

The largest bore size (280 to 400mm) in general cylinders. The piston and rod seal used on U seals that has durable specification.

- Conforming to ISO Standards
- (The 320 mm bore cylinders conform to ISO Standards. The cylinders with other bores are manufactured in accordance with similar standards.)



Cylinder Specifications

Type	Standard type
Cylinder bore (mm)	φ 280 · φ 320 · φ 360 · φ 400
Working fluid	Air
Lubrication	Necessary [JIS K2213 Class 1 (additive-free turbine oil ISO VG32) or its equivalent]
Working pressure range	0.1 to 1 MPa
Proof test pressure	1.6 MPa
Note 1) Working speed range	50 to 500 mm/s
Working temperature range	−10 to +70℃ (No freezing)
Structure of cushioning	With cushions on both ends
Cushion stroke (cushion ring length)	φ 280 · φ 320 : 25mm φ 360 · φ 400 : 30mm
Tolerance for thread	JIS 6g/6H
Tolerance of stroke	0 to 100mm ^{+0.8} ₀ 101 to 250mm ^{+1.0} ₀ 251 to 630mm ^{+1.25} ₀ 631 to 1,000mm ^{+1.4} ₀ 1,001 to 1,600mm ^{+1.6} ₀ 1,601 to 2,000mm ^{+1.8} ₀
Mounting style	LB · FA · FB · CA · TC
Accessories	Note 2) Boots Standard: Nylon tarpaulin Semi-standard: Chloroprene, Conex
	Rod end attachments Rod eye (T-end), rod clevis (Y-end) with pin
	Others Lock nut

Note 1) If the speed is less than this lower limit, chattering or jerking may be caused. If the speed exceeds this upper limit, the seals may wear earlier.

Note 2) Conex is the registered trademark of Teijin Limited.

Standard Stroke Range

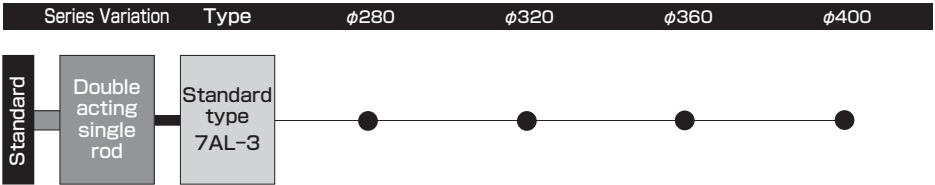
Unit: mm

Bore	φ 280	φ 320	φ 360	φ 400
Stroke limit	2000	2000	2000	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.

Product Lineup

Unit: mm



Weight Table

Unit: kg

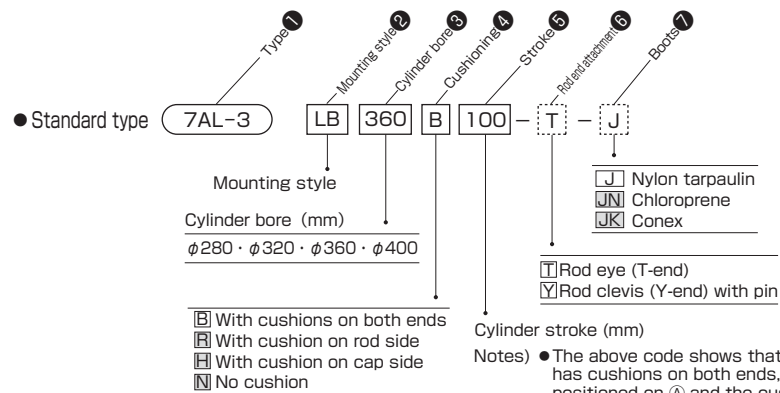
Bore (mm)	Basic weight	Additional weight per mm of stroke	Mounting accessory weight				Rod end attachment weight	
			LB	FA·FB	CA	TC	Rod eye (T-end)	Rod clevis (Y-end) with pin
φ280	115.6	0.104	23.4	4.9	5.0	18.6	7.0	9.0
φ320	148.6	0.127	29.0	5.9	5.0	23.6	7.0	9.0
φ360	217.1	0.152	53.2	9.0	8.8	35.5	12.0	17.0
φ400	266.6	0.161	62.0	10.2	8.8	43.5	12.0	17.0

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

Calculation example 7AL-2, bore φ360, cylinder stroke 300 mm, CA
217.1+(0.152×300)+8.8=271.5kg

