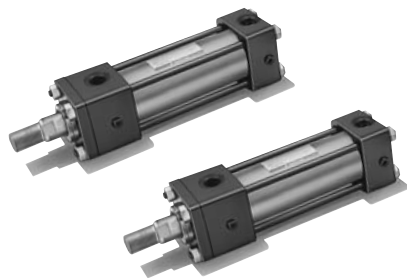


## 21 MPa hydraulic cylinders

- Double acting hydraulic cylinders for 21 MPa with bores from 40 to 160 mm.
- The performance and mounting dimensions conform to the standard of Japan Fluid Power Association (JOHS).



## Standard Specifications

Type	Standard type
Nominal pressure	21 MPa
Maximum allowable pressure	Cap side: 24.5 MPa Rod side: 26.5 MPa
Proof test pressure	31.5 MPa
Minimum operating pressure	Rod side: 0.45 MPa or less    Cap side: 0.3 MPa or less
Working speed range	8 to 300 mm/s (excluding cushion)
Working temperature range (ambient/fluid temperature)	-10 to +80°C (No freezing)
Structure of cushioning	Metal fitting system
Adaptable fluid	Petroleum-based fluid (When using another fluid, refer to the table of fluid adaptability.)
Tolerance for thread	JIS 6g/6H
Tolerance of stroke	0 to 100 mm <sup>+0.8</sup> <sub>0</sub> 101 to 250mm <sup>+1.0</sup> <sub>0</sub> 251 to 630mm <sup>+1.25</sup> <sub>0</sub> 631 to 1000mm <sup>+1.4</sup> <sub>0</sub> 1001 to 1600mm <sup>+1.6</sup> <sub>0</sub> 1601 to 2000mm <sup>+1.8</sup> <sub>0</sub>
Mounting style	SD, LA, 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
	Other    Lock nut

## Standard Stroke Range

Unit: mm

Bore	Stroke
φ40	1500
φ50 to φ160	2000

- 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

Cylinder bore	Cushion ring length on rod side	Cushion ring length on cap side
φ40 to φ63	20	20
φ80 to φ160	25	25

Note) The cushion stroke lengths in case of cylinders used up to the stroke end.

## 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.

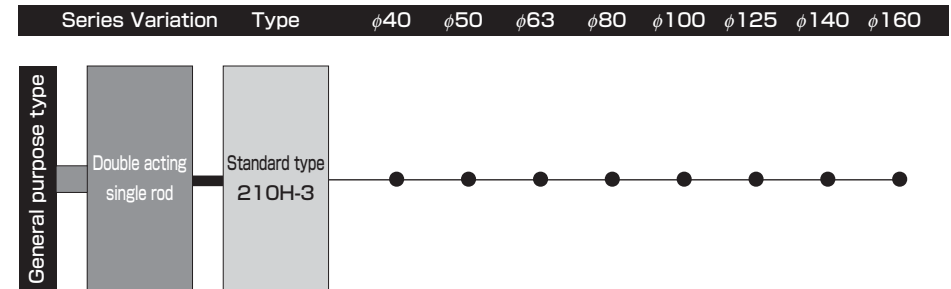
- In case that the lock nut is attached to the piston rod end thread part, increase the thread length (dimension A).

- For the internal structure, refer to the sectional drawings at the end of this catalog.

- Conex, material of the boots, is the registered trademark of Teijin Limited.

## Product Lineup

Unit: mm



## Adaptability of Fluid to Seal Material

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

Notes) 1. ◎: Applicable, ×: Inapplicable. Consult us before using the △-marked items.

2. The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.

## Weight Table

Unit: kg

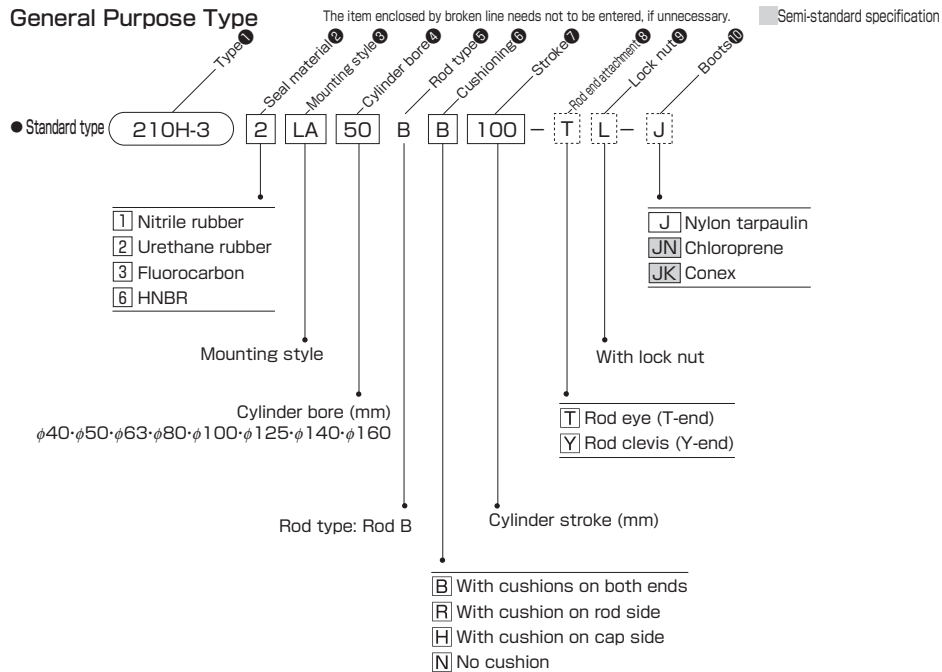
Bore mm	Basic weight	Additional weight per mm of stroke	Mounting accessory weight							Rod end attachment weight		
			LA	FA	FB	CA	CB	TA	TC	Rod eye (T-end)	Rod clevis (Y-end) w/ pin	Lock nut
φ40	4.44	0.0122	0.964	0.7	1.0	0.7	0.7	0.4	0.969	1.0	1.2	0.03
φ50	8.06	0.0202	1.11	1.2	1.9	1.3	1.1	0.4	1.49	1.4	2.2	0.05
φ63	13.2	0.0293	1.27	1.9	3.7	2.0	1.7	0.6	2.03	2.2	3.7	0.11
φ80	23.6	0.0451	1.91	2.0	4.7	3.4	3.0	1.0	2.91	4.2	7.7	0.24
φ100	39.6	0.0738	5.11	4.4	9.7	6.4	5.2	2.1	7.61	8.0	14.6	0.52
φ125	68.5	0.121	8.50	10.0	18.6	13.2	11.0	4.0	13.0	31.1	20.5	1.10
φ140	92.4	0.164	5.20	8.6	21.8	16.5	13.4	5.2	15.1	36.7	24.4	1.44
φ160	126	0.192	4.70	13.7	30.0	25.6	20.4	7.1	23.7	58.8	41.1	1.93

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

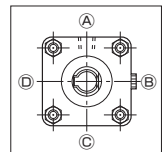
Calculation example) 210H-3, bore φ100, cylinder stroke 500 mm, LA style  
39.6+(500×0.0738)+5.11=81.61kg

### How to order

#### General Purpose Type



#### Standard specifications



Note) There are check valves on two sides out of the four outer sides of cap and rod covers except the port and cushion sides. The check valve is concurrently used with air vent.

