

# Diaphragm Pneumatic Cylinder

## FC series

Standard BF cylinders using dry-bearing are designed in a variety of sizes from 10 to 200mm(0.39~7.87in).



## SC series

Linear ball bearings is adopted for bearings.



## SCSA series

Achieved the lowest friction and the highest sensitivity in the series with thinner BF diaphragms in SC series.



## PC series

Compliant with JIS mounting instructions.  
Available to attach sensor.



## LC series

Minimal low friction double action type cylinder.

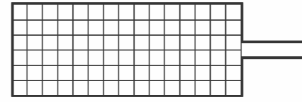




FUJIKURA COMPOSITES

# Fujikura BF Cylinders

**FC** SERIES



**FCS** Single Action Push Type

**FCD** Double Action Type



**F**ujikura  
**C**ylinder



# Fujikura BF Cylinders

## DESIGN CONCEPTION :

### "No Leakage and Less Friction"

— *The main Design conception that lies extended at the basis of **BF Cylinders**.*

### "Precision Control rather than Power"

— *The main object of developing **BF Cylinders**.*

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## General Description of BF Cylinders

### TYPES

**FC Series** : Single/Double Action ..... Standard Cylinders

### FEATURES IN COMMON

**BF Cylinders** are bound together by unique unrivaled common features, which are all attributable to the rolling action of **BF Diaphragms**.

- **Perfect Leak-proof** ..... No Blow-By Leakage.
- **Very Low Friction** ..... : Responsive to minute pressure variations.
  - : Virtually no hysteresis-loss in movement.
  - : Low start up pressure as low as 0.01MPa.
  - : Smooth "Non-Jarring" action.
  - : Ready to start even after long interval.
- **Lubrication-Free** ..... No Lubricator required in the air line.
- **Excellent resistance to pressure** ... Assured by the rolling principle of **BF Diaphragms**.  
(Molded products of durable fabric-reinforced NBR)

### PREFERRED APPLICATIONS

**BF Cylinders** find its best applications in such cases where air leakage is not allowed and/or sensitive response is desired to minute pressure variations.

- Sensitive Actuators in Automatic Controllers & Instruments, Pressure rollers and Dancer rollers.
- Air line equipment in the clean factories disliking oil mist contamination.
- Polishing equipment for Lenses and Jewels.
- Precision actuators of constant output force. (Spot welder etc.)
- Actuator for emergency use.



Model FCS: Single Action (push)

Model FCD: Double Action

■ SPECIFICATIONS

Operating Style	Single Action (Push)/Double Action	
Cylinder Diameter	mm	10 to 200
Stroke	mm	6 to 320
Working Fluid	Compressed Air (Non-Lubricated)	
Working Pressure Range	MPa	0.01~0.7
Working Temperature Range	°C	0 to 60
Rod Bearing	Dry Bearing	
Mounting	Direct, L, Front Flange, Rear Flange, Trunnion, Pivot-Mounting	

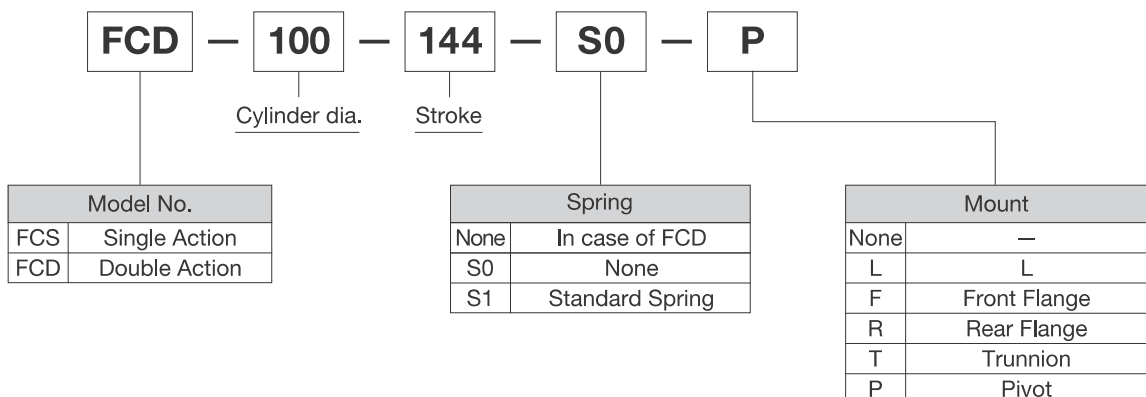
■ FEATURES

- FC Series are standard type of **BF Cylinders**. They are designed in a variety of sizes from 10 to 200.
- Each size is available in both a single action and a double action style.
- A variety of mounts is provided.

■ NOTE

- Customers are requested to follow the "**BF Cylinders Handling Manual**" (KS-569E) before installing and putting in service.
- Large size **BF Cylinders** of 112mm and over in diameter are customized only for individual requirement.  
Customers are kindly advised to check up the delivery time.
- Consult Fujikura for any special requirements.

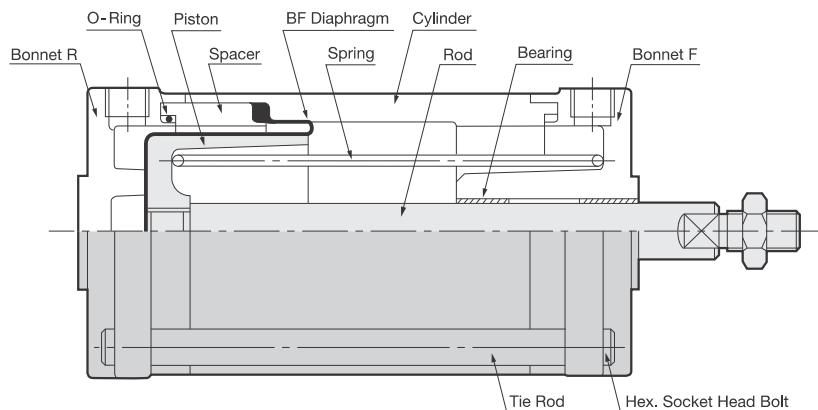
■ ORDERING DATA [ Example ]



# INTERNAL CONSTRUCTION/PARTS DESCRIPTION

(For Cylinders of 40mm and over in diameter)

## SINGLE ACTION TYPE Model FCS-40 to-200

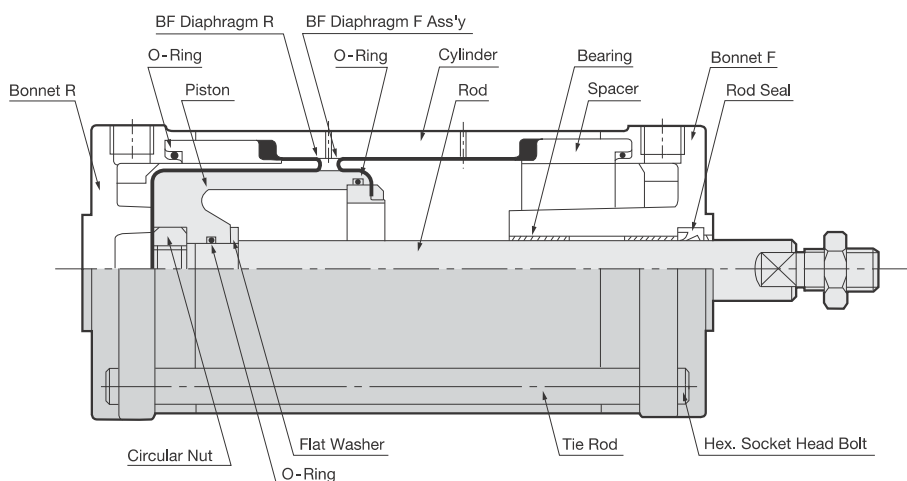


### ■ PARTS LIST

DESCRIPTION	MATERIAL
Bonnet F/R	A $\ell$ Alloy Die-Casting A $\ell$ Alloy Casting (FCS-160 & over)
O-Ring	NBR
Piston	A $\ell$ Alloy Casting
Cylinder/Spacer	A $\ell$ Alloy
Rod	Stainless Steel Hard Steel, Hard Chrome Plated (FCS-80 & over)
BF Diaphragm	Fabric Reinforced NBR
Return Spring	Spring Steel Wire
Bearing	Dry Bearing
Tie Rod	Carbon Steel

- Note : 1. A $\ell$  parts are anodic treated.  
 2. Unless otherwise specified, steel parts are galvanized.  
 3. A $\ell$  die-casting parts are bake painted.

## DOUBLE ACTION TYPE Model FCD-40 to-100

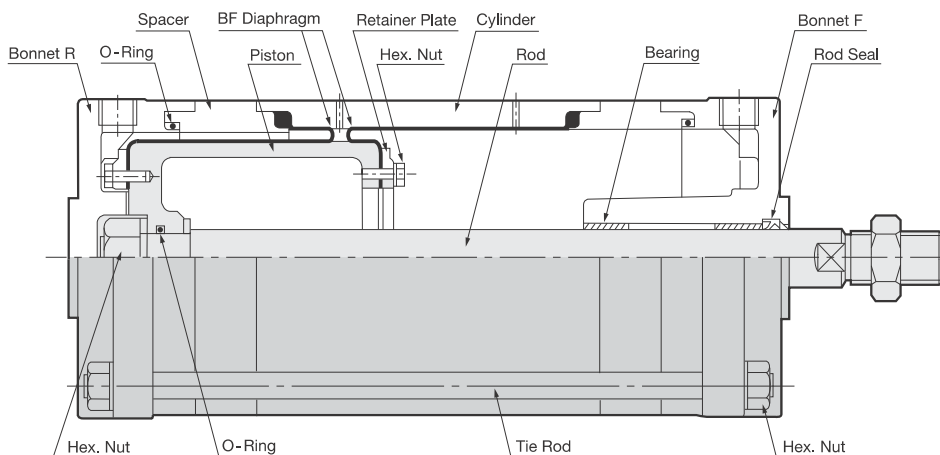


### ■ PARTS LIST

DESCRIPTION	MATERIAL
Bonnet F/R	A $\ell$ Alloy Die-Casting
Circular Nut	Carbon Steel
O-Ring	NBR
Piston	A $\ell$ Alloy Casting
BF Diaphragm R	Fabric Reinforced NBR
BF Diaphragm F Ass'y	Fabric Reinforced NBR with Fitting Caulked
Cylinder/Spacer	A $\ell$ Alloy
Rod	Stainless Steel Hard Steel, Hard Chrome Plated (FCD-80 & -100)
Bearing	Dry Bearing
Rod Seal	NBR
Tie Rod	Carbon Steel

- Note : 1. A $\ell$  parts are anodic treated.  
 2. Unless otherwise specified, steel parts are galvanized.  
 3. A $\ell$  die-casting parts are bake painted.

## DOUBLE ACTION TYPE Model FCD-112 to-200



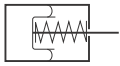
### ■ PARTS LIST

DESCRIPTION	MATERIAL
Bonnet F/R	A $\ell$ Alloy Die-Casting A $\ell$ Alloy Casting (FCD-160 & over)
Cylinder/Spacer	A $\ell$ Alloy Casting
Piston	A $\ell$ Alloy Casting
BF Diaphragm	Fabric Reinforced NBR
Retainer Plate	A $\ell$ Alloy Casting
Rod	Hard Steel, Hard Chrome Plated
Bearing	Dry Bearing
Rod Seal	NBR
Tie Rod	Carbon Steel

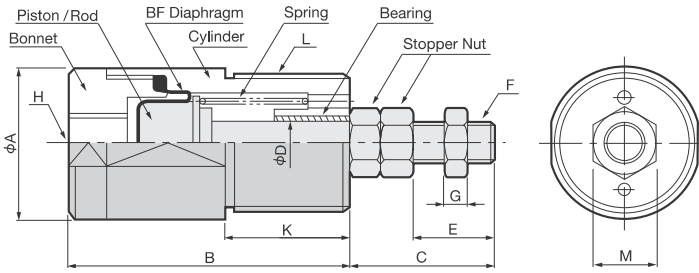
- Note : 1. A $\ell$  parts are anodic treated.  
 2. Unless otherwise specified, steel parts are galvanized.  
 3. A $\ell$  die-casting parts are bake painted.



# Model FCS-10-6 to 20-22



**Internal Construction Outline Dimensions**



**■ PARTS LIST**

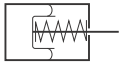
DESCRIPTION	MATERIAL
Piston/Rod	Stainless Steel
BF Diaphragm	Fabric Reinforced NBR
Bonnet	Brass
Cylinder	Brass
Spring	Spring Steel Wire
Bearing	Dry Bearing
Stopper Nut	Carbon Steel

F<sub>0</sub>/F<sub>1</sub> : Spring force at zero/full stroke (N)  
 Ae : Effective area (mm<sup>2</sup>)

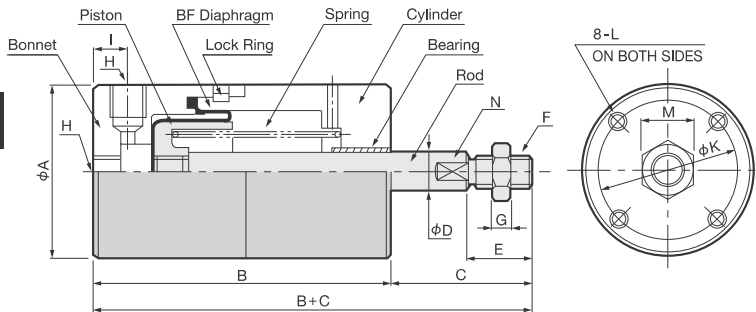
**■ OUTLINE DIMENSIONS**

Dc-STROKE	A	B	C	D	E	F	G	H	K	L	M	Ae	SPRING FORCE	
													F <sub>0</sub>	F <sub>1</sub>
10 - 6	18	35	18	5	10	M5×0.5	3.2	Rc 1/8	16	M16×1.5	8	57	0.3	0.9
12.5 - 11	20	45	20		12				20	M18×1.5			95	0.8
16 - 10	24	45	23	7	13	M6×0.75	3.6	Rc 1/8	20	M22×1.5	10	165	1.5	2.9
20 - 8		58							25	20			M26×1.5	269
	22	72	26	8	16				30					

# Model FCS-25-6 to 31.5-35



**Internal Construction Outline Dimensions**



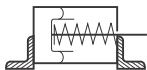
**■ PARTS LIST**

DESCRIPTION	MATERIAL
Bonnet	Al Alloy
Piston	Al Alloy
BF Diaphragm	Fabric Reinforced NBR
Lock Ring	Brass Wire
Spring	Spring Steel Wire
Cylinder	Al Alloy
Bearing	Dry Bearing
Rod	Stainless Steel

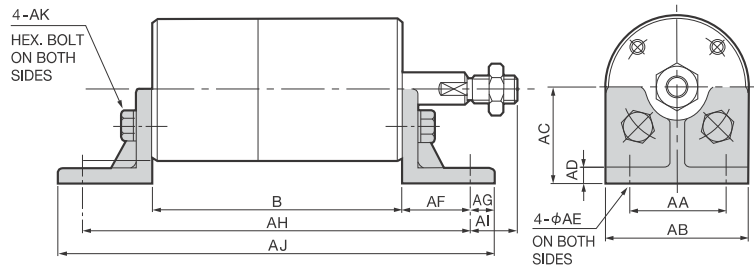
F<sub>0</sub>/F<sub>1</sub> : Spring force at zero/full stroke (N)  
 Ae : Effective area (mm<sup>2</sup>)  
 N : Wrench flat width

**■ OUTLINE DIMENSIONS**

Dc-STROKE	A	B	C	B+C	D	E	F	G	H	I	K	L	M	N	Ae	SPRING FORCE	
																F <sub>0</sub>	F <sub>1</sub>
25 - 6	38	46	30	76	8	12	M6 P=0.75	3.6	Rc 1/8	9	30	M4 DP6	10	6	400	3.4	6.9
16		63		93													
26		79		109													
31.5 - 14	45	61	36	97	10	16	M8 P=1	5	Rc 1/8	10	35	M5 DP7.5	13	8	660	4.9	11.8
24		78		114													
35		97		133													

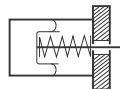


**L Type Mount**

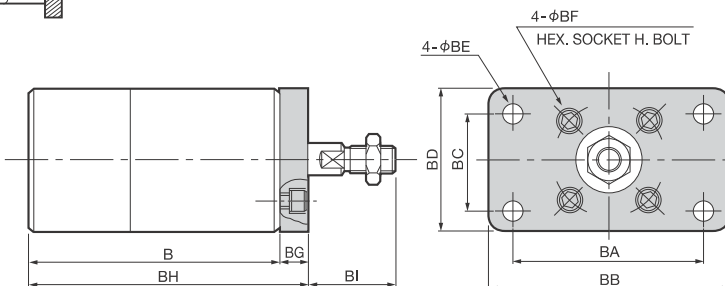


Dc-STROKE	B	AH	AJ
25 - 6	46	84	96
16	63	101	113
26	79	117	129
31.5 - 14	61	105	121
24	78	122	138
35	97	141	157

Dc	AA	AB	AC	AD	AE	AF	AG	AI	AK
25	25	38	25	4	6	19	6	11	M4×10
31.5	30	45	30	5	6	22	8	14	M5×12

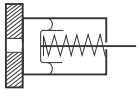


**Front Flange Type Mount**

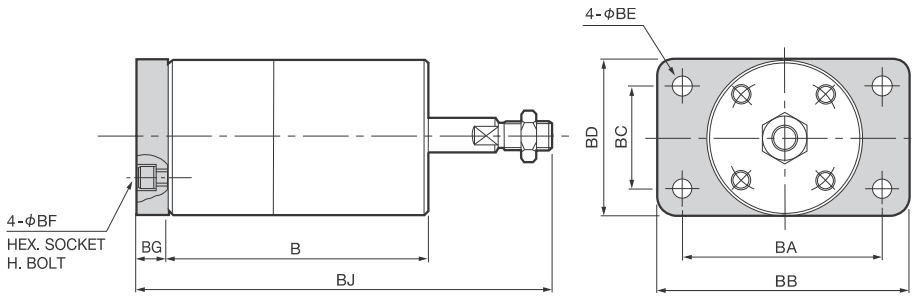


Dc-STROKE	B	BH
25 - 6	46	52
16	63	69
26	79	85
31.5 - 14	61	69
24	78	86
35	97	105

Dc	BA	BB	BC	BD	BE	BF	BG	BI
25	50	65	25	38	5	M4×6	6	24
31.5	60	75	30	45	6	M5×8	8	28

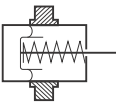


## Rear Flange Type Mount

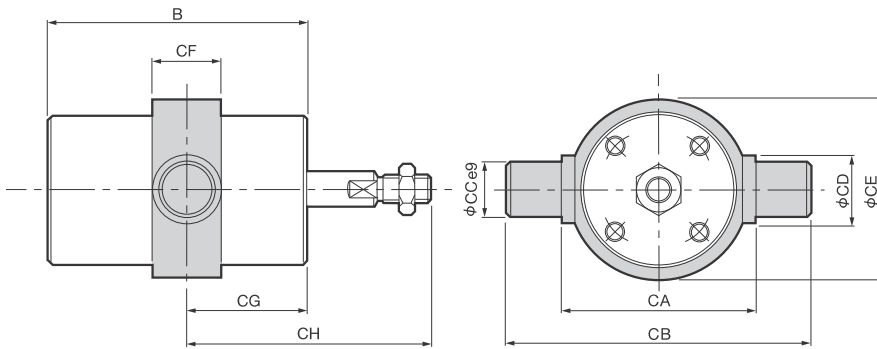


Dc-STROKE	B	BJ
25	6	46
	16	63
	26	79
31.5	14	61
	24	78
	35	97

Dc	BA	BB	BC	BD	BE	BF	BG
25	50	65	25	38	5	M4×6	6
31.5	60	75	30	45	6	M5×8	8

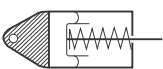


## Trunnion Type Mount

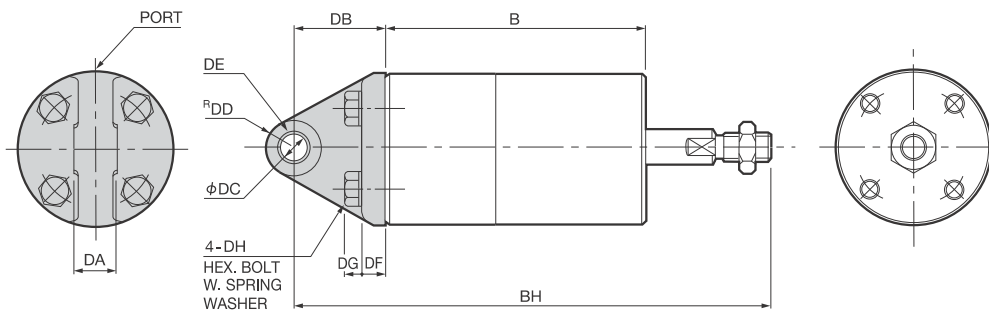


Dc-STROKE	B	CG	CH
25	6	46	12
	16	63	24
	26	79	40
31.5	14	61	24
	24	78	36
	35	97	48

Dc	CA	CB	CC	CD	CE	CF
25	46	66	10	15	46	16
31.5	54	78	12	16	53	17



## Pivot Type Mount



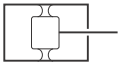
Dc-STROKE	B	BH
25	6	101
	16	118
	26	134
31.5	14	124
	24	141
	35	160

