA)	WF (other than FA)
φ40	35	M24	1.5	φ28	1	24	35	25
φ50	45	M30	1.5	φ36	1.6	30	41	25
φ63	60	M39	1.5	φ45	1.6	41	48	32
φ80	75	M48	1.5	φ56	1.6	50	51	31
φ100	95	M64	2	φ70	2	65	57	35
φ125	120	M80	2	φ90	2	Drill hole	57	35

A51

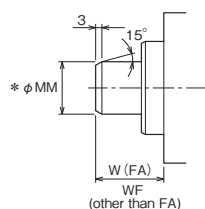


Table of Basic Dimensions

Bore	φMM	W (FA)	WF (other than FA)
φ40	φ28	35	25
φ50	φ36	41	25
φ63	φ45	48	32
φ80	φ56	51	31
φ100	φ70	57	35
φ125	φ90	57	32

A81

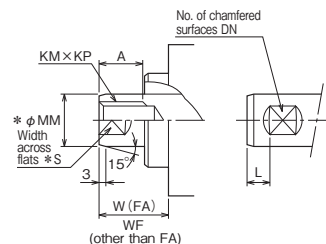


Table of Basic Dimensions

Bore	A	DN	KM	KP	L	*MM	*S	W (FA)	WF (other than FA)
φ40	24	2	M20	2.5	0	φ28	24	35	25
φ50	33	2	M27	3	0	φ36	30	41	25
φ63	36	2	M30	3.5	0	φ45	41	48	32
φ80	45	2	M39	4	0	φ56	50	51	31
φ100	58	2	M48	2	0	φ70	65	57	35

Note) ● The number of chamfered surfaces DN is 2 (standard) or 4 only.

A82

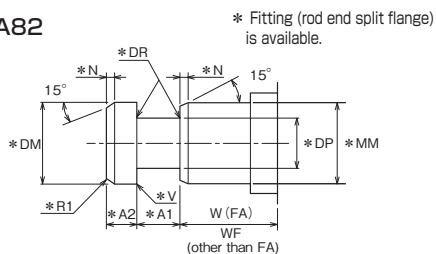


Table of Basic Dimensions

Bore	*A1	*A2	*DM	*DP	*DR	*MM	*N	*V	W (FA)	WF (other than FA)
φ40	12.5	12.5	φ28	φ21	1.5	φ28	3	C0.2	35	25
φ50	15	15	φ36	φ26	2.0	φ36	3	C0.2	41	25
φ63	15	15	φ45	φ31	2.0	φ45	3	C0.2	48	32
φ80	20	20	φ56	φ38	3.0	φ56	3	C0.2	51	31
φ100	25	25	φ70	φ49	3.5	φ70	3	R1	57	35
φ125	30	30	φ90	φ60	5.0	φ90	6	R1	57	32

MM is the rod diameter.

- The * -marked dimensions are fixed.
- If it is necessary to change the fixed dimensions, consult us.

Mounting of Cylinder

Use the cylinder in consideration of the followings. We are not liable for any failure due to inappropriate mounting of the cylinder.

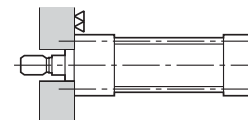
- (1) Stationary style
SD style

- Tie rod screw accuracy: JIS 6g
- Tightening torque: Specified tie rod tightening torque

Specified Tie Rod Tightening Torque Table (when molybdenum paste is applied)

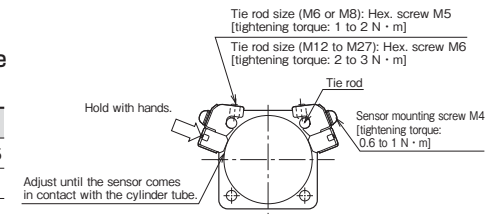
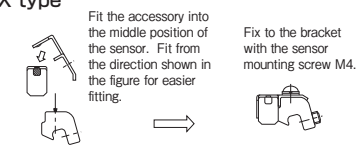
Bore (mm)	φ32	φ40	φ50-63	φ80-100
Tie rod screw	M6×1	M8×1	M12×1.25	M16×1.5
Tightening torque (N·m)	8	22	70	170

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



How to set sensor detection position

AX type



1. Loosen the two set screws with an allen wrench, and move them along the tie rod.
2. Adjust the detecting position (for the 2-LED type, the position where the green lamp lights up) 2 to 5 mm (about half of the operating range is appropriate) before the required position where the sensor indicator lamp starts to light up (ON). Then, gently hold the top of the sensor so that the cylinder tube contacts the detecting face of the sensor, and clamp the hex. screw to an appropriate tightening torque.
Note) Inappropriate tightening torque may cause the off-center of the sensor position.
3. The indicating lamp lights up when the sensor is set to the ON position.
4. Sensors 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 sensor to the most suitable position to detect the stroke end with the "sensor mounting dimension" (dimension UX).