

T Series

21 MPa



Tie Rod Type Cylinder

■ Features

Excellent Dependability

To prevent damage to the rod, the rod sliding surface is plated with high-quality chromium, and soft high strength brass is used for the rod bush. Also, high-performance U-packing is used for the rod packing. Back-pressure preventive grooved packing is used for the piston packing. Thus, the T series provides high reliability against oil leak and durability.

Certain, steady operation

The piston uses a wear ring to prevent seizure, ensuring improved reliability. The cushion mechanism provides high accuracy, enabling reliable operation.

■ Specifications

Series Name	T	TR
Nominal Pressure <small>Note1)</small>	21MPa	
Model	Standard : T	Switch adjusted :TR
Bore <small>Note2)</small>	$\phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100 \cdot \phi 125 \cdot \phi 140$ $\phi 160 \cdot \phi 180 \cdot \phi 200 \cdot \phi 224 \cdot \phi 250$	$\phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80$
Maximum Allowable Pressure <small>Note3)</small>	Cap Side:26.5MPa Head Side:Rod Type A 26.5MPa,Rod Type B 24.5MPa	
Proof Pressure	31.5MPa	
Minimum Working Pressure <small>Note4)</small>	Less than 0.84MPa	
Thread Tolerance	JIS6g/6H (Corresponds to JIS Grade 2)	
Range of Operating Temperature <small>Note5)</small>	Standard Specifications: -10°C to +80°C High Temperature Specifications: -10°C to +120°C	Standard Specifications: -10°C to +60°C High Temperature Specifications: -10°C to +100°C
Hydraulic Oil Applied	General purpose mineral hydraulic oil (When using operating oils other than above, be sure to report the brand name (s) after referring to the Packing material.)	
Adjustment standard	Governed by Former JIS B 8354	

Note 1) The "Nominal Pressure" is the set pressure of the relief valve in the hydraulic circuit the cylinder uses.

Note 2) The $\phi 180$ to $\phi 250$ bore diameters of the standard type are special sizes.

Note 3) The Maximum Allowable Pressure is the tolerance value for pressures such as surge pressures and increased pressures, in the hydraulic cylinder circuit that exceed the pressure set for operation.

Note 4) The Minimum Working Pressure is the value when the pressure is supplied from the cap side.

Note 5) In switch adjusted specifications, the temperature limit for the switch body should be under 60°C.

(Select a special high-temperature switch when temperatures will exceed 60°C)

■ Ranges of Operating Speed

Bore	Range
$\phi 40$ to $\phi 63$	8 to 400mm/s
$\phi 80$ to $\phi 125$	8 to 300mm/s
$\phi 140$ to $\phi 250$	8 to 200mm/s

Note) When operating at the maximum cylinder speed, keep the inertial load pressures generated within the cylinder chamber below the Nominal Pressure.

■ Maximum Stroke : Tie Rod Type

Bore	Maximum Stroke
$\phi 40$ or $\phi 50$	1,500mm
$\phi 63$ or $\phi 80$	1,600mm
$\phi 100$ to $\phi 160$	2,000mm
$\phi 180$ to $\phi 250$	1,500mm

Note 1) This is the Maximum Stroke for the standard item produced.

Note 2) Please consider the rod buckling separately.

■ Stroke Tolerance: Grade A

Units:mm

Stroke	100 or less	101 to 250	251 to 630	631 to 1,000	1,001 to 1,600	1,601 to 2,000
Allowable Value	+0.8 0	+1.0 0	+1.25 0	+1.4 0	+1.6 0	+1.8 0

Note) The dimensions and precision of other parts conform to the former JIS B 8354 standard.

■ Mounting Type

Format	Code	Appearance	Format	Code	Appearance
Basic	S φ40 to φ250		Single Protrusion Clevis	CA φ40 to φ250	
Axial Right Angle Direction Foot	LA φ40 to φ160		Double Protrusion Clevis	CB φ40 to φ160	
Head Side: Rectangular Flange	FA φ40 to φ250		Head Side Integral Trunnion	TA φ40 to φ250	
Cap Side Rectangular Flange	FB φ40 to φ250		Middle Trunnion	TC φ40 to φ250	

Note 2) (A)(B)(C)(D) are the positioning relationships for the port valve, etc.

■ Cushion Symbols

Code	B	R	H	N
Attachment Section	Cushion on Both Sides	Head-side Cushion	Cap-side Cushion	No Cushion

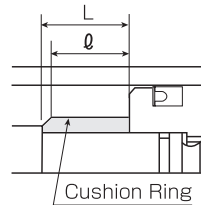
Note 1) The cushion for the φ40 A rod is a fixed cushion on the head side.

Note 2) For the φ40 A rod of the TR series (switch adjusted), the cushion on the rod side cannot be produced.

■ Cushion Shape

Units:mm

Bore	Cushion Ring Length (L)	Cushion Ring Parallel Section Length (ℓ)
φ40 to φ63	20	16
φ80 to φ100	25	21
φ125 to φ160	25	21
φ180 to φ224	30	26
φ250	35	31



Note 1) When stoppage is not done at the end of the stroke at a distance of 3mm or more beforehand, the cushioning effect is weakened and this should be taken into consideration. (Note that this is from φ32 to φ100)

Note 2) When a cushion with a stroke shorter than the cushion ring length is used, the cushion will remain expanded, so this should also be taken into consideration.

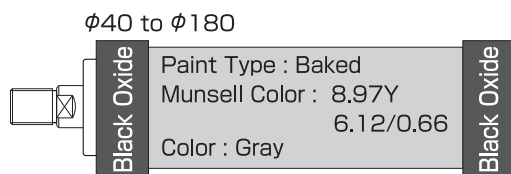
■ Cover Securing Formats

Securing Format	Appearance
Tie-rod System	

Note) The above specifications are the standard. The specifications may be changed depending on the mounting type.

■ Tube Coating Colors

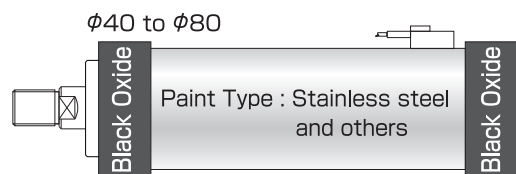
Standard



φ40 to φ180



Switch Adjusted Specifications



Note) If you have any questions with regard to the type of paint, please contact us.

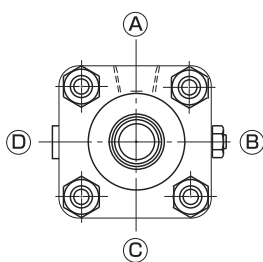
Slide Section Processing

Piston Rod: Hard chrome plating processing (more than 2/100mm)

Port/Valve Locations

In each of the dimension diagrams for mounting, the base position is given as A as seen from the rod side with the following positions expressed as BCD continuing in a clockwise direction.

- 1) The standard positions are: A……Port B……Cushion Valve C……Check Valve D……Air Bleed
- 2) In the case where differences from the standard positions have been specified, these are indicated by (A), (B), (C), (D).
- 3) In the case of no cushion, the standard positions are indicated by (A)(C)(D).
- 4) In the TA attachment format, the basic position for the head side is (A)(C)(C) or (A)(D)(C).
- 5) In the case of a fixed cushion, there is no cushion valve so this is annotated as (C).
- 6) In the case where there is no air bleed, this is indicated by (–).
The cylinder equipped with a cushion valve, no air bleed and two check valves is indicated as (C).
- 7) In the case where the head side and the cap side positions are different, they are indicated as (A)(B)(D) and (B)(C)(D) with the former being the head side and the latter being the cap side. In the case where they are depicted on two levels, the upper level is the cap side and the lower level is the head side.



Packing Materials

Code	1	2	3	9
Material	Nitrile Rubber	Urethane Rubber	Fluoric Rubber	Hydrogenated Nitrile Rubber
Range of operating temperature	–10°C to +80°C	–10°C to +80°C	–10°C to +120°C	–10°C to +120°C
General-purpose mineral hydraulic oil	○	◎	○	○
Emulsions of water in mineral oil	○	△	○	◎
Emulsions of mineral oil in water	○	△	○	◎
Water + Glycol-type Operating Oil	○	×	×	◎
Phosphate Ester fluid	×	×	○	×
Fatty Acid Ester fluid	○	×	△	△

Note) The ◎ or ○ mark indicates its use is possible. The X mark indicates it is not possible to use it.

Regarding the △ mark, consult us for details. The ◎ mark indicates the packing material recommended for applications where wear resistance is important.

Theoretical Output Table

Bore	Rod Diameter (mm)		Piston Area (cm ²)			Theoretical Output (N)		
	A Rod	B Rod	Push	Pull A Rod	Pull B Rod	Push	Pull A Rod	Pull B Rod
φ40	28	22.4	12.5	6.4	8.6	26,380	13,450	18,110
φ50	35.5	28	19.6	9.7	13.4	41,230	20,440	28,300
φ63	45	35.5	31.1	15.2	21.2	65,460	32,060	44,670
φ80	56	45	50.2	25.6	34.3	105,550	53,830	72,150
φ100	71	56	78.5	38.9	53.9	164,930	81,790	113,210
φ125	90	71	122.7	59.1	83.1	257,700	124,110	174,560
φ140	100	80	153.9	75.3	103.6	323,260	158,330	217,710
φ160	112	90	201.0	102.5	137.4	422,230	215,330	288,630
φ180	125	100	254.4	131.7	175.9	534,380	276,670	369,450
φ200	140	112	314.1	160.2	215.6	659,730	336,460	452,840
φ224	160	125	394.0	193.0	271.3	827,570	405,340	569,860
φ250	180	140	490.8	236.4	336.9	1,030,830	496,450	707,560

Code

The switch codes are not necessary for the T.

T - S A 2 TC 100 B B 320 A B D - [] Y P N J
TR - S A 2 TC 80 B B 300 A B D - 2 C - Y P N J
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯ ⑰ ⑱ ⑲

① Series Name	T: 21MPa
② Switch Adjusted Specifications	"R" is affixed in the case of cylinders with switch adjusted specifications. :TR
③ Single/Double Classification	S: Single Rod Type (Standard Type) W: Double Rod Type (Standard Equivalent)
④ Standard Special Classification <small>(Note1)</small>	A: Standard Dimensions
⑤ Packing Material	1. Nitrile Rubber (Standard Type:φ180 to φ250) 2. Urethane Rubber (Standard Type:φ40 to φ160) 3. Fluoric Rubber 9. Hydrogenated Nitrile Rubber
⑥ Mounting	S·LA·FA·FB·CA·CB·TA·TC (φ180 to φ250, there is no LA and CB.)
⑦ Bore (mm)	40·50·63·80·100·125·140·160·180·200·224·250 (Specifications for switch adjusted φ40 to φ80 is standard Type.).
⑧ Type of Rod	A: A Rod B: B Rod (Standard)
⑨ Cushion Format	B: Cushion on Both Sides R: Head-side Cushion H: Cap-side Cushion N: No Cushion
⑩ Stroke Length (mm)	Indicate the stroke.
⑪ Port Location	Refer to P.81 and then indicate A, B, C or D.
⑫ Cushion Valve Location	Refer to P.81 and then indicate A, B, C or D. O: No Cushion or Fixed Cushion
⑬ Air Bleed Location	Refer to P.81 and then indicate A, B, C or D. – No notation : None (Standard Equivalent)
⑭ Switch Quantity	Mentioned the quantity. 1A. When the switch is not needed in a switch-adjusted specifications.
⑮ Switch Type <small>(Note2)</small>	C:TOV3 J:TOV5 CK:T5V3 CL:T5V5 DT:T2V3 DU:T2V5 CW:T2YV3 CH:TOH3 JH:TOH5 FJ: TOV-0.5 (For a DC connector system) FW: TOV-0.5 (For an AC connector system) XX: Special Part <div style="background-color: #e0e0e0; padding: 5px; text-align: center;">Please refer to P.138 for more detailed information on switches.</div>
⑯ End Joint	T: Single Protrusion End Joint Y: Double Protrusion End Joint No notation: None
⑰ Pin	P: CB or the Y joint has a pin attached } (at φ125 or less, the pin is attached P2: CB and the Y joint have a pin attached } as standard equipment)
⑱ Lock Nut	N: Available (3 types) N2: Two lock nuts (3 types × 2 pieces) No notation: None
⑲ Bellows	J: Neoprene JS: Silicon Glass Cloth JA: Aluminum Foil Glass Cloth No entry: None (In the case where there are any other material specifications, please specify them).