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

#### Change of port position

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

(Example) 210H-3 2SD50BB100-B[C]-J

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

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

#### Standard range

- Change of piston rod end
- Change of TC accessory position (dimensional symbol: PH)
- With boots
- Plated cylinder tube (hard chrome plating thickness: 0.02 mm)

#### Standard Stroke Range

Unit: mm

Bore	Stroke
φ40	1500
φ50 to φ160	2000

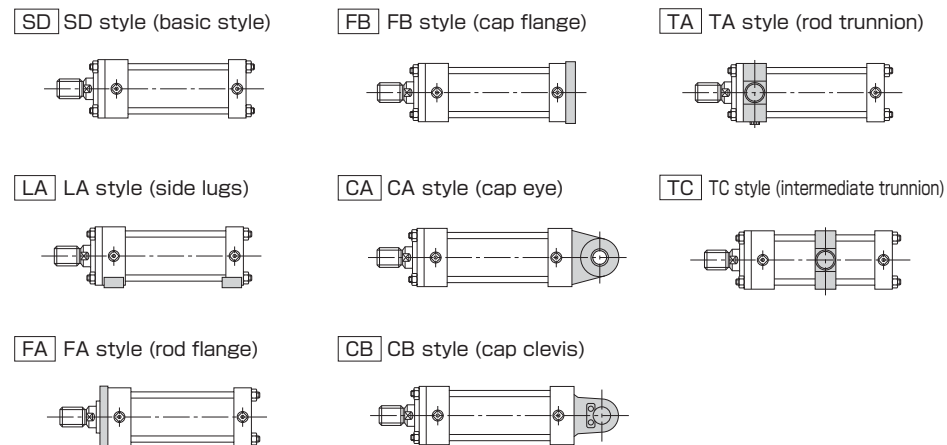
- The above strokes indicate the maximum available strokes for the standard type.
- For the rod buckling, check with the buckling chart in the selection materials.
- Contact us for longer strokes.

#### Adaptability of Fluid to Seal Material

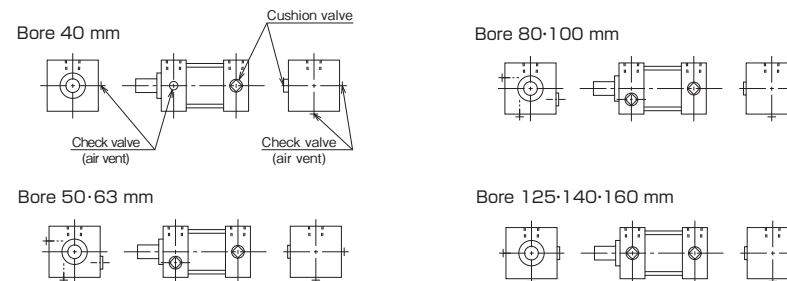
Seal material	Adaptable fluid				
	Petroleum-based fluid	Water-glycol ester fluid	Phosphate ester fluid	Water in oil fluid	Oil in water fluid
1 Nitrile rubber	○	○	×	○	○
2 Urethane rubber	◎	×	×	△	△
3 Fluorocarbon	○	×	○	○	○
6 HNBR	○	◎	×	◎	◎

Notes) 1. ◎○: Applicable, ×: Inapplicable. Consult us before using the △-marked items.  
2. The ◎-marked items are recommended seal materials in case of giving the first priority to abrasion resistance.

### Mounting style



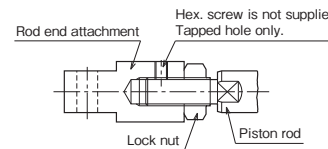
Cushion valve and check valve (air vent) positions depending on cylinder bore (when port is on A and cushion is on B)



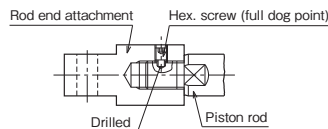
#### Delivery of rod end attachment (T-end or Y-end)

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

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



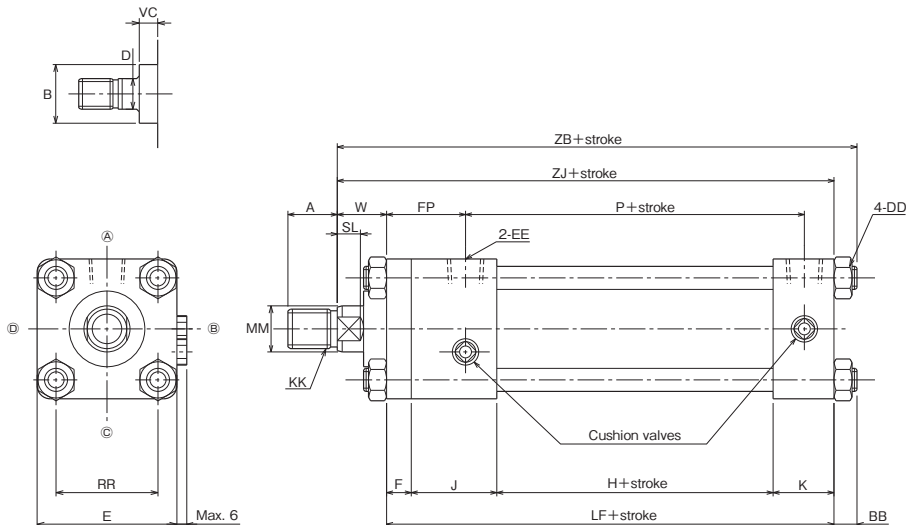
- When only the rod end attachment is additionally ordered (without lock nut)



210H-3/TH210 Bore CAD/DATA is available.

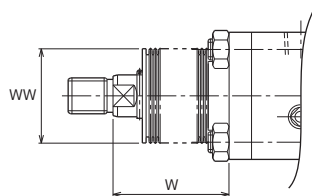
### SD

210H-3 2 SD Bore B B Stroke



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 Bore



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

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

#### Dimension W

Nylon tarpaulin	$\left( \begin{array}{l} \phi 40 \cdot \phi 50 \quad 1/3.5 \text{ stroke}+X \\ \phi 63 \text{ to } \phi 100 \quad 1/4 \text{ stroke}+X \\ \phi 125 \text{ to } \phi 160 \quad 1/5 \text{ stroke}+X \end{array} \right)$
Chloroprene	
Conex	
	$\left( \begin{array}{l} \phi 40 \cdot \phi 50 \quad 1/2.5 \text{ stroke}+X \\ \phi 63 \text{ to } \phi 100 \quad 1/3 \text{ stroke}+X \\ \phi 125 \cdot \phi 140 \quad 1/3.5 \text{ stroke}+X \\ \phi 160 \quad 1/4 \text{ stroke}+X \end{array} \right)$

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

### Dimensional Table

Symbol Bore	A	B	BB	D	DD	E	EE	F	FP	H
φ40	25	φ40	13	19	M12×1.5	□70	Rc <sup>3</sup> / <sub>8</sub>	13	43	64
φ50	30	φ46	14	24	M14×1.5	□85	Rc <sup>1</sup> / <sub>2</sub>	15	48	68
φ63	35	φ55	16	30	M16×1.5	□100	Rc <sup>1</sup> / <sub>2</sub>	18	56	75
φ80	45	φ65	18	41	M18×1.5	□125	Rc <sup>3</sup> / <sub>4</sub>	24	69	85
φ100	55	φ80	21	50	M22×1.5	□160	Rc <sup>3</sup> / <sub>4</sub>	26	71	95
φ125	75	φ95	25	65	M27×1.5	□190	Rc1	33	83	105
φ140	80	φ105	27	75	M30×1.5	□215	Rc1	36	86	110
φ160	90	φ120	29	85	M33×1.5	□240	Rc1	41	94	132

Symbol Bore	J	K	KK	LF	MM	P	RR	SL	VC	W	ZB	ZJ
φ40	47	32	M20×1.5	156	φ22.4	98	□50	11	11	30	199	186
φ50	52	37	M24×1.5	172	φ28	106	□62	12	14	30	216	202
φ63	57	37	M30×1.5	187	φ35.5	113	□74	16	15	35	238	222
φ80	67	42	M39×1.5	218	φ45	129	□92	20	9	35	271	253
φ100	67	42	M48×1.5	230	φ56	139	□120	20	14	40	291	270
φ125	77	52	M64×2	267	φ71	159	□145	26	13	45	337	312
φ140	77	52	M72×2	275	φ80	164	□165	30	14	50	352	325
φ160	80	51	M80×2	304	φ90	186	□185	33	14	55	388	359

- The tolerance of B is h8, and that of MM is f8.

