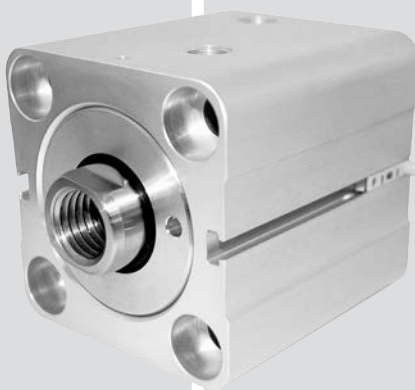


# C Series

10·14·16·21MPa



Compact Type Cylinder

## Compact Design. A host of variations.

Our compact hydraulic cylinders use a unified tube and cover construction to provide a size that is approximately only a third (in-house comparison) of that of tie rod type cylinders. This enables them to be installed in spaces that would be impossible for conventional cylinders, making them perfect for variable applications.



### ■ Features

#### Easy Maintenance

The packing can be changed by simply loosening the rod bushing without having to remove the main unit or disconnecting lines – the ultimate in easy maintenance!

#### Innovations that make installation a breeze

The attachment holes have been recessed to hide the cap bolts in the cylinder main unit. They can be attached from either the front or the rear. A parallel key has been attached in the Foot type, thereby eliminating the need for positioning

## Specifications

Series Name	CS	
Model	Standard Type	Foot Type
Mounting	SA·FA·FB	
Bore	$\phi 32 \cdot \phi 40 \cdot \phi 50 \cdot \phi 63 \cdot \phi 80 \cdot \phi 100 \cdot \phi 125 \cdot \phi 140 \cdot \phi 150 \cdot \phi 160$	$\phi 32 \cdot \phi 40 \cdot \phi 50 \cdot \phi 63$
Nominal Pressure <sup>Note 1)</sup>	16MPa	
Maximum Allowable Pressure <sup>Note 2)</sup>	16MPa	
Proof Pressure	21MPa	
Minimum Working Pressure <sup>Note 3)</sup>	0.64MPa or less	
Range of Operating Speed <sup>Note 4)</sup>	8 to 100mm/s	
Range of Operating Temperature	$\phi 32$ to $\phi 125$ : -10°C to +120°C (H-NBR) $\phi 140$ to $\phi 160$ : -10°C to +80°C (NBR)	-10°C to +120°C (H-NBR)
Cushion	None	
Hydraulic Oil Applied	General Purpose Mineral Hydraulic Oil (Please specify when a different type of working oil is to be used)	
Thread Tolerance <sup>Note 5)</sup>	JIS 6g/6H (corresponds to JIS Grade 2)	
Stroke Tolerance	100mm or less $^{+0.8}_0$ : 101mm to 250mm $^{+1.0}_0$	
Rod End Type	Female Thread or Male Thread	

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

Note 2) 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 3) When operating at the maximum operating speed, keep the inertial load pressures generated within the cylinder chamber below the Maximum Allowable Pressure.

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

Note 5) The female thread is a metric coarse thread.

Note 6) None of these cylinders have air bleeds.

Note 7) Radial loads cannot be applied to the piston rod, so care is necessary when adjusting them during installation.

Note 8) The range of operating temperature will vary with the packing material used.

Note 9) In the case where the piston strikes the cylinder end surface at the end of the stroke, reduce the speed to below the minimum speed.

Note 10) When tightening a double rod piston rod, always use on the width across flats side of the rod for tightening. The double rod type of piston rod ends with a thread, so make sure that the torque does not affect the ends of the piston rods.

## Mass Table

Units: kg

Symbol	CS							
	Standard Type				Foot Type			
	Single Rod		Double Rod		Single Rod		Double Rod	
	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass
$\phi 32$	1.36	0.25	2.21	0.25	1.39	0.26	2.01	0.26
$\phi 40$	1.67	0.30	2.83	0.30	1.76	0.32	2.56	0.32
$\phi 50$	2.32	0.37	3.87	0.37	2.58	0.41	3.62	0.41
$\phi 63$	3.57	0.47	5.89	0.47	4.26	0.57	5.90	0.57
$\phi 80$	6.35	0.67	9.94	0.67	—	—	—	—
$\phi 100$	15.4	1.22	20.6	1.22	—	—	—	—
$\phi 125$	27.8	2.02	36.8	2.02	—	—	—	—
$\phi 140$	58.3	2.26	—	—	—	—	—	—
$\phi 150$	72.4	2.59	—	—	—	—	—	—
$\phi 160$	96.4	3.31	—	—	—	—	—	—

Note) The stroke mass is the mass per 10mm of stroke.



### ■ Packing Material

Code	1 (Standard)	3	9 (Standard)
Material	Nitrile Rubber	Fluoric Rubber	Hydrogenated Nitrile Rubber
Range of Operating Temperature	-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 Hydraulic Oil in Water	○	○	◎
Water + Glycol-type Operating Oil	○	×	◎
Phosphate Ester Fluid	×	○	×
Fatty Acid Ester Fluid	○	○	○

### ■ Piston Area

Bore (mm)	Rod Diameter (mm)	Piston Area (cm <sup>2</sup> )	
		Push	Pull
φ32	φ18	8.0	5.5
φ40	φ22.4	12.6	8.6
φ50	φ28	19.6	13.5
φ63	φ35.5	31.2	21.3
φ80	φ45	50.2	34.3
φ100	φ56	78.5	53.9
φ125	φ71	122.7	83.1
φ140	φ80	153.9	103.6
φ150	φ85	176.7	119.9
φ160	φ90	201.0	137.4

Note) The ○ 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.

### ■ Code

**CS - S A 9 SA 32 B 10 - M N YP**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

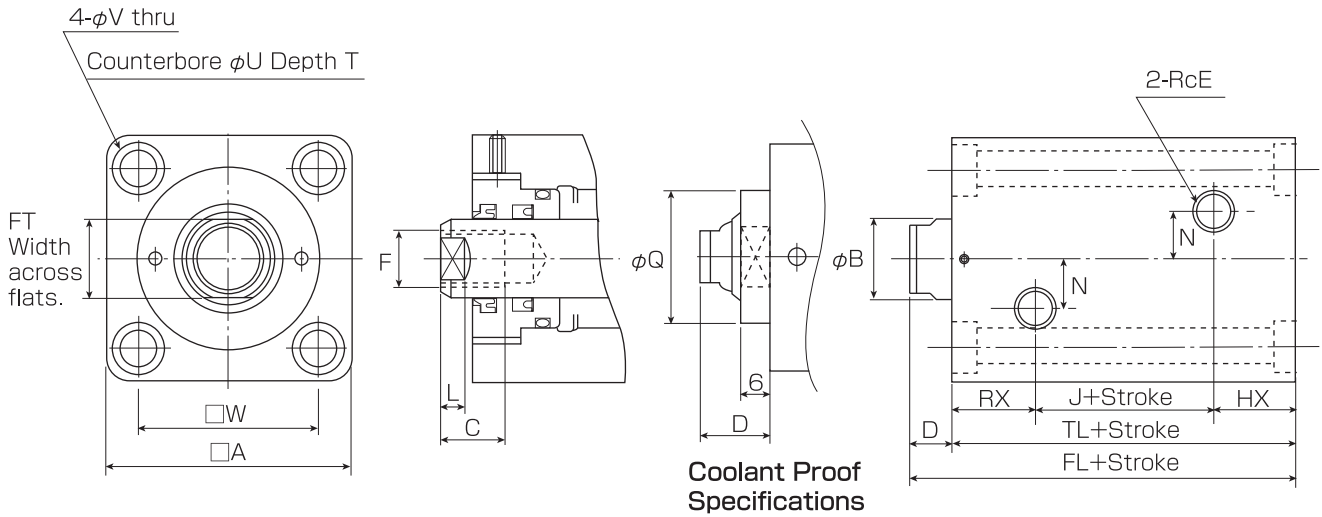
① Series Name	Standard: CS
② Single/Double Classification	S: Single Rod Type W: Double Rod Type (Special Order)
③ Standard Special Classification	A: Standard Dimensions
④ Packing Material	1. Nitrile Rubber (Standard: φ140 to φ160) 3. Fluoric Rubber 6. Coolant Proof Nitrile Rubber 7. Coolant Proof Fluoric Rubber 9. Hydrogenated Nitrile Rubber (Standard: φ32 to φ125)
⑤ Mounting	SA·FA·FB·LD (The key places to the accessory. )
⑥ Bore (mm)	φ32·φ40·φ50·φ63·φ80·φ100·φ125·φ140·φ150·φ160 (LD Foot type is up to 63. )
⑦ Type of Rod	B:B Rod
⑧ Stroke Length (mm)	5·10·15·20·25·30·35·40·45·50·60·70·80·90·100
⑨ Thread Specifications	M: Male Thread Specifications , No Notation; Female Thread Specifications(Standard) *In the case of double rods: male thread M , Female thread L : notated as MM, LL, ML, etc.Male / Female threads are standard for double rods , and so thread specifications are not described here.
⑩ Lock Nut	N: With Lock Nut; No Notation: None (this is an option of male thread specifications)
⑪ Rod End Joint	YP: Double Protrusion End Joint with Pin (Refer to P47.) T: Single Protrusion End Joint (Refer to P46.) (this is an option of male thread specifications)

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

Note 2) The standard of the packing material is hydrogenated nitrile for φ32 to φ125 and nitrile for φ140 to φ160.

Please refer to P.132 for information regarding male thread dimensions.

## Basic Type [CS-SA] Single Rod(up to 100 strokes)



The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units:mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX
φ32	62	18	15	10 (20)	1/4	M12XP1.75	64 (74)	14	12	14	7	10	28
φ40	70	22.4	20	10 (20)	1/4	M16XP2.0	65 (75)	19	12	16	7	10	27
φ50	80	28	24	11 (21)	1/4	M20XP2.5	71 (81)	24	13	19	8	10	28
φ63	94	35.5	33	13 (23)	1/4	M27XP3.0	80 (90)	30	13	24	9	10	30
φ80	114	45	33	17 (27)	3/8	M30XP3.5	95 (105)	41	18	25	14	15	35
φ100	145	56	45	26 (36)	3/8	M39XP4.0	121 (131)	50	21	39	20	0	35
φ125	185	71	50	31	1/2	M42XP4.5	136	65	26	44	25	0	35
φ140	205	80	55	35	1/2	M42XP4.5	220	75	66	53	25	0	66
φ150	220	85	60	40	1/2	M45XP4.5	240	80	71	58	30	0	71
φ160	245	90	65	40	1/2	M48XP5.0	255	85	76	63	30	0	76

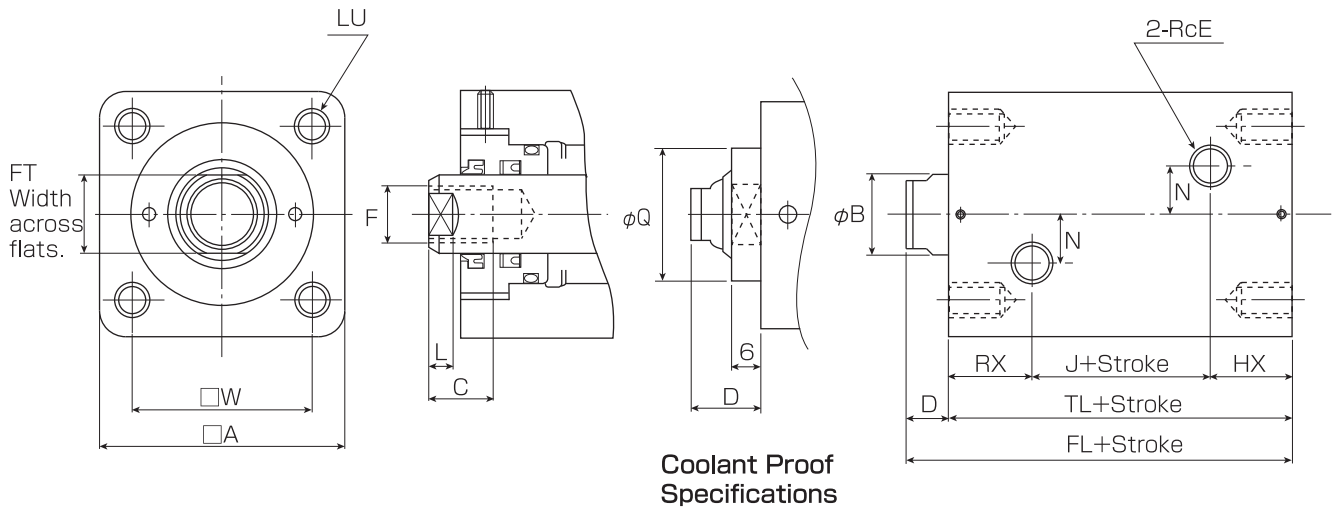
Units:mm

Symbol Bore	T	TL	φU	φQ	φV	□W
φ32	6.5	54	11	(37)	6.6	47
φ40	8.6	55	14	(45)	9	52
φ50	10.8	60	17.5	(53)	11	58
φ63	13	67	20	(63)	14	69
φ80	15.2	78	23	(80)	16	86
φ100	21.5	95	32	(105)	22	105
φ125	25.5	105	39	—	26	140
φ140	29	185	43	—	30	150
φ150	32	200	48	—	33	160
φ160	35	215	54	—	36	175

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

# Basic Type [CS-SA]

Single Rod [Above 100 strokes, up to Maximum Stroke for Each Bore]



■ Table of Dimensions (Above 100 strokes, up to maximum stroke)

Units:mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N
φ32	62	18	15	10(20)	1/4	M12×P1.75	82(92)	14	28	16	7	10
φ40	70	22.4	20	10(20)	1/4	M16×P2.0	82(92)	19	27	18	7	10
φ50	80	28	24	11(21)	1/4	M20×P2.5	86(96)	24	28	19	8	10
φ63	94	35.5	33	13(23)	1/4	M27×P3.0	95(105)	30	30	22	9	10
φ80	114	45	33	17(27)	3/8	M30×P3.5	112(122)	41	35	25	14	15
φ100	145	56	45	26(36)	3/8	M39×P4.0	138(148)	50	35	42	20	0
φ125	185	71	50	31	1/2	M42×P4.5	148	65	35	47	25	0
φ140	205	80	55	35	1/2	M42XP4.5	220	75	66	53	25	0
φ150	220	85	60	40	1/2	M45XP4.5	240	80	71	58	30	0
φ160	245	90	65	40	1/2	M48XP5.0	255	85	76	63	30	0