Dc	DA	DB	DC	DD	DE	DF	DG	DH
25	12	25	8	8	0812	6	3.8	M4×12
31.5	13	27	8	8	0812	7	4.8	M4×14

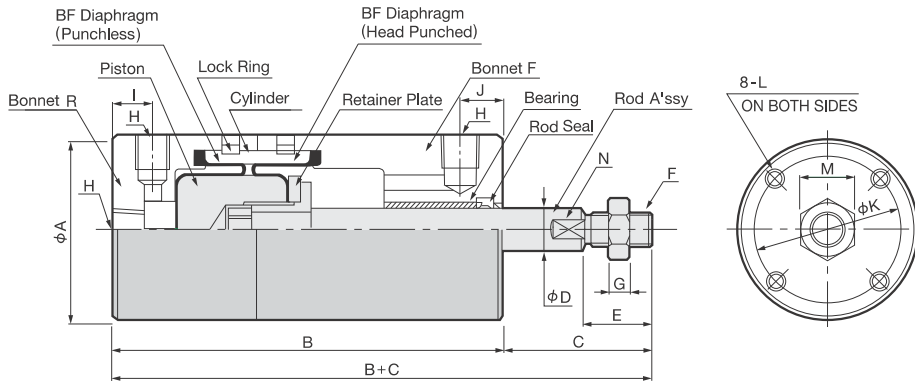
DE : Bearing Size No.



# Model FCD-25-6 to 31.5-35



## Internal Construction Outline Dimensions



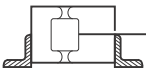
## PARTS LIST

DESCRIPTION	MATERIAL
Bonnet	A $\ell$ Alloy
Piston	A $\ell$ Alloy
BF Diaphragm	Fabric Reinforced NBR
Lock Ring	Brass Wire
Cylinder	A $\ell$ Alloy
Retainer Plate	A $\ell$ Alloy
Bearing	Dry Bearing
Rod Seal	NBR
Rod Ass'y	Stainless Steel/Carbon Steel

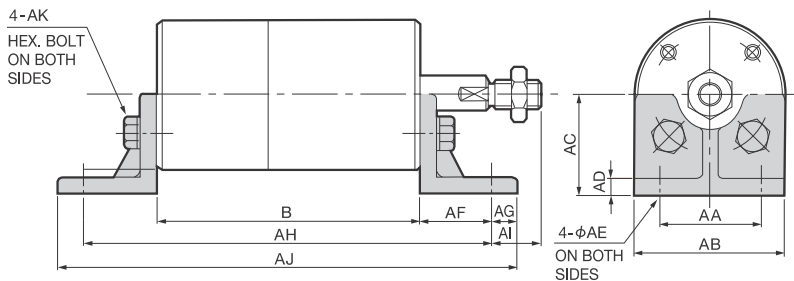
## OUTLINE DIMENSIONS

Ae : Effective area (mm<sup>2</sup>)  
N : Wrench flat width

Dc-STROKE	A	B	C	B+C	D	E	F	G	H	I	J	K	L	M	N	Ae		
																PUSH	PULL	
25 - 6		71		101														
	16	38	86	30	116	8	12	M6 P=0.75	3.6	Rc1/8	9	9	30	M4 DP6	10	6	400	350
	26		101		131													
31.5 - 14		85		121														
	24	45	101	36	137	10	16	M8 P=1	5	Rc1/8	10	10	35	M5 DP7.5	13	8	660	580
	35		118		154													

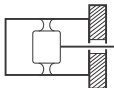


## L Type Mount

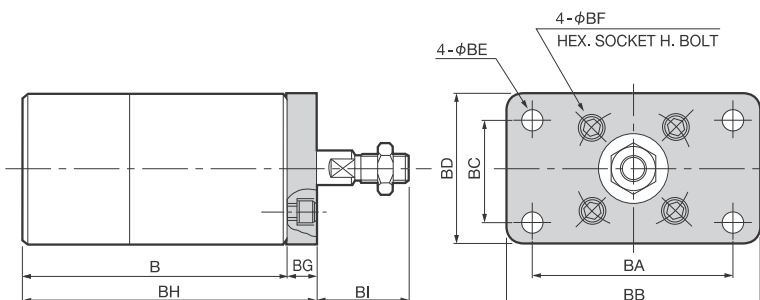


Dc-STROKE	B	AH	AJ
25 - 6	71	109	121
	86	124	136
	101	139	151
31.5 - 14	85	129	145
	101	145	161
	118	162	178

Dc	AA	AB	AC	AD	AE	AF	AG	AI	AK
25	25	38	25	4	6	19	6	11	M4x10
31.5	30	45	30	5	6	22	8	14	M5x12

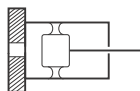


## Front Flange Type Mount

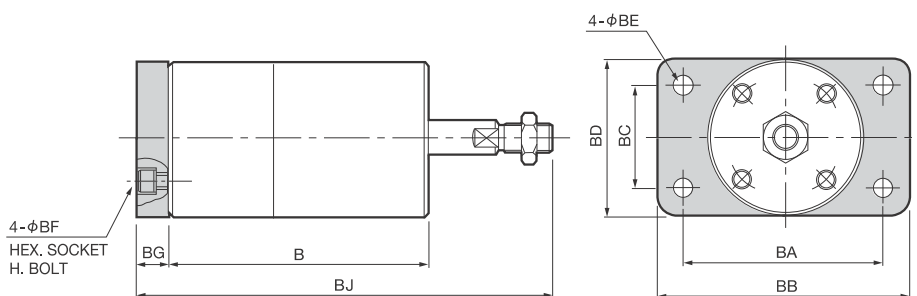


Dc-STROKE	B	BH
25 - 6	71	77
	86	92
	101	107
31.5 - 14	85	93
	101	109
	118	126

Dc	BA	BB	BC	BD	BE	BF	BG	BI
25	50	65	25	38	5	M4x6	6	24
31.5	60	75	30	45	6	M5x8	8	28

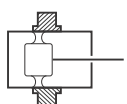


### Rear Flange Type Mount

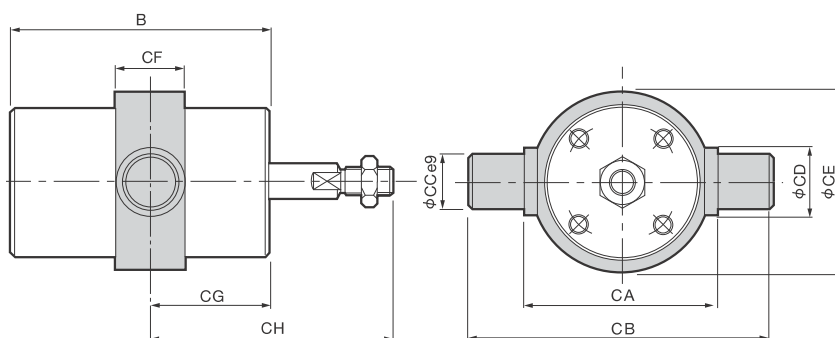


Dc-STROKE	B	BJ
25	- 6	71
	16	86
	26	101
31.5	- 14	85
	24	101
	35	118

Dc	BA	BB	BC	BD	BE	BF	BG
25	50	65	25	38	5	M4×6	6
31.5	60	75	30	45	6	M5×8	8

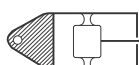


### Trunnion Type Mount

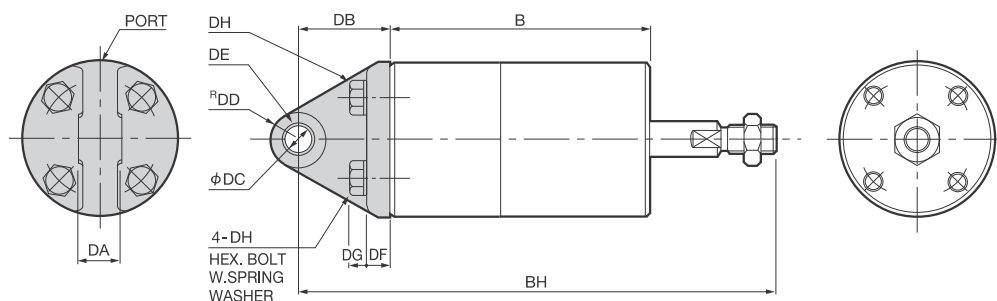


Dc-STROKE	B	CG	CH
25	- 6	71	26
	16	86	33
	26	101	38
31.5	- 14	85	44
	24	101	60
	35	118	67

Dc	CA	CB	CC	CD	CE	CF
25	46	66	10	15	46	16
31.5	54	78	12	16	53	17



### Pivot Type Mount

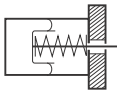


Dc-STROKE	B	BH
25	- 6	126
	16	141
	26	156
31.5	- 14	148
	24	164
	35	181

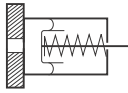
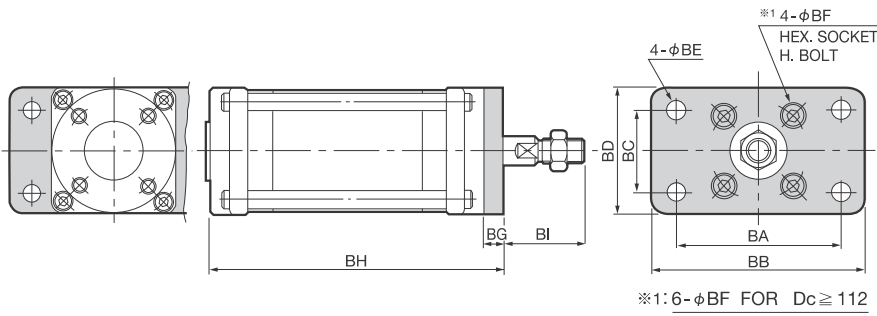
Dc	DA	DB	DC	DD	DE	DF	DG	DH
25	12	25	8	8	0812	6	3.8	M4×12
31.5	13	27	8	8	0812	7	4.8	M4×14

DE : Bearing Size No.

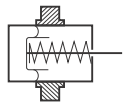
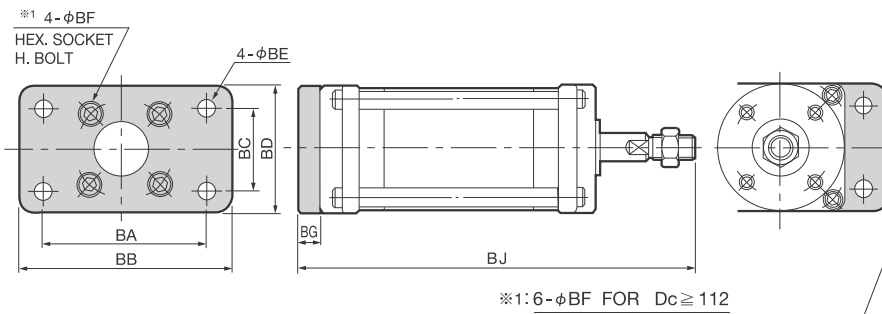




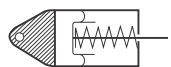
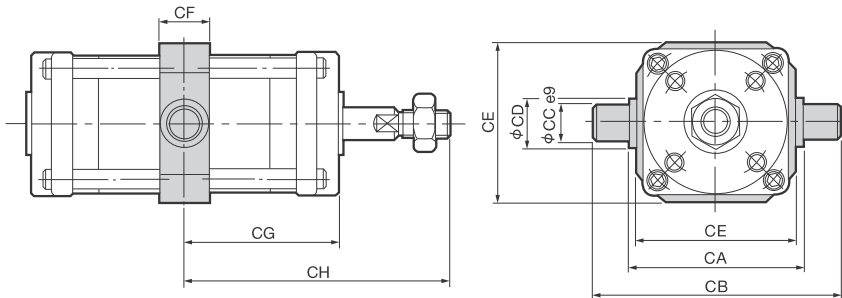
**Front Flange Type Mount**



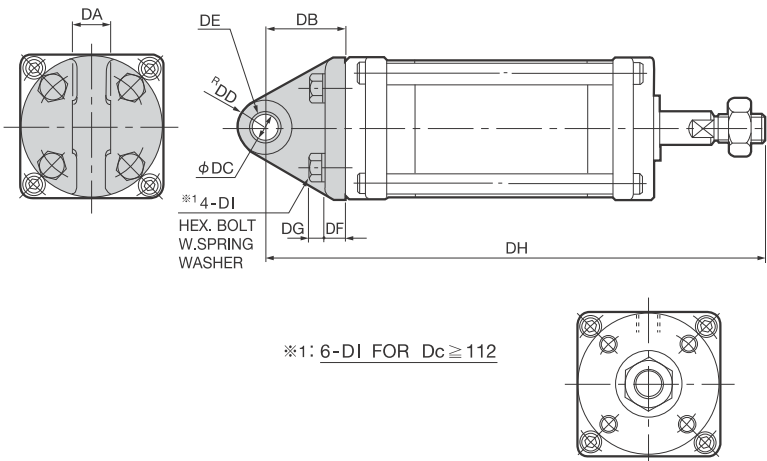
**Rear Flange Type Mount**



**Trunnion Type Mount**



**Pivot Type Mount**



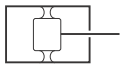
Dc-STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ								
40	8	24	36	48	70	90	35	53	6.5	M6 × 10	53	77	96	114	119	138	156	
50	16	36	50	64	80	100	40	63	7.5	M6 × 10	67	97	119	140	142	164	185	212
63	16	42	59	78	105	130	55	82	9.5	M8 × 12	78	117	143	172	167	193	222	258
80	30	62	87	108	120	150	70	100	9.5	M8 × 12	100	148	186	218	206	244	276	312
100	46	86	115	144	150	180	85	120	11.5	M10 × 16	132	192	237	282	257	302	347	392
112	42	88	122	156	166	195	100	137	14	M10 × 16	132	201	253	305	273	325	377	429
125	52	102	140	178	180	210	115	150	14	M10 × 16	148	223	281	338	299	357	414	472
140	62	122	162	204	195	225	125	165	16	M12 × 20	173	263	325	389	347	409	473	537

Dc-STROKE	CA	CB	CC	CD	CE	CF	CG	CH																																																																
40	8	24	36	48	64	92	14	18	60	18	34	76	43.5	85.5	52.5	94.5	28.5	73.5	43.5	88.5	54.5	99.5	65	110	33	83	52.5	102.5	65.5	115.5	80	130	43.5	101.5	67.5	125.5	86.5	144.5	102.5	160.5	59	124	89	154	111.5	176.5	134	199	58.5	130.5	93	165	119	191	145	217	66	142	103.5	179.5	132.5	208.5	161	237	77	161	122	206	153	237	185	269

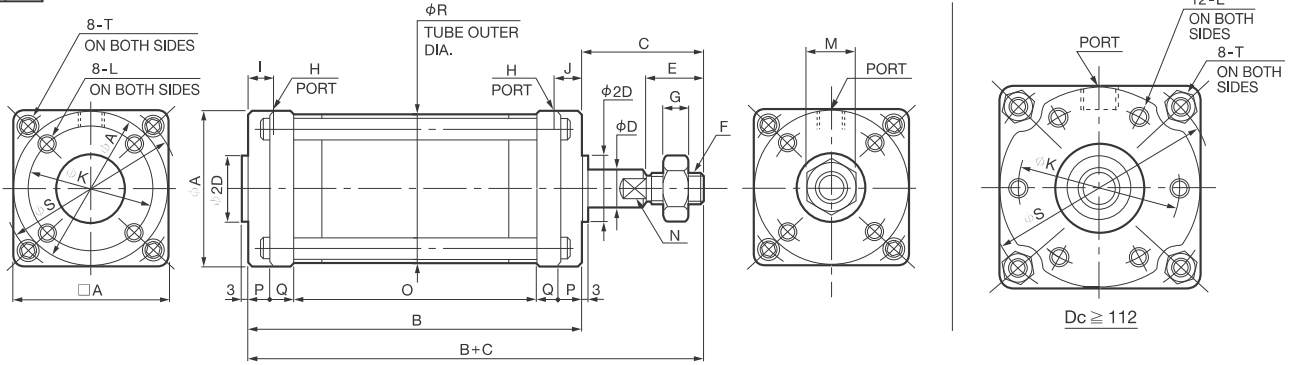
Dc-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI							
40	8	24	36	48	15	30	10	14	1015	8	5.5	116	140	159	177	M6 × 18
50	16	36	50	64	15	33	10	14	1015	9	5.5	135	165	187	208	M6 × 18
63	16	42	59	78	20	38	12	15	1220	10	7.5	154	193	219	248	M8 × 22
80	30	62	87	108	20	44	15	16.5	1520	12	7.5	189	237	275	307	M8 × 22
100	46	86	115	144	25	50	18	18	1825	15	9.5	233	293	338	383	M10 × 30
112	42	88	122	156	28	54	18	20	1810	16	9.5	243	312	364	416	M10 × 30
125	52	102	140	178	30	59	20	23	2010	17	9.5	267	342	400	457	M10 × 30
140	62	122	162	204	34	64	22	25	2210	19	11	302	392	454	518	M12 × 35

DE : Bearing Size No.

