

Compact design hydraulic cylinder at 21MPa.

- 21 MPa double-acting hydraulic cylinder with bores from 40 mm to 250 mm.
- Innovation of design scrutinized carefully the excess of conventional model 210H-3.
- High performance cushioning system works for the smooth stop.
- Easy adjustment of cushioning on newly designed cushion valve.
- The cushion valve has been revised to apply the new stopper, paying attention to the safety measure.



Standard specifications

Types	Standard type, switch set		
Nominal pressure	21 MPa		
Maximum allowable pressure	Rod side: Rod A: 26.5 MPa Rod B: 24.5 MPa	Head side: Rod A: 26.5 MPa Rod B: 26.5 MPa	
Proof test pressure	31.5 MPa		
Minimum working pressure	Rod side: Rod A: 0.6 MPa or less Rod B: 0.45 MPa or less	Head side: 0.3 MPa or less	
Operating speed range (Except part of cushion)	$\phi 40 - \phi 63$: 8 - 400 mm/s $\phi 80 - \phi 125$: 8 - 300 mm/s $\phi 140 - \phi 250$: 8 - 200 mm/s		
Temperature range (ambient/oil temperature)	Standard type : $-10 - +80^{\circ}\text{C}$ Switch set : $-10 - +70^{\circ}\text{C}$ (Free from freezing)		
Structure of cushioning	Metal fitting system		
Adaptable working oil	Petroleum-based fluid (When using other fluids, refer to the table showing applicability of fluids.)		
Tolerance of thread	JIS 6g/6H		
Tolerance of stroke	100 mm or less $\begin{smallmatrix} +0.8 \\ 0 \end{smallmatrix}$	101-250 mm $\begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$	251-630 mm $\begin{smallmatrix} +1.25 \\ 0 \end{smallmatrix}$ 631-1000 mm $\begin{smallmatrix} +1.4 \\ 0 \end{smallmatrix}$ 1001-1600 mm $\begin{smallmatrix} +1.6 \\ 0 \end{smallmatrix}$ 1601-2000 mm $\begin{smallmatrix} +1.8 \\ 0 \end{smallmatrix}$
Mounting type	SD • LA • FA • FB • CA • CB • TA • TC		
Accessories	Boots	Standard: Nylon tarpaulin Semi-standard: Chloroprene, Conex	
	Rod end attachments	Rod end eye (T-end) • Rod end clevis (Y-end) with pin	
	Others	Lock nut	

Terminologies

Nominal pressure

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

Maximum allowable pressure

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

Proof test pressure

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

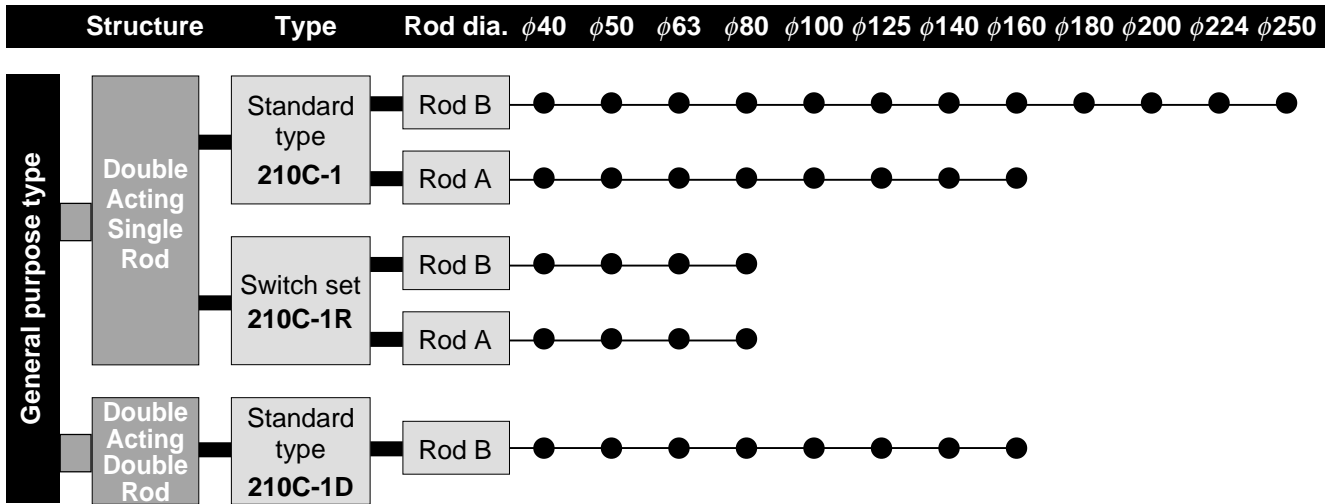
Minimum working pressure

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

- Notes) ● The hydraulic pressure generated in a cylinder due to the inertia of load must be lower than the maximum allowable pressure.
- In case that the lock nut is attached to the piston rod end thread part, lengthen the thread length (dimension A).
 - For the internal structure, refer to the sectional drawings in the end of this catalogue.
 - Conex, material of the boots, is the trademark of Teijin, Ltd.

Lines

Unit : mm



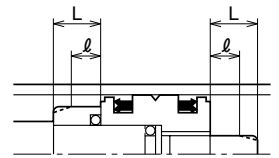
Standard stroke fabrication range Unit : mm

Bore	Stroke
$\phi 40$	- 1500
$\phi 50 - \phi 250$	- 2000

- The strokes above indicate the maximum available strokes for the standard type. If you request larger strokes than those in the table above, contact us.
- For the rod buckling, check with the buckling chart in the selection materials.
- Consult us for bore size 180 mm to 250 mm.

Cushion stroke length Unit : mm

Bore	Cushion ring length L	Cushion ring parallel part length ℓ
$\phi 40 - \phi 63$	25	7
$\phi 80 - \phi 125$	30	8
$\phi 140 \cdot \phi 160$	30	12



- Figures shown in the table above indicate the cushion stroke lengths in the case of cylinders used up to the stroke end.
- In the case that a cylinder is not used up to the stroke end, and if it is stopped 5 mm or more before the stroke end, the cushioning effect will be weakened. In such a case, contact us. Please consult us in this case.
- Consult us for bore size 180 mm to 250 mm.

How to order

General purpose type

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

• Standard type 210C-1

• Switch set 210C-1R

Double-Acting Single Rod

210C-1 : Standard type

210C-1R : Switch set

Double-Acting Double Rod

210C-1D : Standard type

1 Nitrile rubber ($\phi 40 - \phi 250$)

2 Urethane rubber ($\phi 40 - \phi 250$)

3 Fluoric rubber ($\phi 40 - \phi 160$)

6 Hydrogenated nitrile rubber ($\phi 40 - \phi 160$)

Material No.3 and 6 cannot be used for the standard type of 140/160 mm bore and all switch set type.

	Series 1	Packing material 2	Mounting type 3	Cylinder bore 4	Rod type 5	Cushion type 6	Stroke 7	Port specification 8	Port position 9	Cushion valve position 10	Switch code 11	Switch quantity 12	Rod end attachment 13	Lock nut 14	Boots 15
	2	LA	50	B	B	100	G	A	B	 	T	K	J	 	
	2	LA	50	B	B	100	G	A	B	AH	2	T	K	J	

Mounting type

Cylinder bore (mm)

Standard type

$\phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100 \cdot \phi 125 \cdot \phi 140 \cdot \phi 160 \cdot \phi 180 \cdot \phi 200 \cdot \phi 224 \cdot \phi 250$

Switch set

$\phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80$

A Rod A

B Rod B

B with cushions on both ends

R with cushion on the rod side

H with cushion on the head side

N without cushion

Note) The cushion of the rod A, 40 mm bore and head side is not adjustable.

J Nylon tarpaulin

JN Chloroprene

JK Conex

K Long thread with lock nut

A dimension conforms to the basic of long thread.

T T-end (rod end eye)

Y Y-end (rod end clevis)

Rod end attachments are exclusive use on the rod B. In case of the rod A, the thread size should be adjusted to that of the rod B in using attachments, and this change would be informed to us with order.

Switch quantity (1, 2, to n)

Switch code

Note) Select applicable switches out of the Switch List

Notes on order for switch sets

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

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

Port position (A, B, C, D)

None Rc thread

G G thread

Cylinder stroke (mm)

Note) The boots, the lock nuts and the rod end attachments, all accessories are for the 160 mm bore and below.

Mounting type

SD SD type (Basic type)

FB FB type (Cap rectangular flange mounting)

TA TA type (Head trunnion mounting)

LA LA type (Side lugs mounting)

CA CA type (Eye mounting)

TC TC type (Intermediate trunnion mounting)

FA FA type (Head rectangular flange mounting) CB CB type (Clevis mounting)

Switches

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

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

● General purpose type

AX type (Rear wiring)

Cord type



Connector type



AZ type (Upper wiring)

Cord type



Connector type



Adaptability of working oil to packing material

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

Notes) 1. The ◎ and ○-marked items are applicable, while the ×-marked items are inapplicable. For the use of the △-marked items, contact us.
 2. The ◎ -marked items are the recommended packing materials in case of giving the first priority to abrasion resistance.

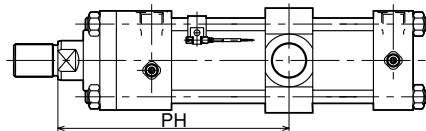
Switch mounting minimum possible stroke Unit: mm

Bore	Types other than TC type		TC type	
	with a switch	with two switches	with a switch	with two switches
φ40	20	20(50)	50	130
φ50	15	20(45)	50	130
φ63	20	20(50)	60	150
φ80	20	20(50)	70	170

Note) The parenthetic numeric value shows the case in which two switches are mounted on the same phase.

Notes)

- For the TC type (with a switch), the cylinder strokes in case that the TC type attachment shown in the right figures are positioned in the place other than the center are shown in the table above.

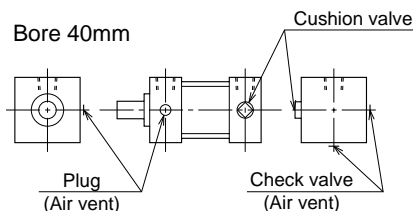


- For the minimum PH dimension at the switch mounting, refer to the dimensional drawings of the TC type.

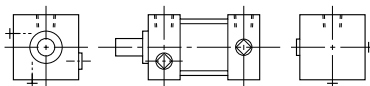
Cushion valve position and check valve (air vent) position depending on cylinder bore (Port position A, cushion valve position B)

Rod A

Bore 40mm

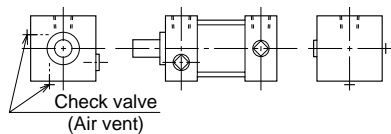


Bore 50 - 125mm

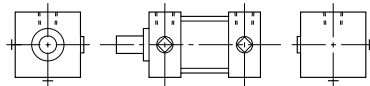


Rod B

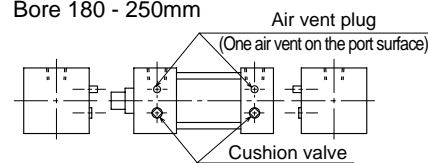
Bore 40 - 140mm



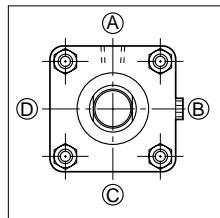
Bore 160mm



Bore 180 - 250mm



★ Standard specifications



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

★ Modification of port position and cushion valve position

When modifying the positions, enter the symbols shown in the dimensional drawings.

Ex.) 210C-1 2LA50BB100 - B A - J

Port position (A, B, C, D)

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

- In case that the cushion is not equipped, the cushion valve position is 0.
- The port and cushion position in LA mounting cannot be specified at the C phase as standard. Special case of C port or cushion in LA mounting needs consulting us.

★ Port G thread (BSPP) type

To order the port G thread type, add "G" ahead of the port position symbol.

Ex.) 210C-1 2LA50BB100 - G A B - J

Port G thread (BSPP) type

Port position

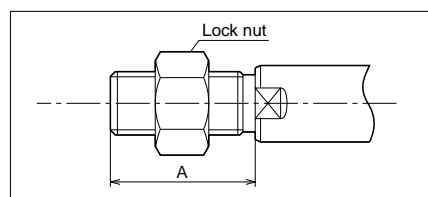
Cushion valve position

★ Notes on order of cylinder with lock nut

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

Ex.) 210C-1 2LA50BB100 - A B - K

Long thread with lock nut



A without lock nut
A=30

A of long thread
with lock nut
A=50

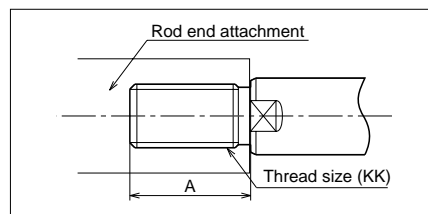
Note) When a lock nut is attached to the rod end, length "A" shown in the figure above must be the same as that of the long thread with lock nut type or longer. For details, refer to "Thread length with lock nut".

★ Note for the use of attachments on the rod A

In case of the rod A, the thread size and length should be adjusted to that of the rod B in using attachments, and this change would be informed to us with order.