Units:mm

Symbol Bore	RX	TL	φQ	□W	LU
φ32	28	72	(37)	47	M6×P1.0 Depth 12
φ40	27	72	(45)	52	M8×P1.25 Depth 116
φ50	28	75	(53)	58	M10×P1.5 Depth 120
φ63	30	82	(63)	69	M12×P1.75 Depth 124
φ80	35	95	(80)	86	M14×P2.0 Depth 128
φ100	35	112	(105)	105	M18×P2.5 Depth 136
φ125	35	117	—	140	M22×P2.5 Depth 144
φ140	66	185	—	150	M27×P3.0 Depth 154
φ150	71	200	—	160	M30×P3.5 Depth 160
φ160	76	215	—	175	M33×P3.5 Depth 166

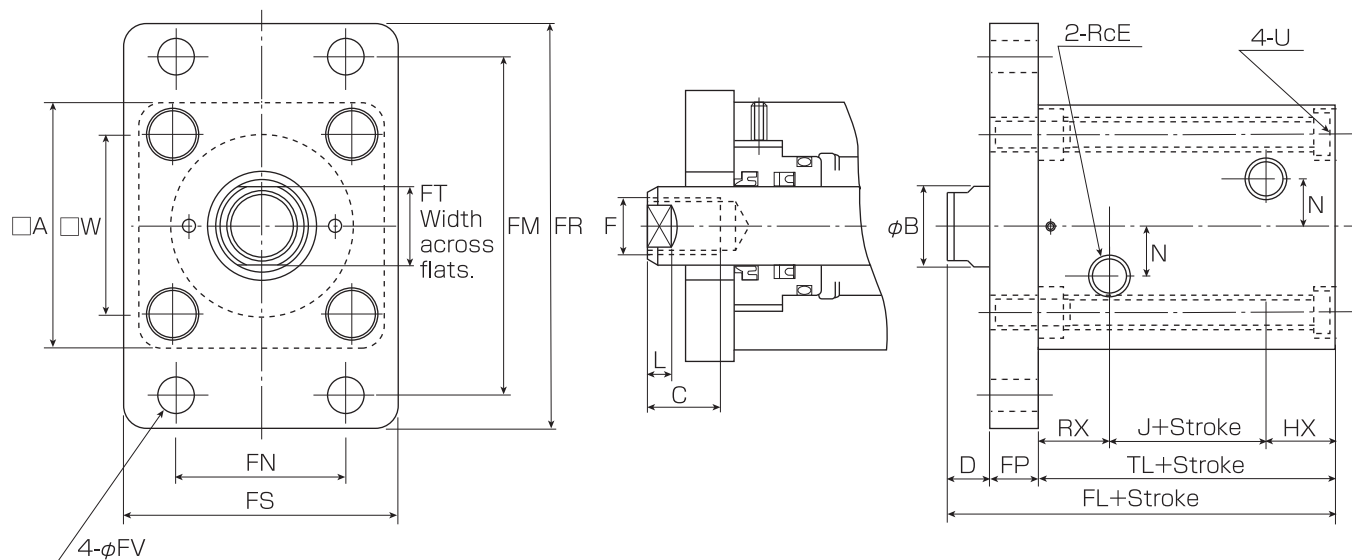
Note1) The stroke is given in units of 10mm.

Note2) The information contained between the parentheses ( ) is the coolant proof specifications.



## Flange Type (CS-FA)

With FA Flange



Note) The standard stroke is up to 100mm.

The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units:mm

Symbol Bore	A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
φ32	62	18	15	10	1/4	M12×P1.75	79 (97)	14	12 (28)	14	7	10	28	54 (72)	47	M6×P1.0
φ40	70	22.4	20	10	1/4	M16×P2.0	85 (102)	19	12 (27)	16	7	10	27	55 (72)	52	M8×P1.25
φ50	80	28	24	11	1/4	M20×P2.5	91 (106)	24	13 (28)	19	8	10	28	60 (75)	58	M10×P1.5
φ63	94	35.5	33	13	1/4	M27×P3.0	100 (119)	30	13 (30)	24	9	10	30	67 (82)	69	M12×P1.75
φ80	114	45	33	17	3/8	M30×P3.5	120 (140)	41	18 (35)	25	14	15	35	78 (95)	86	M14×P2.0
φ100	145	56	45	26	3/8	M39×P4.0	158 (175)	50	21 (35)	39	20	0	35	95 (112)	105	M20×P2.5
φ125	185	71	50	31	1/2	M42×P4.5	182 (194)	65	26 (35)	44	25	0	35	105 (117)	140	M24×P3.0
φ140	205	80	55	35	1/2	M42×P4.5	271	75	66	53	25	0	66	185	150	M27×P3.0
φ150	220	85	60	40	1/2	M45×P4.5	296	80	71	58	30	0	71	200	160	M30×P3.5
φ160	245	90	65	40	1/2	M48×P5.0	316	85	76	63	30	0	76	215	175	M33×P3.5

Units:mm

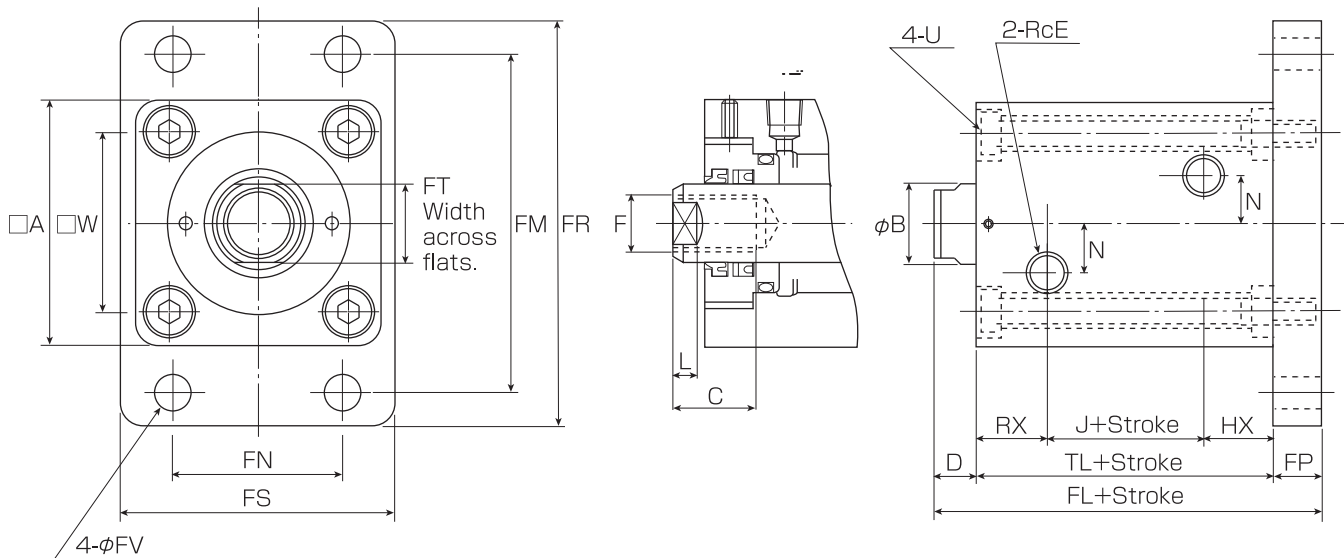
Symbol Bore	FP	FM	FR	FN	FS	φFV
φ32	15	80	95	40	62	6.6
φ40	20	96	118	46	70	11
φ50	20	108	135	58	85	14
φ63	20 (24)	124	150	65	98	14
φ80	25 (28)	154	185	87	118	18
φ100	37	195	235	110	150	22
φ125	46	245	295	140	190	26
φ140	51	270	325	155	210	30
φ150	56	295	355	165	225	33
φ160	61	325	390	185	250	36

Note) The size when 100 strokes are exceeded is ( ).



# Flange Type (CS-FB)

## With FB Flange



Note) The standard stroke is up to 100mm.

The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units:mm

Symbol Bore	A	B	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
φ32	62	18	15	10	1/4	M12×P1.75	79 (97)	14	12 (28)	14	7	10	28	54 (72)	47	M6×P1.0
φ40	70	22.4	20	10	1/4	M16×P2.0	85 (102)	19	12 (27)	16	7	10	27	55 (72)	52	M8×P1.25
φ50	80	28	24	11	1/4	M20×P2.5	91 (106)	24	13 (28)	19	8	10	28	60 (75)	58	M10×P1.5
φ63	94	35.5	33	13	1/4	M27×P3.0	100 (119)	30	13 (30)	24	9	10	30	67 (82)	69	M12×P1.75
φ80	114	45	33	17	3/8	M30×P3.5	120 (140)	41	18 (35)	25	14	15	35	78 (95)	86	M14×P2.0
φ100	145	56	45	26	3/8	M39×P4.0	158 (175)	50	21 (35)	39	20	0	35	95 (112)	105	M20×P2.5
φ125	185	71	50	31	1/2	M42×P4.5	182 (194)	65	26 (35)	44	25	0	35	105 (117)	140	M24×P3.0
φ140	205	80	55	35	1/2	M42XP4.5	271	75	66	53	25	0	66	185	150	M27×P3.0
φ150	220	85	60	40	1/2	M45XP4.5	296	80	71	58	30	0	71	200	160	M30×P3.5
φ160	245	90	65	40	1/2	M48XP5.0	316	85	76	63	30	0	76	215	175	M33×P3.5

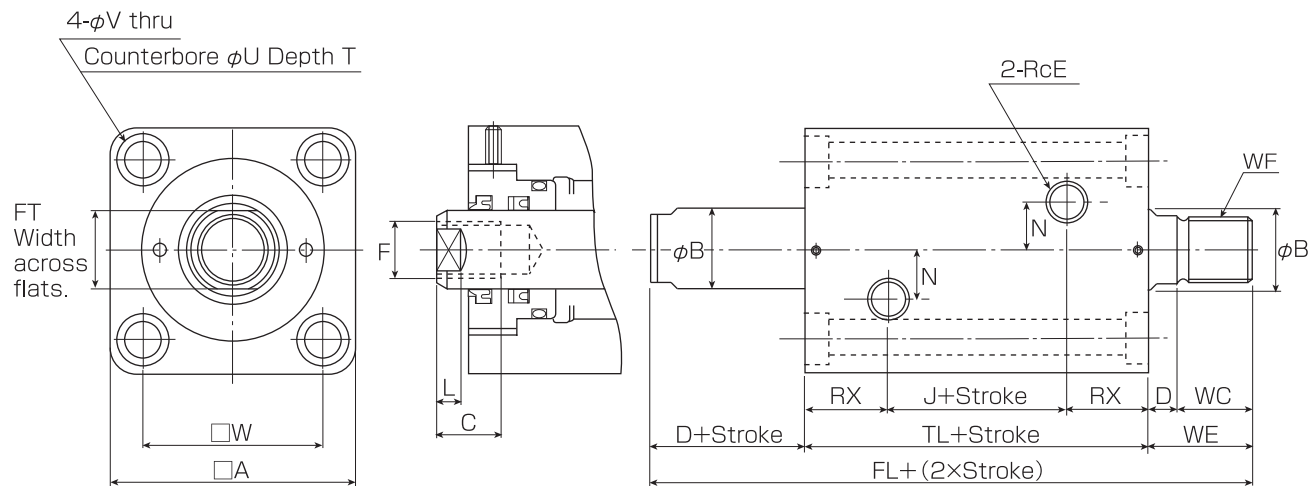
Units:mm

Symbol Bore	FP	FM	FR	FN	FS	φFV
φ32	15	80	95	40	62	6.6
φ40	20	96	118	46	70	11
φ50	20	108	135	58	85	14
φ63	20 (24)	124	150	65	98	14
φ80	25 (28)	154	185	87	118	18
φ100	37	195	235	110	150	22
φ125	46	245	295	140	190	26
φ140	51	270	325	155	210	30
φ150	56	295	355	165	225	33
φ160	61	325	390	185	250	36

Note) The size when 100 strokes are exceeded is ( ).

## Basic Type

### Double Rod [Special Order]



- Note 1) Right side of the double rods has standard male thread specifications.  
 Note 2) In cases of over 50 strokes, they are special specifications.

The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

#### Table of Dimensions

Units: mm

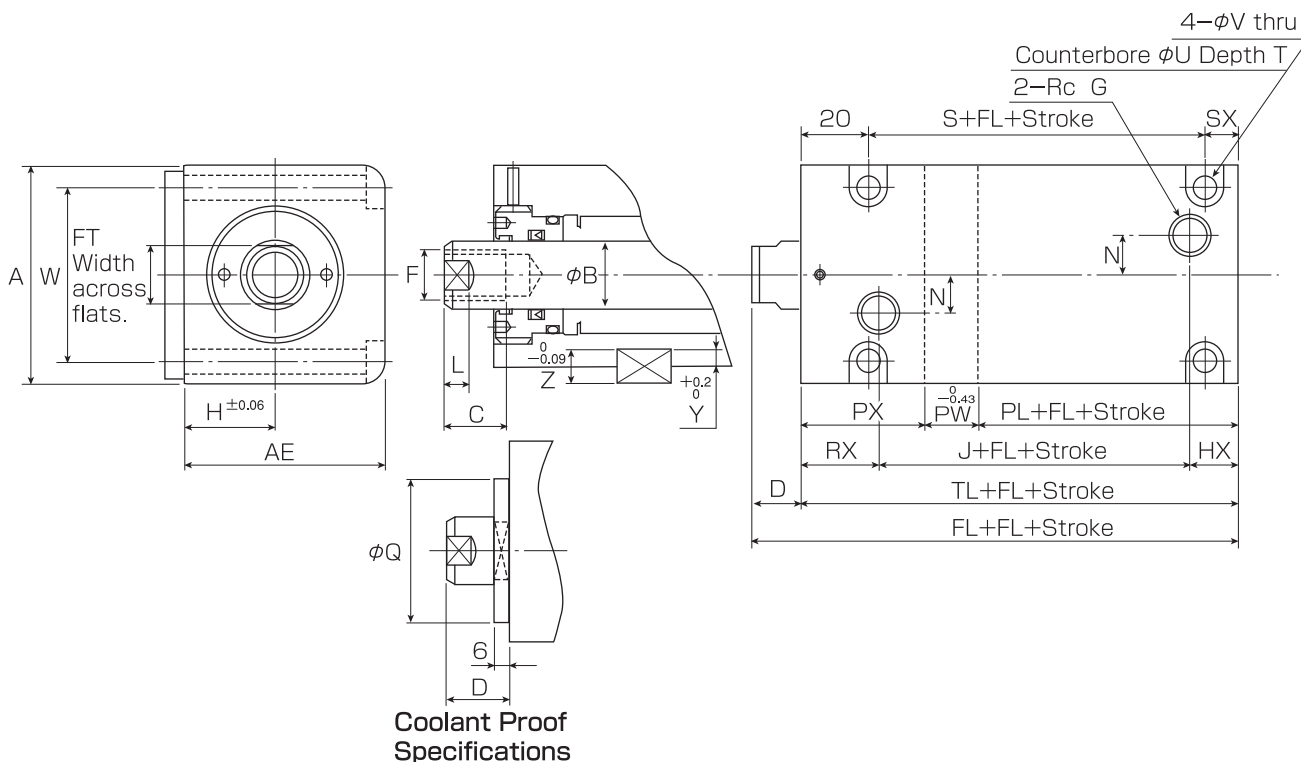
Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	J	L	N	RX	T	TL	φU
φ32	62	18	15	10	1/4	M12XP1.75	117	14	16	7	10	28	6.5	72	11
φ40	70	22.4	20	10	1/4	M16XP2.0	122	19	18	7	10	27	8.6	72	14
φ50	80	28	24	11	1/4	M20XP2.5	132	24	19	8	10	28	10.8	75	17.5
φ63	94	35.5	33	13	1/4	M27XP3.0	153	30	22	9	10	30	13	82	20
φ80	114	45	33	17	3/8	M30XP3.5	189	41	25	14	15	35	15.2	95	23
φ100	145	56	45	26	3/8	M39XP4.0	239	50	42	20	0	35	21.5	112	32
φ125	185	71	50	31	1/2	M42XP4.5	274	65	47	25	0	35	25.5	117	39

