3.5 MPa hydraulic cylinder

- Switch Set Cylinders with bores from 32 mm to 100 mm are standardized.
- For magnetic proximity sensor, the selection of small, reed sensor or solid state sensor type is available. The solid state sensor, 2-wire 2-LED type, facilitates setting at the optimum position (green lighting). WR and WS type sensors are also mountable (semi-standard).
- U-seal is used as the standard piston seal.
- For cushion structure, the metal fitting system is adopted.

Standard Specifications

Type		Standard type		Switch Set	
Nominal pressure		3.5 MPa			
Maximum allowable pressure		4.5 MPa			
Proof test pressure		5 MPa			
Minimum operating pressure		0.2 MPa or less			
Piston seal		U seal	Slipper seal	U seal	Slipper seal
Working speed range		8 to 300mm/s	0.1 to 300mm/s	8 to 300mm/s	0.1 to 300mm/s
Working temperature range (ambient/fluid temperature)		−10 to +80℃ (No freezing)		−10 to +70℃ (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			
Tolerance of stroke		0 to 250mm$^{+1.0}_{0}$ 251 to 1000mm$^{+1.4}_{0}$ 1001 to 1800mm$^{+1.8}_{0}$			
Mounting style		SD·LA·LB·FA·FB·CA·CB·TA·TC			
Accessories	Boots	Standard: Nylon tarpaulin Semi-standard: Chloroprene, Conex			
	Rod end attachments	Rod eye (T-end), Rod clevis (Y-end) with pin, Floating joint (F-end) (ϕ32 to ϕ100)			
	Others	CB bracket, TA/TC bracket			

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.

Notes)
- The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
- The cylinder body is not resistant to cutting oil.
- Conex, material of the boots, is the registered trademark of Teijin Limited.
- For the internal structure, refer to the sectional drawings at the end of this catalog.
- Slipper seal is the registered trade mark of Nippon Valqua Industries, Ltd.

Standard Stroke Range

Unit: mm

Type \ Bore	Standard type	Switch Set
ϕ32·ϕ40	1000	1000
ϕ50·ϕ63	1200	1200
ϕ80	1600	1600
ϕ100	1600	1600
ϕ125·ϕ160	1800	—

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

Cushion Stroke Length

Unit: mm

Bore	Cushion stroke (Cushion ring length)
ϕ32 to ϕ63	16
ϕ80 to ϕ125	20
ϕ160	23

- 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.

Product Lineup

Unit: mm

Series Variations	Type	ϕ32	ϕ40	ϕ50	ϕ63	ϕ80	ϕ100	ϕ125	ϕ160
General purpose type: Double acting single rod	Standard type 35H-3	●	●	●	●	●	●	●	●
	Switch Set 35H-3R	●	●	●	●	●	●		
General purpose type: Double acting double rod	Standard type 35H-3D	●	●	●	●	●	●	●	●
	Switch Set 35H-3RD	●	●	●	●	●	●		

Notes)
- When using a sensor, use a Switch Set Cylinder.
- No sensor can be mounted onto the standard type cylinder.

Double Acting Single Rod

Standard type(35H-3)

Switch Set(35H-3R)

Double Acting Double Rod

Standard type(35H-3D)

Switch Set(35H-3RD)

Adaptability of Fluid to Seal Material

Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	W/O Water in oil fluid	O/W Oil in water fluid
1 Nitrile rubber	○	○	×	○	○
3 Fluorocarbon	○	×	○	○	○
6 HNBR	○	◎	×	◎	◎
8 Slipper seal	○	○	×	○	○

Notes)
1. ◎○: Applicable ×: Inapplicable
2. The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.
3. Slipper seal is the registered trade mark of Nippon Valqua Industries, Ltd.

● How to order

General Purpose Type

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

	❶ Type	❷ Seal material	❸ Mounting style	❹ Cylinder bore	❺ Cushioning	❻ Stroke	❼ Sensor symbol	❽ Sensor quantity	❾ Rod end attachment	❿ Bracket	⓫ Boots
●Standard type	35H-3	1	LB	40	B	200			T	B	– J
●Switch Set	35H-3R	1	LB	40	B	200	– AH	2	– T	B	– J

Double acting single rod
35H-3 : Standard type
35H-3R : Switch Set
Double acting double rod
35H-3D : Standard type
35H-3RD : Switch Set

❶ Type
- 1 Nitrile rubber
- 3 Fluorocarbon
- 6 HNBR
- 8 Slipper seal

❷ Seal material

❸ Mounting style

❹ Cylinder bore
Standard type : ϕ32 to ϕ160
Switch Set : ϕ32 to ϕ100

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

❻ Stroke
Cylinder stroke (mm)

❼ Sensor symbol
Note) Select applicable sensors out of the sensor list.

❽ Sensor quantity
Sensor quantity(1, 2, to n)

❾ Rod end attachment
- T Rod eye (T-end)
- Y Rod clevis (Y-end)
- F Floating joint (F-end)

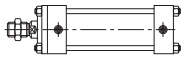
❿ Bracket
With bracket
Applicable mounting styles
CB style, TA style, TC style

⓫ Boots
- J Nylon tarpaulin
- JN Chloroprene
- JK Conex

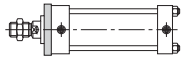
❗ Notes on ordering Switch Set
- When no sensor is required, specify 0 for the sensor symbol ❼ and the sensor quantity ❽.
- Sensors are not mounted on cylinders at delivery.

Mounting Style

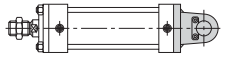
SD SD style (basic style)



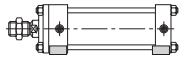
FA FA style (rod flange)



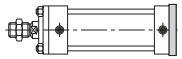
CB CB style (cap clevis)



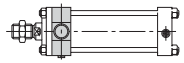
LA LA style (side lugs)



FB FB style (cap flange)

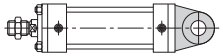


TA TA style (rod trunnion)

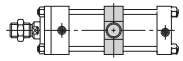


LB LB style (end angles)

CA CA style (cap eye)



TC TC style (intermediate trunnion)



Sensor List

■ Semi-standard

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 AC:5 to 120V	DC:5 to 40mA AC:5 to 20mA	DC:1.5W AC:2VA	None	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm Rear wiring	1.5m	Small relay, programmable controller
	AG AX105CE				Provided			5m	
	AH AX111CE							1.5m	
	AJ AX115CE							5m	
	AE AX125CE	DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AD: 20 mA or less		None	None		5m	
	AK AX11ACE	AC:5 to 120V	5 to 20mA	2VA	Provided	LED (Lights in red when sensing)	4-pin connector type, Rear wiring	0.5m	
	AL AX11BCE	DC:5 to 30V	5 to 40mA	1.5W				0.5m	
	AM AX135CE	AC/DC:90 to 240V	5 to 300mA	B contact output	Provided	LED (Lights in red when not sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, Rear wiring	5m	
	S SR405	AC:80 to 220V	2 to 300mA	30VA	Provided	Neon lamp (Lights when not sensing)	0.5 mm², 2-core, outer dia. ϕ6 mm Rear wiring	5m	
	5 WR505	DC:5 to 50V AC:5 to 120V	DC:3 to 40mA AC:3 to 20mA	DC:1.5W AC:2VA	None	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm Rear wiring	5m	
	7 WR505F							5m	
	6 WR515							5m	
Solid state sensor	BE AX201CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm Rear wiring	1.5m	Small relay, programmable controller
	BF AX205CE-1							5m	
	CE AX211CE-1					LED (2-LED type in red/green)		1.5m	
	CF AX215CE-1							5m	
Cutting oil proof type	RA AX205WCE	DC:5 to 30V	5 to 40mA	—	Provided	LED (Lights in red when sensing)	0.3 mm², 2-core, outer dia. ϕ4 mm, Rear wiring	5m	
	RB AZ205WCE						0.3 mm², 2-core, outer dia. ϕ4 mm, Upper wiring	5m	
	RE AX215WCE		5 to 20mA			LED (2-LED type in red/green)	0.3 mm², 2-core, outer dia. ϕ4 mm, Rear wiring	5m	
	RF AZ215WCE						0.3 mm², 2-core, outer dia. ϕ4 mm, Upper wiring	5m	
Solid state sensor	2 WS215-1	DC:10 to 30V	5 to 20mA	—	Provided	LED (2-LED type in red/green)	0.3 mm², 2-core, outer dia. ϕ4 mm Rear wiring	5m	
	4 WS215-1F							5m	
	3 WS225-1							5m	
Solid state sensor (CE conformed)	CT AX211CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (2-LED type in red/green)	0.3 mm², 2-core, outer dia. ϕ4 mm Rear wiring	1.5m	
	CU AX215CE-1							5m	
	CV AX21BCE-1						4-pin connector type type, Rear wiring	0.5m	
	CW AZ211CE-1						0.3 mm², 2-core, outer dia. ϕ4 mm Upper wiring	1.5m	
	CX AZ215CE-1							5m	
	CY AZ21BCE-1						4-pin connector type Upper wiring	0.5m	

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 AX135CE is a B contact. When the piston is detected, the sensor contact turns off (the lamp turns on).
- For handling 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.

● Standard type

AX type sensor

Cord type

Connector type

SR type sensor

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

Standard Stroke Range

Unit: mm

Type \ Bore	Standard type	Switch Set
φ32・φ40	1000	1000
φ50・φ63	1200	1200
φ80	1600	1600
φ100	1600	1600
φ125・φ160	1800	—

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

Adaptability of Fluid to Seal Material

Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol fluid	Phosphate ester fluid	W/O Water in oil fluid	O/W Oil in water fluid
1 Nitrile rubber	○	○	×	○	○
3 Fluorocarbon	○	×	○	○	○
6 HNBR	○	◎	×	◎	◎
8 Slipper seal	○	○	×	○	○

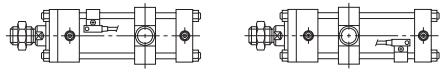
Notes) 1. ◎○: Applicable ×: Inapplicable
2. The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.
3. Slipper seal is the registered trade mark of Nippon Valqua Industries, Ltd.

Sensor Mountable Minimum Stroke

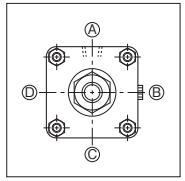
Unit: mm

Bore mm \ Mounting style	Styles other than TC						TC style					
Sensor quantity	With one sensor			With two sensors			With one sensor			With two sensors		
Sensor type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type
φ32	25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130
φ40	25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130
φ50	25	55(40)	35	25	55(40)	35	55	85(70)	65	105	165(140)	130
φ63	20	55(40)	35	20	55(40)	35	55	85(70)	65	105	165(140)	130
φ80	20	55(40)	35	20	55(40)	35	55	85(75)	70	105	165(145)	135
φ100	20	55(40)	35	20	55(40)	35	60	90(80)	75	110	165(150)	140

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 in the right figures) are shown in the table.
- For the minimum dimension PH of TC style for mounting sensor, refer to the dimensional drawings of TC style.
- The parenthesized values in the WR/WS type column are the minimum strokes in case of WR515 or WS225-1.



★ Standard specifications



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

★ Change of port and cushion valve positions

The standard port position is Ⓐ, and the standard cushion valve position is Ⓑ.
When modifying the positions, enter the symbol shown in the dimensional drawings.

Example) 35H-3R 1LB50B100−[B] [C] AH2
Port position(A, B, C, D) | Cushion valve position(A, B, C, D, O)

- For the TA style, the standard port position and cushion valve position are Ⓐ and Ⓒ on the rod side and Ⓐ and Ⓑ on the cap side.
- In case that the cushion is not equipped, the cushion valve position is "O".

