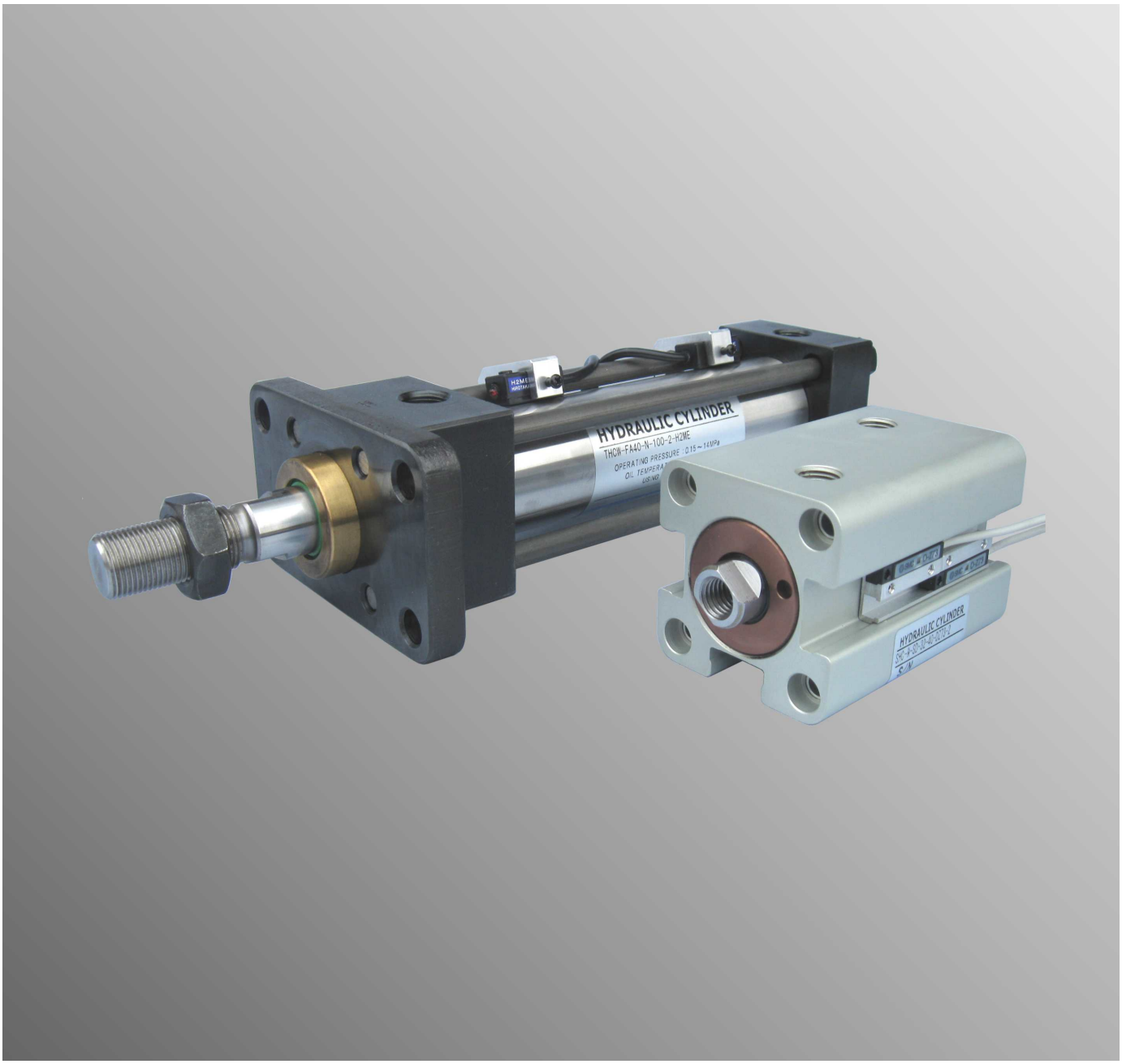
Useable both pneumatic and hydraulic

HYDRAULIC CYLINDER

High thrust can be obtained by pneumatic circuit in combination with Pneumatic Booster or Rush Booster.



HIROTAKA MFG. CO.,LTD.

Hydraulic cylinder

For air-hydro booster
Tie-rod type hydraulic cylinder

A hydraulic cylinder that can be used for both hydraulic and pneumatic pressure.

- It can operate from hydraulic pressure equivalent to pneumatic pressure since it is a hydraulic cylinder designed to be used for both hydraulic and pneumatic pressure.
- By using it in combination with our products “Pneumatic Booster” and “Rush Booster”, it is possible to obtain thrust equivalent to hydraulic pressure by pneumatic circuit.

Specifucation

Nominal pressure	14 MPa・21 MPa
Maximum allowable pressure (Note)	Nominal pressure 14 MPa : Head side 17.7 MPa, Rod side 17.7 MPa (B Rod) 13.7 MPa (C Rod) 21 MPa : Head side 26.5 MPa, Rod side 24.5 MPa
Piston speed	10～300 mm/sec (Excluding cushion stroke)
Fluid temperature	−10～60℃
Fluid	Hydraulic fluid or Pneumatic
Minimum operating pressure	0.15 MPa or less (Bore size φ32 only 0.2 MPa or less.)
With auto switch type (mm)	φ32～φ125 (Nominal pressure 21 MPa : φ40～φ80)

Note) Maximum allowable pressure means the maximum pressure generated in the cylinder that the cylinder can withstand (surge pressure etc.).

Thrust table

Pushing side

Unit : kN

Bore size	Piston area	Operating pressure (MPa)							
(mm)	(mm²)	0.35	0.5	0.7	3.5	7	10	14	21
φ32	804	0.28	0.40	0.56	2.82	5.62	8.04	11.26	—
φ40	1257	0.44	0.62	0.88	4.40	8.80	12.57	17.60	26.40
φ50	1963	0.68	0.98	1.37	6.87	13.74	19.63	27.48	41.22
φ63	3117	1.09	1.55	2.18	10.91	21.82	31.17	43.64	65.46
φ80	5027	1.76	2.51	3.52	17.59	35.19	50.27	70.38	105.57
φ100	7854	2.75	3.92	5.49	27.49	54.98	78.54	109.96	164.93
φ125	12272	4.29	6.13	8.59	42.95	85.90	122.72	171.81	257.71
φ160	20106	7.03	10.05	14.07	70.37	140.74	201.06	281.48	422.23
φ180	25447	8.90	12.72	17.81	89.06	178.13	254.47	356.26	534.39
φ200	31416	10.10	15.70	22.00	109.96	219.91	314.16	439.82	659.74
φ250	49087	17.18	24.54	34.36	171.80	343.61	490.87	687.22	1030.83

Pulling side

Unit : kN

Bore size	B Rod							C Rod					
(mm)	Piston area	Operating pressure (MPa)						Piston area	Operating pressure (MPa)				
	(mm²)	0.35	0.5	0.7	10	14	21	(mm²)	0.35	0.5	0.7	10	14
φ32	550	0.19	0.27	0.38	5.50	7.70	—	650	0.22	0.32	0.45	6.50	9.10
φ40	863	0.30	0.43	0.60	8.63	12.08	18.12	1002	0.35	0.50	0.70	10.02	14.03
φ50	1348	0.47	0.67	0.94	13.48	18.87	28.14	1569	0.55	0.78	1.10	15.69	21.97
φ63	2127	0.74	1.06	1.19	21.27	29.78	44.67	2501	0.87	1.25	1.75	25.01	35.01
φ80	3436	1.20	1.72	2.40	34.36	48.10	72.16	4037	1.41	2.02	2.82	40.37	56.52
φ100	5391	1.88	2.69	3.77	53.91	75.47	113.21	6264	2.19	3.13	4.38	62.64	87.70
φ125	8313	2.91	4.15	5.82	83.13	116.38	174.57	9809	3.43	4.90	6.86	98.09	137.33
φ160	13744	4.81	6.87	9.62	137.44	192.42	288.62	16147	5.65	8.07	11.30	161.47	226.06
φ180	17593	6.15	8.79	12.31	175.93	246.30	369.45	20420	7.14	10.21	14.30	204.20	285.88
φ200	21564	7.54	10.78	15.09	215.64	301.90	452.84	25054	8.77	12.52	17.53	250.54	350.90
φ250	33694	11.79	16.84	23.58	336.94	471.72	707.57	39235	13.73	19.61	27.46	392.35	549.29

Note) In the case of usage that raises the load with air pressure, consider reducing the load weight or securing air pressure so that it is 50% or less of the theoretical output value on the pulling side in order to obtain stable operation and speed.