Units: mm

Symbol Bore	φV	□W	WF	WC	WE
φ32	6.6	47	M16×P1.5	25	35
φ40	9	52	M20×P1.5	30	40
φ50	11	58	M24×P1.5	35	46
φ63	14	69	M30×P1.5	45	58
φ80	16	86	M39×P1.5	60	77
φ100	22	105	M48×P1.5	75	101
φ125	26	140	M64×P2	95	126

# Foot Type [CS-LD]

Single Rod(up to 100 strokes)



The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

## Table of Dimensions

Units:mm

Symbol Bore	A	AE	φB	C	D	F	G	H	RX	HX	J	L	N	S	SX	PL	PX	PW	Y	Z
φ32	70	56	18	15	10 (20)	M12×P1.75	1/4	25	28	12	14	7	10	24	10	14	28	12	3.3	8
φ40	80	64	22.4	20	10 (20)	M16×P2.0	1/4	29	27	12	16	7	10	23	12	15	28	12	3.3	8
φ50	94	74	28	24	11 (21)	M20×P2.5	1/4	34	28	13	19	8	10	27	13	17	29	14	3.8	9
φ63	114	89	35.5	33	13 (23)	M27×P3.0	1/4	42	30	13	24	9	10	32	15	20	31	16	4.3	10

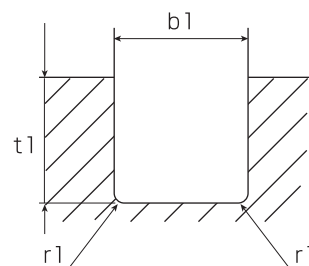
Symbol Bore	FT	TL	FL	φV	φU	φQ	T	W
φ32	14	54	64 (74)	9	14	(37)	8.6	56
φ40	19	55	65 (75)	11	17.5	(45)	10.8	62
φ50	24	60	71 (81)	14	20	(53)	13	74
φ63	30	67	80 (90)	16	23	(63)	15.2	90

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

## Recommended key slot size (Only the Foot type)

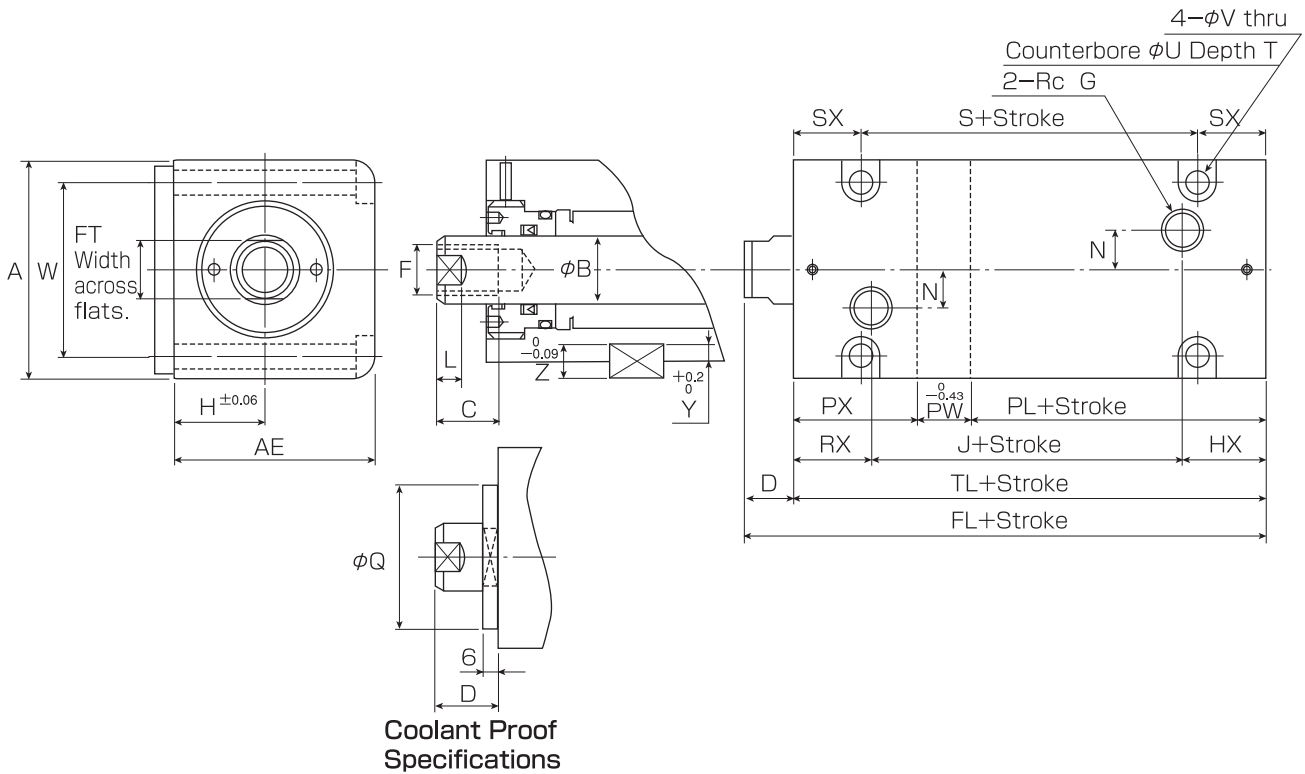
Units:mm

Bore	Key Size	Key Slot Dimension		
	b×h×t (Both are round.)	b l	t l	r l
φ32	12×8×63	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ40	12×8×70	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ50	14×9×90	14 <sup>0</sup> <sub>-0.043</sub>	5.5 <sup>+0.2</sup> <sub>0</sub>	0.3
φ63	16×10×100	16 <sup>0</sup> <sub>-0.043</sub>	6.0 <sup>+0.2</sup> <sub>0</sub>	0.3



## Foot Type [CS-LD]

Single Rod [Above 100 strokes, Maximum Stroke for Each Bore]



The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

### Table of Dimensions

Units:mm

Symbol Bore	A	AE	φB	C	D	F	G	H	RX	HX	J	L	N	S	SX	PL	PX	PW	Y	Z
φ32	70	56	18	15	$\begin{matrix} 10 \\ (20) \end{matrix}$	M12×P1.75	1/4	25	28	28	16	7	10	32	20	32	28	12	3.3	8
φ40	80	64	22.4	20	$\begin{matrix} 10 \\ (20) \end{matrix}$	M16×P2.0	1/4	29	27	27	18	7	10	32	20	32	28	12	3.3	8
φ50	94	74	28	24	$\begin{matrix} 11 \\ (21) \end{matrix}$	M20×P2.5	1/4	34	28	28	19	8	10	35	20	32	29	14	3.8	9
φ63	114	89	35.5	33	$\begin{matrix} 13 \\ (23) \end{matrix}$	M27×P3.0	1/4	42	30	30	22	9	10	42	20	35	31	16	4.3	10

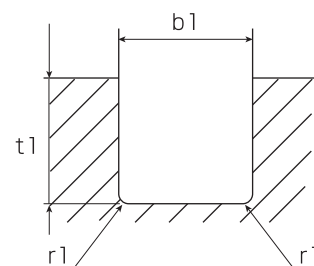
Symbol Bore	FT	TL	FL	φV	φU	φQ	T	W
φ32	14	72	$\begin{matrix} 82 \\ (92) \end{matrix}$	9	14	(37)	8.6	56
φ40	19	72	$\begin{matrix} 82 \\ (92) \end{matrix}$	11	17.5	(45)	10.8	62
φ50	24	75	$\begin{matrix} 86 \\ (96) \end{matrix}$	14	20	(53)	13	74
φ63	30	82	$\begin{matrix} 95 \\ (105) \end{matrix}$	16	23	(63)	15.2	90

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

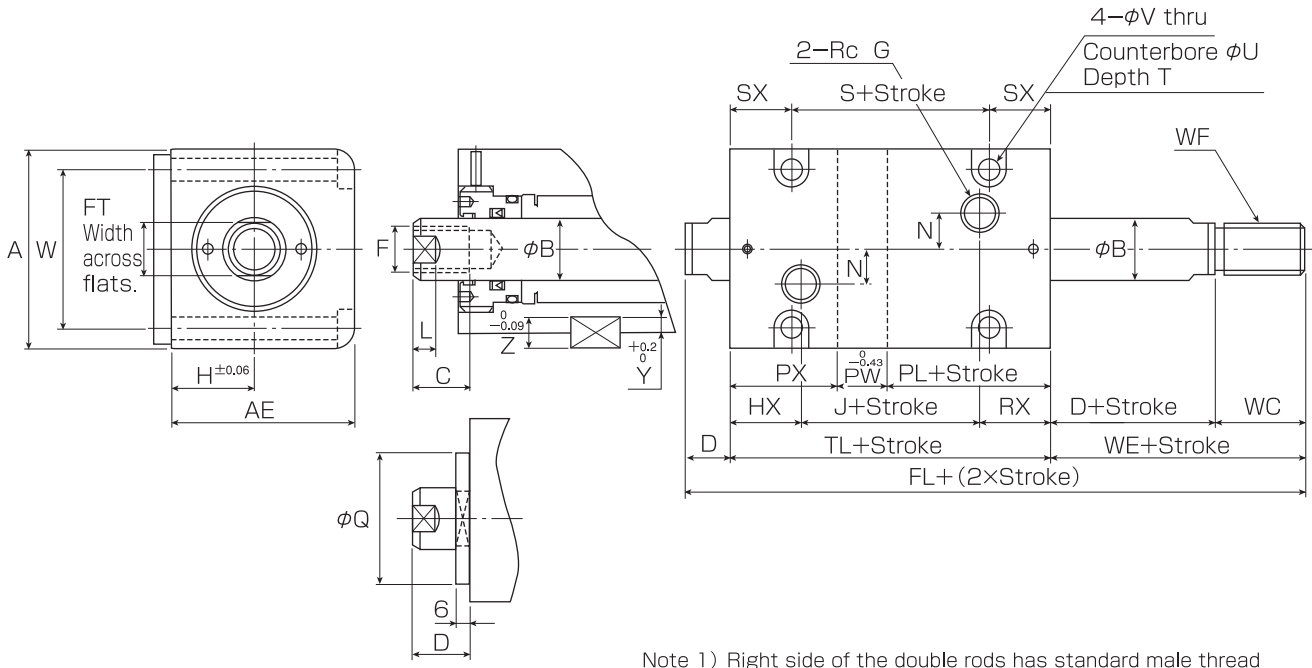
### Recommended key slot size (Only the Foot type)

Units:mm

Bore	Key Size	Key Slot Dimension		
	b×h×t (Both are round.)	b1	t1	r1
φ32	12×8×63	$12 \begin{matrix} 0 \\ -0.043 \end{matrix}$	$5.0 \begin{matrix} +0.2 \\ 0 \end{matrix}$	0.3
φ40	12×8×70	$12 \begin{matrix} 0 \\ -0.043 \end{matrix}$	$5.0 \begin{matrix} +0.2 \\ 0 \end{matrix}$	0.3
φ50	14×9×90	$14 \begin{matrix} 0 \\ -0.043 \end{matrix}$	$5.5 \begin{matrix} +0.2 \\ 0 \end{matrix}$	0.3
φ63	16×10×100	$16 \begin{matrix} 0 \\ -0.043 \end{matrix}$	$6.0 \begin{matrix} +0.2 \\ 0 \end{matrix}$	0.3



## Foot Type [CS-LD] Double Rod



**Coolant Proof Specifications**

Note 1) Right side of the double rods has standard male thread specifications.

Note 2) In cases of over 50 strokes, they are special specifications.