Ex.) 210C-1 2LA50AB100 - A B - T

Rod end attachment (T-end)



Standard rod A
KK=M30×1.5
A=35

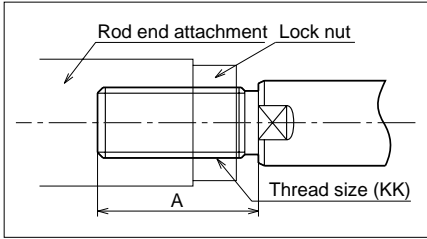
Standard rod B
KK=M24×1.5
A=30

Note) Please refer to the dimensional table of the rod end attachments in detail.

Note for the use of lock nut on the rod A

In case of the rod A, the thread size should be adjusted to that of the rod B in using lock nut, and the thread length should be adjusted to the Long thread basic. (with the symbol K)

Ex.) 210C-1 2LA50AB100 – A B – T K
 Rod end attachment (T-end)
 Long thread basic with lock nut



Standard rod A
 KK=M30×1.5
 A=35
 ↓
 Rod B
 KK=M24×1.5
 A=50 (Long thread basic)

Note) In using the lock nut, the thread length (A dimension) should be extended to the Long thread basic at least. Please refer to the drawing of rod end attachments in detail.

Semi-standard Fabrication range

- Modification of piston rod end
- Modification of TC attachment (dimensional symbol: PH)
- With boots
- Plated cylinder tube (hard chrome plated 2/100 mm)
- Working fluid other than normal mineral oil (Water-glycol fluid)
- BB dimension change (Extension of tie rods)

Weight table

Unit: kg

Bore mm	Rod size	Basic weight (SD type)		Additional weight per 1 mm stroke		Mounting accessories weight								Rod end attachment weight				
		Single rod type	Double rod type	Single rod type	Double rod type	LA		FA		FB	CA	CB	TA	TC	Rod end eye (T-end)	Rod end clevis (Y-end)	With lock nut	
						Single rod type	Double rod type	Single rod type	Double rod type								Lock nut	Lock nut with long thread
φ40	A	4.2	—	0.012	—	0.33	—	0.60	—	0.89	0.42	0.58	0.17	0.67	—	—	0.11	0.18
	B	4.1	5.0	0.011	0.014	0.33	0.38	0.52	0.52	0.89	0.42	0.58	0.17	0.67	0.74	1.17	0.07	0.12
φ50	A	7.1	—	0.019	—	0.78	—	1.24	—	1.72	0.81	1.19	0.28	1.08	—	—	0.22	0.36
	B	6.9	8.5	0.016	0.021	0.78	0.88	1.00	1.00	1.72	0.81	1.19	0.28	1.08	1.67	2.30	0.11	0.18
φ63	A	11.1	—	0.029	—	1.12	—	1.66	—	2.68	1.48	2.08	0.54	1.80	—	—	0.48	0.81
	B	10.5	13.2	0.024	0.032	1.12	1.30	1.50	1.50	2.68	1.48	2.08	0.54	1.80	2.51	3.97	0.22	0.36
φ80	A	18.9	—	0.043	—	1.57	—	2.55	—	4.04	2.46	3.64	1.17	3.25	—	—	0.91	1.48
	B	17.9	22.8	0.036	0.049	1.57	1.87	2.09	2.09	4.04	2.46	3.64	1.17	3.25	3.77	6.54	0.48	0.81
φ100	A	29.0	—	0.065	—	2.44	—	5.11	—	7.67	4.92	7.17	2.87	7.02	—	—	1.84	3.10
	B	27.2	35.2	0.054	0.073	2.44	2.90	4.23	4.23	7.67	4.92	7.17	2.81	7.02	7.47	12.62	0.91	1.48
φ125	A	52.2	—	0.104	—	4.46	—	7.21	—	12.61	8.80	13.68	5.01	14.15	—	—	3.23	5.80
	B	49.9	65.2	0.084	0.114	4.46	5.30	6.19	6.19	12.61	8.80	13.68	5.01	14.15	12.41	22.96	1.84	3.10
φ140	A	74.5	—	0.131	—	8.18	—	8.71	—	16.77	11.79	18.72	7.43	20.61	—	—	5.16	9.60
	B	71.1	94.6	0.109	0.149	8.18	8.38	5.76	5.76	16.77	11.79	18.72	7.43	20.61	19.17	33.75	2.50	4.42
φ160	A	101.7	—	0.166	—	13.21	—	13.10	—	25.22	17.54	26.48	12.02	26.14	—	—	6.22	11.14
	B	97.6	129.9	0.142	0.192	13.21	14.22	10.16	10.16	25.22	17.54	26.48	12.02	26.14	26.97	46.72	3.23	5.80
φ180	B	145	—	0.170	—	—	—	20.10	—	41.10	40.10	—	—	30.90	—	—	—	—
φ200	B	229	—	0.220	—	—	—	35.00	—	70.10	47.90	—	—	50.70	—	—	—	—
φ224	B	272	—	0.280	—	—	—	42.20	—	82.80	68.30	—	—	64.80	—	—	—	—
φ250	B	369	—	0.330	—	—	—	72.40	—	124.00	96.40	—	—	93.70	—	—	—	—

Note) • In case of the Long thread basic (symbol K), please refer to the weight value of the lock nut with long thread.
 • Rod end attachments are exclusive use on the rod B. In case of the rod A, the thread size should be adjusted to that of the rod B in using attachments.

Switch additional weight

Unit: kg

Bore (mm)	Switch	AX · AZ type		
		Cord length 1.5 m	Cord length 5 m	Connector type
φ40 · φ50		0.05	0.13	0.04
φ63 · φ80		0.07	0.15	0.06

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

Calculation example 210C-1R, rod B, bore φ63, cylinder stroke 500 mm, LA type, 2 pcs. of AX215
 10.5 + (0.024 × 500) + 1.12 + (0.15 × 2) = 23.92 kg

CAD/DATA is available.

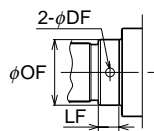
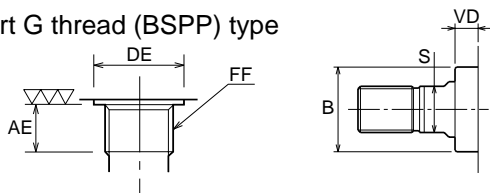
210C-1/THC1 Bore A•B



SD

210C-1 2 SD Bore B B Stroke

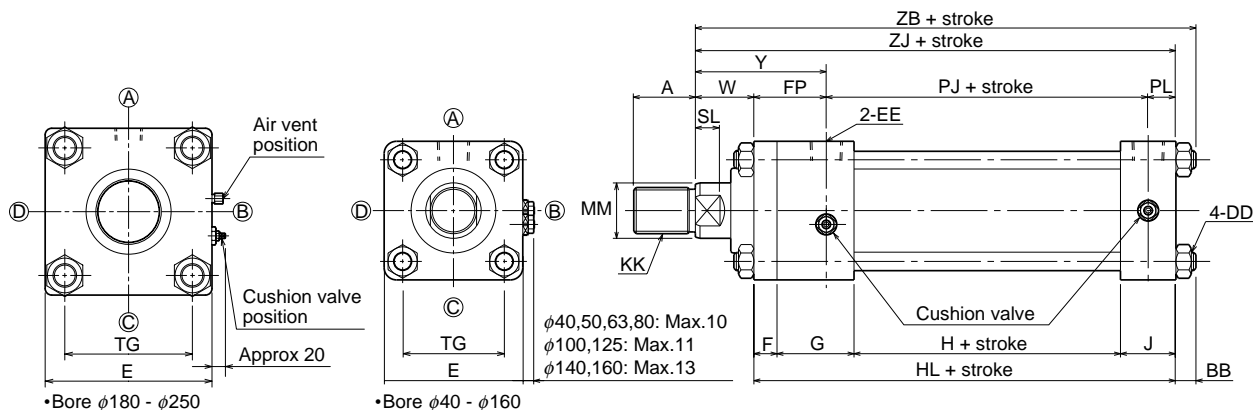
Port G thread (BSPP) type



•Rod dia. over φ90

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30
φ125	φ124	φ15	35
φ140	φ139	φ15	35

Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



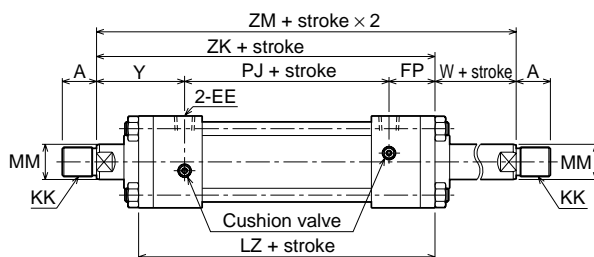
- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".
- We have two types in assembling way, the tie rod type and the tube flange type. These are separated according to the stroke.

Types	Tie rod type	Tube flange type
Stroke	- 800	801 - 2000

Note) The tube flange cylinder has the same dimensions as the tie rod cylinder.

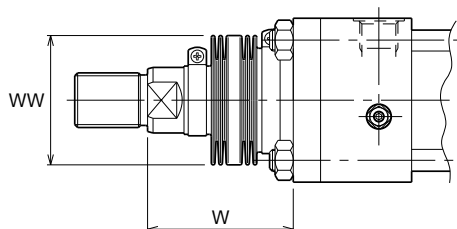
Double-acting double rod (Rod B)

- Bore φ40 - φ160



With boots

210C-1/THC1 BoreK



W dimension

Rod B	Material	Stroke	W dimension
φ40 • φ50	Nylon tarpaulin	1/3.5 Stroke + X	1/4 Stroke + X
φ63 - φ100	Chloroprene	1/4 Stroke + X	
φ125 • φ160	Conex	1/5 Stroke + X	

Rod A	Material	Stroke	W dimension
φ40 • φ50	Nylon tarpaulin	1/2.5 Stroke + X	1/3 Stroke + X
φ63 - φ100	Chloroprene	1/3 Stroke + X	
φ125 • φ140	Conex	1/3.5 Stroke + X	
φ160	Conex	1/4 Stroke + X	1/4 Stroke + X

- If decimals are included into the calculation results, raise them to the next whole number.
- Please consult us the dimensions for the special order of 180mm to 250mm bore.

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

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

Rod A	Material	Stroke	W dimension
φ40	Nylon tarpaulin	1/3.5 Stroke + X	1/4 Stroke + X
φ50 - φ80	Chloroprene	1/4 Stroke + X	
φ100 - φ160	Conex	1/5 Stroke + X	

Rod A	Material	Stroke	W dimension
φ40 • φ50	Nylon tarpaulin	1/2.5 Stroke + X	1/3 Stroke + X
φ63 - φ100	Chloroprene	1/3 Stroke + X	
φ125 • φ140	Conex	1/3.5 Stroke + X	
φ160	Conex	1/4 Stroke + X	1/4 Stroke + X

Dimensional table

Bore	Symbol		Rod B							Rod A								
	A	B	KK	MM	S	SL	VD	W	Y	A	B	KK	MM	S	SL	VD	W	Y
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	70	30	φ43	M24×1.5	φ28	24	14	15	32	70
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	78	35	φ55	M30×1.5	φ36	30	16	15	36	78
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	90	45	φ65	M39×1.5	φ45	41	20	19	43	90
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	105	55	φ80	M48×1.5	φ56	50	23	19	48	105
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	114	75	φ95	M64×2	φ70	65	27	19	53	114
φ125	75	φ95	M64×2	φ70	65	27	19	60	133	90	φ120	M80×2	φ90	–	–	28	60	133
φ140	80	φ105	M72×2	φ80	75	31	15	60	141	105	φ130	M95×2	φ100	–	–	24	60	141
φ160	90	φ120	M80×2	φ90	85	33	15	60	146	110	φ140	M100×2	φ110	–	–	24	60	146
φ180	105	φ130	M95×2	φ100	–	–	10	55	154	–	–	–	–	–	–	–	–	–
φ200	110	φ140	M100×2	φ110	–	–	10	55	170	–	–	–	–	–	–	–	–	–
φ224	130	φ155	M120×2	φ125	–	–	10	60	175	–	–	–	–	–	–	–	–	–
φ250	140	φ170	M130×2	φ140	–	–	10	65	196	–	–	–	–	–	–	–	–	–

Bore	Symbol		AE	BB	DD	DE	E	EE	F	FF	FP	G	H	HL	J	LZ	PJ	PL	TG
	φ40	12	11	M10×1.25	φ25.5	□65	Rc3/8	11	G3/8	38	43	62	147	31	170	94	15	□45	
φ50	14	13	M12×1.25	φ30	□80	Rc1/2	13	G1/2	42	47	66	162	36	186	102	18	□56		
φ63	14	14	M14×1.5	φ30	□94	Rc1/2	15	G1/2	47	50	73	174	36	203	109	18	□68		
φ80	16	16	M16×1.5	φ36.9	□114	Rc3/4	18	G3/4	57	60	83	202	41	239	125	20	□84		
φ100	16	18	M18×1.5	φ36.9	□135	Rc3/4	22	G3/4	61	60	90	213	41	254	132	20	□102		
φ125	18	21	M22×1.5	φ46.1	□165	Rc1	24	G1	73	75	98	248	51	296	150	25	□125		
φ140	18	25	M27×2	φ46.1	□192	Rc1	32	G1	81	75	108	266	51	322	160	25	□144		
φ160	18	27	M30×2	φ46.1	□218	Rc1	37	G1	86	75	127	290	51	351	179	25	□164		
φ180	–	32	M36×1.5	–	□255	Rc1 1/4	41	–	99	90	138	330	61	–	202	29	195		
φ200	–	37	M42×1.5	–	□295	Rc1 1/2	51	–	115	100	148	369	70	–	220	34	220		
φ224	–	39	M45×1.5	–	□325	Rc1 1/2	51	–	115	100	157	378	70	–	229	34	243		
φ250	–	41	M48×1.5	–	□355	Rc2	56	–	131	120	162	428	90	–	252	45	268		

Bore	Symbol			
	ZB	ZJ	ZK	ZM
φ40	190	179	202	234
φ50	211	198	222	258
φ63	231	217	246	289
φ80	266	250	287	335
φ100	284	266	307	360
φ125	329	308	356	416
φ140	351	326	382	442
φ160	377	350	411	471
φ180	385	417	–	–
φ200	424	461	–	–
φ224	438	477	–	–
φ250	493	534	–	–

With boots

Symbol	Bore								
	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160	
WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125	φ140
	Rod A	φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

210C-1/THC1 Bore A•B available.