### With Boots

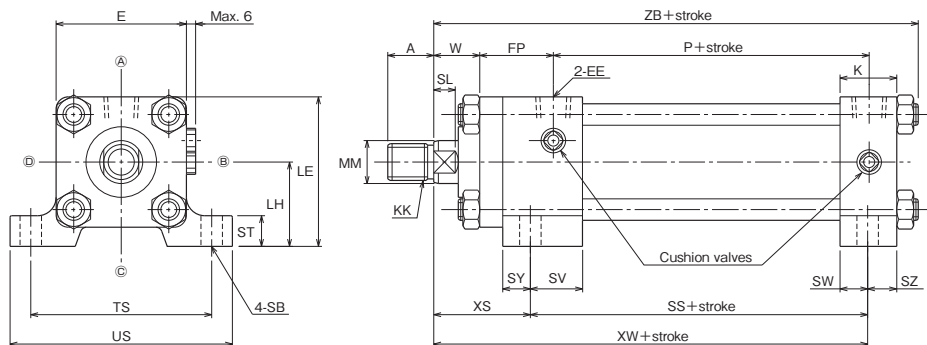
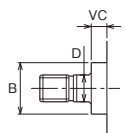
Symbol Bore	WW	X
φ40	φ50	47
φ50	φ63	50
φ63	φ71	61
φ80	φ80	55
φ100	φ100	60
φ125	φ125	69
φ140	φ125	70
φ160	φ140	70

210H-3/TH210 [Bore] CAD/DATA is available.

General Hydraulic Cylinders

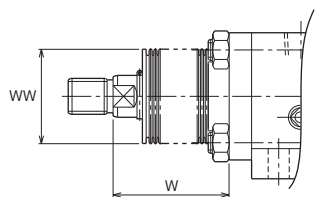
### LA

210H-3 [2] LA [Bore] B B Stroke



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 [Bore]



#### Dimension W

Nylon tarpaulin	$\phi 40 \cdot \phi 50$	1/3.5	stroke+X
Chloroprene	$\phi 63$ to $\phi 100$	1/4	stroke+X
	$\phi 125$ to $\phi 160$	1/5	stroke+X
Conex	$\phi 40 \cdot \phi 50$	1/2.5	stroke+X
	$\phi 63$ to $\phi 100$	1/3	stroke+X
	$\phi 125 \cdot \phi 140$	1/3.5	stroke+X
	$\phi 160$	1/4	stroke+X

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

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

(Notes) • Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.

- The boots have been mounted at our factory prior to delivery.
- Conex is the registered trademark of Teijin Limited.

General Hydraulic Cylinders

210H-3

### Dimensional Table

Symbol Bore	A	B	D	E	EE	FP	K	KK	LE	LH	MM	P	SB
$\phi 40$	25	$\phi 40$	19	$\square 70$	Rc $\frac{3}{8}$	43	32	M20×1.5	77	42±0.15	$\phi 22.4$	98	$\phi 11$
$\phi 50$	30	$\phi 46$	24	$\square 85$	Rc $\frac{1}{2}$	48	37	M24×1.5	97.5	55±0.15	$\phi 28$	106	$\phi 14$
$\phi 63$	35	$\phi 55$	30	$\square 100$	Rc $\frac{1}{2}$	56	37	M30×1.5	113	63±0.15	$\phi 35.5$	113	$\phi 18$
$\phi 80$	45	$\phi 65$	41	$\square 125$	Rc $\frac{3}{4}$	69	42	M39×1.5	137.5	75±0.25	$\phi 45$	129	$\phi 22$
$\phi 100$	55	$\phi 80$	50	$\square 160$	Rc $\frac{3}{4}$	71	42	M48×1.5	165	85±0.25	$\phi 56$	139	$\phi 26$
$\phi 125$	75	$\phi 95$	65	$\square 190$	Rc1	83	52	M64×2	200	105±0.25	$\phi 71$	159	$\phi 33$
$\phi 140$	80	$\phi 105$	75	$\square 215$	Rc1	86	52	M72×2	219.5	112±0.25	$\phi 80$	164	$\phi 33$
$\phi 160$	90	$\phi 120$	85	$\square 240$	Rc1	94	51	M80×2	245	125±0.25	$\phi 90$	186	$\phi 36$

Symbol Bore	SL	SS	ST	SV	SW	SY	SZ	TS	US	VC	W	XS	XW	ZB
$\phi 40$	11	111	15	31	16	16	16	98	122	11	30	59	170	199
$\phi 50$	12	120	20	34	18	18	19	118	145	14	30	63	183	216
$\phi 63$	16	132	25	39	18	18	19	140	175	15	35	71	203	238
$\phi 80$	20	152	30	46	21	21	21	175	210	9	35	80	232	271
$\phi 100$	20	162	35	44	23	23	24	215	260	14	40	89	251	291
$\phi 125$	26	182	45	49	28	28	29	270	330	13	45	106	288	337
$\phi 140$	30	187	45	49	28	28	29	280	335	14	50	114	301	352
$\phi 160$	33	212	50	49	31	31	31	315	375	14	55	127	339	388

• The tolerance of B is h8, and that of MM is f8.

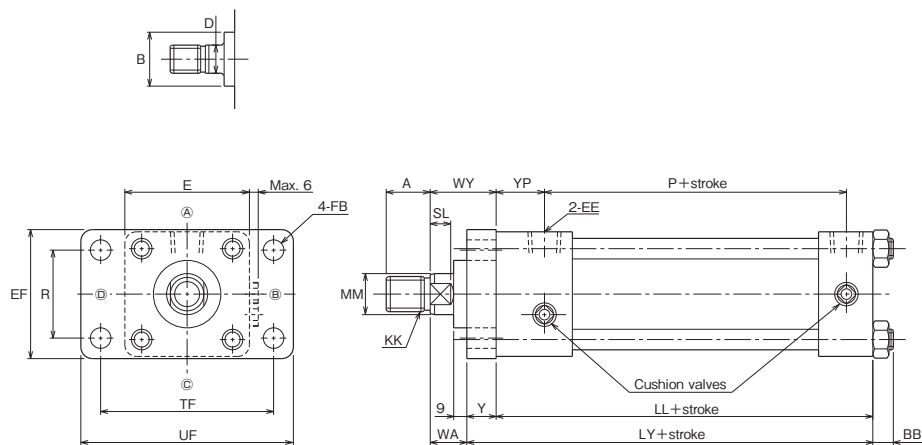
### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	47
$\phi 50$	$\phi 63$	50
$\phi 63$	$\phi 71$	61
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	60
$\phi 125$	$\phi 125$	69
$\phi 140$	$\phi 125$	70
$\phi 160$	$\phi 140$	70



210H-3/TH210  is available. 