The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

### Table of Dimensions

Units:mm

Symbol Bore	A	AE	φB	C	D	F	G	H	RX	HX	J	L	N	S	SX	PL	PX	PW	Y	Z
φ32	70	56	18	15	10 (20)	M12×P1.75	1/4	25	28	28	16	7	10	32	20	32	28	12	3.3	8
φ40	80	64	22.4	20	10 (20)	M16×P2.0	1/4	29	27	27	18	7	10	32	20	32	28	12	3.3	8
φ50	94	74	28	24	11 (21)	M20×P2.5	1/4	34	28	28	19	8	10	35	20	32	29	14	3.8	9
φ63	114	89	35.5	33	13 (23)	M27×P3.0	1/4	42	30	30	22	9	10	42	20	35	31	16	4.3	10

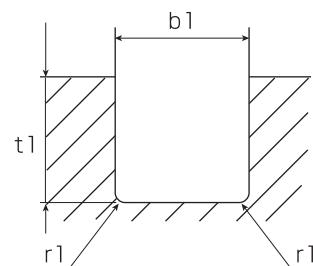
Symbol Bore	FT	TL	FL	φV	φU	φQ	T	W	WC	WE	WF
φ32	14	72	117 (127)	9	14	(37)	8.6	56	25	35	M16×P1.5
φ40	19	72	122 (132)	11	17.5	(45)	10.8	62	30	40	M20×P1.5
φ50	24	75	132 (142)	14	20	(53)	13	74	35	46	M24×P1.5
φ63	30	82	153 (163)	16	23	(63)	15.2	90	45	58	M30×P1.5

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

### Recommended key slot size (Only the Foot type)

Units:mm

Bore	Key Size	Key Slot Dimension		
	b×h×t (Both are round.)	b1	t1	r1
φ32	12×8×63	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ40	12×8×70	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ50	14×9×90	14 <sup>0</sup> <sub>-0.043</sub>	5.5 <sup>+0.2</sup> <sub>0</sub>	0.3
φ63	16×10×100	16 <sup>0</sup> <sub>-0.043</sub>	6.0 <sup>+0.2</sup> <sub>0</sub>	0.3



### Specifications

Series Name	CSR	
Mounting	SA·FA·FB	LD
Bore	φ32·φ40·φ50·φ63·φ80	φ32·φ40·φ50·φ63
Nominal Pressure <small>Note 1)</small>	16MPa	
Maximum Allowable Pressure <small>Note 2)</small>	16MPa	
Proof Pressure	21MPa	
Minimum Operating Pressure <small>Note 3)</small>	0.64MPa or less	
Range of Operating Speed <small>Note 4)</small>	8 to 100mm/sec	
Range of Operating Temperature <small>Note 5)</small>	Standard Specifications : -10°C to +80°C High Temperature Specifications : -10°C to +100°C	
Cushion	None	
Hydraulic Oil Applied	General Purpose Mineral Hydraulic Oil (Please specify when a different type of operating oil is to be used)	
Thread Tolerance <small>Note 6)</small>	JIS 6g/6H	
Stroke Tolerance	100st or less : 0 to +0.8mm 101st to 250st : 0 to +1.0mm	
Rod End Type	Female Thread or Male Thread	

- Note 1) Dimensions of the special model are different from those of the standard model.
- Note 2) The Maximum Allowable Pressure is the tolerance valu for pressures, such as surge pressures and increased pressures, in the hydraulic cylinder circuit that exceed the pressure set for operation.
- Note 3) When operating at the maximum cylinder speed, keep the inertial load pressures generated within the cylinder chamber below Maximum Allowable Pressure.
- Note 4) The Minimum Operating Pressure is the value when the pressure is supplied from the cap side.
- Note 5) In the switch adjusted type, the temperature limit for the switch body should be under 60°C. (Select a special high-temperature switch in the case where temperatures will exceed 60°C) The high temperature specifications for the switch adjusted type vary with the packing/switch specifications so please contact us for usage details.
- Note 6) The female thread is a metric coarse thread.
- Note 7) None of these cylinders have air bleeds.
- Note 8) Radial loads cannot be applied to the piston rod, so care is necessary when adjusting them during installation.
- Note 9) In the case where the piston strikes the cylinder end surface at the end of the stroke, reduce the speed to below the minimum speed.
- Note 10) When tightening a double rod piston rod, always use the double surface width side of the rod for tightening. The double rod type of piston rod ends with a thread, so make sure that the torque does not affect the ends of the piston rods.

### Stroke Table: Single Rod

Units:mm

Type	Mounting	Bore	Stroke																		Male Thread Specifications	Maximum Stroke		
			10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95			100	
CSR	SA FA FB	φ32	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	○	200
		φ40	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	250
		φ50	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	250
		φ63	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	○	◎	○	◎	○	◎	○	◎	○	◎	250
	LD	φ32	◎	○	◎	○	◎	○	◎	○	◎	△	○	△	○	△	○	△	○	△	○	△	○	200
		φ40	◎	○	◎	○	◎	○	◎	○	◎	△	○	△	○	△	○	△	○	△	○	△	○	250
		φ50	◎	○	◎	○	◎	○	◎	○	◎	△	○	△	○	△	○	△	○	△	○	△	○	250
		φ63	◎	○	◎	○	◎	○	◎	○	◎	△	○	△	○	△	○	△	○	△	○	△	○	250

### Stroke Table: Double Rod

Units:mm

Type	Mounting	Bore	Stroke																		Male Thread Specifications	Maximum Stroke		
			10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95			100	
CSR	SA	φ32	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	100
		φ40	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	110
		φ50	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	140
		φ63	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	170
	LD	φ32	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	100
		φ40	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	110
		φ50	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	140
		φ63	◎	○	◎	○	◎	○	◎	○	◎	△	△	△	△	△	△	△	△	△	△	△	○	170

- Note 1) Standard ◎, Standard Equivalent ○, Special Order △
- Note 2) The interval stroke of the multiples of 5 indicated by the 0 mark have external dimensions 5mm longer than the standard stroke.  
Example: The 15 stroke would have the external dimensions of the 20 stroke.
- Note 3) Please contact us for more information.

### ■ Packing Material

Code	8 (Standard)	6 (Coolant Proof Specifications)	9 (Standard)
Material	Nitrile Rubber + Urethane rubber	Nitrile Rubber + Urethane rubber	Hydrogenated Nitrile Rubber
Range of Operating Temperature	-10°C to +80°C	-10°C to +80°C	-10°C to +120°C
General-purpose Mineral Hydraulic Oil	○	◎	○
Emulsions of Water in Mineral Oil	△	△	◎
Emulsions of Mineral Hydraulic Oil in Water	△	△	◎
Water + Glycol-type Operating Oil	×	×	◎
Phosphate Ester Fluid	×	×	×
Fatty Acid Ester Fluid	×	×	△

### ■ Piston Area

Bore (mm)	Rod Diameter (mm)	Piston Area (cm <sup>2</sup> )			
		Single Rod		Double Rod	
		Push	Pull	Push	Pull
φ32	φ18	8.04	5.50	5.50	
φ40	φ22.4	12.57	8.63	8.63	
φ50	φ28	19.63	13.48	13.48	
φ63	φ35.5	31.17	21.27	21.27	
φ80	φ45	50.27	34.36	34.36	

Note 1) ○-◎ mark can be used. x mark cannot be used. Please consult about △ mark separately.

Note 2) Urethane is contained in the piston packing of 8 (standard) and 6 (coolant-proof specification).

Note 3) Packing quality of the material 9: In selection of hydrogenated nitrile rubber, packing exchange cannot be performed of a visitor. Please return to our company.

### ■ Code **CSR - S B 8 SA 32 B 10 - 2 C - M N YP**

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① Series Name	CSR : Switch adjusted type
② Single/Double Classification	S: Single Rod Type W: Double Rod Type (Special Order)
③ Standard Special Classification	A: Standard Dimensions B: In the cases of form with the length of a screw, size, and a special tip, etc. E: When attachment lug, tip metal fittings, etc. are special (a part of B-E -- when special, it writes in our company.)
④ Packing Material	8. Nitrile Rubber (Standard) 6. Coolant Proof Nitrile Rubber + Urethane rubber 9. Hydrogenated Nitrile Rubber (Standard)
⑤ Mounting	SA·FA·FB·LD (A key is included as an attachment)
⑥ Bore (mm)	φ32·φ40·φ50·φ63·φ80 (There is no φ80 Foot Type)
⑦ Type of Rod	B: B Rod
⑧ Stroke Length (mm)	10·15·20·25·30·35·40·45·50·60·70·80·90·100
⑨ Switch Quantity	Mention the quantity. 1A: In cases where a switch is not required. 1A2: For cylinder using CW or CX or WH or XH, No switch required. 1A3: For cylinder using SV or SH, No switch required.
⑩ Switch	C:T0V3 J:T0V5 CK:T5V3 CL:T5V5 DT:T2V3 DU:T2V5 CW:T2YV3 CH:T0H3 JH:T0H5 FJ: TOV-0.5 (For a DC connector system) FW: TOV-0.5 (For an AC connector system)XX: Special Part <b>Please refer to P.138 for more detailed information on switches.</b>
⑪ Thread Specifications	M: Male Thread Specifications, No Notation: Female Thread Specifications (Standard) *In the case of double rods: male threads M, Male Thread: L, is notated as MM, LL, ML, etc.
⑫ Lock Nut	N: With Lock Nut; No Notation: None (this is an option of male thread specifications are used)
⑬ Rod End Joint	YP: Double Protrusion End Joint with Pin (Refer to P47.) T: Single Protrusion End Joint (Refer to P46.) (this is an option of male thread specifications)

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

Note 2) When Switch the CX,CW,WH,XH,SH and SV is used, additional processing will be necessary.

Please refer to P.132 for more detailed information on male thread dimensions.

### ■ Mass Table

Units: kg

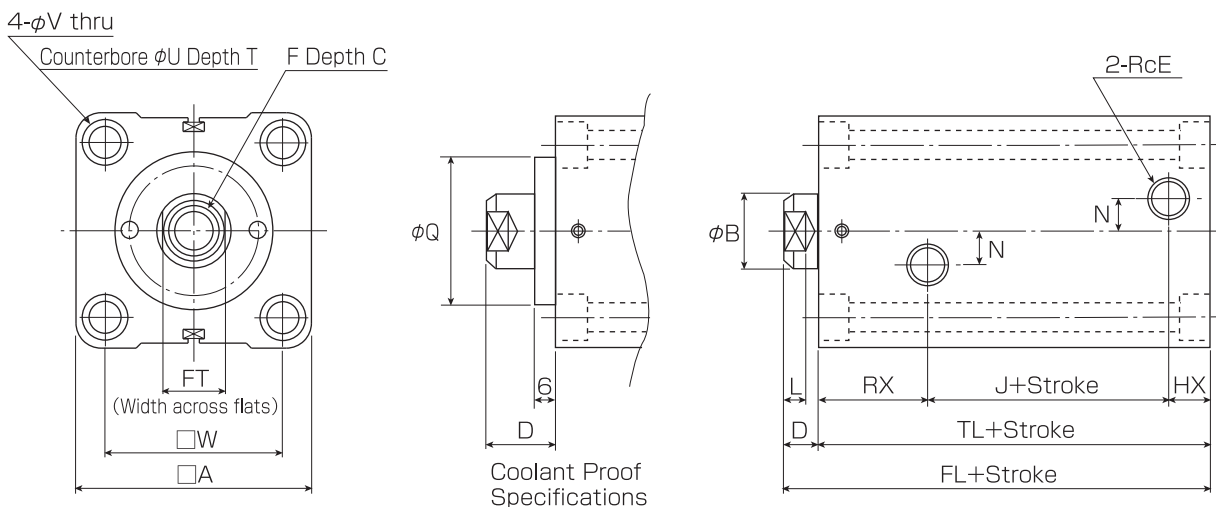
Symbol	CSR							
	SA				LD			
	Single Rod		Double Rod		Single Rod		Double Rod	
Bore	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass
φ32	0.77	0.10	1.09	0.11	0.90	0.11	1.38	0.13
φ40	1.03	0.12	1.48	0.15	1.30	0.15	2.00	0.18
φ50	1.50	0.15	2.11	0.20	1.91	0.19	2.91	0.24
φ63	2.32	0.21	3.28	0.29	3.03	0.27	4.66	0.35
φ80	4.57	0.31	6.51	0.44	—	—	—	—

Note) The stroke mass is the mass per 10mm of stroke.



## Basic Type [CSR-SA]

### Single Stroke (Up to 100 strokes)



The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions (Up to 100 strokes)

Units: mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	T	TL	φU	φQ	φV	□W
φ32	62	18	15	$\frac{10}{(20)}$	1/4	M12XP1.75	$\frac{69}{(79)}$	14	13.5	18.5	7	10	27	6.5	59	11	(37)	6.6	47
φ40	70	22.4	20	$\frac{10}{(20)}$	1/4	M16XP2.0	$\frac{73}{(83)}$	19	16	21	7	10	26	8.6	63	14	(45)	9	52
φ50	80	28	24	$\frac{11}{(21)}$	1/4	M20XP2.5	$\frac{77}{(87)}$	24	19.5	19.5	8	10	27	10.8	66	17.5	(53)	11	58
φ63	94	35.5	33	$\frac{13}{(23)}$	1/4	M27XP3.0	$\frac{87}{(97)}$	30	22.5	22.5	9	10	29	13	74	20	(63)	14	69
φ80	114	45	33	$\frac{17}{(27)}$	3/8	M30XP3.5	$\frac{107}{(117)}$	41	30	26	14	15	34	15.2	90	23	(80)	16	86

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

### Single Rod (Above 100 strokes, Maximum Stroke for Each Bore)

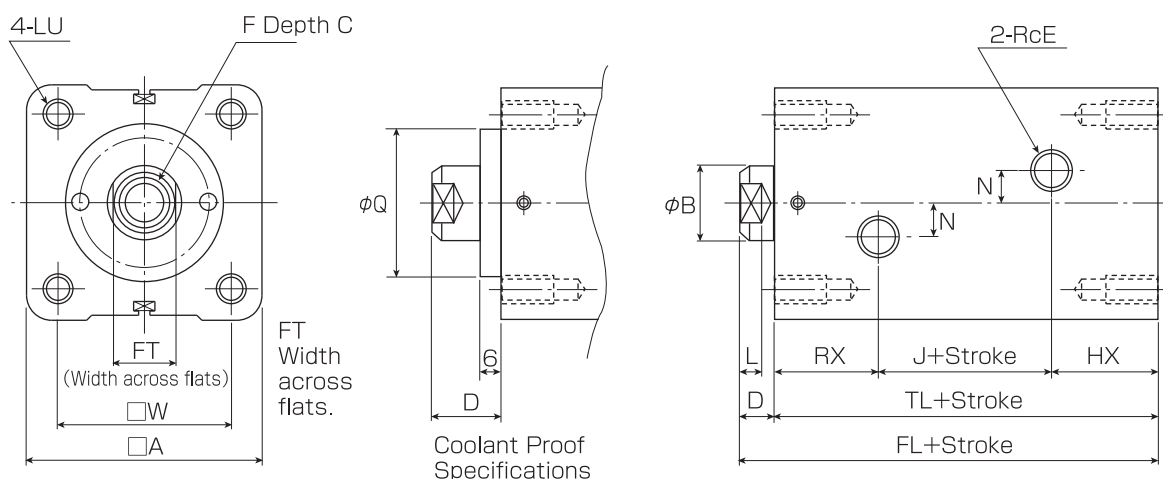


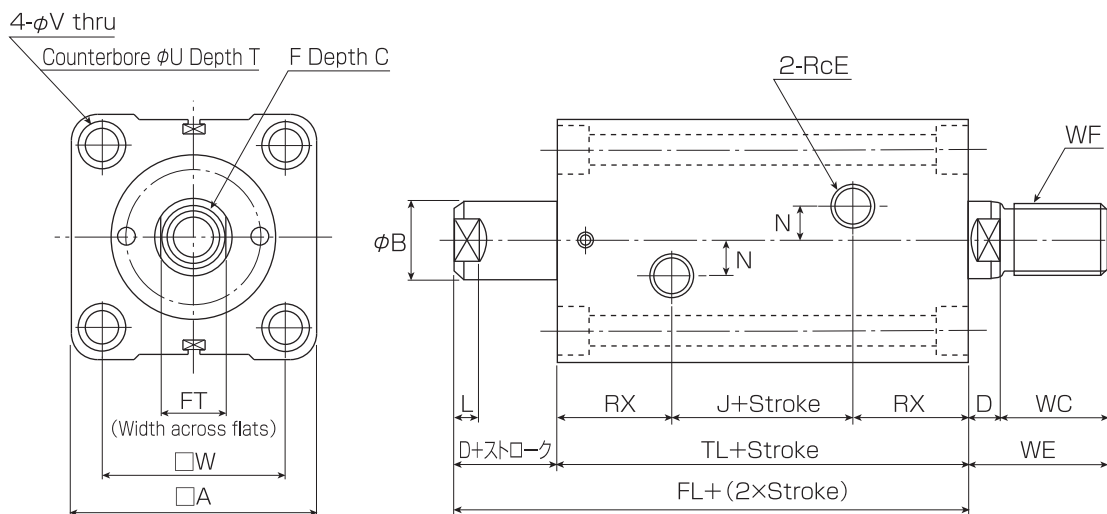
Table of Dimensions (Above 100 strokes, Maximum Stroke for Each Bore)