# Model FCD-40-8 to 140-204



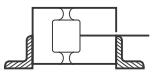
## Outline Dimensions



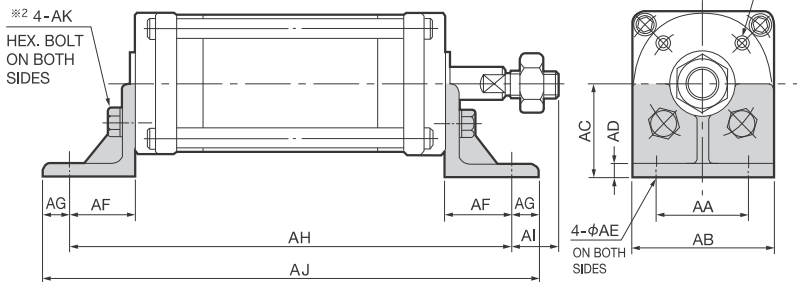
## OUTLINE DIMENSIONS

Ae : Effective area (mm<sup>2</sup>)  
N : Wrench flat width

Dc-STROKE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Ae			
																					PUSH	PULL		
40 - 8		54													24									
	24		78		12	20	M10		Rc 1/8	9	9	42	M6	17	10	48	8	7	51.5	61	M5	1100	980	
	36	53	97	42			× 1.25	6				DP 9			67									
	48		116												86									
50 - 16		67													35									
	36		97		12	20	M10		Rc 1/8	10	10	50	M6	17	10	65	8	8	61.5	73	M6	1770	1650	
	50	63	119	45			× 1.25	6				DP 9			87									
	64		141												109									
63 - 16		79													39									
	42		118		16	24	M12		Rc 1/4	12	12	63	M8	19	13	78	9	11	78.5	94	M8	2730	2530	
	59	82	145	50			× 1.5	7				DP 12			105									
	78		175												135									
80 - 30		100													52									
	62		148		20	32	M16		Rc 1/4	14	14	80	M8	24	17	100	10	14	97	114	M8	4540	4230	
	87	100	187	58			× 1.5	10				DP 12			139									
	108		220												172									
100 - 46		132													78									
	86		192		25	40	M20		Rc 1/4	14	14	98	M10	30	22	138	11	16	117.5	136	M10	7240	6750	
	115	120	239	65			× 1.5	12				DP 15			185									
	144		284												230									
112 - 42		138													76									
	88		207		25	44	M22		Rc 3/8	18	18	112	M10	32	22	145	12	19	135	156	M12	8820	8330	
	122	137	260	72			× 1.5	13				DP 15			198									
	156		313												251									
125 - 52		153													81									
	102		228		30	48	M24		Rc 3/8	18	18	125	M10	36	24	156	16	20	149	170	M14	11100	10400	
	140	150	287	76			× 1.5	14				DP 15			215									
	178		346												274									
140 - 62		173													93									
	122		263		35	52	M27		Rc 3/8	18	18	140	M12	41	30	183	16	24	164	190	M14	14100	13300	
	162	165	326	84			× 1.5	16				DP 18			246									
	204		392												312									



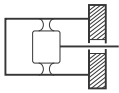
## L Type Mount



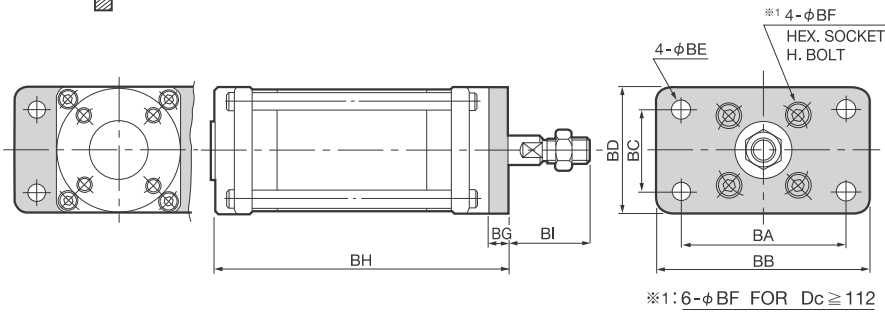
※1 : 12-L FOR Dc ≥ 112 ON BOTH SIDES

※2 : 6-AK FOR Dc ≥ 112 ON BOTH SIDES

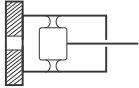
Dc-STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
40 - 8								104		124	
	24	35	53	35	5	6.5	25	128	17	148	M6
	36							147		167	× 14
	48							166		186	
50 - 16								119		141	
	36	40	63	40	6	7.5	26	149	19	171	M6
	50							171		193	× 14
	64							193		215	
63 - 16								141		169	
	42	50	82	50	6	9.5	31	180	19	208	M8
	59							207		235	× 20
	78							237		265	
80 - 30								170		204	
	62	60	100	60	8	9.5	35	218	23	252	M8
	87							257		291	× 20
	108							290		324	
100 - 46								212		252	
	86	75	120	70	8	12	40	272	25	312	M10
	115							319		359	× 25
	144							364		404	
112 - 42								226		272	
	88	85	137	80	8	14	44	295	28	341	M10
	122							348		394	× 25
	156							401		447	
125 - 52								245		293	
	102	95	150	87	10	14	46	320	30	368	M10
	140							379		427	× 25
	178							438		486	
140 - 62								265		313	
	122	100	165	95	10	16	46	355	38	403	M12
	162							418		466	× 30
	204							484		532	



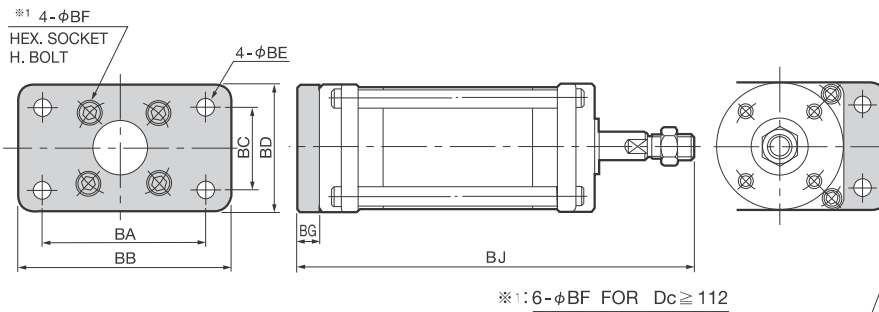
### Front Flange Type Mount



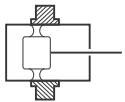
Dc-STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ
40	8	70	90	35	53	6.5	M6 × 10	63	33	105
	24							87		129
	36							106		148
	48							125		167
50	16	80	100	40	63	7.5	M6 × 10	77	35	122
	36							107		132
	50							129		174
	64							151		196
63	16	105	130	55	82	9.5	M8 × 14	91	38	141
	42							130		179
	59							157		207
	78							187		237
80	30	120	150	70	100	9.5	M8 × 14	113	45	171
	62							161		219
	87							200		258
	108							233		291
100	46	150	180	85	120	11.5	M10 × 16	146	51	211
	86							206		271
	115							253		318
	144							298		363
112	42	166	195	100	137	14	M10 × 16	153	57	225
	88							222		294
	122							275		347
	156							328		400
125	52	180	210	115	150	14	M10 × 16	169	60	245
	102							244		320
	140							303		379
	178							362		438
140	62	195	225	125	165	16	M12 × 20	192	65	276
	122							282		366
	162							345		429
	204							411		495



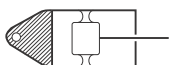
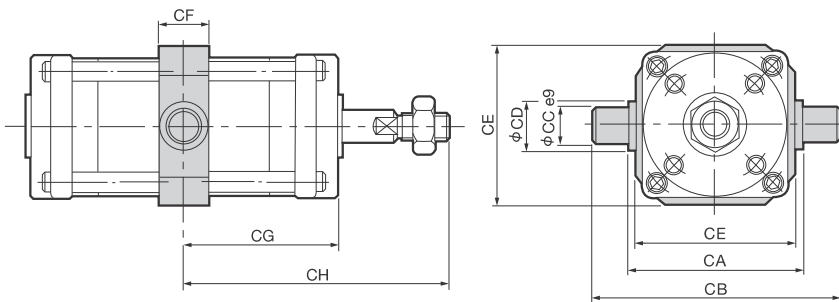
### Rear Flange Type Mount



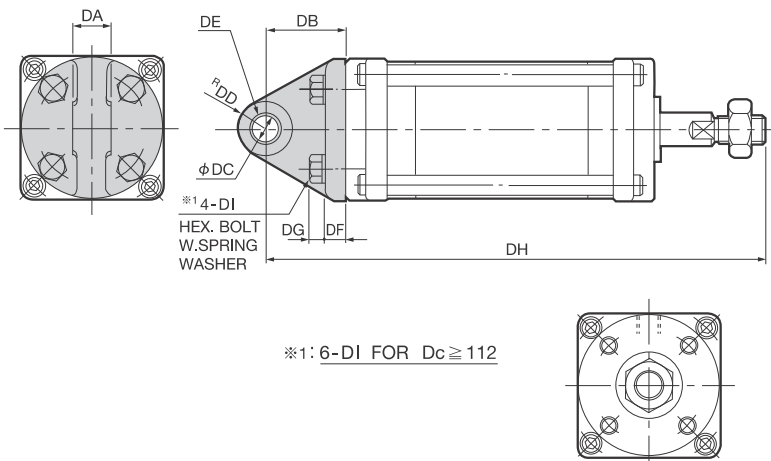
Dc-STROKE	CA	CB	CC	CD	CE	CF	CG	CH	
40	8	64	92	14	18	60	18	27	69
	24							39	81
	36							48.5	90.5
	48							58	100
50	16	74	106	16	20	70	20	33.5	78.5
	36							48.5	93.5
	50							59.5	104.5
	64							70.5	115.5
63	16	94	134	20	25	88	25	39.5	89.5
	42							59	109
	59							72.5	122.5
	78							87.5	137.5
80	30	114	168	25	30	108	30	50	108
	62							74	132
	87							93.5	151.5
	108							110	168
100	46	134	194	30	35	128	35	66	131
	86							96	161
	115							119.5	184.5
	144							142	207
112	42	156	216	30	35	150	35	69	141
	88							103.5	175.5
	122							130	202
	156							156.5	228.5
125	52	170	234	32	38	164	38	76.5	152.5
	102							114	190
	140							143.5	219.5
	178							173	249
140	62	190	260	35	42	184	42	86.5	170.5
	122							131.5	215.5
	162							163	247
	204							196	280



### Trunnion Type Mount



### Pivot Type Mount

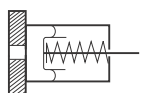


Dc-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI	
40	8	15	30	10	14	1015	8	5.5	126	
	24								150	M6 × 18
	36								169	
	48								188	
50	16	15	33	10	14	1015	9	5.5	145	
	36								175	M6 × 18
	50								197	
	64								219	
63	16	20	38	12	15	1220	10	7.5	167	
	42								206	M8 × 22
	59								233	
	78								263	
80	30	20	44	15	16.5	1520	12	7.5	202	
	62								250	M8 × 22
	87								289	
	108								322	
100	46	25	50	18	18	1825	15	9.5	247	
	86								307	M10 × 30
	115								354	
	144								399	
112	42	28	54	18	20	1810 2pcs.	16	9.5	264	
	88								333	M10 × 30
	122								386	
	156								439	
125	52	30	59	20	23	2010 2pcs.	17	9.5	288	
	102								363	M10 × 30
	140								422	
	178								481	
140	62	34	64	22	25	2210 2pcs.	19	11	321	
	122								411	M12 × 35
	162								474	
	204								570	

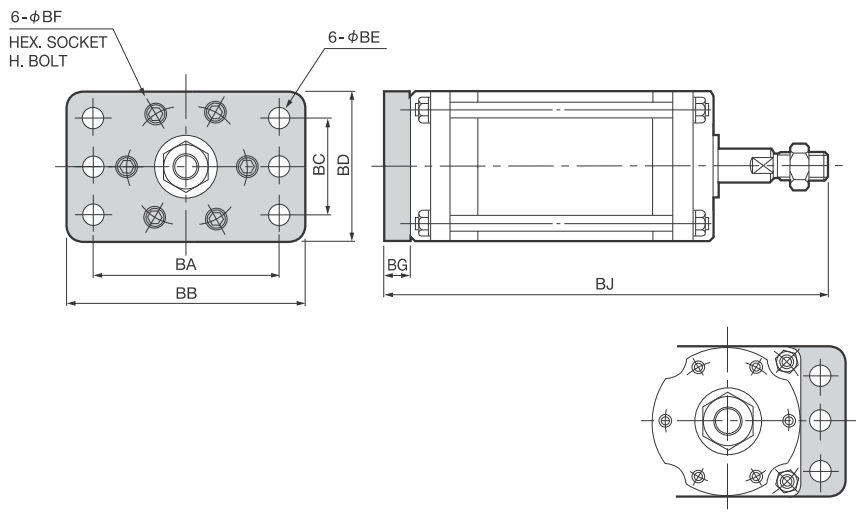
DE: Bearing Size No.



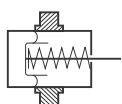




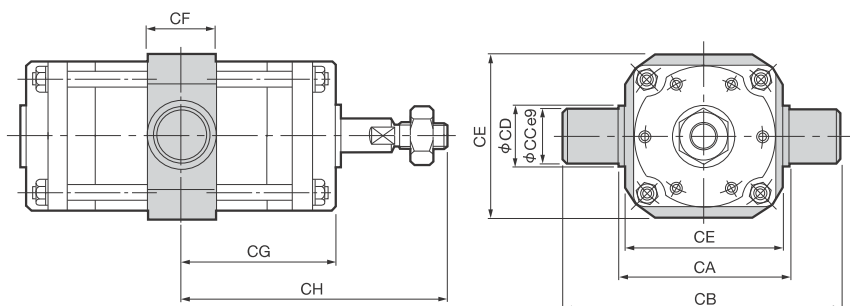
### Rear Flange Type Mount



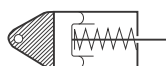
Dc-STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
160	82							297
	142	220	260	140	185	16	M12 × 20	387
	192						19	464
	240							538
180	96							339
	168	250	300	160	205	18	M14 × 25	447
	226						22	536
	280							619
200	112							389
	192	275	320	180	225	18	M16 × 25	509
	256						25	607
	320							705



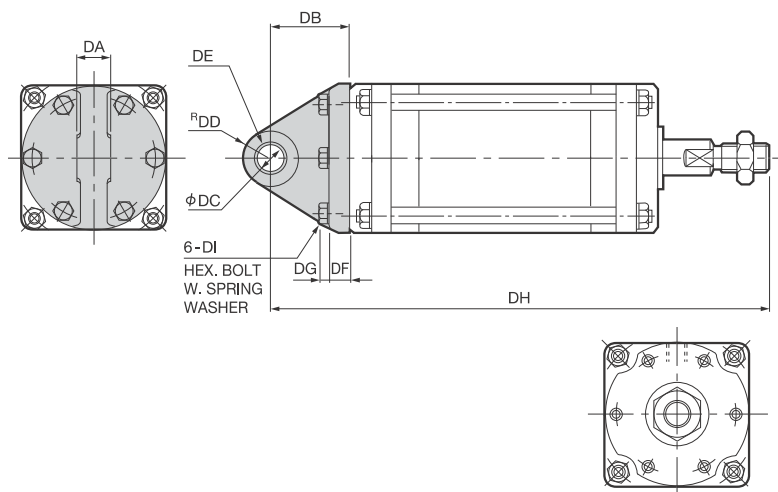
### Trunion Type Mount



Dc-STROKE	CA	CB	CC	CD	CE	CF	CG	CH
160	82						92	186
	142	215	295	40	60	205	60	137 231
	192							175.5 269.5
	240							212.5 306.5
180	96							106.5 210.5
	168	235	325	45	63	225	63	160.5 264.5
	226							205 309
	280							246.5 350.5
200	112							122 242
	192	260	350	45	65	250	65	182 302
	256							231 351
	320							280 400



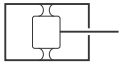
### Pivot Type Mount



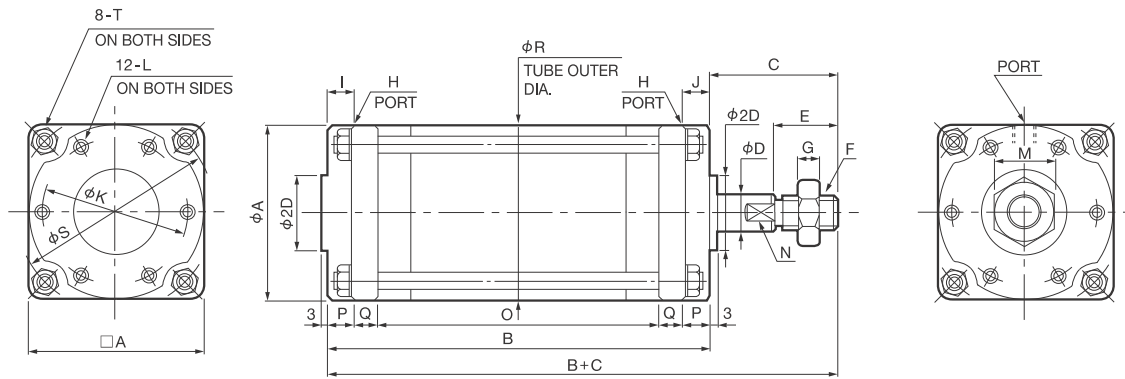
Dc-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
160	82								348
	142	38	70	25	28	2510	21	11	M12 × 40
	192					2pcs.			438
	240								515 589
180	96								394
	168	42	77	28	32	2812	24	12.5	M14 × 45
	226					2pcs.			502 591
	280								591 674
200	112								449
	192	45	85	30	34	3012	26	14	M16 × 50
	256					2pcs.			569 667
	320								667 765

DE : Bearing Size No.