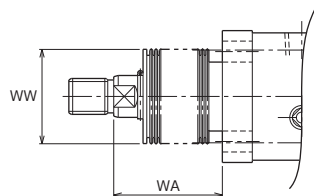
### FA

210H-3  FA  B  Stroke



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210  



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

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

#### Dimension WA

Nylon tarpaulin	(	$\phi 40 \cdot \phi 50$	1/3.5	stroke+X	)
Chloroprene	(	$\phi 63$ to $\phi 100$	1/4	stroke+X	)
	(	$\phi 125$ to $\phi 160$	1/5	stroke+X	)
Conex	(	$\phi 40 \cdot \phi 50$	1/2.5	stroke+X	)
	(	$\phi 63$ to $\phi 100$	1/3	stroke+X	)
	(	$\phi 125 \cdot \phi 140$	1/3.5	stroke+X	)
	(	$\phi 160$	1/4	stroke+X	)

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

### Dimensional Table

Symbol Bore	A	B	BB	D	E	EE	EF	FB	KK	LL
$\phi 40$	25	$\phi 40$	13	19	$\square 70$	Rc $\frac{3}{8}$	73	$\phi 11$	M20×1.5	143
$\phi 50$	30	$\phi 46$	14	24	$\square 85$	Rc $\frac{1}{2}$	88	$\phi 14$	M24×1.5	157
$\phi 63$	35	$\phi 55$	16	30	$\square 100$	Rc $\frac{1}{2}$	106	$\phi 18$	M30×1.5	169
$\phi 80$	45	$\phi 65$	18	41	$\square 125$	Rc $\frac{3}{4}$	130	$\phi 22$	M39×1.5	194
$\phi 100$	55	$\phi 80$	21	50	$\square 160$	Rc $\frac{3}{4}$	165	$\phi 26$	M48×1.5	204
$\phi 125$	75	$\phi 95$	25	65	$\square 190$	Rc1	205	$\phi 33$	M64×2	234
$\phi 140$	80	$\phi 105$	27	75	$\square 215$	Rc1	218	$\phi 33$	M72×2	239
$\phi 160$	90	$\phi 120$	29	85	$\square 240$	Rc1	243	$\phi 36$	M80×2	263

Symbol Bore	LY	MM	P	R	SL	TF	UF	WA	WY	Y	YP
$\phi 40$	158	$\phi 22.4$	98	50	11	98	122	28	43	15	30
$\phi 50$	177	$\phi 28$	106	60	12	118	145	25	45	20	33
$\phi 63$	193	$\phi 35.5$	113	73	16	140	175	29	53	24	38
$\phi 80$	218	$\phi 45$	129	90	20	175	210	35	59	24	45
$\phi 100$	235	$\phi 56$	139	115	20	215	260	35	66	31	45
$\phi 125$	271	$\phi 71$	159	145	26	270	330	41	78	37	50
$\phi 140$	280	$\phi 80$	164	160	30	280	335	45	86	41	50
$\phi 160$	309	$\phi 90$	186	180	33	315	375	50	96	46	53

- The tolerance of B is h8, and that of MM is f8.

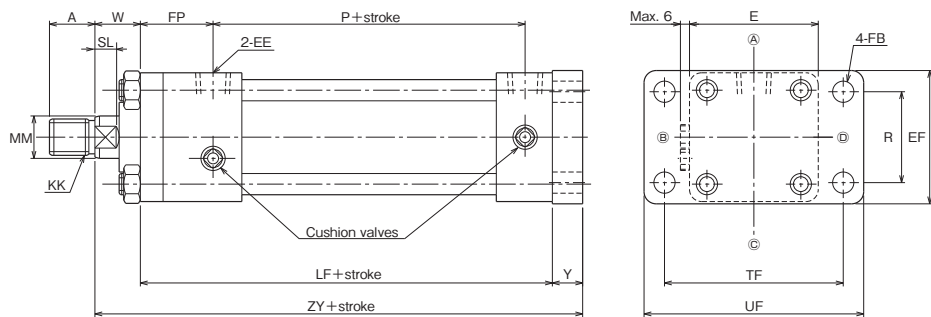
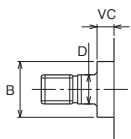
### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	45
$\phi 50$	$\phi 63$	45
$\phi 63$	$\phi 71$	55
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	55
$\phi 125$	$\phi 125$	65
$\phi 140$	$\phi 125$	65
$\phi 160$	$\phi 140$	65

210H-3/TH210  CAD/DATA is available.

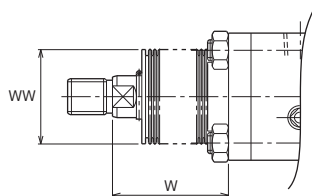
### FB

210H-3



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210



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

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

#### Dimension W

Nylon tarpaulin	(	$\phi 40 \cdot \phi 50$	1/3.5	stroke+X	)
Chloroprene	(	$\phi 63$ to $\phi 100$	1/4	stroke+X	)
	(	$\phi 125$ to $\phi 160$	1/5	stroke+X	)
Conex	(	$\phi 40 \cdot \phi 50$	1/2.5	stroke+X	)
	(	$\phi 63$ to $\phi 100$	1/3	stroke+X	)
	(	$\phi 125 \cdot \phi 140$	1/3.5	stroke+X	)
	(	$\phi 160$	1/4	stroke+X	)

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

### Dimensional Table

Symbol Bore	A	B	D	E	EE	EF	FB	FP	KK
$\phi 40$	25	$\phi 40$	19	$\square 70$	Rc $\frac{3}{8}$	73	$\phi 11$	43	M20×1.5
$\phi 50$	30	$\phi 46$	24	$\square 85$	Rc $\frac{1}{2}$	88	$\phi 14$	48	M24×1.5
$\phi 63$	35	$\phi 55$	30	$\square 100$	Rc $\frac{1}{2}$	106	$\phi 18$	56	M30×1.5
$\phi 80$	45	$\phi 65$	41	$\square 125$	Rc $\frac{3}{4}$	130	$\phi 22$	69	M39×1.5
$\phi 100$	55	$\phi 80$	50	$\square 160$	Rc $\frac{3}{4}$	165	$\phi 26$	71	M48×1.5
$\phi 125$	75	$\phi 95$	65	$\square 190$	Rc1	205	$\phi 33$	83	M64×2
$\phi 140$	80	$\phi 105$	75	$\square 215$	Rc1	218	$\phi 33$	86	M72×2
$\phi 160$	90	$\phi 120$	85	$\square 240$	Rc1	243	$\phi 36$	94	M80×2

Symbol Bore	LF	MM	P	R	SL	TF	UF	VC	W	Y	ZY
$\phi 40$	156	$\phi 22.4$	98	50	11	98	122	11	30	15	201
$\phi 50$	172	$\phi 28$	106	60	12	118	145	14	30	20	222
$\phi 63$	187	$\phi 35.5$	113	73	16	140	175	15	35	24	246
$\phi 80$	218	$\phi 45$	129	90	20	175	210	9	35	24	277
$\phi 100$	230	$\phi 56$	139	115	20	215	260	14	40	31	301
$\phi 125$	267	$\phi 71$	159	145	26	270	330	13	45	37	349
$\phi 140$	275	$\phi 80$	164	160	30	280	335	14	50	41	366
$\phi 160$	304	$\phi 90$	186	180	33	315	375	14	55	46	405

- The tolerance of B is h8, and that of MM is f8.