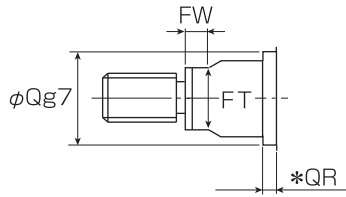
Note 1) The Special Standard Classification will be selected and mentioned at our company. Indicated in the product label.

Note 2) Switches are shipped unattached to prevent breakage.

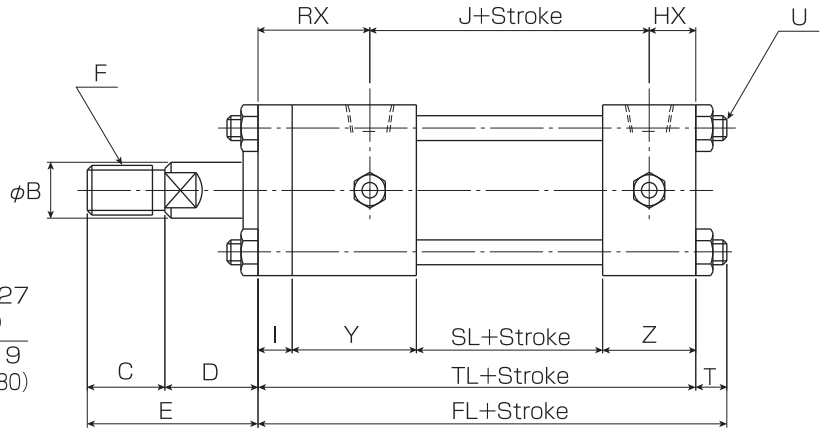
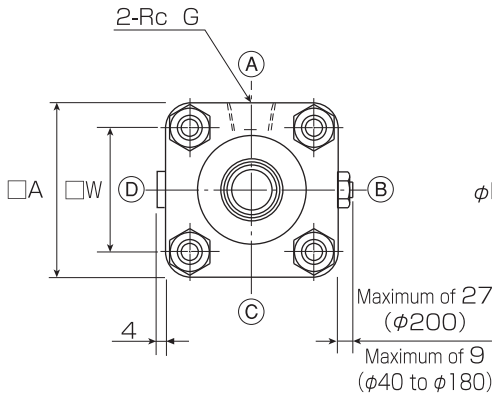
Note 3) To use the cylinder with lock nut, order a longer thread length by referring to the recommended thread length with lock nut given on p. 102.

Note 4) For the cylinder equipped with lock nut and end joint, the thread length conforms to the recommended thread length with lock nut given on p. 102.

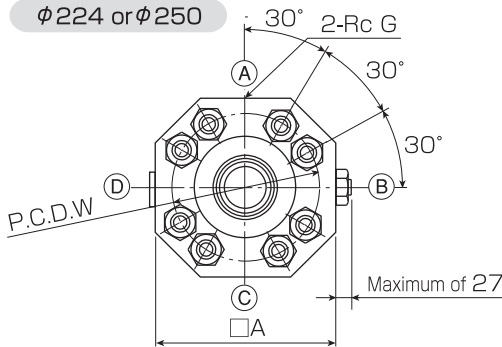
S Single Rod



φ40 to φ200



φ224 or φ250



Note 1) A, B, C, D are the positioning relationships of the port, valve, etc.
 Note 2) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P. 102.

S Type Basic Table of Dimensions

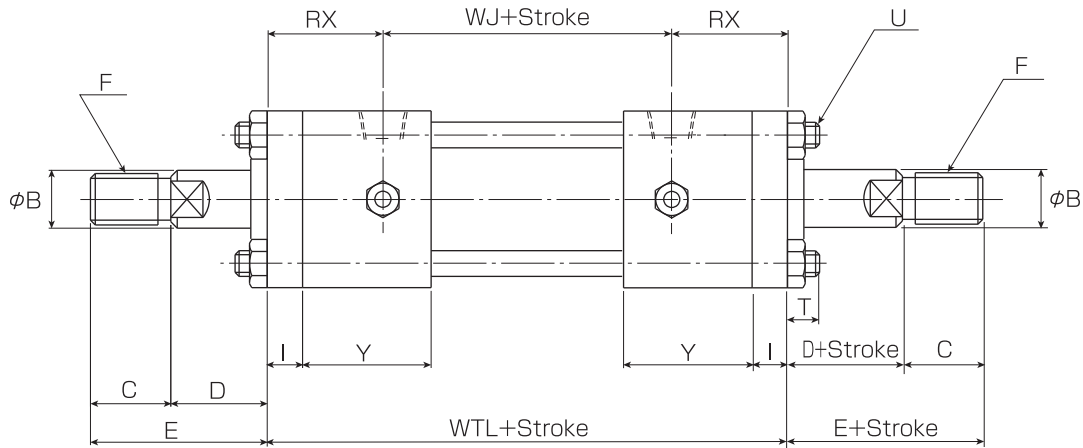
[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

Symbol Bore	B Rod								QR	D	TL	J	FL	RX	HX	SL	I	Y	Z	T	U	□A	□W	RcG
	φB	C	E	F	φQ	FT	FW																	
φ40	22.4	25	55	M20 P1.5	40	19	10	11	30	156	98	169	43	15	64	13	47	32	13	M12 P1.5	70	50	3/8	
φ50	28	30	60	M24 P1.5	46	24	10	14	30	172	106	186	48	18	68	15	52	37	14	M14 P1.5	85	62	1/2	
φ63	35.5	35	70	M30 P1.5	55	30	15	15	35	187	113	203	56	18	75	18	57	37	16	M16 P1.5	100	74	1/2	
φ80	45	45	80	M39 P1.5	65	41	15	9	35	218	129	236	69	20	85	24	67	42	18	M18 P1.5	125	92	3/4	
φ100	56	55	95	M48 P1.5	80	50	20	14	40	230	139	251	71	20	95	26	67	42	21	M22 P1.5	160	120	3/4	
φ125	71	75	120	M64 P2	95	65	25	13	45	267	159	292	83	25	105	33	77	52	25	M27 P1.5	190	145	1	
φ140	80	80	130	M72 P2	105	75	25	14	50	275	164	302	86	25	110	36	77	52	27	M30 P1.5	215	165	1	
φ160	90	90	145	M80 P2	120	85	30	14	55	304	186	333	94	24	132	41	80	51	29	M33 P1.5	240	185	1	
φ180	100	105	160	M95 P2.0	130	95	30	10	55	344	210	380	105	29	146	41	96	61	36	M39 P1.5	260	195	1 1/4	
φ200	112	110	165	M100 P2.0	140	105	30	10	55	389	228	430	121	40	156	51	106	76	41	M45 P1.5	310	230	1 1/2	
φ224	125	130	190	M120 P2.0	155	120	35	10	60	390	229	419	121	40	157	51	106	76	29	M33 P1.5	330	P.C.D. φ317	1 1/2	
φ250	140	140	205	M130 P2.0	170	133	45	10	65	444	262	480	134	48	166	56	126	96	36	M39 P1.5	375	P.C.D. φ355	2	

S Double Rod

[Standard Equivalent]



[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod's.]

Units:mm

Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61
φ180	125	105	165	M95 P2.0	155	120	35	10	60
φ200	140	110	175	M100 P2.0	170	133	45	10	65
φ224	160	130	195	M120 P2.0	190	155	45	10	65
φ250	180	140	205	M130 P2.0	215	170	45	10	65

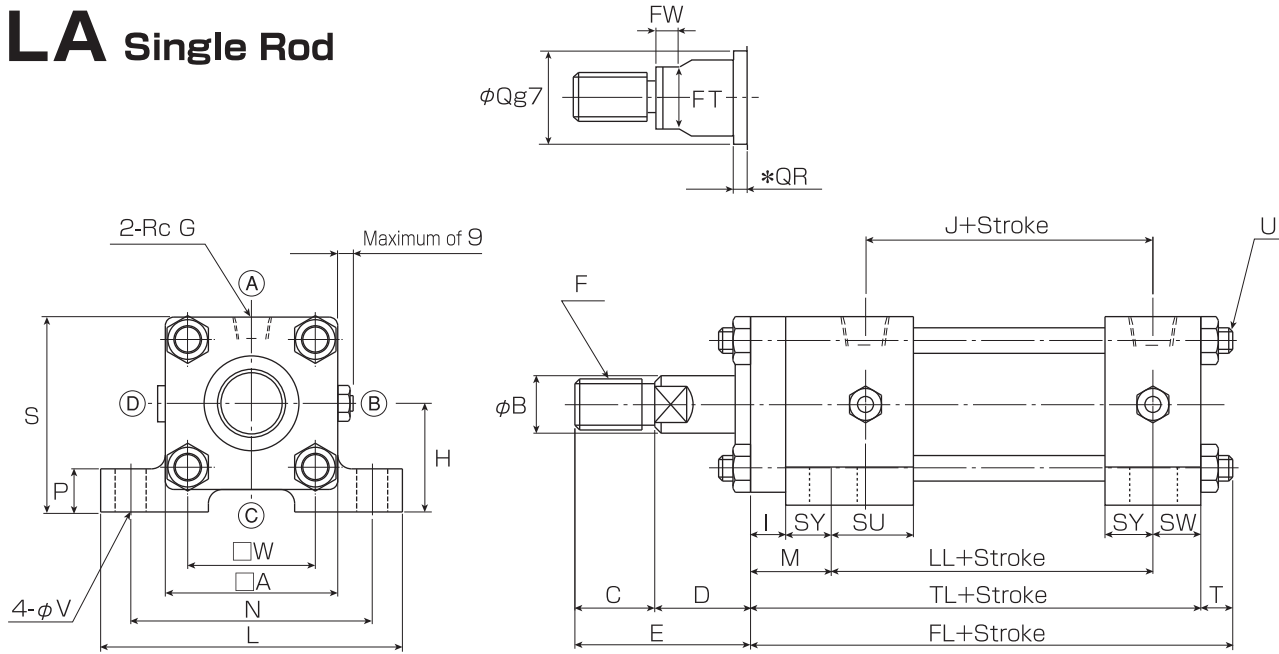
Note) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

Double Rod

Units:mm

Symbol Bore	Double Rod	
	WTL	WJ
φ40	184	98
φ50	202	106
φ63	225	113
φ80	267	129
φ100	281	139
φ125	325	159
φ140	336	164
φ160	374	186

LA Single Rod



Note 1) A, B, C, D are the positioning relationships of the port, valve, etc.

Note 2) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P.102.