# Model FCD-160-82 to 200-320



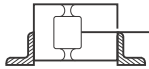
## Outline Dimensions



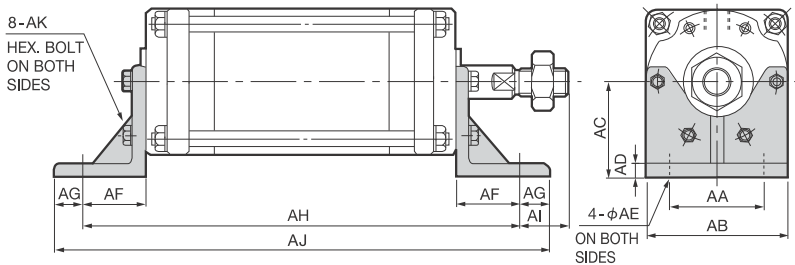
### OUTLINE DIMENSIONS

Ae : Effective area (mm<sup>2</sup>)  
N : Wrench flat width

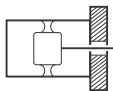
Dc-STROKE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Ae		
																					PUSH	PULL	
160 - 82		230													132								
	142	185	320	94	35	60	M30 × 1.5	18	Rc 1/2	22	22	160	M12 DP 18	46	30	222	23	26	185	215	M16	18600	17600
	192		301																				
	240		377																				
180 - 96		260													148								
	168	205	368	104	40	64	M33 × 1.5	20	Rc 1/2	22	22	176	M14 DP 21	50	36	256	26	30	205	238	M18	23800	22500
	226		347																				
	280		432																				
200 - 112		292													166								
	192	225	412	120	45	72	M36 × 1.5	21	Rc 3/4	24	24	194	M16 DP 24	55	41	286	28	35	225	262	M20	29600	28000
	256		386																				
	320		486																				



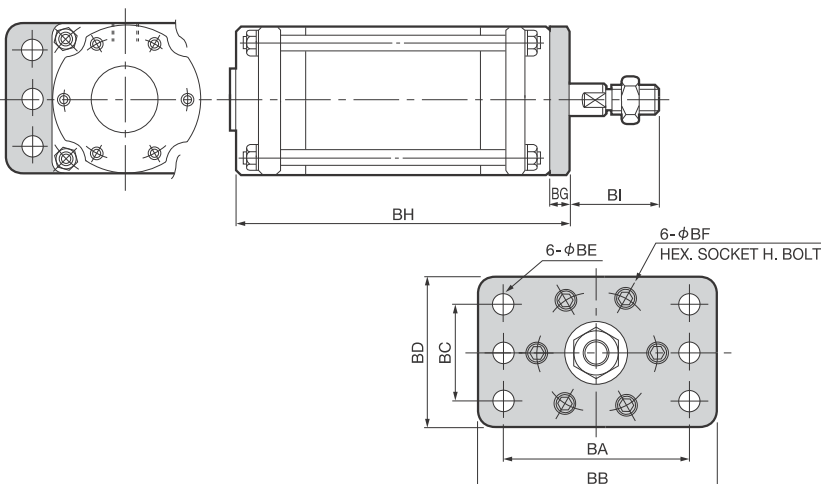
## L Type Mount



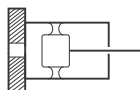
Dc-STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
160 - 82								328		380	M12 × 30
	142	115	185	105	13	18	49	418	45	470	
	192							497		549	
	240							573		625	
180 - 96								364		420	M14 × 35
	168	130	205	115	14	18	52	472	52	528	
	226							563		619	
	280							648		704	
200 - 112								396		452	M16 × 35
	192	140	225	125	14	18	52	516	68	572	
	256							616		672	
	320							716		772	



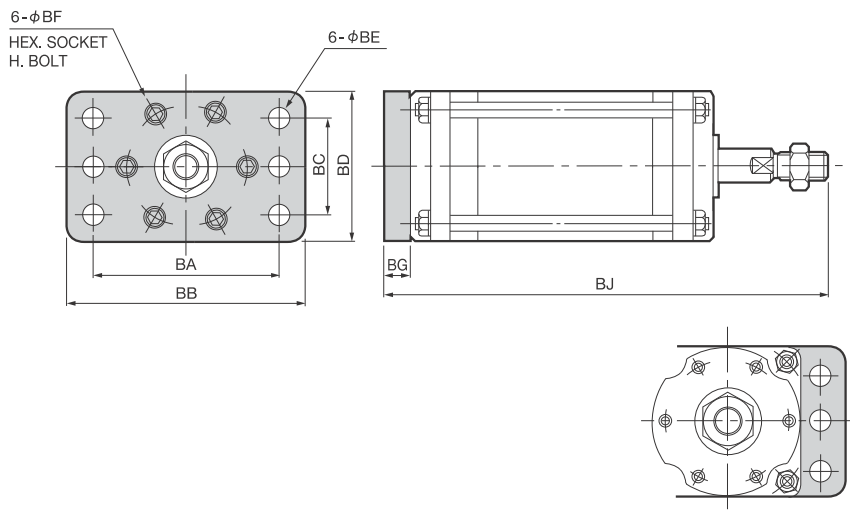
## Front Flange Type Mount



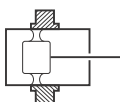
Dc-STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI
160 - 82								249	
	142	220	260	140	185	16	M12 × 20	339	75
	192							418	
	240							494	
180 - 96								282	
	168	250	300	160	205	18	M14 × 25	390	82
	226							481	
	280							566	
200 - 112								317	
	192	275	320	180	225	18	M16 × 25	437	95
	256							537	
	320							637	



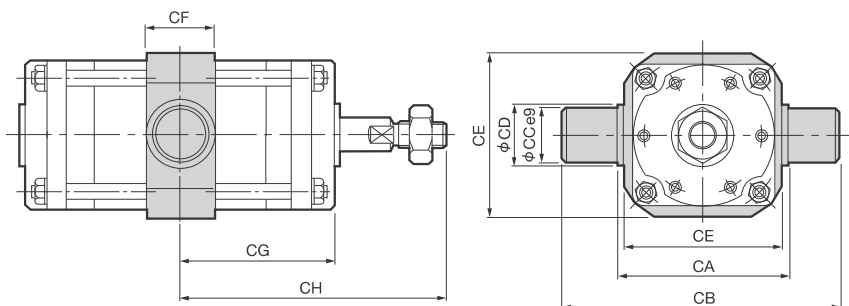
### Rear Flange Type Mount



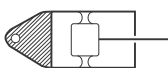
Dc-STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
160	82							343
	142	220	260	140	185	16	M12 × 20	433
	192							512
	240							588
	386							
180	96	250	300	160	205	18	M14 × 25	494
	168							585
	226							670
	280							
200	112	275	320	180	225	18	M16 × 25	437
	192							557
	256							657
	320							757



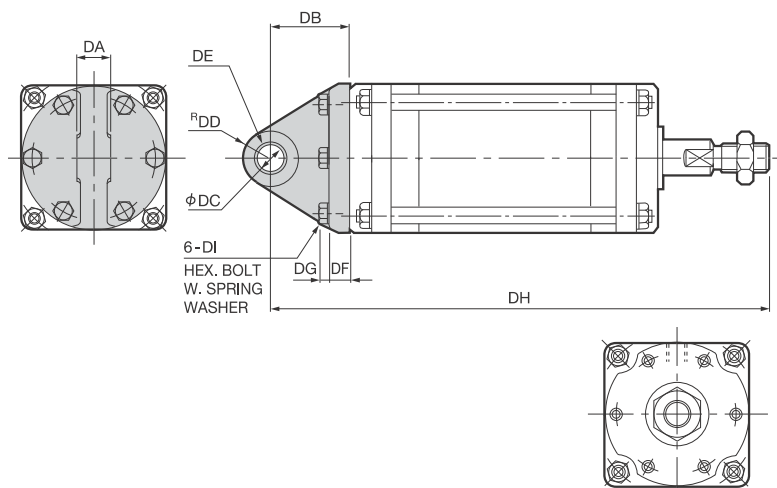
### Trunion Type Mount



Dc-STROKE	CA	CB	CC	CD	CE	CF	CG	CH
160	82						115	209
	142	215	295	40	60	205	60	160
	192							293.5
	240							331.5
	234							
180	96	235	325	45	63	225	63	184
	168							288
	226							333.5
	280							376
200	112	260	350	45	65	250	65	146
	192							326
	256							376
	320							426



### Pivot Type Mount



Dc-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
160	82							394	M12 × 40
	142	38	70	25	28	2510	21	484	
	192							563	
	240							639	
	441								
180	96	42	77	28	32	2812	24	549	M14 × 45
	168							640	
	226							725	
	280								
200	112	45	85	30	34	3012	26	497	M16 × 50
	192							617	
	256							717	
	320							817	

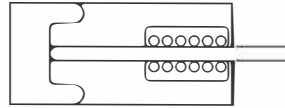
DE : Bearing Size No.



FUJIKURA COMPOSITES

# Fujikura BF Cylinders

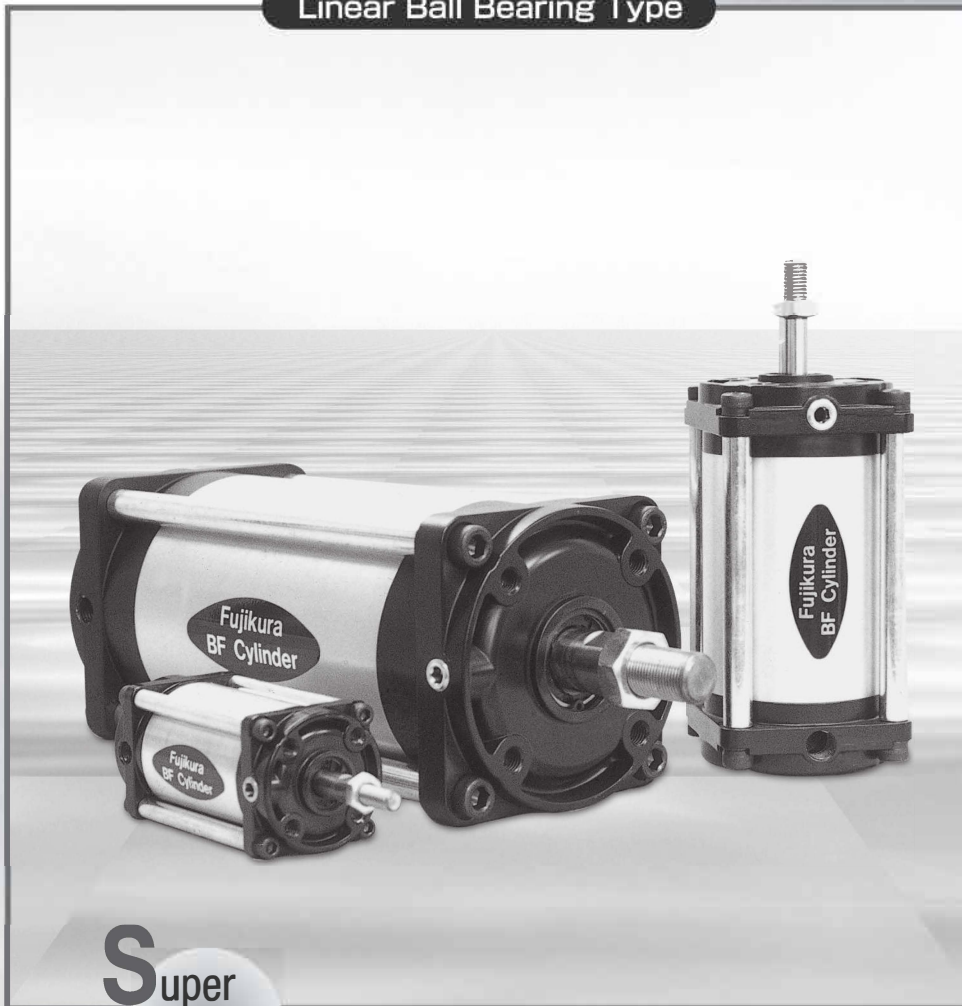
**SC** SERIES



**SCS** Single Action Push Type

**SCD** Double Action Type

Linear Ball Bearing Type



**S**uper  
**C**ylinder



**Linear ball bearing Type**

**Model SCS: Single Action (Push)**

**Model SCD: Double Action**

**■ SPECIFICATIONS**

Operating Style		Single Action (Push) / Double Action										
Cylinder Diameter	mm	40	50	63	80	100	112	125	140	160	180	200
Stroke	(Single) mm	48	64	78	108	144	156	178	204	82, 142, 192, 240	96, 168, 226, 280	112, 192, 256, 320
	(Double) mm	48	64	78	108	144	156	178	204	82, 142, 192, 240	96, 168, 226, 280	112, 192, 256, 320
Working Fluid	Compressed Air (Non-Lubricated)											
Working Pressure Range	MPa	0.01~0.7										
Working Temperature Range	℃	0~60										
Rod Bearing	Linear ball bearing without seal , Linear ball bearing with seal on both sides											
Mounting	Direct , L , Front Flange , Rear Flange ,Trunnion , Pivot-Mounting											

**■ FEATURES**

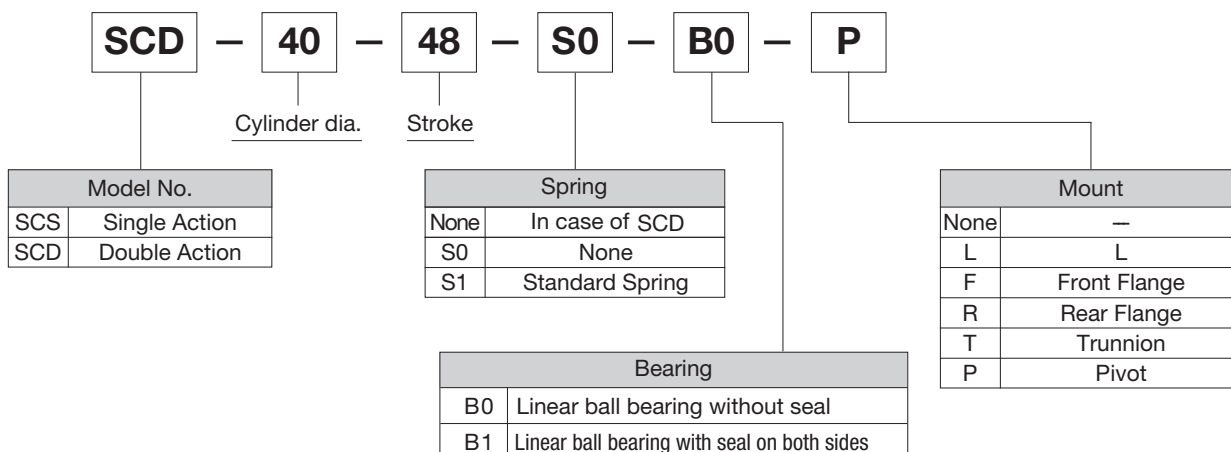
- SC Series is equipped with a linear ball bearing, having the same dimensions and structure as FC Series, to maximize the features of the BF diaphragm.
- The frictional resistance is smaller than the conventional types.
- The pressure fluctuation following capability is excellent.
- Operation is possible even under very small pressure.

**■ NOTE**

This series can be used as an ideal actuator for the following control operations:

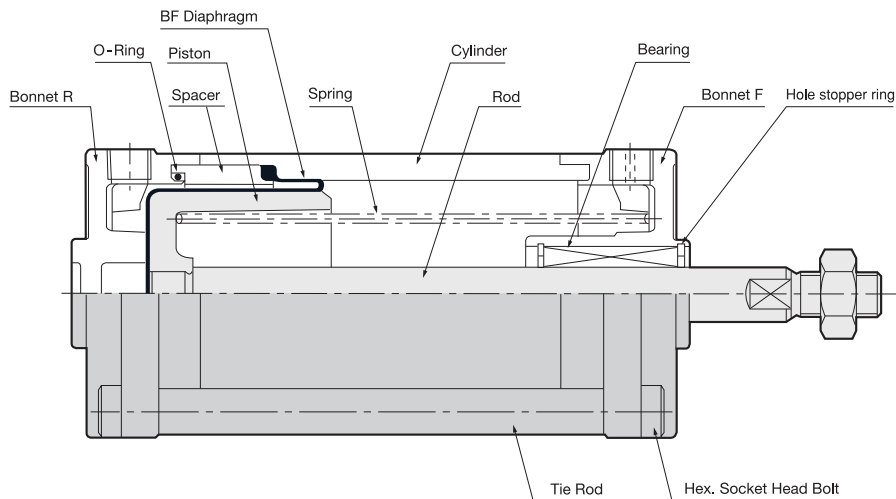
- To ensure correct control under low pressure
- Control of tension of printing machines and plastic production facilities
- Control of contact pressure of textile processing and metalworking machines
- Control of pressing force of polishing machines and testers

**■ ORDERING DATA [ Example ]**



# INTERNAL CONSTRUCTION/PARTS DESCRIPTION

## SINGLE ACTION TYPE

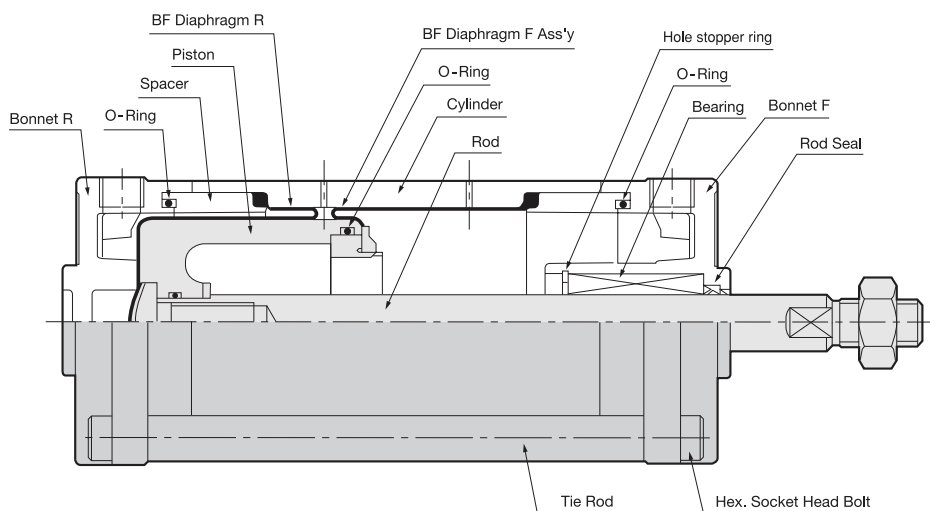


### ■ PARTS LIST

DESCRIPTION	MATERIAL
Bonnet F/R	Aℓ Alloy Die-Casting Aℓ Alloy Casting (FCS-160 & over)
O-Ring	NBR
Piston	Aℓ Alloy Casting
Cylinder/Spacer	Aℓ Alloy
Rod	Stainless Steel Hard Steel, Hard Chrome Plated (FCS-80 & over)
BF Diaphragm	Fabric Reinforced NBR
Return Spring	Spring Steel Wire
Bearing	Linear Ball Bearing
Hole Stopper Ring	Steel (SKS)
Tie Rod	Carbon Steel

Note : 1. Aℓ parts are anodic treated.  
2. Unless otherwise specified, steel parts are galvanized.  
3. Aℓ die-casting parts are bake painted.

## DOUBLE ACTION TYPE



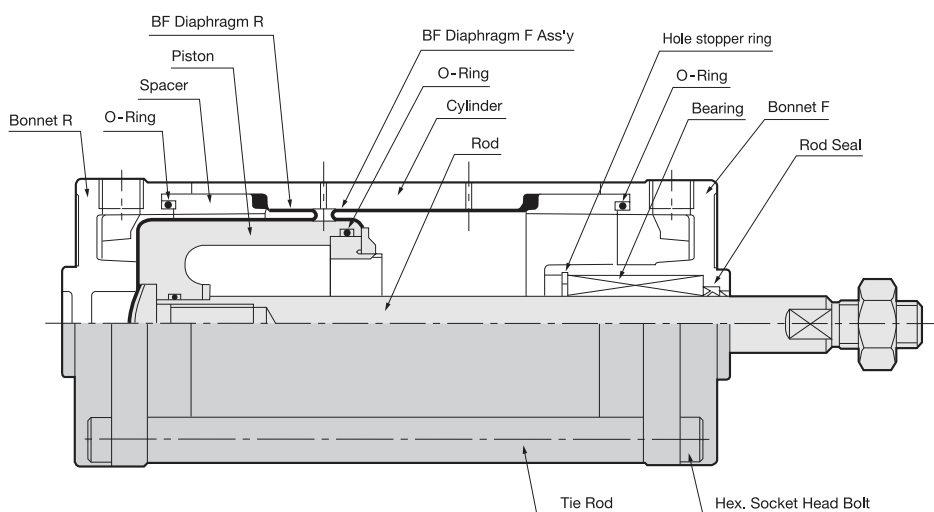
### ■ PARTS LIST

DESCRIPTION	MATERIAL
Bonnet F/R	Aℓ Alloy Die-Casting Aℓ Alloy Casting (FCS-160 & over)
O-Ring	NBR
Piston	Aℓ Alloy Casting
Cylinder/Spacer	Aℓ Alloy
Rod	Stainless Steel Hard Steel, Hard Chrome Plated (FCS-80 & over)
BF Diaphragm F Ass'y	Fabric Reinforced NBR with Fitting Caulked
BF Diaphragm	Fabric Reinforced NBR
Return Spring	Spring Steel Wire
Bearing	Linear Ball Bearing
Hole Stopper Ring	Steel (SKS)
Tie Rod	Carbon Steel

Note : 1. Aℓ parts are anodic treated.  
2. Unless otherwise specified, steel parts are galvanized.  
3. Aℓ die-casting parts are bake painted.