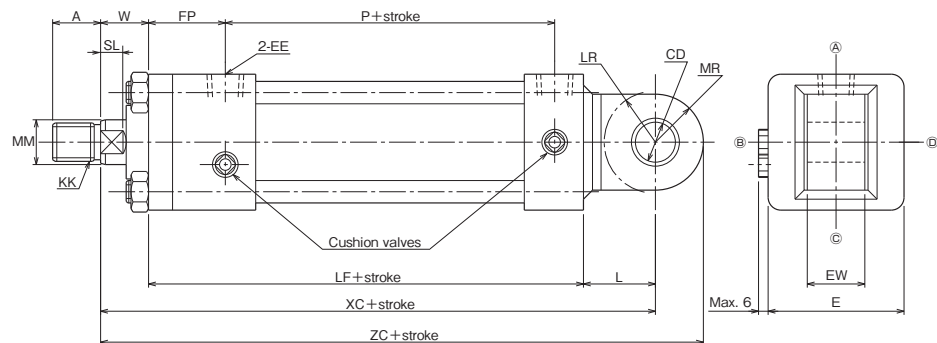
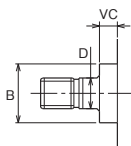
### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	47
$\phi 50$	$\phi 63$	50
$\phi 63$	$\phi 71$	61
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	60
$\phi 125$	$\phi 125$	69
$\phi 140$	$\phi 125$	70
$\phi 160$	$\phi 140$	70

210H-3/TH210 [Bore] CAD/DATA is available.

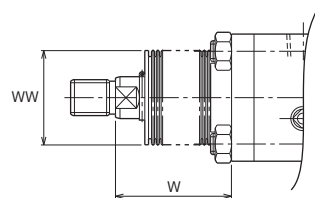
### CA

210H-3 [2] CA [Bore] B B Stroke



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 [Bore]



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

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

#### Dimension W

Nylon tarpaulin Chloroprene	$\phi 40 \cdot \phi 50$	1/3.5	stroke+X
	$\phi 63$ to $\phi 100$	1/4	stroke+X
	$\phi 125$ to $\phi 160$	1/5	stroke+X
Conex	$\phi 40 \cdot \phi 50$	1/2.5	stroke+X
	$\phi 63$ to $\phi 100$	1/3	stroke+X
	$\phi 125 \cdot \phi 140$	1/3.5	stroke+X
	$\phi 160$	1/4	stroke+X

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

### Dimensional Table

Symbol Bore	A	B	CD	D	E	EE	EW	FP	KK
$\phi 40$	25	$\phi 40$	$\phi 20H9$	19	$\square 70$	Rc $\frac{3}{8}$	$32 \begin{smallmatrix} -0.1 \\ -0.4 \end{smallmatrix}$	43	M20×1.5
$\phi 50$	30	$\phi 46$	$\phi 25H9$	24	$\square 85$	Rc $\frac{1}{2}$	$36 \begin{smallmatrix} -0.1 \\ -0.4 \end{smallmatrix}$	48	M24×1.5
$\phi 63$	35	$\phi 55$	$\phi 31.5H9$	30	$\square 100$	Rc $\frac{1}{2}$	$40 \begin{smallmatrix} -0.1 \\ -0.4 \end{smallmatrix}$	56	M30×1.5
$\phi 80$	45	$\phi 65$	$\phi 40H9$	41	$\square 125$	Rc $\frac{3}{4}$	$50 \begin{smallmatrix} -0.1 \\ -0.4 \end{smallmatrix}$	69	M39×1.5
$\phi 100$	55	$\phi 80$	$\phi 50H9$	50	$\square 160$	Rc $\frac{3}{4}$	$63 \begin{smallmatrix} -0.1 \\ -0.4 \end{smallmatrix}$	71	M48×1.5
$\phi 125$	75	$\phi 95$	$\phi 63H9$	65	$\square 190$	Rc1	$80 \begin{smallmatrix} -0.1 \\ -0.6 \end{smallmatrix}$	83	M64×2
$\phi 140$	80	$\phi 105$	$\phi 71H9$	75	$\square 215$	Rc1	$80 \begin{smallmatrix} -0.1 \\ -0.6 \end{smallmatrix}$	86	M72×2
$\phi 160$	90	$\phi 120$	$\phi 80H9$	85	$\square 240$	Rc1	$100 \begin{smallmatrix} -0.1 \\ -0.6 \end{smallmatrix}$	94	M80×2

Symbol Bore	L	LF	LR	MM	MR	P	SL	VC	W	XC	ZC
$\phi 40$	35	156	R25	$\phi 22.4$	R25	98	11	11	30	221	246
$\phi 50$	45	172	R32	$\phi 28$	R30	106	12	14	30	247	277
$\phi 63$	55	187	R40	$\phi 35.5$	R35	113	16	15	35	277	312
$\phi 80$	70	218	R50	$\phi 45$	R40	129	20	9	35	323	363
$\phi 100$	80	230	R63	$\phi 56$	R50	139	20	14	40	350	400
$\phi 125$	105	267	R79	$\phi 71$	R63	159	26	13	45	417	480
$\phi 140$	115	275	R89	$\phi 80$	R71	164	30	14	50	440	511
$\phi 160$	125	304	R100	$\phi 90$	R80	186	33	14	55	484	564

- The tolerance of B is h8, and that of MM is f8.

### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	47
$\phi 50$	$\phi 63$	50
$\phi 63$	$\phi 71$	61
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	60
$\phi 125$	$\phi 125$	69
$\phi 140$	$\phi 125$	70
$\phi 160$	$\phi 140$	70



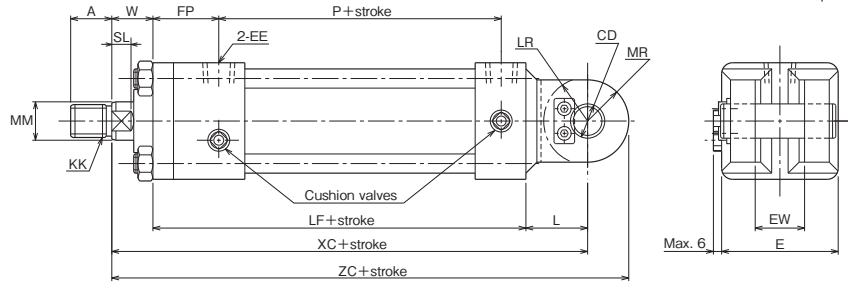
CAD/DATA is available. 

210H-3/TH210 Bore

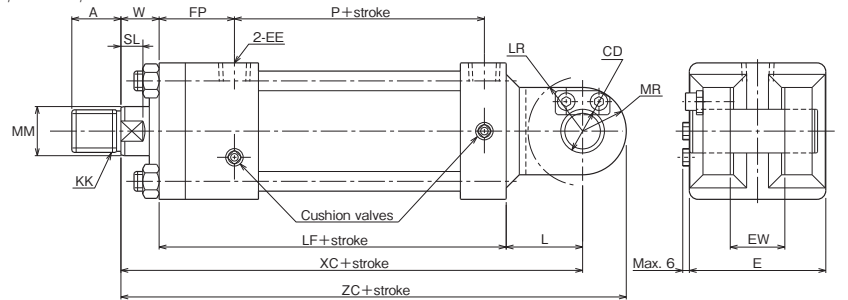
### CB

210H-3 2 CB Bore B B Stroke


#### • φ40 to φ63

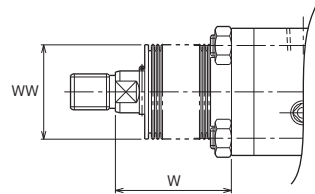


#### • φ80 to φ160



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 Bore 



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

Notes) • Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.

- The boots have been mounted at our factory prior to delivery.
- Conex is the registered trademark of Teijin Limited.