How to order

THC W - FA 50 - N - 200 - 3 - B - L - 21 - WR - H2ME

Series symbol

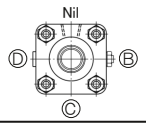
Symbol	With auto switch
Nil	Without magnet
W	Magnet sensing

Magnet sensing bore size
Nominal pressure 14 MPa: ϕ 32 to 125
Nominal pressure 21 MPa: ϕ 40 to 80

Symbol	Mounting type
SD	Basic
FA	Rod flange
FB	Head flange
CA	Single clevis
CB	Double clevis
LB	Axial foot

Symbol	Bore size
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm
125	125 mm
160	160 mm
180	180 mm
200	200 mm
250	250 mm

Nominal pressure 21 MPa
Bore size: ϕ 40 to 250
LB mounting type: ϕ 40 to 160

Symbol	Cylinder port location
Nil	
B	
C	
D	

View from the rod side

Symbol	Number of auto switches
1	1 pc.
2	2 pcs.
N	"N" pcs.

Stroke (mm)
Refer to the stroke limitation table

Symbol	Cushion valve
N	Without cushion valve
H	With head cover side
R	With rod cover side
B	With both sides

Standard is "Without cushion valve"

Symbol	Auto switch
Nil	Read auto switch
H2ME	Solid state auto switch

Symbol	Single/Double Rod
Nil	Single rod type
WR	Double rod type

Bore size of the double rod type
Nominal pressure 21 MPa: ϕ 40 to 160

Symbol	Nominal pressure
Nil	14 MPa
21	21 MPa

Symbol	Type of Rod
Nil	B Rod
L	C Rod

Nominal pressure 21 MPa is B Rod only

Stroke limitation of standard products

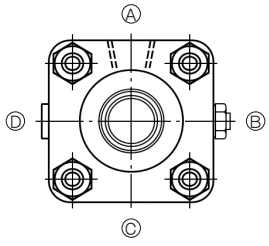
Nominal pressure	Bore size (mm)	32	40・50	63・80	100 to 160	180 to 250
14 MPa	Maximum stroke (mm)	1200	1500	1600	2000	2000
21 MPa		—	1500	1600	2000	1500

Positions of Port, Cushion valve and Air release valve

Viewing each dimension from the rod end of the cylinder, the port position symbol "Nil" is the position shown in the figure below Ⓐ.
At that time, the cushion valve position is Ⓑ, and the air release valve position is Ⓓ. (Position: ⒶⒷⒹ)
Other positions are ⒷⒸⒹ, ⒸⒷⒹ, and ⒹⒶⒷ on the port position.

Standard position (With cushion valve)

Ⓐ • • • Port
Ⓑ • • • Cushion valve
Ⓓ • • • Air release valve



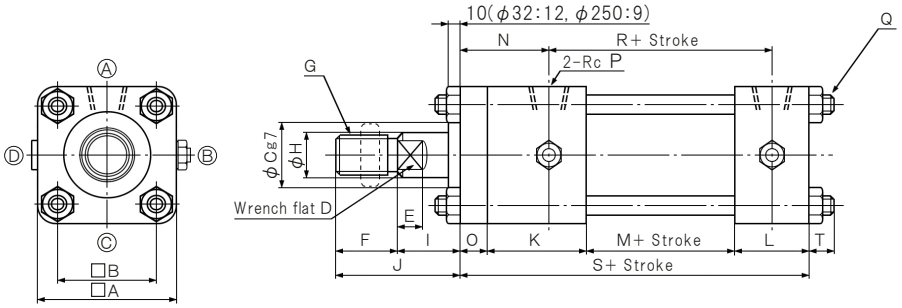
Lock nut

One lock nut is included with all models. Double rod type also is included with one lock nut.

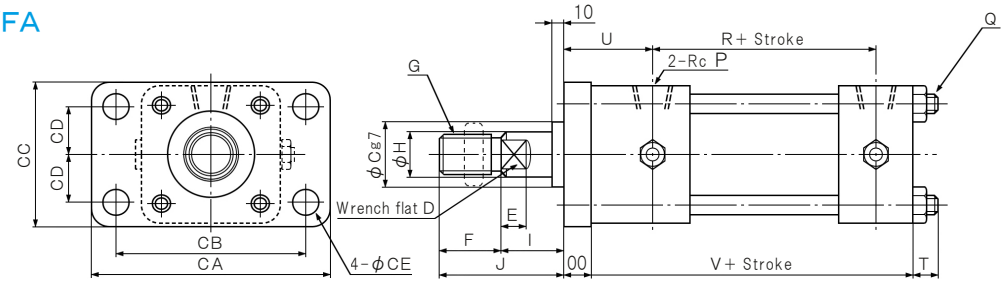
Nominal pressure 14 MPa

Dimension

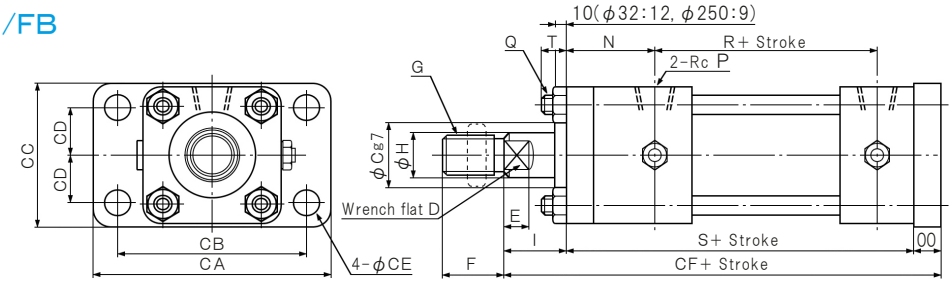
Single rod type
Basic / SD



Single rod type
Rod flange /FA



Single rod type
Head flange /FB



Unit : mm

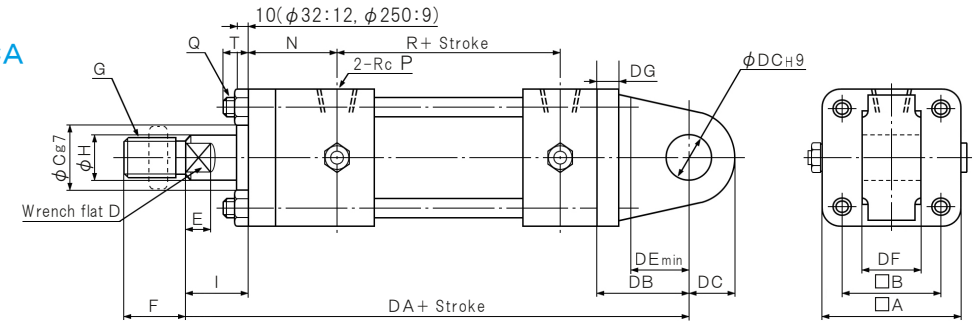
Symbol / Bore size	A	B	I	K	L	M	N	O	P	Q	R	S	T	U	V	00	CA	CB	CC	CD	CE	CF
φ32	55	40	30	40	30	60	36	11	3/8	M8×1.25	90	141	10	38	130	13	109	88	63	20	11	184
φ40	65	45	30	38	28	64	36	11	3/8	M10×1.25	90	141	12	38	130	13	118	95	69	23	11	184
φ50	75	52	30	44	32	66	42	18	1/2	M10×1.25	96	155	12	47	142	18	145	115	85	29	14	203
φ63	90	65	35	44	32	72	44	20	1/2	M12×1.5	102	163	15	49	148	20	165	132	98	32.5	18	218
φ80	110	80	35	56	38	72	56	24	3/4	M16×1.5	108	184	18	62	166	24	190	155	118	43.5	18	243
φ100	135	98	40	56	38	78	58	28	3/4	M18×1.5	114	192	20	66	172	28	224	190	145	54.5	22	260
φ125	165	122	45	65	48	83	66	33	1	M22×1.5	129	220	23	75	196	33	272	224	175	65	26	298
φ160	210	160	55	65	48	109	73	41	1	M27×1.5	155	253	27	83	222	41	335	285	218	85	33	349
φ180	235	182	55	69	58	115	74	46	1 1/4	M30×1.5	171	275	29	87	242	46	375	315	243	92.5	33	376
φ200	262	200	55	83	70	111	85	51	1 1/2	M33×1.5	181	301	31	99	264	51	425	355	272	103	36	407
φ250	325	250	65	102	84	113	107	65	2	M42×1.5	197	346	39	125	299	65	515	425	335	125	45	476