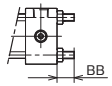
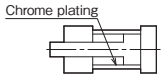
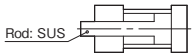
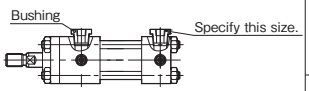
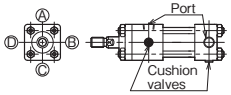
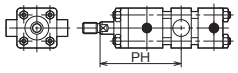
Lock Nut Part Number

Bore (mm)	Part number
φ32	LNA-12F-H
φ40	
φ50	LNA-18F-H
φ63	
φ80	LNA-24F-H
φ100	LNA-30F-H
φ125	LNA-42F-H
φ160	LNA-48F-H

✪ The semi-standard ordering system

The following contents can be easily specified using the semi-standard symbols and specification symbols (position/dimension/material symbols).

How to order: Series | Model number | — × ① Semi-standard symbol | ② ③ ④ Position/Dimension/Material symbols

Order contents	① Semi-standard symbol	Position ②Symbol	Position Description	Dimension ③Symbol	Dimension Description	Material ④Symbol	Material Description
■Tie rods extension  Notes 1) Tolerance of dimension BB is about 2 mm due to elongation by tightening. When precise dimension BB is required, specify the value. 2) For the LB or LC style, only upper two tie rods (on the side opposite to the accessory side) can be extended. For flange or clevis style, four tie rods on the side without the accessory can be extended.	STD	TD-RS	Rod side	BB-□□	□□ is a desired dimension BB of up to 70 mm.	—	—
		TD-HS	Cap side				
		TD-BS	Both sides				
	Example	To specify SD style with dimension BB of 50 mm on both sides 35H-3R 2SD80BB100-ABAH2-X STD TD-BS, BB-50					
■Hard chrome plated on the inside of cylinder tube (Standard style: iron tube only)  Note) Consult us for any special thickness of chrome plating other than 0.02 mm.	STB	—	—	BG-0.02	Plating thickness 0.02 mm	—	—
	Example	To plate the tube inner surface 0.02 mm in thickness 35H-3 2LB80BB100-AB-X STB BG-0.02					
■Stainless steel (SUS) piston rod  Note) Consult us for any special requirement other than material SUS304 or 0.02 mm thickness of chrome plating.	SPR	—	—	—	—	PR-10	Material: SUS304 Plating thickness 0.02mm
	Example	To specify piston rod made of SUS304 with plating thickness of 0.02 mm 35H-3 2LB80BB100-ABAH2-X SPR PR-10					
■Additional port of bushing  Notes 1) Specify the reduced port diameter after mounting a bushing. 2) For reduction by more than two steps by using a bushing, consult us.	PBS	—	—	RC-1.00	Rc1/8	—	—
				RC-2.00	Rc1/4		
				RC-3.00	Rc3/8		
				RC-4.00	Rc1/2		
	Example	To mount a bushing to 35H-3 CA style ϕ80 (standard port dia. Rc1/2) cylinder to reduce the port diameter to Rc3/8 35H-3 2CA80BB300-AB-X PBS RC-3.00					
■Change of port and cushion valve positions on the cap side 	PPC	PC-□□	□□ indicates the port and cushion valve positions on the cap side.	—	—	—	—
	Example	To change the port and cushion valve positions from the cap side to the rod side (AB on rod side, BC on cap side) 35H-3 2LA80BB100-AB-X PPC PC-BC					
■Water-glycol working fluid Notes 1) Iron tubing (standard type) is plated with hard chrome and tested with water-glycol fluid. 2) Stainless steel tubing (sensor type) is not plated in conformity with the standard and tested with water-glycol fluid.	FWF	—	—	—	—	WF-WG	WF-WG: Water-glycol fluid
	Example	35H-3 6LB80BB100-AB-X FWF WF-WG					
■Intermediate trunnion location change (dimension PH) 	MTC	—	—	TCPH-□	□ is a new dimension.	—	—
	Example	To change dimension PH to 360 mm 35H-3R 2TC63BB500-AB-X MTC TCPH-360					

Weight Table

Unit: kg

Bore mm	Basic weight (SD style) Standard type (single rod)	Basic weight (SD style) Double rod type	Additional weight per mm of stroke Standard type (single rod)	Additional weight per mm of stroke Double rod type	Mounting accessory weight LA	LB	FA	FB	CA	CB	TA	TC	Bracket weight CB bracket	TA/TC bracket	Rod end attachment weight Rod eye (T-end)	Rod clevis (Y-end) w/ pin	Floating joint (F-end)
ϕ32	1.17	1.53	0.0041	0.0055	0.12	0.19	0.17	0.24	0.12	0.12	0.051	0.30	0.46	0.45	0.15	0.20	0.19
ϕ40	1.77	2.21	0.0045	0.0059	0.19	0.23	0.25	0.32	0.18	0.15	0.193	0.48	0.66	1.06	0.16	0.34	0.19
ϕ50	2.56	3.27	0.0078	0.0102	0.28	0.36	0.41	0.50	0.26	0.30	0.193	0.56	0.66	1.06	0.22	0.35	0.41
ϕ63	3.98	5.00	0.0094	0.0118	0.29	0.46	0.56	0.64	0.40	0.38	0.193	0.70	0.66	1.06	0.22	0.35	0.41
ϕ80	7.55	9.31	0.0122	0.017	0.66	0.86	1.40	1.56	1.02	0.82	0.193	1.15	1.97	1.50	0.76	1.01	1.41
ϕ100	11.44	14.27	0.020	0.028	0.96	1.60	1.96	2.25	1.28	1.38	0.405	3.10	3.60	4.60	1.30	1.76	2.68
ϕ125	18.58	24.11	0.033	0.044	1.42	2.24	3.76	4.24	4.24	4.42	0.576	4.80	8.02	6.72	3.19	4.36	—
ϕ160	35.03	45.41	0.049	0.066	2.60	5.68	7.76	8.78	8.05	8.91	1.125	6.10	8.84	13.60	4.29	5.82	—

Note) Weight of one set of two TA/TC brackets

Sensor Additional Weight

Unit: kg

Sensor / Bore mm	AX/AZ type Cord length 1.5 m	AX/AZ type Cord length 5 m	AX/AZ type With connector	SR type Cord length 5 m	WR/WS type
ϕ32	0.05	0.13	0.04	0.22	0.5
ϕ40					
ϕ50					
ϕ63					
ϕ80					
ϕ100	0.07	0.14	0.06		

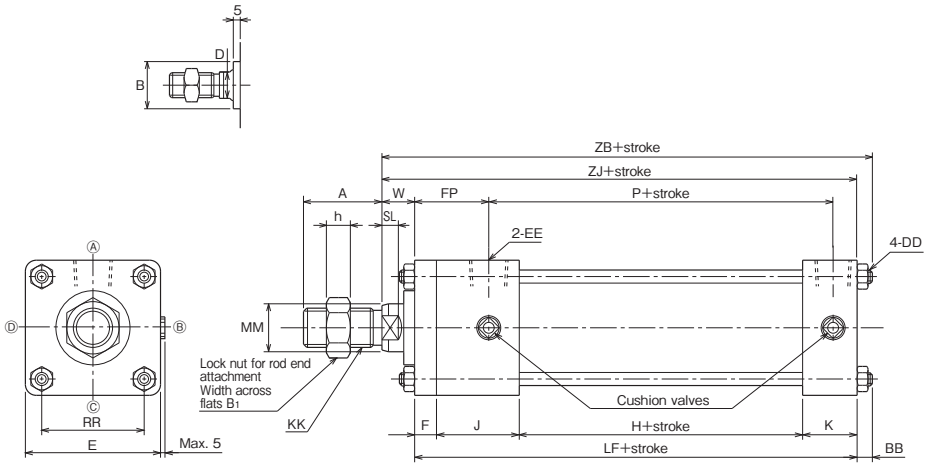
Calculation formula: Cylinder weight (kg)=basic weight+(cylinder stroke (mm)× additional weight per mm of stroke)+(sensor additional weight×sensor quantity)+mounting accessory weight+ bracket weight+rod end attachment weight

Calculation example: 35H-3R, bore ϕ80, cylinder stroke 200 mm, 2 pcs of AX215 (cord length 5 m), LA style 7.55+(200×0.0122)+(0.13×2)+0.66=10.88kg

35H-3/TH35 Bore CAD/DATA is available.

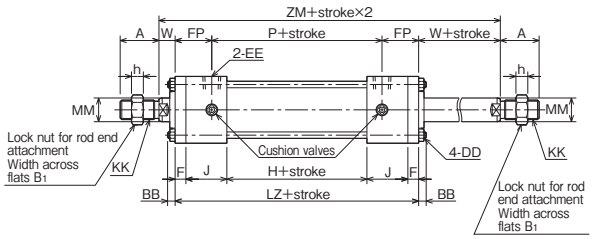
SD

35H-3 1 SD Bore B Stroke

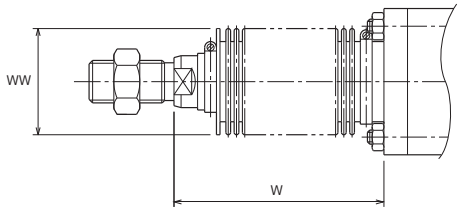


- When mounting a sensor, refer to the dimensional drawings of Switch Set.
- When using the SD style, refer to the precautions for use.

Double acting double rod



35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: φ32 to φ63 1/3 stroke+X; φ80 to φ160 1/4 stroke+X

Conex: φ32 to φ63 1/2.5 stroke+X; φ80 to φ160 1/3 stroke+X

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

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

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

Dimensional Table

Bore \ Symbol	A	B	B1	BB	D	DD	E	EE	F	FP	H	h	J	K	KK
φ 32	24	φ 30	19	7	13	M6×1	□44	Rc1/4	10	34	30	7	38	25	M12×1.25
φ 40	24	φ 30	19	7	13	M6×1	□50	Rc3/8	10	34	30	7	38	25	M12×1.25
φ 50	36	φ 34	24	7	19	M6×1	□62	Rc3/8	10	34	30	11	38	25	M18×1.5
φ 63	36	φ 34	24	9	19	M8×1.25	□76	Rc3/8	10	34	33	11	38	25	M18×1.5
φ 80	48	φ 42	32	10	24	M10×1.25	□94	Rc1/2	16	43	31	14	45	32	M24×2
φ 100	60	φ 50	41	12	30	M12×1.5	□114	Rc1/2	16	43	31	17	45	32	M30×2
φ 125	84	φ 60	60	16	41	M16×1.5	□138	Rc1/2	20	47	37	22	45	32	M42×2
φ 160	96	φ 72	70	19	50	M20×1.5	□178	Rc3/4	25	54	42	26	50	38	M48×2

Bore \ Symbol	LF	LZ	MM	P	RR	SL	W	ZB	ZJ	ZM
φ 32	103	126	φ 16	58	□33	7.5	15	125	118	156
φ 40	103	126	φ 16	58	□37	7.5	15	125	118	156
φ 50	103	126	φ 22	58	□47	7.5	15	125	118	156
φ 63	106	129	φ 22	61	□56	7.5	15	130	121	159
φ 80	124	153	φ 28	67	□70	11	19	153	143	191
φ 100	124	153	φ 36	67	□89	14	23	159	147	199
φ 125	134	167	φ 45	73	□110	17	25	175	159	217
φ 160	155	192	φ 56	84	□142	19	29	203	184	250

- The tolerance of B is f9, and that of MM is f8.