#### Dimension W

Nylon tarpaulin Chloroprene	φ40·φ50	1/3.5	stroke+X
	φ63 to φ100	1/4	stroke+X
	φ125 to φ160	1/5	stroke+X
Conex	φ40·φ50	1/2.5	stroke+X
	φ63 to φ100	1/3	stroke+X
	φ125·φ140	1/3.5	stroke+X
	φ160	1/4	stroke+X

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

### Dimensional Table

Symbol Bore	A	B	CD	D	E	EE	EW	FP	KK
φ40	25	φ40	φ20 <sup>H9/18</sup>	19	□70	Rc3/8	32 <sup>+0.4/+0.1</sup>	43	M20×1.5
φ50	30	φ46	φ25 <sup>H9/18</sup>	24	□85	Rc1/2	36 <sup>+0.4/+0.1</sup>	48	M24×1.5
φ63	35	φ55	φ31.5 <sup>H9/18</sup>	30	□100	Rc1/2	40 <sup>+0.4/+0.1</sup>	56	M30×1.5
φ80	45	φ65	φ40 <sup>H9/18</sup>	41	□125	Rc3/4	50 <sup>+0.4/+0.1</sup>	69	M39×1.5
φ100	55	φ80	φ50 <sup>H9/18</sup>	50	□160	Rc3/4	63 <sup>+0.4/+0.1</sup>	71	M48×1.5
φ125	75	φ95	φ63 <sup>H9/18</sup>	65	□190	Rc1	80 <sup>+0.6/+0.1</sup>	83	M64×2
φ140	80	φ105	φ71 <sup>H9/18</sup>	75	□215	Rc1	80 <sup>+0.6/+0.1</sup>	86	M72×2
φ160	90	φ120	φ80 <sup>H9/18</sup>	85	□240	Rc1	100 <sup>+0.6/+0.1</sup>	94	M80×2

Symbol Bore	L	LF	LR	MM	MR	P	SL	VC	W	XC	ZC
φ40	35	156	R25	φ22.4	R25	98	11	11	30	221	246
φ50	45	172	R32	φ28	R30	106	12	14	30	247	277
φ63	55	187	R40	φ35.5	R35	113	16	15	35	277	312
φ80	70	218	R50	φ45	R40	129	20	9	35	323	363
φ100	80	230	R63	φ56	R50	139	20	14	40	350	400
φ125	105	267	R79	φ71	R63	159	26	13	45	417	480
φ140	115	275	R89	φ80	R71	164	30	14	50	440	511
φ160	125	304	R100	φ90	R80	186	33	14	55	484	564

- The tolerance of B is h8, and that of MM is f8.

### With Boots

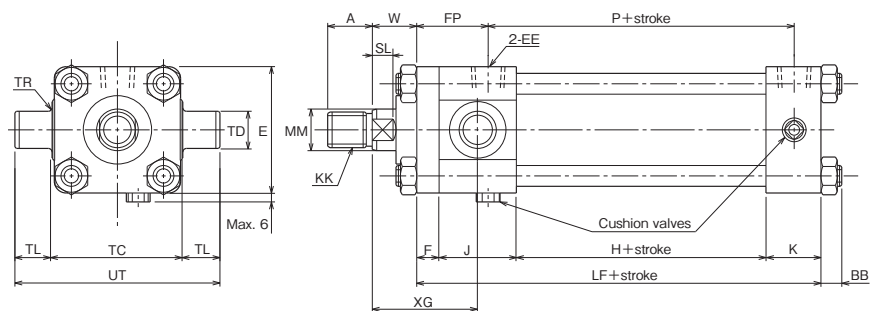
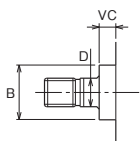
Symbol Bore	WW	X
φ40	φ50	47
φ50	φ63	50
φ63	φ71	61
φ80	φ80	55
φ100	φ100	60
φ125	φ125	69
φ140	φ125	70
φ160	φ140	70



210H-3/TH210 [Bore] CAD/DATA is available.

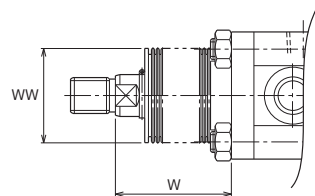
### TA

210H-3 [2] TA [Bore] [B] [Stroke]



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 [Bore]



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

Notes) • Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.

- The boots have been mounted at our factory prior to delivery.
- Conex is the registered trademark of Teijin Limited.

#### Dimension W

Nylon tarpaulin	( $\phi 40 \cdot \phi 50$ 1/3.5 stroke+X)
Chloroprene	( $\phi 63$ to $\phi 100$ 1/4 stroke+X)
	( $\phi 125$ to $\phi 160$ 1/5 stroke+X)
Conex	( $\phi 40 \cdot \phi 50$ 1/2.5 stroke+X)
	( $\phi 63$ to $\phi 100$ 1/3 stroke+X)
	( $\phi 125 \cdot \phi 140$ 1/3.5 stroke+X)
	( $\phi 160$ 1/4 stroke+X)

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

### Dimensional Table

Symbol Bore	A	B	BB	D	E	EE	F	FP	H	J	K
$\phi 40$	25	$\phi 40$	13	19	$\square 70$	Rc $\frac{3}{8}$	13	43	64	47	32
$\phi 50$	30	$\phi 46$	14	24	$\square 85$	Rc $\frac{1}{2}$	15	48	68	52	37
$\phi 63$	35	$\phi 55$	16	30	$\square 100$	Rc $\frac{1}{2}$	18	56	75	57	37
$\phi 80$	45	$\phi 65$	18	41	$\square 125$	Rc $\frac{3}{4}$	24	69	85	67	42
$\phi 100$	55	$\phi 80$	21	50	$\square 160$	Rc $\frac{3}{4}$	26	71	95	67	42
$\phi 125$	75	$\phi 95$	25	65	$\square 190$	Rc1	33	83	105	77	52
$\phi 140$	80	$\phi 105$	27	75	$\square 215$	Rc1	36	99	110	90	52
$\phi 160$	90	$\phi 120$	29	85	$\square 240$	Rc1	41	114	132	100	51

Symbol Bore	KK	LF	MM	P	SL	TC	TD	TL	TR	UT	VC	W	XG
$\phi 40$	M20×1.5	156	$\phi 22.4$	98	11	73 $^{0}_{-0.3}$	$\phi 25e9$	25	2.5	123	11	30	66
$\phi 50$	M24×1.5	172	$\phi 28$	106	12	88 $^{0}_{-0.35}$	$\phi 25e9$	25	2.5	138	14	30	71
$\phi 63$	M30×1.5	187	$\phi 35.5$	113	16	106 $^{0}_{-0.35}$	$\phi 31.5e9$	31.5	2.5	169	15	35	81
$\phi 80$	M39×1.5	218	$\phi 45$	129	20	128 $^{0}_{-0.4}$	$\phi 40e9$	40	3	208	9	35	92
$\phi 100$	M48×1.5	230	$\phi 56$	139	20	170 $^{0}_{-0.4}$	$\phi 50e9$	50	3	270	14	40	99
$\phi 125$	M64×2	267	$\phi 71$	159	26	205 $^{0}_{-0.46}$	$\phi 63e9$	63	4	331	13	45	116
$\phi 140$	M72×2	288	$\phi 80$	164	30	225 $^{0}_{-0.46}$	$\phi 71e9$	71	4	367	14	50	131
$\phi 160$	M80×2	324	$\phi 90$	186	33	255 $^{0}_{-0.52}$	$\phi 80e9$	80	4	415	14	55	146

- The tolerance of B is h8, and that of MM is f8.