Symbol / Bore size	B Rod							C Rod						
	C	D	E	F	G	H	J	C	D	E	F	G	H	J
φ32	35	14	10	25	M16×1.5	18	55	35	12	8	18	M12×1.5	14	48
φ40	40	19	10	30	M20×1.5	22. 4	60	36	14	10	25	M16×1.5	18	55
φ50	46	24	10	35	M24×1.5	28	65	40	19	10	30	M20×1.5	22. 4	60
φ63	55	30	15	45	M30×1.5	35. 5	80	46	24	10	35	M24×1.5	28	70
φ80	65	41	15	60	M39×1.5	45	95	55	30	15	45	M30×1.5	35. 5	80
φ100	80	50	20	75	M48×1.5	56	115	65	41	15	60	M39×1.5	45	100
φ125	95	65	25	95	M64×2.0	71	140	80	50	20	75	M48×1.5	56	120
φ160	115	85	30	120	M80×2.0	90	175	95	65	25	95	M64×2.0	71	150
φ180	125	95	30	140	M95×2.0	100	195	105	75	25	110	M72×2.0	80	165
φ200	140	105	30	150	M100×2.0	112	205	115	85	30	120	M80×2.0	90	175
φ250	170	133	45	195	M130×2.0	140	260	140	105	30	150	M100×2.0	112	215

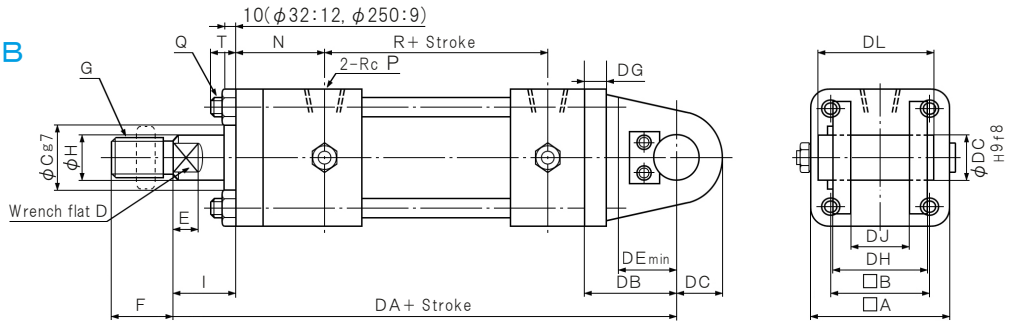
Nominal pressure 14 MPa

Dimension

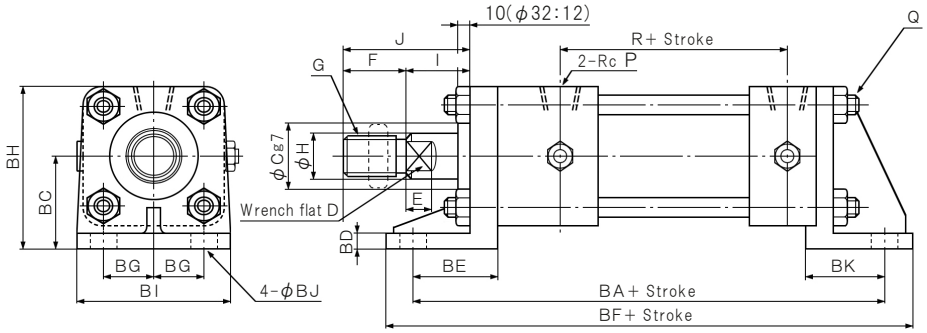
Single rod type
Single clevis / CA



Single rod type
Double clevis / CB



Single rod type
Axial foot /LB



Unit : mm

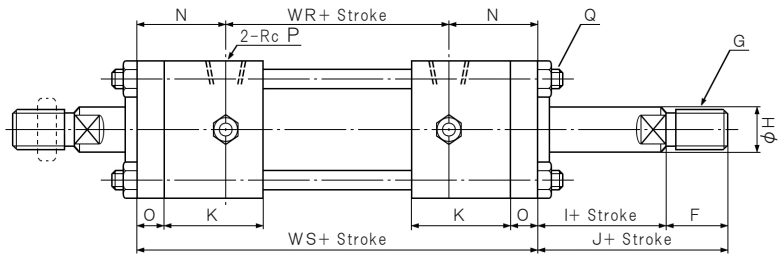
Symbol / Bore size	A	B	I	N	P	Q	R	T	DA	DB	DC	DE	DF	DG	DH	DJ	DL	BA	BC	BD
φ32	55	40	30	36	3/8	M8×1.25	90	10	209	38	16	22	25 $^{-0.1}_{-0.4}$	11	50	25 $^{+0.4}_{+0.1}$	62	205	40 ±0.15	7
φ40	65	45	30	36	3/8	M10×1.25	90	12	209	38	16	20	25 $^{-0.1}_{-0.4}$	11	50	25 $^{+0.4}_{+0.1}$	62	205	43 ±0.15	7
φ50	75	52	30	42	1/2	M10×1.25	96	12	230	45	20	25	31.5 $^{-0.1}_{-0.4}$	13	63.5	31.5 $^{+0.4}_{+0.1}$	76.5	225	50 ±0.15	7
φ63	90	65	35	44	1/2	M12×1.5	102	15	261	63	31.5	40	40 $^{-0.1}_{-0.4}$	15	80	40 $^{+0.4}_{+0.1}$	93	247	60 ±0.15	10
φ80	110	80	35	56	3/4	M16×1.5	108	18	291	72	31.5	40	40 $^{-0.1}_{-0.4}$	18	80	40 $^{+0.4}_{+0.1}$	93	284	72 ±0.25	14
φ100	135	98	40	58	3/4	M18×1.5	114	20	316	84	40	50	50 $^{-0.1}_{-0.4}$	20	100	50 $^{+0.4}_{+0.1}$	117	302	85 ±0.25	14
φ125	165	122	45	66	1	M22×1.5	129	23	365	100	50	63	63 $^{-0.1}_{-0.4}$	24	126	63 $^{+0.4}_{+0.1}$	143	352	105 ±0.25	14
φ160	210	160	55	73	1	M27×1.5	155	27	445	137	71	90	80 $^{-0.1}_{-0.6}$	31	160	80 $^{+0.6}_{+0.1}$	183	403	132 ±0.25	18
φ180	235	182	55	74	1 1/4	M30×1.5	171	29	480	150	80	100	100 $^{-0.1}_{-0.6}$	33	200	100 $^{+0.6}_{+0.1}$	225	445	148 ±0.25	20
φ200	262	200	55	85	1 1/2	M33×1.5	181	31	526	170	90	115	125 $^{-0.1}_{-0.6}$	36	251	125 $^{+0.6}_{+0.1}$	276	497	165 ±0.25	25
φ250	325	250	65	107	2	M42×1.5	197	39	596	185	100	125	125 $^{-0.1}_{-0.6}$	48	251	125 $^{+0.6}_{+0.1}$	280	606	208 ±0.25	35

Symbol / Bore size	BE	BF	BG	BH	BI	BJ	BK	B Rod							C Rod						
								C	D	E	F	G	H	J	C	D	E	F	G	H	J
φ32	43	231	20	67.5	63	11	35	35	14	10	25	M16×1.5	18	55	35	12	8	18	M12×1.5	14	48
φ40	43	231	23	75.5	69	11	35	40	19	10	30	M20×1.5	22.4	60	36	14	10	25	M16×1.5	18	55
φ50	48	255	29	87.5	85	14	38	46	24	10	35	M24×1.5	28	65	40	19	10	30	M20×1.5	22.4	60
φ63	57	283	32.5	105	98	18	45	55	30	15	45	M30×1.5	35.5	80	46	24	10	35	M24×1.5	28	70
φ80	68	324	43.5	127	118	18	50	65	41	15	60	M39×1.5	45	95	55	30	15	45	M30×1.5	35.5	80
φ100	75	348	54.5	152.5	150	22	55	80	50	20	75	M48×1.5	56	115	65	41	15	60	M39×1.5	45	100
φ125	90	410	65	187.5	175	26	66	95	65	25	95	M64×2.0	71	140	80	50	20	75	M48×1.5	56	120
φ160	106	473	85	237	225	33	75	115	85	30	120	M80×2.0	90	175	95	65	25	95	M64×2.0	71	150
φ180	118	525	92.5	265.5	243	33	85	125	95	30	140	M95×2.0	100	195	105	75	25	110	M72×2.0	80	165
φ200	135	577	103	296	272	36	98	140	105	30	150	M100×2.0	112	205	115	85	30	120	M80×2.0	90	175
φ250	176	706	125	370.5	335	45	131	170	133	45	195	M130×2.0	140	260	140	105	30	150	M100×2.0	112	215