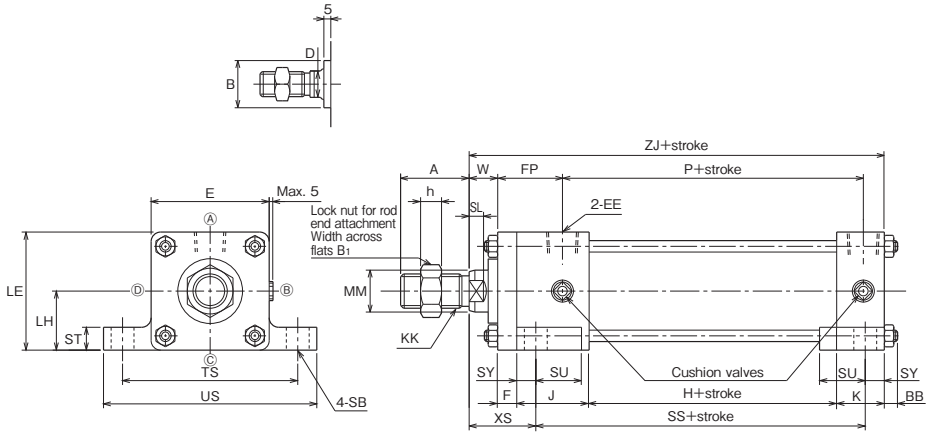
With Boots

Bore \ Symbol	WW	X
φ 32	φ 36	50
φ 40	φ 40	50
φ 50	φ 45	55
φ 63	φ 45	55
φ 80	φ 60	65
φ 100	φ 71	65
φ 125	φ 80	65
φ 160	φ 100	70

35H-3/TH35 Bore CAD/DATA is available.

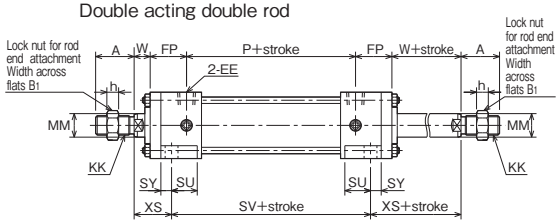
LA

35H-3 1 LA Bore B Stroke

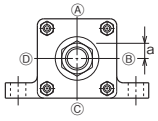


- When mounting a sensor, refer to the dimensional drawings of Switch Set.

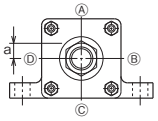
Double acting double rod



Port position Ⓑ



Port position Ⓓ

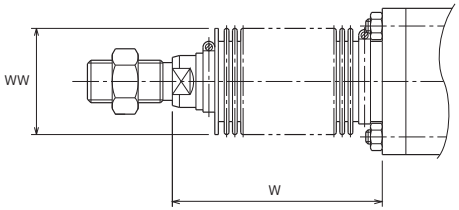


Note) Dimension "a" for port position Ⓑ or Ⓓ

Symbol \ Bore	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ160
a	5	6	6	0	0	0	0	0

- The same applies to the Switch Set Cylinders.

35H-3/TH35 Bore



Nylon tarpaulin, Chloroprene: φ32 to φ63 1/3 stroke+X; φ80 to φ160 1/4 stroke+X

Conex: φ32 to φ63 1/2.5 stroke+X; φ80 to φ160 1/3 stroke+X

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

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

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

Dimensional Table

Symbol / Bore	A	B	B1	BB	D	E	EE	F	FP	H	h	J	K	KK
φ32	24	φ30	19	7	13	□44	Rc1/4	10	34	30	7	38	25	M12×1.25
φ40	24	φ30	19	7	13	□50	Rc3/8	10	34	30	7	38	25	M12×1.25
φ50	36	φ34	24	7	19	□62	Rc3/8	10	34	30	11	38	25	M18×1.5
φ63	36	φ34	24	9	19	□76	Rc3/8	10	34	33	11	38	25	M18×1.5
φ80	48	φ42	32	10	24	□94	Rc1/2	16	43	31	14	45	32	M24×2
φ100	60	φ50	41	12	30	□114	Rc1/2	16	43	31	17	45	32	M30×2
φ125	84	φ60	60	16	41	□138	Rc1/2	20	47	37	22	45	32	M42×2
φ160	96	φ72	70	19	50	□178	Rc3/4	25	54	42	26	50	38	M48×2

Symbol / Bore	LE	LH	MM	P	SB	SL	SS	ST	SU	SV	SY	TS	US	W	XS	ZJ
φ32	44	22 $^{-0.300}_{-0.384}$	φ16	58	φ9	7.5	73	8	18	86	10	69	84	15	35	118
φ40	50	25 $^{-0.300}_{-0.384}$	φ16	58	φ12	7.5	73	8	24	86	10	80	100	15	35	118
φ50	62	31 $^{-0.310}_{-0.410}$	φ22	58	φ12	7.5	73	12	24	86	10	92	112	15	35	118
φ63	76	38 $^{-0.310}_{-0.410}$	φ22	61	φ12	7.5	76	12	24	89	10	108	128	15	35	121
φ80	94	47 $^{-0.320}_{-0.420}$	φ28	67	φ14	11	82	19	32	95	13	128	150	19	48	143
φ100	114	57 $^{-0.340}_{-0.460}$	φ36	67	φ18	14	72	24	27	85	18	154	182	23	57	147
φ125	138	69 $^{-0.360}_{-0.480}$	φ45	73	φ22	17	70	29	23	83	22	189	224	25	67	159
φ160	178	89 $^{-0.380}_{-0.520}$	φ56	84	φ26	19	82	42	26	94	24	236	278	29	78	184

- The tolerance of B is f9, and that of MM is f8.

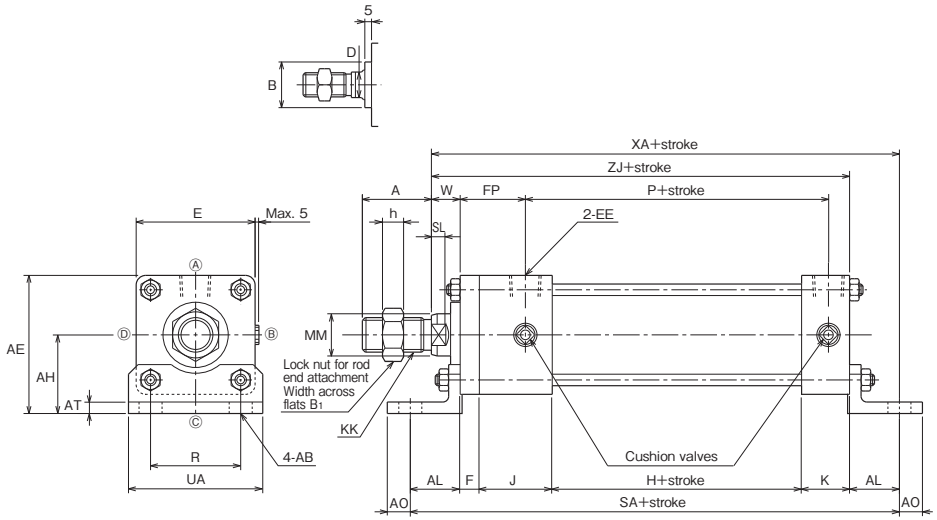
With Boots

Symbol / Bore	WW	X
φ32	φ36	50
φ40	φ40	50
φ50	φ45	55
φ63	φ45	55
φ80	φ60	65
φ100	φ71	65
φ125	φ80	65
φ160	φ100	70

35H-3/TH35 Bore CAD/DATA is available.

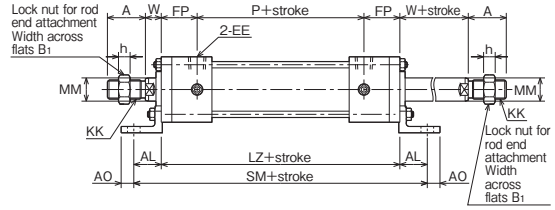
LB

35H-3 1 LB Bore B Stroke

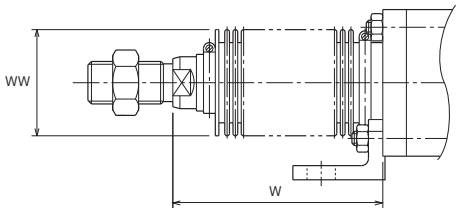


● When mounting a sensor, refer to the dimensional drawings of Switch Set.

Double acting double rod



35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: φ32 to φ63 1/3 stroke+X; φ80 to φ160 1/4 stroke+X

Conex: φ32 to φ63 1/2.5 stroke+X; φ80 to φ160 1/3 stroke+X

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

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

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

Dimensional Table

Bore \ Symbol	A	AB	AE	AH	AL	AO	AT	B	B1	D	E	EE	F	FP
φ 32	24	φ 9	55	33	23	10	5	φ 30	19	13	□44	Rc1/4	10	34
φ 40	24	φ 12	60	35	25	12	5	φ 30	19	13	□50	Rc3/8	10	34
φ 50	36	φ 12	72	41	26	12	6	φ 34	24	19	□62	Rc3/8	10	34
φ 63	36	φ 12	86	48	28	12	6	φ 34	24	19	□76	Rc3/8	10	34
φ 80	48	φ 14	106	59	34	14	8	φ 42	32	24	□94	Rc1/2	16	43
φ 100	60	φ 18	127	70	40	18	9	φ 50	41	30	□114	Rc1/2	16	43
φ 125	84	φ 22	155	86	47	22	10	φ 60	60	41	□138	Rc1/2	20	47
φ 160	96	φ 26	200	111	58	26	15	φ 72	70	50	□178	Rc3/4	25	54

Bore \ Symbol	H	h	J	K	KK	LZ	MM	P	R	SA	SL	SM	UA	W	XA	ZJ
φ 32	30	7	38	25	M12×1.25	126	φ 16	58	33	149	7.5	172	54	15	141	118
φ 40	30	7	38	25	M12×1.25	126	φ 16	58	37	153	7.5	176	60	15	143	118
φ 50	30	11	38	25	M18×1.5	126	φ 22	58	47	155	7.5	178	70	15	144	118
φ 63	33	11	38	25	M18×1.5	129	φ 22	61	56	162	7.5	185	80	15	149	121
φ 80	31	14	45	32	M24×2	153	φ 28	67	70	192	11	221	97	19	177	143
φ 100	31	17	45	32	M30×2	153	φ 36	67	89	204	14	233	120	23	187	147
φ 125	37	22	45	32	M42×2	167	φ 45	73	95	228	17	261	138	25	206	159
φ 160	42	26	50	38	M48×2	192	φ 56	84	128	271	19	308	178	29	242	184

● The tolerance of B is f9, and that of MM is f8.

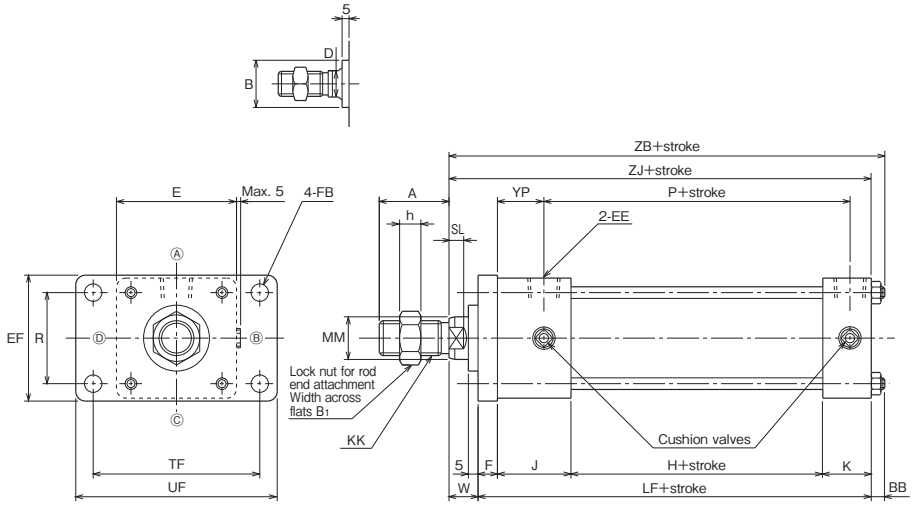
With Boots

Bore \ Symbol	WW	X
φ 32	φ 36	50
φ 40	φ 40	50
φ 50	φ 45	55
φ 63	φ 45	55
φ 80	φ 60	65
φ 100	φ 71	65
φ 125	φ 80	65
φ 160	φ 100	70

35H-3/TH35 Bore CAD/DATA is available.