LA Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

Symbol Bore	B Rod				QR	D	TL	J	LL	FL	I	M	SW	T	SU	SY	U	□A	□W	N	L	P	H	S	φV	RcG
	φB	C	E	F																						
φ40	22.4	25	55	M20 P1.5	11	30	156	98	111	169	13	29	16	13	31	16	M12 P1.5	70	50	98	122	15	42±0.15	77	11	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	120	186	15	33	19	14	34	18	M14 P1.5	85	62	118	145	20	55±0.15	97.5	14	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	132	203	18	36	19	16	39	18	M16 P1.5	100	74	140	175	25	63±0.15	113	18	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	152	236	24	45	21	18	46	21	M18 P1.5	125	92	175	210	30	75±0.25	137.5	22	3/4
φ100	56	55	95	M48 P1.5	14	40	235	139	162	251	26	49	24	21	44	23	M22 P1.5	160	120	215	260	35	85±0.25	165	26	3/4
φ125	71	75	120	M64 P2	13	45	272	159	182	292	33	61	29	25	49	28	M27 P1.5	190	145	270	330	45	105±0.25	200	33	1
φ140	80	80	130	M72 P2	14	50	280	164	187	302	36	64	29	27	49	28	M30 P1.5	215	165	280	335	45	112±0.25	219.5	33	1
φ160	90	90	145	M80 P2	14	55	315	186	212	333	41	72	31	29	49	31	M33 P1.5	240	185	315	375	50	125±0.25	245	36	1

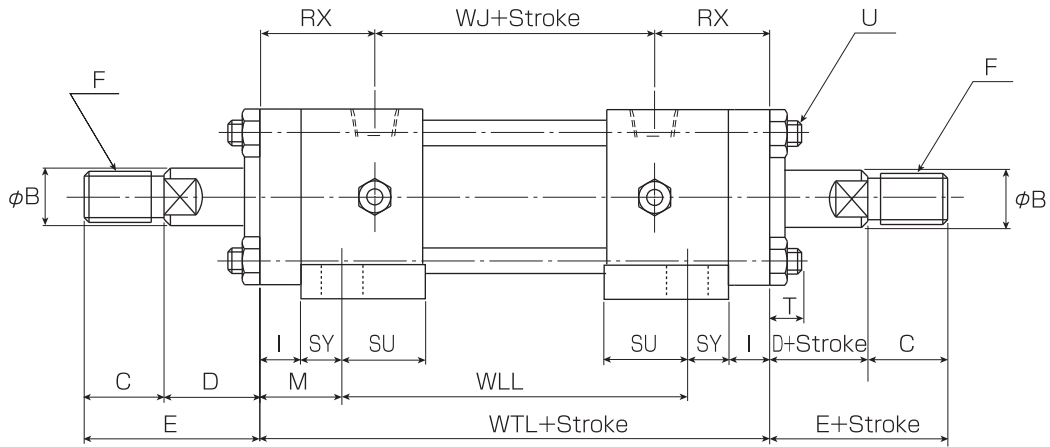
[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod 's.]

Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61

Note1) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

Note2) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

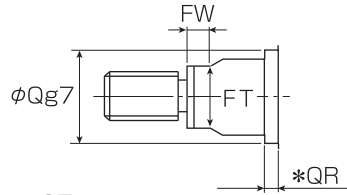
LA Double Rod
[Standard Equivalent]



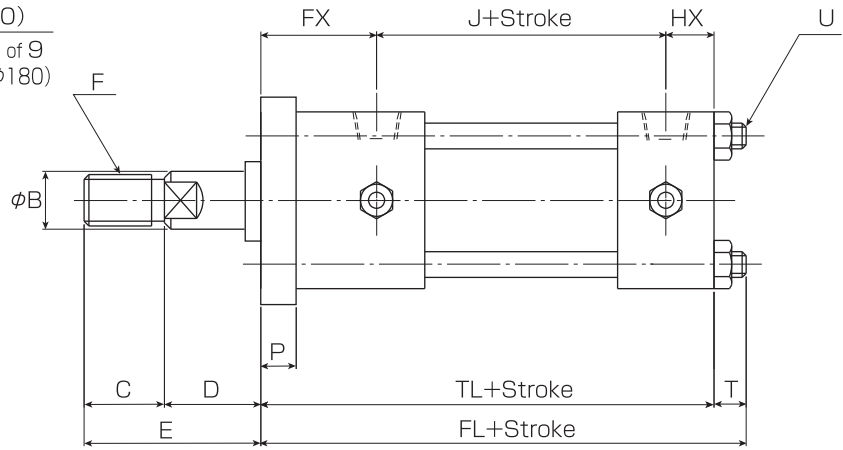
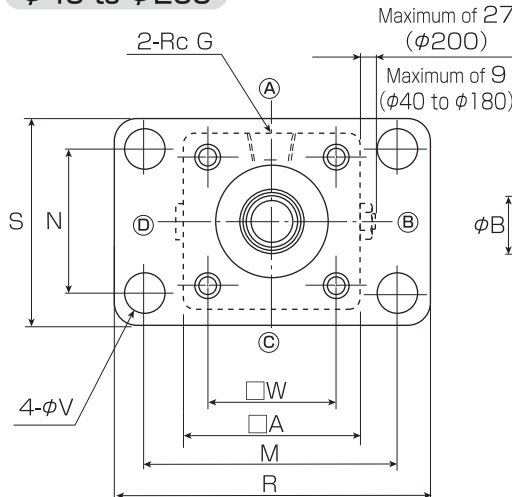
■ Double Rod Units:mm

Symbol Bore	WLL	WTL	WJ
φ40	126	184	98
φ50	136	202	106
φ63	153	225	113
φ80	177	267	129
φ100	183	281	139
φ125	203	325	159
φ140	208	336	164
φ160	230	374	186

FA Single Rod

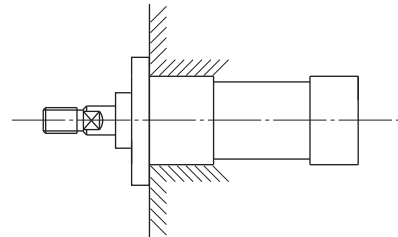
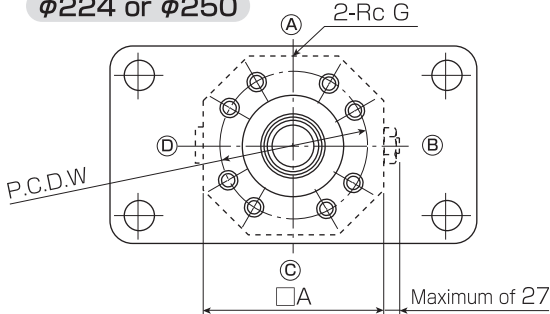


φ40 to φ200



Note 1) (A),(B),(C),(D) are the positioning relationships of the port, valve, etc.

φ224 or φ250



Note 2) When the 21 MPa FA series hydraulic cylinder shown in this figure is used for press applications, mount the cylinder in the above condition.

Note 3) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P.102.

FA Type Basic Table of Dimensions

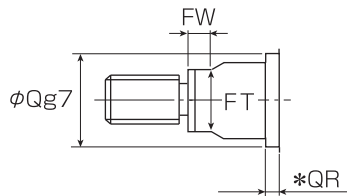
[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

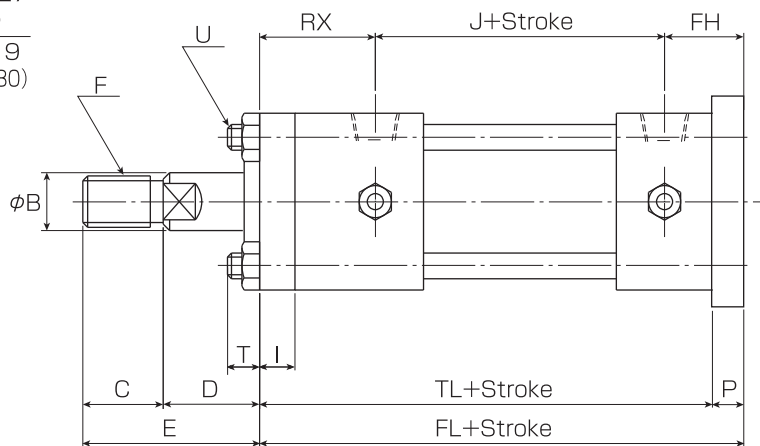
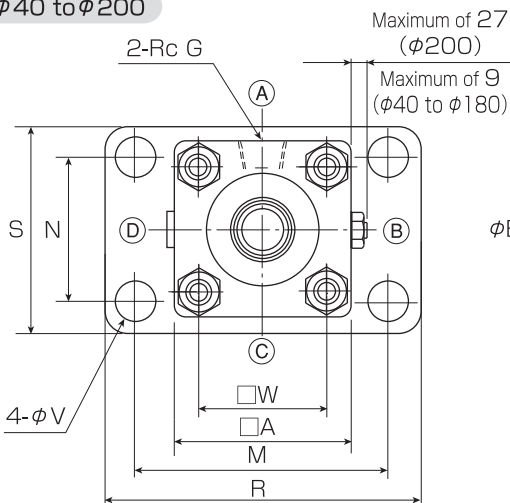
Symbol Bore	B Rod						QR	D	TL	J	FL	FX	HX	P	T	U	□A	□W	M	R	N	S	φV	RcG
	φB	C	E	F	φQ	φQ																		
φ40	22.4	25	53	M20 P1.5	40	9	28	158	98	171	45	15	15	13	M12 P1.5	70	50	98	122	50	73	11	3/8	
φ50	28	30	55	M24 P1.5	46	9	25	177	106	191	53	18	20	14	M14 P1.5	85	62	118	145	60	88	14	1/2	
φ63	35.5	35	64	M30 P1.5	55	9	29	193	113	209	62	18	24	16	M16 P1.5	100	74	140	175	73	106	18	1/2	
φ80	45	45	80	M39 P1.5	65	9	35	218	129	236	69	20	24	18	M18 P1.5	125	92	175	210	90	130	22	3/4	
φ100	56	55	90	M48 P1.5	80	9	35	235	139	256	76	20	31	21	M22 P1.5	160	120	215	260	115	165	26	3/4	
φ125	71	75	116	M64 P2	95	9	41	271	159	296	87	25	37	25	M27 P1.5	190	145	270	330	145	205	33	1	
φ140	80	80	125	M72 P2	105	9	45	280	164	307	91	25	41	27	M30 P1.5	215	165	280	335	160	218	33	1	
φ160	90	90	140	M80 P2	120	9	50	309	186	338	99	24	46	29	M33 P1.5	240	185	315	375	180	243	36	1	
φ180	100	105	160	M95 P2.0	130	10	55	359	210	395	120	29	56	36	M39 P1.5	260	195	345	412	200	265	39	1 1/4	
φ200	112	110	165	M100 P2.0	140	10	55	404	228	445	136	40	66	41	M45 P1.5	310	230	412	500	230	315	48	1 1/2	
φ224	125	130	190	M120 P2.0	155	10	60	410	229	439	141	40	71	29	M33 P1.5	330	P.C.D φ317	425	515	250	335	48	1 1/2	
φ250	140	140	205	M130 P2.0	170	10	65	469	262	505	159	48	81	36	M39 P1.5	375	P.C.D φ355	490	590	285	385	56	2	

Note) Please refer to S type basic size table of P.84 for B rod FT·FW.

FB Single Rod

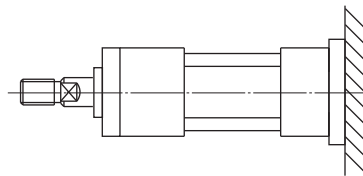
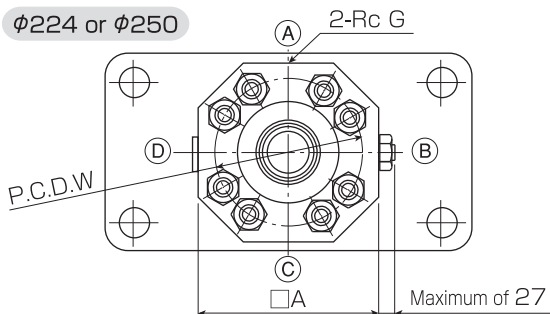


φ40 to φ200



Note 1) A, B, C, D are the positioning relationships of the port, valve, etc.