Units: mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	φQ	□W	LU
φ32	62	18	15	$\frac{10}{(20)}$	1/4	M12XP1.75	$\frac{86}{(96)}$	14	27	22	7	10	27	76	(37)	47	M 6XP1.0 Depth 12
φ40	70	22.4	20	$\frac{10}{(20)}$	1/4	M16XP2.0	$\frac{87}{(97)}$	19	26	25	7	10	26	77	(45)	52	M 8XP1.25 Depth 16
φ50	80	28	24	$\frac{11}{(21)}$	1/4	M20XP2.5	$\frac{89}{(99)}$	24	27	24	8	10	27	78	(53)	58	M10XP1.5 Depth 20
φ63	94	35.5	33	$\frac{13}{(23)}$	1/4	M27XP3.0	$\frac{98}{(108)}$	30	29	27	9	10	29	85	(63)	69	M12XP1.75 Depth 24
φ80	114	45	33	$\frac{17}{(27)}$	3/8	M30XP3.5	$\frac{116}{(126)}$	41	34	31	14	15	34	99	(80)	86	M14XP2.0 Depth 28

Note) The information contained between the parentheses ( ) is the coolant proof specifications.

## Basic Type [CSR-SA] Double Rod



Note 1) Right side of the double rods has standard male thread specifications.  
 Note 2) In cases of over 50 strokes, They are special specifications.  
 Note 3) It becomes tap attachment when a stroke exceeds 100 mm.

■ Table of Dimensions

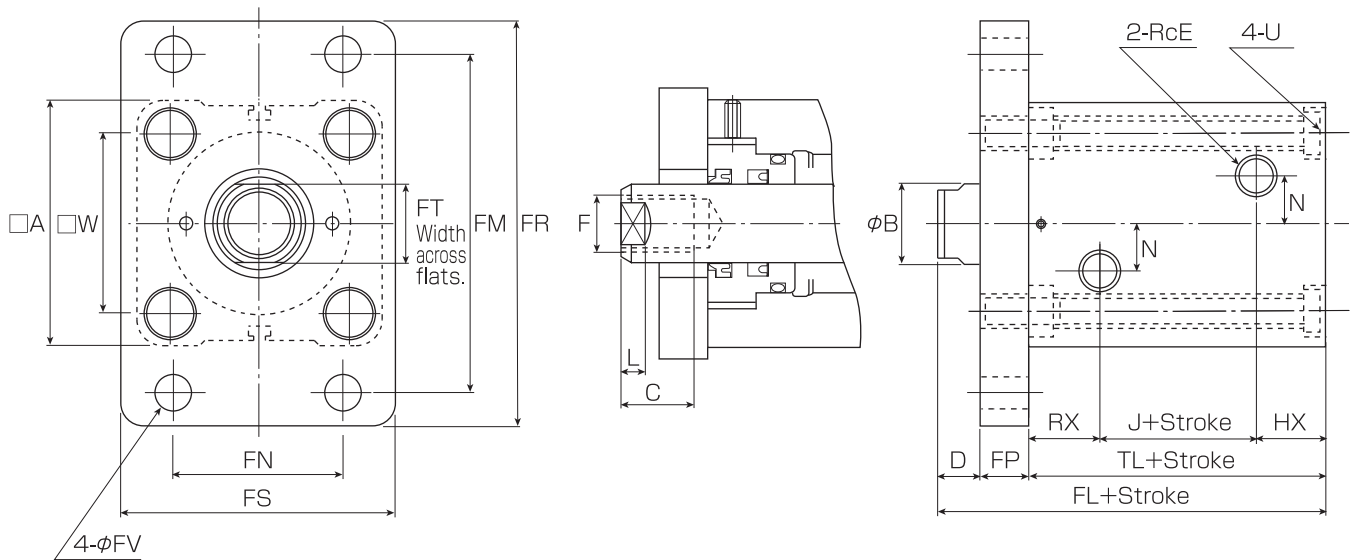
Units: mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	J	L	N	RX	T	TL	φU
φ32	62	18	15	10	1/4	M12XP1.75	119	14	20	7	10	27	6.5	74	11
φ40	70	22.4	20	10	1/4	M16XP2.0	127	19	25	7	10	26	8.6	77	14
φ50	80	28	24	11	1/4	M20XP2.5	133	24	22	8	10	27	10.8	76	17.5
φ63	94	35.5	33	13	1/4	M27XP3.0	153	30	24	9	10	29	13	82	20
φ80	114	45	33	17	3/8	M30XP3.5	193	41	31	14	15	34	15.2	99	23

Units: mm

Symbol Bore	φV	□W	WF	WC	WE
φ32	6.6	47	M16XP1.5	25	35
φ40	9	52	M20XP1.5	30	40
φ50	11	58	M24XP1.5	35	46
φ63	14	69	M30XP1.5	45	58
φ80	16	86	M39XP1.5	60	77

## Basic Type [CSR-FA] With FA Flange



Note) The standard stroke is up to 100mm. Please contact us for stroke lengths above 100mm.

The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units: mm

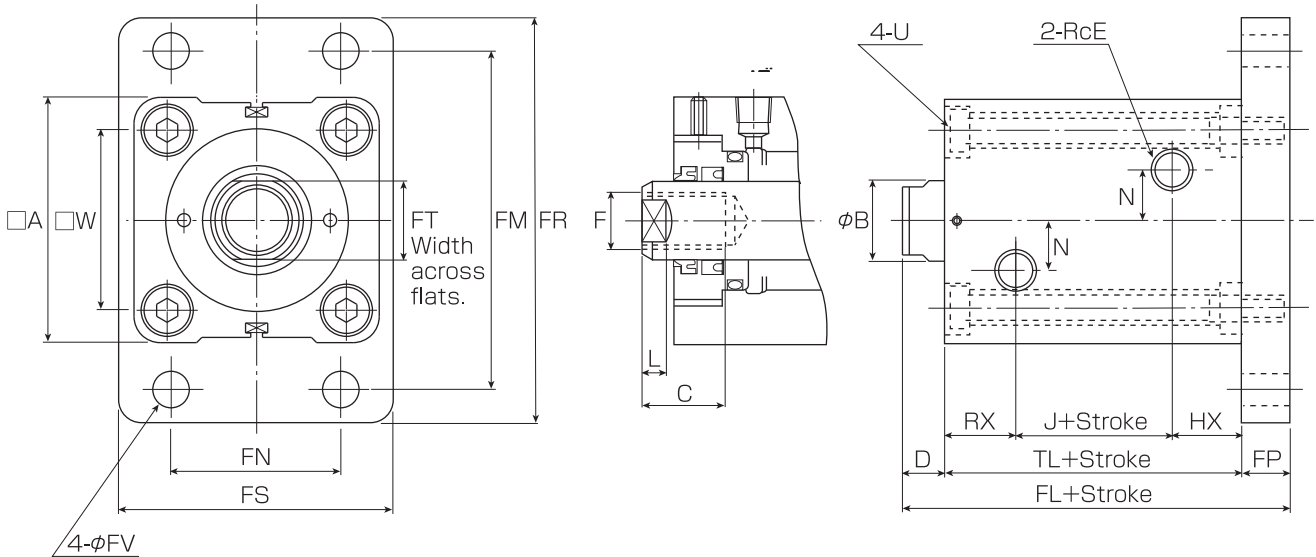
Bore	Symbol	A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
φ32		62	18	15	10	1/4	M12×P1.75	84 (101)	14	13.5 (27)	18.5 (22)	7	10	27	59 (76)	47	M6×P1.0
φ40		70	22.4	20	10	1/4	M16×P2.0	93 (107)	19	16 (26)	21 (25)	7	10	26	63 (77)	52	M8×P1.25
φ50		80	28	24	11	1/4	M20×P2.5	97 (109)	24	19.5 (27)	19.5 (24)	8	10	27	66 (78)	58	M10×P1.5
φ63		94	35.5	33	13	1/4	M27×P3.0	107 (122)	30	22.5 (29)	22.5 (27)	9	10	29	74 (85)	69	M12×P1.75
φ80		114	45	33	17	3/8	M30×P3.5	132 (144)	41	30 (34)	26 (31)	14	15	34	90 (99)	86	M14×P2.0

Units: mm

Bore	Symbol	FP	FM	FR	FN	FS	φFV
φ32		15	80	95	40	62	6.6
φ40		20	96	118	46	70	11
φ50		20	108	135	58	85	14
φ63		20 (24)	124	150	65	98	14
φ80		25 (28)	154	185	87	118	18

Note) The size when 100 strokes are exceeded is ( ).

## Basic Type [CSR-FB] With FB Flange



Note) The standard stroke is up to 100mm. Please contact us for stroke lengths above 100mm.

The interval stroke of the multiples of 5 for 50 strokes or more has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units: mm

Symbol Bore	A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
φ32	62	18	15	10	1/4	M12×P1.75	84 (101)	14	13.5 (27)	18.5 (22)	7	10	27	59 (76)	47	M6×P1.0
φ40	70	22.4	20	10	1/4	M16×P2.0	93 (107)	19	16 (26)	21 (25)	7	10	26	63 (77)	52	M8×P1.25
φ50	80	28	24	11	1/4	M20×P2.5	97 (109)	24	19.5 (27)	19.5 (24)	8	10	27	66 (78)	58	M10×P1.5
φ63	94	35.5	33	13	1/4	M27×P3.0	107 (122)	30	22.5 (29)	22.5 (27)	9	10	29	74 (85)	69	M12×P1.75
φ80	114	45	33	17	3/8	M30×P3.5	132 (144)	41	30 (34)	26 (31)	14	15	34	90 (99)	86	M14×P2.0

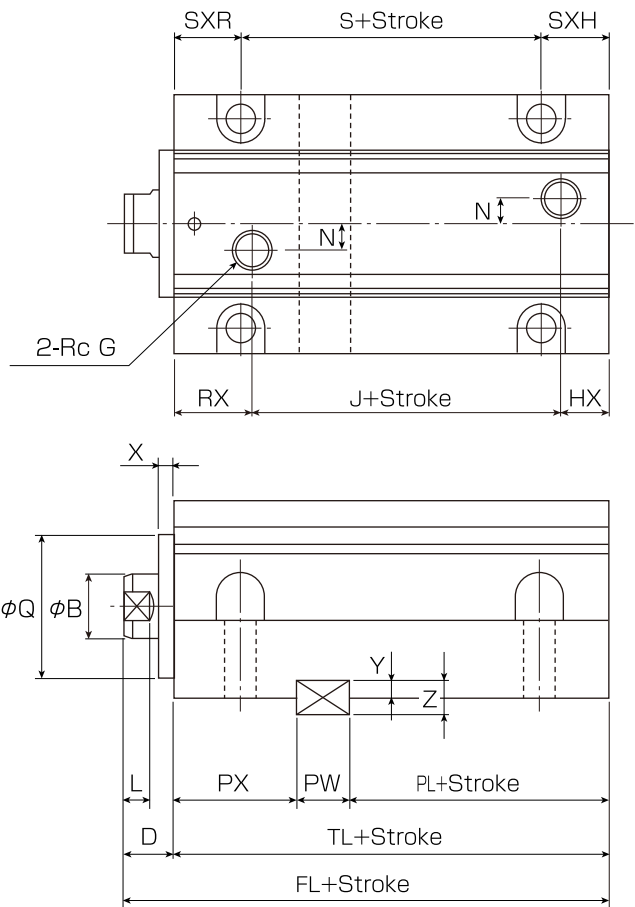
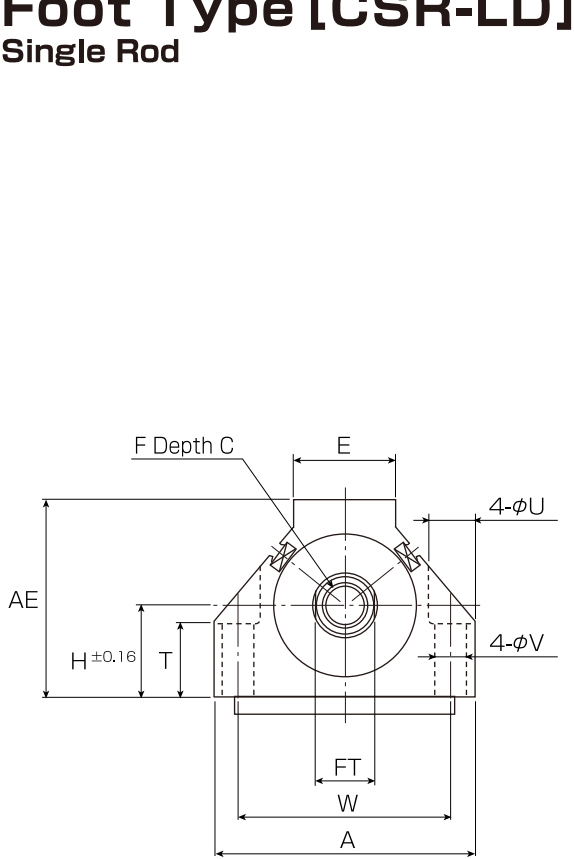
Units: mm

Symbol Bore	FP	FM	FR	FN	FS	φFV
φ32	15	80	95	40	62	6.6
φ40	20	96	118	46	70	11
φ50	20	108	135	58	85	14
φ63	20 (24)	124	150	65	98	14
φ80	25 (28)	154	185	87	118	18

Note 1) The size when 100 strokes are exceeded is ( ).