CAD/DATA is available.

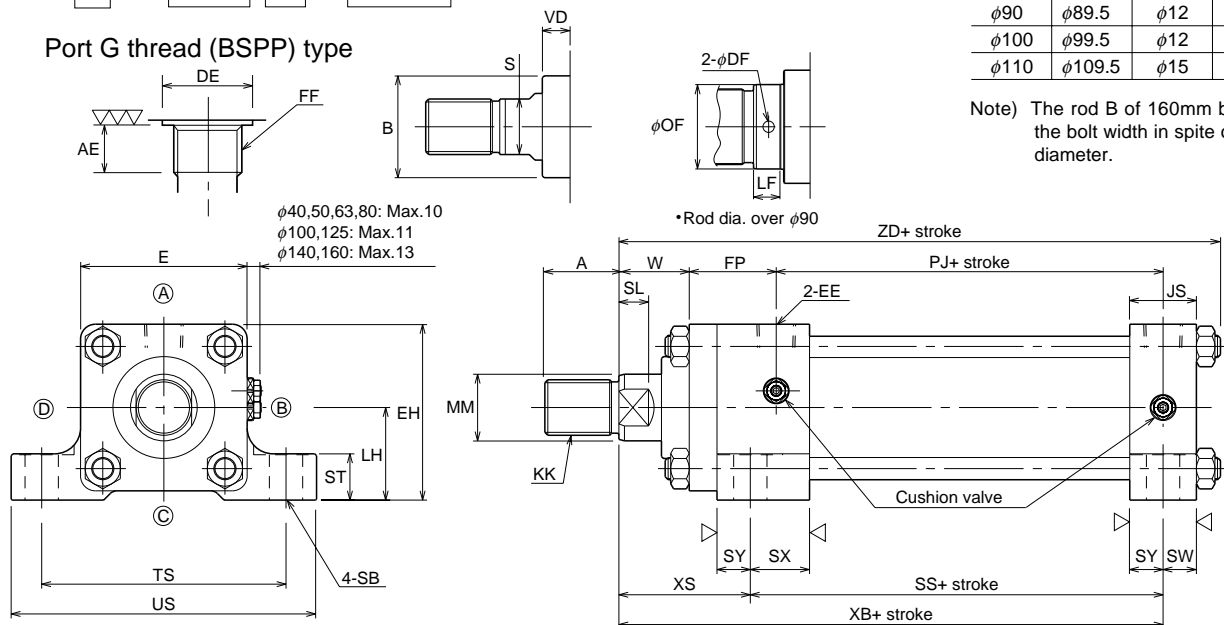


LA

210C-1 2 LA Bore B B Stroke

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30

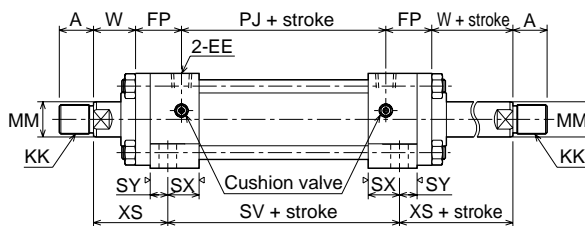
Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- Please consult us in the case that the cushion or check valves would be on the C phase.
- Having the side port on (B) or (D) phase, the port has some deviation to the center like the figure below.
- When you want to change the length of the projected rod, specify the "W".

Double-acting double rod (Rod B)

- Bore φ40 - φ160

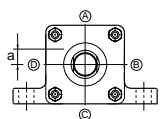
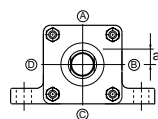


Note) a dimension (deviation to the center)

Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160	
Symbol	a	5	6	6	10	10	10	0	0

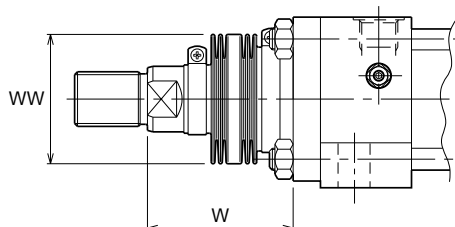
Port position (B)

Port position (D)



With boots

210C-1/THC1 BoreK



W dimension

Rod B	(φ40 • φ50 1/3.5 Stroke + X)
Nylon tarpaulin	(φ63 - φ100 1/4 Stroke + X)
Chloroprene	(φ125 - φ160 1/5 Stroke + X)

Conex	(φ40 • φ50 1/2.5 Stroke + X)
	(φ63 - φ100 1/3 Stroke + X)
	(φ125 • φ140 1/3.5 Stroke + X)
	(φ160 1/4 Stroke + X)

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

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

Rod A	(φ40 1/3.5 Stroke + X)
Nylon tarpaulin	(φ50 - φ80 1/4 Stroke + X)
Chloroprene	(φ100 - φ160 1/5 Stroke + X)

Conex	(φ40 1/2.5 Stroke + X)
	(φ50 - φ80 1/3 Stroke + X)
	(φ100 1/3.5 Stroke + X)
	(φ125 - φ160 1/4 Stroke + X)

- If decimals are included into the calculation results, raise them to the next whole number.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60

Symbol Bore	AE	DE	E	EE	EH	FF	FP	JS	LH	PJ	SB	SS	ST	SV	SW	SX	SY	TS
	φ40	12	φ25.5	□65	Rc3/8	68.5	G3/8	38	31	36±0.15	94	φ11	105	15	116	15	27	16
φ50	14	φ30	□80	Rc1/2	85	G1/2	42	36	45±0.15	102	φ14	113	20	124	18	29	18	115
φ63	14	φ30	□94	Rc1/2	97	G1/2	47	36	50±0.15	109	φ18	123	25	137	18	32	18	136
φ80	16	φ36.9	□114	Rc3/4	117	G3/4	57	41	60±0.25	125	φ18	143	30	161	20	39	21	155
φ100	16	φ36.9	□135	Rc3/4	137.5	G3/4	61	41	70±0.25	132	φ22	150	35	164	18	37	23	190
φ125	18	φ46.1	□165	Rc1	167.5	G1	73	51	85±0.25	150	φ26	173	45	192	23	47	28	224
φ140	18	φ46.1	□192	Rc1	196	G1	81	56	100±0.25	160	φ30	183	45	202	28	47	28	262
φ160	18	φ46.1	□218	Rc1	224	G1	86	60	115±0.25	179	φ33	202	55	217	30	45	30	294

Symbol Bore	US	XB	XS	ZD
	φ40	122	164	59
φ50	145	180	67	211
φ63	169	199	76	231
φ80	190	230	87	266
φ100	230	248	98	284
φ125	272	285	112	329
φ140	320	303	120	356
φ160	356	329	127	386

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

CAD/DATA is

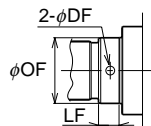
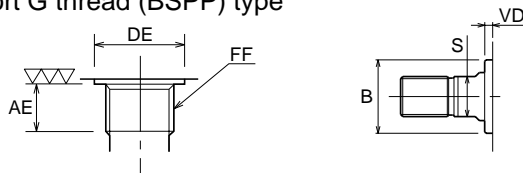
210C-1/THC1 Bore A•B available.



FA

210C-1 2 FA Bore B B Stroke

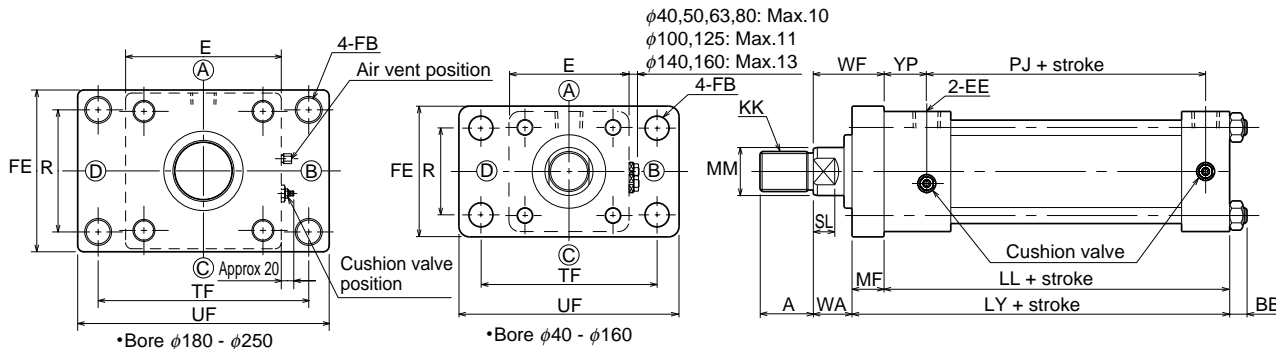
Port G thread (BSPP) type



• Rod dia. over φ90

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30
φ125	φ124	φ15	35
φ140	φ139	φ15	35

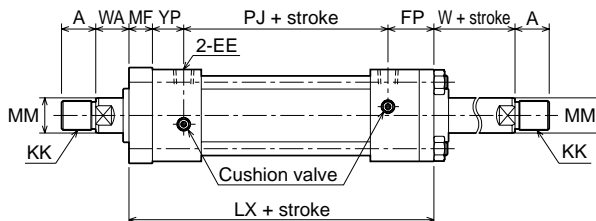
Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "WA".
- We have two types in assembling way, the tie rod type and the tube flange type. These are separated according to the stroke.

Double-acting double rod (Rod B)

- Bore φ40 - φ160

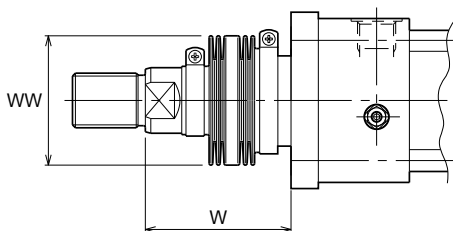


Types	Tie rod type	Tube flange type
Stroke	- 800	801 - 2000

Note) The tube flange cylinder has the same dimensions as the tie rod cylinder.

With boots

210C-1/THC1 BoreK



W dimension

Rod B	(φ40 • φ50 1/3.5 Stroke + X)
Nylon tarpaulin	(φ63 - φ100 1/4 Stroke + X)
Chloroprene	(φ125- φ160 1/5 Stroke + X)

Conex	(φ40 • φ50 1/2.5 Stroke + X)
	(φ63 - φ100 1/3 Stroke + X)
	(φ125 • φ140 1/3.5 Stroke + X)
	(φ160 1/4 Stroke + X)

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

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

Rod A	(φ40 1/3.5 Stroke + X)
Nylon tarpaulin	(φ50 - φ80 1/4 Stroke + X)
Chloroprene	(φ100- φ160 1/5 Stroke + X)

Conex	(φ40 1/2.5 Stroke + X)
	(φ50 - φ80 1/3 Stroke + X)
	(φ100 1/3.5 Stroke + X)
	(φ125- φ160 1/4 Stroke + X)

- If decimals are included into the calculation results, raise them to the next whole number.
- The wearing bush design at FA mounting or boots style is different from others.
- Please consult us the dimensions for the special order of 180mm to 250mm bore.