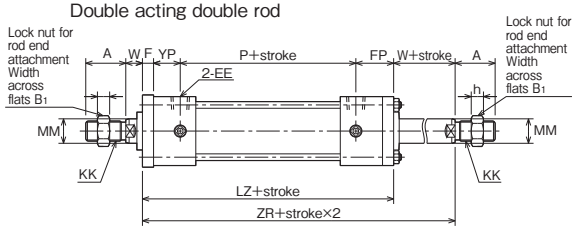
FA

35H-3 1 FA Bore B Stroke

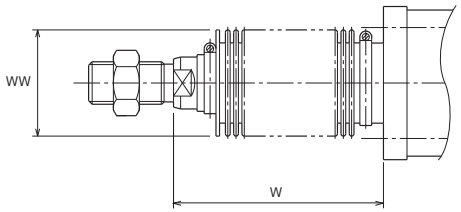


● When mounting a sensor, refer to the dimensional drawings of Switch Set.

Double acting double rod



35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: φ32 to φ63 1/3 stroke+X; φ80 to φ160 1/4 stroke+X

Conex: φ32 to φ63 1/2.5 stroke+X; φ80 to φ160 1/3 stroke+X

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

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

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

Dimensional Table

Bore \ Symbol	A	B	B1	BB	D	E	EE	EF	F	FB	FP	H	h	J	K
φ32	24	φ30	19	7	13	□44	Rc1/4	47	10	φ7	34	30	7	38	25
φ40	24	φ30	19	7	13	□50	Rc3/8	52	10	φ7	34	30	7	38	25
φ50	36	φ34	24	7	19	□62	Rc3/8	65	10	φ9	34	30	11	38	25
φ63	36	φ34	24	9	19	□76	Rc3/8	76	10	φ9	34	33	11	38	25
φ80	48	φ42	32	10	24	□94	Rc1/2	95	16	φ12	43	31	14	45	32
φ100	60	φ50	41	12	30	□114	Rc1/2	115	16	φ14	43	31	17	45	32
φ125	84	φ60	60	16	41	□138	Rc1/2	138	20	φ18	47	37	22	45	32
φ160	96	φ72	70	19	50	□178	Rc3/4	178	25	φ22	54	42	26	50	38

Bore \ Symbol	KK	LF	LZ	MM	P	R	SL	TF	UF	W	YP	ZB	ZJ	ZR
φ32	M12×1.25	103	126	φ16	58	33	7.5	58	72	15	24	125	118	141
φ40	M12×1.25	103	126	φ16	58	36	7.5	70	84	15	24	125	118	141
φ50	M18×1.5	103	126	φ22	58	47	7.5	86	104	15	24	125	118	141
φ63	M18×1.5	106	129	φ22	61	56	7.5	98	116	15	24	130	121	144
φ80	M24×2	124	153	φ28	67	70	11	119	143	19	27	153	143	172
φ100	M30×2	124	153	φ36	67	84	14	140	166	23	27	159	147	176
φ125	M42×2	134	167	φ45	73	110	17	176	212	25	27	175	159	192
φ160	M48×2	155	192	φ56	84	142	19	225	270	29	29	203	184	221

● The tolerance of B is f9, and that of MM is f8.

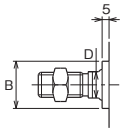
With Boots

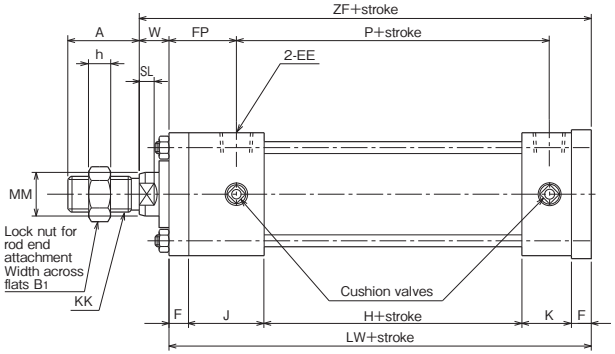
Bore \ Symbol	WW	X
φ32	φ36	50
φ40	φ40	50
φ50	φ45	55
φ63	φ45	55
φ80	φ60	65
φ100	φ71	65
φ125	φ80	65
φ160	φ100	70

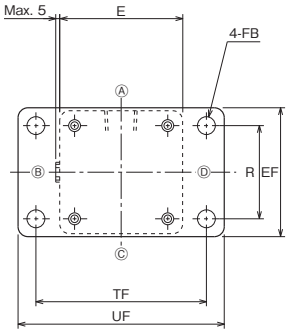
35H-3/TH35 Bore CAD/DATA is available.

FB

35H-3 1 FB Bore B Stroke

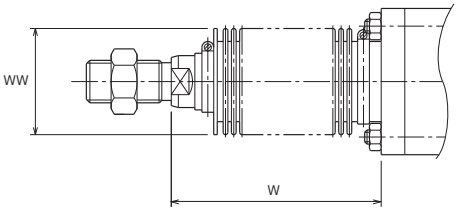






● When mounting a sensor, refer to the dimensional drawings of Switch Set.

35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: ϕ32 to ϕ63 1/3 stroke+X; ϕ80 to ϕ160 1/4 stroke+X

Conex: ϕ32 to ϕ63 1/2.5 stroke+X; ϕ80 to ϕ160 1/3 stroke+X

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

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

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

Dimensional Table

Symbol / Bore	A	B	B1	D	E	EE	EF	F	FB	FP	H	h
ϕ 32	24	ϕ 30	19	13	□44	Rc1/4	47	10	ϕ 7	34	30	7
ϕ 40	24	ϕ 30	19	13	□50	Rc3/8	52	10	ϕ 7	34	30	7
ϕ 50	36	ϕ 34	24	19	□62	Rc3/8	65	10	ϕ 9	34	30	11
ϕ 63	36	ϕ 34	24	19	□76	Rc3/8	76	10	ϕ 9	34	33	11
ϕ 80	48	ϕ 42	32	24	□94	Rc1/2	95	16	ϕ 12	43	31	14
ϕ 100	60	ϕ 50	41	30	□114	Rc1/2	115	16	ϕ 14	43	31	17
ϕ 125	84	ϕ 60	60	41	□138	Rc1/2	138	20	ϕ 18	47	37	22
ϕ 160	96	ϕ 72	70	50	□178	Rc3/4	178	25	ϕ 22	54	42	26

Symbol / Bore	J	K	KK	LW	MM	P	R	SL	TF	UF	W	ZF
ϕ 32	38	25	M12×1.25	113	ϕ 16	58	33	7.5	58	72	15	128
ϕ 40	38	25	M12×1.25	113	ϕ 16	58	36	7.5	70	84	15	128
ϕ 50	38	25	M18×1.5	113	ϕ 22	58	47	7.5	86	104	15	128
ϕ 63	38	25	M18×1.5	116	ϕ 22	61	56	7.5	98	116	15	131
ϕ 80	45	32	M24×2	140	ϕ 28	67	70	11	119	143	19	159
ϕ 100	45	32	M30×2	140	ϕ 36	67	84	14	140	166	23	163
ϕ 125	45	32	M42×2	154	ϕ 45	73	110	17	176	212	25	179
ϕ 160	50	38	M48×2	180	ϕ 56	84	142	19	225	270	29	209

● The tolerance of B is f9, and that of MM is f8.

With Boots

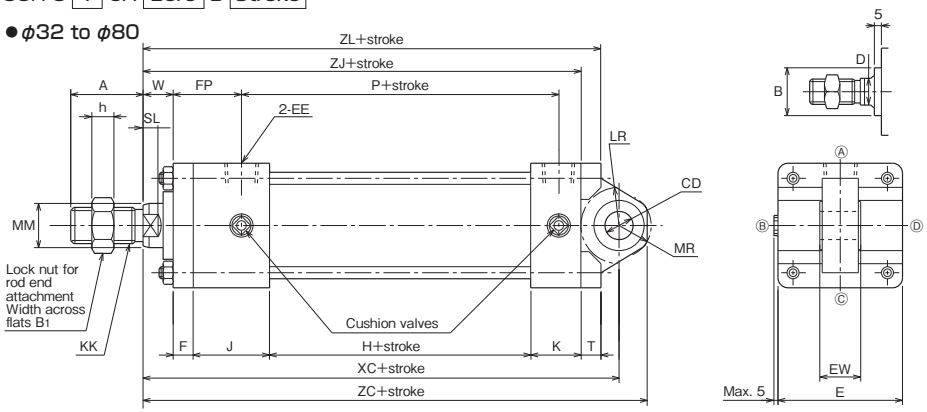
Symbol / Bore	WW	X
ϕ 32	ϕ 36	50
ϕ 40	ϕ 40	50
ϕ 50	ϕ 45	55
ϕ 63	ϕ 45	55
ϕ 80	ϕ 60	65
ϕ 100	ϕ 71	65
ϕ 125	ϕ 80	65
ϕ 160	ϕ 100	70

35H-3/TH35 Bore CAD/DATA is available.

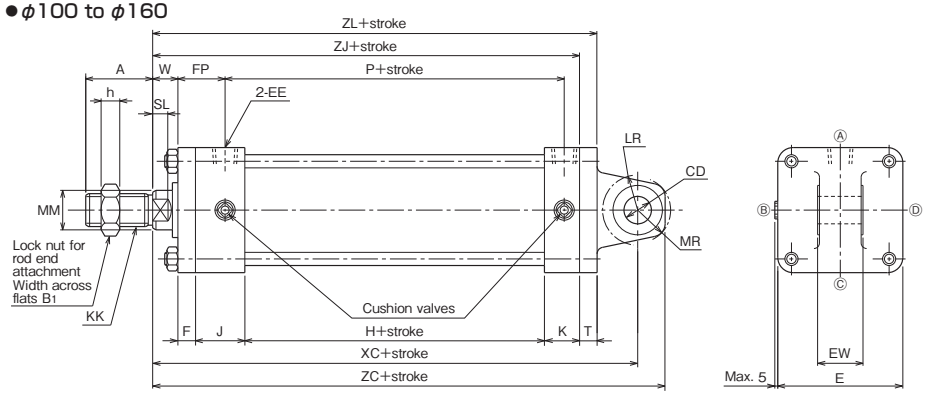
CA

35H-3 1 CA Bore B Stroke

●ϕ32 to ϕ80

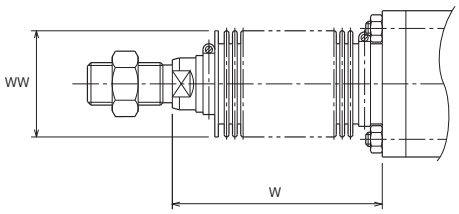


●ϕ100 to ϕ160



- When mounting a sensor, refer to the dimensional drawings of Switch Set.
- Dimension LR is the maximum size of the mating part.