## SPECIAL TYPE CYLINDER

### SCD-40 ~ 200 SUPER CYLINDER DOUBLE ACTION TYPE



#### ■ PARTS LIST

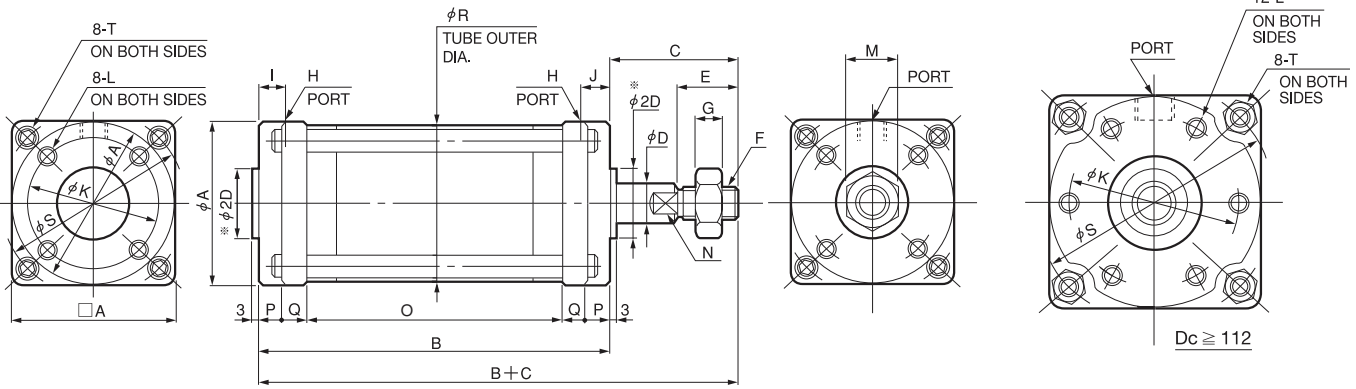
DESCRIPTION	MATERIAL
Bonnet F/R	A $\ell$ Alloy Die-Casting A $\ell$ Alloy Casting (FCS-160 & over)
O-Ring	NBR
Piston	A $\ell$ Alloy Casting
Cylinder/Spacer	A $\ell$ Alloy
Rod	Stainless Steel Hard Steel, Hard Chrome Plated (FCS-80 & over)
BF Diaphragm F Ass'y	Fabric Reinforced NBR with Fitting Caulked
BF Diaphragm	Fabric Reinforced NBR
Return Spring	Spring Steel Wire
Bearing	Linear Ball Bearing
Hole Stopper Ring	Steel (SKS)
Tie Rod	Carbon Steel

- Note : 1. A $\ell$  parts are anodic treated.  
 2. Unless otherwise specified, steel parts are galvanized.  
 3. A $\ell$  die-casting parts are bake painted.





## Outline Dimensions

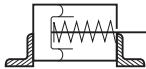


F<sub>0</sub>/F<sub>1</sub> : Spring force at zero/full stroke (N)  
 Ae : Effective area (mm<sup>2</sup>)  
 N : Wrench flat width

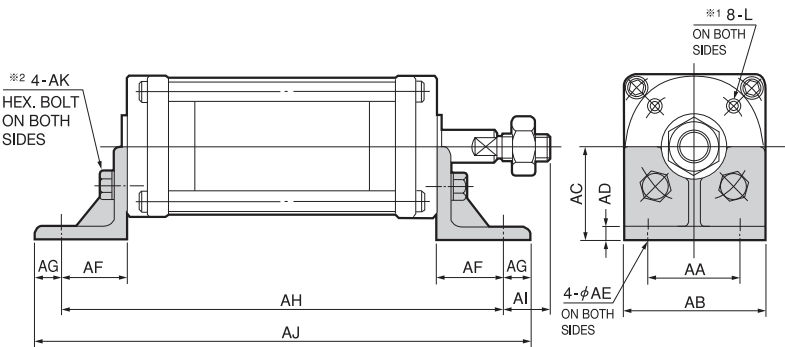
### OUTLINE DIMENSIONS

Dc—STROKE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Ae	SPRING FORCE	
																						F <sub>0</sub>	F <sub>1</sub>
40 — 48	53	105	42	10	20	M 8×1	6	Rc 1/8	9	—	42	M 6DP 9	17	8	75	8	7	51.5	61	M 5	1100	7.8	19.6
50 — 64	63	130	45	12	20	M 10×1.25	6	Rc 1/8	10	—	50	M 6DP 9	17	10	98	8	8	61.5	73	M 6	1770	14.7	29.4
63 — 78	82	160	50	16	24	M 12×1.5	7	Rc 1/4	12	—	63	M 8DP 12	19	13	120	9	11	78.5	94	M 8	2730	23.5	47
80 — 108	100	205	58	20	32	M 16×1.5	10	Rc 1/4	14	—	80	M 8DP 12	24	17	157	10	14	97	114	M 8	4540	39.2	78.4
100 — 144	120	268	65	25	40	M 20×1.5	12	Rc 1/4	14	—	98	M 10DP 15	30	22	214	11	16	117.5	136	M 10	7240	61.7	127.4
112 — 156	137	290	72	25	44	M 22×1.5	13	Rc 3/8	18	—	112	M 10DP 15	32	22	228	12	19	135	156	M 12	8820	76.4	158.8
125 — 178	150	322	76	30	48	M 24×1.5	14	Rc 3/8	18	—	125	M 10DP 15	36	24	249	16	20	149	170	M 14	11100	95.1	198
140 — 204	165	370	84	35	52	M 27×1.5	16	Rc 3/8	18	—	140	M 12DP 18	41	30	290	16	24	164	190	M 14	14100	119.6	254.8

※ : 径40のみ2Dは24mm



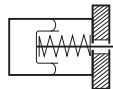
## L Type Mount



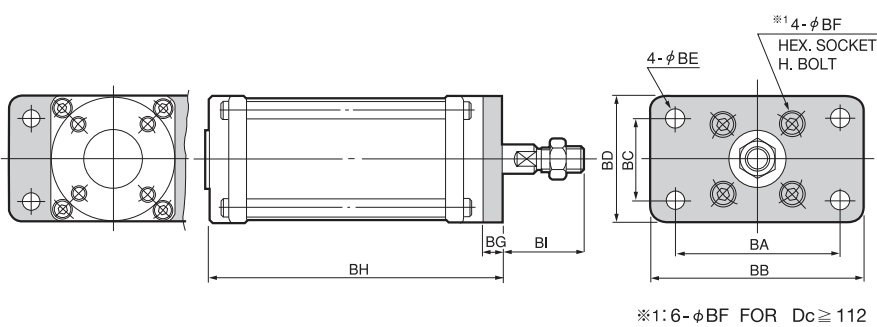
※1 : 12-L FOR Dc ≥ 112 ON BOTH SIDES

※2 : 6-AK FOR Dc ≥ 112 ON BOTH SIDES

Ds-STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
40 - 48	35	53	35	5	6.5	25	10	155	17	175	M6 × 14
50 - 64	40	63	40	6	7.5	26	11	182	19	204	M6 × 14
63 - 78	50	82	50	6	9.5	31	14	222	19	250	M8 × 20
80 - 108	60	100	60	8	9.5	35	17	275	23	309	M8 × 20
100 - 144	75	120	70	8	12	40	20	348	25	388	M10 × 25
112 - 156	85	137	80	8	14	44	23	378	28	424	M10 × 25
125 - 178	95	150	87	10	14	46	24	415	30	463	M10 × 25
140 - 204	100	165	95	10	16	46	24	462	38	510	M12 × 30

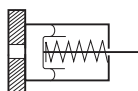


## Front Flange Type Mount

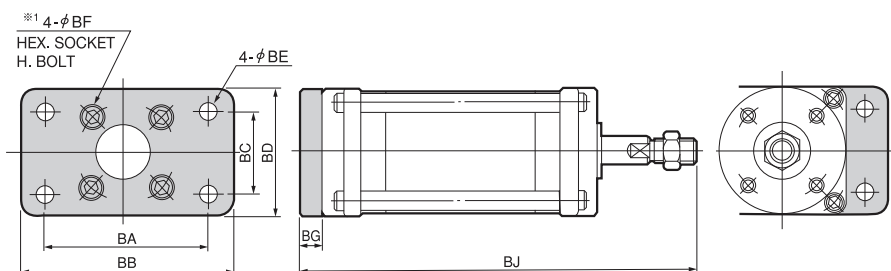


※1: 6-φBF FOR Dc ≥ 112

Ds-STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI
40 - 48	70	90	35	53	6.5	M6 × 10	9	114	33
50 - 64	80	100	40	63	7.5	M6 × 10	10	140	35
63 - 78	105	130	55	82	9.5	M8 × 14	12	172	38
80 - 108	120	150	70	100	9.5	M8 × 14	13	218	45
100 - 144	150	180	85	120	11.5	M10 × 16	14	282	51
112 - 156	166	195	100	137	14	M10 × 16	15	305	57
125 - 178	180	210	115	150	14	M10 × 16	16	338	60
140 - 204	195	225	125	165	16	M12 × 20	19	389	65

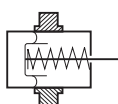


### Rear Flange Type Mount

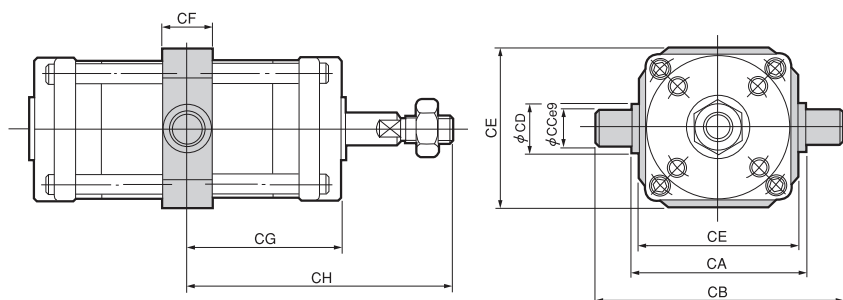


\*1: 6- $\phi$ BF FOR  $D_c \geq 112$

Ds-STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
40 - 48	70	90	35	53	6.5	M6 × 10	9	156
50 - 64	80	100	40	63	7.5	M6 × 10	10	185
63 - 78	105	130	55	82	9.5	M8 × 14	12	222
80 - 108	120	150	70	100	9.5	M8 × 14	13	276
100 - 144	150	180	85	120	11.5	M10 × 16	14	347
112 - 156	166	195	100	137	14	M10 × 16	15	377
125 - 178	180	210	115	150	14	M10 × 16	16	414
140 - 204	195	225	125	165	16	M12 × 20	19	473



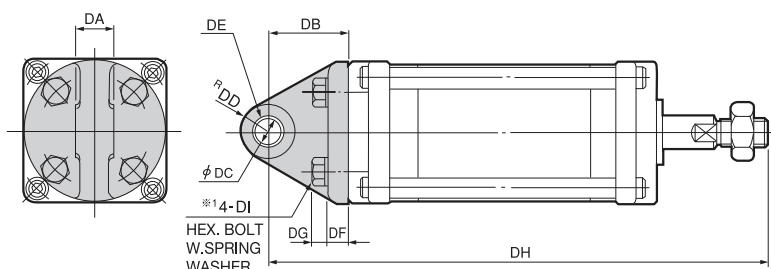
### Trunnion Type Mount



Ds-STROKE	CA	CB	CC	CD	CE	CF	CG	CH
40 - 48	64	92	14	18	60	18	52.5	94.5
50 - 64	74	106	16	20	70	20	65	110
63 - 78	94	134	20	25	88	25	80	130
80 - 108	114	164	25	30	108	30	102.5	160.5
100 - 144	134	194	30	35	128	35	134	199
112 - 156	156	216	30	35	150	35	145	217
125 - 178	170	234	32	38	164	38	161	237
140 - 204	190	260	35	42	184	42	185	269



### Pivot Type Mount

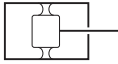


\*1: 6-DI FOR  $D_c \geq 112$

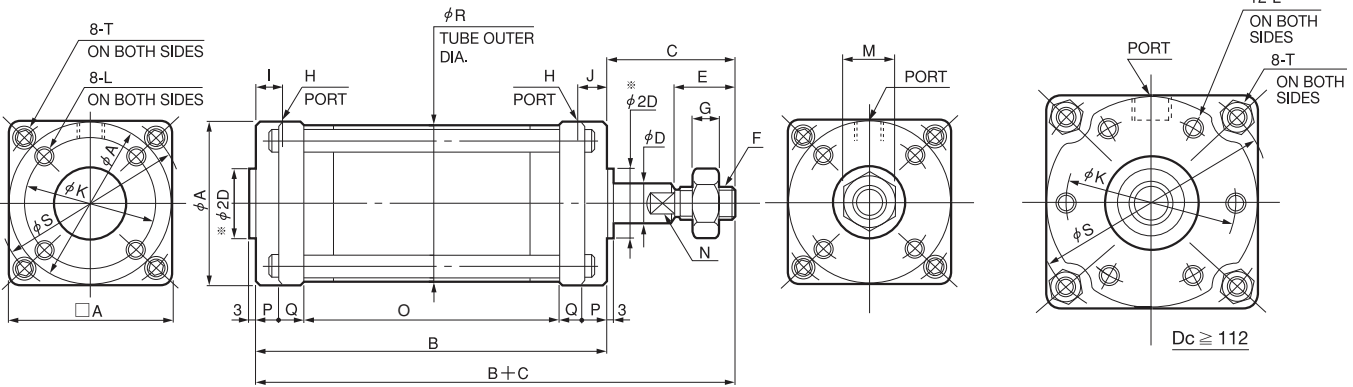
Ds-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
40 - 48	15	30	10	14	1015	8	5.5	177	M 6×16
50 - 64	15	33	10	14	1015	9	5.5	208	M 6×18
63 - 78	20	38	12	15	1220	10	7.5	248	M 8×22
80 - 108	20	44	15	16.5	1520	12	7.5	307	M 8×25
100 - 144	25	50	18	18	1825	15	9.5	383	M10×25
112 - 156	28	54	18	20	1810 2pcs.	16	9.5	416	M10×30
125 - 178	30	59	20	23	2010 2pcs.	17	9.5	457	M10×30
140 - 204	34	64	22	25	2210 2pcs.	19	11	518	M12×35

DE : Bearing Size No.

# SCD-40-48~140-204



## Outline Dimensions

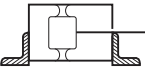


### OUTLINE DIMENSIONS

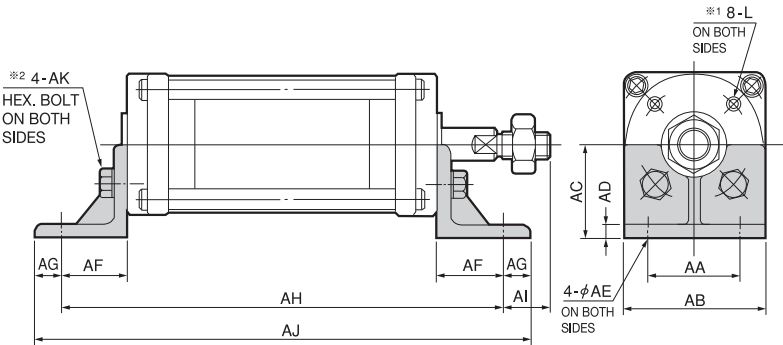
Ae : Effective area (mm<sup>2</sup>)  
N : Wrench flat width

Dc—STROKE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Ae	
																					PUSH	PULL
40 — 48	53	116	42	10	20	M 8×1	6	Rc 1/8	9	9	42	M 6 DP 9	17	8	86	8	7	51.5	61	M 5	1100	1020
50 — 64	63	141	45	12	20	M 10×1.25	6	Rc 1/8	10	10	50	M 6 DP 9	17	10	109	8	8	61.5	73	M 6	1770	1650
63 — 78	82	175	50	16	24	M 12×1.5	7	Rc 1/4	12	12	63	M 8 DP 12	19	13	135	9	11	78.5	94	M 8	2730	2530
80 — 108	100	220	58	20	32	M 16×1.5	10	Rc 1/4	14	14	80	M 8 DP 12	24	17	172	10	14	97	114	M 8	4540	4230
100 — 144	120	284	65	25	40	M 20×1.5	12	Rc 1/4	14	14	98	M10 DP 15	30	22	230	11	16	117.5	136	M 10	7240	6750
112 — 156	137	313	72	25	44	M 22×1.5	13	Rc 3/8	18	18	112	M10 DP 15	32	22	251	12	19	135	156	M 12	8820	8330
125 — 178	150	346	76	30	48	M 24×1.5	14	Rc 3/8	18	18	125	M10 DP 15	36	24	274	16	20	149	170	M 14	11100	10400
140 — 204	165	392	84	35	52	M 27×1.5	16	Rc 3/8	18	18	140	M12 DP 18	41	30	312	16	24	164	190	M 14	14100	13300

※ : 径40のみ2Dは24mm



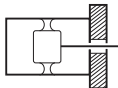
## L Type Mount



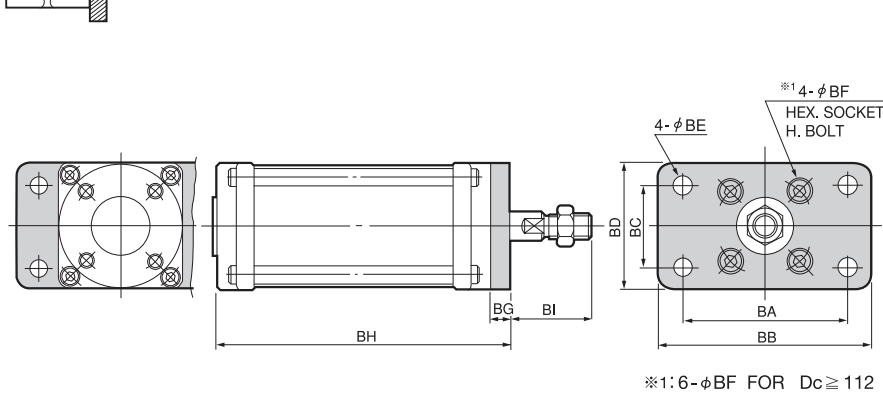
※1 : 12-L FOR Dc ≥ 112 ON BOTH SIDES

※2 : 6-AK FOR Dc ≥ 112 ON BOTH SIDES

Ds-STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
40 - 48	35	53	35	5	6.5	25	10	166	17	186	M6 × 14
50 - 64	40	63	40	6	7.5	26	11	193	19	215	M6 × 14
63 - 78	50	82	50	6	9.5	31	14	237	19	265	M8 × 20
80 - 108	60	100	60	8	9.5	35	17	290	23	324	M8 × 20
100 - 144	75	120	70	8	12	40	20	364	25	404	M10 × 25
112 - 156	85	137	80	8	14	44	23	401	28	447	M10 × 25
125 - 178	95	150	87	10	14	46	24	438	30	486	M10 × 25
140 - 204	100	165	95	10	16	46	24	484	38	532	M12 × 30