Dimensional table

Symbol Bore	Rod B										Rod A									
	A	B	KK	MM	S	SL	VD	W	WA	WF	A	B	KK	MM	S	SL	VD	W	WA	WF
φ40	25	φ40	M20×1.5	φ22	19	11	7	32	28	43	30	φ43	M24×1.5	φ28	24	14	11	32	28	43
φ50	30	φ46	M24×1.5	φ28	24	14	6	36	29	49	35	φ55	M30×1.5	φ36	30	16	8	36	29	49
φ63	35	φ55	M30×1.5	φ36	30	16	6	43	34	58	45	φ65	M39×1.5	φ45	41	20	10	43	34	58
φ80	45	φ65	M39×1.5	φ45	41	20	6	48	42	66	55	φ80	M48×1.5	φ56	50	23	13	48	42	66
φ100	55	φ80	M48×1.5	φ56	50	23	6	53	44	75	75	φ95	M64×2	φ70	65	27	10	53	44	75
φ125	75	φ95	M64×2	φ70	65	27	6	60	47	84	90	φ120	M80×2	φ90	—	—	15	60	47	84
φ140	80	φ105	M72×2	φ80	75	31	6	60	51	92	105	φ130	M95×2	φ100	—	—	15	60	51	92
φ160	90	φ120	M80×2	φ90	85	33	6	60	51	97	110	φ140	M100×2	φ110	—	—	15	60	51	97
φ180	105	φ130	M95×2	φ100	—	—	10	—	55	116	—	—	—	—	—	—	—	—	—	—
φ200	110	φ140	M100×2	φ110	—	—	10	—	55	121	—	—	—	—	—	—	—	—	—	—
φ224	130	φ155	M120×2	φ125	—	—	10	—	60	131	—	—	—	—	—	—	—	—	—	—
φ250	140	φ170	M130×2	φ140	—	—	10	—	65	141	—	—	—	—	—	—	—	—	—	—

Symbol Bore	AE	BB	DE	E	EE	FB	FF	Rod B	Rod A	LL	LX	Rod B	Rod A	Rod B	Rod A	PJ	R
	FE	FE	LY	LY	MF	MF											
φ40	12	11	φ25.5	□65	Rc3/8	φ11	G3/8	73	80	136	174	151	151	15	15	94	46
φ50	14	13	φ30	□80	Rc1/2	φ14	G1/2	85	92	149	193	169	169	20	20	102	58
φ63	14	14	φ30	□94	Rc1/2	φ18	G1/2	98	105	159	212	183	183	24	24	109	65
φ80	16	16	φ36.9	□114	Rc3/4	φ18	G3/4	125	140	184	245	208	208	24	24	125	87
φ100	16	18	φ36.9	□135	Rc3/4	φ22	G3/4	150	165	191	263	222	222	31	31	132	109
φ125	18	21	φ46.1	□165	Rc1	φ26	G1	175	195	224	309	261	261	37	37	150	130
φ140	18	25	φ46.1	□192	Rc1	φ30	G1	195	215	234	331	275	275	41	41	160	145
φ160	18	27	φ46.1	□218	Rc1	φ33	G1	225	245	253	360	299	299	46	46	179	170
φ180	—	32	—	□255	Rc1 1/4	φ39	—	265	—	289	—	350	—	61	—	202	200
φ200	—	37	—	□295	Rc1 1/2	φ48	—	315	—	318	—	384	—	66	—	220	230
φ224	—	39	—	□325	Rc1 1/2	φ48	—	335	—	327	—	398	—	71	—	229	250
φ250	—	41	—	□355	Rc2	φ56	—	375	—	372	—	448	—	76	—	252	275

Symbol Bore	TF	UF	YP
φ40	95	118	27
φ50	115	145	29
φ63	132	165	32
φ80	155	190	39
φ100	190	230	39
φ125	224	272	49
φ140	250	300	49
φ160	285	345	49
φ180	345	412	58
φ200	412	500	64
φ224	425	515	64
φ250	480	585	75

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

CAD/DATA is available.

210C-1/THC1 Bore A•B



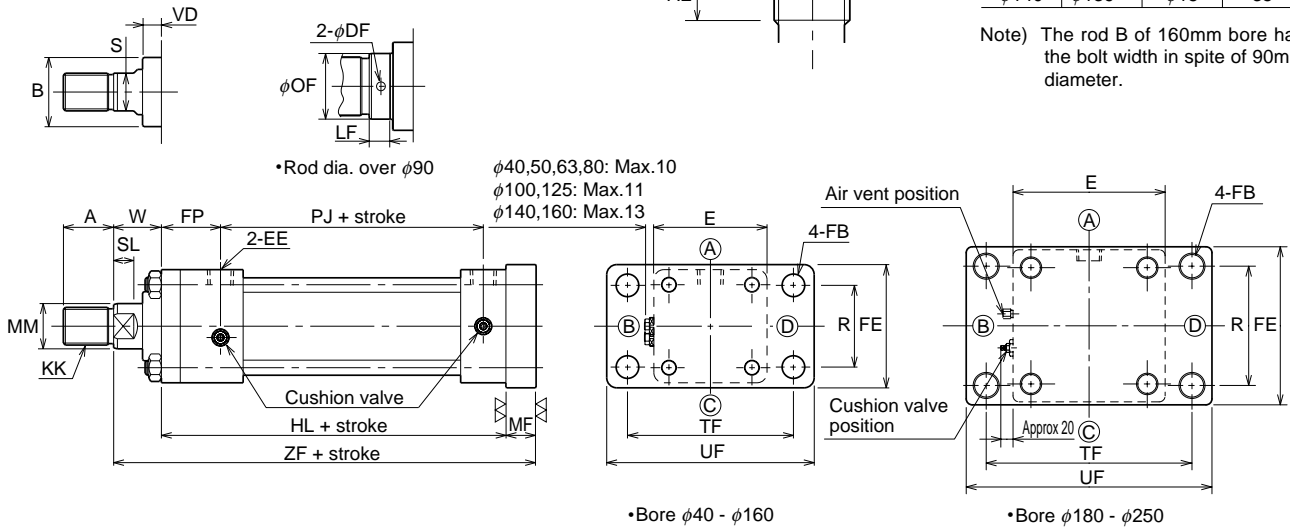
FB

210C-1 2 FB Bore B B Stroke

Port G thread (BSPB) type

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30
φ125	φ124	φ15	35
φ140	φ139	φ15	35

Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



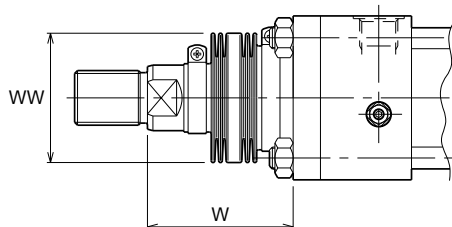
- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".
- We have two types in assembling way, the tie rod type and the tube flange type. These are separated according to the stroke.

Types	Tie rod type	Tube flange type
Stroke	- 800	801 - 2000

Note) The tube flange cylinder has the same dimensions as the tie rod cylinder.

With boots

210C-1/THC1 BoreK



W dimension

Rod B	(φ40 • φ50 1/3.5 Stroke + X)
Nylon tarpaulin	(φ63 - φ100 1/4 Stroke + X)
Chloroprene	(φ125 - φ160 1/5 Stroke + X)

Conex	(φ40 • φ50 1/2.5 Stroke + X)
	(φ63 - φ100 1/3 Stroke + X)
	(φ125 • φ140 1/3.5 Stroke + X)
	(φ160 1/4 Stroke + X)

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

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

Rod A	(φ40 1/3.5 Stroke + X)
Nylon tarpaulin	(φ50 - φ80 1/4 Stroke + X)
Chloroprene	(φ100 - φ160 1/5 Stroke + X)

Conex	(φ40 1/2.5 Stroke + X)
	(φ50 - φ80 1/3 Stroke + X)
	(φ100 1/3.5 Stroke + X)
	(φ125 - φ160 1/4 Stroke + X)

- If decimals are included into the calculation results, raise them to the next whole number.
- Please consult us the dimensions for the special order of 180mm to 250mm bore.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60
φ180	105	φ130	M95×2	φ100	–	–	10	55	–	–	–	–	–	–	–	–
φ200	110	φ140	M100×2	φ110	–	–	10	55	–	–	–	–	–	–	–	–
φ224	130	φ155	M120×2	φ125	–	–	10	60	–	–	–	–	–	–	–	–
φ250	140	φ170	M130×2	φ140	–	–	10	65	–	–	–	–	–	–	–	–

Symbol Bore	AE	DE	E	EE	FB	FE	FF	FP	HL	MF	PJ	R	TF	UF	ZF
	φ40	12	φ25.5	□65	Rc3/8	φ11	73	G3/8	38	147	15	94	46	95	118
φ50	14	φ30	□80	Rc1/2	φ14	85	G1/2	42	162	20	102	58	115	145	218
φ63	14	φ30	□94	Rc1/2	φ18	98	G1/2	47	174	24	109	65	132	165	241
φ80	16	φ36.9	□114	Rc3/4	φ18	125	G3/4	57	202	24	125	87	155	190	274
φ100	16	φ36.9	□135	Rc3/4	φ22	150	G3/4	61	213	31	132	109	190	230	297
φ125	18	φ46.1	□165	Rc1	φ26	175	G1	73	248	37	150	130	224	272	345
φ140	18	φ46.1	□192	Rc1	φ30	195	G1	81	266	41	160	145	250	300	367
φ160	18	φ46.1	□218	Rc1	φ33	225	G1	86	290	46	179	170	285	345	396
φ180	–	–	□255	Rc1 1/4	φ39	265	–	99	330	61	202	200	345	412	446
φ200	–	–	□295	Rc1 1/2	φ48	315	–	115	369	66	220	230	412	500	490
φ224	–	–	□325	Rc1 1/2	φ48	335	–	115	378	71	229	250	425	515	509
φ250	–	–	□355	Rc2	φ56	375	–	131	428	76	252	275	480	585	569

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
		WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125
	Rod A	φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

210C-1/THC1 **Bore** A•B CAD/DATA is available.

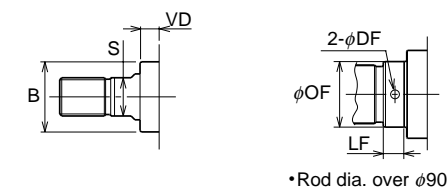
CA

210C-1 **2** CA **Bore** **B** **B** **Stroke**

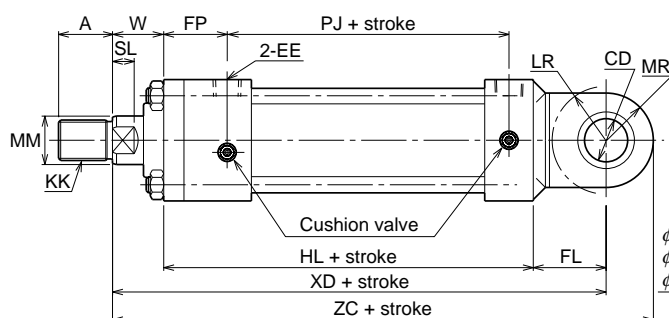
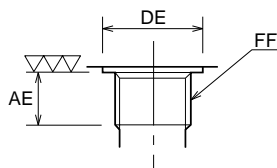
Port G thread (BSPB) type

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30
φ125	φ124	φ15	35
φ140	φ139	φ15	35

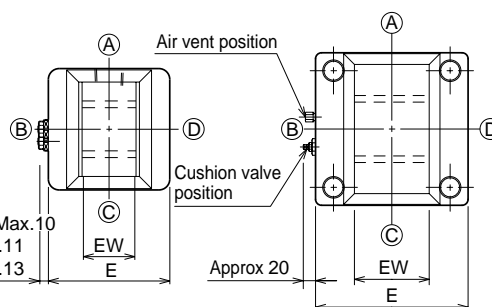
Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



•Rod dia. over φ90



φ40,50,63,80: Max.10
φ100,125: Max.11
φ140,160: Max.13



•Bore φ40 - φ160

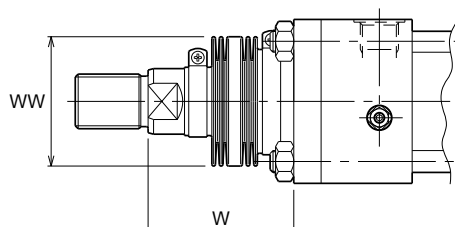
•Bore φ180 - φ250

- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".
- We have two types in assembling way, the tie rod type and the tube flange type. These are separated according to the stroke.

Types	Tie rod type	Tube flange type
Stroke	- 800	801 - 2000

Note) The tube flange cylinder has the same dimensions as the tie rod cylinder.