35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: ϕ32 to ϕ63 1/3 stroke+X; ϕ80 to ϕ160 1/4 stroke+X

Conex: ϕ32 to ϕ63 1/2.5 stroke+X; ϕ80 to ϕ160 1/3 stroke+X

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

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

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

Dimensional Table

Symbol / Bore	A	B	B1	CD	D	E	EE	EW	F	FP	H	h	J
ϕ 32	24	ϕ 30	19	ϕ12H9	13	□44	Rc1/4	$16^{\ 0}_{-0.070}$	10	34	30	7	38
ϕ 40	24	ϕ 30	19	ϕ14H9	13	□50	Rc3/8	$20^{\ 0}_{-0.084}$	10	34	30	7	38
ϕ 50	36	ϕ 34	24	ϕ14H9	19	□62	Rc3/8	$20^{\ 0}_{-0.084}$	10	34	30	11	38
ϕ 63	36	ϕ 34	24	ϕ14H9	19	□76	Rc3/8	$20^{\ 0}_{-0.084}$	10	34	33	11	38
ϕ 80	48	ϕ 42	32	ϕ20H9	24	□94	Rc1/2	$32^{\ 0}_{-0.100}$	16	43	31	14	45
ϕ 100	60	ϕ 50	41	ϕ25H9	30	□114	Rc1/2	$40^{\ 0}_{-0.100}$	16	43	31	17	45
ϕ 125	84	ϕ 60	60	ϕ32H9	41	□138	Rc1/2	$45^{\ 0}_{-0.100}$	20	47	37	22	45
ϕ 160	96	ϕ 72	70	ϕ36H9	50	□178	Rc3/4	$50^{\ 0}_{-0.100}$	25	54	42	26	50

Symbol / Bore	K	KK	LR	MM	MR	P	SL	T	W	XC	ZC	ZJ	ZL
ϕ 32	25	M12×1.25	R17	ϕ 16	R14	58	7.5	8	15	137	149	118	126
ϕ 40	25	M12×1.25	R17	ϕ 16	R16	58	7.5	8	15	137	151	118	126
ϕ 50	25	M18×1.5	R19	ϕ 22	R16	58	7.5	10	15	137	151	118	128
ϕ 63	25	M18×1.5	R19	ϕ 22	R16	61	7.5	13	15	140	154	121	134
ϕ 80	32	M24×2	R26	ϕ 28	R22	67	11	18	19	175	195	143	161
ϕ 100	32	M30×2	R32	ϕ 36	R30	67	14	16	23	200	225	147	163
ϕ 125	32	M42×2	R42	ϕ 45	R36	73	17	19	25	226	258	159	178
ϕ 160	38	M48×2	R45	ϕ 56	R42	84	19	24	29	261	297	184	208

- The tolerance of B is f9, and that of MM is f8.

With Boots

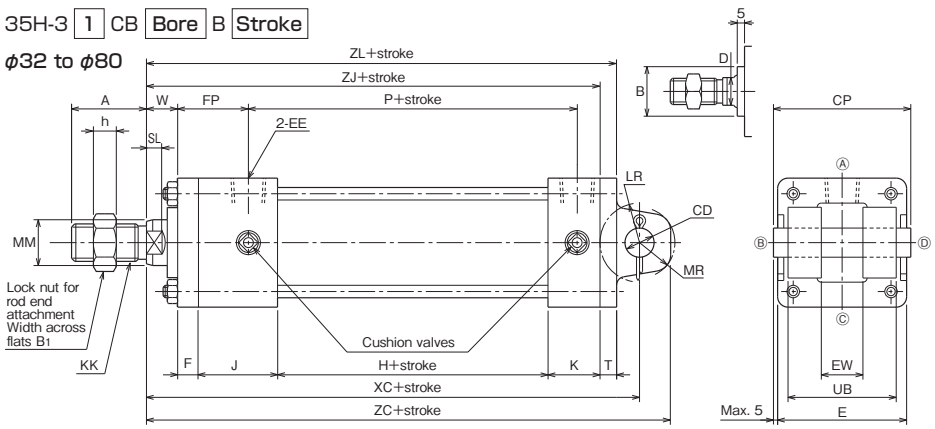
Symbol / Bore	WW	X
ϕ 32	ϕ 36	50
ϕ 40	ϕ 40	50
ϕ 50	ϕ 45	55
ϕ 63	ϕ 45	55
ϕ 80	ϕ 60	65
ϕ 100	ϕ 71	65
ϕ 125	ϕ 80	65
ϕ 160	ϕ 100	70

35H-3/TH35 Bore CAD/DATA is available.

CB

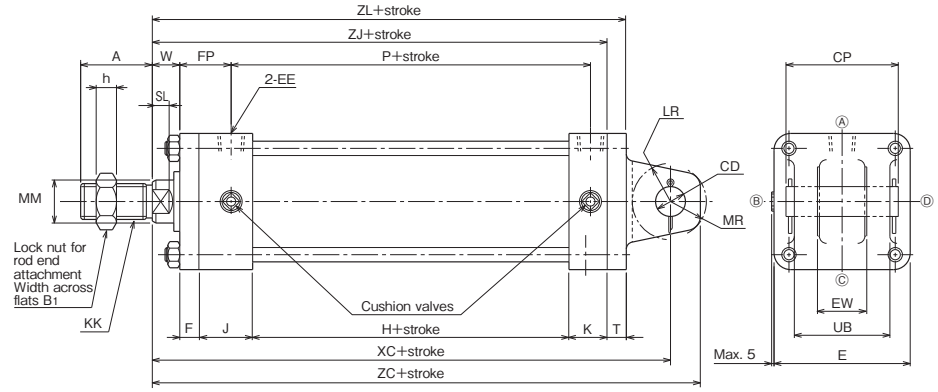
35H-3 1 CB Bore B Stroke

ϕ32 to ϕ80



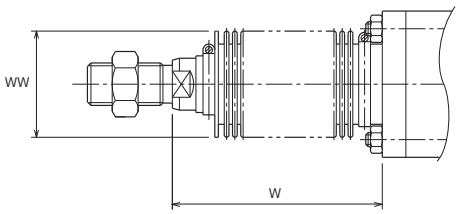
ϕ100 to ϕ160

● The 125 and 160 mm bore cylinders are provided with retainers.



● When mounting a sensor, refer to the dimensional drawings of Switch Set.
● Dimension LR is the maximum size of the mating part.

35H-3/TH35 Bore



Nylon tarpaulin, Chloroprene: ϕ32 to ϕ63 1/3 stroke+X; ϕ80 to ϕ160 1/4 stroke+X
Conex: ϕ32 to ϕ63 1/2.5 stroke+X; ϕ80 to ϕ160 1/3 stroke+X

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

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

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

Dimensional Table

Symbol / Bore	A	B	B1	CD	CP	D	E	EE	EW	F	FP	H	h	J
ϕ32	24	ϕ30	19	ϕ12 H9/f8	46	13	□44	Rc1/4	16 +0.7 +0.5	10	34	30	7	38
ϕ40	24	ϕ30	19	ϕ14 H9/f8	58	13	□50	Rc3/8	20 +0.7 +0.5	10	34	30	7	38
ϕ50	36	ϕ34	24	ϕ14 H9/f8	66	19	□62	Rc3/8	20 +0.7 +0.5	10	34	30	11	38
ϕ63	36	ϕ34	24	ϕ14 H9/f8	66	19	□76	Rc3/8	20 +0.7 +0.5	10	34	33	11	38
ϕ80	48	ϕ42	32	ϕ20 H9/f8	78	24	□94	Rc1/2	32 +0.7 +0.5	16	43	31	14	45
ϕ100	60	ϕ50	41	ϕ25 H9/f8	94	30	□114	Rc1/2	40 +0.7 +0.5	16	43	31	17	45
ϕ125	84	ϕ60	60	ϕ32 H9/f8	105	41	□138	Rc1/2	45 +0.7 +0.5	20	47	37	22	45
ϕ160	96	ϕ72	70	ϕ36 H9/f8	115	50	□178	Rc3/4	50 +0.7 +0.5	25	54	42	26	50

Symbol / Bore	K	KK	LR	MM	MR	P	SL	T	UB	W	XC	ZC	ZJ	ZL
ϕ32	25	M12×1.25	R18	ϕ16	R15	58	7.5	8	32	15	137	150	118	126
ϕ40	25	M12×1.25	R18	ϕ16	R15	58	7.5	8	44	15	137	150	118	126
ϕ50	25	M18×1.5	R19	ϕ22	R17	58	7.5	8	52	15	137	152	118	126
ϕ63	25	M18×1.5	R19	ϕ22	R17	61	7.5	8	52	15	140	155	121	129
ϕ80	32	M24×2	R32	ϕ28	R23	67	11	11	64	19	175	196	143	154
ϕ100	32	M30×2	R32	ϕ36	R30	67	14	16	80	23	200	225	147	163
ϕ125	32	M42×2	R42	ϕ45	R36	73	17	19	90	25	226	258	159	178
ϕ160	38	M48×2	R45	ϕ56	R42	84	19	24	100	29	261	297	184	208

● The tolerance of B is f9, and that of MM is f8.

With Boots

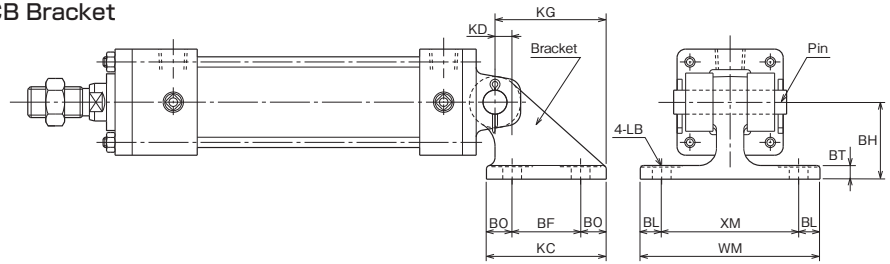
Symbol / Bore	WW	X
ϕ32	ϕ36	50
ϕ40	ϕ40	50
ϕ50	ϕ45	55
ϕ63	ϕ45	55
ϕ80	ϕ60	65
ϕ100	ϕ71	65
ϕ125	ϕ80	65
ϕ160	ϕ100	70

CB Bracket

Symbol / Bore	Part number	BF	BH	BL	BO	BT	KC	KD	KG	LB	WM	XM
ϕ32	BCA-12-H	40	35	10	11.5	8	63	5	56.5	ϕ9	85	65
ϕ40	BCA-14-H	40	45	12.5	16.5	8	73	10	66.5	ϕ11	105	80
ϕ50												
ϕ63												
ϕ80	BCA-20-H	65	60	15	16.5	12	98	10	86.5	ϕ14	135	105
ϕ100	BCA-25-H	75	70	18.5	21.5	16	118	13.5	110	ϕ18	162	125
ϕ125	BCA-32-H	90	80	25	22.5	29	135	22.5	135	ϕ22	200	150
ϕ160	BCA-36-H	125	100	25	27.5	38	180	27.5	180	ϕ26	250	200

35H-3/TH35 Bore

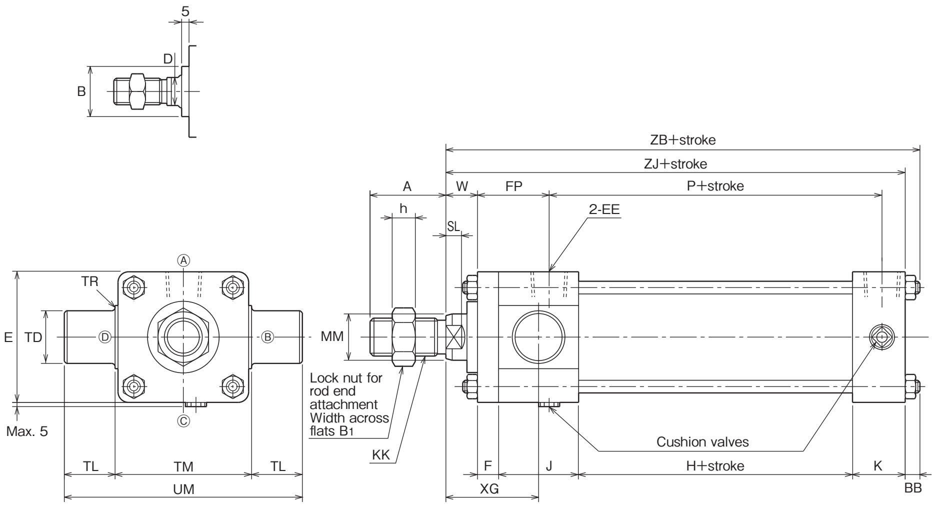
CB Bracket



CAD/DATA
35H-3/TH35 Bore is available.

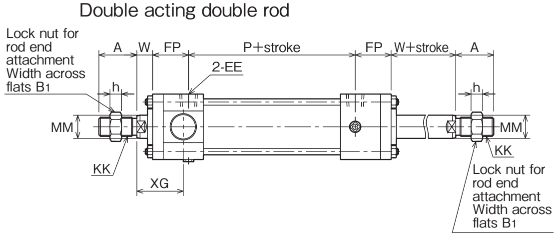
TA

35H-3 1 TA Bore B Stroke

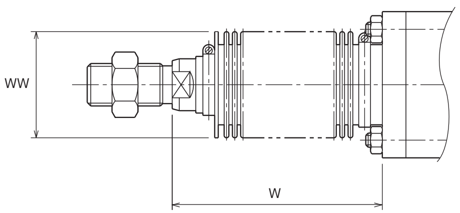


- The TA style cylinder has a cushion valve and an air vent on Ⓒ of the rod cover for structural reasons.
- If the TA style mounting bracket interferes with the sensor, change the sensor mounting face. (Mounting on upper surface)
- When mounting a sensor, refer to the dimensional drawings of Switch Set.