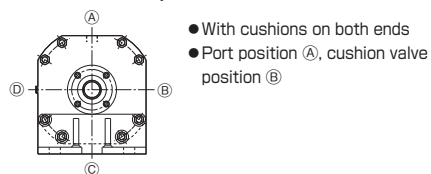
● How to order

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



- Notes
- The above code shows that the cylinder has cushions on both ends, the port is positioned on (A) and the cushion valve is positioned on (B). In case that the cushion is not equipped (N), the cushion valve position is "0".
 - Pressure vessels with a cylinder inner volume of 0.04 m³ or more at the actual gauge pressure are subject to the standard for class 2 pressure vessels.
 - Conex is the registered trademark of Teijin Limited.

★ Standard specifications



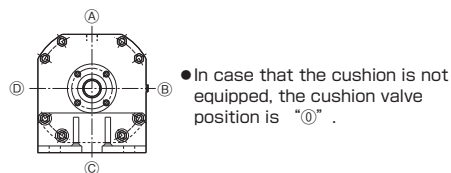
★ Change of port and cushion valve positions

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

Example) 7AL-3 LB360B500- B D -J

Port position (A, B, C, D)

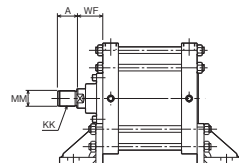
Cushion valve position (A, B, C, D, 0)



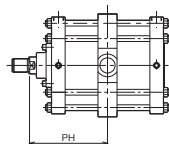
(The symbols of the port and cushion valve positions are written in the clockwise direction as viewed from the rod side.)

★ Semi-standard range

- Change of piston rod end (dimensional symbol: WF, A, KK)
- When the lock nut is provided, dimension A is increased. (See the accessories.)



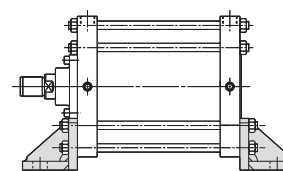
- Change of TC accessory position (dimensional symbol: PH)