Note 2) Refer to CSR-SA for the dimensional drawing relation of Coolant Proof Specifications.

## Foot Type [CSR-LD] Single Rod



The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

Table of Dimensions (Up to 100 strokes)

Symbol Bore	A	AE	φB	C	D	E	F	Rc G	H	RX	HX	J	L	S	SXR	SXH
φ32	84	62	18	15	<sup>10</sup> <sub>(20)</sub>	38	M12XP1.75	1/4	28	27	13.5	18.5	7	29	15	15
φ40	98	70	22.4	20	<sup>10</sup> <sub>(20)</sub>	44	M16XP2.0	1/4	32	30	15	21	7	33	15	18
φ50	110	81	28	24	<sup>11</sup> <sub>(21)</sub>	50	M20XP2.5	1/4	38	30	19.5	19.5	8	39	15	15
φ63	132	96	35.5	33	<sup>13</sup> <sub>(23)</sub>	50	M27XP3.0	1/4	46	32	22.5	22.5	9	37	20	20

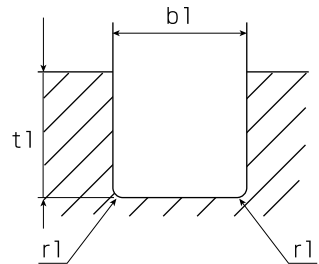
Note) The information contained between the parentheses ( ) is the coolant proof specifications.

Symbol Bore	PL	PX	PW	Y	Z	FT	TL	FL	φV	φU	φQ	X	T	W	N
φ32	19	28	12	3.3	8	14	59	<sup>69</sup> <sub>(79)</sub>	9	14	50	5(6)	23	70	6
φ40	26	28	12	3.3	8	19	66	<sup>76</sup> <sub>(86)</sub>	11	17.5	58	5(6)	25	80	8
φ50	25	30	14	3.8	9	24	69	<sup>80</sup> <sub>(90)</sub>	14	20	68	6(6)	32	90	10
φ63	30	31	16	4.3	10	30	77	<sup>90</sup> <sub>(100)</sub>	16	23	82	7(7)	37	108	10

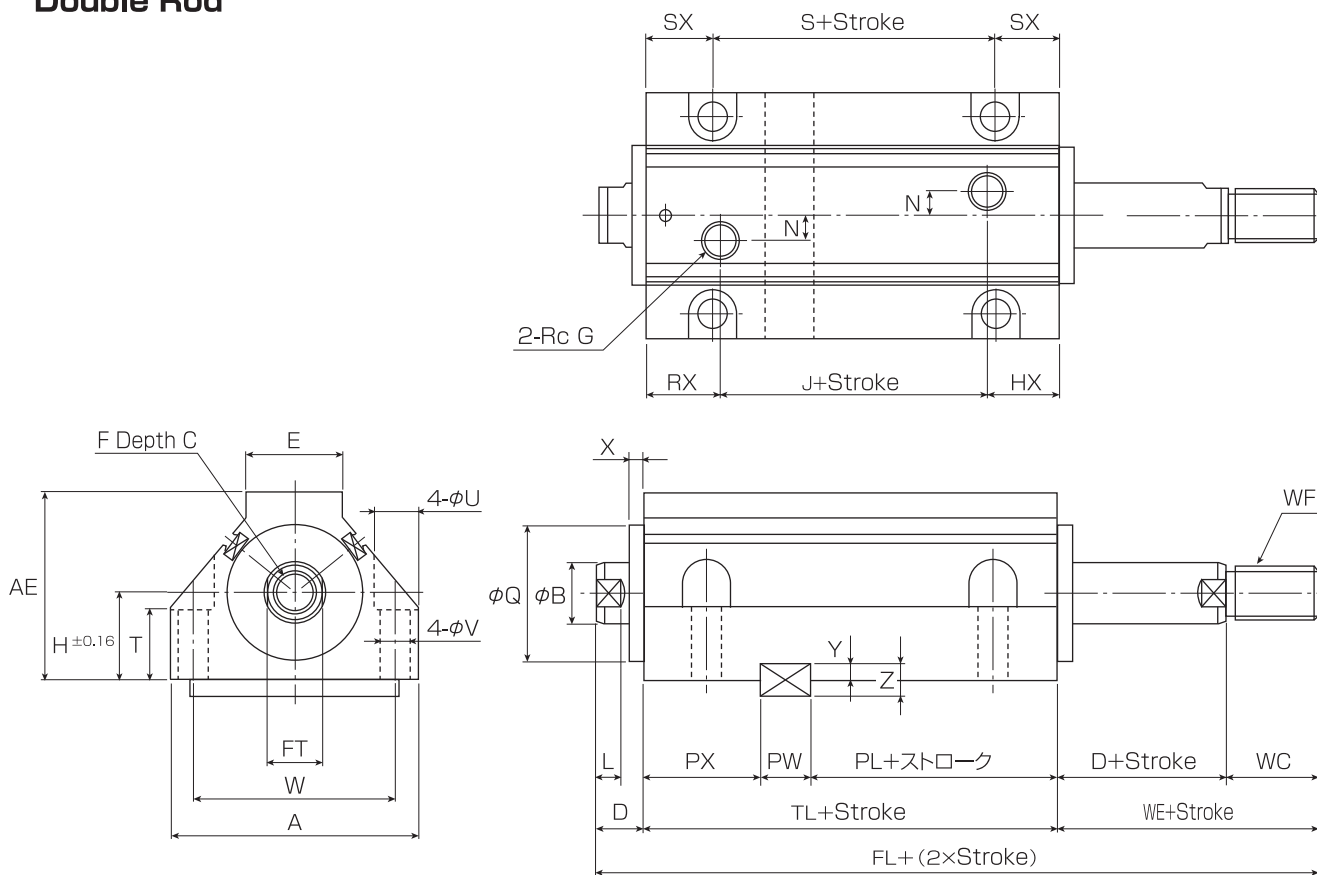
Note) The information contained between the parentheses ( ) is the coolant proof specifications.

Recommended key slot size

Bore (mm)	Key Size	Key Slot Dimension		
	b×h×t (Both are round.)	b1	t1	r1
φ32	12 <sup>-0.043</sup> ×8 <sup>-0.09</sup> ×70	12 <sup>-0.043</sup>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ40	12 <sup>-0.043</sup> ×8 <sup>-0.09</sup> ×80	12 <sup>-0.043</sup>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ50	14 <sup>-0.043</sup> ×9 <sup>-0.09</sup> ×100	14 <sup>-0.043</sup>	5.5 <sup>+0.2</sup> <sub>0</sub>	0.3
φ63	16 <sup>-0.043</sup> ×10 <sup>-0.09</sup> ×100	16 <sup>-0.043</sup>	6.0 <sup>+0.2</sup> <sub>0</sub>	0.3



## Foot Type [CSR-LD] Double Rod



Note 1) Right side of the double rods has standard male thread specifications.  
 Note 2) In cases of over 50 strokes, They are special specifications.

The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units:mm

Symbol Bore	A	AE	φB	C	D	E	F	RcE	H	RX	HX	J	L	S	SX	PL	PX
φ32	84	62	18	15	10	38	M12XP1.75	1/4	28	27	27	20	7	44	15	34	28
φ40	98	70	22.4	20	10	44	M16XP2.0	1/4	32	30	30	25	7	55	15	45	28
φ50	110	81	28	24	11	50	M20XP2.5	1/4	38	30	30	22	8	52	15	38	30
φ63	132	96	35.5	33	13	50	M27XP3.0	1/4	46	32	32	24	9	48	20	41	31

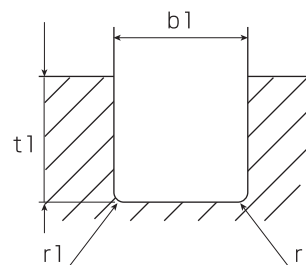
Units:mm

Symbol Bore	PW	Y	Z	FT	TL	FL	φV	φU	φQ	X	T	W	N	WF	WC	WE
φ32	12	3.3	8	14	74	119	9	14	50	5	23	70	6	M16XP1.5	25	35
φ40	12	3.3	8	19	85	135	11	17.5	58	5	25	80	8	M20XP1.5	30	40
φ50	14	3.8	9	24	82	139	14	20	68	6	32	90	10	M24XP1.5	35	46
φ63	16	4.3	10	30	88	159	16	23	82	7	37	108	10	M30XP1.5	45	58

Recommended key slot size

Units:mm

Bore (mm)	Key Size	Key Slot Dimension		
	b×h×t (Both are round.)	b1	t1	r1
φ32	12 <sup>0</sup> <sub>-0.043</sub> ×8 <sup>0</sup> <sub>-0.09</sub> ×70	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ40	12 <sup>0</sup> <sub>-0.043</sub> ×8 <sup>0</sup> <sub>-0.09</sub> ×80	12 <sup>0</sup> <sub>-0.043</sub>	5.0 <sup>+0.2</sup> <sub>0</sub>	0.3
φ50	14 <sup>0</sup> <sub>-0.043</sub> ×9 <sup>0</sup> <sub>-0.09</sub> ×100	14 <sup>0</sup> <sub>-0.043</sub>	5.5 <sup>+0.2</sup> <sub>0</sub>	0.3
φ63	16 <sup>0</sup> <sub>-0.043</sub> ×10 <sup>0</sup> <sub>-0.09</sub> ×100	16 <sup>0</sup> <sub>-0.043</sub>	6.0 <sup>+0.2</sup> <sub>0</sub>	0.3







## ■ Packing Material

Code	1 (Standard)	3	9
Material	Nitrile Rubber	Fluoric Rubber	Hydrogenated Nitrile Rubber
Range of Operating Temperature	-10 to +80°C	-10 to +120°C	-10 to +120°C
General-purpose Mineral Hydraulic Oil	○	○	○
Emulsions of Water in Mineral Oil	○	○	◎
Emulsions of Mineral Hydraulic Oil in Water	○	○	◎
Water + Glycol-type Operating Oil	○	×	◎
Phosphate Ester Fluid	×	○	×
Fatty Acid Ester Fluid	○	△	△

## ■ Piston Area

Bore (mm)	Rod Diameter (mm)	Piston Area (cm <sup>2</sup> )	
		Push	Pull
φ32	φ18	8.0	5.5
φ40	φ22.4	12.6	8.6
φ50	φ28	19.6	13.5
φ63	φ35.5	31.2	21.2
φ80	φ45	50.2	34.3
φ100	φ56	78.5	53.9

Note) The ○ 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.

## ■ Code

**CHR - SA 1 SA 32 B 10 - 2 C - MN YP**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

① Series Name	CHR: Switch adjusted type
② Single/Double Classification	S: Single Rod Type W: Double Rod Type (Special Order)
③ Standard Special Classification	A: Standard Dimensions; B, E, F: some of special specifications
④ Packing Material	1. Nitrile Rubber (Standard) 3. Fluoric Rubber 6. Coolant Proof Nitrile Rubber 7. Coolant Proof Fluoric Rubber 9. Hydrogenated Nitrile Rubber
⑤ Mounting	SA: Standard FA: FA Type
⑥ Bore (mm)	φ32·φ40·φ50·φ63·φ80·φ100
⑦ Type of Rod	B: B Rod
⑧ Stroke Length (mm)	10·15·20·25·30·35·40·45·50
⑨ Switch Quantity	Mention the quantity. 1A: In cases where a switch is not required. 1A2: For cylinder using CW or CX or WH or XH, No switch required. 1A3: For cylinder using SV or SH, No switch required.
⑩ Switch	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) FJ: TOV-0.5 (For an AC connector system) XX: Special Part <b>Please refer to P.138 for more detailed information on switches.</b>
⑪ Thread Specifications	M: Male Thread Specifications, No Notation: Female Thread Specifications (Standard) *In the case of double rods: male threads M, Male Thread: L, is notated as MM, LL, ML, etc. Standard male threads - female thread specifications are not described here.
⑫ Lock Nut	N:With Lock Nut No Notation:None (This is an option of male thread specifications.)
⑬ End Joint	YP: Double Protrusion End Joint with Pin (Refer to P47.) T: Single Protrusion End Joint (Refer to P46.) (This is an option of male thread specifications.)

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

Note 2) When Switch the CX,CW,WH,XH,SH and SV is used, additional processing will be necessary.

Please refer to P.132 for more detailed information on male thread dimensions.

## ■ Mass Table

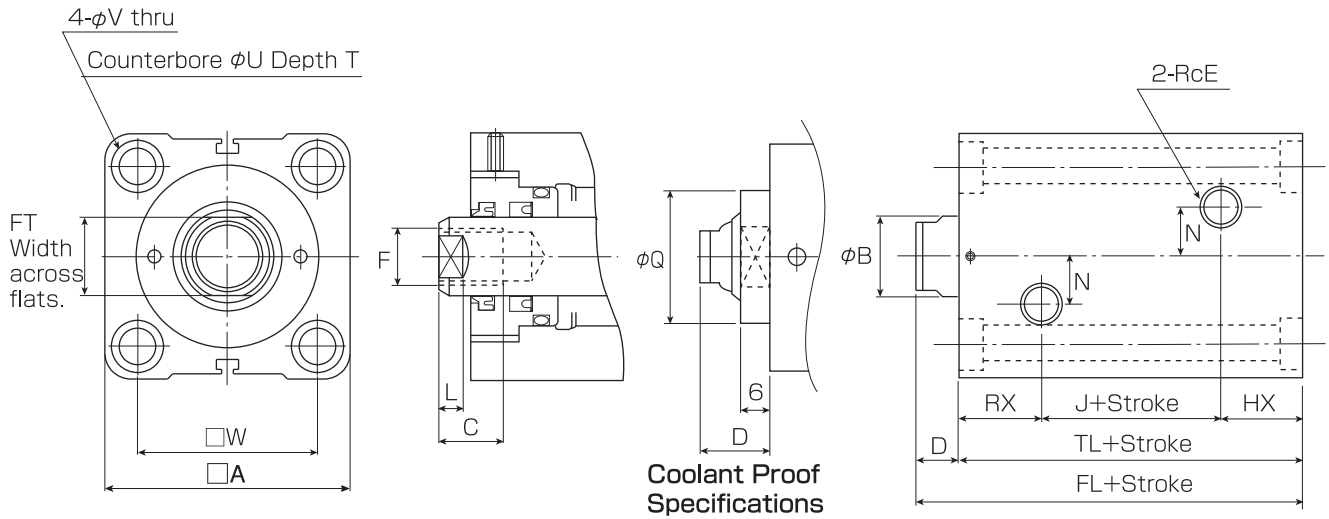
Units: kg

Symbol	CHR			
	Single Rod		Double Rod	
	Basic Mass	Stroke Mass	Basic Mass	Stroke Mass
φ32	0.79	0.097	1.03	0.118
φ40	1.10	0.118	1.62	0.143
φ50	1.61	0.161	2.34	0.209
φ63	2.59	0.226	3.64	0.306
φ80	4.59	0.328	6.33	0.454
φ100	9.03	0.508	12.09	0.701

Note) The stroke mass is the added mass per 10mm of stroke.