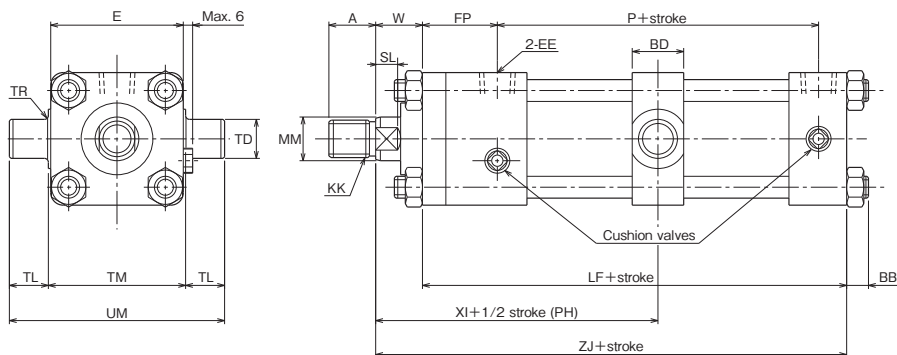
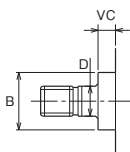
### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	47
$\phi 50$	$\phi 63$	50
$\phi 63$	$\phi 71$	61
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	60
$\phi 125$	$\phi 125$	69
$\phi 140$	$\phi 125$	70
$\phi 160$	$\phi 140$	70

210H-3/TH210 [Bore] is available.

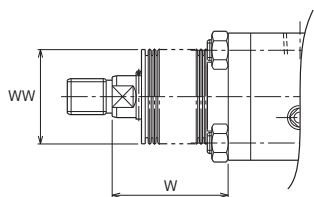
### TC

210H-3 [2] TC [Bore] B [B] Stroke



- The rod side of the 40 mm bore cylinder is provided with a fixed cushion. On cylinders with bores from 125 to 160 mm, the cushion valve is positioned in the center.
- For the thread length (dimension A) when the lock nut is used, refer to "Rod End Attachment".

210H-3/TH210 [Bore]



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

Notes) • Remember that the heat proof field in the table above shows the allowable temperatures for the boots, not for the cylinder.

- The boots have been mounted at our factory prior to delivery.
- Conex is the registered trademark of Teijin Limited.

#### Dimension W

Nylon tarpaulin	$\phi 40 \cdot \phi 50$	1/3.5	stroke+X
Chloroprene	$\phi 63$ to $\phi 100$	1/4	stroke+X
	$\phi 125$ to $\phi 160$	1/5	stroke+X
Conex	$\phi 40 \cdot \phi 50$	1/2.5	stroke+X
	$\phi 63$ to $\phi 100$	1/3	stroke+X
	$\phi 125 \cdot \phi 140$	1/3.5	stroke+X
	$\phi 160$	1/4	stroke+X

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

### Dimensional Table

Symbol Bore	A	B	BB	BD	D	E	EE	FP	KK	LF	MM
$\phi 40$	25	$\phi 40$	13	33	19	$\square 70$	Rc $\frac{3}{8}$	43	M20×1.5	156	$\phi 22.4$
$\phi 50$	30	$\phi 46$	14	33	24	$\square 85$	Rc $\frac{1}{2}$	48	M24×1.5	172	$\phi 28$
$\phi 63$	35	$\phi 55$	16	43	30	$\square 100$	Rc $\frac{1}{2}$	56	M30×1.5	187	$\phi 35.5$
$\phi 80$	45	$\phi 65$	18	53	41	$\square 125$	Rc $\frac{3}{4}$	69	M39×1.5	218	$\phi 45$
$\phi 100$	55	$\phi 80$	21	63	50	$\square 160$	Rc $\frac{3}{4}$	71	M48×1.5	230	$\phi 56$
$\phi 125$	75	$\phi 95$	25	78	65	$\square 190$	Rc1	83	M64×2	267	$\phi 71$
$\phi 140$	80	$\phi 105$	27	88	75	$\square 215$	Rc1	86	M72×2	275	$\phi 80$
$\phi 160$	90	$\phi 120$	29	98	85	$\square 240$	Rc1	94	M80×2	304	$\phi 90$

Symbol Bore	P	Min. PH	SL	TD	TL	TM	TR	UM	VC	W	XI	ZJ
$\phi 40$	98	107	11	$\phi 25e9$	25	73 $_{-0.3}^0$	2.5	123	11	30	122	186
$\phi 50$	106	114	12	$\phi 25e9$	25	88 $_{-0.35}^0$	2.5	138	14	30	131	202
$\phi 63$	113	132	16	$\phi 31.5e9$	31.5	106 $_{-0.35}^0$	2.5	169	15	35	148	222
$\phi 80$	129	153	20	$\phi 40e9$	40	128 $_{-0.4}^0$	3	208	9	35	169	253
$\phi 100$	139	165	20	$\phi 50e9$	50	170 $_{-0.4}^0$	3	270	14	40	181	270
$\phi 125$	159	219	26	$\phi 63e9$	63	205 $_{-0.46}^0$	4	331	13	45	208	312
$\phi 140$	164	232	30	$\phi 71e9$	71	225 $_{-0.46}^0$	4	367	14	50	218	325
$\phi 160$	186	253	33	$\phi 80e9$	80	255 $_{-0.52}^0$	4	415	14	55	242	359

- The tolerance of B is h8, and that of MM is f8.

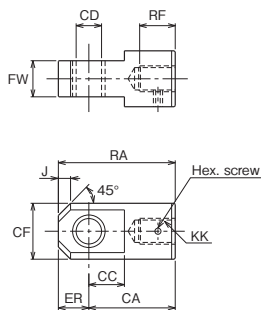
### With Boots

Symbol Bore	WW	X
$\phi 40$	$\phi 50$	47
$\phi 50$	$\phi 63$	50
$\phi 63$	$\phi 71$	61
$\phi 80$	$\phi 80$	55
$\phi 100$	$\phi 100$	60
$\phi 125$	$\phi 125$	69
$\phi 140$	$\phi 125$	70
$\phi 160$	$\phi 140$	70

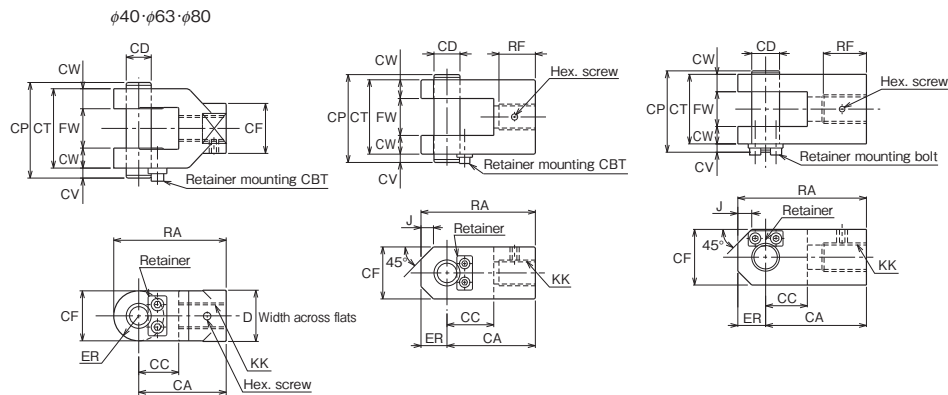
210H-3/TH210 Bore CAD/DATA is available.

### Rod End Attachment

#### ● Rod eye (T-end)



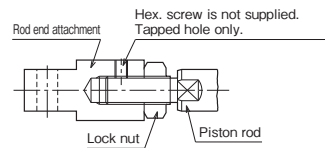
#### ● Rod clevis (Y-end) with pin



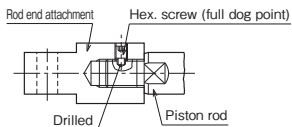
Note) The retainer of the 80 mm bore cylinder is located in the same position as that of cylinders with bores from 100 to 160 mm.

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

① When the lock nut and rod end attachment are additionally ordered  
 The rod end attachment and lock nut are temporarily assembled to the piston rod for delivery. Since the lock nut is not tightened, tighten it after adjusting the position of the rod end attachment. No hex. screw is supplied.