Double acting double rod



35H-3/TH35 Bore



Nylon tarpaulin / Chloroprene: φ32 to φ63 1/3 stroke+X; φ80 to φ160 1/4 stroke+X

Conex: φ32 to φ63 1/2.5 stroke+X; φ80 to φ160 1/3 stroke+X

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

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

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

Dimensional Table

Symbol / Bore	A	B	B1	BB	D	E	EE	F	FP	H	h	J	K
φ 32	24	φ 30	19	7	13	□44	Rc1/4	10	34	30	7	38	25
φ 40	24	φ 30	19	7	13	□50	Rc3/8	10	34	30	7	38	25
φ 50	36	φ 34	24	7	19	□62	Rc3/8	10	34	30	11	38	25
φ 63	36	φ 34	24	9	19	□76	Rc3/8	10	34	33	11	38	25
φ 80	48	φ 42	32	10	24	□94	Rc1/2	16	43	31	14	45	32
φ 100	60	φ 50	41	12	30	□114	Rc1/2	16	43	31	17	45	32
φ 125	84	φ 60	60	16	41	□138	Rc1/2	20	47	37	22	45	32
φ 160	96	φ 72	70	19	50	□178	Rc3/4	25	54	42	26	50	38

Symbol / Bore	KK	MM	P	SL	TD	TL	TM	TR	UM	W	XG	ZB	ZJ
φ 32	M12×1.25	φ 16	58	7.5	φ 16e9	16	44	R1	76	15	44	125	118
φ 40	M12×1.25	φ 16	58	7.5	φ 25e9	25	50	R1.6	100	15	44	125	118
φ 50	M18×1.5	φ 22	58	7.5	φ 25e9	25	63	R1.6	113	15	44	125	118
φ 63	M18×1.5	φ 22	61	7.5	φ 25e9	25	76	R1.6	126	15	44	130	121
φ 80	M24×2	φ 28	67	11	φ 25e9	25	95	R1.6	145	19	57	153	143
φ 100	M30×2	φ 36	67	14	φ 32e9	32	114	R2.5	178	23	61	159	147
φ 125	M42×2	φ 45	73	17	φ 36e9	36	144	R2.5	216	25	67	175	159
φ 160	M48×2	φ 56	84	19	φ 45e9	45	184	R3	274	29	79	203	184

- The tolerance of B is f9, and that of MM is f8.

With Boots

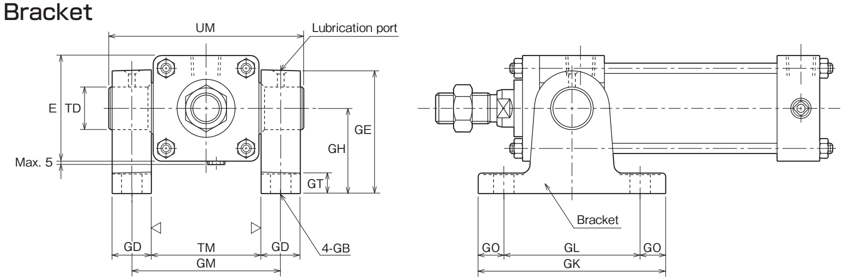
Symbol / Bore	WW	X
φ 32	φ 36	50
φ 40	φ 40	50
φ 50	φ 45	55
φ 63	φ 45	55
φ 80	φ 60	65
φ 100	φ 71	65
φ 125	φ 80	65
φ 160	φ 100	70

TA Bracket

Symbol / Bore	Part number	E	GB	GD	GE	GH	GK	GL	GM	GO	GT	TD	TM	UM
φ 32	BTA-16-H	□44	φ 9	15	56	40	80	60	59	10	12	φ16 H9/e9	44	76
φ 40	BTA-25-H	□50	φ 12	23	72	50	110	80	73	15	12	φ25 H9/e9	50	100
φ 50		□62	φ 12	23	72	50	110	80	86	15	12	φ25 H9/e9	63	113
φ 63		□76	φ 12	23	72	50	110	80	99	15	12	φ25 H9/e9	76	126
φ 80	BTA-25-1-H	□94	φ 14	23	92	70	120	85	118	17.5	14	φ25 H9/e9	95	145
φ 100	BTA-32-H	□114	φ 18	34	112	80	175	135	148	20	22	φ32 H9/e9	114	178
φ 125	BTA-36-1-H	□138	φ 22	36	128	85	205	160	180	22.5	26	φ36 H9/e9	144	216
φ 160	BTA-45-1-H	□178	φ 26	45	158	105	245	190	229	27.5	36	φ45 H9/e9	184	274

35H-3/TH35 Bore

TA Bracket



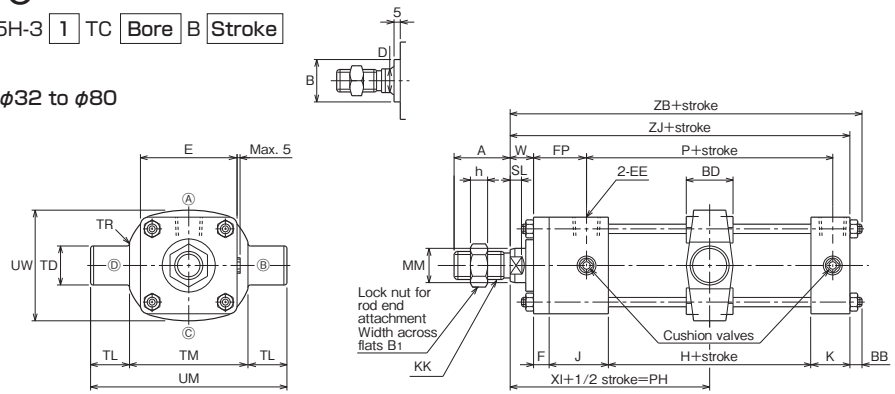
- Insert the TA bracket to the TA accessory from the surface finished ▽.
- Bushes have been inserted to the holes with dimension TD of the cylinders with bores of 100, 125 and 160 mm.

35H-3/TH35 Bore CAD/DATA is available.

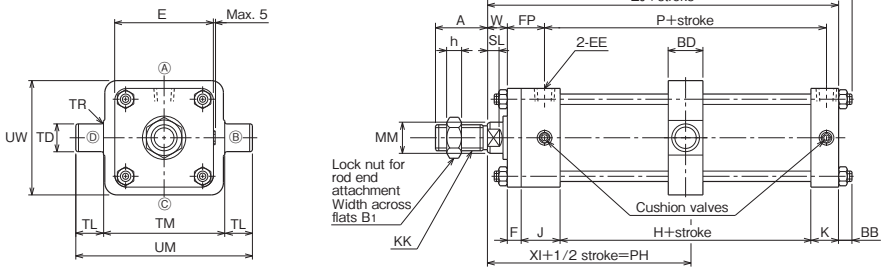
TC

35H-3 1 TC Bore B Stroke

● ϕ32 to ϕ80

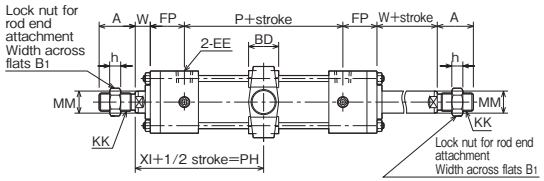


● ϕ100 to ϕ160

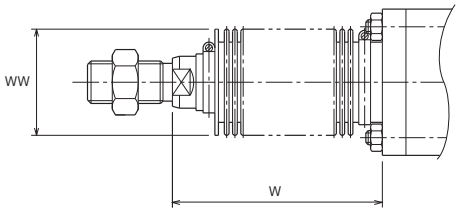


- When mounting a sensor, refer to the dimensional drawings of Switch Set.
- To change the position of TC accessory, specify dimension PH.

Double acting double rod



35H-3/TH35 Bore



Nylon tarpaulin Chloroprene	ϕ32 to ϕ63 1/3 stroke+X ϕ80 to ϕ160 1/4 stroke+X
Conex	ϕ32 to ϕ63 1/2.5 stroke+X ϕ80 to ϕ160 1/3 stroke+X

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

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

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

Dimensional Table

Bore \ Symbol	A	B	B_1	BB	BD	D	E	EE	F	FP	H	h	J	K
ϕ 32	24	ϕ 30	19	7	30	13	□44	Rc1/4	10	34	30	7	38	25
ϕ 40	24	ϕ 30	19	7	30	13	□50	Rc3/8	10	34	30	7	38	25
ϕ 50	36	ϕ 34	24	7	30	19	□62	Rc3/8	10	34	30	11	38	25
ϕ 63	36	ϕ 34	24	9	30	19	□76	Rc3/8	10	34	33	11	38	25
ϕ 80	48	ϕ 42	32	10	35	24	□94	Rc1/2	16	43	31	14	45	32
ϕ 100	60	ϕ 50	41	12	40	30	□114	Rc1/2	16	43	31	17	45	32
ϕ 125	84	ϕ 60	60	16	53	41	□138	Rc1/2	20	47	37	22	45	32
ϕ 160	96	ϕ 72	70	19	58	50	□178	Rc3/4	25	54	42	26	50	38

Bore \ Symbol	KK	MM	P	Min. PH	SL	TD	TL	TM	TR	UM	UW	W	XI	ZB	ZJ
ϕ 32	M12×1.25	ϕ 16	58	78	7.5	ϕ 16e9	16	55	R1	87	52	15	78	125	118
ϕ 40	M12×1.25	ϕ 16	58	78	7.5	ϕ 25e9	25	63	R1.6	113	59	15	78	125	118
ϕ 50	M18×1.5	ϕ 22	58	78	7.5	ϕ 25e9	25	76	R1.6	126	71	15	78	125	118
ϕ 63	M18×1.5	ϕ 22	61	78	7.5	ϕ 25e9	25	88	R1.6	138	86	15	79.5	130	121
ϕ 80	M24×2	ϕ 28	67	98	11	ϕ 25e9	25	114	R1.6	164	104	19	95.5	153	143
ϕ 100	M30×2	ϕ 36	67	104	14	ϕ 32e9	32	140	R2.5	204	132	23	99.5	159	147
ϕ 125	M42×2	ϕ 45	73	117	17	ϕ 36e9	36	166	R2.5	238	160	25	108.5	175	159
ϕ 160	M48×2	ϕ 56	84	133	19	ϕ 45e9	45	214	R3	304	208	29	125	203	184

- The tolerance of B is f9, and that of MM is f8.