φ224 or φ250



Note 2) When the 21 MPa FA series hydraulic cylinder shown in this figure is used for press applications, mount the cylinder in the above condition.

Note 3) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P.102.

FB Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

Symbol Bore	B Rod				QR	D	TL	J	FL	RX	FH	P	T	I	U	□A	□W	M	R	N	S	φV	RcG
	φB	C	E	F																			
φ40	22.4	25	55	M20 P1.5	11	30	156	98	171	43	30	15	13	13	M12 P1.5	70	50	98	122	50	73	11	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	192	48	38	20	14	15	M14 P1.5	85	62	118	145	60	88	14	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	211	56	42	24	16	18	M16 P1.5	100	74	140	175	73	106	18	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	242	69	44	24	18	24	M18 P1.5	125	92	175	210	90	130	22	3/4
φ100	56	55	95	M48 P1.5	14	40	230	139	261	71	51	31	21	26	M22 P1.5	160	120	215	260	115	165	26	3/4
φ125	71	75	120	M64 P2	13	45	267	159	304	83	62	37	25	33	M27 P1.5	190	145	270	330	145	205	33	1
φ140	80	80	130	M72 P2	14	50	275	164	316	86	66	41	27	36	M30 P1.5	215	165	280	335	160	218	33	1
φ160	90	90	145	M80 P2	14	55	304	186	350	94	70	46	29	41	M33 P1.5	240	185	315	375	180	243	36	1
φ180	100	105	160	M95 P2.0	10	55	344	210	400	105	85	56	36	41	M39 P1.5	260	195	345	412	200	265	39	1 1/4
φ200	112	110	165	M100 P2.0	10	55	389	228	455	121	106	66	41	51	M45 P1.5	310	230	412	500	230	315	48	1 1/2
φ224	125	130	190	M120 P2.0	10	60	390	229	461	121	111	71	29	51	M33 P1.5	330	P.C.D φ317	425	515	250	335	48	1 1/2
φ250	140	140	205	M130 P2.0	10	65	444	262	525	134	129	81	36	56	M39 P1.5	375	P.C.D φ355	490	590	285	385	56	2

Note 2) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

FB

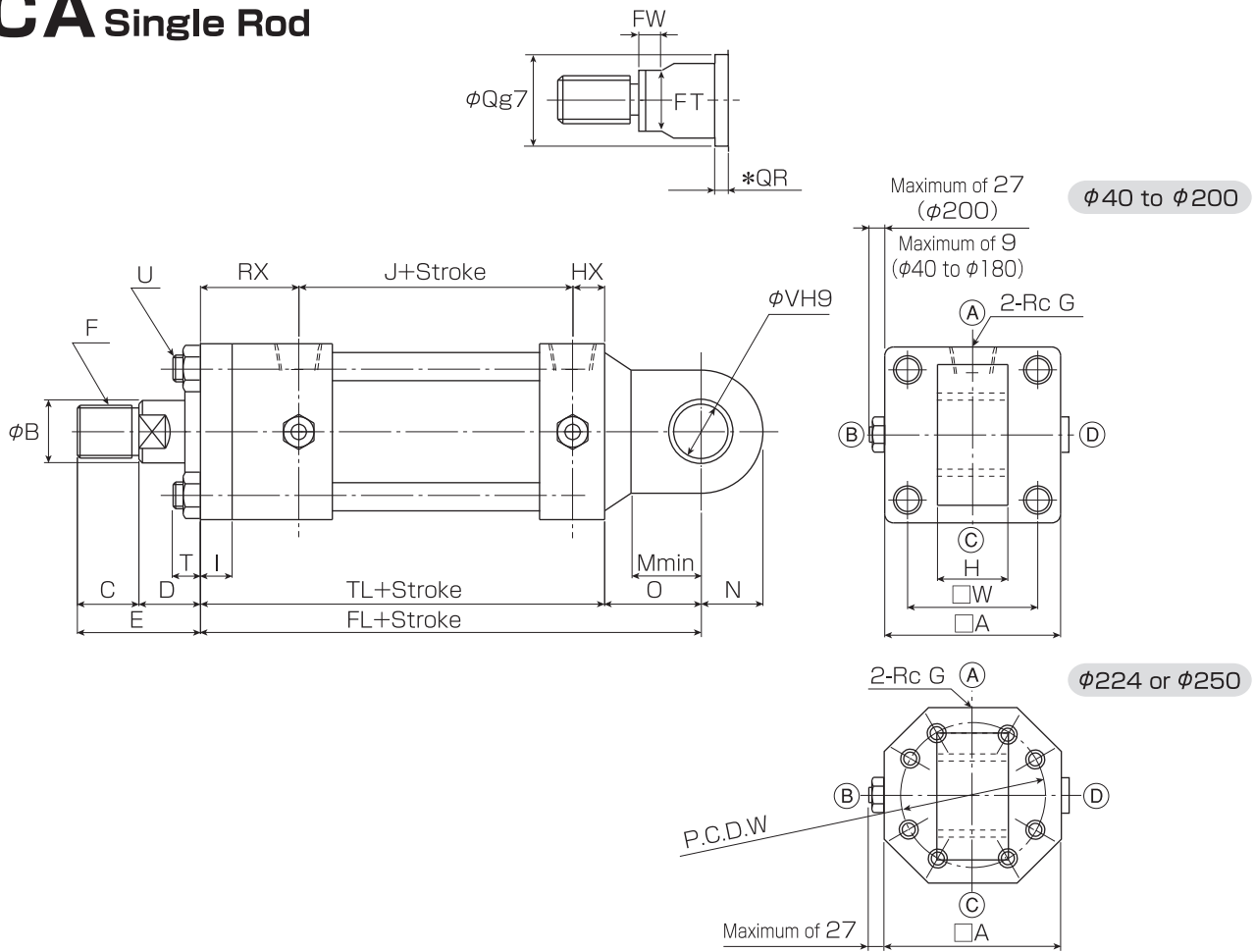
[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod 's.]

Units:mm

Symbol Bore	A Rod									
	φB	C	E	F	φQ	FT	FW	QR	D	
φ40	28	25	60	M20 P1.5	46	24	10	16	35	
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35	
φ63	45	35	70	M30 P1.5	65	41	15	15	35	
φ80	56	45	87	M39 P1.5	80	50	20	16	42	
φ100	71	55	101	M48 P1.5	95	65	20	20	46	
φ125	90	75	129	M64 P2	120	85	30	13	54	
φ140	100	80	131	M72 P2	130	95	30	15	51	
φ160	112	90	151	M80 P2	140	105	30	14	61	
φ180	125	105	165	M95 P2.0	155	120	35	10	60	
φ200	140	110	175	M100 P2.0	170	133	45	10	65	
φ224	160	130	195	M120 P2.0	190	155	45	10	65	
φ250	180	140	205	M130 P2.0	215	170	45	10	65	

Note) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

CA Single Rod



Note 1) (A),(B),(C),(D) are the positioning relationships of the port, valve, etc.

Note 2) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P.102.

CA Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

Symbol Bore	B Rod				QR	D	TL	J	FL	RX	HX	T	I	M	N	O	φV	U	□A	□W	H	RcG
	φB	C	E	F																		
φ40	22.4	25	55	M20 P1.5	11	30	156	98	191	43	15	13	13	25	25	35	20	M12 P1.5	70	50	32 ^{-0.1} -0.4	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	217	48	18	14	15	32	30	45	25	M14 P1.5	85	62	36 ^{-0.1} -0.4	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	242	56	18	16	18	40	35	55	31.5	M16 P1.5	100	74	40 ^{-0.1} -0.4	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	288	69	20	18	24	50	40	70	40	M18 P1.5	125	92	50 ^{-0.1} -0.4	3/4
φ100	56	55	95	M48 P1.5	14	40	230	139	310	71	20	21	26	63	50	80	50	M22 P1.5	160	120	63 ^{-0.1} -0.4	3/4
φ125	71	75	120	M64 P2	13	45	267	159	372	83	25	25	33	79	63	105	63	M27 P1.5	190	145	80 ^{-0.1} -0.6	1
φ140	80	80	130	M72 P2	14	50	275	164	390	86	25	27	36	89	71	115	71	M30 P1.5	215	165	80 ^{-0.1} -0.6	1
φ160	90	90	145	M80 P2	14	55	304	186	429	94	24	29	41	100	80	125	80	M33 P1.5	240	185	100 ^{-0.1} -0.6	1
φ180	100	105	160	M95 P2.0	10	55	344	210	489	105	29	36	41	120	108	145	90	M39 P1.5	260	195	125 ^{-0.1} -0.6	1 1/4
φ200	112	110	165	M100 P2.0	10	55	389	228	544	121	40	41	51	130	120	155	100	M45 P1.5	310	230	125 ^{-0.1} -0.6	1 1/2
φ224	125	130	190	M120 P2.0	10	60	390	229	565	121	40	29	51	150	135	175	112	M33 P1.5	330	P.C.D. φ317	140 ^{-0.1} -0.6	1 1/2
φ250	140	140	205	M130 P2.0	10	65	444	262	639	134	48	36	56	165	150	195	125	M39 P1.5	375	P.C.D. φ355	160 ^{-0.1} -0.6	2

Note) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

CA

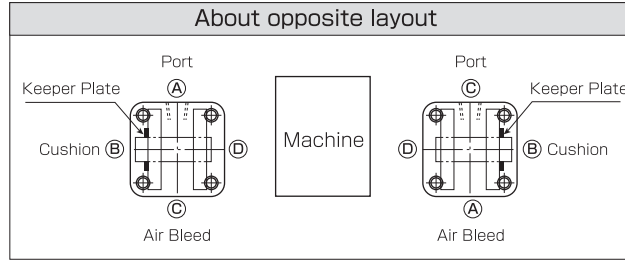
[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod's.]

Units:mm

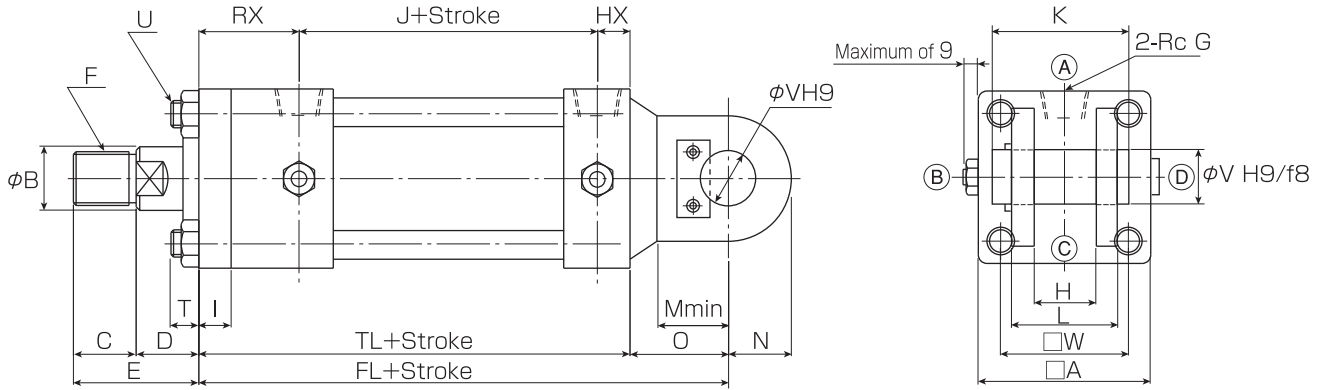
Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61
φ180	125	105	165	M95 P2.0	155	120	35	10	60
φ200	140	110	175	M100 P2.0	170	133	45	10	65
φ224	160	130	195	M120 P2.0	190	155	45	10	65
φ250	180	140	205	M130 P2.0	215	170	45	10	65

Note) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

CB Single Rod



The CB mounting is equipped with a keeper plate for fastening the pin. Normally, the keeper plate is located at the B position. If you order the opposite layout to use two cylinders, specify the model code that indicates the opposite layout: For example: "ABC" (as shown on the left), or "CBA" (as shown on the right).