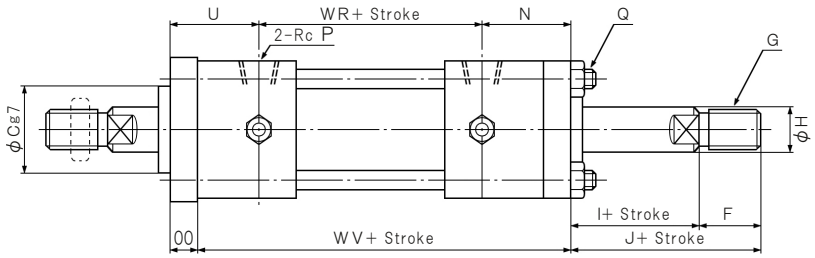
Nominal pressure 14 MPa

Dimension

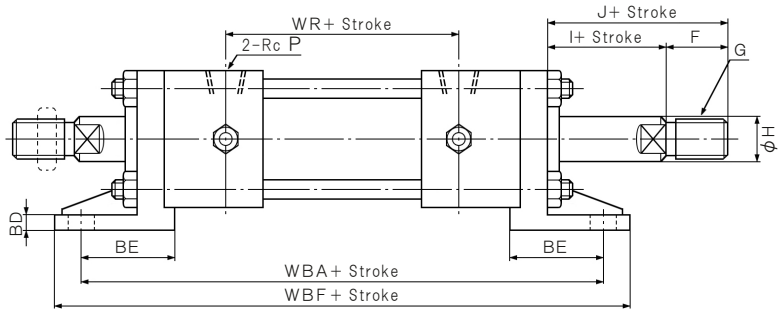
Double rod type
Basic / SD



Double rod type
Rod flange /FA



Double rod type
Axial foot /LB



Unit : mm

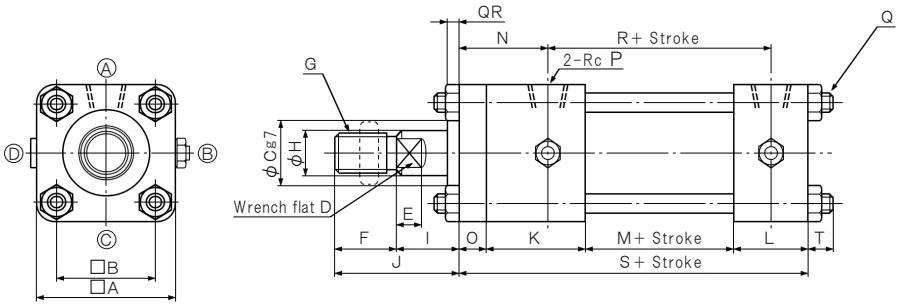
Symbol / Bore size	I	K	N	O	P	Q	U	00	WR	WS	WV	BD	BE	WBA	WBF
φ32	30	40	36	11	3/8	M8×1.25	38	13	94	166	155	7	46	230	256
φ40	30	38	36	11	3/8	M10×1.25	38	13	94	166	155	7	46	230	256
φ50	30	44	42	13	1/2	M10×1.25	47	18	98	182	169	7	51	252	282
φ63	35	44	44	15	1/2	M12×1.5	49	20	106	194	179	10	60	278	314
φ80	35	56	56	18	3/4	M16×1.5	62	24	110	222	204	14	68	322	362
φ100	40	56	58	20	3/4	M18×1.5	66	28	116	232	212	14	75	342	388
φ125	45	65	66	24	1	M22×1.5	75	33	132	264	240	14	90	396	454
φ160	55	65	73	31	1	M27×1.5	83	41	158	304	273	18	106	454	524
φ180	55	69	74	33	1 1/4	M30×1.5	87	46	174	322	289	20	118	492	572
φ200	55	83	85	37	1 1/2	M33×1.5	99	51	192	362	325	25	135	558	638
φ250	65	102	107	47	2	M42×1.5	125	65	202	416	369	35	176	674	774

Symbol / Bore size	B Rod					C Rod				
	C	F	G	H	J	C	F	G	H	J
φ32	35	25	M16×1.5	18	55	35	18	M12×1.5	14	48
φ40	40	30	M20×1.5	22. 4	60	36	25	M16×1.5	18	55
φ50	46	35	M24×1.5	28	65	40	30	M20×1.5	22. 4	60
φ63	55	45	M30×1.5	35. 5	80	46	35	M24×1.5	28	70
φ80	65	60	M39×1.5	45	95	55	45	M30×1.5	35. 5	80
φ100	80	75	M48×1.5	56	115	65	60	M39×1.5	45	100
φ125	95	95	M64×2.0	71	140	80	75	M48×1.5	56	120
φ160	115	120	M80×2.0	90	175	95	95	M64×2.0	71	150
φ180	125	140	M95×2.0	100	195	105	110	M72×2.0	80	165
φ200	140	150	M100×2.0	112	205	115	120	M80×2.0	90	175
φ250	170	195	M130×2.0	140	260	140	150	M100×2.0	112	215

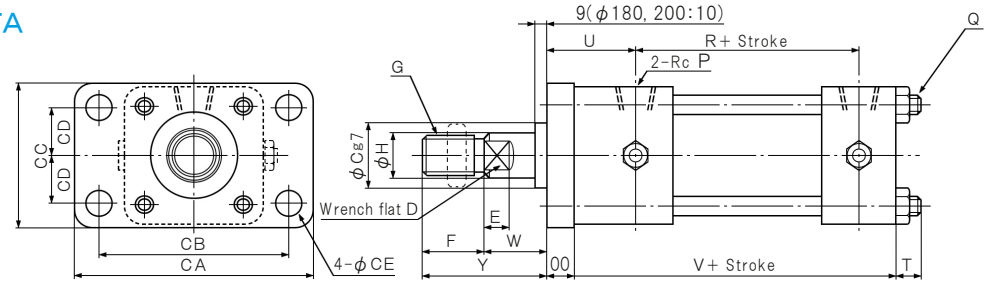
Nominal pressure 21 MPa

Dimension

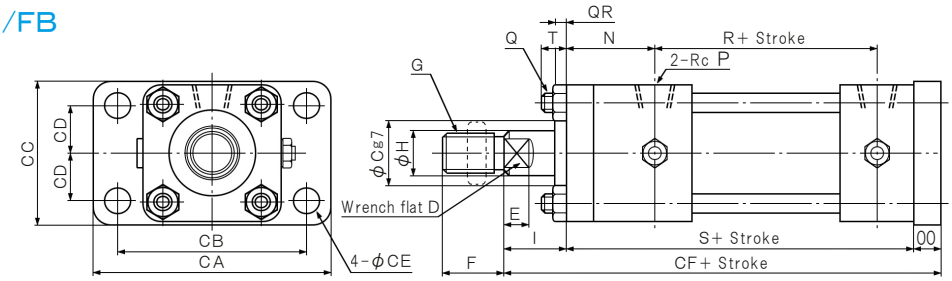
Single rod type
Basic / SD



Single rod type
Rod flange /FA



Single rod type
Head flange /FB



Unit : mm

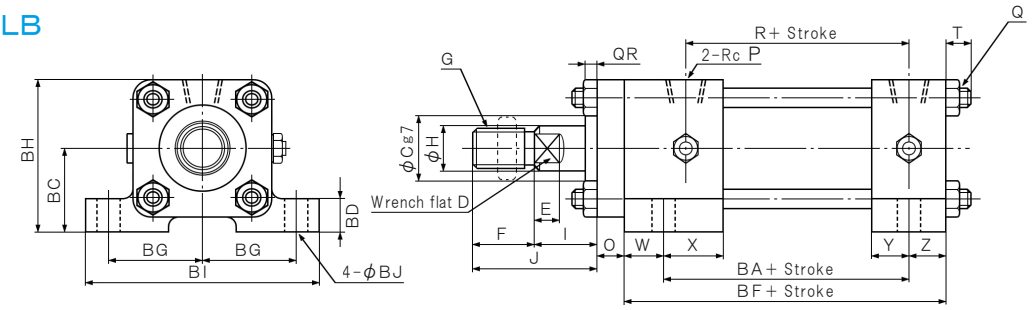
Symbol / Bore size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
φ40	70	50	40	19	10	25	M20×1.5	22.4	30	55	47	32	64	43	13	3/8
φ50	85	62	46	24	10	30	M24×1.5	28	30	60	52	37	68	48	15	1/2
φ63	100	74	55	30	15	35	M30×1.5	35.5	35	70	57	37	75	56	18	1/2
φ80	125	92	65	41	15	45	M39×1.5	45	35	80	67	42	85	69	24	3/4
φ100	160	120	80	50	20	55	M48×1.5	56	40	95	67	42	95	71	26	3/4
φ125	190	145	95	65	25	75	M64×2.0	71	45	120	77	52	105	83	33	1
φ160	240	185	120	85	30	90	M80×2.0	90	55	145	80	51	132	94	41	1
φ180	260	195	130	95	30	105	M95×2.0	100	55	160	96	61	146	105	41	1 1/4
φ200	310	230	140	105	30	110	M100×2.0	112	55	165	106	76	156	121	51	1 1/2
φ250	Contact us															