With boots

210C-1/THC1 **Bore**K 

W dimension

Rod B
Nylon tarpaulin $\left(\begin{array}{l} \phi 40 \cdot \phi 50 \quad 1/3.5 \text{ Stroke} + X \\ \phi 63 - \phi 100 \quad 1/4 \text{ Stroke} + X \\ \phi 125 - \phi 160 \quad 1/5 \text{ Stroke} + X \end{array} \right)$
Chloroprene

Conex $\left(\begin{array}{l} \phi 40 \cdot \phi 50 \quad 1/2.5 \text{ Stroke} + X \\ \phi 63 - \phi 100 \quad 1/3 \text{ Stroke} + X \\ \phi 125 \cdot \phi 140 \quad 1/3.5 \text{ Stroke} + X \\ \phi 160 \quad 1/4 \text{ Stroke} + X \end{array} \right)$

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

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

Rod A
Nylon tarpaulin $\left(\begin{array}{l} \phi 40 \quad 1/3.5 \text{ Stroke} + X \\ \phi 50 - \phi 80 \quad 1/4 \text{ Stroke} + X \\ \phi 100 - \phi 160 \quad 1/5 \text{ Stroke} + X \end{array} \right)$
Chloroprene

Conex $\left(\begin{array}{l} \phi 40 \quad 1/2.5 \text{ Stroke} + X \\ \phi 50 - \phi 80 \quad 1/3 \text{ Stroke} + X \\ \phi 100 \quad 1/3.5 \text{ Stroke} + X \\ \phi 125 - \phi 160 \quad 1/4 \text{ Stroke} + X \end{array} \right)$

- If decimals are included into the calculation results, raise them to the next whole number.
- Please consult us the dimensions for the special order of 180mm to 250mm bore.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60
φ180	105	φ130	M95×2	φ100	–	–	10	55	–	–	–	–	–	–	–	–
φ200	110	φ140	M100×2	φ110	–	–	10	55	–	–	–	–	–	–	–	–
φ224	130	φ155	M120×2	φ125	–	–	10	60	–	–	–	–	–	–	–	–
φ250	140	φ170	M130×2	φ140	–	–	10	65	–	–	–	–	–	–	–	–

Symbol Bore	AE	CD	DE	E	EE	EW	FF	FL	FP	HL	LR	MR	PJ	XD	ZC
	φ40	12	φ20H10	φ25.5	□65	Rc3/8	25 ^{-0.1} _{-0.4}	G3/8	35	38	147	R25	R25	94	214
φ50	14	φ25H10	φ30	□80	Rc1/2	32 ^{-0.1} _{-0.4}	G1/2	44	42	162	R32	R30	102	242	272
φ63	14	φ32H10	φ30	□94	Rc1/2	40 ^{-0.1} _{-0.4}	G1/2	54	47	174	R40	R35	109	271	306
φ80	16	φ40H10	φ36.9	□114	Rc3/4	50 ^{-0.1} _{-0.4}	G3/4	66	57	202	R50	R40	125	316	356
φ100	16	φ50H10	φ36.9	□135	Rc3/4	63 ^{-0.1} _{-0.4}	G3/4	79	61	213	R63	R50	132	345	395
φ125	18	φ63H10	φ46.1	□165	Rc1	80 ^{-0.1} _{-0.6}	G1	90	73	248	R71	R63	150	398	461
φ140	18	φ70H10	φ46.1	□192	Rc1	90 ^{-0.1} _{-0.6}	G1	99	81	266	R80	R70	160	425	495
φ160	18	φ80H10	φ46.1	□218	Rc1	100 ^{-0.1} _{-0.6}	G1	110	86	290	R90	R80	179	460	540
φ180	–	φ90H10	–	□255	Rc1 ¹ / ₄	125 ^{-0.1} _{-0.6}	–	145	99	330	R120	R108	202	530	638
φ200	–	φ100H10	–	□295	Rc1 ¹ / ₂	125 ^{-0.1} _{-0.6}	–	155	115	369	R130	R120	220	579	699
φ224	–	φ112H10	–	□325	Rc1 ¹ / ₂	140 ^{-0.1} _{-0.6}	–	175	115	378	R150	R135	229	613	748
φ250	–	φ125H10	–	□355	Rc2	160 ^{-0.1} _{-0.6}	–	195	131	428	R165	R150	252	688	838

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

CAD/DATA is available.

210C-1/THC1 Bore A•B



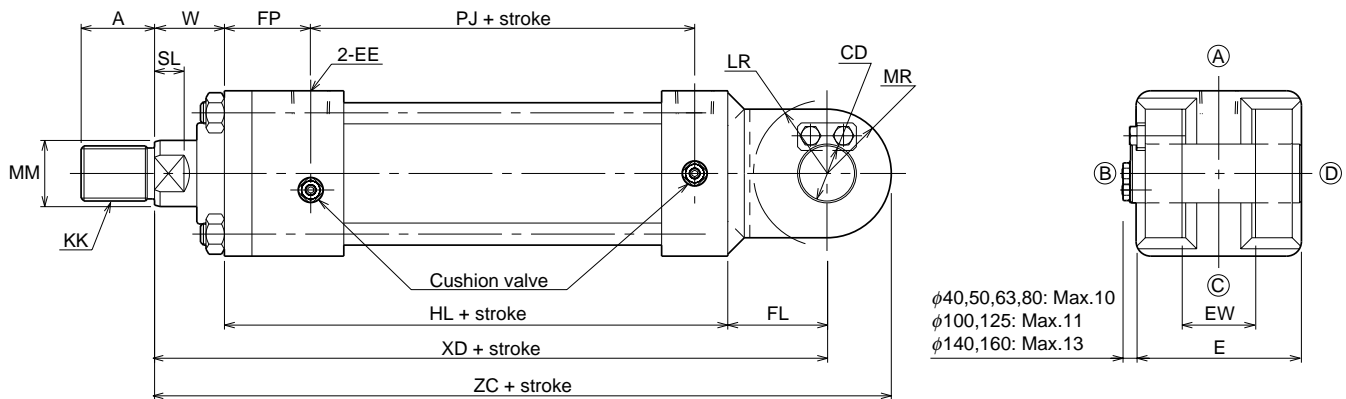
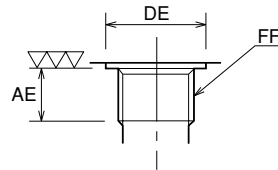
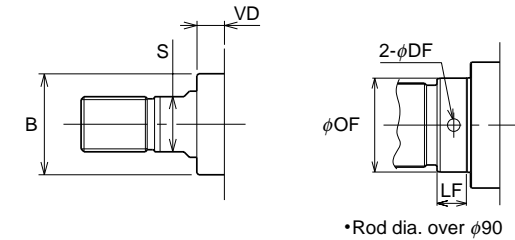
CB

210C-1 2 CB Bore B B Stroke

Port G thread (BSPG) type

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30

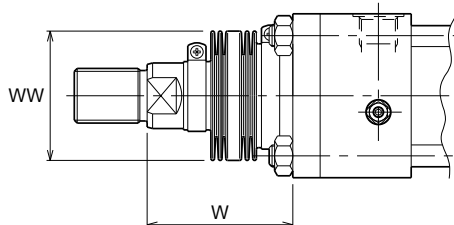
Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".

With boots

210C-1/THC1 Bore K



W dimension

Rod B	Material	W dimension
φ40 • φ50	Nylon tarpaulin	1/3.5 Stroke + X
φ63 - φ100	Chloroprene	1/4 Stroke + X
φ125 - φ160	Conex	1/5 Stroke + X

Rod B	Material	W dimension
φ40 • φ50	Nylon tarpaulin	1/2.5 Stroke + X
φ63 - φ100	Chloroprene	1/3 Stroke + X
φ125 • φ140	Conex	1/3.5 Stroke + X
φ160	Conex	1/4 Stroke + X

- If decimals are included into the calculation results, raise them to the next whole number.

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

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

Rod A	Material	W dimension
φ40	Nylon tarpaulin	1/3.5 Stroke + X
φ50 - φ80	Chloroprene	1/4 Stroke + X
φ100 - φ160	Conex	1/5 Stroke + X

Rod A	Material	W dimension
φ40	Nylon tarpaulin	1/2.5 Stroke + X
φ50 - φ80	Chloroprene	1/3 Stroke + X
φ100	Conex	1/3.5 Stroke + X
φ125 - φ160	Conex	1/4 Stroke + X

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60

Symbol Bore	AE	CD	DE	E	EE	EW	FF	FL	FP	HL	LR	MR	PJ	XD	ZC
	φ40	12	φ20 ^{H10/f8}	φ25.5	□65	Rc3/8	25 ^{+0.4/+0.1}	G3/8	35	38	147	R25	R25	94	214
φ50	14	φ25 ^{H10/f8}	φ30	□80	Rc1/2	32 ^{+0.4/+0.1}	G1/2	44	42	162	R32	R30	102	242	272
φ63	14	φ32 ^{H10/f8}	φ30	□94	Rc1/2	40 ^{+0.4/+0.1}	G1/2	54	47	174	R40	R35	109	271	306
φ80	16	φ40 ^{H10/f8}	φ36.9	□114	Rc3/4	50 ^{+0.4/+0.1}	G3/4	66	57	202	R50	R40	125	316	356
φ100	16	φ50 ^{H10/f8}	φ36.9	□135	Rc3/4	63 ^{+0.4/+0.1}	G3/4	79	61	213	R63	R50	132	345	395
φ125	18	φ63 ^{H10/f8}	φ46.1	□165	Rc1	80 ^{+0.6/+0.1}	G1	90	73	248	R71	R63	150	398	461
φ140	18	φ70 ^{H10/f8}	φ46.1	□192	Rc1	90 ^{+0.6/+0.1}	G1	99	81	266	R80	R70	160	425	495
φ160	18	φ80 ^{H10/f8}	φ46.1	□218	Rc1	100 ^{+0.6/+0.1}	G1	110	86	290	R90	R80	179	460	540

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

CAD/DATA is

210C-1/THC1 Bore A•B

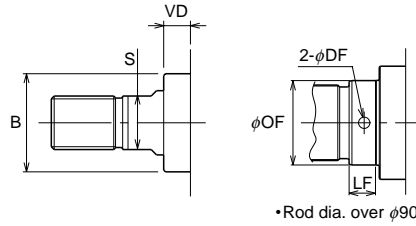
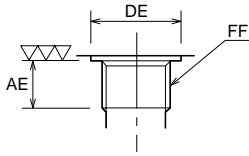
available.



TA

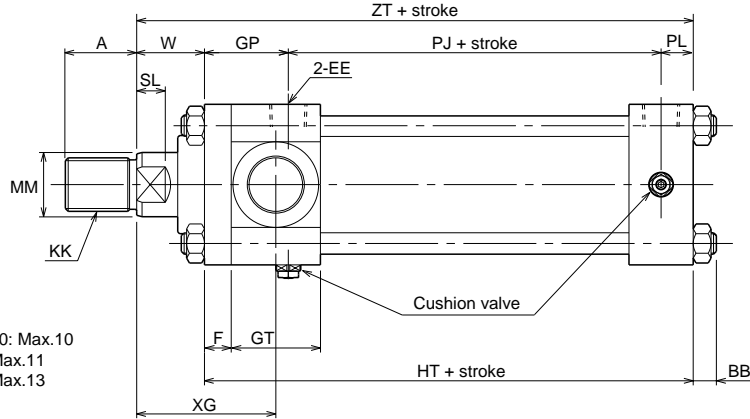
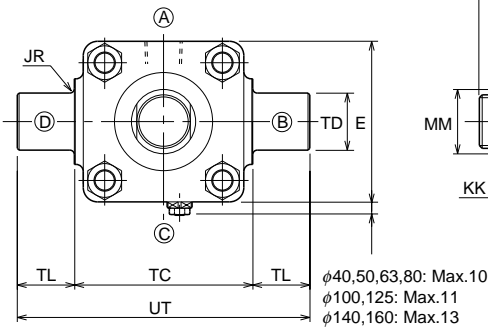
210C-1 2 TA Bore B B Stroke

Port G thread (BSPP) type



Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30

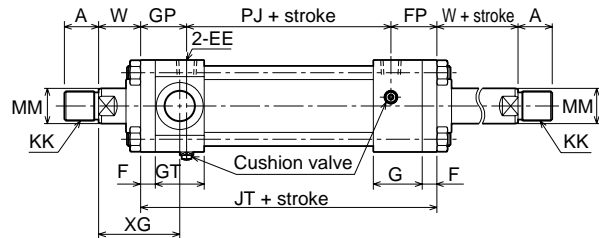
Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".
- The port and cushion position is only (A)C or C(A) because of the mounting boss.

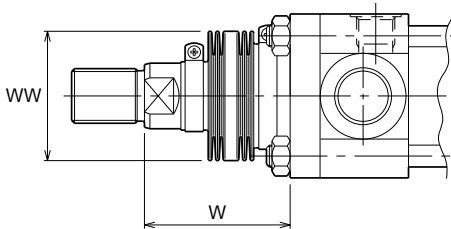
Double-acting double rod (Rod B)

- Bore φ40 - φ80



With boots

210C-1/THC1 BoreK



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

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

W dimension

Rod B	φ40 • φ50	1/3.5 Stroke + X
Nylon tarpaulin	φ63 - φ100	1/4 Stroke + X
Chloroprene	φ125 - φ160	1/5 Stroke + X

Rod A	φ40	1/3.5 Stroke + X
Nylon tarpaulin	φ50 - φ80	1/4 Stroke + X
Chloroprene	φ100 - φ160	1/5 Stroke + X

Conex	φ40 • φ50	1/2.5 Stroke + X
	φ63 - φ100	1/3 Stroke + X
	φ125 • φ140	1/3.5 Stroke + X
	φ160	1/4 Stroke + X

Conex	φ40	1/2.5 Stroke + X
	φ50 - φ80	1/3 Stroke + X
	φ100	1/3.5 Stroke + X
	φ125 - φ160	1/4 Stroke + X

- If decimals are included into the calculation results, raise them to the next whole number.