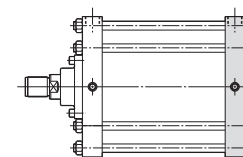
- With boots

Mounting Style

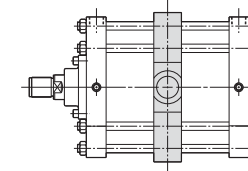
LB End angle



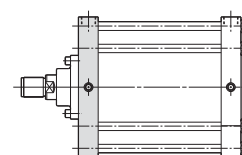
FB Cap flange



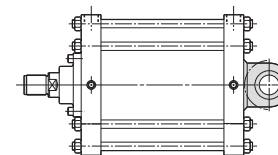
TC Intermediate trunnion



FA Rod flange

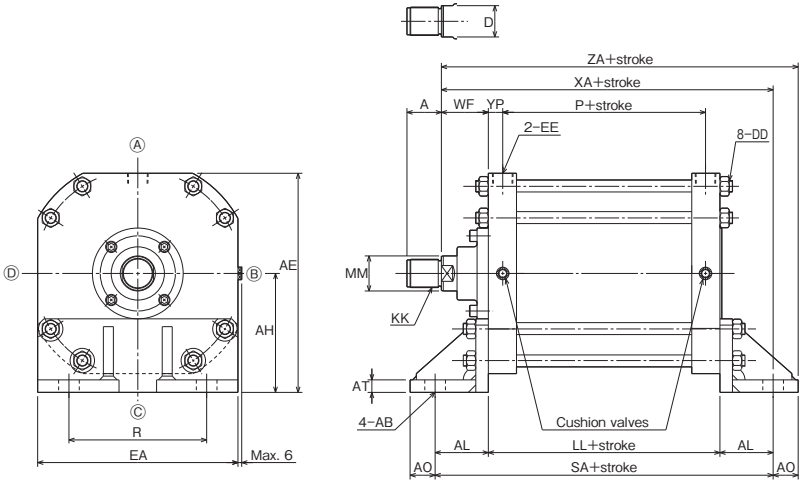


CA Cap eye

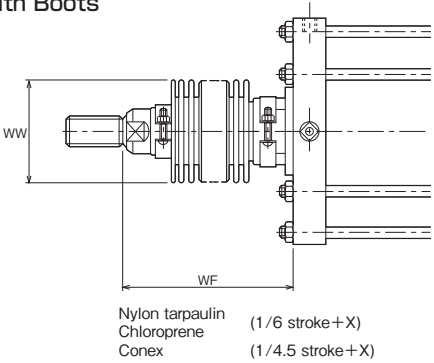


LB

7AL-3 LB Bore B Stroke



With Boots



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

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

Dimensional Table

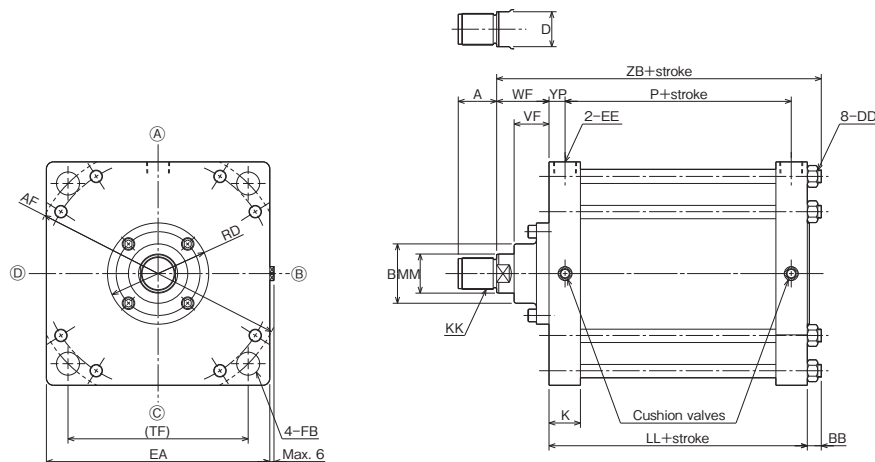
Symbol	A	AB	AE	AH	AL	AO	AT	D	DD	EA
Bore										
φ 280	55	φ 33	350	190	85	40	20	50	M18×1.5	320
φ 320	55	φ 33	390	210	85	40	20	50	M20×1.5	360
φ 360	60	φ 39	440	240	100	45	30	65	M22×1.5	400
φ 400	60	φ 39	480	260	100	45	30	65	M24×1.5	440

Symbol	EE	KK	LL	MM	P	R	SA	WF	XA	YP	ZA
Bore											
φ 280	Rc1	M48×2	170	φ 56	124	220	340	75	330	23	370
φ 320	Rc1	M48×2	170	φ 56	124	260	340	75	330	23	370
φ 360	Rc1 1/4	M56×2	200	φ 71	146	300	400	85	385	27	430
φ 400	Rc1 1/4	M56×2	200	φ 71	146	340	400	85	385	27	430

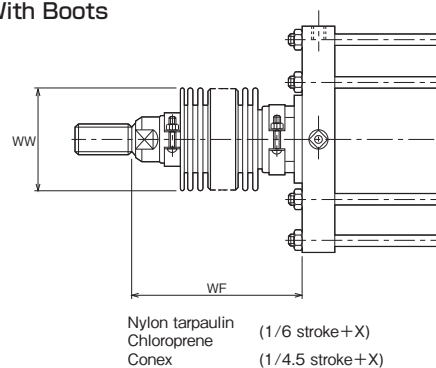
With Boots

Symbol	X	WW
Bore		
φ 280	85	φ 160
φ 320	85	φ 160
φ 360	95	φ 180
φ 400	95	φ 180

FA

7AL-3 FA 

With Boots



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

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

Dimensional Table

Symbol Bore	A	AF	B	BB	D	DD	EA	EE	FB
φ 280	55	φ 365	φ 85	18	50	M18×1.5	□320	Rc1	φ 33
φ 320	55	φ 415	φ 85	19	50	M20×1.5	□360	Rc1	φ 33
φ 360	60	φ 460	φ 95	21	65	M22×1.5	□400	Rc1 ^{1/4}	φ 39
φ 400	60	φ 510	φ 95	22	65	M24×1.5	□440	Rc1 ^{1/4}	φ 39