Symbol / Bore size	Q	R	S	T	U	V	W	Y	00	QR	CA	CB	CC	CD	CE	CF
φ40	M12×1.5	98	156	13	45	143	28	53	15	11	122	98	73	25	11	201
φ50	M14×1.5	106	172	14	53	157	25	55	20	14	145	118	88	30	14	222
φ63	M16×1.5	113	187	16	62	169	29	64	24	15	175	140	106	36.5	18	246
φ80	M18×1.5	129	218	18	69	194	35	80	24	9	210	175	130	45	22	277
φ100	M22×1.5	139	230	21	76	204	35	90	31	14	260	215	165	57.5	26	301
φ125	M27×1.5	159	267	25	87	234	41	116	37	13	330	270	205	72.5	33	349
φ160	M33×1.5	186	304	29	99	263	50	140	46	14	375	315	243	90	36	405
φ180	M39×1.5	210	344	36	120	303	55	160	56	10	412	345	265	100	39	455
φ200	M45×1.5	228	389	41	136	338	55	165	66	10	500	412	315	115	48	510
φ250	Contact us															

Nominal pressure 21 MPa

Dimnsion

Single rod type
Axial foot /LB

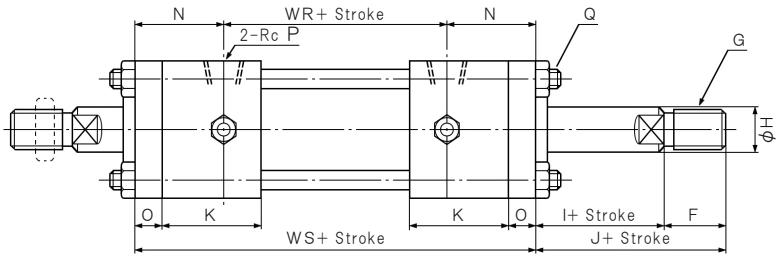


Unit : mm

Symbol / Bore size	C	D	E	F	G	H	I	J	O	P	Q	R	T
φ40	40	19	10	25	M20×1.5	22.4	30	55	13	3/8	M12×1.5	98	13
φ50	46	24	10	30	M24×1.5	28	30	60	15	1/2	M14×1.5	106	14
φ63	55	30	15	35	M30×1.5	35.5	35	70	18	1/2	M16×1.5	113	16
φ80	65	41	15	45	M39×1.5	45	35	80	24	3/4	M18×1.5	129	18
φ100	80	50	20	55	M48×1.5	56	40	95	26	3/4	M22×1.5	139	21
φ125	95	65	25	75	M64×2.0	71	45	120	33	1	M27×1.5	159	25
φ160	120	85	30	90	M80×2.0	90	55	145	41	1	M33×1.5	186	29

Symbol / Bore size	W	X	Y	Z	BA	BC	BD	BF	BG	BH	BI	BJ	QR
φ40	16	31	16	16	111	42 ±0.15	15	143	49	77	122	11	11
φ50	18	34	18	19	120	55 ±0.15	20	157	59	97.5	145	14	14
φ63	18	39	18	19	132	63 ±0.15	25	169	70	113	175	18	15
φ80	21	46	21	21	152	75 ±0.25	30	194	87.5	137.5	210	22	9
φ100	23	44	23	24	162	85 ±0.25	35	209	107.5	165	260	26	14
φ125	28	49	28	29	182	105 ±0.25	45	239	135	200	330	33	13
φ160	31	49	31	31	212	125 ±0.25	50	274	157.5	245	375	36	14

Double rod type
Basic / SD



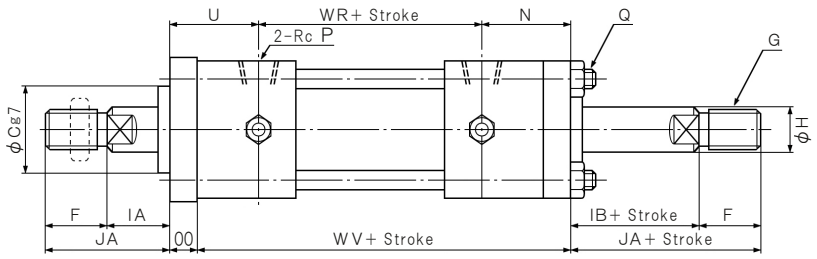
Unit : mm

Symbol / Bore size	F	G	H	I	J	K	N	O	P	Q	WR	WS
φ40	25	M20×1.5	22.4	30	55	47	43	13	3/8	M12×1.5	98	184
φ50	30	M24×1.5	28	30	60	52	48	15	1/2	M14×1.5	106	202
φ63	35	M30×1.5	35.5	35	70	57	56	18	1/2	M16×1.5	113	225
φ80	45	M39×1.5	45	35	80	67	69	24	3/4	M18×1.5	129	267
φ100	55	M48×1.5	56	40	95	67	71	26	3/4	M22×1.5	139	281
φ125	75	M64×2.0	71	45	120	77	83	33	1	M27×1.5	159	325
φ160	90	M80×2.0	90	55	145	80	94	41	1	M33×1.5	186	374

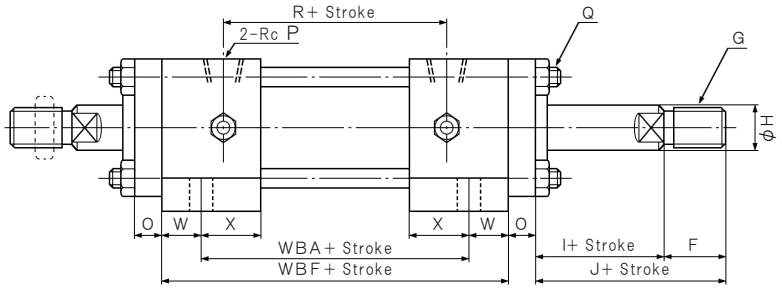
Nominal pressure 21 MPa

Dimension

Double rod type
Rod flange /FA



Double rod type
Axial foot /LB



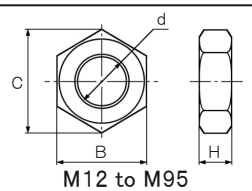
Unit : mm

Symbol / Bore size	C	F	G	H	I	J	N	O	P	Q
φ40	40	25	M20×1.5	22.4	30	55	43	13	3/8	M12×1.5
φ50	46	30	M24×1.5	28	30	60	48	15	1/2	M14×1.5
φ63	55	35	M30×1.5	35.5	35	70	56	18	1/2	M16×1.5
φ80	65	45	M39×1.5	45	35	80	69	24	3/4	M18×1.5
φ100	80	55	M48×1.5	56	40	95	71	26	3/4	M22×1.5
φ125	95	75	M64×2.0	71	45	120	83	33	1	M27×1.5
φ160	120	90	M80×2.0	90	55	145	94	41	1	M33×1.5

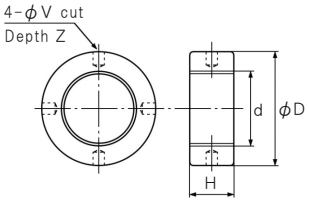
Symbol / Bore size	R	U	W	X	00	IA	IB	JA	WR	WV	WBA	WBF
φ40	98	45	16	31	15	28	30	53	98	171	126	158
φ50	106	53	18	34	20	25	30	55	106	187	136	172
φ63	113	62	18	39	24	29	35	64	113	207	153	189
φ80	129	69	21	46	24	35	35	80	129	243	177	219
φ100	139	76	23	44	31	35	40	90	139	255	183	229
φ125	159	87	28	49	37	41	45	116	159	292	203	259
φ160	186	99	31	49	46	50	55	140	186	333	230	292

Lock nut

Unit : mm



M12 to M95



M100、M130

Screw / Symbol	M12	M16	M20	M24	M30	M39	M48	M64	M72	M80	M95	M100	M130
d	M12 P1.5	M16 P1.5	M20 P1.5	M24 P1.5	M30 P1.5	M39 P1.5	M48 P1.5	M64 P2.0	M72 P2.0	M80 P2.0	M95 P2.0	M100 P2.0	M130 P2.0
H	7	10	12	14	18	23	29	38	42	48	57	45	60
B	19	24	30	36	46	60	75	95	105	115	135	——	
C	21.9	27.7	34.6	41.6	53.1	69.3	86.5	110	121	133	156	——	
φD	——											155	205
φV	——											15	15
Z	——											18	18

Mass

Nominal pressure 14 MPa

Single rod type (THC)