- Note 1) A, B, C, D are the positioning relationships of the port, valve, etc.
- Note 2) Pins are included as standard up to φ125. They are offered as options above φ140.
- Note 3) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P.102.

CB Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

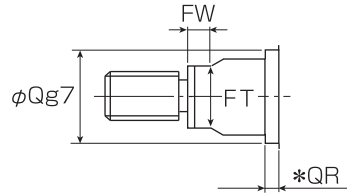
Symbol Bore	B Rod				QR	D	TL	J	FL	RX	HX	T	I	M	N	O	φV	U	□A	□W	H	L	K	RcG
	φB	C	E	F																				
φ40	22.4	25	55	M20 P1.5	11	30	156	98	191	43	15	13	13	25	25	35	20	M12 P1.5	70	50	32 ^{+0.4} / _{+0.1}	64	76.5	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	217	48	18	14	15	32	30	45	25	M14 P1.5	85	62	36 ^{+0.4} / _{+0.1}	72	85	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	242	56	18	16	18	40	35	55	31.5	M16 P1.5	100	74	40 ^{+0.4} / _{+0.1}	80	93	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	288	69	20	18	24	50	40	70	40	M18 P1.5	125	92	50 ^{+0.4} / _{+0.1}	100	117	3/4
φ100	56	55	95	M48 P1.5	14	40	230	139	310	71	20	21	26	63	50	80	50	M22 P1.5	160	120	63 ^{+0.4} / _{+0.1}	126	143	3/4
φ125	71	75	120	M64 P2	13	45	267	159	372	83	25	25	33	79	63	105	63	M27 P1.5	190	145	80 ^{+0.6} / _{+0.1}	160	183	1
φ140	80	80	130	M72 P2	14	50	275	164	390	86	25	27	36	89	71	115	71	M30 P1.5	215	165	80 ^{+0.6} / _{+0.1}	160	183	1
φ160	90	90	145	M80 P2	14	55	304	186	429	94	24	29	41	100	80	125	80	M33 P1.5	240	185	100 ^{+0.6} / _{+0.1}	200	225	1

[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod 's.]

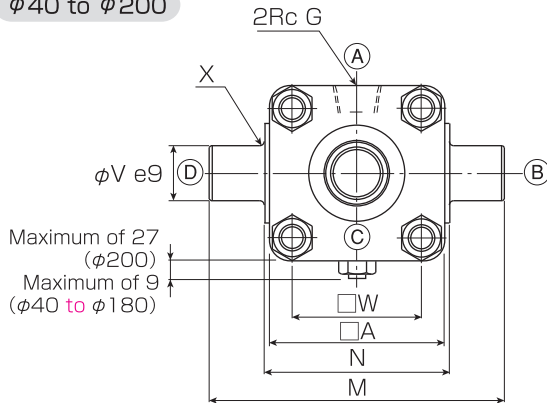
Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61

- Note 1) The cushion for the φ40 A Rod is a fixed cushion on the head-side.
- Note 2) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

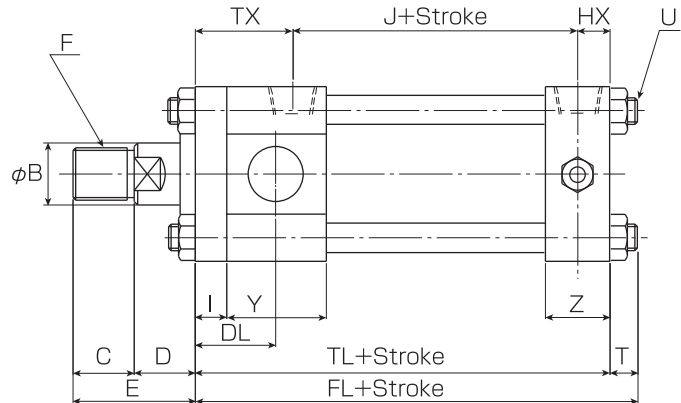
TA Single Rod



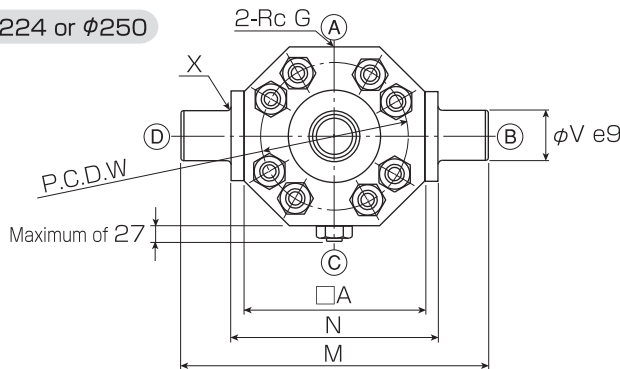
φ40 to φ200



Maximum of 27
(φ200)
Maximum of 9
(φ40 to φ180)



φ224 or φ250



Note 1) (A),(B),(C),(D) are the positioning relationships of the port, valve, etc.

Note 2) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P. 102.

TA Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

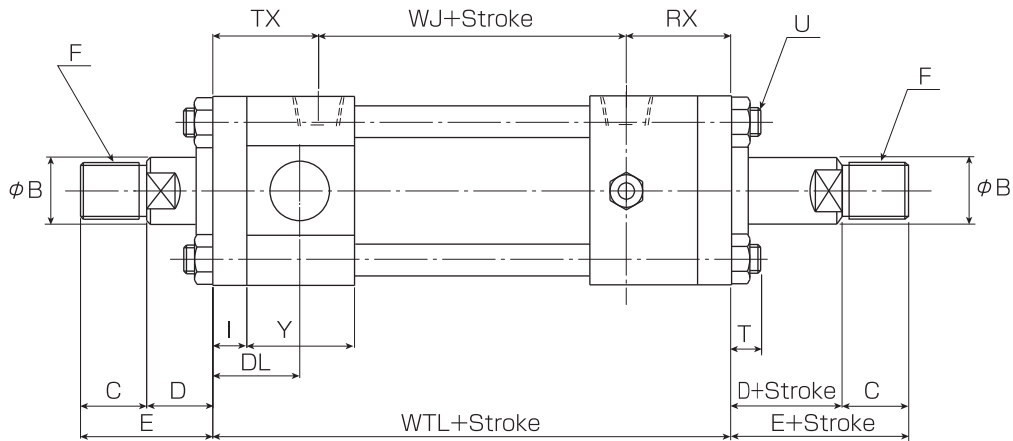
Units:mm

Symbol Bore	B Rod				QR	D	TL	J	FL	TX	HX	I	Y	Z	DL	T	U	□A	□W	N	M	X	φV	RcG
	φB	C	E	F																				
φ40	22.4	25	55	M20 P1.5	11	30	156	98	169	43	15	13	47	32	36	13	M12 P1.5	70	50	73 ⁰ _{-0.30}	123	R2.5	25	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	186	48	18	15	52	37	41	14	M14 P1.5	85	62	88 ⁰ _{-0.35}	138	R2.5	25	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	203	56	18	18	57	37	46	16	M16 P1.5	100	74	106 ⁰ _{-0.35}	169	R2.5	31.5	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	236	69	20	24	67	42	57	18	M18 P1.5	125	92	128 ⁰ _{-0.40}	208	R3	40	3/4
φ100	56	55	95	M48 P1.5	14	40	230	139	251	71	20	26	67	42	59	21	M22 P1.5	160	120	170 ⁰ _{-0.40}	270	R3	50	3/4
φ125	71	75	120	M64 P2	13	45	267	159	292	83	25	33	77	52	71	25	M27 P1.5	190	145	205 ⁰ _{-0.46}	331	R4	63	1
φ140	80	80	130	M72 P2	14	50	288	164	315	99	25	36	90	52	81	27	M30 P1.5	215	165	225 ⁰ _{-0.46}	367	R4	71	1
φ160	90	90	145	M80 P2	14	55	324	186	353	114	24	41	100	51	91	29	M33 P1.5	240	185	255 ⁰ _{-0.52}	415	R4	80	1
φ180	100	105	160	M95 P2.0	10	55	354	210	390	115	29	41	106	61	94	36	M39 P1.5	260	195	280 ⁰ _{-0.8}	460	R5	90	1 1/4
φ200	112	110	165	M100 P2.0	10	55	399	228	440	131	40	51	116	76	109	41	M45 P1.5	310	230	320 ⁰ _{-0.8}	520	R5	100	1 1/2
φ224	125	130	190	M120 P2.0	10	60	420	229	449	151	40	51	136	76	119	29	M33 P1.5	330	P.C.D. φ317	355 ⁰ _{-0.8}	579	R5	112	1 1/2
φ250	140	140	205	M130 P2.0	10	65	464	262	500	154	48	56	146	96	129	36	M39 P1.5	375	P.C.D. φ355	400 ⁰ _{-0.8}	650	R5	125	2

Note) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

TA Double Rod

[Standard Equivalent]



[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod's.]

Units:mm

Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61
φ180	125	105	165	M95 P2.0	155	120	35	10	60
φ200	140	110	175	M100 P2.0	170	133	45	10	65
φ224	160	130	195	M120 P2.0	190	155	45	10	65
φ250	180	140	205	M130 P2.0	215	170	45	10	65

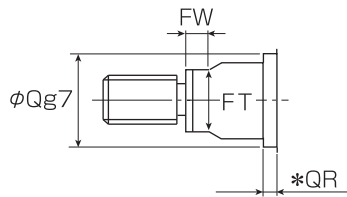
Double Rod

Units:mm

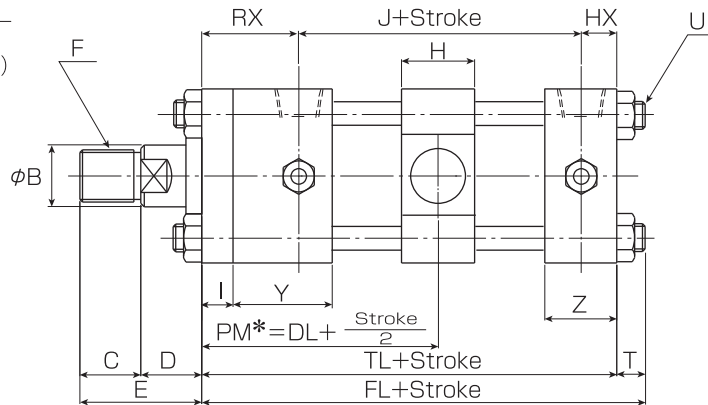
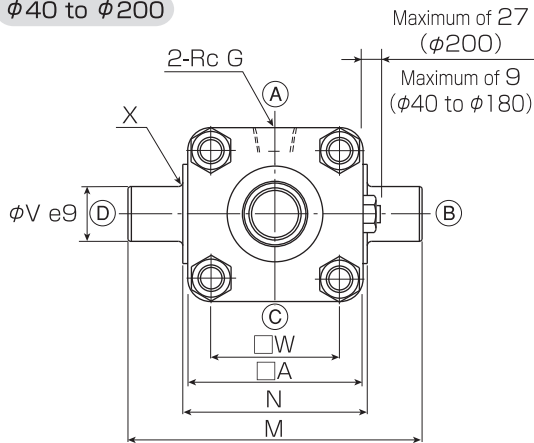
Symbol Bore	WTL	WJ	RX
φ40	184	98	43
φ50	202	106	48
φ63	225	113	56
φ80	267	129	69
φ100	281	139	71
φ125	325	159	83
φ140	349	164	86
φ160	394	186	94

Note) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

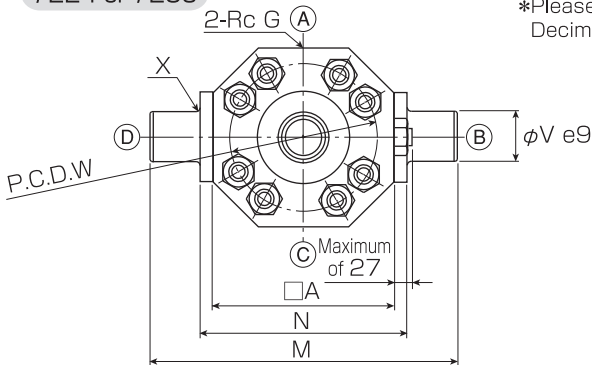
TC Single Rod



φ40 to φ200



φ224 or φ250



*Please direct it separately when the size PM is different from the catalogue mark. Decimal digits of the PM dimension are omitted.