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60

Symbol Bore	AE	BB	DE	E	EE	F	FF	FP	G	GP	GT	HT	JR	JT	PJ	PL	TC
	φ40	12	11	φ25.5	□65	Rc3/8	11	G3/8	38	43	38	43	147	R2.5	170	94	15
φ50	14	13	φ30	□80	Rc1/2	13	G1/2	42	47	42	47	162	R2.5	186	102	18	85 ⁰ _{-0.35}
φ63	14	14	φ30	□94	Rc1/2	15	G1/2	47	50	47	50	174	R2.5	203	109	18	100 ⁰ _{-0.35}
φ80	16	16	φ36.9	□114	Rc3/4	18	G3/4	57	60	57	60	202	R3	239	125	20	125 ⁰ _{-0.4}
φ100	16	18	φ36.9	□135	Rc3/4	22	G3/4	61	60	66	65	218	R3	259	132	20	155 ⁰ _{-0.4}
φ125	18	21	φ46.1	□165	Rc1	24	G1	73	75	73	75	248	R4	296	150	25	195 ⁰ _{-0.46}
φ140	18	25	φ46.1	□192	Rc1	32	G1	81	75	86	80	271	R4	327	160	25	220 ⁰ _{-0.46}
φ160	18	27	φ46.1	□218	Rc1	37	G1	86	75	111	100	315	R4	376	179	25	240 ⁰ _{-0.46}

Symbol Bore	TD	TL	UT	XG	ZT
	φ40	φ20e9	20	110	65
φ50	φ25e9	25	135	72	198
φ63	φ32e9	32	164	83	217
φ80	φ40e9	40	205	96	250
φ100	φ50e9	50	255	107	271
φ125	φ63e9	63	321	122	308
φ140	φ70e9	70	360	132	331
φ160	φ80e9	80	400	147	375

With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

CAD/DATA is

210C-1/THC1 Bore A•B

available.

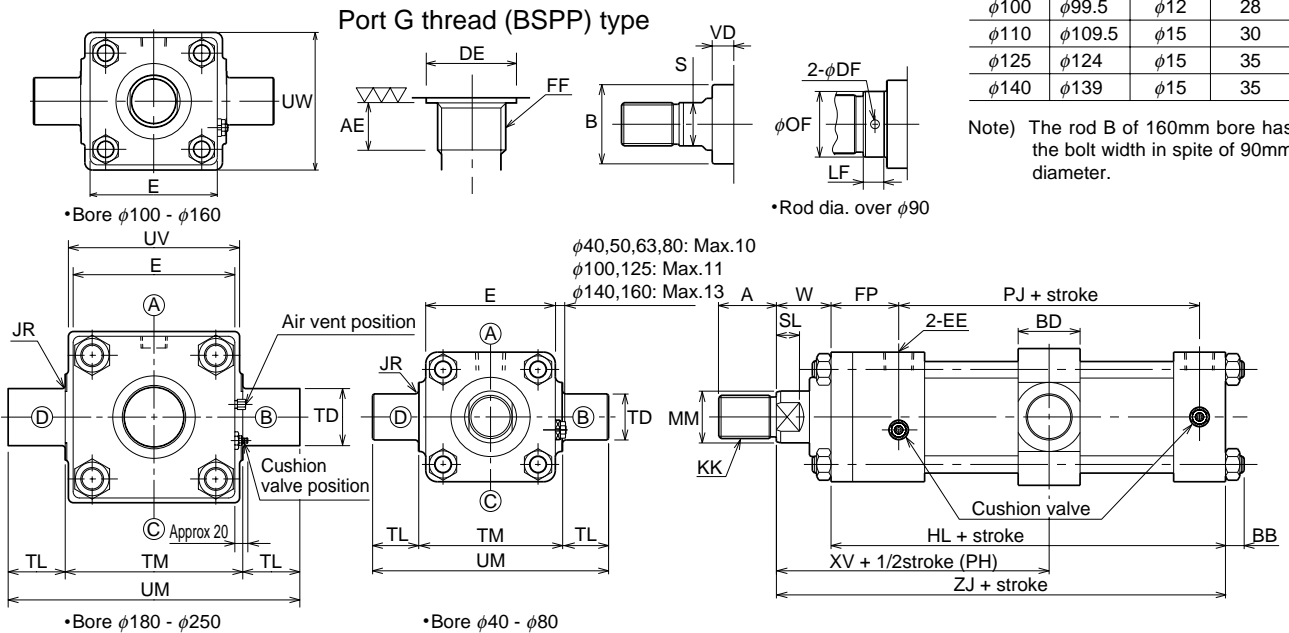


TC

210C-1 2 TC Bore B B Stroke

Rod dia.	OF	DF	LF
φ90	φ89.5	φ12	28
φ100	φ99.5	φ12	28
φ110	φ109.5	φ15	30
φ125	φ124	φ15	35
φ140	φ139	φ15	35

Note) The rod B of 160mm bore has the bolt width in spite of 90mm diameter.



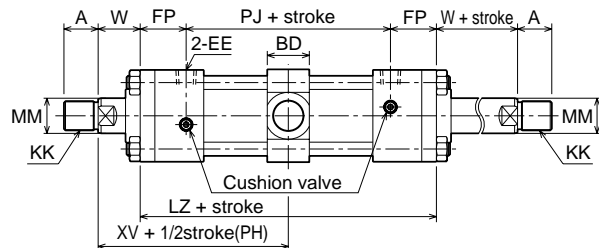
- The cushion of the rod A, 40mm bore and head side is not adjustable.
- Positions of the cushion needles depend on the cylinder bore.
- For the short stroke cylinder or the small PH dimension, the interference of the cushion valve should be checked in designing.
- For the screw length (dimension A) in the case of using the lock nut, refer to "Accessories".
- When you want to change the length of the projected rod, specify the "W".
- We have two types in assembling way, the tie rod type and the tube flange type. These are separated according to the stroke

Types	Tie rod type	Tube flange type
Stroke	- 800	801 - 2000

Note) The tube flange cylinder has the same dimensions as the tie rod cylinder.

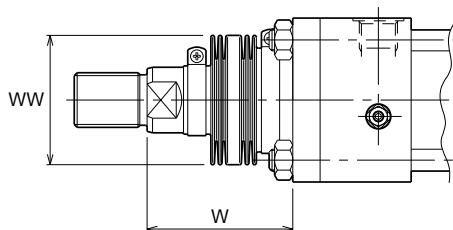
Double-acting double rod (Rod B)

- Bore φ40 - φ160



With boots

210C-1/THC1 BoreK



W dimension

Rod B	φ40 • φ50	1/3.5 Stroke + X
Nylon tarpaulin	φ63 - φ100	1/4 Stroke + X
Chloroprene	φ125 - φ160	1/5 Stroke + X

Conex	φ40 • φ50	1/2.5 Stroke + X
	φ63 - φ100	1/3 Stroke + X
	φ125 • φ140	1/3.5 Stroke + X
	φ160	1/4 Stroke + X

- If decimals are included into the calculation results, raise them to the next whole number.
- Please consult us the dimensions for the special order of 180mm to 250mm bore.

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

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

Rod A	φ40	1/3.5 Stroke + X
Nylon tarpaulin	φ50 - φ80	1/4 Stroke + X
Chloroprene	φ100 - φ160	1/5 Stroke + X

Conex	φ40	1/2.5 Stroke + X
	φ50 - φ80	1/3 Stroke + X
	φ100	1/3.5 Stroke + X
	φ125 - φ160	1/4 Stroke + X

Dimensional table

Symbol Bore	Rod B								Rod A							
	A	B	KK	MM	S	SL	VD	W	A	B	KK	MM	S	SL	VD	W
φ40	25	φ40	M20×1.5	φ22	19	11	11	32	30	φ43	M24×1.5	φ28	24	14	15	32
φ50	30	φ46	M24×1.5	φ28	24	14	13	36	35	φ55	M30×1.5	φ36	30	16	15	36
φ63	35	φ55	M30×1.5	φ36	30	16	15	43	45	φ65	M39×1.5	φ45	41	20	19	43
φ80	45	φ65	M39×1.5	φ45	41	20	12	48	55	φ80	M48×1.5	φ56	50	23	19	48
φ100	55	φ80	M48×1.5	φ56	50	23	15	53	75	φ95	M64×2	φ70	65	27	19	53
φ125	75	φ95	M64×2	φ70	65	27	19	60	90	φ120	M80×2	φ90	–	–	28	60
φ140	80	φ105	M72×2	φ80	75	31	15	60	105	φ130	M95×2	φ100	–	–	24	60
φ160	90	φ120	M80×2	φ90	85	33	15	60	110	φ140	M100×2	φ110	–	–	24	60
φ180	105	φ130	M95×2	φ100	–	–	10	55	–	–	–	–	–	–	–	–
φ200	110	φ140	M100×2	φ110	–	–	10	55	–	–	–	–	–	–	–	–
φ224	130	φ155	M120×2	φ125	–	–	10	60	–	–	–	–	–	–	–	–
φ250	140	φ170	M130×2	φ140	–	–	10	65	–	–	–	–	–	–	–	–

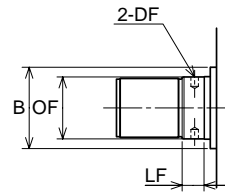
Symbol Bore	AE	BB	BD	DE	E	EE	FF	FP	HL	JR	LZ	The minimum dimension PH	PJ	TD
	φ40	12	11	33	φ25.5	□65	Rc3/8	G3/8	38	147	R2.5		170	102.5
φ50	14	13	33	φ30	□80	Rc1/2	G1/2	42	162	R2.5	186	112.5	102	φ25e9
φ63	14	14	43	φ30	□94	Rc1/2	G1/2	47	174	R2.5	203	129.5	109	φ32e9
φ80	16	16	53	φ36.9	□114	Rc3/4	G3/4	57	202	R3	239	152.5	125	φ40e9
φ100	16	18	63	φ36.9	□135	Rc3/4	G3/4	61	213	R3	254	166.5	132	φ50e9
φ125	18	21	78	φ46.1	□165	Rc1	G1	73	248	R4	296	198	150	φ63e9
φ140	18	25	88	φ46.1	□192	Rc1	G1	81	266	R4	322	211	160	φ70e9
φ160	18	27	98	φ46.1	□218	Rc1	G1	86	290	R4	351	221	179	φ80e9
φ180	–	32	108	–	□255	Rc1 ^{1/4}	–	99	330	R5	–	398	202	φ90
φ200	–	37	118	–	□295	Rc1 ^{1/2}	–	115	369	R5	–	433	220	φ100
φ224	–	39	137	–	□325	Rc1 ^{1/2}	–	115	378	R5	–	466.5	229	φ112
φ250	–	41	147	–	□355	Rc2	–	131	428	R5	–	511.5	252	φ125

Symbol Bore	TL	TM	UM	UW	XV	ZJ
	φ40	20	70 ⁰ _{-0.3}	110	–	117
φ50	25	85 ⁰ _{-0.35}	135	–	129	198
φ63	32	100 ⁰ _{-0.35}	164	–	144.5	217
φ80	40	125 ⁰ _{-0.4}	205	–	167.5	250
φ100	50	155 ⁰ _{-0.4}	255	□146	180	266
φ125	63	195 ⁰ _{-0.46}	321	□185	208	308
φ140	70	220 ⁰ _{-0.46}	360	□210	221	326
φ160	80	240 ⁰ _{-0.46}	400	□230	235.5	350
φ180	90	280 ⁰ _{-0.8}	460	–	255	385
φ200	100	320 ⁰ _{-0.8}	520	–	280	424
φ224	112	355 ⁰ _{-0.8}	579	–	289.5	438
φ250	125	400 ⁰ _{-0.8}	650	–	322	493

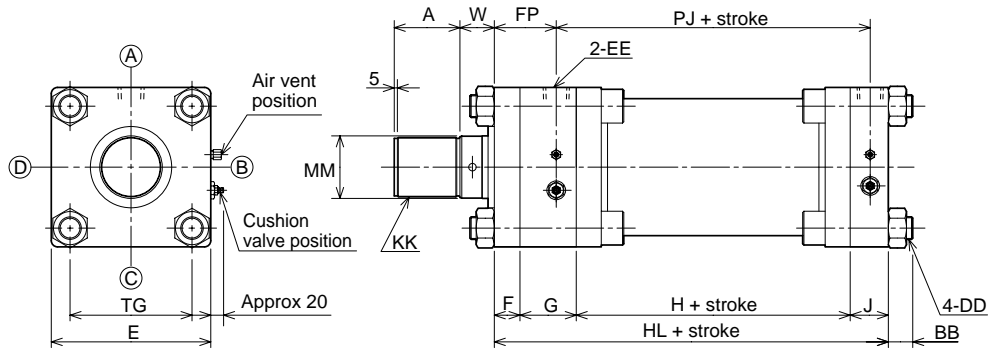
With boots

Symbol	Bore	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
	WW	Rod B	φ50	φ63	φ71	φ80	φ100	φ125	φ125
Rod A		φ63	φ71	φ80	φ100	φ125	φ140	φ160	φ180
X	Rod B	45	45	55	55	55	65	65	65
	Rod A	45	55	55	55	65	65	65	65