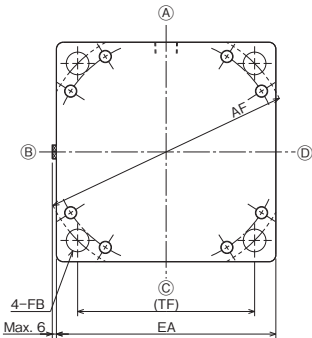
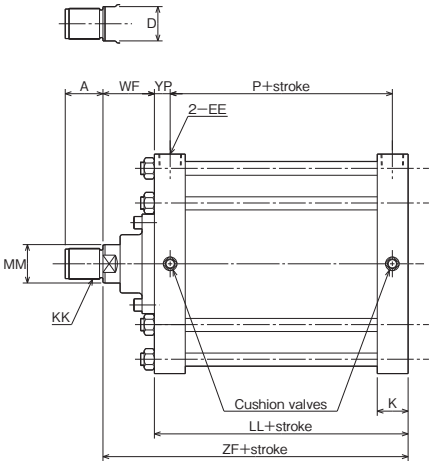
Symbol Bore	K	KK	LL	MM	P	RD	(TF)	VF	WF	YP	ZB
φ 280	45	M48 × 2	170	φ 56	124	φ 145	258	50	75	23	263
φ 320	45	M48 × 2	170	φ 56	124	φ 145	293	50	75	23	264
φ 360	55	M56 × 2	200	φ 71	146	φ 165	325	60	85	27	306
φ 400	55	M56 × 2	200	φ 71	146	φ 165	360	60	85	27	307

With Boots

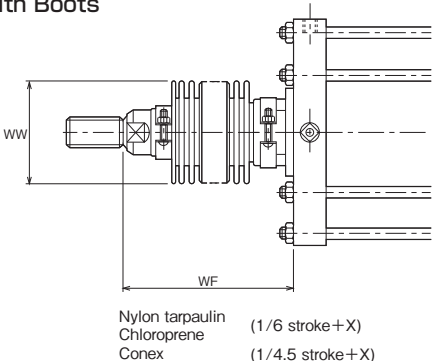
Symbol Bore	X	WW
φ 280	85	φ 160
φ 320	85	φ 160
φ 360	95	φ 180
φ 400	95	φ 180

FB

7AL-3 FB Bore B Stroke



With Boots



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

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

Dimensional Table

Symbol	A	AF	D	EA	EE	FB	K
Bore							
φ 280	55	φ 365	50	□ 320	Rc1	φ 33	45
φ 320	55	φ 415	50	□ 360	Rc1	φ 33	45
φ 360	60	φ 460	65	□ 400	Rc1 1/4	φ 39	55
φ 400	60	φ 510	65	□ 440	Rc1 1/4	φ 39	55

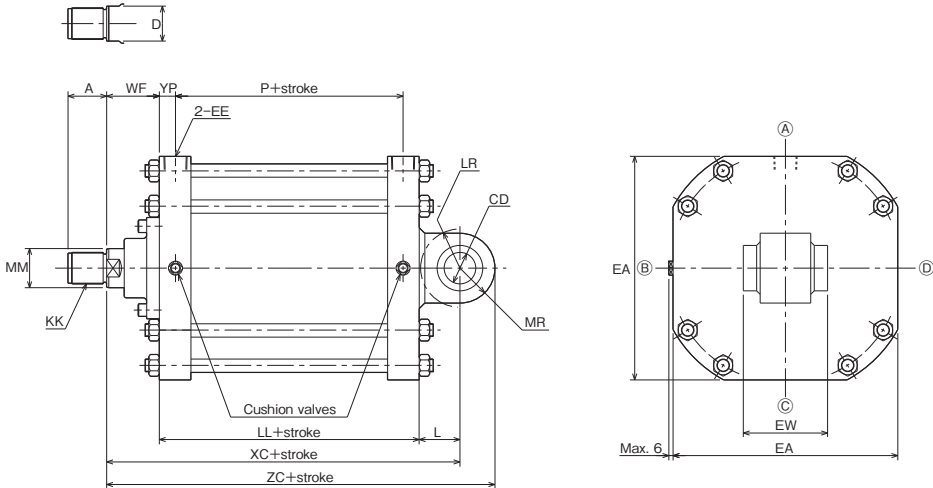
Symbol	KK	LL	MM	P	(TF)	WF	YP	ZF
Bore								
φ 280	M48×2	170	φ 56	124	258	75	23	245
φ 320	M48×2	170	φ 56	124	293	75	23	245
φ 360	M56×2	200	φ 71	146	325	85	27	285
φ 400	M56×2	200	φ 71	146	360	85	27	285

With Boots

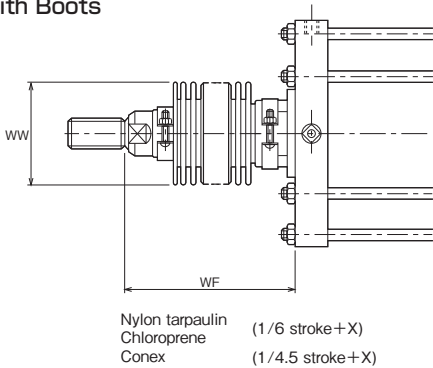
Symbol	X	WW
Bore		
φ 280	85	φ 160
φ 320	85	φ 160
φ 360	95	φ 180
φ 400	95	φ 180