With Boots

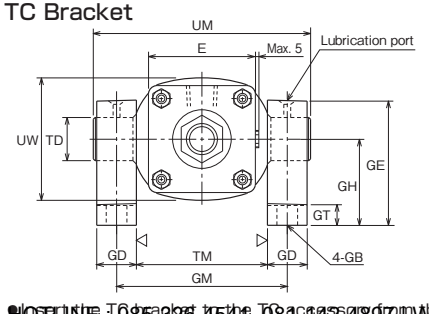
Bore \ Symbol	WW	X
ϕ 32	ϕ 36	50
ϕ 40	ϕ 40	50
ϕ 50	ϕ 45	55
ϕ 63	ϕ 45	55
ϕ 80	ϕ 60	65
ϕ 100	ϕ 71	65
ϕ 125	ϕ 80	65
ϕ 160	ϕ 100	70

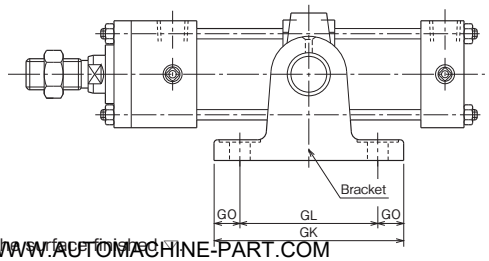
TC Bracket

Bore \ Symbol	Part number	E	GB	GD	GE	GH	GK	GL	GM	GO	GT	TD	TM	UM	UW
ϕ 32	BTA-16-H	□44	ϕ 9	15	56	40	80	60	70	10	12	ϕ16 H9/e9	55	87	52
ϕ 40		□50	ϕ 12	23	72	50	110	80	86	15	12	ϕ25 H9/e9	63	113	59
ϕ 50	BTA-25-H	□62	ϕ 12	23	72	50	110	80	99	15	12	ϕ25 H9/e9	76	126	71
ϕ 63		□76	ϕ 12	23	72	50	110	80	111	15	12	ϕ25 H9/e9	88	138	86
ϕ 80	BTA-25-1-H	□94	ϕ 14	23	92	70	120	85	137	17.5	14	ϕ25 H9/e9	114	164	104
ϕ 100	BTA-32-H	□114	ϕ 18	34	112	80	175	135	174	20	22	ϕ32 H9/e9	140	204	132
ϕ 125	BTA-36-1-H	□138	ϕ 22	36	128	85	205	160	202	22.5	26	ϕ36 H9/e9	166	238	160
ϕ 160	BTA-45-1-H	□178	ϕ 26	45	158	105	245	190	259	27.5	36	ϕ45 H9/e9	214	304	208

35H-3/TH35 Bore

TC Bracket





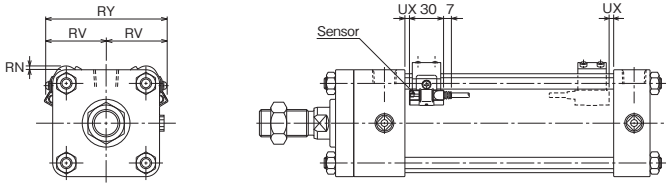
- Use the TC bracket in the TC accessory for the surface finished parts.

35H-3/TH35 Bore CAD/DATA is available.

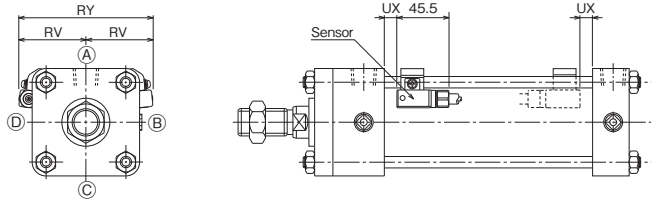
Switch Set

35H-3R 1 Mounting style Bore B Stroke – Sensor symbol Sensor quantity

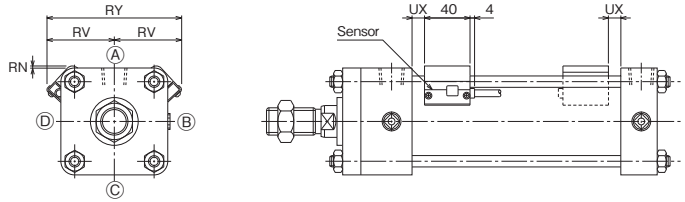
● AX1**(Reed sensor)·AX2**, AZ2**(Solid state sensor)



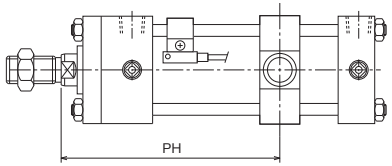
● WR type (Reed sensor), WS type (Solid state sensor/2-wire, 2-LED type) 〈Cutting oil proof type〉



● SR type (Reed sensor)



● Minimum dimension PH of Switch Set Cylinder



● The minimum dimension PH of a Switch Set Cylinder is obtained when the sensor is mounted on the rod side and the trunnion is moved as close to the rod as possible as shown above.

When boots are provided, dimension W changes. In such a case, specify dimension PH.

Dimensional Table

Symbol / Bore	RN			RV			RY		
	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type	AX/AZ type	WR/WS type	SR type
ϕ 32	7	5	5	34	37	37	68	74	74
ϕ 40	5	5	4	36	41	40	72	82	80
ϕ 50	4	3	4	41	46	45	82	92	90
ϕ 63	3	3	4	47	51	51	94	102	102
ϕ 80	3	1	3	54	59	59	108	118	118
ϕ 100	4	1	1	63	68	68	126	136	136

Symbol / Bore	UX				
	Reed sensor			Solid state sensor	
	AX1**	SR type	WR type	AX2**·AZ2**	WS type
ϕ 32	5	0	2	5	5
ϕ 40	5	0	2	5	5
ϕ 50	5	0	2	5	5
ϕ 63	6	1	3	6	6
ϕ 80	4	0	2	4	4
ϕ 100	4	0	2	4	4

Note) Dimension UX indicates the optimum sensor mounting position for detection of stroke end.

Sensor / Bore	Minimum PH		
	AX/AZ type	WR/WS type	SR type
ϕ 32	133	163	143
ϕ 40	133	163	143
ϕ 50	133	163	143
ϕ 63	136	166	146
ϕ 80	149	180	164
ϕ 100	155	191	170

Operating Range and Hysteresis

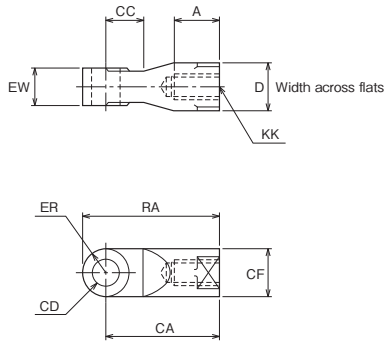
Bore	Reed sensor						Solid state sensor			
	AX1**		WR type		SR type		AX2**·AZ2**		AX2**W·AZ2**W·WS type	
	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis	Operating range	Hysteresis
ϕ 32	5 to 10	1 or less	6 to 9	2 or less	7 to 10	3 or less	3 to 6	1 or less	8 to 13	2 or less
ϕ 40										
ϕ 50										
ϕ 63	7 to 11		8 to 10		9 to 12		3 to 7		10 to 14	
ϕ 80										
ϕ 100	8 to 12		9 to 11				4 to 7		13 to 17	

35H-3/TH35 Bore CAD/DATA is available.

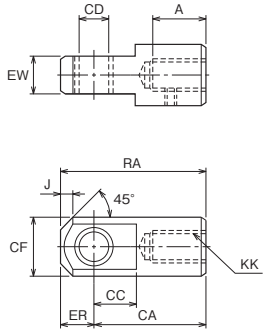
Rod End Attachment

● Rod eye (T-end)

● ϕ32 to ϕ100

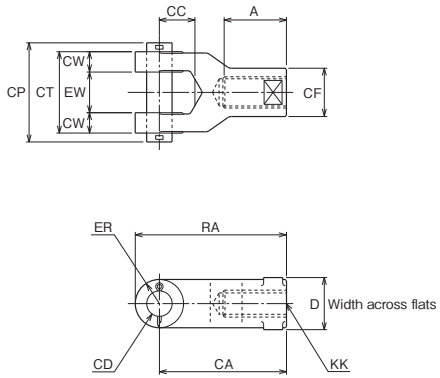


● ϕ125 · ϕ160

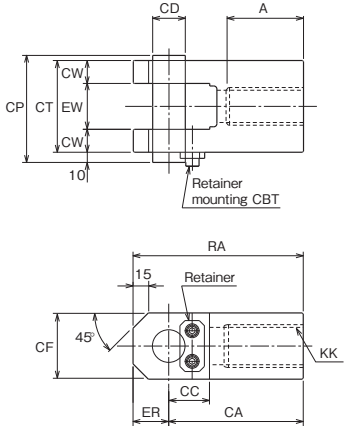


● Rod clevis (Y-end) with pin

● ϕ32 to ϕ100

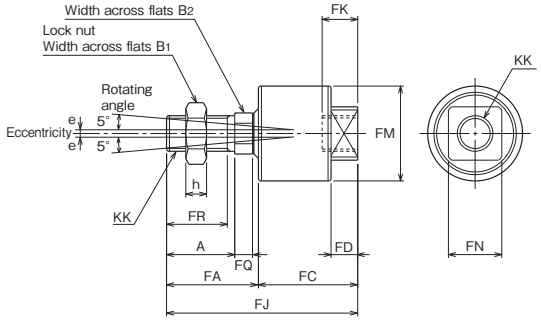


● ϕ125 · ϕ160



● Floating joint (F-end)

● ϕ32 to ϕ100



Notes)
- The insertion of the floating joint into the socket shall not equal or exceed the dimension of screw diameter. (Return the joint one or two turns after it gets into contact with the socket bottom, and fix it with a lock nut.) Excessive insertion can cause operation failure.
- DO NOT use together with CA, CS, CB, TA, and TC accessories.
- The lock nut is indispensable in using the floating joint. Please don't miss to order the lock nut with the floating joint.

Dimensional Table/Rod eye (T-end)

Bore \ Symbol	Part number	A	CA	CC	CD	CF	D	ER	EW	J	KK	RA
ϕ 32	RTA-12-1-H	25	55	20	ϕ12H9	ϕ24	24	R12	$16^{\ 0}_{-0.07}$	—	M12×1.25	67
ϕ 40	RTA-12-H	25	60	20	ϕ14H9	ϕ24	24	R12	$20^{\ 0}_{-0.1}$	—	M12×1.25	72
ϕ 50 / ϕ 63	RTA-18-H	37	64	18	ϕ14H9	ϕ28	30	R14	$20^{\ 0}_{-0.1}$	—	M18×1.5	78
ϕ 80	RTA-24-H	49	100	30	ϕ20H9	ϕ38	41	R19	$32^{\ 0}_{-0.1}$	—	M24×2	119
ϕ 100	RTA-30-H	61	110	37	ϕ25H9	ϕ48	50	R24	$40^{\ 0}_{-0.1}$	—	M30×2	134
ϕ 125	RTA-42-2-H	67	132	40	ϕ32H9	ϕ70	—	32	$45^{\ 0}_{-0.1}$	15	M42×2	164
ϕ 160	RTA-48-1-H	78	150	45	ϕ36H9	ϕ79	—	36	$50^{\ 0}_{-0.1}$	19	M48×2	186

Dimensional Table/Rod clevis (Y-end) with pin

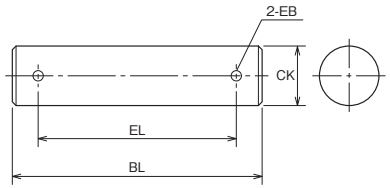
Bore \ Symbol	Part number	A	CA	CC	CD	CF	CP	CT	CW	D	ER	EW	KK	RA
ϕ 32	RYA-12-2-H	25	55	20	$\phi12^{H9}_{f8}$	ϕ24	46	32	8	24	R12	$16^{+1.5}_{+0.5}$	M12×1.25	67
ϕ 40	RYA-12-1-H	25	60	20	$\phi14^{H9}_{f8}$	ϕ24	58	44	12	24	R12	$20^{+1.5}_{+0.5}$	M12×1.25	72
ϕ 50 / ϕ 63	RYA-18-H	37	64	18	$\phi14^{H9}_{f8}$	ϕ28	58	44	12	30	R14	$20^{+1.5}_{+0.5}$	M18×1.5	78
ϕ 80	RYA-24-H	49	100	28	$\phi20^{H9}_{f8}$	ϕ38	78	64	16	41	R19	$32^{+1.5}_{+0.5}$	M24×2	119
ϕ 100	RYA-30-H	61	110	35	$\phi25^{H9}_{f8}$	ϕ48	94	80	20	50	R24	$40^{+1.5}_{+0.5}$	M30×2	134
ϕ 125	RYA-42-2-H	75	132	40	$\phi32^{H9}_{f8}$	65	105	90	22.5	—	35	$45^{+1.5}_{+0.5}$	M42×2	167
ϕ 160	RYA-48-H	86	150	45	$\phi36^{H9}_{f8}$	70	115	100	25	—	40	$50^{+1.5}_{+0.5}$	M48×2	190