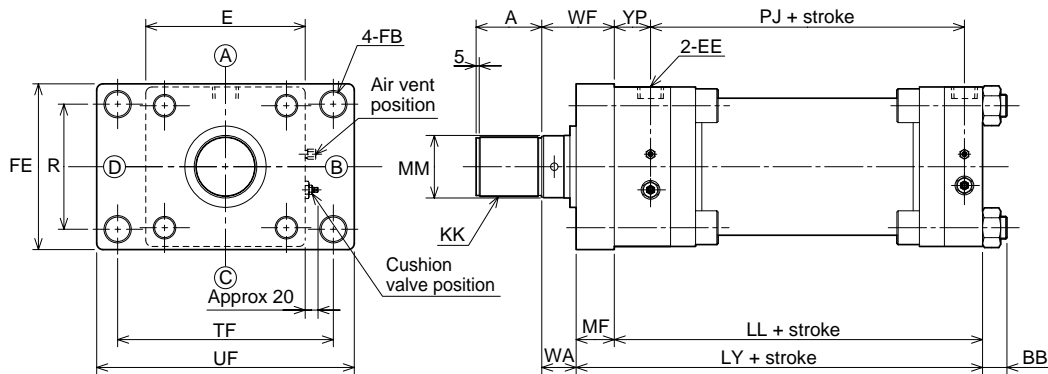
Tube flange type (Stroke: 801 - 2000mm)



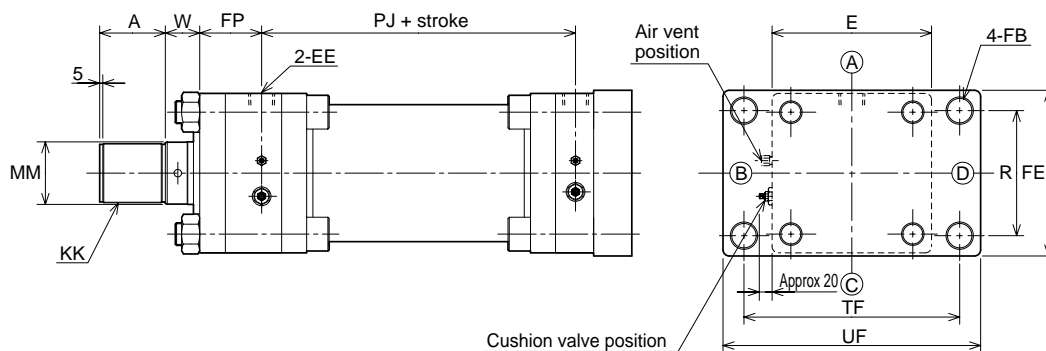
● SD type



● FA type



● FB type



Dimensional table/SD•FA•FB type

Symbol Bore	A	B	DF	E	EE	KK	LF	MM	OF	PJ
φ180	105	φ130	φ12	255	Rc1 ¹ / ₄	M95×2	28	φ100	φ99.5	202
φ200	110	φ140	φ15	295	Rc1 ¹ / ₂	M100×2	30	φ110	φ109.5	220
φ224	130	φ155	φ15	325	Rc1 ¹ / ₂	M120×2	35	φ125	φ123	229
φ250	140	φ170	φ15	355	Rc2	M130×2	35	φ140	φ138	252

Dimensional table/SD type

Symbol Bore	BB	DD	F	FP	G	H	HL	J	TG	W
φ180	32	M36×1.5	41	99	90	138	330	61	195	55
φ200	37	M42×1.5	51	115	100	148	369	70	220	55
φ224	39	M45×1.5	51	115	100	157	378	70	243	60
φ250	41	M48×1.5	56	131	120	162	428	90	268	65

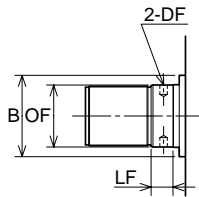
Dimensional table/FA type

Symbol Bore	BB	FB	FE	LL	LY	MF	TF	UF	WA	WF	YP
φ180	32	φ39	265	289	350	61	345	412	55	116	58
φ200	37	φ48	315	318	384	66	412	500	55	121	64
φ224	39	φ48	335	327	398	71	425	515	60	131	64
φ250	41	φ56	375	372	448	76	480	585	65	141	75

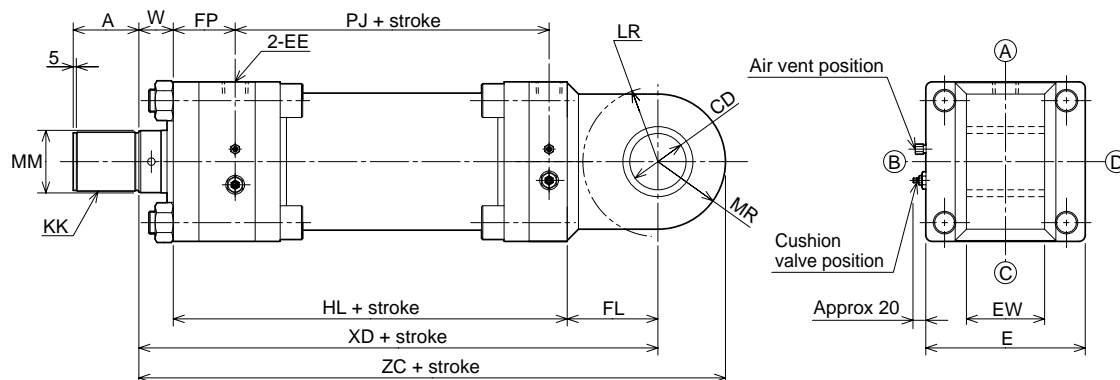
Dimensional table/FB type

Symbol Bore	FB	FE	FP	HL	MF	R	TF	UF	W	ZF
φ180	φ39	265	99	330	61	200	345	412	55	446
φ200	φ48	315	115	369	66	230	412	500	55	490
φ224	φ48	335	155	378	71	250	425	515	60	509
φ250	φ56	375	131	428	76	275	480	585	65	569

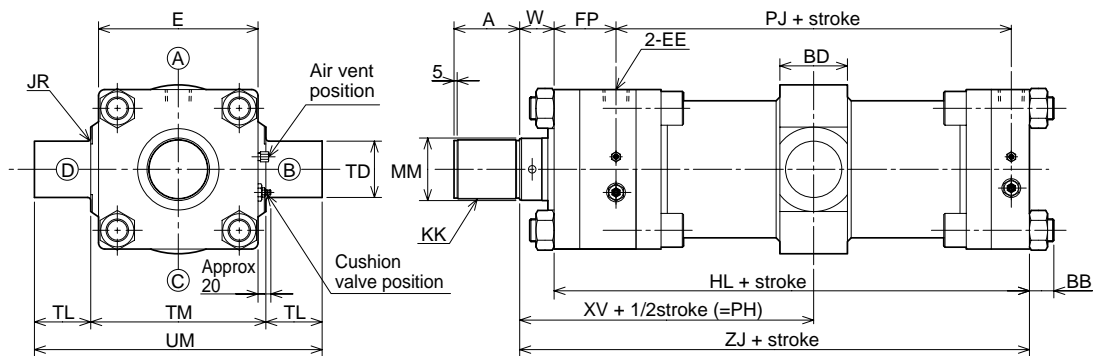
Tube flange type (Stroke: 801 - 2000mm)



● CA type



● TC type



Dimensional table/CA•TC type

Symbol Bore	A	B	DF	E	EE	KK	LF	MM	OF	PJ	W
φ180	105	φ130	φ12	255	Rc1 ¹ / ₄	M95×2	28	φ100	φ99.5	202	55
φ200	110	φ140	φ15	295	Rc1 ¹ / ₂	M100×2	30	φ110	φ109.5	220	55
φ224	130	φ155	φ15	325	Rc1 ¹ / ₂	M120×2	35	φ125	φ123	229	60
φ250	140	φ170	φ15	355	Rc2	M130×2	35	φ140	φ138	252	65

Dimensional table/CA type

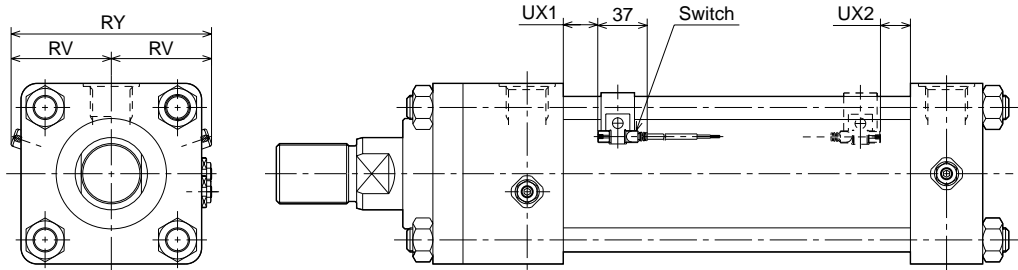
Symbol Bore	CD	EW	FL	FP	HL	LR	MR	XD	ZC
φ180	φ90H10	125 ^{-0.1} / _{-0.6}	145	99	330	R120	R108	530	638
φ200	φ100H10	125 ^{-0.1} / _{-0.6}	155	115	369	R130	R120	579	699
φ224	φ112H10	140 ^{-0.1} / _{-0.6}	175	115	378	R150	R135	613	748
φ250	φ125H10	160 ^{-0.1} / _{-0.6}	195	131	428	R165	R150	688	838

Dimensional table/TC type

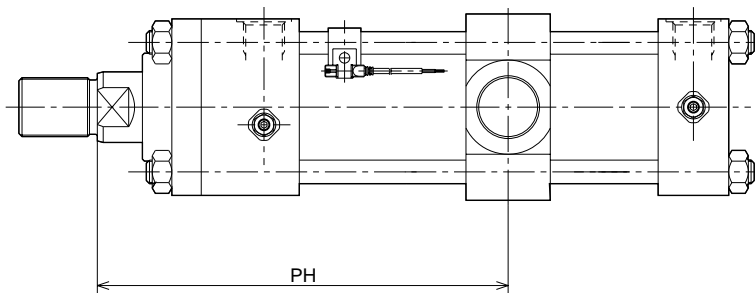
Symbol Bore	BB	BD	FP	HL	JR	Minimum PH	TD	TL	TM	UM	XV	ZJ
φ180	32	108	99	330	R5	398	φ90	90	280 ⁰ / _{-0.8}	460	255	385
φ200	37	118	115	369	R5	433	φ100	100	320 ⁰ / _{-0.8}	520	280	424
φ224	39	137	115	378	R5	466.5	φ112	112	355 ⁰ / _{-0.8}	579	289.5	438
φ250	41	147	131	428	R5	511.5	φ125	125	400 ⁰ / _{-0.8}	650	322	493

Switch set

210C-1R 2 SD Bore B B Stroke - A B Switch symbol Switch quantity



Minimum dimension PH of switch set cylinder 210C-1R



Note) Please consult us the details for TC mounting of switch set as the special order.

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

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

Dimensional table

Bore		Symbol	RV	RY	UX1		UX2		The minimum dimension PH
					Contact	No contact	Contact	No contact	
φ40	Rod B		40	80	21	24	21	23	176
	Rod A				21	23	21	23	176
φ50	Rod B		46	92	23	25	23	25	187
	Rod A				23	25	23	25	187
φ63	Rod B		53	106	26	29	27	29	208
	Rod A				26	28	27	28	208
φ80	Rod B		61	122	31	34	32	33	236
	Rod A				34	33	32	33	236

Note) The dimension UX indicates the optimum switch mounting position at the detection of the stroke end.

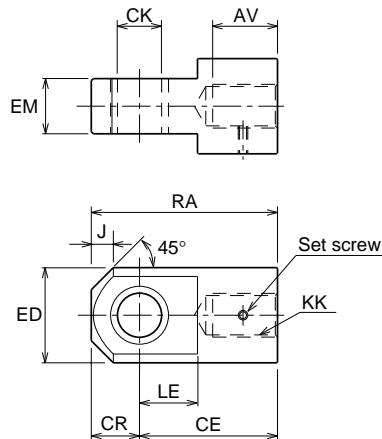
Working range and difference

Bore	Contact		No contact	
	Working range	Difference	Working range	Difference
φ40	9	1 or less	4	1 or less
φ50	10		5	
φ63	11		5	
φ80	12		6	

210C-1/THC1 Bore A•B CAD/DATA is available.

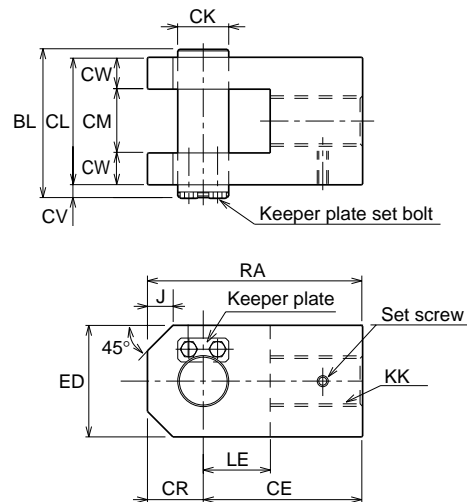
Rod end attachment

• Rod end eye (T-end)



- Using on the rod A, the thread size should be adjusted to that of rod B.

• Rod end clevis (Y-end)

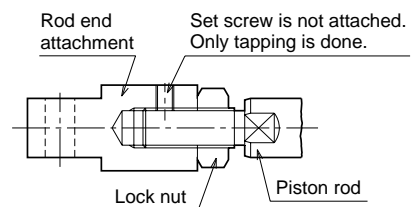


- Using on the rod A, the thread size should be adjusted to that of rod B.