CA

7AL-3 CA Bore B Stroke



With Boots



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

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

Dimensional Table

Symbol	A	CD	D	EA	EE	EW	KK
Bore							
φ 280	55	φ 45 ^{+0.062} ₀	50	320	Rc1	120 ⁻⁰ _{-0.35}	M48×2
φ 320	55	φ 45 ^{+0.062} ₀	50	360	Rc1	120 ⁻⁰ _{-0.35}	M48×2
φ 360	60	φ 56 ^{+0.074} ₀	65	400	Rc1 ¹ / ₄	140 ⁻⁰ _{-0.40}	M56×2
φ 400	60	φ 56 ^{+0.074} ₀	65	440	Rc1 ¹ / ₄	140 ⁻⁰ _{-0.40}	M56×2

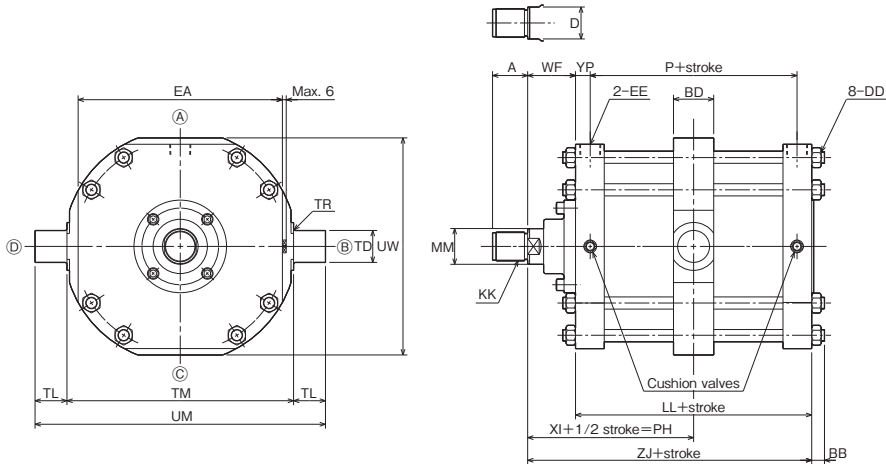
Symbol	L	LL	LR	MM	MR	P	WF	XC	YP	ZC
Bore										
φ 280	58	170	R56	φ 56	R50	124	75	303	23	353
φ 320	58	170	R56	φ 56	R50	124	75	303	23	353
φ 360	70	200	R68	φ 71	R65	146	85	355	27	420
φ 400	70	200	R68	φ 71	R65	146	85	355	27	420

With Boots

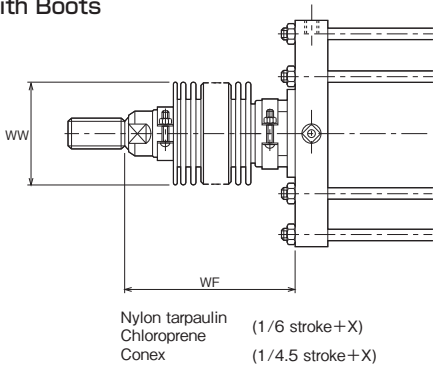
Symbol	X	WW
Bore		
φ 280	85	φ 160
φ 320	85	φ 160
φ 360	95	φ 180
φ 400	95	φ 180

TC

7AL-3 TC Bore B Stroke



With Boots



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

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

Dimensional Table

Symbol	A	BB	BD	D	DD	EA	EE	KK	LL	MM	P
Bore											
φ 280	55	18	63	50	M18×1.5	320	Rc1	M48×2	170	φ 56	124
φ 320	55	19	63	50	M20×1.5	360	Rc1	M48×2	170	φ 56	124
φ 360	60	21	78	65	M22×1.5	400	Rc1 1/4	M56×2	200	φ 71	146
φ 400	60	22	78	65	M24×1.5	440	Rc1 1/4	M56×2	200	φ 71	146