Unit:kg

Symbol / Bore size	Basic weight at 0 mm of stroke										Additional weight per each 100 mm of stroke	
	SD		FA		FB		LB		CA・CB			
	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod
φ32	3.1	3.0	3.3	3.2	3.5	3.4	3.5	3.4	3.5	3.4	0.9	0.8
φ40	3.9	3.8	4.1	4.0	4.4	4.1	4.4	4.3	4.5	4.4	1.0	0.9
φ50	5.9	5.8	6.3	6.2	6.9	6.8	6.3	9.2	6.9	6.8	1.4	1.2
φ63	9.1	8.7	9.6	9.2	10.6	10.2	9.9	9.5	11.1	10.7	2.0	1.7
φ80	16.1	15.1	17.0	16.0	18.6	17.7	17.5	16.6	18.9	18.0	3.4	3.0
φ100	24.9	23.5	26.7	25.3	29.4	28.0	27.2	25.8	31.1	29.7	4.9	4.2
φ125	44.9	42.0	48.4	45.4	53.2	50.3	49.7	46.8	56.5	53.6	7.6	6.4
φ160	81.1	75.7	87.9	82.5	97.3	92.1	90.2	84.7	104.2	98.7	13.9	12.0
φ180	112.9	105.5	122.6	115.2	136.3	128.3	126.7	119.3	151.0	143.6	17.4	15.1
φ200	155.4	147.1	163.3	155.0	182.7	174.4	171.3	163.0	203.6	195.3	21.4	18.7
φ250	269.0	254.0	284.0	269.0	322.2	307.0	309.2	294.0	339.2	324.0	33.6	29.6

Double rod type (THC−WR)

Unit:kg

Symbol / Bore size	Basic weight at 0 mm of stroke						Additional weight per each 100 mm of stroke	
	SD		FA		LB			
	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod
φ32	3.7	3.6	3.9	3.8	4.1	4.0	1.22	0.98
φ40	4.8	4.7	5.0	4.9	5.3	5.2	1.49	1.20
φ50	7.3	7.1	7.7	7.5	7.7	7.5	2.18	1.67
φ63	11.5	10.8	12.0	11.3	12.3	11.6	3.32	2.46
φ80	20.6	19.1	21.5	20.0	22.0	20.6	5.53	4.30
φ100	32.3	30.2	34.1	32.0	34.6	32.5	8.38	6.51
φ125	57.8	53.1	61.3	56.6	62.6	57.9	13.51	10.27
φ160	108.0	97.0	114.8	103.8	117.1	106.0	24.39	18.53
φ180	143.9	131.0	153.6	140.7	157.7	144.8	30.35	23.39
φ200	199.0	185.1	207.3	193.0	215.3	201.0	37.64	29.19
φ250	353.7	324.8	368.7	339.8	393.9	364.8	61.39	47.39

Nominal pressure 21 MPa

Single rod type (THC−21)

Unit:kg

Symbol / Bore size	Basic weight at 0 mm of stroke				Additional weight per each 100 mm of stroke
	SD	FA	FB	LB	
φ40	4.1	5.1	5.4	5.4	1.2
φ50	8.1	9.3	10.0	9.2	2.0
φ63	13.2	15.1	16.9	14.5	2.9
φ80	23.6	25.6	28.3	25.5	4.5
φ100	39.6	44.0	49.3	44.7	7.4
φ125	68.5	78.5	87.1	77.0	12.1
φ160	126.0	139.7	156.0	130.7	19.2
φ180	155.6	177.9	199.4	——	21.2
φ200	244.9	282.1	319.5	——	23.9
φ250	393.3	470.1	525.4	——	35.4

Double rod type (THC−21−WR)

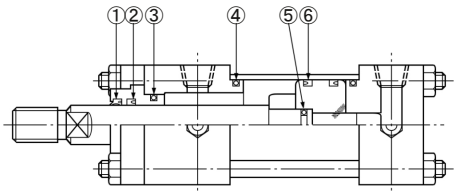
Unit:kg

Symbol / Bore size	Basic weight at 0 mm of stroke			Additional weight per each 100 mm of stroke
	SD	FA	LB	
φ40	5.1	5.8	6.1	1.4
φ50	9.3	10.5	10.4	2.3
φ63	15.3	17.2	16.6	3.4
φ80	27.6	29.6	29.5	5.4
φ100	46.7	51.1	51.8	9.0
φ125	81.5	91.5	90.0	15.4
φ160	151.5	165.2	156.2	25.5

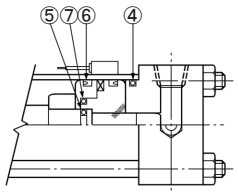
Example) THC−FA80−N−200
Basic weight at 0 mm of stroke: 17.0 kg Additional weight at 200 mm of stroke: 3.4 × 200/100 = 6.8 kg
17.0 kg + 6.8 kg = 23.8 kg

Nominal pressure 14 MPa

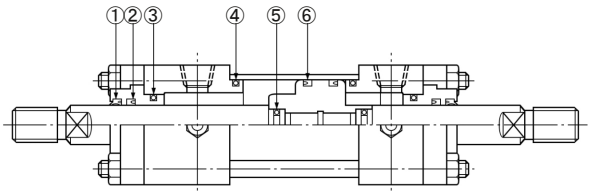
Single rod type



With auto switch



Double rod type

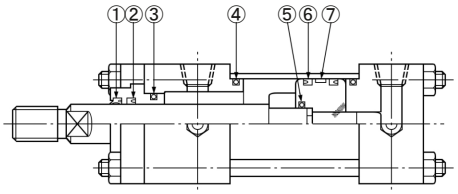


No.	①		②		③		④	⑤		⑥	⑦
Description	Dust seal		Rod packing		Metal gasket		Tube gasket	Piston gasket		Piston packing	Piston gasket
Q'ty	1(2)		1(2)		1(2)		2	1(2)		2	1
Bore size / Rod type	B Rod	C Rod	B Rod	C Rod	B Rod	C Rod	B, C Rod	B Rod	C Rod	B, C Rod	B, C Rod
φ32	LBH-18	LBH-14	USH-18	USH-14	G-25		S-29	S-10		OUHR-32	S-15
φ40	DHS-22.4	DHS-18	UHR-22.4	UHR-18	G-30		G-35	S-14		UHP-40	S-20
φ50	DHS-28	DHS-22.4	UHR-28	UHR-22.4	G-30		G-45	P-15		UHP-50	S-26
φ63	DHS-35.5	DHS-28	UHR-35.5	UHR-28	G-40		G-58	P-20		UHP-63	S-32
φ80	DHS-45	DHS-35.5	UHR-45	UHR-35.5	G-50		G-75	G-25		UHP-80	S-46
φ100	DHS-56	DHS-45	UHR-56	UHR-45	G-60		G-95	P-32		UHP-100	G-55
φ125	DHS-71	DHS-56	UHR-71	UHR-56	G-75		G-120	P-42		UHP-125	G-75
φ160	DHS-90	DHS-71	UHR-90	UHR-71	G-95	G-75	G-150	G-55		UHP-160	——
φ180	DHS-100	DHS-80	UHR-100	UHR-80	G-110	G-85	G-170	G-60		UHP-180	——
φ200	DHS-112	DHS-90	UHR-112	UHR-90	G-125	G-95	G-190	G-100	G-80	UHP-200	——
φ250	DHS-140	DHS-112	UHR-140	UHR-112	G-155	G-125	G-240	G-130	G-100	UHP-250	——

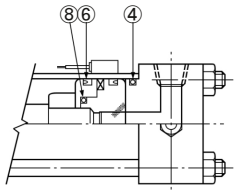
Note) The number of Q'ty inside ( ) is double rod type.

Nominal pressure 21 MPa

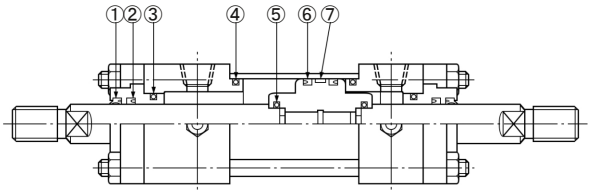
Single rod type



With auto switch



Double rod type



No.	①	②	③	④	⑤	⑥	⑦	⑧
Description	Dust seal	Rod packing	Metal gasket + BR	Tube gasket + BR	Piston gasket	Piston packing + BR	Wearing	Piston gasket
Bore size / Q'ty	1(2)	1(2)	1(2)	2	1(2)	2	1	1
φ40	DHS-22.4	UHR-22.4	G- 40+BR	G- 35+BR	P-18	UHP- 40+BR	40x36x10	S-18
φ50	DHS-28	UHR-28	G- 45+BR	G- 45+BR	P-22	UHP- 50+BR	50x46x12	P-22
φ63	DHS-35.5	UHR-35.5	G- 55+BR	G- 58+BR	P-28	UHP- 63+BR	63x57x16	P-28
φ80	DHS-45	UHR-45	G- 55+BR	G- 75+BR	G-35	UHP- 80+BR	80x74x20	G-35
φ100	DHS-56	UHR-56	G- 65+BR	G- 95+BR	G-45	UHP-100+BR	100x94x25	——
φ125	DHS-71	UHR-71	G- 80+BR	G-120+BR	G-65	UHP-125+BR	125x119x30	——
φ160	DHS-90	UHR-90	G-100+BR	G-150+BR	G-80	UHP-160+BR	160x154x40	——
φ180	DHS-100	UHR-100+BR	G-115+BR	G-170+BR	G-85	UHP-180+BR	180x174x50	——
φ200	DHS-112	UHR-112+BR	G-130+BR	G-190+BR	G-95	UHP-200+BR	200x194x50	——
φ250	Contact us							

Note) The number of Q'ty inside ( ) is double rod type.
There is no backup ring of piston packing for models with auto switch.