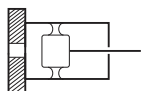


## Front Flange Type Mount

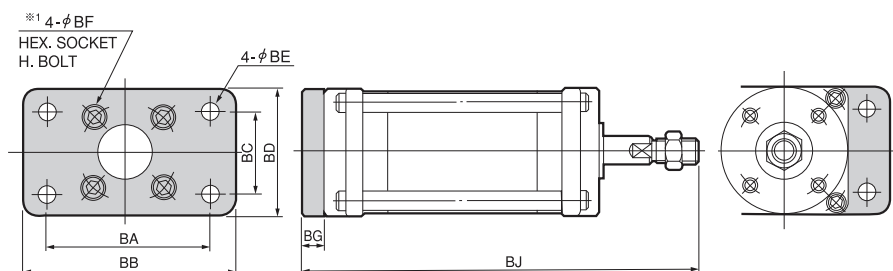


※1 : 4-φBF FOR Dc ≥ 112

Ds-STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI
40 - 48	70	90	35	53	6.5	M6 × 10	9	125	33
50 - 64	80	100	40	63	7.5	M6 × 10	10	151	35
63 - 78	105	130	55	82	9.5	M8 × 14	12	187	38
80 - 108	120	150	70	100	9.5	M8 × 14	13	233	45
100 - 144	150	180	85	120	11.5	M10 × 16	14	298	51
112 - 156	166	195	100	137	14	M10 × 16	15	328	57
125 - 178	180	210	115	150	14	M10 × 16	16	362	60
140 - 204	195	225	125	165	16	M12 × 20	19	411	65

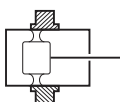


### Rear Flange Type Mount

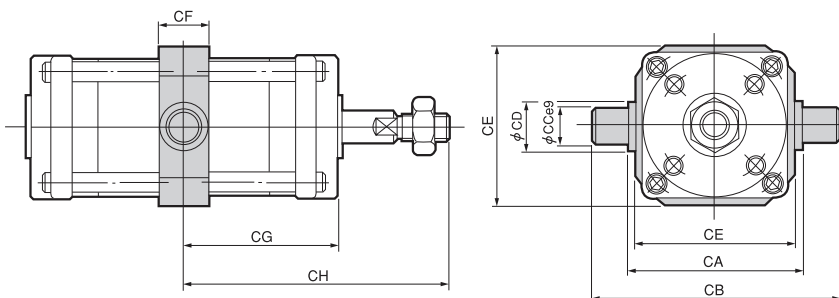


※1: 6-φBF FOR  $D_c \geq 112$

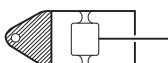
Ds-STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
40 - 48	70	90	35	53	6.5	M6 × 10	9	167
50 - 64	80	100	40	63	7.5	M6 × 10	10	196
63 - 78	105	130	55	82	9.5	M8 × 14	12	237
80 - 108	120	150	70	100	9.5	M8 × 14	13	291
100 - 144	150	180	85	120	11.5	M10 × 16	14	363
112 - 156	166	195	100	137	14	M10 × 16	15	400
125 - 178	180	210	115	150	14	M10 × 16	16	438
140 - 204	195	225	125	165	16	M12 × 20	19	495



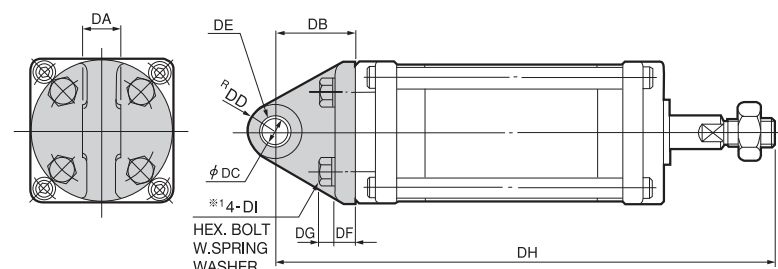
### Trunion Type Mount



Ds-STROKE	CA	CB	CC	CD	CE	CF	CG	CH
40 - 48	64	92	14	18	60	18	58	100
50 - 64	74	106	16	20	70	20	70.5	115.5
63 - 78	94	134	20	25	88	25	87.5	137.5
80 - 108	114	164	25	30	108	30	110	168
100 - 144	134	194	30	35	128	35	142	207
112 - 156	156	216	30	35	150	35	156.5	228.5
125 - 178	170	234	32	38	164	38	173	249
140 - 204	190	260	35	42	184	42	196	280



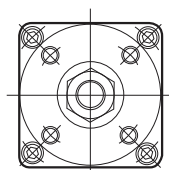
### Pivot Type Mount

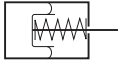


※1: 6-DI FOR  $D_c \geq 112$

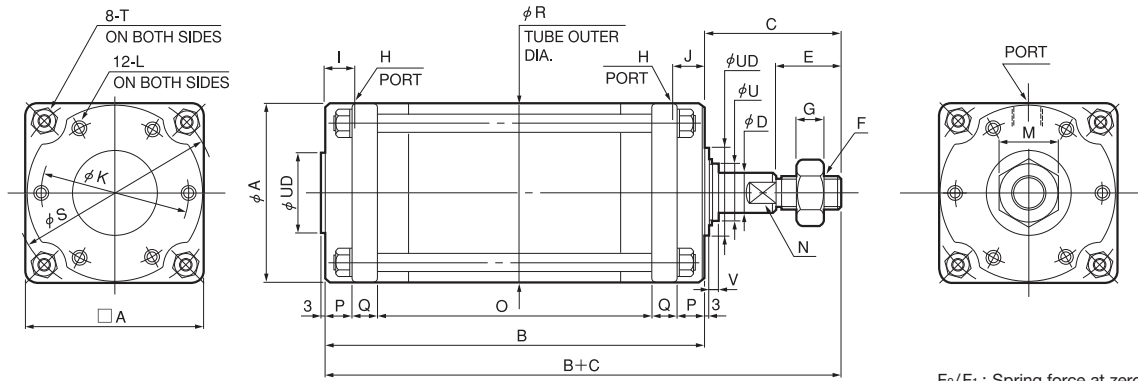
Ds-STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
40 - 48	15	30	10	14	1015	8	5.5	188	M 6×16
50 - 64	15	33	10	14	1015	9	5.5	219	M 6×18
63 - 78	20	38	12	15	1220	10	7.5	263	M 8×22
80 - 108	20	44	15	16.5	1520	12	7.5	322	M 8×25
100 - 144	25	50	18	18	1825	15	9.5	399	M10×25
112 - 156	28	54	18	20	1810 2pcs.	16	9.5	439	M10×30
125 - 178	30	59	20	23	2010 2pcs.	17	9.5	481	M10×30
140 - 204	34	64	22	25	2210 2pcs.	19	11	570	M12×35

DE : Bearing Size No.





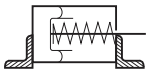
## Outline Dimensions



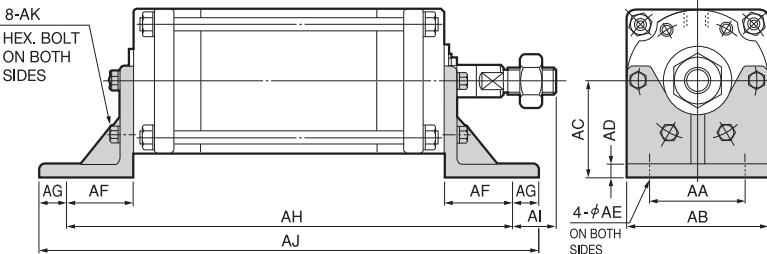
F<sub>0</sub>/F<sub>1</sub> : Spring force at zero/full stroke (N)  
 Ae : Effective area (mm<sup>2</sup>)  
 N : Wrench flat width

## OUTLINE DIMENSIONS

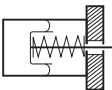
Dc—STROKE	A	B	C	D	UD	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	Ae	SPRING FORCE				
																									F <sub>0</sub>	F <sub>1</sub>			
160	82	184														86							52	12.4	18600	158.8	356.7		
	142	274					M30						M12			176						—	—						
	192	351	94	35	70	60	× 1.5	18	Rc 1/2	22	—	160	DP 18	46	30	253	23	26	185	215	M16	—	—						
	240	425														327						—	—						
180	96	227														115						60	11.9	23800	205.8	490			
	168	321					M33						M14			209					—	—							
	226	410	104	40	80	64	× 1.5	20	Rc 1/2	22	—	176	DP 21	50	36	298	26	30	205	238	M18	—	—						
	280	493														381						—	—						
200	112	244														118						60	11.9	29600	254.8	656.6			
	192	364					M36						M16			238					—	—							
	256	462	120	40	90	72	× 1.5	21	Rc 3/4	24	—	194	DP 24	55	36	336	28	35	225	262	M20	—	—						
	320	560														434						—	—						



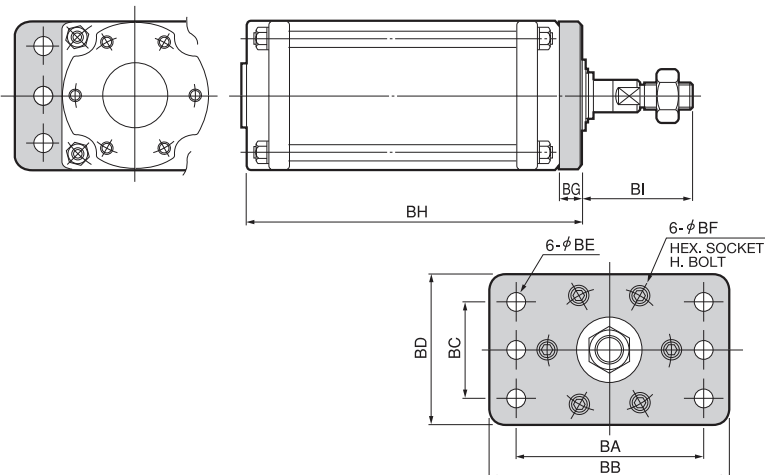
## L Type Mount



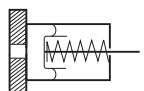
Dc—STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
160	82							282		334	M12 × 30
	142	115	185	105	13	18	49	372	19	424	
	192							449		501	
	240							523		575	
180	96							331		387	M14 × 35
	168	130	205	115	14	18	52	425	24	481	
	226							514		570	
	280							597		653	
200	112							348		404	M16 × 35
	192	140	225	125	14	18	52	468	40	524	
	256							566		622	
	320							664		720	



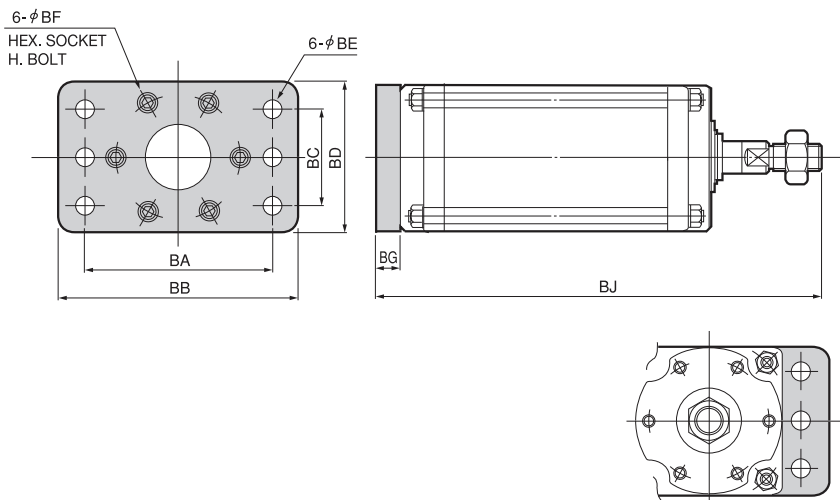
## Front Flange Type Mount



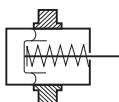
Dc—STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI
160	82							203	75
	142	220	260	140	185	16	M12	293	
	192						× 20	370	
	240							444	
180	96							249	82
	168	250	300	160	205	18	M14	343	
	226						× 25	432	
	280							515	
200	112							269	95
	192	275	320	180	225	18	M16	389	
	256						× 25	487	
	320							585	



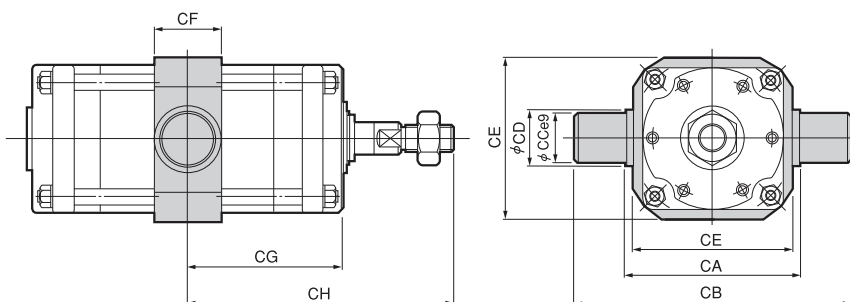
### Rear Flange Type Mount



Dc—STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
160	82	220	260	140	185	16	M12 × 20	19
	142							297
	192							387
	240							464
180	96	250	300	160	205	18	M14 × 25	22
	168							353
	226							447
	280							536
200	112	275	320	180	225	18	M16 × 30	25
	192							389
	256							509
	320							607



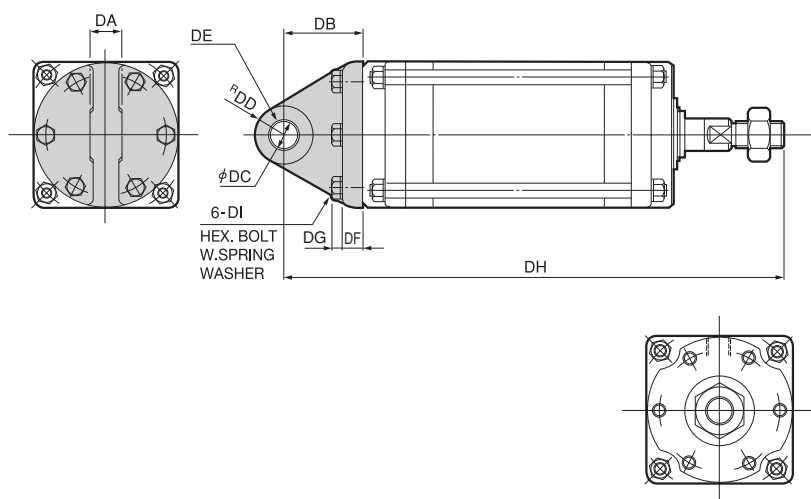
### Trunnion Type Mount



Dc—STROKE	CA	CB	CC	CD	CE	CF	CG	CH	
160	215	295	40	60	205	60	92	186	
							142	137	231
							192	175.5	269.5
							240	212.5	306.5
180	235	325	45	63	225	63	113.5	217.5	
							168	160.5	264.5
							226	205	309
							280	246.5	350.5
200	260	350	45	65	250	65	122	242	
							192	182	302
							256	231	351
							320	280	400

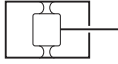


### Pivot Type Mount

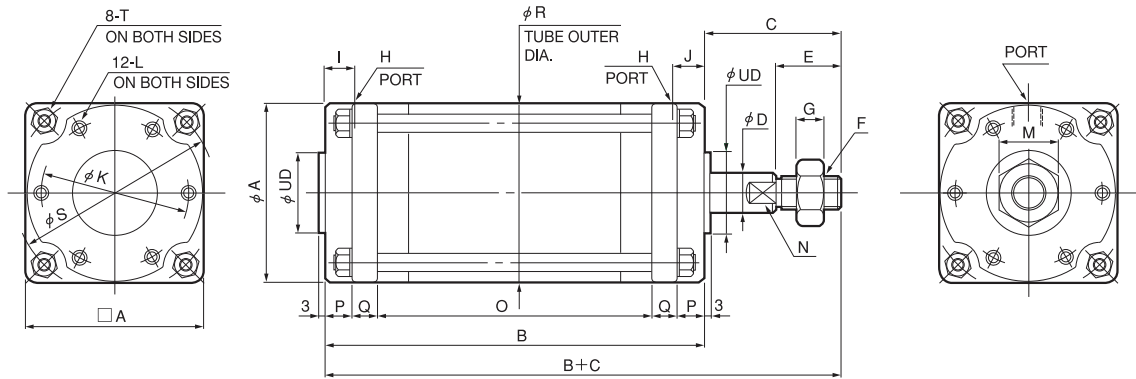


Dc—STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
160	38	70	25	28	2510 2ヶ	21	11	348	M12 × 40
								438	
								515	
								589	
180	42	77	28	32	2812 2ヶ	24	12.5	408	M14 × 45
								502	
								591	
								674	
200	45	85	30	34	3012 2ヶ	26	14	449	M16 × 50
								569	
								667	
								765	

DE : Bearing Size No.



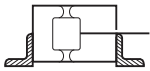
## Outline Dimensions



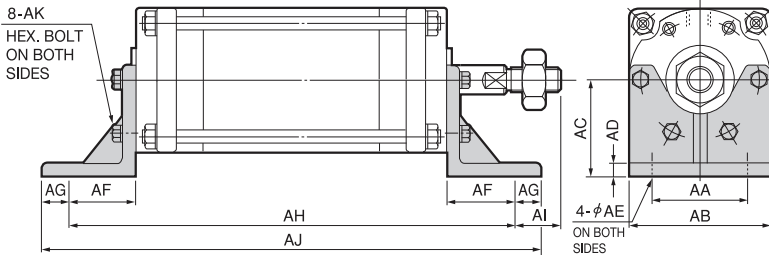
### OUTLINE DIMENSIONS

Ae : Effective area (mm<sup>2</sup>)  
N : Wrench flat width

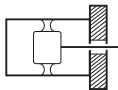
Dc—STROKE	A	B	C	D	UD	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	Ae		
																						PUSH	PULL	
160	82	230														132								
	142	320	94	35	70	60	M30 × 1.5	18	Rc 1/2	22	22	160	M 12 DP 18	46	30	222	23	26	185	215	M 16	18600	17600	
	192	399														301								
	240	475														377								
180	96	260														148								
	168	368	104	40	80	64	M33 × 1.5	20	Rc 1/2	22	22	176	M 14 DP 21	50	36	256	26	30	205	238	M 18	23800	22500	
	226	459														347								
	280	544														432								
200	112	292														166								
	192	412	120	40	90	72	M36 × 1.5	21	Rc 3/4	24	24	194	M 16 DP 24	55	36	286	28	35	225	262	M 20	29600	28000	
	256	512														386								
	320	612														486								



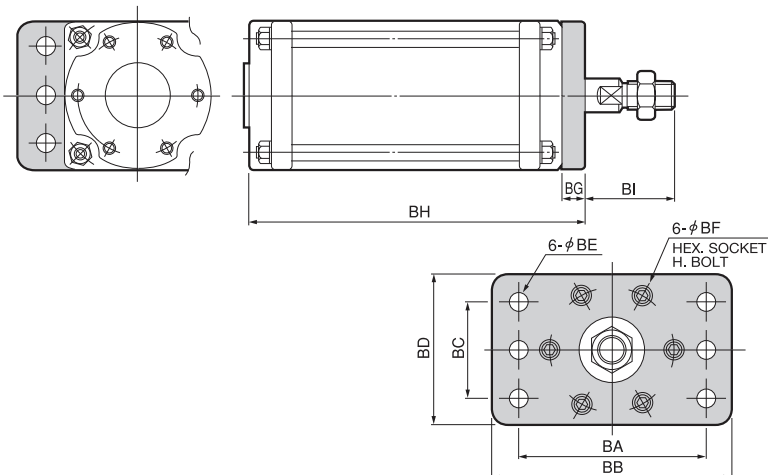
## L Type Mount



Dc—STROKE	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK
160	82							328		380	M12 × 30
	142	115	185	105	13	18	49	418	45	470	
	192							497		549	
	240							573		625	
180	96							364		420	M14 × 35
	168	130	205	115	14	18	52	472	52	528	
	226							563		619	
	280							648		704	
200	112							396		452	M16 × 35
	192	140	225	125	14	18	52	516	68	572	
	256							616		672	
	320							716		772	