Note 1) A, B, C, D are the positioning relationships of the port, valve, etc.

Note 2) The length of the thread (C dimension) of the lock nut-end fitting will be the recommended thread length for the lock nut assembly given on P. 102.

TC Type Basic Table of Dimensions

[□ indicates no switch, switch adjusted specifications (up to φ80) are common ranges.]

Units:mm

Symbol Bore	B Rod				QR	D	TL	J	FL	DL	RX	HX	I	Y	Z	T	H	U	□A	□W	N	M	X	φV	RcG
	φB	C	E	F																					
φ40	22.4	25	55	M20 P1.5	11	30	156	98	169	92	43	15	13	47	32	13	33	M12 P1.5	70	50	73 ⁰ _{-0.30}	123	R2.5	25	3/8
φ50	28	30	60	M24 P1.5	14	30	172	106	186	101	48	18	15	52	37	14	33	M14 P1.5	85	62	88 ⁰ _{-0.35}	138	R2.5	25	1/2
φ63	35.5	35	70	M30 P1.5	15	35	187	113	203	113	56	18	18	57	37	16	42	M16 P1.5	100	74	106 ⁰ _{-0.35}	169	R2.5	31.5	1/2
φ80	45	45	80	M39 P1.5	9	35	218	129	236	134	69	20	24	67	42	18	52	M18 P1.5	125	92	128 ⁰ _{-0.40}	208	R3	40	3/4
φ100	56	55	95	M48 P1.5	14	40	230	139	251	141	71	20	26	67	42	21	62	M22 P1.5	160	120	170 ⁰ _{-0.40}	270	R3	50	3/4
φ125	71	75	120	M64 P2	13	45	267	159	292	163	83	25	33	77	52	25	77	M27 P1.5	190	145	205 ⁰ _{-0.46}	331	R4	63	1
φ140	80	80	130	M72 P2	14	50	275	164	302	168	86	25	36	77	52	27	87	M30 P1.5	215	165	225 ⁰ _{-0.46}	367	R4	71	1
φ160	90	90	145	M80 P2	14	55	304	186	333	187	94	24	41	80	51	29	97	M33 P1.5	240	185	255 ⁰ _{-0.52}	415	R4	80	1
φ180	100	105	160	M95 P2.0	10	55	344	210	380	207	105	29	41	96	61	36	107	M39 P1.5	260	195	280 ⁰ _{-0.8}	460	R5	90	1 1/4
φ200	112	110	165	M100 P2.0	10	55	389	228	430	234	121	40	51	106	76	41	117	M45 P1.5	310	230	320 ⁰ _{-0.8}	520	R5	100	1 1/2
φ224	125	130	190	M120 P2.0	10	60	390	229	419	234	121	40	51	106	76	29	137	M33 P1.5	330	P.C.D φ317	355 ⁰ _{-0.8}	579	R5	112	1 1/2
φ250	140	140	205	M130 P2.0	10	65	444	262	480	264	134	48	56	126	96	36	147	M39 P1.5	375	P.C.D φ355	400 ⁰ _{-0.8}	650	R5	125	2

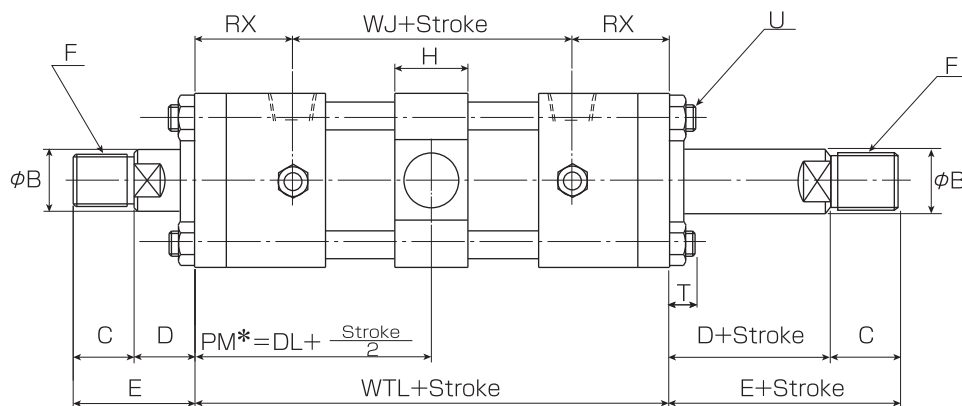
Note) Please refer to S type basic size table of P.84 for B rod φQ·FT·FW.

T

Series ■ 21MPa

TC Double Rod

[Standard Equivalent]



[The A Rod thread diameter conforms to our company's standards and corresponds to the B Rod's.]

Units:mm

Symbol Bore	A Rod								
	φB	C	E	F	φQ	FT	FW	QR	D
φ40	28	25	60	M20 P1.5	46	24	10	16	35
φ50	35.5	30	65	M24 P1.5	55	30	13	18	35
φ63	45	35	70	M30 P1.5	65	41	15	15	35
φ80	56	45	87	M39 P1.5	80	50	20	16	42
φ100	71	55	101	M48 P1.5	95	65	20	20	46
φ125	90	75	129	M64 P2	120	85	30	13	54
φ140	100	80	131	M72 P2	130	95	30	15	51
φ160	112	90	151	M80 P2	140	105	30	14	61
φ180	125	105	165	M95 P2.0	155	120	35	10	60
φ200	140	110	175	M100 P2.0	170	133	45	10	65
φ224	160	130	195	M120 P2.0	190	155	45	10	65
φ250	180	140	205	M130 P2.0	215	170	45	10	65

Double Rod

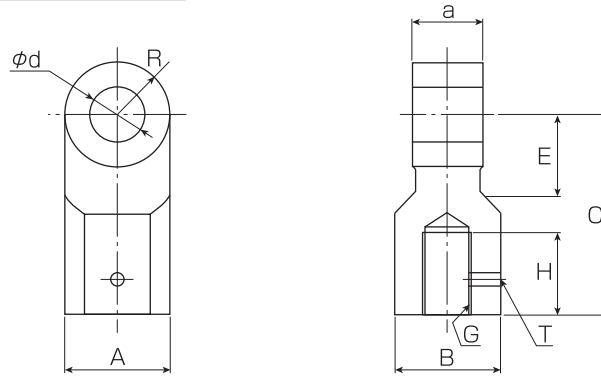
Units:mm

Symbol Bore	WTL	WJ
φ40	184	98
φ50	202	106
φ63	225	113
φ80	267	129
φ100	281	139
φ125	325	159
φ140	336	164
φ160	374	186

Note) The cushion for the φ40 A Rod is a fixed cushion on the head-side.

Single Protrusion End Joint : T type

Bore	Material
φ40 to φ100	Spheroidal Graphite Iron Casting



Single Protrusion End Joint Dimension Table <B (A) Rods>

Units:mm

Symbol Bore	φd	a	A	B	C	E	G	H	R	T
φ40	20	31.5 ^{-0.1} / _{-0.4}	42	47	70	28	M20 P1.5	35	22	M8
φ50	25	35.5 ^{-0.1} / _{-0.4}	52	52	85	35	M24 P1.5	38	27	M8
φ63	31.5	40 ^{-0.1} / _{-0.4}	62	62	115	43	M30 P1.5	47	33	M8
φ80	40	50 ^{-0.1} / _{-0.4}	82	82	145	55	M39 P1.5	62	43	M10
φ100	50	63 ^{-0.1} / _{-0.4}	102	102	180	65	M48 P1.5	77	53	M10

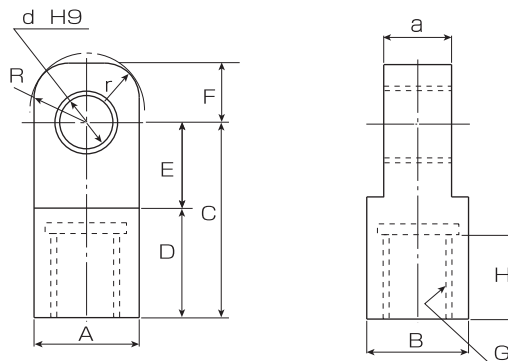
Mass Table of Single Protrusion End Joint

Units:kg

内径	Single Protrusion End Joint
φ40	0.70
φ50	1.21
φ63	2.29
φ80	5.33
φ100	10.00

Single Protrusion End Joint : T type

Bore	Material
φ125 to φ250	Rolled Steel for General Structure (With Bush)



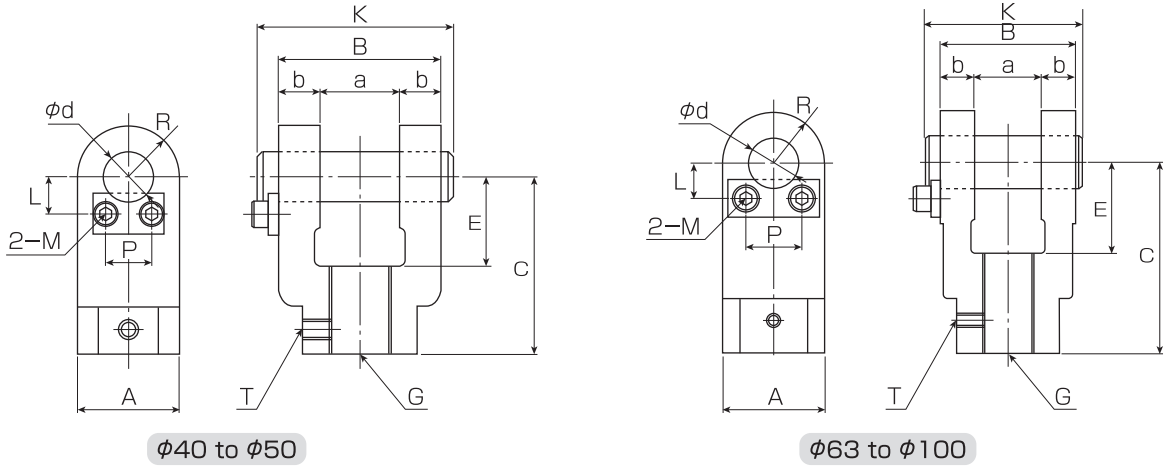
Single Protrusion End Joint Dimension Table