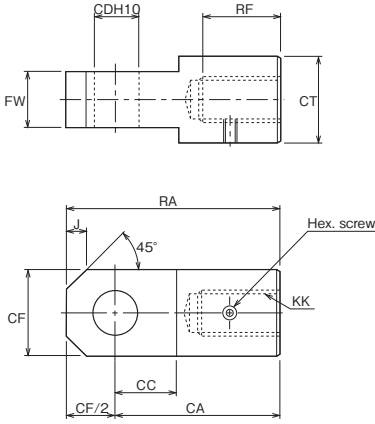
Symbol	Min. PH	TD	TL	TM	TR	UM	UW	WF	XI	YP	ZJ
Bore											
φ 280	157	φ 50 ^{-0.05} _{-0.112}	50	355 ⁰ _{-1.4}	R3	455	340	75	160	23	245
φ 320	157	φ 50 ^{-0.05} _{-0.112}	50	400 ⁰ _{-1.4}	R3	500	380	75	160	23	245
φ 360	185	φ 63 ^{-0.06} _{-0.134}	63	445 ⁰ _{-1.55}	R4	571	425	85	185	27	285
φ 400	185	φ 63 ^{-0.06} _{-0.134}	63	495 ⁰ _{-1.55}	R4	621	470	85	185	27	285

With Boots

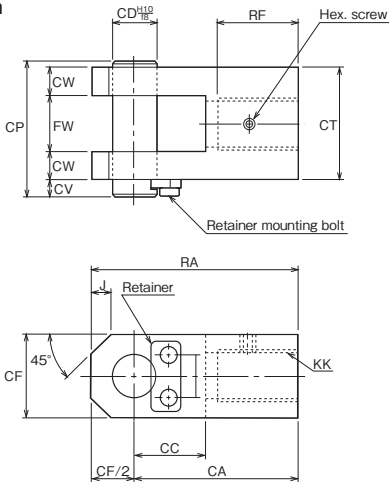
Symbol	X	WW
Bore		
φ 280	85	φ 160
φ 320	85	φ 160
φ 360	95	φ 180
φ 400	95	φ 180

Rod End Attachment

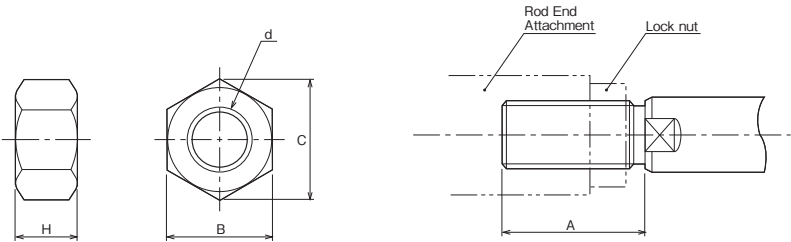
- Rod eye (T-end)



- Rod clevis (Y-end) with pin



- Lock nut



Dimensional Table: Rod eye (T-end)

Symbol	Part number	CA	CC	CD	CF	CP	CT	CV	CW	FW	J	KK	RA	RF
Bore														
φ 280	RTA-48-A	140	50	φ 45	90	122	75	18	25	50	20	M48×2	185	60
φ 320	RTA-48-A	140	50	φ 45	90	122	75	18	25	50	20	M48×2	185	60
φ 360	RTA-56-1-A	170	65	φ 56	110	148	85	18	31.5	63	25	M56×2	225	65
φ 400	RTA-56-1-A	170	65	φ 56	110	148	85	18	31.5	63	25	M56×2	225	65

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

Symbol	Part number	CA	CC	CD	CF	CP	CT	CV	CW	FW	J	KK	RA	RF
Bore														
φ 280	RYA-48-1-A	140	60	φ 45	90	122	100	18	25	50	20	M48×2	185	60
φ 320	RYA-48-1-A	140	60	φ 45	90	122	100	18	25	50	20	M48×2	185	60
φ 360	RYA-56-1-A	170	75	φ 56	110	148	126	18	31.5	63	25	M56×2	225	65
φ 400	RYA-56-1-A	170	75	φ 56	110	148	126	18	31.5	63	25	M56×2	225	65

Dimensional Table: Lock nut

Symbol	Part number	d	H	B	C
Bore					
φ 280	LNA-48F-A	M48×2	26	70	80.8
φ 320	LNA-48F-A	M48×2	26	70	80.8
φ 360	LNA-56F-A	M56×2	30	80	92.4
φ 400	LNA-56F-A	M56×2	30	80	92.4

Dimensional Table

Symbol	A
Bore	
φ 280	80
φ 320	80
φ 360	90
φ 400	90