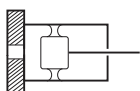


## Front Flange Type Mount

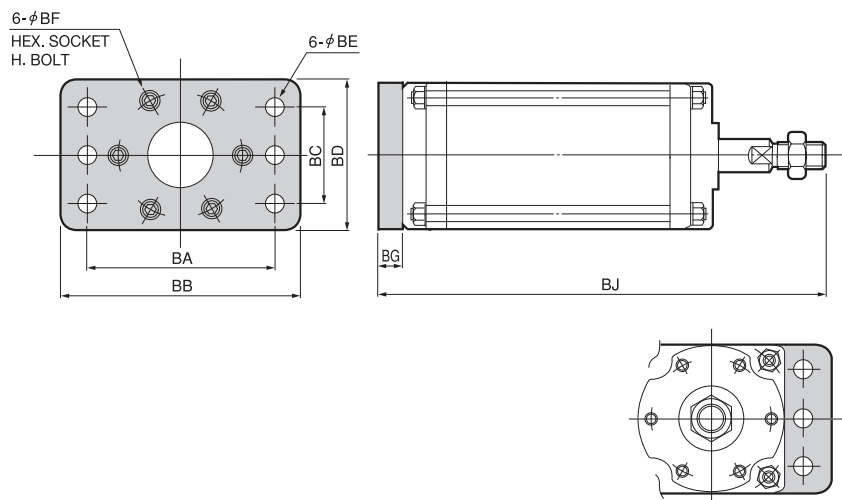


Dc—STROKE	BA	BB	BC	BD	BE	BF	BG	BH	BI
160	82							249	
	142	220	260	140	185	16	M12 × 20	339	75
	192							418	
	240							494	
180	96							282	
	168	250	300	160	205	18	M14 × 25	390	82
	226							481	
	280							566	
200	112							317	
	192	275	320	180	225	18	M16 × 25	437	95
	256							537	
	320							637	

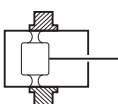




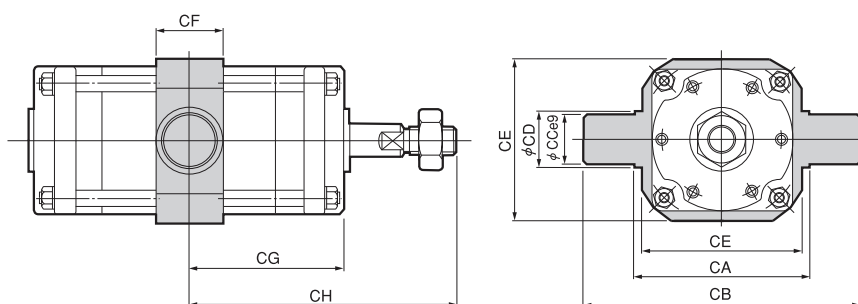
### Rear Flange Type Mount



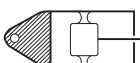
Dc—STROKE	BA	BB	BC	BD	BE	BF	BG	BJ
160	82	220	260	140	185	16	M12 × 20	343
	142							433
	192							512
	240							588
180	96	250	300	160	205	18	M14 × 25	386
	168							494
	226							585
	280							670
200	112	275	320	180	225	18	M16 × 30	437
	192							557
	256							657
	320							757



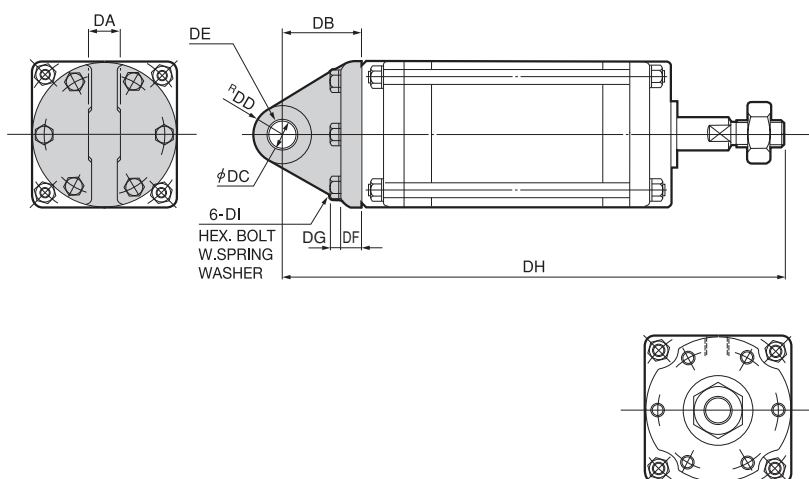
### Trunnion Type Mount



Dc—STROKE	CA	CB	CC	CD	CE	CF	CG	CH	
160	215	295	40	60	205	60	115	209	
							160	254	
							192	293.5	
							240	331.5	
180	235	325	45	63	225	63	130	234	
							168	184	288
							226	229.5	333.5
							280	272	376
200	260	350	45	65	250	65	146	266	
							192	206	326
							256	256	376
							320	306	426



### Pivot Type Mount



Dc—STROKE	DA	DB	DC	DD	DE	DF	DG	DH	DI
160	38	70	25	28	2510 2pcs.	21	11	394	M12 × 40
								484	
								563	
								639	
180	42	77	28	32	2812 2pcs.	24	12.5	441	M14 × 45
								549	
								640	
								725	
200	45	85	30	34	3012 2pcs.	26	14	497	M16 × 50
								617	
								717	
								817	

DE : Bearing Size No.



## BF cylinder "SCSA" series

### ■ Features

- Thinner rolling diaphragm with high sensitivity
- Lower slide resistance and better responsiveness



### ■ Specification

Operating style		Single action type		
Cylinder diameter	mm[in.]	40 mm [1.57in]	50 mm [1.97in]	63 mm [2.48in]
Stroke	mm[in.]	- 48 mm [1.89in]	- 64 mm [2.52in]	- 78 mm [3.07in]
Effective pressure receiving area	mm <sup>2</sup>	1100mm <sup>2</sup>	1770mm <sup>2</sup>	2730mm <sup>2</sup>
Spring reaction force	N	Max.19.6 Min.7.8	Max.29.4 Min.14.7	Max.47.0 Min.23.5
Working fluid		Clean compressed air		
Working pressure range	MPa[psi]	0.01 ~ 0.4 [1.5 ~ 58.01]		
Working temperature	°C[°F]	0 ~ 60 [32 ~ 140]		
Bearing		Linear ball bearing		
Mount type *option		Rear flange type, Front flange type, Pivot type, Trunnion type, L type		



# FUJIKURA COMPOSITES

## What's benefits of rolling diaphragm?

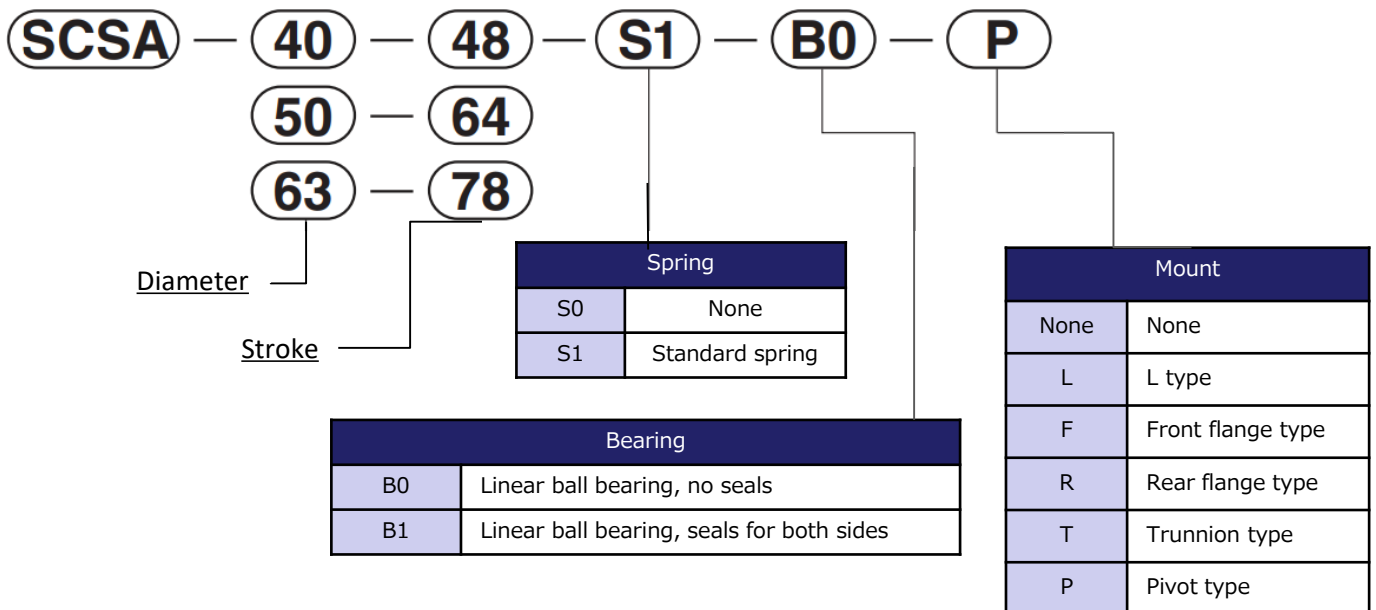
- Smooth stroke movement by rolling action of diaphragm
- Low start up pressure and high responsive to minute pressure variations by a thin diaphragm made of basic-cloth rubber within original rubber
- Stable and smooth movement at low speed.
- No lubricator required.
- Stable output pressure at any stroke position
- Available to change materials and to adapt to specific circumstances or forms.



## Application

- Tension control of gravure printing machines.
- Press control of polishing machines.
- Tension control of film-production facilities for liquid crystals.
- Testing machines, inspection equipment.
- Tension control of industrial film-production facilities

## Model designation



### Contact us



## BF cylinder "PC" series

Compliant with JIS mounting instructions. Available to attach sensor.

### ■ Features

PC cylinder is compliant with JIS, which gathered unrivaled characteristics of BF diaphragms.

-It is compliant with specifications of cylinder installing size 1PS of JIS B 8368.

-Extremely little air-leakage.

-Implanted sensor switch and sensor for ferromagnetic field to keep it from mechanical error under adverse conditions.



### ■ Specification

Operating style		Single action(push) / Double action
Cylinder diameter	mm[in.]	20 ~ 50 [0.79 ~ 1.97]
Stroke	mm[in.]	10 ~ 50 [0.39 ~ 1.97]
Working fluid		Clean compressed air
Working pressure range	Mpa[psi]	0.015 ~ 0.7 [2.18 ~ 101.53] *1
Working temperature	°C[°F]	0 ~ 60 [32 ~ 140]
Bearing		Metal guide
Mount type		No mount, Rear flange, Front flange, Pivot, Trunnion, L type

\*1 : Working pressure range of φ20 is 0.02~0.7MPa[2.90 ~ 101.53psi].

### ■ What's BF diaphragm?

- Perfect Leak-proof.
- Virtually no hysteresis-loss in smooth movement by rolling action.
- Low start up pressure and responsive to minute pressure variations by thin diaphragms made by basic cloth and rubber.
- Smooth movement at low speed.
- No lubricator required.
- Steady working pressure range at any strokes and steady output pressure.
- Available to change materials and to adapt to specific circumstances or forms.



Diaphragm is adopted for moving part.



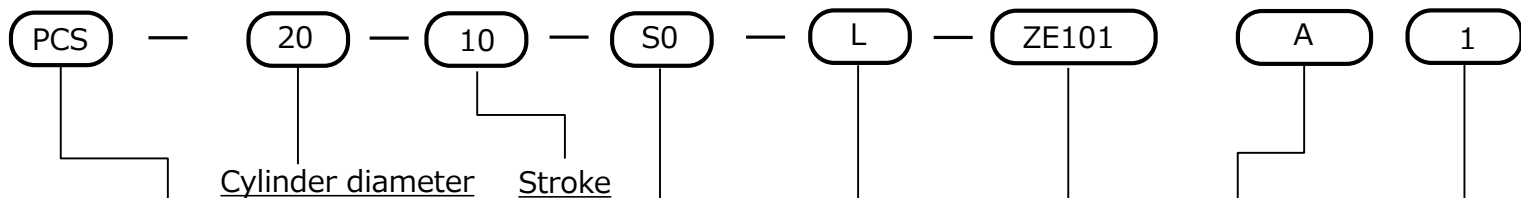
## Model designation

PCS series (Single action type)

Cylinder diameter mm[in.]	20 [0.79]	32 [1.26]	40 [1.57]
stroke mm[in.]	10 [0.39]	10 [0.39]	10 [0.39]

PCD series (Double action type)

Cylinder diameter mm[in.]	20 [0.79]		32 [1.26]			40 [1.57]				50 [1.97]			
Stroke mm[in.]	10 [0.39]	20 [0.79]	10 [0.39]	20 [0.79]	30 [1.18]	10 [0.39]	20 [0.79]	30 [1.18]	40 [1.57]	20 [0.79]	30 [1.18]	40 [1.57]	50 [1.97]



Cylinder diameter    Stroke

### Operating style

PCS	Single action type
PCD	Double action type

### Mount type

None	None
L	L type
RL	Quartering L type
F	Front flange type
R	Rear flange type

### Length of lead

A	1m[39.4in.]
B	3m[118.1in.]

### Sensor switch

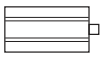
1	1
2	2

### Spring

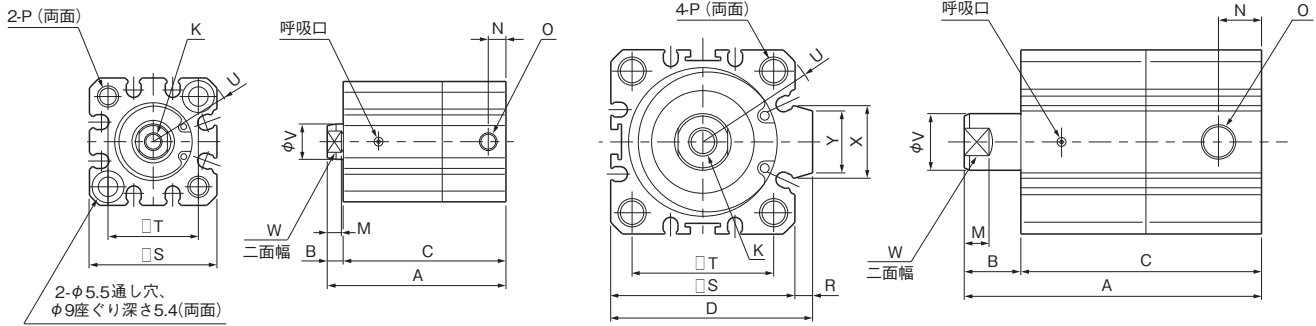
None	Double action type
S0	None
S1	Standard spring

### Sensor switch

None	No sensor
ZE135	2-wire, non-contact type with pilot lamp, lead wore from the side,DC10-28V
ZE155	3-wire, non-contact type with pilot lamp, lead wore from the side,DC4.5-28V
ZE235	2-wire, non-contact type with pilot lamp, lead wore from the top,DC10-28V
ZE255	3-wire, non-contact type with pilot lamp, lead wore from the top,DC4.5-28V
ZE101	2-wire, contact type, no pilot lamp, lead wore from the side,DC5-28V, AC85-115V
ZE201	2-wire, contact type, no pilot lamp, lead wore from the top, DC5-28V, AC85-115V
ZE102	2-wire, contact type, with pilot lamp, lead wore from the side, DC10-28V, AC85-115V
ZE202	2-wire, contact type, with pilot lamp, lead wore from the top, DC10-28V, AC85-115V



## 基本形寸法図 及び内部構造

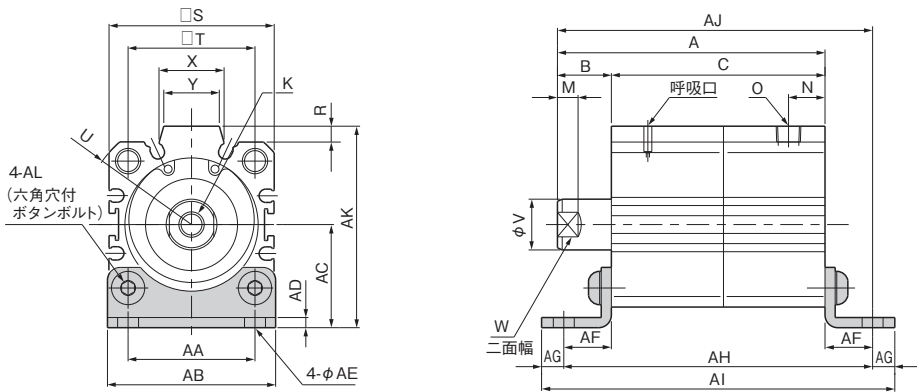


### ■ PCS形 基本寸法表

形式	A	B	C	D	K	M	N	O	P	R	S	T	U	V	W	X	Y	有効受圧面積 (mm <sup>2</sup> )	ばね反力 (N)		BFダイヤフラム
																			マイクロタイプ	全タイプ	
20-10-S1	50.5	4.5	46	—	M5×0.8 深さ7	4	5	M5×0.8	M6 深さ12	—	36	25.5	R23.5	10	8	—	—	269	2.94	4.90	PC-DM1-20-20
32-10-S1	74	15	59	49.5	M8×1.25 深さ13	6.5	7.5	Rc1/8	M6 深さ12	4.5	45	34	R30	16	14	17.5	15	684	4.90	7.85	PC-DM1-32-32
40-10-S1	88	17	71	57	M8×1.25 深さ13	6.5	11.5	Rc1/8	M6 深さ12	5	52	40	R34.5	16	14	20.5	17.5	1100	7.85	11.8	PC-DM1-40-40



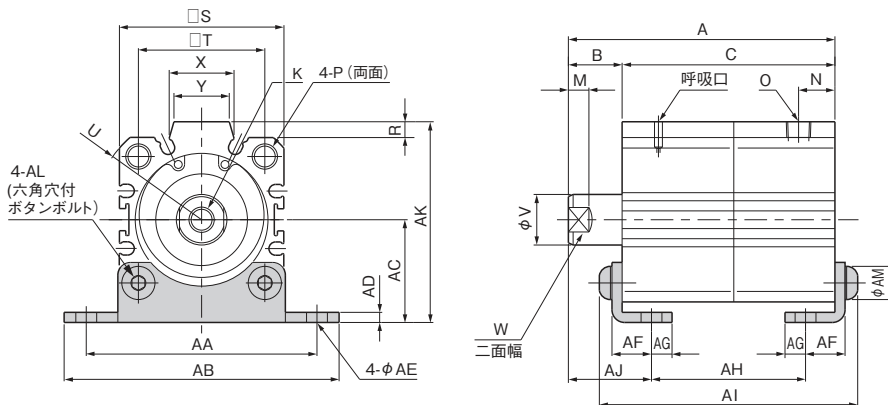
## エル形寸法図



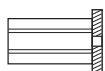
形式	A	B	C	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	K	M	N	O	P	R	S	T	U	V	W	X	Y
32-10-S1-L	74	15	59	34	45	28.5	3.2	6.6	15	7	89	103	89	55.5	M6×12	M8×1.25 深さ13	6.5	7.5	Rc1/8	M6 深さ12	4.5	45	34	R30	16	14	17.5	15
40-10-S1-L	88	17	71	40	53	32.5	3.2	6.6	15	7	101	115	103	63.5	M6×12	M8×1.25 深さ13	6.5	11.5	Rc1/8	M6 深さ12	5	52	40	R34.5	16	14	20.5	17.5