Dimensional Table/Floating joint (F-end)

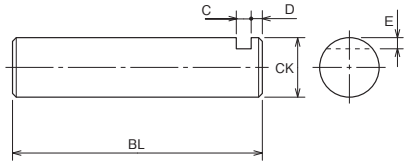
Bore \ Symbol	Part number	A	B_1	B_2	e	FA	FC	FD	FJ	FK	FM	FN	FQ	FR	h	KK
ϕ 32 / ϕ 40	RFH-12	24	19	13	1	33	36.5	11	69.5	13.5	ϕ32	19	7	20.5	7	M12×1.25
ϕ 50 / ϕ 63	RFH-18	35	24	19	1.5	46	46	13	92	16	ϕ40	24	8	31	11	M18×1.5
ϕ 80	RFH-24-2	46	32	24	2.5	62	67	18	129	24	ϕ64	36	12	41	14	M24×2
ϕ 100	RFH-30-2	58	41	32	2.5	78	83	21	161	30	ϕ76	46	14	52	17	M30×2

Parallel Pin

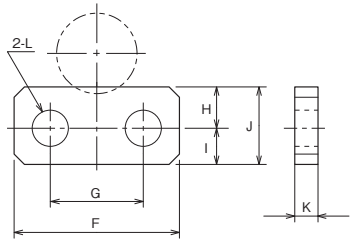
●ϕ32 to ϕ100



●ϕ125・ϕ160



Retainer



Dimensional Table/Parallel pin

Symbol / Bore	BL		C	CK	D	E	EB	EL		Nominal of split pin
	For Y-end	For CB						For Y-end	For CB	
ϕ 32	46	46	—	ϕ 12	—	—	ϕ 3	37	37	3
ϕ 40	58	58	—	ϕ 14	—	—	ϕ 3	49	49	3
ϕ 50	58	66	—	ϕ 14	—	—	ϕ 3	49	57	3
ϕ 63	58	66	—	ϕ 14	—	—	ϕ 3	49	57	3
ϕ 80	78	78	—	ϕ 20	—	—	ϕ 3	71	71	3
ϕ 100	94	94	—	ϕ 25	—	—	ϕ 3	87	87	3
ϕ 125	105	105	6	ϕ 32	4	5	—	—	—	—
ϕ 160	115	115	6	ϕ 36	4	7	—	—	—	—

●The tolerance of CK is f8.

Dimensional Table/Retainer

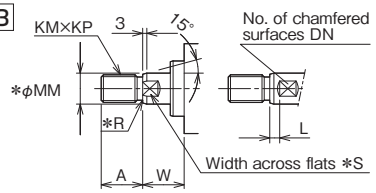
Symbol / Bore	F	G	H	I	J	K	L	Retainer mounting bolt size
ϕ 125	50	30	12	12	24	6	ϕ 10	M8×1.25×16L
ϕ 160	50	30	12	12	24	6	ϕ 10	M8×1.25×16L

Change of Rod End Shape

■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.)

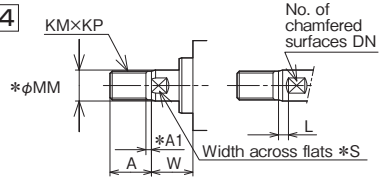
How to order [Series] [Model number] − × [Semi-standard symbol] [Dimension symbol (Specify only when the dimension differs from the basic dimension.)]
└KM and KP need to be specified as a pair.

Example 1) A53



●Bore: 40 mm, rod end shape: A53, A=50, W=60, screw: M10×1.25, 2 surfaces chamfered, position of width across flats L=15
(Port and cushion positions: Standard AB)
35H-3R 1FA40B200-X A53
A-50, KM-10, KP-1.25, L-15, W-60

Example 2) A54



●Bore: 63 mm, rod end shape: A54, with basic dimensions
35H-3 2LB63B500-BD-X A54

Note) In case of A54, if KM and KP are changed, dimension A1 is changed as shown below.

KP (pitch)	Dimension A1
1.25 or less	3
1.5	4
2	5
2.5 or more	KP (pitch)×2

Special Rod End Shapes

A00

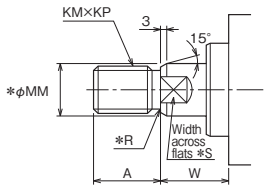


Table of Basic Dimensions

*Bore	A	KM	KP	* MM	* R	* S	W
φ 32	24	12	1.25	φ 16	1	13	15
φ 40	24	12	1.25	φ 16	1	13	15
φ 50	36	18	1.5	φ 22	1	19	15
φ 63	36	18	1.5	φ 22	1	19	15
φ 80	48	24	2	φ 28	1	24	19
φ 100	60	30	2	φ 36	1.6	30	23
φ 125	84	42	2	φ 45	1.6	41	25
φ 160	96	48	2	φ 56	1.6	50	29

A51

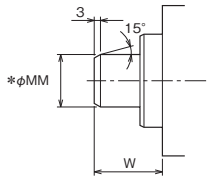


Table of Basic Dimensions

*Bore	* MM	W
φ 32	φ 16	15
φ 40	φ 16	15
φ 50	φ 22	15
φ 63	φ 22	15
φ 80	φ 28	19
φ 100	φ 36	23
φ 125	φ 45	25
φ 160	φ 56	29

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

Special Rod End Shapes

A53

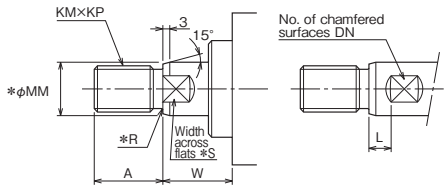


Table of Basic Dimensions

*Bore	A	DN	KM	KP	L	* MM	* R	* S	W
φ 32	24	2	12	1.25	0	φ 16	1	13	15
φ 40	24	2	12	1.25	0	φ 16	1	13	15
φ 50	36	2	18	1.5	0	φ 22	1	19	15
φ 63	36	2	18	1.5	0	φ 22	1	19	15
φ 80	48	2	24	2	0	φ 28	1	24	19
φ 100	60	2	30	2	0	φ 36	1.6	30	23
φ 125	84	2	42	2	0	φ 45	1.6	41	25
φ 160	96	2	48	2	0	φ 56	1.6	50	29

A54

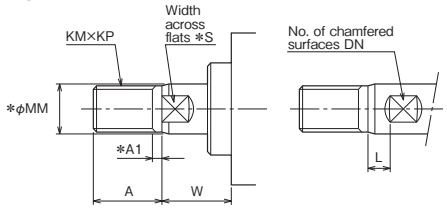


Table of Basic Dimensions

*Bore	A	A1	DN	KM	KP	L	* MM	* S	W
φ 32	24	3	2	12	1.25	0	φ 16	13	15
φ 40	24	3	2	12	1.25	0	φ 16	13	15
φ 50	36	4	2	18	1.5	0	φ 22	19	15
φ 63	36	4	2	18	1.5	0	φ 22	19	15
φ 80	48	5	2	24	2	0	φ 28	24	19
φ 100	60	5	2	30	2	0	φ 36	30	23
φ 125	84	5	2	42	2	0	φ 45	41	25
φ 160	96	5	2	48	2	0	φ 56	50	29

A55

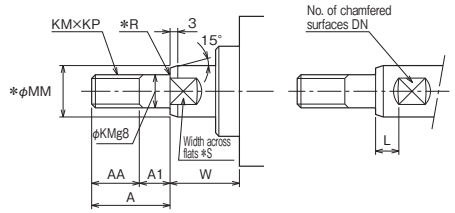


Table of Basic Dimensions

*Bore	A	AA	A1	DN	KM	KP	L	*MM	* R	* S	W
φ 32	22	12	10	2	8	1	0	φ16	1.6	13	15
φ 40	22	12	10	2	8	1	0	φ16	1.6	13	15
φ 50	34	20	14	2	14	1.5	0	φ22	1.6	19	15
φ 63	34	20	14	2	14	1.5	0	φ22	1.6	19	15
φ 80	44	30	14	2	20	1.5	0	φ28	1.6	24	19
φ 100	55	35	20	2	24	2	0	φ36	2	30	23
φ 125	65	45	20	2	30	2	0	φ45	2	41	25
φ 160	83	63	20	2	42	2	0	φ56	2	50	29

When changing dimension A1, change it to 10 or more.

A81

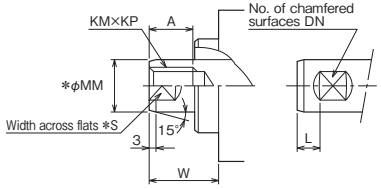


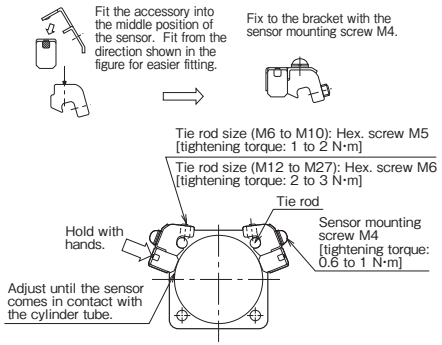
Table of Basic Dimensions

*Bore	A	DN	KM	KP	L	* MM	* S	W
φ 32	12	2	10	1.5	0	φ 16	13	15
φ 40	12	2	10	1.5	0	φ 16	13	15
φ 50	20	2	16	2	0	φ 22	19	15
φ 63	20	2	16	2	0	φ 22	19	15
φ 80	24	2	20	2.5	0	φ 28	24	19
φ 100	33	2	27	3	0	φ 36	30	23
φ 125	36	2	30	3.5	0	φ 45	41	25
φ 160	45	2	39	4	0	φ 56	50	29

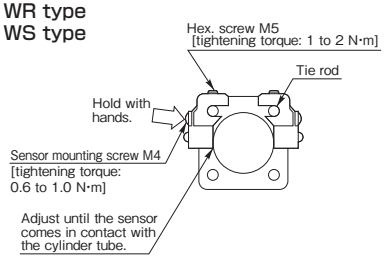
●The *-marked dimensions are fixed.
●The number of chamfered surfaces DN is 2 (standard) or 4.

Setting method of sensor detecting position

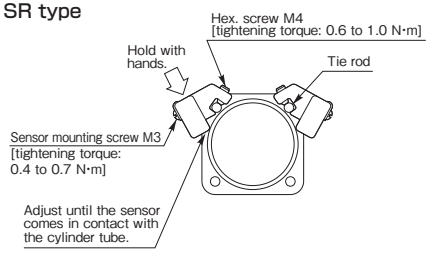
AX type



WR type
WS type



SR type

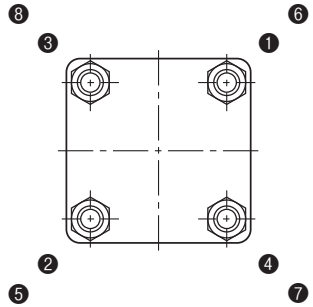


1. Loosen the two hex. screws with a hex. wrench, and move them along the tie rod.
2. Adjust the detecting position (for the 2-LED type, the position where the green lamp lights up) 2 to 5 mm (about half of the operating range is appropriate) before the required position where the sensor indicator lamp 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).

Notes on assembly

Tightening of tie rods

- DO NOT tighten only one tie rod at a time, but tighten them gradually in the order shown in the right diagram. Uneven tightening of the tie rods can cause operation failure or stick-slip.



Specified Tie Rod Tightening Torque Table

Bore mm	φ32	φ40	φ50	φ63	φ80	φ100	φ125	φ160
Tie rod thread	M6×1	M6×1	M6×1	M8×1.25	M10×1.25	M12×1.5	M16×1.5	M20×1.5
Tightening torque (N·m)	4.1	4.1	4.1	10	21	35	87	180