## [CHR-SA]

### Single Rod [up to 100 strokes]



Note) The information contained between the parentheses ( ) is the coolant proof specifications.

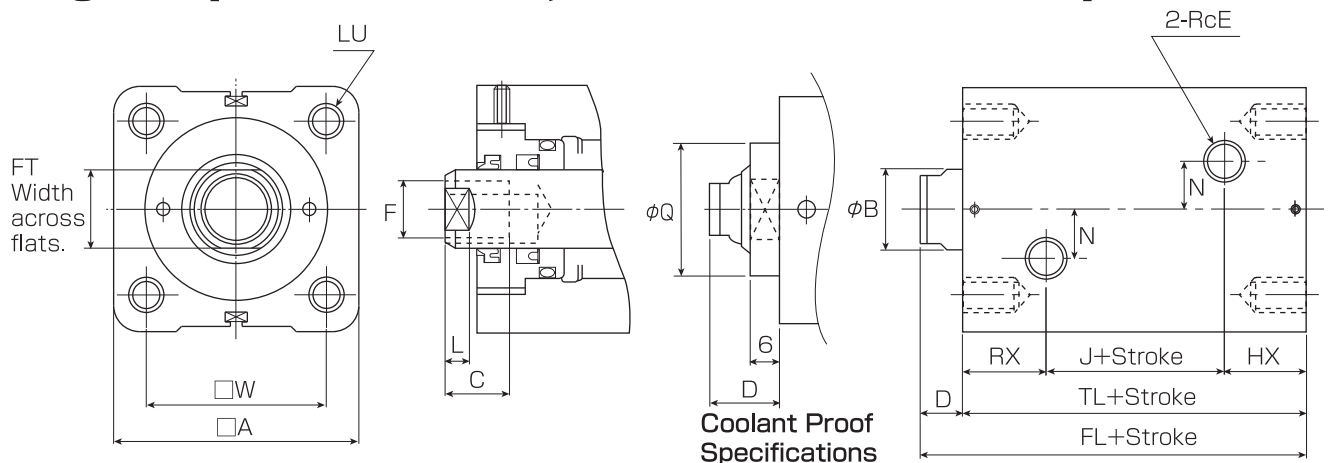
The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

Table of Dimensions (up to 100 strokes)

Units:mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	T	TL	φU	φQ	φV	□W
φ32	62	18	15	10 (20)	1/4	M12×P1.75	64 (74)	14	12	14	7	10	28	6.5	54	11	(37)	6.6	47
φ40	70	22.4	20	10 (20)	1/4	M16×P2.0	65 (75)	19	12	16	7	10	27	8.6	55	14	(45)	9	52
φ50	80	28	24	11 (21)	1/4	M20×P2.5	71 (81)	24	13	19	8	10	28	10.8	60	17.5	(53)	11	58
φ63	94	35.5	33	13 (23)	1/4	M27×P3.0	80 (90)	30	13	24	9	10	30	13	67	20	(63)	14	69
φ80	114	45	36	17 (27)	3/8	M30×P3.5	95 (105)	41	18	25	14	15	35	15.2	78	23	(80)	16	86
φ100	142	56	45	26 (36)	3/8	M39×P4.0	122 (132)	50	26	34	20	15	36	17.5	96	26	(100)	18	106

### Single Rod [Above 100 strokes, Maximum Stroke for Each Bore]



Note) The information contained between the parentheses ( ) is the coolant proof specifications.

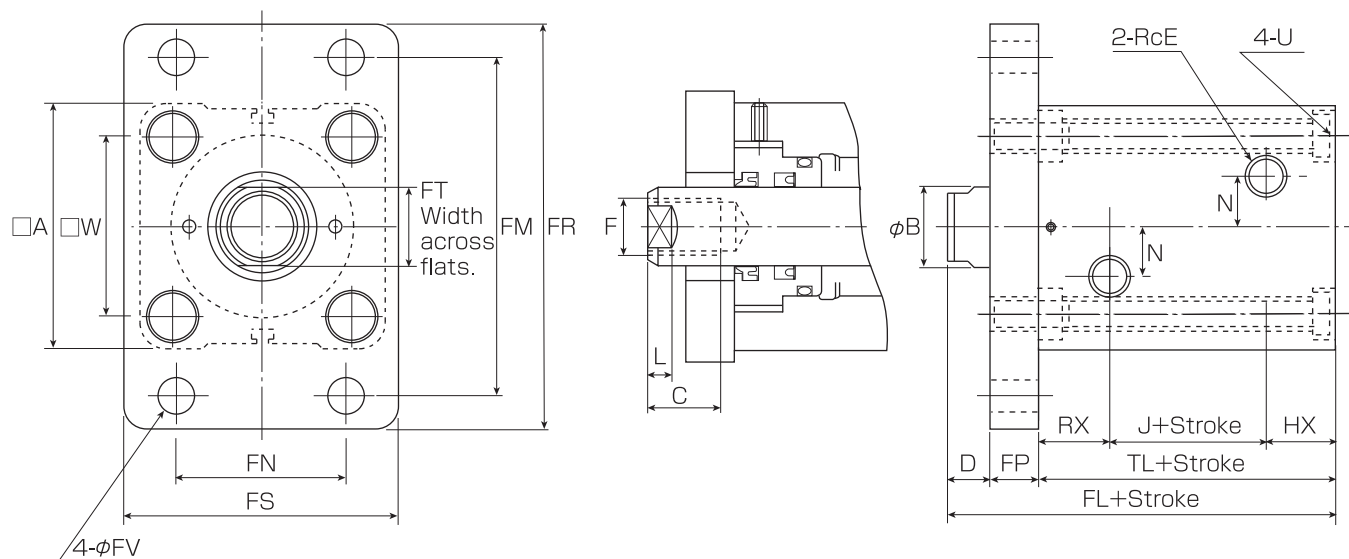
Table of Dimensions (Above 100 strokes, Maximum Stroke for Each Bore)

Units:mm

Symbol Bore	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	φQ	□W	LU
φ40	70	22.4	20	10 (20)	1/4	M16×P2.0	84 (94)	19	27	20	7	10	27	74	(45)	52	M 8×P1.25 Depth 16
φ50	80	28	24	11 (21)	1/4	M20×P2.5	89 (99)	24	28	22	8	10	28	78	(53)	58	M10×P1.5 Depth 20
φ63	94	35.5	33	13 (23)	1/4	M27×P3.0	96 (119)	30	30	23	9	10	30	83	(63)	69	M12×P1.75 Depth 24
φ80	114	45	36	17 (27)	3/8	M30×P3.5	111 (121)	41	35	24	14	15	35	94	(80)	86	M14×P2.0 Depth 28
φ100	142	56	45	26 (36)	3/8	M39×P4.0	135 (145)	50	36	37	20	15	36	109	(100)	106	M16×P2.0 Depth 32

## Basic Type [CHR-FA]

With FA Flange [up to 100 strokes]



Note) The standard stroke is up to 100mm. Please contact us for stroke lengths above 100mm.

The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

### Table of Dimensions

Units: mm

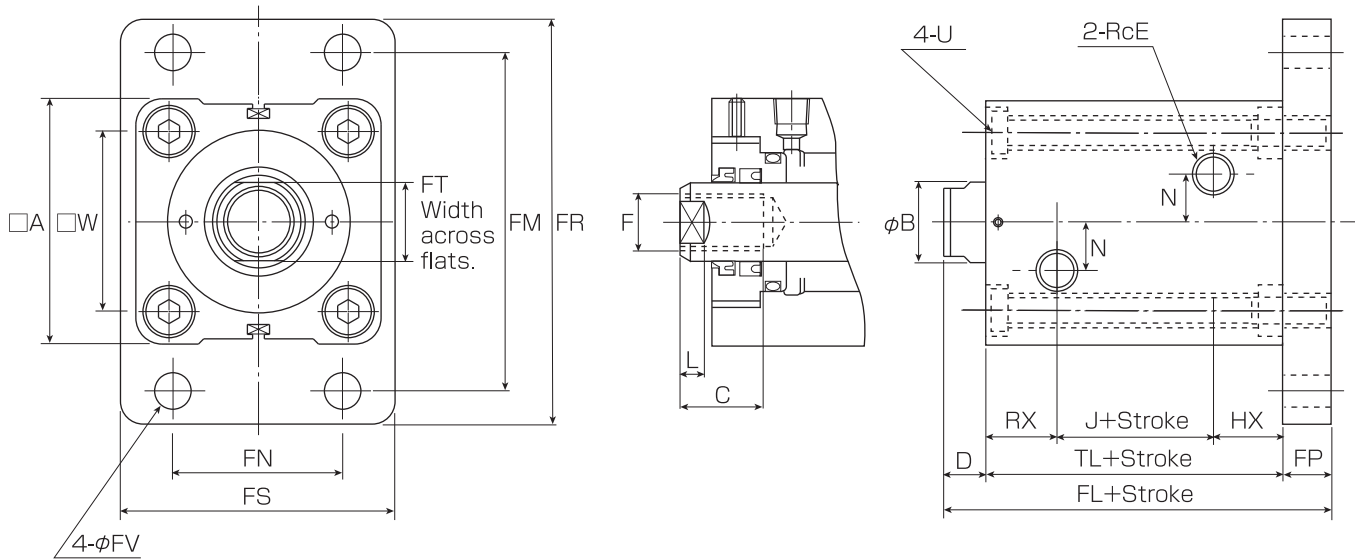
Bore	Symbol	A	phi B	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
phi 32		62	18	15	10	1/4	M12xP1.75	79	14	12	14	7	10	28	54	47	M6xP1.0
phi 40		70	22.4	20	10	1/4	M16xP2.0	85	19	12	16	7	10	27	55	52	M8xP1.25
phi 50		80	28	24	11	1/4	M20xP2.5	91	24	13	19	8	10	28	60	58	M10xP1.5
phi 63		94	35.5	33	13	1/4	M27xP3.0	100 (104)	30	13	24	9	10	30	67	69	M12xP1.75
phi 80		114	45	36	17	3/8	M30xP3.5	120 (123)	41	18	25	14	15	35	78	86	M14xP2.0
phi 100		142	56	45	26	3/8	M39xP4.0	152 (154)	50	26	34	20	15	36	96	106	M16xP2.0

Units: mm

Bore	Symbol	FP	FM	FR	FN	FS	phi FV
phi 32		15	80	95	40	62	6.6
phi 40		20	96	118	46	70	11
phi 50		20	108	135	58	85	14
phi 63		20 (24)	124	150	65	98	14
phi 80		25 (28)	154	185	87	118	18
phi 100		30 (32)	190	230	109	150	22

Note) The size when 100 strokes are exceeded is ( ).

## Basic Type [CHR-FB] With FB Flange



The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units: mm

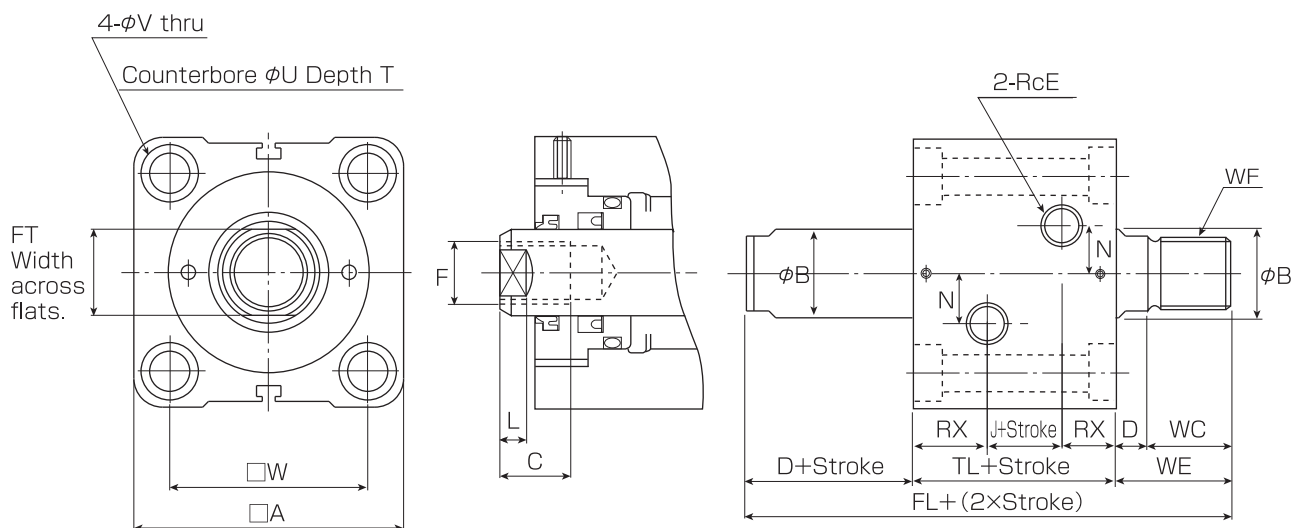
Bore	Symbol	A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	TL	W	U
φ32		62	18	15	10	1/4	M12×P1.75	79	14	12	14	7	10	28	54	47	M6×P1.0
φ40		70	22.4	20	10	1/4	M16×P2.0	85	19	12	16	7	10	27	55	52	M8×P1.25
φ50		80	28	24	11	1/4	M20×P2.5	91	24	13	19	8	10	28	60	58	M10×P1.5
φ63		94	35.5	33	13	1/4	M27×P3.0	100	30	13	24	9	10	30	67	69	M12×P1.75
φ80		114	45	36	17	3/8	M30×P3.5	120	41	18	25	14	15	35	78	86	M14×P2.0
φ100		142	56	45	26	3/8	M39×P4.0	152	50	26	34	20	15	36	96	106	M16×P2.0

Units: mm

Bore	Symbol	FP	FM	FR	FN	FS	φFV
φ32		15	80	95	40	62	6.6
φ40		20	96	118	46	70	11
φ50		20	108	135	58	85	14
φ63		20(24)	124	150	65	98	14
φ80		25(28)	154	185	87	118	18
φ100		30(32)	190	230	109	150	22

Note) The size when 100 strokes are exceeded is ( ).