② When only the rod end attachment is additionally ordered (without lock nut)  
 The rod end attachment is tightened to the piston rod, and a drill hole is made on the piston rod for delivery. If the drill hole is unnecessary, give us such instructions.



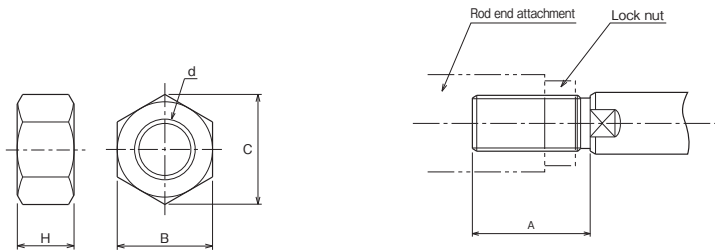
### Dimensional Table: Rod eye (T-end)

Symbol	Part number	CA	CC	CD	CF	ER	FW	J	KK	RA	RF
$\phi 40$	RTH-20-1-H	70	28	$\phi 20_{H10}$	$\phi 49$	25	$31.5_{-0.1}^{-0.4}$	10	M20×1.5	95	32
$\phi 50$	RTH-24-2-H	85	35	$\phi 25_{H10}$	$\phi 55$	30	$35.5_{-0.1}^{-0.4}$	12	M24×1.5	115	35
$\phi 63$	RTH-30-1-H	115	43	$\phi 31.5_{H10}$	$\phi 62$	35	$40_{-0.1}^{-0.4}$	15	M30×1.5	150	47
$\phi 80$	RTH-39-1-H	145	55	$\phi 40_{H10}$	$\phi 79$	40	$50_{-0.1}^{-0.4}$	20	M39×1.5	185	62
$\phi 100$	RTH-48-1-H	180	65	$\phi 50_{H10}$	$\phi 100$	50	$63_{-0.1}^{-0.4}$	30	M48×1.5	230	77
$\phi 125$	RTH-64-2-H	225	85	$\phi 63_{H10}$	$\phi 130$	65	$80_{-0.1}^{-0.4}$	40	M64×2	290	82
$\phi 140$	RTH-72-2-H	240	90	$\phi 71_{H10}$	$\phi 140$	70	$80_{-0.1}^{-0.6}$	45	M72×2	310	97
$\phi 160$	RTH-80-2-H	280	100	$\phi 80_{H10}$	$\phi 160$	80	$100_{-0.1}^{-0.6}$	50	M80×2	360	112

### Dimensional Table: Rod clevis (Y-end) with pin

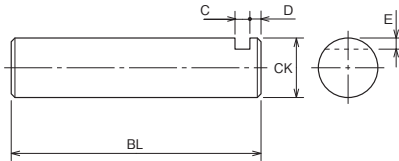
Symbol	Part number	CA	CC	CD	CF	CP	CT	CW	CV	D	ER	FW	J	KK	RA	RF
$\phi 40$	RYH-20-1-H	70	32	$\phi 20_{H10}$	40	76.5	63.5	16	8	41	R20	$31.5_{+0.1}^{+0.4}$	—	M20×1.5	90	—
$\phi 50$	RYH-24-2-H	85	45	$\phi 25_{H10}$	50	84.5	71.5	18	8	—	25	$35.5_{+0.1}^{+0.4}$	12	M24×1.5	110	35
$\phi 63$	RYH-30-H	115	50	$\phi 31.5_{H10}$	60	93	80	20	8	60	R30	$40_{+0.1}^{+0.4}$	—	M30×1.5	145	—
$\phi 80$	RYH-39-1-H	145	60	$\phi 40_{H10}$	80	117	100	25	12	80	R40	$50_{+0.1}^{+0.4}$	—	M39×1.5	185	—
$\phi 100$	RYH-48-1-H	180	70	$\phi 50_{H10}$	100	143	126	31.5	12	—	50	$63_{+0.1}^{+0.4}$	30	M48×1.5	230	77
$\phi 125$	RYH-64-2-H	225	90	$\phi 63_{H10}$	120	183	160	40	18	—	65	$80_{+0.1}^{+0.6}$	30	M64×2	290	82
$\phi 140$	RYH-72-2-H	240	100	$\phi 71_{H10}$	140	183	160	40	18	—	70	$80_{+0.1}^{+0.6}$	40	M72×2	310	97
$\phi 160$	RYH-80-2-H	280	110	$\phi 80_{H10}$	160	210	180	40	24	—	80	$100_{+0.1}^{+0.6}$	40	M80×2	360	112

### Lock nut

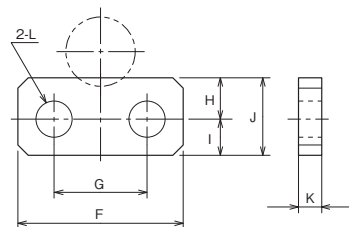


The standard fitting length of the rod end attachment and piston rod is about 80% of the thread diameter. If the fitting length is insufficient due to the use of the lock nut, it is necessary to increase the thread length (dimension A) as shown above.

### Parallel Pin



### Retainer



### Dimensional Table: Lock nut

Symbol	Part number	B	C	d	H
φ40	LNH-20F-H	27	31.2	M20×1.5	12
φ50	LNH-24F-H	32	37.0	M24×1.5	14
φ63	LNH-30F-H	41	47.3	M30×1.5	17
φ80	LNH-39F-H	55	63.5	M39×1.5	20
φ100	LNH-48F-H	70	80.8	M48×1.5	26
φ125	LNH-64F-H	90	104	M64×2	35
φ140	LNH-72F-H	100	115	M72×2	38
φ160	LNH-80F-H	110	127	M80×2	43

### Dimensional Table

Symbol	Dimension A
φ40	45
φ50	50
φ63	60
φ80	80
φ100	95
φ125	125
φ140	140
φ160	155

### Dimensional Table: Parallel pin

Symbol	BL	C	CK	D	E
φ40	76.5	5	φ20	3	3
φ50	84.5	5	φ25	3	3.5
φ63	93	5	φ31.5	3	4.75
φ80	117	7	φ40	5	5
φ100	143	7	φ50	5	5

• The tolerance of CK is f8.

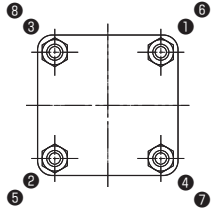
### Dimensional Table: Retainer

Symbol	F		G		H		I		J		K	L		Retainer mounting bolt size	
	For Y-end	For CB	For Y-end	For CB	For Y-end	For CB	For Y-end	For CB	For Y-end	For CB		For Y-end	For CB	For Y-end	For CB
φ40	32	32	18	18	7.5	7.5	7.5	7.5	15	15	4.5	φ7	φ7	M6	M6
φ50	32	32	18	18	7.5	7.5	7.5	7.5	15	15	4.5	φ7	φ7	M6	M6
φ63	32	32	18	18	7.5	7.5	7.5	7.5	15	15	4.5	φ7	φ7	M6	M6
φ80	50	50	30	30	10	12	10	10	20	22	6	φ10	φ12	M8	M10
φ100	65	50	40	30	12	12	10	10	22	22	6	φ12	φ12	M10	M10

## 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)	φ40	φ50	φ63	φ80	φ100	φ125	φ140	φ160
Tie rod screw	M12×1.5	M14×1.5	M16×1.5	M18×1.5	M22×1.5	M27×1.5	M30×1.5	M33×1.5
Tightening torque (N·m)	70	120	170	250	460	880	1100	1400

Use hex. nuts conforming to JIS B 1181 Class 2 (material: S45C). When tightening, apply molybdenum paste to the nuts.