Hydraulic cylinder

For air–hydro booster
Compact type hydraulic cylinder

How to order

SHC - W - SD - 40 - 30 - M - DZ73 - 2 - N

Series symbol

Mounting type

Symbol	With auto switch
Nil	Without magnet
W	Magnet sensing

Symbol	Bore size
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Symbol	Rod end threed type
Nil	Female thread
M	Male thread

Stroke (mm)

Note : Refer to the table 1 below.

Symbol	Lock nut (For male thread)
Nil	Without lock nut
N	With lock nut

Symbol	Number of auto switches
1	1 pc.
2	2 pcs.
N	"N" pcs.

Symbol	Auto switch
Nil	Without auto switch
Model	With auto switch

Note : For applicable auto switches, refer to the table 2 below.

◀ Standard strokes ▶

Table 1

Bore size (mm)	Standard strokes (mm)
20, 25	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
32	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75
40, 50, 63, 80, 100	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

※ Overall length of intermediate strokes.
55, 60, 65 and 70 mm stroke cylinders have the same overall length as a 75 mm stroke cylinder. (Bore size 32 to 100 mm)
80, 85, 90 and 95 mm stroke cylinders have the same overall length as a 100 mm stroke cylinder. (Bore size 40 to 100 mm)

◀ Applicable auto switches ▶

Table 2

Bore size (mm)	Read auto switch		Solid state auto switch	
	Model	Load voltage	Model	Load voltage
20, 25	DA93	DC24V, AC100V	DM9B	DC24V
32, 40, 50, 63, 80, 100	DZ73		DY59B	

Specification

Action	Double acting / Single rod type
Fluid	Hydrauic fluid or air
Nominal pressure	16 MPa
Proof pressure	24 MPa
Minimum operating pressure	0.15 MPa (φ20, 25, 32 : 0.2 MPa or less)
Ambient and fluid temperature	Without auto switch : −10 to 80℃ With auto switch : −10 to 60℃
Piston speed	8 to 100 mm/sec
Cushion	None
Rod end thread	Female thread, Male thread
Stroke length tolerance	$^{0}_{+0.8}$ mm
Mounting type	Basic type
Mounting method	Through hole

Note) Since SHC series does not have an air release valve, release air from piping, etc.

Thrust table

Pushing side

Unit : kN

Bore size (mm)	Piston area (mm²)	Operating pressure (MPa)							
		0.35	0.5	0.7	3.5	7	10	14	16
ϕ20	314	0.10	0.15	0.21	1.09	2.19	3.14	4.39	5.02
ϕ25	491	0.17	0.24	0.34	1.71	3.43	4.91	6.87	7.85
ϕ32	804	0.28	0.40	0.56	2.81	5.62	8.04	11.26	12.86
ϕ40	1257	0.44	0.62	0.88	4.40	8.80	12.57	17.60	20.11
ϕ50	1963	0.68	0.98	1.37	6.87	13.74	19.63	27.48	31.40
ϕ63	3117	1.09	1.55	2.18	10.91	21.82	31.17	43.64	49.87
ϕ80	5027	1.76	2.51	3.52	17.59	35.19	50.27	70.38	80.43
ϕ100	7854	2.75	3.92	5.49	27.49	54.98	78.54	109.96	125.66

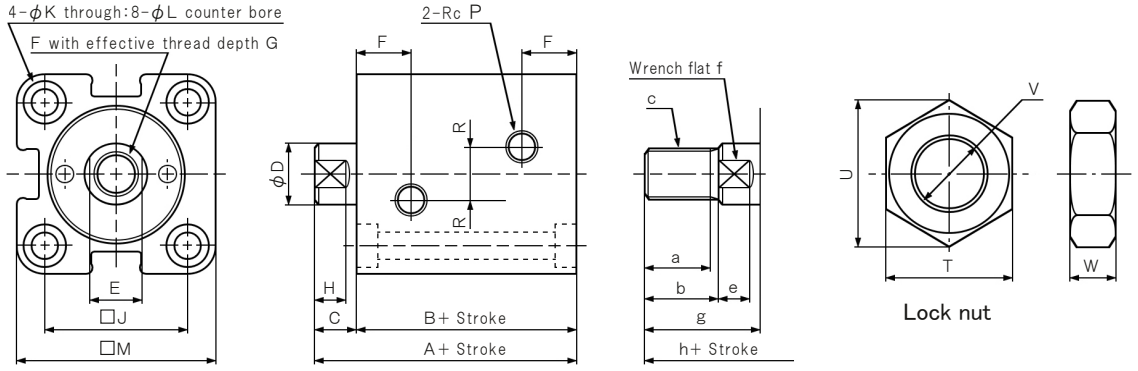
Pulling side

Unit : kN

Bore size (mm)	Piston area (mm²)	Operating pressure (MPa)							
		0.35	0.5	0.7	3.5	7	10	14	16
ϕ20	201	0.07	0.10	0.14	0.70	1.40	2.01	2.81	3.21
ϕ25	337	0.11	0.16	0.23	1.17	2.35	3.37	4.71	5.39
ϕ32	550	0.19	0.27	0.38	1.92	3.85	5.50	7.70	8.80
ϕ40	863	0.30	0.43	0.60	3.02	6.04	8.63	12.08	13.80
ϕ50	1348	0.47	0.67	0.94	4.71	9.43	13.48	18.87	21.56
ϕ63	2127	0.74	1.06	1.19	7.44	14.88	21.27	29.78	34.03
ϕ80	3436	1.20	1.72	2.40	12.02	24.05	34.36	48.10	54.97
ϕ100	5391	1.88	2.69	3.77	18.86	37.73	53.91	75.47	86.25

Note) The weight of jig or mold during vertical operation should be 50% or less of the return thrust value to obtain stable operation and speed.

Dimension



Unit : mm

Symbol / Bore size	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R	S
ϕ20	51	43	8	12	10	M8×1.25	10	6	30	5.5	9.5 depth 5.4	43	1/8	16.5	6	11.5
ϕ25	53	45	8	14	12	M10×1.5	12	6	36	5.5	9.5 depth 5.4	49	1/8	17	8	12
ϕ32	66	56	10	18	14	M12×1.75	15	7	47	6.6	11 depth 6.5	63	1/4	19.5	10	19.5
ϕ40	75	65	10	22.4	19	M16×2.0	20	7	52	9	14 depth 8.6	71	1/4	21.5	10	21.5
ϕ50	81	70	11	28	24	M20×2.5	24	8	58	11	17.5 depth 10.8	81	1/4	24	10	24
ϕ63	90	77	13	35.5	30	M27×3.0	33	9	69	13	20 depth 13	100	1/4	27.5	10	27.5
ϕ80	105	88	17	45	41	M30×3.5	36	14	86	15	23 depth 15.2	121	3/8	31	15	31
ϕ100	132	106	26	56	50	M39×4.0	45	21	106	17	26 depth 17.5	146	3/8	36	15	36

Symbol / Bore size	a	b	c	e	f	g	h
ϕ20	12.5	15	M10×1.25	6	10	23	66
ϕ25	15.5	18	M12×1.25	6	12	26	71
ϕ32	22	25	M16×1.5	7	14	35	91
ϕ40	27	30	M20×1.5	7	19	40	105
ϕ50	32	35	M24×1.5	8	24	46	116
ϕ63	42	45	M30×1.5	9	30	58	135
ϕ80	57	60	M39×1.5	14	41	77	165
ϕ100	72	75	M48×1.5	21	50	101	207

Lock nut

Symbol / Bore size	Part no.	T	U	V	W
ϕ20	NTH-025	17	19.6	M10×1.25	6
ϕ25	NTH-032	19	21.9	M12×1.25	7
ϕ32	NTH-040	22	25.4	M16×1.5	10
ϕ40	NTH-050	27	31.2	M20×1.5	12
ϕ50	NTH-060	32	37	M24×1.5	14
ϕ63	NTH-080	41	47.3	M30×1.5	17
ϕ80	NTH-100	55	63.5	M39×1.5	20
ϕ100	NTH-125	70	80.8	M48×1.5	26