Units:mm

Bore	Symbol	φd	a	A	B	C	D	E	F	G	H	r	R	Parts Code
φ125		63	80 ^{-0.1} / _{-0.6}	120	120	225	140	85	65	M64 P2.0	82	42	71.5	TJ-T125B
φ140		71	80 ^{-0.1} / _{-0.6}	140	140	240	150	90	70	M72 P2.0	97	54	76	TJ-T140B
φ160		80	100 ^{-0.1} / _{-0.6}	160	160	270	170	100	80	M80 P2.0	112	62	87.5	TJ-T160B
φ180		90	125 ^{-0.1} / _{-0.6}	180	180	280	170	110	90	M95 P2.0	135	69	99	TJ-T180B
φ200		100	125 ^{-0.1} / _{-0.6}	200	200	300	180	120	100	M100 P2.0	120	72	112	TJ-T200B
φ224		112	140 ^{-0.1} / _{-0.6}	230	230	332	200	132	112	M120 P2.0	145	82	124.5	TJ-T224B
φ250		125	160 ^{-0.1} / _{-0.6}	250	250	355	210	145	125	M130 P2.0	155	87	141	TJ-T250B

Double Protrusion End Joint : Y type

Bore	Material
φ40 to φ100	Spheroidal Graphite Iron Casting



Double Protrusion End Joint Dimension Table <B(A) Rods>

Units:mm

Symbol Bore	φd	a	b	A	B	C	E	G	R	K	T	M	L	P
φ40	20	31.5 ^{+0.4} / _{+0.1}	16	42	63.5	70	32	M20 P1.5	22	76.5	M8	M6	14.5	18
φ50	25	35.5 ^{+0.4} / _{+0.1}	18	52	71.5	85	45	M24 P1.5	27	85	M8	M10	18.5	25
φ63	31.5	40 ^{+0.4} / _{+0.1}	20	62	80	115	50	M30 P1.5	33	93	M8	M10	22	33
φ80	40	50 ^{+0.4} / _{+0.1}	25	82	100	145	65	M39 P1.5	43	117	M10	M10	25	40
φ100	50	63 ^{+0.4} / _{+0.1}	31.5	102	126	180	75	M48 P1.5	53	143	M10	M10	29	50

Mass Table of Double Protrusion End Joint

Units:kg

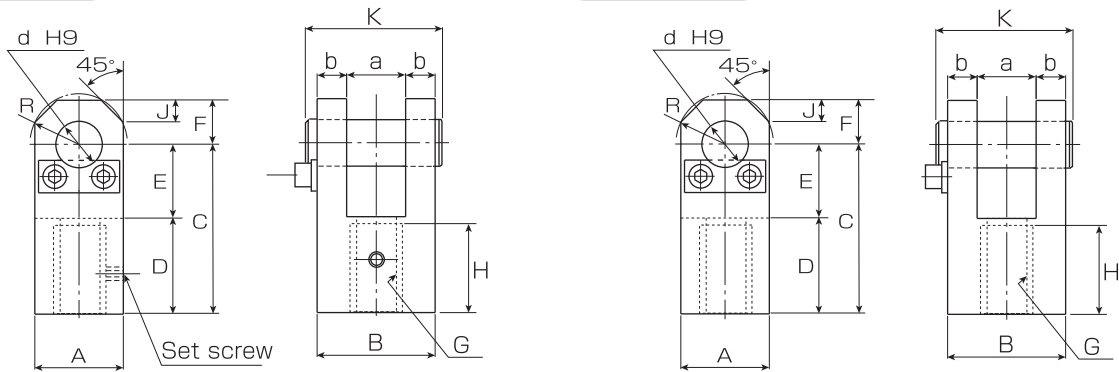
内径	Double Protrusion End Joint
φ40	0.77
φ50	1.29
φ63	2.33
φ80	5.01
φ100	10.01

Double Protrusion End Joint : Y type

Bore	Material
φ125 to φ250	Rolled Steel for General Structure

φ125 to φ160

φ180 to φ250



Note) Pins are included as standard up to φ125. They are offered as options above φ140.

Double Protrusion End Joint Dimension Table

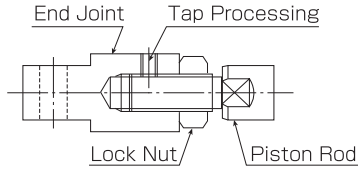
Units:mm

Bore	Symbol	φd	a	b	A	B	C	D	E	F	G	H	J	R	K	Parts Code
φ125		63	80 ^{+0.6} / _{+0.1}	40	120	160	225	135	90	65	M64 P2.0	92	30	71.5	183	YJ-T125B
φ140		71	80 ^{+0.6} / _{+0.1}	40	140	160	240	140	100	70	M72 P2.0	103	40	76	183	YJ-T140B
φ160		80	100 ^{+0.6} / _{+0.1}	50	160	200	270	160	110	80	M80 P2.0	112	45	87.5	225	YJ-T160B
φ180		90	125 ^{+0.6} / _{+0.1}	62.5	180	250	280	170	110	90	M95 P2.0	135	50	98.5	276	YJ-T180B
φ200		100	125 ^{+0.6} / _{+0.1}	62.5	200	250	300	180	120	100	M100 P2.0	120	55	110	276	YJ-T200B
φ224		112	140 ^{+0.6} / _{+0.1}	70	220	280	332	200	132	110	M120 P2.0	145	65	121.5	310	YJ-T224B
φ250		125	160 ^{+0.6} / _{+0.1}	80	250	320	355	210	145	125	M130 P2.0	155	70	136.5	350	YJ-T250B

Shipping Methods for Cylinders with End Joint

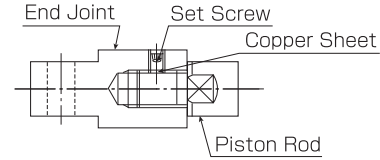
① When a cylinder with a lock nut and end joint is ordered

The end joint and lock nut are loosely assembled on the piston rod before shipping. The lock nut is not tightened so it will have to be tightened after adjusting the position of the end joint.



② When a cylinder is ordered with the end joint alone.

The end joint will be tightened onto the piston rod and fixed with a set screw before shipping.



Bellows

J : (Material : Neoprene, Heat Resistant : 100°C)

JC : (Material : Conex, Heat Resistant : 220°C)

JS : (Material : Silicon Glass Cloth, Heat Resistant : 220°C)

JA : (Material : Aluminum Leaf Glass Cloth, Heat Resistant : 350°C)

Note 1) The Heat Resistance indicates the maximum allowable temperature for bellows.

Caution is advised because it differs from the heat resistant temperature of the cylinder body.

Note 2) Bellows is sent out after installing it on the cylinder.

Note 3) As for cylinders originally equipped with bellows, please specify the serial number or dimension D (in the illustration below) when ordering a replacement without the bellows.

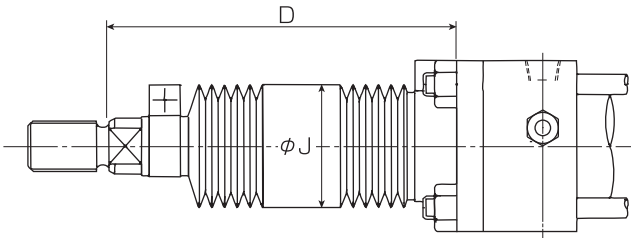


Table of Dimensions [Neoprene (J), Conex (JC)]

Units:mm

Symbol Bore	B Rod				A Rod			
	J		D	J		D		
	5 to 49	from 50		5 to 49	from 50			
φ40	65	45	$\frac{ST}{3.5} + 45$	70	55	$\frac{ST}{3.5} + 45$		
φ50	65	55	$\frac{ST}{3.5} + 45$	80	70	$\frac{ST}{3.5} + 45$		
φ63	80	65	$\frac{ST}{4} + 55$	85	80	$\frac{ST}{4} + 55$		
φ80	100	80	$\frac{ST}{4} + 55$	105	85	$\frac{ST}{4} + 55$		
φ100	115	100	$\frac{ST}{4} + 55$	105	105	$\frac{ST}{4} + 55$		
φ125	115	115	$\frac{ST}{5} + 65$	135	135	$\frac{ST}{5} + 65$		
φ140	138	138	$\frac{ST}{5} + 65$	150	150	$\frac{ST}{5} + 65$		
φ160	160	160	$\frac{ST}{5} + 65$	170	170	$\frac{ST}{5} + 65$		
φ180	182	182	$\frac{ST}{5} + 65$	185	185	$\frac{ST}{5} + 65$		
φ200	200	200	$\frac{ST}{5} + 65$	210	210	$\frac{ST}{5} + 65$		
φ224	225	225	$\frac{ST}{6} + 80$	230	230	$\frac{ST}{5} + 80$		
φ250	250	250	$\frac{ST}{6} + 80$	260	260	$\frac{ST}{6} + 80$		

Note 1) In cases where the calculations resulted in decimal values, the values were rounded.

Note 2) The numbers under "J" indicate the Stroke.

Note 3) Bellows for less than 5-strokes cannot be manufactured.

Table of Dimensions [Silicon Glass Cloth(JS)]

Units:mm

Symbol Bore	B Rod				A Rod			
	J		D	J		D		
	6 to 59	from 60		6 to 59	from 60			
φ40	55	45	$\frac{ST}{3} + 45$	65	55	$\frac{ST}{3} + 45$		
φ50	65	55	$\frac{ST}{3} + 45$	80	65	$\frac{ST}{3} + 45$		
φ63	80	65	$\frac{ST}{3} + 55$	85	80	$\frac{ST}{3} + 55$		
φ80	100	80	$\frac{ST}{3} + 55$	105	85	$\frac{ST}{3} + 55$		
φ100	115	100	$\frac{ST}{3.2} + 55$	105	105	$\frac{ST}{3.2} + 55$		
φ125	115	115	$\frac{ST}{3.2} + 65$	135	135	$\frac{ST}{3.2} + 65$		
φ140	138	138	$\frac{ST}{3.2} + 65$	150	150	$\frac{ST}{3.2} + 65$		
φ160	160	160	$\frac{ST}{3.7} + 65$	165	165	$\frac{ST}{3.7} + 65$		
φ180	182	182	$\frac{ST}{4} + 65$	175	175	$\frac{ST}{4} + 65$		
φ200	200	200	$\frac{ST}{4.5} + 65$	200	200	$\frac{ST}{4.5} + 65$		
φ224	225	225	$\frac{ST}{4.5} + 80$	225	225	$\frac{ST}{4.5} + 80$		
φ250	250	250	$\frac{ST}{4.5} + 80$	250	250	$\frac{ST}{4.5} + 80$		

Note 1) In cases where the calculations resulted in decimal values, the values were rounded.

Note 2) The numbers under "J" indicate the Stroke.

Note 3) Bellows for less than 6-strokes cannot be manufactured.

Table of Dimensions [Aluminum Foil Glass Cloth (JA)]

Units:mm

Symbol Bore	B Rod				A Rod			
	J		D	J		D		
	7 to 69	from 70		7 to 69	from 70			
φ40	55	50	$\frac{ST}{2.5} + 45$	65	55	$\frac{ST}{2.5} + 45$		
φ50	70	55	$\frac{ST}{2.5} + 45$	80	65	$\frac{ST}{2.5} + 45$		
φ63	80	70	$\frac{ST}{2.5} + 55$	85	80	$\frac{ST}{3.5} + 55$		
φ80	100	80	$\frac{ST}{3.5} + 55$	105	85	$\frac{ST}{3.5} + 55$		
φ100	120	100	$\frac{ST}{3.5} + 55$	105	105	$\frac{ST}{3.5} + 55$		
φ125	120	120	$\frac{ST}{3.5} + 65$	135	135	$\frac{ST}{4} + 55$		
φ140	130	130	$\frac{ST}{4} + 65$	150	150	$\frac{ST}{4.5} + 65$		
φ160	140	140	$\frac{ST}{4.5} + 65$	170	170	$\frac{ST}{4.5} + 65$		
φ180	150	150	$\frac{ST}{4.5} + 65$	180	180	$\frac{ST}{5} + 65$		
φ200	170	170	$\frac{ST}{4.5} + 65$	220	220	$\frac{ST}{5} + 65$		
φ224	180	180	$\frac{ST}{5} + 80$	230	230	$\frac{ST}{5} + 80$		
φ250	205	205	$\frac{ST}{5} + 80$	260	260	$\frac{ST}{5} + 80$		

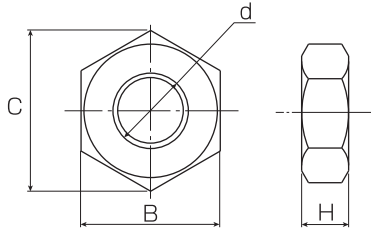
Note 1) In cases where the calculations resulted in decimal values, the values were rounded.