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

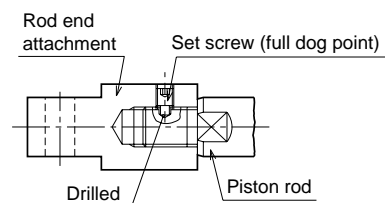
- ① In the case that the lock nut and rod end attachment are additionally ordered

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



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

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



If a drill hole is unnecessary, advise us.

Dimensional table/Rod end eye (T-end)

Bore	Symbol	Rod B									
	Part code	AV	CE	CK	CR	ED	EM	J	KK	LE	RA
φ40	RTH-20-2-H	32	70	φ20H10	22.5	φ45	25 ^{-0.1} _{-0.4}	8	M20×1.5	27	92.5
φ50	RTH-24-3-H	35	80	φ25H10	30	φ55	32 ^{-0.1} _{-0.4}	15	M24×1.5	34	110
φ63	RTH-30-2-H	40	95	φ32H10	35	φ70	40 ^{-0.1} _{-0.4}	16	M30×1.5	42	130
φ80	RTH-39-2-H	53	110	φ40H10	40	φ80	50 ^{-0.1} _{-0.4}	15	M39×1.5	52	150
φ100	RTH-48-2-H	62	135	φ50H10	50	φ98	63 ^{-0.1} _{-0.4}	20	M48×1.5	65	185
φ125	RTH-64-3-H	80	160	φ63H10	63	φ118	80 ^{-0.1} _{-0.6}	30	M64×2	75	223
φ140	RTH-72-3-H	87	180	φ70H10	70	φ138	90 ^{-0.1} _{-0.6}	35	M72×2	82	250
φ160	RTH-80-3-H	96	195	φ80H10	80	φ158	100 ^{-0.1} _{-0.6}	40	M80×2	94	275

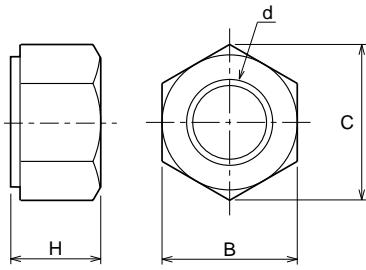
Dimensional table/Rod end clevis (Y-end) with pin

Bore	Symbol	Rod B												
	Part code	BL	CE	CK	CL	CM	CR	CV	CW	ED	J	KK	LE	RA
φ40	RYH-20-2-H	63	70	φ20 ^{H10} / _{F8}	50	25 ^{+0.4} _{+0.1}	22.5	8	12.5	45	8	M20×1.5	27	92.5
φ50	RYH-24-3-H	77	80	φ25 ^{H10} / _{F8}	64	32 ^{+0.4} _{+0.1}	30	8	16	60	15	M24×1.5	34	110
φ63	RYH-30-1-H	93	95	φ32 ^{H10} / _{F8}	80	40 ^{+0.4} _{+0.1}	35	8	20	70	16	M30×1.5	42	130
φ80	RYH-39-2-H	117	110	φ40 ^{H10} / _{F8}	100	50 ^{+0.4} _{+0.1}	40	12	25	80	15	M39×1.5	52	150
φ100	RYH-48-2-H	143	135	φ50 ^{H10} / _{F8}	126	63 ^{+0.4} _{+0.1}	50	12	31.5	100	20	M48×1.5	65	185
φ125	RYH-64-3-H	183	160	φ63 ^{H10} / _{F8}	160	80 ^{+0.6} _{+0.1}	63	18	40	120	30	M64×2	75	223
φ140	RYH-72-3-H	203	180	φ70 ^{H10} / _{F8}	180	90 ^{+0.6} _{+0.1}	70	18	45	140	35	M72×2	82	250
φ160	RYH-80-3-H	223	195	φ80 ^{H10} / _{F8}	200	100 ^{+0.6} _{+0.1}	80	18	50	160	40	M80×2	94	275

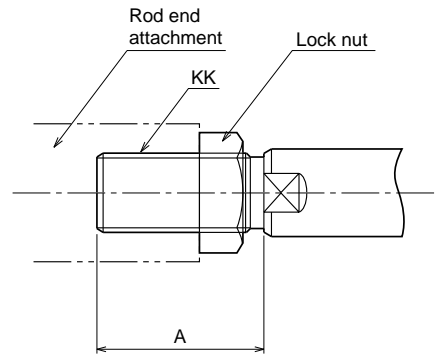
Note) Rod end attachments are exclusive use on the rod B. In case of the rod A, the thread size should be adjusted to that of the rod B in using attachments, and this change would be informed to us with order.

In using the lock nut and the attachment at one time, the thread length should be adjusted to the Long thread basic. (with the symbol K)

• Lock nut

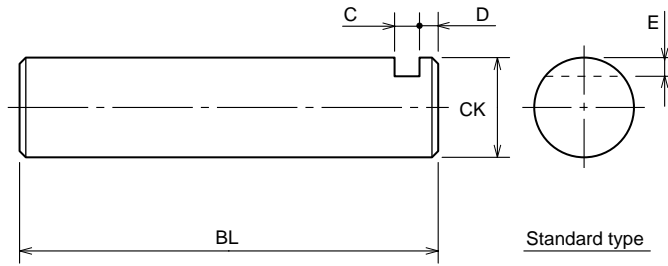


• A dimension in using lock nut

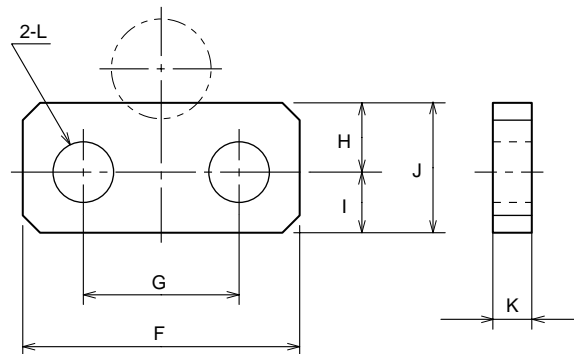


The guide of the fitting length of the rod end attachment and piston rod is approx. 80% of the thread dia. If the fitting length is insufficient when the lock nut is used, it is required to lengthen the thread length (dimension A) as shown in the figure below.

• Parallel pin



• Keeper plate



Dimensional table/A dimension in using the lock nut (The Long thread basic)

Symbol Bore	Rod B		Rod A	
	A	KK	A	KK
φ40	45	M20×1.5	50	M24×1.5
φ50	50	M24×1.5	60	M30×1.5
φ63	60	M30×1.5	80	M39×1.5
φ80	80	M39×1.5	95	M48×1.5
φ100	95	M48×1.5	125	M64×2
φ125	125	M64×2	155	M80×2
φ140	140	M72×2	185	M95×2
φ160	155	M80×2	190	M100×2

Dimensional table/Lock nut

Symbol Bore	Rod B					Rod A				
	Part code	B	C	d	H	Part code	B	C	d	H
φ40	LNH-20F-1-H	30	34.6	M20×1.5	18	LNH-24F-1-H	36	41.6	M24×1.5	20
φ50	LNH-24F-1-H	36	41.6	M24×1.5	20	LNH-30F-1-H	46	53.1	M30×1.5	25
φ63	LNH-30F-1-H	46	53.1	M30×1.5	25	LNH-39F-1-H	60	69.3	M39×1.5	32
φ80	LNH-39F-1-H	60	69.3	M39×1.5	32	LNH-48F-1-H	75	86.6	M48×1.5	38
φ100	LNH-48F-1-H	75	86.6	M48×1.5	38	LNH-64F-1-H	95	109.7	M64×2	51
φ125	LNH-64F-1-H	95	109.7	M64×2	51	LNH-80F-1-H	115	132.8	M80×2	64
φ140	LNH-72F-1-H	105	121.2	M72×2	58	LNH-95F-1-H	135	155.9	M95×2	76
φ160	LNH-80F-1-H	115	132.8	M80×2	64	LNH-100F-1-H	145	167.4	M100×2	80

Dimensional table/Parallel pin

Symbol Bore	BL	C	CK	D	E
	φ40	63	5	φ20	3
φ50	77	5	φ25	3	3.5
φ63	93	5	φ32	3	4
φ80	117	7	φ40	5	5
φ100	143	7	φ50	5	5
φ125	183	10	φ63	8	8
φ140	203	10	φ70	8	8
φ160	223	10	φ80	8	8

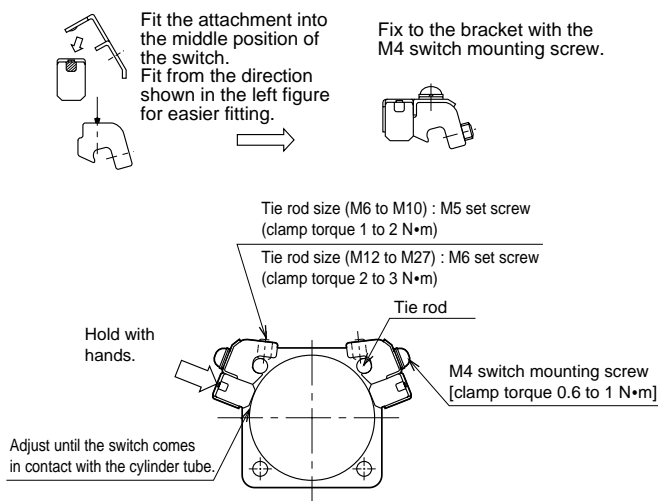
• Allowance of CK is f8.

Dimensional table/Keeper plate

Symbol Bore	F	G	H	I	J	K	L	Volt size
	φ40	32	18	8	7	15	4.5	φ7
φ50	32	18	8	7	15	4.5	φ7	M6
φ63	32	18	8	7	15	4.5	φ7	M6
φ80	50	30	10	8	18	6	φ10	M8
φ100	65	40	12	10	22	6	φ12	M10
φ125	75	48	17	13	30	9	φ14	M12
φ140	75	48	17	13	30	9	φ14	M12
φ160	75	48	17	13	30	9	φ14	M12

Setting method of switch detecting position

AX type



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

Notes on assembly

Clamping of tie rod

- When clamping the tie rods, DO NOT clamp only one tie rod at once, but clamp them gradually in the order shown in the right diagram. The single clamping of the tie rod may cause malfunctions or cracks of cylinders.

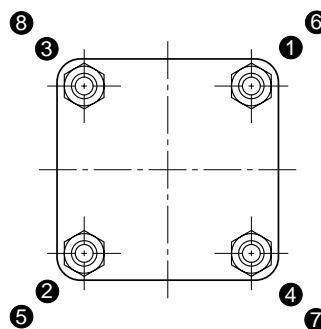


Table of specified tie rod clamp torque

Bore mm	φ40	φ50	φ63	φ80	φ100	φ125
Tie rod screw	M10×1.25	M12×1.25	M14×1.5	M16×1.5	M18×1.5	M22×1.5
Clamp torque N•m	41	70	120	170	280	500
Bore mm	φ140	φ160	φ180	φ200	φ224	φ250
Tie rod screw	M27×2	M32×2	M36×1.5	M42×1.5	M45×1.5	M48×1.5
Clamp torque N•m	880	1100	1900	3000	3700	4600

Precautions for use

Take sufficient care to prevent the pressure in the cylinder with the rod A from exceeding the maximum allowable pressure, since the cylinder has the smaller pressurized area on the rod side, and the pressure in it tends to increase easily.

< Example >

Find the pressure on the rod side when the cylinder is moved forward (lowered) under the conditions shown below.

- Cylinder : 210C-1 ϕ 80 Rod A
 - Load : $W = 1000 \text{ kg} (\approx 10000 \text{ N})$
 - Set pressure : $P_H = 12 \text{ MPa}$
 - Installing direction : Rod facing downward
 - Speed control : Meter-out
- The working speed is slow, and the load rate is 100%.

< Answer >

The pressure P_R , generated on the rod side is the sum of the pressure P_1 , generated to balance with the load W and the pressure P_2 , boosted by the supply from the head side.

- The pressure P_1 , generated to balance with the load W , can be calculated with the formula below.

$$P_1 = \frac{W}{A_R} = \frac{10000 \text{ (N)}}{2564 \text{ (mm}^2\text{)}} = 3.9 \text{ (MPa)}$$

- The pressure P_2 , boosted by the supply from the head side, can be calculated with the formula below.
where, $P_2 A_R = P_H A_H$

$$P_2 = \frac{P_H A_H}{A_R} = \frac{12 \text{ (MPa)} \times 5027 \text{ (mm}^2\text{)}}{2564 \text{ (mm}^2\text{)}} = 23.5 \text{ (MPa)}$$

- The pressure P_R , generated on the rod side, can be calculated with the formula below.

$$P_R = P_1 + P_2 = 3.9 + 23.5 = 27.4 \text{ (MPa)}$$

- ∴ Therefore, the pressure in the cylinder exceeds the maximum allowable pressure of the 210C-1, rod A type, on the rod side, 26.5 MPa shown in the standard specifications, and the cylinder is not applicable. Modify the working conditions, and recalculate.