Mass

Unit : kg

Bore size	Standard strokes (mm)											
	5	10	15	20	25	30	35	40	45	50	75	100
ϕ20	0.22	0.24	0.26	0.28	0.31	0.33	0.35	0.37	0.39	0.41	——	——
ϕ25	0.31	0.34	0.37	0.39	0.42	0.45	0.48	0.50	0.53	0.56	——	——
ϕ32	0.58	0.63	0.67	0.72	0.76	0.80	0.85	0.89	0.94	0.98	1.20	1.42
ϕ40	0.93	0.99	1.05	1.11	1.17	1.22	1.28	1.34	1.40	1.46	1.76	2.05
ϕ50	1.35	1.43	1.51	1.59	1.67	1.75	1.83	1.90	1.99	2.06	2.46	2.85
ϕ63	1.82	1.94	2.06	2.18	2.31	2.43	2.55	2.68	2.80	2.92	3.54	4.15
ϕ80	3.87	4.06	4.24	4.42	4.60	4.79	4.97	5.15	5.34	5.52	6.43	7.35
ϕ100	7.19	7.46	7.73	8.00	8.27	8.54	8.80	9.07	9.34	9.61	10.96	12.30

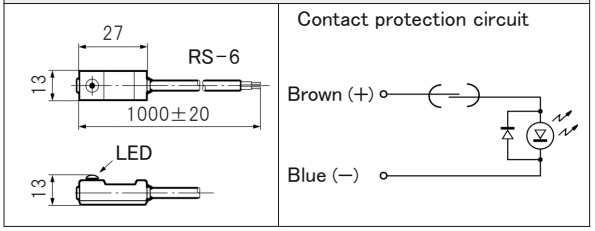
Auto Switch

Applicable cylinder : Tie-rod type hydraulic cylinder (THCW series)

Read auto switch		
Auto switch model	RS-6	
Voltage	24 VDC	100 V/200 VAC
Max. switching current	20 mA	20 mA
Max. switching capacity	5 W	5 VA
Average operating time	1 m SEC	
Insulation resistance	100 MΩ or more (at 500 VDC)	
Impact resistance	30 G	
Ambient temperature	−10 to 60℃ (Non-freezing)	
Lead wire	2 cores cable, 1 m	
Indicator light	Red LED illuminates when turned ON	

Read auto switch

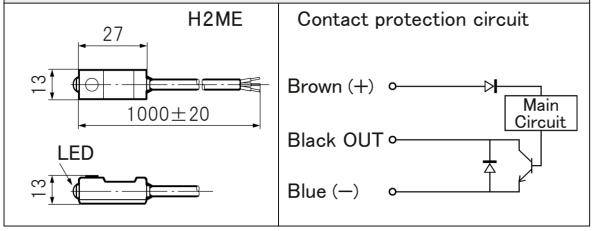
Dimentions and internal circuit



Solid state auto switch	
Auto switch model	H2ME
Output type	NPN
Voltage	5, 12, 24 VDC
Max. load current	5 mA (5 VDC),10 mA (12 VDC),20 mA (24 VDC)
Max. switching current	100 mA (5 VDC), 200 mA (24 VDC)
Internal voltage drop	0.6 V or less (24 VDC)
Max. leakage current	0.1 mA or less (24 VDC)
Impact resistance	30 G
Ambient temperature	−10 to 60℃ (Non-freezing)
Lead wire	3 cores cable, 1 m
Indicator light	Red LED illuminates when turned ON

Solod state auto switch

Dimentions and internal circuit



Mounting bracket compatibility : The same mounting bracket is used for both Read auto switch (RS-6) and Solid state auto switch (H2ME).

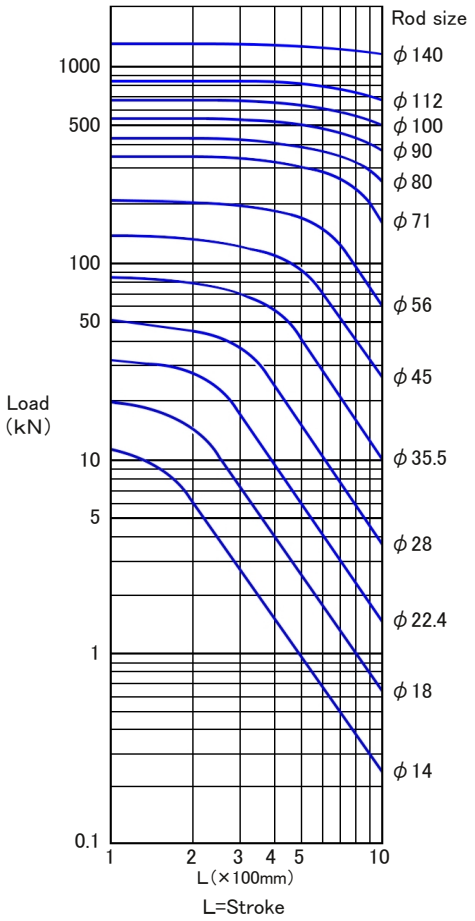
Applicable cylinder : Compact type hydraulic cylinder (SHC series)

	Read auto switch		Solid state auto switch	
Model No.	DA93	DZ73	DM9B	DY59B
Indicating lamp	Red LED illuminates when turned ON			
Lead wire	Two − core cable, 0.5 m			
Applicable load	Relay, PLC		24 VDC Relay, PLC	
Load voltage	24 VDC, 100 VAC		24 VDC	
Max. load current and load current range	24 VDC : 5 to 40 mA 100 VAC : 5 to 20 mA		2.5 to 40 mA	5 to 40 mA
Internal voltage drop	2.7 V or less	2.4 V or less	4 V or less	
Leakage current	——		0.8 mA or less	
Contact protection current	None		——	

Safety precautions

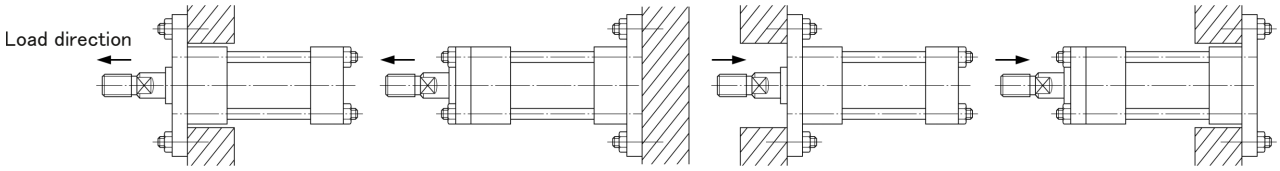
1. Refer to the bucking table and use below the maximum load so that bucking does not occur in the piston rod.
2. Mounting
   (1) Be certain to align the axis center of the piston with the load and direction of movement when connecting.
   (2) When an external guide is used, connect the piston rod end and the load in such a way that there is no interference.
   (3) Do not scratch or gouge the cylinder tube, piston rod by striking them with other objects.
   (4) Do not use until you confirm that the equipment can operate properly.
3. Piping
   (1) Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to clean inside the pipe.
   (2) When screwing in piping, be certain that debris like the sealing material do not get inside the piping.
   (3) Set up so that air cannot accumulate inside the piping.
4. Cushion
   (1) Readjust using the cushion needle.
   (2) Do not operate with the cushion needle in a fully closed condition.
   (3) Do not overly loosen the cushion needle.
5. Air release
   (1) Operate after loosen the air release valve and completely releasing any internal air.
   (2) When adjusting the air release, do not excessively loosen the plug.
6. Maintenance
   Before machinery is removed, first ensure that there are measures in place to prevent the fall or sudden, erratic movement of driven objects and equipment. Then, cut off the air supply and electric power, and reduce the pressure in the system to zero.

Bucking table



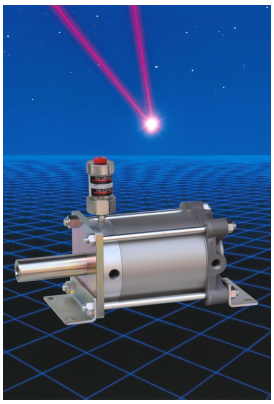
Precautions for mounting direction

For the FA or FB mounting type, mount as shown in the figure below depending on the load direction.



Related equipment

Pneumatic Booster



Rush Booster

Operates on pneumatic pressure and concerts it into hydraulic pressure several times to tens of times that of pneumatic pressure.

Fast feed with hydraulic pressure equivalent to pneumatic pressure, high thrust feed with increased high hydraulic pressure

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High thrust feed only with boosted high oil pressure

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