Note 2) The numbers under "J" indicate the Stroke.

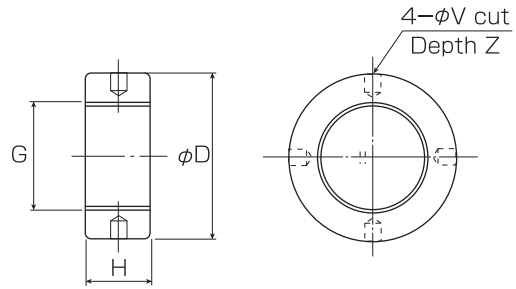
Note 3) Bellows for less than 7-strokes cannot be manufactured.

Lock Nut

Bore	Material
φ40 to φ250	Rolled Steel for General Structure



φ40 to φ180



φ200 to φ250

Table of Dimensions

Units:mm

Symbol Bore	B Rod				
	d	H	B	C	Parts Code
φ40	M20 P1.5	12	30	34.6	LN-T40B
φ50	M24 P1.5	14	36	41.6	LN-T50B
φ63	M30 P1.5	18	46	53.1	LN-T63B
φ80	M39 P1.5	23	60	69.3	LN-T80B
φ100	M48 P1.5	29	75	86.5	LN-T100B
φ125	M64 P2	38	95	110	LN-T125B
φ140	M72 P2	42	105	121	LN-T140B
φ160	M80 P2	48	115	133	LN-T160B
φ180	M95 P2	57	135	156	LN-T180B

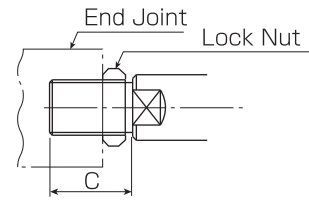
Symbol Bore	G	H	φD	φd	Z	Parts Code
φ200	M100 P2	45	155	15	18	LN-T200B
φ224	M120 P2	55	185	15	18	LN-T224B
φ250	M130 P2	60	205	15	18	LN-T250B

Recommended Thread Lengths with Lock Nuts

Units:mm

Symbol Bore	C Dimension (thread length)
	A Rod·B Rod
φ40	45
φ50	50
φ63	60
φ80	80
φ100	95
φ125	125
φ140	140
φ160	155
φ180	185

Symbol Bore	G	C Dimension
φ200	M100 P2	165
φ224	M120 P2	200
φ250	M130 P2	215

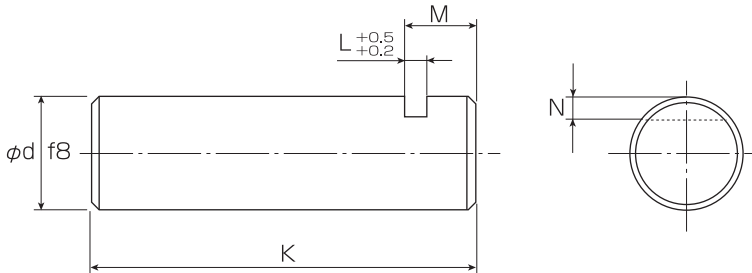


※The length of the thread (C Dimension) of the piston rod with a lock nut is based on an insertion length of 80% of the thread diameter, so in cases where it is insufficient, use the dimensions in the illustration above.

The recommended thread length with lock nut is adjusted in the case of equipped with the end joint and the lock nut.

Pin

Bore	Material
φ32 to φ250	Carbon Steel for Machine Structural Use



Keeper Plate

Bore	Material
φ40 to φ250	Rolled Steel for General Structure

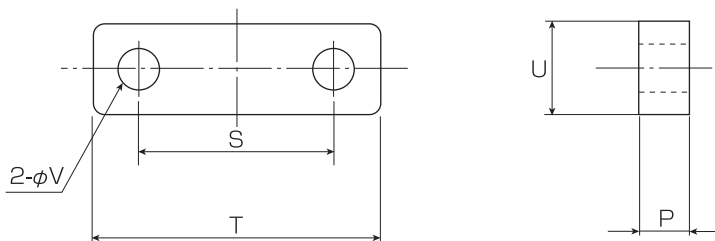


Table of Dimensions

Units:mm

Bore	Symbol	φd	L	M	N	K
φ40		20	4.5	8.5	3.5	76.5
φ50		25	6	9	5.5	85
φ63		31.5	6	9	5.5	93
φ80		40	6	12	6.5	117
φ100		50	6	12	7.5	143
φ125		63	8	18	10	183
φ140		71	9	19	11	183
φ160		80	9	20	12	225
φ180		90	12	22	14	276
φ200		100	12	22	14	276
φ224		112	12	25	15	310
φ250		125	12	25	15	350

Table of Dimensions

Units:mm

Bore	Symbol	V	U	P	S	T	With Hex Hole Bolt
φ40		6.5	16	4.5	18	28	M6
φ50		11	22	6	25	47	M10
φ63		11	22	6	33	55	M10
φ80		11	22	6	40	62	M10
φ100		11	22	6	50	72	M10
φ125		14	30	8	63	93	M12
φ140		14	30	9	71	101	M12
φ160		16	35	9	80	115	M14
φ180		16	38	2	90	125	M14
φ200		18	38	12	100	140	M16
φ224		18	38	12	115	155	M16
φ250		18	38	12	125	165	M16

■ Mass Table (B Rod)

Units: kg

Symbol Bore	Basic Mass (Stroke: Omm)							Stroke Mass per 100mm
	S	FA	FB	LA	CA·CB	TA	TC	
φ40	4.4	5.1	5.4	5.4	5.1	4.6	5.4	1.2
φ50	8.1	9.3	10.0	9.2	9.4	8.3	9.6	2.0
φ63	13.2	15.1	16.9	14.5	15.2	13.6	15.2	2.9
φ80	23.6	25.6	28.3	25.5	27.0	24.4	26.5	4.5
φ100	39.6	44.0	49.3	44.7	46.0	41.3	47.2	7.4
φ125	68.5	78.5	87.1	77.0	81.7	71.9	81.5	12.1
φ140	92.4	101.0	114.2	97.6	108.9	97.1	107.5	16.4
φ160	126.0	139.7	156.0	130.7	151.6	132.9	149.7	19.2
φ180	155.6	177.9	199.4	—	198.1	171.3	188.5	18.7
φ200	244.9	282.1	319.5	—	295.9	265.0	298.9	23.9
φ224	290.7	335.6	378.8	—	363.3	331.9	359.6	29.3
φ250	393.3	470.1	525.4	—	495.8	434.5	493.0	35.4

■ Mass Table (A Rod)

Units: kg

Symbol Bore	Basic Mass (Stroke: Omm)							Stroke Mass per 100mm
	S	FA	FB	LA	CA·CB	TA	TC	
φ40	4.6	5.3	5.6	5.6	5.3	4.8	5.6	1.4
φ50	8.4	9.6	10.3	9.5	9.7	8.6	9.9	2.3
φ63	13.8	15.7	17.5	15.1	15.8	14.2	15.8	3.4
φ80	24.6	26.6	29.3	26.5	28.0	25.4	27.5	5.2
φ100	41.4	45.8	51.1	46.5	47.8	43.1	49.0	8.6
φ125	71.8	81.8	90.4	80.3	85.0	75.2	84.8	14.0
φ140	96.3	95	118.1	101.5	112.8	101.0	111.4	14.5
φ160	131.4	145.1	161.4	136.1	157.0	138.3	155.1	21.9
φ180	158.2	179.8	202.0	—	200.6	173.7	191.0	22.2
φ200	249.7	286.0	324.3	—	300.7	269.1	303.7	28.2
φ224	294.8	338.2	382.9	—	367.4	334.5	363.7	35.5
φ250	398.1	472.3	530.2	—	500.6	438.3	497.8	43.3

■ Mass Table of Double Rod (B Rod)

Units: kg

Symbol Bore	Basic Mass (Stroke: Omm)							Stroke Mass per 100mm
	S	FA	FB	LA	CA·CB	TA	TC	
φ40	5.1	5.8	6.1	6.1	5.8	5.3	6.1	1.4
φ50	9.3	10.5	11.2	10.4	10.6	9.5	10.8	2.3
φ63	15.3	17.2	19.0	16.6	17.3	15.7	17.3	3.4
φ80	27.6	29.6	32.3	29.5	31.0	28.4	30.5	5.4
φ100	46.7	51.1	56.4	51.8	53.1	48.4	54.3	9.0
φ125	81.5	91.5	100.1	90.0	94.7	84.9	94.5	15.4
φ140	110.5	119.1	132.3	115.7	127.0	115.2	125.6	20.9
φ160	151.5	165.2	181.5	156.2	177.1	158.4	175.2	25.5
φ180	187.2	209.5	231.0	—	229.7	202.9	220.1	28.0
φ200	295.0	332.2	369.6	—	346.0	315.1	349.0	35.0
φ224	350.7	395.6	438.8	—	423.3	391.9	419.6	46.7
φ250	475.4	552.2	607.5	—	577.9	516.6	575.1	57.9

■ Mass Table of Double Rod (A Rod)

Units: kg

Symbol Bore	Basic Mass (Stroke: Omm)							Stroke Mass per 100mm
	S	FA	FB	LA	CA·CB	TA	TC	
φ40	5.5	6.2	6.5	6.5	6.2	5.7	6.5	1.6
φ50	9.9	11.1	11.8	11.0	11.2	10.1	11.4	2.7
φ63	16.1	18.0	19.8	17.4	18.1	16.5	18.1	4.0
φ80	29.2	31.2	33.9	31.1	32.6	30.0	32.1	6.4
φ100	46.4	53.8	59.1	54.5	55.8	51.1	57.0	10.8
φ125	86.4	96.4	105.0	94.9	99.6	89.8	99.4	18.6
φ140	115.8	124.4	137.6	121.0	132.3	120.5	130.9	24.3
φ160	159.0	172.7	189.0	163.7	184.6	165.9	182.7	30.2
φ180	192.3	213.9	236.1	—	234.7	207.8	225.1	33.9
φ200	303.6	339.9	378.2	—	354.6	323.0	357.6	42.9
φ224	359.4	402.8	447.5	—	432.0	399.1	428.3	57.4
φ250	485.6	559.8	617.7	—	588.1	525.8	585.3	70.9

■ Mass Table (End Joint, Lock Nut) Units: kg

Symbol Bore	Single Protrusion End Joint	Double Protrusion End Joint	Lock Nut
φ40	1.1	1.1	0.1
φ50	1.9	1.8	0.1
φ63	3.1	3.4	0.2
φ80	6.4	7.2	0.3
φ100	12.6	14.2	0.6
φ125	22.9	27.2	1.3
φ140	31.3	32.7	1.7
φ160	48.1	53.8	2.2
φ180	65.5	63.0	3.2
φ200	84.1	81.1	3.9
φ224	120.3	115.7	6.7
φ250	155.4	149.3	9.3

The A rod end joint is also applicable to the B rod.