## Basic Type Double Rod [Special Order]



Note) Right side of the double rods has standard male thread specifications.

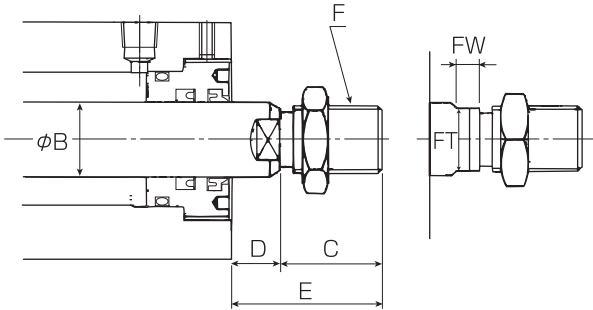
The interval stroke of the multiples of 5 has external dimensions 5mm longer than the standard stroke.

Table of Dimensions

Units: mm

Symbol Bore	A	$\phi B$	C	D	RcE	F	FL	FT	J	L	N	RX	T	TL	$\phi U$	$\phi V$	W	WF	WC	WE
$\phi 32$	62	18	15	10	1/4	M12×P1.75	116	14	15	7	10	28	6.5	71	11	6.6	47	M16×P1.5	25	35
$\phi 40$	70	22.4	20	10	1/4	M16×P2.0	124	19	20	7	10	27	8.6	74	14	9	52	M20×P1.5	30	40
$\phi 50$	80	28	24	11	1/4	M20×P2.5	135	24	22	8	10	28	10.8	78	17.5	11	58	M24×P1.5	35	46
$\phi 63$	94	35.5	33	13	1/4	M27×P3.0	154	30	23	9	10	30	13	83	20	14	69	M30×P1.5	45	58
$\phi 80$	114	45	36	17	3/8	M30×P3.5	188	41	24	14	15	35	15.2	94	23	16	86	M39×P1.5	60	77
$\phi 100$	142	56	45	26	3/8	M39×P4.0	236	50	37	20	15	36	17.5	109	26	18	106	M48×P1.5	75	101

■ Rod End Male Thread Type



■ Table of Dimensions

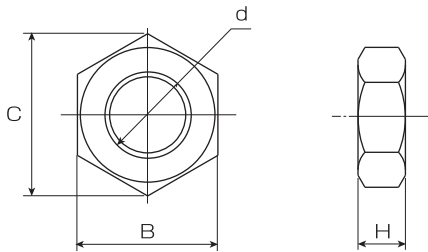
Units: mm

Symbol Bore	φB	F	C	D	E	FT	FW
φ32	18	M16XP1.5	25	10	35	14	7
φ40	22.4	M20XP1.5	30	10	40	19	7
φ50	28	M24XP1.5	35	11	46	24	8
φ63	35.5	M30XP1.5	45	13	58	30	9
φ80	45	M39XP1.5	60	17	77	41	14
φ100	56	M48XP1.5	75	26	101	50	20
φ125	71	M64XP2	95	31	126	65	25
φ140	80	M72XP2	110	35	145	75	25
φ150	85	M76XP2	115	40	155	80	30
φ160	90	M80XP2	120	40	160	85	30

Note) The lock nut is an option.

■ Lock Nut

Bore	Material
φ32 to φ100	Rolled Steel for General Structure



■ Table of Dimensions

Units: mm

Symbol Bore	B Rod				Parts Code
	d	H	B	C	
φ32	M16XP1.5	10	24	27.7	LN-F32B
φ40	M20XP1.5	12	30	34.6	LN-F40B
φ50	M24XP1.5	14	36	41.6	LN-F50B
φ63	M30XP1.5	18	46	53.1	LN-F63B
φ80	M39XP1.5	23	60	69.3	LN-F80B
φ100	M48XP1.5	29	75	86.5	LN-F100B
φ125	M64XP2	38	95	110	LN-F125B
φ140	M72XP2	42	105	121	LN-F140B
φ150	M76XP2	46	110	127	LN-F150B
φ160	M80XP2	48	115	133	LN-F160B

## Specifications

Series Name	CT
Type	Standard Type
Mounting	Basic Type: SA
Bore	φ40·φ50·φ63
Nominal Pressure	21MPa
Maximum Allowable Pressure <sup>Note 1)</sup>	Cap Side: 27MPa Head Side: 25MPa (Column B)
Proof Pressure	31.5MPa
Minimum Working Pressure <sup>Note 3)</sup>	0.84MPa or less
Range of Operating Speed <sup>Note 2)</sup>	8 to 100mm/sec
Range of Operating Temperature	-10°C to +80°C
Cushion	None
Hydraulic Oil Applied	General Purpose Mineral Hydraulic Oil
Thread Tolerance	JIS 6g/6H (corresponds to JIS Grade 2)
Stroke Tolerance	0 to +0.8mm
Rod End Type	Male Thread

Note 1) Dimensions of the special model are different from those of the standard model.

Note 2) 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 3) When operating at the maximum cylinder speed, keep the inertial load pressures generated within the cylinder chamber below Maximum Allowable Pressure.

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

Note 5) None of these cylinders have air bleeds.

Note 6) Radial loads cannot be applied to the piston rod, so care is necessary when adjusting them during installation.

Note 7) In the case where the piston strikes the cylinder end surface at the end of the stroke, reduce the speed to below the minimum speed.

Note 8) When tightening a double rod piston rod, always use the double surface width side of the rod for tightening. The double rod type of piston rod ends with a thread, so make sure that the torque does not affect the ends of the piston rods.

## Packing Material

Code	1	3
Material	Nitrile Rubber	Fluoric Rubber
Range of Operating Temperature	-10°C to +80°C	-10°C to +120°C
General-purpose Mineral Hydraulic Oil	○	○
Water + Glycol-type Operating Oil	○	×
Fatty Acid Ester Fluids	○	△

Note) The ○ mark indicates its use is possible. The X mark indicates it is not possible to use it. Regarding the △ mark, consult us for details.

## Standard Stroke Table

Mounting	Bore (mm)	Stroke (mm)				
		10	20	30	40	50
SA	φ40	○	○	○	○	○
	φ50	○	○	○	○	○
	φ63	○	○	○	○	○

## Piston Area

Bore (mm)	Rod Diameter (mm)	Piston Area (cm <sup>2</sup> )	
		Push	Pull
φ40	φ22.4	12.6	8.6
φ50	φ28	19.6	13.5
φ63	φ35.5	31.2	21.3

## Mass Table

Units: kg

Bore (mm)	Item	CT	
		SA	
	Basic Mass	Stroke Mass	
φ40		6.21	0.33
φ50		9.21	0.55
φ63		15.2	0.78

Note) The stroke mass is the mass per 10mm of stroke.

## Code

**CT - S A 1 SA 40B 50 M N**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Series Name	Standard: CT
② Single/Double Classification	S: Single Rod Type W: Double Rod Type (Special Order)
③ Standard Special Classification	A: Standard Dimensions B, E: Some of special specifications, devised by our company
④ Packing Material	1. Nitrile Rubber (Standard) 3. Fluoric Rubber
⑤ Mounting	SA: Basic Type
⑥ Bore	φ40·φ50·φ63
⑦ Type of Rod	B:B Rod
⑧ Stroke Length (mm)	10·20·30·40·50
⑨ Thread Specifications	M: Male Thread Specifications
⑩ Lock Nut	N:With Lock Nut No Notation: None

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



## Basic Type [CT-SA]

Single Rod (up to 50 strokes)

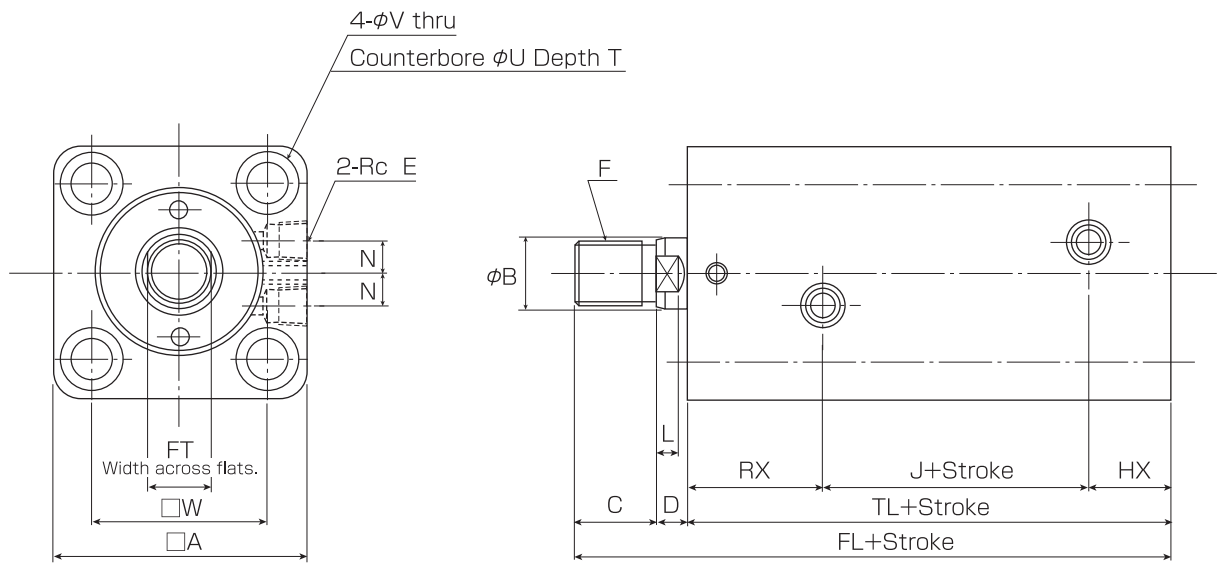


Table of Dimensions

Units:mm

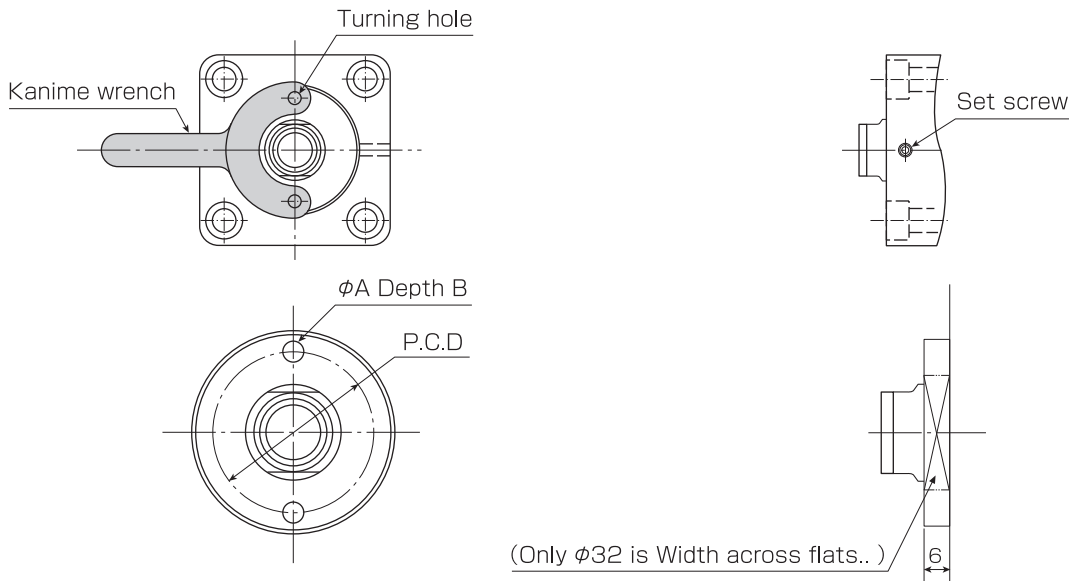
Bore	Symbol	□A	φB	C	D	RcE	F	FL	FT	HX	J	L	N	RX	T	TL	φU	φV	□W
φ40		80	22.4	25	10	1/4	M20XP1.5	134	19	26	31	7	10	42	15.5	99	20	14	56
φ50		94	28	30	11	1/4	M24XP1.5	149	24	31	35	8	10	42	17.5	108	23	16	67
φ63		114	35.5	35	13	3/8	M30XP1.5	168	30	37	38	9	15	45	19.5	120	26	18	82

### Notes When Using It

- Please use the bolt (JIS B 1176 strength division 10.9 or more) with the hexagon socket for the installation of the cylinder.
- The material of the mounting part should be SS400 or equivalent.
- To screw-mount the cylinder into the mounting part with a bolt, the bolt insertion depth should be 100% of the thread diameter or more.
- To mount the cylinder with bolts and nuts, the nut strength should be Class 6 or higher level.
  - ※ Do not use Class 3 nut.
- Please do the air bleed when you drive the cylinder for the first time.
  - ※ The compact cylinder body has no air bleeder. Bleed air through the piping.
- After air bleeding, start the cylinder operation at a low speed, and gradually increase the pressure to the operating pressure.
- Consider the load mounting structure so that eccentric load is not applied to the piston rod.
- To connect the end screws of the double rods to a load, use the width across flats of the rod on the connection side, and make sure that twisting force will not be applied to the piston rod.

### Notes When Resolving and Assembling It

- After removing the set screw, remove the rod bush from the cylinder body through the turning hole.
  - ※ You can easily remove the rod bush by using a special tool (we call it "Kanime wrench").
  - When you place an order, confirm the series name and bore diameter which you need.



Standard Specifications φ32 to φ160

Coolant Proof Specifications φ40 to φ100

Bore	Standard Specifications			Coolant Proof Specifications		
	P.C.D	A	B	P.C.D	A	B
φ32	32	3	4	Width across flats 35		
φ40	38	5	5	40	3	4
φ50	45	5	5	47	3	4
φ63	56	5	5	57	3	4
φ80	71	5	5	71	5	5
φ100	85	11	10	85	7	7
φ125	100	11	10			
φ140	125	11	15			
φ150	130	11	15			
φ160	140	11	15			

Bore	Standard Specifications			Coolant Proof Specifications		
	P.C.D	A	B	P.C.D	A	B
φ32	32	3	4	Width across flats 35		
φ40	38	5	5	40	3	4
φ50	45	5	5	47	3	4
φ63	56	5	5	57	3	4
φ80	71	5	5	71	5	5

Bore	Standard Specifications			Coolant Proof Specifications		
	P.C.D	A	B	P.C.D	A	B
φ32	32	3	4	36	3	4
φ40	38	5	5	40	3	4
φ50	45	5	5	47	3	4
φ63	56	5	5	57	3	4

\*When you re-assemble the cylinder after replacing the packing, be careful that dust or other foreign object will not enter the cylinder.





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