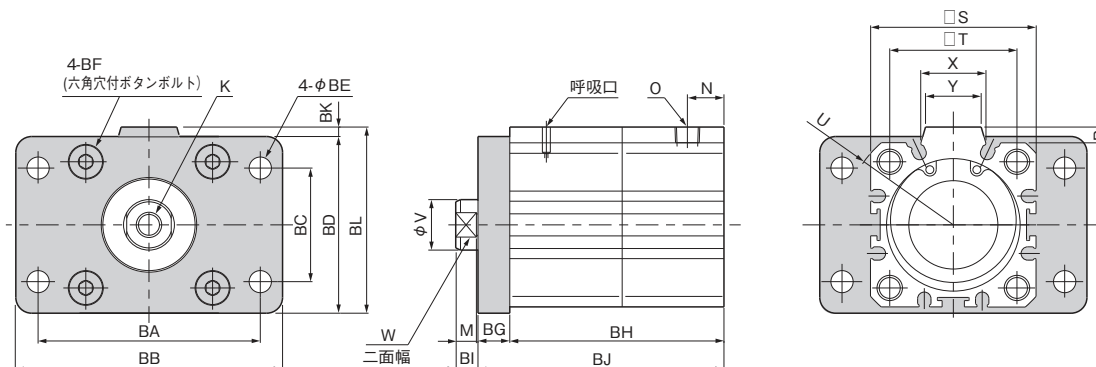
## 軸直角エル形寸法図



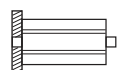
形式	A	B	C	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	K	M	N	O	P	R	S	T	U	V	W	X	Y
32-10-S1-RL	74	15	59	65	78	28.5	3.2	6.6	12.5	6.5	40.4	73.4	24.3	55.5	M6×12	10.5	M8×1.25 深さ13	6.5	7.5	Rc1/8	M6 深さ12	4.5	45	34	R30	16	14	17.5	15
40-10-S1-RL	88	17	71	73	87	32.5	3.2	6.6	12.5	6.5	52.4	85.4	26.3	63.5	M6×12	10.5	M8×1.25 深さ13	6.5	11.5	Rc1/8	M6 深さ12	5	52	40	R34.5	16	14	20.5	17.5



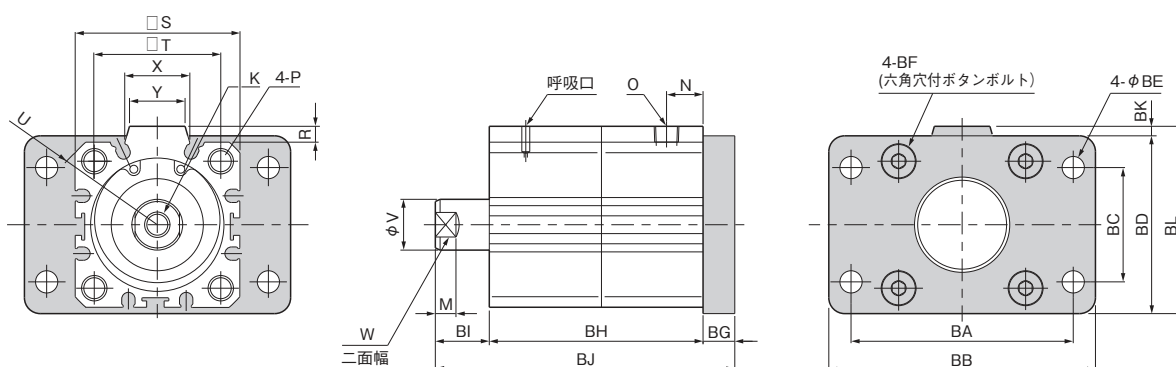
フロントフランジ形寸法図



形 式	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	K	M	N	O	P	R	S	T	U	V	W	X	Y
32-10-S1-F	58	72	33	48	7	M6×12	8	59	7	67	3	51	M8×1.25深さ13	6.5	7.5	Rc1/8	M6深さ12	4.5	45	34	R30	16	14	17.5	15
40-10-S1-F	70	84	36	56	7	M6×15	10	71	7	81	3	59	M8×1.25深さ13	6.5	11.5	Rc1/8	M6深さ12	5	52	40	R34.5	16	14	20.5	17.5

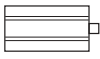


リアフランジ形寸法図



形 式	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	K	M	N	O	P	R	S	T	U	V	W	X	Y
32-10-S1-R	58	72	33	48	7	M6×12	8	59	15	82	3	51	M8×1.25深さ13	6.5	7.5	Rc1/8	M6深さ12	4.5	45	34	R30	16	14	17.5	15
40-10-S1-R	70	84	36	56	7	M6×15	10	71	17	98	3	59	M8×1.25深さ13	6.5	11.5	Rc1/8	M6深さ12	5	52	40	R34.5	16	14	20.5	17.5

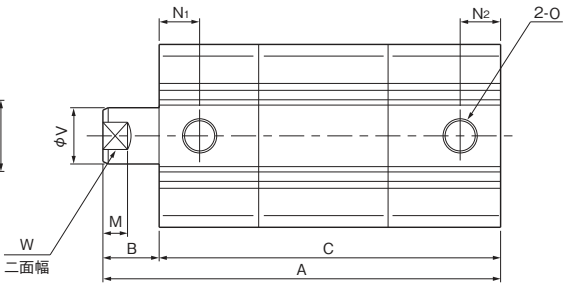
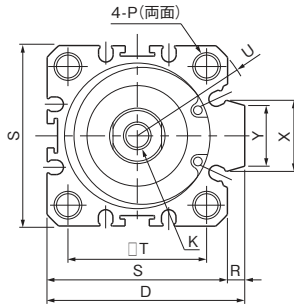
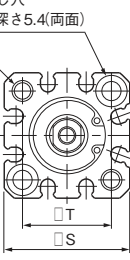
# PCD-20-10 ~ 50-50



## 基本形寸法図 及び内部構造

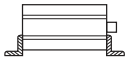
2-φ5.5通し穴  
φ9座ぐり深さ5.4(両面)

2-P(両面)

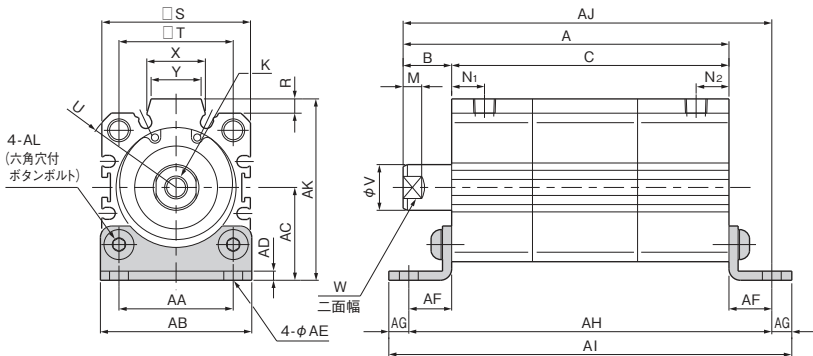


■ PCD形 基本寸法表

形式	A	B	C	D	K	M	N <sub>1</sub>	N <sub>2</sub>	O	P	R	S	T	U	V	W	X	Y	有効受圧面積(mm <sup>2</sup> )		BFダイヤフラム	
																			押側	引側		
20-10	58	4.5	53.5	—	M5×0.8 深さ7	4	10	5	M5×0.8	M6深さ12	—	36	25.5	R23.5	10	8	—	—	269	190	PC-DM1-20-20	
	20		68																			63.5
32-10	96	15	81	49.5	M8×1.25 深さ13	6.5	11	7.5	Rc1/8	M6深さ12	4.5	45	34	R30	16	14	17.4	15	684	483	PC-DM1-32-32	
	20		96																			81
	30		106																			91
40-10	114	17	97	57	M8×1.25 深さ13	6.5	11.5	11.5	Rc1/8	M6深さ12	5	52	40	R34.5	16	14	20.5	17.5	1100	903	PC-DM1-40-40	
	20		114																			97
	30		124																			107
	40		134																			117
50-20	136	18	118	71	M10×1.5 深さ15	7	12	12	Rc1/4	M8深さ16	7	64	50	R42.5	20	17	21.6	19	1770	1450	PC-DM1-50-50	
	30		136																			118
	40		146																			128
	50		156																			138

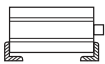


## エル形寸法図

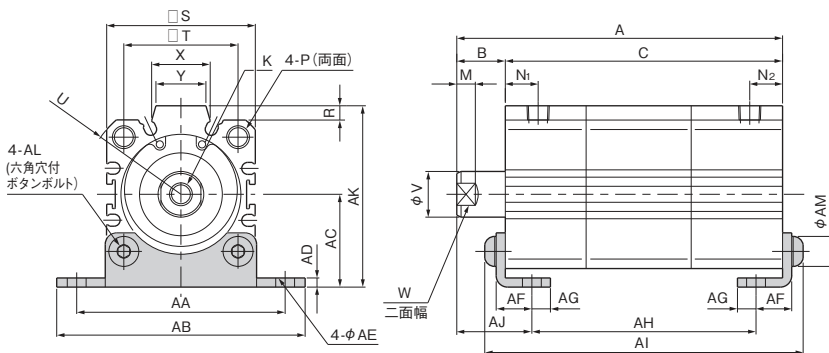


形式	A	B	C	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
32-10-L	96	81	15	81	34	45	28.5	3.2	6.6	15	7	111	125	111	M6 × 12
	20-L	96		81	34	45	28.5	3.2	6.6	15	7	111	125	111	
	30-L	106		91	34	45	28.5	3.2	6.6	15	7	121	135	121	
40-10-L	114	97	17	97	40	53	32.5	3.2	6.6	15	7	127	141	129	M6 × 12
	20-L	114		97	40	53	32.5	3.2	6.6	15	7	127	141	129	
	30-L	124		107	40	53	32.5	3.2	6.6	15	7	137	151	139	
	40-L	134		117	40	53	32.5	3.2	6.6	15	7	147	161	149	
50-20-L	136	118	18	118	50	64	38	3.2	9	18	9	154	172	154	M8 × 15
	30-L	136		118	50	64	38	3.2	9	18	9	154	172	154	
	40-L	146		128	50	64	38	3.2	9	18	9	164	182	164	
	50-L	156		138	50	64	38	3.2	9	18	9	174	192	174	

形式	K	M	N <sub>1</sub>	N <sub>2</sub>	O	P	R	S	T	U	V	W	X	Y
32-10-L	M8×1.25 深さ13	6.5	11	7.5	Rc 1/8	M6 深さ12	4.5	45	34	R 30	16	14	17.4	15
	M8×1.25 深さ13	6.5	11.5	11.5	Rc 1/8	M6 深さ12	5	52	40	R 34.5	16	14	20.5	17.5
	M10×1.5 深さ15	7	12	12	Rc 1/4	M8 深さ16	7	64	50	R 42.5	20	17	21.6	19



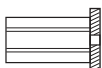
## 軸直角エル形寸法図



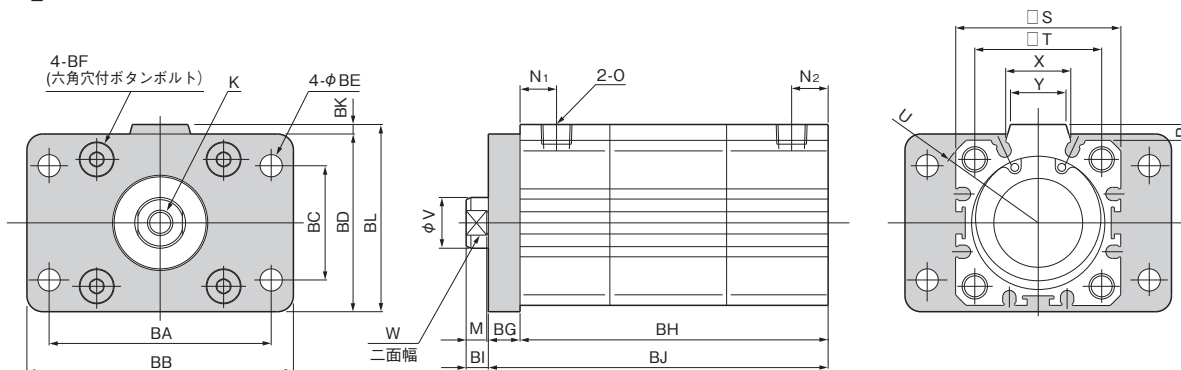
形式	A	B	C	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM
32-10-RL	96	81	15	81	65	78	28.5	3.2	6.6	12.5	6.5	62.4	95.4	24.3	55.5	M6 × 12
	20-RL	96		81	65	78	28.5	3.2	6.6	12.5	6.5	62.4	95.4	24.3	55.5	
	30-RL	106		91	65	78	28.5	3.2	6.6	12.5	6.5	72.4	105.4	28.3	63.5	
40-10-RL	114	97	17	97	73	87	32.5	3.2	6.6	12.5	6.5	78.4	111.4	26.3	63.5	M6 × 12
	20-RL	114		97	73	87	32.5	3.2	6.6	12.5	6.5	78.4	111.4	26.3	63.5	
	30-RL	124		107	73	87	32.5	3.2	6.6	12.5	6.5	88.4	121.4	28.8	77	
	40-RL	134		117	73	87	32.5	3.2	6.6	12.5	6.5	98.4	131.4	28.8	77	
50-20-RL	136	118	18	118	87	103	38	3.2	9	14	8	96.4	134.4	28.8	77	M8 × 15
	30-RL	136		118	87	103	38	3.2	9	14	8	96.4	134.4	28.8	77	
	40-RL	146		128	87	103	38	3.2	9	14	8	106.4	144.4	28.8	77	
	50-RL	156		138	87	103	38	3.2	9	14	8	116.4	154.4	28.8	77	

形式	K	M	N <sub>1</sub>	N <sub>2</sub>	O	P	R	S	T	U	V	W	X	Y
32-10-RL	M8×1.25 深さ13	6.5	11	7.5	Rc 1/8	M6 深さ12	4.5	45	34	R 30	16	14	17.4	15
	M8×1.25 深さ13	6.5	11.5	11.5	Rc 1/8	M6 深さ12	5	52	40	R 34.5	16	14	20.5	17.5
	M10×1.5 深さ15	7	12	12	Rc 1/4	M8 深さ16	7	64	50	R 42.5	20	17	21.6	19

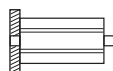




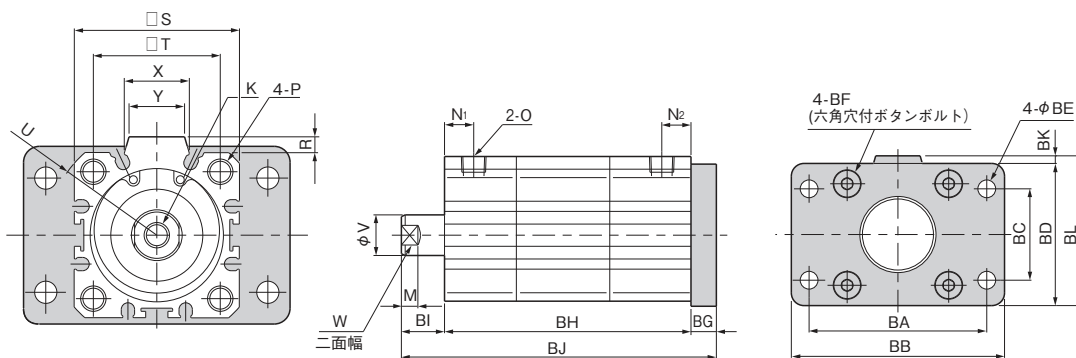
フロントフランジ形寸法図



形式	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	K	M	N <sub>1</sub>	N <sub>2</sub>	O	P	R	S	T	U	V	W	X	Y
32-10-F						M6	8	81		89																
20-F	58	72	33	48	7	M6	8	81	7	89	3	51	M8×1.25 深さ13	6.5	11	7.5	Rc1/8	M6 深さ12	4.5	45	34	R30	16	14	17.4	15
30-F						M6	8	91		99																
40-10-F						M6	10	97		107																
20-F	70	84	36	56	7	M6	10	97	7	107	3	59	M8×1.25 深さ13	6.5	11.5	11.5	Rc1/8	M6 深さ12	5	52	40	R34.5	16	14	20.5	17.5
30-F						M6	10	107		117																
40-F						M6	10	117		127																
50-20-F						M8	10	118		128																
30-F	86	104	47	70	9	M8	10	118	8	128	4	74	M10×1.5 深さ15	7	12	12	Rc1/4	M8 深さ16	7	64	50	R42.5	20	17	21.6	19
40-F						M8	10	128		138																
50-F						M8	10	138		148																



リアフランジ形寸法図



形式	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	K	M	N <sub>1</sub>	N <sub>2</sub>	O	P	R	S	T	U	V	W	X	Y
32-10-R						M6	8	81		104																
20-R	58	72	33	48	7	M6	8	81	15	104	3	51	M8×1.25 深さ13	6.5	11	7.5	Rc1/8	M6 深さ12	4.5	45	34	R30	16	14	17.4	15
30-R						M6	8	91		114																
40-10-R						M6	10	97		124																
20-R	70	84	36	56	7	M6	10	97	17	124	3	59	M8×1.25 深さ13	6.5	11.5	11.5	Rc1/8	M6 深さ12	5	52	40	R34.5	16	14	20.5	17.5
30-R						M6	10	107		134																
40-R						M6	10	117		144																
50-20-R						M8	10	118		146																
30-R	86	104	47	70	9	M8	10	118	18	146	4	74	M10×1.5 深さ15	7	12	12	Rc1/4	M8 深さ16	7	64	50	R42.5	20	17	21.6	19
40-R						M8	10	128		156																
50-R						M8	10	138		166																



**FUJIKURA COMPOSITES**

# BF cylinder "LC" series

Minimal low friction double action type cylinder.

## ■ Features

- It is compact in shape and can be used in side by space saving.
- Because there is no rod seal, the resistance is the smallest among the double action type.
- Smooth operation is possible even after a long stop.
- Since there is no air leakage, almost no dust is generated.



## ■ Specification

Operating style	Double action type		
Cylinder diameter    mm[in.]	10 [0.39]	20 [0.79]	31.5 [1.24]
Stroke                    mm[in.]	5 [0.20]	20 [0.79]	35 [1.38]
Working fluid	Clean compressed air		
Working pressure range Mpa[psi]	0.01~ 0.5 [1.45 ~ 72.52]		
Working temperature    °C [F ]	0~ 60 [32 ~ 140]		
Bearing	Linear ball bearing *1		
Mount type	None		

\* 1: BF diaphragm can be manufactured with fluorine rubber as clean room specification.

## ■ What's BF diaphragm?

- Perfect Leak-proof.
- Virtually no hysteresis-loss in smooth movement by rolling action.
- Low start up pressure and responsive to minute pressure variations by thin diaphragms made by basic cloth and rubber.
- Smooth movement at low speed.
- No lubricator required.
- Steady working pressure range at any strokes and steady output pressure.
- Available to change materials and to adapt to specific circumstances or forms.

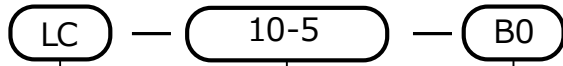




## ■ Application

- Precision press control (high decomposition load) : Lamination of ultrathin plates
- Tension control for film, paper, fiber
- High precision load control for lens polishing machine, crimping machine.

## ■ Model designation



Model name

Cylinder diameter- Stroke mm[in.]
10-5 [0.39-0.20]
20-20 [0.79-0.79]
31.5-35 [1.24-1.38]

Linear ball bearing	
B0	No seals
B1	Seals for both sides